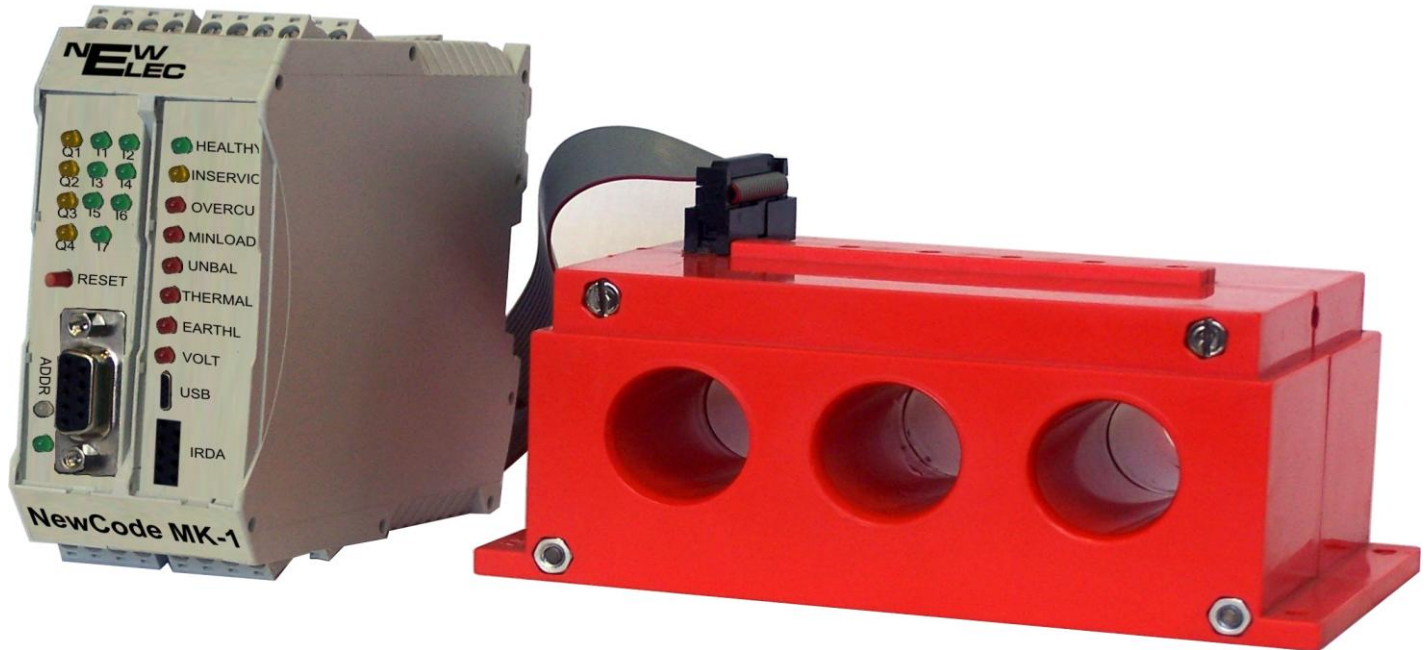


Electronic Motor Protection Relay

NewElec NewCode MK-1 Series



The NewCode MK-1 relay is an ISO 9001:2000 compliant, locally designed and manufactured three phase electronic motor protection relay.

The relay is fully configurable with the aid of front-end software or a man-machine interface unit (MMI).

An on-board data base stores Fault and Event records, which are date and time stamped. The front-end data recorder and spectrum analyzer can be used to monitor motor performance or to detect harmonics up to the 9th harmonic of any three phase currents.

Thermal overload, Over and Under voltage and voltage symmetry protection as well as frequency, power factor and power dissipation measurement are basic features offered by the relay. More advanced features including starter logic and logic function blocks result in an all encompassing relay, which, coupled with its communication options, make the NewCode relay an ideal solution for plant protection and automation.

