Accessories

External Memory Module (Part number: FPR0467)
The external, pluggable memory module stores the relay setting, logic function settings and starter configurations. The memory module is updated by the relay each time any of these settings are changed via the front-end software or door mounted MMI. The module is intended to aid field maintenance personnel in the setup of a replacement relay should a relay need to be changed.

Insulation Lock-out Module (Part number: FPR0468)
The insulation resistance of the motor is measured while in a static (not in service) condition. If the resistance drops below 20 kilo ohms, the relay will trip and prevent a start-up.

Expanded I/O Module (Part number: FPR0469)
This is an expansion module with 4 programmable output relays and 8 digital inputs (all with LED status indication). The unit connects to the relay via a T-Bus connector and derives power from the relay's own power supply.

RTD Expansion Module (Part number: FPR0470)
This is an expansion module with 4 RTD inputs which can accept a NTC, PTC, PT100 or PT1000 input. The unit connects to the relay via the T-Bus connector and derives power from the relay's own power supply.

4-20 mA Module (Part number: FPR0471)
This is an expansion module with 2 input loops and 2 output loops for 4-20 mA signals. Running amps or thermal capacity, or any analog signal, can be sent out though the output loops. Similarly, any analog input can be sent to the ProBeck-IPS relay for control purposes.

Ordering information

ProBeck-IPS Motor Protection Relay	Product Code
ProBeck-IPS MP Relay - Profibus	FPR0450
ProBeck-IPS MP Relay - Modbus	FPR0451
ProBeck-IPS MP Relay - DeviceNet	FPR0452
ProBeck-IPS MP Relay - EtherNet	FPR0453
ProBeck-IPS CTMB 1Amp 110-550Volt	FPR0455
ProBeck-IPS CTMB 5Amp 110-550Volt	FPR0456
ProBeck-IPS CTMB 25Amp 110-550Volt	FPR0457
ProBeck-IPS CTMB 50Amp 110-550Volt	FPR0458
ProBeck-IPS CTMB 100 Amp 110-550Volt	FPR0459
ProBeck-IPS CTMB 300 Amp 110-550Volt	FPR0460
ProBeck-IPS-CTMB-CABLE-1000-1m	FPR0462
ProBeck-IPS-CTMB-CABLE-500-500mm	FPR0463
ProBeck-IPS-CTMB-CABLE-300-300mm	FPR0464
ProBeck-IPS-CTMB-CABLE-100-100mm	FPR0465
ProBeck-IPS-I2C Settings Memory Module	FPR0467
ProBeck-IPS-Insulation Lockout Module	FPR0468
ProBeck-IPS-I/O Expansion Module 8I/40	FPR0469
ProBeck-IPS-RTD Module 4 Input	FPR0470
ProBeck-IPS 4-20mA Module 2 In X 2 Out	FPR0471
ProBeck-IPS Pilot Wire PW-TLM Controller	FPR0472

