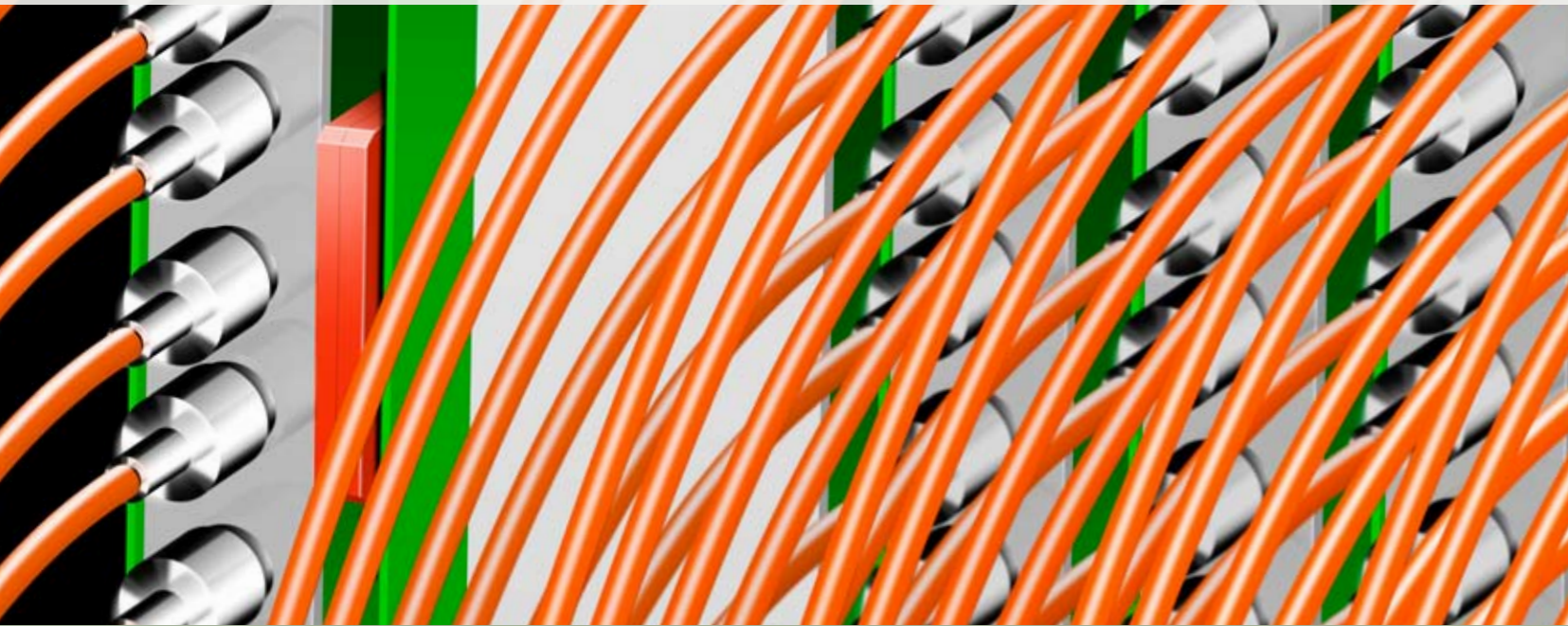


Central Control Unit (CCU)

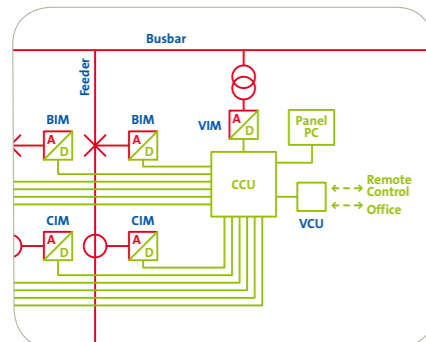
Perfect separation between hardware & functionality



The Central Control Unit (CCU) is one of the computing devices of SASensor®. The CCU is an “all-in-one-box” unit, consisting of a mainstream “off-the-shelf” Single Board Computer (SBC) and a configurable number of fiber optic interface boards which functionally act as Ethernet switch.

The CCU is a modular unit with the following hardware properties:

- One scalable Single Board Computer with Flash (hard) disk
- Selectable number of boards with 7 Ethernet 100BaseFX ports
- 1 or 3 backplanes with integrated wide range power supply powering the Ethernet boards and SBC



Flexible and open software environment

The computer of the CCU runs the open real-time operating system ARTOS®. All required functionality is installed directly or later as new functions become available.

