

Cabinet Guards

To monitor access to control cabinets and keep an eye on temperature values, the distribution system operator e-netz Süd Hessen AG uses compact cabinet guards from Turck

In many households, the living room can be heated to a comfortable temperature within a few minutes – literally at the turn of a dial – and in almost every second home, it is done with the help of natural gas. However, the complex route that the energy source passes along between the point of production and its destination is generally of little interest to end users. Security of supply is also rarely a concern. Electricity, water and gas are considered to be constant in Germany, and disruptions to supply are the exception. This is due, among other things, to regional distribution system operators such as e-netz Süd Hessen AG,

QUICK READ

For the distribution system operator e-netz Süd Hessen AG, high information security also means monitoring the doors of control cabinets in its decentralized gas control stations. Since neither door contacts nor roller switches were suitable for easy retrofitting, the subsidiary of Entega AG now uses compact cabinet guards from Turck. Employees in the control center use the IM12 CCM devices to register any door openings – whether planned or unauthorized. In non-air-conditioned stations, the IM12-CCM also sends a signal when temperature values are exceeded.



which operates electricity and natural gas networks for electricity and gas suppliers. Since high plant availability is the priority for e-netz Süd Hessen, the Darstadt-based company itself monitors the condition of control cabinets in decentralized facilities such as transfer stations or biogas plants. There, Turck's IM12-CCM cabinet guards can detect when a door is opened or when temperatures are too high.

Strictly monitored gas pressure control

In e-netz Süd Hessen's network area, ten transfer stations allow natural gas to be fed into local networks at the appropriate pressure. e-netz Süd Hessen receives the gas at a pressure of 30 to 80 bar and reduces it to supply pressures of between 12 and 13 bar. This process, which is also called "expansion," has a cooling effect. Therefore, it is necessary not only to filter the gas, add an odor agent and perform pressure reduction, but also to preheat it. This is followed by a quantity measurement by the gas meter before the gas is transferred to the periphery and the pressure on site is finally reduced to 23 to 700 millibars by control systems. All pre-processing steps are carried out under strict monitoring, both by a central control center and by staff in technical field service.

Information security until the door is opened

As a network operator, e-netz Süd Hessen counts as part of the critical infrastructure (KRITIS). For these organizations and institutions deemed to be of great



The IM12-CCM is simply mounted on the DIN rail and then reliably monitors temperature, humidity and door closure

importance to the community, the Federal Ministry of the Interior has defined strategic content to ensure high availability and security – for example of IT systems. Based on this, the Entega subsidiary defined specific requirements for internal information security. "We wanted to be able to monitor entrance doors and control cabinets in all gas pressure control and

measuring stations," said Jürgen Nagel, who is responsible for the electrical system in the gas and water supply plants of e-netz Südhessen. When was a control cabinet door opened at which location? This information is expected to reach the control center without the need for complex electrotechnical expansions in the decentralized stations.



In the transfer station, e-netz Südhessen AG adapts the supplied natural gas to the conditions of the local pipelines

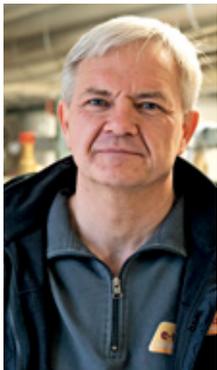
IM12-CCM replaces costly roller switches

"I did not think that door contact switches were reliable enough, and the costs would have been too high for roller switches," said Nagel, describing the selection process. "With these, you have to drill holes into the cabinets, bend the metal in part or work with small tools." The tests with Turck's IM12-CCM cabinet guard were more successful. This compact device for direct DIN rail mounting has internal sensors that measure three values: temperature, humidity and the distance to the door. "The device is ideal for our purposes: clip it in, apply two wires and voltage, route two wires to the PLC – and you're done."

e-netz Südhessen now uses three interconnected cabinet guards in its largest transfer station. Using reed contacts, the two downstream devices transmit their signals to the primary IM12 CCM, which in turn forwards the information to the PLC. This notifies the control center employees that a control cabinet door has been opened on site in the station. This simple possibility of retrofitting control cabinets with an internal monitor set a precedent at the Darmstadt-based company. In the meantime, the electricians are also using the devices in district heating and biogas plants.

Temperature measurement

Most gas transfer stations and district heating plants already have air conditioning technology, which prevents overheating of the electronic devices. Components installed in the control cabinet include frequency converters or power supplies for pressure



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Jürgen Nagel | e-netz Südhessen AG

transmitters and temperature measurement. Isolation amplifiers are also present, and e-netz Südhessen has been relying on Turck for these for more than 30 years. Nevertheless, not all stations are air-conditioned yet. In one of the transfer stations, Jürgen Nagel therefore also uses the temperature measurement provided by the IM12-CCM. "The control cabinet is located in the heating room, where it can become very warm despite insulation. Especially with a PLC or a power supply, I prefer it to be a little cooler."

If the temperature exceeds 42 °C, the cabinet guard sends a signal to the PLC. Nagel has programmed this limit value into the IM12-CCM via an IO-Link USB adaptor.