Features Include:

- Thermal Overload Protection
- Locked Rotor Protection
- Running Stall Protection - Jam Protection
- Vectorial Stall Detection
- Unbalanced Current - Single Phasing Protection
- Minimum Load - Under Load Protection
- Earth Leakage Protection - Earth Fault Protection
- Short Circuit Protection
- Starts per Hour Limitation
- Over Voltage - Under Voltage - Phase Rotation
- Over Frequency - Under Frequency Protection
- Power Factor Measurement
- Power Dissipation Measurement
- Insulation Lock-out
- 2000 Event Recording
- 60 last Fault Records
- 2 Timers
- Real Time Clock (24 Hour)
- Starter Logic
- 7 Field Inputs
- 4 Programmable Outputs
- 3 Phase recorder
- On-Board Simulator
- Communication: Profibus, Modbus, Canbus

NewElec NewCode MK-1 Series

Accessories

Model	Range	C.T.'s
MK 5	0.5 to 5 Amp	Not Required
MK 10	1 to 10 Amp	Not Required
MK 50	5 to 50 Amp	Not Required
MK 100	10 to 100 Amp	Not Required
MK 200	20 to 200 Amp	Not Required
MK 400	40 to 400 Amp	400 : 5
MK MMI		Pic 1
MK FLED		Pic 2
MK RDU		Pic 3



Pic 1



Pic 2



Pic 3

Management Tools

Event Records - 2000 Events

Time and date stamped with I act, V act, Running Hours as well as Circuit Interruption Time.

Fault Records - Last 60 faults

A typical display of the Fault Records, which can be exported to an Excel spreadsheet.

Grp	Status	Date	Time	Fault Description	Run Hrs	Imax %	Vmin	Brkr Clr
1	Sim	2009/11/13	12h56	Earth Leakage	2	76	215	10 ms
2	Sim	2009/11/13	12h56	Voltage Symmetry	2	76	65	10 ms
3	Sim	2000/00/00	00h00	Minimum Load	2	68	215	0 ms
4	Sim	2009/11/13	11h15	Overcurrent	2	600	0	10 ms

Status indicates whether the fault was a Simulated Fault (see On-board Simulator) or an Actual Fault.

NewElec NewCode MK-1 Series

Technical Information

Product Specifications	
<p>Input Converter</p> <p>Class : Class 1 Rating : 0,1 VA Frequency Response : 40 to 66 Hz</p> <p>Overload Trip Delay Curves Class 3 -40 to IEC 60255-8 Specification</p> <p>Unbalance / Single Phasing Setting</p> <p>Level Setting : 5 - 50 % I_e (M.F.L.) Trip Delay : 1 to 10 seconds</p> <p>Underload Detection</p> <p>Range : 10 to 100% of Maximum Load Dial</p> <p>Trip Delay : 1 to 10 seconds Priming Time Available : 1 to 200 seconds Power Factor Settings : 0.1 to 1 on Minimum Load Dial</p> <p>Auto Reset Limiter Auto Reset limited to only 3 times per hour</p>	<p>Maximum Load Current Setting</p> <p>Level Setting Accuracy : ± 2% Linearity : ± 2% Repeatability : ± 1% Detection Level : ± 2% Calibration : Amps</p> <p>Main Trip Relay : 5 Amps 220Volt A.C.</p> <p>Configuration : 1 n/o + 1 n/c Terminals : n/c 7 and 8 : n/o 9 and 10</p> <p>Fault Indication</p> <p>Operation : Latch on trip Resetting Fault Ind. : Latch</p> <p>Running Stall Protection</p> <p>Detection Level : 110 to 300% of Maximum Load Dial Setting with a 1s Trip Delay</p>
<p>Restart Timer</p> <p>User-selectable range : Manual only, 5 sec, 10 sec, 2 min, 10 min, 20 min, 30 min, 45 min, 1 hr, 3 hrs OR 6 hrs delay. : T reset = Curve [2.33 (35,49 x 4) 15 log (100/70)] - Motor Standstill</p>	
<p>Overload Thermal Lock-out Time to Recover 30% Capacity</p> <p>Example shown for a 15 sec curve selection : T reset = Curve [2.33 (35,49 x 2) 15 log (100/70)] - Motor Running</p>	

