FAMILY OVERVIEW

EuroProt+ product line overview

PROTECTA HUNGARY

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PROTECTION, AUTOMATION AND CONTROL FOR POWER INDUSTRY

VERSION INFORMATION

VERSION	DATE	MODIFICATION	COMPILED BY
1.0	2019-04-05	First edition	Erdős, Tóth
1.1	2020-02-17	Minor corrections	Erdős

CONTENTS

1 Introduction

Protecta Ltd. offers intelligent electronic devices (IEDs) for fault protection and for the control of low-, medium- and high-voltage electric power networks. The EuroProt+ product family of IEDs produced by Protecta Ltd. draws on more than 60 years' experience in the field of efficient protection relaying.

The EuroProt+ product line complex protection - in respect of hardware and software - is a modular device. The EuroProt+ type complex protection in respect of hardware and software is a modular device. The modules are assembled and configured according to the requirements, and then the software determines the functions. Because of the modular design of the hardware and software, it ensures completely customized solutions for your needs in the power energy system throughout the life cycle of the device. The modular design allows for easy configuration and facilitates future upgrades.

The IED EP+ S24 Smart Line series is a special selection of the EuroProt+ products, bearing in mind the cost-effective realization. All modules, all FW and SW are identical to the general EuroProt+ series therefore all test reports and certificates issued for EuroProt+ apply to the S24 series.
The Smart Line devices provide an optimized range of protection, monitoring and control functions in a space-saving enclosure, bearing in mind cost-effective implementation.

1.1 EuroProt+ product line general features

- Scalable hardware to adapt to different applications
- Flexible protection and control functionality to meet special customer requirements and to provide easy upgrade solutions
- Because of the customer-focused design in the hardware and the software, the product provides easy-to-handle hardware and software engineering throughout the IED lifecycle
- Advanced HMI functionality via color touchscreen and embedded WEB server, extended measuring, control and monitoring functions
- The pre-defined factory configuration can be customized to the user's specification with the powerful EuroCAP tool

Reliable, secure and tailor-made solution

- Built-in self-supervisory function minimizes the risk of device malfunctions
- Straightforward integration in retrofit applications
- Thanks to the modular architecture in HW and functions, the IEDs are assembled and configured according to the user's requirements
- Because of the control, measuring and monitoring functions implemented, the IED can also be used as a bay control unit
- Integrated advanced cyber security – Conformity with the Cyber Security requirements in accordance with the BDEW White Paper and NERC CIP guidelines and standards
- Can handle several communication protocols simultaneously

2 Product positioning

The following types can be categorized under the EuroProt+ product line:

S24 smart line series:
Protecta S24 smart line protection and control relays have been designed to be the main or back-up protection in utility and industrial power system. The S24 devices provide extensive range of protection and control functions in a space-saving enclosure.

DTVA – Transmisison line protection & control:
The DTVA product type is configured to protect, control and supervise the elements of the transmission network, where systems are typically solidly grounded.

DTRV – Transformer protection & control:
The DTRV products are designed for protection and control applications of power transformers and generators including generator-transformer blocks

OGYD/DGYD – Busbar protection:
The OGYD and DGYD products are made for busbar protection applications.

DTIVA – Distributed network components protection & control:
The DTIVA products are configured to protect, control and supervise elements of the utility and industrial distribution systems, including radial, looped and meshed distribution networks.

DAUT – Special automation & control:
The DAUT type incorporates special automation devices, such as high speed bus transfer device; automatic event-driven bus transfer device; arc suppression coil control device; transfromer inrush current minimizer; automatic generator synchronizer

DVEZ – Bay control:
DVEZ IEDs are used for bay control unit applications in transmission and distribution network.

