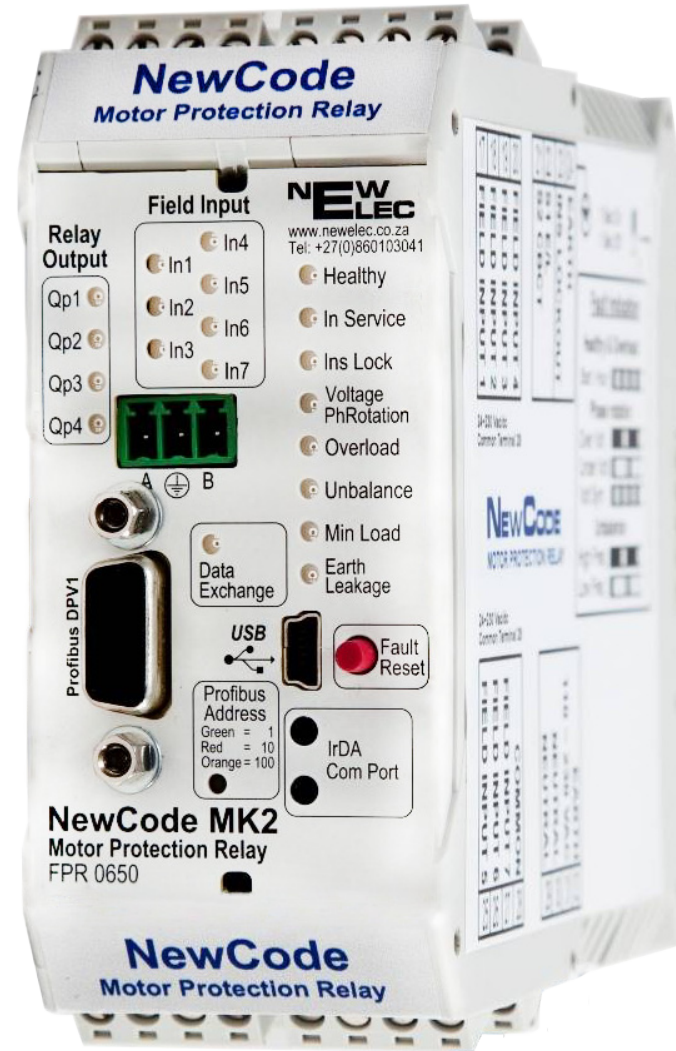




MOTOR PROTECTION & CONTROL TECHNOLOGY

# NewCode Motor Protection & Control Relay



A South African Company to be Proud of



Physical Address: 298 Soutter Street, Pretoria West  
Tel: 083 454 6949, +27 12 327 1729 Fax: +27 (0)12 327 1733 Toll Assist: 0860 10 30 41  
www.newelec.co.za sales@newelec.co.za

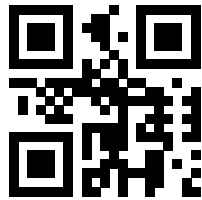


MOTOR PROTECTION & CONTROL TECHNOLOGY

+27 12 327 1729  
Toll Assist: 0860 10 30 41

 [www.newelec.co.za](http://www.newelec.co.za)

 GPS Coordinates:  
-25.752984, 28.162957



*Innovative solutions from South Africa's Leading Motor Protection Specialists*

## **About NewElec**

*NewElec designs and manufactures a wide range of superior electronic motor protection relays for both local and International markets. NewElec's goal, for the past 38 years, has been to exceed the expectations of every client by OFFERING quality products, outstanding customer service and greater value, thus optimizing system functionality and improved operational efficiency.*

*As experts in motor protection, NewElec is involved in every stage of the client's selection of the required protection relay offering ongoing functional and technical support. Our R&D division is continually designing the most up to date motor protection products to meet customer requirements.*

*NewElec's electronic motor protection relays can be found in refineries, mining, steel, petrochemical, pulp and paper, sugar mills, agriculture and material handling industries to name a few, both locally and internationally. The NewElec product range includes software programmable LV motor protection relays for process control applications, protection relays for LV and MV motors, relays for pump motor protection, as well as earth leakage protection relays.*

*NewElec is continually expanding and has recently installed a manufacturing division for its relay housings. This ensures that the final product meets NewElec's precise requirements.*

*With headquarters in Pretoria West, Gauteng, South Africa, NewElec was established in May 1978 and is accredited with ISO 9002.*

*A South African Company to be Proud of*



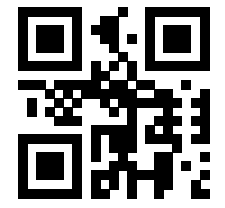
# NEW ELEC

MOTOR PROTECTION & CONTROL TECHNOLOGY

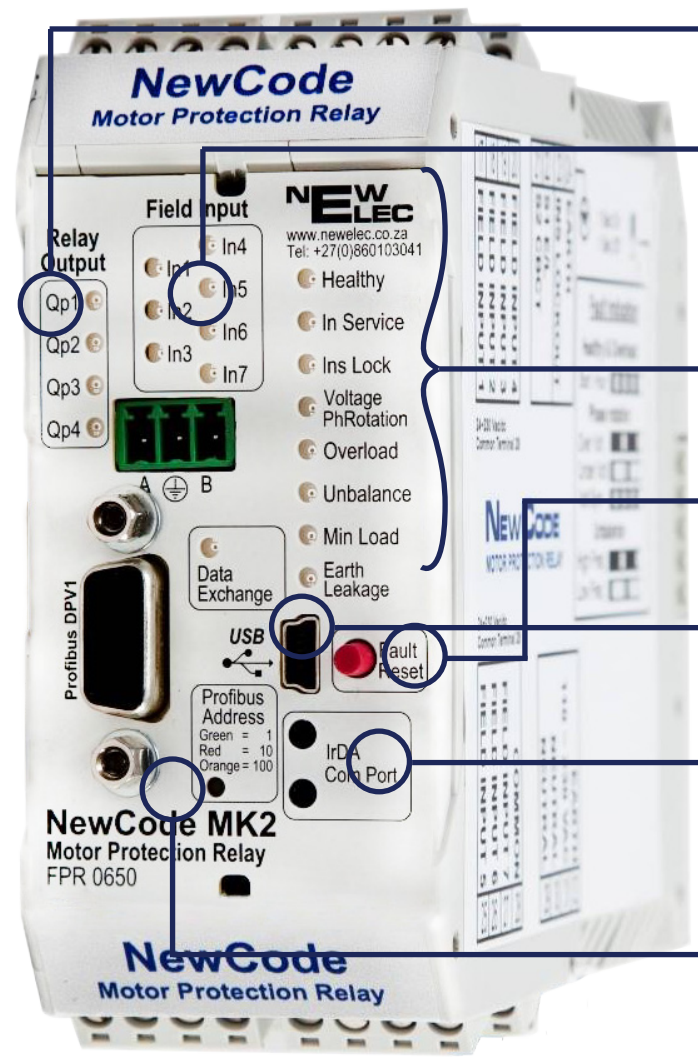
+27 12 327 1729  
Toll Assist: 0860 10 30 41

www.newelec.co.za

GPS Coordinates:  
-25.752984, 28.162957



*Innovative solutions from South Africa's Leading Motor Protection Specialists*



Output Relays Status X 4 off

Digital Input Status X 7 off

User friendly latched fault diagnostic LED s

Fault acknowledgement / Reset

USB port

Infrared data acquisition port

Communications port with multi protocol support

A South African Company to be Proud of



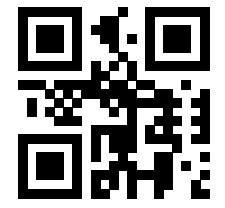
# NEW ELEC

MOTOR PROTECTION & CONTROL TECHNOLOGY

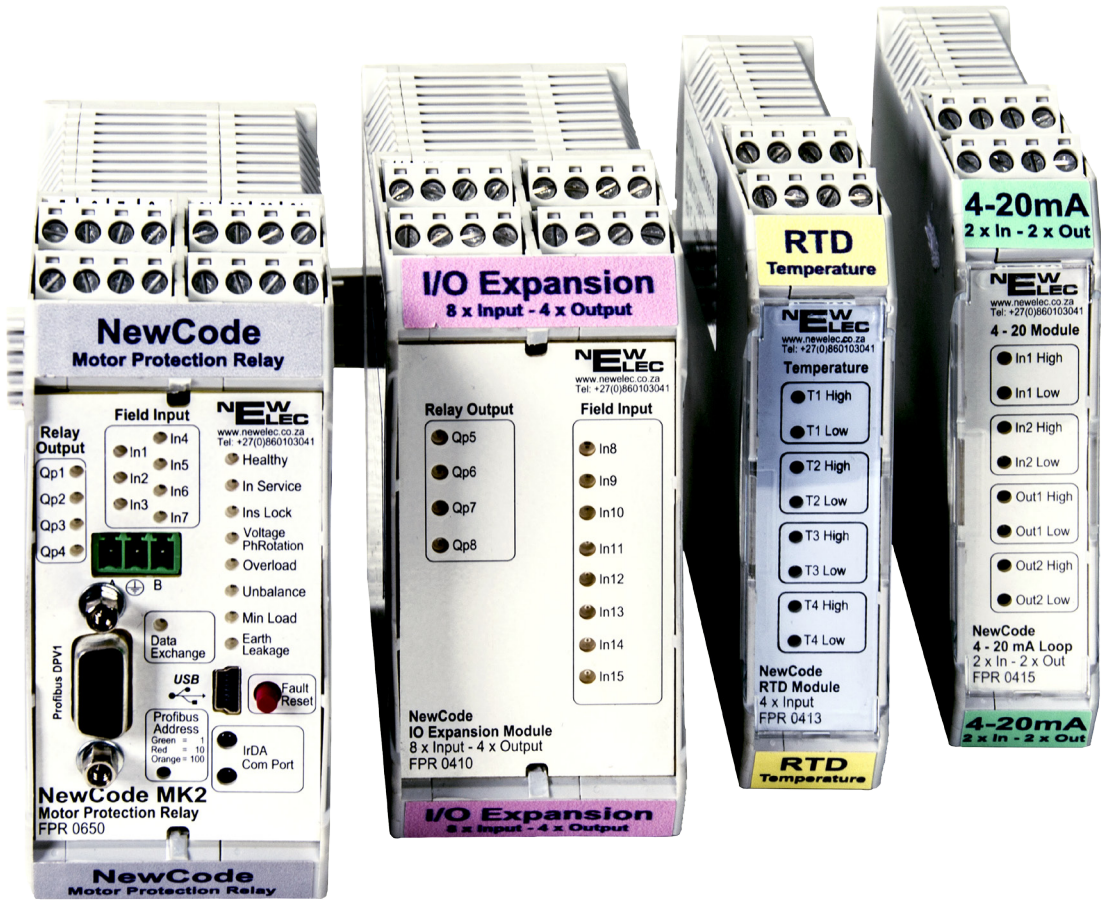
+27 12 327 1729  
Toll Assist: 0860 10 30 41

www.newelec.co.za

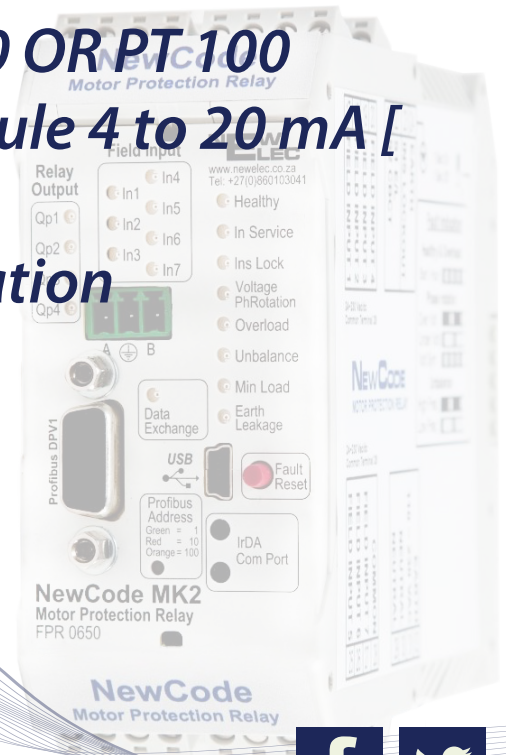
GPS Coordinates:  
-25.752984, 28.162957



*Innovative solutions from South Africa's Leading Motor Protection Specialists*

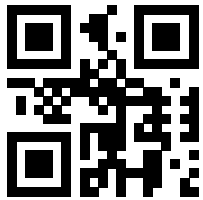


- Plus ....
- Expansion I / O comprising 8 Inputs and 4 Outputs
- Expansion 4 channel RTD Module PTC 100 OR PT 100
- Expansion Module 4 to 20 mA [ 2 IN / 2 OUT ]
- Relay Configuration MemoryCard



