SIPROTEC 5 i SIPROTEC V

Digitalna trafostanica:

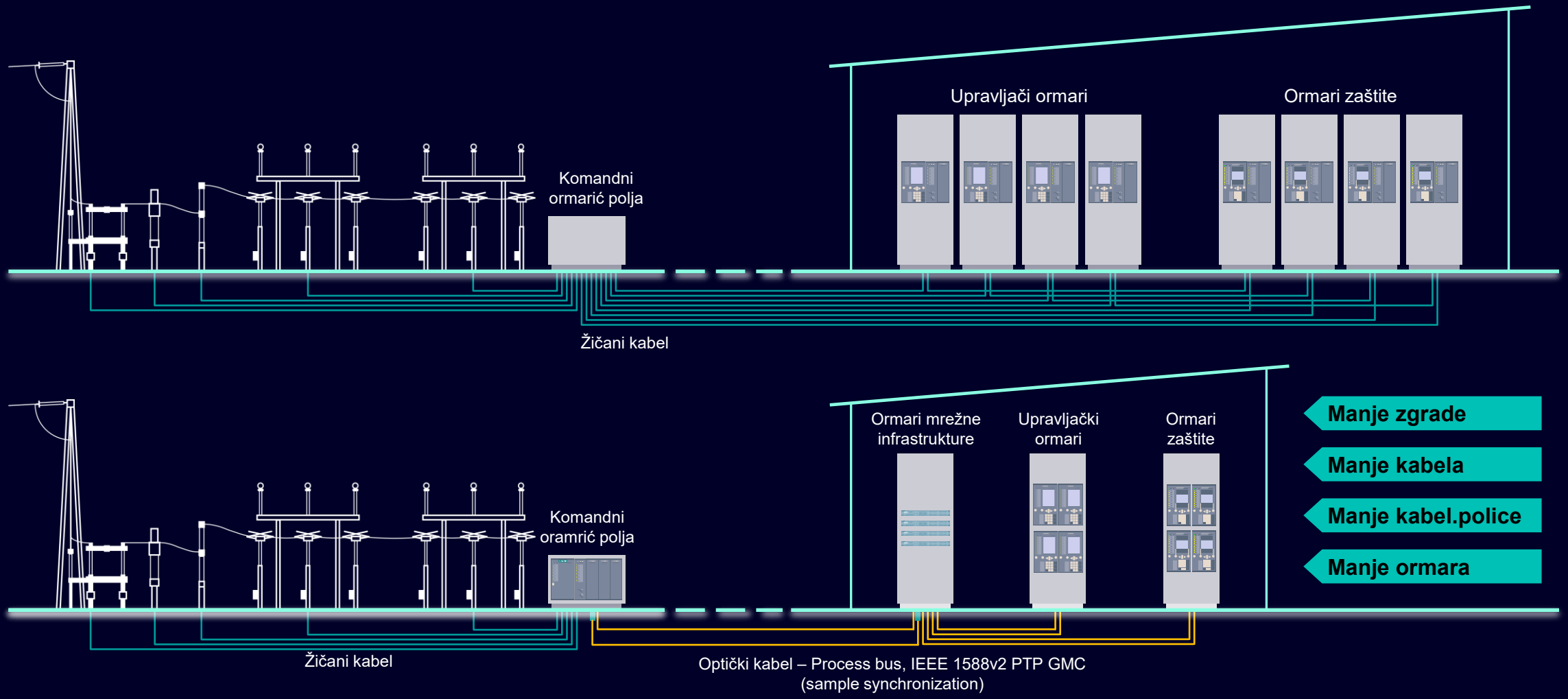
Procesna sabirnica

Virtualizirana zaštita i upravljanje

Visit our website

SIEMENS

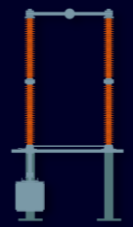
Potencijal održivosti digitalnih trafostanica
Koja rješenja digitalna trafostanica pruža za veću održivost?



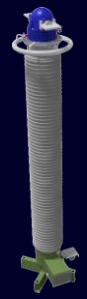
SIEMENS

SIPROTEC 6MU85 Jedinica za spajanje (Merging unit - MU)

Digitalizacija svih primarnih uređaja



Rstavljač
Upravljanje i položaj



Siemens Energy
VN-GIS LPIT

Blokada na razini polja

Automatski regulator napona

Logika za upravljanje hlađenjem transformatora

Ostala logika

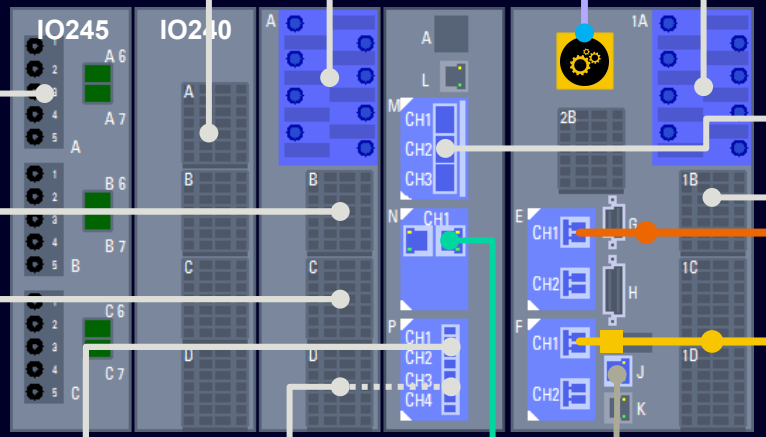
Mjerna jezgra

Zaštitna jezgra

Induktivni strujni Transformator
1A, 5A

Prekidač
Isklop, Upravljanje i ploža
Nadzor isklopnog kruga

Trench Optički SMT



Senzor zaštite od el. luka

Induktivni naponski Transformator

IEC 61850-8-1 MMS
IEC 61850-8-1 GOOSE

IEC 61850-9-2 SV
IEC 61850-8-1 GOOSE

Buchholz relej
Isklop i alarm

Uređaj za smanjenje tlaka

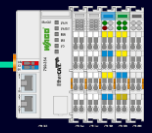
Temperatura
4..20 mA

Senzor protoka
4..20 mA

Tap pozicija
Pozicija i upravljanje digitalno ili 4..20mA

TR1200 IP

Temperaturni senzor
up to 12x PT100



Modbus TCP
Uređaji, senzori, …

RS485 bus

Modbus RTU
e.g. SF6 senzor gustoće plina

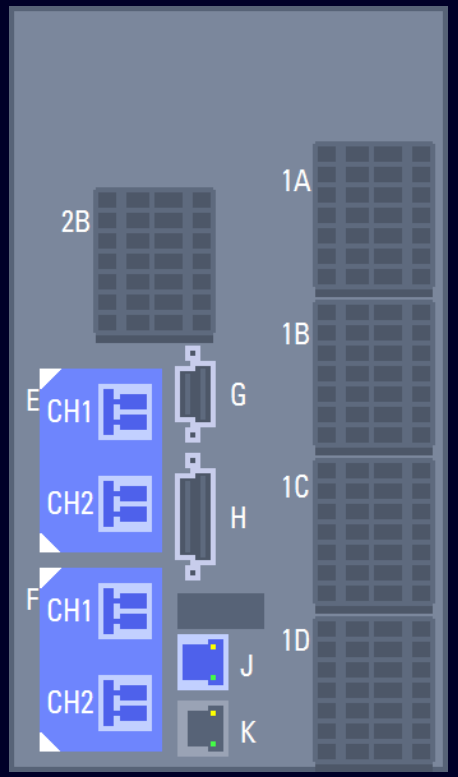
SIEMENS

SIPROTEC 5
7SX85 bez analognih ulaza za mjerenje struje i napona

Napajanje

Ethernet sučelje
Stanična sabirnica

Ethernet sučelje
Procesna sabirnica



Bez strujnih ulaza

Bez naponskih ulaza

Binarni ulazi

Binarni izlazi

Nova HW varijante 7SX85 uređaja

Bez CT i VT ulaza

- Savršeno rješenje kao klijent za procesnu sabirnicu
- Optimalni uređaj za centralnu zaštitu malih trafostancia

Ethernet sučelja

- Station Bus (MMS, GOOSE)
- Process Bus (SV, GOOSE)

Binarni ulazi i izlazi

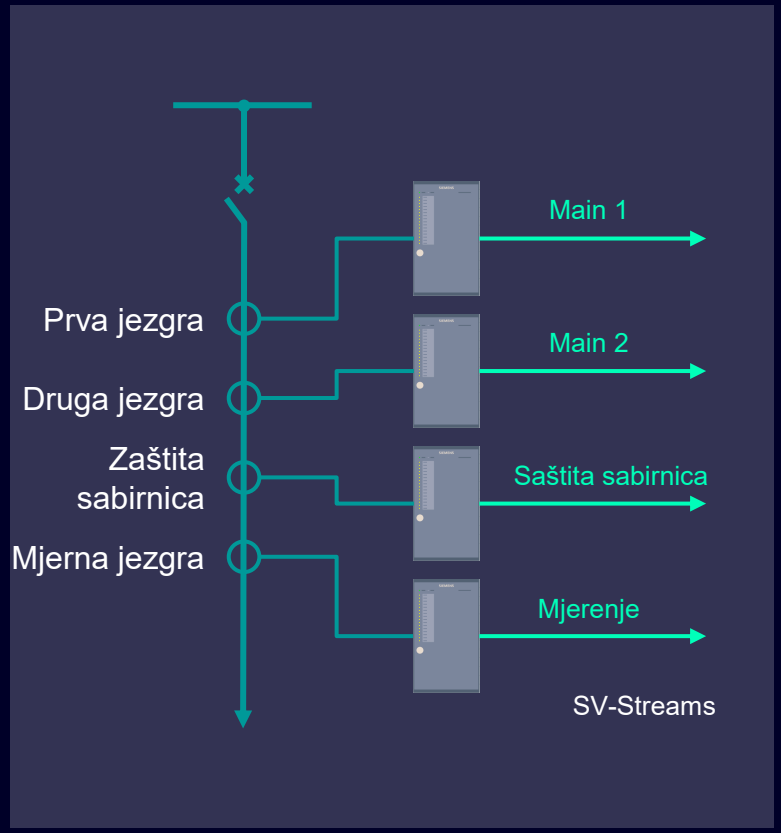
- Prikupljanje binarnih podatak (19BI, 11BO)

