

WITT CM 7 – Cable Monitoring System



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Application

Detection of damage to RHEYRAIL cables, protection against theft and detection of manipulations for the purpose of cable theft.

Description

Changes to the cable, as well as those affecting the monitoring wires, are identified, and reported immediately. In the event of a fault, localization can alternatively occur by measuring the resistance or the capacitance. The following changes to the cable cause an alarm:

Cable shortening without short circuit between monitoring wire and inner conductor leads to a smaller capacitance between monitoring wire and inner conductor, so that the resulting distance is determined and displayed by using a stored reference value.

Cable shortening with short circuit between monitoring wire and inner conductor leads to a smaller resistance of the monitoring wire, so that the resulting distance is determined and displayed by using a predetermined reference value.

Bridging a monitoring wire.

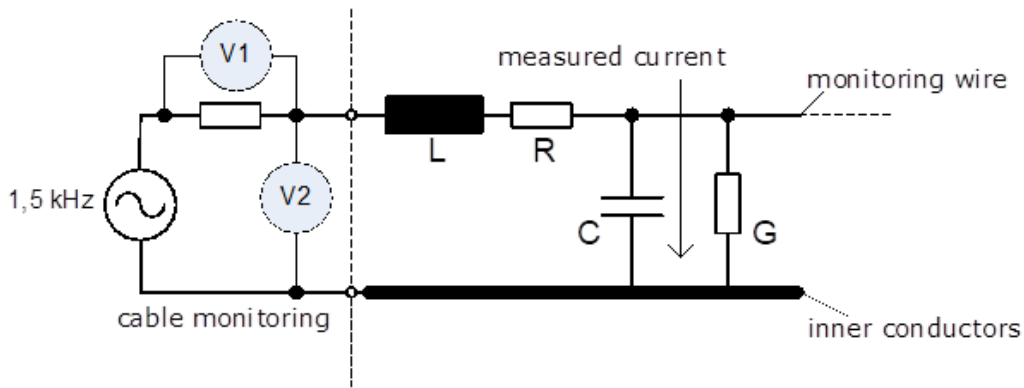
Penetration of liquids into the cable.

The cable fault monitoring devices have a modular design. The following modules can be configured for cable monitoring:

- Base unit
- Power supply unit
- Measuring module

The communication interface (part of the base unit) is specified when ordering (signal contacts, LAN, WLAN, RS485, CAN, GSM, LTE). If several cables are to be monitored with one device, the inner conductors of the cables must have the same potential.

Measurement Principle



- R... Resistance of the monitoring wire (approx. 13...15 Ohm/km)
 G... Conductance between monitoring wire and inner conductor
 C... Capacity between monitoring wire and inner conductor (approx. 140 nF/km)
 L... Cable inductance (approx. 470 mH/km)

The cable fault monitor generates a measuring current with a frequency of 1.5 kHz. The measuring voltages V1 and V2 are proportional to R or C. They are monitored alternately and evaluated internally. If the cable is faultless, R and G can be neglected. The measuring voltage V2, which is proportional to the capacitance C, is determined individually for all monitoring wires (learning) and stored as a reference value for fault location. The reference value for fault location via the measuring voltage V1 proportional to the resistor is specified by the manufacturer.

Interfaces

Auxiliary voltage:	230V / 50Hz (max. 4 mm ²)
Interface to Monitoring-Program:	USB
communications interface(optional):	LAN, WLAN, RS485, CAN, GSM, LTE
Connections for monitoring cables:	(max. 1.5 mm ²)
Connection for inner conductor:	(max. 1.5 mm ²)

Cable connection:

- Up to four monitoring wires can be connected per measuring module.
- At least one monitoring wire must be connected.
- The potential of the module is that of the connected cable

Messages

On the device:

Operation (green) - flashes on startup and lights up continuously once the device is operational

Alarm (red) - lights up when cable fault has been detected

At the central office:

Operation

Alarm (incl. Length)

Modules

- **Base unit 2M** incl. evaluation module and communication module (for monitoring max. 2 cables with up to 4 monitoring cores)
- **Base unit 8M** incl. evaluation module and communication module (for monitoring up to 8 cables with up to 4 monitoring wires)
- **Power supply 1kV** (isolating voltage 1kV)
- **power supply 3kV** (isolating voltage 3kV)
- **Measuring module 1000m** (1 cable with max. cable length of 1000m)
- **Measuring module 2000m** (1 cable with max. cable length of 2000m)
- **Measuring module 3000m** (1 cable with max. cable length of 3000m)