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# JUMO mTRON Relay module

## Brief description

The unit is a module of the JUMO mTRON control and automation system. The plastic housing measures 91 mm x 85.5 mm x 73.5 mm (W x H x D) and is mounted on a standard rail.

In addition to direct operation through logic network variables there is a facility for limit comparator functions with delays and latching. The module can also convert analogue operating signals into quasi-analogue pulse trains for operating output devices. Functions such as pulse width modulation, pulse frequency modulation and actuator driver are provided.

The module has a total of 4 switching outputs (relay, logic or solid-state relay output) which can be operated via the LON<sup>1</sup> bus.

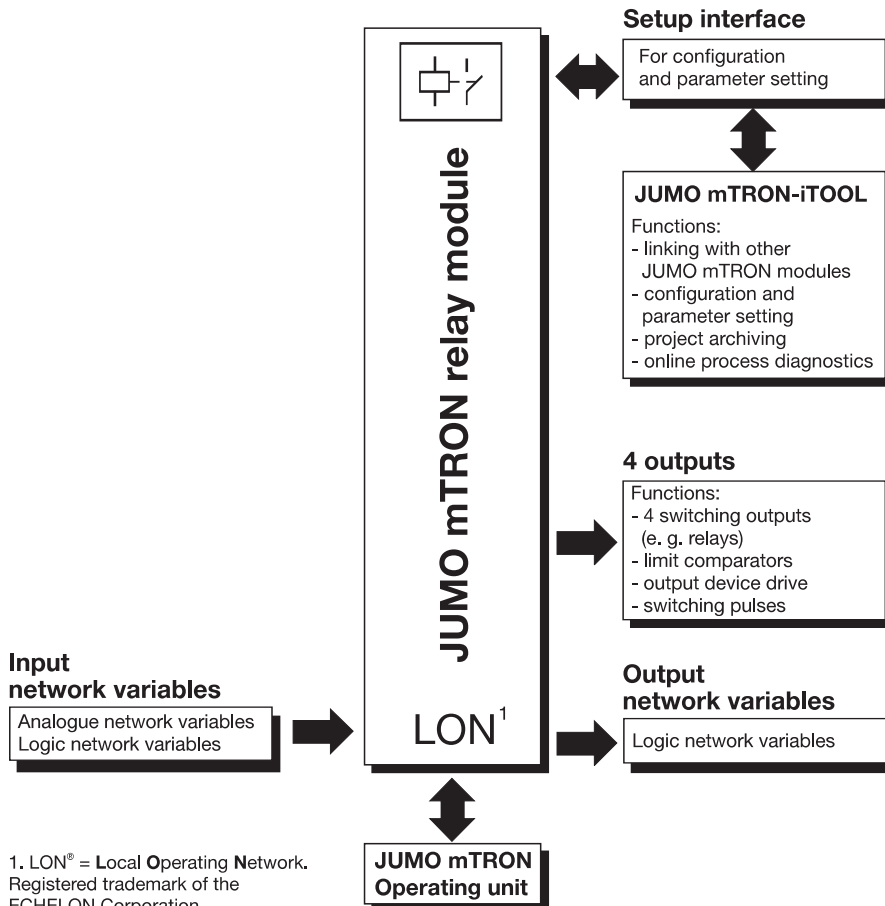
The module incorporates a network connection for communication and data interchange between the modules. A screened twisted pair is used as transmission line.

There is a setup interface for module parameter setting and configuration from a PC under the JUMO mTRON-iTOOL project design software. The electrical connections are made through plug-in connectors with screw terminals.



Type 704015/0-...

