SECO

PRODUCT
GUIDE
2023

SECO

PRODUCT GUIDE

INDEX

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, HMIs, communications gateway, custom packaged product, and AI/IoT software solutions through worldwide engineering design, manufacturing, and technical support excellence.

Multi-decade experience at the forefront of innovation

Global/local footprint

We continuously **add value** to our products

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

900+ people

~300 R&D people of which ~180 in AI algorithm development

~8-10% of revenue invested in R&D every year
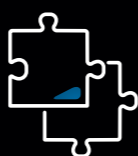
10 R&D centers
5 production plants

Data refer to 2022

HOW WE ADDRESS THE NEED FOR DIGITALIZATION FROM EDGE TO AI

We make devices smart through edge computing and our all-in-one IoT-AI software platform CLEA.

EDGE PLATFORMS, (off-the-shelf, semi-custom, full custom) **PAYMENT SOLUTIONS**

Data transfer to the cloud, Artificial Intelligence, Real time analytics, Data orchestration

((CLEA
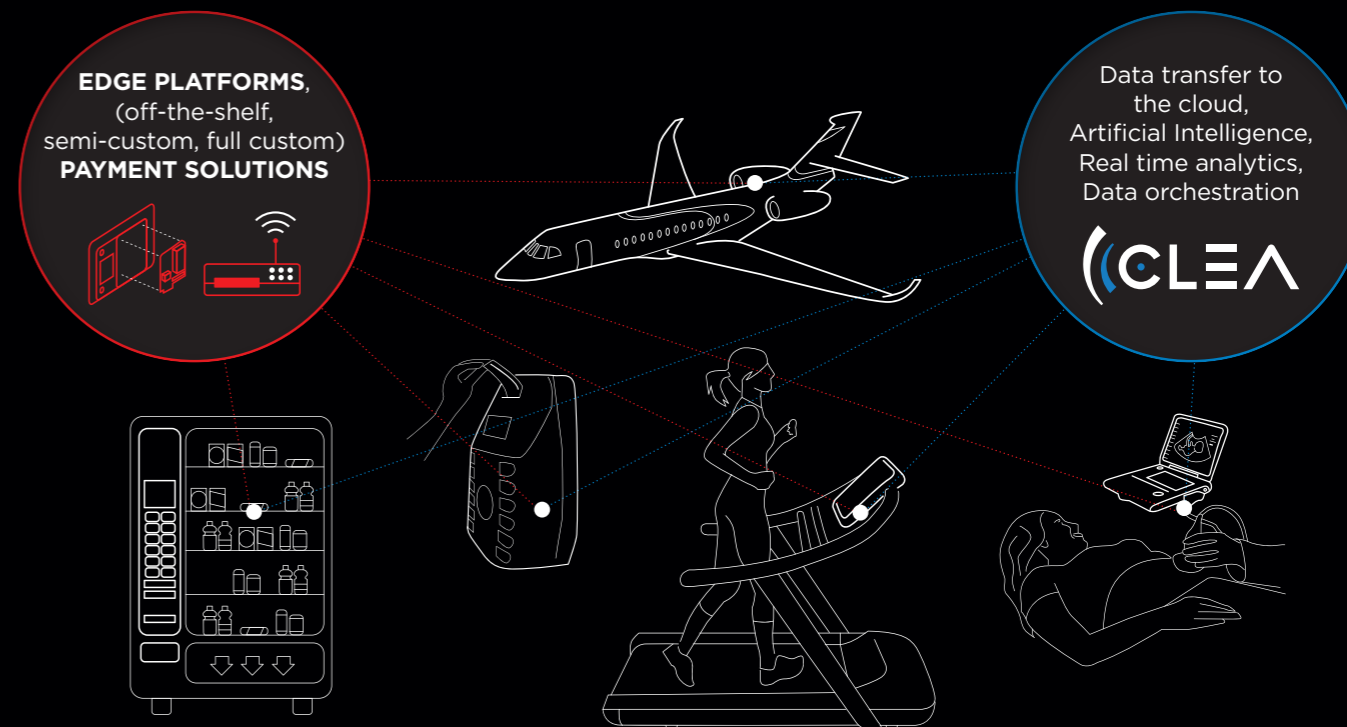
LEADING MARKETS

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, digital signage, and emerging applications like mobile devices and robotics.

ENERGY & UTILITIES

MEDICAL

SMART BUILDING & SMART CITIES

COFFEE & VENDING

TRANSPORTATION

DIGITAL SIGNAGE

INDUSTRIAL AUTOMATION

EDGE COMPUTING

KNOW - HOW

DESIGN
Decades of leading-edge embedded computing design: hardware, software, packaging

MANUFACTURING
Lean manufacturing maximizes quality, accelerates time-to-market, minimizes waste

SYSTEMS
Design and integration of packaged product with displays, controls, and interfaces

Analysis & design

FPGA design

BIOS engineering & development

Hardware engineering & development

Software development

Mechanical engineering & development

Signal integrity

Device driver development

Operating systems and BSPs

Firmware development

Validation & verification

Thermal analysis

PRODUCTS

OFF-THE-SHELF PRODUCTS

HMI SOLUTIONS AND FANLESS EMBEDDED COMPUTERS
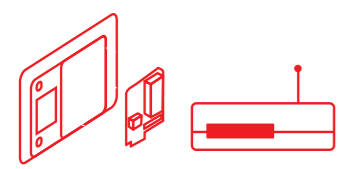
PAYMENT SYSTEMS

SINGLE BOARD COMPUTERS

Embedded NUC™

3.5"

Pico-ITX

other SBCs

MODULAR SOLUTIONS

Qseven®

SMARC®

COM-HPC®

COM Express®

ETX®/XTX

Trizeps

Myon

SEMI-CUSTOM SOLUTIONS

CUSTOM CARRIER BOARDS + MODULAR SOLUTIONS

FULL-CUSTOM SOLUTIONS

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

SERVICES

CUSTOMIZED COMPUTING PLATFORMS

Off-the-shelf SBC customization | Carrier board design for modular computing platforms
Full custom SBC design | European and US design and production

Design review

x86, Arm®, FPGA expertise & cross-platform design

In-house design and production excellence

Custom product design

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 available

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

Handheld devices

PARTNERSHIPS

LEADING SILICON VENDORS

intel partner Gold | ALTERA | nxp Gold Partner | Rockchip | AMD | AXELERA ARTIFICIAL INTELLIGENCE
QUALCOMM | XILINX | NVIDIA | ESPRESSIF | MEDIATEK

OPERATING SYSTEMS

Windows Embedded Partner | Linux | yocto PROJECT
ANDROID | Wind River Partner Program PLATINUM

STANDARDS & CONSORTIUMS

arm Leading Edge Partner | SGe STANDARDIZATION GROUP FOR EMBEDDED TECHNOLOGIES | Q.LEVEN | embedded NUC™ | SMARC module | DVB | VESA | SFF sig
COM·HPC | COM Express | PICMG | ETX 3.0 Long Term Support | Z-WAVE ALLIANCE | HDMI

IoT & ARTIFICIAL INTELLIGENCE

ACCELERATE YOUR BUSINESS WITH EDGE & CLOUD AI

((CLEA

A full-fledged AI as a service (AIaaS) platform for IoT

EXTENSIVE, SCALABLE DATA ORCHESTRATION
CLEA is scalable for any volume of connected devices and exchanged messages, and allows you to configure the data journey to your liking.

DEVICE LIFECYCLE MANAGEMENT
CLEA manages OTA updates, remote debugging, blue/green app deployments and much more, with a strong focus on security.

DEPLOY AI MODELS EVERYWHERE
Providing the capability to deploy AI models at scale in minutes, the CLEA platform enables companies to quickly reap the benefits of AI and achieve significant ROI.

OPEN-SOURCE CORE
All core middleware CLEA components are open-source software. This makes it not only future-proof and by design open for connection to the system of your choice but also benefits from a growing community.

CORE FEATURES

CLEA is our edge and cloud AI/IoT platform at the foundation of everything we build. Built by developers for developers, with hundreds of deployments and a growing community, CLEA is your central hub where your devices and data become actionable value – in the easiest and most secure way. And privacy, freedom and security are all built in.
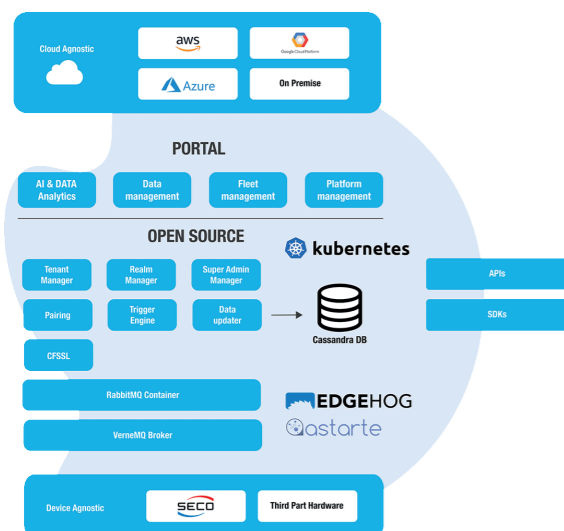
BUILT-IN MULTITENANCY
CLEA manages tenancies at different levels in different ways: from complete data segregation to logical grouping.

SCALE UP, BREAK OUT
When it comes to integrating with third parties and delivering your data, CLEA gives you all the tools: from full-fledged, customizable data pipelines, to your friendly rule engine.

BUILT FOR KUBERNETES
You love Kubernetes. We have something in common! CLEA leverages the most popular container orchestration solution to deliver all of its features. This means you can run CLEA anywhere.

TAKE YOUR PRODUCT TO THE NEXT LEVEL WITH AI

With our 180+ AI specialists we enhance the abilities of machines and people by using AI wherever computing takes place.

Augmented reality
Computer generated visual, auditory, haptic, somatosensory and olfactory enhancements for personalized experiences

Anomalies & forecast
Patterns, seasonality, anomalies, diagnostic, predictive, prescriptive, & descriptive analytics

Recommendation engine
Predict user relevant products, services, and information

Vision & audio
Facial recognition, voice authentication, body pose estimation, emotion AI, video analytics, speech synthesis, audio analytics, audio enhancer, etc.

Conversational AI
Beyond chatbots - intent recognition, natural language processing, entity extraction, etc.

Cybersecurity
Threat intelligence, internal/external attack vectors, alert triage, prioritize vulnerabilities, automation, verify remediation, etc.

GIVE YOUR CUSTOMERS FLEXIBILITY AND VALUE THROUGH CUSTOM APPS

CLEA is an open platform that gives you all the tools to build your own applications

Create your own CLEA apps with the same developing experience you would expect for mobile applications: use any language, quickly and easily. If you cannot do it by yourself: no problem, let us or one of our CLEA Development Partners build it for you.

BUILD YOUR APPS
Create your own customized app: from scratch or based on one of our pre-built structures. Match for your needs thanks to the open SDKs to create a value-added apps that can be distributed by the CLEA platform with to all your devices. It's easy.

USE YOUR PLATFORM
Does your application already have a management platform? Integrate CLEA with its complete set of APIs. Let CLEA act as the framework between it and your apps thanks to its incredible flexibility.

USE OUR APPS
We offer a dedicated app store with easily customizable, pre-developed apps and AI models to process and use your data. A team of 180 software developers enables rapid adaptation of existing applications or develops exactly the solution you need on demand.

IoT & ARTIFICIAL INTELLIGENCE

CLEA VERTICAL APPLICATIONS

COFFEE & VENDING

The perfect solution to monitor and maintain your vending machine fleet with ease

RECIPE SALES TREND ANALYSIS
CLEA shows the status of primary consumables, where the vending machine is located, and recipe trends. CLEA analyzes the user routines, predicting demand and suggesting satisfying recipes.

CLEA AI SMART REFILL
The CLEA AI smart refill system will identify vending machines that are running out of products and suggest refill routes in order to optimize operations and reduce consumption.

AI PREDICTIVE MAINTENANCE
Through real-time AI predictive maintenance models, CLEA identifies anomalies in vending machine functionality to avoid machine downtime. CLEA makes it easier to recognize faults and streamlines technical assistance procedures.

SMART CITIES

Bring intelligence to the construction, maintenance, and management of infrastructure such as roads, bridges and smart tunnels

DYNAMIC WEIGHING SYSTEM
Driving direction and lane analysis. Vehicle overload analysis. Time-based visualization, vehicle classification by vehicle type, number of axles, total weight.

STRUCTURAL MONITORING OF VIADUCTS
Viaduct health status visualization, alarm threshold generation and management.

STRUCTURAL TUNNEL MONITORING
Tunnel health status visualization, alarm threshold generation and management.

WATER PIPELINE AND PAYLOAD MONITORING
Monitoring water pH, temperature, dissolved oxygen, oxidation-reduction potential, dissolved chemicals. Temperature, humidity, pressure, daily, weekly and monthly consumption, graphics and comparisons.

SMART METROPOLITAN WASTE MANAGEMENT
Optimization in collecting containers, full or empty, garbage truck routes to improve environmental care and quality of life.

SMART PLATE RECOGNITION AND TRAFFIC MONITOR
Plate detection, traffic density, road conditions, camera geolocation.

ENERGY MANAGEMENT

Utilize AI to manage, maintain, and optimize a wide range of energy equipment, from building HVAC to EV charging stations to power supplies

AI PREDICTIVE MAINTENANCE
Utilize AI models to constantly monitor, analyze, predict anomalies, and act before your hard faults and downtime arise.

SMART BUILDING MANAGEMENT
Monitor crowds, room occupancy, temperature, and energy consumption.

REMOTE FAULT CORRECTION
Perform remote diagnostics, configuration updates, fault resolution, and upgrades.

INFORMATION DISPLAY MANAGEMENT
Remotely configure and manage on-site displays with user instructions, status/warnings, and general information/advertising.

REMOTE UPS MANAGEMENT
CLEA vertical application for UPS devices. The CLEA application allows complete management of UPS devices, monitoring their status, max load, input and output voltage and battery capacity.

INDUSTRIAL AUTOMATION

Monitor machine status with AI models and pre-emptively schedule maintenance interventions before issues arise

AI PREDICTIVE MAINTENANCE
Monitor the status of your machines with AI models. Schedule maintenance interventions on the machines before they break down.

REMOTE ASSISTANCE
Remote assistance avoids prolonged downtime of your machines increasing your productivity.

PERFORMANCE OPTIMIZATION
CLEA Smart HMI enables an advanced machine management system aimed at increasing efficiency and reducing machine downtime.

PLANT MONITORING
CLEA Smart Factory: this powerful tool immediately and automatically monitors and identifies machine malfunctions, and alerts operators of any anomalies.

IoT & ARTIFICIAL INTELLIGENCE

CLEA FEATURES LIST

DEVICE MANAGER

FLEET AND DEVICE MANAGER
With this feature the IT manager can control the whole device fleet.

FILE TRANSFER
File transfer allows you to manage file uploads on Linux devices.

REMOTE SHELL
This is a web-based remote terminal for Linux devices.

DEVICE STATUS
Check the status of all the connected devices (online/offline, size of free storage memory, ID info, connectivity info).

PORT FORWARDING
An easy way to SSH/VNC/Web-view remotely.

LOG REVIEW
For debugging and low-level analysis.

GEOLOCALIZATION
Accurately detect a device's geographic location on a map. The data can be sent via cell-ID, Wi-Fi, or through modem GPS.

MOBILE, WI-FI AND BLUETOOTH CONNECTIVITY MANAGER
A BLE mobile app that allows the client to manage the Wi-Fi and SIM/eSIM connectivity.

SECURE OVER THE AIR (OTA) SOFTWARE UPDATES
Remotely update a device's firmware, operating system, and/or containerized applications.

DATA ORCHESTRATION

TELEMETRY
The client has all the data coming from the machines always under control. He can also sort the data in groups, dates, download and visualize them in a very simple way.

DATA ORCHESTRATION
Simple and flexible data management allowing the client to program the data orchestration if needed.

DATA FLOW
This tool allows to manage data that flows towards different kind of software in cloud.

ARTIFICIAL INTELLIGENCE

DATA ANALYTICS
A feature that analyzes the data coming from the connected devices and machines.

CUSTOM AI ALGORITHMS ON THE EDGE AND CLOUD
The data analytics allows to develop AI models that can be a huge value added for the client in terms of ROI.

CUSTOM APPLICATION
CLEA platform supports loading external web apps that can be developed by third-party actors.

HIGH CUSTOMIZATION

CUSTOM THEME & LOGO
CLEA platform allows logo, look and feel customization. It's possible to choose a different color schema from a number of available schemas, for each tenant from the tenant admin panel.

DATA VISUALIZATION FRONTEND AND APPS
Starting from the client needs we can develop mobile apps and frontend services specifically tailored for their own use. An easy and quick solution to create powerful visualization services.

((CLEA

Documentation

OPEN SOURCE COMPONENTS

astarte

The CLEA data orchestration module
Astarte manages your devices, organizes their data, and automatically orchestrates your data science pipelines.

Docs   **Code repository**

EDGEHOG

The CLEA device manager module
EDGEHOG conveniently handles fundamental operations such as performing update campaigns, getting device status information, geolocation and much more.

Docs   **Code repository**

Open SDK for everything

Interface CLEA thanks to a variety of open SDKs that will let you connect devices to Astarte platform enabling rapid development and a pleasant developer experience.

SDK for ESP32 devices, based on esp-idf.

SDK for Linux: Qt5, Java, Rust, Python, Go.
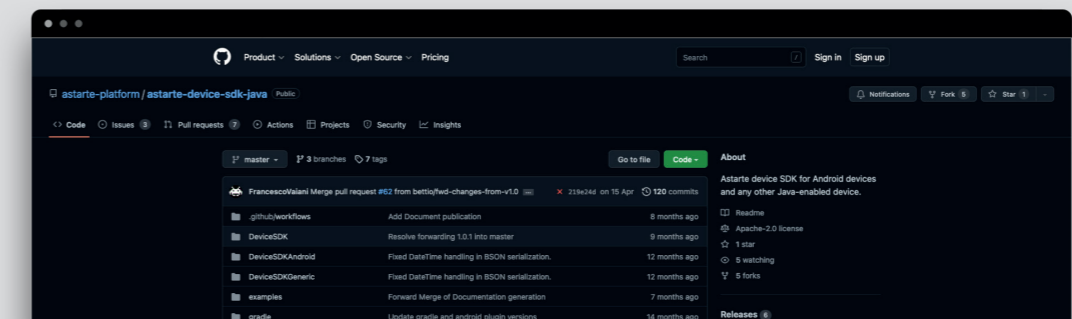
Qt
C++ (Qt5) SDK

Java / Android SDK

Elixir SDK

R
Rust SDK (beta)

Python SDK (beta)

GO
Go SDK (beta)

EDGE PLATFORM HIGHLIGHTS FOR 2023
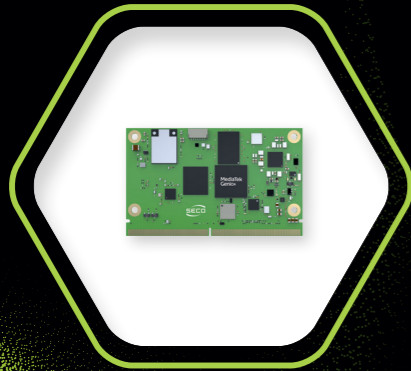
WILK
SMARC®

MediaTek Genio 700

- High performance multimedia Arm® processing
- Multiple 4K displays and cameras
- AI acceleration
- Basis for 4K fanless HMI product line, up to 27"

MEDIATEK
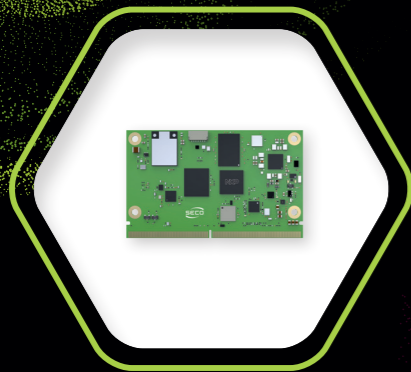
MAURY
SMARC®

NXP i.MX 93

- Cost-effective Arm® processing
- ML acceleration
- For low power, headless or simple display handheld devices

NXP GOLD PARTNER
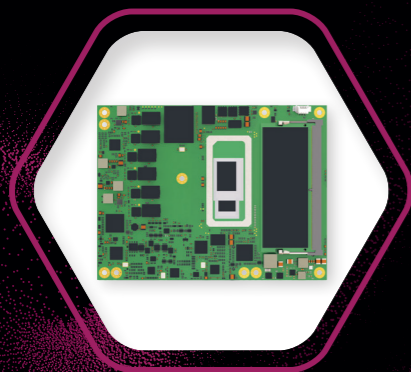
CALLISTO
COM Express®

**13th Gen Intel® Core®
(Codename: Raptor Lake)**

- High-end x86 processing
- AI-accelerated analytics
- Multidisplay UHD video
- For high-end machine control, complex decision making

intel partner Gold
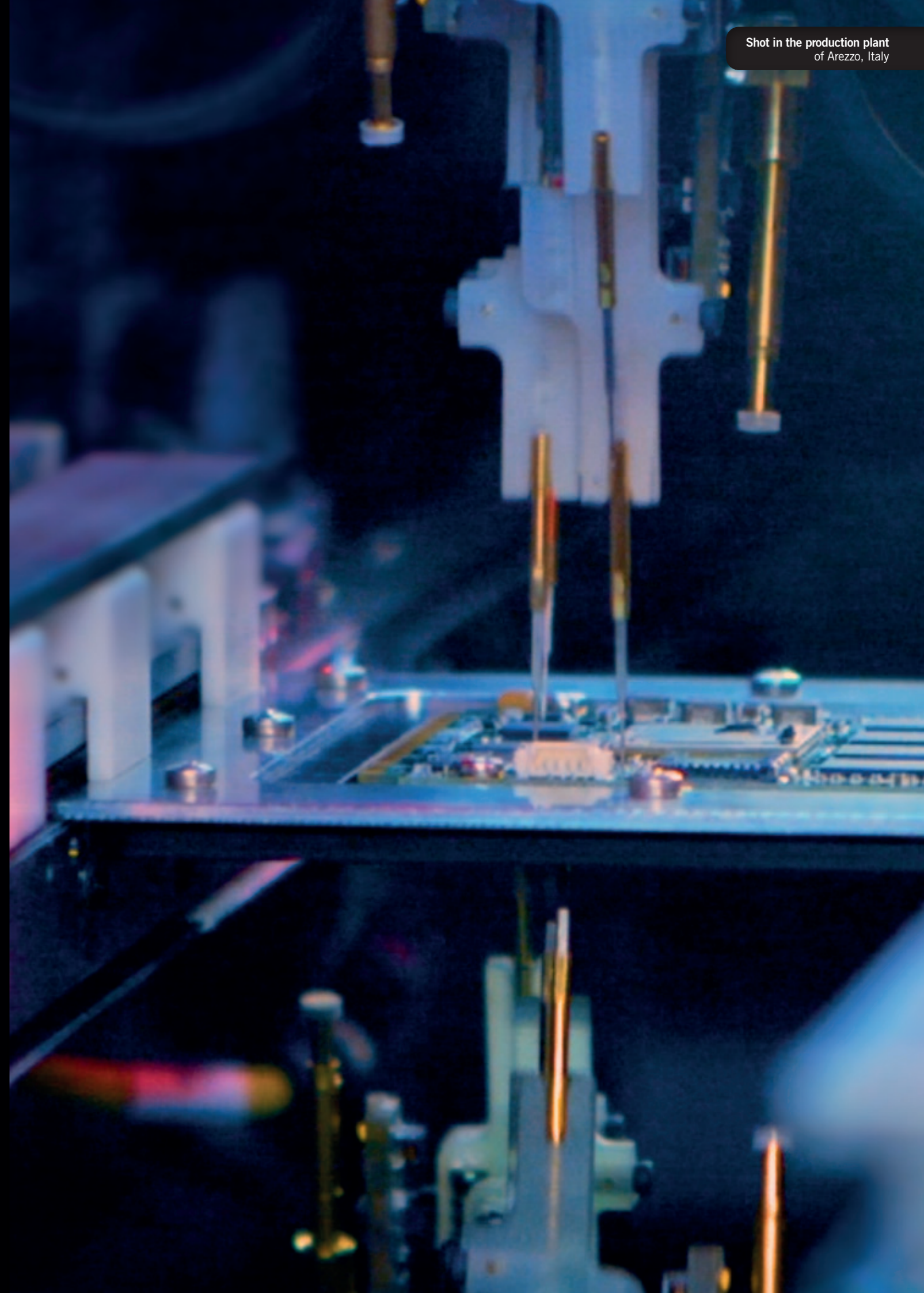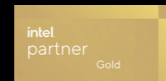
QSEVEN® STANDARD ADVANTAGES

- COST EFFECTIVE SOLUTION FOR HIGH VOLUME PROJECTS
- LOW POWER CONSUMPTION
- COMPACT FORM FACTOR
- LOW PROFILE DESIGN
- EXCELLENT FOR IOT PROJECTS
- HIGH SPEED MXM EDGE CONNECTOR

COMPUTER-ON-MODULE APPROACH

Design investment limited to the carrier board I Consolidated standard form factor I Scalable and future-proof

Long-term availability I Arm® and x86 cross-compatibility I Multi-vendor solution I Highly configurable

Innovative and upgradable I Accelerated time-to-market

QSEVEN® FEATURES OVERVIEW

70 mm - 2,76"

Arm®
x86

Qseven
70 mm - 2,76"

µQseven
40 mm - 1,57"

Also available in Industrial temperature range, -40°C ÷ +85°C

Qseven

Qseven® with **Intel® Atom® x6000E, Pentium®** and **Celeron® J / N Series** (Codename: **Elkhart Lake**)

