ADLINK

TRX R1

Future-proofing Onboard Train Connectivity With A Low Powered Modular Gateway And Intelligent Edge OS.

Overview

Deliver sustainable, resilient and future-proofed connectivity on trains.

Challenges

- Reduce onboard IT infrastructure and operational costs
- Retain the flexibility to evolve with rail/operation standards
- Continuously maintain secure and resilient connectivity

Solution

TRX R1 compact modem/router gateways powered by KlasOS Keel.

Benefits

Future-proofed - EN compliant, low power gateway, with wired and modular wireless components.

Reduced Costs - Keel provides an OS with virtual switch, route, firewall, and SD-WAN capabilities on the low powered gateway.

Resilient Communications - no single point of failure, multiple modems distributed throughout the train.

Enhanced Security - integrated IT automation and monitoring for a consistent security posture.

Executive Summary

In partnership with Adlink, TRX R1 built on the AVA 1000 gateway series, is a compact and EN rail compliant modem/router, for distributed connectivity architectures onboard trains and buses. TRX R1 is designed to be positioned close to the antenna, requiring a maximum of 15 watts of power (when active on the mobile network).

TRX R1 is modular by design and supports Wi-Fi 6 and a 4G or 5G modem, alongside Gigabit ethernet. The ability to swap out modems in the future makes the TRX R1 a good fit for the Radio Function in the FRMCS TOBA architecture (OBRAD).

TRX R1 is underpinned by the KlasOS Keel (Keel) operating system, ensuring the highest levels of protection of the device, administrative functions and data in-transit over the mobile network.

Today's Rail Challenges

With rail standards and sustainability goals continuously evolving, train operators and owners need the agility of an open communications architecture that reduces operational and communication costs.

Future-proofing starts by placing low-powered modular gateways close to antennas. By distributing the modems across the train, there is a saving in terms of power consumption, but more importantly a reduction in physical cabling.

However, to operate resilient and secure networking and connectivity, requires an operating system that can run on the low powered modem and can be securely managed remotely.

Klas, in partnership with Adlink, solves these challenges with TRX R1 and the KlasOS Keel lightweight operating system. Furthermore, with Blackrock Ansible automation and monitoring platform from Klas, operators can easily maintain and secure TRX R1 gateways at scale.

Figure: TRX R1 side views

KLAS

TRX R1 - Keel, a Secure Intelligent OS From Klas

Keel is the lightweight OS on the TRX R1, requiring minimal resource to operate. Keel provides network configuration and management on low powered devices with ARM and x86 CPUs.

Keel delivers seamless configuration and management of the TRX R1 modems, which includes management and update of the installed modem's firmware.

In addition, Keel supports virtual switch and route capabilities on the low power device, including SD-WAN capabilities of secure connectivity over mobile networks.

A significant advantage of Keel is the ability to aggregate secure managed connections from multiple TRX R1 gateways, into the cloud or on-premise, via a single headend application.

Furthermore, with Keel, IT admins can securely remote access onboard systems with bi-directional communications on a per modem basis.

In addition, Blackrock from Klas, an Ansible automation platform, is integrated into Keel. The result is improved IT productivity by automating manual, mundane and repetitive tasks such as firmware and security updates at scale.

TRX R1 - Adlink AVA 1000 Series

TRX R1 built on the AVA gateway series, is a compact EN rail compliant modem/router, for distributed connectivity architectures, onboard trains and buses.

In partnership with Klas, rail operators and owners can now avail of a holistic solution of EN compliant hardware, running a proven and highly secure operating system, Keel. Keel is extensively used in transportation, public-safety and government deployments.

With integrated software capabilities of Keel SD-WAN and Blackrock - deploying, managing and updating AVA remotely is greatly simplified.

