

ZIV SAS

SUBSTATION AUTOMATION SYSTEMS



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4. VALUE ADDED SERVICES
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1. SUBSTATION AUTOMATION SYSTEMS

COMPONENTS, ARCHITECTURES AND VALUE ADDED SERVICES

In a constantly evolving energy landscape, substation automation is essential to ensure smarter, more efficient, and secure power grids.

ZIV SAS delivers proven, flexible, and innovative solutions tailored to each project—making us the trusted partner for building the intelligent grids of the future.



1 Substation Central Unit
Gateways & HMI

2 BCPU & BCU

3 Switch L2/L3 PTP

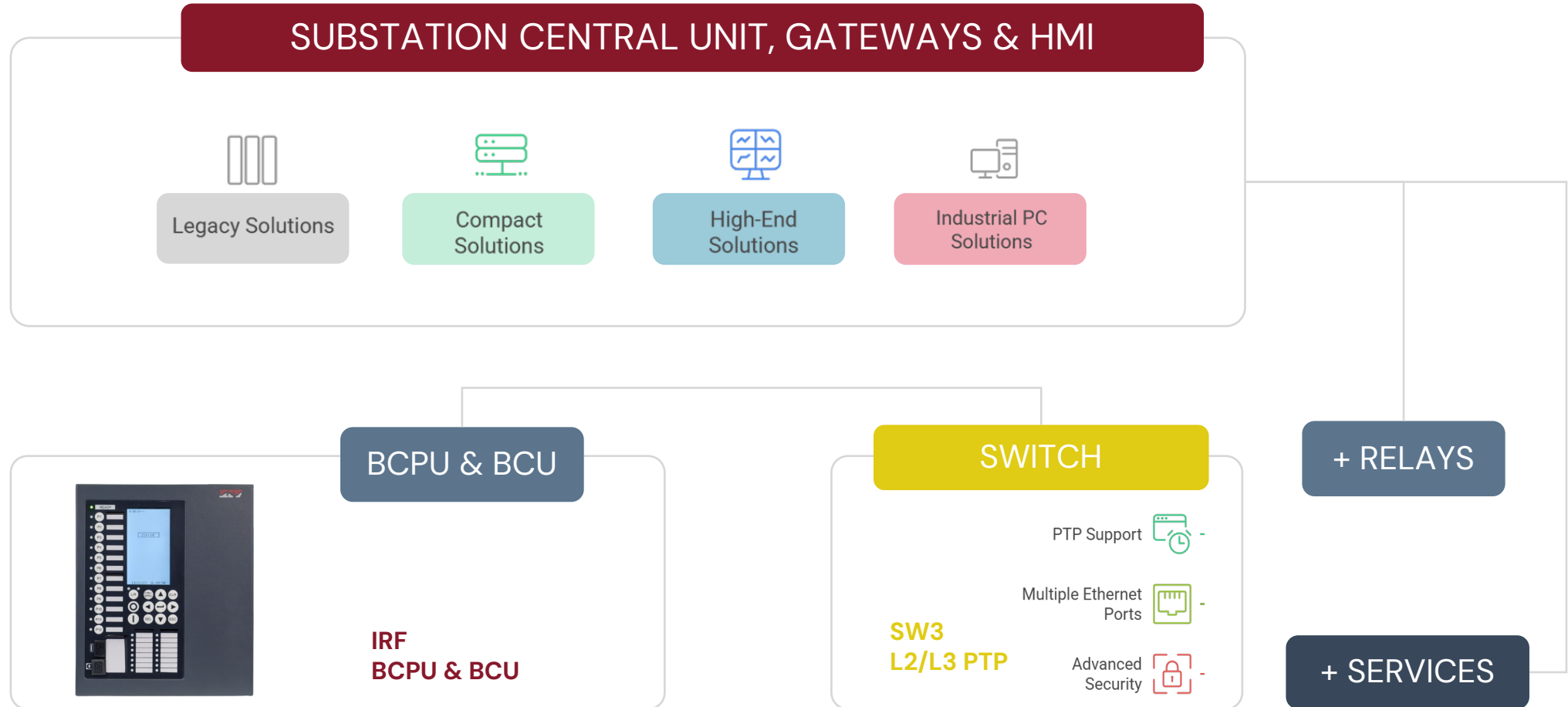
1. SAS COMPONENTS

+ Protection Relays

2. ARCHITECTURES

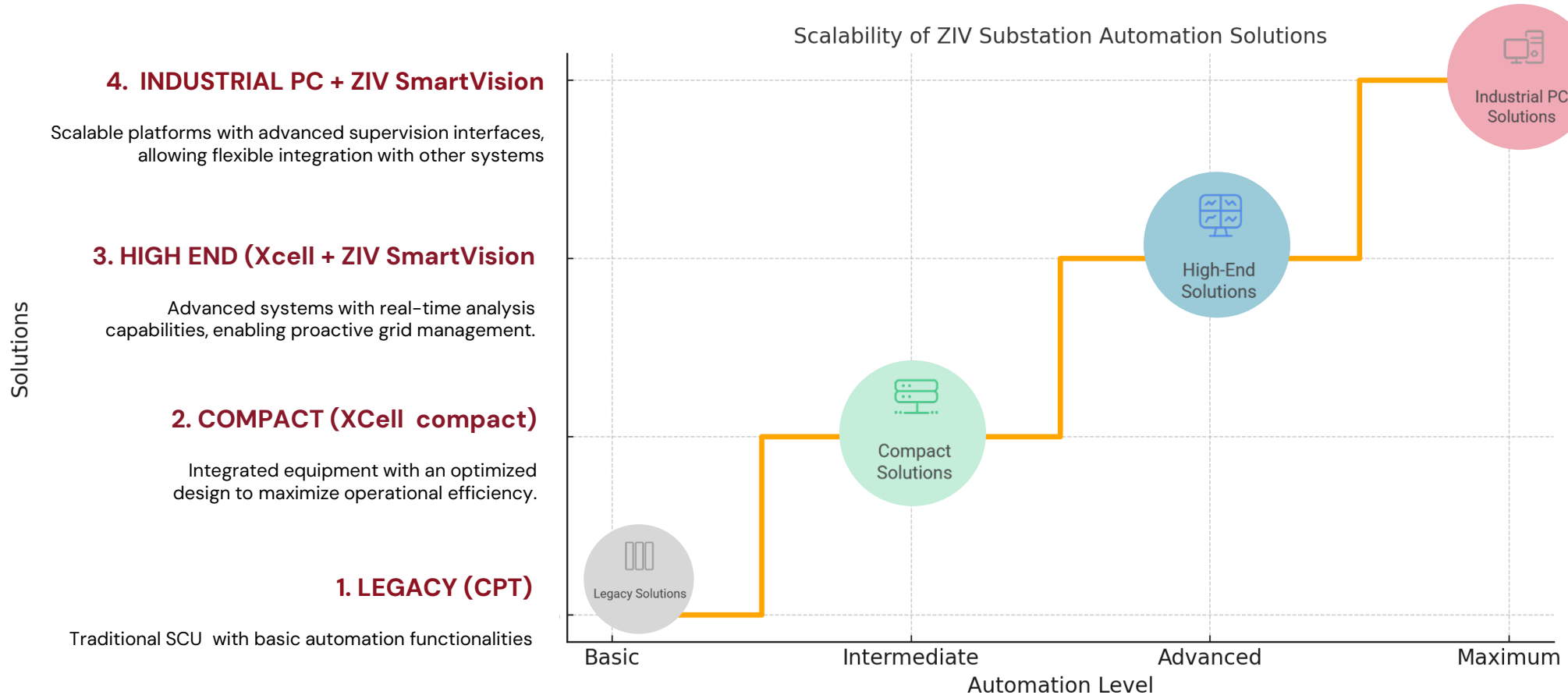
3. SERVICES

2. ZIV SAS COMPONENTS



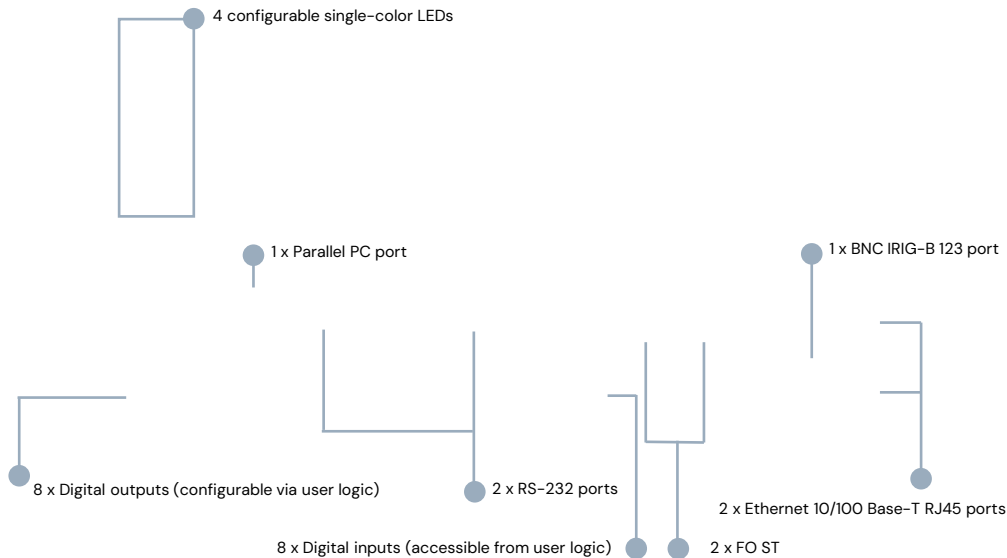
2. ZIV SAS COMPONENTS

GATEWAYS & HMI



2. ZIV SAS COMPONENTS

GATEWAYS & HMI



Legacy Solutions

CPT

Gateway + Web HMI

Traditional systems with basic automation functionalities

Different operating modes:

HMI, Gateway, HMI + Gateway

Configurable logic, IEC 61131-compliant tool

Protocols:

- IEC 61850 Ed.1 – Compatible with Ed.2 (Client/Server)