SIEMENS

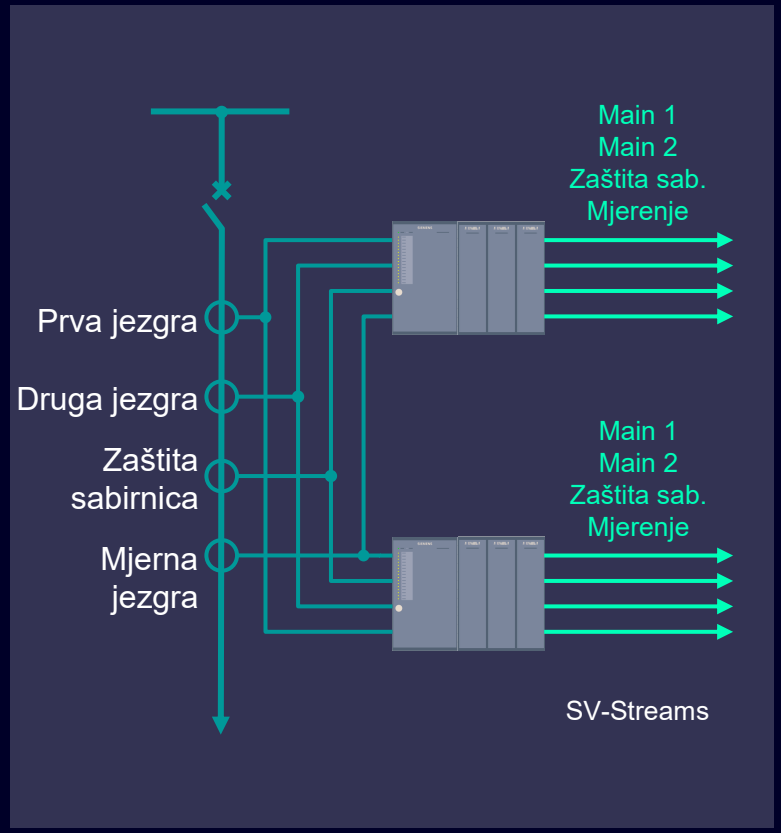
SIPROTEC 6MU85 Jedinica za spajanje

Prilagodljiv za razne CT i LPIT strujne jezgre / zahtjeve

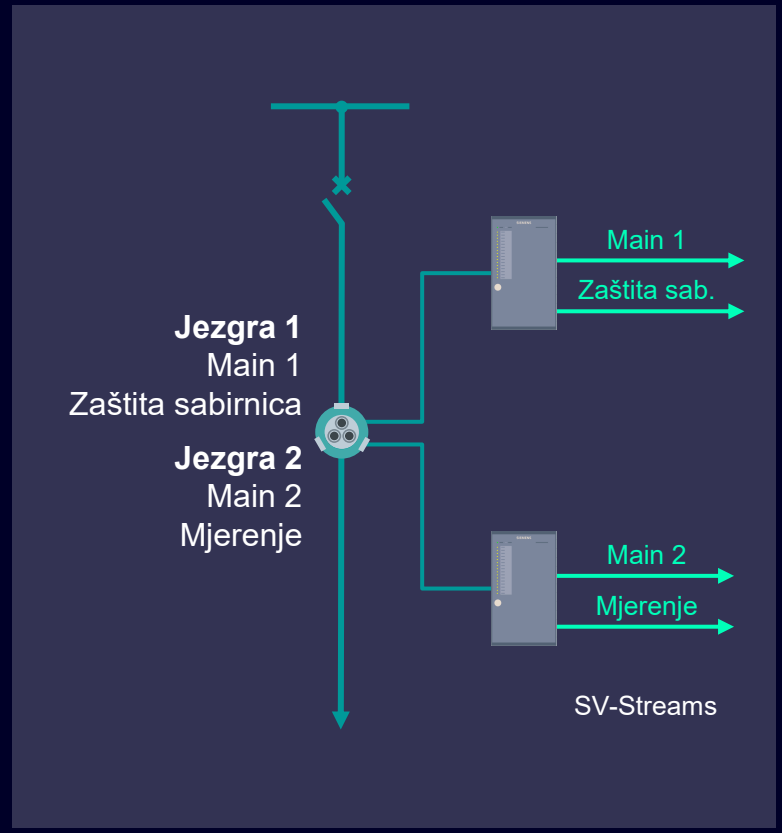
Jedan MU po CT jezgri



Redundantni MU za sve CT jezgre



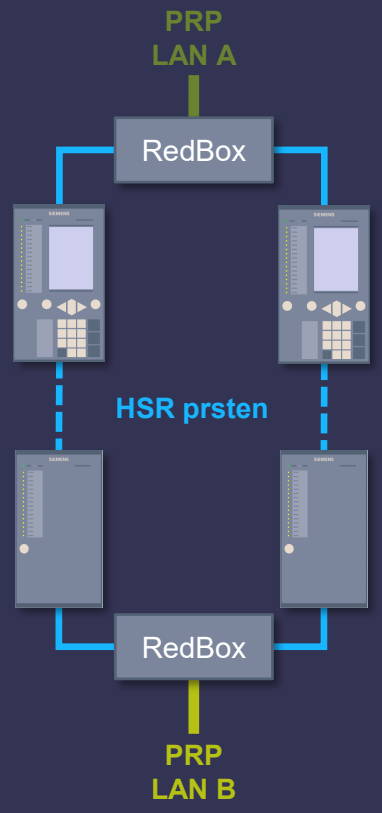
Redundantni MU za sve CT jezgre



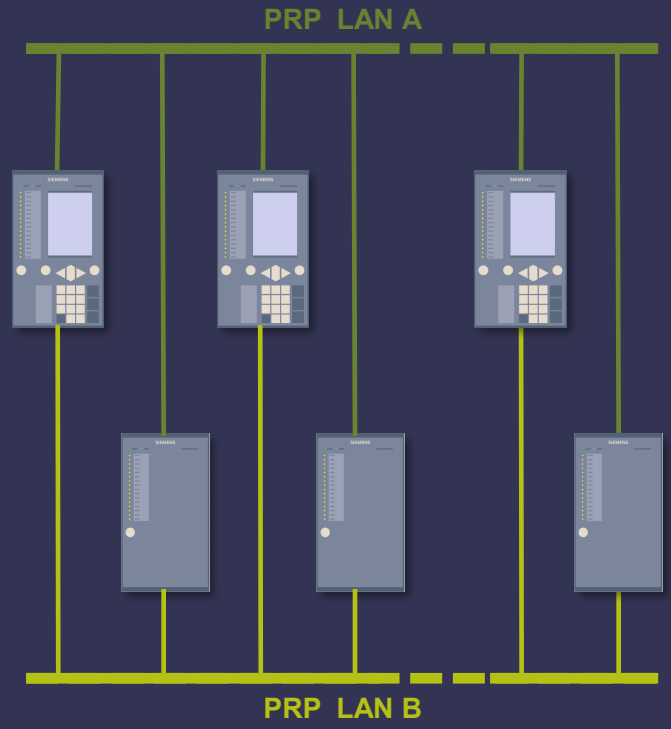
SIEMENS

SIPROTEC 5 Procesna sabirnica – Arhitektura mreže
Mrežna redundancija procesne sabirnice

HSR
(High Availability Seamless Redundancy)



PRP
(Parallel Redundancy Protocol)



Osigurajte dostupnost

Procesna sabirnica mora biti pouzdana i stoga je besprijekorna redundancija ključna

Opterećenje mreže ne smie prelaziti više od 60% dostupne propusnosti.

Može se primijeniti VLAN ili fizička Ethernet segregacija.

PRP

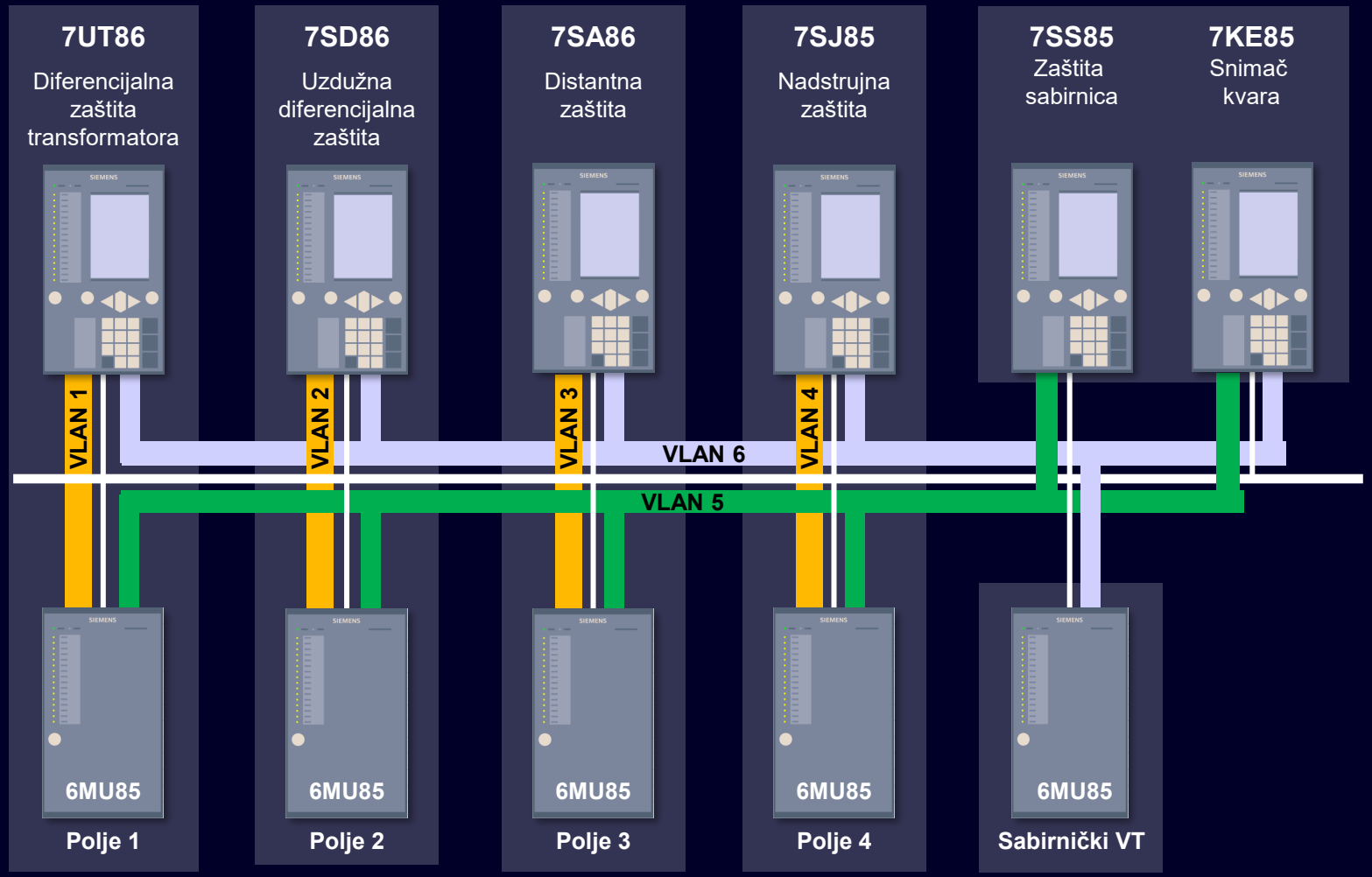
- IEEE 1588v2/PTP (OCSO ili OCGC)

