PRODUCT SPECIFICATION

Smart Line IED-EP+ family in 24HP industrial enclosure

PROTECTA
HUNGARY

PROTECTION, AUTOMATION AND CONTROL FOR POWER INDUSTRY

VERSION INFORMATION

VERSION	DATE	MODIFICATIONS	COMPILED BY
1.0 Preliminary	2013-09-17	Initial creation of IED EP+S24 relay specification	Dienes/Budenszki
1.1 Preliminary	2013-10-07	Mounting method drawing updated	Dienes/Budenszki
1.2	2013-11-29	TRIP current updated	Budenszki
1.2	2014-03-19	Variants drawings and options update	Dienes
1.3	2014-03-26	BW and True colour display drawing	Dienes
1.4	2014-06-06	S24 variant 6 added	Dienes
1.5	2014-09-10	2.4 Chapter: Hardware configuration modified 4.2 Chapter: Mounting methods of IED EP+S24 added	Tóth
1.6	2014-11-25	Added: Resticted earth fault and the Generator/Motor differential protection in the Protection function table	Tóth
1.7	2016-10-15	Breaker failure protection function added, minor corrections	Tóth, Erdős
2.0	2021-02-19	Variant 0 and Variant 7 added New documentation design Semi-flush mounting removed IRIG-B time synchronization removed	Erdős

CONTENTS

1   Introduction

The IED EP+ S24 series is member of the *EuroProt+* product line, made by Protecta Co. Ltd. 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. 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 IED provides main protection for overhead lines and cable feeders in distribution networks. EP+ S24 is a dedicated transformer protection and control IED (intelligent electronic device) for power transformers, unit and step-up transformers including power generator-transformer blocks in utility and industry power distribution systems. EP+ S24 is also used as back-up protection for motors, transformers and generators in utility and industry applications, where an independent and redundant protection system is required. Depending on the chosen standard configuration, the IED is adapted for the protection of medium voltage feeders in isolated neutral, resistance earthed, compensated and solidly earthed networks. Once the standard configuration IED has been given the application-specific settings, it can directly be put into service. Application area also covers protection functions for a large variety of applications, e.g. frequency and voltage based protection, motor protection and thermal overload protection function.

The IEDs support a range of communication protocols including the IEC 61850 substation automation standard with horizontal GOOSE communication, IEC 60870-5-101, IEC 60870-5-103 and Modbus® RTU. The IED-EP+ S24 is available in six predefined standard configurations to suit the most common feeder protection and control applications.

The relay is provided with a built-in digital disturbance recorder for up to eight analog signal channels and 32 digital signal channels. The recordings are stored in a non-volatile memory from which data can be uploaded for subsequent fault analysis.

To provide network control and monitoring systems with feeder level event logs, the relay incorporates a non-volatile memory with capacity of storing 1000 event codes including time stamps. The non-volatile memory retains its data also in case the relay temporarily loses its auxiliary supply. The event log facilitates detailed pre- and post-fault analyses of feeder faults and distribution disturbances.

The trip circuit supervision continuously monitors the availability and operability of the trip circuit. It provides open circuit monitoring both when the circuit breaker is in its closed and in its open position.

The relay's built-in self-supervision system continuously monitors the state of the relay hardware and the operation of the relay software. Any fault or malfunction detected will be used for alerting the operator. When a permanent relay fault is detected the protection functions of the relay will be completely blocked to prevent any incorrect relay operation.

2 Application

The IED-EP+ S24 protection device is a member of the EuroProt+ product line, made by Protecta Co. Ltd. The EuroProt+ type complex protection in respect of hardware and software is a modular device with defined variants. The modules are assembled and configured according to the requirements, and then the software determines the functions.

As of now, the IED-EP+ S24 is available in eight predefined standard configurations to suit the most common feeder protection application.

EP+S24:
- **Variant 0** serves as a simple bay control unit.
- **Variant 1** is mainly used main or backup protection as overcurrent and motor protection.
- **Variant 2** has additional provide voltage protection above **Variant 1**. Especially for those applications where small generators are connected to the network / smart grids.
  Additionally, it can be extended with restricted earth fault protection function for simple protection of small transformer.
- **Variant 3** is used main protection for overhead lines and cable feeders in distribution networks with distance protection function.
- **Variant 4** application has already included line differential protection function for medium voltage distribution network
- **Variant 5** is dedicated transformer protection and control IED (intelligent electronic device) for power transformers, unit and step-up transformers including power generator-transformer blocks in utility and industry power distribution systems.
- **Variant 6** is dedicated for those application where is only voltage and frequency-based protection functions are required.
- **Variant 7** provides high-impedance differential protection for machines, power transformers and busbar installations as well as for other applications where high-impedance differential protection is required.

The functions of the standard configurations are listed in Table 2-1.

2.1 Protection functions

The configuration measures three phase currents, the residual current component and additionally three phase voltages and the busbar voltage. These measurements allow, in addition to the current- or voltage-based functions, directionality extension of the configured phase and residual overcurrent functions. It is intended to protect overhead line or cable networks. The choice of the functions is extended with the automatic reclosing function and synchrocheck. The configuration is designed to meet the requirements of a medium voltage field unit.

Based on the voltage measurement also the frequency is evaluated to realize frequency-based protection functions.

The configured protection functions are listed in Table 2-1.