- IEC 60870-5-101/104 (Slave)
- DNP3 (Master and Slave) – Serial / TCP/IP
- MODBUS (Master and Slave) – Serial / TCP/IP
- PROCOME (Master and Transparent) – Serial / TCP/IP

Synchronization: NTP, SNTP, IRIG-B 123

2. ZIV SAS COMPONENTS

GATEWAYS & HMI



High-End
Solutions

XCELL

Gateway + Web HMI
(2nd Generation – HTML5)

Up to 8 processors in parallel in a single rack (CPU redundancy possible)

Protocols:

- **Master:** IEC 61850 Ed.1/2, Procome, DNP3, MODBUS, IEC 103, DLMS, SPABUS, ...
- **Slave:** IEC 61850 Ed.1/2, IEC 101/104, MODBUS, DNP3, ...

PRP Redundancy

Synchronization: SNTP v4, PTP v2 Power Profile

Cybersecurity: SSH, SFTP, SSL/TLS, SNMP V3, LDAPS, 2FA

2. ZIV SAS COMPONENTS

GATEWAYS & HMI



Compact
Solutions

XCELL COMPACT

Gateway + Web HMI

(2nd Generation – HTML5)

Same functionality as the XCell unit +

- 19" x 4U rack
- Rear connection panel
- Up to 4 processors in the same chassis
- 4 Ethernet ports per processor/CPU
- Redundant power supply
- Hot Stand-By and Hot-Hot redundancy
- LCD display, keyboard
- 8 configurable general-purpose LEDs

2. ZIV SAS COMPONENTS

GATEWAYS & HMI

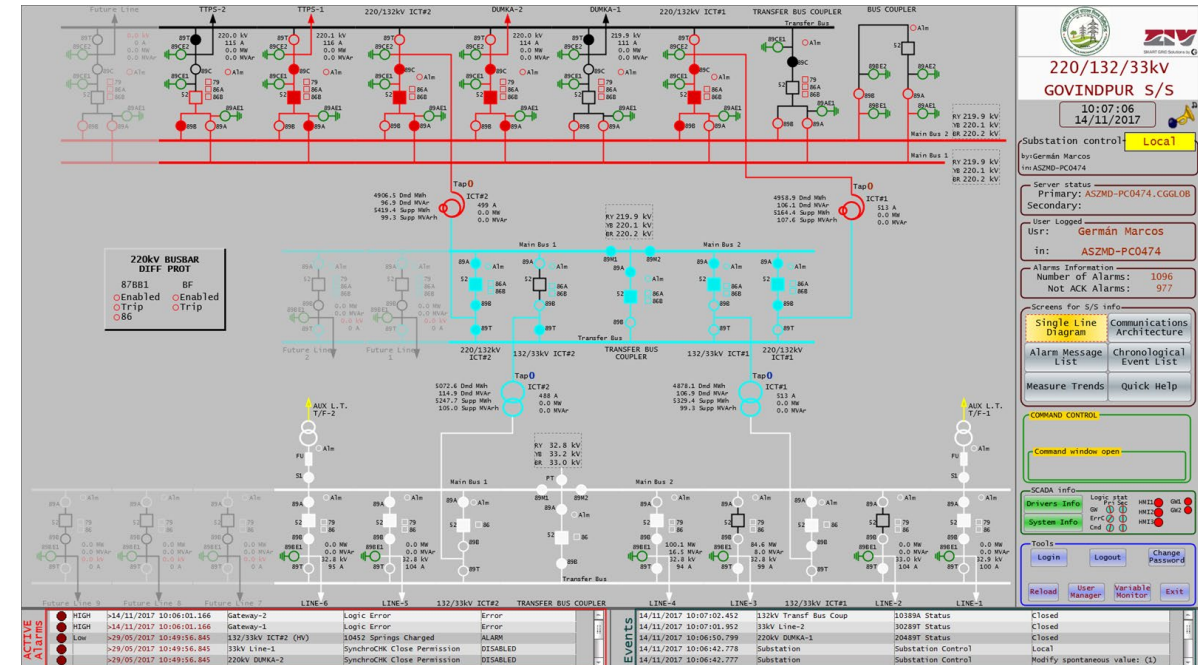
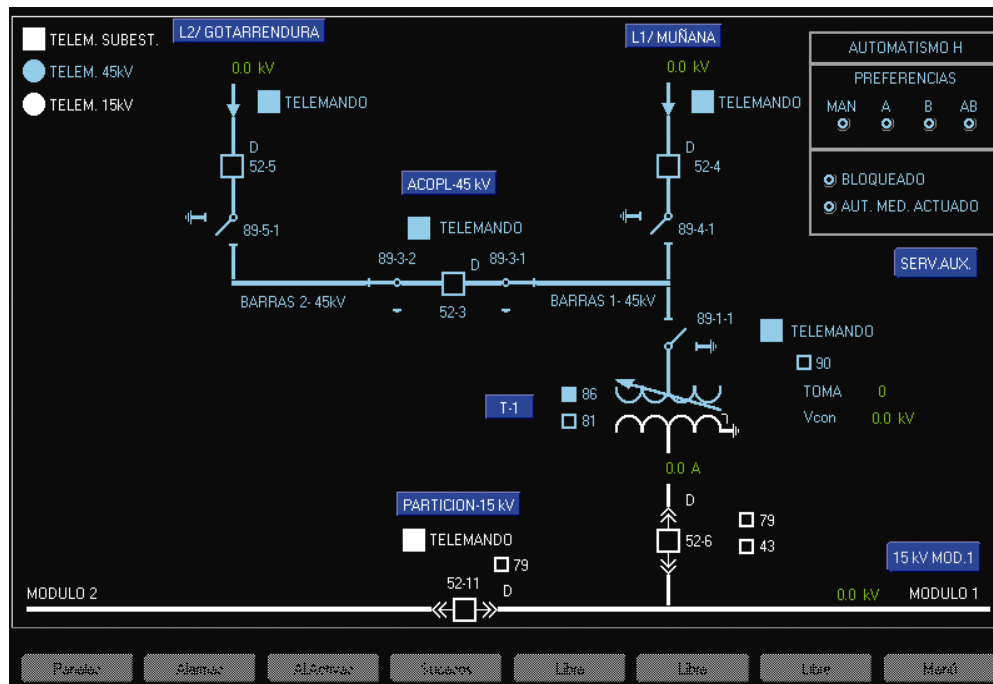
ZIV SMART VISION