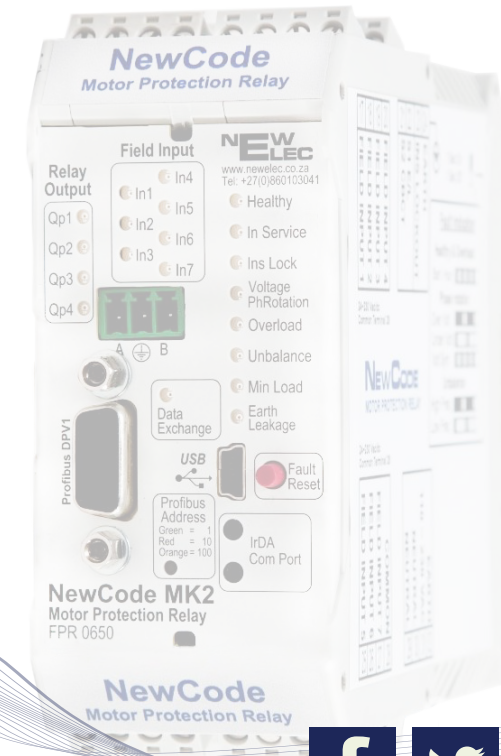
*A South African Company to be Proud of*

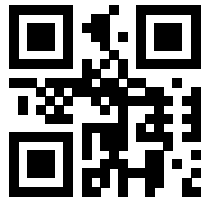




## Management Features

- *Apparent Power and Real Power Measurement*
- *Statistical Data*
- *Last 40 Faults Record*
- *Last 1440 Events Record*
- *3 Phase Recorder*
- *Training Simulator*



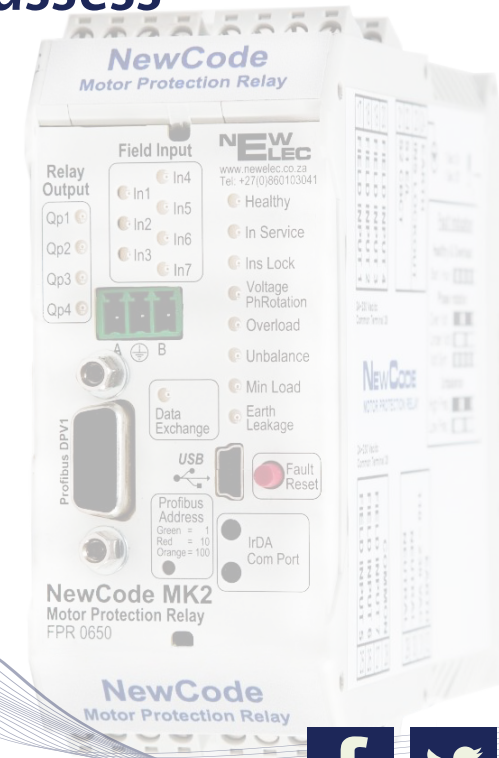


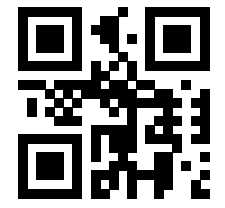
## *Apparent Power and Real Power Measurement*

*The relay distinguishes between real & apparent power consumption*

*Use this information and management skills to assess*

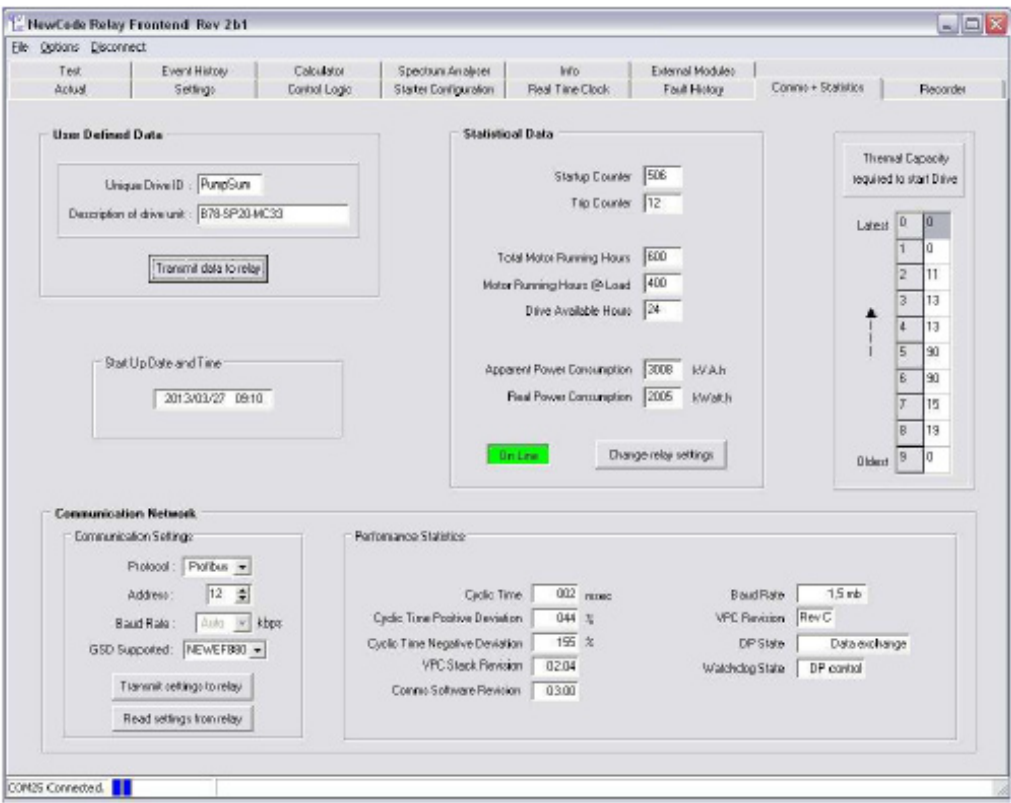
*Revision of motor sizes  
Improve power factor  
Reduce electricity bills  
Create a greener footprint*





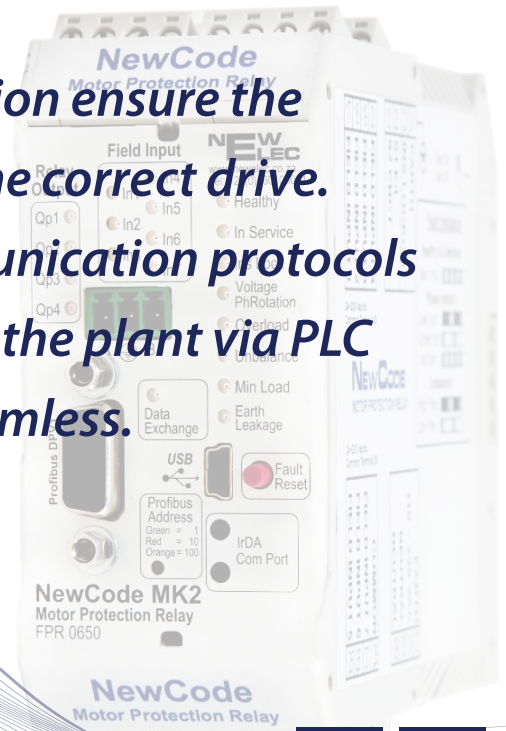
*Innovative solutions from South Africa's Leading Motor Protection Specialists*

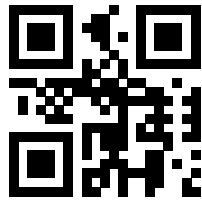
## Statistical data



*Essential Statistical Data ensures that information retrieved from the relay can be used for maintenance purposes before failure of the drive.*

*The Drive ID and Description ensure the information pertains to the correct drive. Various selectable Communication protocols mean that automation of the plant via PLC and SCADA systems is seamless.*





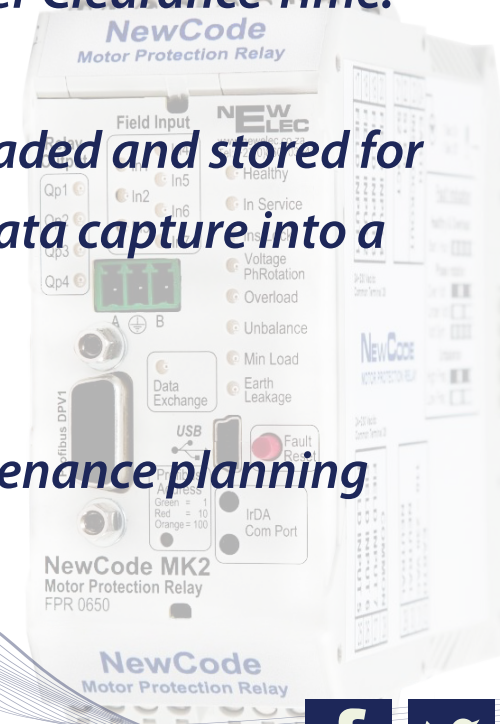
## Last 40 Faults Record

Grp	Status	Date	Time	Fault Description	Run Hrs	Inax %	Vmin	Brkr Cr
1	Simulation	2011/02/03	11h31	Overcurrent	3	360	226	50ms
2	Simulation	2011/02/03	11h37	Overcurrent	3	628	226	100ms
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								

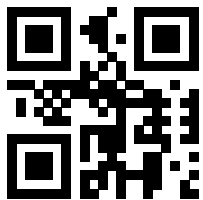
*The Last 40 Faults Record is Date and Time stamped with the fault description, Running Hours of the drive, Current Maximum, Voltage Minimum and Breaker Clearance Time.*

*This information can be uploaded and stored for viewing in MS Excel later or data capture into a SAP system.*

*Particularly helpful for maintenance planning on a plant.*

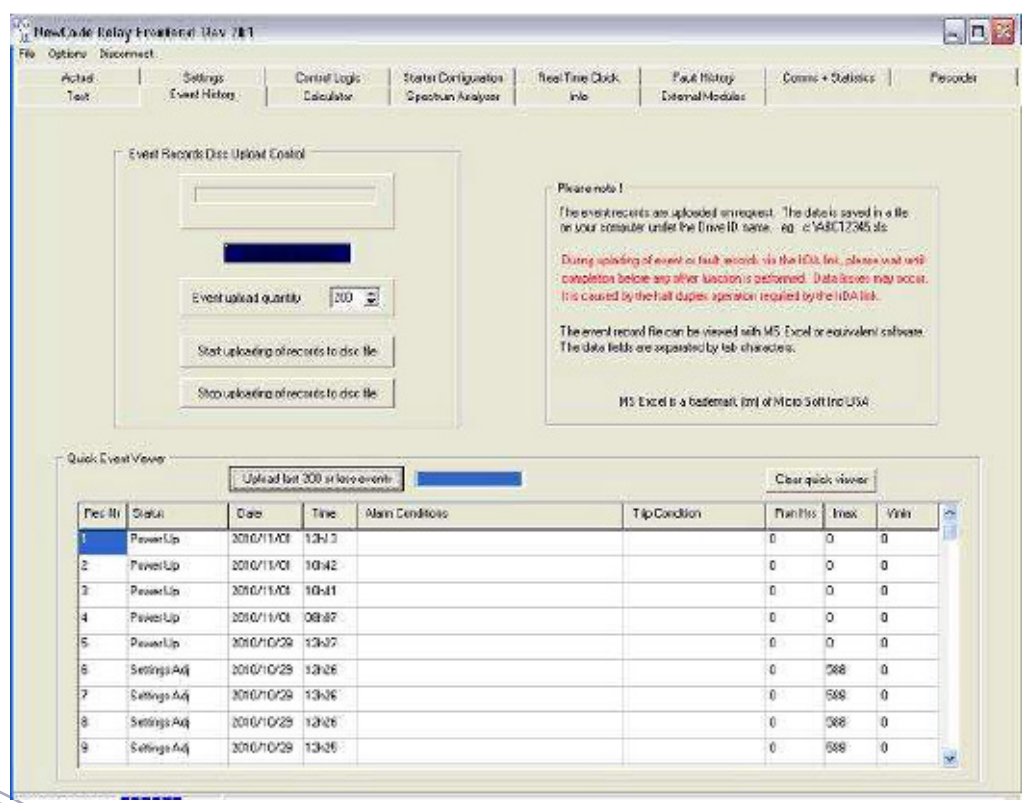






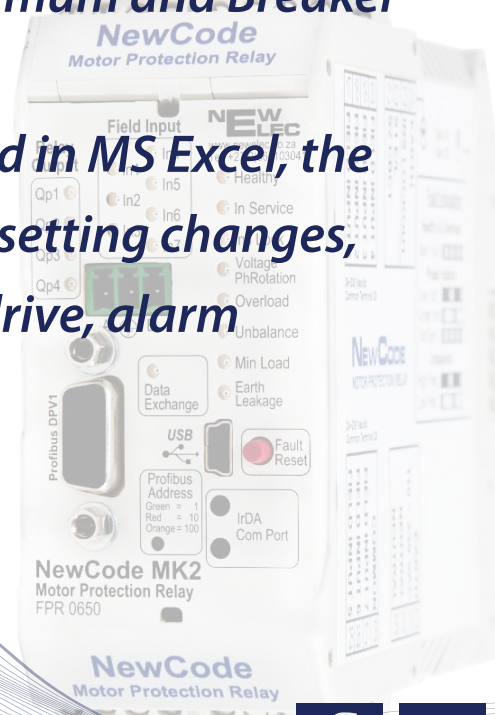
*Innovative solutions from South Africa's Leading Motor Protection Specialists*

