

KT8

Modular Train Control System Extension, 8 Cards menTCS Safe Remote I/O Box SIL 2 to SIL 4

- » SIL 4 modular Train Control System menTCS
- » Certified safe I/O boards
- » QNX safe operating system available
- » Certification packages available
- » Distributed safe I/O and controller boxes connected via real-time Ethernet
- » Compact 40 HP housing for remote locations
- » Full EN 50155 compliance
- » Rack-mounted or wall-mounted



KT8 is a safe, remote I/O box inside the modular Train Control System menTCS. It is a modular system platform usable for safety-critical train applications like train control, automatic train operation (ATO) and automatic train protection (ATP) up to SIL 4.

Modular, Built-to-Order I/O Configuration

Based on modular 19" technology, KT8 provides eight slots for safe I/O cards, which can be configured as built-to-order (BTO) options. menTCS I/O cards support the common I/O requirements requested in trains. The KT series of systems is available with scalable sizes of eight slots, six slots and four slots.

Part of the menTCS Train Control System

menTCS is a modular SIL 4 certifiable family of CompactPCI-based standard products usable for every kind of safety-critical railway application - from a single function to the main control system of the train. It can be configured to control anything in the train that requires functional safety - under SIL 4, SIL 3 or SIL 2 requirements. menTCS communicates via standard real-time Ethernet and interfaces to any type of consist fieldbus network like MVB, CANopen, Profinet etc. This makes it easy to integrate into a TCN network as well as into regionally different Train Control Systems like ETCS, CTCS, ATCS or Klub-U. The high level of flexibility of menTCS results in significant cost and time savings during computerization of the train.

Compact and Cost-Saving Remote I/O

Being modular and SIL 4 certifiable, the KT series reduces the certification risk and efforts. This makes both your system costs and project schedule predictable. All KT systems have a dedicated real-time Ethernet component, the I/O head, for interconnection of the boxes and power supply. This in turn reduces cabling. I/O functions can still be located close to the remote actors and sensors, with fast data transmission within the menTCS.

The compact format with a maximum width of 9.5 inches (half 19") and a reduced depth compared to standard 3U systems allows installation even where space is very restricted, simplifying retrofitting of older trains.

Certification and Standards Compliance Included

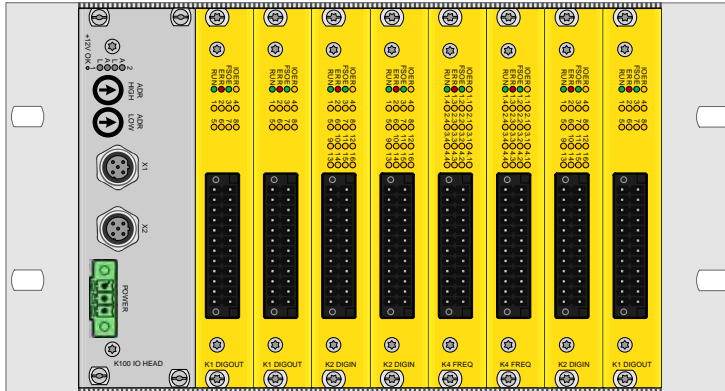
Safety-related menTCS components come with certification packages and complete support for the safe operating system QNX, including safe protocols, I/O transfer layer etc.

All menTCS components that are safety-relevant are developed according to EN 50128 and EN 50129 standards and comply with all environmental requirements of EN 50155 for rolling stock: temperature class TX, shock, vibration, humidity, dust, isolation, PSU hold-up times, EMC regulations etc.

Mounting and Cooling Options

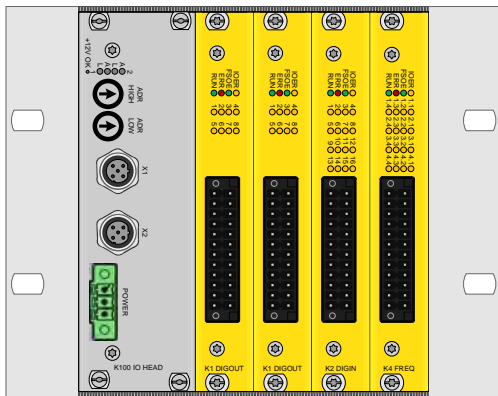
The system can be wall or rack-mounted, also on a DIN rail, and is cooled by natural convection. Cooling is independent of the mounting position.

menTCS Remote I/O Boxes KT8 and KT4



KT8, Configuration Example

- 8 digital outputs, SIL 4 (each using 2 pins)
- 16 digital inputs, SIL 4 (each using 2 pins)
- 4 frequency input channels, SIL 4 (using 2 separate frequency counters)
- 16 digital inputs, SIL 2
- 8 digital outputs, SIL 2