## Block structure

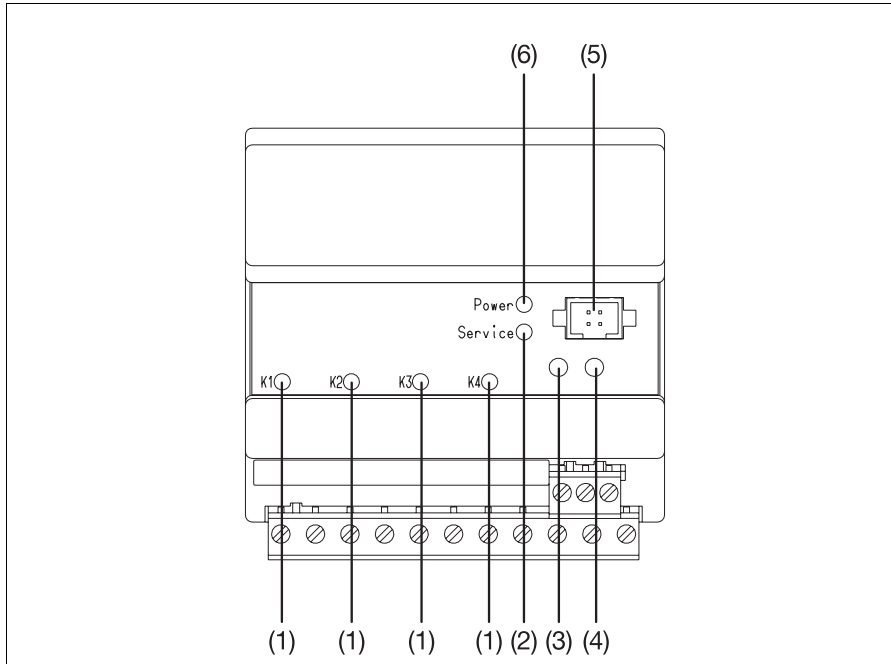


1. LON<sup>®</sup> = Local Operating Network. Registered trademark of the ECHELON Corporation.

## Features

- **Limit comparators**  
 Comparator and window functions, direct or reversed, with switch-on and switch-off delay, also latching and gate circuit
- **Pulse width modulation**  
 PD controller converting the analogue control signals into switching pulses for operating contactors and solenoid valves
- **Pulse frequency modulation**  
 This function converts analogue control signals into switching pulses for operating dosing pumps, for example
- **Actuator driver**  
 Controller for operating actuating motors with position retransmission
- **Setup interface**  
 For configuration and setting of parameters the module is linked to a PC via a PC interface
- **Plug & Play function**  
 Problem-free replacement of modules without re-configuration

## Displays and controls



|     |   |     |   |
|-----|---|-----|---|
| (1) | <b>Status LED, yellow</b><br>for the logic outputs K1 to K4;<br>lights up when relay is energised<br>or logic output is activated   | (4) | <b>Installation key</b><br>the module reports to the<br>JUMO mTRON-iTOOL project design<br>software or operating unit |
| (2) | <b>Service LED, red</b><br>– lights up on operating fault<br>– flashes when the mechanical<br>connection to the module from<br>JUMO mTRON-iTOOL or the<br>operating unit is being checked by a<br>test signal (“wink”)<br>– long flashing pulses (3 sec on/1sec<br>off) when a Plug & Play fault occurs | (5) | <b>Setup interface</b><br>for the PC interface line which links the<br>module to the PC                               |
| (3) | <b>Switch</b><br>for the termination resistance of the<br>LON network   | (6) | <b>Power LED, green</b><br>lights up when the supply is switched on   |

## Output

### network variables

#### Logic network variables

Output cycle: controlled by event,  
but at least every 6.3sec

Functions:

- monitoring function for the network inputs (combined alarm)
- output of the relay states

### General data

#### Electrical safety

as per EN 61010-1

Overvoltage category: II

Pollution degree: 2

#### Environmental influences

Operating and ambient temperature:  
0 to 55°C

Permitted storage temperature:  
–40 to +70°C

Relative humidity: rH 80 % max.

Electromagnetic compatibility  
as per EN 61326-1

- interference emission:  
Class A - Only for industrial use -
- interference immunity:  
to industrial requirements

### Housing

Material: plastic, self-extinguishing

Flammability Class: UL 94 V0

Protection: IP20 (as per EN 60529)

Mounting: on standard rail

### Supply

110 – 240V AC +10/–15%, 48 – 63Hz,

or 20 – 53V AC/DC, 48 – 63Hz

Power consumption: 5 VA max.

## Network

### (LON interface)

Transceiver: free topology FTT-10A

Topology: ring, star, line or mixed  
structure

Baud rate: 78 kbaud

Max. lead length (depending on lead type):

line: 2700 m

star: 500 m

ring: 500 m

mixed: 500 m

Max. number of modules: 64

## Technical data

### Hardware outputs

Functions:

- direct relay outputs
- limit comparator output
- actuator driver outputs
- pulse width outputs
- pulse frequency outputs

### Relay outputs

Type: n.o. (make) contact

Nominal voltage: 250V

Nominal current: 3A

Rating: 3A, 250V AC, resistive load

Life:  $5 \cdot 10^5$  operations  
on resistive load

Contact material: AgCdO

(hard gold plated)

