DDL9000

DC Catenary Protection
Catenary voltage up to 3 kV

Our DDL9000 protection relay protects the fixed electric traction installations responsible for supplying the catenaries with direct current up to 3 kV.

Thanks to a hybrid acquisition of currents and voltages (through sensors or IEC 61850-9-2 SV), it facilitates the operation of your railway electrical network.

Based on more than 40 years of experience in this field, our DDL9000 relay is part of our 9000 Series designed for monitoring and controlling railway systems.

- High resolution colour touch screen
- Embedded web server
- IEC 61850 ed2 or Modbus servers

- 2x16 A circuit breaker outputs
- 12 configurable digital outputs
- 18 configurable digital inputs
- 16 configurable LEDs

- 48 Vdc to 125 Vdc ± 15% power supply
- 19" - 3U - 355 mm rack

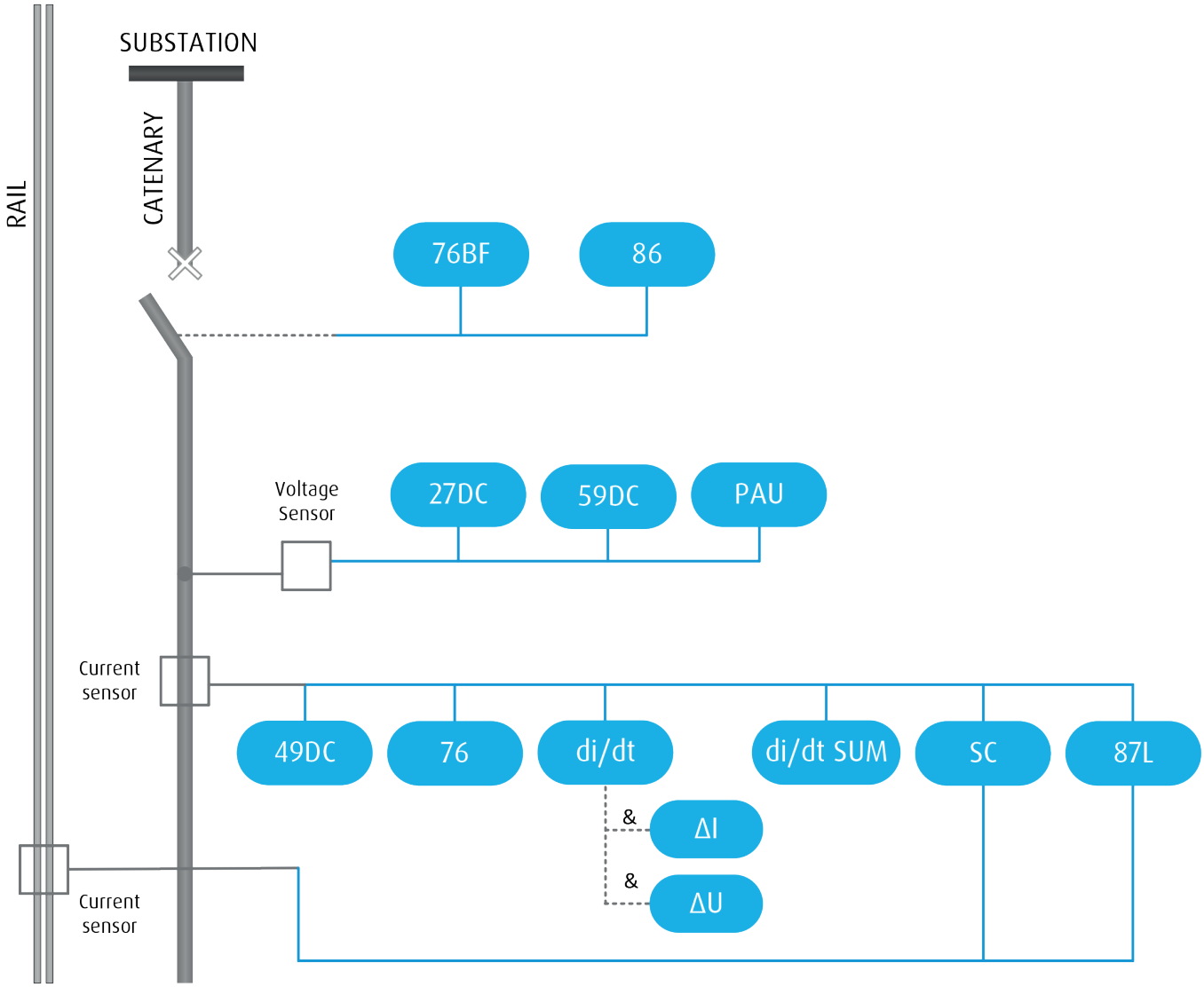
- Performance
  - Instantaneous tripping time in less than 30 ms
  - Sampling rate: 4 kHz
  - Operating temperature: -5 °C to 55 °C

- Main standards
  - Design according to IEC 60255, EN 50124-1
  - EMC according to IEC 61000-4-*, EN 50121-5
  - Communication according to IEC 61850
  - CE marking according to IEC 60255-27 and IEC 60255-26

OUR TRADEMARKS
ice EE TECHNIREL

Protection & Control ice
Our energy at your service

FUNCTIONAL SCHEME



PROTECTION FUNCTIONS

- **[27DC] [59DC]** Catenary voltage monitoring
- **[76BF]** Breaker failure function
- **[76-1] [76-2]** Overcurrent function
- **[di/dt]** Rate of change of current function
  - AND criteria: **[ΔI]** Delta I current deviation
  - AND criteria: **[ΔU]** Voltage drop monitoring function
- **[87L]** De-icing differential function
- **[di/dt SUM]** Rate of change of summed current function
- **[49DC]** Cable thermal overload function
- **[PAU]** Presence and lack of catenary voltage