HSR

- Do17 IED po HSR prstenu i 2x Redundantni Box (RedBox)
- IEEE 1588v2/PTP (P2P TC, P2P TC + OCSO ili P2P TC + OCGC)

SIEMENS

SIPROTEC 5 Precesna sabirnica – Arhitektura mreže
Segregacija virtualne mreže (VLAN)



Pojednostavljenje složenog

Segregacija jedne redundantne mreže procesne sabirnice u nekoliko virtualnih LAN-ova kako bi smanjili opterećenje

VLAN 1-4	CT, VT vrijednosti zaštite polja
VLAN 5	CT vrijednosti za zaštitu sabirnica i snimač kvara
VLAN 6	Sabirnički VT za centralni snimač kvara zaštita polja

SIEMENS

SIPROTEC 5 – WebUI

Dijagnostika funkcionalnosti komunikacijskog modula za procesnu sabirnicu ETH-BD-2FO

Overview > Health

Health Information

Module	OK
Channel #1	OK
IEC61850_8_1	OK
PBMu	OK
HSR	OK
IEEE1588	OK

Application Diagnosis > HSR

HSR Diagnostic

	CH 1 (Port A)	CH 2 (Port B)
Status	Up	Up
txPacket	0	0
rxPacket	0	0
txPacket 10s	0	0
rxPacket 10s	0	0
Seamless Connections	0	
Deleted Duplicates	0	0
Deleted Duplicates 10s	0	0

Application Diagnosis > IEEE 1588 HiAcc

PTP General

PTP profile	IEC 61850-9-3:2016		
Transport protocol	Layer 2 Multicast		
VLAN tag	Not Supported		
Channel live state	On		
Clock type	OCSO and P2P TC		
Mode of synchronization	1-step		
Port state	LISTENING		

P2P Transparent Clock

General			
Clock ID	00:A0:0A:FF:FE:10:3C:3D		
Domain number	0		
Path delay mechanism	Peer-to-Peer		
P2P request interval	1000		milliseconds
Syntonization	No		
	CH1	CH2	
Peer mean path delay	0	0	nanoseconds

Slave Clock

General			
Slave clock ID	00:A0:0A:FF:FE:10:3C:3D		
Domain number	0		
Path delay mechanism	Peer-to-Peer		
P2P request interval	1000		milliseconds
Announce receipt timeout	3000		milliseconds
Servo status	Acquiring		
Offset from master	+0		nanoseconds
	CH1	CH2	
Peer mean path delay	0	0	nanoseconds

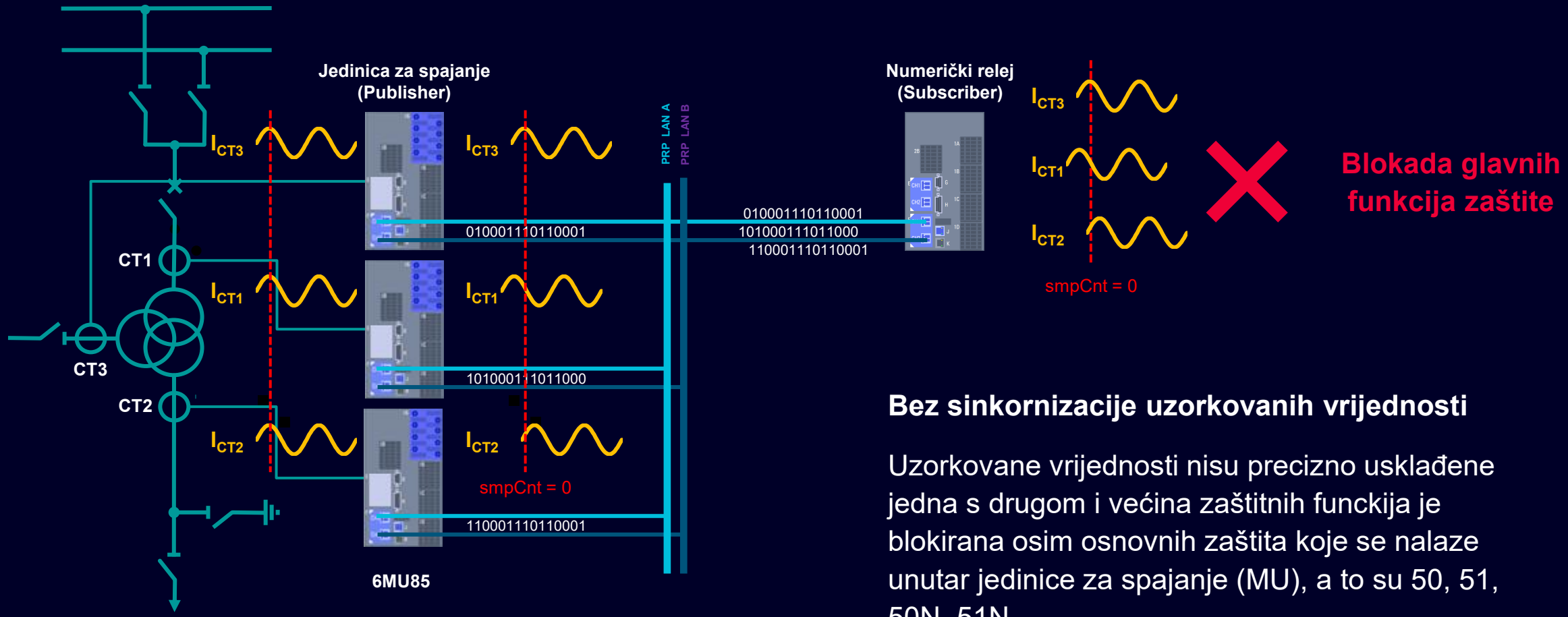
Prednosti

Jednostavan, siguran i brz pristup detaljnom stanju komunikacijske veze prilikom ispitivanja i pogonskog rada.

- Status portova
- IEEE 1588v2/PTP
- Process Bus Merging Unit
- Process Bus Client
- HSR
- PRP
- SNTP
- …

SIEMENS

Sinkronizacija uzorkovanih vrijednosti
Zašto je potrebna sinkronizacija?

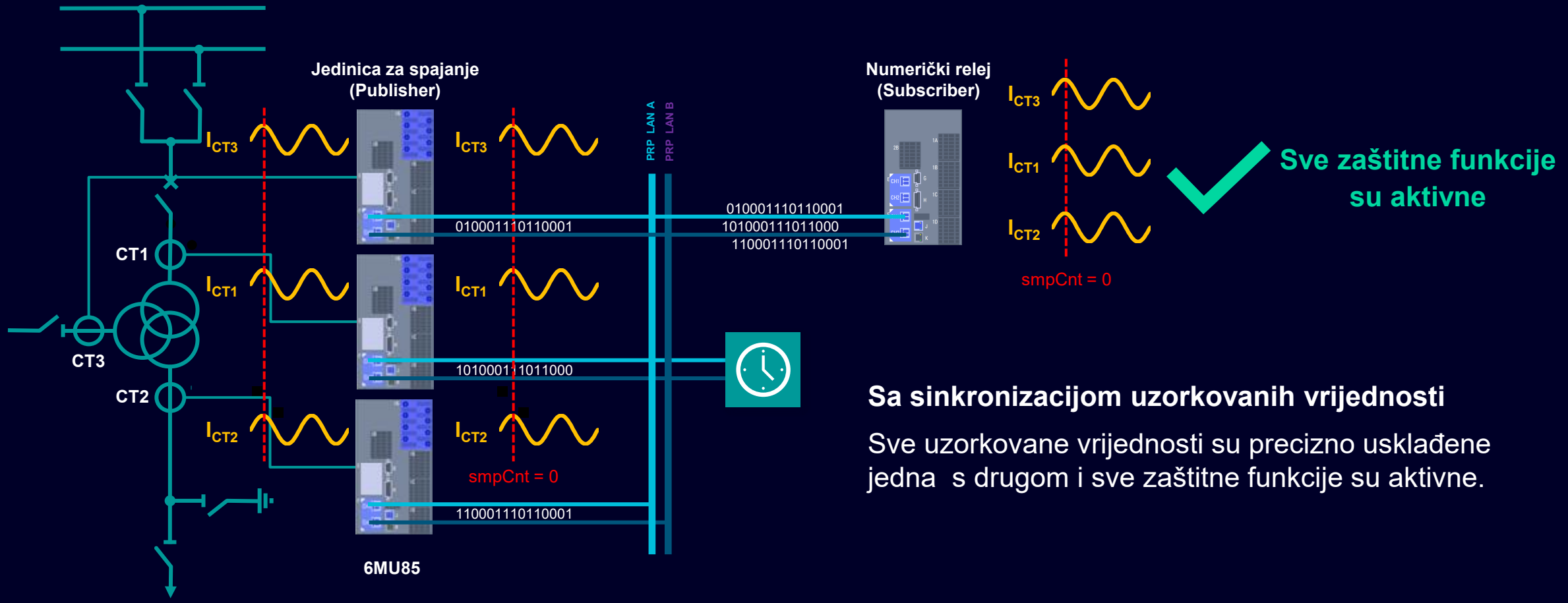


Bez sinkornizacije uzorkovanih vrijednosti

Uzorkovane vrijednosti nisu precizno usklađene jedna s drugom i većina zaštitnih funckija je blokirana osim osnovnih zaštita koje se nalaze unutar jedinice za spajanje (MU), a to su 50, 51, 50N, 51N

SIEMENS

Sinkronizacija uzorkovanih vrijednosti
Zašto je potrebna sinkronizacija?



