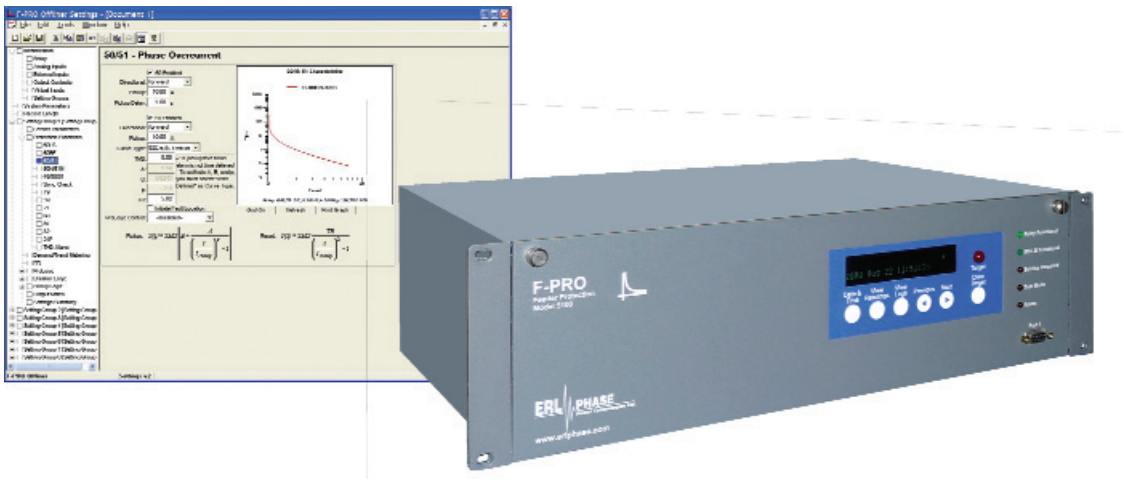
People with Passion
Best in Class Technology
Power System Focus
Elegant Efficient
e^3
Easy to Use

ERL

F-PRO 5100 Multi-function Distribution Protection & Management Relay

- Easy to use with intuitive settings and analysis software
- Offers reliable protection with superior transient fault and trend recording
- Excellent breaker monitoring and maintenance functions
- Common look and feel with other ERLPhase relays and recorders



The F-PRO relay provides comprehensive feeder management protection, standard ring bus capability, reclosing, demand/trend metering and recording, DFR quality fault oscillography, sequence of event logging, fault location, SCADA control and metering in a fully integrated protective relay solution.

- Comprehensive and flexible breaker monitoring using breaker logic and I*I*t functions
- Demand, Peak Demand and Energy metering features with complete SCADA metering (DNP or Modbus)
- IRIG-B time stamping and sample synchronization
- 96 samples/cycle fault recording, 30 to 360 day load trending (integrating, rolling or thermal modes) and event logging (1 ms)
- Protection functions include IEEE devices 50LS, 50BF, 50/51/67, 50N/51N/67, 46/50/51/67, 25/27/59 (25C), 21P, 27, 32(P&Q), 59, 60, 79, 81, and THD

dnp Distributed Network Protocol

10 Year WARRANTY

F-PRO 5100 Multi-function Distribution Protection & Management Relay

Protection

- Comprehensive overcurrent and recloser functions: over/under frequency load shedding and inter-tie protection
- Protection functions include IEEE devices 50LS, 50BF, 50/51/67, 50N/51N/67, 46/50/51/67, 25/27/59 (25C), 21P, 27, 32(P&Q), 59, 60, 79, 81, and THD
- ProLogic - control logic statements
- 8 settings groups available with 16 group logic statements for adaptive relay setting

Recording, Monitoring and Metering

- High quality recording - 96 samples/cycle fault recording, 30 to 360 day load trending (integrating, rolling or thermal modes) and event logging (1 ms)
- Comprehensive and flexible breaker monitoring using breaker logic and I*I*t functions
- Demand, Peak Demand and Energy metering features with complete SCADA metering (DNP or Modbus)
- Front display, fault location, MW, MVAR, volts, amps, power factor, frequency and THD
- Trend recording with maximum 360 day capacity

Substation Automation – Ethernet Ready

- Direct-connect DNP3 and Modbus SCADA communication protocols
- 3 RS-232 communication ports
- IRIG-B time stamping and sample synchronization
- 30 virtual inputs with complete SCADA metering and DNP control
- Standard 100BASE-TX Ethernet Port
- Optional internal modem

Easy to Use

- Easy to use, simplified relay setting and record analysis software (Windows® 2000/XP)
- Intuitive ASCII-terminal interface provides full local or remote access

