

Computing Intelligence for Rail & Public Transport

ModuSio

Our IP-based <u>Modu</u>lar <u>Smart Input/O</u>utput modules for rail and public transport smartly fill the gap between any data source and the control computer. IP-based connections (LAN, Wi-Fi) grant independence and abstraction – EN50155 compliant.



ModuSio – THE CONCEPT

The <u>Modu</u>lar <u>Smart Input</u> / <u>O</u>utput modules help to expand existing systems with missing interfaces and sensors, simply by adding them to IP-based networks. The growing ModuSio portfolio includes interface extensions, non-retroactive listen-only modules as well as sensors and actors.

Beside the functional aspects, all ModuSio components offer:

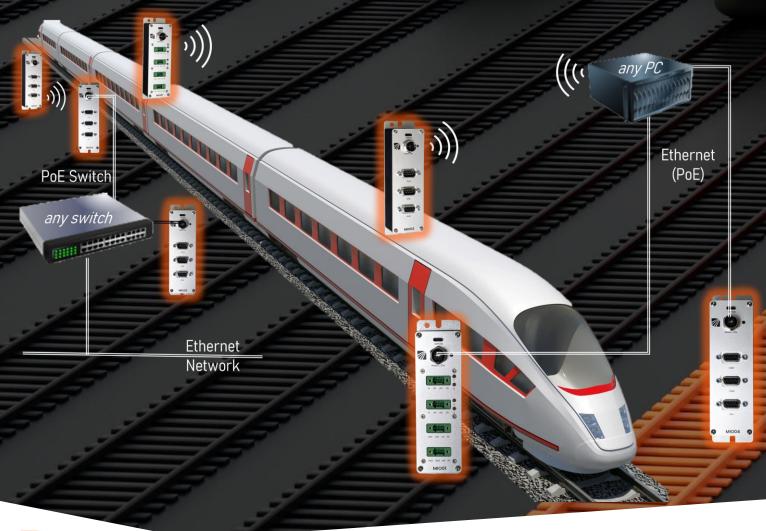
- Integrated intelligence for data acquisition and conversion
- IP-based host connectivity; Ethernet & Wi-Fi
- Power supply via PoE or local 24V VDC
- Simple provisioning via USB console
- Support of zeroconf protocols to allow automatic IP assignment and detection of the devices in the network
- IT secure firmware update, hardware/firmware identification and device restart via network

ModuSio modules easily complete any Embedded Computer with any Operation System.

ModuSio products easily integrate into applications by standardized, platform and programminglanguage agnostic protocols (protobuf and TCP), supported by open-source client libraries offering APIs for popular programming languages.

API functions include:

- Interface configuration, such as setting the CAN baud rate
- Immediate interaction with the interface (e.g., get/set current values of a binary I/O)
- Define and receive one or multiple streams of timestamped samples





THE PORTFOLIO

MIO03

MVB, CAN, RS485 Sniffer, non-retroactive

- 1 x MVB listen only via 2x 9-pin D-Sub (male/female)
- 1 x CAN listen only via 1x 9-pin D-Sub (male)
- 1 x RS485 listen only (shared with CAN interface connector)
- Non-reactive datalogger function: multiple time stamped data streams

MIO06

IBIS Master, CAN, RS485, 2x Binary Out (24V

- 1 x IBIS Master via 1 x 9-pin D-Sub, 24V, 100mA
- 1 x CAN via 1 x 9-pin D-Sub*
- 1 x RS422/485 via 1 x 9-pin D-Sub*
- 2 x 24 V Binary Output

*shared D-Sub for CAN and RS4xx

MIO09

8x Analog Inputs

- 4 x 2 analog inputs input via 4x 6-pin terminal connector; voltage (+/-10 V) or current (4..20 mA)
- Provides 4 x 24 V / 40 mA for supplying 8 intelligent sensors
- Configurable modes for usage as real time input or data logger
- Sampling rates of up to 64 kHz and resolutions of up to 19 bit

MIO12

8x Relay Output

- 8 relay outputs with changeover contacts via 4 x 6-pin terminal connector
- Switching voltage 220 V DC, 125 V AC also for 110V railways
- Max. switching capacity (ohmic) 30 W (DC), 62.5 VA (AC)

MIO01 4x Binary I/O (110V), 2x Analog Input

- 2 x 2 digital inputs / outputs via 2x 4-pin terminal connector; 24..110 V (nom), common ground or common supply
- 2 x 1 analog input via 2x 4-pin terminal connector; voltage (+/-10 V) or current (4..20 mA) type
 - 24V supply to external sensor
- Usable as real time 1/0 or datalogger

MI004

2x RS232/RS485, CAN

- 2 x Serial Interface RS232/422/485; up to 230 kB Linux tty device support via RFC2217 protocol
- 1 x CAN Interface, up to 1 MBit/s; useable as direct I/O or datalogger function with multiple time stamped data streams
- SW configurable listen only mode (CAN)

MIO07

16x Binary I/O (24V)

- 4 x 4 digital inputs / outputs via 4x 6-pin terminal connector; 24 VDC (nom)
- Integrated diagnosis: Output watchdog, protection for overcurrent & reverse polarity, short circuit proof
- Real time date or datalogger function
- IEC 61131-2 compliant

MIO11 4x PT100/PT1000 Temperature Inputs

- 4 PT100 / PT1000 2-wire, 3-wire or 4- wire inputs via 4x 6-pin terminal connector
 - Integrated SINC3 + SINC1 digital filters ensure excellent noise suppression.
 - Configurable modes for usage as real time input or data logger
 - -100...650 °C measurement range with 0.1 °C resolution and +/- 2 °C precision



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



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