

# WATT'S New

Schneider Egypt external newsletter - N0.3 - June 1999

## LH4... soft start - stop units

### Summary

#### ■ Applications & Solutions

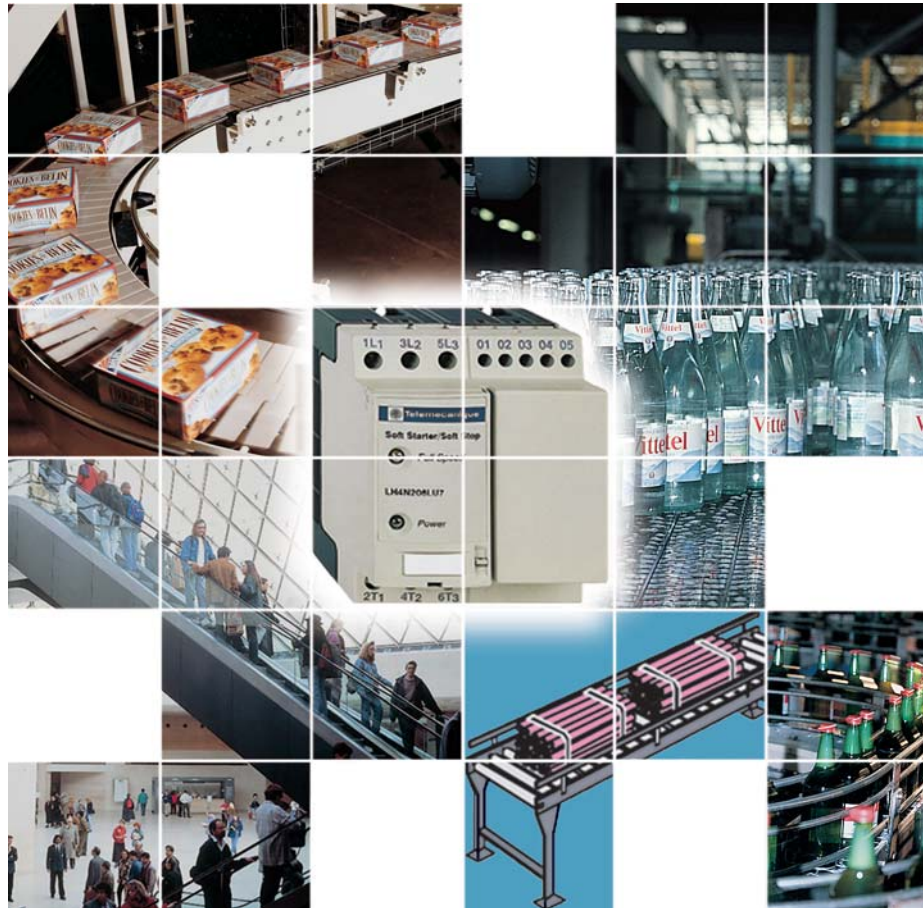
■ Insulating, monitoring and fault locating.

#### ■ Highlight on Products

■ Premium automation platform,  
■ TL & TLI impulse relays,  
■ LE1-D starters.

#### ■ Guide to Standards

■ IEC 1131,  
Programmable controllers.



Merlin Gerin

Modicon

Square D

Telemecanique

**Schneider**  
 **Electric**  
*We do more with electricity.*

## What's new?



Egypt took a commitment to be supporting the country's directions and policies.

As expressed in the previous issue we are working on supporting the export business either directly or through companies and machinery that incorporates our products.

Nowadays, the government has a long term plan to work on the renovation of **Old Cairo** and mainly the Islamic monuments that had reached a critical situation of deterioration. One of the main risks those monuments have is "fire risk" which by statistics proved to be mainly due to bad electrical installation.