High computing and graphics performance in Qseven® form factor
ATLAS

AI-ENABLED WITH CLEA

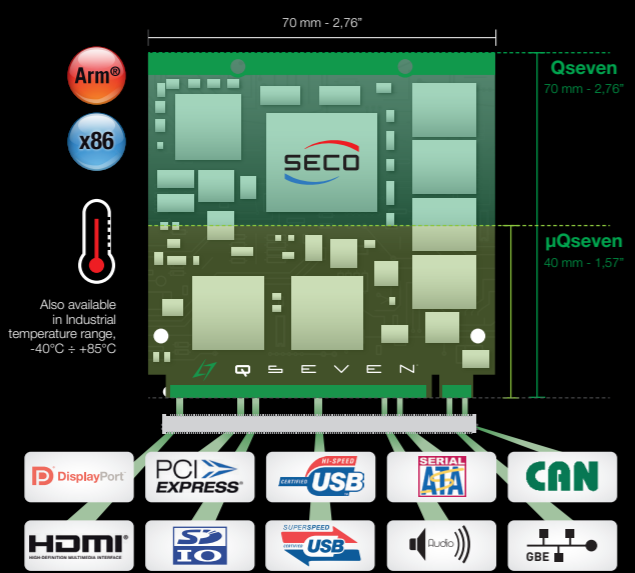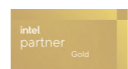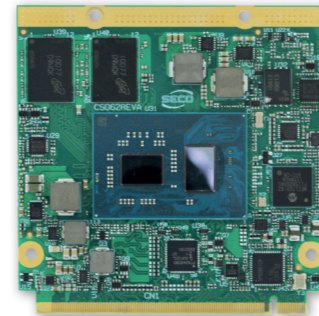|	
Processor	Intel Celeron® J6413 Quad Core @ 1.8GHz (3GHz Turbo) 10W TDP Intel Celeron® N6211 Dual Core @1.2GHz (3GHz Turbo) 6.5W TDP Intel Pentium® J6426 Quad Core @1.8GHz (3GHz Turbo) 10W TDP Intel Pentium® N6415 Quad Core @1.2GHz (3GHz Turbo) 6.5W TDP Intel Atom® x6211E Dual Core @1.2GHz (3GHz Turbo) 6W TDP, IBECC - Industrial Intel Atom® x6413E Quad Core @1.5GHz (3GHz Turbo) 9W TDP, IBECC - Industrial Intel Atom® x6425E Quad Core @1.8GHz (3GHz Turbo) 12W TDP, IBECC - Industrial Intel Atom® x6212RE Dual Core @1.2GHz (no Turbo) 6W TDP, IBECC and TCC* – Industrial Intel Atom® x6414RE Quad Core @1.5GHz (no Turbo) 9W TDP, IBECC and TCC* – Industrial Intel 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$_{DC}$ and +5V$_{SB}$ (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

GOLD PARTNER NXP

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

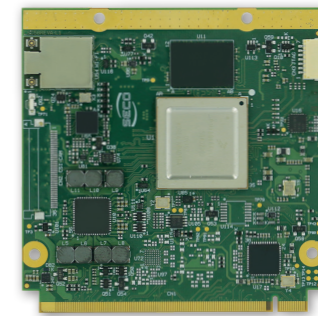|	
Processor	NXP i.MX 8X family SoCs: Dual or Quad Arm®Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing • NXP **i.MX8 QuadXplus**, 4x Arm®Cortex®-A35 Cores + 1x Cortex® M4F core for real-time processing • NXP **i.MX8 DualXplus**, 2x Arm®Cortex®-A35 Cores + 1x Cortex® M4F core for real-time 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$_{DC}$ and +3.3V_RTC
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® with NXP® i.MX 8

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

MAIA

GOLD PARTNER NXP

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range
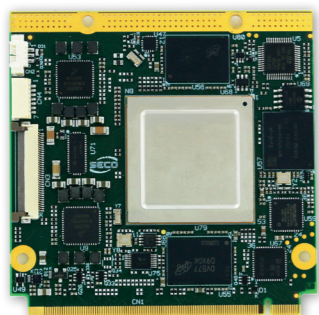
Processor	NXP i.MX 8 Family: • **i.MX 8QuadMax** - 2x Cortex®-A72 cores @1.6GHz + 4x Cortex®-A53 cores @1.2GHz + 2x Cortex®-M4F cores @264MHz • **i.MX 8QuadPlus** - 1x Cortex®-A72 cores @1.6GHz + 4x Cortex®-A53 cores @1.2GHz + 2x Cortex®-M4F cores @264MHz
Memory	Soldered Down LPDDR4-3200 memory, 64-bit 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 2x 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 GPI/Os Boot select signal Power Management Signals Watchdog
Power Supply	+5V_{DC} ±5% +3.3V_RTC
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")

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Qseven® with NXP® i.MX 8M

Qseven® solution for next generation embedded systems

MIRA

GOLD PARTNER NXP

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

Processor	NXP i.MX 8M Family based on Arm®Cortex®-A53 cores + general purpose Cortex®-M4 processor: • **i.MX 8M Quad** - 4x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Dual** - 2x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M QuadLite** - 4x Cortex®-A53 cores up to 1.5GHz, no VPU
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 GPI/Os UltraLow Power RTC Power Management Signals Watchdog
Power Supply	+5V_{DC} ±5% and +5V_{SB} (optional) +3.3V_RTC
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.
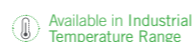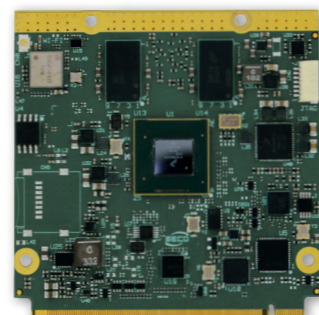

Qseven® with Intel® Atom® X, Celeron® J / N and Pentium® N Series (Codename: Apollo Lake)

High graphics performance and extreme temperature for low power designs

NAOS

intel partner Gold

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

Processor	Intel® Atom® **x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom® **x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom® **x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® **N4200** Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **J3455**, Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® **J3355**, 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 (*) (*) Second USB 3.0 Host port can be exploited only using Qseven® Rel. 2.1 compliant Carrier boards
PCI-e	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_{DC} and +5V_{SB} (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.
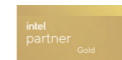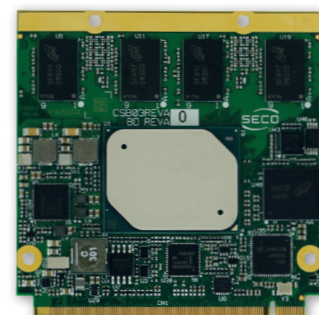

Qseven® with Intel® Atom® E3800 and Celeron® (Codename: Bay Trail)

Mobile-oriented with eMMC and Camera Interface

ASTERION

intel partner Gold

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

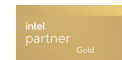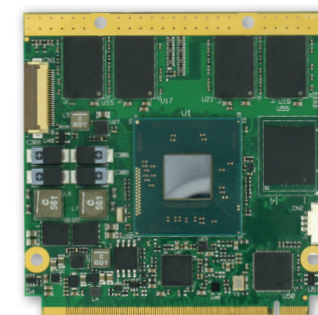|	
Processor	Intel® Atom® **E3845**, Quad Core @1.91GHz, 2MB Cache, 10W TDP Intel® Atom® **E3827**, Dual Core @1.75GHz, 1MB Cache, 8W TDP Intel® Atom® **E3826**, Dual Core @1.46GHz, 1MB Cache, 7W TDP Intel® Atom® **E3825**, Dual Core @1.33GHz, 1MB Cache, 6W TDP Intel® Atom® **E3815**, Single Core @1.46GHz, 512KB Cache, 5W TDP Intel® Atom® **E3805**, Dual Core @1.33GHz, 1MB Cache, 3W TDP Intel® Celeron® **J1900**, Quad Core @2.0GHz, 2MB Cache, 10W TDP Intel® Celeron® **N2930**, Quad Core @1.83GHz, 2MB Cache, 7.5W TDP Intel® Celeron® **N2807**, 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 (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 **Optional Camera interface**
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 **Optional eMMC 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_{DC} ± 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.

AVIOR

Qseven® with **Intel® Atom® E3800** and **Celeron®**
(Codename: **Bay Trail**)

x86 performance on a low-power module

AI-ENABLED WITH CLEA · Available in Industrial Temperature Range
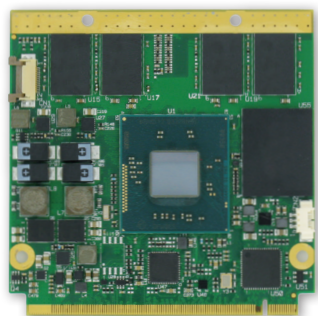
CPU	Intel® Atom® E3800 and Celeron® families of System-on-Chip
GRAPHICS	Integrated Intel® HD Graphics controller
CONNECTIVITY	6x USB 2.0; 1x USB 3.0; 3x PCI-e x1
MEMORY	up to 8GB Dual-Channel DDR3L 1333MHz

ALKES

Qseven® with **NXP i.MX 6**

Optimal balance of performance and power

AI-ENABLED WITH CLEA · Available in Industrial Temperature Range
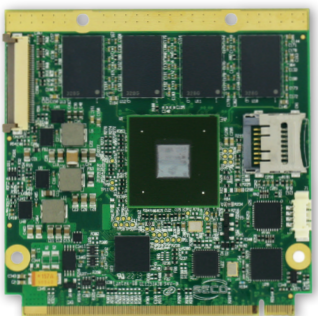
CPU	Single-, Dual- and Quad- Core (Arm® Cortex® -A9 Cores)
GRAPHICS	2D/3D dedicated graphics processors
CONNECTIVITY	2x serial ports; CAN port
MEMORY	up to 4GB DDR3L on-board

ELECTRA

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

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

AI-ENABLED WITH CLEA · Available in Industrial Temperature Range

GOLD PARTNER NXP

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** - 4x Cortex®-A53 cores up to 1.8GHz, no VPU • **i.MX 8M Mini Dual Lite** - 2x Cortex®-A53 cores up to 1.8GHz, no VPU • **i.MX 8M Mini Solo Lite** - 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: • **i.MX 8M Nano Quad** - Full featured, 4x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Nano Dual** - Full featured, 2x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Nano Solo** - Full featured, 1x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Nano Quad Lite** - 4x Cortex®-A53 cores up to 1.5GHz, no VPU • **i.MX 8M Nano Dual Lite** - 2x Cortex®-A53 cores up to 1.5GHz, no VPU • **i.MX 8M Nano Solo Lite** - 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_DC and +5V_SB (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.
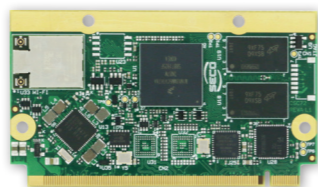

KUMA

µQseven® with **Intel® Atom® E3800** and **Celeron®**
(Codename: **Bay Trail**)

Smallest x86 standard module at proprietary costs

AI-ENABLED WITH CLEA
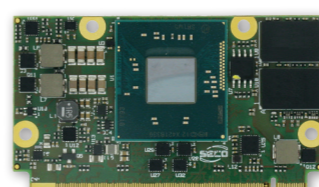
Processor	Intel® Celeron® **N2807**, Dual Core @1.58GHz, 1MB Cache, 4.3W TDP Intel® Atom® **E3815**, Single Core @1.46GHz, 512KB Cache, 5W TDP Intel® Atom® **E3825**, Dual Core @1.33GHz, 1MB Cache, 6W TDP
Max Cores	2
Max Thread	2
Memory	Soldered on-board DDR3L memory E3825, E3815: up to 4GB Single-Channel 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_DC ± 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.

NEMBUS

µQseven® with **NXP i.MX 6**

Small, flexibile OTS module at proprietary costs

AI-ENABLED WITH CLEA · Available in Industrial Temperature Range

GOLD PARTNER NXP
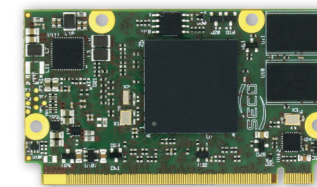
CPU	Single and Dual Core Lite (Arm®Cortex® A9 Cores)
GRAPHICS	2D/3D dedicated graphics processors
CONNECTIVITY	FastEthernet; GPI/Os
MEMORY	up to 1GB DDR3L on-board

LIBERTAS

µQseven® with **NXP i.MX 6**

Optimal balance of performance and size
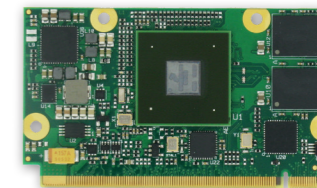
AI-ENABLED WITH CLEA · Available in Industrial Temperature Range

GOLD PARTNER NXP

CPU	Single-, Dual- and Quad- Core (Arm® Cortex® -A9 Cores)
GRAPHICS	2D/3D dedicated graphics processors
CONNECTIVITY	4x USB 2.0; 2x Serial ports; CAN Bus
MEMORY	up to 2GB DDR3L on-board

Column 1

Carrier Board for
Qseven® modules in **3.5"** Form Factor

Wide range of interfaces for broad development possibilities

CQ7-D59

CROSS PLATFORM *Philosophy*
Cross-compatible
platform with x86
and Arm® solutions

Available in Industrial
Temperature Range

Video Interfaces	LVDS Single/Dual Channel 18-24-bit + HDMI™ Connector **or** 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 3.0 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$_{DC}$ ±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

Column 2

Carrier Board for Qseven® and µQseven® modules in
Embedded NUC™ Form Factor
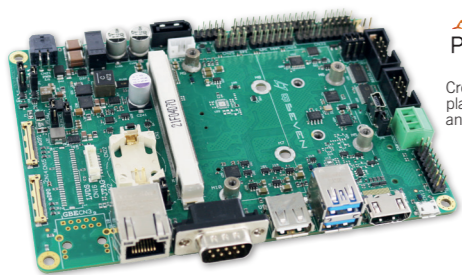
Wide range of interfaces for broad development possibilities

CQ7-D03

CROSS PLATFORM *Philosophy*
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	Embedded Nuc™ form factor compliant:101.6 x101.6 mm (4"x 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

Column 3

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

Available in Industrial
Temperature Range

FEATURES OF CQ7-D59

Video Interfaces	LVDS Single/Dual Channel 18-24-bit + HDMI™ Connector **or** 2 x eDP connectors + Multimode Display Port
Mass Storage	1x 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	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 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 16x GPIO signals on pin header via a GPIO expander controlled via SM Bus or I2C Front panel header 1 x 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$_{DC}$ ±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.

Development kit for Qseven® and µQseven® Modules

SMARC module
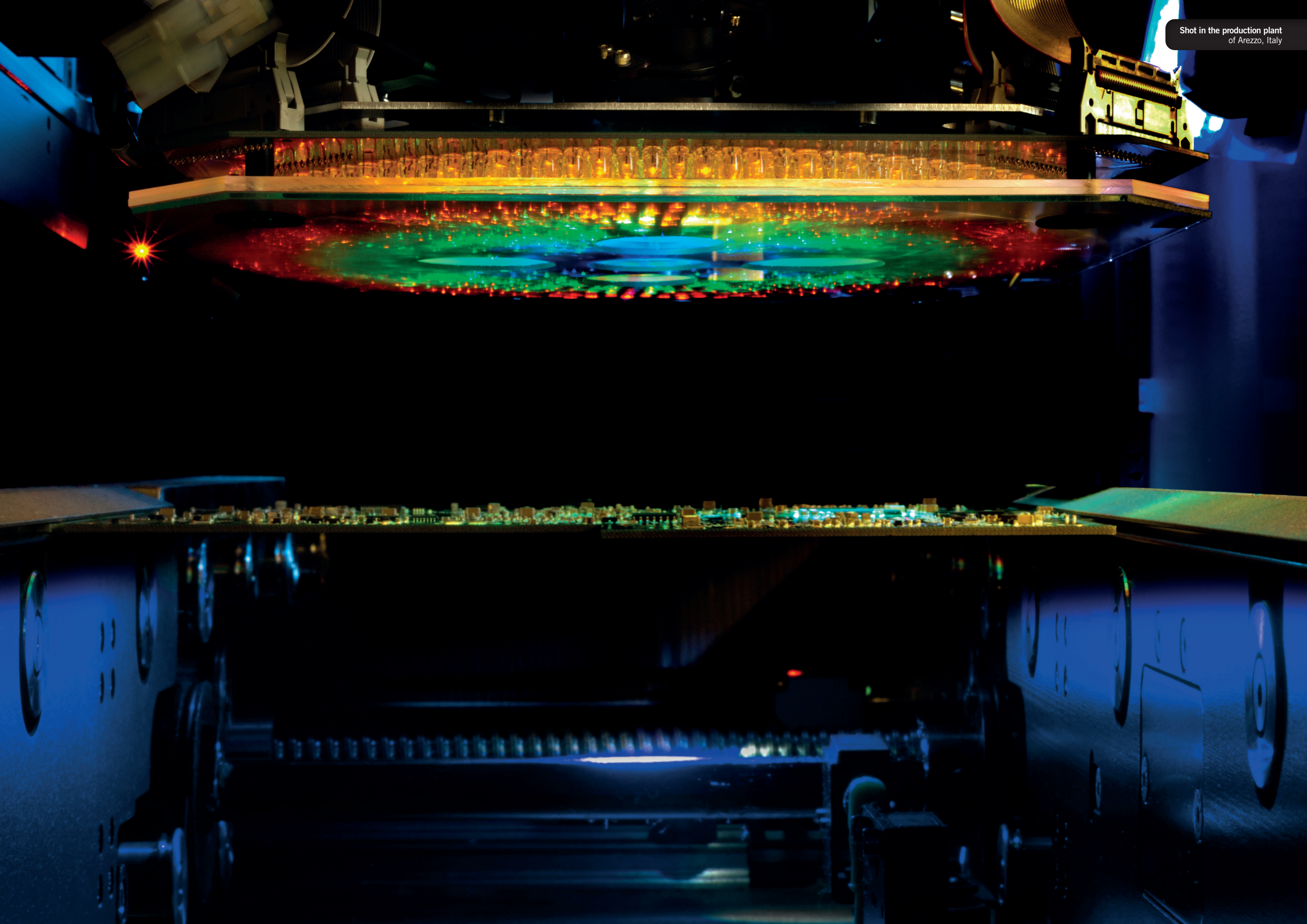
SMARC® STANDARD ADVANTAGES

- EXTREME LOW POWER DESIGN
- LOW PROFILE DESIGN
- DEDICATED BATTERY MANAGEMENT SIGNALS
- x4 UP TO FOUR DISPLAY INTERFACES
- DUAL ETHERNET
- SMARC COMPACT 82×50 mm

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
PCI Express lanes	4
Serial ATA channels	1
USB 2.0 ports	6
USB 3.0 ports	2
LVDS channels embedded DisplayPort	2
DP++ / HDMI	1 dedicated DP++ 1 shared DP++ / HDMI
Camera interfaces	2 MIPI CSI
High Definition Audio / I2S	1 I2S + 1 shared I2S / HD Audio
Ethernet 10/100/1000 Mbps	2
UARTs	2 x 4-Wire + 2 x 2-Wire

System I/O interface	# of interfaces
Secure Digital I/O 4-bit	1
I²C Bus	5
SPI Bus	2
CAN Bus	2
Watchdog Timer	1
Boot selection signals	3
GPIOs	12 (some with alternate functions)
System and Power management signals	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

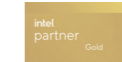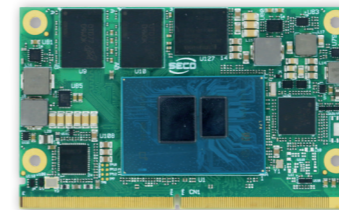SECO is one of the founding members of SGET and a co-founder of the Qseven® standard

STANDARDIZATION GROUP FOR EMBEDDED TECHNOLOGIES

SMARC® Rel. 2.1 with Intel® Atom® x7000E Series, Intel® Core™ i3, Intel® N Series (Codename: Alder Lake-N) processors

Power efficient deep learning inference and UHD media processing within a small footprint
FINLAY

AI-ENABLED WITH CLEA

Processor	Intel® Atom® processors x7000E Series, Intel® Core™ i3 processor and Intel® Processors N Series (Codename: Alder Lake-N): • **Intel® Atom® x7213E**, 2 Cores @1.7 GHz (3.2 GHz Turbo), 10W TDP, with TSN and TCC* • **Intel® Atom® x7425E**, 4 Cores @1.5 GHz (3.4 GHz Turbo), 12W TDP, with TSN and TCC* • **Intel® Atom® x7211E**, 2 Cores @1.0 GHz (3.2 GHz Turbo), 6W TDP, with TSN and TCC* • **Intel® Core™ i3-N305**, 8 Cores @1.8 GHz (3.8 GHz Turbo), 15W TDP • **Intel® Processor N200**, 4 Cores @1.0 GHz (3.7 GHz Turbo), 6W TDP • **Intel® Processor N97**, 4 Cores @2.0 GHz (3.6 GHz Turbo), 12W TDP • **Intel® Processor N50**, 2 Cores @1 GHz (3.4 GHz Turbo), 6W TDP * Time Sensitive Network and Time Coordinate Computing
Memory	Up to 16GB LPDDR5-4800 soldered down memory with IBECC (in-band error correction code)
Graphics	Integrated Intel® UHD Graphics driven by Intel® Xe architecture: • Intel® Atom® x7213E processors with 16 Execution Units • Intel® Atom® x7425E processors with 24 Execution Units • Intel® Atom® x7211E processors with 16 Execution Units • Intel® Core™ i3-N305 processors with 32 Execution Units • Intel® Processor N200 with 32 Execution Units • Intel® Processor N97 with 24 Execution Units • Intel® Processor N50 with 16 Execution Units AVX256 & VNNI support for faster AI inference and media transcoding Support with up to 3 independent 4K60 SDR displays
Video Interfaces	eDP 1.3 or Dual Channel 18/24bit LVDS interface (factory alternatives) 2x DP++ multimode DP 1.4 / HDMI 2.1 interface 2x MIPI CSI-2 inputs (1x 2-lanes and 1x 4-lanes)
Video Resolution	Up to 4096x2160 @60Hz
Mass Storage	1x external S-ATA Gen3.2 channel Optional eMMC 5.1 drive soldered on-board
Networking	2x NBase-T Ethernet ports (2.5GbE supported) with Time-Sensitive Networking functionality, implemented using as many Intel® i225 Gigabit Ethernet controllers, managed by two integrated PCH PCI-e ports Optional SERDES (SGMII) interface for additional third Gigabit Ethernet (factory option, alternative to fourth PCI-e lane)
USB	6x USB 2.0 host ports 2x USB 3.2 Gen2 ports
PCI-e	4x PCIe Gen3 lanes Possible channel aggregations: • 4 ports x1 lanes (4x1) • 1 port x2 lanes + 2 ports x1 lane (1x2 + 2x1) or SERDES in place of fourth PCIe lane
Audio	HD Audio and Soundwire/i2S Audio interfaces
Serial Ports	2x UARTs 2x HS-UARTs
Other Interfaces	Up to 14x GPIOs SM bus I2C bus 1x SPI interface for boot 1x General Purpose SPI or eSPI (factory alternatives) Power management signals, watchdog
Power Supply	+5V$_{DC}$ and +3V$_{DC}$ for RTC
Operating System	Microsoft® Windows 10 Linux Kernel LTS
Operating Temperature*	0°C to +60°C (Commercial 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.

SMARC® Rel. 2.1.1 module with NXP i.MX 9 Applications Processors

NXP i.MX 93 in SMARC® module for low power applications
MAURY

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

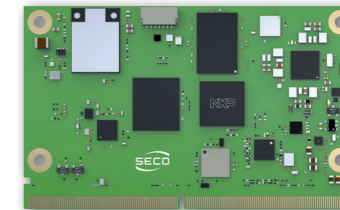| Processor	1-2x Arm®Cortex®-A55 @ 1.7 GHz Arm®Cortex®-M33 @ 250Mhz Arm® Ethos™ U-65 microNPU
Memory	Soldered-down LPDDR4X/LPDDR4-3200 memory, up to 2GB total, 16-bit interface
Graphics	Display up to FHD
Video Interfaces	LVDS Single Channel MIPI_DSI or eDP interface (factory alternatives)
Video Resolution	MIPI-DSI: up to 1080p60 LVDS: up to 720p60
Mass Storage	eMMC 5.1 Drive soldered on-board, up to 64GB (boot device) SD 4-bit interface (boot device)
Networking	2x Gigabit Ethernet interfaces, opt. Wi-Fi + BT5.0
USB	1x USB 2.0 OTG port up to 4x USB 2.0 using optional internal 2.0 HUB
Audio	1x I2S port
Serial Ports	2x UART (4-wires) 2x UART (2-wires)
CAN Bus	2x CAN interfaces
Other Interfaces	12 x GPIOs 1x MIPI-CSI 2 Lanes Camera interface 1x General Purpose I2C Bus 2 x PWM ports
Security	TPM
Embedded Controller Functionalities	Power management Watchdog Boot select signals GP I/O
Power Supply	+5VDC ± 5% and +3.3V_RTC
Operating System	Linux Yocto
Operating Temperature*	0 to +60°C (Commercial Range) -40 to +85°C (Industrial Range)
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.