MONITORING FUNCTIONS

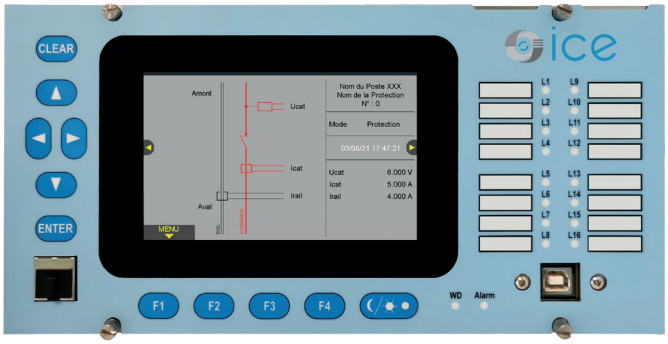
- **[SC]** Sensors monitoring
- **[86]** Circuit breaker monitoring
- Disturbance recording

ADVANCED CONNECTIVITY

Compliant with the requirements of the IEC 61850 edition 2 standards, our DDL9000 relay also incorporates the following communication features:

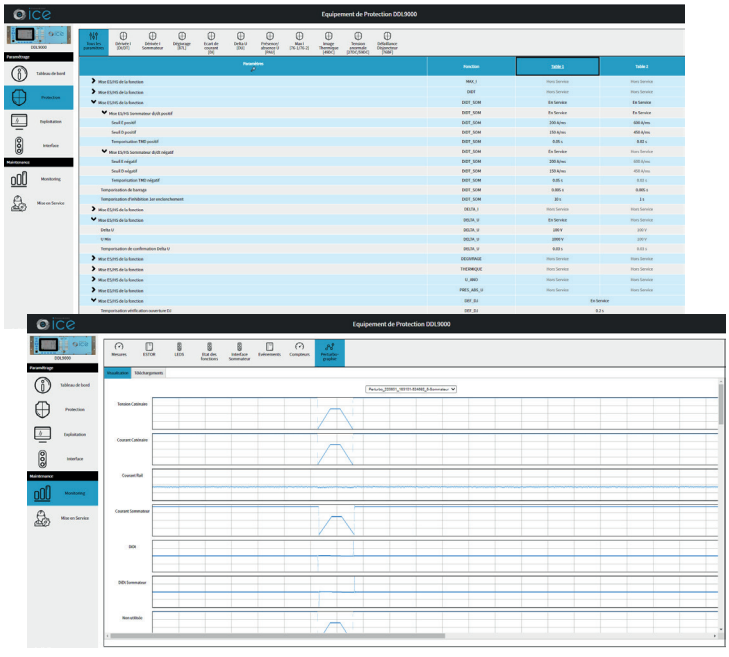
- IEC 61850-8-1 (MMS) and IEC 61850-9-2 (SV) synchronised by PTP 1588 (option)
- Modbus (serial and over TCP/IP) – 2 separate parameter sets
- Https (Configuration by Embedded Web Server)
- Time synchronisation by NTP
- Network redundancy via HSR/PRP (option)
- SFP cage (Ethernet RJ45 reception or optic fibre choice)

HMI AND OPERATION



- 800x480 colour touch screen
- Navigation directly from the screen or via the dedicated keys
- 16 configurable LEDs

WEB INTERFACE



- Interface easily accessible with a web browser, locally via the USB type b interface or via the Ethernet port
- Convenient tool that simplifies and speeds up operations of:
  - Diagnostic
  - Setup
  - Equipment commissioning

TECHNICAL CHARACTERISTICS

Current inputs: Catenary, Rail (2)

- Un = 5 or 10 V
- Primary value from 1 000 A to 10 000 A
- Withstand a permanent 12 V | 20 V 1 s

Voltage inputs: Catenary (1)

- Un = 5 or 10 V
- Primary value from 500 V to 4 000 V
- Nominal value from 500 V to 3 500 V
- Withstand a permanent 2 Un

Digital inputs: 18

- Proofreading of inputs status
- Power supply: 48 Vdc to 125 Vdc ±10%
- Current: ≥ 2mA

CB outputs: 2

- Trip relay
  - DC voltage withstand: 125 Vdc
  - Continuous current: 16 A
  - Breaking capacity: 4,000 VA
- Output control

Digital outputs: 12

- Signalling relays
  - DC voltage: 125 Vdc
  - Continuous current: 6 A
  - Breaking capacity: 1,500 VA
  - Max switching time: 10 ms (activation and deactivation)
- Coil/contact insulation: 4 kV
- Output control

Performance

- Instantaneous tripping time < 30ms
- Sampling rate: 4 kHz

Dimensions

- 19" - 3U - 355 mm rack

Recordings

- 1,000 events
- 32 disturbance records in COMTRADE format

Communication protocols

- IEC 61850 edition 2
  - IEC 61850-8-1 (GOOSE, MMS)
  - IEC 618509-2 SV with IEEE 1588 PTP sync
- Network redundancy
  - PRP (Parallel Redundancy Protocol)
  - HSR (High-availability Seamless Redundancy)
- Modbus
- Configuration via HTTPS (Embedded Web server)

Power supply

- 48 Vdc to 125 Vdc ±15%

Operating temperature

- From –5 °C to +55 °C

The specifications and drawings given are subject to change and are not binding unless confirmed by our specialists.

Protection & Control ice
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• ISO 19443 : 2018 • ISO 9001 : 2015 • ISO 14001 : 2015 certified •