

## Brief Description

- Universal Error Message / Indication Module for machinery, electrical cabinets, etc.
- 12 message inputs, free configurable.
- 3 relay outputs
- 2 external reset inputs
- Internal beeper
- Networkable via RS-485-interface
- Easy, free configuration via display
- Housing for panel-/door mounting

## Intended Use

This product is designed as an universal error message module for machineries and should not be used for employee safety !  
For the mounting position and the environment the technical data and the safety instructions must be considered !



# ELREHA

ELEKTRONISCHE REGELUNGEN GMBH

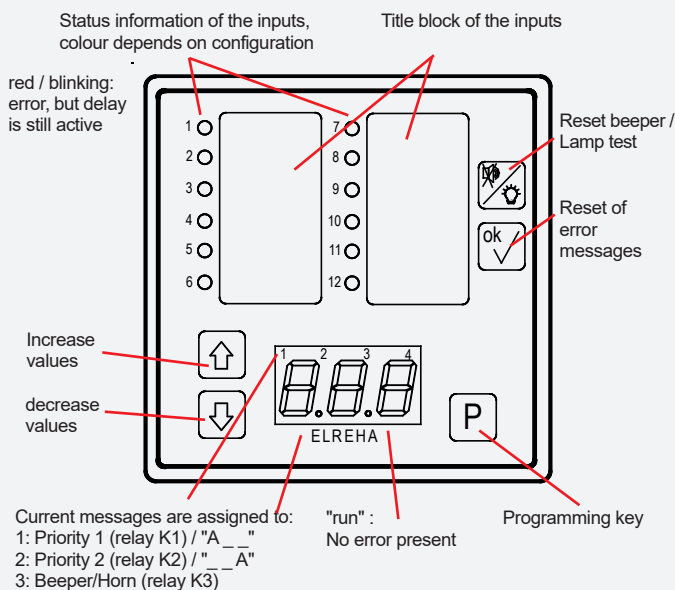
Technical Manual **5311443-00/02e**  
from software vers. 1.0.1

## Universal Error Message Module

Type

# SM 501

### Operating Elements



### Configuration

The SM-501 module can be configured in an easy way via the integrated display. Each of the 12 message inputs can be configured by parameters.

### Parameters

All selectable parameters hold a parameter number (e.g. P03), you will find a listing on the next page.

### Calling up and editing

Press key 'P' ..... parameter number appears  
Use '↑/↓' ..... select desired parameter (hold key for autoscroll)  
Press "P" again ..... parameter value appears  
Use keys '↑/↓' ..... adjust parameter value (hold key for autoscroll)  
Press 'P' again ..... value is stored, back to parameter no.

### Unlock Keys / Access code

To prevent un-authorized persons from editing parameter values, there is a locking function which allows only the most important parameters to be changed at any time. All other parameters must be unlocked as follows:

- enter access code before programming at parameter **Pd9** or
- directly at the parameter to be changed. If a code no. is necessary the display shows "C00". Set the matching code no. by the "↑/↓"-keys (C88) and confirm by "P".

If no key is hit for about 3 minutes, the access code is cancelled and the editing function is locked automatically.

### Start-up behavior

Directly after start-up the display shows "501" (controller type). If an error message is present, an 'A' appears. While normal operation the display shows 'run'.

### How to find out the controller type

- Press key "P" for > 2 sec. = Display shows controller type (**501**)
- Key "↓" additionally = Software version is displayed

### Reset parameters to factory settings

Switch OFF supply voltage, press and hold "P"-key, switch supply voltage ON again. Code request "C" appears. Enter "88", confirm by "P". After 'def' has been appeared, all values are reset to factory settings.

