

# rehlko

## so'rail®

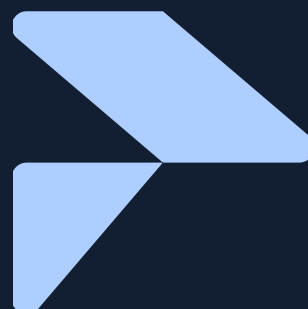
# Railway *solutions*

DC solutions & services

Power Control & Distribution



MADE IN FRANCE





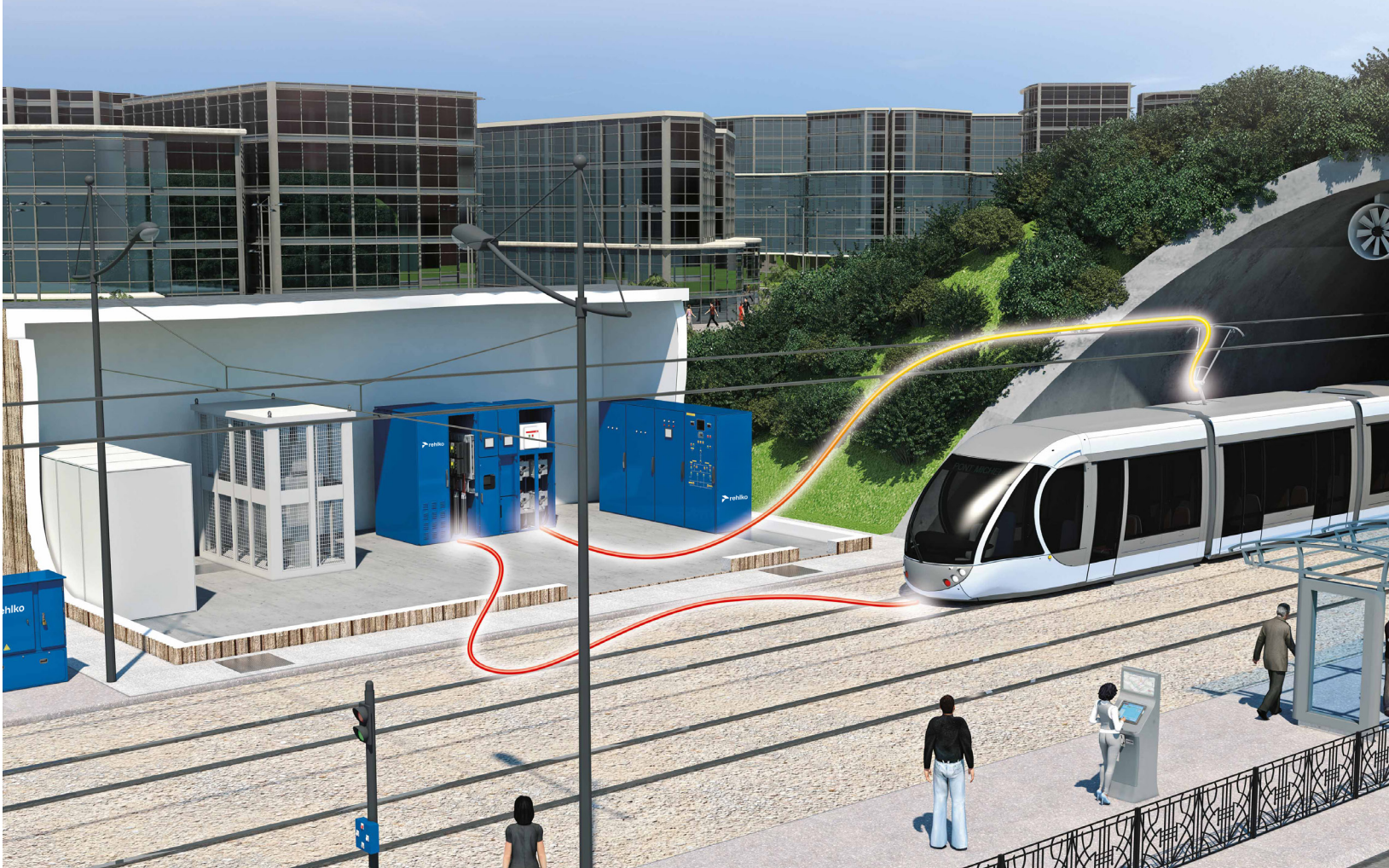
# so'rail® *Range of products*

## DC Railway Solutions

The so'rail range of products is dedicated to DC traction substations to supply your mass transit and light railway networks. We offer power conversion, protection, and distribution solutions.

Our products and solutions power trams, subways and trolleybuses located in France and across the globe.

The design of our products was thought very carefully to ease maintenance and reduce work on site.