becker MINING AMERICA
emis SALES 2002 (Pty) Ltd

EMIS Sales 2002 (Pty) Ltd
4 Albert Street
Heidelberg
Gauteng

Tel: 016 341 6134
Fax: 016 341 6218

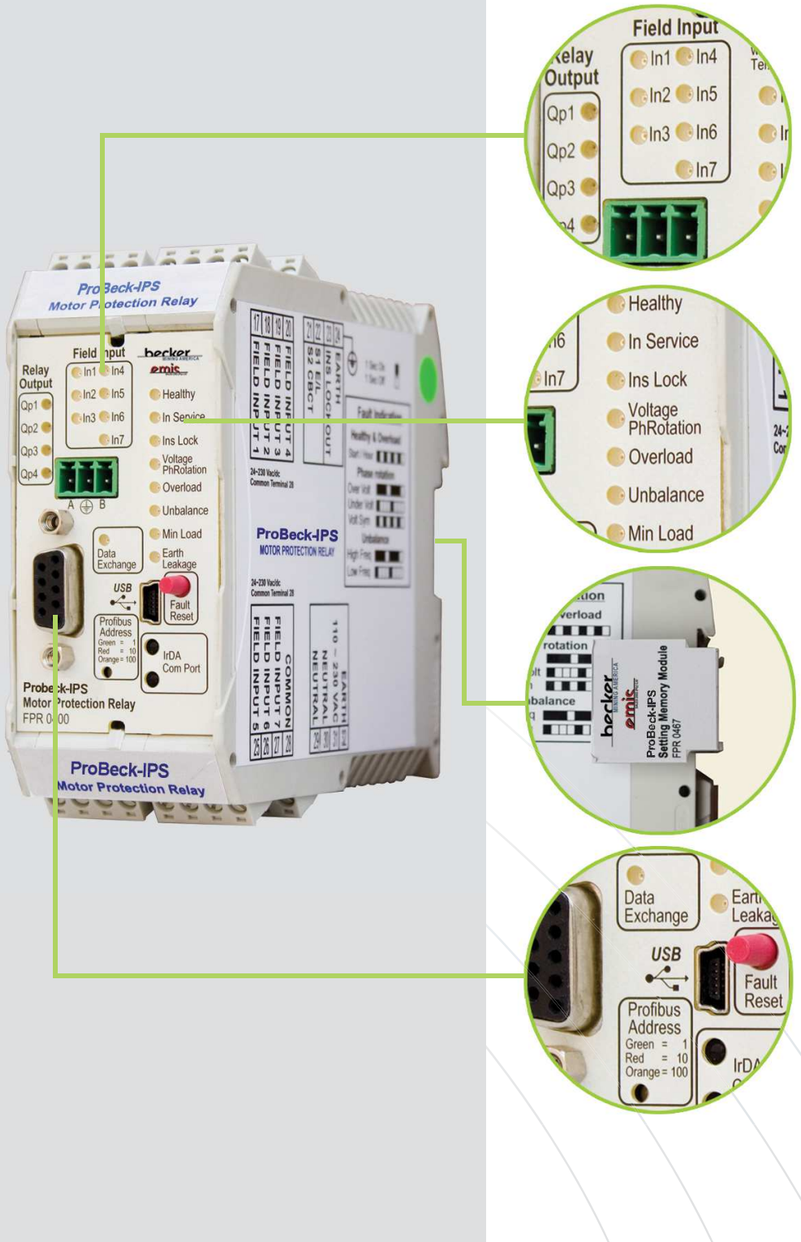
After Hours No:
082 468 7613
(Ivan Van Niekerk-
Technical Support)

Web Address:
www.emis.co.za

Technical Support:
www.newelec.co.za
sales@newelec.co.za

ProBeck-IPS

Comprehensive Motor Protection and Control Relay



Relay Field Input and Output LEDs

LED Fault Indicators

Configurable Memory Module on a T-Bus

IrDA and USB Connectors
Profibus Address Indicator

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About

The ProBeck-IPS Relay is an ISO 9001:2000 compliant, locally designed and manufactured, three-phase motor protection relay. It is a micro-controller based precision instrument with protection, advanced control features and starter logic. The relay is designed to cater for the low voltage motor protection market. The current transformers, including the core balance current transformers are external.

Protection Features:

Thermal Overload
Locked Rotor
Running Stall – Jam
Vectorial Stall - Start Stall
Unbalanced Current
Single Phasing
Minimum Load – Underload - Dry Run
Earth Leakage
Earth Fault
Short-circuit
Starts per Hour Limitation
Overvoltage – Undervoltage
Phase Rotation
Over Frequency – Under Frequency
Insulation Lock-out

Management Features:

Power Factor Measurement
Power Consumption Measurement
Statistical Data
1400 Event Records with time and date stamp
35 Last Fault Records with time and date stamp

Configurable Automation Features:

