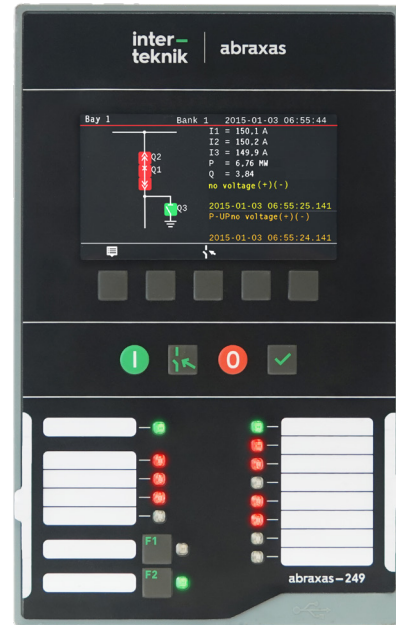


DIGITAL PROTECTION RELAYS



OVERVIEW

Abraxas digital protection relay family has state-of-the-art technology and design which ensures ruggedness, simplicity of usage, maximum flexibility groundbreaker user experience. The portfolio is positioned in terms of device platform rather than type of protected object.



abraxas-229

abraxas-249

MODULAR DESIGN

Easy to scale with expansion I/O card slots

EASY BATTERY CHANGE

Allows you to change the battery without powering off the device

HIGH RESOLUTION SCREEN

Lucid and simple display settings, high resolution OLED screen and colored graphic options

QUICK START-UP

Ready for protection and substation automation less than a few seconds

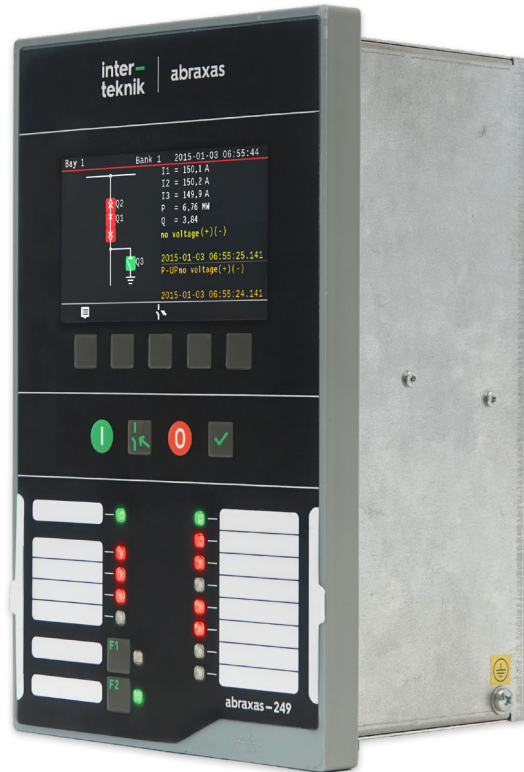
LEAN MENU STRUCTURE

Easy to understand, smart phone-like visuals and menu items

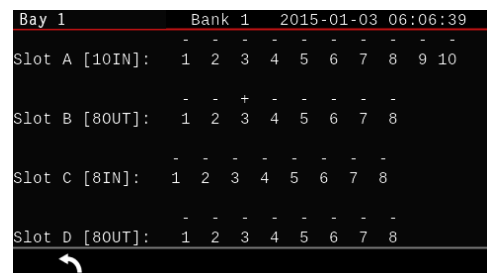
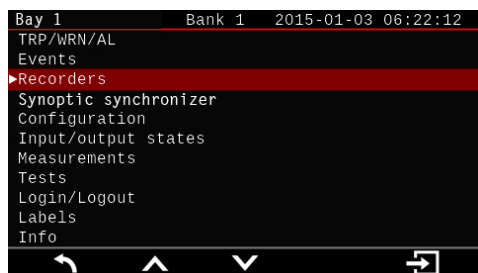
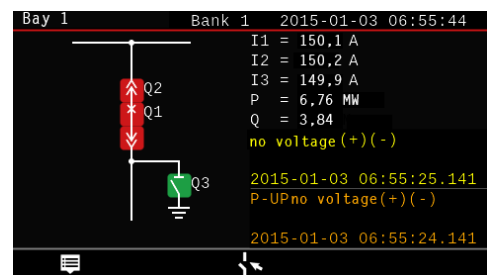
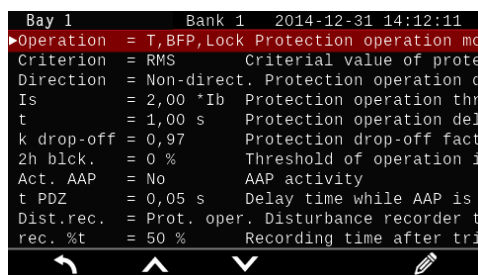


