ADLINK
LEADING EDGE COMPUTING

Future Proofing Onboard Train-to-Ground Gateway



AVA-1000 | Railway-Certified T2G Onboard Gateway

Application Story

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

ADLINK
LEADING EDGE COMPUTING



Future Proofing Onboard Train-to-Ground Gateway

Overview

In today's urban rail networks, high-speed 5G, private LTE and Wi-Fi 6 have become the backbone of train-to-ground communications. By outfitting each subway car with multi-access gateways, onboard edge-compute nodes and AI-enhanced NVRs, operators can create a fully IP-based monitoring and control platform. Traffic control centers and dispatch rooms enjoy seamless, low-latency voice and data links with drivers, live video feeds from cabins and equipment health telemetry—all secured via network slicing and industrial-grade encryption. The result is smarter traffic dispatch, proactive maintenance scheduling and an elevated passenger experience through real-time infotainment and digital services.

Customer Challenges

As rail standards evolve and connectivity demands grow, operators must shift to open, cost-effective architectures. One renowned European customer aims to replace centralized head-end systems with compact gateway modules—an approach that brings several complex demands:



- Risk of unplanned downtime, hard to guarantee service
- Frequent power line fluctuations across countries
- Complex SIM management on cross border routes
- Scalability demands for mixed ARM/x86 platforms
- Harsh vibration and shock in rolling stock

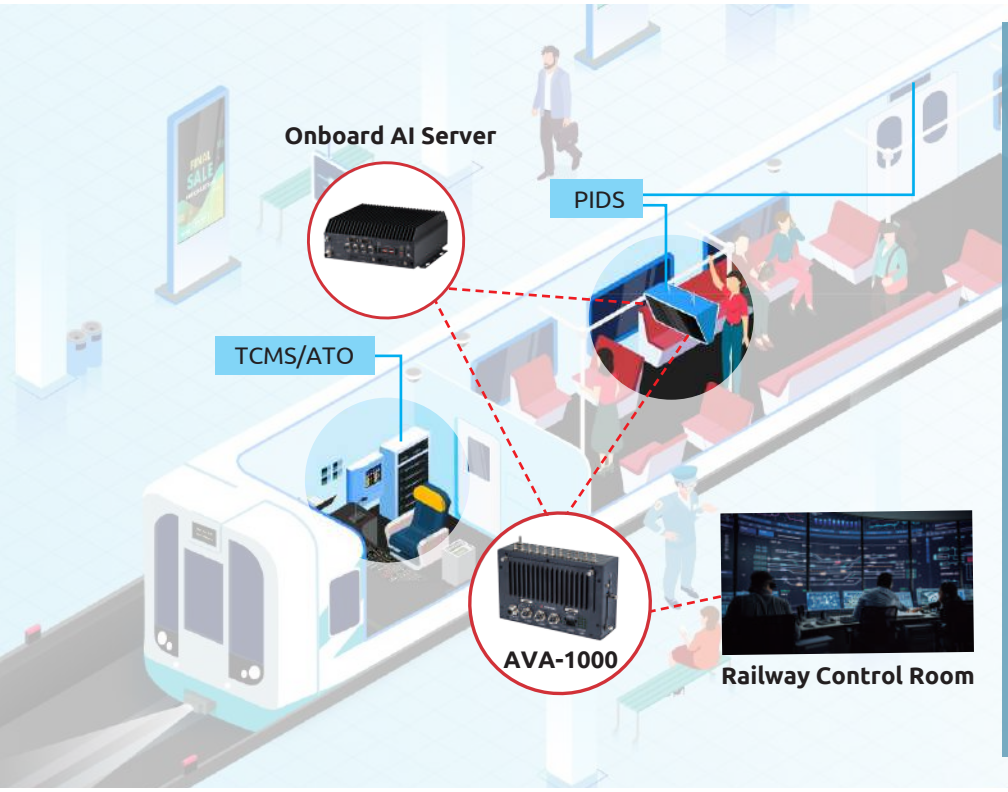
ADLINK Solution

ADLINK provided the AVA-1000, a compact, EN50155-compliant onboard gateway designed to meet the connectivity demands of this project. Deployed in each car, the AVA-1000 enables internet connectivity between onboard rail systems and supports train-to-ground communication.

For instance, data from the traffic control center is transmitted to each AVA-1000 and then distributed to the car's Passenger Information Display System (PIDS) to show real-time updates. Conversely, each car's NVR sends video data to the onboard server via the AVA-1000. In abnormal situations, the system automatically uploads data to the traffic control center, which can also actively retrieve video feeds through the network.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Solution Diagram



5G Train-to-Ground Gateway



AVA-1000
Arm-based and Intel-based scalable gateway

AI-enabled PIDS Server



AVA-7100
Intel® 13th Gen core Rugged with rich IO interfaces

Onboard PIDS



ARD-R2150/RS2860/ 21.5”/28.6”
Intel® 7th Gen Atom

Why ADLINK?

