

AI Rugged Computer

COMPACT AI Rugged Vehicle Series

Intelligent Machine Learning Unit with NVIDIA Jetson AGX Xavier

LTE / GNSS / Wi-Fi



Dual nanoSIM
CFast
microSD
DisplayPort
USB

optional
Serial RS232
RS485

image similar

DC supply

2 x CAN
M12 a-coded

4 x GBE w/PoE
M12 x-coded

2 x LAN
M12 x-coded

optional
I/Os

RPC/COMPACT RML A3 Series

This fanless RPC COMPACT-A3 generation is based on the NVIDIA Jetson AGX Xavier processor module and offers a wide range of highly integrated interface options. The ultra rugged and uncompromising design allows the use in the most demanding AI applications on mobile systems as well as in outdoor applications with harsh environmental conditions and guarantees long-term availability.

- 24/7 continuous operation
- Power Over Ethernet (PoE+), 48VDC out
- IP67 Protection
- Shock and vibration resistant
- Milled aluminium housing

 **NVIDIA**
Linux for Tegra (L4T)



Product Highlights

Ultra rugged
Sealed housing, protection class IP67 & IP69
Maintenance free
Power Ignition controller
No moving parts / passively cooled
Pressure equalization membrane
Resistance to chemicals
Long term availability (fixed BOM)

Product Features

512-core NVIDIA Volta™ GPU
with 64 Tensor Cores
8-Core ARM v8.2 64-bit NVIDIA Carmel CPU
32GB 256-Bit LPDDR4x RAM soldered on board
Storage options: NVMe M.2 2280 & CFast
PoE+ Power over Ethernet
Ethernet, USB, Passive or Active CAN
Rugged M12 connectors

Industries

Agriculture
Construction
Transportation
Off-Highway Vehicles
Heavy Industry
Autonomous Mobile Robots (AMRs)
Outdoor applications

Processor module / Performance

NVIDIA Jetson AGX Xavier (JAX) | 512-core NVIDIA Volta™ GPU with 64 Tensor Cores

8-Core ARM v8.2 64-bit NVIDIA Carmel CPU

AI Performance 32 TOPs 32 TOPs 32 TOPs

Memory / Storage

Data L3 Cache Size 4MB 4MB 4MB

256-Bit LPDDR4x RAM soldered on board 32GB 32GB 32GB

eMMC 5.1 Flash Storage on board 32GB 32GB 32GB

microSD Card socket 1 1 1

M.2 2280 Key M socket (for NVMe SSD)² 1 1 1CFast socket with retention frame² 1 1 1**Features**

Real time clock (RTC) with battery backup Renata CR2477 (950 mAh) • • •

Hardware Watchdog & Temperature supervisor • • •

Buzzer • • •

Inertial measurement unit (IMU) STMicroelectronics ISM330DHCXTR on request on request on request

Communication InterfacesGraphic interface^{behind the cover} DisplayPort 1.2 DisplayPort 1.2 DisplayPort 1.2Internal USB version 2.0 OTG^{behind the cover} (micro USB Type AB) 1 1 1USB version 2.0^{behind the cover} (Type A) 2 2 2

Ethernet 10/100/1000 BASE-T (M12 female x-coded) 2 2 2

CAN 2.0A / CAN 2.0B (active/passive), CAN FD supported, isolated (M12 female a-coded) none 2 2

Power over Ethernet - IEEE802.3at 10/100/1000Mbit (M12 female x-coded) 4 4 4

PSE - Power sourcing equipment, producing 48VDC out (total max power: 39W) (total max power: 39W) (total max power: 39W)

USB version 2.0 (M12 female a-coded) optional optional on request

Serial RS232 / RS422/RS485 (M12 female a-coded) optional optional on request

Digital I/O's, 24VDC (up to 4in & 4out) optional optional on request

Analog input1, 0-20mA or -10...+10V / 0... 30V^(16bit resolution Accuracy: +/- 0.1%) (4 inputs) optional optional on requestMini PCIe socket^{2 - used for extensions depending on configuration} 1 full-size / 1 half-size 1 full-size / 1 half-size 1 full-size / 1 half-sizeI2C bus² 1 1 1MIPI CSI-2 / GMSL2 / FPDLinkIII Camera interface¹ on request on request on request**Wireless Connectivity**

Cellular 4G Module (LTE/UMTS/GSM) with GNSS Sierra Wireless MC7455 - M2M only! (full size Mini PCIe Slot) 3x SMA 3x SMA none

Dual nano SIM support

Wireless LAN IEEE 802.11a/b/g/n/ac dual-band 2x2 MIMO Sparklan WPEB-263ACNI (half size Mini PCIe Slot) 2x RP-SMA 2x RP-SMA none

High Accuracy GNSS Positioning Module w/ RTK support¹ u-blox ZED F9P optional optional none

Cellular 5G Module (4G/3G fallback) with GNSS Module tbd optional optional none

Wireless LAN (Wi-Fi 6) 802.11ax/ac/a/b/g/n 2T2R Module tbd optional optional none

Technical Data

Dimensions mm (housing, excl. mounting) w250 x h105 x d170 w250 x h105 x d170 w250 x h105 x d170

Net weight in gram ~3750 ~3750 ~3700

Non isolated input voltage, with Ignition controller, reverse polarity protected (M12 5P male a-coded) 9 ... 45VDC 9 ... 45VDC 9 ... 45VDC

Power consumption³ depends on power mode (15W, 30W, MAXN)**Environmental Conditions**Operating temperature³ -25°C ... +60°C -25°C ... +60°C -25°C ... +60°C

Storage temperature -25°C ... +80°C -25°C ... +80°C -25°C ... +80°C

Ingress protection standard according to EN60529 (ISO 20653) IP67 / IP69 IP67 / IP69 IP67 / IP69

Conformal coating⁴ on request on request on requestRoad vehicles⁵ UN/ECE R10 (E-mark) on request on request

Shock ISO 15003 / EN60068-2-64 (designed to meet) • • •

Vibration ISO 15003 / EN60068-2-64 (designed to meet) • • •

EMI-Conformity EN55032 / EN55035 EN55032 / EN55035 EN55032 / EN55035

Safety (designed to meet) EN62368-1 EN62368-1 EN62368-1

Radio and Telecommunication (designed to meet) RED RED RED

MTBF @ 25°C ambient^{according to Telcordia SR-332, Environment GB, excluding battery and optional interfaces} ~280 000h ~280 000h ~355 000h¹ Please contact factory for minimum order quantities² Internal connector³ Depending on installation situation, interface connection and power mode.