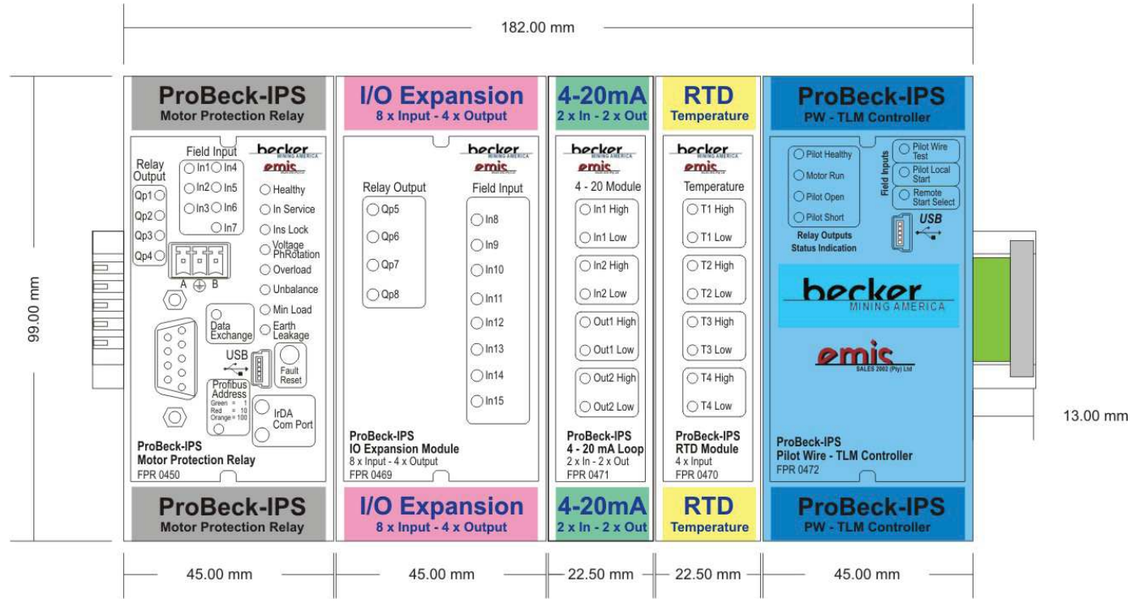
Timers
Real Time Clock (24 Hour)
Starter Controller Logic
Logic Function Blocks
7 Field Inputs
Motor Parameter Calculator
4 Programmable Outputs
3 Phase Recorder
On-board Simulator for Training / Commissioning
Multiple Communication Protocols

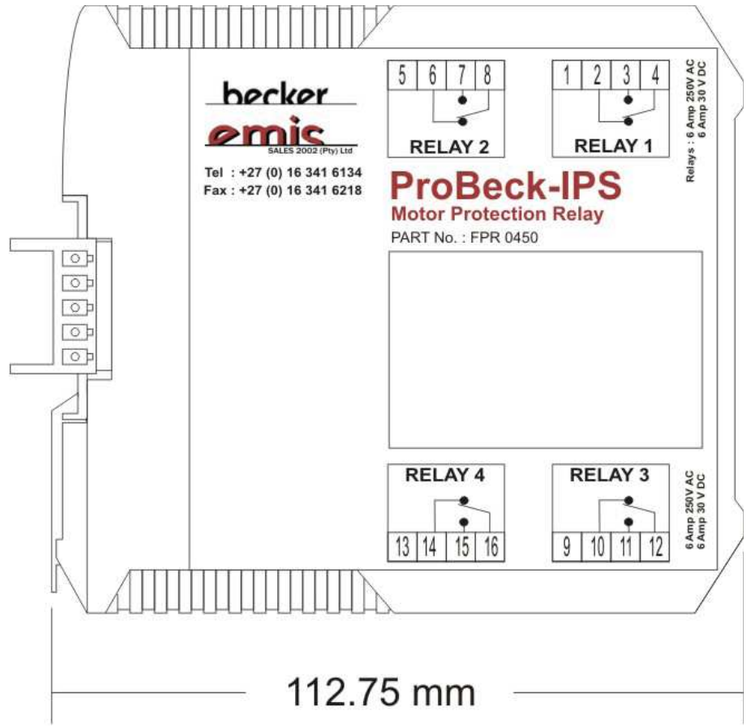
The ProBeck-IPS relay is fully configurable with the aid of front-end software or a man machine interface unit (MMI). Event records can also be downloaded with the aid of the laptop for further analysis. All the settings are password protected. The relay has an onboard database where time and date stamped records are kept. Two types of records are kept namely fault records (35 last faults) and event records (1400 events). In the case of event records, the user has limited access rights (read only).