Environmental Specifications	
<p>Reference Standards IEC 255</p> <p>Isolation N/O contact 1kV for 1 minute To IEC 255-5 C</p> <p>Impulse Withstand 5kV To IEC 255-4 EIII</p>	<p>Isolation Seperate Contacts 1kV for 1 minute To IEC 255-5 C</p> <p>High Frequency IEC 255-4 EIII</p>

NewElec NewCode MK-1 Series

Measurement Specifications

Current

- Three Phase Current
- Range: 1 Amp to 400 Amps
- Models: MK5 (5 Amp), MK10 (10 Amp), MK50 (50 Amp), MK100 (100 Amp), MK200 (200 Amp), MK400 (400 Amp)
- Dynamic Range: 0 % to 1000 %

Voltage

- Range: 110V, 400V, 525V and 1050V (1050V require additional attenuator circuit)
- Range Selection: Manual or Automatic selection at Power Up. (1050V is only Manual Selectable)

Earth leakage

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

Real Time Clock

- 24hr Clock (Year, Month, Day, Hours and Minutes)
- Battery Backup (5 Days)
- Time & Date Stamping (Fault and Event Records)

Breaker Fault Clearance Time

- Measurement Range: 10 ms to 1000 ms
- Resolution: 10 ms

Insulation resistance

- Measurement Range: 1 to 199 kOhm
- Resolution: 1 kOhm

Frequency

- Range: 30Hz to 100Hz

Power Factor

- Range: 0 to 100% (Phase Angle 0 to 90°)

