ADLINK
LEADING EDGE COMPUTING

ADLINK is committed to leveraging AI
for advancing railway digital transformation,
enabling safer, smarter, and more reliable operations.

ADLINK
Pioneering AI for Railways

Product Brochure

Alcom
electronics

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Navigate the Digital Shift for a Smarter Journey with ADLINK

In the ever-evolving landscape of transportation, the rail industry stands at the forefront of technological advancement, driven by the transformative power of Artificial Intelligence (AI).

From optimizing operations to enhancing passenger experiences, AI has emerged as a game-changer, revolutionizing every facet of rail transportation. As a leader in providing AI-enabled computing platforms, ADLINK empowers rail operators with cutting-edge solutions tailored to the unique demands of the industry. ADLINK's robust computing platforms serve as the backbone for critical applications such as Communication-Based Train Control (CBTC), Train Control and Monitoring Systems (TCMS), Autonomous Train Operations (ATO), Data Communication Systems (DCS), and Passenger Information Display System (PIDS).
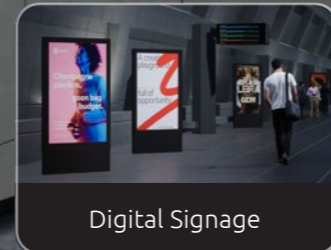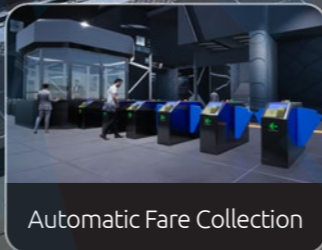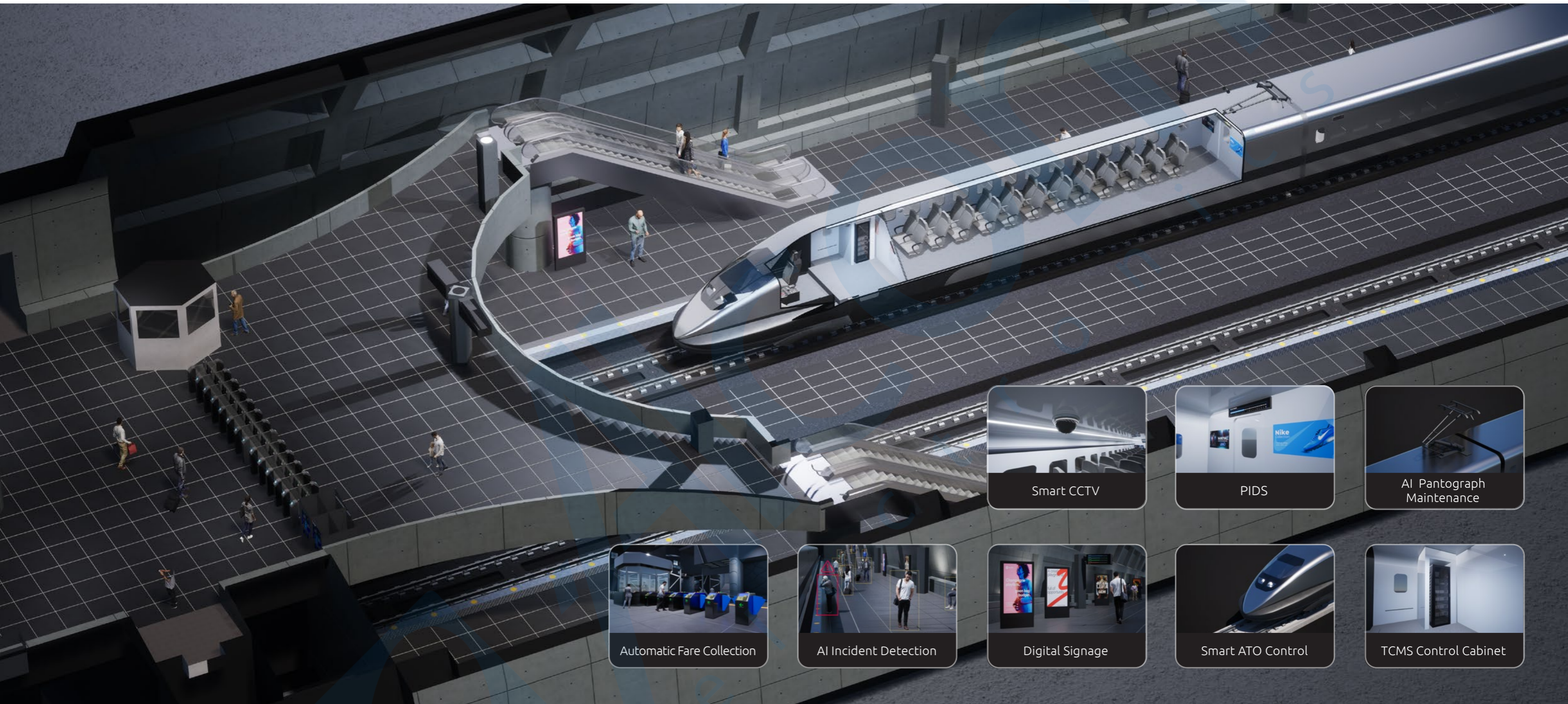
By leveraging advanced AI algorithms and high-performing computing capabilities, ADLINK's platforms enable real-time data analysis, predictive mainte-nance, autonomous operations, seamless communication, and personalized passenger services.