Table 2-1 Protection functions

PROTECTION FUNCTION	IEC	ANSI	VARIANT 0	VARIANT 1	VARIANT 2	VARIANT 3	VARIANT 4	VARIANT 5	VARIANT 6	VARIANT 7
DISTANCE PROTECTION	Z <	21				1				
OVEREXCITATION PROTECTION	V / Hz	24			1					
SYNCHROCHECK	SYN	25				1			1	
UNDERVOLTAGE PROTECTION	U <, U <<	27			2	1			2	
DIRECTIONAL OVERPOWER PROTECTION	P >	32				1				
DIRECTIONAL UNDERPOWER PROTECTION	P <	37				1				
UNDERCURRENT PROTECTION	I <	37		1						
NEGATIVE SEQUENCE OVERCURRENT PROTECTION	I2 >	46		1	1	1	1	1		
NEGATIVE SEQUENCE OVERVOLTAGE PROTECTION	U2 >	47			2	1				
MOTOR START-UP SUPERVISION		48								
LINE THERMAL PROTECTION	T >	49L		1	1	1		1		
MOTOR THERMAL PROTECTION	T >	49M		1						
BREAKER FAILURE PROTECTION	CBFP	50BF		1	1	1	1	2		
INSTANTANEOUS OVERCURRENT PROTECTION	I >>>	50		1	1	1	1	2		
RESIDUAL INSTANTANEOUS OVERCURRENT PROTECTION	Io >>>	50N		1	1	1	1	2		
PHASE OVERCURRENT PROTECTION	I >, I >>	51		2	2	2	2	2		
CAPACITOR UNBALANCE PROTECTION		51C	op.	op.						
RESIDUAL OVERCURRENT PROTECTION	Io >, Io >>	51N		2	2	1	2	2		
VOLTAGE DEPENDENT OVERCURRENT PROTECTION	I > U <	51V		1						
OVERVOLTAGE PROTECTION	U >, U >>	59			2	1			2	
RESIDUAL OVERVOLTAGE PROTECTION	Uo >, Uo >>	59N			2	1			2	
CAPACITOR OVERVOLTAGE PROTECTION		59C	op.							
CURRENT TRANSFORMER SUPERVISION		60		1	1	1	1	1		
VOLTAGE TRANSFORMER SUPERVISION		60			1	1				
STARTS PER HOUR	I^{2}t	66		1						
DIRECTIONAL OVERCURRENT PROTECTION	I Dir >	67			2	2				
RESIDUAL DIRECTIONAL OVERCURRENT PROTECTION	Io Dir >	67N			2	2				
INRUSH DETECTION	I2h >	68		1	1	1	1	1		
VECTOR JUMP PROTECTION	ΔφU >	78			1					
AUTO-RECLOSE	0 → 1	79		1	1	1	1			
OVERFREQUENCY PROTECTION	f >, f >>	81O			2	2			2	
UNDERFREQUENCY DETECTION	f <, f <<	81U			2	2			2	
RATE OF CHANGE OF FREQUENCY PROTECTION	df/dt	81R			2	2			2	
GENERATOR/MOTOR DIFFERENTIAL PROTECTION	3IdG >, 3IdM	87G / 87M						op.		
LINE DIFFERENTIAL PROTECTION	3IdL >	87L					1			
RESTRICTED EARTH FAULT PROTECTION	REF	87N			op.			1		H
TRANSFORMER DIFFERENTIAL PROTECTION	3IdT >	87T						1		H*

op.: optional
H: high impedance differential protection
*mutually exclusive option

2.2 Measurement functions

Based on the hardware inputs the measurements listed below can be available.

- Current (I1, I2, I3, Io)
- Voltage (U1, U2, U3, U12, U23, U31, Uo, Useq) and frequency
- Supervised trip contacts (TCS)

2.3 Software configuration

The implemented protection functions are listed in table below – the applied functions of each IEDs are depending on the configuration. The function blocks are described in details in separate documents. These are referred to also in this table.

The range of the parameter settings of the following function blocks can be modified, if it doesn't correspond to the customer's request. In this case please, contact to the developer team on the Protecta Support Site: http://buy.protecta.hu/support/?language=English

Table 2-2 Function blocks

NAME (ID)	TITLE	DESCRIPTION LINK
DIS21_MV	5 zone MV distance	Link
VPH24	Overexcitation	Link
SYN25	Synchrocheck	Link
TUV27	UnderVoltage	Link
DOP32	OverPower	Link
DUP32	UnderPower	Link
TUC37	UnderCurrent	Link
TOC46	Neg Seq OverCurrent	Link
TOV47	Neg.Seq OverVoltage	Link
MSS48	Start-up Supervision	Link
TTR49L	Thermal Overload	Link
TTR49M	Motor Overload	Link
BRF50	Breaker Failure	Link
IOC50	3ph Inst Overcurrent	Link
IOC50N	Res Inst Overcurrent	Link
TOC51	3ph Time Overcurrent	Link
TOC51N	Res Time Overcurrent	Link
VOC51	VoltDep OC	Link
TOV59	OverVoltage	Link
TOV59N	Res OverVoltage	Link

DLD	DeadLine Detection	Link
VTS	VT Supervision	Link Older version: Link
VCB60	Current Unbalance	Link
TOC67	3ph Dir Overcurrent	Link
TOC67N	Res Dir Overcurrent	Link
INR2	Inrush Detection	Link
VectJmp	Vector jump	Link
REC79	MV AutoReclosing	Link
TOF81	Over Frequency	Link
TUF81	Under Frequency	Link
FRC81_1	ROC of Frequency +	Link
FRC81_2	ROC of Frequency -	
DIF87G	Generator Differential	Link
DIFF87L	Line Differential	Link
DIF87N	Restricted EF	Link
DIFF87T	Transformer Differential – 2-winding	Link
TRC94	Trip Logic	Link
VT4	VT4 module	Link
CT4	CV4 module	Link
MXU_LM	Line measurement	Link
MXU_V	Voltage measurement	
MXU_V1	Voltage measurement	
MXU_C	Current measurement	
MXU_C1	Current measurement	
MXU_F	Frequency measurement	
DRE	Disturbance Rec	Link

2.4 Hardware configuration

The basic hardware shown as follows.