Compact
Solutions

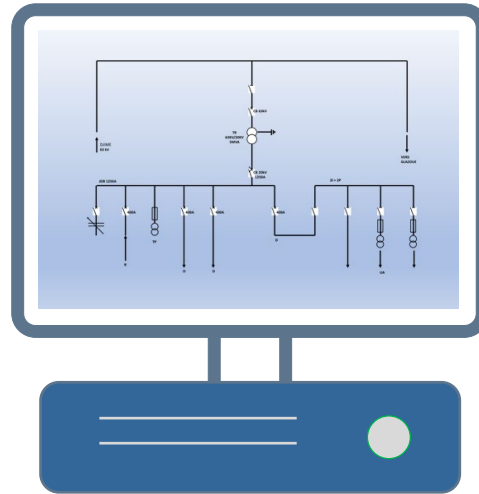


Industrial PC
Solutions



2. ZIV SAS COMPONENTS

GATEWAYS & HMI



Industrial PC
Solutions

INDUSTRIAL PC

ZENON + ZIV SmartVision

Solution based exclusively on industrial PCs, running on Windows OS

ZENON software as Gateway

ZIV SmartVision as HMI

High-performance systems with large storage requirements.

2. ZIV SAS COMPONENTS

ZIV BAY CONTROL & PROTECTION UNIT



BCPU

- IRF-A: Protection and Control for MV

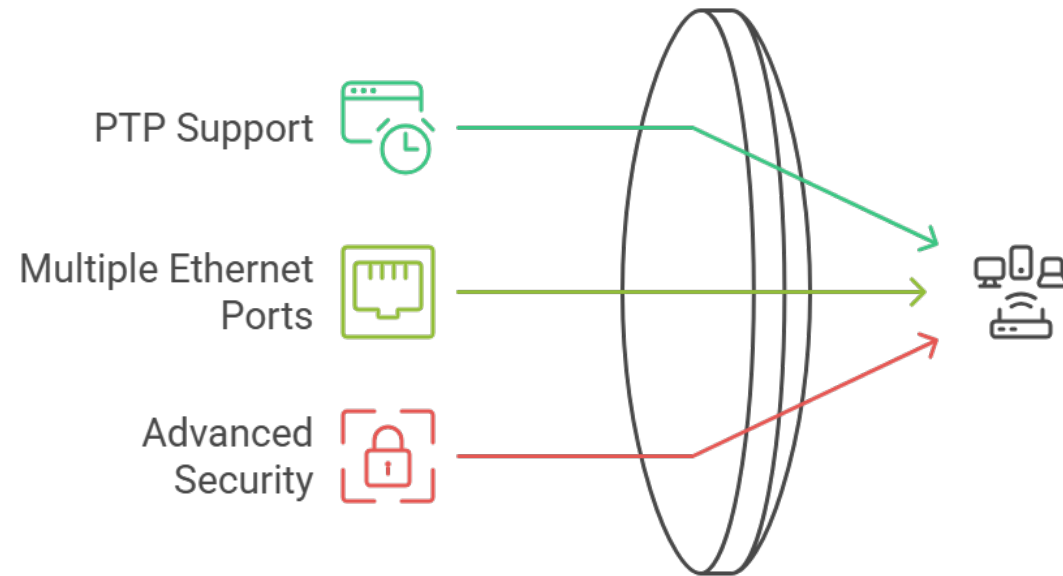


BCU

- IRF-B: Double Breaker and Breaker-and-a-Half
- IRF-C: General Alarms / I/O Box
- IRF-D: Single Breaker

2. ZIV SAS COMPONENTS

ZIV INDUSTRIAL SWITCH



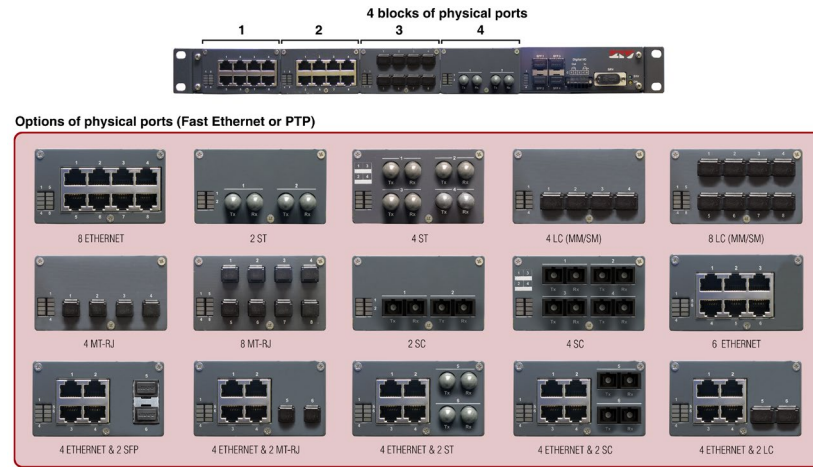
Designed for demanding electrical environments.