The front-end also has a data recorder and a spectrum analyser which could be used to analyse motor performance and supplied power quality respectively. The spectrum analyser can detect harmonics up to the 9th harmonic on any of the three phase currents.

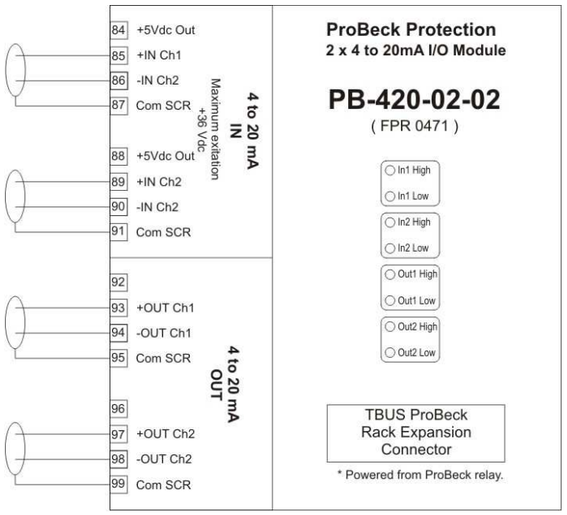
The relay detects earth leakage currents with the aid of the external core balance current transformer and is configurable to operate in inverse definite minimum time (IDMT) or instantaneous definite time (IDT) mode. A unique feature is added to the relay in the form of simulation. This function could be used for personnel training or relay functionality testing.