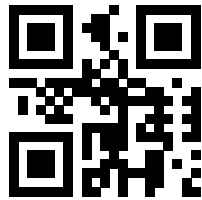
## 1440 Event Records



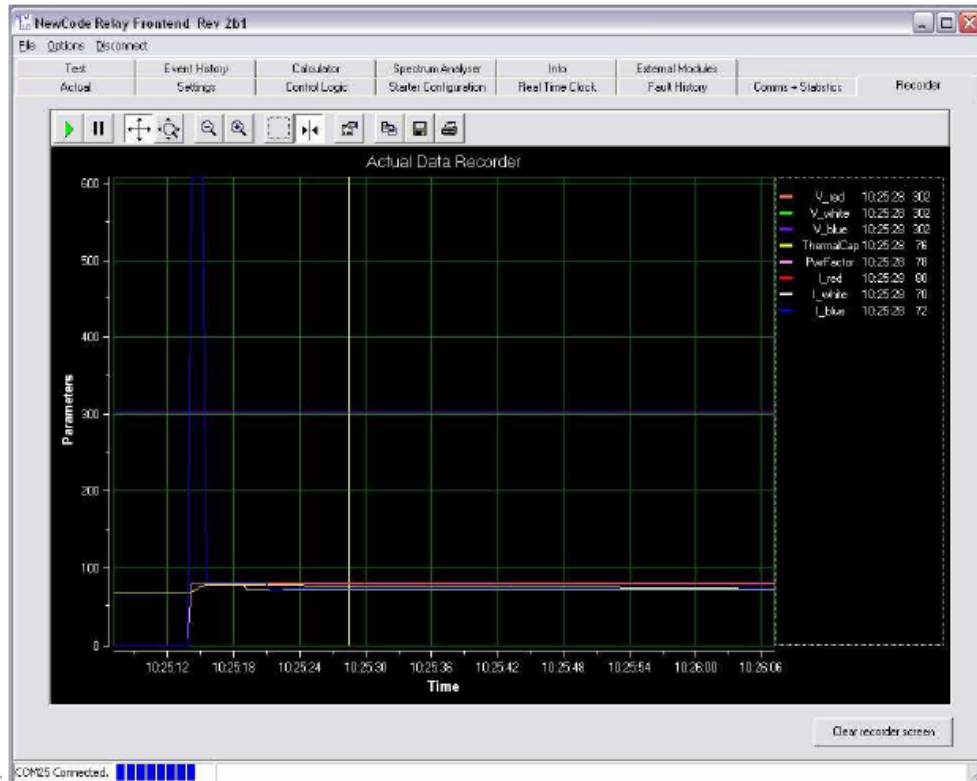
*The Event Records are Date and Time stamped with the event description, Running Hours of the drive, Current Maximum, Voltage Minimum and Breaker Clearance Time.*

*Downloaded and viewed in MS Excel, the event records will show setting changes, stops and starts of the drive, alarm conditions and trips.*





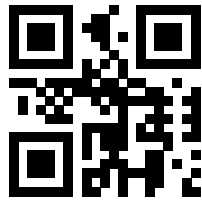
## 3 Phase Recorder



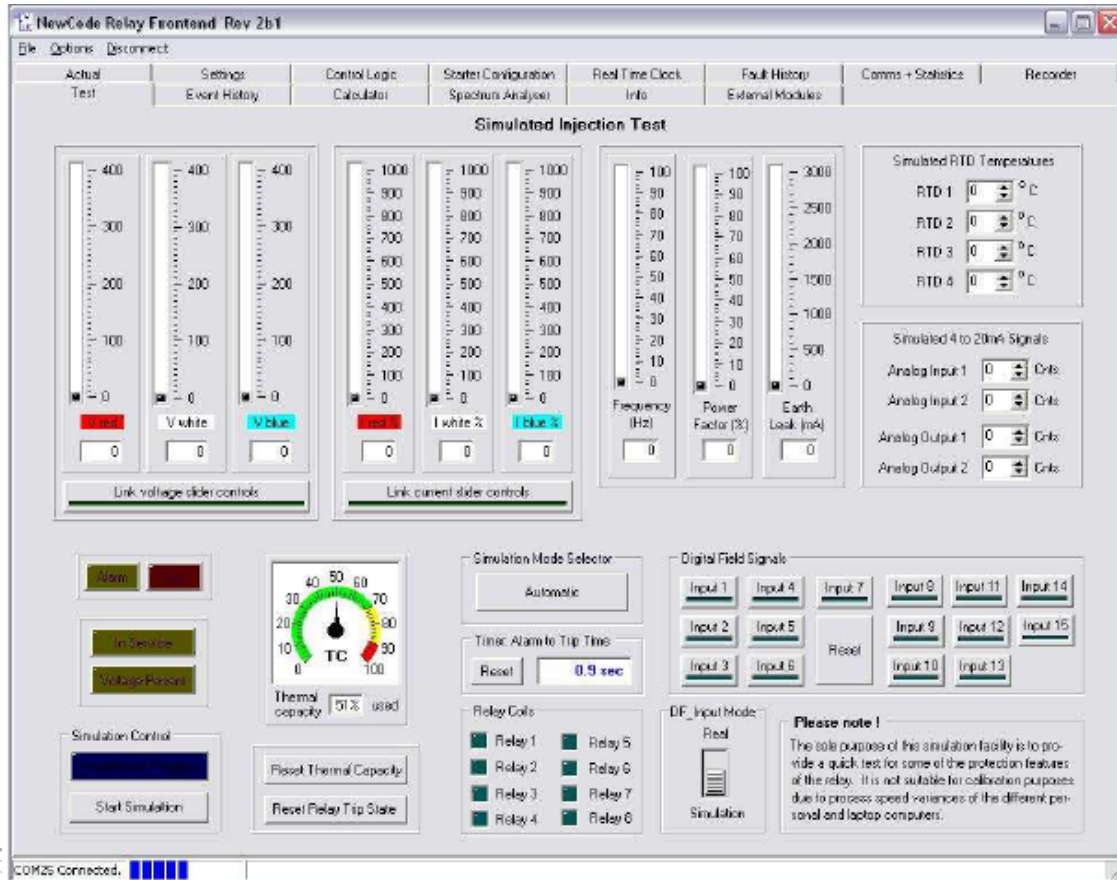
*The 3 Phase Recorder allows the user to record the motor currents, voltages, thermal capacity and power factor. The motor performance can be monitored and analysed in real time.*

*Particularly useful when tripping occurs for no obvious reason. The recorder alleviates to some degree the need for sophisticated equipment to be carried round the plant.*



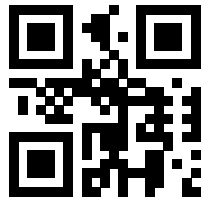


## Training Simulator



*The Training Simulator is a tool that can be used to simulate running conditions. This allows the user to determine what the relay will do to protect the motor. Training of employees is essential for familiarisation and understanding of the protection equipment.*

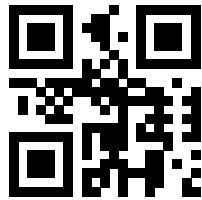




## *Benefits of the Management Features*

- Lower energy costs can be achieved*
- A better green footprint is obtainable*
- Preventative maintenance is possible*
- More Efficient Production is achievable*

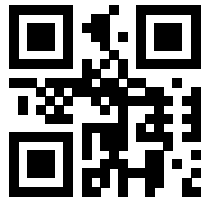




## Protection Features

- **Over Current (Overload) Detection**
- **Underload (Minimum load) Detection**
- **Unbalanced Phase Current Detection**
- **Single Phase (Phase Loss) Detection**
- **Run Stall Detection**
- **Vectorial Stall Detection**
- **Starts per Hour Control**
- **Short Circuit Detection**
- **Voltage Symmetry Detection**
- **Over Voltage Detection**
- **Under Voltage Detection**
- **High or Low Frequency Detection**
- **Voltage Phase Rotation Detection**
- **Insulation Failure Detection**
- **Earth Leakage Detection**
- **Earth Fault Detection**

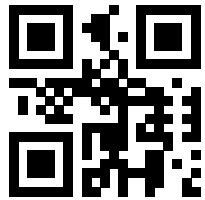




## Over Current (Overload) Detection

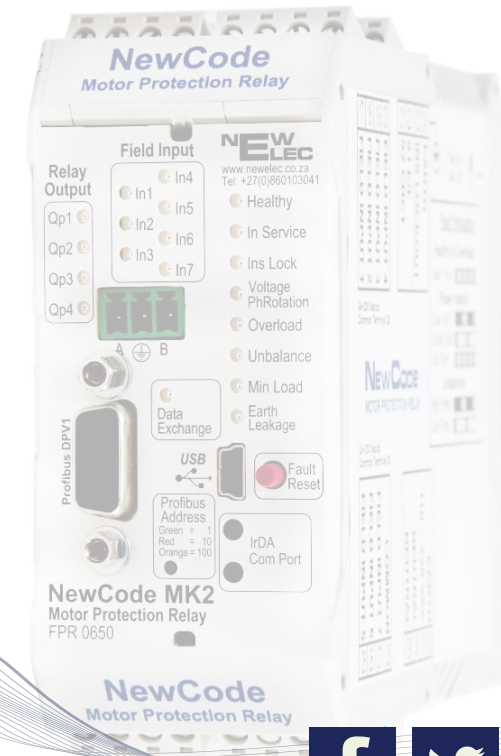
- **Curve class settings: 3 seconds to 40 seconds**
- **IEC 60255-8 specification**
- **Motor full load setting (MLC): 10% to 100%**
- **Reset: Manual or three automatic resets per hour (when selected)**
- **Reset threshold setting: Adjustable from 10% to 80% Thermal**
- **Capacity or Dynamic Threshold**
- **Dynamic Threshold Adjustment determined over 10 last restarts.**

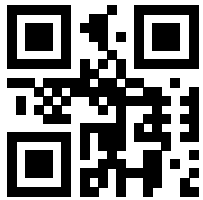




## *Under Current (Underload) Detection*

- *Trip level adjustment: 10% to 100%*
- *Selection: Current level or power factor %*
- *Trip delay time: 1 to 10 seconds*
- *Start up delay: 1 to 200 seconds (To facilitate pump priming)*
- *Reset time: Manual or 10 seconds to 6 hours (9 steps)*
- *Feature selectable*





## *Unbalanced Phase Current Detection*

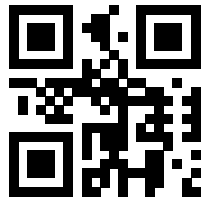
- *Trip level adjustment: 0 to 50%*
- *Trip delay time: 1 to 10 seconds*
- *Reset: Manual*
- *Feature selectable*

## *Single Phase (Phase Loss) Detection*

- *Trip delay time: 1 second fixed*
- *Feature selectable*
- *Reset: Manual*

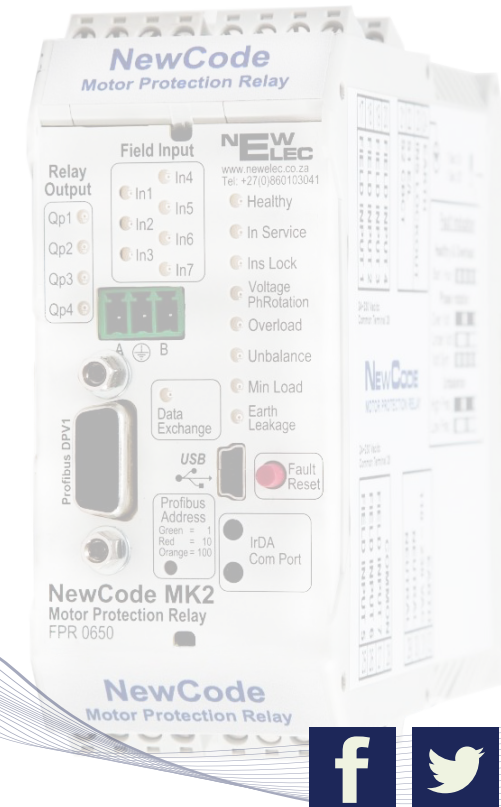


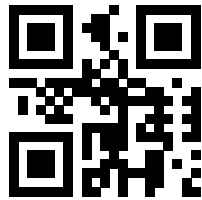




## Run-Stall Detection

- **Stall current trip level adjustment: 110% to 300%**
- **Stall trip delay time: 0 to 120 seconds adjustable**
- **Feature selectable**
- **Reset: Manual**