F-PRO 5100 Multi-function Distribution Protection & Management Relay

Item	Quantity/Specs	Notes
General		
Nominal Frequency	50 or 60 Hz	
Operating Time	16-25 ms typical	Including relay output operation
Sampling Rate	96 samples/cycle	Records up to 25th harmonic
Power Supply	Range: 48–250 Vdc, 120 Vac	Power Consumption: 25-30 VA (AC) 25-30 W (DC)
Protection Functions		
IEEE Device 25/27/59 (25C), 21P, 27, 32, 50LS, 50BF, 50/51/67, 50N/51N/67, 46/50/51/67, 59, 60, 79, 81, THD	2 x 3-phase current inputs (6 current channels) 1 x 3-phase voltage inputs (3 voltage channels) 1 x 1-phase voltage input for sync check	Ring bus configuration and integrated HV breaker auto-recloser
ProLogic	10 statements/setting group, breaker logic	5 inputs/statement, 4 timers/statement
Setting Groups	8 (16 group logic statements per setting group)	Total: 128 group logic statements
Recording		
Record capacity	Up to 30 seconds of records per single phase unit. Each record can beup to a maximum of 2 seconds.	Viewing software provides waveform, symmetrical components and harmonic analysis
Transient	96 s/c oscillography of all analog and external input digital channels	
Trend	Demand metering: trending, integrating, rolling, thermal modes Demand interval: 5-60 minutes @ 5 minute increments Trending: 30 to 360 days	Trend auto save
Events	250 events I*I*t: trigger by user defined event and/or trip	1 ms resolution. When the "event auto save" is enabled a compressed event record is created is created approximately every 230 events
A/D Resolution	13 bits, 8192 counts full scale peak–peak	
Input & Output		
Analog Voltage Inputs 1 set of 3-phase voltage inputs per relay (3 voltage channels) 1 set single-phase positive sequence voltage	Nominal Voltage Continuous rating over voltage Maximum over-scale thermal rating Burden	Vn = 69 Vrms 2x Vn = 138 Vrms 3x Vn = 207 Vrms for 10 seconds <0.15 VA @ 69 Vrms
Analog Current Inputs 2 sets of 3-phase current inputs (6 current channels)	Nominal Current Full Scale/Continuous Maximum full-scale rating Thermal Rating Burden	In = 5 Arms 3x In = 15 Arms 20x In = 100 A for 1 second (no distortion) 80x In = 400 A for 1 second <0.25 VA @ 5 Arms
External Inputs (digital)	9 inputs	Two options: 48-125 or 125-250 Vdc
Output (contacts)	12 programmable outputs and 1 relay inoperative output (N.C.)	Externally wetted Make: 30 A as per IEEE C37.90 Carry: 8 A Break: 0.9 A at 125 Vdc 0.35 A at 250 Vdc

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Item	Quantity/Specs	Notes
Interface & Communication		
Front Display	2 lines x 24 characters, fluorescent	Exceptional visibility in all ambient light conditions.
Front Panel Indicators	6 LEDs	Target, Relay Functional, IRIG-B Functional, Service Required, Test Mode, Alarm
Serial User Interface	Front and rear RS-232 ports to 57.6 K baud	Rear port can support an external modem
Network	Standard 100BASE-TX Ethernet Port	Standard Ethernet card
Internal Modem	33.6 Kbps, V.32 bis	Optional internal modem
SCADA Interface	DNP3 or Modbus	DNP3: Ethernet or RS-232, Modbus: RS-232
Time Sync	IRIG-B, BNC connector	Modulated or unmodulated, auto-detect
Self Checking/Relay Inoperative	1 contact	Closed when relay inoperative
Environmental		
Ambient Temperature Range	-40°C to 85°C for 16 hours -40°C to 70°C continuous	IEC 60068-2-1, 2
Humidity	Up to 95% without condensation	IEC 60068-2-30
Insulation Test (Hi-Pot)	Power supply, analog inputs, external inputs, output contacts at 1.5 kV, 50/60 Hz, 1 minute	IEEE C37.90.1 / (IEC 61000-4-4/ IEC 60255-22-4): Class 3
Electrical Fast Transient		IEEE C37.90.1: 4kV / IEC 60255-22-4 Class 3 / IEC 61000-4-4: Level 3
Oscillatory Transient		IEEE C37.90.1: 2.5 kV / IEC 60255-22-1: Level 3 / IEC 61000-4-12): Level 3
RFI Susceptibility		IEEE C37.90.2: 35 V/m / (IEC 255-22-3/ IEC 61000-43): Level 3
Vibration, Shock and Bump		(IEC 60255-21-1, 2 / IEC 60068 2-8, 27, 29): Class 1
Conducted RF Immunity		(IEC 60255-22-6 / IEC 61000-4-6): Level 3
Voltage Interruptions	200 ms interrupt	IEC 60255-11 / IEC 61000-4-11
Physical		
Weight	11.52 kg	25.40 lbs
Dimensions	13.3 cm (3U) high x 48.3 cm wide x 30.5 cm deep	5.25" (3U) high x 19" wide x 12" deep
Mounting	Vertical or horizontal	Specify at time of order

NOTE: The F-PRO is also available with 1 amp current input.
All current specifications would change accordingly.