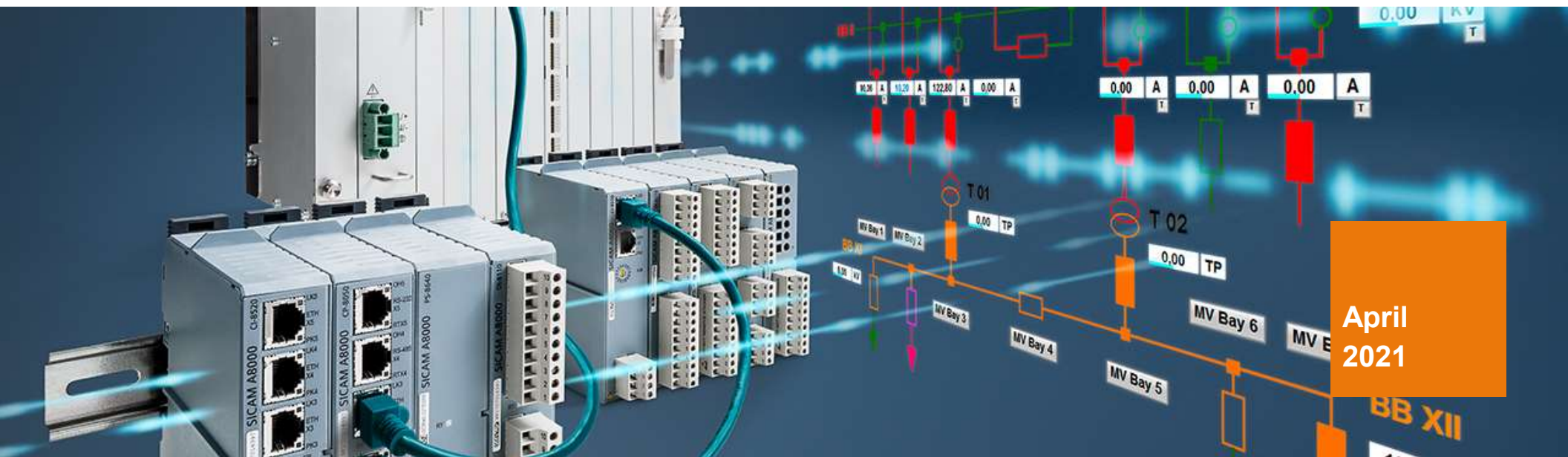




SICAM A8000

Automation solutions – Wherever energy flows

[siemens.com/sicam-a8000](https://www.siemens.com/sicam-a8000)

One for all SICAM A8000 Series

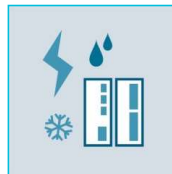


The design of the SICAM A8000 equipment series has been specifically tailored to meet market requirements and customer needs.

- From simple to complex, always adapted in line with the actual requirements of the area of application
- Fulfills highest cybersecurity requirements
- Use of standards ensures secure investment
- Reduced stock inventory thanks to modular platform
- Usable along the entire energy supply chain and the critical infrastructure

SICAM A8000 Series

All requirements combined in a single platform



Rough ambient conditions



Automation



Long product lifecycle



Cybersecurity



Space-saving design



High electric strength



Integrated communication



Scalability

A strong team

SICAM A8000 - equipped for any task

CP-8000



Processor with integrated
power supply and display

CP-8021



Processor with
external power supply

CP-8022



Processor + GPRS with
external power supply

I/O modules



Expansion modules
combinable as needed

A strong team

SICAM A8000 - equipped for any task

CI modules



Ethernet communication module

CP-8050



Modular processor with external power supply (optional: redundant)

CI modules



Detachable expansion module

I/O modules



I/O expansion modules combinable as needed

The entire family at a glance

SICAM A8000 - power supply units and processor modules



SICAM CP-8000

Integrated power supply
DC 24 V

- 12 DI, 8 DO integrated, max. 116 I/O (max. 6 expansion modules)
- Maximum of 4 interfaces
- Integrated function keys and display



SICAM CP-8021

PS-8620 DC 18–78 V, 12 W
PS-8622 DC 82.5–286 V, 12 W

- Maximum of 128 I/O (max. 8 expansion modules)
- Maximum of 4 interfaces



SICAM CP-8022

PS-8620 DC 18–78 V, 12 W
PS-8622 DC 82.5–286 V, 12 W

- Maximum of 128 I/O (max. 8 expansion modules)
- Maximum of 5 interfaces
- Integrated GPRS modem

The entire family at a glance

SICAM A8000 - power supply units and processor modules (Linux based))



SICAM CP-8031

new!

PS-8620 DC 18–78 V, 12 W
PS-8622 DC 82.5–286 V, 12 W
PS-8640 DC 18–78 V, 45 W
PS-8642 DC 82.5–286 V, AC 230 V, DC 24 V output

- 1 local I/O line (max. 8 expansion modules)
- 4 interfaces (2x Ethernet, 2x serial)



SICAM CP-8050 (optional: redundant)

PS-8620 DC 18–78 V, 12 W
PS-8622 DC 82.5–286 V, 12 W
PS-8640 DC 18–78 V, 45 W
PS-8642 DC 82.5–286 V, AC 230 V, DC 24 V output

- max. 16 I/O lines
(max. 8 expansion modules / line)
- max. 34 interfaces (modular)

The entire family at a glance

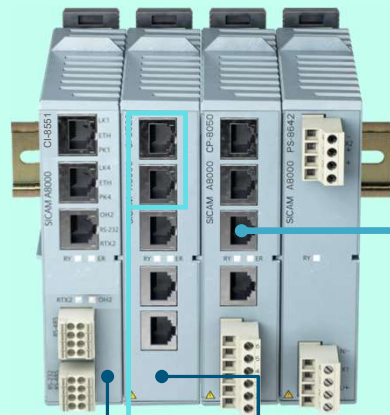
SICAM A8000 CP-8021 / 8031 / 8050 (comparison)

Feature	CP-8021	CP-8031 	CP-8050
Interfaces Ethernet/serial on board	2/2	2/2	2/2
Interfaces modular	-	-	30
Number of protocols	4	4	24 (*)
Several IP addresses on one Ethernet interface	-	•	•
CI-8551/20/22 support	-	-	•
CI-853x support	-	-	•
Number of I/O modules	8	8	16 x 8
Supported I/O modules	all, except not AI-8330/40, DO-3221/30	all, incl. AI-8330/40, DO-8221/30	
FCM parameterization via Modbus	•	○ (in preparation)	
SICAM Web functions	Data point test Diagnosis Online engineering	Data point test Diagnosis Dashboard (monitor & control direction), integrated monitoring, simulate & tracing	
Cybersecurity	Integrated Crypto-Chip, IPsec- encryption, secure https-protocol, TLS-encryption, Password protection to SICAM TOOLBOX II, BDEW White Paper compliant	Same as CP-8021, plus integrated and configurable firewall, firmware signature, security logbook, network authentication, VLAN support, automatic certificate exchange based on EST with SICAM Grid Pass, configurable system functions, Role Based Access Control	
CFC resources	1x 128kB	1x 2MB	5x 2MB (*)
Max. number of data points	20.000	20.000	400.000
Max. number of stations/IEDs	~ 50	50	400
SIAPP support	-	1 (*)	3 (*)
Redundancy	-	-	• (*)
I/O racks	-	-	• (*)

(*)...License
necessary

The entire family at a glance

SICAM A8000 - Communication modules, and remotely installed expansion module



CI-8551

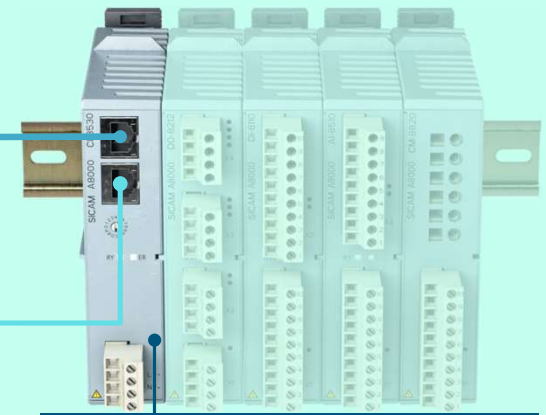
Serial communication module
(3x RJ45, 2x 8-pin clamp)

CI-8520 / 22

CI-8520 Ethernet communication module, 5x RJ45

CI-8522 Ethernet Communication module, 3x electric RJ45, 2x SFP

new!



CI-8530 / 32

CI-8531 / 33

CI-8530 I/O remote interface module, electrical DC 24–60 V

CI-8532 I/O remote interface module, electrical DC 110–220 V

CI-8531 I/O remote interface module, optical DC 24–60 V

CI-8533 I/O remote interface module, optical DC 110–220 V

new!

The entire family at a glance

SICAM A8000 - expansion modules

DO-8212

8 binary outputs

DC 24/48/60/110/220 V;
AC 110/230 V

DO-8221

Secure command output

DC 24-220 V
1-off-n monitoring
Continuity check

DO-8230

16 Binärausgänge

Transistor
16x DC 24-60 V

DI-8110

16 binary inputs

DC 24 V

DI-8111

DC 48/60 V

DI-8112

DC 110 V

DI-8113

DC 220 V

AI-8310

4 analog inputs
(2 groups with 2 AI each) for Pt100/Ni100
in 2-, 3-, or 4-wire design

AI-8320

-20...0...+20 mA
-10...0...+10 V

CM-8820

3 inputs current

I: 1 A/5 A (parameterizable)
Output: 225 mV in accordance
with IEC 60044-8

CM-8830

LED module (upgradable) for
local process visualization per
EBIO line (128 LEDs)