Figure 2-1 IED-EP+ S/S24 design with B&W HMI

Figure 2-2 IED-EP+ S/S24 B&W HMI front panel (standard)

Figure 2-3 IED-EP+ S/S24 True color HMI front panel (optional)

2.4.1 Default hardware arrangements
The following tables show the default I/O of each variant with the picture of the layout below them.

2.4.1.1 Variant 0

Table 2-3 Variant 0 hardware arrangement

HOUSING	See Chapter 4.1
DIGITAL INPUTS	6
SIGNALING RELAY OUTPUTS	7 (4 x NO, 3 x CO)
IRF (INTERNAL FAULT RELAY) CONTACT	1 (CO)
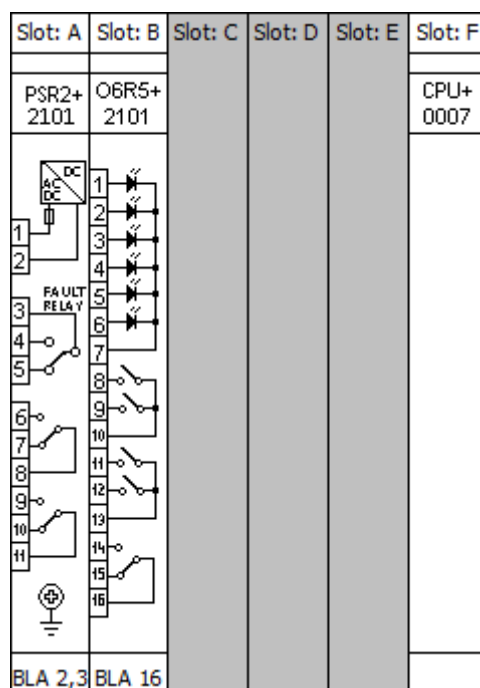
Figure 2-4 Variant 0 default hardware layout

2.4.1.2 Variant 1

Table 2-4 Variant 1 hardware arrangement

HOUSING	See Chapter 4.1
CURRENT INPUTS (4ᵀᴴ CHANNEL CAN BE SENSITIVE)	4 (3 × 1/5 A and 1 × 0.2/1/5 A)
DIGITAL INPUTS	6
SIGNALING RELAY OUTPUTS	5 (4 x NO, 1 x CO)
FAST TRIP CONTACTS	2 (4 A, L/R = 40 ms, NO)
IRF (INTERNAL FAULT RELAY) CONTACT	1 (CO)

Figure 2-5 Variant 1 default hardware layout

2.4.1.3   Variant 2

Table 2-5 Variant 2 hardware arrangement

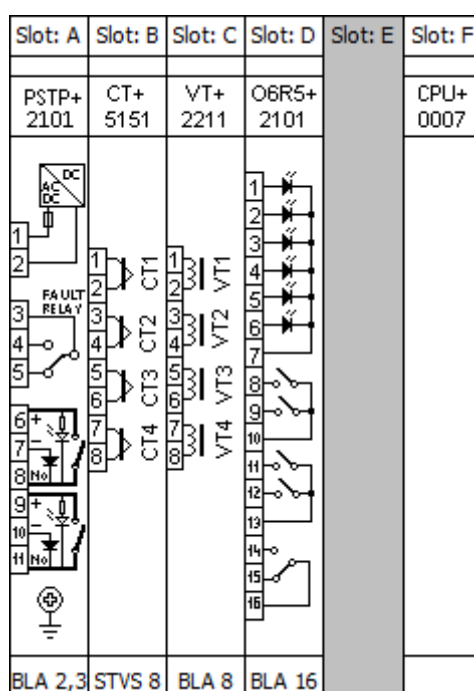| HOUSING	See Chapter 4.1
CURRENT INPUTS (4TH CHANNEL CAN BE SENSITIVE)	4 (3 × 1/5 A and 1 × 0.2/1/5 A)
VOLTAGE INPUTS	4*
DIGITAL INPUTS	6
SIGNALING RELAY OUTPUTS	5 (4 x NO, 1 x CO)
FAST TRIP CONTACTS	2 (4 A, L/R = 40 ms, NO)
IRF (INTERNAL FAULT RELAY) CONTACT	1 (CO)

