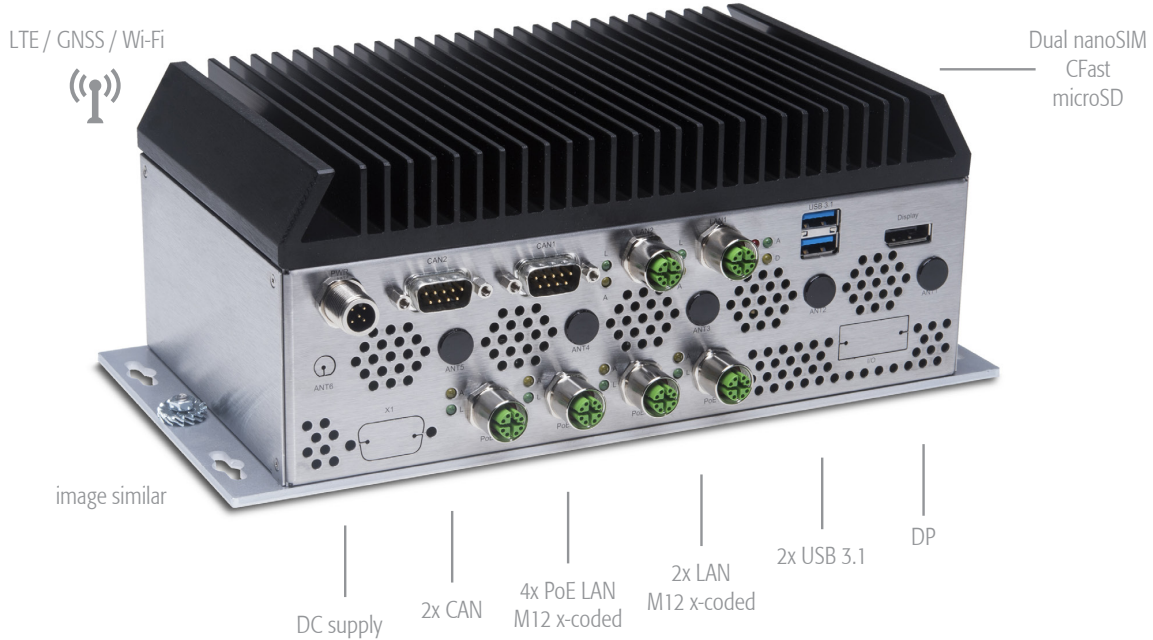


AI Railway Computer

COMPACT AI Railway Series

Computer Vision Edge Unit with NVIDIA Jetson AGX Xavier



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



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



Order Code IPC/RMLA3K22-A205S¹ IPC/RMLA3K22-C201S¹

AI Railway Computer

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
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	32GB
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	on request	on request
Real time clock (RTC) with goldcap backup (charge holds typ. 48h)	•	•
Communication Interfaces		
Graphic interface	DisplayPort 1.2	DisplayPort 1.2
USB version 3.1 (10 Gbit/s)	(Type A)	2
Internal USB version 2.0 OTG <small>behind the cover</small>	(micro USB Type AB)	1
Ethernet 10/100/1000 BASE-T	(M12 female x-coded)	2
Power over Ethernet - IEEE802.3at 10/100/1000Mbit	(M12 female x-coded)	4
PSE - Power sourcing equipment, producing 48VDC out	(total max power: 39W)	(total max power: 39W)
CAN 2.0A / CAN 2.0B (active/passive), CAN FD supported, isolated	(DSUB9)	2
RS232 / RS422/485	(DSUB9)	on request
Digital I/O's, 24VDC	(up to 4 inputs & 4 outputs)	on request
Analog input ¹ , 0-20mA or -10...+10V / 0... 30V <small>(16bit resolution Accuracy: +/- 0.1%)</small>	(up to 4 inputs)	on request
Mini PCIe socket ² - used for extensions depending on configuration	2 full-size / 1 half-size	2 full-size / 1 half-size
MIPI CSI-2 / GMSL 1&2 Camera interface ¹	on request	on request
Wireless Connectivity		
Cellular 4G Module (LTE/UMTS/GSM) with built-in GNSS <small>Telit LE910C4-WWX⁶ (Dual nano SIM support)</small>	3x SMA	none
Wireless LAN IEEE 802.11a/b/g/n/ac dual-band 2x2 MIMO & Bluetooth 5.0 <small>Emwicon WMM6218⁶</small>	2x RP-SMA	none
High Accuracy GNSS Positioning Module w/ RTK & optional heading support ¹ <small>u-blox ZED F9R / F9P</small>	on request	none
Cellular 5G Module (4G/3G fallback) with GNSS	on request	on request
Wireless LAN (Wi-Fi 6) 802.11ax/ac/a/b/g/n 2T2R	on request	on request
Technical Data		
Dimensions [mm] (housing, incl. mounting plate)	w256 x h95 x d127	w256 x h95 x d127
Net weight in gram	~2800	~2800
Isolated input voltage with ignition controller and reverse polarity protection	(M12 5P male a-coded)	16.8 ... 45VDC
Interruption of voltage supply time	>10ms	>10ms
Power consumption ³	depends on power mode (15W, 30W, MAXN)	
Environmental Conditions		
Operating temperature ³	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +80°C	-25°C ... +80°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 <small>according to Telcordia SR-332, environment GB</small>	~280 000h	~355 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)