Fully Compliant

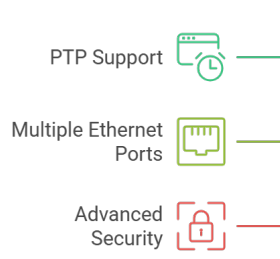
IEC 61850-3 & IEE 1613

2. ZIV SAS COMPONENTS

ZIV INDUSTRIAL SWITCH



Compact 19"/1 s.u. chassis.
Digital I/O (managed via SNMP).




3SWT L2/L3

Substation Switch (rack 19")

- 4 Gigabit Ethernet SFP bays and up to 32 Fast Ethernet ports (RJ-45, MT-RJ, ST, SC, LC, LC SM).
- Standard STP/RSTP. VLAN support.
- Local and remote management through local console, Telnet server, SSH server, or HTTP/HTTPS web server.
- SNMPv1, SNMPv2c and SNMPv3 agent.
- LLDP, GARP/GMRP, NTP/SNTP.
- User access control by TACACS+ or RADIUS remote server.
- Port based Network Access Control by RADIUS or local configured address lists.
- Q-in-Q operation (double tag).
- Link aggregation (LAG) user configured (no LACP), according to IEEE 802.1AX.

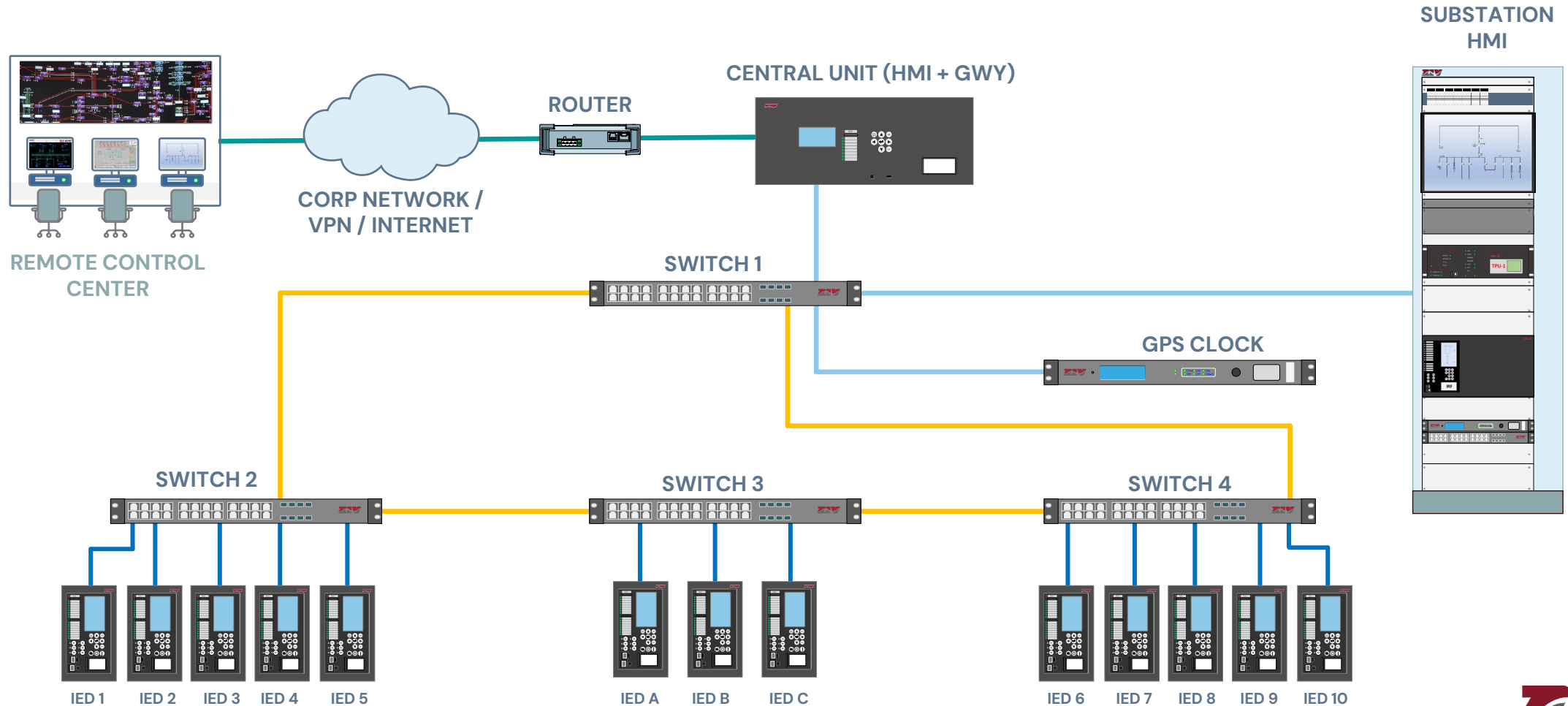
3. SYSTEM ARCHITECTURE

TOPOLOGIES BASED ON SYSTEM CRITICALITY & REDUNDANCY REQUIREMENTS

- 
- **Star topology with fiber optic serial protocols:** A simple and efficient communication setup, ideal for applications where simplicity and cost are key factors.
 - **IEC 61850 with and without UCS (Central Supervision Unit) redundancy:** Enables robust and flexible substation automation management.
 - **PRP (Parallel Redundancy Protocol) network redundancy:** Ensures uninterrupted communication by duplicating packets across two parallel networks.