DESIGN

Abraxas-229 protection relay is equipped with alphanumeric OLED display (4x20 characters) in addition to a keypad consisting of 8 buttons. Moreover, LEDs (6 red and 3 red-green) deployed on front panel indicates the operational status.



Abraxas-249 protection relay's front panel is composed of a color display of 4.3", and embedded with 5 buttons of context-sensitivity nature. It is also provided with four additional buttons for switching control device.



FEATURES

Both version of protection relays contains two additional function buttons F1 and F2 with customizable two-color LEDs. Removable labelling pockets are also inserted in the front panels for function buttons and LED indicator.



```
▶TRP/WRN/AL
Events
Disturbance rec.
Autom. lock/unlock
```

```
Incoming bay
I1 = 98,4 A
I2 = 98,3 A
I3 = 98,4 A
```

Specifications	abraxas-229	abraxas-249
Screen:		
> Type	OLED	4,3" graphic, colored
> Resolution	4x20 character	480x272 pixel
Operating Buttons	8	5
Control Buttons	2	4
Function Buttons	2	2
Leds	9	13
Digital Inputs	8 (max. 24)	8 (max. 24)
Digital Outputs	8 (max. 32)	8 (max. 32)
Current Inputs	4	4
Voltage Inputs	1	1 (max.4)
Max. Swiches That Can Be Controlled	1	6
Ethernet Port	1	1
USB Port	1	1
Communication Protocols	Modbus RTU, Modbus TCP/IP, Profibus, IEC 60870-5-103, DNP 3.0	Modbus RTU, Modbus TCP/IP, Profibus, IEC 60870-5-103, IEC 60870-5-104,DNP 3.0, IEC 61850 (future)
Number of Event Log	1024	1024
Oscillographic Fault Recording Time	20 sec.	30 sec.

PROTECTION FUNCTIONS

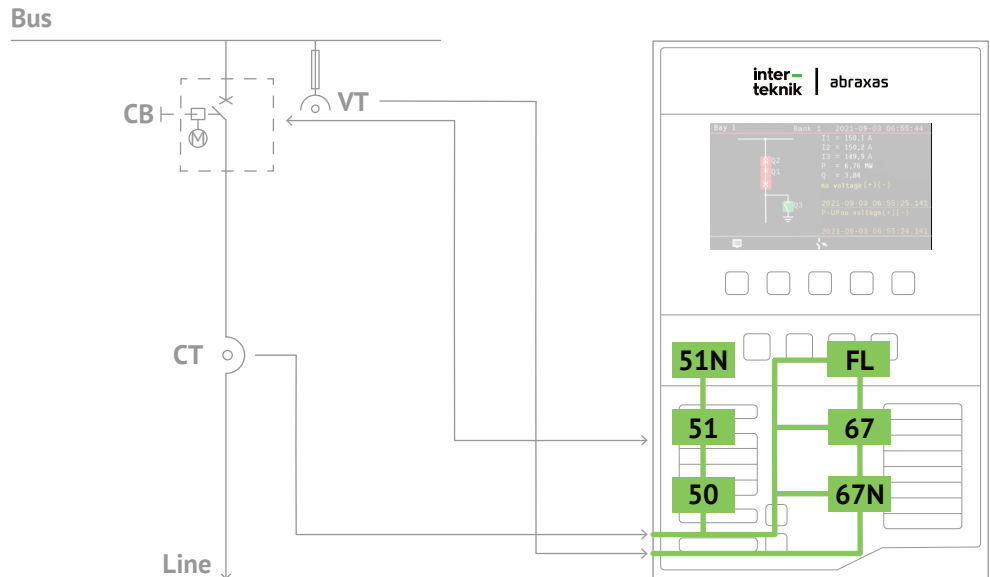
Regardless of generated order code, each Abraxas-229 and Abraxas-249 device include the protection functions listed below:

ANSI Code	Protection Function	IEC	abraxas-229	abraxas-249
50/50N	Instantaneous Overcurrent Relay (phase/earth)	$I_{>>}$	•	•
51/51N	Time Overcurrent Relay (phase/earth)	$I_{>}$	•	•
50HS	Accelerated Instantaneous/Time Overcurrent Relay	$I_{>>>}$	•	•
50BF	Breaker Failure	CBFP	•	•
51	Inverse Time Current Relay (IEC/ANSI curve or 6/point user-defined curve)	$I_{> \text{ inv}}$	•	•
79	Auto Reclose	AR	•	•
67/67N	Directional Overcurrent Relay (phase/neutral)	$I_{\text{Dir}>...I_{\text{Dir}}>>}$ / $I_{\text{oDir}>...I_{\text{oDir}}>>}$	•	•
49/51	Thermal Overload	$\theta I^2 t$	•	•
46	Load Unbalance (Based on negative sequence current or phase currents difference)	$I_{2>}$	•	•
37	Undercurrent Relay	k	•	•
32P	Active Power, Directional	P	-	•
37Q	Reactive Power, Directional	Q	-	•
51VN	Open-Delta Voltage Restrained Time Overcurrent		•	•
59	Overvoltage Relay	$U_{>}$	-	•
27	Undervoltage Relay	$U_{<}$	-	•
47	Negative Sequence Voltage	$U_{2>}$	-	•
81H	Over Frequency	$f_{>}$	-	•
81L	Under Frequency	$f_{<}$	-	•
81R	Rate-of-Change Frequency	df / dt	-	•
59N	Neutral Overvoltage	$U_{o>}, U_{o>>}$	•	•
21N	Neural Admittance	$Y_{o>}$	•	•
50C	Capacitor Bank Internal Fault		•	•
21ND	Directional Neutral Admittance	$Y_{o>d}$	•	•
66	Restart Inhibition	$N_{>}$	•	•
48	Incomplete Sequence Relay		•	•
50LR	Locked Rotor		•	•
25	Synchronism Check		-	•
SEF	Sensitive Earth Fault	SYNC	•	•
REF	Restricted Earth Fault		o	o
HBL2	2nd Harmonic Blocking		•	•
BC	Broken Conductor		o	o
86	Lockout Relay		•	•
68	External Lockout		•	•
FL	Voltage Transformer Fuse Monitoring		-	•
IEF	Intermittent Earth Fault	$\theta, I^2 t$	-	o
49	Thermal Protection (Based on digital input or 4-20mA analog input status)		•	•
74TCM	Trip Coil Monitoring		•	•
CLP	Cold Load Pickup		•	•
AFD	Arc Flash Protection (Based on optical arc sensors)		-	•