Sa sinkronizacijom uzorkovanih vrijednosti

Sve uzorkovane vrijednosti su precizno usklađene jedna s drugom i sve zaštitne funkcije su aktivne.

SIEMENS

Virtualizirana zaštita & upravljanje

SIEMENS

Virtualizirana zaštita & upravljanje
Izazovi s kojima se suočavaju energetske mreže

Velika potreba za povećanjem kapaciteta mreže

- Elektrifikacija svega
- Digitalna ekspanzija: data centri, AI infrastruktura
- Potrebno je udvostručiti kapacitet mreže u sljedećih 10 godina

Jak trend modernizacije

- Zastarjela infrastruktura
- Potreba za većom automatizacijom
- Brža zamjena stare opreme novom

Ljudski faktor

- Transformacija i fleksibilnost radne snage
- Promjena očekivanja krajnjeg korisnika
- Nedostatak kvalificiranog stručnog znanja

SIEMENS

Što, Kako i Zašto!

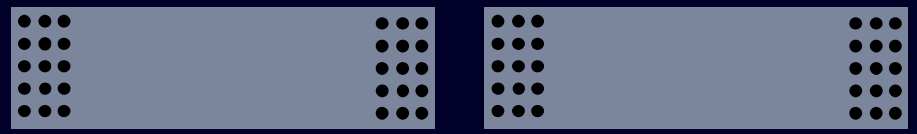
SIEMENS

Virtualizirana zaštita & upravljanje
Što?

Od pristupa proizvoda…

60+
Numeričkih releja

… do softverski definiranog pristupa



Glavno računalo

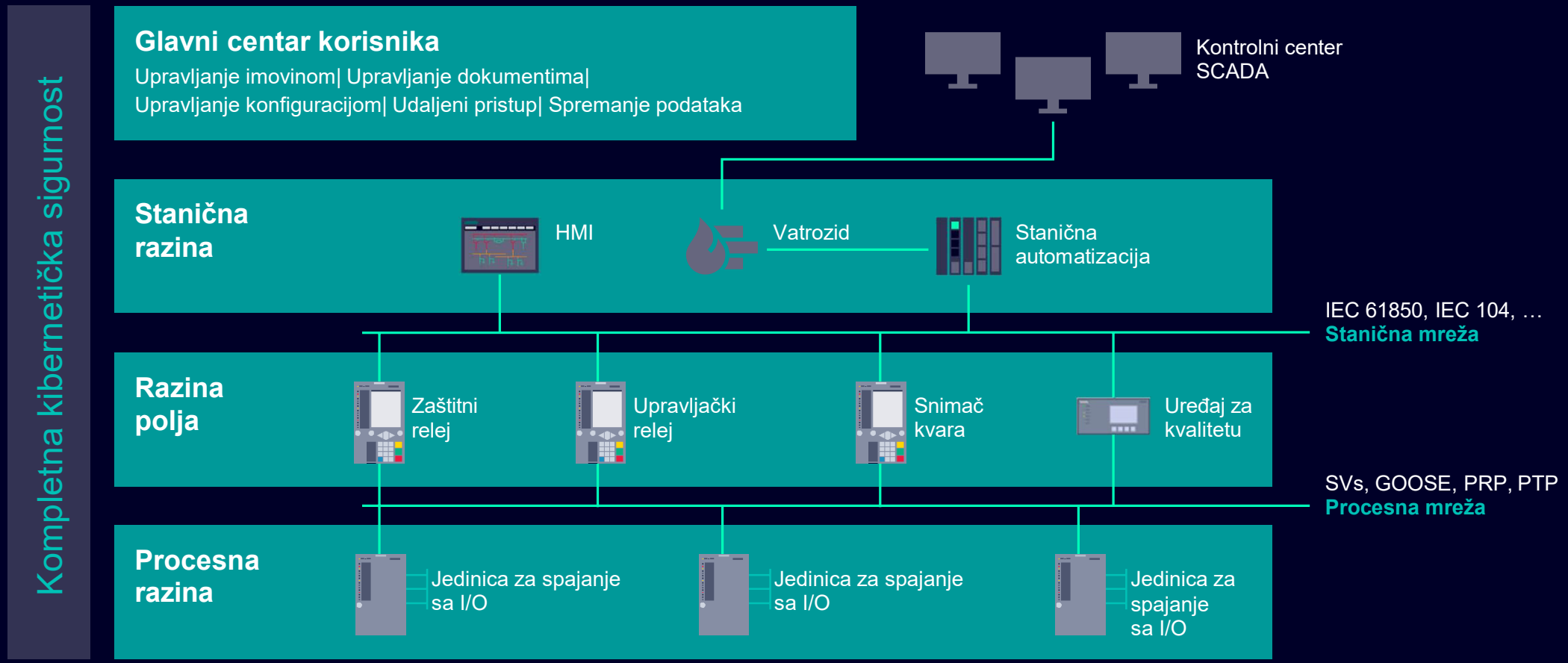
Redundantno računalo

2
Centralizirana zaštita & upravljanje preko računala (HW)

SIEMENS

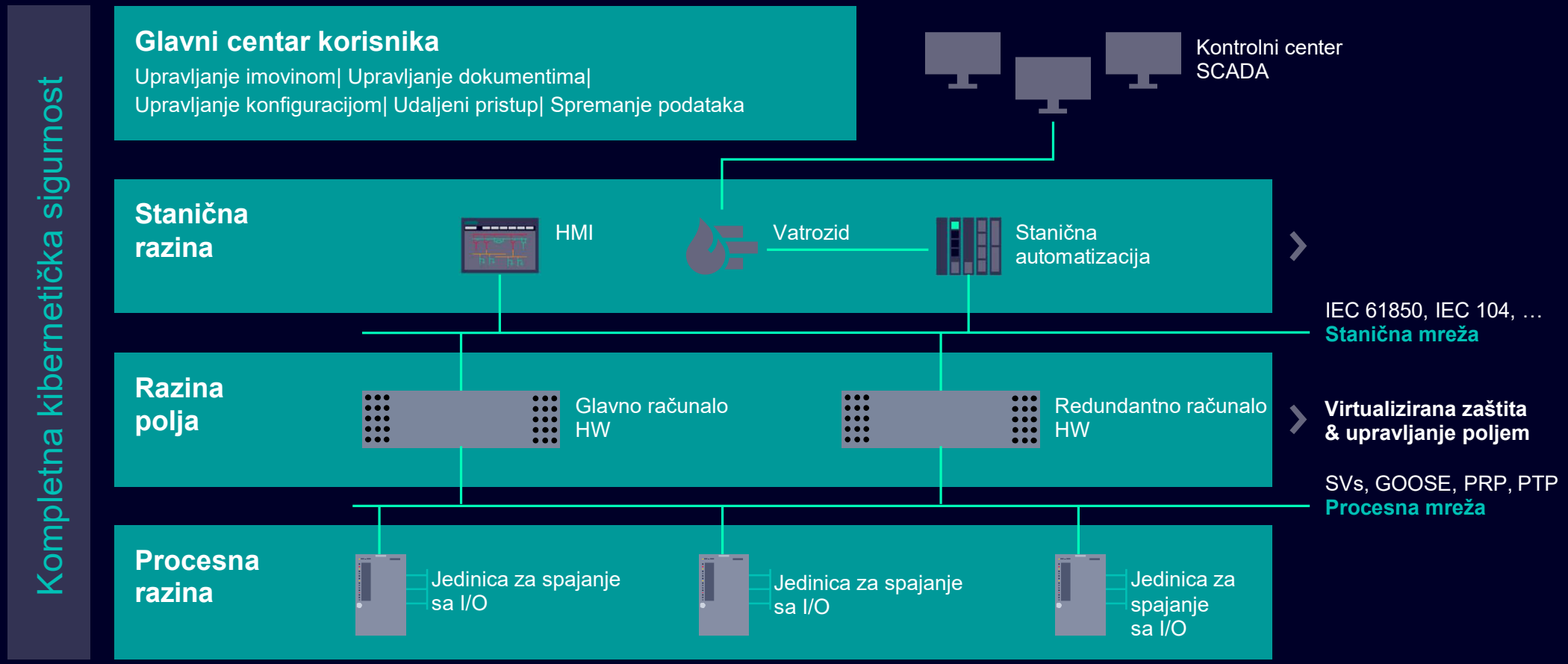
Virtualizirana zaštita & upravljanje

Što – Buduća digitalna trafostanica



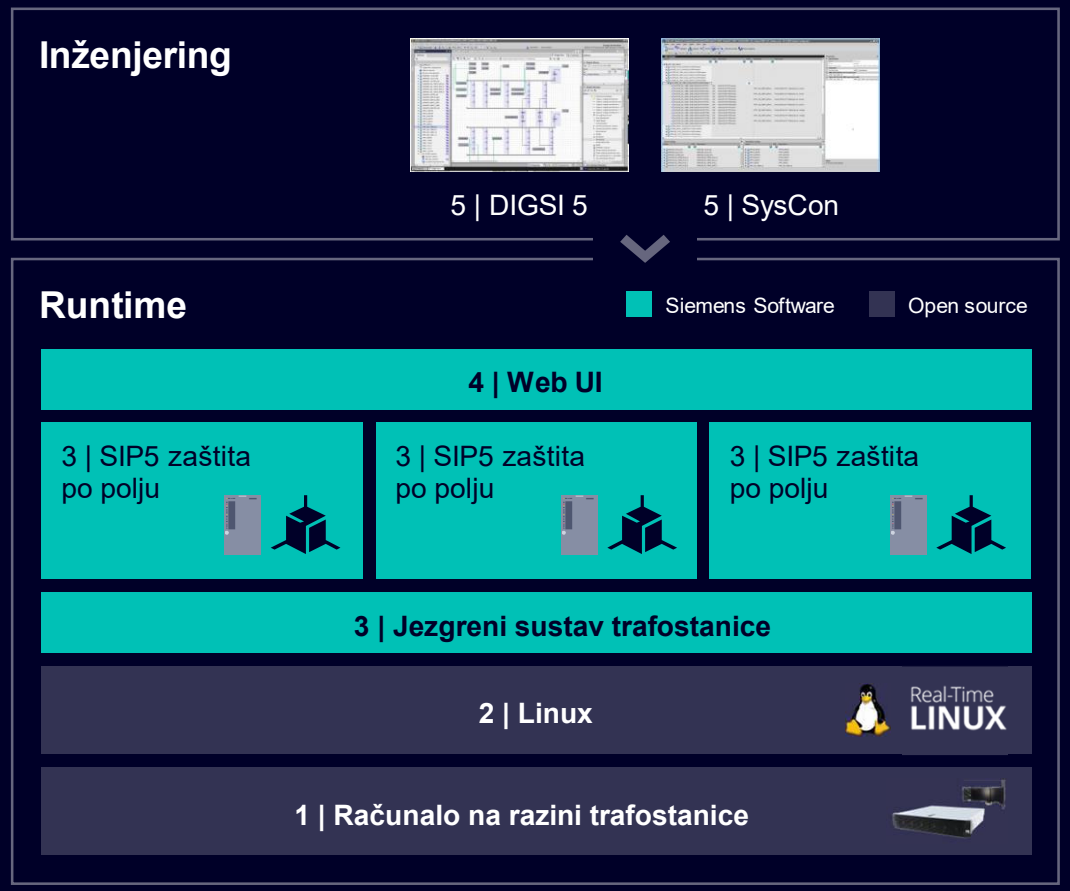
SIEMENS

Virtualizirana zaštita & upravljanje
Što – Buduća digitalna trafostanica



SIEMENS

Virtualizirana zaštita & upravljanje
Kako?