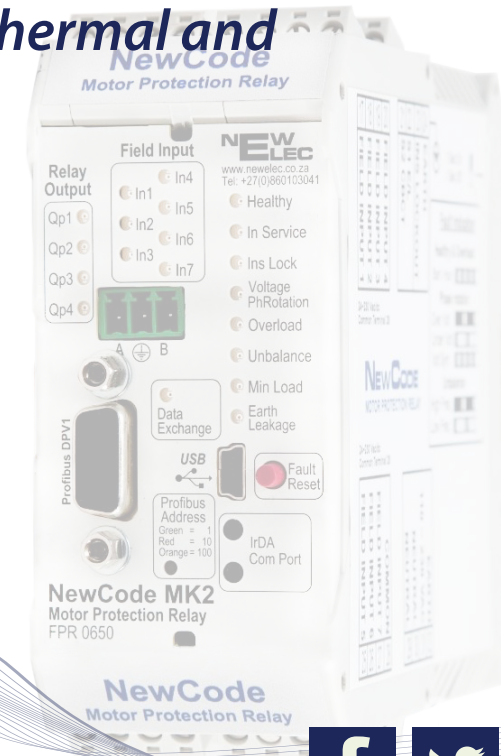


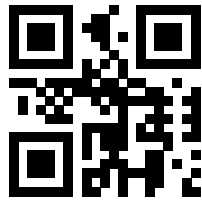


## Vectorial Stall Detection

*Vectorial Stall is detected during the start up procedure of the motor. A motor normally starts up with a bad power factor and gradually improves it as full speed is approached. If no power factor improvement is detected for longer than 33% of the curve class time the motor is tripped to prevent thermal and mechanical damage.*

- *Trip: Static or decreasing power factor*
- *Trip delay: 33% of curve class setting.*
- *Reset: Manual*
- *Feature selectable*



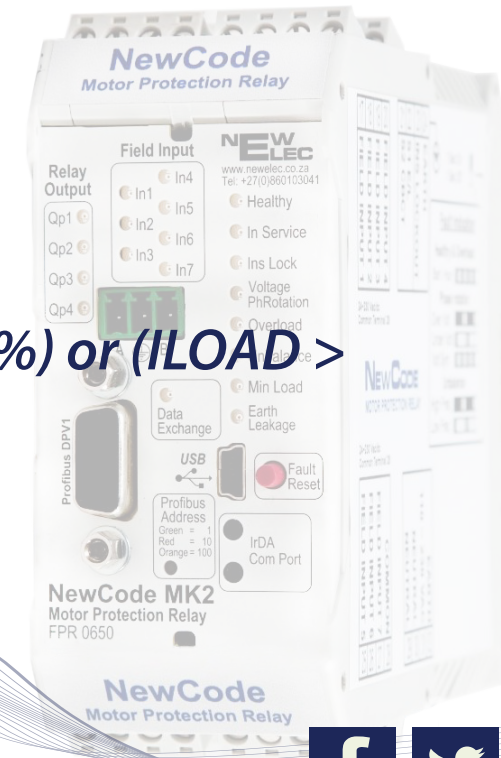


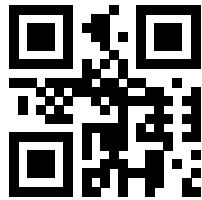
## Starts per Hour Control

- *Starts setting: 1 to 60 starts per hour adjustable*
- *Consecutive starts: 1 to 3 starts per interval adjustable*
- *Reset: Automatic*
- *Feature selectable*

## Short Circuit Detection

- *Articulated detection: If (ILOAD > 950% and Power factor < 85%) or (ILOAD > 300% and Power factor > 85%)*
- *Trip delay time: 1 second fixed*
- *Reset: Manual*
- *Feature selectable*



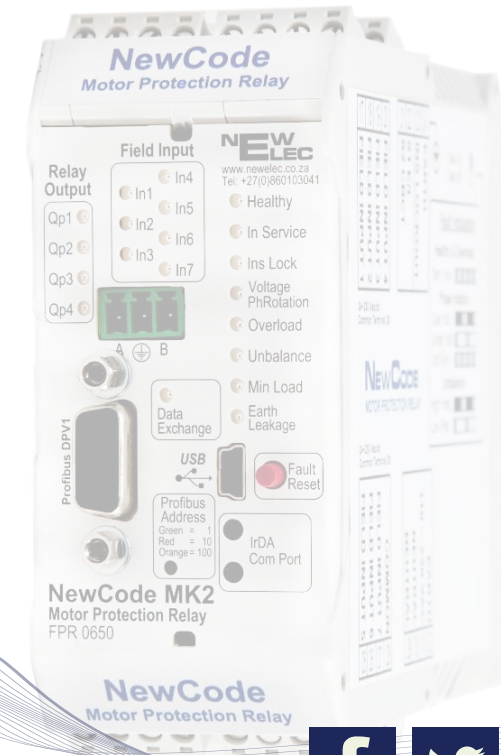


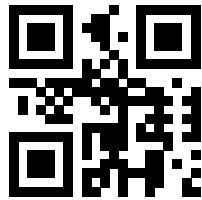
## Voltage Symmetry Detection

- **Trip delay time: 10 seconds fixed**
- **Trip level adjustment: 70% to 99%**
- **Reset: Manual**
- **Feature selectable**

## Over Voltage Detection

- **Trip delay time: 10 seconds fixed**
- **Trip level: Adjustable 1% - 15% Default 10%**
- **Reset: Manual**
- **Feature selectable**





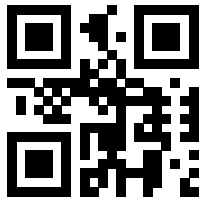
## Under Voltage Detection

- **Trip delay time: 10 seconds fixed**
- **Trip level: Adjustable 1% - 15% Default 10%**
- **Feature selectable**
- **Reset: Manual**

## High or Low Frequency Detection

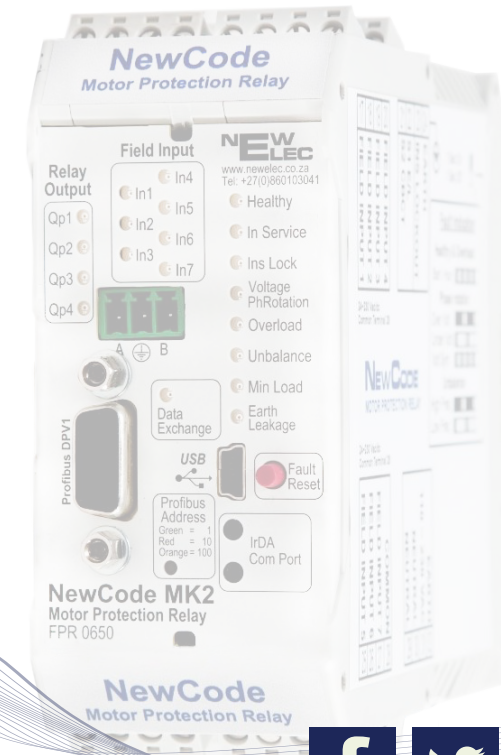
- **Trip delay time: 10 seconds fixed**
- **Trip level: Factory settings (45Hz to 55Hz)**
- **Reset: Manual**
- **Feature selectable**

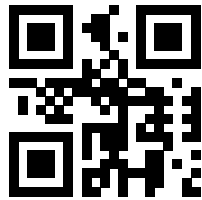




## Voltage Phase Rotation Detection

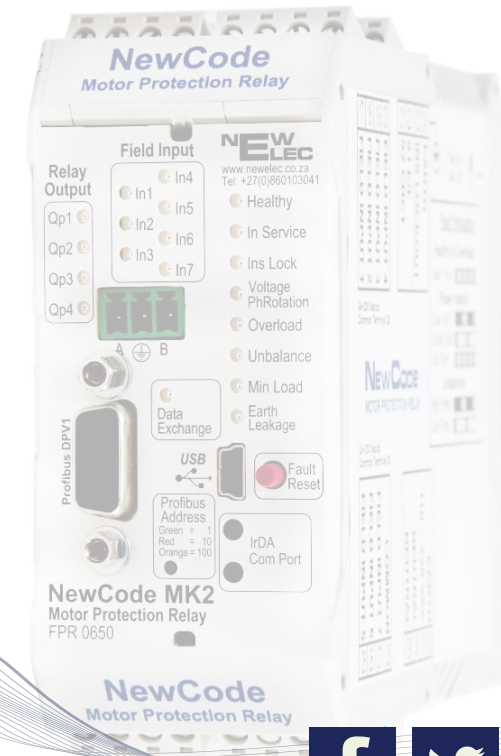
- *Trip delay time: 0.5 seconds.*
- *Auto reset once fault is fixed*
- *Feature selectable (forward, reverse, none)*

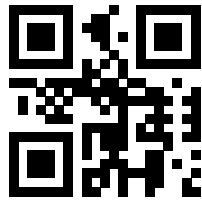




## Insulation Failure Detection

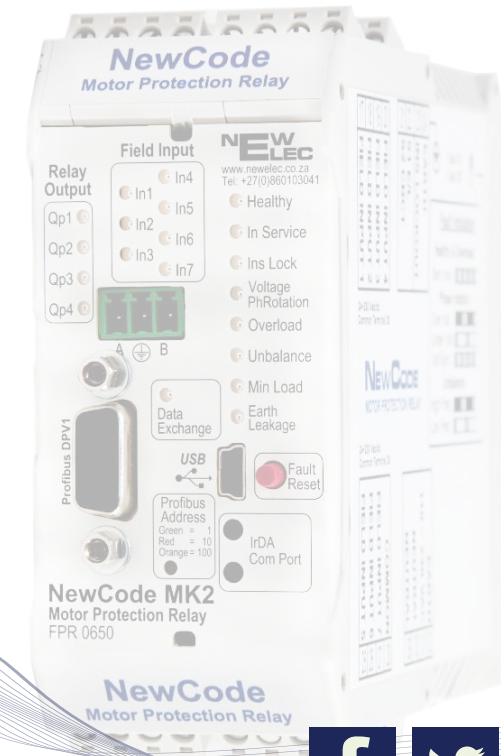
- **Detection: Only in static state (motor not running)**
- **Trip delay time: 1 second fixed**
- **Trip level: Resistance < 20 kOhm (fixed)**
- **Reset: Manual**
- **Feature selectable**



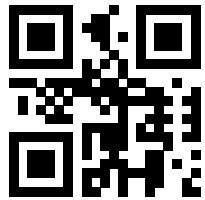


## *Earth Leakage Detection ( $I_{EL} < 2A$ )*

- *Selection between Instantaneous Definite Time or Inverse Definite Minimum Time.*
- *Instantaneous Definite Time (0.1 sec.  $\geq t \geq 1$  sec.), (0.05 sec. steps)*
- *Inverse Define Minimum Time ( Std. Inv. TMS = 0.1 )*
- *Harmonic filtering (suitable for VSD's and soft starters)*
- *Trip level: Adjustable*
- *Reset: Manual*
- *Feature selectable*

