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A - Introduction

**alfanar** provide complete Substation Automation System with system integrator of Sprecher-Automation, Sprecher Automation GmbH offers automation solutions for energy, industry and infrastructure processes. Our customers are power utilities, industries, transportation companies, municipal utilities and public institutions.

Company-own developments and cooperations with technology partners lead to a unique product portfolio consisting of traditional electrical technologies as well as high-tech electronics.
The SPRECON - V460 Energy Edition is a reliable and open platform with special features for the energy industry. Valuable configuration time is saved by optimized processes in SPRECON - V460 Configuration Editor and by fully integration into the SPRECON E – parameterization.

For large and small energy companies, industry companies with their own power supply, the SPRECON - V460 Energy Edition offers outstanding automation control, performance, stability and scalability. The SPRECON-V460 Energy Edition is tailored to the needs of energy generation, transmission, distribution and available in different licensable variables expansions for Server and Client.

- V460 meets all demands of modern control center systems concerning monitoring, evaluation of the processes, generation, Scalability, Redundancy
- Beside the standard protocol IEC60870-5-104&101 and IEC61850 with built in handers of proprietary protocols
- New consept to faclitete V460 in all prosesses vesualization level
  • Local HMI
  • HMI workstations at station control Level , Machine control level or local power plant stystem
  • Hot standby , mulit hierarichical Scada system for Various graid and netwrok station like complete control center
Substation Automation System solution

C – SPRECON-E-C (Bay control unit for any voltage level)

- based on a uniform and modular system architecture in terms of hardware, data structures, communications logical function
- High scalability range the devices applied as RTU, BCU, Protection Device
- High performance and manufacturer-independent CPU acts as the core of the process oriented hardware with multi cards suitable for any processing input and output
- Support attachable control panel and alarm panel

D – Engineering software and work flow

- SPRECON-E Engineering center is workflow oriented software platform for SAS equipment’s it cover configuration parameterization, maintenance
- The platform designed to be comply with project management and international standards like IEC61850 incl. PRP functionality for seamless switch over in case of network.

- GPS (time synchronizing clock with SNTP, NTP and PRP functionality for seamless switch over in case of LAN problems)
E - Ethernet switch

( comply with IEC61850, PRP communication, HSR, RSTP )
- Using IEC61850 communication switch with different topology (Ring, star, Mesh)
- Fully Redundancy, with very high availability

F - Industry Work station

- high availability for client and server applications
- redundancy power supply, SSD storage HD, and FO ports with PRP

G - Protection IEDs

( all vendor comply with international standards, more than 300 legacy protocol supported )
Advanced Distribution Automation solution A–DAS

**alfanar** provide complete Distribution Automation system, the competencies came from the partnership with one of the unique supplier worldwide and and **alfanar** manufacturer capability for most of power Equipment’s like RMU

PSI’s highly available energy systems play a key role in ensuring a stable and dependable supply of electricity, gas, oil, heat and water in the growing energy markets.

**A – PSI Control**

PSIcontrol was developed for maximum productivity increase of operational network management. With this control system, a small staff can reliably and securely operate very large networks with a high number of objects even during extreme information loads.

This increased efficiency is possible only by state-of-the-art application functions.

The sophisticated system technology provides the platform for the realization of the control system and its acceptance by the network management staff. The unique system-technical features are based on comprehensive network capabilities and the purposeful implementation of communication standards.

**PSIcontrol has been designed for sophisticated and economic management of**
- Electrical transmission networks,
- Regional electrical distribution networks,
- Networks for multi-utility supply of electricity, gas, district heating, and water,
- Railway electricity networks, and
- Industrial networks.
B - PSI system features

a) Structural Flexibility
Maximal structural flexibility in the control system design. A PSIcontrol control system is not limited in terms of location. It is possible to sub-divide the control system architecture and to set up sub-systems in different locations. This is particularly beneficial in terms of security and redundancy.

b) Highest system performance by parallel processing
The parallel processing provides the shortest possible system response and processing times, even during worst-case situations and extreme information throughput.

c) Unsurpassed Availability
Parallel processing structures can be added redundantly as needed without affecting the system performance. The PSIcontrol redundancy management handles all error situations even during occurrence of simultaneous errors or multiple errors. As long as one component on each system level remains functional, the entire system remains operational without limitations. In most of the implemented projects, availability of nearly 100% is achieved.

d) System virtualization provides additional potential for savings
Multiple sub-systems running in separate hardware components can be virtualised and run on less hardware.

C - DAS platform component

a) DAS software
- PSIcontrol

b) Power Equipment’s
- RMU, automatic reclosers, RTU, Servers, LCD etc

c) Communication system
- GPRS, Ethernet technology IEC6870-5-104, serial technology through fiber optics IEC6870-5-101
A - Overview

New SFA RM is designed for supplying sustainable energy, protecting electrical equipment in secondary distribution networks up to 17.5 kV.

| Rated Short Time Withstand Current | 21 kA / 1 Sec  
| - | 21 kA / 3 Sec 
| Internal Arc Classification | A (FLR) 21kA / 1 Sec (indoor & outdoor) 
| Relative Humidity | 100% 
| IP Class (Gas Tank / Indoor / Outdoor) | IP 67/ IP41 / IP54 
| Applied Standard | IEC 62271-100 

B - Features

- Self-power RMU
- 3G/4G Communication, VPN Security “IPsec”
- IEC60870-5-104/101 and DNP3
- Accurate Measurements for voltage and current in all switching elements
- Switching units sealed in SF6 gas filled stainless steel tank
- High level operator safety and operating reliability
- Maintenance free unit offering life expectation of over 30 years
- With embedded cable testing compartment, easy and safe cable testing Without cable connection removal
- Smart interlocking with padlocking system for maximum operator safety
- Different feeder combinations with switch disconnector and vacuum circuit breaker
- High resistance to pollution and humidity
- Compact design up to 17.5 kV; KEMA type tested
C - Smart SFA-RM, main component

a) RTU (Remote Terminal Unit) SPRECON-T3:
The Smart RMU has an integrated (RTU) to provide capabilities for remote monitoring & control via control center. The connection between the local RTU and control center will establish over Secured Virtual Private Network connection (VPN).