5 | Inženjering koristeći DIGSI 5 i System Configurator
- poznati alat

4 | Vidljivost cijele stanice
- Ugrađen HMI s mogućnošću upravljanja cijelom trafostanicom

3 | SIPROTEC softver
- SIPROTEC 5 pouzdani algoritmi zaštite
- zadržan je koncept tipskih polja

2 | Linux sa RT-Kernel
- Korištenje standardnog industrijskog operativnog sustava (Debian Linux)

1 | Hardverska neovisnost
- kompatibilnost s komercijalnom hardverskom opremom
- IEC61850-3-1 certificiran
- 2x 1G PRP mrežne kartice
- 4x ugrađena porta

SIEMENS

Virtualizirana zaštita & upravljanje
Zašto? – Prednosti

SIEMENS

Za sada samo ideja!

Uskoro realnost!

Razmislite!

SIEMENS

Vladimir Gagić

Zaštita i Automatizacija - Smart Infrastructure

SI EA PA
Heinzelova 70a,
10000, Zagreb
Hrvatska

+385 91 610 5433
vladimir.gagic@siemens.com

SIEMENS

Electrification X – Digitalizacija

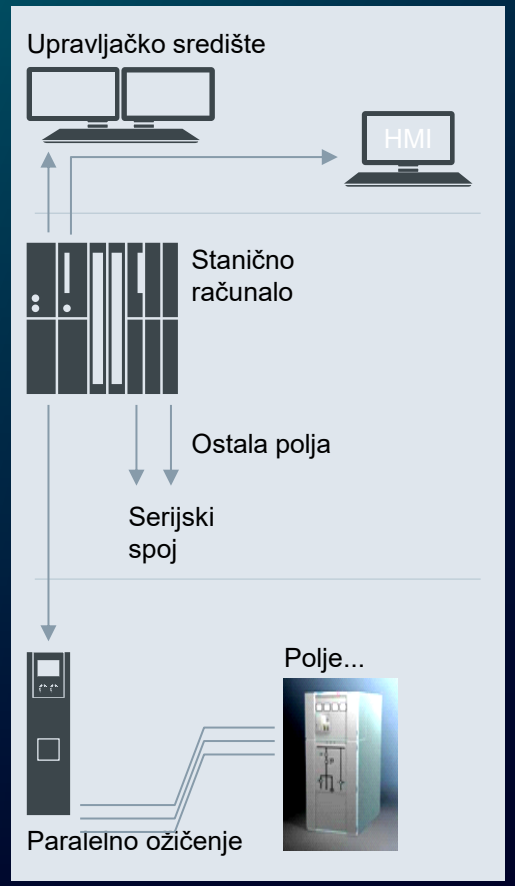
CIGRE 2025

SIEMENS

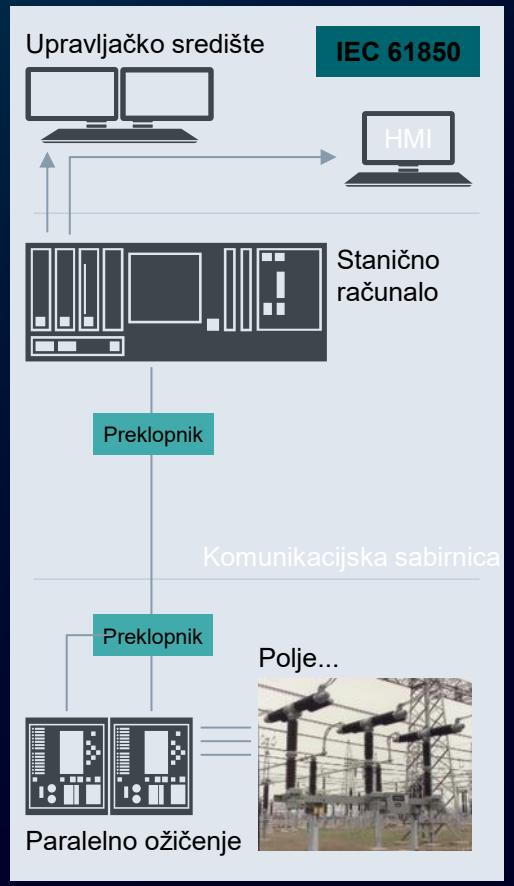
Energetski sustavi – od standardnih kabela do digitalne trafostanice 4.0

1. generacija – standardni kabeli

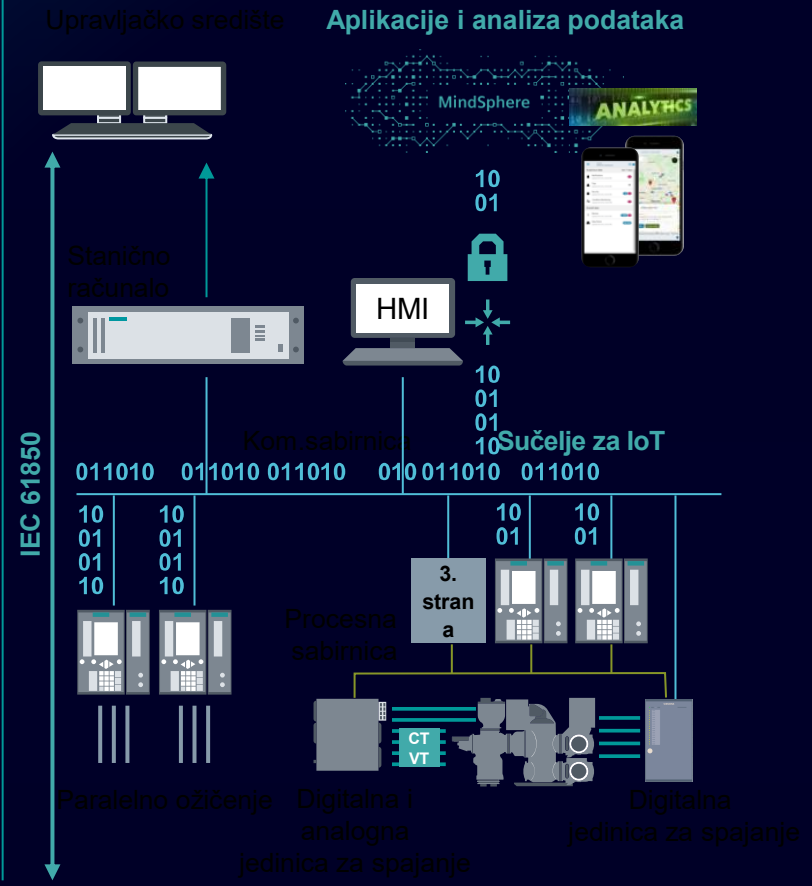
2. generacija – spajanje između zasebnih točaka



3. generacija – digitalna trafostanica



Digitalna trafostanica 4.0 – Procesna sabirnica i povezivost na IoT



SIEMENS

Electrification X

IoT platforma za elektroenergetsku infrastrukturu

SIEMENS

Electrification X

Integrirani IoT paket za svladavanje ključnih izazova energetske tranzicije

- Upravljanje brzo rastućim mrežama za punjenje električnih vozila održavajući stabilnost mreže
- Učinkovito lokaliziranje i upravljanje ispadima
- Povećanje vremena odziva uz smanjenje OPEX-a i CAPEX-a
- Smanjenje troškova i emisija CO2
- Održavanje stabilnosti mreže
- Osiguranje kibernetičke sigurnosti

Electrification X
Operator **Prijenosnog** sustava - primjena

End-to-end cyber security

IoT Cloud Level

Electrification X

Load Mgmt

Network Fault Mgmt (station)

Asset Mgmt

Sust./E Mgmt

Distributio n Grid Monitor.