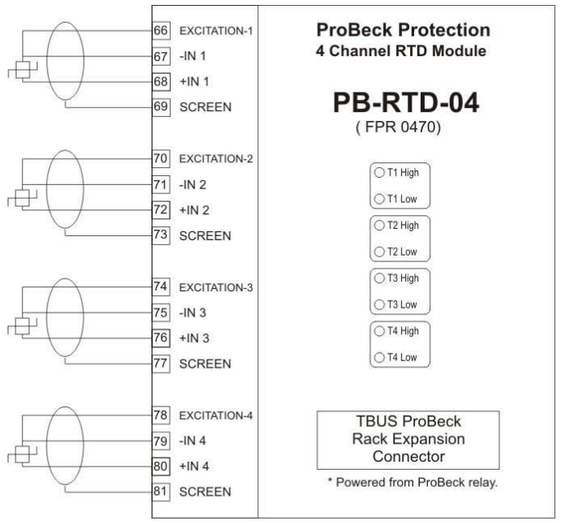
Dimensions



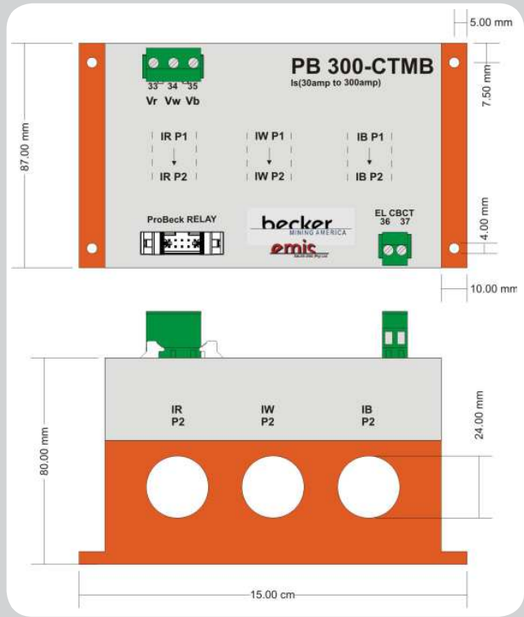


Electrical Connection Diagrams for 4-20 mA and RTD Modules

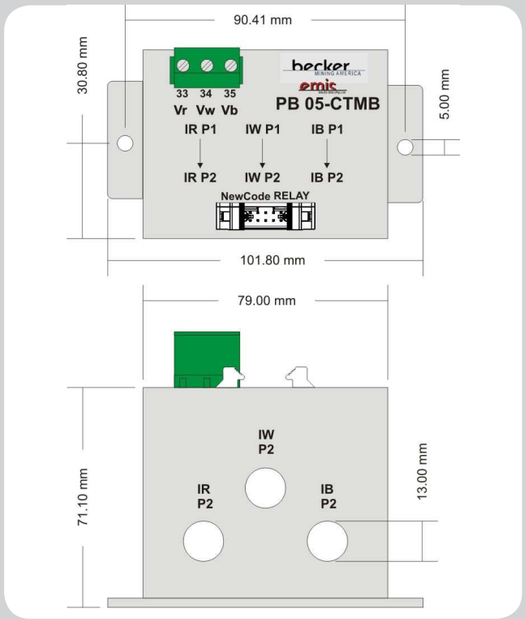




ProBeck-IPS Current module dimensions for 100 and 300 Amps



ProBeck-IPS Current module dimensions for 5, 10, 25 and 50 Amps



Technical Specifications

Auxiliary Power Supply
Voltage requirements : 110 - 230 V AC/DC
Power requirements : 2,5 Watt

Operating Environment
Temperature : -20°C - 65°C
Relative humidity : < 85%

Communication Protocols
Profibus DPV-1, Modbus, CanBus

Input Converter
Class : Class 1
Rating : 0,1 VA
Frequency Response : 40 to 66 Hz

Overload Trip Delay Curves
Class 3 – 40 to IEC 60255-8 Specification

Unbalance / Single Phasing Setting
Level Setting : 5 – 50% Ie (M.F.L.)
Trip Delay : 1 to 10 seconds

Underload Detection
Range : 10 to 100% of Max Load Setting
Trip Delay : 1 to 10 seconds
Priming Time Available : 1 to 200 seconds
Power Factor Setting : 0.1 to 1 on Minimum Load Setting

Auto Reset Limiter
Auto Reset limited to only 3 times per hour

Maximum Load Current Setting
Level Setting Accuracy : ± 2%
Linearity : ± 2%
Repeatability : ± 1%
Detection Level : ± 2%
Calibration : Amps

4X Output Relays : 5 Amps 220 V AC
Configuration : Form C (Common, NC / NO)
: Fully configurable

Fault Indication
Operation : Latch LED on Trip,
record on event and fault records
: Clear LED on Resetting

Running Stall Protection
Detection Level : 110 to 300% of Max Load
Trip Delay Adjustable : 0.100 - 1 second

Three phase current measurement
Range : 1 – 400 Amps
Dynamic range : 0% to 1000%

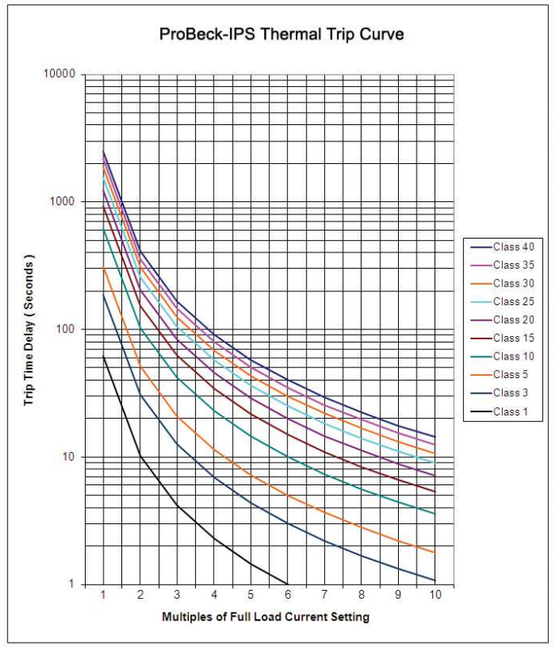
Voltage Range : 110 V, 380 V, 400 V, 525 V, 550 V,
680 V, 950 V, 1100 V, 3 K 3 V /
110 V, 6 K 6 V / 110 V, 11 KV / 110 V
Range selection : manual or automatic selection at
power up