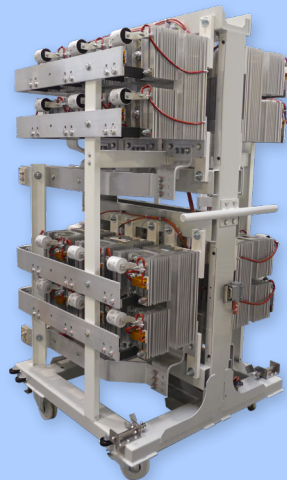
### High Speed Circuit Breaker

- ✓ SRI protection relay
- ✓ Up to 6000A
- ✓ Light or Heavy transit system
- ✓ ANSI 50 / 76 / 27 / 59 / 86
- ✓ Communication Modbus / 61850 / OPC UA



### Rectifier

- ✓ 750 / 1500 Vdc
- ✓ Up to 6 MW
- ✓ Fix or withdrawable
- ✓ 6, 12, 24 pulses
- ✓ Up to IP32



### Voltage Limiting Device

- ✓ Dangerous Voltage Protection
- ✓ Class 1 to 4
- ✓ Indoor or Outdoor
- ✓ EN 50526-2
- ✓ SRI protection relay



### Indoor DC Cabinet

- ✓ Up to 8000A
- ✓ Isolating / Earthing switch
- ✓ Switch, disconnectors, contactors
- ✓ Stray Current / Negative Cubicle
- ✓ Substation or workshop



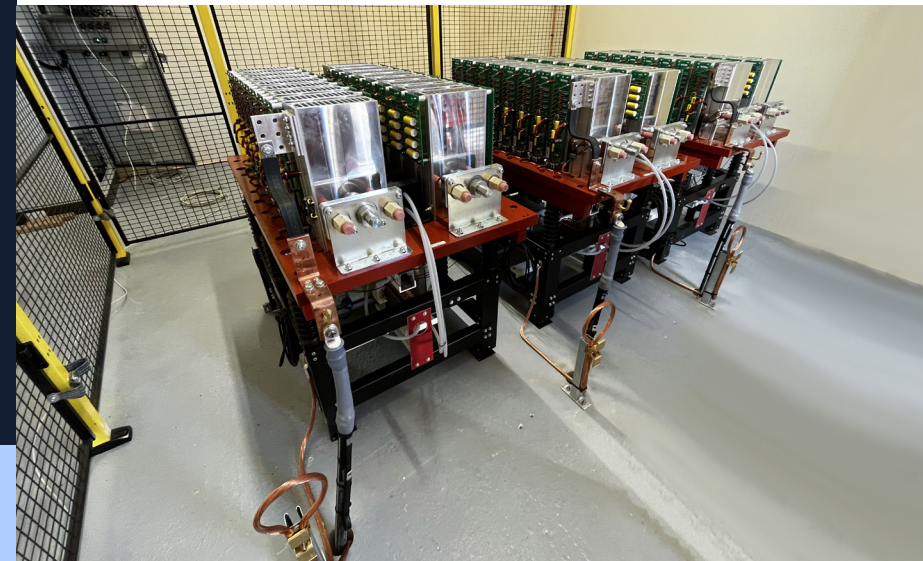




# Clean Energy

To help you choose a more sustainable solution, we can guide you with energy storage systems, power conversion, EMS (Energy Management System) or AC medium voltage static switch.

Moreover, our products are eco-designed and we continuously try to reduce their carbon footprint.



## 20 kV static switch

- ✓ Solution for resilient and sustainable transportation
- ✓ Smooth current evolution to avoid inrush current
- ✓ Transformer usage reduced by 80%
- ✓ Power reduction : 50 MWh/year

## Outdoor Line Equipment

- ✓ Up to 8000A
- ✓ Switch / disconnecter / contactor
- ✓ Metallic or insulating enclosures
- ✓ Up to IP 66
- ✓ Up to ANSI 64, 59, Surge arrester



## Control Command

- ✓ Hardware / Software
- ✓ SIL development
- ✓ Multi-platform
- ✓ Cybersecurity in compliance with 62443
- ✓ Training & Commissioning on site



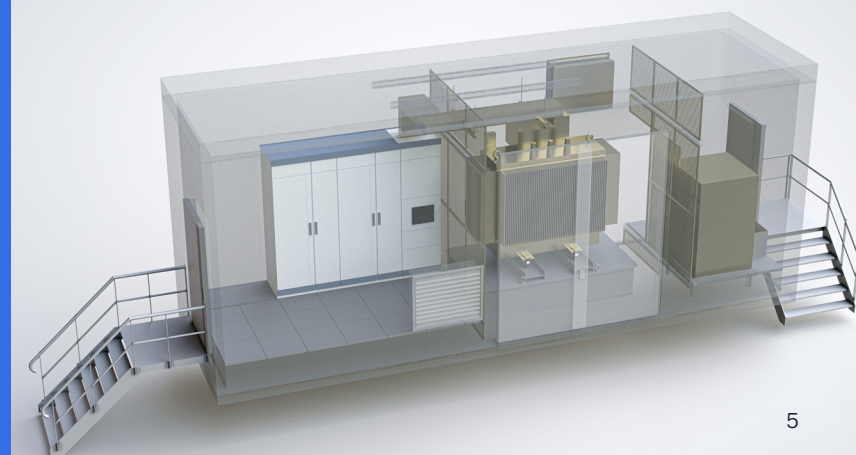
# Overall packages & solutions

To save space, time and cost, Plug&Play electrical sub-station solutions are entirely designed by our engineering department.