ADLINK's extensive experience and proven track record in the railway market make us the ideal partner for addressing the intricate needs of modern rail. We are equipped with a globally distributed team of sales and technical support experts who stand ready to swiftly respond to customer inquiries and tailor solutions to meet specific requirements. With a proven track record of reliability, scalability, and innovation, ADLINK is committed to driving the digital transformation of the rail industry, ushering in a new era of efficiency, safety, and connectivity.

A Comprehensive Portfolio of Railway Solutions

Smart CCTV

PIDS

AI Pantograph Maintenance

Automatic Fare Collection

AI Incident Detection

Digital Signage

Smart ATO Control

TCMS Control Cabinet

Stationary			Onboard / Wayside (EN50155 Compliant)				
Automatic Gate Controller	Edge AI Platform	Fanless Media Player	CPCI/CPCI Serial System	Rugged AI Edge Computing Platforms	Lightweight T2G Computing Platforms	PIDS	Customization ODM System

ADLINK Railway Solutions

Our EN50155 compliant line of AI-enabled platforms empowers rail providers with unparalleled flexibility to choose configurations tailored to their specific needs and facilitates a seamless journey towards railway digital transformation.

Onboard			PIDS
cPCIs-R900 Train-to-ground communication server	**AVA-7200** Fanless Scalable Railway AI Computer	**AVA-1000** Train-to-ground communication gateway	**Advanced Rugged Display** Passenger information display system

Rugged Edge AI Computer: AVA Series

The ADLINK AVA Series encompass a comprehensive set of EN50155 compliant solutions that bring AI and the IoT (AIoT) to the railway industry. The AVA Series is expertly designed for high compute density with I/O flexibility to meet the growing demands of railways developments and provide the essential systems for harnessing AI benefits across their edge infrastructure.

ADLINK's Embedded MXM GPU modules, featuring NVIDIA's latest GPUs, enable AI-driven AVA systems to deliver real-time video analytics capabilities across divers applications in smart ATO and CCTV.

Rail system integrators can deploy AI-driven AVA systems to enhance onboard and wayside functions including:

- **Railroad obstacle detection:** Expedite emergency response capabilities
- **Rail inspection:** Real-time diagnostics to automate equipment fault detection
- **Surveillance:** Real-time CCTV analysis to heighten train terminal security

When installed in a specialized inspection railcar, AVA-7200 models can process images of vital wayside equipment, identify faulty equipment, and disseminate maintenance alerts while travelling at high speeds.