Earth Leakage Range : 30 mA to 3 Amps
Trip Time : Inverse Definite Minimum Time
(IDMT) and Instantaneous Definite
Time (IDT)

Real Time Clock
24hr clock (year, month, day, hours and minutes)
Battery back-up (5 days)
Time & date stamping (fault and event records)
Insulation Resistance
Measurement range : 1 to 99 kOhm
Resolution : 1 kOhm

Power Factor Range : 0 to 100% (phase angle 0 to 90°)

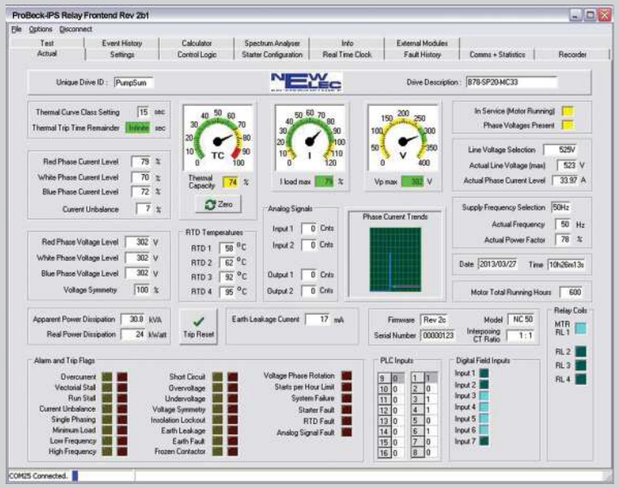
Thermal Curves



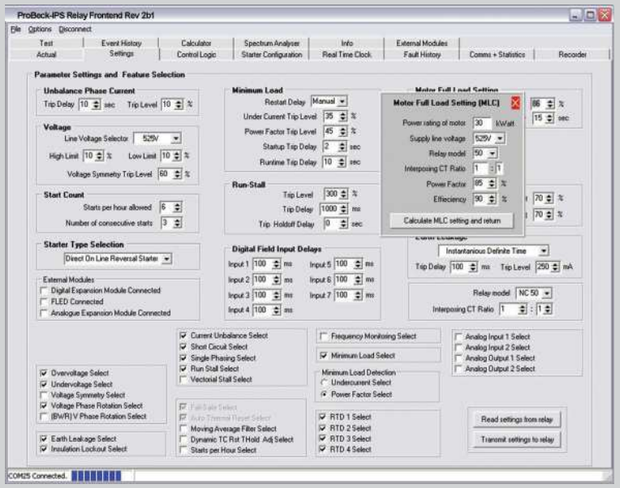
Standards compliance and certifications

ISO 9001:2008	Quality management
CISPR 22:1-15	Radiated emissions
CISPR 22:1-15	Conducted emissions (Power Leads)
IEC 61000-4-2:	Electrostatic discharge immunity test
IEC 61000-4-3:	Radiated, radio-frequency, electromagnetic field immunity test
IEC 61000-4-4:	Electrical fast transient / burst
IEC 61000-4-5:	Surge immunity test
IEC 61000-4-6:	Immunity to conducted disturbances, induced by radio-frequency fields
IEC 61000-4-11:	Voltage dips
IEC 61000-3-2:	Harmonic current emissions
IEC 61000-3-3:	Voltage changes, voltage fluctuations and flicker