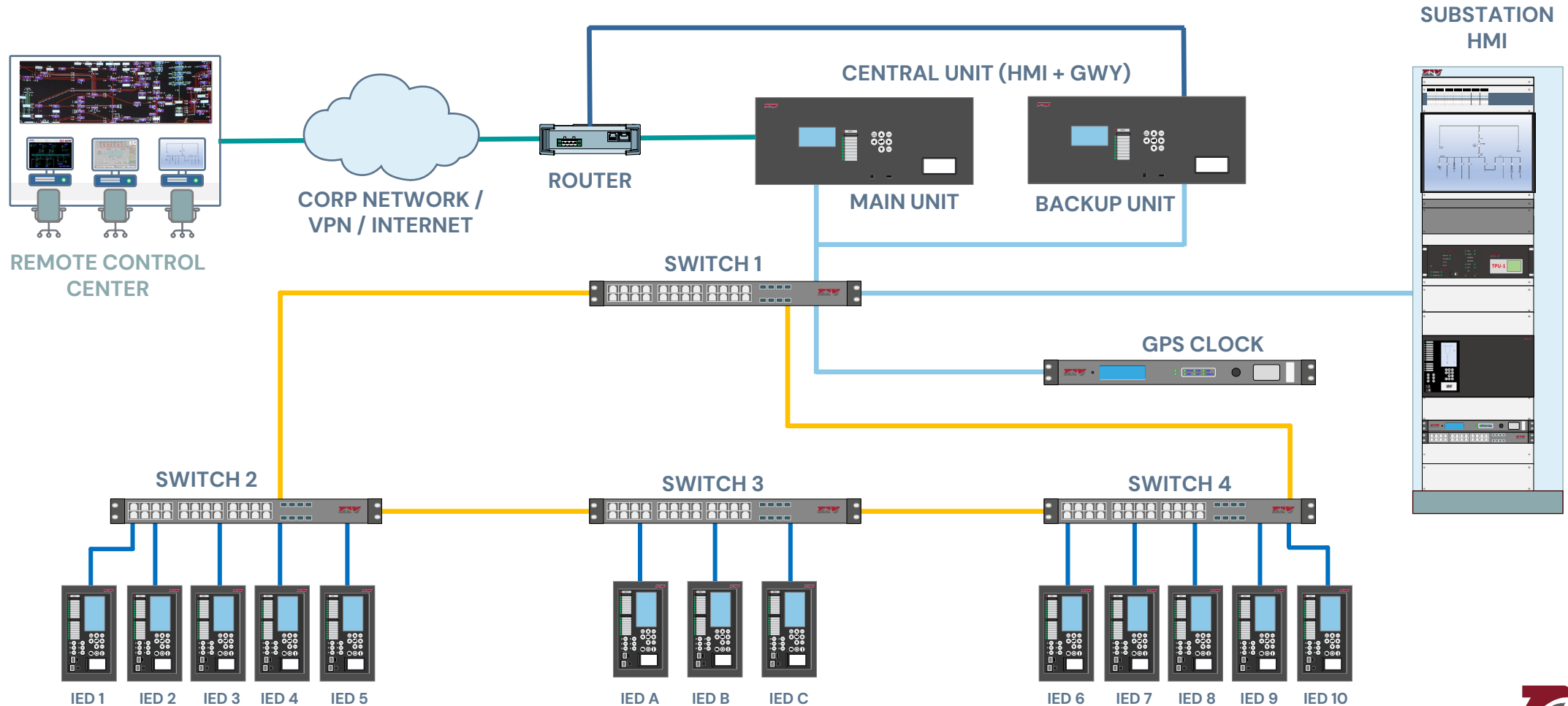
3. SYSTEM ARCHITECTURE

IEC61850 WITHOUT SCU REDUNDANCY AND SINGLE RING



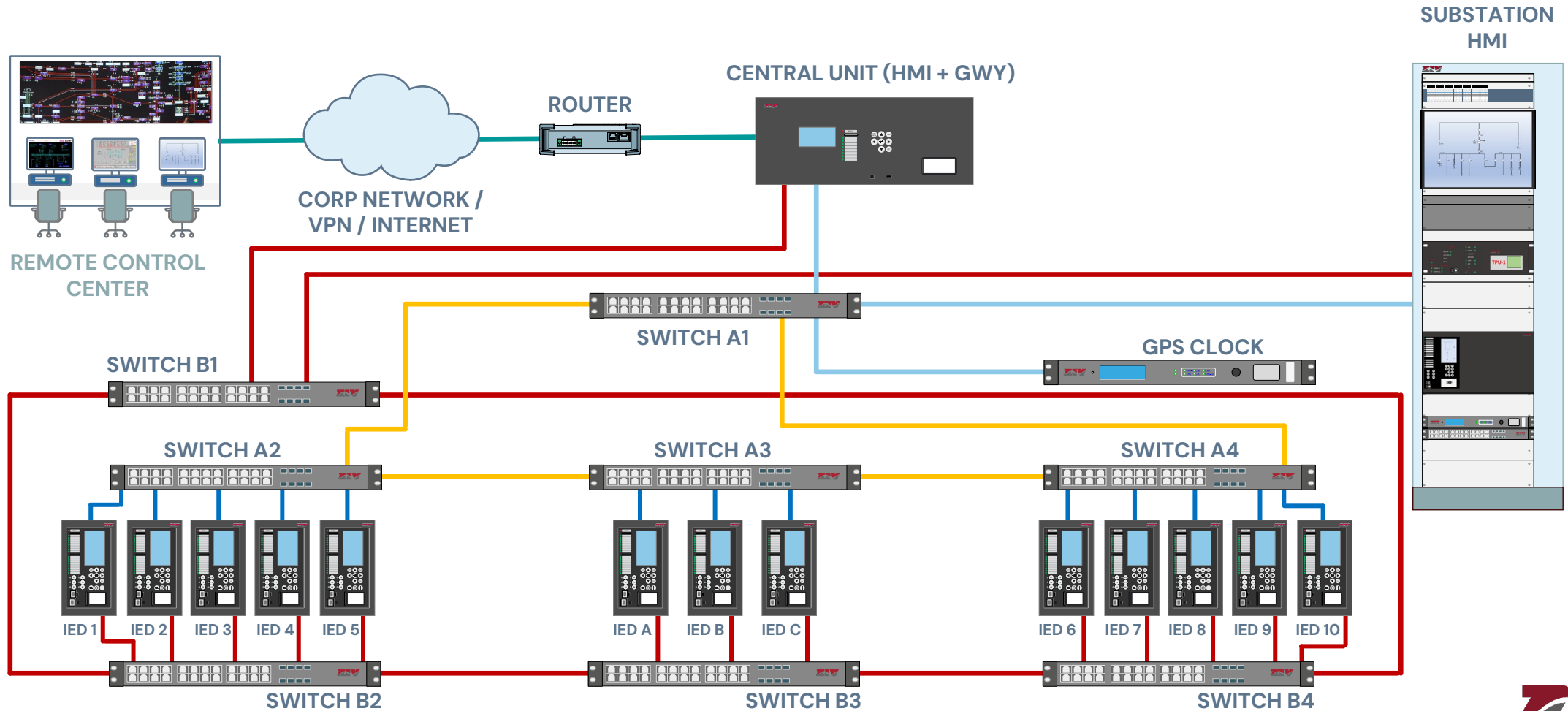
3. SYSTEM ARCHITECTURE

IEC61850 WITH SCU REDUNDANCY AND SINGLE RING



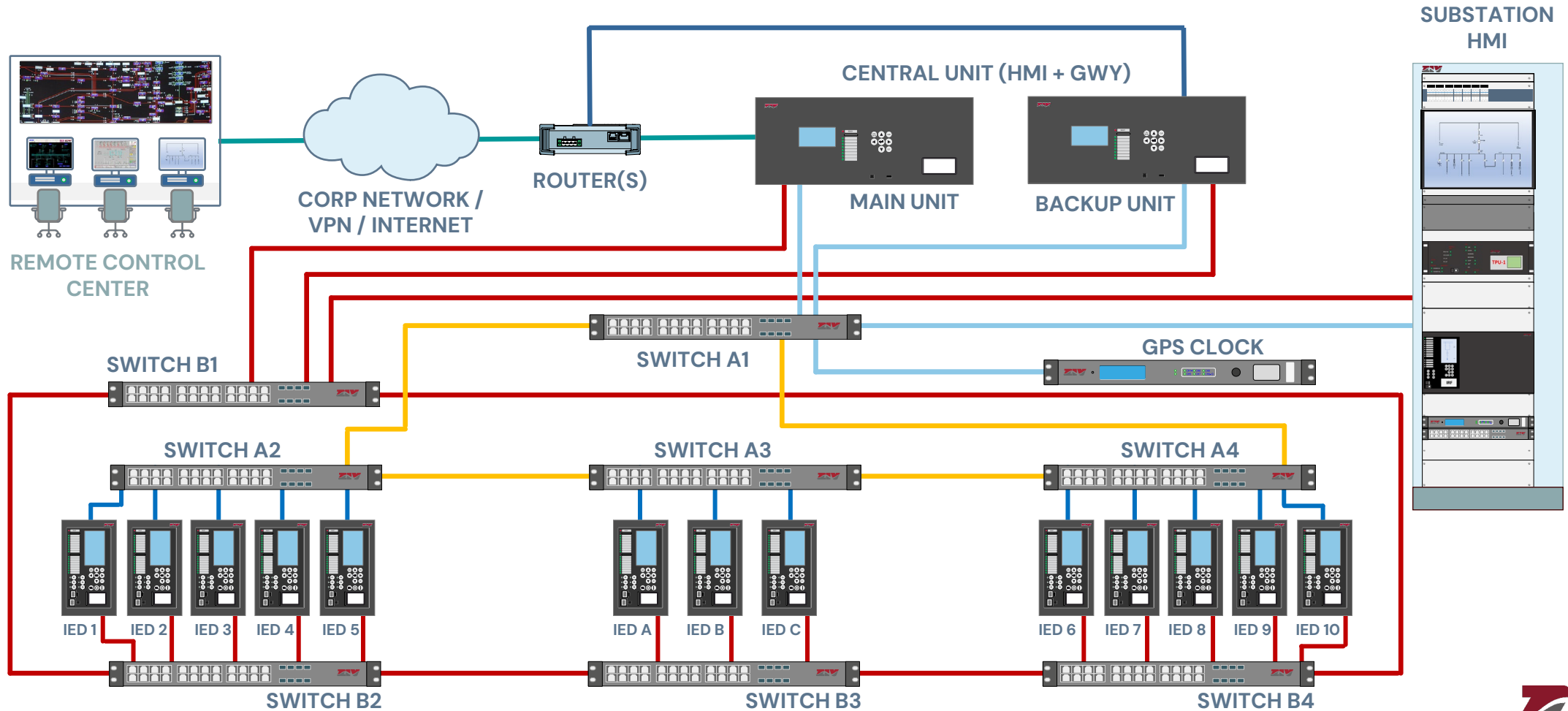
3. SYSTEM ARCHITECTURE

IEC61850 WITHOUT SCU REDUNDANCY AND PRP NETWORK REDUNDANCY



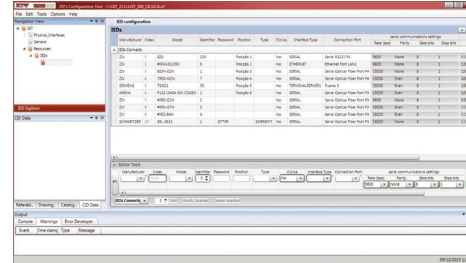
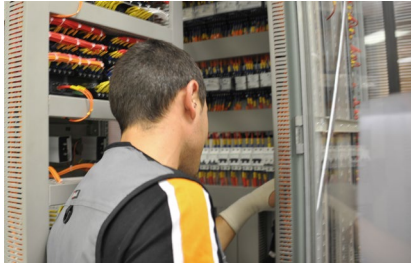
3. SYSTEM ARCHITECTURE

IEC61850 WITH SCU REDUNDANCY AND PRP NETWORK REDUNDANCY



4. ZIV VALUE ADDED SERVICES

ELECTRICAL & LOGICAL ENG



IED configuration
Setting calculation
Panel manufacturing & wiring

ON-SITE SERVICES



Cold Commissioning
Hot Commissioning
Maintenance
SLA 24/07?

FATS

SAT

+ RETROFIT

TRAINING

Onsite COURSES
+ Online Webinars



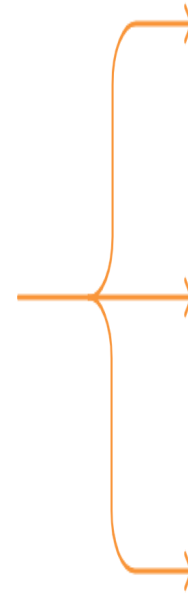
5. DIGITAL RELAYS

ZIV E-NET SUITE RELAYS FAMILY



Integrated Protection Functions

New brochure:
[HFLEX2410lv00](#)



DLF – Line Differential Protection with Distance Backup

Both units are suitable for lines of any voltage level, overhead or under ground, multiterminal, and single or parallel circuits.

IDF –Transformer Protection Transformer Protection for two or three winding transformer or autotransformer, of any voltage level, with single or double circuit breaker.

IRF – Modular Feeder Protection Feeder Protection IED for distribution feeders, transformers and generators, transmission line backup, and BCU (Bay Control Unit for single or double circuit breaker).

RTF – Automatic Voltage Regulator Automatic Voltage Regulator for up to 5 power transformers in parallel.