Harness AI technologies and deploy smart, rugged, real-time graphics/video applications vital to modern railway operations

Rugged 3U CompactPCI Processor Blade: cPCI-A3535

ADLINK continues to expand its range of EN50155 compliant CompactPCI processor blade in response to the increasing need for powerful and durable systems configured for rapid deployment.

The cPCI-A3535 flagship is a 3U, Rugged by Design, Intel Xeon blade built to operate in the challenging environmental conditions many railway operators face. The cPCI-A3535 processor blades offer a wide range of connectivity, graphics, and storage options, giving systems integrators the opportunity to select a blade according to specific applications.

Enable a wide variety of railway applications featuring optimum performance, reliability, flexibility, sustainability, and supply longevity

Following Industrial Standards	CompactPCI®	CompactPCI® Serial	PC/104

Powerful AI-enabled Railway Obstacle Detection

While global rial systems efficiently transport millions daily, inherent risks persist that necessitate a sophisticated security paradigm.

ADLINK's expertise proved instrumental for a European railway client with an advanced railway obstacle detection system. The clients' system relied on a combination of optical radars, digital cameras, and a host of sensors to identify railway failures or other obstacles by leveraging AI-based processing algorithms. The complexity of this application demanded significant graphics processing capability; a challenge expertly met by ADLINK's AVA-7200 Rugged Edge AI fanless platform.

ADLINK's AVA-7200 is equipped with powerful GPGPU-assisted AI processors housed in a rugged and fanless chassis making it adept at handling diverse video analysis tasks in demanding environments. Its' proven success in real-time rail obstacle detection makes it equally suitable for analogous roles in railway terminals or specialized rail inspection cars.

ADLINK collaborates closely with transportation industry partners to empower clients and deliver AVA-7200 platforms that meet specified needs with precision. Our AVA series boasts extreme rugged construction and commits to EN50155-compliance to ensure superior performance and immediate deployment readiness for the railway obstacle detection system.

Video: ADLINK's AI-enabled Video Analytics Platform Driving Safer and Smarter Rail Operations

AVA-7200

- Compliant with EN50155 regulations
- Extreme rugged design suitable for challenging environments
- Host of storage and connectivity options
- GPGPU assisted AI processing to optimize tailored applications
- Supports wide operating temperature
- Wide range DC24-110V power input

Specifications

Railway AI Video Analytics based on NVIDIA Ampere GPGPU

- EN50155 certified AI platform
- NVIDIA Ampere architecture GPGPU A2000/A4500
- Intel 13th Gen mobile processor (Raptor Lake)
- Wide range DC 24-110V power input
- Fanless extended temperature support TPM 2.0
- 8x M12 X-coded 10G/2.5G ports, 5x USB, 4x SATA storage slots, 4DI/4DO, 2x Serial ports
- Internal NVME M.2 slot, 5G M.2 slot, mPCIe slot for expansion

5G Train-to-ground Communication Server

In the dynamic realm of rail transportation, reliable train-to-ground communication is paramount for numerous critical applications which necessitates a high-speed, dependable, and uninterrupted link to ensure seamless functionality.

At the heart of ADLINK's solution lies the cPCI-A3535, a 3U CompactPCI blade powered by the 11th gen Intel® core i7/Intel® Xeon® processor blade with Error-Correcting Code (ECC) capability. This powerful processing unit is complemented by dual 10G M12 Ethernet connections, providing high-speed data transmission essential for robust train-to-ground communication. The cPCI-A3535 is also EN50155-certified, guaranteeing its suitability for deployment in harsh rail environments.

What sets ADLINK apart is our forward-looking approach to supporting cutting-edge technologies such as 5G and Wi-Fi 6. By embracing these advanced wireless standards, ADLINK's 5G Train-to-Ground Communication Server meets current communication demands and future-proofs rail networks, ensuring they remain at the forefront of connectivity innovation.

