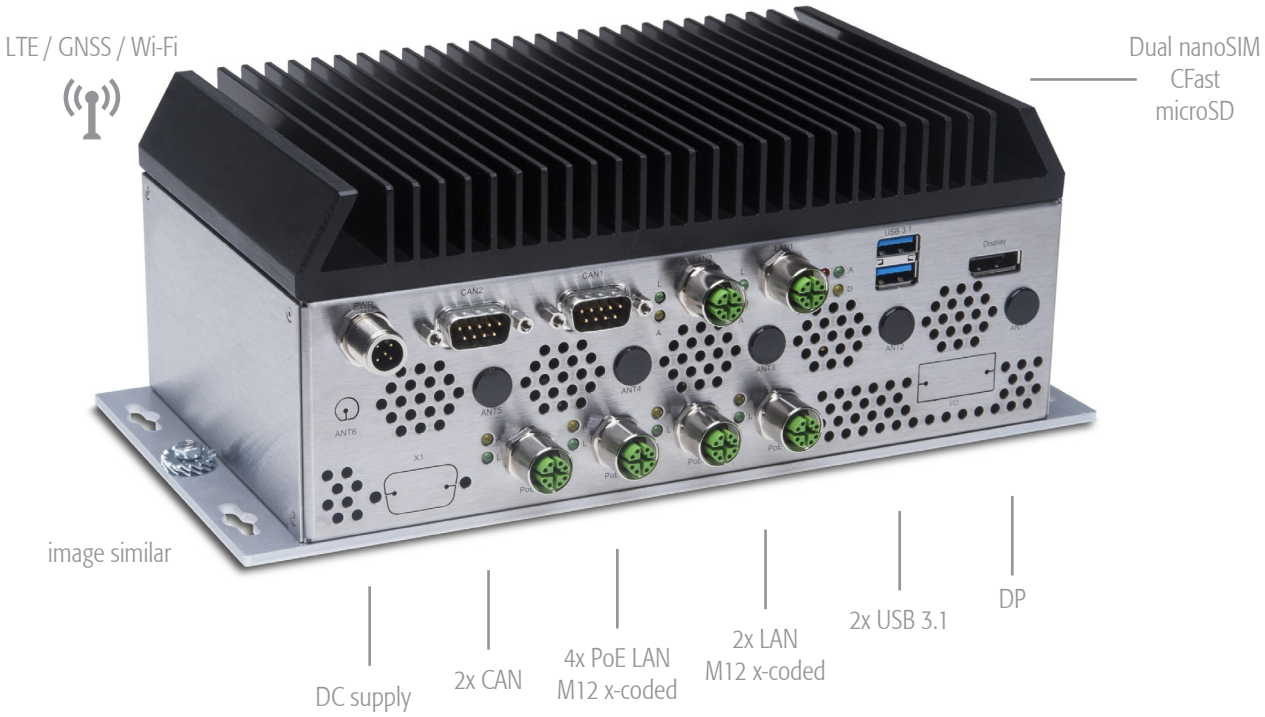
AI Railway Computer

COMPACT AI Railway Series

Intelligent Machine Learning Unit with NVIDIA Jetson AGX Xavier

preliminary



IPC/COMPACT A3 - RML

This fanless RML COMPACT-A3 generation is based on the Jetson AGX Xavier processor module and offers a wide range of interface options.
The robust and uncompromising industrial design allows the implementation in the most demanding AI railway and rolling stock applications and guarantees long term availability.

- **24/7 continuous operation**
- **Railway approved EN50155**
- **Power over Ethernet (PoE+), 48VDC out**
- **Passively cooled, no moving parts**
- **Long term availability with fixed BOM**

NVIDIA. Linux for Tegra (L4T)

Product Highlights

No moving parts / passively cooled
Shock and vibration resistant
Galvanically isolated railway power supply
Each LAN interface has its own dedicated NIC
Long term availability (fixed BOM)
Maintenance free
Goldcap instead of battery backup for RTC

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
Ethernet, USB, Passive or Active CAN
LTE, GNSS and WiFi options
Aluminum & stainless steel housing

