

Modular I/O system

Rugged Modular I/O System Solutions
EN-50155 certified for railway applications

Made in Italy



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The systems and devices of the **MODULAR I/O** family are the Tecnint HTE solutions for industrial and technological application of automation, acquisition and management that require particularly robustness and high reliability.

The modules architecture, very flexible, allows you to generate configurations of CPUs, RTUs and I/Os, to meet different application requirements, allowing the realization of local and distributed controls.

The used CPUs, microcontrollers Freescale PowerPC MPC5200 with realtime/multitasking kernel, provide high and professional-type performances: the software can be fully customized by the system integrator; it can be also adaptable and inserted into pre-existing hardware contexts, allowing great flexibility and easy upgrades.

Modules can be programmed in C language or with the most widely used PLC-like programming languages, according to IEC-61131-3.

A variety of digital, analog, encoder/counter/stepper/PWM I/o boards are available then any system architecture can be easily realized.

All the cards are provided with a plastic case, completely electrically isolated, conforming to CEI 11170-3; connectors have been designed for simple and fast wiring, with crimp contacts.

Mechanical kit anti-shock and vibration is also available for installations on board the train.

Certifications

EN-50155
EN 50121-3-2
EN 50121-4
IS 402 § 5.6
IS 402 Tab. C1, C2, C3, C4, C7, C9
IS 402 § 3.7.6
CEI 11170-3
EN 45545-5 (in progress)
Rina Rules

Software


IEC 61131-3

- **Customization and branding**
- **I/O expansion on fieldbus Modbus Ethernet, Modbus serial, CanOpen, by means of fieldbus couplers**
- **Wide range of Digital, Analog, Encoder, Counter, Stepper, PWM I/O modules**
- **Fast installation on DIN rail**
- **Easy upgrading of existing hardware systems**
- **Anti-shock and vibration mechanical kit**
- **Connectors with crimp contacts**
- **Customizable software, also for pre-existing plants**
- **On board train applications, signalling, security**
- **Technological plants supervision; rail stations**

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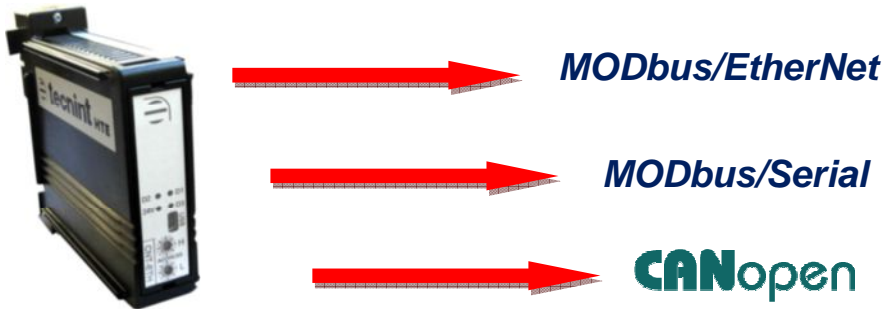
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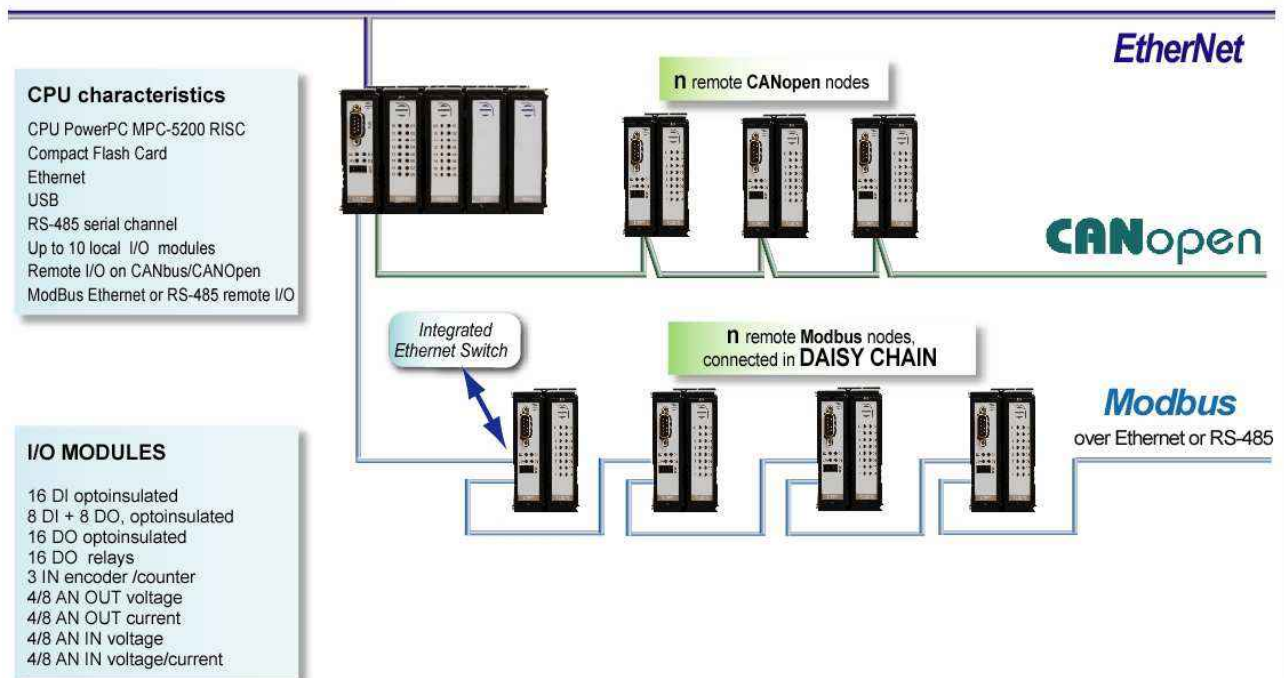