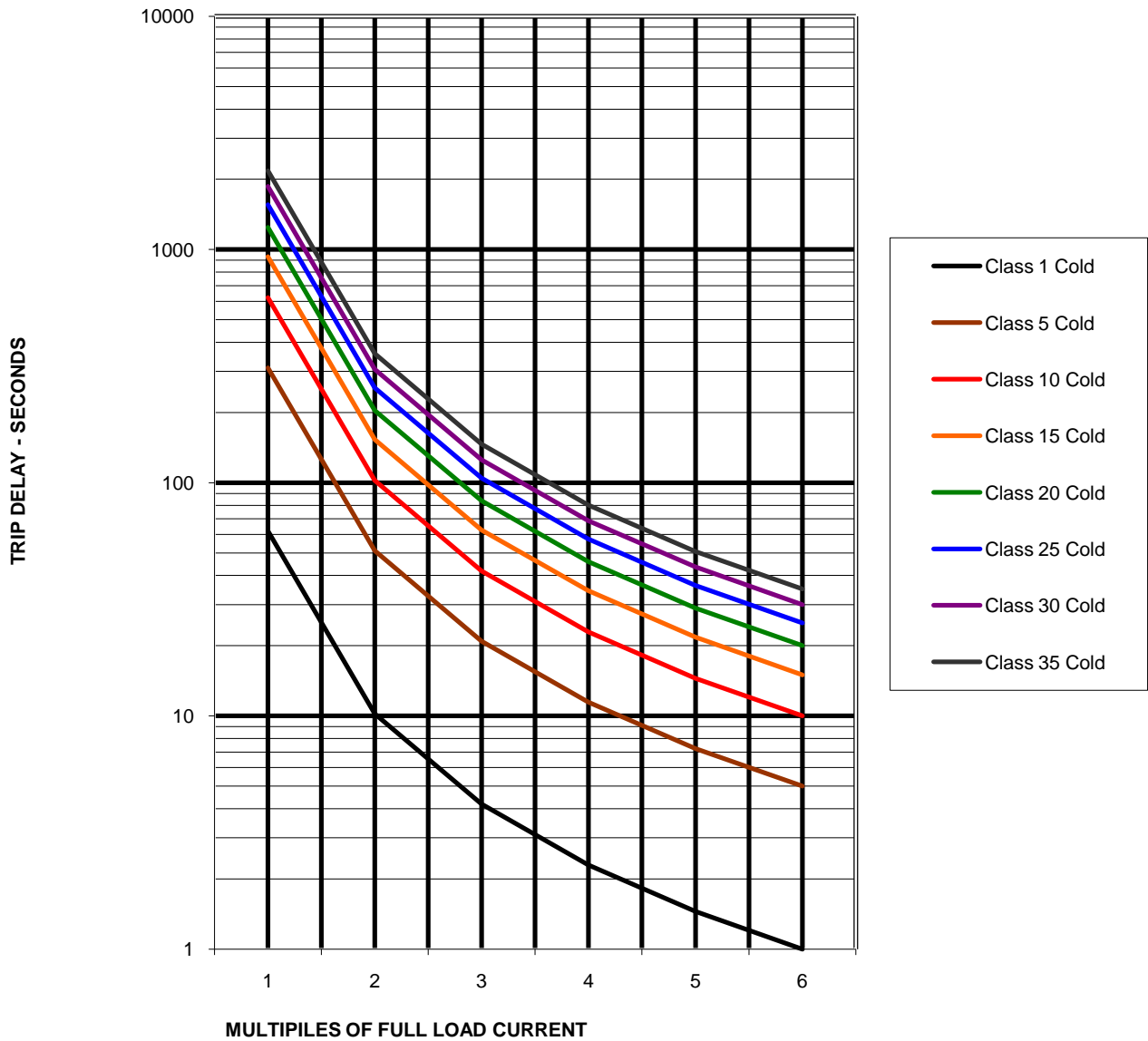
Approvals

Manufactured to ISO 9001: 2000 Standards

Copy ISO certificate available on request

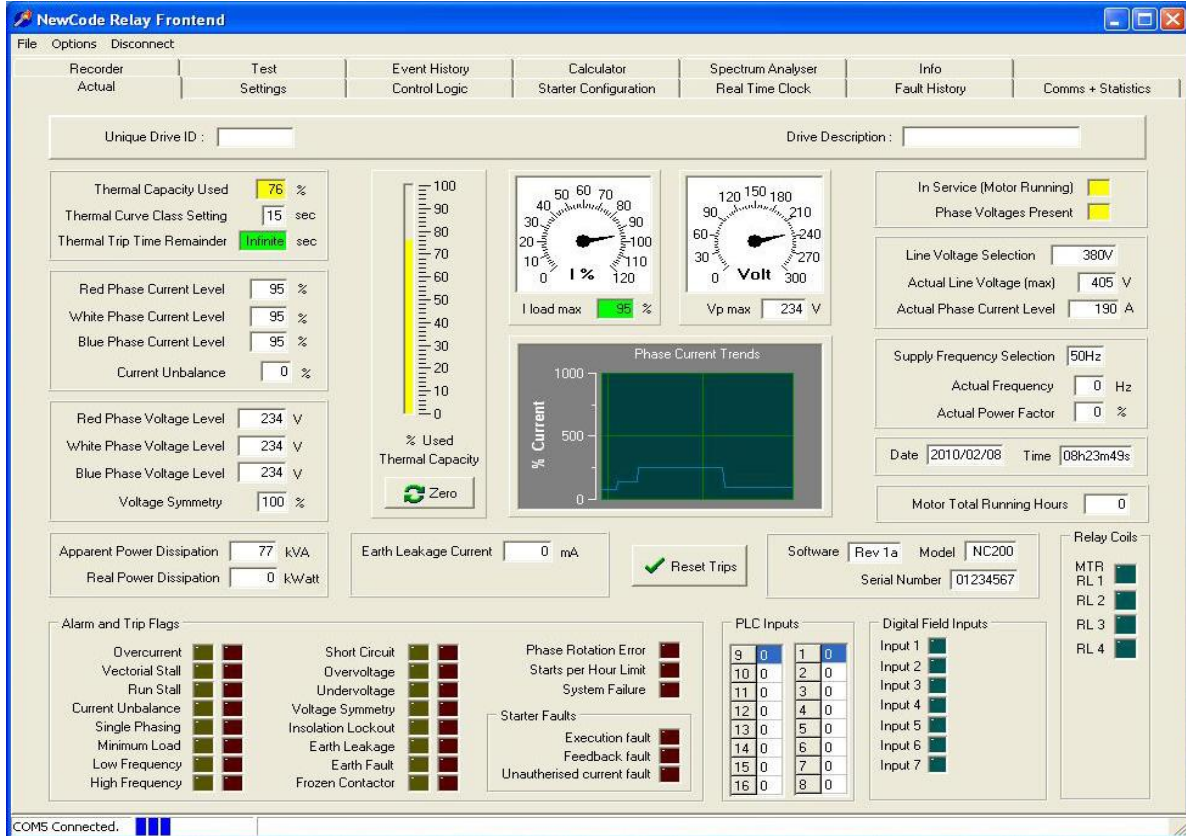
NewElec NewCode MK-1 Series

Thermal Curves



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Frontend Actual Readings