ADLINK's 5G Train-to-Ground Communication Server, anchored by the robust cPCI-A3535 processor blade, represents a paradigm shift in rail connectivity solutions. With our proven reliability, global support infrastructure, extreme ruggedness, and compatibility with next-generation wireless technologies, ADLINK empowers rail operators to enhance communication efficiency and unlock new possibilities for innovation in rail transportation.

cPCI-A3535

11th gen Intel® core i7/ Intel® Xeon® processor blade with ECC

Supports advanced wireless standards including 5G and Wi-Fi 6

Dual 10G M12 Ethernet Connection

Compliant with EN50155 regulations

Specifications

3U CompactPCI Serial 11th gen Intel® core i7/Intel® Xeon® processor blade with ECC

- Intel® Xeon® W-11555MLE 6-Core 1.9GHz Processor
- Max. 64GB DDR4-3200 by 2x SODIMMs (ECC by option)
- 80GB 3D Nand flash SSD in SLC mode
- USB 3.2, USB-C and RJ-45 iAMT front panel service ports
- 2x M12 2.5GbE / 10GbE front panel ports for on train use
- 2x 1GbE, 10x USB 2.0/3.0 and 5x SATA (RAID) to rear

Communication Gateway for Reliable Train to Ground Connectivity

In an always-on era, rail service providers have the opportunity to enhance passengers' quality of life by providing fast and stable connectivity that enables uninterrupted productivity throughout their journeys.

ADLINK's AVA-1000 marks a significant advancement in realizing this vision. Engineered for the modern traveler, it offers a seamless bridge between moving trains and ground networks, ensuring that passengers remain connected, informed, and productive regardless of their physical location.

The AVA-1000 is EN50155 certified with a fanless design and durability in extended temperature ranges (OT4, ST1), which ensures its reliability and performance in demanding environments. It supports both Arm based NXP i.MP 8MP and Intel based Alder Lake N platforms, providing flexibility with different technological needs and preferences. More-

over, security is paramount in AVA-1000's design. ADLINK integrates the advanced TPM 2.0 technology within its architecture to ensure the utmost data integrity and privacy protection. The AVA-1000 is also equipped with 11x QMA antennas and 3x M12 Ethernet ports to support a wide range of secure communication options.

ADLINK's AVA-1000 distinguishes itself not only through its robust performance but also through its thoughtful design, which prioritizes a compact and lightweight form. This design facilitates easy installation and makes it a practical choice for rail integrators in conditions where space is at a premium.

Uninterrupted connectivity is paramount for railway providers to meet the increasing expectations for superior travel experiences of modern passengers. In this landscape, ADLINK's AVA-1000 emerges as the cornerstone for delivering consistent connectivity that redefine rail travel.

Passenger Information Display System for Real-time Communication

Passenger Information Display Systems (PIDS) are integral to enhancing passenger experience, safety, and efficiency in modern public transportation.

By providing real-time data on upcoming stops, estimated arrival times, service disruptions, and emergency announcements, passengers can make more informed decisions and foster greater satisfaction. Moreover, PIDS can manage crowd flow and minimize congestion. Its seamless integration with various transit systems creates a cohesive transportation network that ensures travelers enjoy a convenient, reliable, and transparent journey.

As a leading provider for the transportation industry, ADLINK offers cutting-edge hardware and software tailored specifically for PIDS applications. The ARD-R3660 and ARD-R2150 series stand out for their versatility, offering multiple panel size choices to acco-

mmodate diverse installation requirements across various transit environments. ADLINK's PIDS features innovative V- or T-shape system designs, enhancing accessibility for passengers while providing installation flexibility. It also incorporates anti-glare technology to ensure the uninterrupted legibility of information even in bright conditions. Additionally, ADLINK's PIDS boasts reliable performance and robust protection against dust, moisture, and harsh environmental factors with IP67-rated durability. Beyond hardware, ADLINK's PIDS is complemented with comprehensive software solutions, empowering transit operators to create engaging, informative, and responsive passenger experiences.