ZLF – Distance Protection Distance Protection suitable for lines of any voltage level, single or double circuit breaker with any configuration: overhead or underground, single or parallel circuits

DBF – Distributed Busbar Protection Distributed Busbar Protection with Ethernet HSR or PRP Redundant communication between the central and bay units, based on process bus

5. DIGITAL RELAYS

ZIV E-NET SUITE RELAYS FAMILY



General Characteristics

Modular, Flexible & Cybersecure
Protection IEDs designed to meet the
most demanding requirements in each
Application Field.

- Powerful programable logic.
- 2000 event log. Up to 100 oscillography seconds.
- Alphanumeric or graphic display.
- Up to 20 analog channels, 160 DI, 80 DO, and 22 LEDs.
- Bonding, RSTP, PRP and HSR Redundancy.
- IEC 61850 Ed. 2, DNP3, Modbus RTU and PROCOME protocols.
- Native process bus. Analog input cards operate as Merging Units for the CPU. Synchronized samples at 4800 Hz (as per IEC 61869-9).
- Cybersecurity in accordance with IEC 62351, IEC 62443 and IEEE 1686-2013 standards. RBAC, secure keys, physical and logical port disabling, cybersecurity event log, securing of management protocols (PROCOME, HTTPS, SFTP, SSH), remote authentication (LDAP, RADIUS) and digital firmware securitization.
- Time synchronization by IRIG-B, SNTP and PTP (Ordinary Clock / Transparent Clock).

ZIV SAS

DIGITAL RELAYS

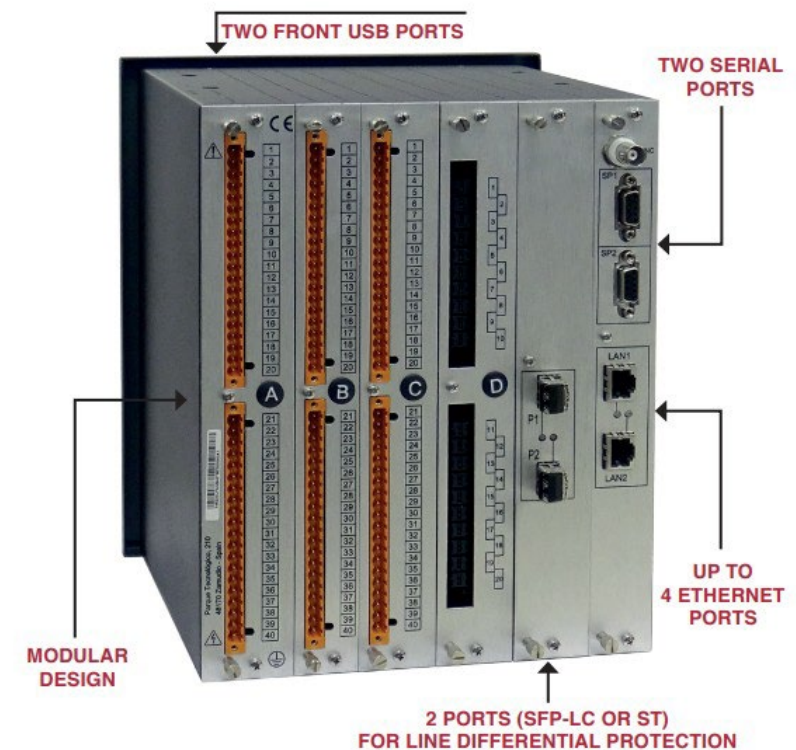


PROTECTION & CONTROL RELAYS

DLF :LINE DIFFERENTIAL PROTECTION WITH DISTANCE BACKUP

Both units are suitable for lines of any voltage level, overhead or under ground, multiterminal, and single or parallel circuits.