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

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

AI-ENABLED WITH (CLEA

⚬ 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: • Atom® **x6427FE** Quad Core @1.9GHz (no Turbo) 12W TDP w/ IBECC, IHS and TCC, FuSa Certified - Ind. Temp. Range • Atom® **x6200FE** Dual Core @1.0GHz (no Turbo) 4.5W TDP no Graphics w/ IBECC, IHS and TCC, FuSa Certified- Ind. Temp. Range **Other Intel Atom® x6000E, Pentium® and Celeron® N and J Series CPUs:** • Celeron® **J6413** Quad Core @ 1.8GHz (3.0GHZ Turbo) 10W TDP - Comm. Temp. Range • Celeron® **N6211** Dual Core @1.2GHz (3.0GHZ Turbo) 6.5W TDP - Comm. Temp. Range • Pentium® **J6426** Quad Core @2GHz (3.0GHz Turbo) 10W TDP - Comm. Temp. Range • Pentium® **N6415** Quad Core @1.2GHz (3.0GHZ Turbo) 6.5W TDP - Comm. Temp. Range • Atom® **x6211E** Dual Core @1.3GHz (3.0GHZ Turbo) 6W TDP w/ IBECC and IHS - Ind. Temp. Range • Atom® **x6413E** Quad Core @1.5GHz (3.0GHZ Turbo) 9W TDP w/ IBECC and IHS -Ind. Temp. Range • Atom® **x6425E** Quad Core @2GHz (3.0GHZ Turbo) 12W TDP w/ IBECC and IHS - Ind. Temp. Range • Atom® **x6212RE** Dual Core @1.2GHz (no Turbo) 6W TDP w/ IBECC, IHS and TCC - Ind. Temp. Range • Atom® **x6414RE** Quad Core @1.5GHz (no Turbo) 9W TDP w/ IBECC, IHS and TCC - Ind. Temp. Range • Atom® **x6425RE** Quad Core @1.9GHz (no Turbo) 12W TDP w/ IBECC, IHS and TCC - Ind. Temp. Range (*) IHS: Integrated Heatspreader; TCC: Time Coordinated Computing
Max Cores	4
Memory	32-bit LPDDR4x Soldered Down Memory I 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 I Speed: 4267MT/s single rank (1GB / 2GB / 4GB / 8GB), 3733MT/s dual rank (16GB)
Graphics	Up to 3 independent displays I Integrated Gen11 UHD Graphics controller with up to 32 EU I 4K HW decoding and encoding of HEVC (H.265), H.264, VP8/VP9, WMV9/VC1 (decoding only) I 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) 2 x DP++ 1.4 or 1x DP++ 1.4 and 1x HDMI 1.4 interfaces
Video Resolution	Up to 4096x2160 @60Hz
Mass Storage	1 x external S-ATA Gen3 Channel I SDIO interface I Optional eMMC 5.1 drive soldered on-board (Safety Related)
Networking	2x Gigabit Ethernet PHY with precision clock synchronization and synchronous Ethernet clock output for IEEE 1588 (Safety Related – Black channel) I Optional SERDES (SGMII) Interface for additional third Gigabit Ethernet (factory option, alternative to fourth PCI-e lane)
USB	6 x USB 2.0 Host Ports I 2 x USB 3.1 Gen2 Ports
PCI-e	Up to 4 x PCI-e Gen3 Lanes
Audio	HD Audio interface
Serial Ports	2 x HS-UARTs (Safety Related) I 2 x UARTs
CAN Bus	2x
Other Interfaces	Up to 14x GPIOs I SM Bus I Power Management Signals I I2C Bus I 1x SPI interface for boot I 1x General Purpose SPI or eSPI (Factory Alternatives)
Functional Safety features	FuSa Interface signals for IEC 61508 and ISO 13849
Power Supply	+5V_DC and +3.3V_RTC
Operating System	Microsoft® Windows 10 Enterprise (64 bit) I Linux Yocto 64-bit
Operating Temperature*	-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.
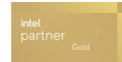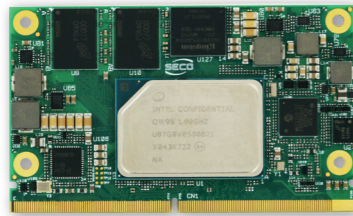

SMARC® with NXP i.MX 8M Plus

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

AI-ENABLED WITH (CLEA — GOLD PARTNER NXP

⚬ Available in Industrial Temperature Range

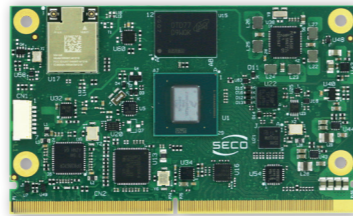|	
Processor	NXP i.MX 8M Plus family SoCs: Dual or Quad Arm®Cortex®-A53 Cores + general purpose Cortex® M7 800MHz processor • NXP **i.MX 8M Plus Quad**, 4x Arm®Cortex®-A53 Cores up to 1.8GHz • NXP **i.MX 8M Plus Dual**, 2x Arm®Cortex®-A53 Cores up to 1.8GHz • NXP **i.MX 8M Plus Quad Lite**, 4x Arm®Cortex®-A53 Cores up to 1.8GHz, no VPU / NPU
Max Cores	4+1
Memory	Soldered down LPDDR4-4000 memory, 32-bit interface, up to 6GB
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 Supports OpenVG 1.1, OpenGL ES 3.1, OpenCL 1.2 Full Profile and Vulkan
Video Interfaces	Up to 3 video display interfaces HDMI 2.0a interface, supporting HDCP 2.2 and HDCP 1.4/1.3 2xLVDS Single Channel / 1xLVDS Dual Channel or eDP + 1xLVDS Single Channel (factory alternatives)
Video Resolution	HDMI, LVDS, eDP Up to 1920 x 1080p @60
Mass Storage	Soldered onboard eMMC 5.1 Drive, up to 64GB SD 4-bit interface
Networking	Up to 2 x Gigabit Ethernet interfaces Optional WiFi + BT LE module onboard
USB	Up to 2 x USB 2.0 Host Ports 2 x USB 3.0 Host Ports 1 x USB 2.0 OTG port
PCI-e	Up to 1x PCI-e x1 Gen3 port
Audio	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 1x 2-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_DC and +3.3V_RTC
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® with NXP i.MX 8X

Safety-certifiable and efficient performance in SMARC® Standard module
SWAN

AI-ENABLED WITH (CLEA — 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 • 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 / Mipi-DSI Single Channel or 1xLVDS / Mipi-DSI Dual Channel 18-/24-bit interface • LVDS / Mipi-DSI Single Channel 18-/24-bit interface + HMDI interface • eDP 4-lane interface + LVDS / Mipi-DSI 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	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_DC and +3.3V_RTC
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")

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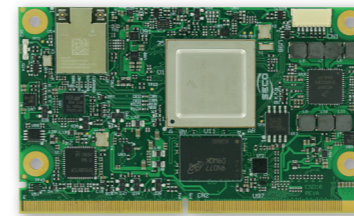

SMARC® with NXP i.MX 8M

Standard solution for next generation multimedia applications
LEXELL

AI-ENABLED WITH (CLEA — GOLD PARTNER NXP

⚬ Available in Industrial Temperature Range

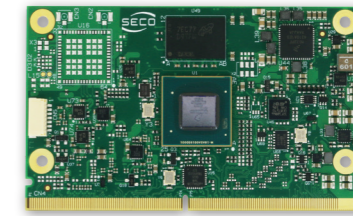|	
Processor	NXP i.MX 8M Family based on Arm®Cortex®-A53 cores + general purpose Cortex®-M4 processor: • **i.MX 8M Quad** - 4x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Dual** - 2x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M QuadLite** - 4x Cortex®-A53 cores up to 1.5GHz, no VPU
Memory	Soldered Down 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-onboard 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 GPI/Os Boot select signals Power Management Signals
Power Supply	+5V_DC +3.3V_RTC
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")

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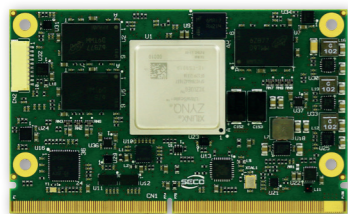
SMARC® with **Xilinx® Zynq® Ultrascale+™**

SMARC® 2.0 / 2.1.1 **Dev Kit**

Flexibile Arm® + FPGA Heterogeneous Processing in a Standard Form Factor

RUSSELL

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

SMARC® DEV KIT

XILINX.

CROSS PLATFORM Philosophy

Cross-compatible platform with x86 and Arm® solutions

SCHEMATICS PUBLICLY AVAILABLE

AI-ENABLED WITH ((CLEA

Available in Industrial Temperature Range

FEATURES OF CSM-B79

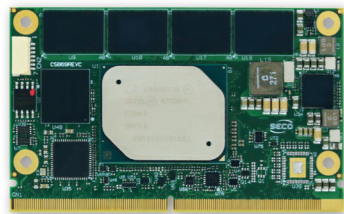|	
Video Interfaces	LVDS/MIPI-DSI connector, interface shared with 2x eDP connectors Backlight control + LCD selectable voltages dedicated connector 2xDP++ connectors HDMI™ connector (can be used in alternative to 1xDP++) 2x CSI Camera input interfaces
Mass Storage	SATA M 7p connector with dedicated 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)

CPU
Xilinx® Zynq® Ultrascale+™ CG/EG/EV MPSoCs in C784 package

GRAPHICS
Integrated Arm® Mali-400 MP2 GPU

CONNECTIVITY
PCI-e x4; 2x GbE; 2x CAN Bus; 2x SPI; 12x GPI/Os

MEMORY
Up to 8GB + 2GB DDR4 soldered down

SMARC

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

High performance, low power and feature-rich

JAGER

intel partner Gold

AI-ENABLED WITH ((CLEA

Available in Industrial Temperature Range

CPU
Intel® Atom® X Series, Intel® Celeron® J / N Series and Intel® Pentium® N Series (Codename: Apollo Lake) Processors

GRAPHICS
Intel® HD Graphics 500 series controller with up to 18 Execution Units

CONNECTIVITY
2x GbE; 2x USB 3.0; 6x USB 2.0; 4x PCI-e

MEMORY
Dual Channel Soldered Down LPDDR4-2400 memory

*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
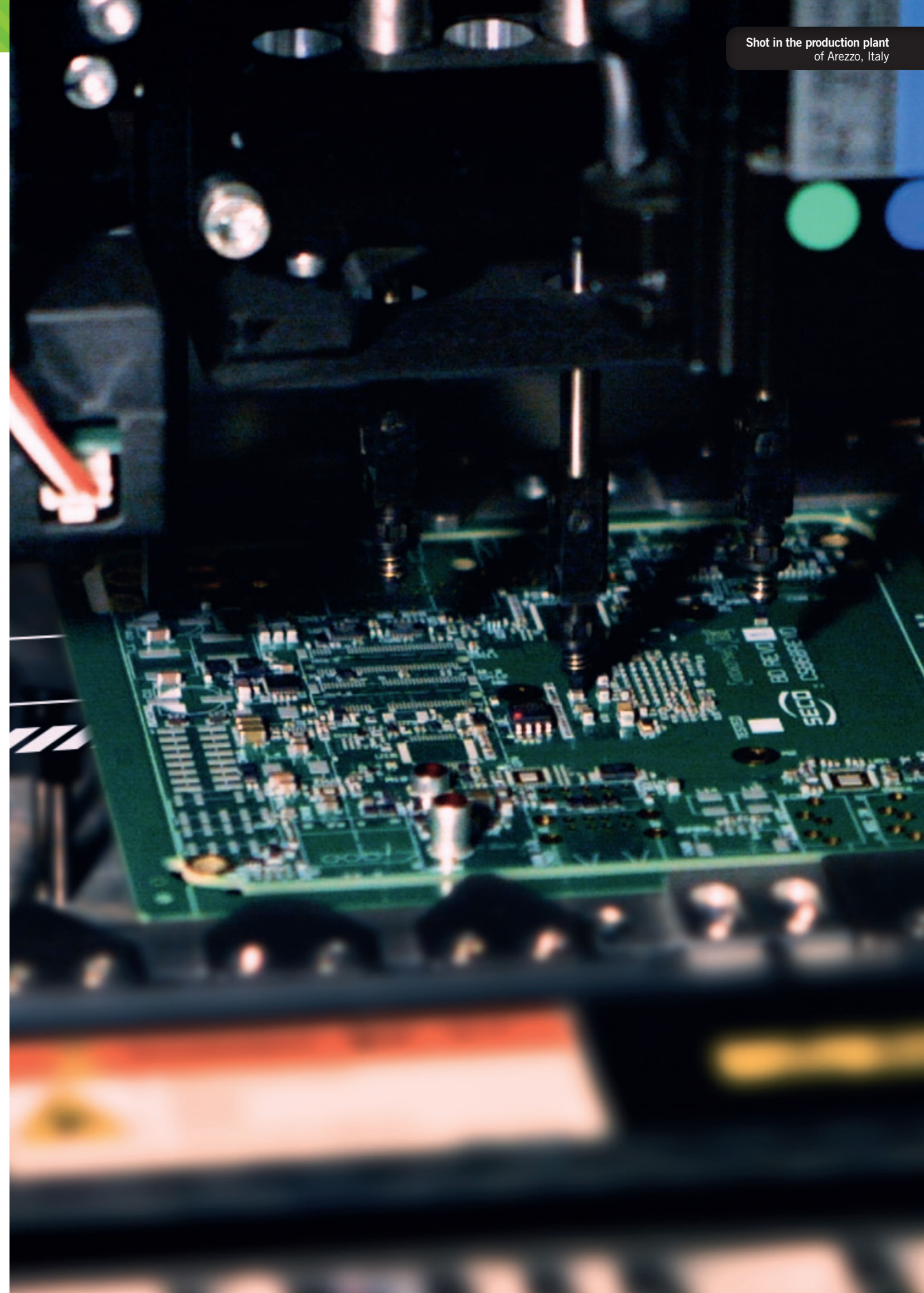
COM ✦ Express

COM EXPRESS® STANDARD ADVANTAGES

- FOR HIGH-END DESIGNS AND MARKETS
- HIGH GRAPHICS COMPUTING
- EXTREMELY FEATURE-RICH
- HIGH PERFORMANCE PROJECT REQUIREMENTS
- BASIC: 125X95 mm COMPACT: 95X95 mm

COMPUTER-ON-MODULE APPROACH

Design investment limited to the carrier board **I** Consolidated standard form factor **I** Scalable and future-proof
Long-term availability **I** Arm® and x86 cross-compatibility **I** Multi-vendor solution **I** Highly configurable
Innovative and upgradable **I** 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® Basic Type 7 with Intel® Xeon® D-1700 (Codename: **Ice Lake-D**)

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

JULIET

intel partner Gold

AI-ENABLED WITH CLEA

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 Gen 3 Channels
Networking	• 1x Gigabit Ethernet LAN port with NC-SI (Network Controller Sideband Interface) functionality, managed by an Intel® I21x Gigabit Ethernet Controller. • 4x 10Gigabit Ethernet interfaces (10GBASE-KR), directly managed by the Xeon® D-1700 SoCs.
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	$+12V_{DC} \pm 10\%$ and $+5V_{SB}$ (optional)
Operating System	Microsoft® Windows 10 IoT Enterprise. Microsoft® 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	125 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® Basic Type 7 with AMD EPYC™ Embedded 3000 Series

Scalable offerings with outstanding performance and more connectivity

THEBE

AMD

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

Processor	AMD EPYC™ Embedded 3000 family of SoCs: • AMD EPYC™ Embedded **3451**, Sixteen Core Dual Thread @ 2.14GHz (3.0 Boost), 32MB L3 shared Cache, TDP 80-100W • AMD EPYC™ Embedded **3351**, Twelve Core Dual Thread @ 1.9GHz (3.0 Boost), 32MB L3 shared Cache, TDP 60-80W • AMD EPYC™ Embedded **3251**, Eight Core Dual Thread @ 2.5GHz (3.1 Boost), 16MB L3 shared Cache, TDP 55W • AMD EPYC™ Embedded **3201**, Eight Core Single Thread @ 1.5GHz (3.1 Boost), 16MB L3 shared Cache, TDP 30W • AMD EPYC™ Embedded **3151**, Quad Core Dual Thread @ 2.7GHz (2.9 Boost), 16MB L3 shared Cache, TDP 45W • AMD EPYC™ Embedded **3101**, Quad Core Single Thread @ 2.1GHz (2.9 Boost), 8MB L3 shared Cache, TDP 35W • AMD EPYC™ Embedded **3255**, Eight Core Dual Thread @ 2.5GHz (3.1 Boost), 16MB L3 shared Cache, TDP 55W, industrial grade
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	• 1x Gigabit Ethernet LAN port with NC-SI (Network Controller Sideband Interface) functionality, managed by an Intel® I210 Gigabit Ethernet Controller • 4x 10Gigabit Ethernet interfaces (10GBASE-KR), directly managed by the EPYC™ SoCs
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	$+12V_{DC} \pm 10\%$ and $+5V_{SB}$ (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.

Column 1

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 PLATFORM Philosophy — Cross-compatible platform with x86 and Arm® solutions

SCHEMATICS PUBLICLY AVAILABLE

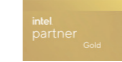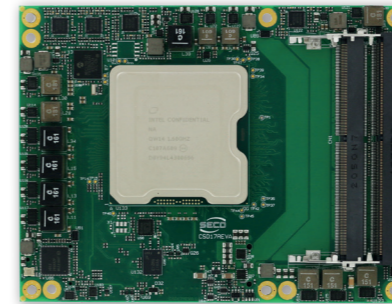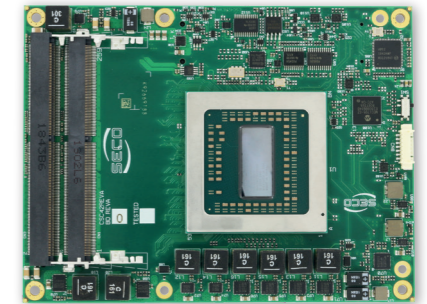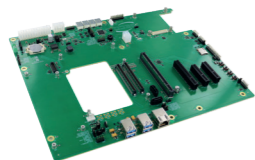### FEATURES OF CCOMe-C79

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.
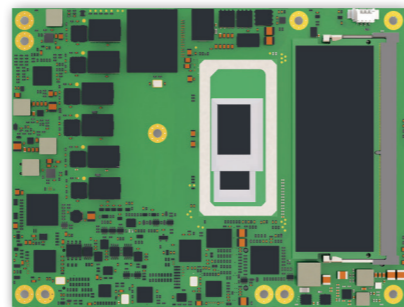
Development kit for COM Express® Modules

Column 2

COM Express® 3.1 Type 6 Basic Module with **13th Gen Intel® Processors (Codename: Raptor Lake-P)**

Intensive video processing and AI-based analytics for edge devices in challenging environments

CALLISTO

intel partner Gold

early access

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

Processor	13th Generation Intel® Processors (Raptor Lake-P) • **Intel® Core™ i7 13800HRE**, 14 Core 6P+8E, 45W TDP • **Intel® Core™ i5 1250PRE**, 12 Core 4P+8E, 28W TDP • **Intel® Core™ i3 1315URE**, 6 Core 2P+4E, 15W TDP • **Intel® Core™ i7 13800HE**, 14 Core 6P+8E, 45W TDP • **Intel® Core™ i5 1350PE**, 12 Core 4P+8E, 28W TDP • **Intel® Core™ i3 1315UE**, 6 Core 2P+4E, 15W TDP • **Intel® Processor U300E**, 5 Core 1P+4E, 15W TDP
Memory	Two DDR5 SO-DIMM slots supporting DDR5-4800, IBECC modules memory, up to 64GB
Graphics	Integrated Gen12 UHD Graphics • Intel® Core™ i7: Iris® Xe with 96 Execution Units • Intel® Core™ i5: Iris® Xe with 80 Execution Units • Intel® Core™ i3: Iris® Xe with 64 Execution Units • Intel® Processor U300E: Iris® Xe with 48 Execution Units Improved image (IPU6EP) and video processing (AV1/GNA 3.0) Support up to 4 independent displays @ 4K
Video Interfaces	Up to 3x Digital Display Interfaces (DDIs), supporting DVI, DP 1.4, HDMI 2.1 1x VGA (factory option) 1x eDP 1.3 or single/dual-channel 18-/24-bit LVDS interface (factory alternatives)
Video Resolution	HDMI and DP up to 8K @ 60Hz via TCSS with Hayden Bridge eDP 1.4b up to 5K @ 120Hz (HBR3 with VDSC1.1) LVDS up to 1920x1200 @ 60Hz
Mass Storage	2x SATA Gen3 channels Up to 128 GB on-board NVMe SSD (factory alternative to one PCI-express Graphics (PEG) x4 Gen4)
Networking	1x NBase-T Ethernet interface with Intel® I225 GbE controller, with TSN and 2.5GbE supported
USB	Up to 2x USB 4 Gen2 host ports (depending on carrier board retimer implementation) 4x USB 3.2 Gen2 (10Gbps) host ports (depending on carrier board retimer implementation) 8x USB 2.0 host ports
PCI-e	Up to 8x PCI-e x1 Gen3 lanes 1x PCI-express Graphics (PEG) x8 Gen4 Up to 2x PCI-express Graphics (PEG) x4 Gen4
Audio	HD audio and Soundwire/i2S audio interfaces
Serial Ports	2x UARTs
Other Interfaces	SPI, I2C, SM Bus, Thermal Management, FAN management Optional eSPI or LPC bus (factory alternatives) Optional TPM 2.0 on-board LID#/SLEEP#/PWRBTN#, Watchdog 4 x GPI, 4 x GPO
Power Supply	+12VDC ± 10%, +5VSB (optional), +3VRTC (optional)
Operating System	Microsoft® Windows 10 Linux Ubuntu
Operating Temperature*	0°C to +60°C (commercial version) -40°C to +85°C (industrial 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.

Column 3

COM Express® 3.1 Type 6 Compact Module with Intel® **Atom® x6000E Series, Intel® Pentium® and Celeron® N and J Series Processors (Codename: Elkhart Lake)**

Cost-Effective, Low Power Computing with Real Time Options

EUPHORIA

intel partner Gold

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

Processor	Intel® Atom® x6000E Series, and Intel® Pentium® and Celeron® N and J Series Processors: • **Intel® Celeron® J6413** Quad Core @ 1.8GHz (3GHz Turbo) 10W TDP, Com. • **Intel® Pentium® J6426** Quad Core @2.0GHz (3GHz Turbo) 10W TDP, Com. • **Intel® Celeron® N6211** Dual Core @1.2GHz (3GHz Turbo) 6.5W TDP, Com. • **Intel® Pentium® N6415** Quad Core @1.2GHz (3GHz Turbo) 6.5W TDP, Com. • **Intel® Atom® x6211E** Dual Core @1.2GHz (3GHz Turbo) 6W TDP, IBECC, Ind. • **Intel® Atom® x6413E** Quad Core @1.5GHz (3GHz Turbo) 9W TDP, IBECC, Ind. • **Intel® Atom® x6425E** Quad Core @2.0GHz (3GHz Turbo) 12W TDP, IBECC, Ind. • **Intel® Atom® x6212RE** Dual Core @1.2GHz (no Turbo) 6W TDP, IBECC, TCC, Ind. • **Intel® Atom® x6414RE** Quad Core @1.5GHz (no Turbo) 9W TDP, IBECC, TCC, Ind. • **Intel® Atom® x6425RE** Quad Core @1.9GHz (no Turbo) 12W TDP, IBECC, TCC, Ind. (*)IBECC: In-Band Error-Correcting Code memory (**)TCC: Time Coordinated Computing
Memory	Two DDR4 SO-DIMM slots supporting DDR4-3200 IBECC modules memory, up to 32GB
Graphics	Integrated Intel® Gen11 UHD Graphics controller with up to 32 EU Support up to 3 independent displays
Video Interfaces	Up to 2x Digital Display Interfaces (DDIs), supporting DVI, DP 1.4, HDMI 1.4 1x eDP 1.3 or Single/Dual-Channel 18-/24-bit LVDS interface (factory alternatives)
Video Resolution	DP 1.4 and HDMI 1.4: up to 4096x2160@60 Hz eDP 1.3: up to 4096x2160@60 Hz LVDS: up to 1920x1200 @ 60Hz
Mass Storage	2x S-ATA Gen3 channels Optional eMMC 5.1 drive soldered on-board
Networking	1x NBase-T Ethernet interface with MaxLinear GPY211/215 GbE controller, with 2.5GbE supported
USB	Up to 4x USB 3.2 Gen 1 host ports Up to 8x USB 2.0 host ports
PCI-e	Up to 6x PCI-e Gen3 lanes
Audio	HD audio interface
Serial Ports	Up to 2x UARTs 1x CAN (factory alternative to one UART)
Other Interfaces	SPI, I2C, SM bus, thermal management, FAN management Optional eSPI or LPC bus (factory alternatives) Optional TPM 1.2/2.0 on-board LID#/SLEEP#/PWRBTN#, watchdog 4x GPI, 4x GPO
Power Supply	+12VDC ± 10%, +5VSB (optional), +3VRTC (optional)
Operating System	Microsoft® Windows 10 IoT Enterprise 2019 LTSC Microsoft® Windows 10 IoT Enterprise 2021 LTSC Yocto Kirkstone
Operating Temperature*	0°C to +60°C (commercial version) -40°C to +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.