AO-8380

4 analog outputs

-20...0...+20 mA
-10...0...+10 mA
-10...0...+10 V

AI-8510

3 inputs current/voltage

I: 225 mV as per IEC 60044-8
U: 100/√3 VAC, 230 VAC,
400/√3 VAC

AI-8511

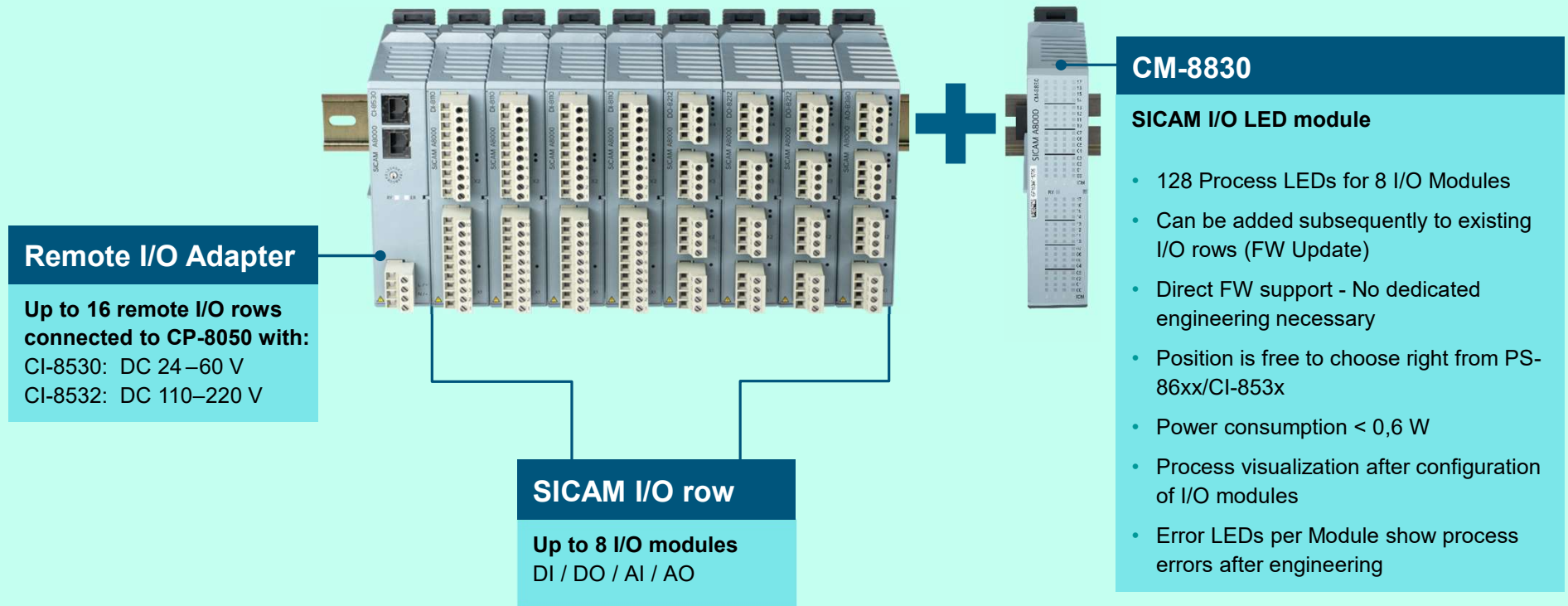
I: 225 mV as per IEC 60044-8
U: 3.25/√3 VAC

Integration of
functionality
of **SICAM FCM**



The SICAM A8000 I/O family grows up

SICAM A8000 CM-8830 I/O LED module



Module by module

SICAM A8000 - precisely tailored to the application



Space-saving dimensioning with slim CP module

- Grid connection for solar and wind farms
- Control and monitoring of electricity and gas distribution stations
- Simple gateway function

Everything in view with the compact solution on site

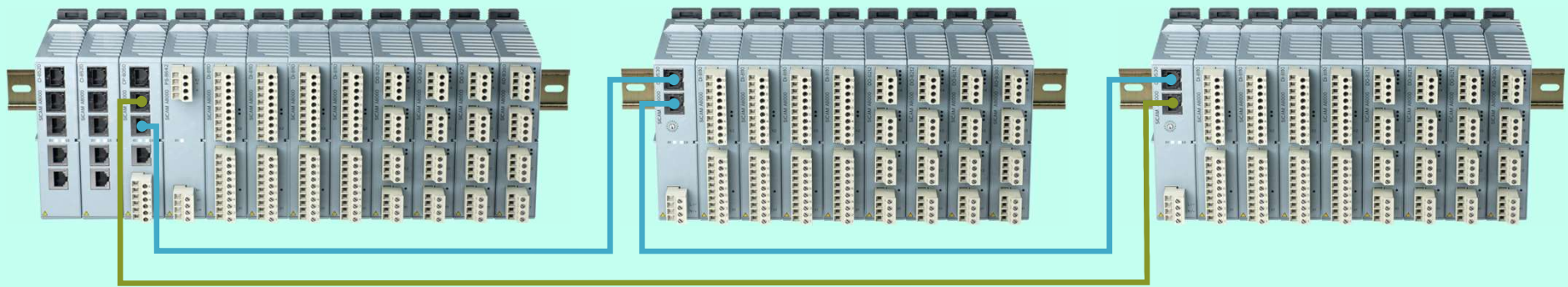
- Distribution grid automation and micro-grids
- Optimized for use in MV switchgear
- Load-flow control

With additional interfaces for complex tasks

- Power distribution and transmission, micro-grids
- Railway power supply
- Communication gateway

Module by module

SICAM A8000 - precisely tailored to the application



Ready to meet all challenges thanks to a modular system concept,
powerful CPU, and an integrated firewall

- **Daisy Chain & Ring**
- Max. 16 I/O lines
- Up to 100 m via standard Ethernet
- More than 100 m:
 - electrical/optical converters
 - “repeater function” of the CI-8530/32

- Small data nodes
- Communications gateway
- Pipelines
- Hydroelectric power plants

- Railway power supply
- Switchgear and transformer substations
- Automation of widely distributed networks

Redundancies

SICAM A8000 – additional features with CP-8050

Interface extension modules

Up to 6 modules possible:
2x CI-8520/22 or
6x CI-8551 or
1x CI-8520/22 and 5x CI-8551

PRP

In conjunction with CI-852x:
Parallel-Redundancy-
Protocol acc. to IEC 62439

HSR

In conjunction with CI-8520/22:
High Availability Seamless
Redundancy

RSTP & Line Mode

In conjunction with CI-8520/22:
Rapid-Spanning-Tree Protocol

Firmware Extension

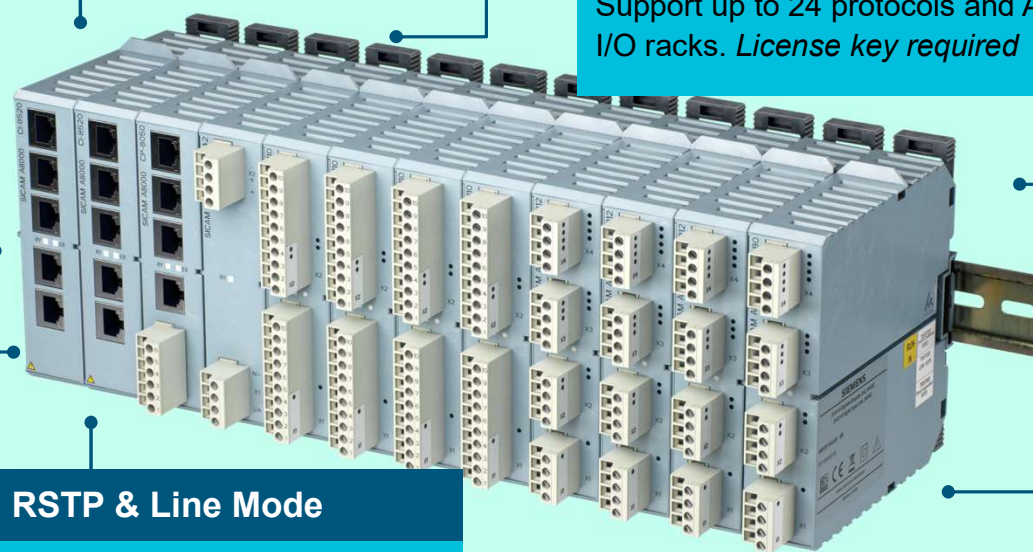
Support up to 24 protocols and A8000
I/O racks. *License key required*

Device Redundancy

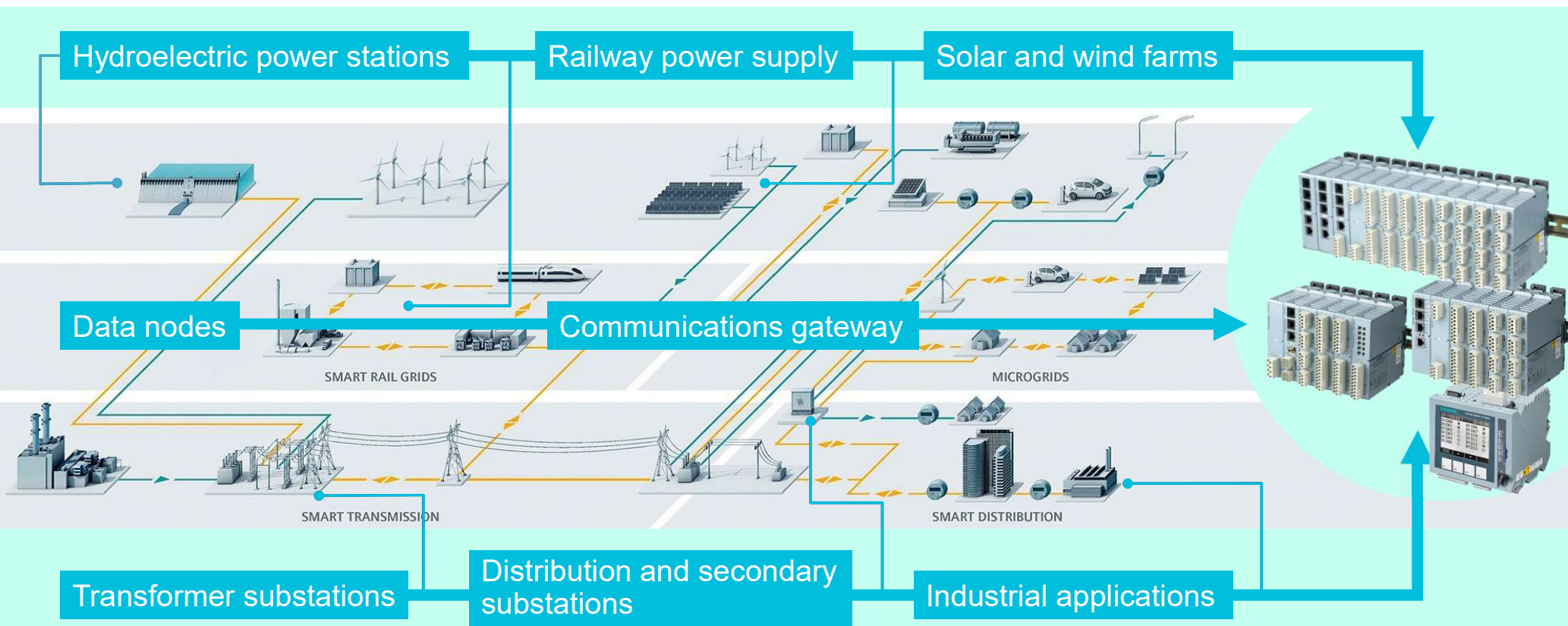
Device redundancy with
singular I/O modules and
integrated voting.
License key required