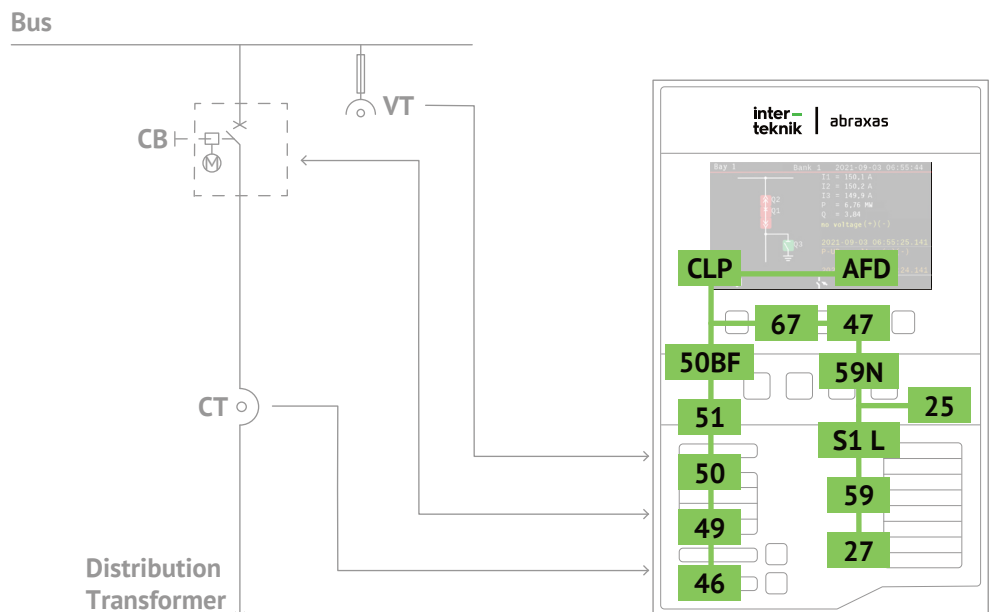
APPLICATIONS

Due to their wide range of protections and functions accompanying substation automation functionalities, Abraxas-229 & 249 can be effectively integrated to protect a variety of feeders such as transformer, measuring, coupling, capacitor bank, incoming, line incoming-outgoing feeder. It has been also designed to be cooperative in renewable energy plants.

Feeder Protection



Distribution Transformer Protection



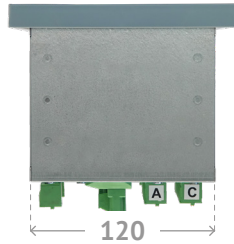
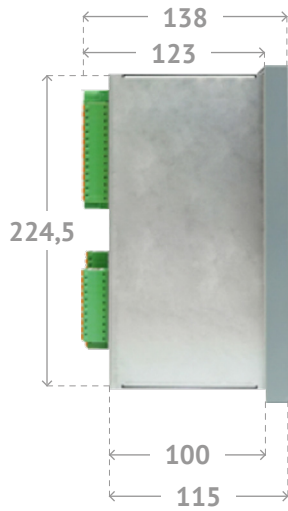
TECHNICAL SPECIFICATIONS

Technical Specifications	abraxas-229 & 249
Auxiliary Supply:	
Voltage	24..220 V AC/DC
Power Consumption	10 W (VA) max.
Current Inputs:	
Rated Current	1 / 5 A AC
Rated Frequency	50 Hz
Measuring Range:	
> Phase Currents	0,1..150 A (secondary)
> I02	0,005..1 A / 1..10 A
Voltage Inputs:	
Rated Voltage	57,7/100/230 V AC
Rated Frequency	50 Hz
Rated Range:	
> Phase Voltage	3..280 V
> U0	3..280 V
Measuring Accuracy:	
Current / Voltage	2 %
Phase Angle	1°
Frequency	10 MHz
Device Operating Time	35 ms (typical)
Digital Inputs:	
Quantity	8 (max. 24)
Power Consumption	15 mA
Digital Outputs:	
Quantity	8 (max. 32)
Max. Open Contact Voltage	250 V AC / 440 V DC
Current Carrying Capacity	5A continuous
Breaking Capacity:	
> 220 V DC (L/R=40 ms)	0,15 A
> 220 V AC (cosφ=0,1)	2 A
Environmental Conditions:	
Operating Temperature	-10..55 °C
Storage Temperature	-25..70 °C
Humidity	5..95 %
Vibration & Mechanical Shock	Class 1 (IEC 60255-21)
Electromagnetic Decay	Class A (IEC 60255-26)
Electrical Insulation	2 kV 50 Hz / 60 sec. (IEC 60255-27)
Physical Properties:	
Weight	1 kg
Dimensions (L x W x H)	147 x 138 x 235 mm
IP Degree:	
> Front	IP 54
> Rear (Terminal Side)	IP 3X