Architecture

The CCU is the “spider” for other SASensor devices like: Bay Control Units (BCU), Merging Units (MU), Voltage Interface Modules (VIM), Current Interface Modules (CIM), Breaker Interface Modules (BIM), Versatile Communication Unit (VCU) and other Ethernet based devices like a PC for the graphical user interface and IEC61850 devices.



All devices are interconnected with fiber optic cables

Central Control Unit (CCU)

Plug and play scalability

Designed for long life

Long life reliability is maximized by design and architecture. There are no mechanical moving parts such as fans and conventional hard discs. Single Board Computers have a relative short economic life. The computer is a universal part of the control unit which makes it easy to replace by a later version. Life is effectively elongated, and spare parts management is simplified.

“All-in-one box” device

The CCU600 series is modular to be sized for any substation, but functionally still “one box” running selectable functionality. Besides the power cable the CCU can only handle fiber optic communication ports. The CCU supports

functional interfaces with IEC61850-8-1 and IEC61850-9-2LE devices.

Plug and play

The SASensor system hardware is designed from the viewpoint of the substation plant engineer. Hardware is replaced in a plug and play manner, no special electronics training is required. Software is separated from the hardware so no special requirements there as well.

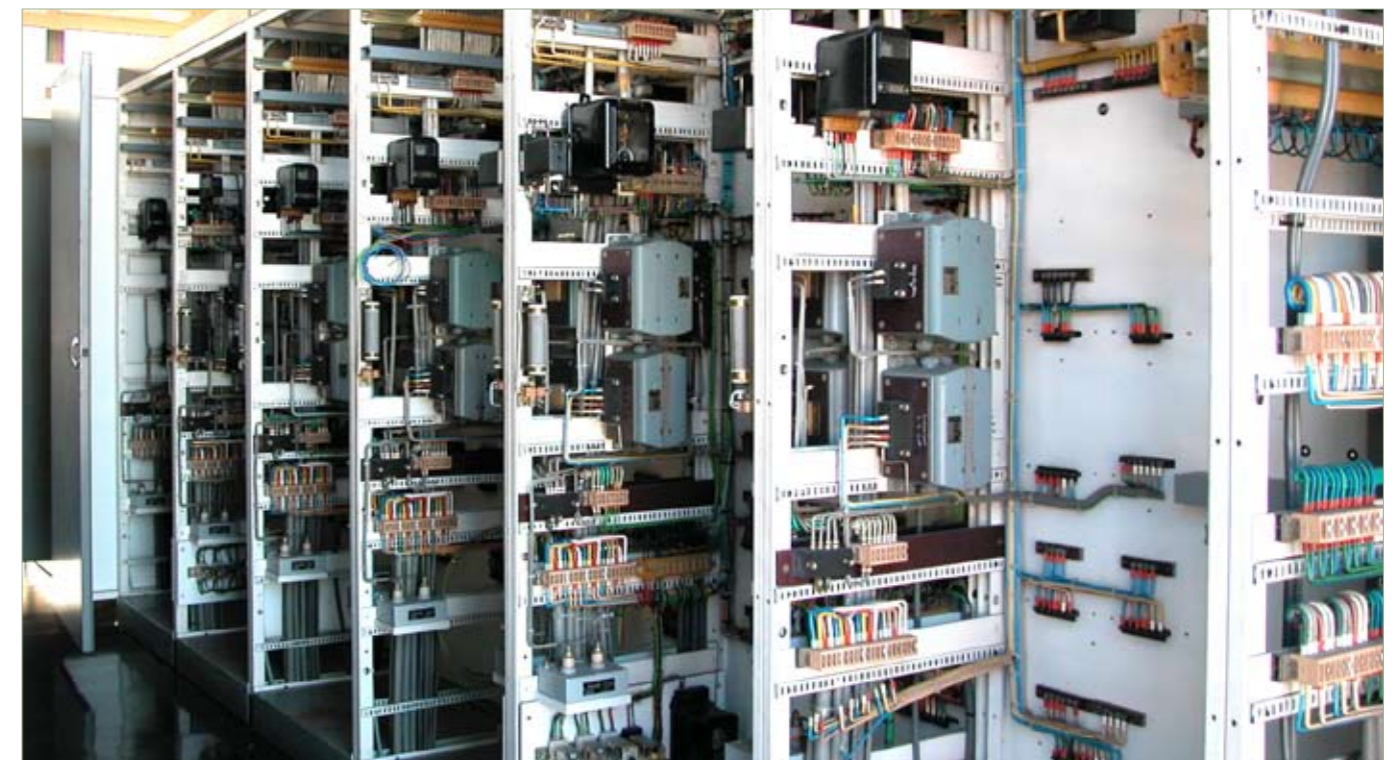
Flexible performance

Functional performance requirements are translated to a type of computer suiting the job. Performance of available computers is continually increasing and in principle of no issue anymore in substation automation applications.