PIDS is critical in shaping the passenger experience and optimizing transit operations. ADLINK's ARD-R3660 and ARD-R2150 series, with their multi-panel size choices, ergonomic designs, anti-glare technology, IP67-rated durability, and comprehensive software solutions, are well-equipped to exceed the evolving needs of modern transit systems.

Rugged Fanless Railway AI Platforms

AVA-7200

Fanless Railway AI Video Analytics based on NVIDIA Ampere GPGPU

- EN50155 certified AI platform
- NVIDIA Ampere architecture GPGPU A2000/A4500
- Intel 13h Gen mobile processor (Raptor Lake)
- Wide range DC 24-110V power input
- Fanless extended temperature support TPM 2.0
- 8x M12 X-coded 10G/2.5G ports, 5x USB, 4x SATA storage slots, 4DI/4DO, 2x Serial ports
- Internal NVME M.2 slot, 5G M.2 slot, mPCIeslot for expansion

AVA-1000

FanlessRailway Train to Ground communication Gateway

- EN50155 certified T2G platform
- Arm based NXP i.MX 8M / Intel based Elkhart Lake by option
- 3x M.2 slots: 2x for 5G modem, 1x for Wi-Fi module
- 11x QMA antenna, 3x M12 Ethernet ports
- TPM 2.0
- Wide range DC 24-100V power input, S2, C1
- Fanless extended temperature OT4, ST1
- Compact size for easy installation

AVA-5500/5600

Rugged, FanlessAI-enabled Video Analytics Platform with NVIDIA® Quadro® GPU

- 6th/7th Gen Intel® Core i7 processors
- NVIDIA® GPU MXM 3.1 Type A/B module on PCIe x16 Gen 3
- 8x M12 GbE (4x PoE), 4x RS-422, 4x USB 3.0, 1x DVI-I, 4x DisplayPort with lockable connectors; 4x isolated DI and 4x isolated DO
- Multiple storage options: 2x 2.5" SATA 6.0Gb/s drive bays, 1x M.2 2280 slot,1x CFast socket
- GNSS/3G/4G/WLAN support via 2x mPCIe slots and 2x USIM slots
- MVB/CAN bus support through mPCIe add-on modules
- Nominal power input voltage: 24VDC, 36VDC, 72VDC and 110VDC (EN50155 compliant)
- -25°C to +70°C wide operating temperature range (EN50155 class OT3)

AVA-RAGX

Fanless AIoT Video Analytics Platform with NVIDIA Jetson AGX Xavier

- NVIDIA Jetson AGX Xavier with 32 TOPs AI performance
- 4x M12 GbE with PoE, 1x lockable HDMI output, 4x USB 3.0
- 1x M.2 B-key for LTE/5G; 1x M.2 A/E key 2230 for Wi-Fi
- 2x CAN DB-9 CAN-FD from AGX module, with isolation
- Power with ignition control
- Nominal power input voltage: 24VDC, 36VDC, 72VDC and 110VDC (EN50155 compliant)
- -25°C to +70°C wide operating temperature range (EN50155 class OT3)

ARD-R2150/R2150B

Passenger information display system

- 21.5 inch panel size
- 1920 x 1080 resolution
- 500nit/1000nit brightness
- i.MX 8M Plus CPU
- 24 ~110VDC
- EN50155 ready

ARD-RS3660/RS3660B

Passenger information display system

- 36.6 inch panel size
- 1920 x 290 resolution
- 500nit/1000nit brightness
- i.MX 8M Plus CPU
- 24 ~110VDC
- EN50155 ready

