

Eaton's Electrical Sector is a global leader in power distribution, power quality, control and automation, and monitoring products. When combined with Eaton's full-scale engineering services, these products provide customer-driven PowerChain™ solutions to serve the power system needs of the data center, industrial, institutional, public sector, utility, commercial, residential, IT, mission critical, alternative energy and OEM markets worldwide.

PowerChain™ solutions help enterprises achieve sustainable and competitive advantages through proactive management of the power system as a strategic, integrated asset throughout its life cycle, resulting in enhanced safety, greater reliability and energy efficiency. For more information, visit www.eaton.com/electrical.

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Power Xpert® air insulated switchgear UX with SASensor® technology
IEC medium voltage switchgear up to 24 kV for Smart Grid applications

Managing medium voltage grids with innovative station automation



EATON

Powering Business Worldwide

UX with SASensor® technology

Managing medium-voltage grids with innovative

Eaton's air insulated medium voltage switchgear UX with SASensor® 12 - 24 kV

As a result of changes in electrical distribution networks, optimum management of medium-voltage grids has become increasingly important. As part of this change the quality and reliability of the energy supply needs to be improved. Cost effective long-term investments must be made. All of this requires simple station automation solutions that makes it possible to obtain, transmit and exchange network status and data.

Eaton has a complete automation solution available for UX medium voltage substations. By integrating SASensor® products from Locamation, the UX switchgear system is easy to protect and manage. This makes it possible to easily measure the energy, monitor the power quality, register faults and obtain accurate data and transmit this to higher level supervisory systems to provide up to the minute data for overall network management and control.

A central control unit or CCU is linked to three types of I/O modules to provide a simple, accurate and cost effective solution. The modules are a Current Interface Module (CIM), Voltage Interface Module (VIM)

and a Breaker Interface Module (BIM).

These interface modules are now integrated into the UX medium voltage switchgear. The output of the different modules is connected with fibre optic cables to the Central Control Unit (CCU). The CCU is, a computer that collects all the data, processes it, then displays it on a screen and can transmit the data over a SCADA network. The touch screen LCD-display can also be used for local operation of the complete switchgear system.

When connected to the Internet, the CCU can be used to monitor and control the entire system safely and effectively from any distance.



Long life solution

Due to the architecture of the SASensor® system, future upgrades or replacement of a CCU or an I/O module is easy without interruption to the network supply.

Adding new functionality or upgrading the CCU is a simple matter of a software upgrade.

Due to the long-life of the I/O components and the CCU it is highly unlikely that any replacement of a device will be necessary. In the unlikely event that a device does need to be changed then this is a simple plug and play replacement with no additional programming or set-up required in the system.

Reliable distribution of electrical power requires accurate and reliable measuring, protection, data collection, and switching

Functionality with SASensor®

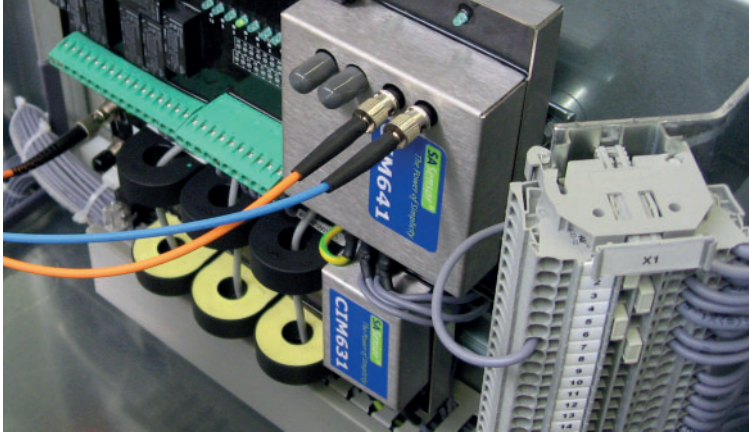
Basic substation automation functions

SASensor® offers e.g. the following functionality:

- Protection
- IEC 61850 compliant
- Digital fault registration
- Alarm & Event handling
- Accurate data acquisition
- Power Quality monitoring
- Revenue metering (kWh-measurement)
- Remote Control and Local Control (LCD system)



station automation



Functionality of the interface-modules



CCU
Central Control Unit
Perfect separation between I/O hardware and operational functionality
The Central Control Unit (CCU) is the computing heart of the SASensor® technology. The CCU unit is an “all-in-one-box” consisting of a mainstream “off-the-shelf” Single Board Computer (SBC) and a configurable number of fibre optic interface boards that enable the communication with the I/O modules.



BIM
Breaker Interface Module
A Fail safe device for switching primary equipment
The Breaker Interface Module (BIM) is a compact I/O module used to monitor and control the UX Vacuum Circuit Breaker.

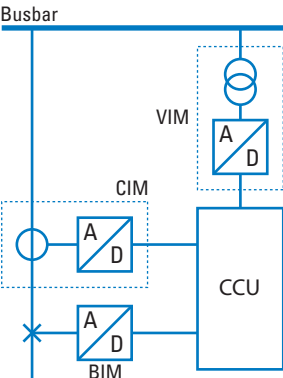


VIM
Voltage Interface Module
Accurate voltage measurement
The Voltage Interface Module (VIM) measures the three phase voltages and converts the analogue values to digital signals. The VIM is supplied via the secondary windings of a conventional voltage transformer (VT). The digital signals from the VIM contain all the voltage information over their full dynamic range of the switchgear system.



CIM
Current Interface Module
Single device for monitoring both operational and short-circuit currents
The Current Interface Module (CIM) measures the three phase currents supplied by the secondary windings of a conventional current transformer (CT). and converts the analogue current values to digital signals. The digital signals from the CIM contain all the information of the current transformer’s secondary currents over their full dynamic range.

UX with SASensor® technology is ideal for optimal remote control of the medium voltage grid



VIM: Voltage Interface Module
CIM: Current Interface Module
BIM: Breaker Interface Module
CCU: Central Control Unit

Analogue signals are converted into digital signals in CIM, VIM and BIM and then sent to the CCU via fibre optic cable.

System		12 kV	17.5 kV	24 kV
Rated voltage	kV	12	17.5	24
Lightning impulse withstand voltage	kV	75	95	125
Power frequency withstand voltage	kV	28	38	50
Rated frequency	Hz	50/60	50/60	50/60
Internal arc class			AFLR	
Loss of service continuity category			LSC2B	
Partition class			PM	
External degree of protection		IP4X (IP41 as an option)		
Busbar system and circuit breakers				
Rated normal current	A	630, 1250, 1600, 2000, 2500, 3150, 4000 (FC*)		800, 1250, 2000, 2500
Rated short-time withstand current	kA - 3 s	25 / 26.3 / 31.5 / 40 / 50		20 / 25
Rated peak withstand current	kA/50 Hz	63 / 66 / 80 / 100 / 125		63 / 80
	kA/60 Hz	65 / - / 82 / 104 / 130		65 / 82

*) FC = Fan cooled.