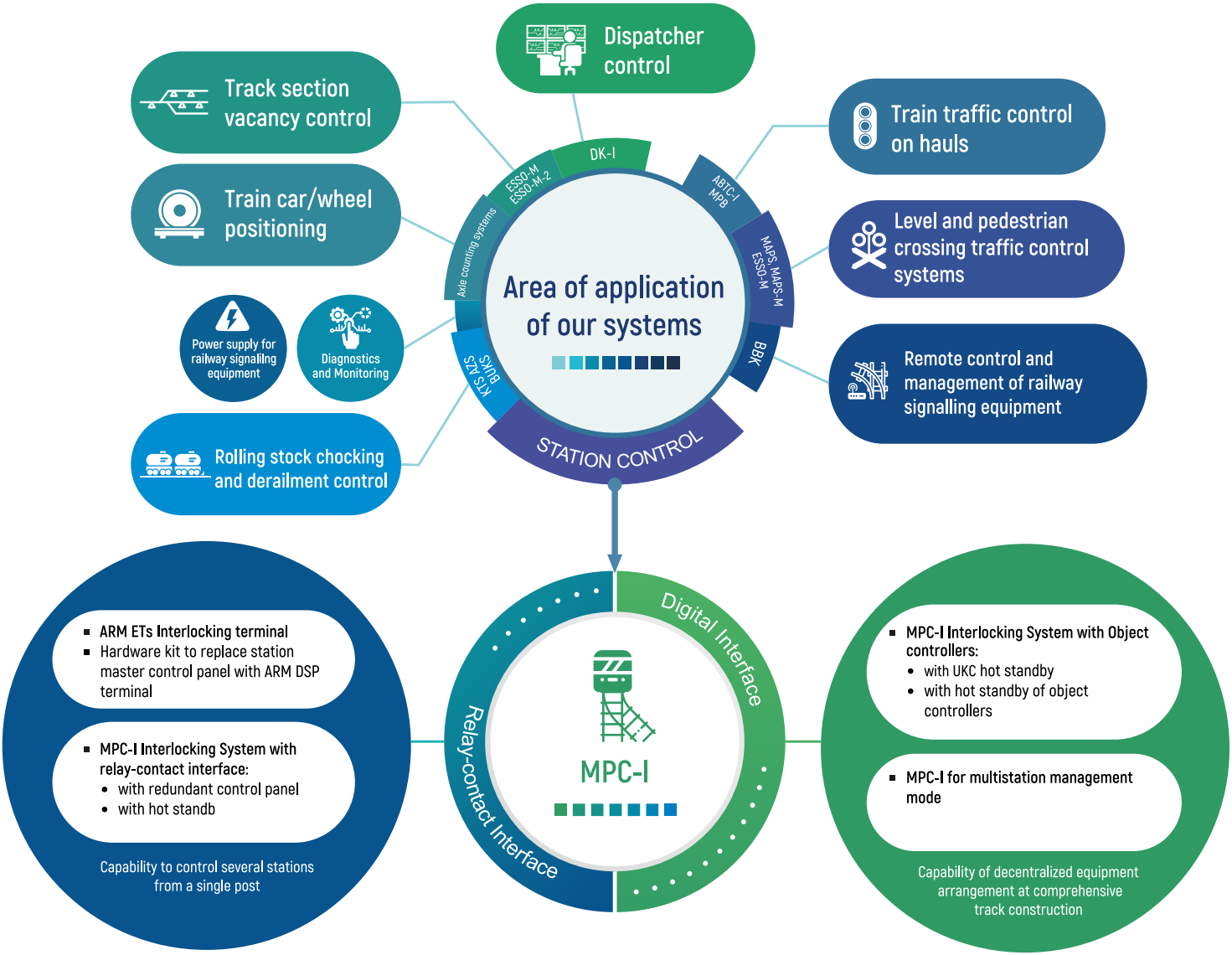
Research&Development Company
PROMELECTRONICA

