



Computing Intelligence for Rail & Public Transport

ModuCop

No matter whether computing performance at the edge of a network or embedded applications. The basis is always a reliable qualified computer. For bus & rail!
This is ModuCop! Fully manageable remotely.



ModuCop – THE CONCEPT

The modular and flexibly expandable Edge Computer ModuCop MEC (Modular Edge Computer) is qualified for use in rail and public transport applications. Due to its flexibility, MEC adapts to a wide range of vehicle interfaces and thus represents the basic platform for numerous onboard applications.

ModuCop consists of the basic units Power Supply (slot 1), CPU unit (slot 2&3) and various intelligent extension units to cover any application specific interface needs, as e.g., MVB.

Build-to-order configuration allows application tailored edge devices with one extension (28 HP), 3 extensions (42 HP) or up to 9 extension (84 HP).

MEC features an ARM Quad Core offering the computing power to host additional custom applications up to machine learning algorithms in a containerized environment. In addition, a variety of wireless connectivity is provided, enabling both a connection to the cloud and a connection to wireless sensor technology in a vehicle.

The edge computer comes as ONE platform, differencing only by application specific power supply and custom configurations.

As the computer itself, also the mounting is as flexible as possible. With accessories, ModuCop can be mounted on TH35 DIN Rail, to any wall or 19" sub-rack.

ModuCop is by far more than a HW Computer platform. It comes with an open source Yocto Linux operating system, hosting a docker container runtime to easily allow multiple application deployments. Fully integrated into Ci4Rail's EdgeFarm backoffice SW, ModuCop is fully manageable Over-The-Air.

With it's integrated KubeEdge Kubernetes cluster support, each ModuCop appears simple as a cloud node in a Kubernetes cluster environment. This allows Cloud applications to be deployed easily also to mobile Edge Computers.



THE PORTFOLIO

ModuCop – MEC01 (Rail) / MEC02 (Automotive)

Power Supply

Depending on use case

- PSU01: 14.4 ... 154V (DC) wide range, ~20W, EN50155 compliant
- PSU02: 9..50 V (DC), ~60W, UN ECE R10 compliant
- PSU03: 14.4 ... 154V (DC) wide range, ~60W, EN50155 compliant (in development)

CPU Unit

Computing performance on smallest installation space

- 4-C ARM® Cortex A53; 1x Cortex M4F
- 2 or 4 GB DDR4; 16GB eMMC integrated
- 2x Gbit/s Ethernet
- 1x RS232; 1x USB
- WLAN, LTE, GPS integrated
- Opt. Neural Processing Unit (NPU)
- Service Interfaces

IOU01 – BIN / AN In & Outputs

- 4x Binary Inputs / Outputs 14.4...154V (DC)
- 2x Analogue Inputs: +/-10V or 0..24mA
- Galvanically isolated interfaces
- Usable as direct I/O or data logger function with timestamped streams

IOU03 – Non-retroactive network coupler

- 1x MVB listen only
- 1x CAN listen only
- Galvanically isolated interfaces
- Data logger function with timestamped streams

IOU04 – Serial Interfaces

- 2x RS232/422/485 as Linux tty device
- 1x CAN (direct I/O or data logger)
- Galvanically isolated interfaces

IOU06 – Bus & Light rail

- 1x CAN
- 1x IBIS Master
- 1x Serial IF
- Audio



IOU02 – ETH Switch incl. PoE

- 4x 1 GBit/s Ethernet (switch)
- PoE (Power-over-Ethernet (PSE)) acc. to IEEE 802.3af
- IOU05 w/o PoE

IOU07 – Binary I/O

- 16x Binary Inputs / Outputs (24V)
- Galvanically isolated groups (4x4)
- Usable as direct I/O or data logger function with timestamped streams



THE COMPANY

We increase the competitiveness of transport operators through computer-aided solutions using latest technologies such as machine learning and IT security for condition-based and predictive maintenance.

Ci4Rail offers computer and service solutions that support mobility operators, vehicle manufacturers and manufacturers of subsystems in their digital transformation.



Our Mission:

Driving the digitalization of rail and public transport with game changing technologies

Our Vision:

A world in which everyone likes to use public transport because it is faster, cheaper and more environmentally friendly than other forms of transport.

Our focus is both on new equipment and retrofit for:

- Long distance passenger transport
- Freight rail transport
- Rail-bound local public transport
- Road-bound local public transport