Choosing ADLINK means gaining a future-ready solution that delivers real operational advantages:

1. High MTBF & Longevity: Engineered for railway environments, the AVA-1000 designed and tested a MTBF of over 200,000 hours.
2. 24–110 V Wide Range Power Input: The fanless, maintenance-free power module accepts DC 24–110 V directly—eliminating bulky external converters and simplifying system integration. This wide voltage tolerance safeguards stable operation across fluctuating power conditions in vehicles and remote installations.
3. Uninterrupted cross-border operation: Dual 5G modems, each supporting two SIM cards, enable automatic switching between telecom providers to ensure continuous internet access.
4. Future Proof Scalability: Support both Arm and Intel x86 modules, allowing easy upgrades with minimal requalification effort. As processing needs evolve for demanding edge computing tasks, the system can be upgraded to extend its service life.
5. Rugged design with full EN compliance: Certified to EN50155, EN45545, EN61373, and EN303 413, the AVA-1000 withstands shock, vibration, fire, and electromagnetic disturbances in rail settings. M12 push-pull connectors deliver solid, vibration-resistant I/O for harsh-environment deployments.
6. CRA (Cyber Resilience Act): AVA-1000 is designed with cybersecurity in mind, fully compliant with IEC 62443-4-1 to meet the EU Cyber Resilience Act (CRA) requirements. By integrating Wind River OS, which also adheres to IEC 62443-4-1 standards, we provide a hardened platform for secure and reliable operations.

Conclusion

To further enhance train communication, operational efficiency, and passenger service quality, ADLINK provides a comprehensive train-to-ground wireless communication solution—backed by prompt support from our global sales team.

Got a project in mind? **Request a quote** or **contact our experts** today.

www.adlinktech.com

All products and company names listed are trademarks or trade names of their respective companies. ©2025 ADLINK Technology, Inc.
All Rights Reserved. All pricing and specifications are subject to change without further notice.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Global Headquarters

ADLINK Technology, Inc.
No. 66, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan

Tel: +886-3-216-5088
Fax: +886-3-328-5706

www.adlinktech.com

Worldwide Offices

Ampro ADLINK Technology, Inc.
6450 Via Del Oro, San Jose, CA 95119, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200
Fax: +1-408-600-1189

ADLINK Technology (China) Co., Ltd.
300 Fang Chun Rd., Zhangjiang Hi-Tech Park, Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5192-3588

ADLINK Technology GmbH
Hans-Thoma-Straße 11
68163 Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621-43214-30

ADLINK Technology Japan Corporation (Tokyo Office)
KDX Kanda Ekimae Bldg. 4F, 3-7-4 Kanda Kajicho, Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81-3-5209-6001
Fax: +81-3-5209-6013

ADLINK Technology Beijing
Rm. 801, Power Creative E, No. 1, Shang Di East Rd., Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8626

ADLINK Technology GmbH (Healthcare Business Center)
Ulrichsbergerstraße 17
94469 Deggendorf, Germany
Tel: +49-991-29094-10

ADLINK Technology Japan Corporation (Nagoya office)
LINKS Meieki Bldg. 3F, 5-31-10 Meieki, Nakamura-ku, Nagoya-city, Aichi 450-0002, Japan
Tel: +81-52-589-9018
Fax: +81-52-583-2807

ADLINK Technology Shenzhen
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7, High-Tech Industrial Park S.,Shenzhen, 518057 Chin
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353

ADLINK Technology, Inc. (UK Liaison Office)
First Floor West Exeter House, Chichester fields Business Park. Tangmere, West Sussex, PO20 2FU. United Kingdom
Tel: +44-1243-859677

ADLINK Technology Korea Ltd.
A-1503,U-TOWER,767 Sinsu-ro, Suji-gu, Yongin-si, Gyeonggi-do, Republic of Korea, 16827
Tel: +82-31-786-0585
Fax: +82-31-786-0583

ADLINK Technology Nanjing
Rm. 1908, 105 Zhongshan N Rd, Gulou, Nanjing, Jiangsu, China, 210093
Tel: +86-25-86652110
Fax: +86-25-86652110

ADLINK Technology, Inc. (Israel Liaison Office)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7, High-Tech Industrial Park S.,Shenzhen, 518057 Chin
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353

ADLINK Technology Singapore Pte. Ltd.
1008 Toa Payoh North, 07-17/18 Singapore 318996
Tel: +65-6844-2261
Fax: +65-6844-2263

ADLINK Technology Chengdu
Rm. 4207, 500 Tianfu Blvd Middle Section, Wuhou District, Chengdu, Sichuan, China, 610023
Tel: +86-28-85216698
Fax: +86-28-85258206

ZettaScale Technology Limited
Suite 1, First Floor, The Honeycomb, The Watermark, Gateshead, Tyne & Wear, United Kingdom, NE11 9SZ
Tel: +44 (0) 191-4979900

ADLINK Technology Singapore Pte. Ltd. (Indian Liaison Office)
#50-56, First Floor, Spearhead Towers, Margosa Main Road (between 16th/17th Cross), Malleswaram, Bangalore - 560 055, India
Tel: +91-80-4224-6107, +91-80-2346-4606
Fax: +91-80-2346-4606

ZettaScale Technology SARL
Bâtiment Thalès – Parc des Algorithmes Route de l'Orme des Merisiers, 91190 SAINT AUBIN, France
Tel: +33(0) 1 60 12 35 66
Fax: +33(0) 1 60 12 35 66

ZettaScale Technology B.V.
Amarilstraat 30,
7554TV Hengelo (OV), Netherlands
Tel: +31-(0)-7424-72570

intel partner Titanium

All products and company names listed are trademarks or trade names of their respective companies. ©2025 ADLINK Technology, Inc. All Rights Reserved. All pricing and specifications are subject to change without further notice.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000