Station
Control

MPC-I Electronic Interlocking System

npcprom.ru


Dispatcher control
Track section vacancy control
Train traffic control on hauls
Train car/wheel positioning
Level and pedestrian crossing traffic control systems
Power supply for railway signaliing equipment
Diagnostics and Monitoring
Remote control and management of railway signalling equipment
Rolling stock chocking and derailment control
DK-I
ESSO-M
ESSO-M-2
Axle counting systems
ABTC-I
MPB
MAPS, MAPS-M
ESSO-M
BBK
KTS AZS
BUKS
Area of application of our systems
STATION CONTROL
ARM ETs Interlocking terminal
Hardware kit to replace station master control panel with ARM DSP terminal
MPC-I Interlocking System with relay-contact interface:
with redundant control panel
with hot standb
Capability to control several stations from a single post
Relay-contact Interface
Digital Interface
MPC-I
MPC-I Interlocking System with Object controllers:
with UKC hot standby
with hot standby of object controllers
MPC-I for multistation management mode
Capability of decentralized equipment arrangement at comprehensive track construction

Centralized control of trackside equipment – points, light signals, level-crossings.

MPC-I is designed for railway facilities of any configuration (small, medium, and large stations, turnouts, passing stations, junctions) that ensure routing of train and shunting traffic by light signals, as well as auto block, semi-automatic block and CTC systems.

MPC-I can be housed both in stationary buildings and MKM Transportable Equipment Modules.

APPLICATIONS

- Reduction of running costs due to the system reliability and self-diagnostics
- Train traffic safety improvement
- Replacement of outdated relay interlocking systems
- Provision of better work environment and improvement of personnel productivity
- Event logging, database building of personnel actions and operation of system components
- Expansion of functional capabilities of interlocking system
- Saving usable floor space at interlocking posts
- Reduction of staff size

STATION OPERATES
24/7/365

IMPLEMENTED IN
7 COUNTRIES

160 STATIONS

≈3000 points
CONTROLLED BY MPC-I

MPC-I is approved for application on Russian Railways network

100% compliance to RAMS requirements

FSTEK Certificate for absence of undeclared capabilities and unauthorized access

RELIABILITY AND SAFETY

Award of the Russian Railways for the best quality of complex technical solutions

Highest safety integrity level **CENELEC SIL4**

Diagnostics and monitoring: KID-I and KID-N controllers provide accurate measurement of insulation resistance and voltage