Minimum load: 10mA 5V DC

### Solid-state relay output

Type: 1A 250V AC

### Logic output

Type: 0/12V

Internal resistance: 600Ω

## Input

### network variables

#### Analogue network variables

Functions:

- input variables  
for the limit comparators,  
pulse width modulation,  
pulse frequency modulation and  
actuator driver

#### Sampling time

210msec

#### Logic network variables

Functions:

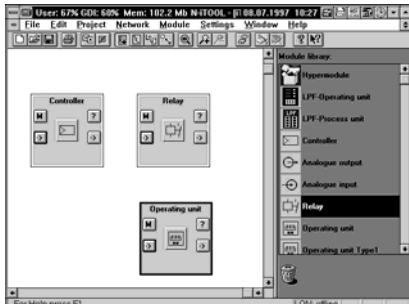
- direct relay operation
- gate circuit for the limit comparators
- latch reset
- actuator driver switch-off

## Operation and project design

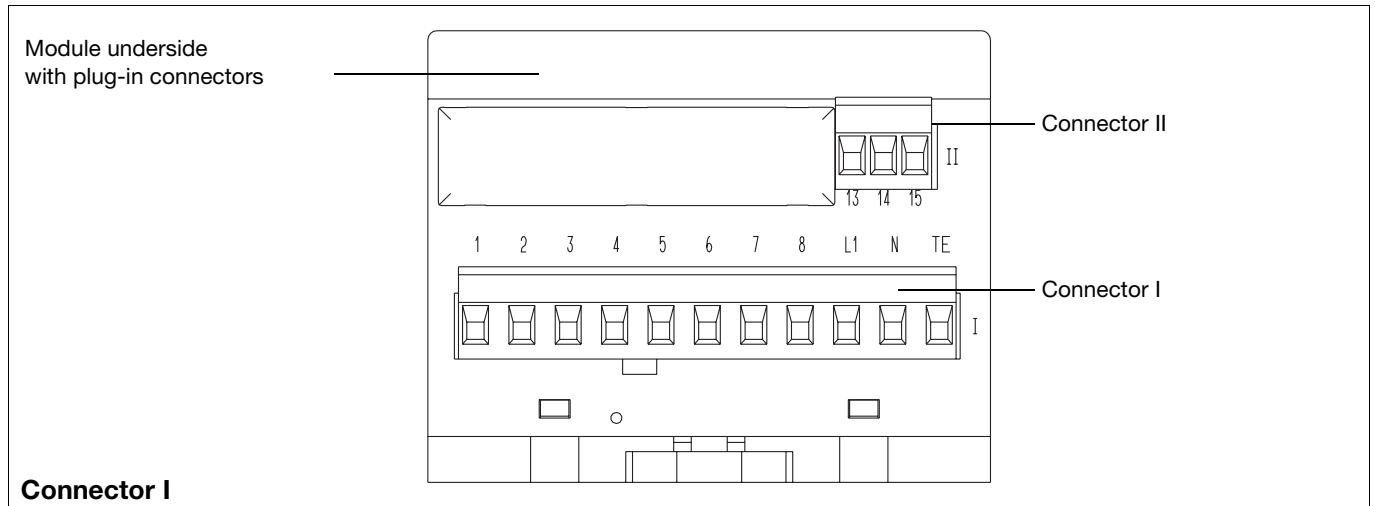
Operation, parameter setting and configuration of JUMO mTRON modules can be carried out from the JUMO mTRON operating unit.

The JUMO mTRON-iTOOL project design software permits convenient design and start-up of a JUMO mTRON system.

The projects can be archived and documented. Individual modules are linked via LON by assigning network variable (NV) names.



### Connection diagram



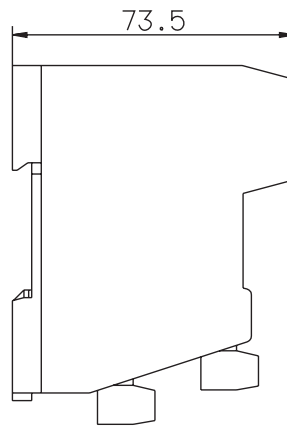
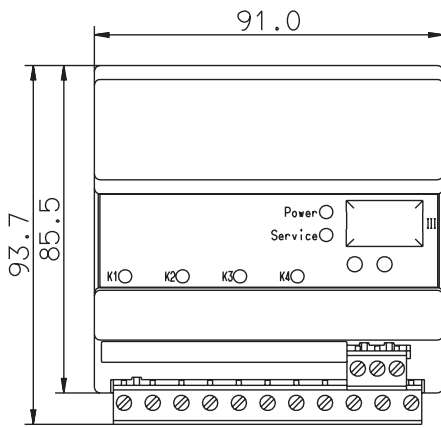
#### Connector I