Frontend Settings

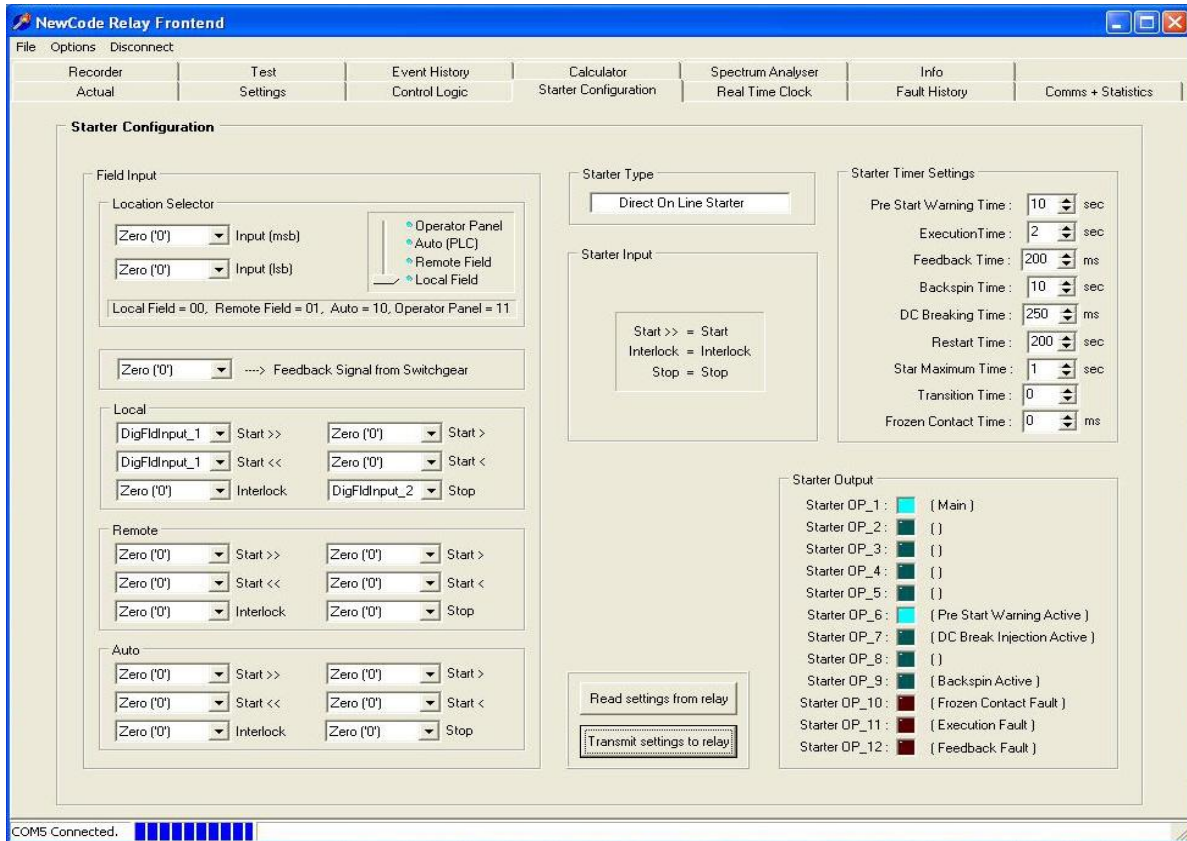
The screenshot displays the 'NewCode Relay Frontend' software interface in the 'Settings' tab. The main area is titled 'Parameter Settings and Feature Selection'. It contains several configuration sections:

- Unbalance Phase Current:** Trip Level (0 %), Trip Delay (1 sec).
- Voltage:** Line Voltage Selector (dropdown), High Limit (0 %), Low Limit (0 %), Voltage Symmetry Trip Level (100 %).
- Start Count:** Starts per hour allowed (1), Number of consecutive starts (1).
- Starter Type Selection:** (dropdown).
- External Modules:** Expansion Module Connected, FLED Connected (checkboxes).
- Relay 1 Configuration:** Dedicated Main Trip Relay Select, Configurable Relay (+100ms) Select (radio buttons).
- Protection Selects:** Overvoltage Select, Undervoltage Select, Voltage Symmetry Select, Voltage Phase Rotation Select, Reversed V Phase Rotation (BWR) Select, Earth Leakage Select, Insulation Lockout Select (checkboxes).
- Minimum Load:** Restart Delay (dropdown), Under Current Trip Level (10 %), Power Factor Trip Level (10 %), Startup Trip Delay (0 sec), Runtime Trip Delay (0 sec).
- Run-Stall:** Trip Level (110 %), Trip Delay (1000 ms), Trip Holdoff Delay (0 sec).
- Digital Field Input Delays:** Input 1-7 (100 ms).
- Starter Faults:** Current Unbalance Select, Short Circuit Select, Single Phasing Select, Run Stall Select, Vectorial Stall Select (checkboxes).
- Fail-Safe Select:** Auto Thermal Reset Select, Moving Average Filter Select, Dynamic TCap Reset THold Adj Select, Starts per Hour Select (checkboxes).
- High Speed Motor Setting:** Motor Full Load Setting (100 %), Thermal Curve Class Selector (3 sec).
- Low Speed Motor Setting:** Motor Full Load Setting (100 %), Thermal Curve Class Selector (3 sec).
- Thermal Capacity:** Actual Used Adjust (0 %), Reset Threshold (0 %).
- Earth Leakage:** Trip Level (0 mA), Trip Delay (100 ms).
- Frequency Monitoring Select:** (checkbox).
- Minimum Load Select:** (checkbox).
- Minimum Load Detection:** Undercurrent Select, Power Factor Select (radio buttons).

