

## Smart Secondary Switchgear

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#### Smart Secondary Switchgear – The intelligent Ring Main Unit (iRMU)

Lead-gel battery

2 UPS with power supply unit and battery

3 Modem

4 SICAM A8000

5 Motor Control Unit

6 SICAM FCM

Low power VT

8 Low power CT

**9** SIBushing (integrated NCIT's)





#### **Classical solution: SICAM FCM with separate NCITs**



#### **SICAM FCM (Feeder Condition Monitor)**

- Directional short-circuit/earth-fault indicator suitable for grids with all types of neutral treatment
- Measurement of U/I/P/Q/S/cosφ/f
- Environmental conditions: -40°C... + 70°C
- LC display for information and parameterizing
- Inputs:

3 x I – Phase currents or 2 x I – Phase + 1 x I sensitive earth (225mV Low-Power due to IEC 61869-10 or 1A) 3 x U – Phase Voltages ( $3.25V/\sqrt{3}$  Low-Power due to IEC 61869-11 or  $100V/\sqrt{3}$  or 230V)

- Communication: Modbus RTU/RS485
- Event archive for the last 20 faults Imin/max for 15/30/45min/1h/1d/30d/1Y
- Power supply: 24-250VDC / 230VAC Integrated battery for >15 years



#### Low-power current transformer according to IEC 61869-10

- Output signal 225mV (at IP = 300A or 60A)
- Accuracy class 0.5 (for phase current only), 1 or 3
- Ring-core transformer with integrated precision shunt

#### Available in 4 versions

- As phase current transformer for installation around the bushing
- 2 As split-core phase current transformer for installation around the cable
- 3 As split-core zero-sequence current transformer for sensitive earth-fault current
- As bushing-type current transformer with
  2x phase current and 1x sensitive earth-fault current or
  3x phase current





#### Low-power voltage transformer according to IEC 61869-11

- Output signal  $3.25V/\sqrt{3}$  (at Ur max. 36kV)
- Accuracy class 0.5, 1 or 3
- Resistive voltage divider
- Voltage sensor for insolated T-connector with symmetric cone (e.g. Nexans K400-TB) and also for "short" plugs (e.g. TE Connectivity RSTI-58 or NKT CB24)





### Innovative Solution: SIBushing – Smart and Intelligent Bushing together with SICAM FCM plus



#### Innovative solution: SIBushing and SICAM FCM plus



#### **SIBushing - Cable connection bushing with integrated sensors**

#### **Technical information:**

- Cable connection bushing type C according to EN 50181
- Rogowski coil for current measurement according IEC 61869-10 with 22.5mV @ 50A, 50Hz
- Capacitive voltage divider for voltage measurement according IEC 61869-11 with transmission ratio 10.000/1
- Accuracy for current and voltage measurement <= class 0.5</li>
- Additional capacitive voltage divider for VDIS to determine the absence of voltage
- PT100 temperature sensor with the possibility to monitor the temperature at the cable connection







#### **SICAM FCM plus - Salient features**



#### SICAM FCM plus Overview of interfaces

Auxiliary power supply AC 230 V, DC 24 V to 250 V

User configurable Digital inputs (6x) and outputs (4x)

Remote communication protocol - Serial Modbus RTU





4 function keys for HMI navigation, information, and configuration

> 3 LEDs to indicate the operating mode Fault, Com and Run

Analog input acquisition as per IEC 61869 - 10 & 11



#### **Currently planned devices for connection to the SIBushing**



First frame contract with Netze BW for SIBushing with a.eberle e.or-3ds



7SY82 SIPROTEC 5 non-modular protection relay



SICAM FCM plus as intelligent short circuit indicator





#### SICAM A8000 Series: All requirements combined in a single platform

- Platform modularity for versatile application options and reduced inventory
- Extended temperature range of -40°C to +70°C for rough ambient conditions
- Highest EMC stability up to 5 kV (IEC 60255) for direct use in substations
- Use of international standards such as IEC 61850 for high investment security
- Integrated crypto chip and IPSec encryption to fulfill the high cyber security requirements
- Multitude of interfaces and integrated GPRS module for simple adaptation to existing communication infrastructures
- Integrated web parameterization tool for simple engineering





#### **Distribution Automation and IoT gateway Box**





- Interface to cloud application and to network control center with standardized communication protocols OPC-UA-PubSub / Mindconnect Lib resp. IEC 60870-5-104 or IEC61850
- Includes
  - RTU Telecontrol SICAM A8000
  - Uninterrupted power supply
  - Communication Modem
- Use cases
  - Monitoring of secondary transformer substations
  - Remote control of medium and low voltage components
  - Load management, voltage regulation and self-healing applications

## The intelligent Ring Main Unit (iRMU) as part of an Intelligent transformer substation





#### **Smart Secondary Switchgear – Happy Customers**







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