Supported Protocols in SPRECON-T3:
1 - Tele control protocols: IEC 60870-5-101/-104
2 - Station bus protocols: IEC 60870-5-101/-104
3 - IED protocols:
   - IEC 60870-5-101/-103/-104
   - Modbus
   - IEC61850 and DNP3.0
4 - Electric metering protocol: IEC 62056 (IEC 1107)
5 - Standards GSM/GPRS
6 - GSM frequencies: 850, 900, 1800, 1900 MHz

b) Power supply and batteries:
The proposed Smart RMU is self-power unit, the supplied power come from the CPT (Control Power Transformer) connected directly to the live bus and provide the LV circuit by 220VAC. All used equipment like: aux relays, RTU, modem & trip close motors coils are operate by 24VDC which come from the AC/DC converter capable to provide a sufficient power, also this unit has battery system to ensure the sustainability of the power supply.

c) Self-Powered Overcurrent Protection
Where dependable auxiliary power source is not available, the IRS Relay can be energized either directly from Main Current Transformers, AC/DC Auxiliary Voltage or through the USB Front Port.
Integrated solutions for HV, MV & LV Systems and Metering

A - Overview

Providing greater selectivity, reliability and security to T&D networks Helping to remove barriers in the deployment of Smart Grids.

Protection + Control + Communications + Metering
contributing to the sustainability of energy networks

B - Product Families

d) Monitoring & Control:
Solutions available for all kind of system architectures centralized, Distributed or combined.
- Substation Central Units (XCELL Modular & compact RTU)
- Stand Alone Bay Control Units (Smart Bay Control Unit, Voltage Regulator RTV)
- Advanced Network Manager
- MV Supervision & Automation (Modular 2TCA, ADFD)
- LV Supervision systems (USP 20, 4CCTI, 5CTI)

e) Communications:
Data transport for services in/to EHV / HV / MV Secondary Substations.
- Power Line Carrier Systems
- Tele protection Systems
- LMUs (Line Matching Units) & Accessories for PLC
- Networking Solutions:
  - Primary Substation Solutions (SWT-L3, NRTR, CIC, 4CCN)
  - Secondary Substation Solutions (SWT, DRA-2, EMR-2, 4UMMG, SIP-2)
- Communications over PLC (ZBP-1, NDLC)
f) Protection & Control:
New generation of Adaptable & Interoperable Protection & Control IEDs.
• OHL / Cable (ZLV Distance Protection, DLX Line Differential Protection)
• Bus bar (DBC/DBP Differential, DRV Multifunction & Differential,
   DCV Capacitor Bank Multifunction & Differential.
• Capacitor Bank (BCV Capacitor Bank Protection)
• Transformer (IDV, IDX Differential Protection)
• Feeder (IRV IRX Overcurrent multifunction)

E-NET suite
• IRF Relays for HV Power Systems (Adaptable, Modular & Cyber secures) E-NET flex
• IRL Compact Multifunction Protections for MV Power Systems & Industry E-NET compact
• IRS Self-powered relays E-NET self

g) Metering:
• Smart Meters (5CTM, 5CTL, 5CTD, 5CTD Link Y)
• Industrial Meters (5CTD)
• High precision Meters (5CTE)
• Data Concentrator Units (DCUs)
Protection Solution

A - Overview

Alfanar provide complete protection schemes with system integrator of PROTECTA Ltd. Protecta has more than half a century of experience in production and development of electromechanically, solid state protection devices till the edge of technology in numerical protection relays.

We are offering full range of products and services from technical training to after-sales service.

B - Development milestones

- 1949 - 1960 Electromechanical devices
- 1960 - 1970 Transistor-based devices
- 1971 - Protection with analog integrated circuits
- 1990 - Numerical protective devices

C - Areas of Applications

- Transmission Network 120KV-400KV
- Main distribution network of original distribution of companies (10KV 120 KV)
- Generator - transformer units and Auxiliary network of power station
D – Product Range

• DTIVA [MV Feeder protection and control application]
  - Complete MV bay unit including full protection and control functions
  - Enhanced interlocking schemes
  - Distribution load shedding schemes
  - Protection against islanding operation for wind farm and photovoltaic energy application

• DTRV [Transformer and generator protection two and three winding]
  - Biased differential protection characteristics
  - Optional impedance protection
  - Transformer inrush current minimizing function for expanding lifetime and maintenance reduction

• DTVA [line differential protection with distance built-in]
  - CCVT filtering algorithm to maintain protection speed and fault coverage
  - Fast trip of appr.20ms
  - Load encroachment
  - Single pole/three pole autoreclosing with synchrocheck and synchroswitch
  - Redundant line differential protection via two physical links 2 end application

• OGYD & DGYD [Bus Bar protection]
  - Support Centralized and decentralized solution
  - Built in breaker failure protection
  - Open CT detection ,and enhanced CT saturation detection

• S24 [MV Feeder protection and control application]
  - Smart MV protection feeder manager with multi variant for different requirements
  - Trip circuit supervision
  - Several mounting method
  - Wide range auxiliary power supply

Futures
• Color TFT touch screen
• Built in Event
• Disturbance Recorder
• IEC61850-PRP-HSR-GOOSE
• Webserver