CompactPCI Processor Card

cPCI-3640

3U CompactPCI Quad-Core Intel Atom® X Series Processor Blade

- Low power quad-core Intel Atom® x6413E Processor (Elkhart Lake)
- Up to 32GB DDR4-2400-3200MT/s ECCsoldered memory
- Optional onboard 32GB SSD support
- Smart Embedded Management Agent (SEMA) for system health monitoring
- Optional additional GbE ports with MIL-STD M12 connectors
- EN50155 compliant for railway applications

cPCI-6660

6U CompactPCI Intel® Atom X Series Processor Blade

- Low power quad-core Intel Atom® x6413E Processor (ElkhartLake)
- Up to 32GB DDR4-3200M T/s with IBECC by dual channel SODIMM
- Up to 4x Gigabit Ethernet ports; up to 3x RJ-45 2.5G ports on front
- 1x SATA/mSATA interface and onboard SSD
- 1x XMC site with PCIex4

cPCI-3520

3U CompactPCI 8th/9th Gen Intel® Core, Intel® Xeon®/Celeron® Processor Blade with ECC

- Up to 32GB DDR4-2666 soldered memory (ECC by option)
- Support sthree independent displays
- System/Peripheral slot operation
- Extended temperature support
- Optional storage interfaces include cFast, SSD, mSATA, 2.5" SATA drive
- Flexible IO interfaces by mezzanine card
- Designed for EN50155 compliance

cPCI-3630

3U CompactPCI Quad-Core Intel Atom® X Series Processor Blade

- Up to 8GB DDR3L-1600 ECC soldered memory andonboard SSD
- Smart Embedded Management Agent (SEMA) for system health monitoring
- Optional GbE ports with MIL-STD M12 connectors
- EN50155 compliant for railway safety-critical applications
- -40°C to +70°C fanless operation (up to +85°C with airflow)
- Minimum 10 years product life support

cPCI-3E10/3E12

3U CompactPCI 2/4-Port Gigabit Ethernet Card

- 32-bit/33MHz, 66-bit/64M Hz CompactPCI bus
- 2x or 4x RJ-45 10/100/1000BASE-Tports on front panel
- 2x LAN ports switchable to rear
- Optional LAN port via D-Sub connector

cPCI-3548

3U CompactPCI 8-Port RS-232/422/485 COM Card

- 2x or 4x RJ-45 10/100/1000BASE-T ports on front panel
- Plug-and-play, IRQ & I/O address automatically assigned by PCI BIOS
- 8x asynchronous communications ports with intelligent buffer
- 2500 VDC signal to ground isolation voltage
- Support multiple OS
- Surge protectors and rugged DB37 connectors

CompactPCI Serial Peripherals

cPCI-A3535

3U CompactPCI Serial 11th gen Intel® core i7/ Intel® Xeon® processor blade with ECC

- Intel® Xeon® W-11555MLE 6-Core 1.9GHz Processor
- Max. 64GB DDR4-3200 by 2x SODIMMs (ECC by option)
- 80GB 3D Nand flash SSD in SLC mode
- USB 3.2, USB-C and RJ-45 iAMT front panel service ports
- 2x M12 2.5GbE / 10GbE front panel ports for on train use
- 2x 1GbE, 10x USB 2.0/3.0 and 5x SATA (RAID) to rear

cPCI-A3525
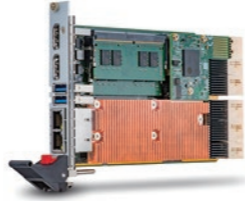
CompactPCI Serial 9th Gen Intel® Corei7 / Intel® Xeon® Processor Blade with ECC

- 9th Gen Intel® Corei7 / Intel® Xeon® processor, 14nm process, up to 6-core
- Dual channel DDR4-2666 SODIMM, up to 32GB (ECC by option)
- Supports 2x PCIe x8 Gen 3 and 2x PCIe x4 Gen 3
- Up to 10x USB 2.0/3.0, up to 7x SATA to rear
- Onboard SATA SSD storag

cPCI-A3ETH

3U CompactPCI Serial Ethernet Card

- 5x RJ-45 ports support up to 2.5G (with PoE support optional)
- 5x independent Intel® i226IT Ethernet controllers
- Operating temperature: -40°C to +85°C
- EN50155 compliant