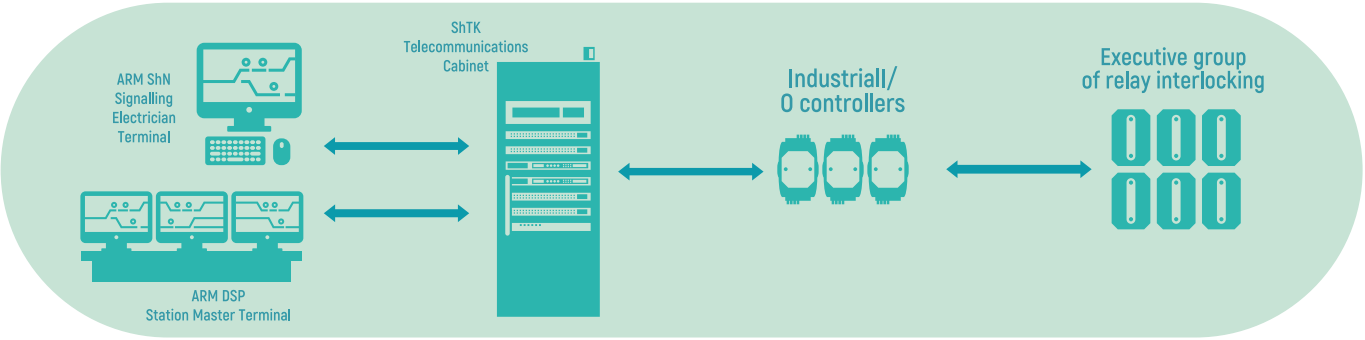
Validated cybersecurity

USER ADVANTAGES

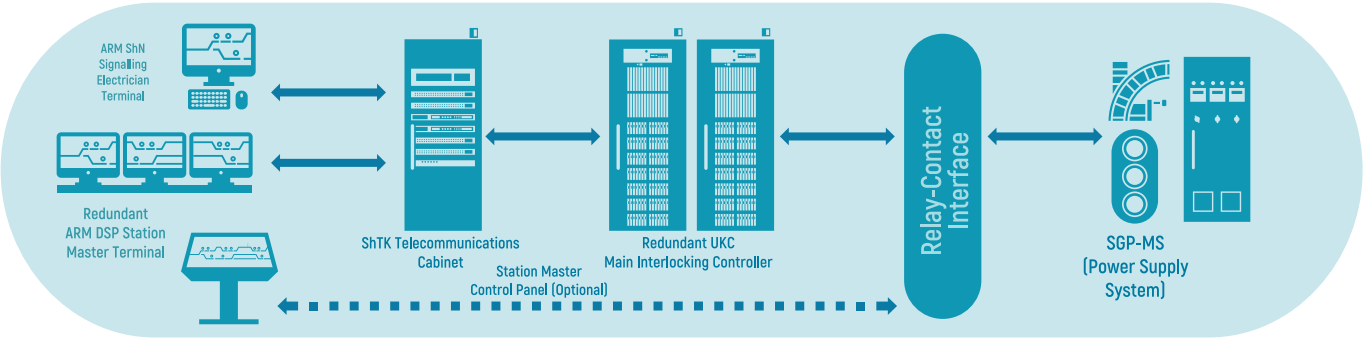
- System interface in 4 languages
- Operating documentation translated into local language
- Improved personnel performance
- Training – simulators for station masters, MPC-I lab set