Fieldbus coupler for I/O expansion



- Fieldbus coupler for I/O expansion
- CANopen, MODbus-Serial, MODbus-Ethernet
- Processor ARM7
- FW programming/upgrading via serial channel or USB
- Retentive memory on board
- Integrated real time clock
- 24 Vdc power supply
- Ethernet with double Ethernet 10/100 BaseTX for local switch (DAISY CHAIN)
- Simple cabling on DIN rail

Architecture examples



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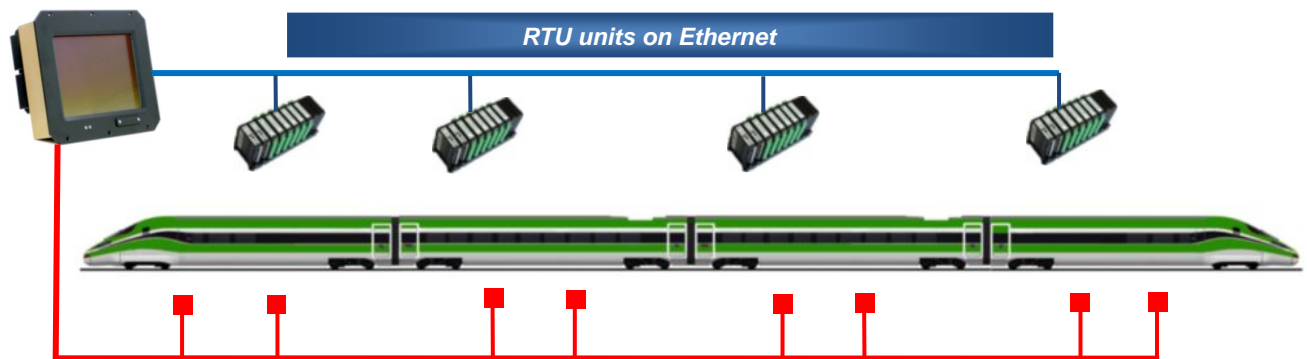


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On board train applications

HMI RUGGED
EN-50155 compliant



MVBbus: brakes, radio, power line, engine control, power electronics, doors, cockpit, diagnostics, etc.