*if the secondary voltage is 230 VAC, then a different VT module is applied: instead of the VT+/2211 module, the VT+/2245 is installed
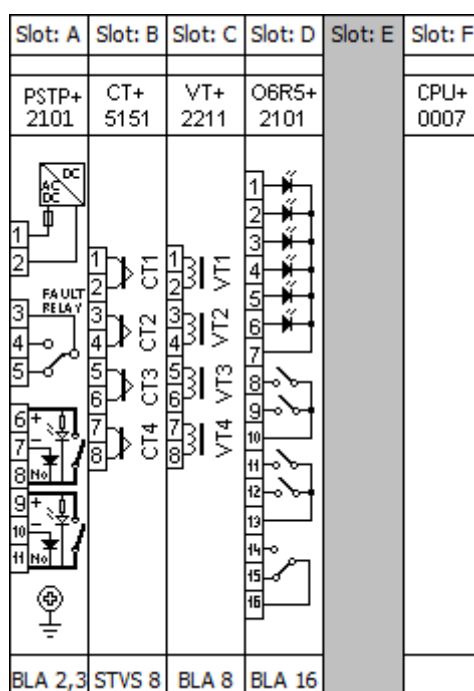
Figure 2-6 Variant 2 default hardware layout

2.4.1.4 Variant 3

Table 2-6 Variant 3 hardware arrangement

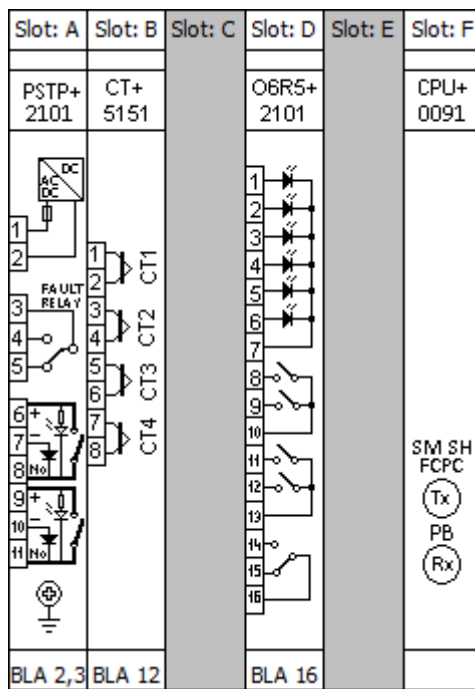| HOUSING	See Chapter 4.1
CURRENT INPUTS (4TH CHANNEL CAN BE SENSITIVE)	4 (3 × 1/5 A and 1 × 0.2/1/5 A)
VOLTAGE INPUTS	4
DIGITAL INPUTS	6
SIGNALING RELAY OUTPUTS	5 (4 x NO, 1 x CO)
FAST TRIP CONTACTS	2 (4 A, L/R = 40 ms, NO)
IRF (INTERNAL FAULT RELAY) CONTACT	1 (CO)

Figure 2-7 Variant 3 default hardware layout

2.4.1.5 Variant 4

Table 2-7 Variant 4 hardware arrangement

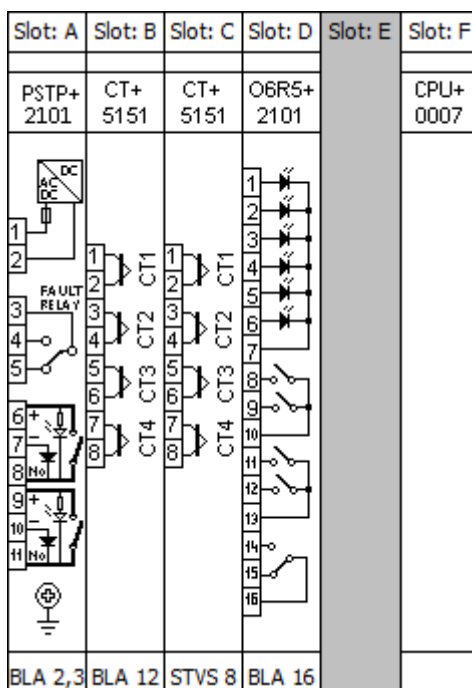| HOUSING	See Chapter 4.1
CURRENT INPUTS (4TH CHANNEL CAN BE SENSITIVE)	4 (3 × 1/5 A and 1 × 0.2/1/5 A)
DIGITAL INPUTS	6
SIGNALING RELAY OUTPUTS	5 (4 x NO, 1 x CO)
FAST TRIP CONTACTS	2 (4 A, L/R = 40 ms, NO)
IRF (INTERNAL FAULT RELAY) CONTACT	1 (CO)

Figure 2-8 Variant 4 default hardware layout

2.4.1.6 Variant 5

Table 2-8 Variant 5 hardware arrangement

HOUSING	See Chapter 4.1
CURRENT INPUTS (4TH CHANNEL CAN BE SENSITIVE)	8 (6 × 1/5 A and 2 × 0.2/1/5 A)
DIGITAL INPUTS	6
SIGNALING RELAY OUTPUTS	5 (4 x NO, 1 x CO)
FAST TRIP CONTACTS	2 (4 A, L/R = 40 ms, NO)
IRF (INTERNAL FAULT RELAY) CONTACT	1 (CO)