SYSTEM VARIANTS

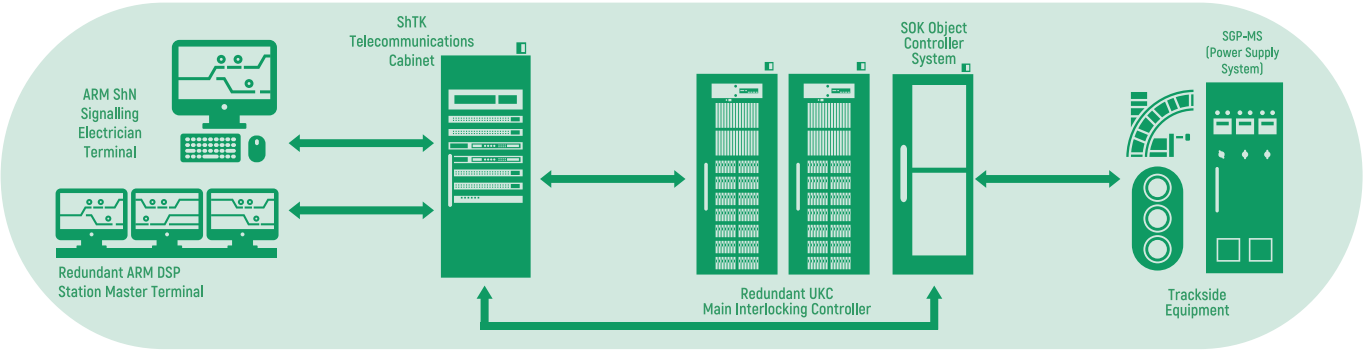
ARM ETs



MPC-I with relay-contact interface



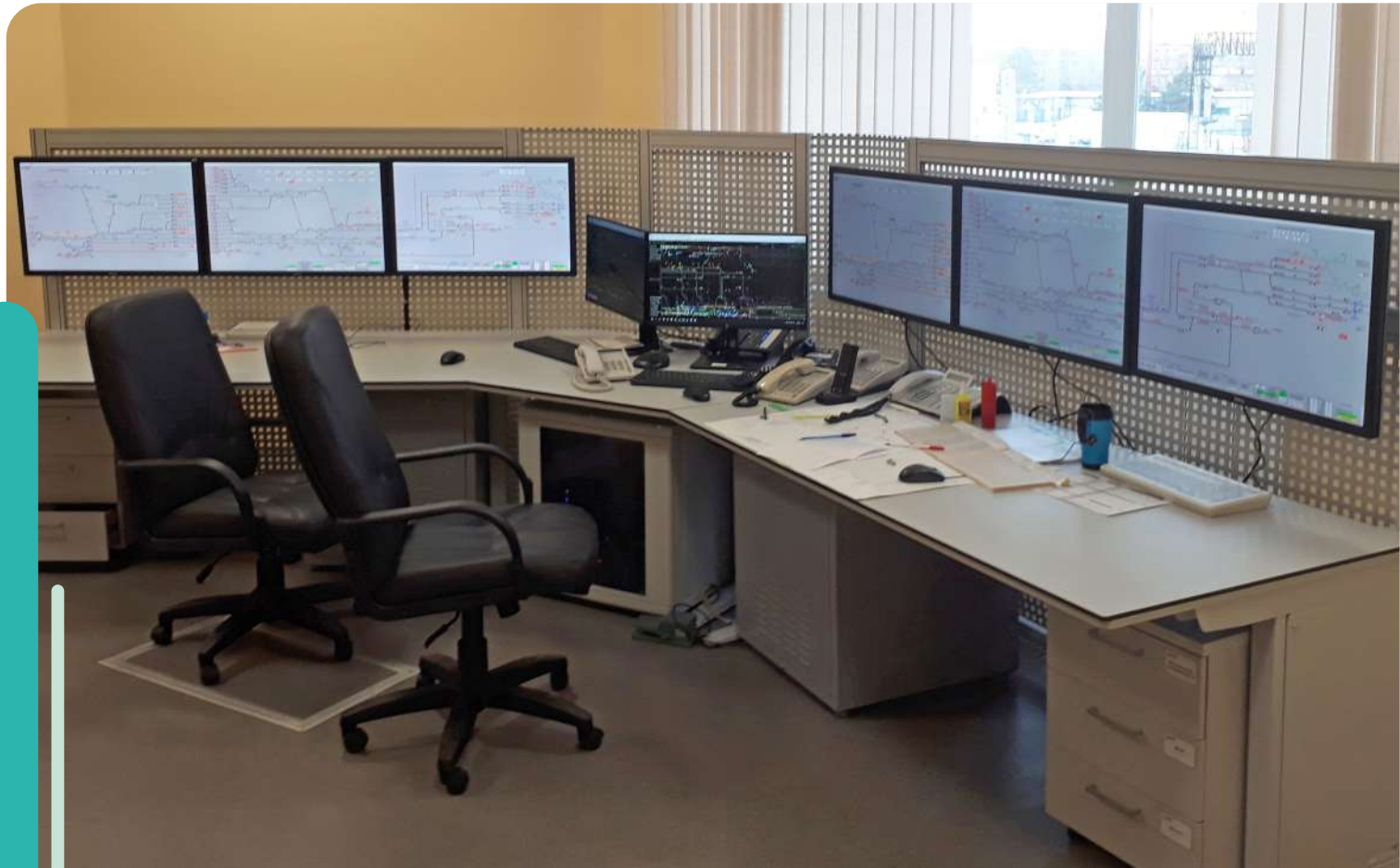
MPC-I with digital interface



ARM ETs

Technical solution designed for partial modernization of relay interlocking systems. New hardware and software allows replacing control panel with a modern Station Master Terminal at minimal expense. Modernized electrical interlocking is updated with new event logging features, as well as capability to view all actions of a station master and station status, as well as provides remote control capability.

- Can be used on stations of any size even if already installed relay electronic interlocking reached end of their life cycle.
- This solution is efficient for designing of new small stations with a small number of points.
- The solution allows reducing running costs for relay equipment.



MPC-I WITH RELAY-CONTACT INTERFACE

MPC-I with relay-contact interface uses 1st class railway relays to directly control trackside equipment.

MPC-I with relay-contact interface uses UKC Main Interlocking Controller in order to perform logical dependencies of interlocking.

One UKC Main Interlocking Controller cabinet is used to control all objects on a station with up to 35 points. Up to four UKCs can be cascaded if there are more than 35 points on a station. Each cascaded UKC provides efficient control of up to 45 points.

This solution is efficient for partial modernization of stations: for example, in a case when the cable network of trackside equipment shall not be replaced.