Together, Adlink and Klas, are delivering a sustainable rail solution, that requires minimal IT effort to operate and maintain.
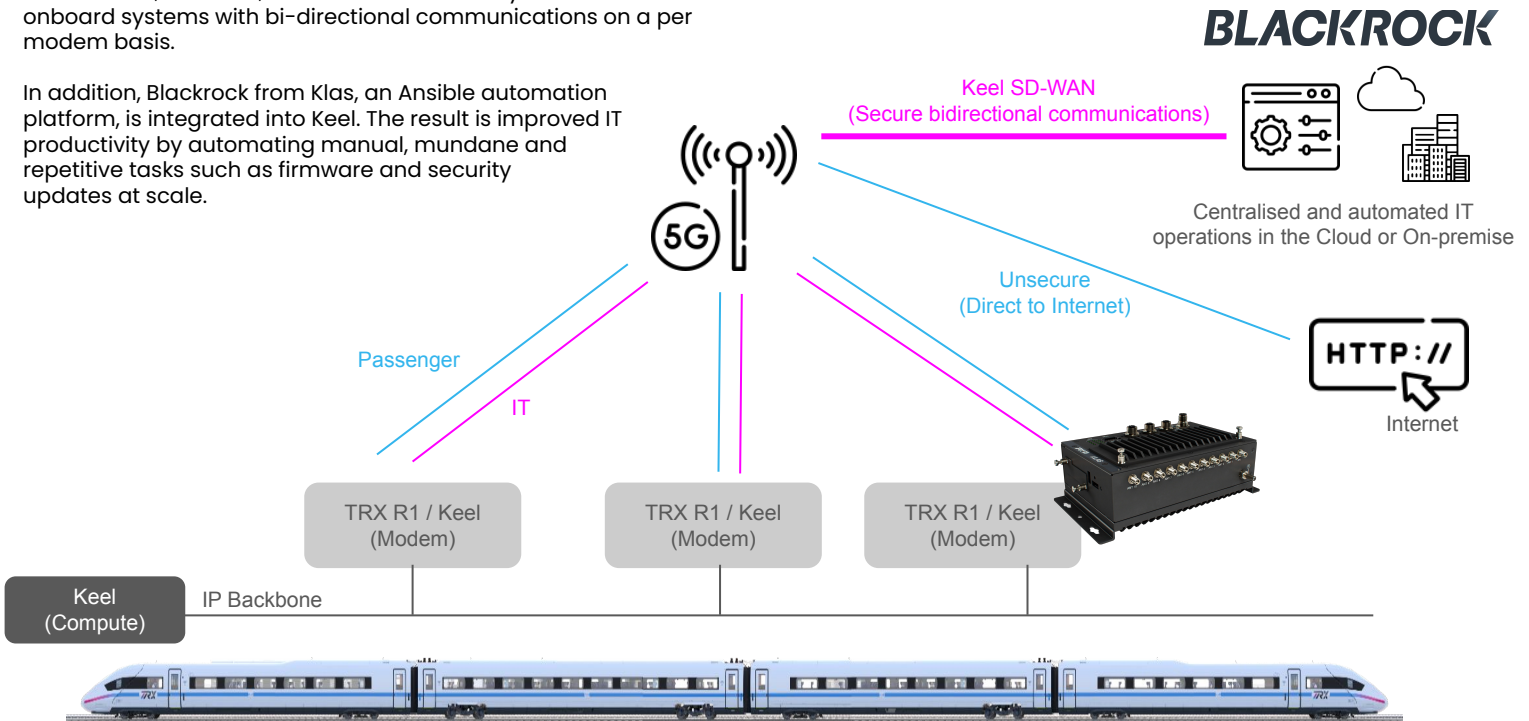

Figure: Keel intelligently and securely routes traffic over the distributed modem architecture to private networks or direct to the internet.

Conclusion

The TRX R1 compact gateway with Keel, significantly reduces the onboard network and connectivity infrastructure footprint.

- Future-proof investment against evolving standards and technology, with a modular and open architecture solution
- Eliminate the need for additional 3rd party infrastructure and expensive licenses e.g. VPN, private APNs, firewalls, etc.
- Simplify IT operations with secure remote access over bidirectional connectivity on a per-modem, per train basis.
- Enhance security with a proven OS, also used in government deployments, and validated under NIST NIAP compliance

For more information on Adlink AVA-1000 visit:
https://www.adlinktech.com/Products/RuggedRailwaySystems/Onboard-System/AVA-1000?lang=en

For more information about Klas visit:
www.klasgroup.com/transportation/

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