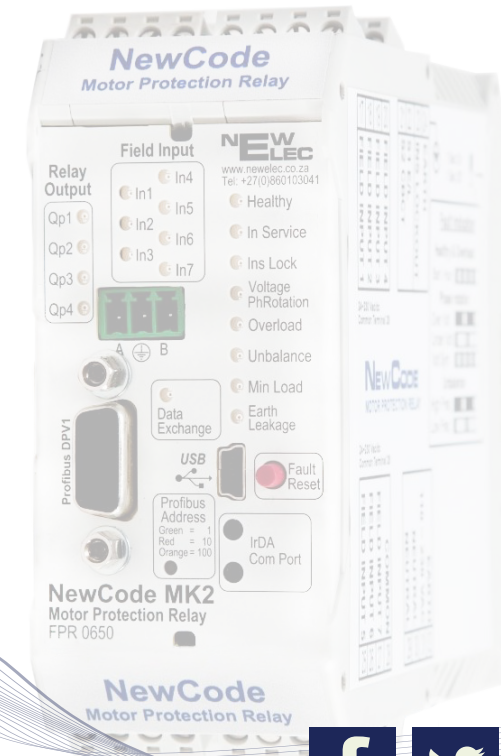


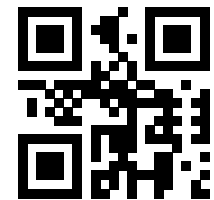




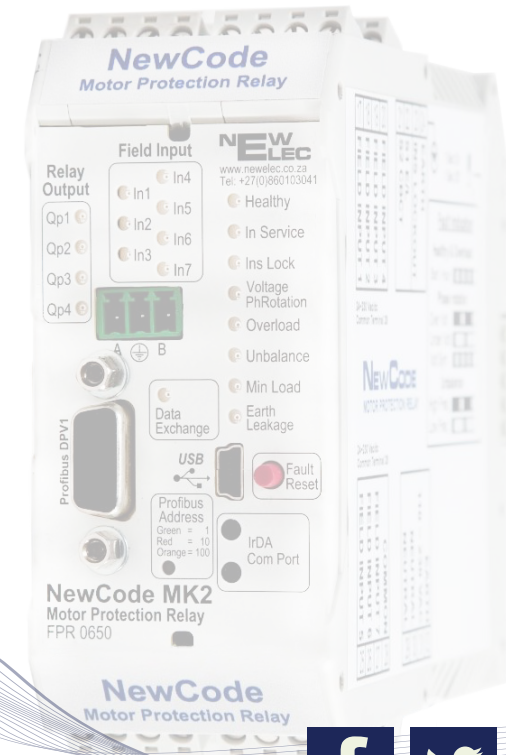
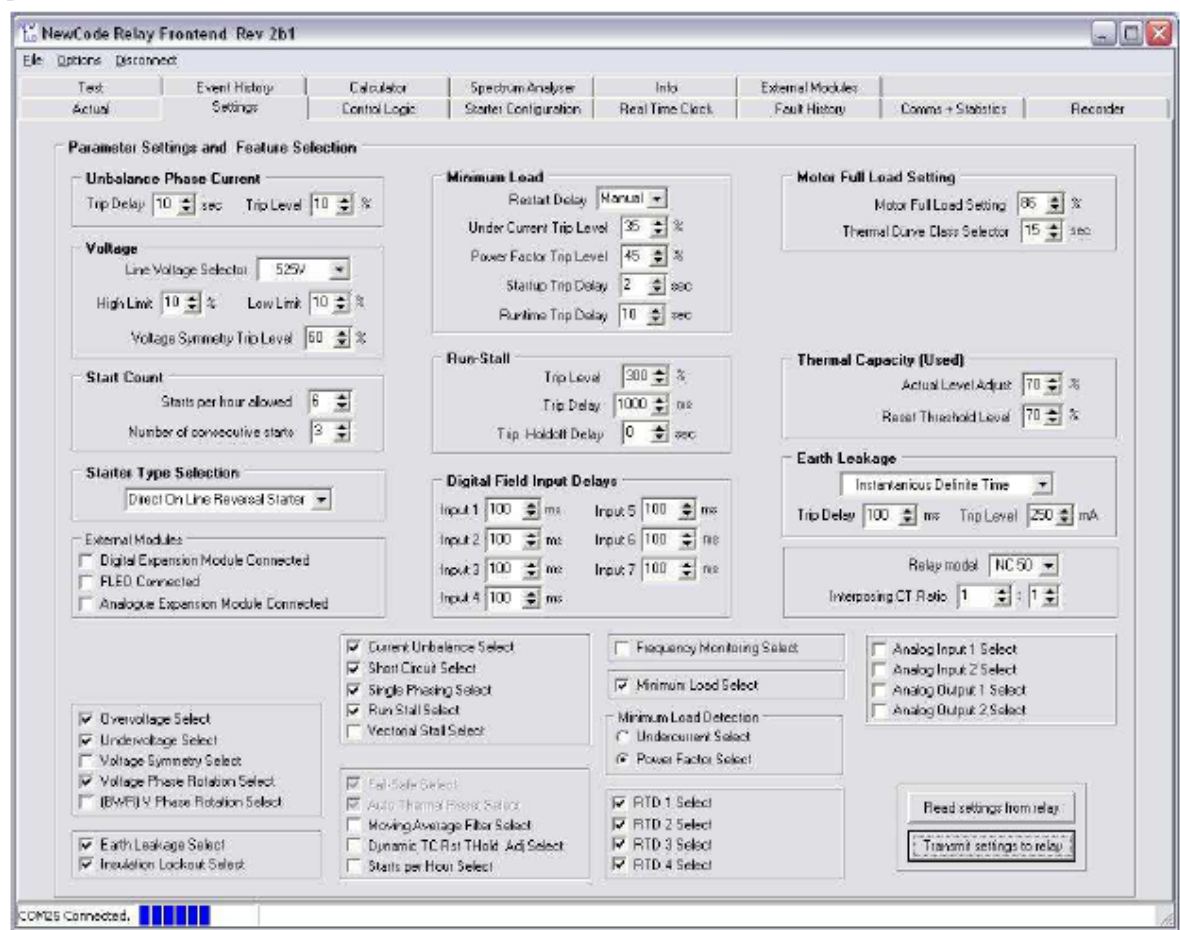
## *Earth Fault Detection ( $I_{EL} < 2A$ )*

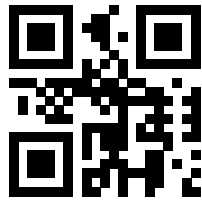
- *Harmonic filtering (suitable for VSD's and soft starters)*
- *Trip delay time: 1 second fixed*
- *Trip level: 2A fixed*
- *Reset: Manual*
- *Feature selectable*





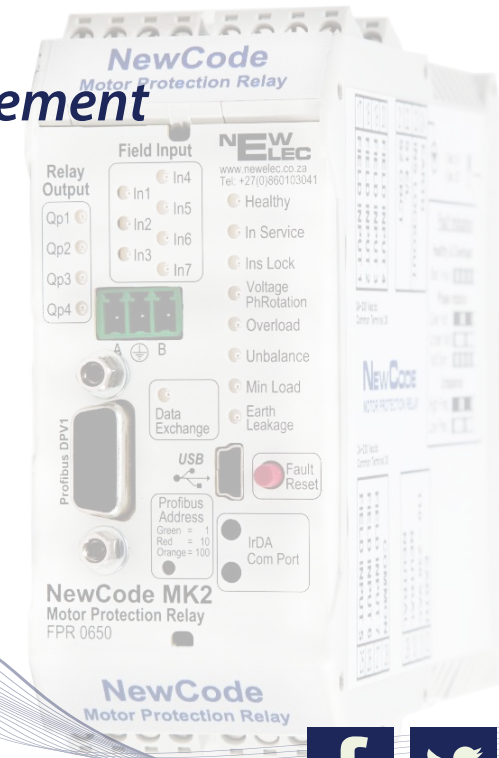
## Setting up the Protection Features

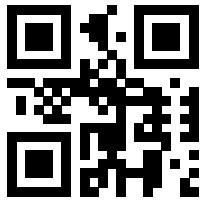




## Features and Control

- **Input Voltages (110V to 550V)**
- **Power Dissipation Measurement**
- **Communication Protocols**
- **Field Inputs**
- **Programmable Outputs**
- **Timers**
- **Real Time Clock**
- **Spectrum Analyzer**
- **Calculators**
- **Free Frontend Software**
- **Logic Function Blocks**
- **Starter Logic**
- **Power Factor Measurement**





## Input Voltages

### Direct measurement

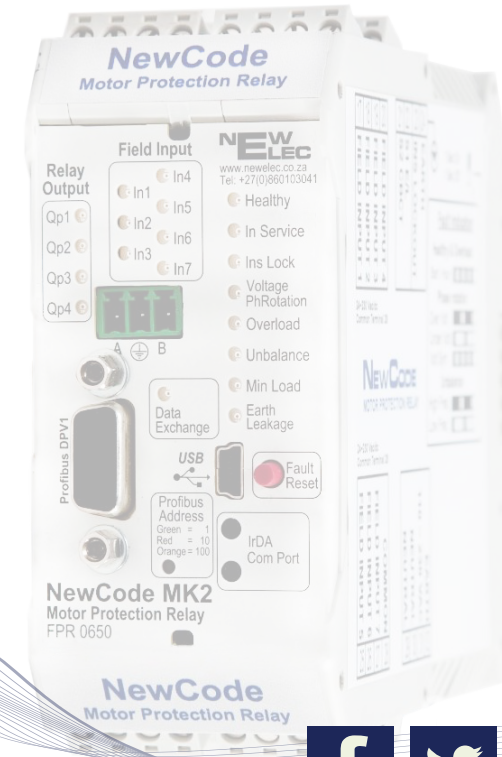
- 110V
- 380V
- 400V
- 525V
- 550V

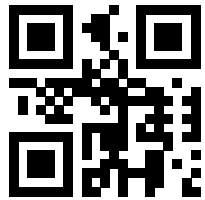
### With converter

- 680V
- 950V
- 1100V

### With PT ( transformer )

- 3300V / 110V
- 6600V / 110V
- 11000V / 110V



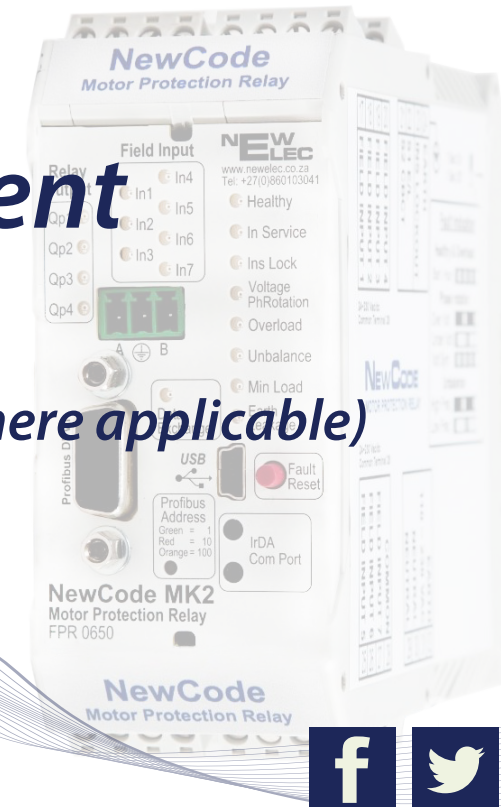


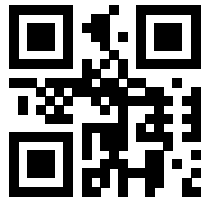
## Power Factor Measurement

- *Is the relationship between real power and apparent power Power factor % =  $((V \times I \times \cos\theta) / (V \times I)) \times 100\%$  Power factor =  $\cos\theta$*
- *Range: 0 to 100% (leading / lagging)*

## Power Dissipation Measurement

- *Type: Apparent power (kVA) and Real power (kWatt)*
- *Derived from line voltage, phase voltage and power factor (where applicable)*



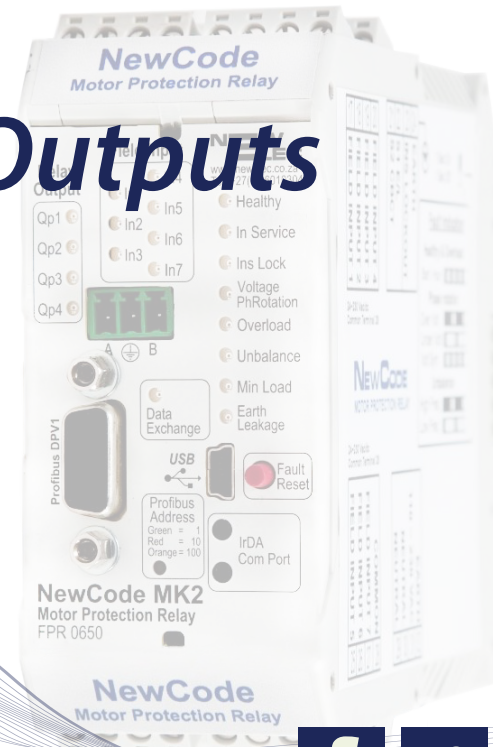


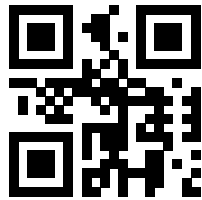
## Communication Protocols

- *Profibus DPV-1*
- *ModBus*
- *CANbus*
- *DeviceNet [ Under development ]*

## Field Inputs and Programmable Outputs

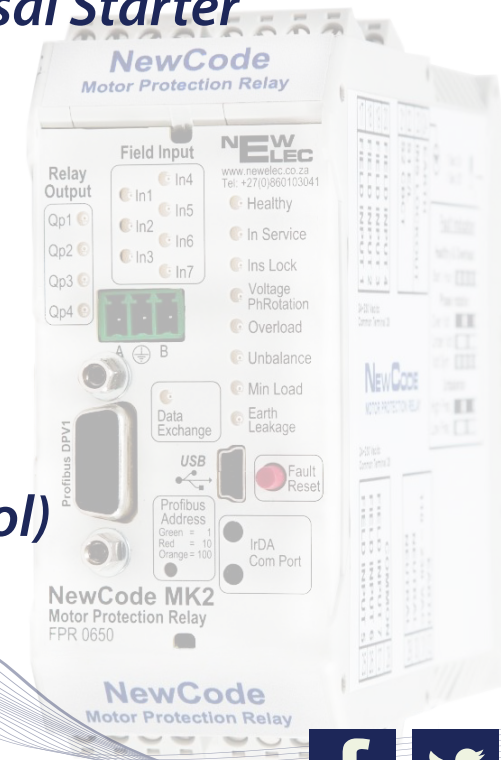
- *7 Inputs*
- *24 to 240V AC or DC*
- *LED Indication for High Inputs*
- *4 Fully Programmable Output Relays*
- *Selectable dedicated fast trip output relay 1*
- *Single set of potential free switch-over contacts*