**Schneider Electric Egypt**, contributing to this cultural and tourism issue, sponsored technically and financially the supply, installation and wiring of electrical network for two famous monuments. The first is "**Beit Al Harrawy**" or House of Harrawy in the Azhar district and the second is the house of Ibrahim Bey called "**Senary House**" near the mosque of Sayyeda Zeinab.

*Once again, we confirm our commitment to the country's directions whether it is ecological, cultural or economical.*

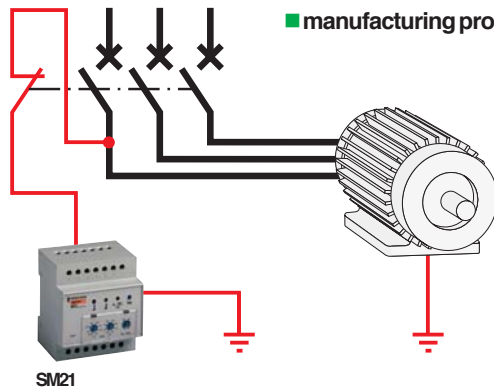
**Khaled Rehab**  
Marketing Director

## Applications & Solutions

# Insulation monitoring without power on

*The failure for a motor to start can have serious consequences. This is especially true in the following applications; whatever the earthing system:*

- safety equipment ( fire pumps, smoke extractors, ...etc. );
- production ( glass works, cement plants, ...etc. );
- manufacturing processes ( rolling mills, ...etc. ).



### Off - line insulation monitoring

Motors often fail to start due to insulation problems caused by the humidity that accumulates in the microscopic cracks of the insulation during periods when the motor is not running.

It is also possible to prevent motor starting automatically if the insulation resistance is below a certain threshold.

### Solution for such application

We should install a device which injects a DC voltage applied, with the motor de-energised, between the stator and earth, thereby creating a leakage current in the motor insulation resistances;

- 2 pre-set thresholds:
  - 1 prealarm threshold, adjustable in steps from 0,5 to 10 MΩ,
  - 1 alarm threshold, adjustable in steps from 0,25 to 2 MΩ.

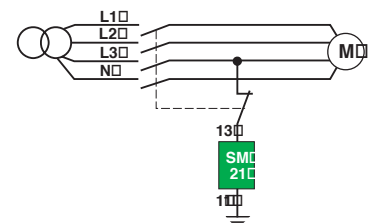
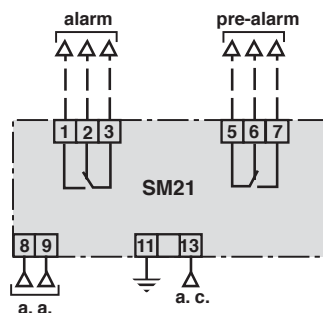
An electronic device measures insulation from the leakage current created by the voltage injected and activates the alarm or prevents starting when insulation drops below the corresponding threshold.

When associated with a circuit breaker processing an under voltage of shunt trip release or with a contactor, the insulation monitoring device (e.g. **Merlin Gerin SM21**) protects motors against insulation faults that may be produced during operating shutdowns (e.g. due to condensation), by initiating an alarm or motor starting lock-out.

The device is also used with a contact that opens to disconnect the device from the installation when the installation is energised.

**This kind of insulation monitoring is defined in IEC1557-8.**

### Connection diagram



Legend: a.a. = supply

**Note:** Make sure that the auxiliary contact of the motor control system can withstand the rated voltage when the contact is open.

