Combined hardware and software solution running KlasOS Keel allows a range of applications to be supported on a single platform.

Supported applications include Passenger Wi-Fi, Infotainment and Passenger Information Systems, CCTV and TCMS access.

Open platform allowing the operator to add features over time.

**Cellular Gateway With In-built Compute**

**Key Features**

- Combined router/server with multiple CPU options
- Dual-core Intel® Celeron® Processor G Series
- 6th Generation Intel® Core™ processors with dual-core i3, quad-core i5 and quad-core i7
- Support for six cellular modems, Wi-Fi and Ethernet for connectivity
- Supports MVB, RS-422, RS-485 and GPS for telematics
- Integrated KlasOS Keel to support third-party virtual machines
- Easily managed through integrated Keel CLI or SNMP via single IP address
- Firewall, captive portal and load balancing
- SDWAN tunnelling provides reliable connectivity over multiple WAN links with variable bandwidth
KlasOS Keel

Connectivity
- 3G/4G modems
- Wi-Fi Client and Access Point
- Software Defined WAN (SDWAN) tunnels isolate TCP and UDP connections from changes in WAN infrastructure

Virtualisation
- Integrated KVM hypervisor
- Existing legacy systems can be virtualised and deployed as a Guest OS
- Configurable resources such as CPU cores, RAM, Storage, Networking

Telematics
- RS-422 / RS-485 module and MVB module can be mapped to a Guest OS

Management
- Compatible with off-the-shelf tools such as Nagios
- SNMP v1/v2/v3
- SNMP and scripts can be combined to gather data
- Ansible/Vagrant for provisioning and deployment

KlasOS Martello

Firewall
- Captive Portal
- Session-based load balancing

Third Party NFVs

Wireless LAN controller
- Management
- CCTV
- Media hosting
- Routing
- Firewall
- Telematics

Integrated GPU
- Intel HD Graphics 530 integrated in KlasOS
- Ideal for Artificial Intelligence / Machine Learning workloads

Optimised Management & Virtualization

Connectivity, Virtualisation, Management
KlasOS Keel

Wireless LAN Controller
Cisco vWLC

Infotainment, PIS

Train Telematics
MVB, RS-422, RS-485, RS-232

3rd party NFVs

Hardware
6th Generation Intel® Core™ i3/i5/i7
Hardware Specifications

Server Features
- Processor options available:
  - Dual-Core Intel® Celeron® G3900E 2.4 GHz clock rate
  - Dual-Core 6th Gen Intel® i3-6102E 1.9 GHz clock rate
  - Quad-Core 6th Gen Intel® i7-6822EQ 2.0 GHz clock rate
- Intel® Virtualization Technology (VT-x) with IPMI
- Up to 32 GB RAM
- Internal storage with capacity of 16 GB
- Dual removable 2.5" SATA Solid State Drive in sizes 256 GB - 4 TB

4G LTE Modems
- Sierra Wireless MC7430 / EM7430 LTE Cat-6
- Sierra Wireless MC7455 / EM7455 LTE Cat-6
- Sierra Wireless EM7511 LTE Cat-12
- Sierra Wireless EM7565 LTE Cat-12

GNSS
- Reception of GPS, GLONASS, QZSS, BeiDou
- High sensitivity acquisition and single-satellite timing
- Automatic holdover

Wi-Fi Interface
- IEEE802.11 ac/b/g/n modem with datarates of 1.3 Gb/s downlink
- 3x3 MIMO
- Supports 2.4 GHz and 5 GHz bands
- Enhanced wireless security supporting 64/128/256-bit WEP, WPA, WPA2, 802.1x
- Additional Wi-Fi interfaces supported via expansion slots

4G LTE Modems
- Sierra Wireless MC7430 / EM7430 LTE Cat-6
- Sierra Wireless MC7455 / EM7455 LTE Cat-6
- Sierra Wireless EM7511 LTE Cat-12
- Sierra Wireless EM7565 LTE Cat-12

Physical Specifications
- 9.8"W x 11"L x 3.05"H (250 mm x 279 mm x 76.5 mm)
- 9.9 lb / 4.5 kg

Electrical Specifications
- 24 - 110 VDC
- Power consumption:
  - 60 W including 6 modems, excluding PoE
  - 160 W when all PoE ports are in use. 48 VDC input required

Software Specifications

Networking
- Software Defined WAN (SDWAN)
- Static Routing
- OSPF, RIP, BGP4
- Virtual Switch (vSwitch)
- NAT (PAT)
- 802.1q VLAN
- Access Control Lists (ACL)
- DHCP Client/Server
- NTP Client and Master

Supported Interfaces
- Gigabit Ethernet
- Wi-Fi Client and Access Point
- 4G/LTE and 3G/UMTS modems

Compliance
- EN61373:2017 Railway Applications - Rolling stock equipment Shock and Vibration
- EN50121-3-2:2017 Railway Applications - Electromagnetic Compatibility - Part 3-2 Rolling Stock - Apparatus
- EN55032 Electromagnetic Compatibility of Multimedia Equipment
- RED Compliant
- IP 54 Ingress protection
- RoHS 2 Compliant
- FCC/CE

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