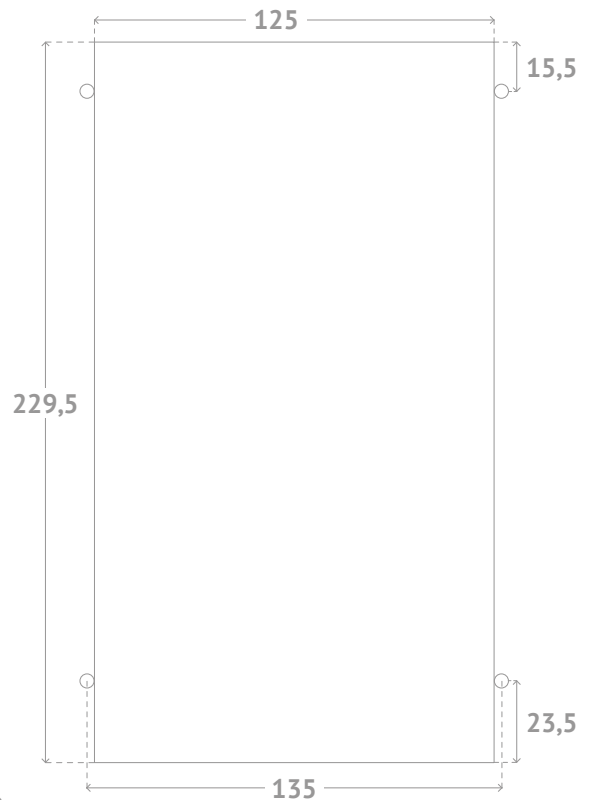
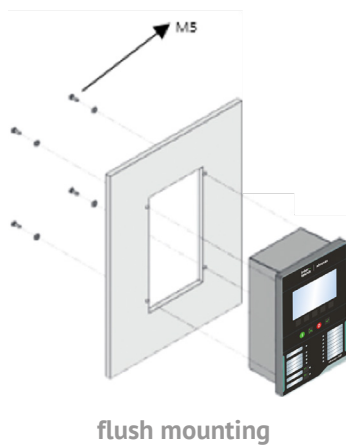