| Connection for                       | Terminals                |            |                          |            | Notes                         | Diagram |
|--------------------------------------|--------------------------|------------|--------------------------|------------|-------------------------------|---------|
| Outputs                              | Output 1                 | Output 2   | Output 3                 | Output 4   |                               |         |
| Relay<br>3A, 250V AC, resistive load | I_1<br>I_2               | I_3<br>I_4 | I_5<br>I_6               | I_7<br>I_8 | P = common<br>S = n.o. (make) |         |
| Logic output<br>12V 20mA             | I_1<br>I_2               | I_3<br>I_4 | I_5<br>I_6               | I_7<br>I_8 | -<br>+                        |         |
| Solid-state relay output<br>250V 1A  | I_1<br>I_2               | I_3<br>I_4 | I_5<br>I_6               | I_7<br>I_8 |                               |         |
| <b>Supply</b><br>as label            | <b>AC</b>                |            | <b>DC</b>                |            |                               |         |
|                                      | I_L1 line<br>I_N neutral |            | I_L1 any<br>I_N polarity |            |                               |         |
|                                      | I_TE technical earth     |            | I_TE technical earth     |            |                               |         |

#### Connector II

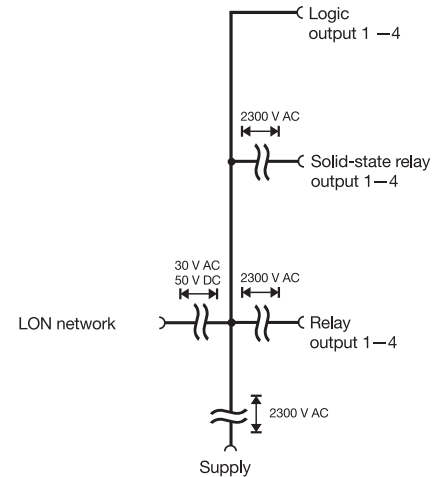
| Connection for       | Terminals                      | Notes        | Diagram |
|----------------------|--------------------------------|--------------|---------|
| <b>LON interface</b> | II_13 = TE                     | screen       |         |
|                      | II_14 = Net_A<br>II_15 = Net_B | any polarity |         |

### Dimensions



| mm   | inch |
|------|------|
| 73.5 | 2.89 |
| 85.5 | 3.37 |
| 91.0 | 3.58 |
| 93.7 | 3.69 |

### Isolation



### Ordering details

704015/0- (1) (2) ... - ..

#### (1) Outputs

Standard version .....

| Outputs                             | Code       |
|-------------------------------------|------------|
| 4 relays (n.o.make)                 | <b>154</b> |
| 4 logic outputs 12V 20mA            | <b>165</b> |
| 4 solid-state relay outputs 250V 1A | <b>170</b> |

#### Special version ..... 999

Factory-configured to customer specification. Please specify type of outputs in plain language.

#### (2) Supply .....

| Type                              | Code      |
|-----------------------------------|-----------|
| 110 – 240V AC +10/-15%, 48 – 63Hz | <b>23</b> |
| 20 – 53V AC/DC, 48 – 63Hz         | <b>22</b> |

### Standard accessory

1 Installation Instructions M 70.4015

### Accessories

#### PC interface

#### with TTL/RS232C converter

for connecting the module to a PC, length 2m.

Sales No. 70/00301315

#### Project design software

#### JUMO mTRON-iTOOL

Using the JUMO mTRON-iTOOL project design software the modules can be designed graphically on the PC. The user is able to link modules of the JUMO mTRON family and to configure the application-specific parameters.

#### System Manual JUMO mTRON

Documentation of configuration, parameter setting and installation of the modules.

Sales No. 70/00334336

### JUMO mTRON modules

#### Controller module

Data Sheet 70.4010

#### Relay module

Data Sheet 70.4015

#### Analogue input module

Data Sheet 70.4020

#### Analogue output module

Data Sheet 70.4025

#### Logic module

Data Sheet 70.4030

#### Operating unit

Data Sheet 70.4035

#### Communication module

Data Sheet 70.4040

#### Project design software

#### JUMO mTRON-iTOOL

Data Sheet 70.4090