ARM ShN Electrician Terminal

ARM DSP Station Master Terminal

ShTK Telecommunication Cabinet

UKC Main Interlocking Controller

MPC-I WITH DIGITAL INTERFACE

MPC-I Interlocking system can be fitted with object controllers for direct control over trackside equipment.

MPC-I with digital interface uses UKC Main Interlocking Controller to perform logical dependencies of electronic interlocking. In case MPC-I is fitted with object controllers, one redundant UKC Cabinet is added to MPC-I.

Expansion of trackside equipment is achieved by adding more object controller cabinets.

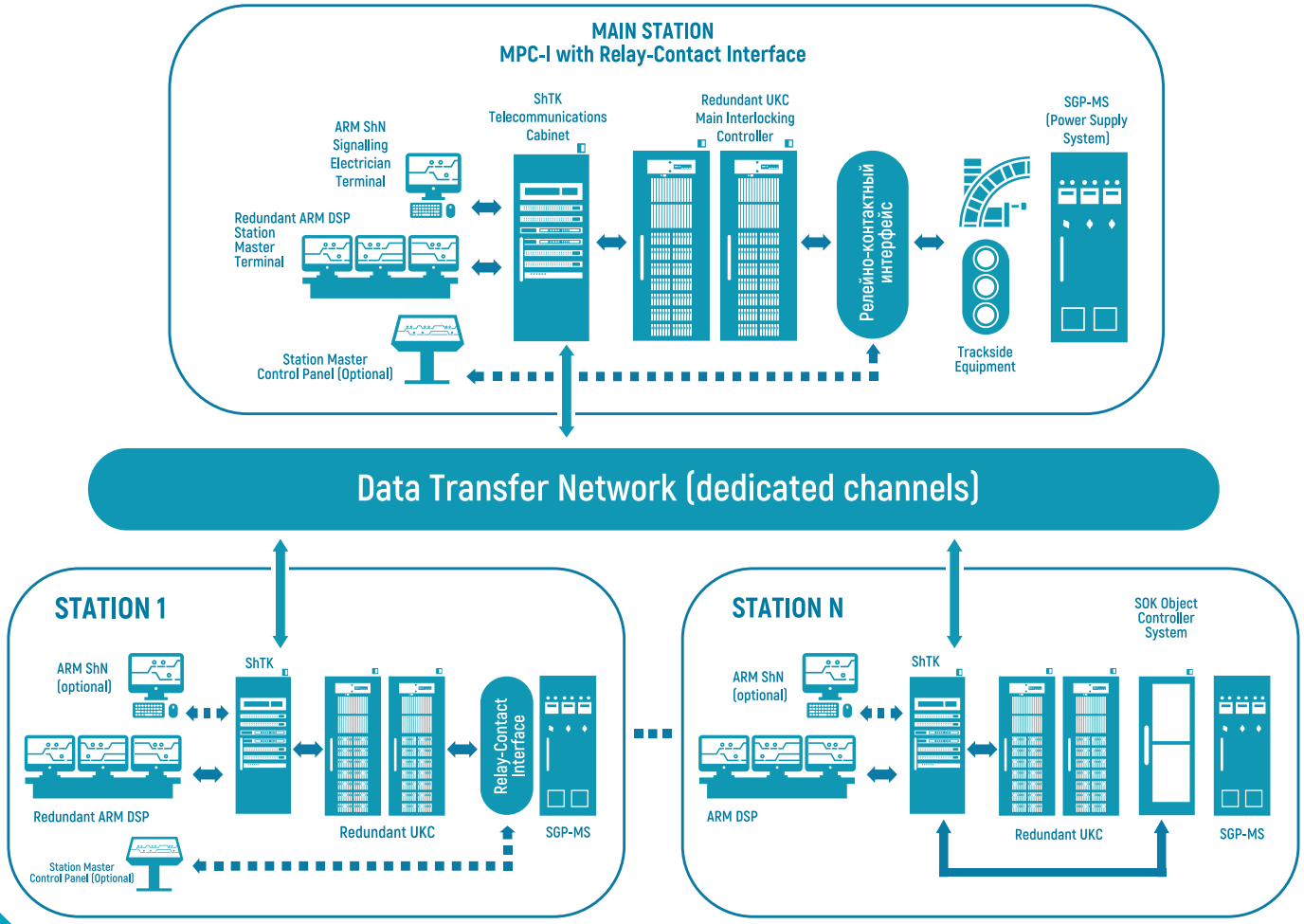
On average, one object controller cabinet controls and monitors 12 points.