Dimensions

Dimensions are the same for both abraxas-229 & 249

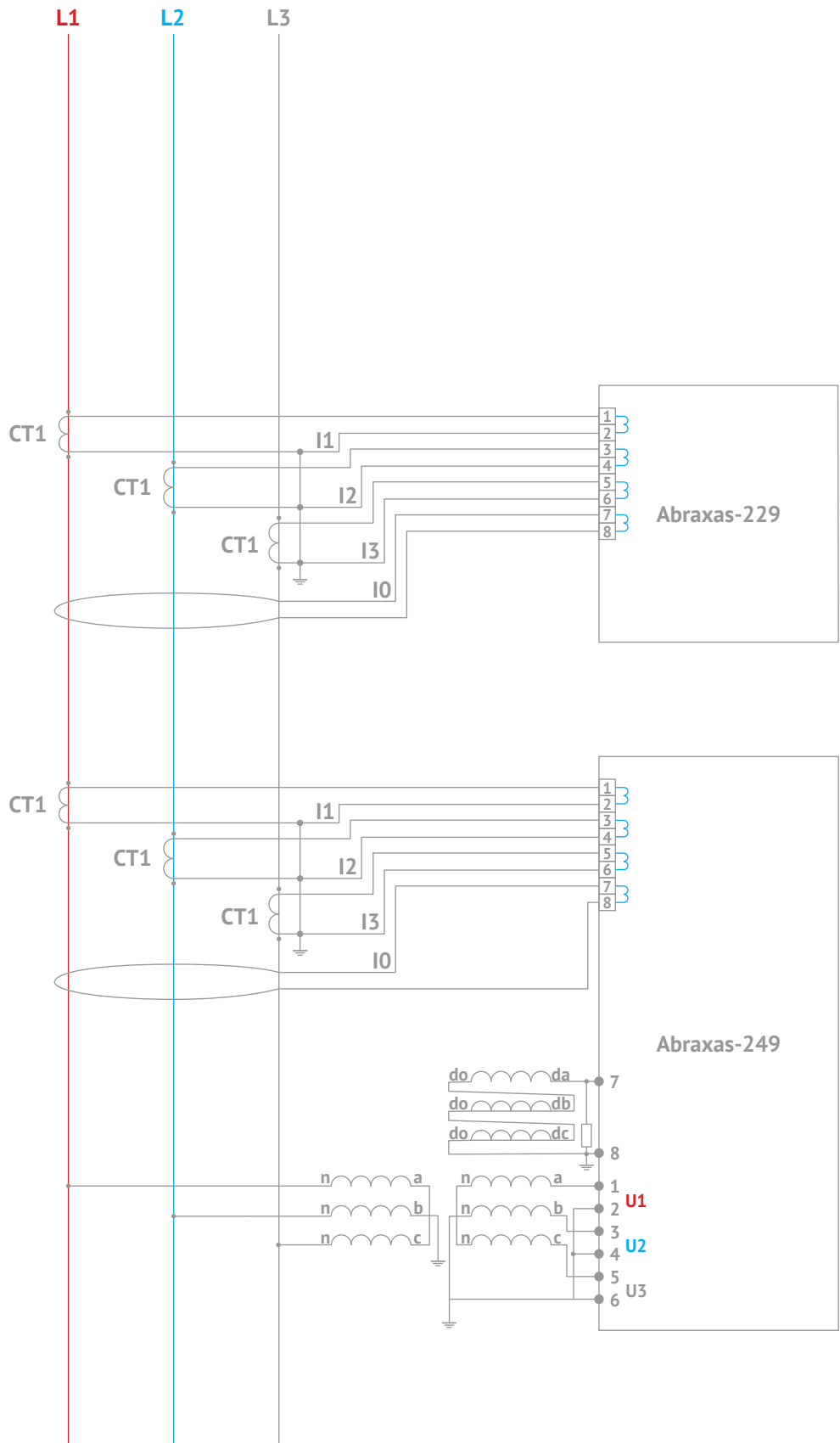


Panel Cut-Out Dimensions



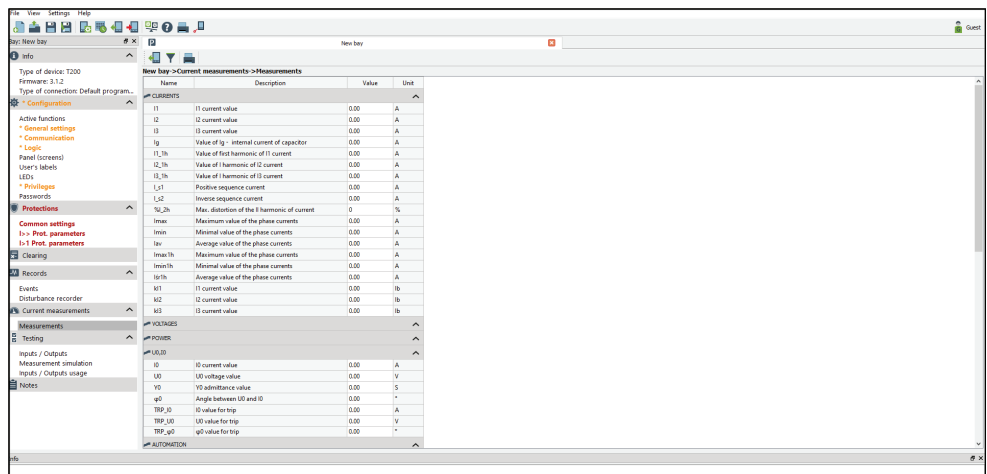
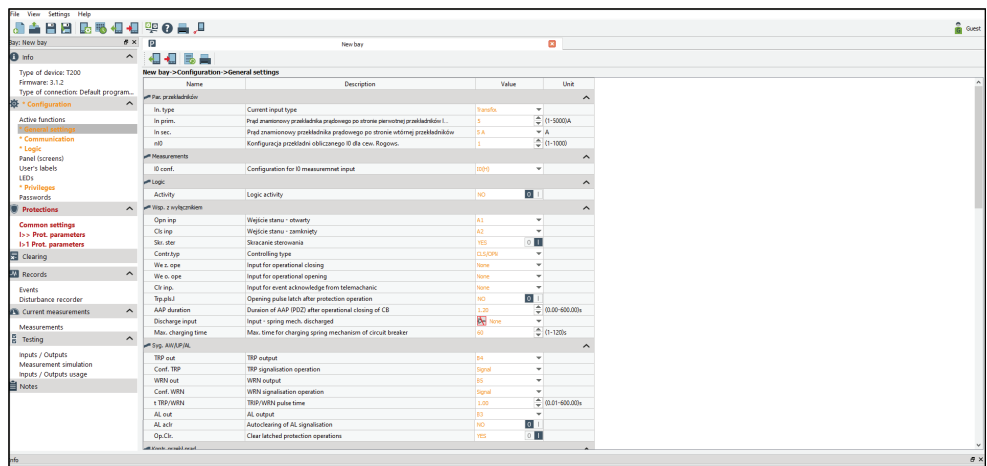
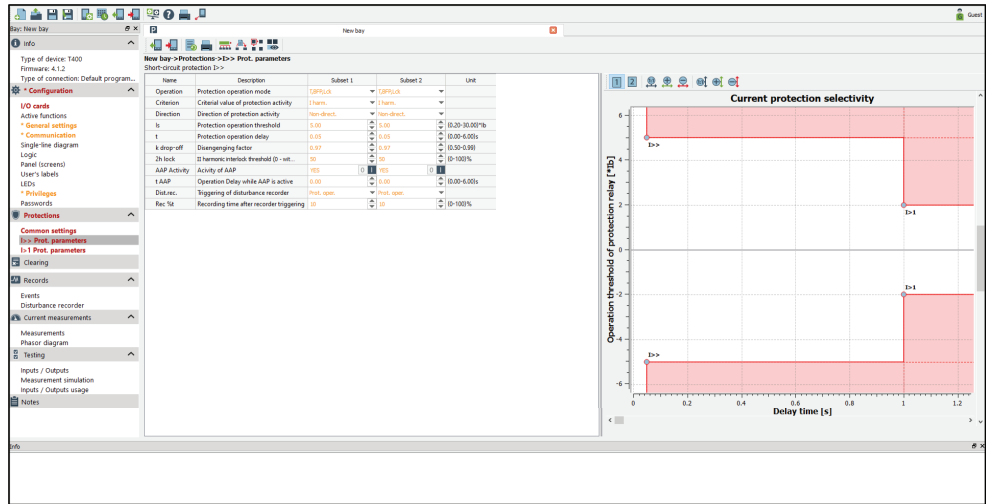
(all dimensions are in mm)