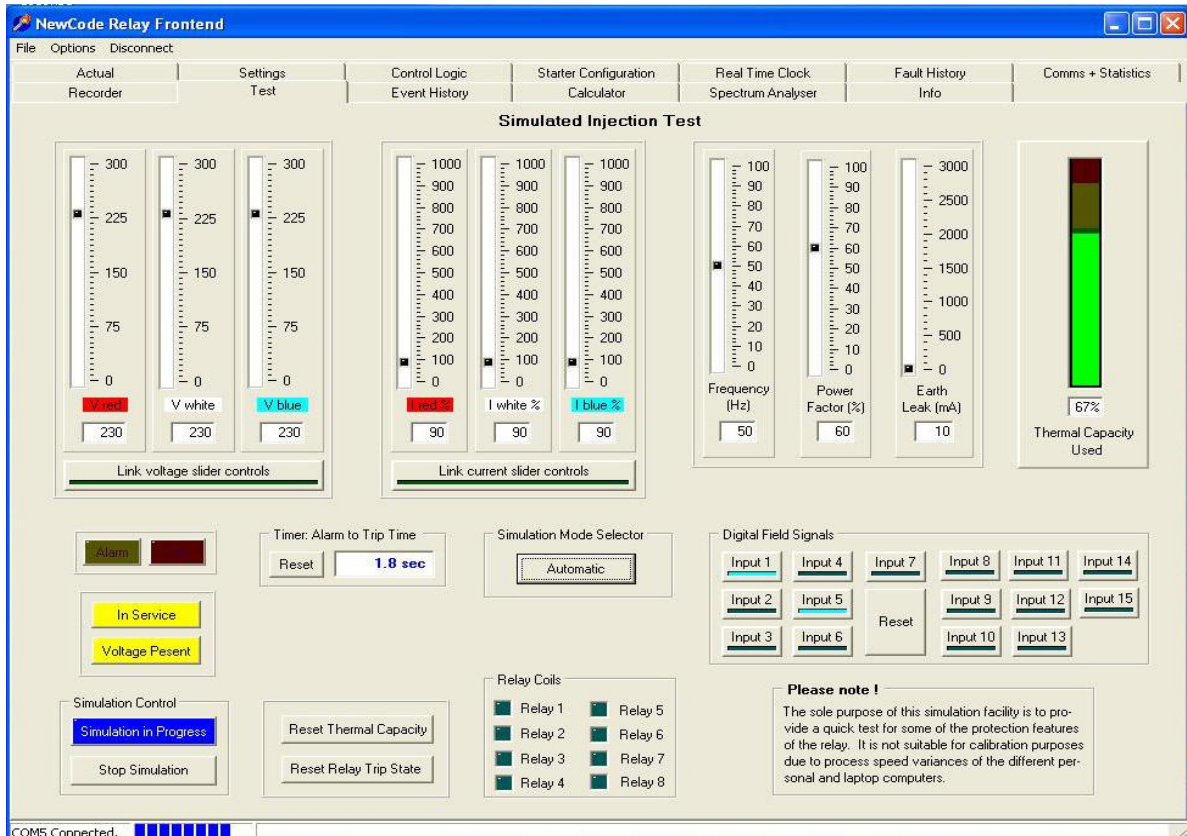
 At the bottom right, there are buttons for 'Read settings from relay' and 'Transmit frontend settings to relay'.

NewElec NewCode MK-1 Series

Starter Configuration



Frontend Simulator



NewElec NewCode MK-1 Series

Statistical Screen

The screenshot shows the 'NewCode Relay Frontend' software interface. The main window is titled 'NewCode Relay Frontend' and has a menu bar with 'File', 'Options', and 'Disconnect'. Below the menu bar is a toolbar with icons for Recorder, Test, Event History, Calculator, Spectrum Analyser, Info, and Comms + Statistics. The main area is divided into several sections:

- User Defined Data:** Unique Drive ID: AIR-15B, Description of drive unit: Aerator Drive 15B. A button 'Transmit data to relay' is present.
- Communication Network:** Protocol: Profibus, Address: 5, Baud Rate: Auto kbps. A button 'Transmit comms settings to relay' is present.
- Performance Statistics:** Cyclic Time: 0 msec, Cyclic Time Positive Deviation: 0 %, Cyclic Time Negative Deviation: 0 %.
- Statistical Data:** Startup Counter: 230, Trip Counter: 2, Motor Total Running Hours: 1750, Motor Full Load Running Hours: 525, Relay Running Hours: 1225, Apparent Power Consumption: 35000 kVA.h, Real Power Consumption: 17500 kWatt.h. A green 'On Line' indicator and a 'Change relay settings' button are also visible.
- Thermal Capacity required to start Drive:** A table showing the latest thermal capacity values for 9 different drive units.

At the bottom left, a status bar indicates 'COMS Connected.' with three blue bars.

Latest	0	0
1	0	0
2	0	0
3	0	0
4	2	0
5	39	0
6	2	0
7	2	0
8	2	0
9	0	0
Oldest		

Dimensional Diagram

Still to be completed