Redundancy required? Just duplicate the CCU!

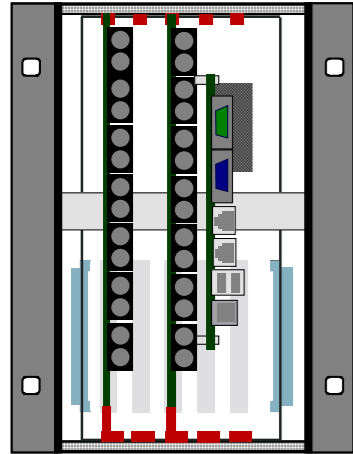
Since the CCU contains the selected functionality in its software, it is very easy to make a duplication of the system by simply using a second identical CCU. Although the interface devices are single in the system, their Ethernet communication ports are redundant with a double set of fiber optic cables, one set for each CCU connection. This creates a complete redundant system. In a redundant system one CCU can be turned off for repair or replacement without any degradation of functionality or shutdown of the substation. The other CCU simply continues to control the SASensor system.

CCU will replace all of this old equipment and if required even fully redundant



Central Control Unit (CCU)

Easy upgrading, scalability and redundancy

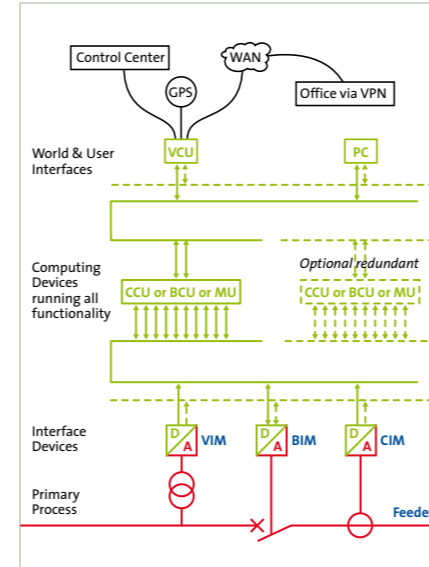
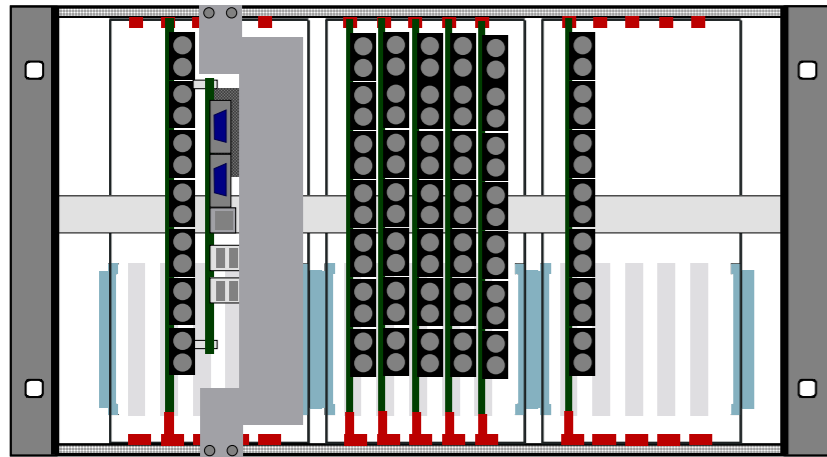


The CCU600 series consists of two types. Each MP601 contains 7 optic fiber ports.