TITLE	EUROPROT+						
TYPE	**S24 SMART LINE SERIES**	**DTVA**	**DTRV**	**OGYD/DGYD**	**DTIVA**	**DAUT**	**DVEZ**
Field of application							
Power plants generator, transformer protection and control, autosynchroniser			■			■	
Transmission lines distance and line differential, protection and autorecloser		■					
Transformers protection and control, automatic voltage regulator, arc suppression, coil controller, inrush current minimizer, auto-changeover	■		■				
Busbar busbar protection, automatic bus transfer				■			
Distribution networks feeder, capacitor bank protection and control, load shedding	■				■		
Industry applications incoming feeder, motor and small generator protection and control	■				■		
Railway applications railway catenary and transformer protection and control					■		
Renewable energy protection against island operation, reverse power flow, inverter control, small generator protection	■		■		■		
Bay control							■
Main features							
Power supply	Wide range of selectable PS modules	Wide range of selectable PS modules • Nominal DC voltage from 24 V to 220 V • Nominal AC voltage from 110 V to 230 V					
Analog inputs	Conventional and/or sensor	Conventional and/or sensor					
Binary inputs	Wide range of binary input rated voltages	Wide range of binary input rated voltages • Nominal DC voltage from 24 V to 220 V					
Case type	• 24HP wide, limited module variations (Input / Output quantity selectable based on requirements) • Din-rail mounting option	• 42 or 84HP wide housing with comprehensive range of withdrawable modules • Several mounting methods: Rack; Flush mounting; Semi-flush mounting; Wall mounting; Wall-mounting with terminals; Flush mounting with IP54 rated cover.					
Local HMI	• Default 128 x 64 pixel monochrome display • optional 3,5" TFT display with resistive touchscreen interface • 16 programmable+ 1 status LED • Front RJ-45 user interface for programming	• 3,5" or optional 5,7" TFT display with resistive touchscreen interface • 16 programmable+ 1 status LEDs • Front RJ-45 ethernet user interface for programming					
Local Command and Control	Controllable object definition on the optional TFT display with customizable user screens	Controllable object definition on the TFT display with customizable user screens.					
Communication	• IEC 61850 • Serial protocols (IEC 60870-5-101/103, Modbus RTU, DNP3, ABB-SPA) • Network protocols (IEC 60870-5-104, DNP3, Modbus-TCP)	• IEC 61850 • Ethernet redundancy PRP and HSR • Serial protocols (IEC 60870-5-101/103, Modbus RTU, DNP3, ABB-SPA) • Network protocols (IEC 60870-5-104, DNP3, Modbus-TCP)					
Time synchronization	• NTP server • Legacy protocol master • Minute pulse • IRIG-B000 or IRIG-B12X	• NTP server • Legacy protocol master • Minute pulse • IRIG-B000 or IRIG-B12X					
Supervision	• Built-in self supervision • CT/VT supervision • Trip value recording • Built-in trip contact supervision (TCS)	• Built-in self supervision • CT/VT supervision • Trip contact supervision (TCS) • Trip value recording					
Fault analysis	• High capability event recording with 1ms timestamp (more than 10 000 events stored) • Integrated disturbance recorder for up to 32 analogue and 64 digital signal channels (sampling rate 20 or 40 samples/cycle)	• High capability event recording with 1ms timestamp (more than 10 000 events stored) • Integrated disturbance recorder for up to 32 analogue and 64 digital signal channels (sampling rate 20 or 40 samples/cycle)					
Programming interface	• Local HMI • EuroCAP configuration tool • Web browser	• Local HMI • EuroCAP configuration tool • Web browser					
Special modules		• Detachable display • Remote I/O unit • RTD • mA inputs					

Remote I/O (RIO) server is an IED which provides remote binary inputs and outputs at a distance from an EUROPROT+ protection device. It communicates with the EP+ device via COM+1335 module, MODBUS/TCP protocol.

3 Communication

3.1 Flexible communication capabilities

- The relays provide one front port for engineering purposes and several rear communication ports for remote access
- 61850 native support
- Handling of comprehensive range of serial or Ethernet-based communications protocols and several parallel communication channels:
  - Serial communication: DNP3.0; IEC60870-5-101/103; MODBUS, SPA
  - Ethernet-based communication: IEC61850; IEC60870-5-104; DNP3.0 TCP; Modbus TCP
- 2 independent Ethernet or serial protocols handled in one channel simultaneously
- Seamless redundancy protocols PRP, HSR

3.2 Interoperability and easy integration solutions

- Straightforward integration in retrofit applications
- Native IEC 61850 IED with Edition 2 compatibility
- Interoperability in compliance with IEC 61850 Edition 1 and Edition 2

3.3 Secure communication

Integrated advanced cyber security – Conformity with the Cyber Security requirements in accordance with the BDEW White Paper

- Passwords are stored in encrypted form
- IED configuration management via a secured channel (SFTP)
- User-selectable access modes of the built-in web interface: enabled, disabled, read-only modes
- All kinds of user interactions are logged
- Security-related events can be sent to a remote log server
- Remote access may be allowed for dedicated clients only (Whitelist)
- IED management and SCADA accesses can be controlled individually
- Local debug console is password protected

4 Monitoring and supervision capability

4.1 Self-Monitoring

- Built-in self-monitoring to detect internal hardware or software errors to minimize the risk of device malfunctions
- The relevant information of the self-diagnostics is stored in various log files. This can be useful during problem analysis and in designing the appropriate corrective actions.