Column 4

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

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

CALYPSO

intel partner Gold

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

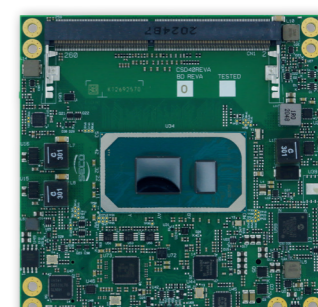|	
Processor	**Intel® Core™ i7-1185G7E**, Quad Core @2.8GHz (4.4GHz Turbo Boost), 12MB Cache, 28W TDP (12W cTDP), with Hyperthreading **Intel® Core™ i5-1145G7E**, Quad Core @2.6GHz (4.1GHz Turbo Boost), 8MB Cache, 28W TDP (12W cTDP), with Hyperthreading **Intel® Core™ i3-1115G4E**, Dual Core @3.0GHz (3.9GHz Turbo Boost), 6MB Cache, 28W TDP (12W cTDP), with Hyperthreading **Intel® Core™ i7-1185GRE**, Quad Core @2.8GHz (4.4GHz Turbo Boost), 12MB Cache, with IBECC, 28W TDP (12W cTDP), with Hyperthreading - Industrial **Intel® Core™ i5-1145GRE**, Quad Core @2.6GHz (4.1GHz Turbo Boost), 8MB Cache, with IBECC, 28W TDP (12W cTDP), with Hyperthreading - Industrial **Intel® Core™ i3-1115GRE**, 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

AMD

AI-ENABLED WITH CLEA

Processor	AMD Ryzen™ Embedded **V2748** with AMD Radeon™ Graphics with 7 CU, Eight Core Dual Thread @ 2.9GHz (4.15 Boost), TDP 35-54W AMD Ryzen™ Embedded **V2718** with AMD Radeon™ Graphics with 7 CU, Eight Core Dual Thread @ 1.7GHz (4.15 Boost), TDP 10-25W AMD Ryzen™ Embedded **V2546** with AMD Radeon™ Graphics with 6 CU, Six Core Dual Thread @ 3GHz (3.95 Boost), TDP 35-54W AMD Ryzen™ Embedded **V2516** 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$_{DC}$ ± 10%, +5V$_{SB}$ (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)

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

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

METIS

AMD

AI-ENABLED WITH CLEA

Processor	AMD Ryzen™ Embedded **R1606G** with GPU AMD Radeon™ Vega 3, Dual Core Four Thread @ 2.6GHz (3.5 Boost), TDP 12-25W AMD Ryzen™ Embedded **R1505G** 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 1.4/2.0I 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$_{DC}$ ± 10% and +5V$_{SB}$ (optional)
Operating System	Microsoft® 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)

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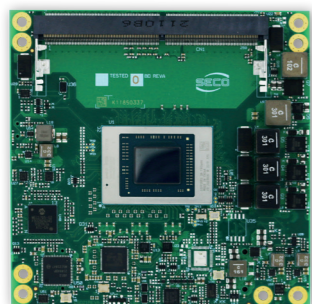

COM Express® Compact Type 6 with 8th Gen Intel® Core™ and Celeron™ U-series (Codename: Whiskey Lake-U)

Low power multi-core Intel® architecture for mobile applications

LARISSA

intel partner Gold

AI-ENABLED WITH CLEA

Processor	Intel® Core™ **i7-8665UE**, Quad Core @ 1.7GHz (Turbo Boost 4.4GHz) with HT, 8MB Cache, 15W TDP (12.5W..25W cTDP) Intel® Core™ **i5-8365UE**, Quad Core @ 1.6GHz (Turbo Boost 4.1GHz) with HT, 6MB Cache, 15W TDP (12.5W..25W cTDP) Intel® Core™ **i3-8145UE**, Dual Core @ 2.2GHz (Turbo Boost 3.9GHz) with HT, 4MB Cache, 15W TDP (12.5W..25W cTDP) Intel® Celeron® **4305UE**, 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 or 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): • 8 ports PCI-e x1 • 6 ports PCI-e x 1 + PEG x2 • 5 ports PCI-e x 1 + PEG x4 • 4 ports PCI-e x 1 + PEG x4 + 3rd SATA
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$_{DC}$ ± 10% and +5V$_{SB}$ (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.
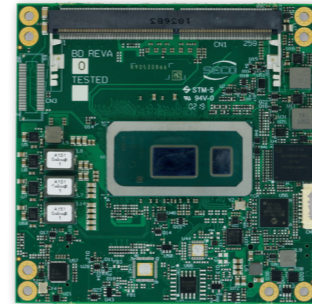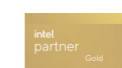

COM Express® Compact Type 6 with Intel® Atom® X, Celeron® J / N and Pentium® N Series (Codename: Apollo Lake)

Rugged solution for industrial environment

MIRANDA

intel partner Gold

AI-ENABLED WITH CLEA

Available in Industrial Temperature Range

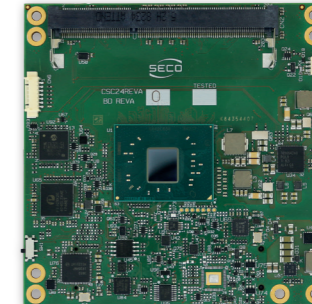|	
Processor	Intel® Atom® **x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom® **x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom® **x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® **N4200** Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **J3455**, Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® **J3355**, 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$_{DC}$ ± 10% and +5V$_{SB}$ (optional)
Operating System	Microsoft® Windows 10 Enterprise (64-bit) Microsoft® Windows 10 IoT core Wind River Linux (64 bit) Yocto (64 bit) Android (planned)
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.
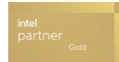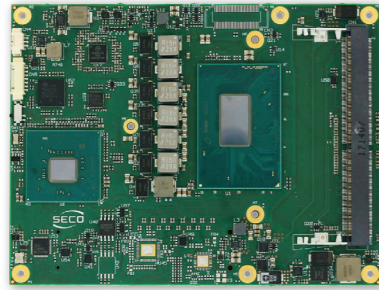
COM Express Type 6

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

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

OBERON

AI-ENABLED WITH (CLEA

CPU	8th Gen Core™/Xeon® (Coffee Lake) & 9th Gen Core™/Xeon® /Celeron® CPUs (Coffee Lake Refresh)
GRAPHICS	Intel® UHD Graphics 630/P630 architecture, up to 48 Execution Units
CONNECTIVITY	4x USB 3.0; 8x USB 2.0; 8x PCI-e x1 Gen3; PEG x16 Gen3
MEMORY	Two DDR4 SO-DIMM Slots supporting DDR4-2666 ECC Memory, up to 64GB

COM Express Type 6

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

When high graphics and Hyper-threading matter

TARVOS

AI-ENABLED WITH (CLEA

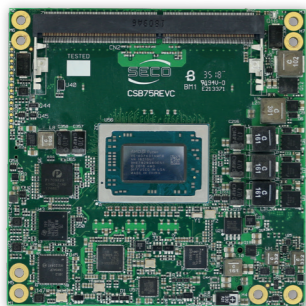|	
CPU	Intel® 6th and 7h generation Core™ / Xeon® CPUs
GRAPHICS	Intel® HD Graphics 530 /P530/630/P630
CONNECTIVITY	4x USB 3.0; 8x USB 2.0; 8x PCI-e x1 Gen3; PEG x16 Gen3
MEMORY	2 x DDR4 So-DIMM slots

COM Express Type 6

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

Next Generation x86 "Zen" Core and elite GPU performance

CHARON

AMD

AI-ENABLED WITH (CLEA

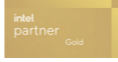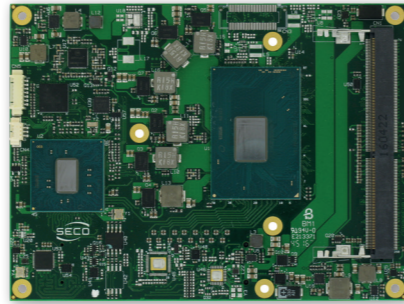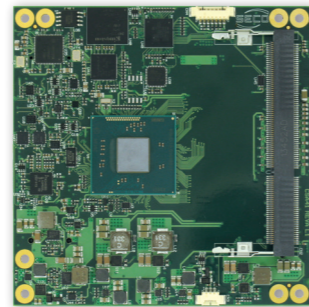Available in Industrial Temperature Range

CPU	AMD Ryzen™ Embedded V1000 processors
GRAPHICS	AMD Radeon™ Vega GPU with up to 11 Compute Units DirectX® 12 supported
CONNECTIVITY	4x USB 3.0; 8x USB 2.0; 4x PCI-e x1 Gen 3, PEG x8 Gen3
MEMORY	Up to two DDR4 SO-DIMM Slots supporting DDR4-3200 ECC Memory

COM Express Type 6

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

Versatile and rugged

CHANDRA

AI-ENABLED WITH (CLEA

Available in Industrial Temperature Range

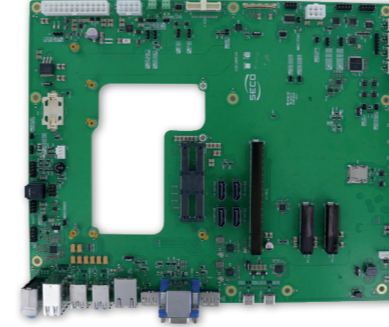|	
CPU	Intel® Atom® E3800 and Celeron® families
GRAPHICS	Integrated Intel® HD Graphics 4000 Series controller
CONNECTIVITY	4x USB 3.0; 7x USB 2.0; 4x PCI-e x1 Gen2
MEMORY	2x DDR3L SO-DIMM slots, up to 8GB

Carrier Board

Carrier Board for COM-Express® **Rel. 3.1 Type 6 Modules** for Development

Connectivity and Flexibility to Accelerate Development

CCOMe-E10

CROSS PLATFORM Philosophy

Cross-compatible platform with x86 and Arm® solutions

Video Interfaces	3 x DP++ connectors or 1 x DP++ connector and 2 x USB4.0 Type-C with Alternate-Mode VGA connector LVDS 24-bit Single/Dual Channel eDP 4-lanes 40 poles VESA connector Backlight control + LCD selectable voltages dedicated 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
PCI-e	2x PCI-e x4 Slots Gen4 1x PCI-e x16 Slot Gen4
USB	2 x USB 4.0 on Type-C sockets with Alternate-Mode (factory alternative to 2 x DP++ and 2 x USB 2.0) 4 x USB 3.2 Host ports on Type-A sockets 4 x USB 2.0 Host ports on Quad Type-A sockets
Audio	On-board HD Audio Codec (Realtek ALC888S) 5.1 Audio Jack with S/PDIF Optical interface 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 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
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.

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 PLATFORM Philosophy

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_{DC} (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")

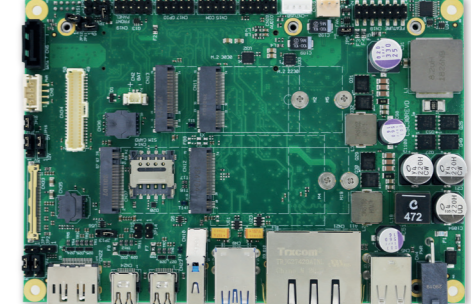*All carrier board components must remain within the operating temperature at any and all times, including start-up; carrier operating temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure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

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 PLATFORM *Philosophy*

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

COM·HPC®

COM-HPC® STANDARD ADVANTAGES

- FOR HIGH-END DESIGNS AND MARKETS
- HIGH GRAPHICS COMPUTING
- SUPPORT FOR HIGH-SPEED INTERFACES
- INTEGRATED VIDEO INTERFACES
- "CLIENT" AND "SERVER" VERSIONS

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	8x 25GbE KR
3x DDI	
2x BaseT (up to 10 Gb)	
2x SoundWire, I²S	BaseT (up to 10 Gb)

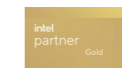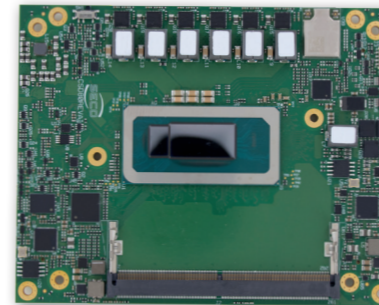| COM-HPC® Client	COM-HPC® Server
4x USB4	2x USB4
	2x USB3.2
4x USB2.0	4x USB2.0
2x SATA	2x SATA
eSPI, 2x SPI, SMB	eSPI, 2x SPI, SMB
2x I²C, 2x UART	2x I2C, 2x UART
12x GPIO	12x GPIO

ORION
COM-HPC® with 12th Gen Intel® Core™ (Codename: **Alder Lake-P**)

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

LAGOON
COM-HPC® with 11th Gen Intel® Xeon® W-11000E Series, Core™ vPro® and Celeron® (Codename: **Tiger Lake-H**)

Processing power, high performance graphics and top class connectivity

AI-ENABLED WITH (CLEA)

Available in Industrial Temperature Range

	ORION
Processor	12th 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*. *Certification upon request
USB	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$_{DC}$ .. +20V$_{DC}$ Main power supply. +5V$_{DC}$ stand-by
Operating System	Microsoft® Windows 10 IoT Enterprise LTSC. Microsoft® Windows Server 2022. Wind River VxWorks 7.0. Linux Kernel LTS. Wind River Linux. Yocto. Android
Operating Temperature*	0°C ÷ +60°C (Commercial version)
Dimensions	120 x 95 mm (COM-HPC® Size A Form factor, Client pinout)

	LAGOON
Processor	11th Generation Intel® Xeon®, Core™ and Celeron® Processors, also available in industrial temperature range. • Intel® Core™ vPRO® **i7-11850HE**, Eight Core @ 2.6GHz (up to 4.7GHz in Turbo Boost) with HT, 24MB Cache L3, 45/35W cTDP • Intel® Core™ vPRO® **i5-11500HE**, Six Core @ 2.6GHz (up to 4.5GHz in Turbo Boost) with HT, 12MB L3 Cache, 45/35W cTDP • Intel® Core™ **i3-11100HE**, Quad Core @ 2.4GHz (up to 4.4GHz in Turbo Boost) with HT, 8MB L3 Cache, 45/35W cTDP • Intel® Celeron® **6600HE**, Dual Core @2.6GHz, 8MB L3 Cache, 35W TDP • Intel® Xeon® vPRO® **W-11865MRE**, 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® **W-11555MRE**, 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® **W-11555MRE**, 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® **W-11865MLE**, 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® **W-11555MLE**, 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® **W-11155MLE**, 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	MPEG2, WMV9, AVC/H.264, JPEG/MJPEG, HEVC/H.265, VP9, AV1 HW decoding, up to 8k60.	AVC/H.264, HEVC/H.265, JPEG, VP9 HW encoding, up to 8k30	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)
Video Resolution	DP, eDP: Up to 5120x3200 @60Hz 24bpp / 7680x4320@60Hz 30bpp with DSC. 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	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	2x USB 3.2 Gen 2x2 ports	8 x USB 2.0 Host ports
PCI-e	1x PCI-e x4 Gen 4 port for NVME	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	SPI, eSPI, 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$_{DC}$ .. +20V$_{DC}$ Main power supply. +5V stand-by
Operating System	Microsoft® Windows 10 IoT Enterprise LTSC	Linux Kernel LTS	Yocto Project 3.0	WindRiver VxWorks 7.0	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.
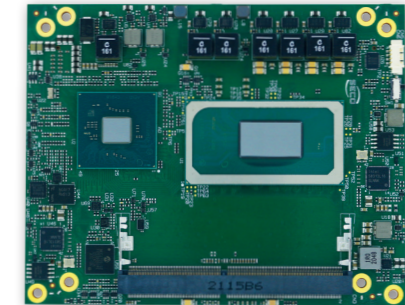
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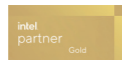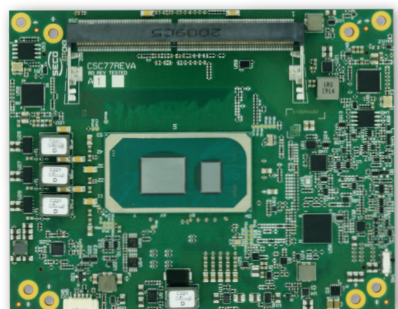
COM-HPC® with **11th Gen Intel® Core™** and
Celeron® (Codename: **Tiger Lake UP3**)

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

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

CARINA

intel partner Gold

AI-ENABLED WITH ((CLEA

Available in Industrial Temperature Range

Development Kit for COM-HPC Client Modules

COM-HPC CLIENT DEV KIT

CROSS PLATFORM Philosophy

Cross-compatible platform with x86 and Arm® solutions

SCHEMATICS PUBLICLY AVAILABLE

Processor	11th Generation Intel® Core™ and Celeron® Processors, also available in industrial temperature range • Intel® Core™ **i7-1185G7E**, Quad Core @ 2.8GHz (4.4GHz in Turbo Boost) with HT, 12MB Cache, 28/15/12W cTDP • Intel® Core™ **i5-1145G7E**, Quad Core @ 2.6GHz (4.1GHz in Turbo Boost) with HT, 8MB Cache, 28/15/12W cTDP • Intel® Core™ **i3-1115G4E**, Dual Core @ 3.0GHz (3.9GHz in Turbo Boost) with HT, 6MB Cache, 28/15/12W cTDP • Intel® Celeron® **6305E**, Dual Core @1.8GHz, 4MB Cache, 15W TDP • Intel® Core™ **i7-1185GRE**, Quad Core @ 2.8GHz (4.4GHz in Turbo Boost) with HT, 12MB Cache, with IBECC, 28/15/12W cTDP – Industrial (w/ Turbo OFF) • Intel® Core™ **i5-1145GRE**, Quad Core @ 2.6GHz (4.1GHz in Turbo Boost) with HT, 8MB Cache, with IBECC, 28/15/12W cTDP - Industrial (w/ Turbo OFF) • Intel® Core™ **i3-1115GRE**, Dual Core @ 3.0GHz (3.9GHz in Turbo Boost) with HT, 6MB Cache, 28/15/12W cTDP - Industrial (w/ Turbo OFF)
Max Cores	4
Memory	2x DDR4-3200 SODIMM Slots with IBECC (In-Band Error Correction Code), up to 64GB supported
Graphics	Integrated Iris® Xe 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$_{DC}$ .. +20V$_{DC}$ Main power supply +5V stand-by
Operating System	Microsoft® 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)

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

*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.

ETX® 3.0
Long Term Support

ETX® Module with the **Intel® Atom® E3800** and **Celeron®** (Codename: **Bay Trail**) System-on-Chip

Update your legacy design

ETX-A61

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Processor	Intel® Atom® **E3845**, Quad Core @1.91GHz, 2MB Cache, 10W TDP Intel® Atom® **E3827**, Dual Core @1.75GHz, 1MB Cache, 8W TDP Intel® Atom® **E3826**, Dual Core @1.46GHz, 1MB Cache, 7W TDP Intel® Atom® **E3825**, Dual Core @1.33GHz, 1MB Cache, 6W TDP Intel® Atom® **E3815**, Single Core @1.46GHz, 512KB Cache, 5W TDP Intel® Celeron® **J1900**, Quad Core @2.0GHz, 2MB Cache, 10W TDP Intel® Celeron® **N2930**, Quad Core @1.83GHz, 2MB Cache, 7.5W TDP Intel® Celeron® **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® 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$_{DC}$ ± 5% and + 5V$_{SB}$ (optional)	
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 Standard 8 (32 / 64 bit) Microsoft® 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.

ETX® STANDARD ADVANTAGES

FOR LEGACY DESIGNS

X86 BASED COM

EXTEND THE LIFE OF EXISTING ETX-BASED PROJECTS

PROVEN AND ESTABLISHED STANDARD

ISA BUS SUPPORT

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
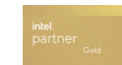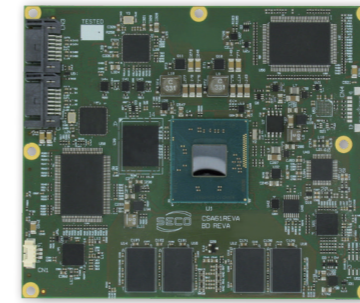
Innovative and upgradable | Accelerated time-to-market

MYON

MicroModule SOM

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

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

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

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

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Available in Industrial Temperature Range

AI-ENABLED WITH ((CLEA

Available in Industrial Temperature Range

MYON STANDARD ADVANTAGES

COMPACT FORM FACTOR

IDEAL FOR IOT AND BATTERY-OPERATED HANDHELD DEVICES

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

Myon I

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	Microsoft® Windows 10 IoT Core Linux Android
Operating Temperature*	-25 ÷ 85°C
Dimensions	48 x 32 x 4.2 mm

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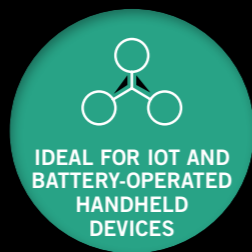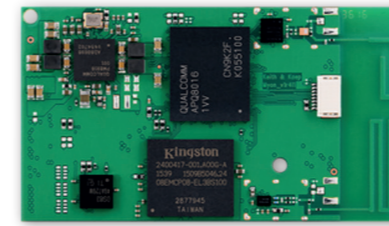ng temperature is independent of the module installed. Please refer to the specific module for more details. Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system.

Myon II

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** - 4x Cortex®-A53 cores up to 1.8GHz, no VPU • **i.MX 8M Mini Dual Lite** - 2x Cortex®-A53 cores up to 1.8GHz, no VPU • **i.MX 8M Mini Solo Lite** - 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: • **i.MX 8M Nano Quad** - Full featured, 4x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Nano Dual** - Full featured, 2x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Nano Solo** - Full featured, 1x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Nano Quad Lite** - 4x Cortex®-A53 cores up to 1.5GHz, no VPU • **i.MX 8M Nano Dual Lite** - 2x Cortex®-A53 cores up to 1.5GHz, no VPU • **i.MX 8M Nano Solo Lite** - 1x Cortex®-A53 cores up to 1.5GHz, no VPU
Memory	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
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
Video Interfaces	MIPI display (4 channel) / Single- or Dual-LVDS
Video Resolution	LVDS, MIPI: Up to 1920 x 1080p @60
Mass Storage	onboard 8 Bit wide eMMC 2x SDIO interface (e.g. for external SD cards)
Networking	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 Microsoft® 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.
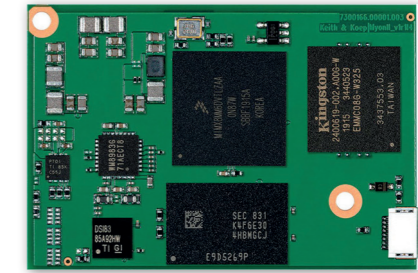
MicroModule Carrier Board for **Myon SOMs**

HMI for **Myon** MicroModule **SOMs**

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

ConXM

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

i-PAN M7

	Processor	Defined by compatible Myon SOMs • **Qualcomm® Snapdragon™** 410E Cortex® A53, QuadCore up to 1.2GHz on Myon I SOM • **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 • **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
	Video Interfaces	LVDS, HDMI
	Mass Storage	μSD Card Socket
	Networking	10/100 Mbit Ethernet RJ45 Connector WLAN 802.11 b/g/n 2.4GHz, Bluetooth via Myon I
	USB	USB2.0 Host, USB2.0 OTG
	Audio	Footprint for one optional 16-pin analog expansion connector for stereo headset/line-out, speaker and analog line-in
	Serial Ports	UART (low speed expansion connector)
	Other Interfaces	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
	Power Supply	Industrial +12 up to +24V supply, +5V (USB) / Lithium-ion, lithium-ion-polymer battery-charger / Coin-Cell charger (Myon I PMIC)
	Operating System	Microsoft® Windows 10 IoT Core Linux Android
	Operating Temperature*	-20 ÷ 85°C
	Dimensions	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.

