



#### Application

SensorPro LINETRAXX® RCMB300 series

## The design of resilient data centres can be achieved with residual current monitoring of electrical systems and PDU technology

**In recent years,** residual current monitoring (RCM) has become more established in data centres.

Designed to remove the need for power shutdown and meet the demands for advanced data centre availability and resilience, residual current monitoring is used in earthed (TN/TT) power systems to monitor residual and fault currents in electrical infrastructure. It provides early warning of developing failure and enables more cost-effective planned, predictive maintenance.



▶▶▶ **Alongside installations within data centre infrastructure, RCM has also been specified for use within rack power distribution units (intelligent rack PDU) and integrated within third-party data centre solutions.**

However, since monitoring in the PDU alone does not fulfil the normative requirements of the professional associations and the insurer in the upstream data centre installation, additional monitoring must also be implemented. The new LINETRAXX® RCMB300 series is a suitable solution for busbar systems, which can now be offered in addition to the standard residual monitoring within various distributions.

For the outlets of the feed units we recommend RCMB300 sensors, whereas monitoring panel distributions we advise the use of RCMS460 due to the more extensive measurement technique (harmonic components, data points etc). If the installation is only possible in the input feed of the rails, the Modbus-ready sensors of the RCMB300 SensorPro series are suitable.

Residual current sensors are now available for monitoring the final circuits in tap-off boxes – in most cases the RCMB132-02 is suitable for this application, to monitor final circuits up to 32 A.

For larger outlets, the RCMB300 series offers a solution that can be seamlessly integrated into the structure.

Modbus technology also allows for easy scaling by adding or removing boxes without much installation effort.

This allows to continuously monitor the leakage and residual currents in the busways up to the terminals. Thus, any tendencies to deteriorate the equipment are likely to be detected early and countermeasures can be initiated long before a system deteriorates due to age and failure or a connection may cause a failure or faulty system.

For this purpose, in the case of conspicuous residual current developments and the smallest exceeding of previously defined thresholds, automatic warning messages are issued to the data centre or facility management.

So far, data centre experts have only had the option for periodic testing of the electrical installation when disconnected by manually performing insulation measurements. Poor insulation, connections and corresponding developments could only be detected, if at all, when an insulation measurement was carried out. But if the error does not occur constantly, but only sporadically, there is an increased risk of power supply disruptions.

## Predictive maintenance strategy

Comprehensive 24-hour operational readiness, constant competitive pressure and high cost pressure require the highest level of electrical safety in the power supply of high-availability data centres. With the permanent monitoring of safety-relevant circuits for fault, residual and operating currents as well as stray currents, critical operating states are recognized at an early stage. Potential personal injury, fire and property damage as well as EMC interference can be avoided and supports a predictive maintenance strategy.



Figure 1:  
AC/DC sensitive residual current monitoring modules  
RCMB300 series



Figure 2: Typical power busway  
Photo: ©Universal Electric Corporation, Canonsburg, PA, USA

With the option of equipping the busbar with suitable residual current sensors for the in-feeds and also for the tap-offs (outgoing modules), you have all data in real time and permanently in view. Current measured values can thus be matched with the corresponding loads, and a permanent analysis of the trend data enables a meaningful definition of optimal work areas and threshold values. The slightest deviations and overruns trigger early alarms and provide the data centre personnel with enough time to thoroughly analyse changes and, if necessary, take measures so that the power distribution cannot be compromised from the feed to the final circuit.

The measurement data of the sensor modules can be viewed up at any time via the WEB interface of the COMTRAXX® communications gateway system. In addition, support for various serial and web-based protocols, such as Modbus RTU/TCP and SNMP, enables integration and processing across a variety of third-party building monitoring or data centre infrastructure management systems.

Possible equipment of a busbar with RCM in the upstream distribution and in the final circuits, energy measurement in the in-feeds.

## Advantages:

- RCM + SensorPro in the distributions: harmonic and dataloggers available (harmonics important for troubleshooting assistance)
- RCMB300 (RCMB132-01) in the outputs for monitoring the final circuits with the bus structure for easy and seamless integration
- MK system for local, redundant, network independent alerting
- PEM system for measuring the power and the individual currents. Possibly PQ
- COMTRAXX® gateway for merging the measured values and generating virtual measured values (residual current in relation to the load current) and integration in SCADA and / or GLT (building control system).