⁶ These LTE and Wi-Fi modules have replaced the previously used Sierra Wireless MC7455 and SparkLAN WPEB-263ACNI(BT) due to these modules going EOL (previous products: IPC/RMLA3K22-A201S)

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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Order Code IPC/RMLA3K21-A205E¹ IPC/RMLA3K21-C201E¹

AI Railway Computer

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
Memory / Storage		
Data L3 Cache Size	4MB	4MB
QSPI NOR Flash Storage	64MB	64MB
256-Bit LPDDR4x ECC RAM soldered on board	32GB	32GB
eMMC 5.1 Flash Storage on board	64GB	64GB
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 ISM330DHCXR	on request	on request
Real time clock (RTC) with goldcap backup (charge holds typ. 48h)	not possible	not possible
Communication Interfaces		
Graphic interface	DisplayPort 1.2	DisplayPort 1.2
USB version 3.1 (10 Gbit/s) (Type A)	2	2
Internal USB version 2.0 OTG <small>behind the cover</small> (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 (M12 female x-coded)	4	4
PSE - Power sourcing equipment, producing 48VDC out	(total max power: 39W)	(total max power: 39W)
CAN 2.0A / CAN 2.0B (active/passive), CAN FD supported, isolated (DSUB9)	2	2
RS232 / RS422/485 (DSUB9)	on request	on request
Digital I/O's, 24VDC (up to 4 inputs & 4 outputs)	on request	on request
Analog input ¹ , 0-20mA or -10...+10V / 0... 30V (16bit resolution Accuracy: +/- 0.1%) (up to 4 inputs)	on request	on request
Mini PCIe socket ² - used for extensions depending on configuration	2 full-size / 1 half-size	2 full-size / 1 half-size
MIPI CSI-2 / GMSL 1&2 Camera interface ¹	on request	on request
Wireless Connectivity		
Cellular 4G Module (LTE/UMTS/GSM) with built-in GNSS Telit LE910C4-WWX ⁶ (Dual nano SIM support)	3x SMA	none
Wireless LAN IEEE 802.11a/b/g/n/ac dual-band 2x2 MIMO & Bluetooth 5.0 Emwicon WMX6218 ⁶	2x RP-SMA	none
High Accuracy GNSS Positioning Module w/ RTK & optional heading support ¹ u-blox ZED F9R / F9P	on request	none
Cellular 5G Module (4G/3G fallback) with GNSS	on request	on request
Wireless LAN (Wi-Fi 6) 802.11ax/ac/a/b/g/n 2T2R	on request	on request
Technical Data		
Dimensions [mm] (housing, incl. mounting plate)	w256 x h95 x d127	w256 x h95 x d127
Net weight in gram	~2800	~2750
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
Power consumption ³	depends on power mode (15W, 30W, MAXN)	
Environmental Conditions		
Operating temperature ³	-40°C ... +65°C	-40°C ... +65°C
Storage temperature	-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 <small>according to Telcordia SR-332, environment GB</small>	~270 000h	~340 000h

¹Please contact factory for minimum order quantities

²Internal connector

³Depending on installation situation and interface connection. Please see user documentation.

⁴On all possible components (excl. NVIDIA Xavier Module, connectors and wireless devices)

⁶These LTE and Wi-Fi modules have replaced the previously used Sierra Wireless MC7455 and SparkLAN WPEB-263ACNI(BT) due to these modules going EOL (previous products: IPC/RMLA3K22-A201E)

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