Figure 2-9 Variant 5 default hardware layout

2.4.1.7 Variant 6

Table 2-9 Variant 6 hardware arrangement

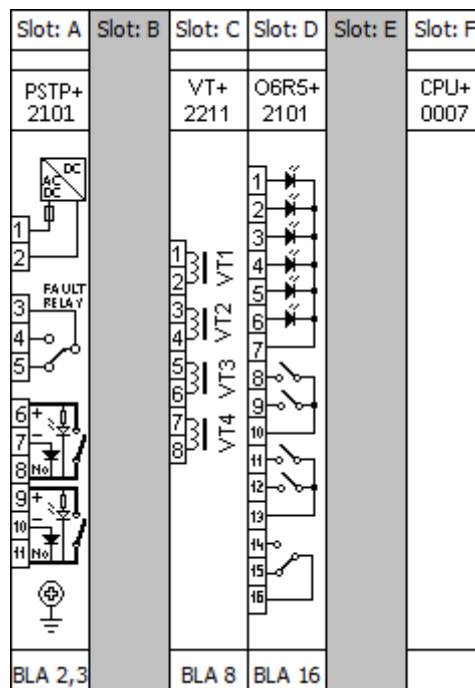| HOUSING	See Chapter 4.1
VOLTAGE INPUTS	4
DIGITAL INPUTS	6
SIGNALING RELAY OUTPUTS	5 (4 x NO, 1 x CO)
FAST TRIP CONTACTS	2 (4 A, L/R = 40 ms, NO)
IRF (INTERNAL FAULT RELAY) CONTACT	1 (CO)

Figure 2-10 Variant 6 default hardware layout

2.4.1.8 Variant 7

Table 2-10 Variant 7 hardware arrangement

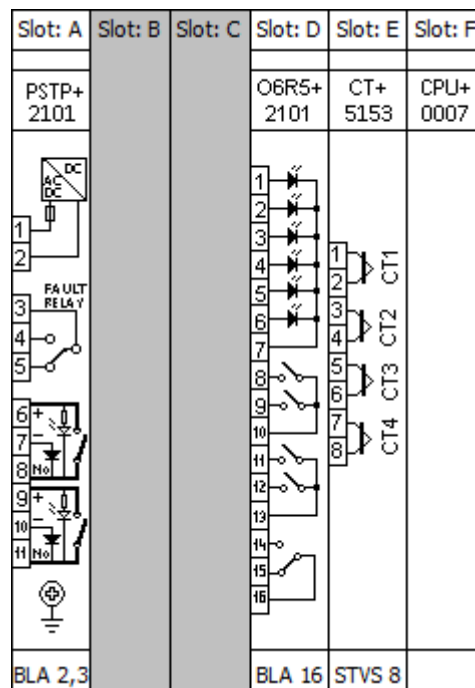| HOUSING	See Chapter 4.1
CURRENT INPUTS	4 (3 × 1/5 A and 2 × 0.2/1/5 A sensitive)
DIGITAL INPUTS	6
SIGNALING RELAY OUTPUTS	5 (4 x NO, 1 x CO)
FAST TRIP CONTACTS	2 (4 A, L/R = 40 ms, NO)
IRF (INTERNAL FAULT RELAY) CONTACT	1 (CO)

Figure 2-11 Variant 7 default hardware layout

2.4.2 Binary I/O options

The free slots for the options of the binary inputs and outputs are listed in the following tables. The default binary I/O module is the O6R5 module. The following modules can be chosen optionally.

Mixed I/O module:
* O6R5

Binary input modules:
* O8
* O12

Binary output modules:
* R8+/00
* R8+/C0
* R12+/0000
* R12+/4000
* R12+/4400

Table 2-11 Binary I/O options for each variant

I/O MODULE	SLOT B	SLOT C	SLOT D	SLOT E
VARIANT 0	Default	Free	Free	Free
VARIANT 1	-	-	Default	Free
VARIANT 2	-	-	Default	Free
VARIANT 3	-	-	Default	Free
VARIANT 4	-	-	Default	Free
VARIANT 5	-	-	Default	Free
VARIANT 6	-	-	Default	Free
VARIANT 7	-	Free	Default	-

3   Hardware specification

The EuroProt+S24 protection device line is a scalable hardware platform to adapt to different applications. Data exchange is performed via a 16-bit high-speed digital non-multiplexed parallel bus with the help of a backplane module. Each module is identified by its location and there is no difference between module slots in terms of functionality. The only restriction is the position of the CPU module because it is limited to the "CPU" position. The built-in self-supervisory function minimizes the risk of device malfunctions.
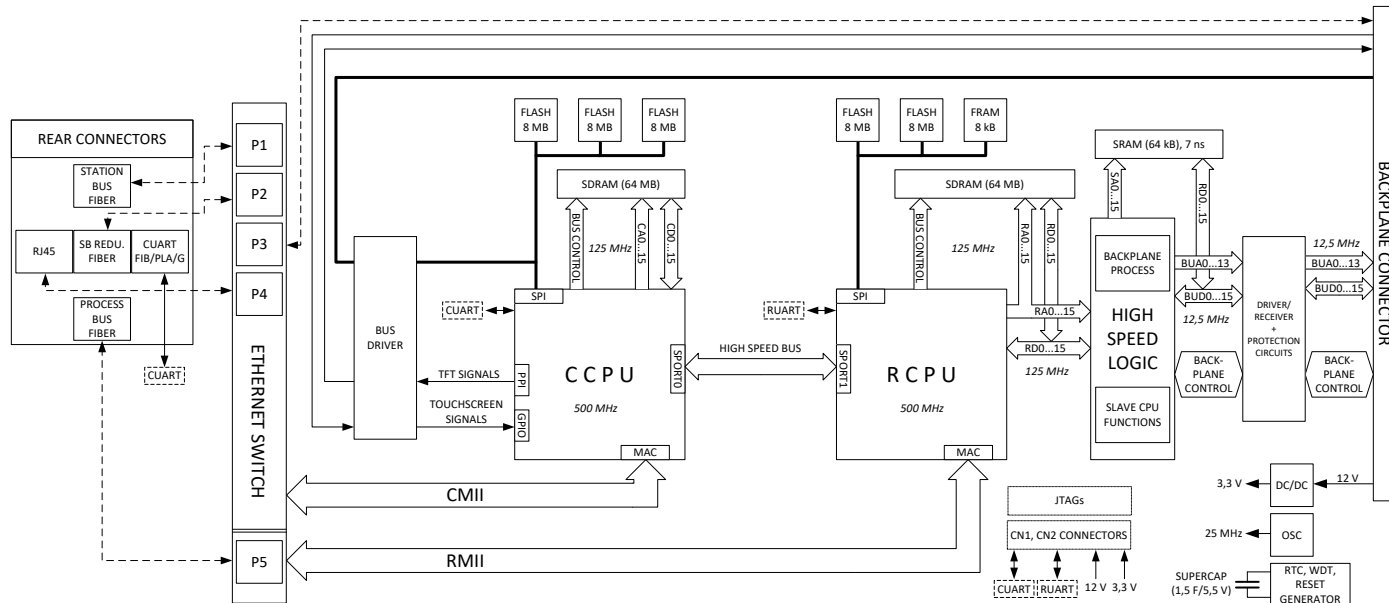