The AC/DC sensitive SensorPRO residual current monitors combine the best high-resolution measurement technology with open communication in a minimum of space.

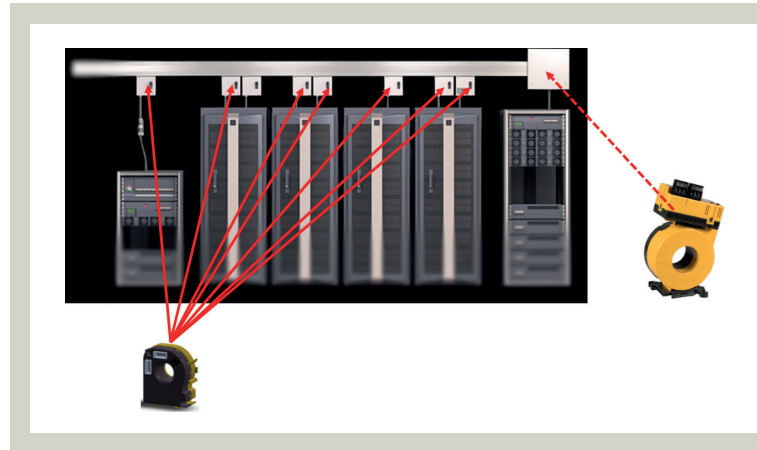


Figure 3: Placement of the individual Bender systems in the busbars

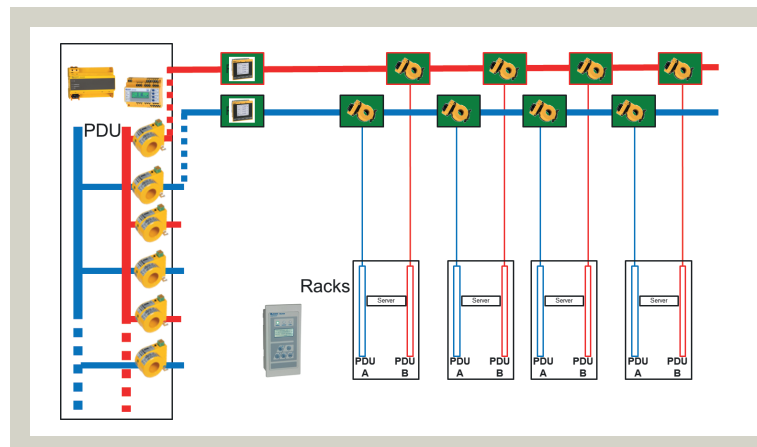


Figure 4: Basic structure

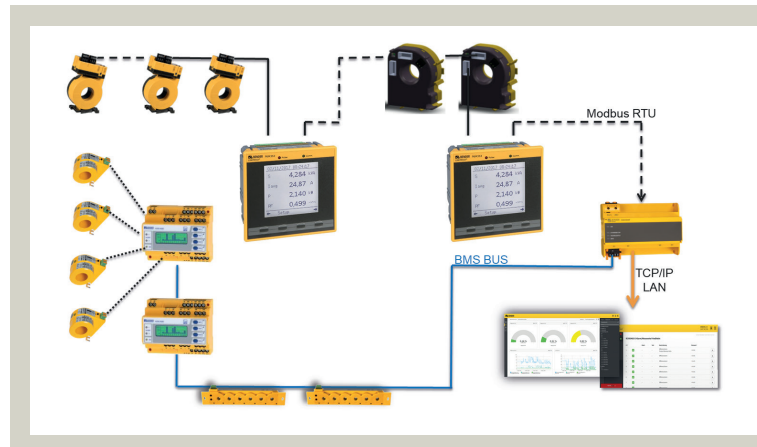


Figure 5: Bus setup and networking of the individual Bender systems

This Bender RCM solution can be easily integrated into busbar applications. Whether current regulations and requirements or upcoming standards – thanks to the open interface and modular design, LINETRAXX® devices with SensorPRO are already prepared for predictive maintenance and future requirements in data centres. ■



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