Coupling SICAM TM I/O modules

CM-6812 for coupling existing
I/O modules to SICAM A8000
CP-8050



Wherever energy flows SICAM A8000 - universal platform allows versatile use



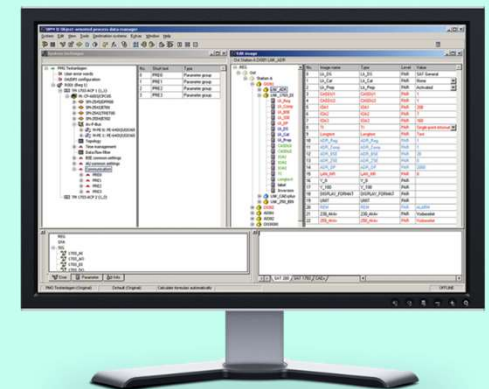
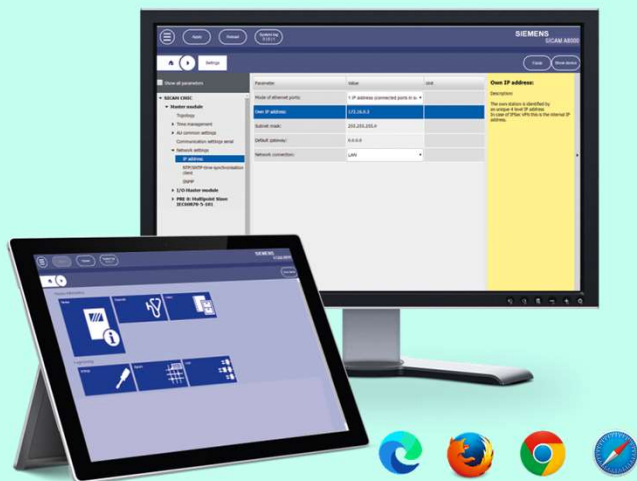
Convenient engineering

SICAM A8000 - parameterization, commissioning, and operation

with SICAM Web

with SICAM Device Manager

with SICAM TOOLBOX II



SICAM Web

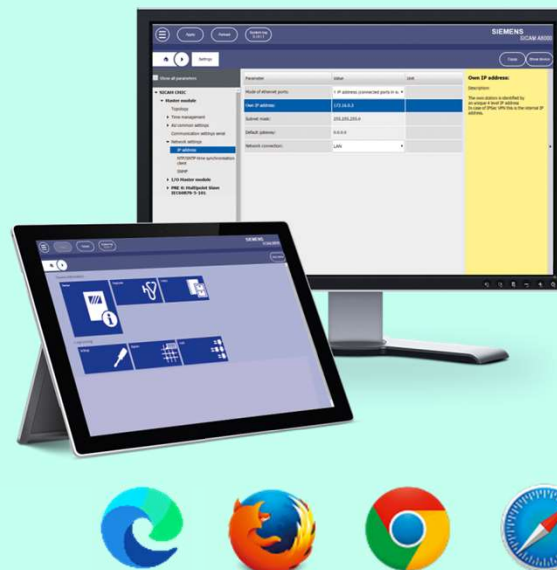
Parameterization made easy – with the online tool for SICAM A8000

Convenient functions

- Reliable and secure remote maintenance via https
- Cleartext diagnostics
- Event and alarm lists
- Supports simulation and testing

Technical highlights

- Plug & play functionality
- Simple and intuitive user interface
- Multilingual support
- Universal use on tablets and desktop PCs
- Operable on all standard browsers
- Optimized for small bandwidth



Advantages

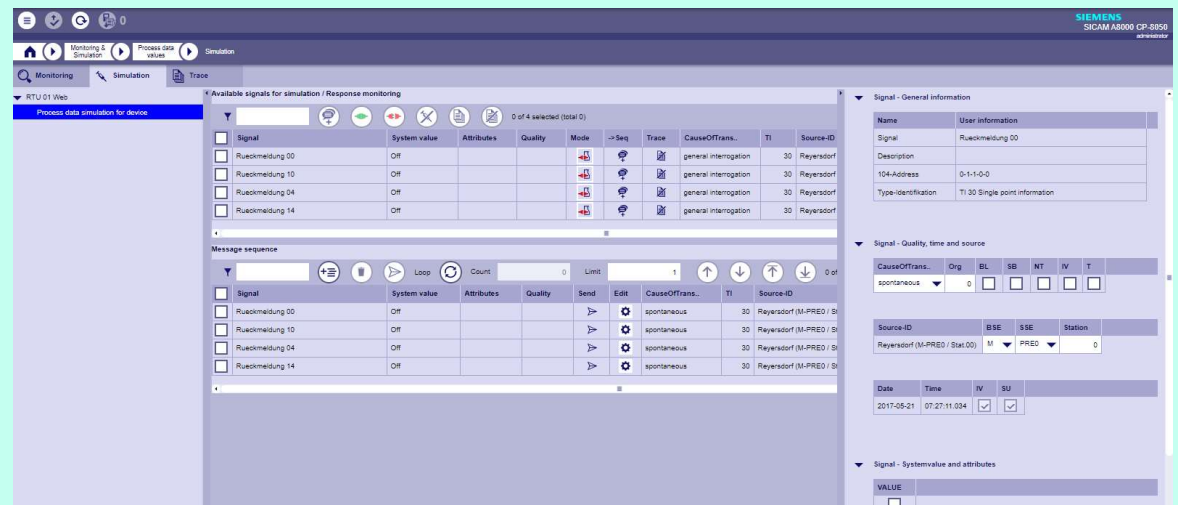
- Access to all parameters 24/7
- One-time assignment of address
- No limitation of applicability
- Maximized user friendliness

SICAM A8000 Series CP-8031, CP-8050 SICAM Web News



New SICAM Web functions for CP-8031/50

- System and firmware overview
- Wiring test of the I/O modules
- I/O datapoint simulation
- Monitoring, simulation & tracing of signals
- Integrated Wireshark functionality
- Protocol specific Websites



Why SICAM Web?

- Access via https directly to the device with role-based access
- Simulation functions only with appropriate authorization
- Diagnostic entry is set as soon as signals are disconnected from the process

SICAM Web for CP-8050, CP-8031

Customized dashboard

Customized dashboards

- Integration of individual SVG graphics
- Design of the SVG graphics with OpenSource Software Inkscape
- Structuring of the graphics using tile levels
- LED symbols for alarm visualization
- Integrated system functions (command, operating bar, key switch)
- Role-based SICAM Web access via https
- No additional engineering tool required



SICAM CP-8050



SICAM CP-8031

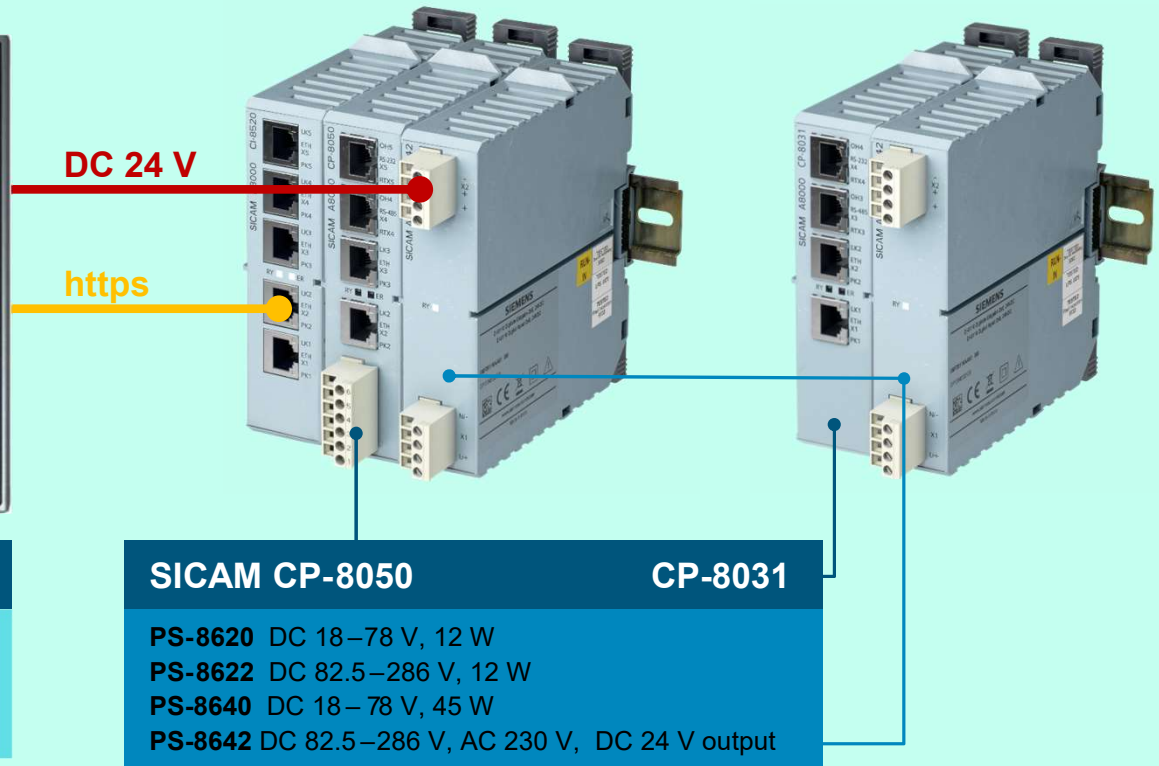
SICAM Web for CP-8050, CP-8031

Customized dashboard



SIMATIC Touchpanel

- IWP 700 7" (800 x 480)
- IWP 900 9" (800 x 480)
- IWP 1200 12" (1280 x 800) [own power supply required]