	Processor	Depends on compatible Myon SOMs • **Qualcomm® Snapdragon™** 410E Cortex® A53, QuadCore up to 1.2GHz on Myon I SOM • **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 • **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
	Graphics	Depends on compatible Myon MicroModule SOMs
	Video Interfaces	MIPI-CSI Camera connector
	Video Resolution	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)
	Mass Storage	μSD Card Socket
	Networking	10/100 Mbit Ethernet RJ45 Connector WLAN 802.11 b/g/n 2.4GHz, Bluetooth via Myon I
	USB	USB 2.0 Host, μUSB 2.0 OTG / USB via i-MOD extension connector
	Audio	Solderpads for Speaker, Headphone, Microphone
	Serial Ports	UART via i-MOD extension connector
	Other Interfaces	I2C, CAN, Keys via i-MOD extension connectors 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	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.
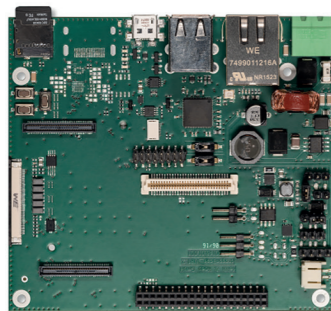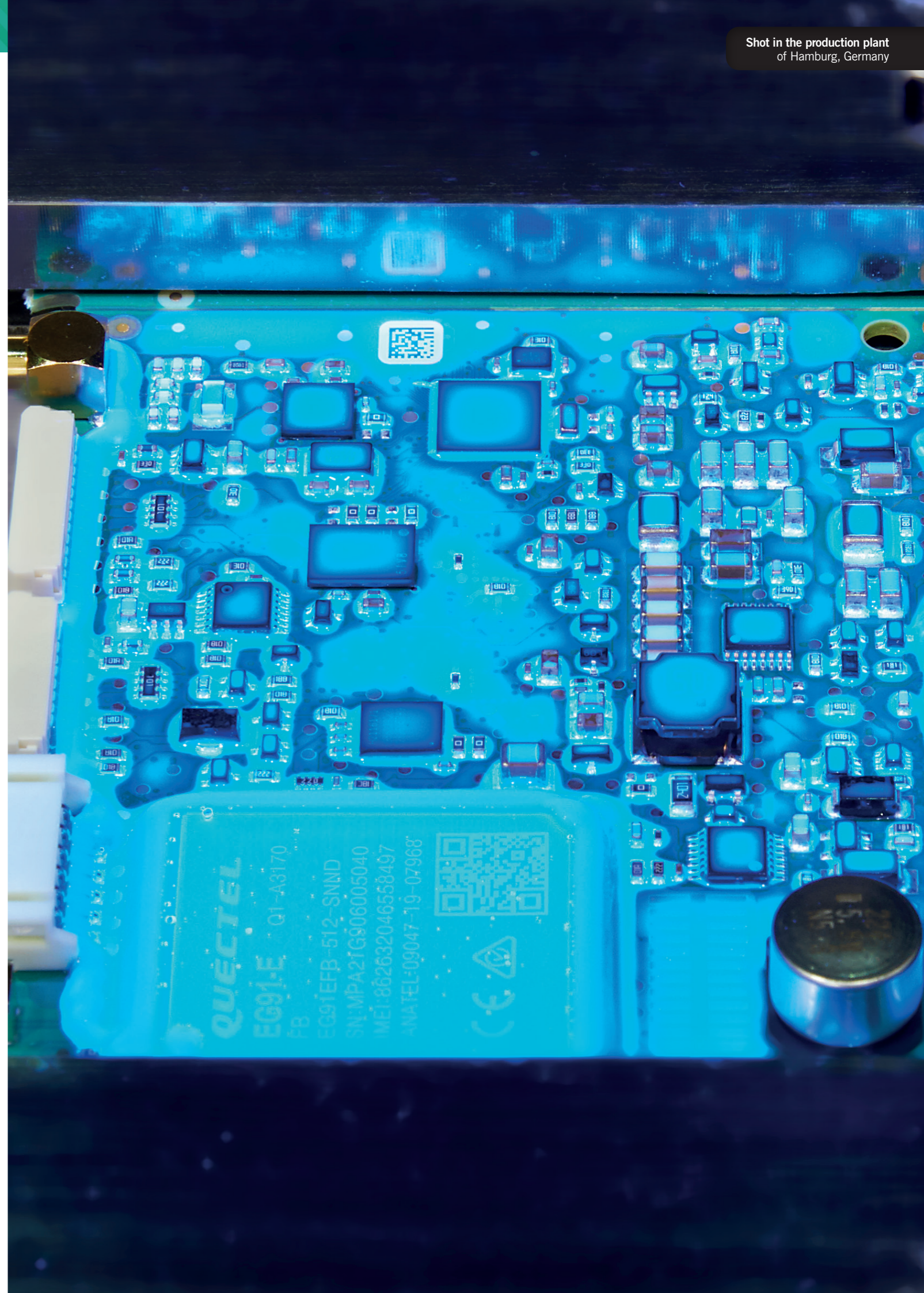
SODIMM-200 CPU-Module with
NXP i.MX 8M Mini

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

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

Trizeps VIII Mini

Bringing artificial intelligence to Arm® embedded edge solutions

Trizeps VIII Plus

GOLD PARTNER NXP

GOLD PARTNER NXP

AI-ENABLED WITH (CLEA) | Available in Industrial Temperature Range

AI-ENABLED WITH (CLEA) | Available in Industrial Temperature Range

TRIZEPS

SODIMM SOM

TRIZEPS STANDARD ADVANTAGES

POWERFUL

SPACE AND COST SAVING

SODIMM 200 STANDARD

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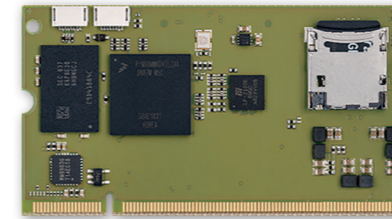
Trizeps VIII Mini

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** - 4x Cortex®-A53 cores up to 1.8GHz, no VPU • **i.MX 8M Mini Dual Lite** - 2x Cortex-A53 cores up to 1.8GHz, no VPU • **i.MX 8M Mini Solo Lite** - 1x Cortex®-A53 cores up to 1.8GHz, no VPU Optional: Programmable FPGA with up to 4300 LUTs to convert parallel display/camera/data-streams to MIPI DSI/CSI
Memory	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 Microsoft® Windows 10 IoT
Operating Temperature*	-40° ÷ 85°C (industrial) -25° ÷ 85°C (Extended Consumer) 0° ÷ 85°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 VIII Plus

Processor	NXP i.MX 8M Plus family SoCs: Dual or Quad Arm®Cortex®-A53 Cores + general purpose Cortex® M7 800MHz processor • NXP **i.MX 8M Plus Quad**, 4x Arm®Cortex®-A53 Cores up to 1.8GHz • NXP **i.MX 8M Plus Dual**, 2x Arm®Cortex®-A53 Cores up to 1.8GH NPU: 2.3 TOPS Neural Network performance (not for Quad Lite) Optional: NXP™ Kinetis V Arm® Cortex®-M0+ 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
Other Interfaces	3x 4 Bit wide SDIO 3.0 SPDIF In/Out I2S Multichannel Serial-Audio-Interface 2x I2C SPI QSPI GPIOs PWMs 2x CAN
Power Supply	3.3 VDC
Operating System	Linux Yocto Linux Debian Android Microsoft® Windows 10 IoT
Operating Temperature*	-40° ÷ 85°C (industrial) -25° ÷ 85°C (Extended Consumer) 0° ÷ 85°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.
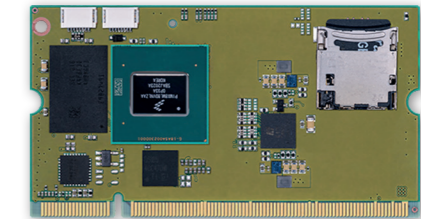
SODIMM-200 CPU-Module with
NXP i.MX 8M

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

Trizeps VIII

GOLD PARTNER NXP

AI-ENABLED WITH ((CLEA

Available in Industrial Temperature Range

Processor	NXP i.MX 8M Family based on Arm®Cortex®-A53 cores + general purpose Cortex®-M4 processor: • **i.MX 8M Quad** - 4x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M Dual** - 2x Cortex®-A53 cores up to 1.5GHz • **i.MX 8M QuadLite** - 4x Cortex®-A53 cores up to 1.5GHz, no VPU 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	
Memory	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 RGMII PHY or 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 Microsoft® Windows 10 IoT	
Operating Temperature*	-40° ÷ 85°C (industrial) -25° ÷ 85°C (Extended Consumer) 0° ÷ 85°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.
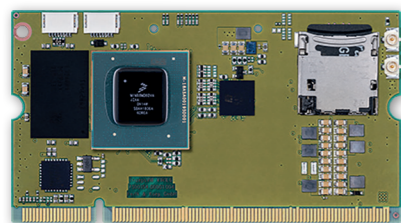

SODIMM-200 CPU-Module with
NXP i.MX6

High-performance i.MX6 CPU module with compact dimensions

Trizeps VII

GOLD PARTNER NXP
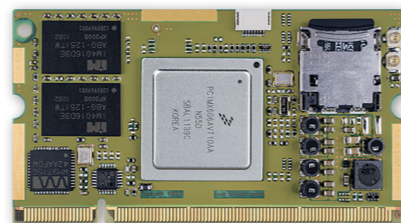
AI-ENABLED WITH ((CLEA

Available in Industrial Temperature Range

CPU	NXP i.MX6 Applications Processors, Solo up to QuadCore	
GRAPHICS	Vivante GC3500 2D accelerator + Vivante GC2000 3D accelerator	
CONNECTIVITY	1x 100/1000 Megabit Ethernet, WiFi/Bluetooth, USB 2.0, PCIe, HDMI	
MEMORY	Up to 2 GB LPDDR3-1066 RAM memory, 64 Bit	

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

GOLD PARTNER NXP

AI-ENABLED WITH ((CLEA

Available in Industrial Temperature Range

CPU	NXP i.MX 6SoloX, Single core Cortex®-A9 @ 1GHz + Cortex®-M4 core @ 227MHz	
GRAPHICS	Vivante GC400T, 2D and 3D HW accelerator	
CONNECTIVITY	2x Fast Ethernet, WiFi/Bluetooth, USB 2.0, PCIe	
MEMORY	Up to 2 GB LPDDR3-533 RAM memory, 32 Bit	

Carrier Board for **Trizeps VII**

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

ConXT

GOLD PARTNER NXP

Available in Industrial Temperature Range

|		
Processor	Defined by compatible Trizeps SODIMM SOMs • NXP **i.MX 6** Quad, Dual, DualLite, Solo, SoloX Arm®Cortex® A9 up to 1.0 GHz on Trizeps VII SOM	
Video Interfaces	RGB, LVDS, Dual LVDS	
Mass Storage	SD Card Socket	
Networking	2x 10/100 Mbit Ethernet RJ45 Connector Wireless functionalities depend on Trizeps SOM: • 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	
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 IOs (4x inputs (3 with ADC), 4x outputs), analog PAL camera (Cinch), UPS (Uninterruptible Power Supply), RTC with battery, 2x LED, I2C, GPIOs	
Power Supply	Industrial +12 up to +24V supply	
Operating System	Microsoft® Windows Embedded Compact Linux Debian Microsoft® 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** SODIMM SOMs

Carrier Board for Trizeps VII / VIII / VIII Mini / VIII Nano / VIII Plus SOMs

pConXS

GOLD PARTNER NXP

Available in Industrial Temperature Range

Processor	Defined by compatible Trizeps SODIMM SOMs • NXP **i.MX 6** Quad, Dual, DualLite, Solo, SoloX Arm®Cortex® A9 up to 1.0 GHz on Trizeps VII SOM • NXP **i.MX 8M** Arm®Cortex® A53 up to 1.5 GHz, up to Quad Core, integrated Arm®Cortex® M4 on Trizeps VIII SOM • 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 • 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 • 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	
Mass Storage	SD Card Socket	
Networking	10/100/1000 Mbit Ethernet RJ45 Connector Wireless functionalities depend on Trizeps SOM: • 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 • 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	
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), LineIn, 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 Microsoft® 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.
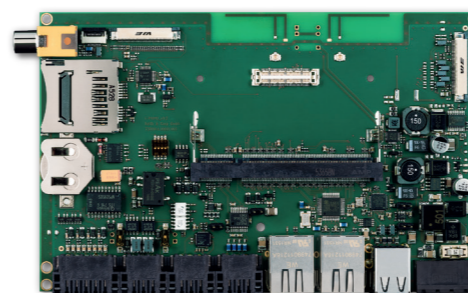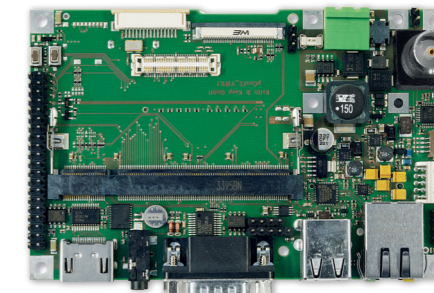
Carrier Board for **Trizeps** SODDIM SOMs

SODIMM-200 Carrier Board for **Trizeps**

HMI for **Trizeps** SODIMM SOMs

HMI for **Trizeps** SODIMM SOMs

Carrier Board for TrizepsVII / VIII / VIII Mini / VIII Nano / VIII Plus SOMs
iP5-Base

Available in Industrial Temperature Range

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

Available in Industrial Temperature Range

HMI with Trizeps SODIMM SOM tech supporting Trizeps VII and Trizeps VIII Nano/Mini/Plus
i-PAN T7 II

Available in Industrial Temperature Range

HMI with Trizeps SODIMM SOM technology which supporting Trizeps CPU modules
i-PAN7

Available in Industrial Temperature Range

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iP5-Base

Processor
Defined by compatible Trizeps SODIMM SOMs
- NXP **i.MX 6** Quad, Dual, DualLite, Solo, SoloX Arm®Cortex® A9 up to 1.0 GHz on Trizeps VII SOM
- NXP **i.MX 8M** Arm®Cortex® A53 up to 1.5 GHz, up to Quad Core, integrated Arm®Cortex® M4 on Trizeps VIII SOM
- 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
- 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
- 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

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:
- 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
- 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

USB
USB2.0 Host, USB2.0 OTG

Audio
SL2-40 pin header: stereo headphone (16R and 32R), speaker (Mono, 8R), LineIn, 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
Microsoft® Windows 10 IoT

Operating Temperature*
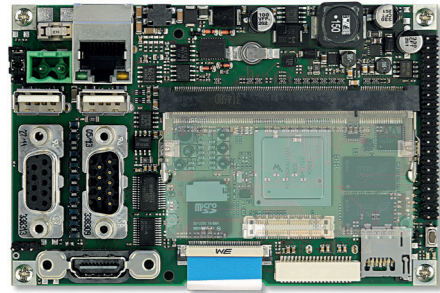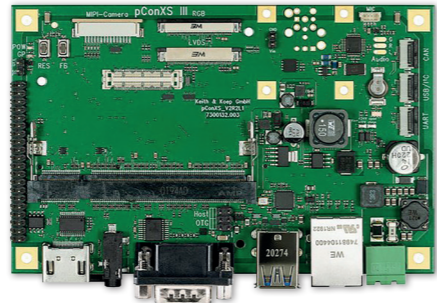-20 ÷ 85°C

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.

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pConXS III

Processor
Defined by compatible Trizeps SODIMM SOMs
- NXP **i.MX 6** Quad, Dual, DualLite, Solo, SoloX Arm®Cortex® A9 up to 1.0 GHz on Trizeps VII SOM
- NXP **i.MX 8M** Arm®Cortex® A53 up to 1.5 GHz, up to Quad Core, integrated Arm®Cortex® M4 on Trizeps VIII SOM
- 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
- 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
- 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

Mass Storage
SD Card Socket

Networking
10/100/1000 Mbit Ethernet RJ45 Connector

Wireless functionalities depend on Trizeps SOM:
- 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
- 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

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), LineIn, 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
Microsoft® 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.

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i-PAN T7 II

Processor
Depends on compatible Trizeps SODIMM SOMs
- NXP **i.MX 6** Quad, Dual, DualLite, Solo, SoloX Arm®Cortex® A9 up to 1.0 GHz on Trizeps VII SOM
- NXP **i.MX 8M** Arm®Cortex® A53 up to 1.5 GHz, up to Quad Core, integrated Arm®Cortex® M4 on Trizeps VIII SOM
- 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
- 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
- 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

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:
- 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
- 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

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.

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i-PAN7

Processor
Depends on compatible Trizeps SODIMM SOMs, i.e.
- NXP **i.MX 6** Quad, Dual, DualLite, Solo, SoloX Arm®Cortex® A9 up to 1.0 GHz on Trizeps VII SOM

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® 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.
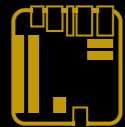
SINGLE BOARD COMPUTER ADVANTAGES

SBC

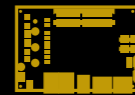- READY FOR SYSTEMS INTEGRATION
- REDUCED TIME-TO-MARKET
- BEST PRICE POINT FOR LOW VOLUME PROJECTS
- VERY LOW ENGINEERING DESIGN INVESTMENT
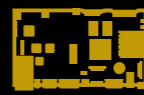- OFF-THE-SHELF SOLUTIONS

Embedded NUC™   3.5"   Pico-ITX   other SBCs
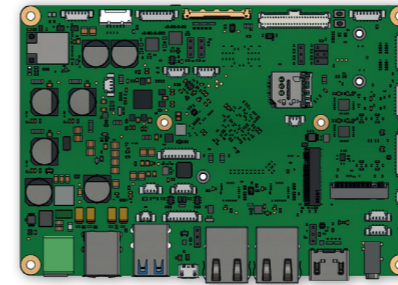

3.5" SBC with Rockchip RK3568 SoC

Up to 4K Multimedia Arm® Computing with Wireless and Wired Connectivity
SAYLOR

AI-ENABLED WITH CLEA

Processor	**Rockchip RK3568** processor • 4x Cortex®-A55 cores, up to 2.0GHz, 64-bit architecture, with Neural Processing Unit (NPU)
Memory	Soldered-down DDR4-3200 memory, up to 4GB
Graphics	Mali-G52 1-Core-2EE GPU • OpenGL ES 1.1/2.0/3.2 • Vulkan 1.0 and 1.1 • OpenCL 2.0 Full Profile Embedded Video CODEC • H.265/H.264/VP9 4K@60fps HW decoding • VP8/VC1/MPEG-4/MPEG-2/MPEG-1 1080p @60fps HW decoding • H.265/H.264 1080p@60fps HW encoding Supports 3 independent video outputs
Video Interfaces	HDMI™ LVDS single / dual channel interface eDP 1.3 interface
Video Resolution	HDMI™: up to 4K x 2K @60Hz LVDS: up to 1920 x 1080 @60Hz eDP: up to 4096 x 2160 (4K)
Mass Storage	eMMC 5.1 drive soldered on-board, up to 64GB (first boot device) microSD slot (second boot device) I2C flash QSPI flash (factory option)
Networking	2x Gigabit Ethernet ports, implemented using TI DP83867 Ethernet PHY on RGMII interface coming from SoC Optional on-boad M.2 1216 module WLAN 802.11 a/b/g/n/ac + BT 5.0 M.2 Socket 2 Key B for LTE module + microSIM card slot on-board
USB	2x USB 3.0 Type-A 1x USB 2.0 Type-A 1x USB 2.0 OTG micro-AB muxed with one USB 3.0 (used for Deep Recovery) 1x USB 2.0 internal pin header 1x USB 2.0 internal pin header, dedicated to touch screen
Audio	TRRS combo audio jack (stereo mic in, stereo line out) Mono speaker out (amplified 1.3Watt @8Ohm) on internal header 1x PDM signal ports on internal header
Serial Ports	1x debug UART 1x JTAG port 2x 4 wire RS-232 / RS-422 / RS-485 (multistandard transceivers) on internal header 2x 2 wire TTL UART ports on internal header
Other Interfaces	2x 2-lanes MIPI-CSI camera connector or 1x 4-lanes M.2 Socket 2 Key M for AI accelerator modules Dedicated connector for I2C touch screen controller 8x GPIOs or 4x GPIOs + 4 ADC (factory configuration alternatives) 2x CAN, 1x I2C, 1x SPI
Power Supply	+12V$_{DC}$ .. +24V$_{DC}$ range RTC battery
Operating System	Linux Yocto Android
Operating Temperature*	0°C to +60°C (Commercial 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.

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

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

AI-ENABLED WITH CLEA

🌡 Available in Industrial Temperature Range

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 IBECC, 28W TDP (12W cTDP) – Industrial **Intel® Core™ i5-1145GRE**, Quad Core @2.6GHz (4.1GHz Turbo) with HT, 8MB Cache, with IBECC, 28W TDP (12W cTDP) - Industrial **Intel® Core™ i3-1115GRE,** Dual Core @3.0GHz (3.9GHz Turbo) with HT, 6MB Cache, with IBECC, 28W TDP (12W cTDP) - Industrial
Memory	2x DDR4-3200 SODIMM slots Up to 64GB with IBECC 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) 1x eDP 1.3 or Single/Dual-Channel 18-/24-bit LVDS interface
Video Resolution	DP, eDP Up to 5120x3200 @60Hz 24bpp / 7680x4320 @60Hz 30bpp with DSC HDMI 1.4 Up to 4Kx2K 24-30Hz 24bpp
Mass Storage	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 Micro-SIM slot. ** M.2 WiFi/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$_{DC}$ .. +24V$_{DC}$ range Cabled coin cell battery for RTC
Operating System	Microsoft® Windows 10 IoT Enterprise LTSC 2021 Linux (Kernel ≥ 5.4 version)
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 (Codename: Elkhart Lake)

Compact Size & High Performance SBC with a multicore SoC
ICARUS

intel partner Gold

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Available in Industrial Temperature Range

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/ IBECC and IHS - Industrial Intel® Atom® x6413E Quad Core @1.5GHz (3GHz Turbo) 9W TDP w/ IBECC and IHS - Industrial Intel® Atom® x6425E Quad Core @2.0GHz (3GHz Turbo) 12W TDP w/ IBECC and IHS - Industrial Intel® Atom® x6212RE Dual Core @1.2GHz (no Turbo) 6W TDP w/ IBECC, IHS and TCC – Industrial Intel® Atom® x6414RE Quad Core @1.5GHz (no Turbo) 9W TDP w/ IBECC, IHS and TCC – Industrial Intel® Atom® x6425RE Quad Core @1.9GHz (no Turbo) 12W TDP w/ IBECC, IHS and TCC – Industrial (*) IHS: Integrated heat spreader; 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 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 3.0 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_DC 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.
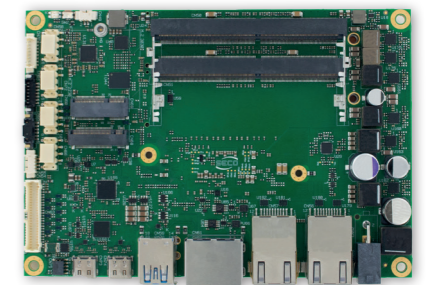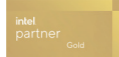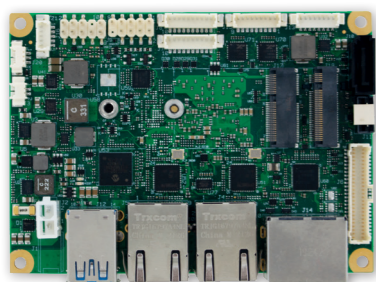** SATA SSD and WWAN functionalities share the same slot and are therefore mutually exclusive.

3.5'' SBC with Rockchip PX30

High-performance application processor designed for digital multimedia applications
JUNO

Rockchip 瑞芯微电子

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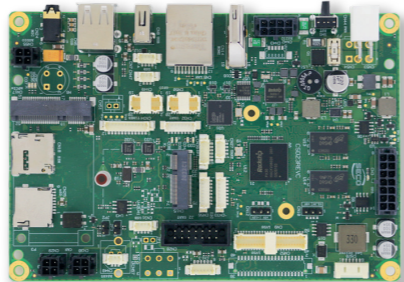|	
Processor	Rockchip PX30 processor, 4x Cortex®-A35 cores
Max Cores	4
Memory	Soldered-down DDR3L memory, up to 4GB total, 32-bit interface
Graphics	Mali-G31 GPU with High performance dedicated 2D processor OpenGL ES 1.1 / 2.0 / 3.2, Vulkan 1.0, OpenCL 2.0, DX11 FL9_3 Embedded VPU, able to offer: • Multi-format 1080p 60fps video decoders (H.265, H.264, VC-1, MPEG-4, VP8) • H.264 1080p@30fps HW encoding 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 Hosts 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 GPIs @3.3V (5V tolerant) 16x GPOs @3.3V
Power Supply	+12V_DC ÷ +24 V_DC 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.

3.5'' SBC with AMD Ryzen™ Embedded R1000 / V1000

Full connectivity on powerful AMD Ryzen™ platform
MERIDA

AMD

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Available in Industrial Temperature Range

Processor	AMD Ryzen™ Embedded V1000 family SoCs: • AMD Ryzen™ Embedded V1807B with AMD Radeon™ Vega 11 Graphics, Quad Core Dual Thread @ 3.35GHz (3.8 Boost), TDP 35-54W • AMD Ryzen™ Embedded V1756B with AMD Radeon™ Vega 8 Graphics, Quad Core Dual Thread @ 3.25GHz (3.6 Boost), TDP 35-54W • AMD Ryzen™ Embedded V1605B with GPU AMD Radeon™ Vega 8, Quad Core Dual Thread @ 2.0GHz (3.6 Boost), TDP 12-25W • AMD Ryzen™ Embedded V1202B with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 2.3GHz (3.2 Boost), TDP 12-25W AMD Ryzen™ Embedded R1000 family SoCs: • AMD Ryzen™ Embedded R1606G with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 2.6GHz (3.5 Boost), TDP 12-25W • AMD Ryzen™ Embedded R1505G with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 3.25GHz (3.6 Boost), TDP 12-25W
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 GPI/Os 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_DC ÷ +24 V_DC 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.

3.5'' SBC with NXP i.MX 8M Mini

Compact Size & High Performance SBC with a multicore SoC
ASTRID

GOLD PARTNER NXP

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Available in Industrial Temperature Range

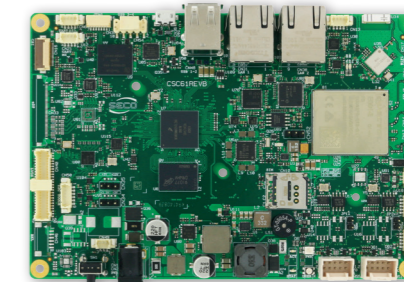|	
Processor	NXP i.MX 8M Mini Family based on Arm® Cortex®-A53 cores + general purpose Cortex®-M4 400MHz processor: • i.MX 8M Mini Quad – Full featured, 4x Cortex®-A53 cores up to 1.8GHz • i.MX 8M Mini Dual – Full featured, 2x Cortex®-A53 cores up to 1.8GHz • i.MX 8M Mini Solo – Full featured, 1x Cortex®-A53 cores up to 1.8GHz • i.MX 8M Mini Quad Lite –4x Cortex®-A53 cores up to 1.8GHz, no VPU • i.MX 8M Mini Dual Lite –2x Cortex®-A53 cores up to 1.8GHz, no VPU • i.MX 8M Mini Solo Lite –1x Cortex®-A53 cores up to 1.8GHz, no VPU
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: • 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 or 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 slots 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: • 2xPWM @3.3V • GP I2C interface @3.3V • 1x Open Drain output (max 12V, 250mA) • 2x GPIOs @3.3V • 1xRS-232 or 1x RS-485 or 4x GPIOs / 1x UART or 1x CAN (factory options) • 1xRS-232 or 1x RS-485 or 4x GPIOs / 1x UART or 1x CAN + on-board ultra-low power RTC (factory options) Watchdog Dedicated connector for I2C Touch Screen Controller Support Onboard Buzzer (Comm. temp. range only) Optional Ultra Low Power RTC
Power Supply	+12V_DC ÷ +24V_DC
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	146x102mm (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.