CONNECTION DIAGRAM



ABRAXAS-STUDIO SOFTWARE

Specially built abraxas-Studio simplifies configuration, and allows smooth functioning of protection relays. This seemingly sophisticated but handy program with its visual widget configuration affords creation of multiple projects aimed at array of devices, bays, switchgears and substations.



ORDERING INFORMATION

abraxas - - -

DEVICEPLATFORM:

229: Feeder protection relay with 4x20 OLED display
249: Feeder protection with 4,3" colored display

POWER SUPPLY:

U: 24..110 V DC universal
A: 24V DC
B: 110..230V AC/DC

CURRENT INPUTS:

C: 1/5A configurable

VOLTAGE INPUTS:

X: 1U for open delta voltage
V: 5U for phase and open delta voltage

COMMUNICATION INTERFACE:

X: RJ-45Ethernet
R: Ethernet + RS-485

COMMUNICATION PROTOCOL:

X: None
A: IEC 60870-5-103 and Modbus-RTU
B: IEC 60870-5-104, IEC 60870-5-103 and Modbus-RTU

OPTION:

X: None

OPTION:

X: None

EXPANSION SLOT A:

S: 3 inputs 6 outputs

EXPANSION SLOT B:

X: None
A: 8 inputs
B: 8 outputs
C: 4 pcs. 4-20mA analog inputs
D: 4 pcs. 4-20mA analog outputs
E: 4 pcs. 0-10V analog inputs
F: 4 pcs. 0-10V analog outputs
G: 6 pcs. PT100 temperature inputs
H: 6 pcs. PT1000 temperature inputs
I: 6 pcs. arc sensor inputs

EXPANSION SLOT C:

X: None
A: 8 inputs
B: 8 outputs
C: 4 pcs. 4-20mA analog inputs
D: 4 pcs. 4-20mA analog outputs
E: 4 pcs. 0-10V analog inputs
F: 4 pcs. 0-10V analog outputs
G: 6 pcs. PT100 temperature inputs
H: 6 pcs. PT1000 temperature inputs
I: 6 pcs. arc sensor inputs

EXPANSION SLOT D:

X: None
A: 8 inputs
B: 8 outputs
C: 4 pcs. 4-20mA analog inputs
D: 4 pcs. 4-20mA analog outputs
E: 4 pcs. 0-10V analog inputs
F: 4 pcs. 0-10V analog outputs
G: 6 pcs. PT100 temperature inputs
H: 6 pcs. PT1000 temperature inputs
I: 6 pcs. arc sensor inputs

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