### Technical Data (more details you will find in the parameter listing)

Supply Voltage.....	230V AC, 50-60 Hz
Power Consumption.....	12 VA max.
Output Relays.....	3x potential free
Contact Rating.....	8A cos phi = 1, 3A ind. / 250V
Operating-/Storage Temperature.....	0...+50°C / -30...+70°C
Relative Humidity.....	max. 85% r.H., not condensing
Display.....	LED, 7-segment, red, character height 11mm (.44)
Status Indicators.....	LED, 3mm, color configurable
Data storage parameters.....	unlimited
Clock backup.....	typ. 10 days after mains voltage is lost
Digital Input (DI).....	14x 230V, max. 3mA, optically decoupled
Data Interface.....	E-Link (RS-485)
Electrical Connection.....	Screw Terminals 2,5mm <sup>2</sup>
	Data Interface 1,5mm <sup>2</sup>
Housing, Protection.....	Plastic, door-/panel mounting, IP 54 from front



**Please note Safety Instructions !**  
**While replacing older types please note changed functions!**

*Please read these instructions carefully before applying power. Your attention is drawn to the fact that the warranty is subject to the application of power sources that are within the limits specified in this manual. This documentation was compiled with utmost care, however, we cannot guarantee for its correctness in every respect. Technical details can be changed without notice, especially the software. Please note that the described functions are only valid for units containing the software with the version-number shown on page 1. Units with an other software number can work a little bit different. You will find this software number on the label of the unit too.*

**ELREHA GmbH**

D-68766 Hockenheim, Germany Schwetzingen Str. 103  
Telefon 0 62 05 / 2009-0 - Fax 0 62 05 / 2009-39 - sales@elreha.de

## Parameter Listing

ParNo.	Description						Setting Range						Factory Setting		
P00	Relay K1, polarity .....						1 = de-energize, 2 = energize .....						1		
P01	Relay K1, re-energize with a new message .....						1 = yes, 2 = no .....						2		
P02	Relay K2, polarity .....						1 = de-energize, 2 = energize .....						1		
P03	Relay K2, re-energize with a new message .....						1 = yes, 2 = no .....						2		
P04	Maintenance mode (Period of time without any error forwarding) .....						0...120 min .....						0		
P05	Internal beeper mode (Period of time without beeper or always off) .....						0...120 min, oFF .....						0		
Digital Input		Alarm Delay		Operating Mode		LED color		Input Polarity		Relay Message		Reset Mode		Alarm Repetition	
		h.mm		1= alarm 2= operating		1=red 2=green 3=yellow		1=active (230V) 2=passive (0V)		relay K1 = 1 relay K2 = 2 relay K3 = 4		1= autoreset 2= manually/ button		h.mm	
Range		0...959		1...2		1...3		1...2		Example see *1		1...2		0...959	
Factory Setting		0		1		1		2		1		2		0	
1	P10		P11		P12		P13		P14		P15		P16		
2	P20		P21		P22		P23		P24		P25		P26		
3	P30		P31		P32		P33		P34		P35		P36		
4	P40		P41		P42		P43		P44		P45		P46		
5	P50		P51		P52		P53		P54		P55		P56		
6	P60		P61		P62		P63		P64		P65		P66		
7	P70		P71		P72		P73		P74		P75		P76		
8	P80		P81		P82		P83		P84		P85		P86		
9	P90		P91		P92		P93		P94		P95		P96		
10	PA0		PA1		PA2		PA3		PA4		PA5		PA6		
11	Pb0		Pb1		Pb2		Pb3		Pb4		Pb5		Pb6		
12	Pc0		Pc1		Pc2		Pc3		Pc4		Pc5		Pc6		
Configuration															
Pd0	Year .....						0...99 .....						0		
Pd1	Month .....						1...12 .....						1		
Pd2	Day .....						1...31 .....						1		
Pd3	Hour .....						0...23 .....						0		
Pd4	Minute .....						0...59 .....						0		
Pd5	Second .....						0...59 .....						0		
Pd7	Address in a network .....						0...78 .....						78		
Pd8	Baudrate (data speed via interface in Baud) .....						1= 1200, 2= 2400, 3= 4800, 4=9600 5= 19200, 6= 28800, 7= 57600 .....						4		
Pd9	Code Input (88 here or at any othet parameter) .....						0...99 .....						00		

## Functional Description

### Field of Application

The SM 501 is designed as an universal error message or indication module for machinery, electrical cabinets, etc. and is free configurable.