3.5" SBC with NXP i.MX 8X

Ideal for certified performance requirements and safety efficient
VESTA

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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
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: • eDP 4-lane interface + LVDS single Channel 18-/24-bit interface • LVDS Dual Channel / 2 x LVDS Single Channel interface
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: • 16x GPIOs • I2C interface • 2x analog inputs • 1x PWM 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.
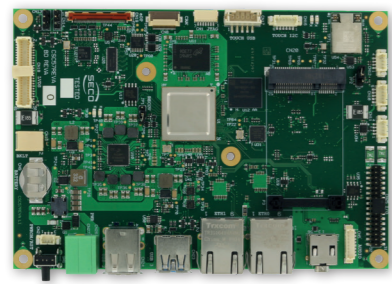

3.5" SBC with NXP i.MX8

Industrial Arm® solution for IoT edge computing applications
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Available in Industrial Temperature Range

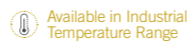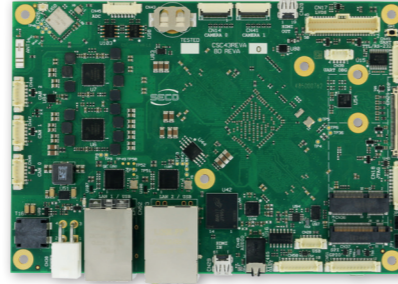|	
Processor	NXP i.MX 8 Family: **i.MX 8QuadMax**: 2x Arm®Cortex®-A72 + 4x Arm®Cortex®-A53 + 2x Cortex®-M4F **i.MX 8QuadPlus**: 1x Arm®Cortex®-A72 + 4x Arm®Cortex®-A53 + 2x Cortex®-M4F
Max Cores	8
Memory	Soldered down LPDDR4 memory, 64-bit interface, 1600MHz. Base configuration 2GB, up-scalable to 4GB, 6GB, 8GB
Graphics	2x Graphics accelerators Vivante GC7000 / XVSX or GC7000Lit /XVSX QuadMax and QuadPlus 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™ output (Micro) Optional eDP 1.4 interface Optional Single/Dual-Channel 18-/24- bit LVDS interface INPUTS: HDMI™ input 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_DC ± 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.

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

x86 solution designed for IoT edge computing in harsh environments
ADLER

intel partner Gold

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Available in Industrial Temperature Range

Processor	Intel® Atom® **x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom® **x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom® **x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® **N4200** Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **J3455**, Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® **J3355**, 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 GPI/Os 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_DC Cabled coin cell battery for RTC
Operating System	Microsoft® Windows 10 Enterprise (64-bit) Microsoft® Windows 10 IoT Core (32- / 64-bit) WindRiver Linux 64-bit Yocto (64-bit) Android (planned)
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.
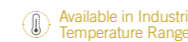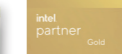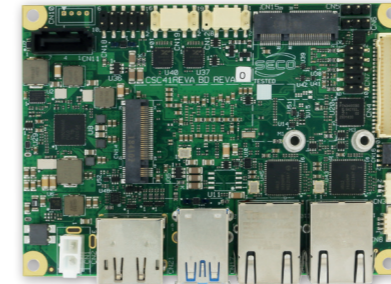

3.5" SBC with Rockchip RK3399

The Right Balance of Graphic/Computing Performance and Cost
SOLON

Rockchip 瑞芯微电子

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Available in Industrial Temperature Range

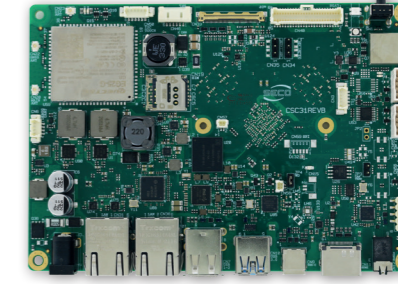|	
Processor	**Rockchip RK3399** processor, 2x Cortex®-A72 MP cores + 4x Cortex®-A53 MPCores, up to 1.8GHz, 64-bit architecture
Max Cores	2+4
Memory	Soldered-down LPDDR4 memory, up to 4GB total, 64-bit interface
Graphics	4-Core Mali-T860MP4 GPU OpenGL ES 1.1/2.0/3.0/3.1, OpenVG 1.1, OpenCL, DX11 support Embedded VPU, able to offer: • H.265 10-bit, H.264 10-bit, VP9 8-bit 4Kx2K@60fps HW Decoding • MPEG-4/MPEG-2/VP8 1080p@60fps HW Decoding • H.264, VP8 1080p@30fps HW encoding 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_DC + +24 V_DC 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.

3.5" SBC with **NXP i.MX 8X**

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

ALBION

AI-ENABLED WITH (CLEA

Available in Industrial Temperature Range

Processor	NXP i.MX 8M Family, based on Arm® Cortex®-A53 MPCore + Cortex®-M4 core platform: **i.MX 8M Quad** - Quad core up to 1.5GHz **i.MX 8M QuadLite** - Quad core up to 1.5 GHz per core **i.MX 8M Dual** - 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	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) USB 2.0 Dual Type-A connector 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 GPI/Os connector SPI Connector
Power Supply	+12V$_{DC}$ 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.
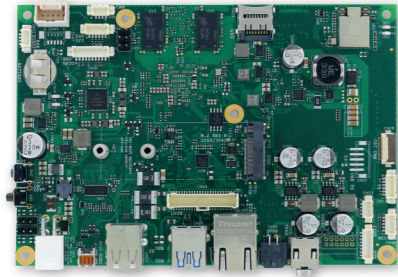

Modular SBC with **NXP i.MX 8M Mini/Nano**

Modularly expandable ready to use Single Board Computer (SBC)

SBCSOM

AI-ENABLED WITH (CLEA

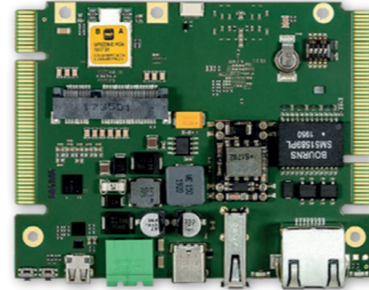| Processor	NXP i.MX 8M Mini Family based on Arm® Cortex®-A53 cores + general purpose Cortex®-M4 400MHz processor: **i.MX 8M Mini Quad** – Full featured, 4x Cortex®-A53 cores up to 1.8GHz **i.MX 8M Mini Dual** – Full featured, 2x Cortex®-A53 cores up to 1.8GHz **i.MX 8M Mini Solo** – Full featured, 1x 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	Microsoft® 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 with **NXP i.MX8M Mini**

High performance with low power consumption for edge computing

TANARO CORE

AI-ENABLED WITH (CLEA

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 with **NXP i.MX6**

Optimized SBC for small sized HMI solutions

SANTINO LT CORE

AI-ENABLED WITH (CLEA

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 VDC
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.
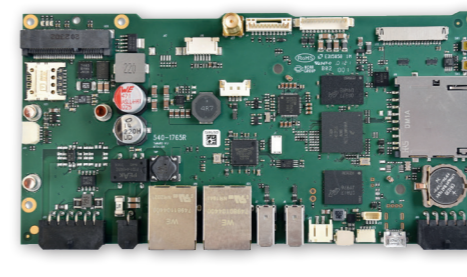
SBC with **NXP i.MX6**

Optimized SBC for medium sized HMI solutions
SANTINO CORE

AI-ENABLED WITH CLEA

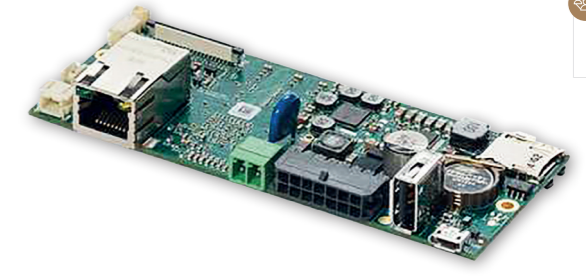|		
Processor	NXP i.MX 6 Family, based on Arm® Cortex®-A9 processors: **i.MX6S Solo** - Single core up to 1 GHz **i.MX6DL Dual Lite** - Dual core up to 1 GHz per core	
Memory	1 GB 32 bit LPDDR4	
Graphics	2D graphics accelerator OpenGL® ES 2.0 3D graphics accelerator with a shader	
Video Interfaces	18-bit 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_{DC}	
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 with **NXP i.MX6**

Flexible, powerful all-rounder for any demanding applications
SANTARO CORE

AI-ENABLED WITH CLEA

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_{DC}
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.
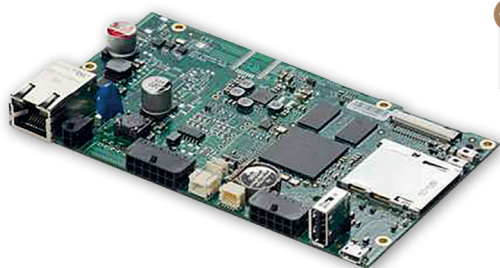

SBC with **NXP i.MX6**

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

AI-ENABLED WITH CLEA

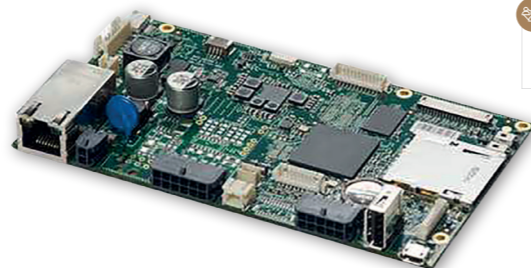|	
Processor	NXP i.MX 6 Family based on Arm® Cortex®-A9 cores : **i.MX 6 Quad Plus** – Full featured, 4x Cortex®-A9 cores up to 1.0GHz **i.MX 6 Quad** – Full featured, 4x Cortex®-A9 cores up to 1.0GHz **i.MX 6 Dual** – Full featured, 4x Cortex®-A9 cores up to 1.0GHz **i.MX 6 Single** – Full featured, 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 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 with **NXP i.MX6**

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

AI-ENABLED WITH CLEA

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.
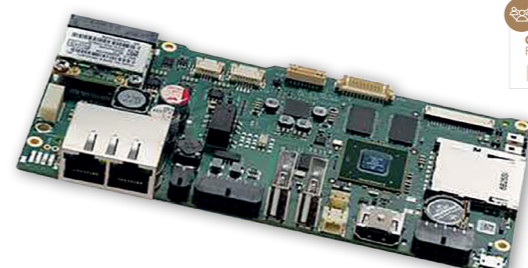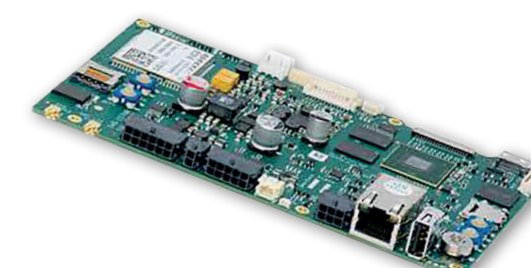
IoT Sensor to Cloud with ESP32-D0WDQ6

From sensors to Cloud in a single step

SCORPIUS

ESPRESSIF

AI-ENABLED WITH CLEA   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$_{DC}$ ... +24V$_{DC}$
Operating Temperature	-40°÷+85°C (Industrial Temperature range)
Dimensions	4x8 cm

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

Flexible and expandable full industrial x86 eNUC SBC

ALVIN

intel partner Gold

AI-ENABLED WITH CLEA   Available in Industrial Temperature Range

Processor	Intel® Atom® x5-E3930 Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom® x5-E3940 Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom® x7-E3950 Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® N4200 Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® N3350 Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® J3455, Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® J3355, 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
Video Interfaces	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 Resolution	DP: Up to 4096 x 2160 @60HZ eDP: Up to 3840 x 2160 @60Hz HDMI: Up to 3840 x 2160 @60Hz LVDS: Up to 1920 x 1200 @ 60Hz
Mass Storage	Optional eMMC drive onboard M.2 SATA SSD slot (Socket 2 Key B Type 3042/2260 **) microSD Card slot 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)
USB	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
PCI-e	1 x PCI-e x2 port on M.2 SSD/WWAN Slot 1 x PCI-e x1 port on WLAN M.2 Slot
Audio	HD Audio codec / Cirrus Logic CS4207 Mic In and Line Out Audio jacks Amplified Speaker output on internal pin header
Serial Ports	2 x RS-232/RS-422/RS-485 UARTS software configurable, on internal Pin Header
Other Interfaces	2 x I2C + 8 x GPI/Os 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
Power Supply	+18V$_{DC}$ ÷ +32 V$_{DC}$ recommended +15V$_{DC}$ ÷ +36 V$_{DC}$ absolute RTC battery
Operating System	Microsoft® Windows 10 Enterprise (64 bit) Microsoft® Windows 10 IoT Core Yocto (64 bit) Linux
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.
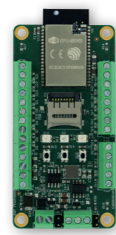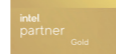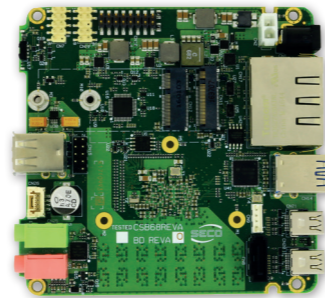** SATA SSD and WWAN functionalities share the same slot and are therefore mutually exclusive.

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

Multifunctional SBC on the eNUC form factor

NOLAN

intel partner Gold

Microsoft Azure Certified

AI-ENABLED WITH CLEA
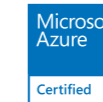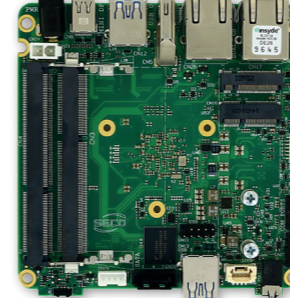
CPU	N-series Intel® Pentium® and Celeron® SOCs
GRAPHICS	Integrated Graphics, three independent display support
CONNECTIVITY	2x GbE; CIR sensor; 8x GPI/Os
MEMORY	2 x DDR3L SO-DIMM Slots with Dual Channel Support, up to 8GB DDR3L-1600

SBC

SBC with NXP i.MX 6 Processor

Flexible, Open-source, Industrial SBC

DORIS
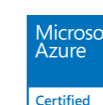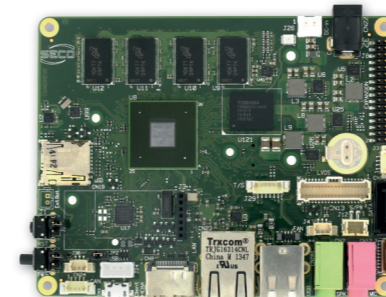
GOLD PARTNER NXP

Microsoft Azure Certified

AI-ENABLED WITH CLEA   Available in Industrial Temperature Range

CPU	Single-, Dual- and Quad- Core (Arm® Cortex® A9 Cores)
GRAPHICS	2D/3D dedicated graphics processors
CONNECTIVITY	Wi-Fi add-on module; up 28 GPI/Os; CAN Bus
MEMORY	Up to 2GB DDR3L on-board

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

Limitless Embedded applications

LAMPOS

intel partner Gold

AI-ENABLED WITH CLEA   Available in Industrial Temperature Range
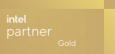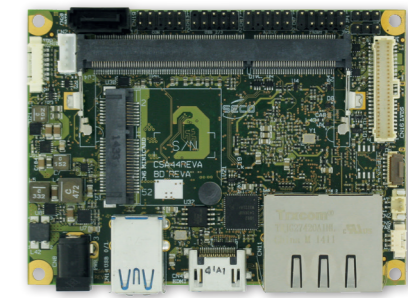
CPU	Intel® Atom® E3800 family of System-on-Chip
GRAPHICS	Integrated Intel® HD Graphics controller
CONNECTIVITY	2x GbE; Half miniPCI-e slot; 8x GPI/Os
MEMORY	Up to 8GB DDR3L ECC SO-DIMM

SBC

SBC with NXP i.MX6ULL

Optimized SBC for small sized HMI solutions

NALLINO CORE

GOLD PARTNER NXP

AI-ENABLED WITH CLEA
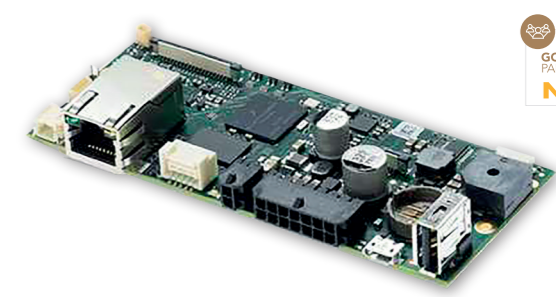
CPU	NXP i.MX 6ULL
CONNECTIVITY	1x 100MbE, 2x USB, RS232, RS485, CAN
MEMORY	Soldered on Board DDR3L memory

UDOO BOARDS

The Most Powerful Maker Board Ever
UDOO X86 II

UDOO X86 II is the New PC: the most powerful x86 maker board ever and an Arduino™ Leonardo-compatible platform, all embedded on the same board. On UDOO X86 II you can run all the software available for the PC world, from gaming to video streaming, from graphical editors to professional development platforms, plus all the software or the Arduino™ Leonardo world, including all the sketches, libraries and the official Arduino™ Leonardo IDE

HIGHLIGHTS

Processors	2.24 GHz Intel® Celeron® N3160	2.56 GHz Intel® Pentium® N3710
CPU Cores	4	4
Memory	4 GB DDR3L Dual Channel 1600 mHz	8 GB DDR3L Dual Channel 1600 mHz
Mass storage	SATA 3 connector - M.2 Key B 2260 SATA 3 SSD Slot (also X2 PCIex modules) - Micro SD card slot eMMC 32 GB	

The Speed Force turned Mini PC
UDOO BOLT GEAR

A true mobile supercomputer with reality-bending graphics and an ultrafast processor that gives you power to watch 4K 60fps videos on multiple screens at once, run deep neural networks, play the latest AAA games, build robots, explore lifelike VR and AR worlds

HIGHLIGHTS

Processors	AMD Ryzen™ Embedded V1202B	AMD Ryzen™ Embedded V1605B
CPU Cores	Dual Core/Quad Thread @ 2.3GHz (3.2GHZ Boost)	Quad Core/Eight Thread @ 2.0GHz (3.6GHZ Boost)
Graphics	AMD Radeon™ Vega 3 Graphics (3 GPU CU)	AMD Radeon™ Vega 8 Graphics (8 GPU CU)
Multimedia	DirectX® 12, OpenCL™, OpenGL®, The Vulkan® API H.265 Decode & Encode (8-bit), VP9 Decode	

The Computer Vision and AI Mini PC
UDOO VISION

UDOO Vision is the Computer Vision and Artificial Intelligence mini PC based on Intel® Atom™ X Series and Arduino-Leonardo microcontroller.

HIGHLIGHTS

Processors	Intel®Atom™ x5-E3940	Intel®Atom™ x7-E3950
CPU Cores	Quad Core @1.6GHz, 2MB L2 Cache, 9,5W TDP	Quad Core @1.6GHz, 2MB L2 Cache, 12W TDP
Memory	4GB - 32-bit Quad-Channel, LPDDR4	8GB - 32-bit Quad-Channel, LPDDR4
Mass storage	M.2 Key B Slot for optional SSD, SATA Gen3, Micro SD card slot	

Raising the Maker World to the Next Level
UDOO BOLT

The UDOO BOLT is a quantum leap compared to current maker boards: a portable, breakthrough supercomputer that goes up to 3.6 GHz thanks to the AMD Ryzen™ Embedded V1000 SoC, a top-notch, multicore CPU with a mobile GPU on par with GTX 950M and an integrated Arduino™-compatible platform, all wrapped into one.

HIGHLIGHTS

Processors	AMD Ryzen™ Embedded V1202B	AMD Ryzen™ Embedded V1605B
CPU Cores	Dual Core/Quad Thread @ 2.3GHz (3.2GHZ Boost)	Quad Core/Eight Thread @ 2.0GHz (3.6GHZ Boost)
Graphics	AMD Radeon™ Vega 3 Graphics (3 GPU CU)	AMD Radeon™ Vega 8 Graphics (8 GPU CU)
Multimedia	DirectX® 12, OpenCL™, OpenGL®, The Vulkan® API H.265 Decode & Encode (8-bit), VP9 Decode	

The World's Most Flexible AI Platform
UDOO KEY

UDOO KEY is a fully programmable board combining Raspberry Pi RP2040 and ESP32 into a single powerful solution. It allows you to use either RP2040, ESP32 or both to build any AI projects on your terms.

HIGHLIGHTS

Microcontrollers	ESP32-WROVER-E	RP2040
Memory	8 MB PSRAM	264 KB SRAM
Flash Storage	16 MB Internal flash,	64 M-bit External QSPI Flash
Connectivity	Wi-Fi/BT/BLE	
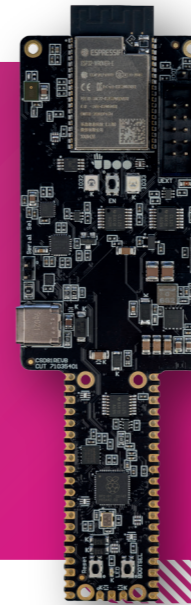
UDOO BOARDS

Fanless embedded PC with the 11th Gen Intel® Core™
and Intel® Celeron® SoCs (Codename: **Tiger Lake UP3**)

Rugged industrial box PC with 11ᵗʰ Gen Intel® Core™ performance

PHOENIX

Fanless embedded PC with the
Intel® Atom® x6000E, Pentium®, Celeron® N,
and J (Codename: **Elkhart Lake**) SoCs

Low power Atom®-based Box PC ready for industrial automation and edge computing

PYXIS

FANLESS EMBEDDED COMPUTERS

SECO OFF-THE-SHELF SOLUTIONS FOR EASIER SYSTEM INTEGRATION

TOUCH-DISPLAY SOLUTIONS

EXPERTISE IN ASSEMBLY SERVICES

MECHANICAL DESIGN

PHOENIX

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 IBECC, 28W TDP (12W cTDP) – Industrial **Intel® Core™ i5-1145GRE**, Quad Core @ 2.6GHz (4.1GHz Turbo) with HT, 8MB cache, with IBECC, 28W TDP (12W cTDP) - Industrial **Intel® Core™ i3-1115GRE**, Dual Core @ 3.0GHz (3.9GHz Turbo) with HT, 6MB cache, with IBECC, 28W TDP (12W cTDP) - Industrial
Memory	2x DDR4-3200 SODIMM slots Up to 64GB (IBECC supported only with Core™ industrial SoCs)
Graphics	Up to two video decode boxes (VDBoxes) for enhanced video stream capabilities 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	DP: up to 5120x3200 @60Hz 24bpp / 7680x4320@60Hz 30bpp with DSC HDMI 1.4: up to 4Kx2K 24-30Hz 24bpp
Mass Storage	On-Board NMVe Drive, up to 2 modules with global capacity up to 1TB
Networking	2x 2.5 Gigabit Ethernet RJ45 connectors Optional on-board M.2 Wi-Fi (802.11 ac / a / b / g / n) + BT 5.0 module, with dipole antennas included* Optional on-board M.2 LTE modem with Mini-SIM slot, with dipole antennas included* *Certification upon request
USB	2x Superspeed USB 10Gbps ports on Dual Type-A sockets 2x Superspeed USB 20Gbps on USB Type-C slots
Serial Ports	2x RS-232/RS-422/RS-485 UARTS software configurable, on DB9 connector
Audio	Lineout + MicIn combo TRRS Audio Jack
Other Interfaces	Optional 2x 12 poles terminal block connectors with the following I/O: • 8x GPIOs • 1x I2C • 1x SPI • 1x 5V • 1x 3.3V • 1x 12V • 3x GND Power ON Button Optional TPM 1.2/2.0 module on-board
Power Supply	12V$_{DC}$ to 24V$_{DC}$ range, Mega-Fit 2p RA Connector Coin cell battery for RTC On-Board
Operating System	Microsoft® Windows 10 IoT Enterprise LTSC 2021 Linux (Kernel ≥ 5.4 version)
Operating Temperature	Commercial range: 0°C to +40°C, with 0.7m/s airflow** Extended range: -30°C to +40°C, with 0.7m/s airflow** **Up to 60°C with scaled down CPU TDP
Dimensions	199 x 174 x 73 mm (7.83" x 6.85 " x 2.87") DIN-rail or Wall Mount brackets (Factory Alternatives)

PYXIS

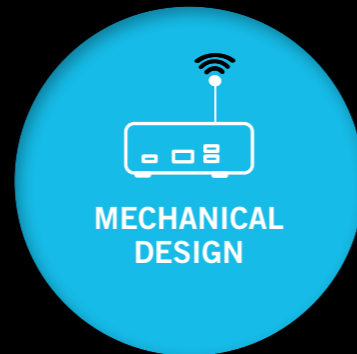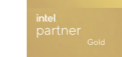|	
Processor	**Intel® Celeron® J6413** Quad Core @ 1.8GHz (3GHz Turbo) 10W TDP **Intel® Celeron® N6211** Dual Core @1.2GHz (3GHz Turbo) 6.5W TDP **Intel® Pentium® J6426** Quad Core @2.0GHz (3GHz Turbo) 10W TDP **Intel® Pentium® N6415** Quad Core @1.2GHz (3GHz Turbo) 6.5W TDP **Intel® Atom® x6211E** Dual Core @1.3GHz (3GHz Turbo) 6W TDP w/ IBECC and HIS - Industrial **Intel® Atom® x6413E** Quad Core @1.5GHz (3GHz Turbo) 9W TDP w/ IBECC and HIS - Industrial **Intel® Atom® x6425E** Quad Core @2.0GHz (3GHz Turbo) 12W TDP w/ IBECC and IHS - Industrial **Intel® Atom® x6212RE** Dual Core @1.2GHz (no Turbo) 6W TDP w/ IBECC, IHS and TCC – Industrial **Intel® Atom® x6414RE** Quad Core @1.5GHz (no Turbo) 9W TDP w/ IBECC, IHS and TCC – Industrial **Intel® Atom® x6425RE** Quad Core @1.9GHz (no Turbo) 12W TDP w/ IBECC, IHS and TCC – Industrial (*) HIS: Integrated Heatspreader; 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	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
Video Resolution	Up to 4096x2160 @60Hz
Mass Storage	Optional eMMC 5.1 drive soldered on-board Optional on-board M.2 SATA SSD **
Networking	2x Gigabit Ethernet RJ45 connectors Optional on-board M.2 Wi-Fi (802.11 ac / a / b / g / n) +BT 5.0 module, external antennas* Optional on-board M.2 LTE modem with nanoSIM slot, external antennas* ** *Certification upon request
USB	Dual USB 3.2 Gen1 Type-A connector
Serial Ports	2x RS-232/RS-422/RS-485 UARTS software configurable, on DB9 connector
Audio	Lineout + MicIn combo TRRS audio jack
Other Interfaces	Optional 2x 12 poles terminal block connectors with the following I/O: • 2x CAN • 8x GPIOs / QEP / PWM / SPI • 2x I2C • 1x SPI • 1x 5V • 1x 3.3V • 1x 12V • 3x GND Power ON button nanoSIM slot soldered on-board for the modem Optional TPM 1.2/2.0 module on-board Optional 4x SMA connectors for external Wi-Fi / WWAN antennas
Power Supply	+12V$_{DC}$ Cabled coin cell battery for RTC
Operating System	Microsoft® Windows 10 Enterprise Microsoft® Windows 10 IoT Core Linux Yocto
Operating Temperature	0°C to +50°C
Dimensions	180 x 107 x 75 mm (7" x 4.2" x 3")