Simple retrofitting of control cabinets: The low installation and commissioning costs of the IM12-CCM convinced the specialists of e-netz Südhessen AG



Insecure door contacts or roller switches that were costly to install were not considered for retrofitting the cabinet guarding system

Alternatively, the parameterization could have been carried out via FDT software such as PACTware or directly on the device using quick-teach. e-netz Südhessen also benefits from the internal data logger of the 12.5-mm-wide cabinet guard, which provides values with a time stamp and stores them for up to two years. This allows technicians to track the conditions under which abnormal temperature values have occurred at any time.

Easy retrofitting of condition monitoring

Condition monitoring is not only required for machines and storage areas, but also for control cabinets. This is demonstrated by the information security management system of e-netz Südhessen AG, which uses Turck's IM12-CCM to monitor the door closure of control cabinets in decentralized plants and thus to draw attention to unauthorized access. The sensors installed in the device for measuring temperature and humidity also pay off in cases where unstable climatic conditions jeopardize the availability of electronic devices. For the e-netz specialists, the effort involved in commissioning was an important factor in the retrofitting. Turck's IM12-CCM impressed them through its simple assembly and uncomplicated teach functions.

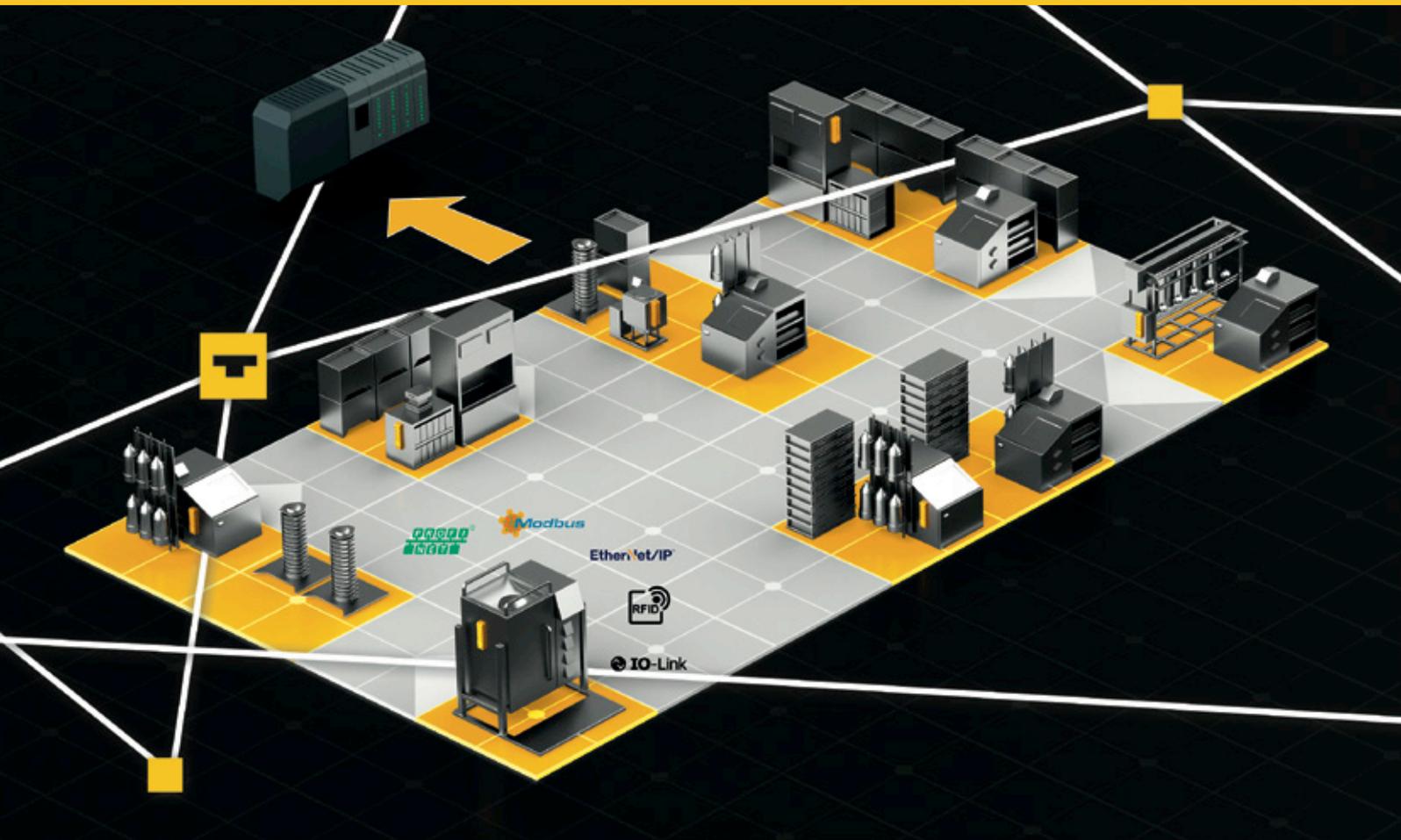
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