CPU Module

- Power PC MPC-5200 RISC
- Compact flash card, removable
- Ethernet 10/100BaseT integrated, USB, Serial channels
- Up to 10 local I/O modules installation
- Remote I/O by fieldbus coupler on CanOpen or Modbus Ethernet or serial



Rugged Panel PC : HMI, supervision and control

- Carrier for CPU, ETX standard form factor
- MVB Interface, optional on ISA or PCI bus
- Reset circuit on board
- Fast Ethernet 10/100Mbit
- Serial channels: RS-232/485 (38400 baud Max)
- Vandal resistant and anti-crash safety glass, with double anti-reflection treatment
- USB outputs
- Mouse PS/2 input (option)
- Standard keyboard PS/2 input (option)
- Compact Flash card Slot
- Buzzer output
- LCD TFT 10,4" LED backlit
- Touch screen SAW
- Internal temperature sensor

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Technical data CPU/RTU

Processor -Microcontroller	<ul style="list-style-type: none">• Power PC Freescale MPC5200 Motorola - 400 MHz
CANbus Interface (only for MD-LC/CO version)	<ul style="list-style-type: none">• 2 communication lines• Controller internal to the MPC5200• Baud rate max 1Mbit/s.• Optoinsulated bus (500Vdc)
Power supply	<ul style="list-style-type: none">• 24Vdc (-15%/+20%) 3A
Interfaccia USB	<ul style="list-style-type: none">• USB 1.1, max 12Mbit/S
Interfaccia Ethernet	<ul style="list-style-type: none">• 10/100BASE-TX, Full duplex
FLASH Memory	<ul style="list-style-type: none">• 2 MB, 8 bit, (option up to 8 MB)
RAM Memory	<ul style="list-style-type: none">• 64 MB SDRAM, 32 bit (option for 128 MB)
Non volatile Memory	<ul style="list-style-type: none">• 128 kB FRAM, 8 bit
EEPROM Memory	<ul style="list-style-type: none">• 256 byte, external, like I2C serial
Compact Flash	<ul style="list-style-type: none">• IDE controller for compact flash card - compact flash socket
Serial channels	<ul style="list-style-type: none">• 2 x RS232 serial channels• 2 x RS485 serial channels
Watch-Dog	<ul style="list-style-type: none">• Internal to the MPC 5200
RTC	<ul style="list-style-type: none">• Backup through mega capacitor
Leds	<ul style="list-style-type: none">• 1 green led on the front panel. (24V power supply)• 3 red leds on the front panel. (controlled from micro I/O)
Connectors	<ul style="list-style-type: none">• Ethernet: RJ45 connector with LINK and RX/TX led• Serial Channels: 2 x RJ45 8-poles• 1 x USB connector on the front panel• 1 x Compact Flash connector• 1 x DIL16 connector for JTAG interface• DB9-poles connector, male, on the front panel (CANbus)
Working temperature	<ul style="list-style-type: none">• From 0°C to +55°C
Warehouse temperature	<ul style="list-style-type: none">• From -25°C to +85°C
Relative humidity	<ul style="list-style-type: none">• From 10% to 90% without condensation
Dimensions	<ul style="list-style-type: none">• 130 × 120 × 35, plastic material for DIN rail

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Available versions and order codes

CPU- Programmable Fieldbus Coupler

- MD-LC-RW** Programmable fieldbus coupler (Isagraf PLC / IEC-61131-3) with Modbus master interface (RS-485 serial port or Ethernet port)
CPU microcontroller Freescale MPC5200, 400MHz supported by 64Mbyte SDRAM, 4GB CF, 128KB retentive memory.
- 1 x USB Host
 - 1 x RS232 serial channels no optoinsulated
 - 2 x RS485 serial channels no optoinsulated
 - 1 x Ethernet
- MD-LC/CO-RW** Programmable fieldbus coupler (Isagraf PLC / IEC-61131-3) with 2 CANopen master interfaces; CPU microcontroller Freescale MPC5200, 400MHz supported by 64Mbyte SDRAM, 4GB CF, 128KB retentive memory.
- 1 x USB Host
 - 1 x RS232 serial channels no optoinsulated
 - 2 x RS485 serial channels no optoinsulated
 - 1 x Ethernet
- MD-LC-R-RW** As MD-LC, but with nr 2 Ethernet channels and a mechanism of a second CPU management for redundancy scope and a secondary power input from an independent powering source. Double power supply input 24V with status controlled.

