

Railway Energy System

Remote isolation and earthing systems





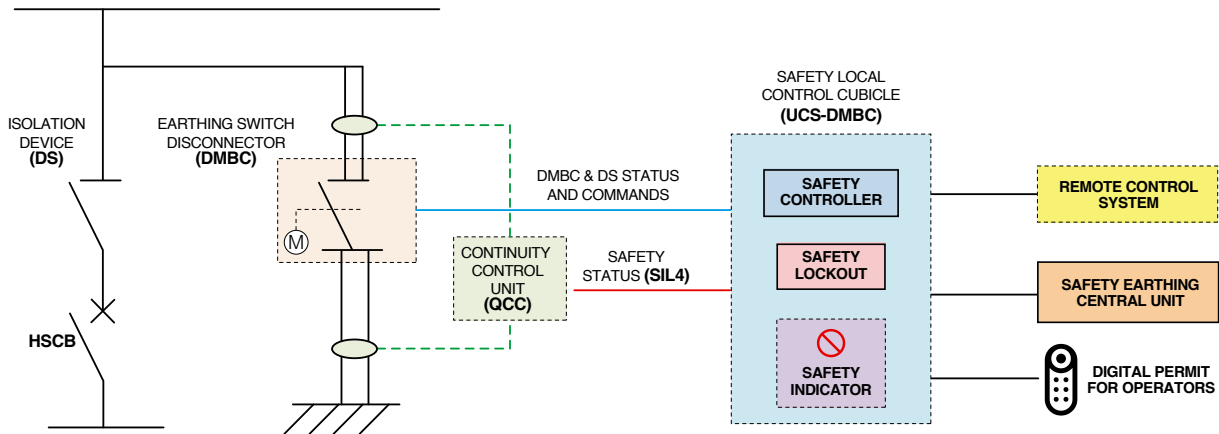
INTRODUCTION

The earthing of overhead line is necessary during maintenance activities, remote assistance or emergency.

Manual device or stand-alone earthing disconnectors are in charge to internal operators or external companies operators who operates locally, often without the proper skill, without any safety assurance system and without the monitoring from remote control center. The Remote Isolation and Earthing System provided by Mont-Ele, is an automatic **Safety Earthing System** of overhead line that allows a complete integrated management from remote control center and provides local operators (internal or external companies) to work in safety condition.

The system is certified up to SIL4 level according to EN 50126, 50128, 50129 standards.

SYSTEM ARCHITECTURE



The system is based on the following equipment:

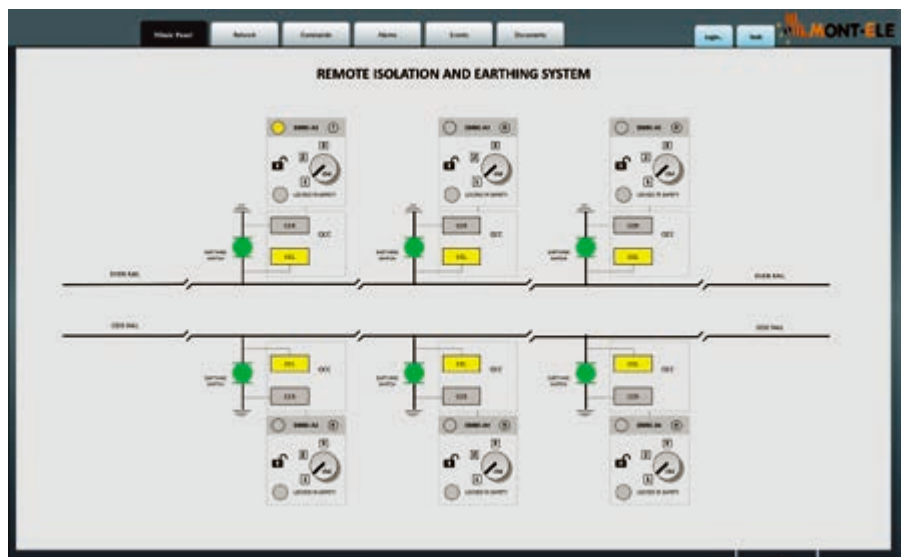
- an earthing switch disconnecter (**DMBC**) with short-circuit capability during closing operation
- a SIL4-certified Continuity Control Unit (**QCC**) to check the integrity of the cable connection from overhead line to the negative rail
- a local control cubicle (**UCS-DMBC**) with a SIL4 safety lockout system to lock the earthing switch in close position and a Safety indicators for operators
- a remote control system

INTEGRATED SYSTEM AND REMOTE CONTROL

Considering a whole railway network, multiple sites of local Earthing Systems are provided and connected to a safety ethernet network for the complete management of the entire system by redundant Central Unit as follow:

- end-to-end SIL4 certified system
- safety local-remote lockout for operators
- complete management of the earthing system by remote
- digital permit to operators

The system is ready to communicate with existing Remote Control System using standard protocol communication in accordance with Client procedure.



EARTHING SWITCH DEVICE (DMBC)

The earthing switch disconnecter (DMBC) devices are designed in accordance with the EN standard and are available in external version (for installation on pole or wall) or in switchboard version for positioning on the ground near the rail. The motorized earthing switch disconnectors are available for AC traction system with making capacity (CLASS E2 according to EN 62271-102) and DC traction system with making capacity (CLASS V according to EN 50123-3) in single pole version or two pole version. The earthing switch disconnecter devices have been certified by Italian Railway authority (RFI) for earthing system.



Single-pole or two-pole, earthing switchgear in withdrawable execution Single-pole or two-pole, earthings switch for assembling on pole or wall

SAFETY LOCAL CONTROL CUBICLE (UCS-DMBC)

This cubicle manages the operation of each earthing switch (DMBC) and isolation device (DS) if present, get safety status of cable connection integrity from QCC and is the interface with remote control system.

The earthing of disconnector and safety lockout can be done by a local command o remote command. The SIL4 Safety Lockout mantains the locked position of earthing switch also in case of power failure.

The Safety locked position is available as below:

- by local: using a Safety indicator
- by remote: using a safety network connecting the remote control center



CONTINUITY CONTROL UNIT (QCC)

This unit is mainly composed by Mont-Ele ME-CCR devices and is very important for the whole system: it checks the cable connection integrity between the earthing switch disconnecter (DMBC) and the ground in order to guarantee the safety earthing connection of overhead line. It is applicable to DC and AC systems at any voltage or frequency and is designed and certified in accordance with European Railway standard.

The CONTINUITY CONTROL UNIT has been certified SIL3 and SIL4 by Independent Assessor (TÜV).



DIGITAL PERMIT



The system allows the safety earthing of overhead line by remote control center and provide to operators a digital permit for working along the line in safety, using smartphone or tablet.

CERTIFICATION

The earthing system of overhead line have been installed in many railway application and have been certified by Independent Assessor as below:

- SIL3 certified according to IEC 61508, IEC 61511
- SIL4 certified according to EN 50126, EN 50128, EN 50129



The information in this document contains general description of the technical options which do not always have to be present in individual cases. Therefore, the required performance characteristics must be defined in individual cases during conclusion of the contract. In view of the constant evolution in standards and design, and due to the continuous development, the characteristics of the elements contained in this catalogue are subject to changes without prior notification. These characteristics, as well as the availability of components, are subject to confirmation by Mont-Ele's Technical Sales Department. Not valid as a contractual item.

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