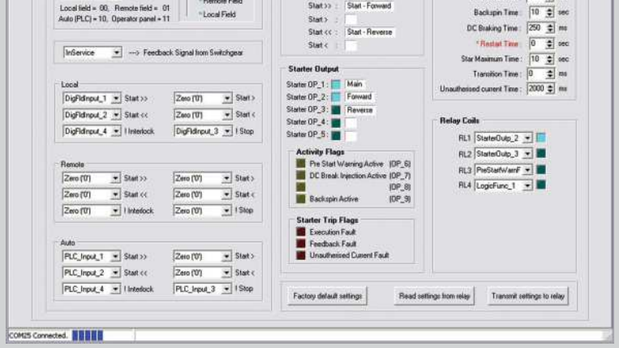
Frontend Actual Readings



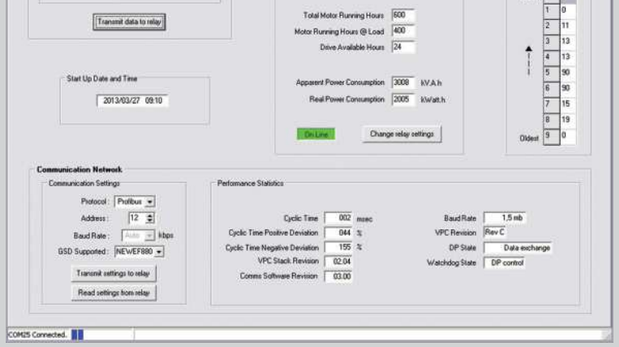
Frontend Settings



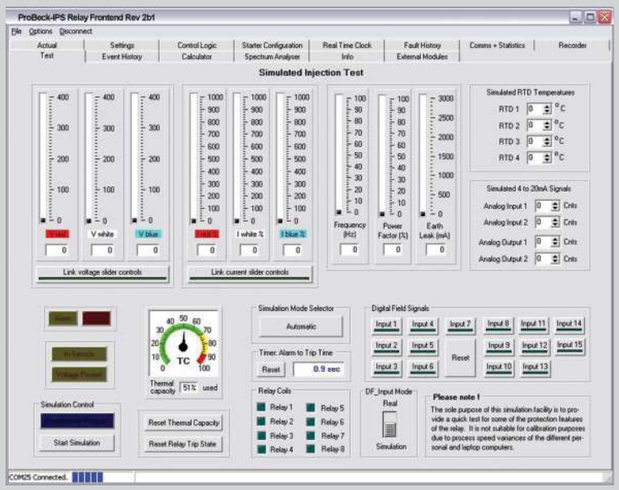
Starter Configuration



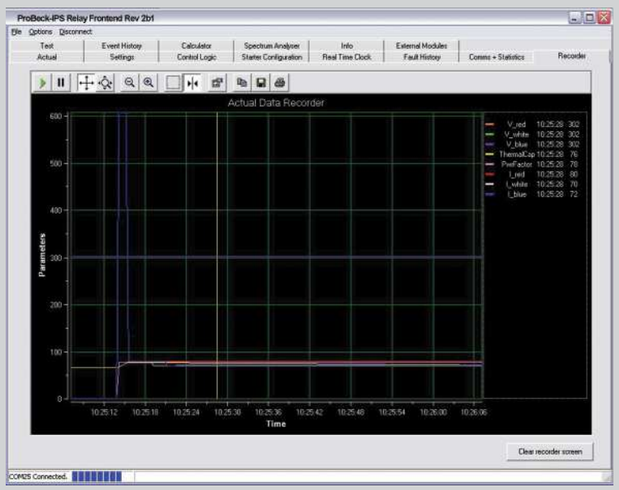
Statistical Screen



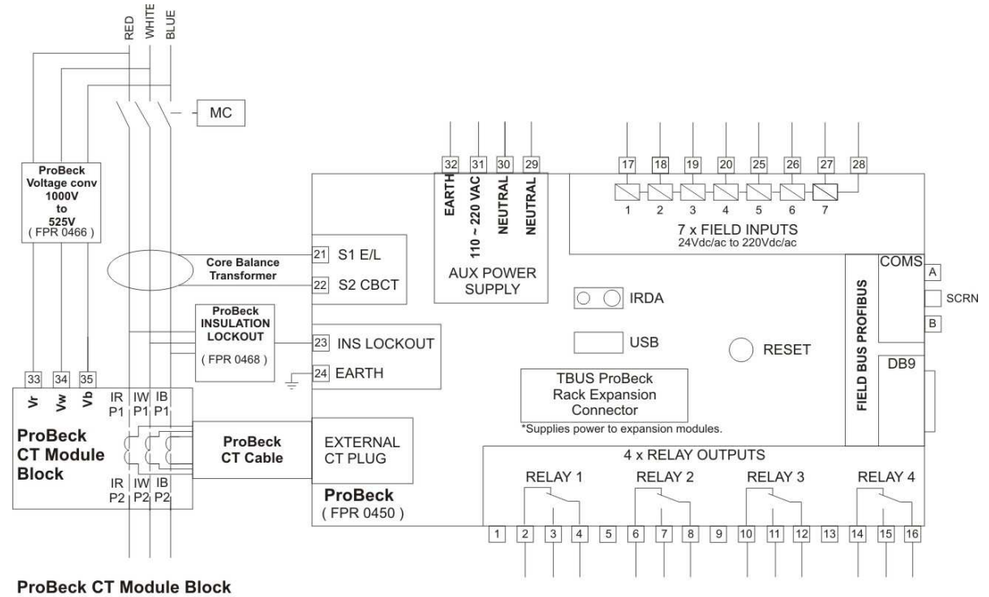
Test Screen



Actual Data Recorder



Electrical Connection Diagram for ProBeck-IPS Relay



ProBeck CT Module Block

PB-300-CBCT [30 to 300 Amps / 550 Vac / EL CBCT] (FPR 0460)
PB-100-CBCT [10 to 100 Amps / 550 Vac / EL CBCT] (FPR 0459)
PB-001-CBCT [0.1 to 1 Amps / 550 Vac] (FPR 0455)
PB-005-CBCT [0.5 to 5 Amps / 550 Vac] (FPR 0456)