cPCI-A3CAN

3U CompactPCI Serial CAN FD Card

- 2 High-speed CAN channels (ISO 11898-2)
- CAN FD bit rates for the data field (64 bytes max.) from 25 kbit/s up to 12 Mbit/s
- CAN bit rates from 25 kbit/s up to 1 Mbit/s
- Operating temperature: -40°C to +85°C
- EN50155 compliant

cPCI-A3H20

3U CompactPCI Serial M.2/U.2/ SATA Storage Carrier

- 1x NVMe M.2 and 1x NVMe U.2 drive slot
- 1x optional SATA 6Gb/s M.2 drive slot shared space with NVMe U.2
- Status LEDs on faceplate: driveactivity, hot-swapstatus, user-configurable
- Operating temperature: -40°C to +85°C with qualified modules
- EN50155 compliant

cPCI-A3W20

3U CompactPCI Serial Wireless Networking Carrier Blade

Coming Soon

- 12x external QMA antennas on front panel
- 2x M.2 slots for5G,LTE communication
- 1x Mini PCIe slot for GPS, Wi-Fi communication
- 8x micro-SIM holders
- EN50155 compliant

cPCI-A3H10

3U CompactPCI Serial 2.5" SATA Storage Carrier

- 1x 2.5" SATA 6Gb/s drive slot
- Status LEDs on faceplate: drive activity, hot-swap status, user-configurable
- Hot swap support
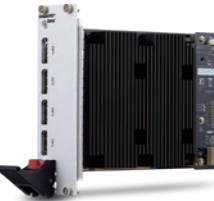- Operating temperature: -40°C t o 85°C

cPCI-A3M12

3U CompactPCI Serial M12 Ethernet Card

Coming Soon

- 4x M12 x-codes support up to 10GB (by option)
- 4x independent Intel® i226IT or X710 Ethernet controllers
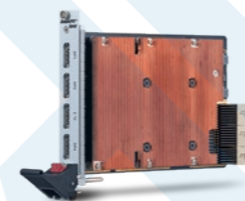- Operating temperature: -40°C to 85°

cPCI-A3MXM/A4500

3U CompactPCI Serial MXM GPU Carrier Card

- Compatible with MXM Type B
- NVIDIA RTXA 4500 with 5888 CUDA®cores, 46RT Cores, and 184 Tensor Cores
- 4x DisplayPort 1.4
- Operating temperature: -40°C to +60°C
- EN50155 compliant

cPCI-A3MXM/A1000

3U CompactPCI Serial MXM GPU Carrier Card

- Compatible with MXM Type A
- NVIDIA A1000 with 2048 CUDA® cores, 16 RT Cores and 64 Tensor Cores
- 4x DisplayPort 1.4
- Operating temperature: -40°C to +70°C
- EN50155 compliant

CompactPCI Serial / CompactPCI Chassis

cPCI-A3COM

3U CompactPCI Serial RS-232/422/485 COM Card

- 2x asynchronous communications ports
- All support RS-232/422/485
- Operating temperature: -40°C t o +85°C
- EN50155 compliant

cPCI-A3USB

3U Comp act PCI Serial 4-Port USB 3.2/2-Port Ethernet Card

- 4x USB 3.2 Gen 1 ports
- 2x RJ-45 ports support up t o 2.5G
- 2x independent Intel® i226IT Ethernet controllers
- Operating temperature: -40°C t o +85°C
- EN50155 compliant

cPCIS-A3100/2DC

4U 84HP CompactPCI Serial Fanless Enclosure with Backplane and Redundant Power Supply

Coming Soon

- 19" 4U rack mount housing w ith 8 peripheral slots
- Comprehensiv e EMC shielding
- Equipped with wide temperature range CompactPCI redundant power supply (Max. output 600 W)

cPCIS-ET1100

3U 84HP CompactPCI Fanless Enclosure with 32-bit Backplane and Redundant Power Supply

- 19" 3U rack mount housing w ith 7 peripheral slots
- Comprehensiv e EMC shielding
- Equipped with wide temperature range CompactPCI redundant power supply (Max. output 500 W)
- Optional dual system segments, each with one system slot and five peripheral slots