# LH4...

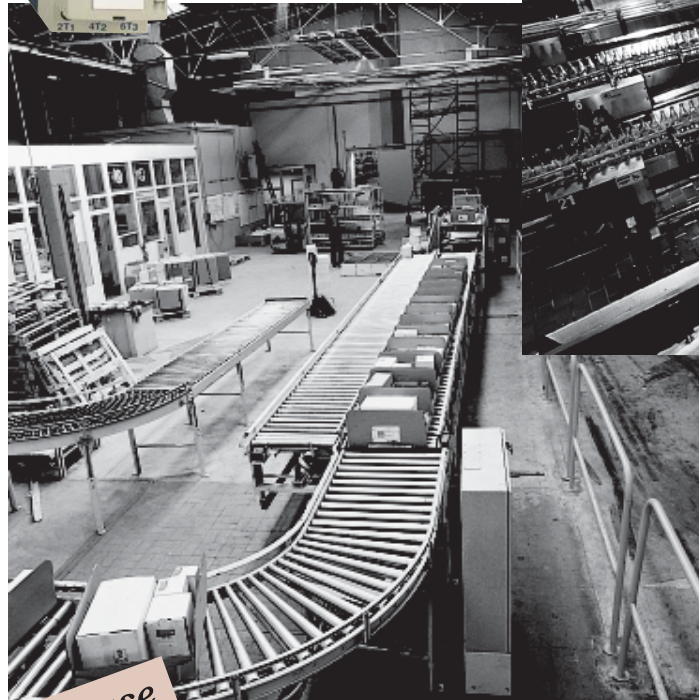
# Soft start-stop units

*Asynchronous motors are widely used because they are robust, reliable, standardized and inexpensive. Starting this type of motor has always required a careful compromise between the cost of the starter unit and performance:*

- torque peaks which may damage the mechanics,
- current peaks on power up,
- significant line voltage drops.

**LH4-N1** starting torque controller is used for single-phase and 3 phase motors whenever surges caused on starting need to be suppressed. It can only be used with low power motors.

**LH4-N2** soft starter stop unit can be used to control starting torque and soft stops, while significantly reducing starting current.



## Principle & use

Unlike electromechanical starters, LH4 electronic starters can be used to adjust starting torque, thus eliminating mechanical shocks which result in increased wear, maintenance and production downtime.

**LH4-N1** soft starter units are recommended for use with conveyors, conveyor belts, fragile or noisy automatic doors, drag lifts, small gantries such as those used in car washes and all machines equipped with drive belts.

**LH4-N2** soft starter – soft stop units are used for fans, pumps, cold compressors, compressed air equipment and all types of high inertia machinery. On machines which do not require electrical isolation, they eliminate the need for a line contactor. LH4-N2 units, which give higher performance, can be used instead of LH4-N1 units.

## Operation

LH4 soft starter units start with the reduced voltage. The voltage rises gradually until it reaches its rated value. This reduces torque surges which can be harmful both to the motor and to the mechanism being driven, and also reduces starting currents (with the LH4-N2).

- starting time can also be adjusted via the second potentiometer.
- the user can adjust the starting torque using one of the LH4 potentiometers.
- the motor connected to the LH4 must be able to start the load at reduced voltage.
- a third potentiometer on LH4-N2 units can be used to adjust deceleration time.
- on the LH4-N2, a fault and isolation relay shows that the product is operating. This can be used to control the line contactor.

Once the starting process has finished, a relay or contactor integrated in the LH4 shunts the electronics limiting electromagnetic interference and temperature rises. This contactor drops out on the stop request, whether deceleration takes place or not.

For the LH4-N230 rating and above, end of starting data can be obtained by adding an attachment which can be mounted on the electronics shunting contactor without dismantling the product.



## Description

The range of LH4-N soft starter units comprises 2 product families :

- **LH4-N1** units, comprising 3 ratings from 6 to 22 A ( can be used with single phase voltage)
- **LH4-N2** units, comprising 7 ratings from 6 to 85 A

The following products are designed for 3-phase voltages:

- 230, 400 and 460 V at 50 or 60 Hz for ratings up to 22 A
  - 200 to 690 V and 400 V at 50 or 60 Hz for ratings from 32 to 85 A
- The maximum power for start units, at an operating voltage of 400 V, is 45 kW.

The range can be supplied in a complete enclosure. For example, LH7KP is an enclosure holding a GV2P motor circuit-breaker providing protection functions, a line contactor for local or remote control and an LH4-N2 electronic soft starter to start-up and slow down smoothly. It is fitted with a " Vario " switch for on-load making, breaking and isolation functions.