You are able to assign different functions to each message input.

All captured messages can be transmitted to a host system (e.g. SMZ, CoolVision, Building Control Technology) by a data interface.

### Digital Inputs

All digital inputs are designed for mains voltage.

DI1...DI12 are alarm/operation message inputs, DI13...DI14 can be used for external resets.

### Operation Messages

Each of the inputs DI1...DI12 can be configured for operation messages. The color of the LED and the input polarities are free selectable.

### Error/Alarm Messages

Each of the inputs DI1...DI12 can be configured as alarm input. The following functions can be assigned individually to each of them:

- Alarm delay time
- LED color
- Input polarity, trigger by voltage (active) or missing voltage (passive)
- Reporting channel (relay message), this can be done via relay K1, K2 and K3 (beeper/horn), selectively or in groups.
- Reset Mode, this determines if an error message is reset automatically or can be reset by a keystroke only.

### \*1 : Configuration example for Relay Messages / Reporting Channel:

Message not via relay = 0  
 Message only via relay K1 = 1  
 Message only via relay K2 = 2  
 Message via relay K1 and K2 = 3  
 Message only via relay K3 (beeper/horn) = 4  
 Message via relay K1 and K3 = 5  
 Message via relay K2 and K3 = 6  
 Message via relay K1, K2 and K3 = 7  
 (Rel. K1 = priority 1, Rel. K2 = priority 2, Rel. K3 = beeper/horn)

### Error Message / New Message

Each of the 2 alarm relays can be configured (parameter P00..P03) in the way that if an error message occurs, they will be energized or de-energized and/or a 're-energizing' must be done.

A 're-energizing' function operates in this way:

- An error message is present, the relay is activated (energized/de-energized, dep. on configuration)
- A new error message is added
- The relay will be de-activated for about 3 seconds and then re-activated again

### Horn / Beeper

If relay K3 (horn/beeper) is selected as a message channel, an internal beeper switches on with a recorded error. By pushing "Reset beeper/Lamp test" the internal beeper and relay K3 will switch off. After the preset 'Alarm Repetition' they will be activated again. A reset can also be done via digital input DI14 (by mains voltage).

### Internal Beeper Mode

The internal beeper can be configured by parameter P05. For machinery configurations or tests you can set a period of time while the beeper is not active. With the standard value '0' the beeper is always active, if you set a higher value, the beeper is de-activated for this time. The timer counts back automatically, if '0' is reached, the beeper is active again. With the value 'off', the beeper is permanently switched off.

### General Maintenance Mode

To prevent an error message forwarding to relay, beeper and error memory while a configuration, a special maintenance mode is available. If a time > 0 is set at P04, while this time period error messages will only be shown by the local LEDs. After the set time period has been expired, the SM-501 works normally.

**Functional Description** (continuation)

If the 'Alarm Repetition' is set to '0', the alarm remains active and cannot be switched off by a keypress or via an external input.

**Lamp Test**

By pushing and holding the button "*Reset beeper / Lamp test*", the input LEDs will be switched successively in 3 possible colors.

**Reset**

With the button 'OK' available error messages can be reset. This is only possible, if a channel has got the reset mode '*manually / button*'.

With the value '*autoreset*' the assigned relays will be reset automatically if the detected error disappears.

A reset can also be done by using the digital input **DI13** (by mains voltage).

**Realtime Clock**

The SM module owns an internal real time clock with date, e.g. to log errors with a time stamp on an external system.

Without mains voltage, the real time clock still works for about 10 days only.

Time and date can be read and set with the parameters **Pd0...Pd5**.

**CONNECTION INFORMATION & SAFETY INSTRUCTIONS**

Product warranty does not cover damage caused by failure to comply with these operating instructions! Nor will ELREHA be held liable for any personal injury or damage to property caused by improper handling or failure to observe the safety instructions and recommendations contained in this or any other ELREHA supplied document related to this product! This manual contains additional safety instructions throughout the functional description. Please pay close attention to these instructions!