4.2 Secondary circuit supervision

- Enhanced breaker monitoring and control
- The heavy-duty tripping contacts are integrated with a trip circuit supervision function. An alarm signal can be generated if an interruption is detected in the trip circuit.
- Monitoring of the secondary circuits (current and voltage circuits) and detection of any abnormal condition in them.

4.3 Equipment condition monitoring

Condition monitoring of primary equipment such as CB, transformer gas or temperature can efficiently help the process of operation and maintenance.

- CB wear monitoring
- Oil or gas insulated switchgear pressure monitoring
- Transformer oil temperature monitoring

4.4 Power system quality monitoring

The EuroProt+ product line can monitor and detect current and voltage harmonics and short-duration system disturbances such as

- harmonics contents of each voltage and current channel
- Current total demand distortion (TDD)
- Voltage total harmonic distortion (THD)
- Sags (Dips), Swells and Interrupts

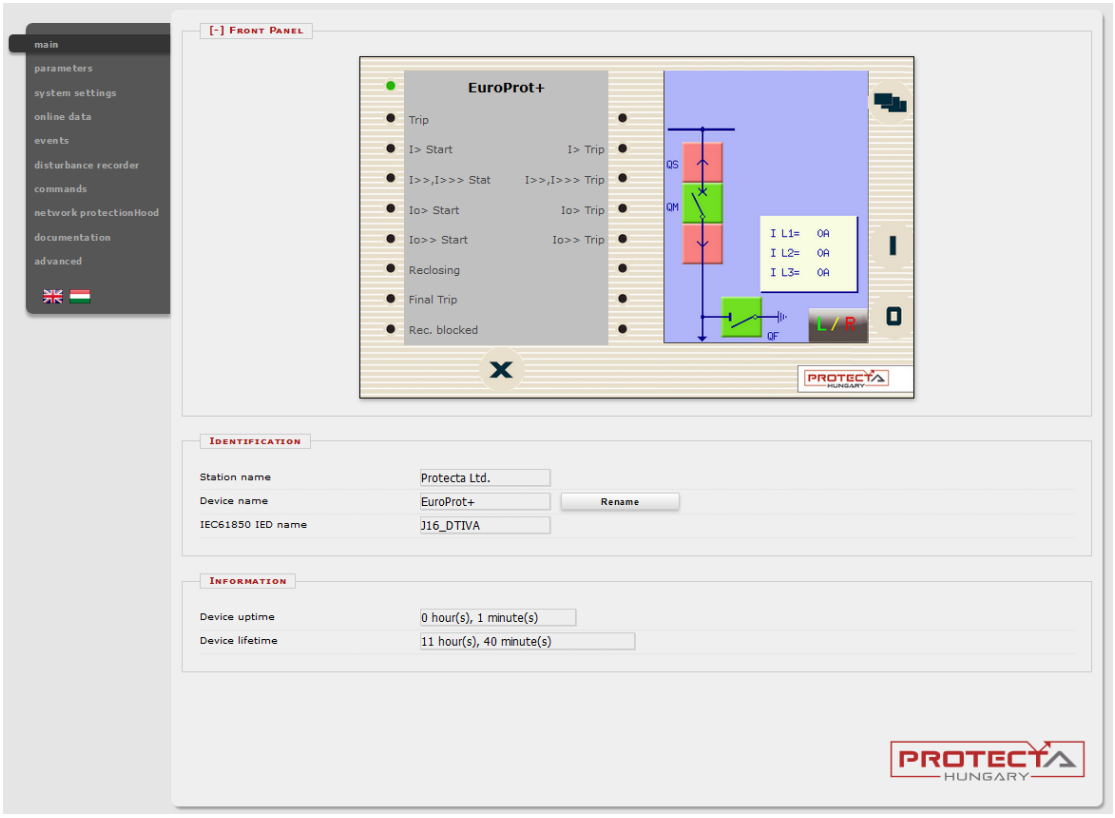
4.5 Event & Disturbance recorder

- High capability event recording with 1 ms timestamp (more than 10,000 events can be stored) - data is stored in non-volatile memory
- Integrated disturbance recorder for up to 32 analogue and 64 digital signal channels (sampling rate 20 or 40 samples/cycle, software selectable). The records are stored in the non-volatile memory of the IED in standard COMTRADE file format
- Depending on the chosen standard configuration, integrated fault locator for fault impedance and distance-to-fault calculation are available

5 Device programming – configuration, parametrization

5.1 Remote user interface

The EuroProt+ devices communicate on standard Ethernet networks; parameter setting can be performed using any “standard” browser (Chrome, Firefox, Edge etc.).