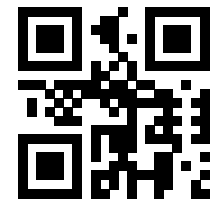




## Logic Function Blocks

- *Direct On Line Starter*
  - *Star – Delta Starter*
  - *Dahlander Starter*
  - *Pole Changing Starter*
  - *Soft Starter*
  - *OCB Direct On Line Starter*
  - *Direct On Line Reversal Starter*
  - *Star – Delta Reversal Starter*
  - *Dahlander Reversal Starter*
  - *Pole Changing Reversal Starter*
  - *Reverse Soft Starter*
- *Adjustable maximum star / delta time: 1 to 100 sec*
  - *Adjustable forward / reverse spin back time: 1 to 100 sec*
  - *DC Breaking time up to 3000ms*
  - *Selectable control sites: Local, remote or automatic (PLC control)*





*Innovative solutions from South Africa's Leading Motor Protection Specialists*

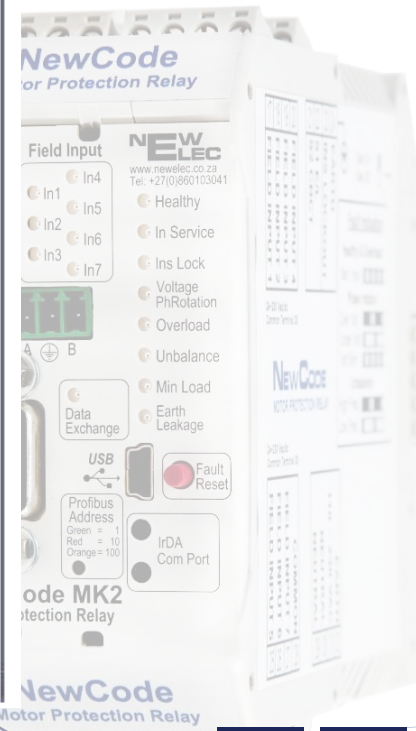
MOTOR PROTECTION & CONTROL TECHNOLOGY

## Control Logic Functions

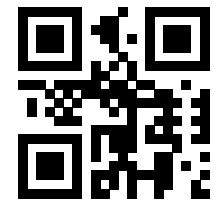
The screenshot displays the 'NewCode Relay Frontend Rev 2b1' software interface. It features a menu bar with options like 'Options' and 'Disconnect'. Below the menu is a toolbar with icons for 'Test', 'Event History', 'Calculator', 'Spectrum Analyser', 'Info', 'External Modules', 'Actual', 'Settings', 'Control Logic', 'Starter Configuration', 'Real Time Clock', 'Fault History', 'Comms -> Statistics', and 'Recorder'. The main workspace is titled 'Control Logic Functions' and contains several configuration panels:

- Timer A:** Configured with 'Zero (0)' as the start input, 'Zero (0)' as the reset input, and a time of 1 second. It has checkboxes for 'Bi-stable output' and 'Mono stable output (pulse)'.
- Timer B:** Similar to Timer A, with 'Zero (0)' inputs and a 1-second time setting.
- Counter A:** Configured with 'Zero (0)' as the 'Cnt up input', 'Zero (0)' as the 'Cnt dn input', and 'Zero (0)' as the 'Reset input'. It shows an 'Actual count' of 0 and a 'Trip out setting' of 1.
- Counter B:** Similar to Counter A, with 'Zero (0)' inputs and a 'Trip out setting' of 1.
- Logic Function 1-6:** Each function is configured with specific inputs (e.g., 'EarthFault', 'PLC\_Input', 'Zero') and outputs (A, B, C) with associated output tables (e.g., 254, 192, 252).
- Pulse Generator:** Configured with 'Zero (0)' as the 'Cnt' input, a 'Period' of 10 minutes, and a 'Duty Cycle' of 50%.
- Latch A and B:** Each has 'Zero (0)' as the 'Set' and 'Reset' inputs.
- Real Time Clock:** Shows 'Start Time' as 4:00 and 'Stop Time' as 22:00.
- Comparator:** Set to 'Thermal Capacity & Usage Warning Level' at 65.
- External Trip Reset:** Configured with 'LogicFunc\_4' as the 'Relay'.
- E Stop Control:** Configured with 'LogicFunc\_3' as the 'I E Stop'.
- Digital PLC Inputs:** A 16-bit input bus with values: 15:0, 14:0, 13:0, 12:0, 11:0, 10:0, 9:0, 8:0, 7:0, 6:0, 5:1, 4:0, 3:1, 2:1, 1:1.
- Digital Field Inputs:** A 4-bit input bus with values: 1:5, 2:6, 3:7, 4:1.

At the bottom left, it indicates 'COM25 Connected' with a status bar.







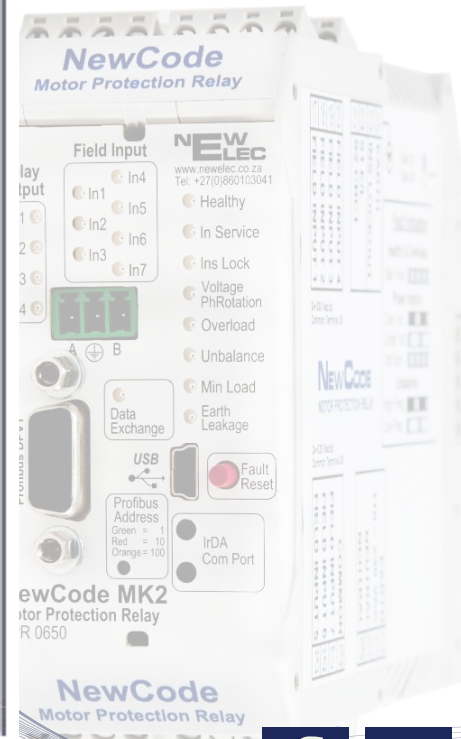
*Innovative solutions from South Africa's Leading Motor Protection Specialists*

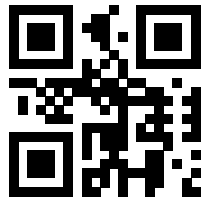
## Starter Set-up

The screenshot shows the 'NewCode Relay Frontend Rev 2b1' software interface. The 'Starter Configuration' section is active, displaying various settings for a 'Direct On Line Reversal Starter'. Key sections include:

- Field Input:** Location Selector (DigFldInput\_3), Local (DigFldInput\_1-4), Remote (Zero [0]), and Auto (PLC\_Input\_1-4) settings.
- Starter Type:** Direct On Line Reversal Starter.
- Starter Input Assignment:** Start >> (Start - Forward), Start << (Start - Reverse).
- Starter Output:** Starter OP\_1 (Main), Starter OP\_2 (Forward), Starter OP\_3 (Reverse).
- Starter Timer Settings:** Pre Start Warning Time (10 sec), Execution Time (8 sec), Feedback Time (2000 ms), Backspin Time (10 sec), DC Braking Time (250 ms), Restart Time (0 sec), Star Maximum Time (10 sec), Transition Time (0 ms), Unauthorized current Time (2000 ms).
- Relay Coils:** RL1 (StarterOut\_2), RL2 (StarterOut\_3), RL3 (PreStartWarnF), RL4 (LogicFunc\_1).
- Activity Flags:** Pre Start Warning Active (OP\_6), DC Break Injection Active (OP\_7), Backspin Active (OP\_8).
- Starter Trip Flags:** Execution Fault, Feedback Fault, Unauthorized Current Fault.

Buttons at the bottom include 'Factory default settings', 'Read settings from relay', and 'Transmit settings to relay'. A status bar at the bottom left indicates 'COM25 Connected'.



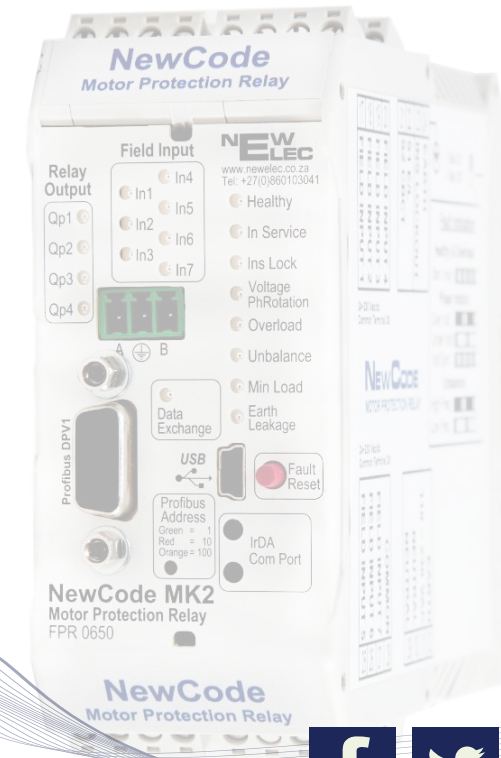


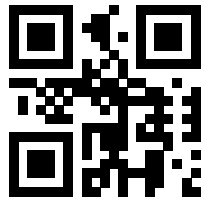
## Control Logic

- *All configurable inputs have 73 possibilities which include alarm flags,*
- *trip flags, timer outputs, function block outputs, RTC output, starter*
- *outputs, digital field inputs, PLC inputs etc.*

## Logic Function Blocks

- *Number of logic function blocks: 6*
- *Three fully configurable inputs per logic function block*
- *Sum of product or product of sums operation*



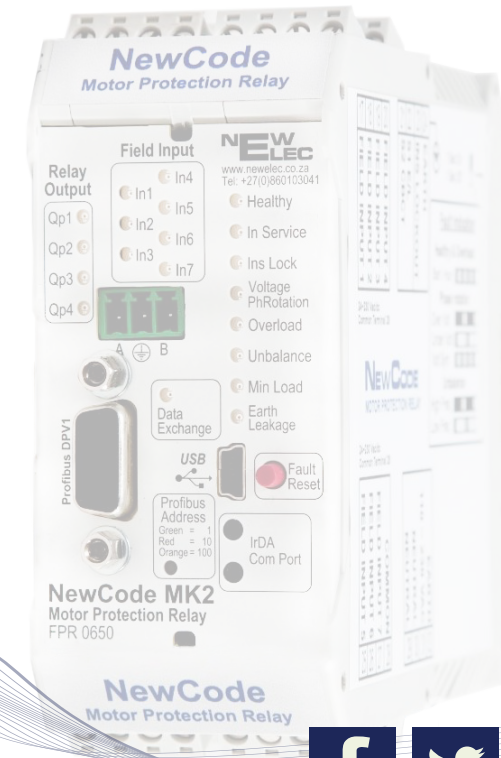


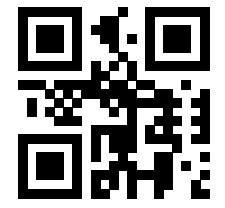
## Timers

- *Timer A and Timer B*
- *Time setting: 0 to 50 minutes*
- *Start input: Configurable*
- *Reset / Inhibit input: Configurable*

