

# WITT CM 7 – Cable Monitoring

Monitor - locate - report



Example structure base 8  
with up to 3000 VDC peak a WB-HS M and 8 WB-CM7  
components for monitoring up to 8 return cables

## Application

Detection of damage to return cable (e.g. 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.

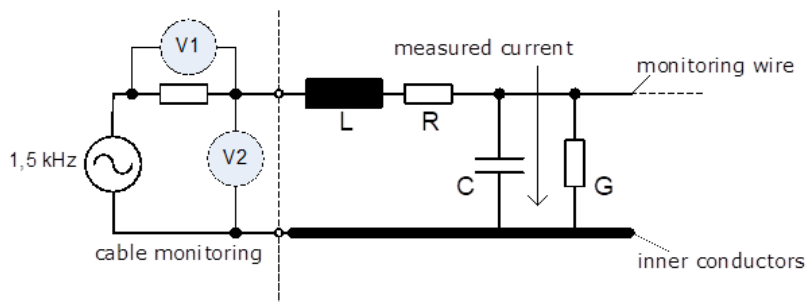
The cable fault monitoring devices pass on the WITT Bridge components and have a modular structure. The following modules can be configured for cable monitoring

- Measuring module WB-CM 7
- WB-HS M for the realization of the visualization, administration and communication protocols

Optional

- Modem for data transmission
- Housing incl. Appealing structures as shown in the picture.
- Power pack, heater, wiring
- The communication interface or protocol is specified when ordering (signaling contacts, LAN, WLAN, RS485, CAN, GSM, LTE). If several cables are to be connected to one device

## Measurement Principle



- R... Resistance of the monitoring wire
- G... Conductance between monitoring wire and inner conductor
- C... Capacity between monitoring wire and inner conductor
- L... Cable inductance

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 in the example

Auxiliary voltage:	60VDC to 250AVC / 50Hz / 60Hz (max. 4 mm <sup>2</sup> )
Interface to Monitoring-Program:	USB
communications interface(optionally):	LAN, WLAN, RS485, CAN, GSM, LTE
Connections for monitoring cables:	(max. 1.5 mm <sup>2</sup> )
Connection for inner conductor:	(max. 1.5 mm <sup>2</sup> )

Cable connection:

- Up to four monitoring wires can be connected per WB-CM7.
- At least one monitoring wire must be connected
- The potential of the module is that of the connected cable

## Messages

WB-CM 7

LED1	Green	flashes when the device starts and lights up permanently when the device is ready for operation.
LED 2	Red	Alarm (red) - lights when cable faults are detected.

## 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)