Figure 3-1 CPU block diagram

3.1   CPU module

3.1.1   CPU+ module

The CPU module contains all the protection, control and communication functions of the EuroProt+S24 device. Dual 500 MHz high-performance Analog Devices Blackfin processors separate relay functions (RDSP) from communication and HMI functions (CDSP). Reliable communication between processors is performed via high-speed synchronous serial internal bus (SPORT).
Each processor has its own operative memory such as SDRAM and flash memories for configuration, parameter and firmware storage. CDSP's operating system (uClinux) utilizes a robust JFFS flash file system, which enables fail-safe operation and the storage of disturbance record files, configuration and parameters.

3.1.2   Module handling

The RDSP core runs at 500 MHz and its external bus speed is 125 MHz. The backplane data speed is limited to approx. 20 MHz, which is more than enough for module data throughput. An additional logic element (CPLD and SRAM) is used as a bridge between the RDSP and the backplane. The CPLD collects analogue samples from CT/VT modules and also controls signaling outputs and inputs.

3.1.3   Fast startup

After power-up, the RDSP processor starts up with the previously saved configuration and parameters. Generally, the power-up procedure for the RDSP and relay functions takes only a few seconds, so it is ready to trip within this time. CDSP's start-up procedure is longer because its operating system needs time to build its file system, initializing user applications such as HMI functions and the IEC61850 software stack.

3.1.4 HMI and communication tasks

The built-in 5-port Ethernet switch allows EuroProt+S24 to connect to IP/Ethernet-based networks. The following Ethernet ports are available:

On the front panel of the device:
- RJ-45 Ethernet or EOB (Ethernet over Board) user interface

On the rear side of the CPU unit:
- Station Bus (100Base-FX Ethernet)
- Redundant Station Bus which can be:
    - 100Base-FX Ethernet, or
    - 10/100Base-T port via RJ-45 (only one can be active of these two)
- Process bus (100Base-FX Ethernet)

Other communication on the rear side of the CPU unit:
- RS422/RS485 interfaces (galvanic interface to support legacy or other serial protocols, ASIF)
- Plastic or glass fiber interfaces to support legacy protocols, ASIF

The embedded web-server supports the following actions:
- Modifying user parameters
- Managing the event list and disturbance records
- Managing passwords
- Online displaying measured data and generated binary information
- Performing commands
- Firmware update
- Performing other administrative tasks
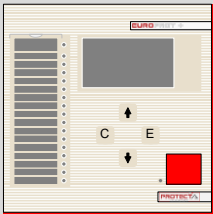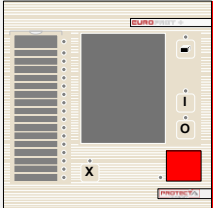
Table 3-1 Front panel HMI modules

MODULE TYPE	DISPLAY	USER KEYS	SERVICE PORT	RACK SIZE	ILLUSTRATION
HMI+/2504 HMI+/2506	128 x 64 pixels, black and white	4 x tactile	RJ45 10/100Mbit/s	24 HP	
HMI+/2404 HMI+/2406 (OPTIONAL)	3,5" TFT	4 x tactile	RJ45 10/100Mbit/s	24 HP	

Table 3-2 Front panel HMI functions

FUNCTION	DESCRIPTION
16 PCS USER LEDS	Three-color, 3 mm circular LEDs
COM LED	Yellow, 3 mm circular LED indicating RJ-45 (on the front panel) communication link and activity
DEVICE LED	1 piece three-color, 3 mm circular LED Green: normal device operation Yellow: device is in warning state Red: device is in error state
TACTILE KEYS	Four tactile mechanical keys (On, Off, Page, LED acknowledgement)
BUZZER	Audible touch key pressure feedback
LED DESCRIPTION	User changeable
128x64 PIXELS DISPLAY	B&W display
3.5" TFT DISPLAY	320x240 pixel TFT display with resistive touchscreen interface
ETHERNET SERVICE PORT	IP56 rated Ethernet 10/100-Base-T interface with RJ-45 type connector

3.2 Detailed module descriptions

The modules are described in details in different chapters of the EuroProt+ Hardware
Description:
https://www.protecta.hu/downloads/downloads_hardware_description

The chapters are listed in the table below.