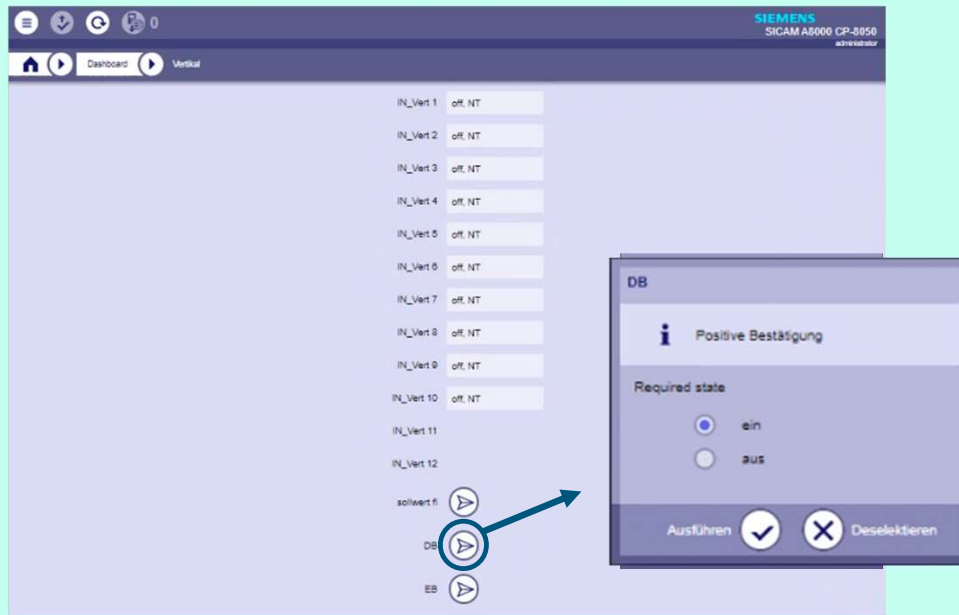
SICAM CP-8050

CP-8031

- PS-8620** DC 18–78 V, 12 W
- PS-8622** DC 82.5–286 V, 12 W
- PS-8640** DC 18–78 V, 45 W
- PS-8642** DC 82.5–286 V, AC 230 V, DC 24 V output

SICAM Web for CP-8050, CP-8031

Customized dashboard – List view

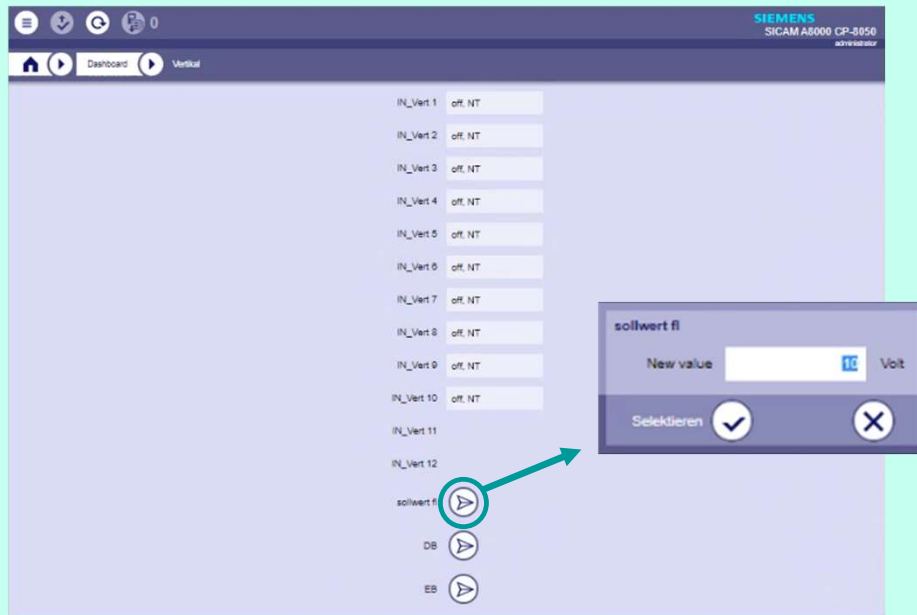


- Display of up to 64 signals (per tile) in list form
- Display of messages and measured values
- Signal names are displayed as tooltip

- Command (one or two stage)

SICAM Web for CP-8050, CP-8031

Customized dashboard – List view



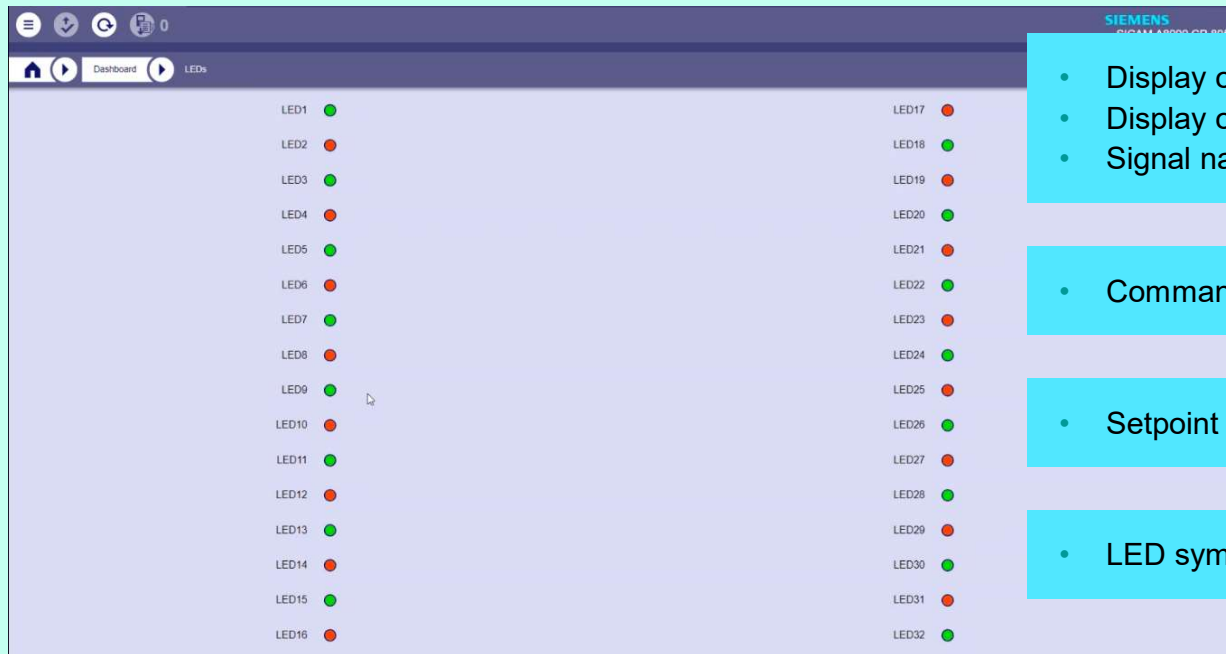
- Display of up to 64 signals (per tile) in list form
- Display of messages and measured values
- Signal names are displayed as tooltip

- Command (one or two stage)

- Setpoint setting

SICAM Web for CP-8050, CP-8031

Customized dashboard – List view



- Display of up to 64 signals (per tile) in list form
- Display of messages and measured values
- Signal names are displayed as tooltip

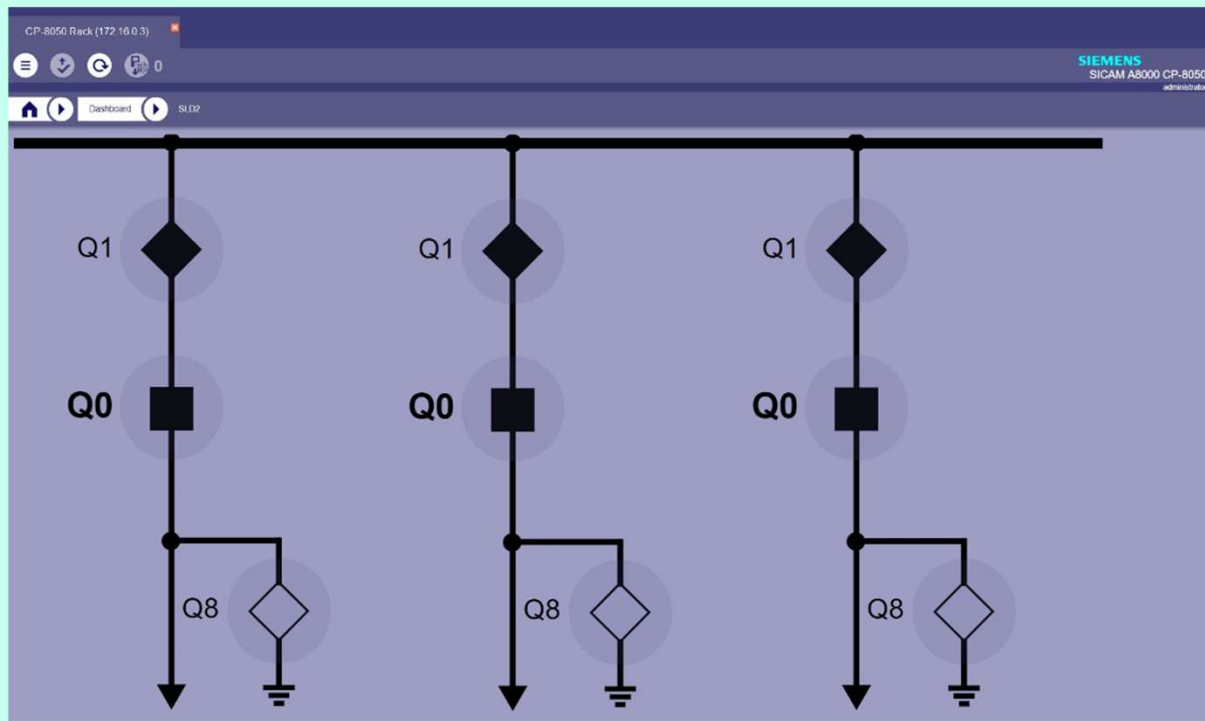
- Command (one or two stage)