- Can be used on stations with unlimited number of interlocked points.
- MPC-I with digital interface can significantly cut down the amount of relay equipment, use integrated train spacing systems (semi-automatic, automatic block systems without intermediary signals), provide detailed diagnostic information on trackside equipment, carry out simple station modernization in case track layout changes. Redundancy of object controllers increases reliability of MPC-I system.
- Setting up multistation mode (one main interlocking processor on one main station and object controllers on 19 remote stations) can only be based on MPC-I with digital interface.

REMOTE STATION CONTROL FROM SINGLE POST

The solution is used on low-traffic lines in order to reduce operating staff, as well as sections that can allow for seasonal work of Station Masters on separate stations.

Each station is fitted with full set of MPC-I equipment – both with relay-contact interface and digital interface.



MULTISTATION MODE

Distributed equipment allocation on major stations, control of adjacent stations without organizing central posts on them.

When used in multistation mode, MPC-I uses a single interlocking processor (redundant UKC with ShTK Telecommunications Cabinet) on a main (sectional, zonal or major intermediate) station and simultaneously interacts with object controllers on several adjacent passing lanes, turnouts and minor intermediary stations, on the basis of the full processor load.

Advantages of MPC-I multistation mode:

- application of a single interlocking processor unit for the whole line of N stations;
- division of redundant interlocking processor sets to various stations of the section;
- application of standard object controller equipment for remote control over N stations;
- autonomous and independent allocation of Station Master panel on each station – continuity of operation;
- allocation of Station Master panels only on main stations;
- integration of the whole line with CTC via a single linear point of a main station;
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Multistation mode can be implemented within comprehensive projects of any complexity to fit a railway line with new railway equipment.

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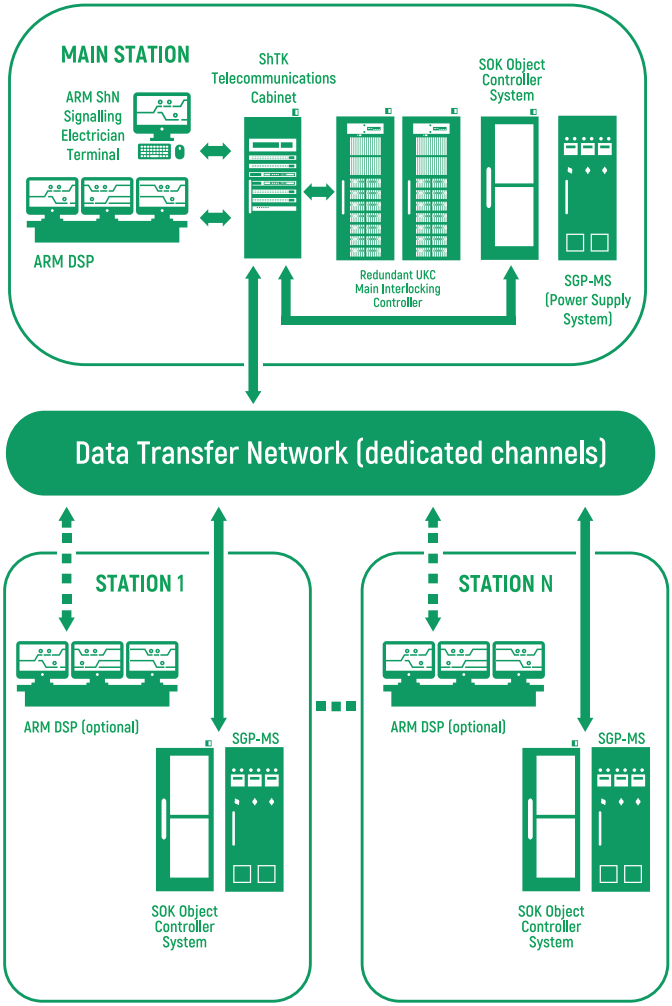