Please see user documentation.

⁴ On all possible components (excl. NVIDIA Xavier Module, connectors and wireless devices)⁵ UN/ECE-R10 is the type-approval test for European automotive electronics. It includes a variety of testing including RF immunity and emissions, transient immunity and emissions. It also includes a requirement for burst, surge, harmonics & flicker and provides advice and requirements for electrical vehicles.

Product specifications subject to change without notice. | All data is for information purposes only and not guaranteed for legal purposes. Information in this data sheet has been carefully checked and is believed to be accurate. However, no responsibility is assumed for inaccuracies. Please refer to the user documentation for additional product specification.

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industrial computing

Processor module / Performance

NVIDIA Jetson AGX Xavier Industrial | 512-Core NVIDIA Volta™ GPU (ECC) with 64 Tensor Cores

8-Core ARM v8.2 64-bit NVIDIA Carmel CPU

Dual Arm® Cortex®-R5 in lockstep (Safety Cluster Engine)

AI Performance (INT8)

30 TOPs

30 TOPs

30 TOPs

Memory / Storage

Data L3 Cache Size

4MB

4MB

4MB

QSPI NOR Flash Storage

64MB

64MB

64MB

256-Bit LPDDR4x ECC RAM soldered on board

32GB

32GB

32GB

eMMC 5.1 Flash Storage on board

64GB

64GB

64GB

microSD Card socket

1

1

1

M.2 2280 Key M socket (for NVMe SSD)²

1

1

1

CFast socket with retention frame²

1

1

1

Features

Real time clock (RTC) with battery backup Renata CR2477 (950 mAh)

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•

Hardware Watchdog & Temperature supervisor

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Buzzer

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Inertial measurement unit (IMU) STMicroelectronics ISM330DHCXTR

on request

on request

on request

Communication InterfacesGraphic interface behind the cover

DisplayPort 1.2

DisplayPort 1.2

DisplayPort 1.2

Internal USB version 2.0 OTG behind the cover

(micro USB Type AB)

1

1

1

USB version 2.0 behind the cover

(Type A)

2

2

2

Ethernet 10/100/1000 BASE-T

(M12 female x-coded)

2

2

2

CAN 2.0A / CAN 2.0B (active/passive), CAN FD supported, isolated

(M12 female a-coded)

none

2

2

Power over Ethernet - IEEE802.3at 10/100/1000Mbit

(M12 female x-coded)

4

4

4

PSE - Power sourcing equipment, producing 48VDC out

(total max power: 39W)

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USB version 2.0

(M12 female a-coded)

optional

optional

on request

Serial RS232 / RS422/RS485

(M12 female a-coded)

optional

optional

on request

Digital I/O's, 24VDC

(up to 4in & 4out)

optional

optional

on request

Analog input1, 0-20mA or -10...+10V / 0... 30V (16bit resolution Accuracy: +/- 0.1%)

(4 inputs)

optional

optional

on request

Mini PCIe socket² - used for extensions depending on configuration

1 full-size / 1 half-size

1 full-size / 1 half-size

1 full-size / 1 half-size

I2C bus²

1

1

1

MIPI CSI-2 / GMSL2 / FPDLinkIII Camera interface¹

on request

on request

on request

Wireless ConnectivityCellular 4G Module (LTE/UMTS/GSM) with GNSS Sierra Wireless MC7455 - M2M only! (full size Mini PCIe Slot)

3x SMA

3x SMA

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Dual nano SIM support

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2x RP-SMA

2x RP-SMA

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High Accuracy GNSS Positioning Module w/ RTK support¹ u-blox ZED F9P

optional

optional

none

Cellular 5G Module (4G/3G fallback) with GNSS Module tbd

optional

optional

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Wireless LAN (Wi-Fi 6) 802.11ax/ac/a/b/g/n 2T2R Module tbd

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depends on power mode (15W, 30W, MAXN)

Environmental ConditionsOperating temperature³

-40°C ... +65°C

-40°C ... +65°C

-40°C ... +65°C

Storage temperature

-40°C ... +85°C

-40°C ... +85°C

-40°C ... +85°C

Ingress protection standard according to EN60529 (ISO 20653)

IP67 / IP69

IP67 / IP69

IP67 / IP69

Conformal coating⁴

on request

on request

on request

Road vehicles UN/ECE R10 (E-mark)⁵

on request

on request

on request

Shock ISO 15003 / EN60068-2-64 (designed to meet)

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•

•

Vibration ISO 15003 / EN60068-2-64 (designed to meet)

•

•

•

EMI-Conformity

EN55032 / EN55035

EN55032 / EN55035

EN55032 / EN55035

Safety (designed to meet)

EN62368-1

EN62368-1

EN62368-1

Radio and Telecommunication (designed to meet)

RED

RED

RED

MTBF @ 25°C ambient according to Telcordia SR-332, Environment GB, excluding battery and optional interfaces

~270 000h

~270 000h

~340 000h

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