Firmware

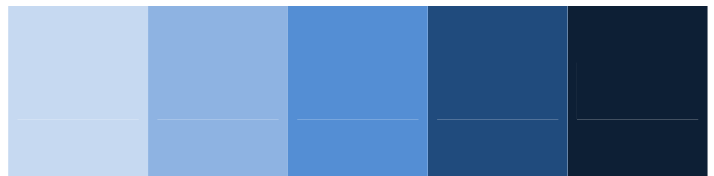
- MPC-FW-02** Firmware support (QNX V6.3x and V.6.4x + Ethernet) for MD-LC/CO, MD-LC and MD-LC-R modules
- MPC-FW-04** Firmware support (QNX V6.3x and V.6.4x + Ethernet + Isagraf) for MD-LC/CO, MD-LC and MD-LC-R modules
- MPC-FW-08** Firmware support (QNX V6.3x and V.6.4x + Ethernet + Isagraf + axes) for MD-LC/CO, MD-LC and MD-LC-R modules

Fieldbus Coupler

- MD-CNT-ETH-RW** Fieldbus coupler - Ethernet version Modbus on TCP-IP. Switch Ethernet for daisy-chain connection
- MD-CNT-MBS-RW** Fieldbus coupler - RS485 version Modbus slave. RS485 optoinsulated
- MD-CNT/CO-RW** Fieldbus coupler - CANopen slave version; CANopen optoinsulated

Fieldbus Adapter / Bridge

- MD-CNT-ET-MS-RW** Bridge Modbus Ethernet-serial channel; stand alone module



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Digital Inputs/Outputs

MD-DI16-RW	16 optoinsulated digital inputs
MD-DI08DOP08-RW	8 optoinsulated digital inputs + 8 optoinsulated transistor outputs, 24V, 0.5A, PNP
MD-DOP16-RW	16 optoinsulated transistor outputs, 24V, 0.5A, PNP
MD-DOR16-RW	16 relays outputs

Encoder/counter

MD-CII03/LD24-RW	3 incremental encoder 24Vdc version (only line driver) – no counter function
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Analog Inputs/Outputs

MD-AOV04-RW	4 analog voltage outputs, 12 bit
MD-AOV08-RW	8 analog voltage outputs, 12 bit
MD-AOI04-RW	4 analog current outputs, 12 bit
MD-AOI08-RW	8 analog current outputs, 12 bit
MD-AIV04-RW	4 differential analog inputs, 14 bit, voltage/current
MD-AIV08-RW	8 differential analog inputs, 14 bit, voltage/current
MD-AIT08-RW	8 analog inputs, 16 bit- each channel selectable as TC or TR <u>Thermocouple:</u> - R, S, B, J, T, E, K, N following the IEC 60584-1; U and L following DIN 43710; C, D, G, M, Platinel II, Ir-Ir40Rh, Pt20Rh-Pt40Rh and Kr-Au007Fe following ASTM E1751; Au-Pt and Pt-Pd following ASTM E1751 and IEC 62460 <u>Thermoresistor:</u> - Platinum with resistive values between 10 and 10000 ohm at 0 °C (from Pt10 to Pt10000) following standard IEC 751 (TCR 3850) and other international standard (US, CSA, JISC) with TCR variable between 3750 and 3926; - Nickel with resistive value between 10 and 10000 ohm a 0 °C (from Ni10 to Ni10000) following stand ard 43760 (TCR 6180) and other TCR values used in industrial field (5000, 6370, 6720) - Nickel-Iron (also known as Balco alloy) - Copper (Cu4210 and Cu4270)