Industries / Applications

Railway (rolling stock)
Transportation

CE

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Order Code		IPC/RMLA3K22-A201S[1]	IPC/RMLA3K22-C201S[1]
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		•	•
NVIDIA Jetson AGX Xavier **Industrial** (JAXi) | 512-Core NVIDIA Volta™ GPU with 64 Tensor Cores 8-Core ARM v8.2 64-bit NVIDIA Carmel CPU		optional pn: IPC/RMLA3K21-A201E	optional pn: IPC/RMLA3K21-C201E
AI Performance		32 TOPs	32 TOPs
Memory / Storage			
Data L3 Cache Size		4MB	4MB
256-Bit LPDDR4x RAM soldered on board		32GB	32GB
eMMC 5.1 Flash Storage on board		32GB / (64GB on JAXi)	32GB / (64GB on JAXi)
microSD Card socket		1	1
M.2 2280 Key M socket (for NVMe SSD) [2]		1	1
CFast socket with retention frame [2]		1	1
Features			
Inertial measurement unit (IMU) STMicroelectronics ISM330DHCXTR		•	•
Real time clock (RTC) with goldcap backup (charge holds typ. 48h)		•	•
Hardware Watchdog & Temperature supervisor		•	•
Intelligent power management		•	•
Communication Interfaces			
Graphic interface		DisplayPort 1.2	DisplayPort 1.2
USB version 3.1	(Type A)	2	2
Internal USB version 2.0 OTG behind the cover	(micro USB Type AB)	1	1
Ethernet 10/100/1000 BASE-T	(M12 female x-coded)	2	2
Power over Ethernet - IEEE802.3at 10/100/1000Mbit PSE - Power sourcing equipment, producing 48VDC out	(M12 female x-coded)	4 (total max power: 39W)	4 (total max power: 39W)
Active/passive-CAN ESD protected, isolated	(DSUB9)	2	2
RS232 / RS422/485	(DSUB9)	optional	optional
Digital I/O's, 24VDC	(up to 4 inputs & 4 outputs)	optional	optional
Analog input, 16bit resolution, voltage input: -10 ...+10V / 0 ... 30V Accuracy: +/- 0.1%	(4 inputs)	optional	optional
Analog input, 16bit resolution, current input: 0-20mA	(4 inputs)	optional	optional
I2C bus [2]		1	1
Buzzer		1	1
MIPI CSI-2 / GMSL 1&2 Camera interface [1]		on request	on request
Wireless Connectivity			
Cellular 4G Module (LTE/UMTS/GSM) with GNSS Sierra Wireless MC7455- M2M only! Dual SIM Support (nanoSIM to mPCIe slot)	(full size miniPCIe Slot)	3x SMA	none
Wireless LAN IEEE 802.11a/b/g/n/ac dual-band 2x2 MIMO Sparklan WPEB 263ACNI(BT)	(half size MiniPCIe Slot)	2x RP-SMA	none
High Accuracy GNSS Positioning Module w/ RTK support [1] u-blox ZED F9P		optional	none
Technical Data			
Dimensions w255 x h103 x d125 mm (housing, incl. mounting)		•	•
Net weight in gram		~2800	~2800
Isolated input voltage with ignition controller and reverse polarity protection	(M12 5P male a-coded)	16.8 ... 45VDC	16.8 ... 45VDC
Interruption of voltage supply time		>10ms	>10ms
Environmental Conditions			
Operating temperature [3]		–25°C ... +55°C	–25°C ... +55°C
Storage temperature		–25°C ... +80°C	–25°C ... +80°C
Operating temperature (JAXi), complies with EN50155 class OT4 [3]		–40°C ... +70°C	–40°C ... +70°C
Storage temperature (JAXi)		–40°C ... +85°C	–40°C ... +85°C
Ingress protection standard according to EN60529		IP20	IP20
Conformal coating [4]		PCX	PCX
Shock		IEC/EN 61373	IEC/EN 61373
Vibration		IEC/EN 61373	IEC/EN 61373
EMC-Conformity		EN 50121-3-2(IEC 62236-3-2)	EN 50121-3-2(IEC 62236-3-2)
Fire protection (designed to meet)		EN 45545-2 HL3	EN 45545-2 HL3
Safety (designed to meet)		EN 62368-1	EN 62368-1
Radio and Telecommunication (designed to meet)		RED	none
MTBF @ 25°C ambient according to Telcordia SR-332, environment GB		~280 000h	~390 000h

[1] Please contact factory for minimum order quantities
[2] Internal connector
[3] Depending on installation situation and interface connection. Please see user documentation.
[4] On all possible components (excl. NVIDIA Xavier Module, connectors and wireless devices)

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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Version 0.4 | June 2021

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industrial computing