OT Companion

Station Level

Connectivity on edge:
SICAM GridEdge on SICAM 8

Gateway hardware:
A8000

Connectivity on edge
SICAM GridEdge on SICAM 8

Gateway hardware:
A8000

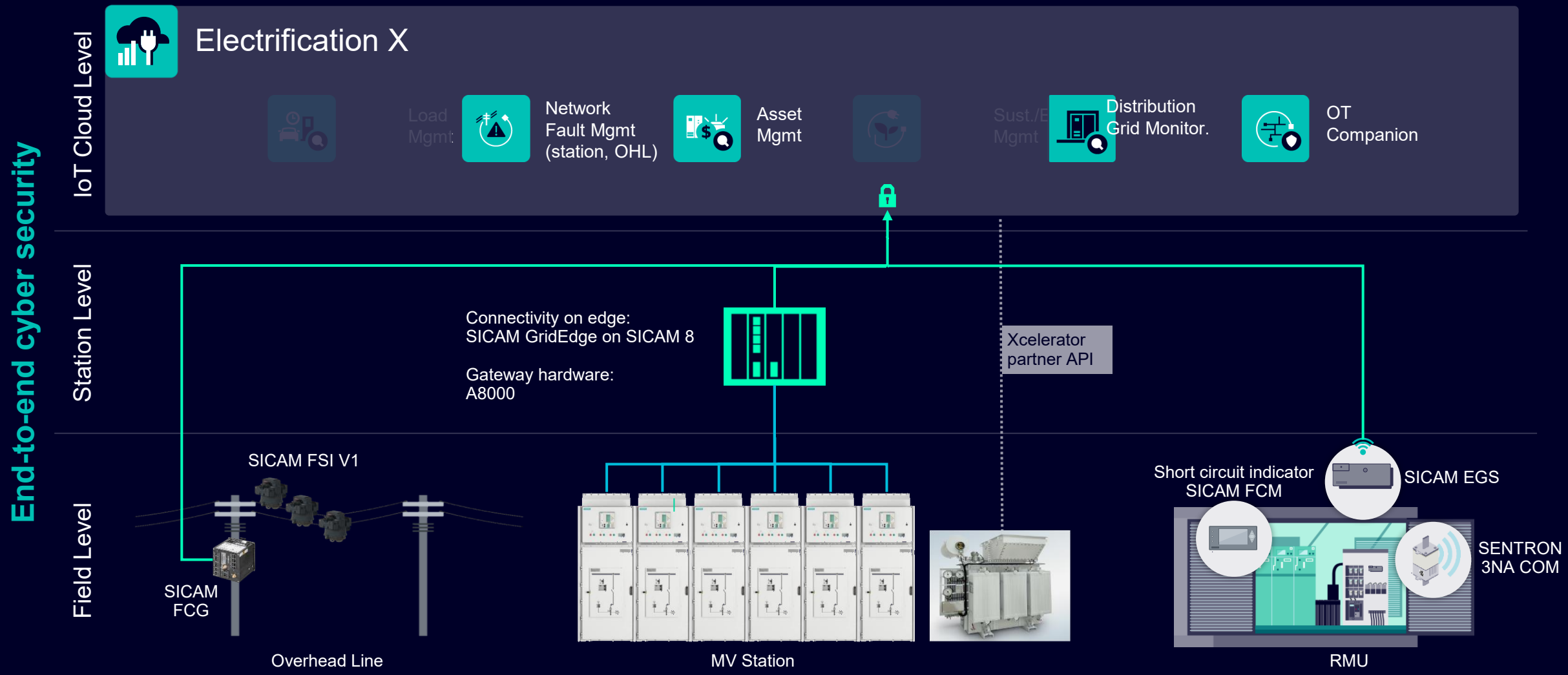
Field Level

HV station 1
Protection relays

HV station n
Protection relays

SIEMENS

Electrification X
Operator **Distribucijskog** sustava - primjena



SIEMENS

Electrification X: Pregled aplikacija i funkcija

Electrification X

IoT Suite for Electrification and Automation

Base Packag

- Log-In
- Account Information
- User Management
- General Notifications
- Measurement (Visualization. of Process - SVG)
- Imprint / Legal Notification
- Subscription Information
- Common Navigation Elements (Filter, Sort, Search)
- Map
- Device Connectivity Monitoring
- Asset Topology
- Event List
- Alarm List
- Subscription Information
- Configuration (Asset Topology, Signal Assignment)

Load Management

- Charger Station Monitoring Feature
- Load Mgmt & Control
- Charger Monitoring Extension Feeder

Network Fault Management

- OVHL Mon. Basic
- Substation Fault Mgmt
- OVHL Mon. extended
- Voice Call

Asset Management

- Asset trans. 1 MV feeder
- PD Monitoring
- T-Monitoring Op Counter
- Motor Monitoring
- CB Monitoring basic
- CB Monitoring advanced

Sust./ Energy Management

- Basic Energy Overview

Distribution Grid Monitoring

- DSO Station Monitoring Feature – LV & MV

OT Companion

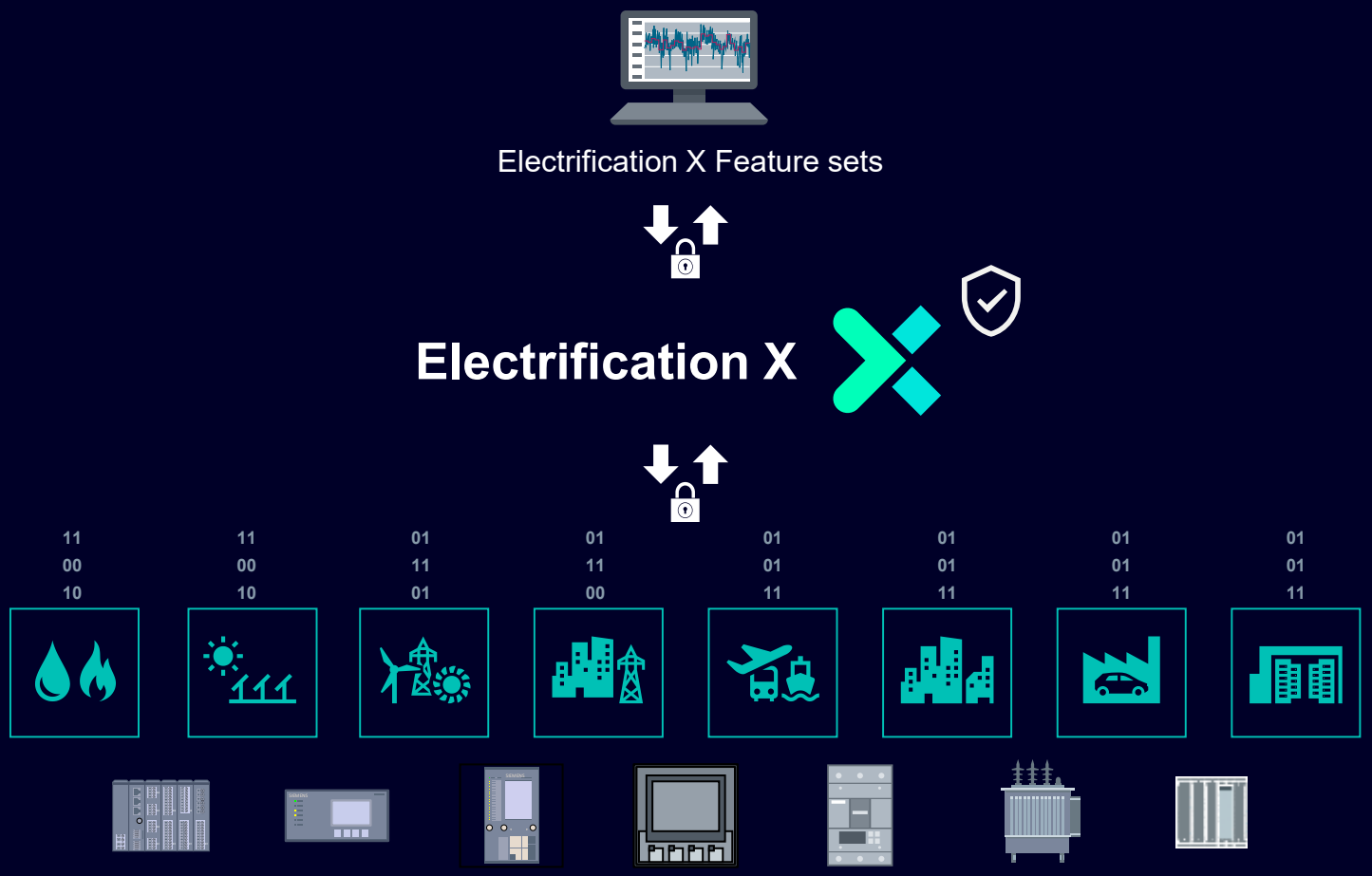
SIEMENS

Kibernetička sigurnost

Međunarodno priznate norme i standardi

SIEMENS

Kibernetička sigurnost je ključna za **Electrification X**
Na temelju vodećih standarda kibernetičke sigurnosti



Various field devices and sensors of different vendors

- **ISO 27001**
  (Information Security Management System Framework)
- **IEC62443; NERC/CIP; CSA; BDEW**
  (Industrial Communication / Network and system security)
- Secure onboarding due to authentication with **X.509 Certificates**
- Multi-tenant system
  Customer is **owner** of its own Data
- Encrypted Data in motion and rest
  Role Based Access Control
- Continuous Security Incident Management via **Siemens CERT**[1]
- With/Without control direction depending on Firmware chosen

[1] Cyber Emergency Response Team

SIEMENS

CLOUD vs ON-PREMISE

- Infrastruktura
- Skalabilnost
- Backup & Recovery
- Podrška i održavanje
- Usklađenost sa zahtjevima kibernetičke sigurnosti

SIEMENS

OT Companion

Upravljanje OT imovinom

Electrification X - OT Companion
Technical Setup

End-to-end cyber security

Control center SCADA

SPECTRUM power

Electrification X

OT Companion

Security Vulnerability Monitoring

Station Level

Multiple connectivity options

MQTT / TLS **or** File-based

SICAM8 GridEdge Applications

IoT Gateway Solution on SICAM A8000 (CP-8031/ CP-8050) and SICAM SWS (VM/ IPC)

IEC 61850, SNMP

Field Level

IEDs

RTUs

IPCs

Networking Devices

- Comprehensive and up-to-date OT inventory
- Extended security vulnerability notifications curated by cybersecurity experts
- Multi-vendor, multi-technology and multi-generation
- Secure communication

SIEMENS

SIEMENS | OT Companion

all Services running
powered by SIEMENS

Stations

+ Add Station

- Dashboard
- Stations
- Assets
- Baseline Management
- Vulnerability Monitoring
- Administration

Filter

6 stations.

SI-EA RC-CA Toronto Substation

Highway 27
Toronto
Canada

Inventory ▸

SI-EA BLR R&D Lab

Electronic City Phase 2 (East)
560100 Bengaluru
India

Inventory ▸

Vejlefjord

Sanatorievej 26
7140 Stouby
Denmark

Inventory ▸

SI-EA NBG H R&D Lab

Humboldtstrasse
90459 Nuremberg
Bavaria
Germany

Inventory ▸

SI-EA BLN WW 5 R&D Lab

Wernerwerkdamm 5
13629 Berlin
Berlin
Germany

Inventory ▸

SI-EA PLS LO R&D Lab

Lobezska 15
32600 Plzen
Czech Republic

Inventory ▸

SIEMENS

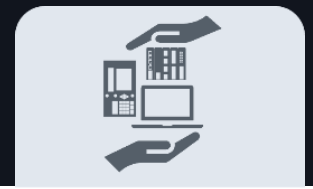
Dashboard
Stations
Assets
Baseline Management
Vulnerability Monitoring
Administration

Filter
SI-EA PLS LO R&D Lab

Station: SI-EA PLS LO R&D Lab

8 of 38 assets match your filter criteria.

