# ModuSio MIO04

## IP based remote serial interface unit for edge applications in rail system

## Features

- Modular Smart Input/Output (ModuSio) Module
- Ethernet & WLAN communication
- Power supply via PoE or 12/24V (DC)
- 2x Serial Interface RS232/422/485; up to 256 kBaud; Linux TTY device support
- 1x CAN Interface, up to 1 MBit/s
- SW configurable listen only mode (CAN) grants non-reactivity
- Configurable mode for usage as direct I/O or data logger with multiple data streams
- EN 50155 compliant


## Introduction

The serial interface unit ***MIO04*** extends the functionality of any embedded computer through simplest IP based remote I/O functionality. As a decentral I/O extension MIO04 provides cost sensitive serial and CAN interfaces even when the embedded computer is installed hundreds of meters away. This lowers not only cabling effort and cost but also eases up software integration dramatically.

MIO04 enables your Embedded System to connect to even more vehicle interfaces and is intended to be used in applications with the need to connect to sub-systems with CAN or serial interface.

In any case, only one cable is necessary for powering and communication. Used as an Ethernet module, MIO04 is powered simple through Power-over-Ethernet. When used as a WLAN connected device, the module is powered through the same M12 connector with 12/24V DC.

For easiest SW integration, MIO04 supports zeroconf protocols to allow automatic IP assignment and detection of the devices in the network. Additionally MIO04 provides secure firmware update through WLAN or Ethernet.

## Applications

- Condition-based / predictive maintenance
- Board Computer
- Data logger
- Fleet optimization
- Process & Control

## Software

ModuSio products are easily integrated into applications through standardized, platform and programming language independent protocols (Protobuf and TCP).

They are supported by open source client libraries that provide APIs for common programming languages.

API functions include:

- Interface configuration, e.g. setting baud rates
- Direct interaction with the interface, e.g., sending/receiving data over the CAN IF
- Defining and receiving one or more streams of time-stamped samples

## Specifications

| Input/Output | S103-MIO04- |
|---|---|
| Serial Interfaces | 2x RS232/422/485* via DSUB-9p socket (Linux TTY device) |
| Serial IF Baudrate | Standard baudrates up to 256 kBaud |
| CAN Interface | 1x CAN via DSUB-9p socket |
| CAN IF Baudrate | Up to 1 MBit/s |
| CAN operational mode | listen only / direct I/O / data logger |
| Galvanic isolation | 750V (DC) / 4 Groups (Serial IF 1 / Serial IF2 / CAN / Shield) |
| **Host Interface** | |
| Ethernet | 10/100 Mbit/s Ethernet via 8-pin M12 x-coded |
| WLAN | WLAN IEEE 802.11b/g/n |
| Power Supply | Power-over-Ethernet (PoE— PD) class 1 |
| Service Interface | USB 2.0 via USB-C |
| **Mechanics** | |
| Dimensions | Height: 151 mm; Width: 42 mm; Depth: 51 mm |
| **Environmental** | |
| Operating Temperature | -40...+70°C / 85°C (10min) (EN 50155:2017 - OT4 + ST1) |
| Storage Temperature | -40...+85°C (EN 50155:2017) |
| Humidity | 95% (EN 50125-1:2014) |
| Altitude | 3000 m max. above sea level (EN 50125-1:2014, class AX) |
| Shock / Vibration | EN 61373:2010; Cat. 1; Class B |
| EMC Emission / Immunity | EN 50121-3-2:2016; EMV 06 (2.0) Class S1;<br>EN 301 489-1 (V2.2.3) |
| Safety | EN 50155:2017; EN 50153:2014+A1:2017; EN 50124-1:2017; EN 62368-1:2016; EN ISO 13732-1:2008 |
| Fire&Smoke | EN 45545-2:2013 + A1:2015; HL3 |
| Useful Life | 20 years (EN 50155:2017, class L4) |
| Pollution Degree | PD2 (EN 50124-1:2017) |
| Certifications | CE |

* For proper use of RS485 half duplex mode external connection of RX+/- and TX+/- lines is required. For more details, see user documentation.

## Order Information

| Article number | Short | Configuration* | Power Input | Serial IF | CAN | Host IF | Service IF | FW update |
|---|---|---|---|---|---|---|---|---|
| S103-MI004- | ModuSio Serial IF | as Ethernet | PoE (PD) class 1 | 2x RS232/422/485 via 2x 9-pin DSub | 1x CAN via 9-pin DSub | 10/100 Mbit/s Ethernet | USB 2.0 | Via USB / Ethernet |
| | | as WLAN | 12/24V DC | | | WLAN IEEE 802.11b/g/n | | Via USB / WLAN |

*Configuration by means of software during provisioning process

Please contact us for your specific requirements.

## Accessories

N/A

## Application Context — *ModuSio*

IP-based Modular Smart Input/Output modules for rail and public transport intelligently close the gap between any data source and the control computer. IP-based connections (LAN, WLAN) guarantee independence, abstraction and easy integration.