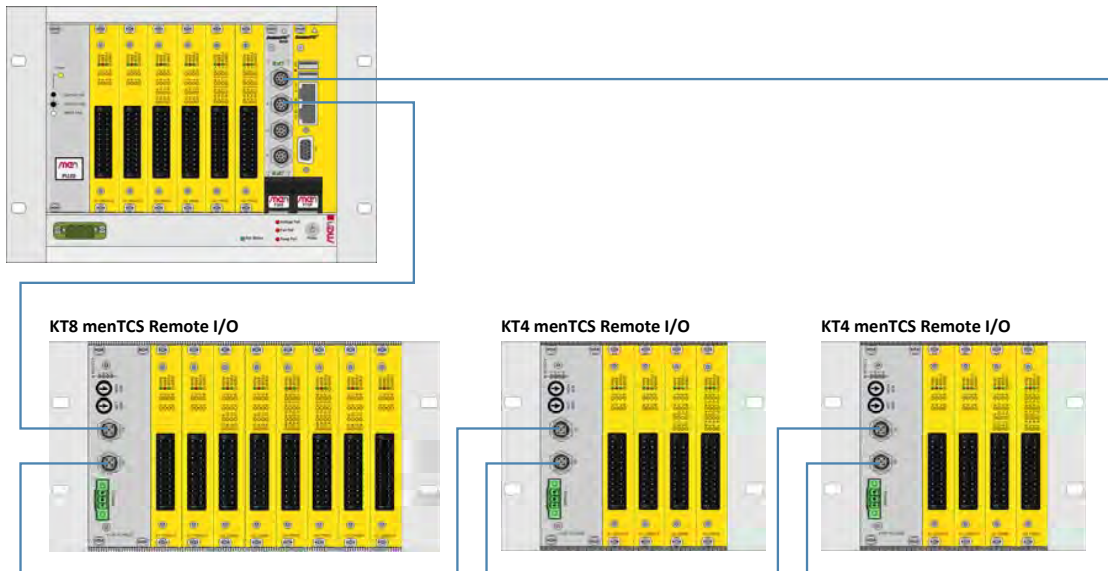
KT4, Configuration Example

- 8 digital outputs, SIL 4 (each using 2 pins)
- 16 digital inputs, SIL 2
- 4 frequency input channels, SIL 2

Note:
A KT6 system with six configurable I/O board slots is available on request.

menTCS System Controller in Combination with Remote I/O Boxes

MH50C menTCS Controller



General System Characteristics

- Modular design, built-to-order configuration
- Slot and backplane set-up of the system
 - 1 I/O head slot
 - 8 menTCS I/O board slots
- Please contact MEN sales for component combination possibilities.

I/O Head for Power Supply and Real-Time Ethernet

- menTCS I/O Head
- Configurable: no
- K100 menTCS I/O head unit; PSU: 40 W, 3U 8 HP PSU, wide range input 24 to 110 V DC, output 12 V DC; front: 2 Fast real-time Ethernet (M12), power inlet connector, hex switches, status LEDs; rear: real-time Ethernet (EBUS); -40..+85°C qualified, conformal coating

Safe Digital I/O

- menTCS I/O Board
- Configurable: yes
- Possible in slots: 1, 2, 3, 4, 5, 6, 7, 8
- Possible Configurations
 - 8 digital outputs, high-side switching, SIL 2 (SIL 4), -40..+85°C qualified, conformal coating
 - 16 digital inputs, SIL 2 (SIL 4), -40..+85°C qualified, conformal coating
 - 4 frequency inputs, SIL 2 (SIL 4), -40..+85°C qualified, conformal coating

Supervision and Control

- Output voltage supervision and thermal supervision

Electrical Specifications

- Supply voltage
 - 24 V, 36 V, 48 V, 72 V, 96 V, 110 V DC nominal; 14.4 to 154 V max. (EN 50155)
 - Power interruption class S2 (10 ms) (EN 50155)
- Power consumption
 - 58 W max.

Mechanical Specifications

- Dimensions
 - 210 x 135 x 130 mm max. without brackets
 - 3U, 40 HP
- Mounting Possibilities
 - Wall-mount, or
 - Rack-mount in 19" cabinet, or
 - DIN-rail mounting
 - Two systems side-by-side to build a single 19" chassis

Environmental Specifications

- Classification for railway applications
 - EN 50155: Rolling stock, vehicle body
- Temperature range (operation):
 - -40..+85°C (qualified components) (EN 50155, class TX; EN 50125-3, low temp. class T2, high temp. class TX)
- Cooling concept
 - Air-cooled, natural convection
- Temperature range (storage): -40..+85°C
- Humidity
 - EN 50155: Rolling stock, vehicle body
- Vibration/Shock
 - EN 50155: Rolling stock, vehicle body class B
- Altitude: -300 m to +3000 m
- Conformal coating of board components
- International Protection Rating (IEC 60529): IP20

Safety

- Functional Safety
 - Certifiable to SIL 1, SIL 2, SIL 3 or SIL 4 according to EN 50129, depending on I/O board configuration
 - Electrical Safety
 - EN 60950-1: Class I equipment
 - Flammability
 - UL 94V-0
 - Fire Protection
 - EN 45545, hazard level tbd.
-

EMC

- EN 50155: Rolling stock, vehicle body
-

Software Support

- PACY (Process Data Framework for Cyclic Applications)
- QNX
- **For more information on supported operating system versions and drivers see Software.**

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Up-to-date information, documentation and ordering information:

www.men.de/products/kt8/

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