Asset name Station	Main Component Type	Product Model Manufacturer	Installed Version Baseline Version	Serial Number	Last Modified Created
ASSTDATACOLL ▸ SI-EA PLS LO R&D Lab ▸	SICAM_CZSIDG_IPC ▸ PC	SICAM GridEdge Siemens	2.6.6.441836 2.7.3.516783		2022/09/19 2022/08/09
TIMESYNCH ▸ SI-EA PLS LO R&D Lab ▸	M100 ▸ GPS Clock	Meinberg M100 Meinberg	6.24.027 6.24.027	031411025400	2022/09/19 2022/08/12
FEEDER A01 ▸ SI-EA PLS LO R&D Lab ▸	SIP ▸ Protection Relay	SIPROTEC 7SJ82 SIEMENS	V08.30 V.8.80	BM2004003654	2022/09/15 2022/08/12
FEED_PROT ▸ SI-EA PLS LO R&D Lab ▸					2022/09/12 2022/09/12
PLSLOCLIENT ▸ SI-EA PLS LO R&D Lab ▸	FULLSERVER01 ▸ Workstation	x64-based PC ECU-4784 Advantech Co., Ltd.	6.3.9600 6.3.9600	KSA2355299	2022/09/12 2022/08/12
SICAM A8000 CP-8050 ▸ SI-EA PLS LO R&D Lab ▸	SICAM A8000 CP-8050 ▸ RTU	SICAM A8000 CP-8050 Siemens AG	04.80 04.80	GF2002035050	2022/09/12 2022/08/12
M-CP2016 ▸ SI-EA PLS LO R&D Lab ▸	M-CP2016 ▸ RTU	SICAM RTUs AK3 CP-2016 Siemens AG	05.01		2022/09/09 2022/08/12
CZSIDGSWITCH ▸ SI-EA PLS LO R&D Lab ▸	CZSIDGSWITCH ▸ Switch	Ruggedcom RS900NC Siemens	v4.3.7 (Jul 05 2021 15:49)	RUMEO06061778	2022/08/16 2022/08/12



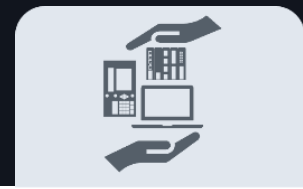
Baseline Management

Dashboard
Stations
Assets
Inventory
Unassigned Components
Baseline Management
Vulnerability Monitoring
Administration

Filter: protec

10 of 43 baselines match your filter criteria.

Status	Software Component	Component Type	Baseline Version	Installed Version	Manufacturer	Product Family	Product Name	Main Component	Asset name	Station
?	Device Firmware ▸	Firmware / OS		V09.20	SIEMENS	SIPROTEC	7SJ85	SIP10 ▸	SIP10	Vejlefjord
?	Device Firmware ▸	Firmware / OS		P14NB___6__620_F	MiCOM	Protection	P14NB	P14N ▸	P14N	SI-EA BLR R&D L
?	Device Firmware ▸	Firmware / OS		P442____LS_E30_D	MiCOM	Protection	P4429	P442 ▸	P442	SI-EA BLR R&D L
?	Device Firmware ▸	Firmware / OS		1.0.1	ABB	Protection	REX64	BT05_IED ▸	BT05_IED	SI-EA BLR R&D L
?	Device Firmware ▸	Firmware / OS			SEL	Protection	0487B	BU1_B_SEL487B ▸	Diff_Prot_R02	SI-EA RC-CA Tor
⇄	Device Firmware ▸	Firmware / OS	V.8.80	V08.30	SIEMENS	SIPROTEC	7SJ82	SIP ▸	FEEDER A01	SI-EA PLS LO R&
?	Device Firmware ▸	Firmware / OS		7.90	GE Multilin	Protection	B30-T	BU1_A_B30 ▸	Diff_Prot_R01	SI-EA RC-CA Tor
?	Device Firmware ▸	Firmware / OS		V08.30	SIEMENS	SIPROTEC	7UT86	T2_A_7UT86 ▸	T2_A_7UT86	SI-EA BLN WW 5
?	Device Parameter Set ▸	Configuration		09.20.01	SIEMENS	SIPROTEC	7SJ85	SIP10 ▸	SIP10	Vejlefjord
?	Device Parameter Set ▸	Configuration		08.30.00	SIEMENS	SIPROTEC	7SJ82	SIP ▸	FEEDER A01	SI-EA PLS LO R&



Dashboard
Stations
Assets
Baseline Management
Vulnerability Monitoring
Notifications
Watchlist
Administration

Station name

7.5 Siemens SIPROTEC 5 Relay, DIGSI 5 - Multiple Vulnerabilities - SSA-899560
High
New
1 - 2020/05/12, 14:41

9.8 Siemens Ethernet Plug-In Communication Modules for SIPROTEC 5 - Multiple Vulnerabilities (aka URGENT/11) - SSA-...
Critical
New
1 - 2020/01/14, 13:17

2.5 Siemens SICAM PAS - Multiple Information Disclosure Vulnerabilities - SSA-444217
Medium
New
1 - 2019/10/15, 20:07

9.8 Siemens SICAM PAS - Multiple Vulnerabilities - SSA-946325
Critical
New
1 - 2019/10/15, 19:57

4.2 Siemens Multiple Products - Remote Code Execution Vulnerability - SSA-159860
High
New
1 - 2018/11/13, 16:33

6.5 ABB Relion REX640 - Remote Improper Access Control Vulnerability - ABBVREP0078
High
New
1 -

7.5 Siemens EN100 Ethernet Communication Module and SIPROTEC 5 relays - Denial of Service Vulnerability - SSA-104088
High
New
1 -

Siemens SIPROTEC 5 Relay, DIGSI 5 - Multiple Vulnerabilities - SSA-899560

Base Score
7.5

Overview
Published: 2019/07/09
Last update: 2020/05/12 14:41
Priority: High

Scores
Base: 7.5
Temporal: 7.1
Overall: 7.1
CVSS:3.0/AV:N/AC:L/PR:N/UI:N/S:U/C:N/I:N/A:H/E:P/RL:U/RC:C

Impact
Exposure of Sensitive Information, Manipulation of Data, Denial of Service (DoS)

CVE
CVE-2019-10930 ▸

CWE
Solution
Unavailable

Details | Potentially Affected Components | Product Tickets | History

7SJ82

Station	Asset name	Asset Operating Status	Main Component	Installed Version
SI-EA PLS LO R&D Lab ▸	FEEDER A01 ▸	None	SIP ▸	

SICAM 8

Platforma za energetsku automatizaciju

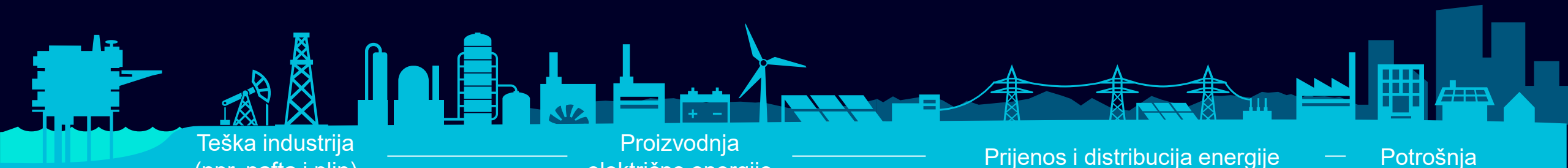
SIEMENS

SICAM S8 – Siemensova globalna i pouzdana platforma
s mnogo stručnjaka diljem svijeta

> 85.000 SICAM jedinica za automatizaciju diljem svijeta

> 600 integriranih sustava automatizacije za obnovljiva postrojenja

> 1.000 sustava automatizacije trafostanica



Teška industrija (npr. nafta i plin) — Proizvodnja električne energije — Prijenos i distribucija energije — Potrošnja

SICAM aplikacije	Rasterećenje (**Load Shedding**)	Kontrola proizvodnje	Kontrola pohrane	Upravljanje i nadzor FNE	Samoiscjeljivanje (Self Healing)	Upravljanje mikromrežom

SICAM 8 platforma

- Jedna otvorena standardizirana arhitektura i infrastruktura
- Modularni dizajn i aplikacije
- Integrirane funkcionalnosti
- Jednostavna buduća proširenja

SIEMENS

SICAM 8
Platforma za energetsku automatizaciju

‘’Wherever energy flows’’....