## Typical application

The roller conveyor moves individual loads on a low friction system with minimum changes in level and optimises the flow of products.

Examples: soft drinks bottling, plastic furniture, batches of PVC tubes, ...etc.

In this case, your requirements are met by the LH4-N2 starter.

To obtain the performance you require, the LH4-N2 starter can:

- prevent products from sliding on the rollers during startup,
- control soft starting and braking to protect the mechanism and the products,
- perform soft restart on loss of AC supply,
- ensure safety by using a latched contact in the LH4 to avoid any accidental on loss of AC supply,
- considerably reduce the current peak each time the conveyor is started.

## Glossary

### Asynchronous motor,

The principle of operation of this type of motor relies upon the creation of an induced current into a conductor which itself is under the influence of a magnetic field.

It is most widely used because it is robust, easy to maintain, simple to implement and economic to buy.

## Highlight on Products

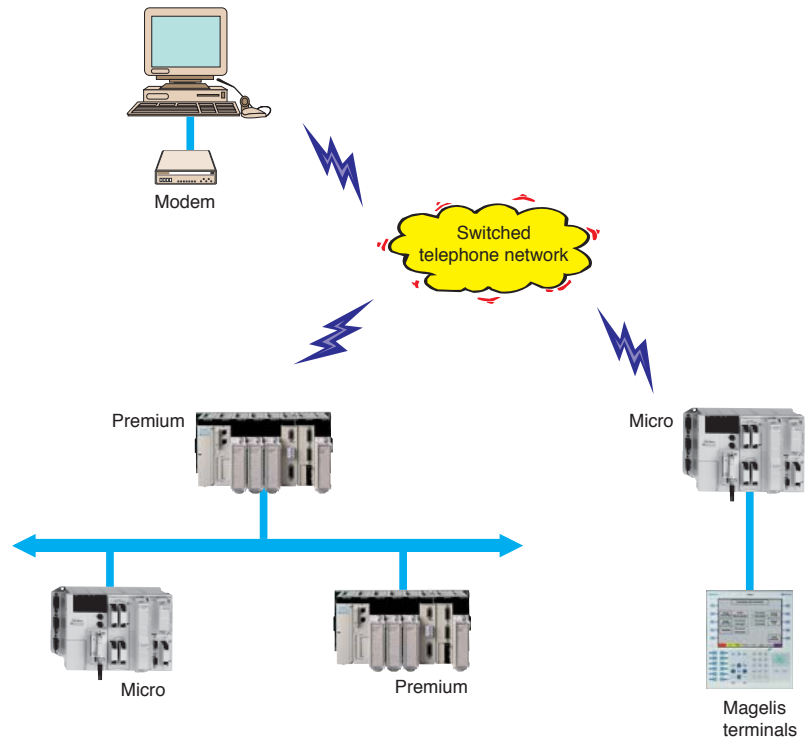
### Premium automation platform

Micro / Premium PLCs offer a Modem connection via the TSX MDM 10 module, which enables them to be integrated into architectures suitable for telemaintenance, telediagnosics, teleadjustment, telealarm or telemonitoring applications via the switched telephone network (STN).

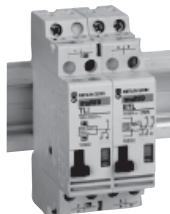
The level of integration allows the user to completely overcome Modem programming constraints. A single PL7 function block can establish or break the telephone connection. A control mechanism by password protects the application against hanking.

The user can, on request, connect from a distance to another PLC or a central station via the Uni-Telway protocol, or even briefly use the ASCII protocol to call a supervisor on a "pager" for example.

When using the Uni-Telway protocol, the characteristics of network transparency via the communication architecture are maintained.