## Real Time Clock (24 Hour)

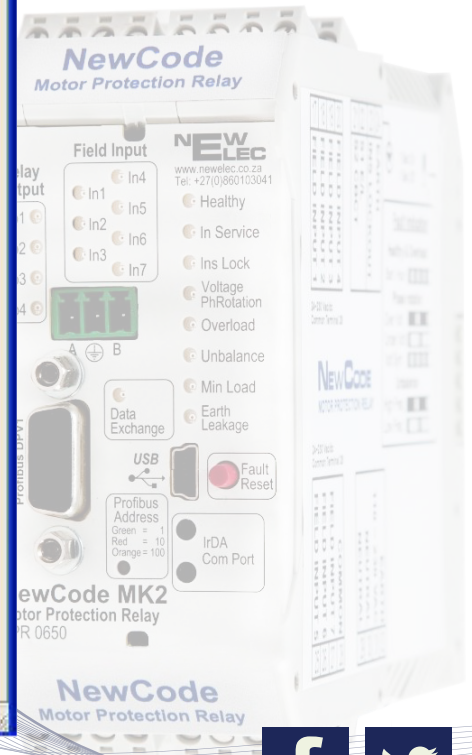
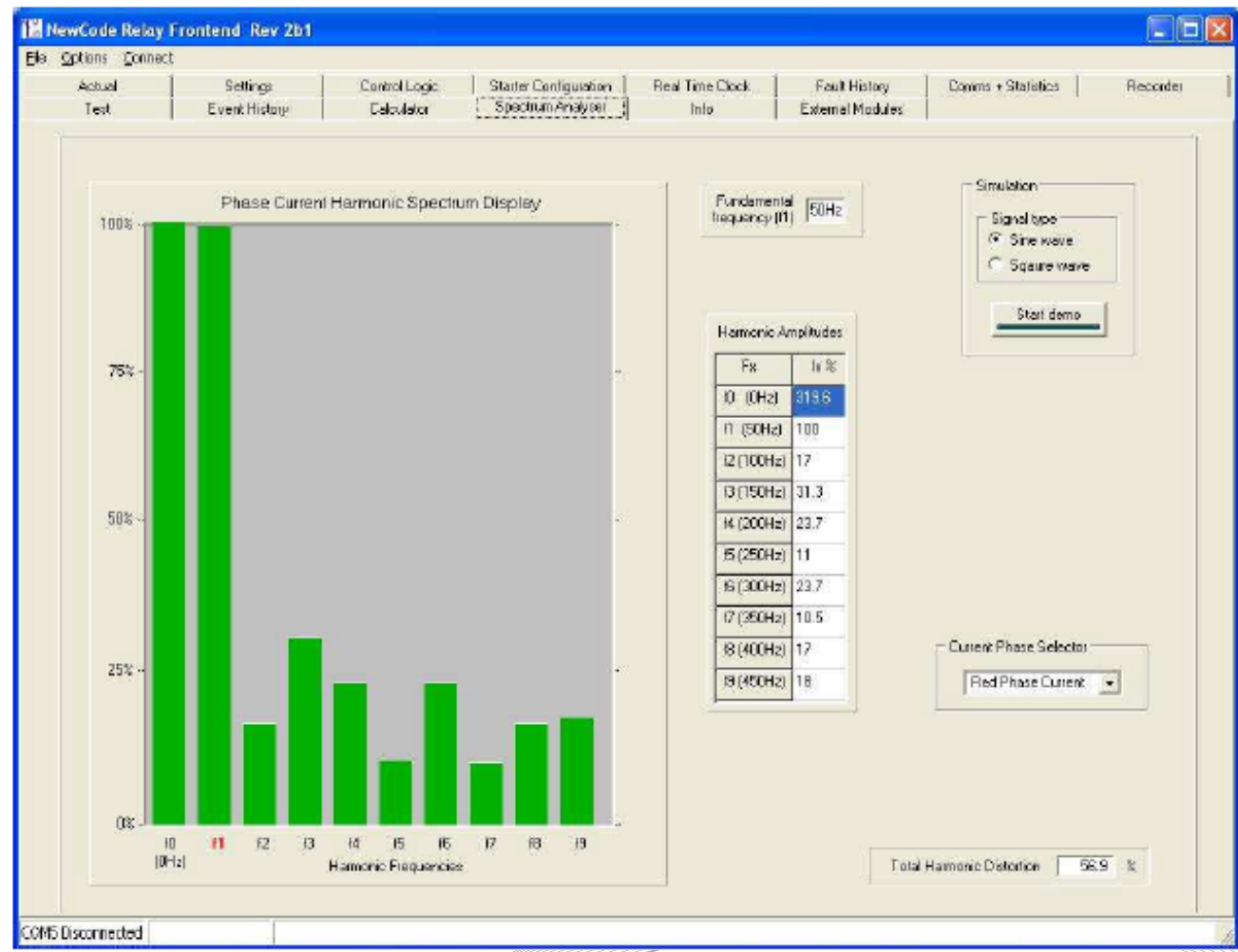
- *Start / Stop time: Hours and minutes configurable*
- *24 hour clock (Year, month, date, hours and minutes)*
- *Battery backup (5 days with 1 Farad super capacitor)*

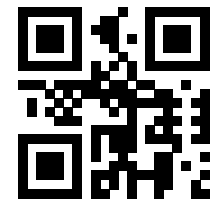




*Innovative solutions from South Africa's Leading Motor Protection Specialists*

## Spectrum Analyzer





## Motor Protection Related Calculators

**Thermal Calculator**

**Trip Time Calculation**

Motor load current: 150 %  
Thermal time constant: 15 sec  
Thermal capacity used: 70 %

Calculate trip time: 93.9 sec

**Cooling Time Calculation**

Initial thermal capacity used: 40 %  
Required thermal capacity: 70 %  
Thermal time constant: 15 sec  
Forced cooling:

Calculate cooling time: 310 sec

**Current Calculation (Delta connection)**

Full load power rating: 30 kWatt  
Line voltage: 525 Volt  
Power factor: 85 %  
Efficiency: 90 %

Calculate load current: 43.1 A

**RMS Load Pattern Calculation**

Load 1: 0 % Load 2: 600 %  
Time 1: 100 sec Time 2: 1 sec  
Load 3: 80 % Load 4: 90 %  
Time 3: 15 sec Time 4: 15 sec

Calculate RMS Load: 66.4 %

**Motor Full Load Setting**

Full load line current: 43 A  
Relay model: 50  
Interposing CT Ratio: 1 : 1

Calculate MLC setting: 86 %

**Power Factor Correction (Inductive load)**

Power dissipation of motor: 30 kWatt  
Supply frequency: 50 Hz  
Phase voltage: 525 V  
Power factor (actual): 0 % (lag)  
Power factor (target): 90 % (lag)

Calculate capacitance required: 5.6575 uF

**Earth Leakage IDMT Calculator**

Actual leak current: 0 mA  
Leak current trip setting: 250 mA  
Time multiplier: 0.1

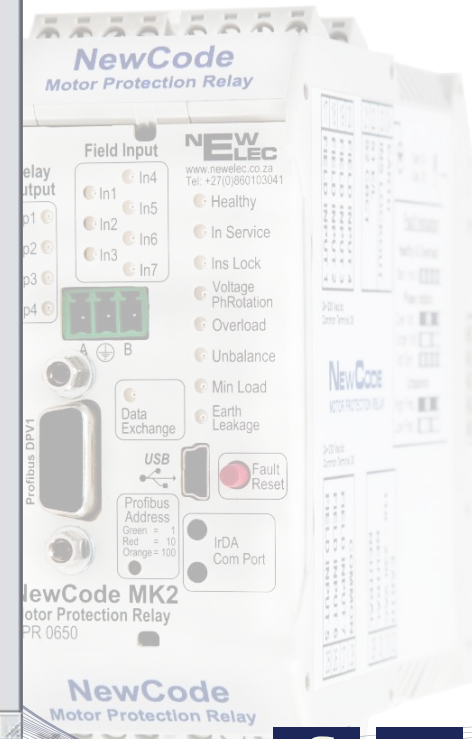
Calculate trip time: 0.0 sec

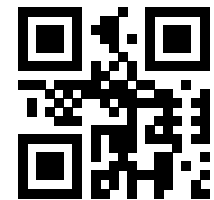
**Thermal Curve Class Setting**

Max current level (lock rotor): 600 %  
Max lock rotor time (no damage): 15 sec

Calculate curve class setting: 15

COM25 Connected: [Progress Bar]



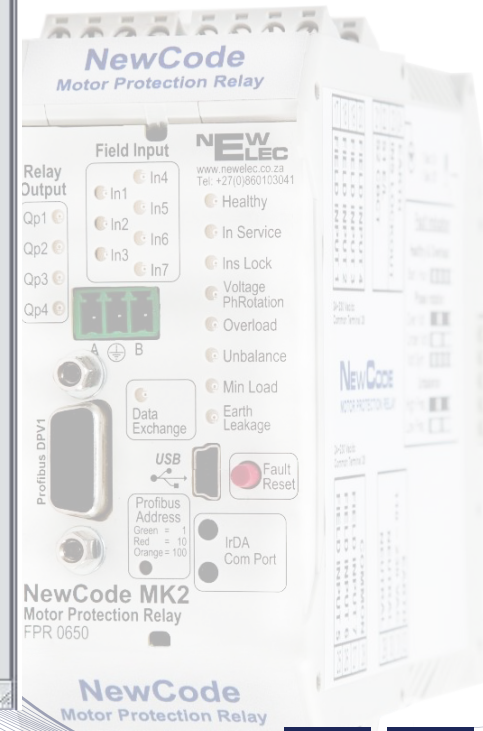


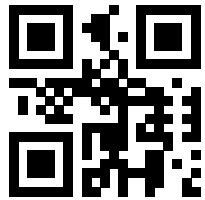
Innovative solutions from South Africa's Leading Motor Protection Specialists

## Frontend Software: Actual Values

The screenshot displays the 'NewCode Relay Frontend Rev 2b1' software interface. It features a top menu bar with options like 'Test Actual', 'Event History Settings', 'Calculator Control Logic', 'Spectrum Analyser Starter Configuration', 'Info Real Time Clock', 'External Modules Fault History', 'Comms + Statistics', and 'Recorder'. The main display area is divided into several sections:

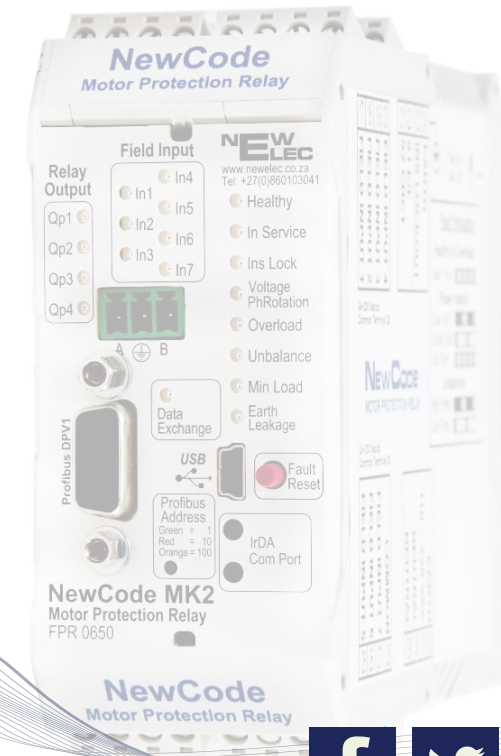
- Drive Information:** Unique Drive ID: Pump5um, Drive Description: B79-SP20-MC39.
- Thermal Protection:** Thermal Curve Class Setting: 15, Thermal Trip Time Remainder: Intake, Thermal Capacity: 74%, Trip Reset button.
- Current Levels:** Red, White, and Blue Phase Current Levels (79%, 70%, 72%), Current Unbalance (7%), Load max (73%), Yp max (300 V).
- Voltage Levels:** Red, White, and Blue Phase Voltage Levels (302 V), Voltage Symmetry (100%).
- RTD Temperatures:** RTD 1 (60°C), RTD 2 (62°C), RTD 3 (62°C), RTD 4 (65°C).
- Power and Frequency:** Apparent Power Dissipation (30.8 kVA), Real Power Dissipation (24 kW), Actual Frequency (50 Hz), Actual Power Factor (78%).
- Alarms and Trip Flags:** A grid of indicators for Overcurrent, Vectorial Stall, Run Stall, Current Unbalance, Single Phasing, Minimum Load, Low Frequency, High Frequency, Short Circuit, Overvoltage, Undervoltage, Voltage Symmetry, Insulation Lockout, Earth Leakage, Earth Fault, Frozen Contactor, Voltage Phase Rotation, Starts per Hour Limit, System Failure, Starter Fault, RTD Fault, and Analog Signal Fault.
- PLC and Digital Inputs:** Tables for PLC Inputs (9-16) and Digital Inputs (1-7).
- Relay Outputs:** MTR RL1-4 status indicators.
- Field Input:** In1-In7 status indicators.
- Relay Output:** Qp1-Qp4 status indicators.
- Motor Status:** In Service (Motor Running), Phase Voltages Present, Line Voltage Selection (525V), Actual Line Voltage (max), Actual Phase Current Level (33.97 A), Supply Frequency Selection (50Hz), Actual Frequency (50 Hz), Actual Power Factor (78%), Date (2013/03/27), Time (10h26m13s), Motor Total Running Hours (600).