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

Fanless embedded PC for **Medical applications** with **Intel® Atom® x5-E3930** Processors

Fanless embedded PC for **Digital Signage** applications with **AMD Ryzen™ Embedded R1000/V1000** family of SOCs

Fanless embedded PCr with **NXP i.MX 8** Applications Processors

Fanless embedded PC with Intel® Atom® X , Celeron® J/N, and Pentium® N Series (Codename: **Apollo Lake**) SOCs

IoT Gateway Solution certified for medical environment
DRACO

Multi-Display Digital Signage Solution
KRATER

NXP i.MX 8 processors in a boxed solution for Edge Computing applications
VELA

Fanless Industrial Edge Computing
PEGASUS

AI-ENABLED WITH CLEA (×4)

DRACO

Processor	Intel® Atom® x5-E3930 Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP
Memory	Quad Channel soldered down LPDDR4 memory, up to 8GB
Graphics	Integrated Intel® HD Graphics 500 series controller, with 12 Execution Units. 4K HW decoding and encoding of HEVC(H.265), H.264, VP8, SVC, MVC. Dual independent display
Video Interfaces	Two multimode Display Port on miniDP++ connectors
Video Resolution	Up to 4096 x 2160
Mass Storage	eMMC drive onboard, up to 64 GB. Optional SATA M.2 SSD module up to 512GB
Networking	2x Gigabit Ethernet ports. 1x 4kV insulated Gigabit Ethernet port. M.2 Socket 2 Key B Slot for Modem modules (not provided by SECO. To be used as alternative to M.2 SSD), connected to internal microSIM Slot. M.2 Socket 1 Key E Slot for WiFi/BT modules
USB	2 x USB 3.0 Type-A sockets on Front Panel
Other Interfaces	Power Button. Power On Status LED
Power Supply	DC Power jack, with cable restraint,type DC-062-4-2.5-S214. +18V_DC ÷ +32 V_DC recommended. +15V_DC ÷ +36 V_DC absolute
Operating System	Linux. EDGEHOG (under development)
Operating Temperature	0°C ÷ +40°C (in presence of air flow)
Optional accessories	miniDP++ to HDMI adapter. Customised bracket for VESA Panel mount
Dimensions	162.3 x 109.3 x 42.4 mm
Compliance with medical standards	IEC 60601-1. IEC 60601-1-2. IEC 60601-1-6. IEC 62366

KRATER

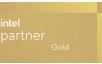|	
Processor	AMD Ryzen™ Embedded V1000 family SoCs: AMD Ryzen™ Embedded **V1605B** with GPU AMD Radeon™ Vega 8, Quad Core Dual Thread @ 2.0GHz (3.6 Boost), TDP 12-25W. AMD Ryzen™ Embedded **V1202B** with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 2.3GHz (3.2 Boost), TDP 12-25W. AMD Ryzen™ Embedded R1000 family SoCs: AMD Ryzen™ Embedded **R1606G** with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 2.6GHz (3.5 Boost), TDP 12-25W. AMD Ryzen™ Embedded **R1505G** with GPU AMD Radeon™ Vega 3, Dual Core Dual Thread @ 3.25GHz (3.6 Boost), TDP 12-25W
System Memory	Up to 2x DDR4 SODIMMs. Available memory sizes: 4GB, 8GB, 16GB Single Channel. 8GB, 16GB, 32GB Dual Channel
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	Up to 4096 x 2160
Mass Storage	Optional M.2 NVMe module (available sizes: 250GB, 500GB, 1TB, 2TB). Optional SATA SSD (available sizes: 250GB, 500GB, 1TB, 2TB)
Networking	2 x Gigabit Ethernet ports. Internal M.2 WWAN slot (Socket 2 Key B Type 2242/3042) for Modems. Internal M.2 Connectivity Slot (Socket 1 Key E Type 2230) for WiFi / BT modules
USB	2 x USB 3.0 Type-A sockets on Rear Panel
Serial Ports	2x RS-232/RS-422/RS-485 ports on DB-9 connectors
Other Interfaces	Externally accessible miniSIM Slot for the optional M.2 Modem. Power Button with Power On Status LED on Front Panel. Optional TPM 1.2 or 2.0 on-board
Power Supply	2-poles Mega-Fit connector. +12V_DC ÷ +24 V_DC
Operating System	Optional preinstalled OS: Microsoft® Windows 10 IoT Enterprise (64bit). Linux
Operating Temperature	0°C ÷ +50°C
Dimensions	179,4 (W) x 109 (D) x 57,8 (H) mm
Optional accessories	VESA standard 100x100 Wall mount plate, dimensions 151 (W) x 111 (D) x 5,08 (H) mm

VELA

Processor	NXP **i.MX 8 QuadMax**: Dual A72-core, Quad A53-core, Dual M4F-core. NXP **i.MX 8 QuadPlus**: Single A72-core, Quad A53-core, Dual M4F-core
System Memory	64-bit soldered down LPDDR4-1600 memory, up to 8GB
Graphics	2x Graphics accelerators Vivante GC7000 / XVSX for QuadMax and GC7000Lite / XVSX for QuadPlus. 1x embedded VPU, supporting H.265 (4K30) and H.264 (1080p60) decoding and H.264 (1080p30) encoding
Video Interfaces	HDMI™ output (Micro)
Video Resolution	Up to 4K
Mass Storage	Optional eMMC 5.1 drive on-board, up to 64GB. M.2 Key B slot for optional SSD drive, up to 512GB. microSD card slot (accessible from panel)
Networking	2x Gigabit Ethernet RJ45 connectors. M.2 WLAN Connectivity Slot for optional accessory WiFi + BT external module, external antennas. M.2 WWAN Connectivity Slot for optional accessory Modem modules (excludes SSD Drive), external antennas
USB	1 x USB 3.0 Host port on Type-A socket. 1 x USB 2.0 Host port on Type-A socket. 1 x USB 2.0 micro-AB connector (OTG)
Serial Ports	1 x RS-232 port on DB9-M connector. 1 x multistandard RS-485 / RS-422 port on DB9-M connector
Audio	Line Out + Mic In combo TRRS audio jack
Other Interfaces	Optional 2x 12 poles terminal block connectors with the following I/O: • 2x CAN • 4x GPIOs • 4x Analog Inputs • 1x SPI • 1x I2C • 1x 5V • 1x 3.3V • 1x 12V • 3x GND. Power ON Button with integrated LED. microSIM slot soldered on-board for the Modem. Coin cell battery holder for RTC. Optional 4x SMA connectors for external WiFi / WWAN antennas
Other	Optional VESA 100 bracket accessory. Optional DIN standard mounting plate accessory
Power Supply	+12V_DC, Mini-Fit Power connector
Operating System	Linux. Android (planned)
Operating Temperature*	0°C ÷ +50°C
Dimensions	181 x 109 x 75 mm

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

PEGASUS

Processor	Intel® Atom® **x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP. Intel® Atom® **x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP. Intel® Atom® **x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP. Intel® Celeron® **N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP. Intel® Pentium® **N4200** Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP
System Memory	32-bit Single-/Dual-/Quad-Channel LPDDR4 soldered onboard, up to 2400 MT/s. Max memory size 8GB
Graphics	Integrated Intel® HD Graphics 500 series controller with up to 18 Execution Units. Two 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	Combo HDMI™ + DP++ connector
Video Resolution	Up to 4K
Mass Storage	Optional eMMC 5.0 drive on-board, up to 64GB. Optional SATA SSD M.2 Socket 2 Key B, up to 512GB (excludes WWAN module). microSD Card slot (combo with miniSIM slot)
Networking	2x Gigabit Ethernet RJ45 connectors with Gigabit Ethernet i210 controllers. M.2 Socket 1 Key E 2230 Slot for accessory WiFi + BTLE module. M.2 Socket 2 Key B Slot for accessory WWAN module (excludes SATA SSD module)
USB	USB 3.0 Dual Type-A connector
Serial Ports	2 x RS-232/RS-422/RS-485 Serial ports on 2x DB9-M connectors
Other Interfaces	Power ON Button with integrated LED. Optional TPM 2.0 on-board. miniSIM slot for M.2 modem (combo with microSD slot). 2x SMA connectors for external WiFi / WWAN antennas
Other	Optional VESA 100 bracket accessory
Power Supply	+12V_DC, 5.7mm DC Power Jack connector. 220mAh non-rechargeable Coin cell battery for RTC
Operating System	Microsoft® Windows 10 IoT Core. Linux
Operating Temperature*	0°C ÷ +50°C
Dimensions	181 x 109 x 79 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.

Fanless embedded PC based on **Rockchip RK3399** Applications Processor

The right match between performance and power in a box PC

PICTOR

AI-ENABLED WITH ((CLEA

Processor	Rockchip RK3399 processor, 2x Cortex®-A72 MP cores + 4x Cortex®-A53 MPCores, up to 1.8GHz, 64-bit architecture
System Memory	64-bit soldered down LPDDR4 memory, up to 4GB
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: • H.265 10-bit, H.264 10-bit, VP9 8-bit 4Kx2K@60fps HW Decoding • MPEG-4/MPEG-2/VP8 1080p@60fps HW Decoding • H.264, VP8 1080p@30fps HW encoding
Video Interfaces	HDMI™ Connector DP interface on USB Type-C connector (Alternate mode)
Video Resolution	Up to 4K
Mass Storage	Optional eMMC 5.1 drive on-board, up to 64GB
Networking	2x Gigabit Ethernet RJ45 connectors Optional on-board WiFi (802.11 ac / a / b / g / n) +BT 5.0 module, external antennas* Optional on-board LTE modem with miniSIM slot or eSIM, external antennas* *Certification upon request
USB	2 x USB 2.0 on Dual Type-A socket 1 x USB 3.0 Type-C connector (alternate mode with DP) 1 x USB 3.0 Type-A connector
Serial Ports	2 x RS-232 or RS-485 ports (factory options) on DB9-M connectors
Audio	Lineout + MicIn combo TRRS Audio Jack
Other Interfaces	Optional 2x 12 poles terminal block connectors with the following I/O: • 2x CAN • 3x GPIOs • 1x Open Drain Output • 1x PWM • 1x I2C • 1x 5V • 1x 3.3V • 1x 12V • 3x GND Power ON Button with integrated LED miniSIM slot soldered on-board for the Modem Optional 4x SMA connectors for external WiFi / WWAN antennas
Other	Optional VESA 100 bracket accessory Optional DIN standard mounting plate accessory
Power Supply	+12V$_{DC}$ ÷ +24V$_{DC}$, DC Power Jack
Operating System	Linux Yocto Android (planned)
Operating Temperature*	0°C ÷ +50°C
Dimensions	181 x 109 x 75 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.

IP20 Fanless embedded PC based on **Rockchip RK3399** Applications Processor

Enhanced graphics and computing performance for high-end industrial applications

DORADO

AI-ENABLED WITH ((CLEA

Processor	Rockchip RK3399 processor, 2x Cortex®-A72 MP cores + 4x Cortex®-A53 MP cores, up to 1.8GHz, 64-bit architecture
System Memory	64-bit soldered down LPDDR4 memory, 2GB
Graphics	4-Core Mali-T860MP4 GPU OpenGL ES 1.1/2.0/3.0/3.1, OpenVG 1.1, OpenCL, DX11 support Embedded VPU: • H.265 10-bit, H.264 10-bit, VP9 8-bit 4Kx2K@60fps hardware decoding • MPEG-4/MPEG-2/VP8 1080p@60fps hardware decoding • H.264, VP8 1080p@30fps hardware encoding Supports 2 independent video outputs
Video Interfaces	HDMI™ Connector DP interface on USB Type-C connector (Alternate mode)
Video Resolution	Up to 4K
Mass Storage	eMMC 5.1 drive on-board, 16GB
Networking	1x Gigabit Ethernet RJ45 connector on-board WiFi (802.11 ac / a / b / g / n) + BT 5.0 module, external antennas on-board LTE Cat4 modem with microSIM slot, external antennas
USB	3x USB 2.0 Type-A connectors 1x USB 3.0 Type-A connector 1x USB 3.0 Type-C connector (alternate mode with DP)
Serial Ports	2x RS-232 on DB9-M connectors
Other Interfaces	Secure Element microSIM slot soldered on-board for the cellular modem
Other	IP20 steel box enclosure Wall mounting brackets
Power Supply	12 VDC to 24 VDC, DC Power Jack
Operating System	Linux Android
Operating Temperature*	-20°C to +50°C
Dimensions	177 x 150 x 27 mm

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

Fanless embedded PC with **NXP i.MX 8M** Applications Processors

Multicore processing and flexible connectivity for multimedia and industrial IoT applications

PAVO

AI-ENABLED WITH ((CLEA

GOLD PARTNER NXP

Processor	NXP **i.MX 8M Quad**, Quad A53-core up to 1.5GHz, with GPU and VPU NXP **i.MX 8M QuadLite**, Quad A53-core up to 1.5GHz, with GPU only NXP **i.MX 8M Dual**, Dual A53-core up to 1.5GHz, with GPU and VPU
System Memory	32-bit 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
Video Interfaces	Optional HDMI 1.4 / 2.0a interface
Video Resolution	Up to 4K
Mass Storage	Optional eMMC 5.0 drive on-board, up to 16GB
Networking	1x Gigabit Ethernet RJ45 connector Optional on-board WiFi (802.11 ac / a / b / g / n) +BT 5.0 module, external antennas* M.2 Socket 2 Key B Slot for optional accessory M.2 Modem, external antennas* *Certification upon request
USB	2 x USB 2.0 on Dual Type-A socket 1 x USB 3.0 Type-A socket 1 x USB 2.0 micro-AB connector (interface shared with USB 3.0 port)
Serial Ports	1 x RS-232 Serial port on DB9-M connector
Audio	Line Out + Mic In combo TRRS audio jack Optional Speaker connector, 10W per channel amplified
Other Interfaces	Optional 2x 12 poles terminal block connectors with the following I/O: • 1x CAN • 8x GPIOs • 1x SPI • 1x I2C • 1x 5V • 1x 3.3V • 1x 12V • 3x GND Power ON Button with integrated LED microSIM slot soldered on-board for the Modem Coin cell battery holder for RTC Optional 4x SMA connectors for external WiFi / WWAN antennas
Other	Optional VESA 100 bracket accessory Optional DIN standard mounting plate accessory
Power Supply	+12V$_{DC}$, Mini-Fit Power connector
Operating System	Linux Android (planned)
Operating Temperature*	0°C ÷ +50°C
Dimensions	181 x 109 x 75 mm

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

Fanless embedded PC with Intel® Atom® X Series (Codename: **Apollo Lake**) Processors

Fanless, compact and versatile embedded box PC

CYGNUS

intel partner Gold

AI-ENABLED WITH ((CLEA

Available in Industrial Temperature Range

Processor	**Intel® Atom® x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP **Intel® Atom® x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP **Intel® Atom® x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP
Memory	Quad Channel soldered down LPDDR4 memory, up to 8GB
Graphics	Integrated Intel® HD Graphics 505 or 500 series controller, with up to 18 Execution Units 4K HW decoding and encoding of HEVC(H.265), H.264, VP8, SVC, MVC Dual independent display
Video Interfaces	Two multimode Display Port on miniDP++ connectors
Video Resolution	Up to 4096 x 2160
Mass Storage	Optional eMMC drive onboard Optional SATA M.2 SSD module up to 512GB
Networking	2 x Gigabit Ethernet ports M.2 Socket 2 Key B Slot for Modem modules (alternative to M.2 SSD), connected to internal microSIM Slot M.2 Socket 1 Key E Slot for WiFi/BT modules
USB	2 x USB 3.0 Type-A sockets on Front Panel 2 x USB 2.0 Type-A sockets on Rear Panel
Serial Ports	2x RS-232/RS-422/RS-485 ports, software configurable, DB9 male connectors
Audio	Internal HD Audio codec Cirrus Logic CS4207 Mic In and Line Out Audio jacks
Other Interfaces	Power Button Power On Status LED
Power Supply	PCB terminal block, type Phoenix 1990973 +18V$_{DC}$ ÷ +32 V$_{DC}$ recommended +15V$_{DC}$ ÷ +36 V$_{DC}$ absolute
Operating System	Preinstalled OS (factory options): • Microsoft® Windows 10 IoT entry • Linux 64-bit Available on request: • Wind River Linux (64-bit) • Yocto (64-bit) • Android (planned)
Operating Temperature	With internal SSD, 0°C ÷ +60°C (in presence of air flow)* Without internal SSD, -40°C ÷ +60°C (in presence of air flow)**
Optional accessories	miniDP++ to HDMI adapter Customised bracket for wall mount
Dimensions	162.3 x 109.3 x 52.4 mm

* Environment temperature measured near the heatsink 's fins. Upon costumer to verify that the temperature remains within the admissible range.
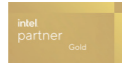** Temperature range below 0°C tested on the SBC only.

HYDRUS

Fanless embedded PC with
Intel® Celeron® J/N and Intel® Pentium® N Series
(Codename: **Apollo Lake**) SOCs

Multi-connectivity and multi-protocol plug & play Industrial IoT gateway

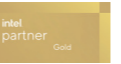**AI-ENABLED WITH (CLEA**

Processor	Intel® **Pentium® N4200** Quad Core @1.1GHz (burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® **Celeron® N3350** Dual Core @1.1GHz (burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® **Celeron® J3455**, Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® **Celeron® J3355**, Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TDP
Memory	Quad Channel soldered down LPDDR4 memory, up to 8GB
Graphics	Integrated Intel® HD Graphics 505 or 500 series controller, with up to 18 Execution Units 4K HW decoding and encoding of HEVC(H.265), H.264, VP8, SVC, MVC Dual independent display
Video Interfaces	Two multimode Display Port on miniDP++ connectors
Video Resolution	Up to 4096 x 2160
Mass Storage	Optional eMMC drive onboard Optional SATA M.2 SSD module up to 512GB
Networking	2 x Gigabit Ethernet ports M.2 Socket 2 Key B Slot for Modem modules (alternative to M.2 SSD), connected to internal microSIM Slot M.2 Socket 1 Key E Slot for WiFi/BT modules
USB	2 x USB 3.0 Type-A sockets on Front Panel 2 x USB 2.0 Type-A sockets on Rear Panel
Audio	Internal HD Audio codec Cirrus Logic CS4207 Mic In and Line Out Audio jacks
Other Interfaces	Power Button Power On Status LED
Power Supply	DC Power jack, with cable restraint, type DC-062-4-2.5-S214 +18V$_{DC}$ ÷ +32 V$_{DC}$ recommended +15V$_{DC}$ ÷ +36 V$_{DC}$ absolute Min power required, 40W
Operating System	Preinstalled OS (factory options): • Microsoft® Windows 10 IoT entry • Linux 64-bit Available on request: • Wind River Linux (64-bit) • Yocto (64-bit) • Android (planned)
Operating Temperature*	0°C ÷ +60°C (in presence of air flow)
Optional accessories	miniDP++ to HDMI adapter Customised bracket for wall mount
Dimensions	162.3 x 109.3 x 42.4 mm

*Environment temperature measured near the heatsink 's fins. Upon costumer to verify that the temperature remains within the ammissible range.

CHAMALEON

IP65 Fanless Embedded PC based on
Intel® Atom® x5 (Codename: **Apollo Lake**)
Applications Processor

High video quality in a boxed solution for Industrial Automation and Edge IoT

AI-ENABLED WITH (CLEA

Processor	Intel® **Atom® x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP
System Memory	Quad Channel soldered down LPDDR4 memory, 2GB
Graphics	Integrated Intel® HD Graphics 500 series controller, 12 Execution Units 4K HW decoding and encoding of HEVC(H.265), H.264, VP8, SVC, MVC
Video Interfaces	1x multimode Display Port on miniDP++ connector
Video Resolution	Up to 4096 x 2160
Mass Storage	eMMC 5.0 drive on-board, 64GB Optional SATA M.2 SSD module up to 512GB (alternative to M.2 Modem / optional 2x GbE)
Networking	2x Gigabit Ethernet RJ45 connectors 2x optional Gigabit Ethernet RJ45 connectors (alternative to M.2 Modem / SSD) M.2 Socket 2 Key B Slot for cellular modem modules (alternative to M.2 SSD / optional 2x GbE), M.2 Socket 1 Key E Slot for WiFi/BT modules, external antennas
USB	2x USB 2.0 Type-A sockets
Serial Ports	2x RS-232/RS-485 ports, software configurable
Other Interfaces	8x GPIOs TPM 2.0 chip for encryption MicroSIM slot soldered on-board for the cellular modem
Other	IP65 aluminium box enclosure DIN standard mounting plate
Power Supply	+18VDC to +32 VDC recommended +15VDC to +36 VDC absolute
Operating System	Preinstalled OS (factory options): • Microsoft® Windows 10 IoT enterprise • Linux 64-bit
Operating Temperature	With internal SSD, 0°C to +60°C (in presence of air flow)* Without internal SSD, -40°C to +60°C (in presence of air flow)**
Dimensions	165 x 110 x 75 mm

* Environment temperature measured near the heatsink 's fins. Upon costumer to verify that the temperature remains within the admissible range.
** Temperature range below 0°C tested on the internal single board computer only.

EASY EDGE

IoT Sensor to Cloud

From sensors to AI in a single step

ESPRESSIF

AI-ENABLED WITH (CLEA

Processor	**ESP32-D0WD-V3** Dual Core Xtensa® 32-bit LX6 Microprocessor
Memory	Internal 520KB SRAM + 16KB SRAM in RTC
Graphics	N.A.
Mass Storage	16MB SPI Flash 8MB PSRAM microSD slot
Networking	Embedded WiFi (802.11 b/g/n) + BT 4.2/BT LE module Optional Modem with GNSS functionality: • Quad Band GSM/GPRS Modem, SIMCOM SIM868 • Global-Band LTE CAT-M/NB-IoT modem, SIMCOM SIM7080G
Serial Ports	RS-232 / TTL UART (jumper selectable) port on 6-pin dedicated connector
CAN	CAN Port on 3-pin dedicated connector
Other Interfaces	Accelerometer Optional Trusted Secure Element Expansion 8-pin connector, able to manage: • Up to 3x Digital GPIOS, 2 of them managed also in UltraLow Power States too • Up to 2x analog Inputs • I2C interface (fixed interface) • Additional 2-Wire UART • Second I2C interface • Up to 2x PWM 1x Pushbutton White LED for Power On Signaling Green LED for Modem Activity Signaling Blue LED for Edgehog network connection signaling Yellow LED for WiFi/BT activity or other signaling eSIM or microSIM slot (factory options) SMA connectors for WiFi/BT, Modem and GNNS (antennas not provided)
Power Supply	2-pin micro-Fit Connector +9VDC .. +24VDC Optional 2000mAh rechargeable battery, LIR18650
Operating Temperature*	0°÷+45°C
Dimensions	110 x 91 x31 mm (LxWxD)
Mechanical	Wall mount and DIN rail mount

*Measured inside the case, during any and all times (including start-up). Actual temperature will widely depend on application and/or environment.

LYRA

Industrial IoT Gateway with
NXP i.MX 6SoloX Processor

Enhance your edge capabilities with a Synthetic Brain

GOLD PARTNER NXP

AI-ENABLED WITH (CLEA

CPU	NXP i.MX 6SoloX Processor
GRAPHICS	N.A.
CONNECTIVITY	up to 2x Fast Eth; WiFi + BTLE; optional LTE Cat4 modem onboard; 3x Multicolor Signalling LEDs; 1x RS-232 port; 1x RS-485 port; 2x CAN port
MEMORY	32-bit DDR3L memory soldered onboard

Fanless embedded PC with AMD Emb. 3rd gen.
R-Series SOC (**Merlin Falcon**) / G-Series SOC-I
(**Brown Falcon**) / G-Series SOC-J (**Prairie Falcon**)

CETUS

The Next Generation Single-Board Computer

AMD

AI-ENABLED WITH (CLEA

CPU	AMD Embedded 3rd generation R-Series SOC or G-Series SOC-I or G-Series SOC-J (Codename: Prairie Falcon)
GRAPHICS	AMD Radeon™ 3rd -Generation Graphics Core Next (GCN)
CONNECTIVITY	2x GbE; 4x USB 3.0; 4x USB 2.0; 6x RS-232
MEMORY	Up to 2x 8GB DDR4 SODIMM modules

PAYMENT SYSTEMS

FAST AND INTUITIVE PAYMENT WITHOUT PIN WITH KarL4

ONE POINT OF CONTACT FOR ALL QUERIES

FAST AND FLEXIBLE INSTALLATION

GET STARTED INSTANTLY THANKS TO PLUG & PLAY

COMPLETE INTEGRATION INTO THE DEVICE

LTE ONBOARD

girocard · mastercard · VISA · AMERICAN EXPRESS · UnionPay 银联 · DISCOVER

Contactless payment terminal

Contactless payment made simple with KarL4

KarL4

AI-ENABLED WITH ((CLEA

HIGHLIGHTS

LOW POWER
Ultra low power for battery powered applications

PLUG & PLAY
Automatic comissioning, modem on board

DESIGN
Modular and seamless integratable design

KarL4 is the new contactless payment terminal from Garz & Fricke. KarL4 is a contactless-only reader (COR). It enables your customers to make payments for amounts up to EUR 50 in a secure and intuitive manner from their debit and credit card without having to enter a PIN. KarL4 uses Near Field Communication (NFC) to transfer data. This leads to very customer-friendly handling: simply pull out the card, position it and pay.
KarL4 can be optionally combined with our touch display HMIs and, on request, can even be tailored to your requirements as a highly individual complete module.