- DLF-**A**: for single breaker
- DLF-**B**: for double breaker or breaker-and-a-half, when CTs are at the line side (1 single set of 3 CTs)

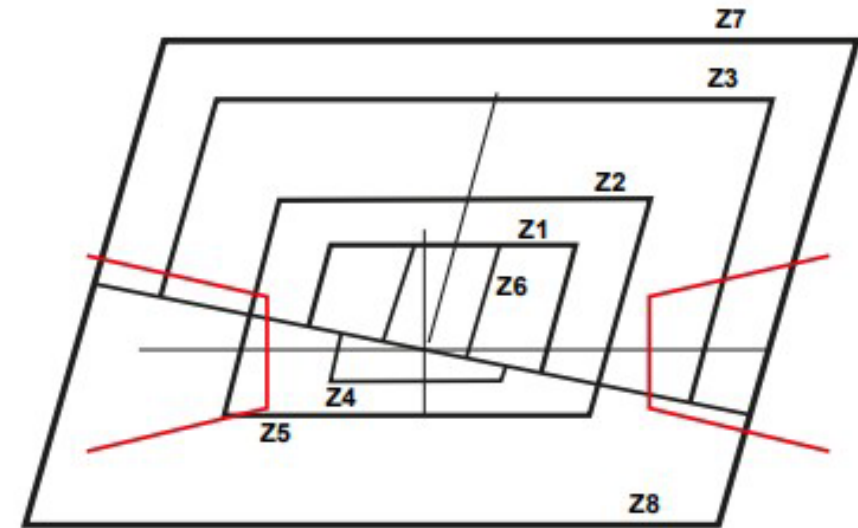


PROTECTION & CONTROL RELAYS

ZLF: DISTANCE PROTECTION

Suitable for lines of any voltage level, single or double circuit bre
single or parallel circuits.

- ZLF-**B**: for single breaker.
- ZLF-**C**: for double breaker or breaker-and-a-half.



Distance zones with
quadrilateral characteristic and load limiters

PROTECTION & CONTROL RELAYS

IDF: TRANSFORMER PROTECTION

For two to four winding transformers or autotransformers, of any voltage level, with single or double circuit breaker.

- IDF-**A**: for two windings Transformers
- IDF-**B**: for up to three windings transformers
- IDF-**E**: for up to four windings transformers, or three windings' transformers with one winding on breaker-and-a-half



PROTECTION & CONTROL RELAYS

IRF: MODULAR FEEDER PROTECTION

For distribution feeders, transformers and generators, transmission line backup, and BCU (Bay Control Unit for single or double circuit breaker).

- IRF-**A**: MV Feeder Protection & Control
- IRF-**B**: double breaker or breaker-and-a-half BCU
- IRF-**C**: general alarms BCU / I/O Box.
- IRF-**D**: single breaker BCU

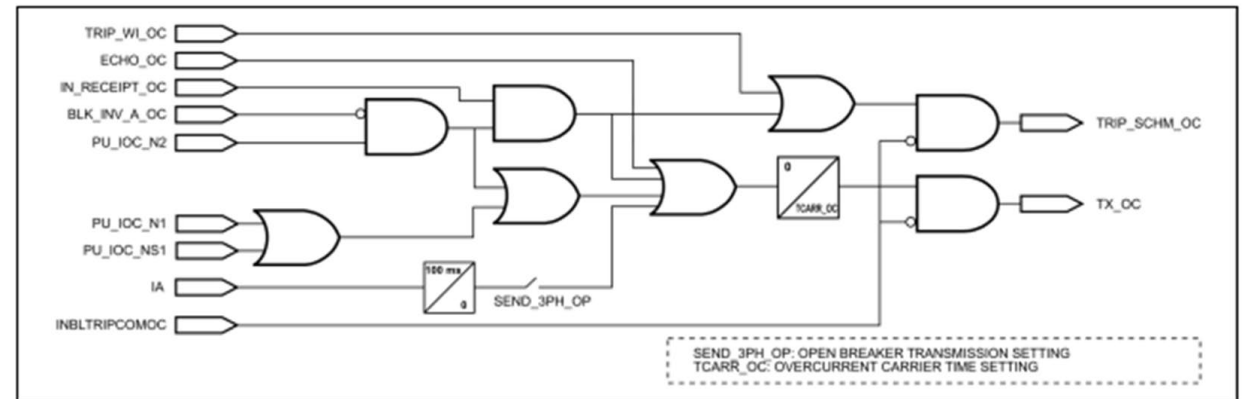


Figure 6. Permissive Overreach Trip Scheme Block Diagram (Overcurrent).

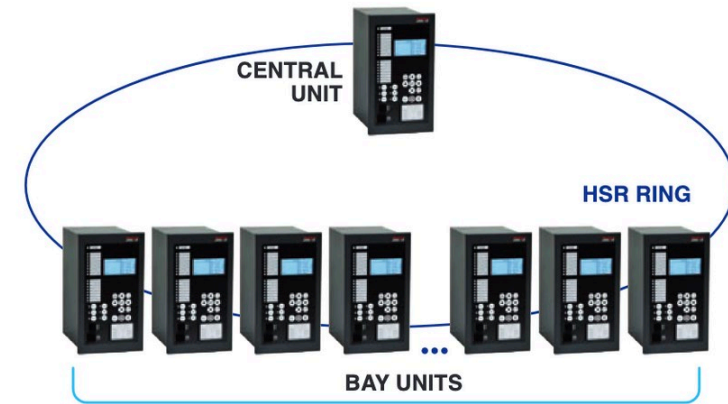
PROTECTION & CONTROL RELAYS

DBF: DISTRIBUTED BUSBAR PROTECTION

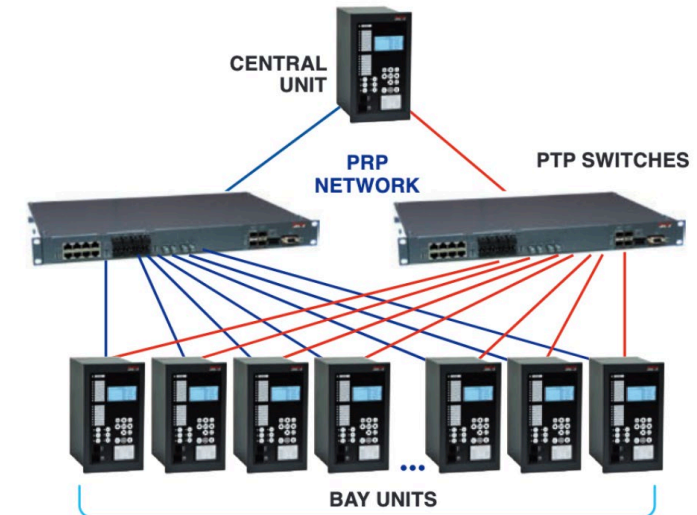
Distributed busbar differential protection for up to 24 bays and 4 busbars, with Ethernet HSR or PRP redundant communication between the central and bay units, based on process bus IEC 61869-9 SV, IEC 61850-8-1 GOOSE and PTP IEC 61850-9-3.