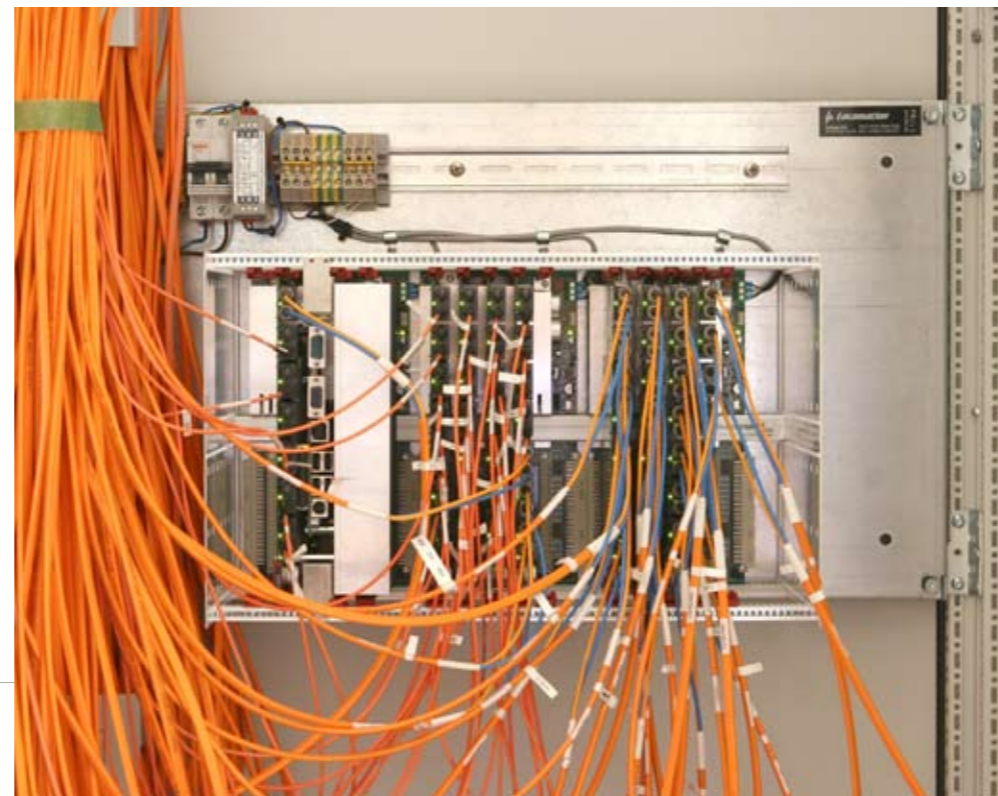
The Single Board Computer is physically mounted to one of the MP601 boards. At present time there are two versions of computers: Celeron-Mobile and Pentium-Mobile. The latter is extra cooled with a heat sink. Both include a 1 Gb FlashDisk.

The CCU601 can have a maximum of 2 MP601 cards with a maximum of 14 optic fiber ports. The maximum of power consumption is 71 W.

The CCU603 can have a maximum of 12 MP601 cards with a maximum of 84 optic fiber ports. The maximum of power consumption is 215 W.



In a redundant system one CCU can be turned off for repair or replacement without any degradation of functionality or shutdown of the substation.



Cabinet	
Type floor cabinet	RITTAL TS8 805.500
Dimensions floor cabinet (H x W x D)	2000 x 800 x 600 mm
Protection	IP55

Power supply input	
DC input range	38 V ... 138 V
Tripping value MCB	6 A @ 110 Vdc
Max. power consumption	215 W
Hold-up time	> 50 ms

DC input protection	Reverse input polarity
Max. surge current	6,5 kA (8/20 µs)
Max. leakage voltage	0,3 mA

Fiber ports	
Communication ports	100Base-FX Ethernet
Connection	ST fiber optic ports
Light source	1300 nm
Fiber optic cables	62,5/125 or 50/125 optical multi mod
Speed	100 Mb/s
Max. number of optic ports (CCU603)	84

CCU versions			
Type	Max. optic fiber ports	Backplanes	Max. power consumption
CCU601	14	1	71 W
CCU603	84	3	215 W

Electromagnetic compatibility			
Test	Standard	Enclosure	PSU
Electrostatic discharge	IEC 61000-4-2	6 kV contact 8 kV air	
RF immunity radiated	IEC 61000-4-3	10 V/m	
Fast transient	IEC 61000-4-4	4 kV	4 kV
Surge	IEC 61000-4-5		2 kV LE, 1 kV LL
RF immunity conducted	IEC 61000-4-6	10 V	10 V
PF magnetic field	IEC 61000-4-7	100 A/m cont 1000 A/m for 1 s	
Dips	IEC 61000-4-11		0, 30, 60 %
Interruptions	IEC 61000-4-11		100 %
Variations	IEC 61000-4-11		+35 ... -20%
100 kHz, 1 MHz oscillatory wave	IEC 61000-4-12 IEC 61000-4-18		2,5 kV CM 1,05 kV DM
Ripple	IEC 61000-4-17		12% Un

Electromagnetic emission			
Test	Standard	Enclosure	PSU
Radiated	IEC 61000-6-4 CISPR 22		Class A
Conducted	IEC 61000-6-4 CISPR 22		Class A

Climatic conditions			
Test	Standard	Enclosure	PSU
Operating temperature	IEC 60068-2-1 IEC 60068-2-2		0 ... +55 °C
Storage temperature	IEC 60068-2-1 IEC 60068-2-2		-10 ... +70 °C
Humidity	IEC 60068-2-78		+40°C, 93% r.h., 10 days

Mechanical conditions			
Test	Standard	Enclosure	PSU
Vibration	IEC 60068-2-6		Class 1
Shock	IEC 60068-2-31		Class 1