

AI Railway Computer

COMPACT AI Railway Series

Computer Vision Edge Unit with NVIDIA Jetson AGX Xavier



IPC/COMPACT A3 - RSL

This fanless RSL 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
- Extended AI Computing
- Railway approved EN50155
- 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
- Long term availability (fixed BOM)
- Maintenance free
- Inertial measurement unit (IMU)
- 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

Markets

- Railway (rolling stock)
- Transportation



Order Code IPC/RSLA3K22-A105S¹ IPC/RSLA3K22-C101S¹

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choose one

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	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
CAN 2.0A / CAN 2.0B (active/passive), CAN FD supported, isolated	(DSUB9)	2	2
Power over Ethernet - IEEE802.3at 10/100/1000Mbit ^{requires taller housing: h95mm}	(RJ45 / M12 female x-coded)	on request	on request
Serial RS232 / RS422/RS485 ^{requires taller housing: h103mm}	(DSUB9)	on request	on request
Digital I/O's, 24VDC ^{requires taller housing: h103mm}	(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%), requires taller housing: h95mm}	(up to 4 inputs)	on request	on request
Mini PCIe socket ^{2 - used for extensions depending on configuration}		1 full-size / 1 half-size	1 full-size / 1 half-size
MIPI CSI-2 / GMSL2 / FPDLinkIII Camera interface ^{1, requires taller housing: h95mm}		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 support ^{1 u-blox ZED F9R / F9P may require taller housing depending on final SKU}	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 h67.5 x d127	w256 x h67.5 x d127
Net weight [gram]	~2300	~2250
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: EN50155 Class S2	>10ms	>10ms
Power consumption ³	depends on power mode (15W, 30W, MAXN)	

Environmental Conditions

Operating temperature ³	-25°C ... +65°C	-25°C ... +65°C
Storage temperature	-25°C ... +80°C	-25°C ... +80°C
Ingress protection standard according to EN60529	IP20	IP20
Conformal coating ⁴	PCX	PCX
UN/ECE R10 (E-mark) certification ⁵	on request	on request
Shock	IEC/EN 61373	IEC/EN 61373
Vibration	IEC/EN 61373	IEC/EN 61373
EMC-Conformity	EN 50121-3-2	EN 50121-3-2
Safety (designed to meet)	EN 50121-3-2(IEC 62236-3-2)	EN 50121-3-2(IEC 62236-3-2)
Fire protection	EN 45545-2 HL3	EN 45545-2 HL3
Radio and Telecommunication (designed to meet)	RED	none
MTBF @ 25°C ambient ^{according to Telcordia SR-332, Environment GB, excluding battery}	~325 000h	~435 000h

¹ Please contact factory for minimum order quantities

² Internal connector

³ 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.

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/RSLA3K22-A101S)

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/RSLA3K21-A105E¹ IPC/RSLA3K21-C101E¹

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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
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
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
CAN 2.0A / CAN 2.0B (active/passive), CAN FD supported, isolated	(DSUB9)	2
Power over Ethernet - IEEE802.3at 10/100/1000Mbit <small>requires taller housing: h95mm</small>	(RJ45 / M12 female x-coded)	on request
Serial RS232 / RS422/RS485 <small>requires taller housing: h103mm</small>	(DSUB9)	on request
Digital I/O's, 24VDC <small>requires taller housing: h103mm</small>	(up to 4 inputs & 4 outputs)	on request
Analog input ¹ , 0-20mA or -10...+10V / 0... 30V <small>(16bit resolution Accuracy: +/- 0.1%), requires taller housing: h95mm</small>	(up to 4 inputs)	on request
Mini PCIe socket ² - used for extensions depending on configuration		1 full-size / 1 half-size
MIPI CSI-2 / GMSL2 / FPDLinkIII Camera interface <small>1, requires taller housing: h95mm</small>		on request
Wireless Connectivity		
Cellular 4G Module (LTE/UMTS/GSM) with built-in GNSS Telit LE910C4-VWX 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 WWM6218 ⁶	2x RP-SMA	none
High Accuracy GNSS Positioning Module w/ RTK support ¹ u-blox ZED F9R / F9P <small>may require taller housing depending on final SKU</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 h67.5 x d127	w256 x h67.5 x d127
Net weight [gram]	~2300	~2250
Isolated input voltage with ignition controller and reverse polarity protection	(M12 5P male a-coded)	16.8 ... 45VDC
Interruption of voltage supply time: EN50155 Class S2		>10ms
Power consumption ³		depends on power mode (15W, 30W, MAXN)
Environmental Conditions		
Operating temperature, complies with EN50155 class OT4 ³	-40°C ... +70°C	-40°C ... +70°C
Storage temperature	-40°C ... +85°C	-40°C ... +85°C
Ingress protection standard according to EN60529	IP20	IP20
Conformal coating ⁴	PCX	PCX
UN/ECE R10 (E-mark) certification ⁵	on request	on request
Shock	IEC/EN 61373	IEC/EN 61373
Vibration	IEC/EN 61373	IEC/EN 61373
EMC-Conformity	EN 50121-3-2	EN 50121-3-2
Safety (designed to meet)	EN 50121-3-2(IEC 62236-3-2)	EN 50121-3-2(IEC 62236-3-2)
Fire protection	EN 45545-2 HL3	EN 45545-2 HL3
Radio and Telecommunication (designed to meet)	RED	none
MTBF @ 25°C ambient <small>according to Telcordia SR-332, Environment GB, excluding battery</small>	~313 000h	~415 000h

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² Internal connector

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

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Assured Systems

Assured Systems is a leading technology company with over 1,500 regular clients in 80 countries, deploying over 85,000 systems to a diverse customer base in 12 years of business. We offer high-quality and innovative rugged computing, display, networking and data collection solutions to the embedded, industrial, and digital-out-of-home market sectors.

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