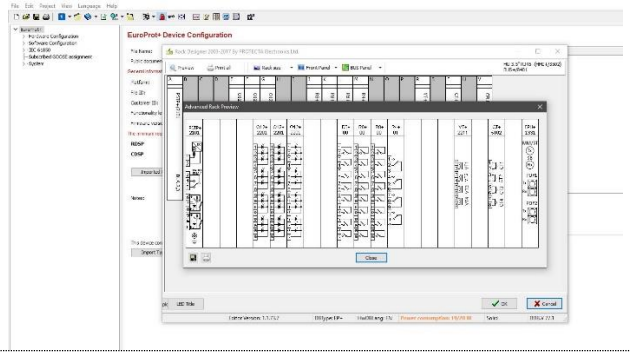
5.2 EuroCAP configuration tool

The EuroCAP configuration tool, which is available free of charge, offers a user-friendly and flexible application for protection, control and measurement functions to ensure that the EuroProt+ product line devices are fully customizable.

5.2.1 Included modules

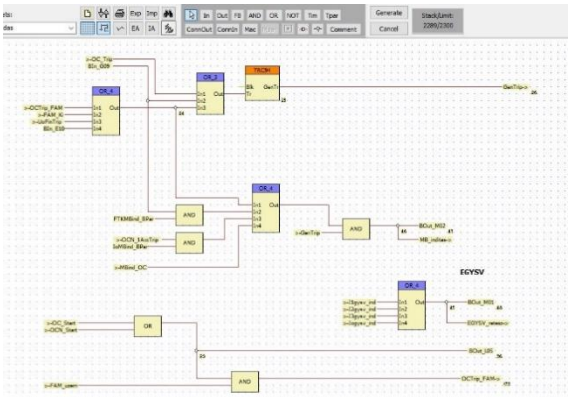
HW configuration

- View the exciting hardware configuration of the IED including card information and slot position
- Modify (add or change) certain HW modules
- Digital and analogue I/O signal definition



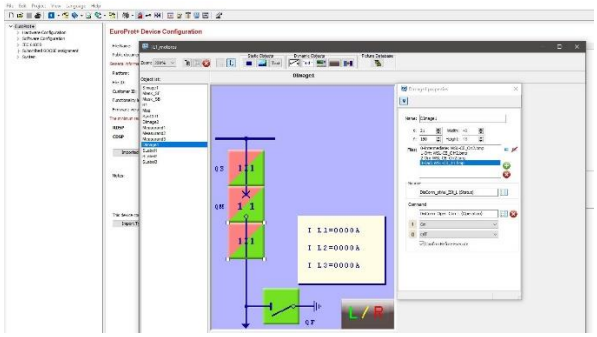
Logic editor

- Create/manage logical sheets
- Factory pre-configured logical schemes to speed up the commissioning process



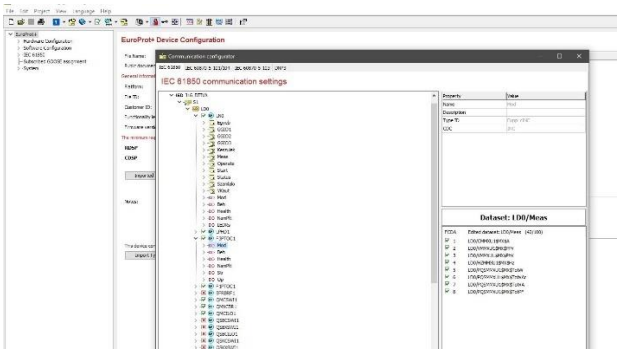
LCD configurator (available with color TFT displays)

- Create/modify user screens with Single Line Diagrams, measuring or status values
- Icon library for effective configuration Own, user-defined symbols can be created as well



Communication configurator

- Set up IEC 61850, 101-104, 103, DNP3 communication protocols
- Configure dataset, report and goose control block properties for IEC 61850 horizontal and vertical communication
- GOOSE configuration between IEDs



Offline Parameter Set Editor

- View, set, compare and save the setting of the IED parameters
- Import existing parameter settings into the Offline parameter Set editor from the IED
- Import/Export parameters in xlsx format
- Generate and save parameters in RIO format for relay tester

Feedback documentation

Automatic documentation of the configured IED, which can contain the actual connection assignment, on-line measurements, all recorded event channels, all recorded disturbance channels, LED assignment, Logical sheets and the relevant communication settings and collect the protection, control and monitoring parameters.