MPC-I COST-EFFICIENCY

INCREASED TRAIN SPEED AND IN-PLANT TRAFFIC VOLUME BY AT LEAST

10%

REDUCED CAPITAL CONSTRUCTION COSTS

YEARLY ECONOMIC BENEFIT FROM INVESTMENT COSTS

38%

PAYBACK PERIOD from

1,5 years

REPAIR COST REDUCED

BY **20%**

POWER COSTS REDUCED by at least

15%

POWER COSTS REDUCED by at least

10%

SGP-MS UNINTERRUPTABLE POWER SUPPLY SYSTEM

AREAS OF APPLICATION

- Replacement of outdated power supply systems.
- Provision of stable and uninterruptable power supply to signalling systems.
- Reduction of running costs due to application of low-maintenance and maintenance-free components.

AUTONOMOUS STATION OPERATION
FOR UP TO 8 HOURS*

*from uninterruptable power supply unit, in case diesel generator is used, duration is determined by its parameters

SYSTEM TYPE
ADAPTABLE TO
STATION PARAMETERS

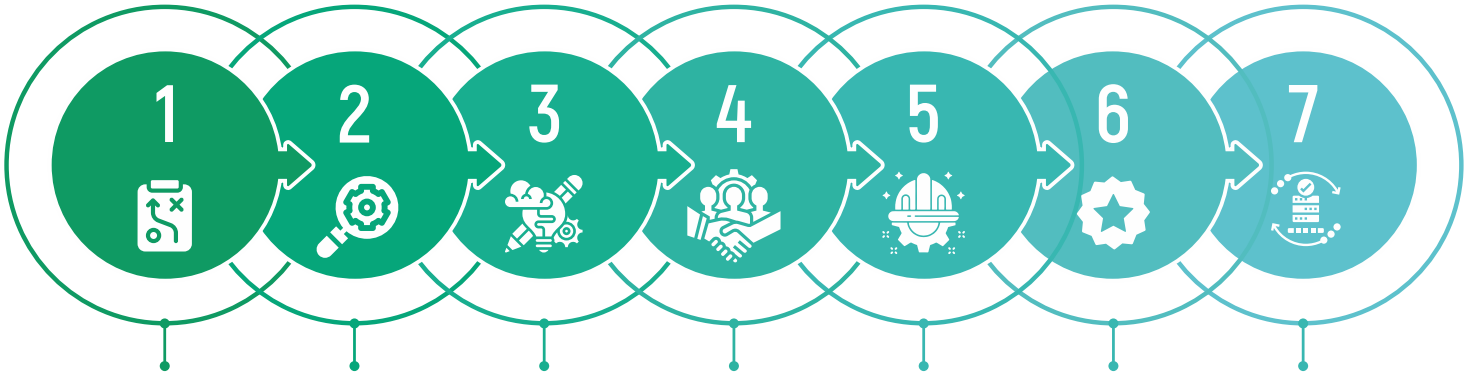
STANDARD DESIGN
SOLUTIONS

REDUCED
TIME FOR
TROUBLESHOOTING

PURPOSE AND ADVANTAGES

- Reception, metering, transforming, distribution of electricity
- Control of power supply quality
- Control and commutation of feeders, diesel generator control, diagnostics
- Protection against overvoltage, short circuits, environmental and surge overvoltages
- Absence of proprietary components
- Open structure – replacement/changing of parameters of separate components

MAIN STAGES OF RAILWAY INFRASTRUCTURE MODERNIZATION



1. We define the task
2. We carry out on-site survey or received initial information from you
3. We propose different solution and provide a quotation and if necessary, a feasibility report
4. We co-ordinate the solution with you and get more details
5. We organize:
   - Designing
   - Furnishing the facility
   - Constructind and assembly efforts
   - Test and commissioning
   - Efforts, personnel
   - Training
6. We provide warranty and post-warrianty maintenance
7. If necessary, we will upgrade your system in the future, add new features and capabilities

*Design, construction and delivery of equipment not manufactured by R&D Company Promelectronica can be carried out by the Customer

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