Cost-Effective Solution

The bay units, not only operate as SV publishers and GOOSE publishers / subscribers but they can also be used as Protection and Control IEDs, as they can run the protection functions of a feeder relay. This makes this solution very cost-effective for MV busbar differential protection.



HSR redundancy between central and bay units



PRP network between central and bay units

PROTECTION & CONTROL RELAYS

RTF: AUTOMATIC VOLTAGE REGULATOR (AVR)

Voltage regulation in power transformers in configurations with up to **5 transformers in parallel**

.Enables parallel transformer regulation using master/slave, circulating current, and negative reactance methods.

It also includes line voltage drop compensation functions.



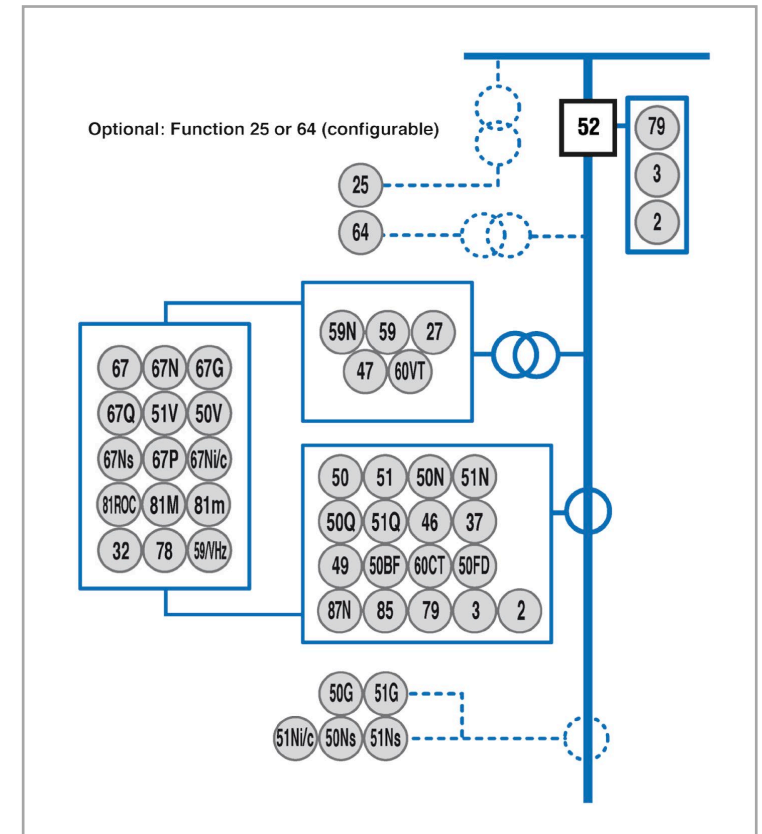
ANSI	Function	Uns.
90	Voltage Regulator.	1
	LDC (LDC-Z, LDC R-X).	1
	Under Voltage Block with Temporization.	1
	Maximum Switching Current Block.	1
	Voltage Out of Range Block with Temporization and Reset.	1
	Power Reversal Detection.	1
	Tap Changer Monitoring.	1
59	Phase Overvoltage.	1
81m	Underfrequency.	1
60VT	VT Supervision.	1

PROTECTION & CONTROL RELAYS

IRL: COMPACT FEEDER MULTIFUNCTION PROTECTION



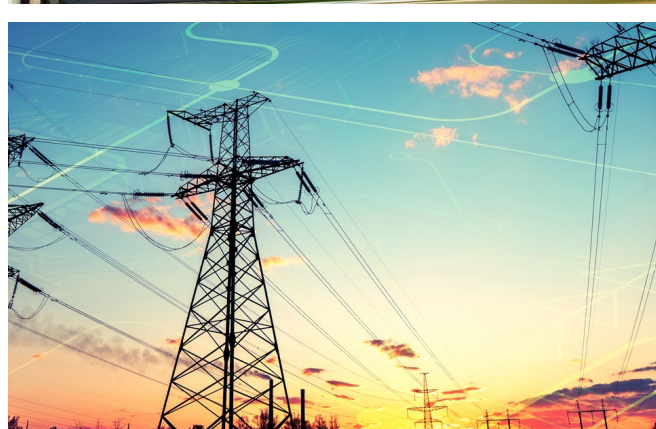
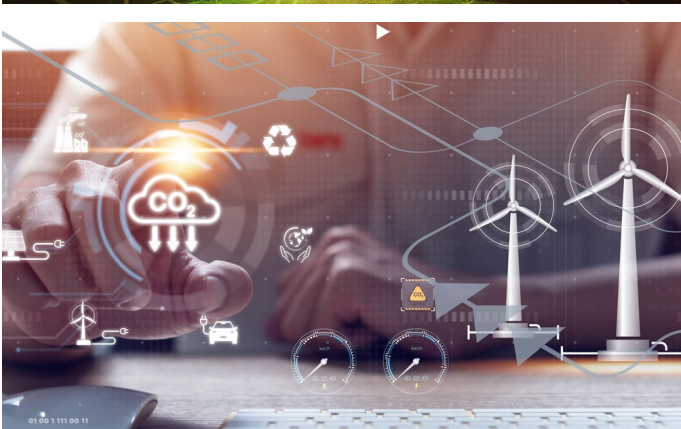
Compact Feeder Multifunction solution for MV switchgear, with Load Shedding Function to ensure the stability of the system, Back-Up performing capability in HV lines and powerful built-in Control Logic Module



PROTECTION & CONTROL RELAYS

New Brochure:
[HFLEX2410lv00](#)

MODEL	Description	Manual	
IDF	TRANSFORMER PROTECTION	MOIDFA2307lv00	
IRF	MODULAR FEEDER PROTECTION	MOIRFA2206lv23	
DLF	LINE DIFFERENTIAL PROTECTION WITH DISTANCE BACKUP	MODLFA1907lv40	
ZLF	DISTANCE PROTECTION	MOZLFBC2303lv09	
DBF	DISTRIBUTED BUSBAR PROTECTION	MODBFA2305lv07	
RTF	AUTOMATIC VOLTAGE REGULATOR	MORTFA1902lv30	
IRL	COMPACT FEEDER MULTIFUNCTION PROTECTION	MOIRLF1806lv22	
IRS	SELF-POWERED OVERCURRENT AND BREAKER FAILURE PROTECTION RELAY WITH HARMONIC BLOCKING	MOIRSA1904lv03	



Thanks for your interest
www.zivautomation.com

Contact us