PB-025-CBCT [2.5 to 25 Amps / 550 Vac] (FPR 0457)
PB-050-CBCT [5 to 50 Amps / 550 Vac] (FPR 0458)

ProBeck CT Cable

PB-CT-CAB-1000-1m (FPR 0462)
PB-CT-CAB-1000-500mm (FPR 0463)
PB-CT-CAB-1000-300mm (FPR 0464)
PB-CT-CAB-1000-100mm (FPR 0465)

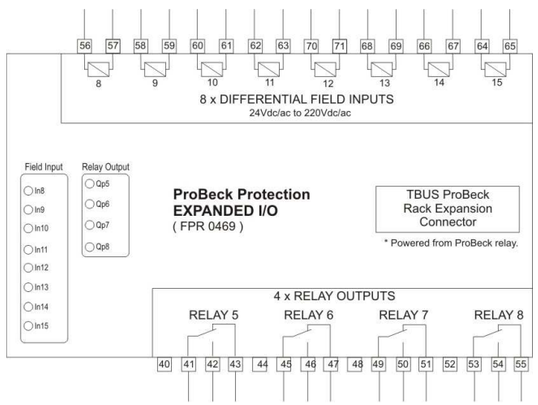
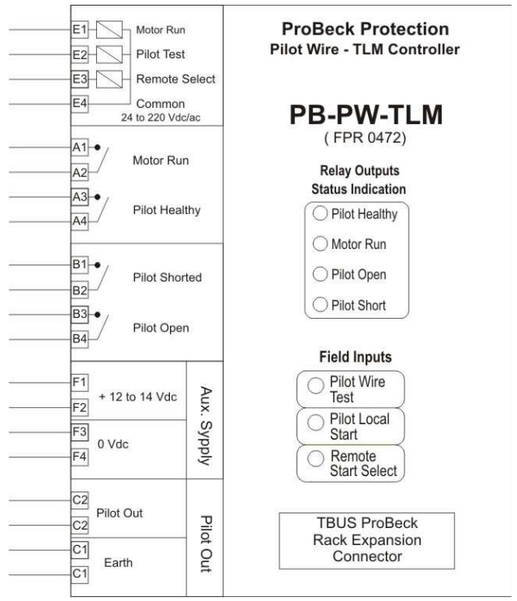
Core Balance Transformer

100mm Inside Diameter (BTX 0010)

ProBeck Backup Memory Module
(FPR 0467)

Backup for ProBeck relay settings and control logic configuration.

TBUS ProBeck Rack Expansion Connector

* Powered from ProBeck relay.

Connection Diagram for Expanded I/O Module and Pilot Wire - TLM Controller