Table 3-3 Chapters in the Hardware description

CHAPTER	MODULE NAME
2.1	CPU+ module
4	Human-Machine Interface (HMI) module
5	Current input module
6	Voltage input module
7	Binary input module
8	Signaling relay module
17.1	PSTP+ module
17.2	PSR2+ module
17.3	O6R5+ module

4 General data

- Storage temperature: -40 °C … +70 °C
- Operation temperature: -20 °C … +55 °C
- Humidity: 10 % - 93 %

- EMC/ESD standard conformance:
  - Electrostatic discharge (ESD) EN 61000-4-2, IEC 60255-22-2, Class 3
  - Electrical fast transients (EFT/B) EN 61000-4-4, IEC 60255-22-4, Class A
  - Surges EN 61000-4-5, IEC 60255-22-5
    - Test voltages: line to earth 4 kV, line to line 1 kV
  - Conducted radio-frequency common mode EN 61000-4-6, IEC 60255-22-6, Level 3
  - 1 MHz damped oscillatory waves IEC 60255-22-1
    - Test voltage: 2.5 kV (for common and differential mode alike)
  - Voltage interruptions IEC 60255-11
    - Duration: 5 s, Criterion for acceptance: C
  - Voltage dips and short interruptions EN 61000-4-11
    - Voltage during dips: 0%, 40%, 70%
  - Power frequency magnetic field EN 61000-4-8, Level 4
  - Power frequency IEC 60255-22-7, Class A
  - Impulse voltage withstand test EN 60255-5, Class III
  - Dielectric test EN 60255-5, Class III
  - Insulation resistance test EN 60255-5
  - Insulation resistance > 15 GΩ

- Radiofrequency interference test (RFI):
  - Radiated disturbance EN 55011, IEC 60255-25
  - Conducted disturbance at mains ports EN 55011, IEC 60255-255
  - Immunity tests according to the test specifications IEC 60255-26 (2004), EN 50263 (1999), EN 61000-6-2 (2001) and IEC TS 61000-6-5 (2001)
  - Radiated radio-frequency electromagnetic field EN 61000-4-3, IEC 60255-22-3

- Vibration, shock, bump and seismic tests on measuring relays and protection equipment:
  - Vibration tests (sinusoidal), Class I, IEC 60255-21-1
  - Shock and bump tests, Class I, IEC 60255-21-2
  - Seismic tests, Class I, IEC 60255-21-3

4.1 Mechanical data

- Construction: anodized aluminum surface in tube
- EMC case protects against electromagnetic environmental influences and protects the environment from radiation from the interior
- IP20 protection from rear side
- Mounting methods:
  - Flush mounting panel instrument case with IP54 (front side)
  - Din rail mounting with IP40 (front side)
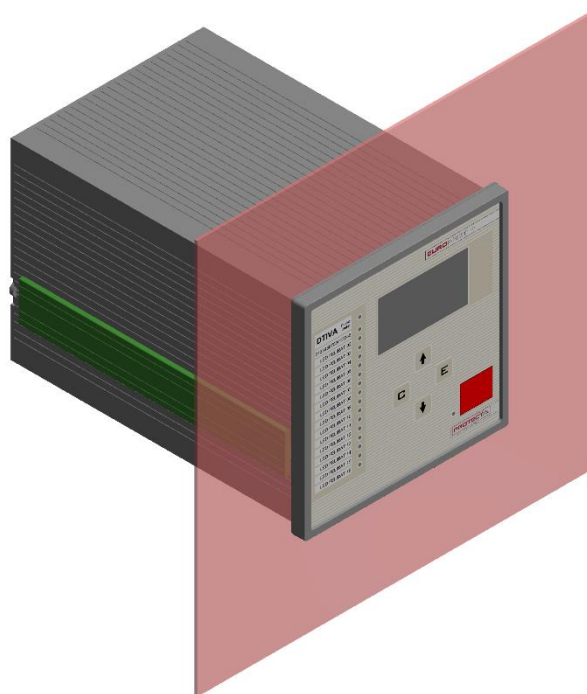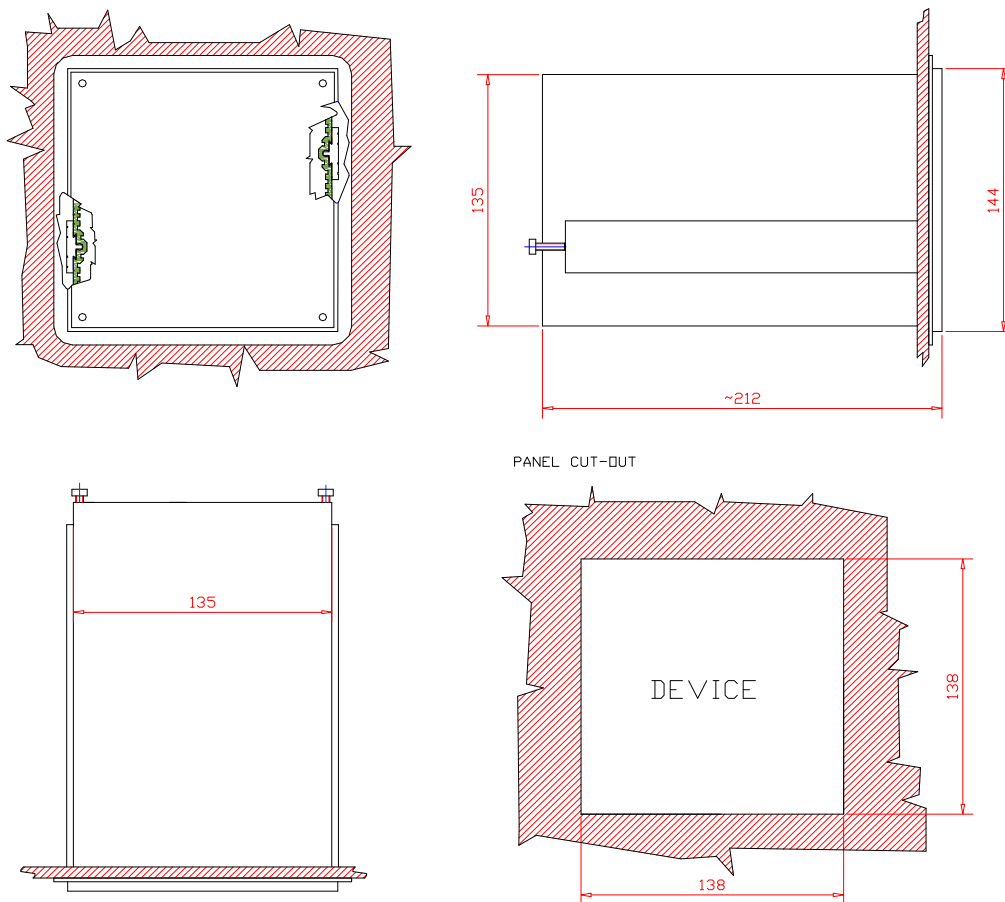- Weight: max. 3 kg