**TO AVOID RISK TO HEALTH OR POSSIBLE LOSS OF LIFE, DO NOT OPERATE IF:**

- The device has visible damage or doesn't work
- After a long storage period under unfavourable conditions
- The device is heavily soiled or wet
- When shipped under inadequate conditions
- Never use this product in equipment or systems that are intended to be used in applications or under circumstances that may affect human life. For applications requiring extremely high reliability, please contact the manufacturer before use.
- **This product may only be used in the applications described on page 1.**
- **Electrical installation and placement into service must be performed by qualified personnel only.**
- **To avoid the risk of Electrical Shock, all 'PE' terminals must be connected to ground. Without adequately grounding the unit, the internal noise filter will not work, which can cause faulty readings, or inaccurate displayed values to occur.**
- **Never operate the device without the supplied enclosure.**
- **To prevent electrical shock, the device may only be operated in a closed control cabinet or control box.**
- **Be sure to observe all local, state, or federal safety regulations in the location that the unit is installed.**



- Before installation, verify that the control specifications suit the application details. Damage may occur if the unit is operated outside of its specified limitations.  
Examples:
  - Supply voltage (printed on the type label).
  - Environmental limits for temperature/humidity.
  - Maximum current rating for the relays.
- Mounting the controller close to power relays is not recommended, due to the risk of strong electro-magnetic interference, which can cause the unit to malfunction!
- Ensure that the interface wiring meets all the necessary requirements.

**Cleaning**

The use of a dry, lint-free cloth is sufficient to clean the product. Never use liquids or acidic fluids! Risk of damage!

**EC Declaration of Conformity**

For the device **SM 501** we state the following:

When operated in accordance with the technical manual, the criteria have been met that are outlined in the EMC Directive **2014/30/EC** and the Low Voltage Directive **2014/35/EC**. This declaration is valid for those products covered by the technical manual which itself is part of the declaration.

Following standards were consulted for the conformity testing to meet the requirements of EMC and Low Voltage Guidelines:

**EN 55011:2016, EN 61010-1:2010, EN 61326-1:2013**

**CE marking of year: 2017**

This statement is made for the manufacturer / importer

**ELREHA Elektronische Regelungen GmbH**  
**D-68766 Hockenheim**

www.elreha.de

(Name / Address)

by:

**Werner Roemer, Technical Director**

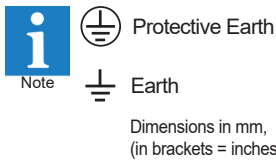
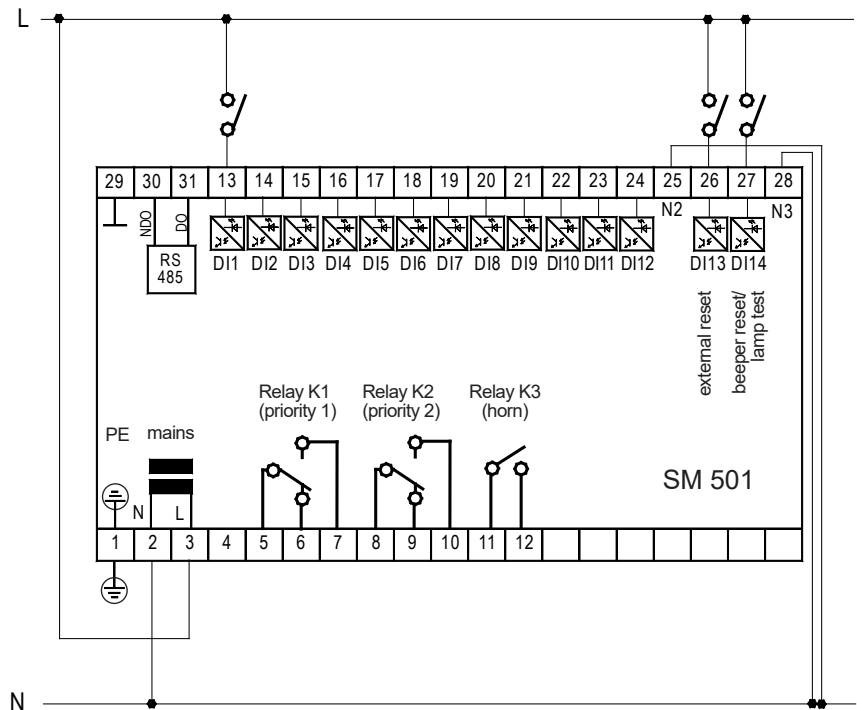
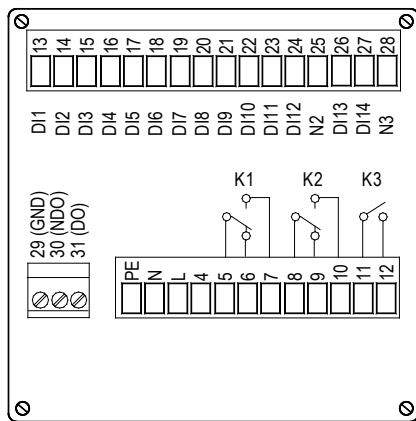
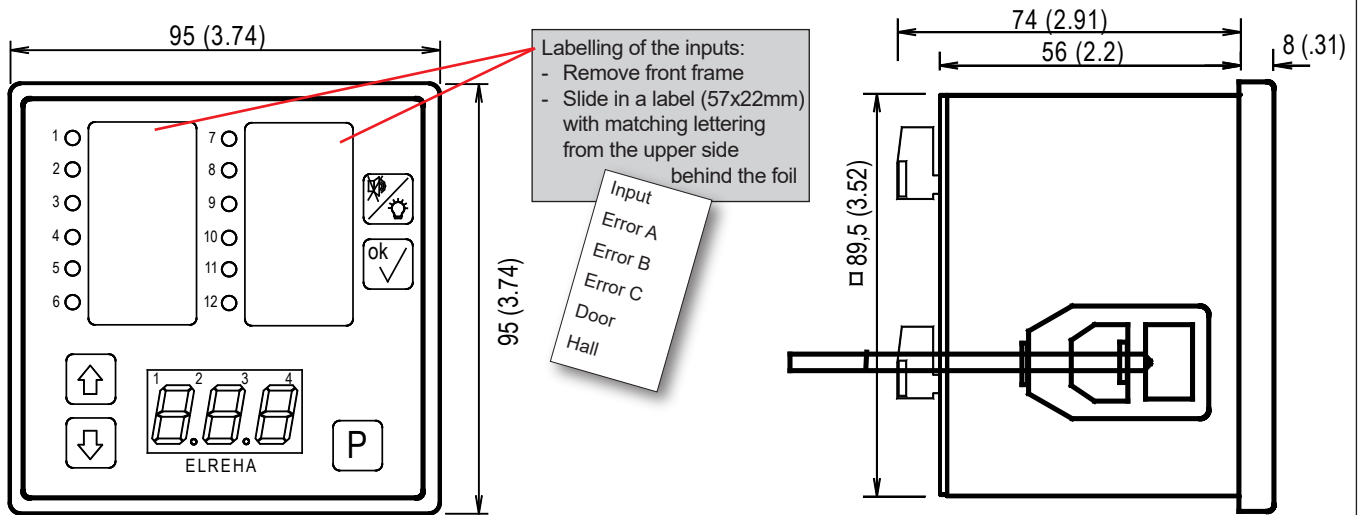
**Hockenheim** ..... **17.11.2017** .....

City

Date

Signature

## Dimensions and Connection



## Networking of SM modules

All SM modules can be networked to a host system via their built-in RS-485-interface, which allows remote control of units and recording of all parameters.

- Because all units are connected parallel on the data cable, each unit has its own network address (**Pd7**) to ensure a specific communication.

**!! NOTE: Never use address 64 !!**

- The data transmission speed is fixed by **Pd8**, the default value is 9600 Baud.
- Wiring must be made by standard data cable.
- Shieldings must be connected to the nearest grounding terminal.
- The unshielded part of the data cable must be as short as possible.