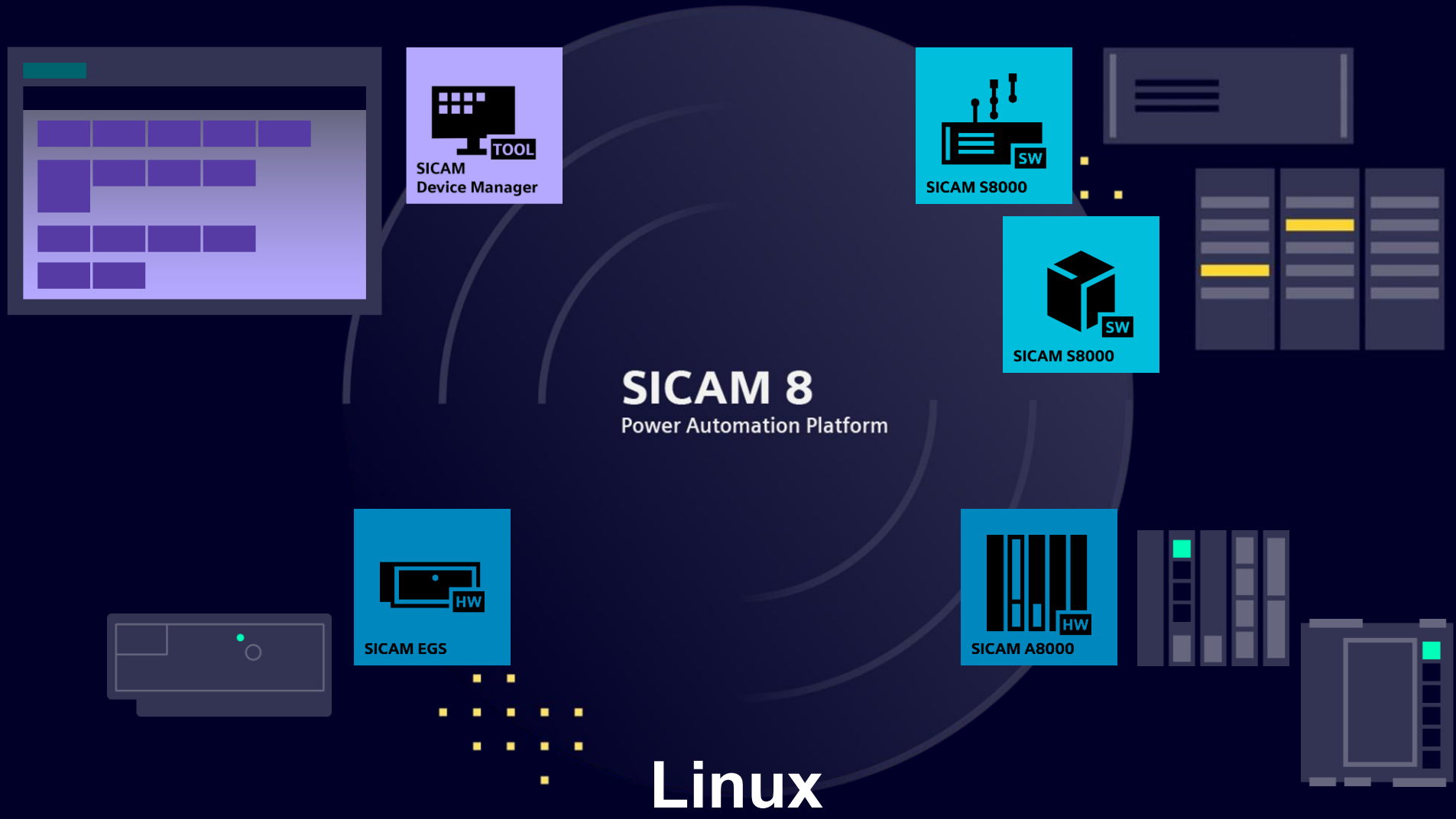







SIEMENS

SICAM 8
Platforma za energetsku automatizaciju

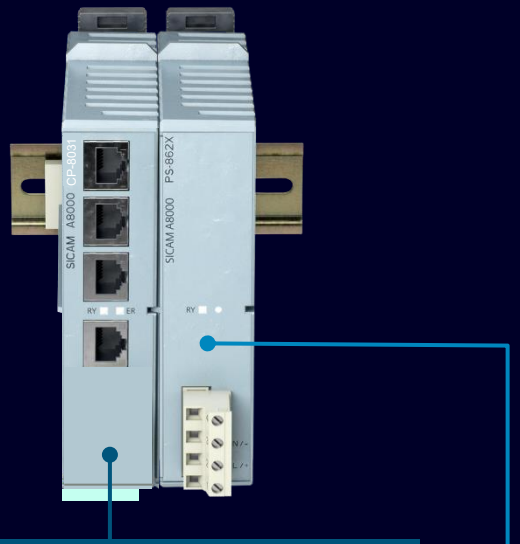


SIEMENS

SICAM A8000 at a glance

Modular approach - power supply units and processor modules

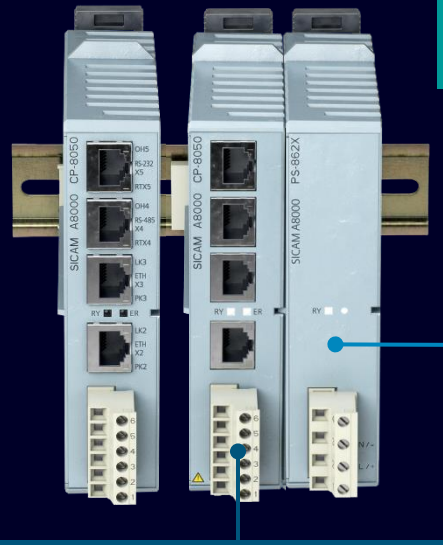
Support for redundant setup planned for future release



SICAM 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

- 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)

SIEMENS

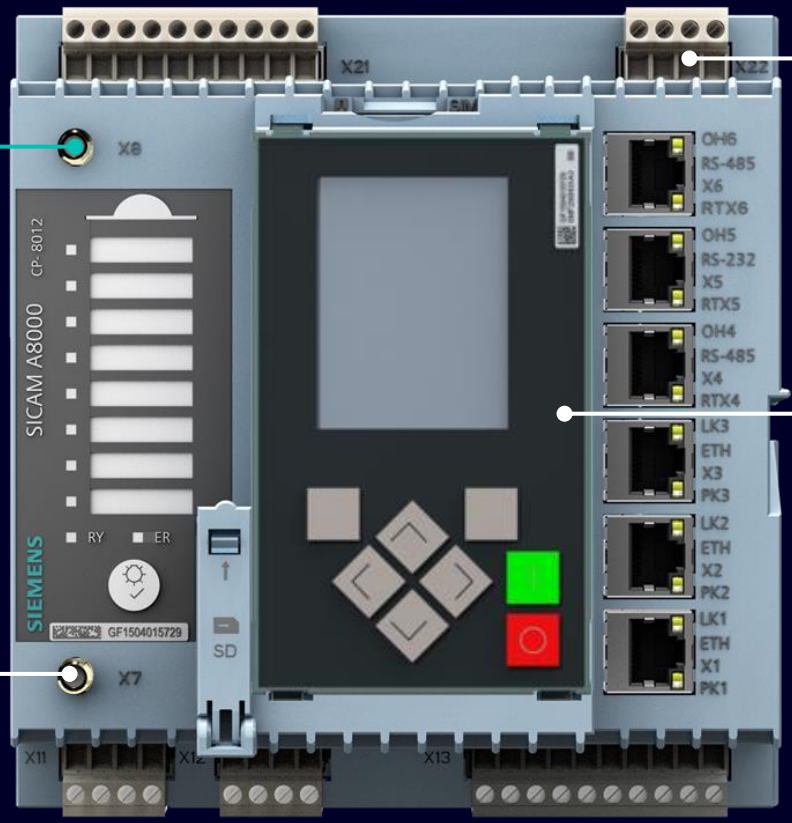
SICAM A8000 CP-8010 & CP-8012
Technical features

CP-8010 / CP-8012

CP-8012 only:
Onboard LTE Modem
with GPRS fallback

8x configurable LEDs
(red/amber/green)

Wireless Communication:
Additional external
antenna port to connect to
3NA COM smart fuse



8x DI, 6x DO, 1x AI

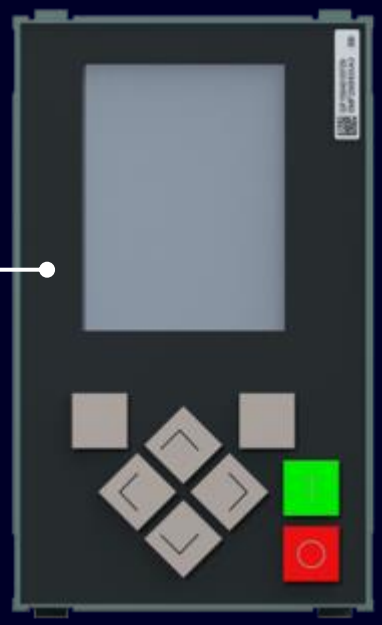
DC 24…60 V
integrated power supply

2x RS-485
1x RS-232

Optional:
snap-on display

3x ETH

CM-8880



Dimensions:
153,5 x 160 x 105mm (W x H x D)

SIEMENS

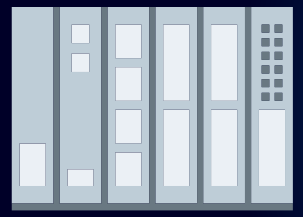
SICAM A8000 Series
All requirements combined in a single platform

- Rough ambient conditions
- Automation
- Long product lifecycle
- Cybersecurity
- Space-saving design
- High electric strength
- Integrated communication
- Scalability

SIEMENS

Inženjering temeljen na SICAM Device Manager
Intuitivni konfiguracijski alat za SICAM A8000

Jednostavna i izravna konfiguracija sa SICAM Device Managerom



SICAM A8000:
CP-8031

SICAM Device Manager

Inženjering i konfiguracija

Funkcije automatizacije, komunikacija i nadzorna ploča

- Standardizirana logika
- Unaprijed konfigurirana nadzorna ploča
- Jednostavna integracija temeljena na IEC 60870-5-101, IEC 60870-5-104, IEC 61850, Modbus RTU, Modbus TCP

SIEMENS

SICAM S8000

Central & Virtualized Substation Automation…

… predviđa konsolidaciju različitih funkcija i aplikacija trafostanice na zajedničku, virtualiziranu platformu, smanjujući hardver uz istovremeno pružanje pune fleksibilnosti i skalabilnosti.

SICAM S8000 ograničenja (po instalaciji):

- ✓ Do **1200** izravno spojenih IED-ova
- ✓ Ukupan broj podatkovnih točaka u smjeru slanja ograničen je samo performansama računala
- ✓ Do 40 komunikacijskih protokola moguće implementirati
- ✓ Do 9 neovisnih logičkih funkcija koje korisnik može definirati

SIEMENS

SICAM 8 Applications

SIEMENS

SICAM 8 ‘’Runtime” Proizvodi – Aplikacije

Control Center Level

Grid Control Center

Virtualized SICAM S8000
redundant if needed

IoT Gateway

Electrification X
or Building X
or any customer specific
Cloud / Data Lake

Station Level

SICAM A8000 or SICAM S8000 on IPC
redundant if needed

SICAM HMI
Station Visualization

IoT Gateway

SICAM A8000 or
SICAM S8000

Field Level

SICAM A8000

3rd Party

3rd Party

SICAM A8000

SICAM A8000

SICAM EGS

SICAM A8000
or S8000 with
- SICAM MGC
- SICAM PPC
- SICAM DLM
- SICAM LS
- SICAM SOG

SICAM A8000

Automation, Control & Monitoring of HV substations

Automation, Control & Monitoring of MV substations

Monitoring of Distribution Grid, SDA

Renewable integration & Grid stabilization

Hydro Powerplant Automation & Control

Horizontal Scalability in terms of connections, functions, performance

Efficient engineering workflow based on one Engineering Tool

Vertical Flexibility to adapt to the changing energy landscape and applications

Integral cyber security based on IEC62443 & IEC62351 ensures highest resilience.

SIEMENS

Kontakt

Dario Markić
Zaštita i automatizacija
IoT & Cyber Security

Siemens d.d.
Smart Infrastructure
Electrification & Automation
RC-HR SI EA S
Heinzelova 70a
10 000 Zagreb

Mobile: +385 91 610 5249
E-Mail: dario.markic@siemens.com

SIEMENS