4.2 Mounting methods

PANEL CUT-OUT

DEVICE

Figure 4-1 S24 flush mounting

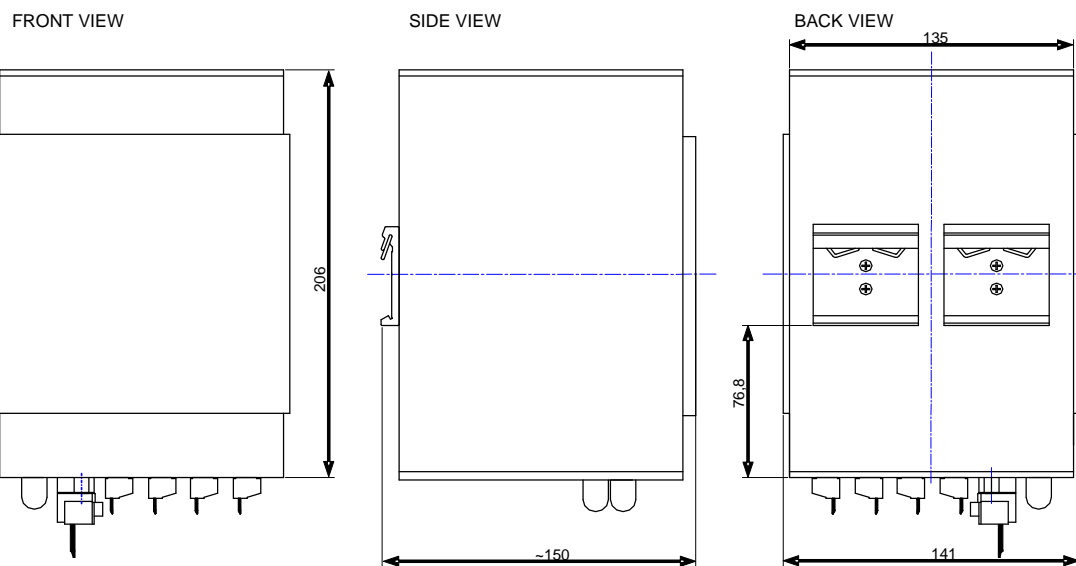FRONT VIEW   SIDE VIEW   BACK VIEW

Figure 4-2 S24 DIN-rail mounting

5 Communication

If the EuroProt+ IED needs to be connected to legacy communication networks, the available options are

- Serial protocols (IEC 60870-5-101/103, Modbus RTU, DNP3, ABB-SPA)
- Network protocols (IEC 60870-5-104, DNP3, Modbus-TCP)
- Legacy network based protocols via 100Base-FX and 10/100Base-TX (RJ45)

Serial interfaces:
- optical (glass/fiber)
- RS485/RS422

All devices of the EuroProt+ IED product range act on an Ethernet network as servers, exchanging with connected clients all information needed for continuous supervision of the entire power network

- Local or remote access to the device by widely used browsers (e.g. Microsoft Edge, Mozilla Firefox, Opera, Google Chrome, smart phones, PDAs)
- Front panel image and system characteristics
- Parameter setting
- On-line information
- Event log
- Disturbance record download and fast view
- Command screen
- Scanning the connected devices
- Download of device documentation
- Advanced functions such as diagnostic information, password manager, update manager, device test

Application of the IEC61850 based communication assures interoperability of the Protecta EuroProt+ IEDs with devices made by other manufacturers
- Native and configurable IEC61850 support for both vertical and horizontal communication
- Full range of devices both for high voltage and medium voltage protection tasks with IEC61850 compatibility

The time synchronization methods offered support easy matching in existing SCADA systems
- Primary and secondary NTP server
- Legacy protocol master
- Minute pulse