MAIN FIELDS OF APPLICATION

Fitness Equipment · Gaming · Point of Sales · Transportation · Vending

FEATURES

Networking	4G Modem		Accessories	Roof antenna for LTE/GSM; 1 dBi; 700-960 MHz/1575-2700 MHz; lenght 200 cm Patch antenna for LTE/GSM; 3 dBi; 700-960 MHz/1700-2700 MHz; length 200 cm
Service Interface	Two switches for settings; red/green LED for status; buzzer		Operating Temperature*	-25°C ÷ +70°C; Humidity up to 100%
Customer Interface	NFC Antenna with 4 green LED's		Dimensions	Controller: 85.0 x 90.0 x 18.0 mm NFC Antenna: 98.0 x 98.0 x 13.0 mm
Machine Interfaces	MDB/IPC Level 02/03 (optional USB)			
Power Supply	8.0 ÷ 42.5 VDC (typ. 130mA @ 13.8V)			
Norms & Standards	EMVCo Level 1 EMVCo Level 2 (Master/Visa) EMVCo Level 3 (Master/Visa) Girocard ISO 18092 (NFC) PCI PTS			

*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.

MODULAR HMI SOLUTIONS

SECO OFF-THE-SHELF SOLUTIONS FOR EASIER SYSTEM INTEGRATION

TOUCH-DISPLAY SOLUTIONS
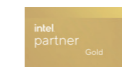
EXPERTISE IN ASSEMBLY SERVICES

MECHANICAL DESIGN

Panel PC with 7.0" LCD display based on
Intel® Atom® X and Celeron® J/N Series
(Codename: **Apollo Lake**) SOCs

Flexibility Meets Style
For Endless Visual Display Applications

Flexy Vision 7 x86

AI-ENABLED WITH CLEA

Processor	Intel® Atom® **x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom® **x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom® **x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® **N4200** Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **J3455** Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® **J3355** Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TD
Memory	Soldered-down LPDDR4 memory Dual/Quad Channel, up to 8GB total, 32-bit interface
Embedded 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 Section	7.0" LVDS display, resolution 800x480, LED lifetime 50K hours life min, 690cd/m2 min. brightness P-Cap (Projected Capacitive touch screen), with 3.0mm glass cover Glass Hardness IK07, Surface Hardness 7H
Video Interfaces	HDMI™ Connector DP++ Connector
Mass Storage	eMMC 5.0 drive soldered on-board, up to 64GB M.2 Key B slot for optional SSD drive, up to 512GB
Networking	2x Gigabit Ethernet port M.2 WWAN Connectivity Slot for accessory 4G modules (excludes SSD Drive) M.2 WLAN Connectivity Slot for accessory WiFi/BT module
USB	2x USB 3.0 Host ports on Type-A sockets 2 x USB 2.0 Host ports on Dual Type-A socket
Serial Ports	2x multistandard RS-232 /RS-422/RS-485 ports on DB-9 connectors
Other Interfaces	Power ON Button with integrated LED Optional TPM 2.0 onboard
Power Supply	Main Power: 12V$_{DC}$ Power In connectors: DC Power Jack.
Operating System	Windows® 10 IoT Linux
Operating Temperature*	0°C ÷ 50°C
Dimensions	202,1 x 133,9 x 58mm

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

Panel PC with 10.1" LCD display based on
Intel® Atom® X and Celeron J/N Series
(Codename: **Apollo Lake**) SOCs

Flexibility Meets Style
For Endless Visual Display Applications

Flexy Vision 10 x86

AI-ENABLED WITH CLEA

Processor	Intel® Atom® **x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom® **x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom® **x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® **N4200** Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **J3455** Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® **J3355** Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TD
Memory	Soldered-down LPDDR4 memory Dual/Quad Channel, up to 8GB total, 32-bit interface
Embedded 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 Section	10.1" LVDS display, resolution 1280x800, LED lifetime 50K hours life min, 340cd/m2 min. brightness P-Cap (Projected Capacitive touch screen), with 3.0mm glass cover Glass Hardness IK07, Surface Hardness 7H
Video Interfaces	HDMI™ Connector DP++ Connector
Mass Storage	eMMC 5.0 drive soldered on-board, up to 64GB M.2 Key B slot for optional SSD drive, up to 512GB
Networking	2x Gigabit Ethernet port M.2 WWAN Connectivity Slot for accessory 4G modules (excludes SSD Drive) M.2 WLAN Connectivity Slot for accessory WiFi/BT module
USB	2x USB 3.0 Host ports on Type-A sockets 2 x USB 2.0 Host ports on Dual Type-A socket
Serial Ports	2x multistandard RS-232 /RS-422/RS-485 ports on DB-9 connectors
Other Interfaces	Power ON Button with integrated LED Optional TPM 2.0 onboard
Power Supply	Main Power: 12V$_{DC}$ Power In connectors: DC Power Jack
Operating System	Windows® 10 IoT Linux
Operating Temperature*	0°C ÷ 50°C
Dimensions	269,5 x 188,1 x 58mm

*Measured at any point of the heatspreader/heatsink during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.
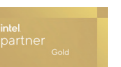
Flexy Vision 13.3 Arm

Panel PC with 13.3" LCD display based on
Rockchip RK3399 SoC

Flexibility Meets Style
For Endless Visual Display Applications

Flexy Vision 13.3 Arm

Rockchip 瑞芯微电子

AI-ENABLED WITH (CLEA)

CPU	**Rockchip RK3399** processor, 2x Cortex®-A72 MP cores + 4x Cortex®-A53 MPCores, up to 1.8GHz, 64-bit architecture
Memory	Soldered-down LPDDR4 memory, up to 4GB total, 64-bit interface
Embedded Graphics	4-Core Mali-T860MP4 GPU, supporting OpenGL ES 1.1/2.0/3.0/3.1, OpenVG 1.1, OpenCL Embedded VPU, able to offer: • H.265 10-bit, H.264 10-bit, VP9 8-bit 4Kx2K@60fps HW Decoding • MPEG-4/MPEG-2/VP8 1080p@60fps HW Decoding • H.264, VP8 1080p@30fps HW encoding Dual Display support
Video Section	13.3" LVDS display, resolution 1920x1080, LED lifetime 50K hours life min, 260cd/m2 min. brightness P-Cap (Projected Capacitive touch screen), with 3.0mm glass cover Glass Hardness IK07, Surface Hardness 7H
Video Interfaces	HDMI 4K interface DP 1.2 interface on USB Type-C connector (alternate mode)
Mass Storage	eMMC drive soldered on-board, up to 64GB Optional SPI Flash
Networking	2x Gigabit Ethernet port Soldered on-board M.2 1216 WLAN 802.11 a/b/g/n/ac + BT 5.0 module* On-board LTE Modem* *Certification upon request
USB	1x 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
Audio	TRRS Audio Jack (Combo MicIn + Lineout)
Serial Ports	2x RS-232 or RS-485 (factory option) on DB-9 connectors
Other Interfaces	Power ON Button with integrated LED Optional Ultra Low Power SPI RTC Optional CAN ports (up to 2x) Optional, 4x GPIOs
Power Supply	Main Power: 12V_{DC} .. 24V_{DC} Power In connectors: DC Power Jack.
Operating System	Linux
Operating Temperature*	0°C ÷ 50°C
Dimensions	349,2 x 220,8 x 58 mm

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

Flexy Vision 13.3 x86

Panel PC with 13.3" LCD display based on the
Intel® Atom® X Series and Intel® Celeron® J / N Series
(Codename: **Apollo Lake**) Processors

Flexibility Meets Style
For Endless Visual Display Applications

Flexy Vision 13.3 x86

intel partner Gold

AI-ENABLED WITH (CLEA)

Processor	Intel® Atom® **x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom® **x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom® **x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® **N4200** Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **J3455** Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® **J3355** Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TD
Memory	Soldered-down LPDDR4 memory Dual/Quad Channel, up to 8GB total, 32-bit interface
Embedded 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 Section	13.3" LVDS display, resolution 1920x1080, LED lifetime 50K hours life typ-, 260cd/m2 min. brightness P-Cap (Projected Capacitive touch screen), with 3.0mm glass cover Glass Hardness IK07, Surface Hardness 7H
Video Interfaces	HDMI™ Connector DP++ Connector
Mass Storage	eMMC 5.0 drive soldered on-board, up to 64GB M.2 Key B slot for optional SSD drive, up to 512GB
Networking	2x Gigabit Ethernet port M.2 WWAN Connectivity Slot for accessory 4G modules (excludes SSD Drive) M.2 WLAN Connectivity Slot for accessory WiFi/BT module
USB	2x USB 3.0 Host ports on Type-A sockets 2 x USB 2.0 Host ports on Dual Type-A socket
Serial Ports	2x multistandard RS-232 /RS-422/RS-485 ports on DB-9 connectors
Other Interfaces	Power ON Button with integrated LED Optional TPM 2.0 onboard
Power Supply	Main Power: 12V_{DC} Power In connectors: DC Power Jack
Operating System	Microsoft® Windows 10 IoT Linux
Operating Temperature*	0°C ÷ 50°C
Dimensions	349,2 x 220,8 x 58mm

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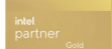

Flexy Vision 15.6 Arm

Panel PC with 15.6" LCD display based on
Rockchip RK3399 SoC

Flexibility Meets Style
For Endless Visual Display Applications

Flexy Vision 15.6 Arm

Rockchip 瑞芯微电子

AI-ENABLED WITH (CLEA)

CPU	**Rockchip RK3399** processor, 2x Cortex®-A72 MP cores + 4x Cortex®-A53 MPCores, up to 1.8GHz, 64-bit architecture
Memory	Soldered-down LPDDR4 memory, up to 4GB total, 64-bit interface
Embedded Graphics	4-Core Mali-T860MP4 GPU, supporting OpenGL ES 1.1/2.0/3.0/3.1, OpenVG 1.1, OpenCL Embedded VPU, able to offer: • H.265 10-bit, H.264 10-bit, VP9 8-bit 4Kx2K@60fps HW Decoding • MPEG-4/MPEG-2/VP8 1080p@60fps HW Decoding • H.264, VP8 1080p@30fps HW encoding Dual Display support
Video Section	15.6" LVDS display, resolution 1920x1080, LED lifetime 50K hours min., 300cd/m2 min. brightness P-Cap (Projected Capacitive touch screen), with 3.0mm glass cover Glass Hardness IK07, Surface Hardness 7H
Video Interfaces	HDMI 4K interface DP 1.2 interface on USB Type-C connector (alternate mode)
Mass Storage	eMMC drive soldered on-board, up to 64GB Optional SPI Flash
Networking	2x Gigabit Ethernet port Soldered on-board M.2 1216 WLAN 802.11 a/b/g/n/ac + BT 5.0 module* On-board LTE Modem* *Certification upon request
USB	1x 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
Audio	TRRS Audio Jack (Combo MicIn + Lineout)
Serial Ports	2x RS-232 or RS-485 (factory option) on DB-9 connectors
Other Interfaces	Power ON Button with integrated LED Optional Ultra Low Power SPI RTC Optional CAN ports (up to 2x) Optional, 4x GPIOs
Power Supply	Main Power: 12V_{DC} .. 24V_{DC} Power In connectors: DC Power Jack.
Operating System	Linux
Operating Temperature*	0°C ÷ 50°C
Dimensions	403,6 x 253 x 58 mm

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

Flexy Vision 15.6 x86

Panel PC with 15.6" LCD display based on
Intel® Atom® X and Celeron® J/N Series
(Codename: **Apollo Lake**) SOCs

Flexibility Meets Style
For Endless Visual Display Applications

Flexy Vision 15.6 x86

intel partner Gold

AI-ENABLED WITH (CLEA)

Processor	Intel® Atom® **x5-E3930** Dual Core @1.3 GHz (Burst 1.8GHz), 2MB L2 Cache, 6.5W TDP Intel® Atom® **x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® Atom® **x7-E3950** Quad Core @1.6 GHz (Burst 2.0GHz), 2MB L2 Cache, 12W TDP Intel® Pentium® **N4200** Quad Core @1.1GHz (Burst 2.5GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP Intel® Celeron® **J3455** Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® Celeron® **J3355** Dual Core @2.0GHz (Burst 2.5GHz), 2MB L2Cache, 10W TD
Memory	Soldered-down LPDDR4 memory Dual/Quad Channel, up to 8GB total, 32-bit interface
Embedded 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 Section	15.6" LVDS display, resolution 1920x1080, LED lifetime 50K hours min., 300cd/m2 min. brightness P-Cap (Projected Capacitive touch screen), with 3.0mm glass cover Glass Hardness IK07, Surface Hardness 7H
Video Interfaces	HDMI™ Connector DP++ Connector
Mass Storage	eMMC 5.0 drive soldered on-board, up to 64GB M.2 Key B slot for optional SSD drive, up to 512GB
Networking	2x Gigabit Ethernet port M.2 WWAN Connectivity Slot for accessory 4G modules (excludes SSD Drive) M.2 WLAN Connectivity Slot for accessory WiFi/BT module
USB	2x USB 3.0 Host ports on Type-A sockets 2 x USB 2.0 Host ports on Dual Type-A socket
Serial Ports	2x multistandard RS-232 /RS-422/RS-485 ports on DB-9 connectors
Other Interfaces	Power ON Button with integrated LED Optional TPM 2.0 onboard
Power Supply	Main Power: 12V_{DC} Power In connectors: DC Power Jack
Operating System	Microsoft® Windows 10 IoT Ubuntu Linux
Operating Temperature*	0°C ÷ 50°C
Dimensions	403,6 x 253 x 58mm

*Measured at any point of the heatspreader/heatsink during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.
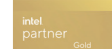
Panel PC with 21.5" LCD display based on Intel® Atom® X and Celeron® J/N Series (Codename: **Apollo Lake**) SOCs

Flexibility Meets Style
For Endless Visual Display Applications

Flexy Vision 21.5

AI-ENABLED WITH ((CLEA

Processor	Intel® **Celeron® J3455**, Quad Core @1.5GHz (Burst 2.3GHz), 2MB L2Cache, 10W TDP Intel® **Atom® x5-E3940** Quad Core @1.6 GHz (Burst 1.8GHz), 2MB L2 Cache, 9.5W TDP Intel® **Celeron® N3350** Dual Core @1.1GHz (Burst 2.4GHz), 2MB L2 Cache, 6W TDP
Memory	Dual/ Quad Channel soldered down LPDDR4 memory, up to 8GB
Embedded 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
Video Section	21.5" LVDS display, resolution 1920x1080, 30K hours life P-Cap (Projected Capacitive touch screen), with 1.8mm glass cover Glass Hardness IK07, Surface Hardness 7H
Video Interfaces	Two DP++ 1.2 interfaces on miniDP connectors
Mass Storage	M.2 2260 SATA SSD Module, up to 512GB
Networking	Dual Gigabit Ethernet RJ45 connector with Gigabit Ethernet i210 controllers M.2 WLAN Connectivity Slot for accessory WiFi/BT module
USB	2 x USB 3.0 Host ports on USB 3.0 Type-A sockets
Other Interfaces	Power ON Button with integrated LED TPM 2.0 on-board 2x SMA connectors for external WiFi antennas
Power Supply	+18VDC ÷ +32 VDC recommended +15VDC ÷ +36 VDC absolute RTC battery
Operating System	Microsoft® Windows 10 Enterprise (64 bit) Microsoft® Windows 10 IoT Core Yocto (64 bit) Linux
Operating Temperature*	0°C ÷ 50°C
Dimensions	537 x 328,5 x 53,5 mm

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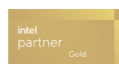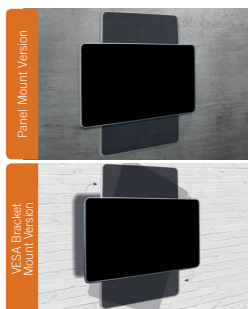

5.0 inch Panel Mount HMI based on **NXP i.MX6 processor**

Ideal HMI solution for limited installation situations with consistent quality

SANTINO LT 5.0 OF PCT

GOLD PARTNER NXP

AI-ENABLED WITH ((CLEA

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 Resolution	5.0 inch display, resolution 800 x 480, LED lifetime typ. 50k hours typ. 1120 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 2.8mm toughened glass cover, RAL 9005
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 VDC
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	134.2 x 83.5 x 33.9 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.

7.0 inch Rear Mount HMI based on **NXP i.MX6 processor**

Optimal price-performance ratio combined with sophisticated design & easy installation

SANTINO 7.0 OF PCT

GOLD PARTNER NXP

AI-ENABLED WITH ((CLEA

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 Resolution	7.0 inch display, resolution 800 x 480, LED lifetime typ. 50k hours typ. 400 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 1.1mm toughened glass cover, colorless
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 VDC
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	185.1 x 101.6 x 35.2 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.

7.0 inch Outdoor Rear Mount HMI based on **NXP i.MX6 processor**

Ideal HMI solution for outdoor situations with high brightness & particularly robust design

SANTARO 7.0 OF PCT

GOLD PARTNER NXP

AI-ENABLED WITH ((CLEA

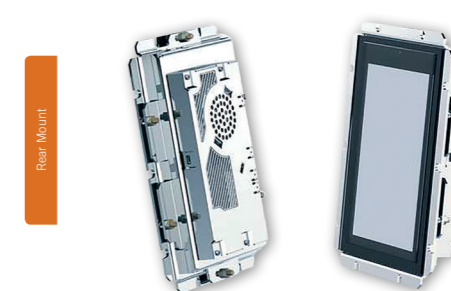|	
Processor	NXP i.MX 6 Family based on Arm® Cortex®-A9 cores : **i.MX 6 Quad** – Full featured, 4x Cortex®-A9 cores up to 1.0GHz **i.MX 6 Dual** – Full featured, 4x Cortex®-A9 cores up to 1.0GHz **i.MX 6 Single** – Full featured, 4x Cortex®-A9 cores up to 1.0GHz
Memory	1 GB 64 bit DDR3L
Graphics	Integrated 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	HDMI interface
Video Resolution	7.0 inch display, resolution 800 x 480, LED lifetime typ. 70k hours typ. 1000 cd/m² brightness P-Cap (Projected Capacitive touch screen) - optical bonded, with 5.0mm toughened glass cover, Pantone black C
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
Other Interfaces	2x Digital Input, 2x Digital Output
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	220.5 x 150.9 x 43.4 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.

7.0 inch Rear Mount HMI based on
NXP i.MX8M Mini processor

High performance, low power consumption, integrated connectivity and multimedia interface
TANARO 7.0 OF PCT IPS

GOLD PARTNER NXP

AI-ENABLED WITH CLEA

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	MIPI-CSI Camera interface connector
Video Resolution	7.0 inch display, resolution 1024x600, LED lifetime typ. 30k hours typ. 500 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 3.0mm toughened glass cover, RAL 9005
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	183.8 x 104.0 x 33.5 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.

5.0 inch Flush Mount HMI based on
NXP i.MX6 processor

Maximum design flexibility with the usual quality
SANTINO LT 5.0 SG

GOLD PARTNER NXP

AI-ENABLED WITH CLEA

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 Resolution	5.0 inch display, resolution 800 x 480, LED lifetime typ. 50k hours typ. 1120 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 2.8mm toughened glass cover, RAL 9005
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 VDC
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	145.5 x 102.4 x 33.4 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.

10.1 inch Flush Mount HMI based on
NXP i.MX6 processor

Flexible, powerful all-rounder for any demanding applications
SANTARO 10.1 SG IPS

GOLD PARTNER NXP

AI-ENABLED WITH CLEA

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 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 Resolution	10.1 inch display, resolution 1280 x 800, LED lifetime typ. 50k hours typ. 420 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 3.0mm toughened glass cover, RAL 9005
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
Other Interfaces	2x Digital Input, 2x Digital Output
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	264.3 x 181.1 x 37.7 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.

10.1 inch Flush Mount HMI based on
NXP i.MX6 processor

The SBC integrated in this HMI from the SANTOKA series makes your product ready for IOT
SANTOKA 10.1 SG IPS

GOLD PARTNER NXP

AI-ENABLED WITH CLEA

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	HDMI interface
Video Resolution	10.1 inch display, resolution 1280 x 800, LED lifetime typ. 50k hours typ. 420 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 3.0mm toughened glass cover, RAL 9005
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 VDC
Operating System	Yocto
CAN Bus	1x CAN (ISO/DIS 11898)
Operating Temperature*	0°C ÷ +60°C
Dimensions	197.0 x 128.0 x 35.9 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.

Column 1

7.0 inch Panel Mount HMI based on
NXP i.MX6 processor

Fanless industrial PC impresses with simple installation and good performance

SANTINO 7.0 BX PCT

AI-ENABLED WITH CLEA

	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 Resolution	7.0 inch display, resolution 800 x 480, LED lifetime typ. 50k hours typ. 400 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 1.1mm toughened glass cover, colorless
	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 VDC
	Operating System	Yocto
	CAN Bus	1x CAN (ISO/DIS 11898)
	Operating Temperature*	0°C ÷ +60°C
	Dimensions	206.9 x 126.2 x 35.6 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.

Column 2

7.0 inch Panel Mount HMI based on
NXP i.MX 8M Mini processor

High performance with low power consumption, integrated connectivity and mulitmedia interface

TANARO 7.0 BX PCT

AI-ENABLED WITH CLEA

	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	MIPI-CSI Camera interface connector
	Video Resolution	7.0 inch LVDS display, resolution 1024x600, LED lifetime typ. 20k hours typ. 420 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 3.0mm toughened glass cover, RAL 9005
	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	202.0 x 126.2 x 35.5 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.
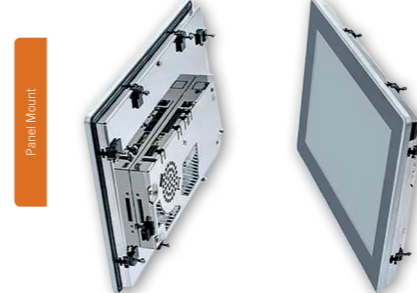
Column 3

10.1 inch Panel Mount HMI based on
NXP i.MX6 processor

Large high-resolution touch display

SANTARO 10.1 BX PCT

AI-ENABLED WITH CLEA

	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 Resolution	10.1 inch display, resolution 1280 x 800, LED lifetime typ. 50k hours typ. 420 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 3.0mm toughened glass cover, RAL 9005
	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
	Other Interfaces	2x Digital Input, 2x Digital Output
	Serial Ports	2x RS-232, RS-485
	Power Supply	9 ÷ 32 VDC
	Operating System	Yocto
	CAN Bus	9 ÷ 32 VDC
	Operating Temperature*	Yocto
	Dimensions	275.2 x 192.0 x 37.7 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.

Column 4

10.1 inch Panel Mount HMI based on
NXP i.MX6 processor

Fanless industrial PC impresses with simple installation and various interfaces

SANTOKA 10.1 BX PCT

AI-ENABLED WITH CLEA

	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	HDMI interface
	Video Resolution	10.1 inch display, resolution 1280 x 800, LED lifetime typ. 50k hours typ. 420 cd/m² brightness P-Cap (Projected Capacitive touch screen), with 3.0mm toughened glass cover, RAL 9005
	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 VDC
	Operating System	Yocto
	CAN Bus	1x CAN (ISO/DIS 11898)
	Operating Temperature*	0°C ÷ +60°C
	Dimensions	275.2 x 192.0 x 37.9 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.
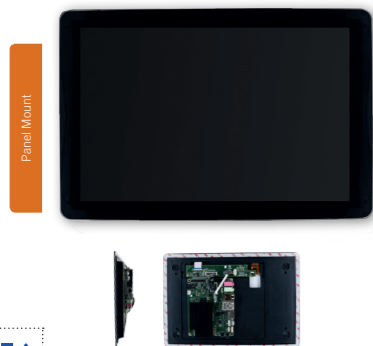
Embedded Panel with 10.1" LCD display based on
the Multicore **NXP i.MX6** SoC family

7" Rugged, Customizable Arm® Tablet with Quad or
Dual Core Cortex-A9 **NXP i.MX6** Processor

Flexible, Open-source, Industrial system

SYS-A62-10

Rugged Arm® tablet customizable to get the job done

HYDRA-N6

Panel Mount

GOLD PARTNER
NXP

VESA Mount Option

HYDRA - N6

GOLD PARTNER
NXP

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CPU
Solo, Dual Lite and Quad- Core (Arm® Cortex® A9 Cores)

CPU
Quad or dual core Cortex-A9 NXP i.MX 6 processor

GRAPHICS
30K hours 10.1" LVDS display with projected capacitive touchscreen integrated

GRAPHICS
7" WSVGA (1024x600) sunlight-readable display with automatic brightness and rotation control

CONNECTIVITY
Wi-Fi add-on module; up 22 GPI/Os; CAN Bus

CONNECTIVITY
Wi-Fi (802.11 b/g/n/ac), Bluetooth 4.2, Cellular (via mPCIe slot), 10/100/1000 Ethernet (via 26-pin expansion connector)

MEMORY
Up to 1GB DDR3L on-board

MEMORY
RAM: 2 GB DDR3 (1GB, 2GB, 4GB available). Nonvolatile: 32 GB standard (8 - 128 GB available). Internal uSD card slot