- Setpoint setting

- LED symbols also possible

SICAM Web for CP-8050, CP-8031

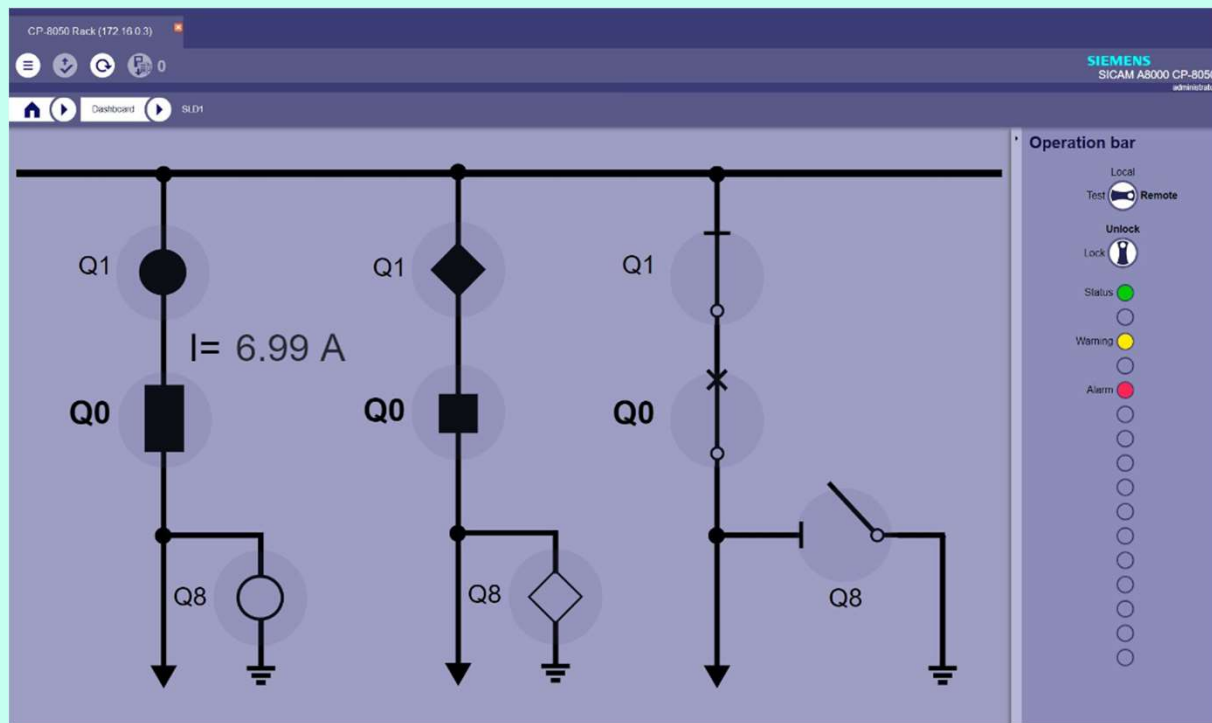
Customized dashboard – SVG-graphic



- Individual SVG graphic per tile
- In total 200 signals can be used for SVG graphics

SICAM Web for CP-8050, CP-8031

Customized dashboard – SVG-graphic with operating bar

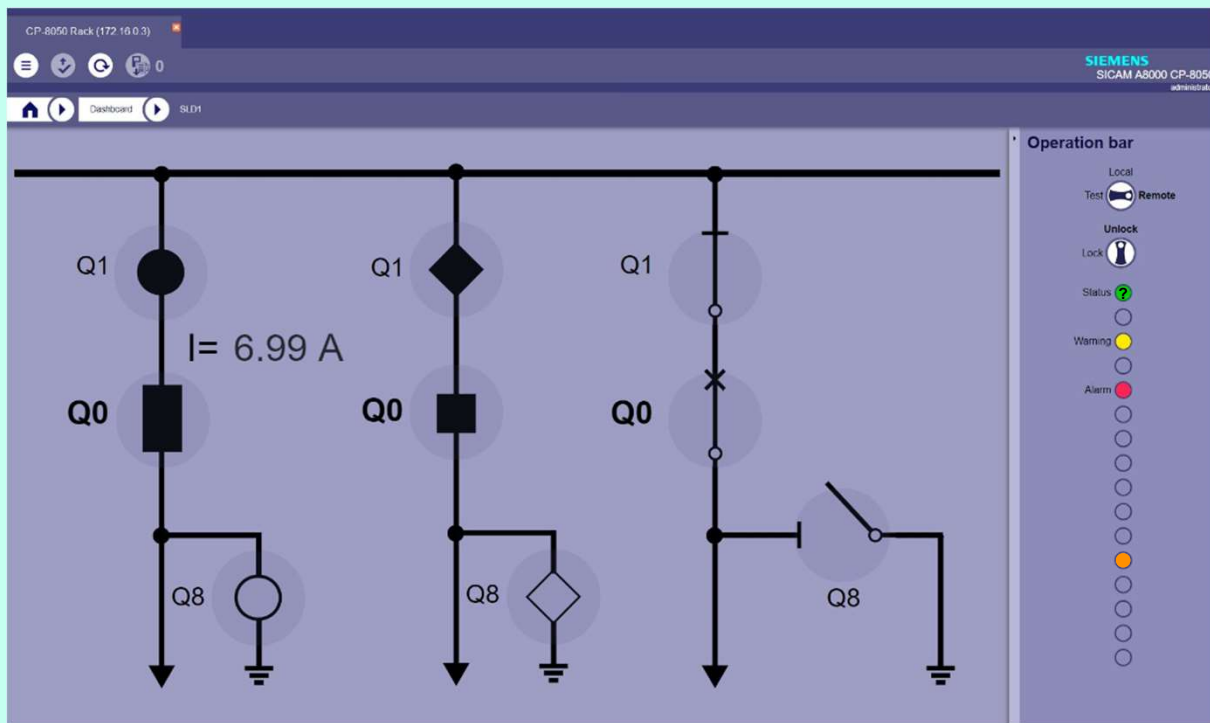


- Control panel as integrated system function
 - 2 key switches power failure safe (local/remote & interlock)
 - 16 LEDs for alarm visualization

- Command (one or two stage)

SICAM Web expansions for CP-8050, CP-8031

Customized dashboard – SLD view



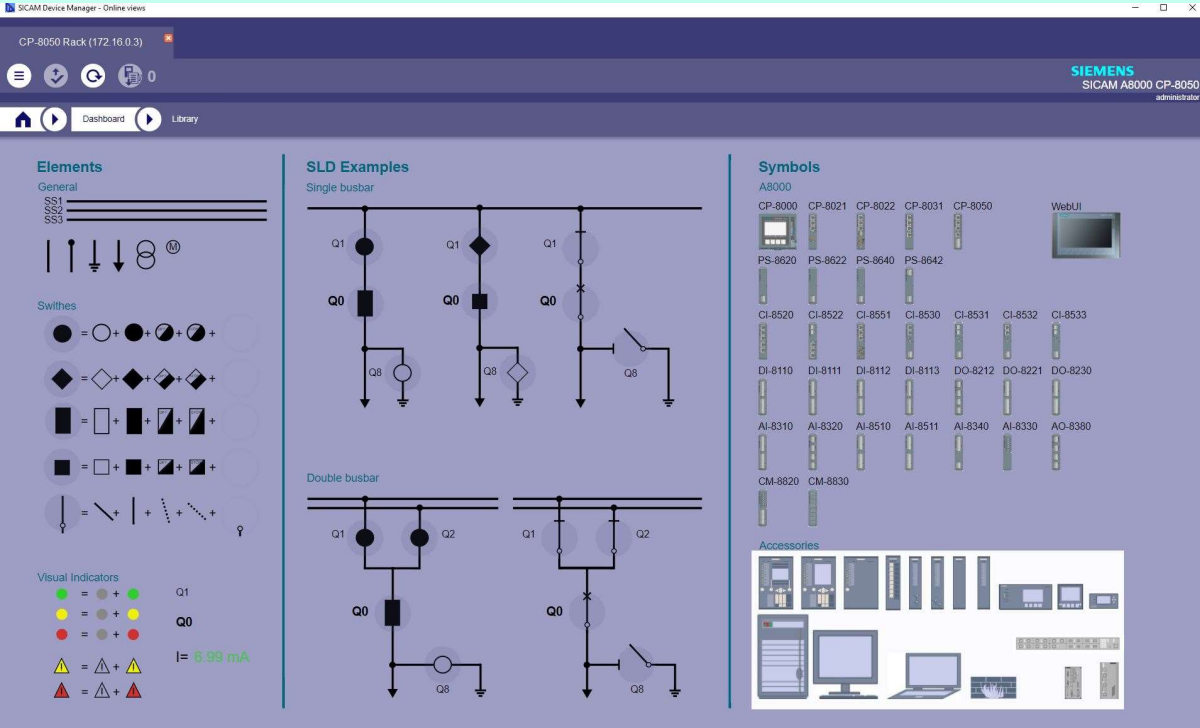
- Control panel as integrated system function
 - 2 key switches power failure safe (local/remote & interlock)
 - 16 LEDs for alarm visualization

- Command (one or two stage)

- NT bit marking incl. last status

- Display of differential positions for double-point indications

Customized dashboard – SVG examples



- Example symbols

SICAM Device Manager:

The intuitive engineering tool for SICAM A8000



Cyber Security:

SICAM A8000 - meeting the requirements of tomorrow

Integrated crypto chip

Protects data in a secure environment

IPSec encryption

Enables secure communication via IP networks

Secure and reliable https protocol

Guarantees the secure transmission of sensitive data

TLS encryption

Certificate based encryption acc. IEC 62351-3 for IEC protocols

Compliant with BDEW White Paper

Fulfills the recommendations for secure and reliable control and communication systems

Password-protected access to SICAM TOOLBOX II

Ensures that only authorized persons can access your system



Cyber Security:

SICAM A8000 - additional features with SICAM CP-8031, CP-8050

Firewall

For the separation of TCP/IP networks via integrated software firewall or additional hardware-based application firewall

Firmware Signature

Protection against firmware manipulation

Security Logbook

Non-volatile storage of SYSLOG events

Network Authentication

Certificate based network authentication acc. 802.1x

VLAN support

VLAN support acc. IEEE 802.1Q on CP-8050 and CI-8520

Hardware-based-Firewall

Hardware-based-Firewall for IEC104 in conjunction with CI-8520. *License key required*

Role Based Access Control

RBAC in accordance with IEC 62351-8 ensures that users may exercise only the rights that correspond to their assigned role