Integration can be done in shelters, containers, skids or modular structures.

## Containerized solution

- ✓ 100% tested in factory
- ✓ Easier to transport
- ✓ Faster installation on site
- ✓ Reduced commissioning
- ✓ Can be considered as a spare substation





# SRI<sup>®</sup>

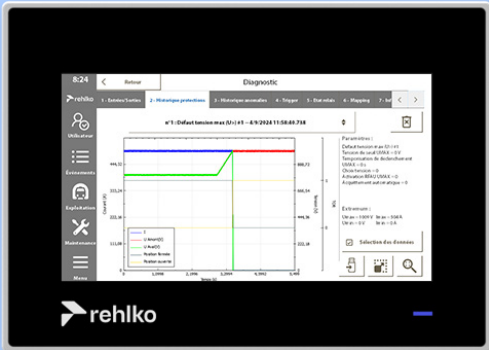
## Smart Railway Interface

The *SRI* protection relay can be integrated on our HSCB or VLD products.

This design is based on a mix processor and FPGA technology that ensures system performance and reliability.

The software and electronics development is carried out in compliance with EN 50128 and EN 50129 safety standards.

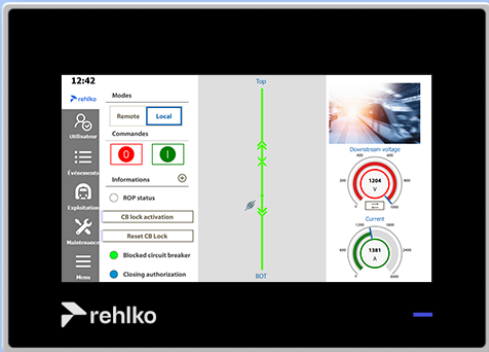
The *SRI* protection relay provides functions to assist the user: commissioning assistance, predictive and curative maintenance help , intuitive interface. All its functions can be consulted and modified locally or remotely.



Scope function for real-time network analysis



Consumption analysis



Voltage limiting device main page



Ladder function for control customization

Hardware	
12 DI (Digital Inputs)	
6 AI (Analog Inputs), +/- 50 mA, +/- 20 mA, +/- 10 Vdc	
6 DO (Digital Outputs)	
1 quick DO	
Hardware extension	
2x SFP Optical fiber (HSR)	
24 DI, 12 DO	
Connection	
RELAY : 4x Ethernet, 1 HMI Ethernet, 1 LED Status	
HMI : 2x USB type A, 2x Ethernet	
HMI	
Multi-touch color screen	
7 "	
Web server	
Safety	
Cybersecurity	EN 62443, Level 2
Development	In accordance with the principle of SIL 2, EN 50128 / EN 50129 standards

Network communication	
Modbus TCP/IP	
OPC UA	
IEC 61850 Edition 2	
Operator assistance	
Customizable HMI	
Control command modification program (with ladder diagram)	
DC Network monitoring	
Railway maintenance support	
Remote diagnosis	
Predictive Maintenance tool	
Measure and analysis tools	

### System Functions

#### Railway DC Line Protection

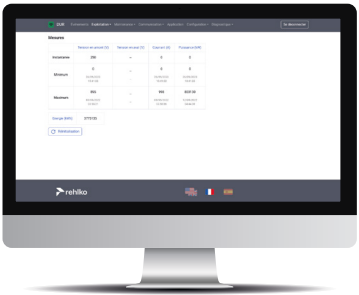
- ✓ Circuit breaker control with anti-pumping function
- ✓ Discrimination between a start train and a distant fault [ $\Delta I$  ANSI50]
- ✓ Short circuit detection [ $di / dt$  ANSI 57]
- ✓ Overload detection [ $I_{max}$  ANSI 51]
- ✓ Current Feedback Limitation [ $I_{min}$  ANSI 32]
- ✓ Overvoltage detection [ $U_{max}$  ANSI 59]
- ✓ Under voltage detection [ $U_{min}$  ANSI 27]

#### Control Command

- ✓ Easily configurable
- ✓ Commissioning assistance
- ✓ Help for maintenance : predictive maintenance, manual and datasheet, remote diagnosis
- ✓ Can be used as remote IO without protection functions

#### Interface

- ✓ Fully customizable main view
- ✓ 7-inch color touch screen
- ✓ USB plug to export data
- ✓ Web Server







SOR28020017EN-A



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