

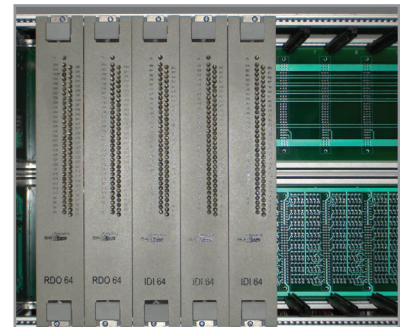
RAILWAY SAFETY HMI - MMI 10

MMI 10 is a safety HMI (Human Machine Interface) system for administrating, monitoring and controlling one or more railroad interlocking devices. It provides a graphics-based visualization that makes railroad standards compliant with user interface, safe and easy to use at the same time. It's highly customizable and available in different languages.



Data acquisition & distribution unit

MMI 10 includes data acquisition & distribution unit for handling both relay and electronic interlocking devices. This unit is based on Cortex M3 MCU and it's been made in a way that guarantees safety and reliability. It's simple and robust, virtually maintenance free. Up to 2560 digital I/O are provided for monitoring and controlling relay-based interlocking devices.



Data communication

The MMI 10 exchanges data with a data acquisition & distribution unit by a LAN or RS485 communication channel. A sophisticated communication protocol ensures high safety and integrity of both acquired and sent data.

Information reliability

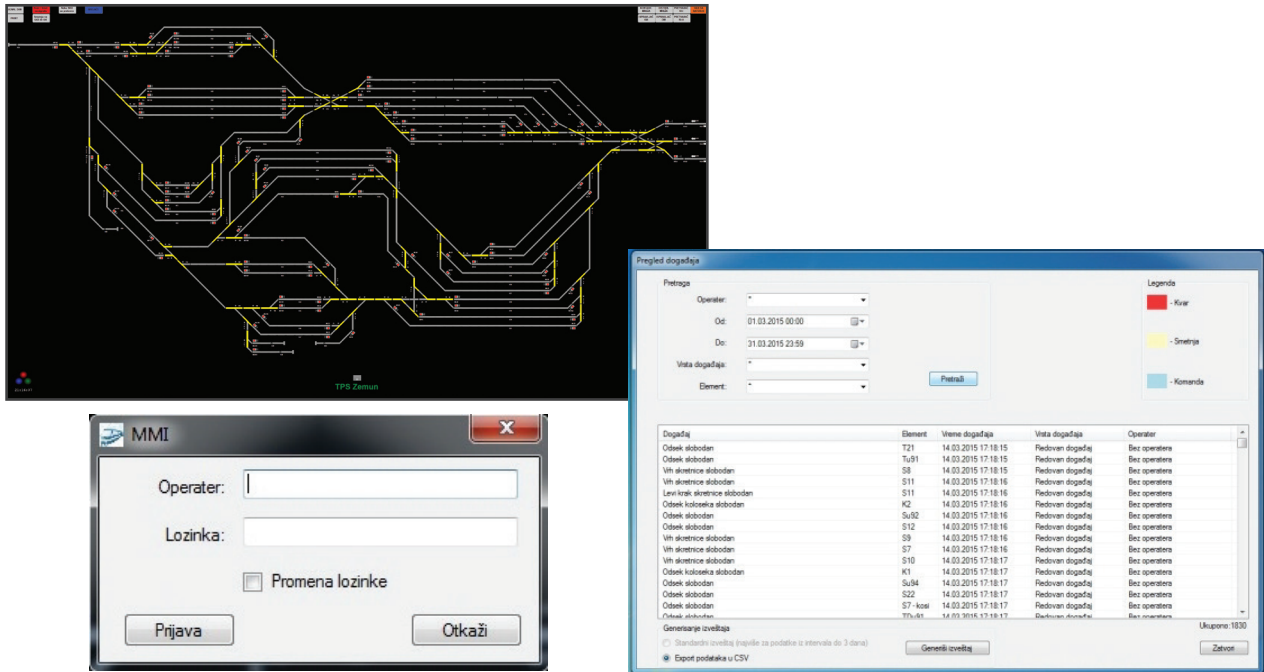
Several control mechanisms are applied to make sure that all displayed information is fresh and correctly represented. Possible faults, like monitor malfunctioning, dead or frozen pixels, etc., cannot jeopardize the system safety.

Operators

Only an authorized operator can handle the system, and only up to a certain level, according to his privileges. Each operator's action is being audited and logged permanently. A complete and powerful operator maintenance module is included in the system.

Data logging & reporting

Every event, command, fault or a failure is being shown as it occurs in a separate textual screen as well. An operator can browse through their history, as deep as needed, because all of them are permanently archived in the database. Based on the archived data and the applied user's criteria, number of data views and reports can be generated.



The image displays three screenshots from the MMI 10 system interface:

- Top Left:** A track diagram showing a complex network of railway lines with yellow and white tracks.
- Bottom Left:** A login window titled "MMI" with fields for "Operater:" and "Lozinka:", a checkbox for "Promena lozinke", and buttons for "Prijava" and "Otkaži".
- Right:** A data logging report window titled "Pregled događaja". It includes filters for "Operator:", "Od:" (01.03.2015 00:00), "Do:" (31.03.2015 23:59), "Vrsta događaja:", and "Element:". A legend indicates "Kvar" (red), "Smetnja" (yellow), and "Komanda" (blue). Below is a table of events:

Događaj	Element	Vreme događaja	Vrsta događaja	Operator
Odslek slobodan	T21	14.03.2015 17:18:15	Redovan događaj	Bez operatera
Odslek slobodan	Tu91	14.03.2015 17:18:15	Redovan događaj	Bez operatera
Vih slonetrice slobodan	S8	14.03.2015 17:18:15	Redovan događaj	Bez operatera
Vih slonetrice slobodan	S11	14.03.2015 17:18:16	Redovan događaj	Bez operatera
Levi krak slonetrice slobodan	S11	14.03.2015 17:18:16	Redovan događaj	Bez operatera
Odslek kolosevka slobodan	K2	14.03.2015 17:18:16	Redovan događaj	Bez operatera
Odslek slobodan	Su32	14.03.2015 17:18:16	Redovan događaj	Bez operatera
Odslek slobodan	S12	14.03.2015 17:18:16	Redovan događaj	Bez operatera
Vih slonetrice slobodan	S9	14.03.2015 17:18:16	Redovan događaj	Bez operatera
Vih slonetrice slobodan	S7	14.03.2015 17:18:16	Redovan događaj	Bez operatera
Vih slonetrice slobodan	S10	14.03.2015 17:18:17	Redovan događaj	Bez operatera
Odslek kolosevka slobodan	K1	14.03.2015 17:18:17	Redovan događaj	Bez operatera
Odslek slobodan	Su34	14.03.2015 17:18:17	Redovan događaj	Bez operatera
Odslek slobodan	S22	14.03.2015 17:18:17	Redovan događaj	Bez operatera
Odslek slobodan	S7-kosa	14.03.2015 17:18:17	Redovan događaj	Bez operatera
Odslek slobodan	T20-01	14.03.2015 17:18:17	Redovan događaj	Bez operatera

At the bottom of the report window, there are options for "Generisanje izveštaja" (Standardni izveštaj, Izveštaj sa podacima iz intervala do 3 dana, Export podataka u CSV) and a "Zatvoriti" button.

MMI 10 system provides :

- high comfort for the operators
- integration of relay and electronic signal-safety devices into modern Centralized Traffic Control systems
- effective diagnostic and reporting of all events, commands, failures and data archiving



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