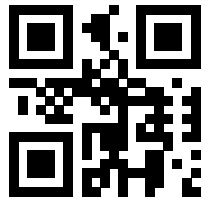




## *Advantages of using NewElec relays*

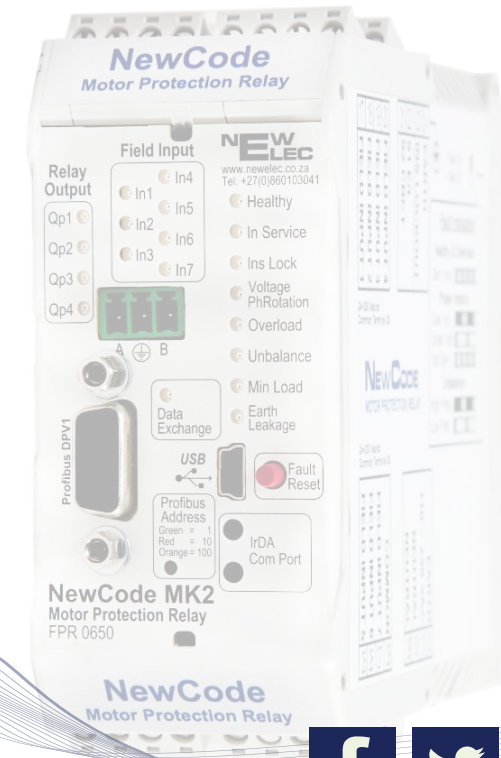
- *Local design and Manufacture*
- *1 Year warranty on all our products (Including after repair)*
- *Relays can be repaired at 50% of their list price*
- *Local support backed up by our excellent customer service*
- *Ongoing new product development*
- *30 years of Local and International experience*



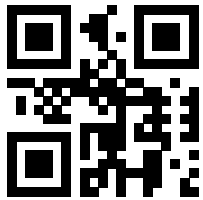


## Approvals

- *Profibus Certification*
- *ISO 9001 Accreditation since November 2001*





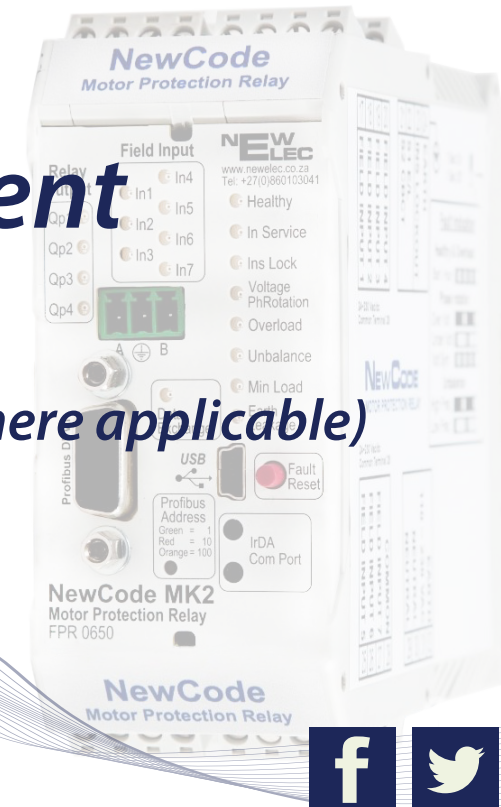


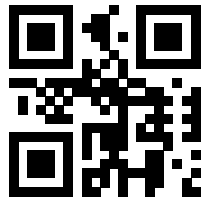
## Power Factor Measurement

- *Is the relationship between real power and apparent power*
- *Power factor % =  $((V \times I \times \cos\theta) / (V \times I)) \times 100\%$*
- *Power factor =  $\cos\theta$*
- *Range: 0 to 100% (leading / lagging)*

## Power Dissipation Measurement

- *Type: Apparent power (kVA) and Real power (kWatt)*
- *Derived from line voltage, phase voltage and power factor (where applicable)*



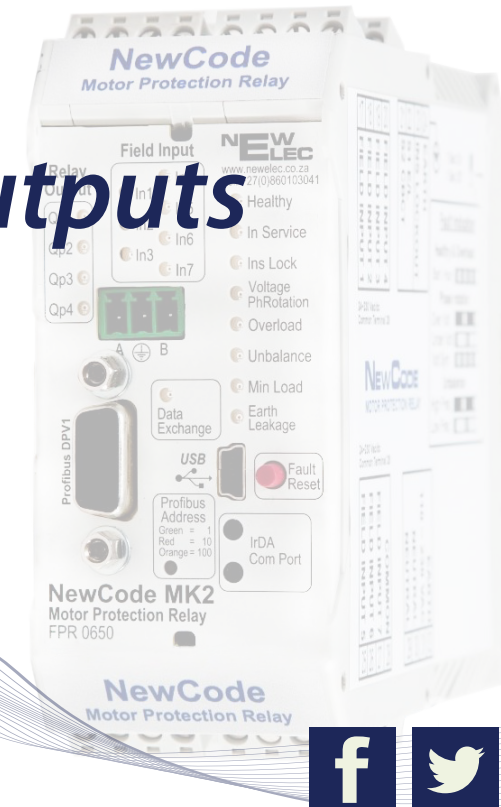


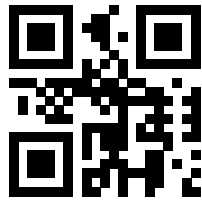
## Communication Protocols

- *Profibus DPV-1*
- *ModBus*
- *CANbus*
- *DeviceNet [ Under development ]*

## Field Inputs and Programmable Outputs

- *7 Inputs*
- *24 to 240V AC or DC*
- *LED Indication for High Inputs*
- *4 Fully Programmable Output Relays*
- *Selectable dedicated fast trip output relay 1*
- *Single set of potential free switch-over contacts*



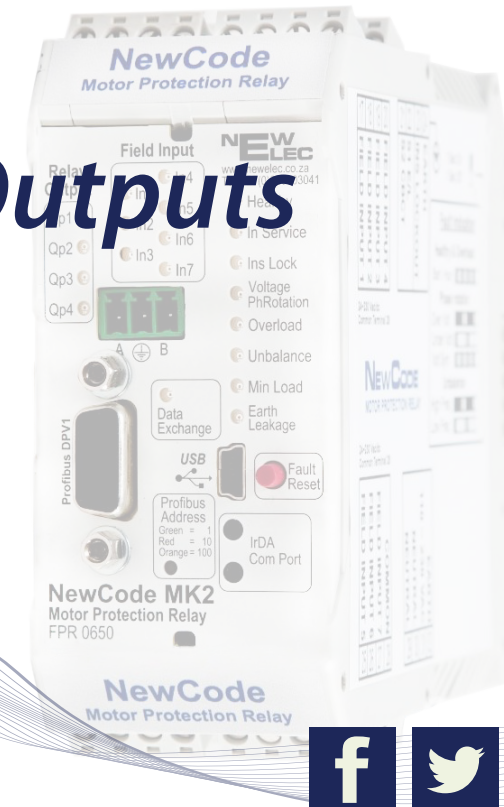


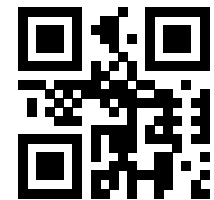
## Communication Protocols

- *Profibus DPV-1*
- *ModBus*
- *CANbus*
- *DeviceNet [ Under development ]*

## Field Inputs and Programmable Outputs

- *7 Inputs*
- *24 to 240V AC or DC*
- *LED Indication for High Inputs*
- *4 Fully Programmable Output Relays*
- *Selectable dedicated fast trip output relay 1*
- *Single set of potential free switch-over contacts*



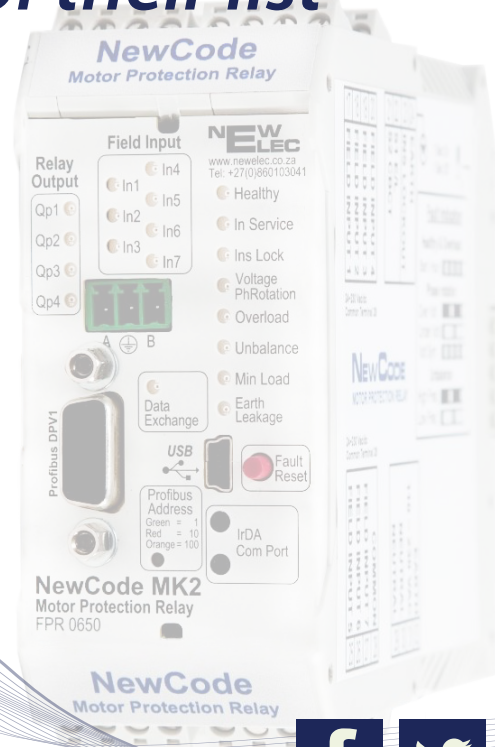


*Innovative solutions from South Africa's Leading Motor Protection Specialists*

*We provide a 1 year renewable guarantee*

*We repair products out of guarantee for 50% of their list price and renew the guarantee*

*Local support*



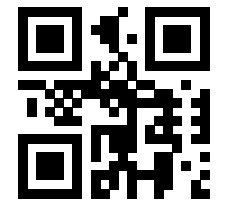
# NEW ELEC

MOTOR PROTECTION & CONTROL TECHNOLOGY

+27 12 327 1729  
Toll Assist: 0860 10 30 41

www.newelec.co.za

GPS Coordinates:  
-25.752984, 28.162957

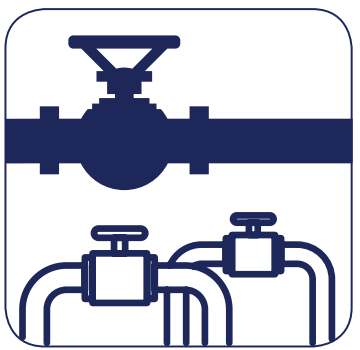


*Innovative solutions from South Africa's Leading Motor Protection Specialists*

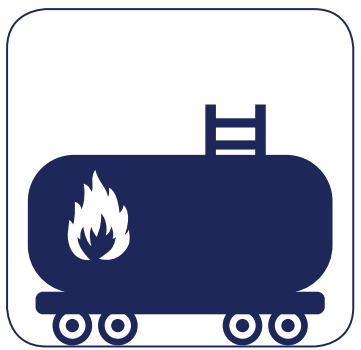
*Applications particularly well suited for use in conjunction with the NewElec range of electronic motor protection relays.*



**Mining**



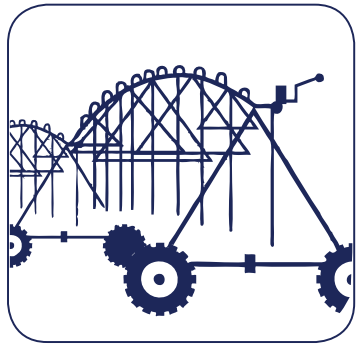
**Water Affairs**



**Petro Chemical**



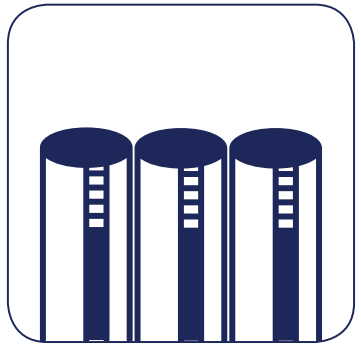
**Refineries**



**Agriculture**



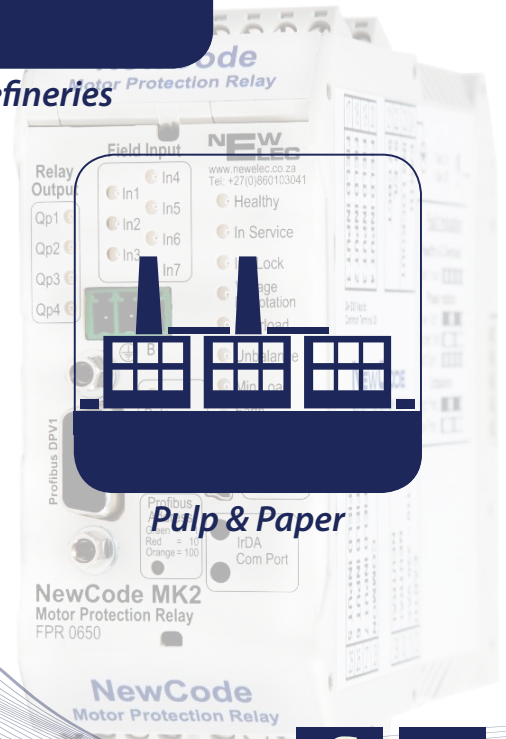
**Material Handling**



**Mills**



**Cable Theft Detection**



*A South African Company to be Proud of*