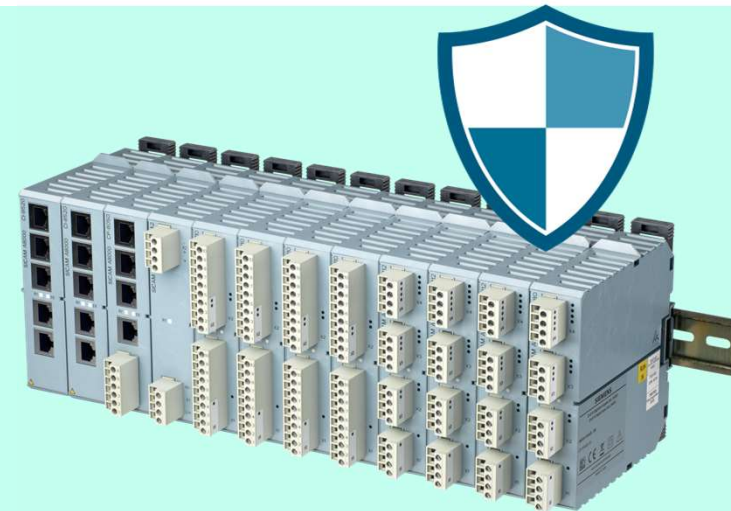
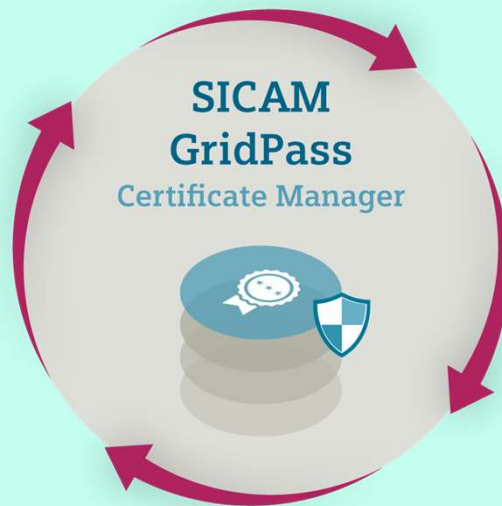
Configurable System Functions

Selective activation of individual or multiple system functions per communications interface



SICAM A8000 CP-8031, CP-8050

Supports SICAM GridPass



**CP-8031, CP-8050 devices can
automatically obtain certificates from
SICAM GridPass
for securing IEC 104, IEC 61850, DNP3**

Flexible communication:

Diverse range of interfaces and protocols with SICAM A8000

CP-8000 / CP-8021

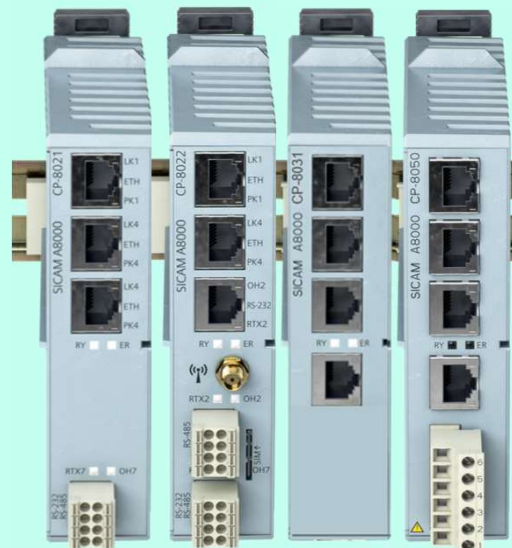
- 2 x RJ45 (Ethernet)
- 1 x RS 232 (RJ45)
- 1 x RS 232/485 (8-pin)

CP-8050

- 2 x Ethernet (RJ45)
- 1 x RS 232 (RJ45)
- 1 x RS 485 (RJ45)
- 6 x Expansion module
 - 2 x CI-8520 or
 - 6 x CI-8551 or
 - 1 x CI 8520 & 5 x CI-8551

in
pre

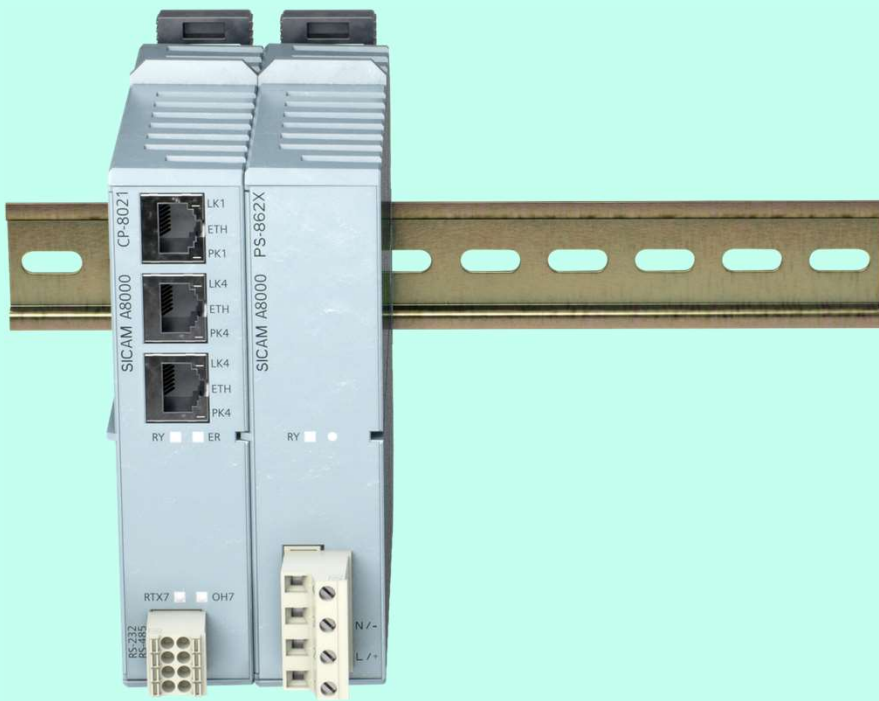
Multiple communication:



Flexible integration into an existing communications infrastructure through the support of standard protocols, legacy systems, and protocols from third-party manufacturers:

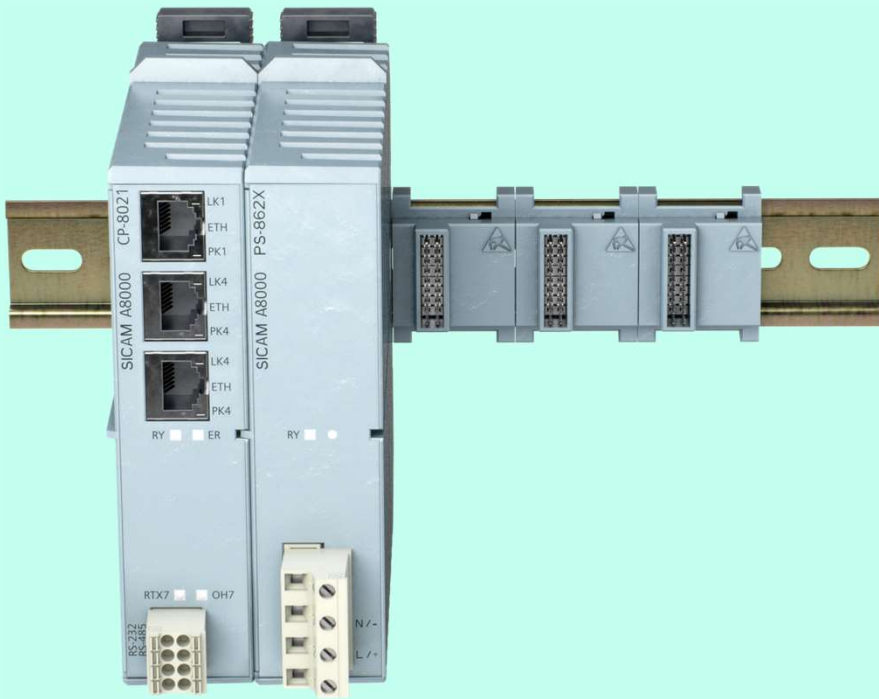
- IEC 61850
- IEC 60870-5-10x
- DNP3.0 serial/TCP
- Modbus RTU/TCP
- Additional protocols upon request

A strong team:
SICAM A8000 - simple to install



- Compact DIN rail mounting

A strong team:
SICAM A8000 - simple to install



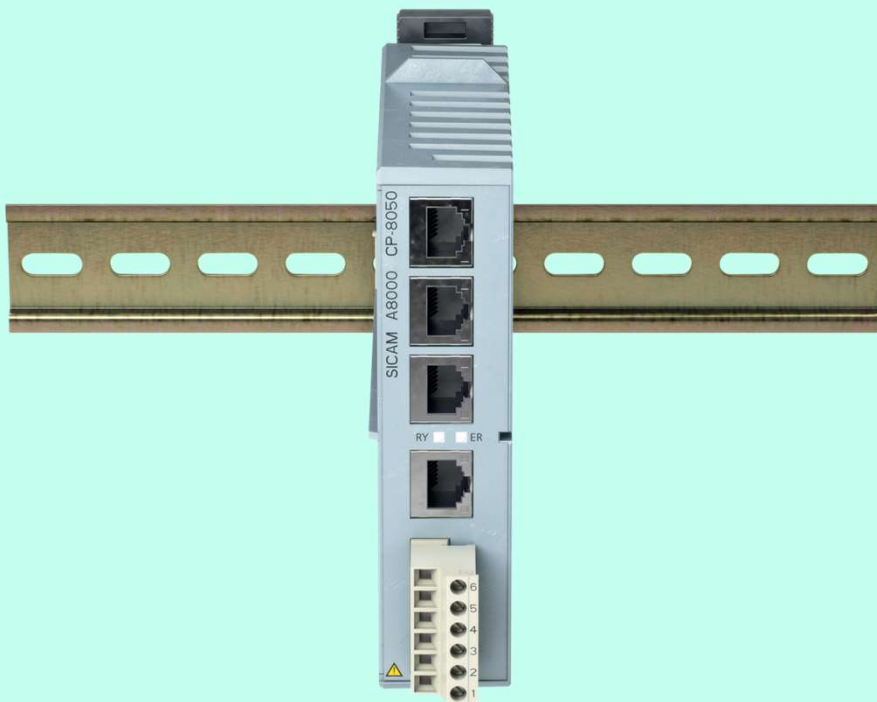
- Compact DIN rail mounting
- Consistent bus for I/O modules

A strong team: SICAM A8000 - simple to install



- Compact DIN rail mounting
- Consistent bus for I/O modules
- Individual combination of modules
- Detection of the plugged modules during startup

A strong team:
SICAM A8000 - module arrangement CP-8050



- SICAM A8000 CP-8050

A strong team:

SICAM A8000 - module arrangement CP-8050



- SICAM A8000 CP-8050
- Expandable Ethernet communication module (CI-8520/22 module)
- Expandable serial communication module (CI-8551 module)

A strong team:

SICAM A8000 - module arrangement CP-8050



- SICAM A8000 CP-8050
- Expandable Ethernet communication module (CI-8520/22 module)
- Expandable serial communication module (CI-8551 module)
- Singular power supply (PS module)

A strong team:

SICAM A8000 - module arrangement CP-8050



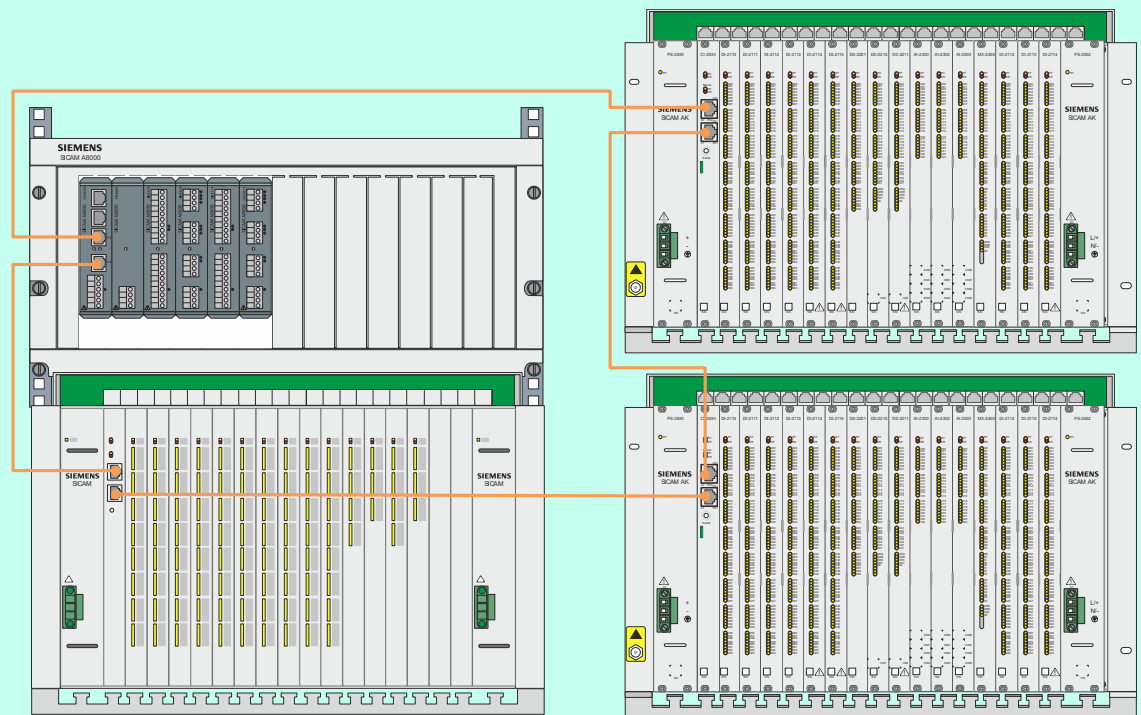
- SICAM A8000 CP-8050
- Expandable Ethernet communication module (CI-8520/22 module)
- Expandable serial communication module (CI-8551 module)
- Singular power supply (PS module)
- Or redundant power supply

SICAM A8000 Rack Solution

Offer packing density and migration for 19-inch rack mounted I/Os

SICAM A8000 CI-2530

- Coupling interface to connect SICAM I/O Racks to a CP-8050
- 1x CI-2530 per I/O Rack required
- 16 Rack I/O Modules can be used in one I/O Rack
- Up to 4 I/O Racks can be used
- Operating temperature -5°C ... +55°C
- Singular or redundant power supply can be used per I/O Rack with supported PS-2630 and PS-2632
- The following Rack I/O Modules will be supported and will aligned to the product-lifecycle of SICAM A8000 CP-8050:
 - Hardware: DI-2112/13/14/15
 - Hardware: DO-2201
 - Hardware: DO-2210/11 incl. SM-2506
 - Hardware: AI-2300 incl. SM-057x
- For migration from SICAM AK to CP-8050, older SICAM AK I/O modules are supported under the following conditions:
 - I/O Rack must be changed
 - Front panel must be changed
 - Power Supplies must be changed
 - Details can be found in the user manual



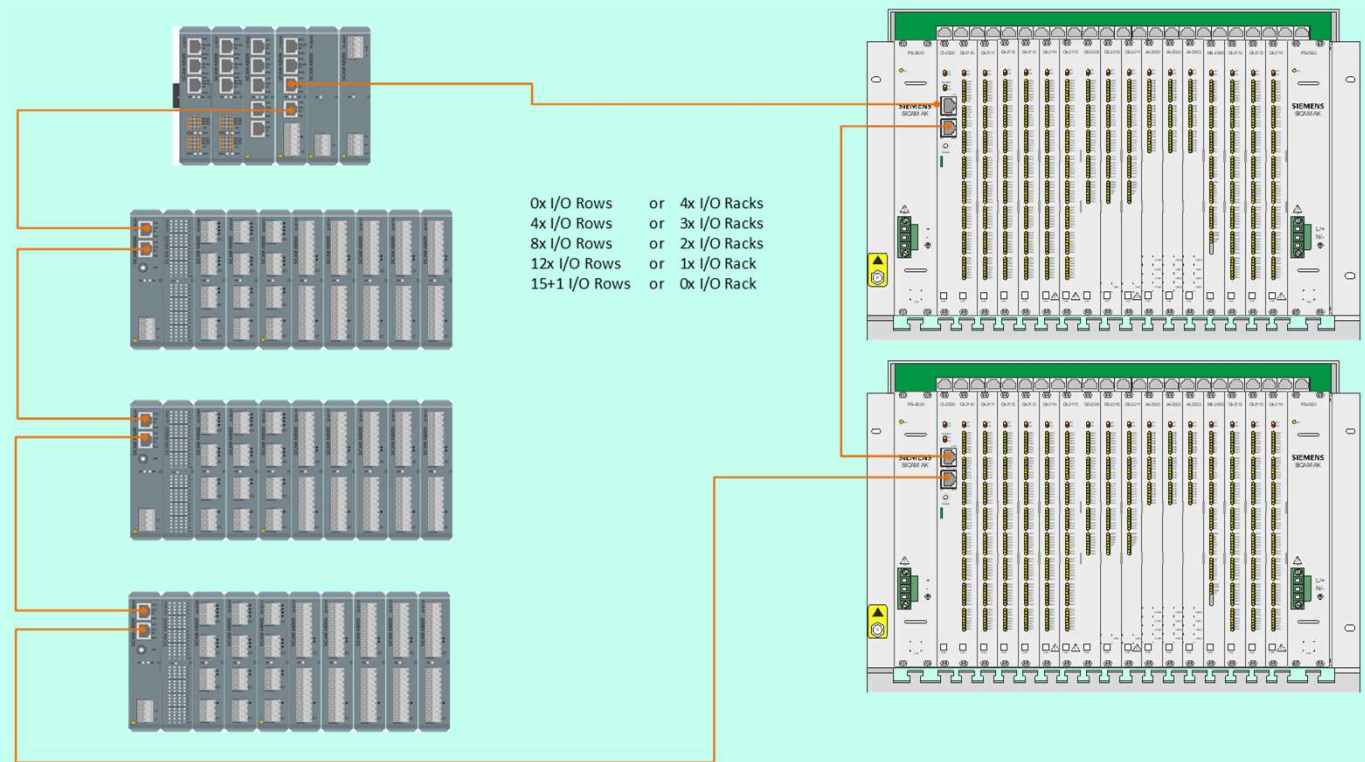
SICAM A8000 Rack Solution

Combining newest platform CP-8050 with packing density

CI-2530

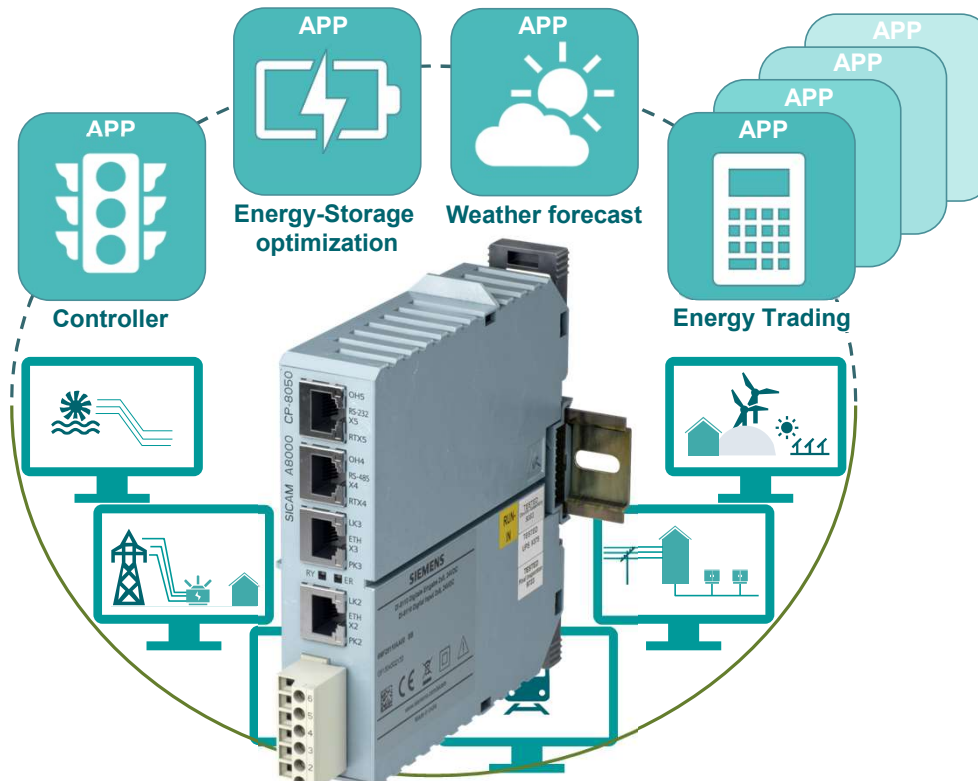
- Line- and ring configurations are supported
- I/O Racks and I/O Rows can be mixed up within a ring.
- The following combinations are allowed:

I/O Rows (within ring)	I/O Racks (within ring)
0	4
4	3
8	2
12	1
15	0



SICAM A8000 SIAPP Concept

SIAPP embedded in CP-8031 or CP-8050



SICAM A8000

Sample Applications

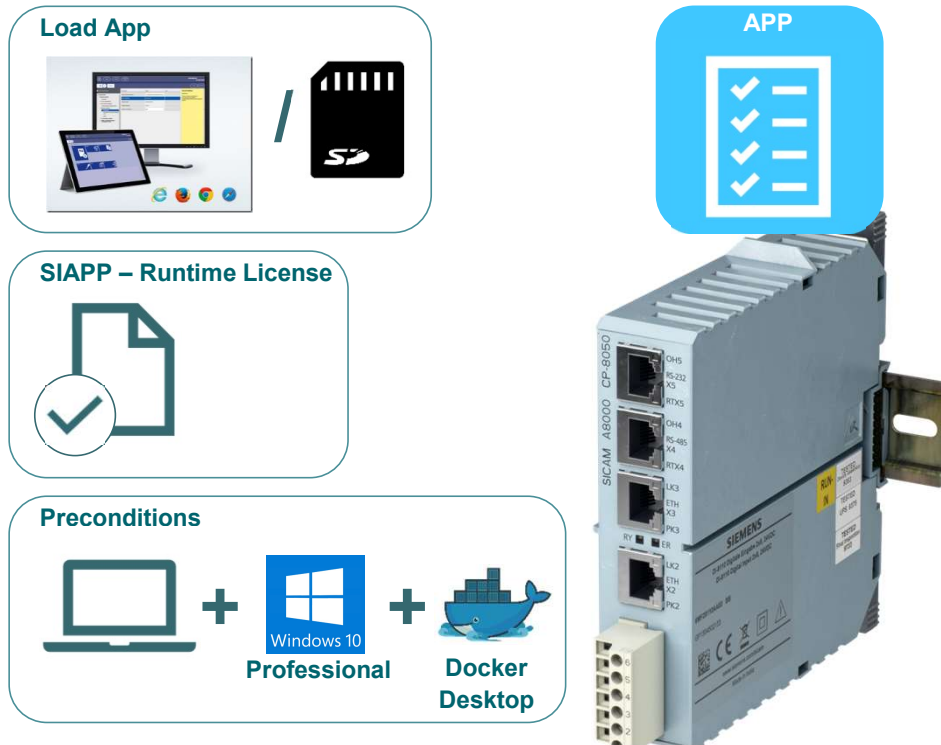
- Transformer-Controller
- Optimization of energy storages
- Weather forecast to optimize control and feed-in algorithms of renewable power plants
- Cost optimization during energy trading

Customer Benefits

- Reducing Hardware / 3rd Party-Devices
- Run customized APPs on a rugged Hardware
- Use RTU-data without physical interfaces
- Use existing features of SICAM A8000-System

SICAM A8000 SIAPP Concept

SIAPP Preconditions



SIAPP Setup

- Preconditions
- SIAPP-Runtime-License
- **SIAPP SDK**
- Program and test against provided API
- Build SIAPP as Docker-Image
- Load SIAPP into CP-8031 or CP-8050 via SICAM Web or SD-Card
- CP-8031 module: 1 SIAPP
- CP-8050 module: max. 3 SIAPPs simultaneous

Summary

Standards

- Standard cable (RJ45, CAT5e)
- Standard technology (Ethernet, Webserver)

Compatibility

- SICAM TOOL BOX II integration
- Further use of CAExplus Logic
- TM I/O module

Reduced complexity

- No proprietary bus hubs (CM-084x)
- SICAM Web online functions in the device available without a license

CP-8021



CP-8022

Integrated GPRS modem

SICAM A8000

CP-8000

Compact design

- SICAM I/O modules are only 30 mm wide

CP-8050



CP-8031

Cyber Security

- Meets future security requirements

Interfaces

- Max. 8 extension modules
- Max. 16 I/O lines or max. 4 I/O racks
- Max. 34 interfaces (modular)
- Network functionality (TCP/IP protocol architecture, switching, HSR, PRP, RSTP)
- Redundancy

Performance

- Remote SICAM I/O modules possible (electrically or optical)
- Dual core CPU & memory

Interfaces

- Max. 8 extension modules
- 1 I/O line
- 4 interfaces (on board) 2x Ethernet, 2x serial

Great benefits right from the factory: SICAM A8000 - well-designed for practical use

1. Platform modularity for **versatile application options and reduced inventory**
2. Extended temperature range of -40°C to +70°C for **rough ambient conditions**
3. Highest EMC stability up to 5 kV (IEC 60255) for **direct use in substations**
4. Integrated short-circuit indicator functionality for **use in cable network monitoring**
5. Use of international standards such as IEC 61850 for **high investment security**
6. Integrated crypto chip and IPsec encryption to **fulfill the high cyber security requirements**
7. Multitude of interfaces and integrated GPRS module for **simple adaptation to existing communication infrastructures**
8. Integrated web server for **simple engineering**
9. Plug-and-Play functionality of the modules for **time and cost savings**

Great benefits right from the factory:
SICAM A8000 - well-designed for practical use

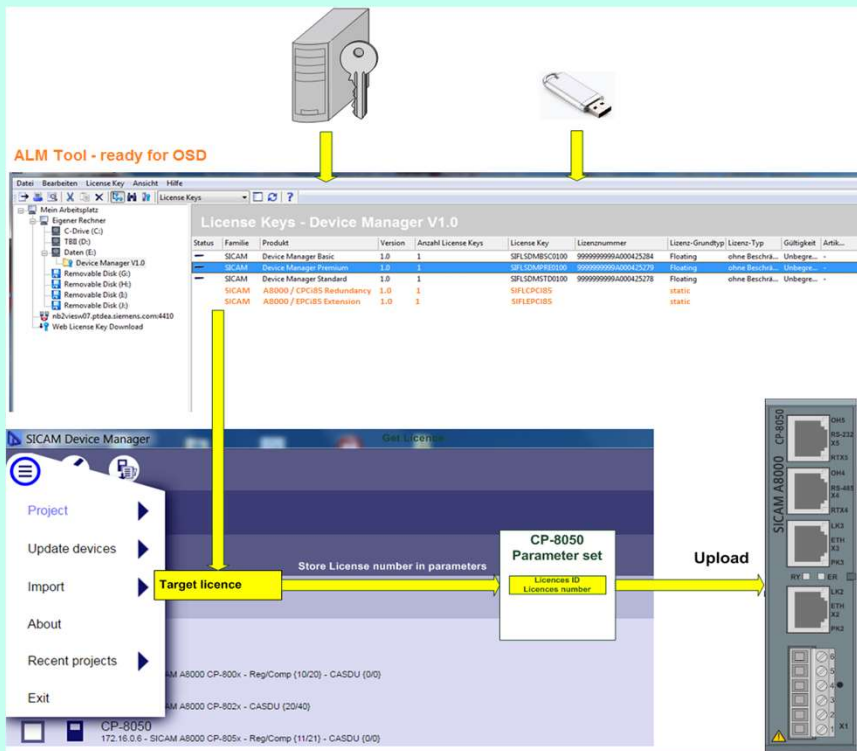
Module	Designation	MLFB
CP-8000	(previously) CMIC (-25 to +70 °C) (integrated power supply)	6MF21010AB100AA0
CP-8000	(previously) CMIC (-40 to +70 °C) (integrated power supply)	6MF21011AB100AA0
PS-8620	Power supply operating voltage DC 24...60 V (12 W)	6MF28620AA00
PS-8622	Power supply operating voltage DC 110...220 V (12 W)	6MF28622AA00
PS-8640	Power supply operating voltage DC 24...60 V (45 W)	6MF28640AA00
PS-8642	Power supply operating voltage DC 110...220 V, AC 230 V (45 W)	6MF28642AA00
CP-8021	Processor module, 4 interfaces onboard	6MF28021AA00
CP-8022	Processor module, 5 interfaces onboard + 1x GPRS	6MF28022AA00
CP-8031	Processor module, 4 interfaces onboard	6MF28031AA00
CP-8050	Processor module, 5 interfaces onboard (expandable up to max. 14)	6MF28050AA00
CI-8520	ETI4/ETI5 Ethernet communication interface	6MF28520AA00
CI-8522	F/O Ethernet communication interface	6MF28522AA00
CI-8530	I/O detached interface module electrical DC 24...60 V	6MF28530AA00
CI-8532	I/O detached interface module electrical DC 110...220 V	6MF28532AA00
CI-8551	Serial communication interface	6MF28551AA00

Great benefits right from the factory:
SICAM A8000 - well-designed for practical use

Module	Designation	MLFB
DI-8110	Binary input 2x8, DC 24 V	6MF28110AA00
DI-8111	Binary input 2x8, DC 48/60 V	6MF28111AA00
DI-8112	Binary input 2x8, DC 110 V	6MF28112AA00
DI-8113	Binary input 2x8, DC 220 V	6MF28113AA00
DO-8212	Binary output relay 8x DC 24...220 V/AC 230 V	6MF28212AA00
DO-8221	Secure command output	6MF28221AA00
DO-8230	Binary output transistor DC 24...60 V	6MF28230AA00
AO-8380	Analog output -20...0...+20 mA, -10...0...+10 mA, -10...0...+10 V	6MF28380AA00
AI-8310	Analog input Pt100/Ni100 (2 groups with 2 AI each)	6MF28310AA00
AI-8320	Analog input 4x ± 20 mA/ ± 10 V	6MF28320AA00
AI-8510	Analog input 3x U, 3x I (LoPo)	6MF28510AA00
AI-8511	Analog input 3x U (LoPo), 3x I (LoPo)	6MF28511AA00
CM-8811	I/O coupler module CP-8000	6MF28811AA00
CM-8820	Current transformer adapter module 3x I (1 A/5 A)	6MF28820AA00
CM-8830	SICAM I/O LED module	6MF28830AA00

SICAM A8000 CP-8050

Enhanced featureset – License import



5 Unique license keys for 5 features

- Delivery preferably via OSD

License management via ALM infrastructure

License keys are stored in the parameter set

License keys are also stored on the SD card

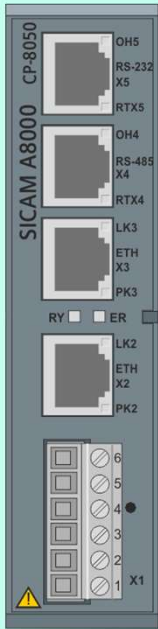
Parameterization without license key possible *

- 3 weeks trial (Diagnostics-Warning)
- After 3 weeks, functionality stops

* not available for 6MF27502WE00

SICAM A8000 CP-8050

Enhanced featureset – License keys



Designation	MLFB
SICAM A8000 Redundancy *	6MF27500RE00
SICAM A8000 Extended processing **	6MF27500EP00
SICAM A8000 IEC104 Firewall	6MF27500FW40
SICAM A8000 LXC Container ***	6MF27500LX00
SICAM A8000 extended SICAM Web ***	6MF27502WE00

- * Delivery of 2 license keys, only for CP-8050
- ** Required per extended processing firmware EPC185
- *** Can also be used on CP-8031

| Contact

Michael Schachinger MSc

SI DG EA-P&R AT PLM

Siemensstraße 90

1210 Vienna, Austria

Phone: +43 (0) 664 8855 6756

E-mail: michael.a.schachinger@siemens.com

www.siemens.com/sicam-a8000