TL+ETL



TLI+ETL



TLC+TLm+TLs

### TL & TLI impulse relays for remote energy management

Modular impulse relays are designed to control load power. The scope of applications cover building sector from domestic uses to industry mainly for lighting management, heating, small motors supply, ... etc.

An impulse order on the coil closes the impulse relay poles which are then open by the next impulse order as each time an impulse order is received on the coil. The impulse relay reverses the position of the poles.

The range comes in many references covering up to 32 A, 4 P in addition to a very wide range of auxiliaries, to satisfy many applications demands and provide more control facilities.

- ☛ ref. 15530: extension module 2 P, 16 A (ETL 16 A)
- ☛ ref. 1541 1: time delay auxiliary (ATLt)
- ☛ ref. 15412: step control auxiliary (ATL4)
- ☛ ref. 15409: centralised control auxiliary (ATLc+s)
- ☛ ref. 15413: lighted push button control auxiliary (ATLz)
- ☛ ref. 15410: multi level centralised control auxiliary (ATLc+c)
- ☛ ref. 15518: impulse relay incorporates centralised control (TLC)
- ☛ ref. 15516: impulse relay incorporates control via latched order (TLm)
- ☛ ref. 15517: impulse relay incorporates remote indication of its status (TLs)



### Enclosed Direct on Line starters, LE1-D

LE1-D is a pre-assembled direct on line starters enclosed in an enclosure with degree of protection up to IP67. It can be used to control motors up to 25 A, 45 kW, AC3 at 380 V. Ready to use LE1-D starters are supplied with the contactor and an LR2-D overload relay pre-wired with setting range from 0,1 up to 25 A. The LE1-D range can also cover motor starters up to 95 A, but without the overload. The starter is simple to choose according to the power and voltage of your motor. For different applications the same contactor can be combined with different range of overload relays as standard references as per your starter requirements (refer to Schneider L.V. manual or price list for the exact reference selection). The starter is compact and resistant to harsh ambient conditions and comes in a very competitive price.

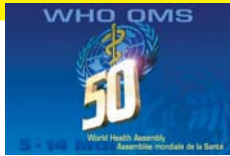


**WHO**  
World Health Organization



**OMS**  
Organisation mondiale de la santé

*The World Health Organization (WHO) new premises is now under construction in Cairo after many debates on whether it should remain in Alexandria or move to Cairo. The new location will be in Nasr City facing the "Child's Park" ( Hadiquatt Al T' hifl ).*



The consultant for this project is the famous "Engineering Consultants Group - ECG" and the leading private Egyptian contracting company "Arabian International Contracting - AIC" won the construction contract. Looking for a reliable and guaranteed electrical installation, **Schneider Electric Egypt** was awarded the electrical lot, from transformers to busduct and up to the final distribution boards.



The scope includes **TRIHAL** cast resin transformer from Schneider manufacturing plant "France Transfo" offering the highest safety and reliability features in the field of transformers. For busduct, the **Telemecanique Canalis** range will be used together with the **Merlin Gerin MV Fluair** and **LV Prisma** switchboards. All these together running under selectivity study will provide the new **WHO** premises with a high performing installation matching this new landmark in Cairo.

**Guide to standards**

**IEC 1131 ( Programmable Controllers )**

In 1979, the IEC commission designated a studying committee to define a set of specific standards for Programmable Controllers. The objective is to overcome the complexity of such system and the diversity of the controllers and incompatibility even within the same brand and range of product. The standards have been designated as IEC 1131 with the following sub-sections:

- IEC1 131-1 : general information ( published 1992 ).
- IEC1 131-2 : hardware specifications & testing ( published 1992 ).
- IEC1 131-3 : programming languages ( published 1993 ).
- IEC1 131-4 : recommendation for users.
- IEC1 131-5 : specifications of communication handling.

Schneider Electric PLCs ( specially Modicon - Telemecanique ) have been the pioneers in adoption of these standards with their fresh state-of the art product families.

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