

JUMO
mTRON

Analogue output module

70.4025
System Manual Part 6

1	Introduction	3
1.1	Preface	3
1.2	Type designation	3
2	Displays and controls	5
3	Overview of functions	7
4	Network variables	9
4.1	Input network-variables	9
4.2	Output network-variables	9
5	Parameter setting	11
5.1	Module settings	12
5.2	Analogue outputs	12
5.3	Combination alarm	14
6	Specific module conditions	15
6.1	Action after a power failure	15
6.2	Action on errors of communication	15
7	Index	17
8	Data Sheet (appendix)	19

Contents

1.1 Preface



The JUMO mTRON System Manual is addressed to equipment manufacturers and users with appropriate technical know-how. It describes the range of functions of the JUMO mTRON automation system with its modules, and provides all the information required for project design and start-up.

This Part 6 of the System Manual “JUMO mTRON analogue output module” contains all the module-specific information.

Part 1 of the System Manual “General section” summarises the information which applies to all modules.

Part 2 of the System Manual “JUMO mTRON-iTOOL project design software“ describes project design for the JUMO mTRON automation system.

1.2 Type designation

The type designation of the analogue output module only indicates the supply (1). The supply must correspond to the voltage shown on the label. The label is affixed to the housing.

(1)
704025/0- ..

(1) Supply

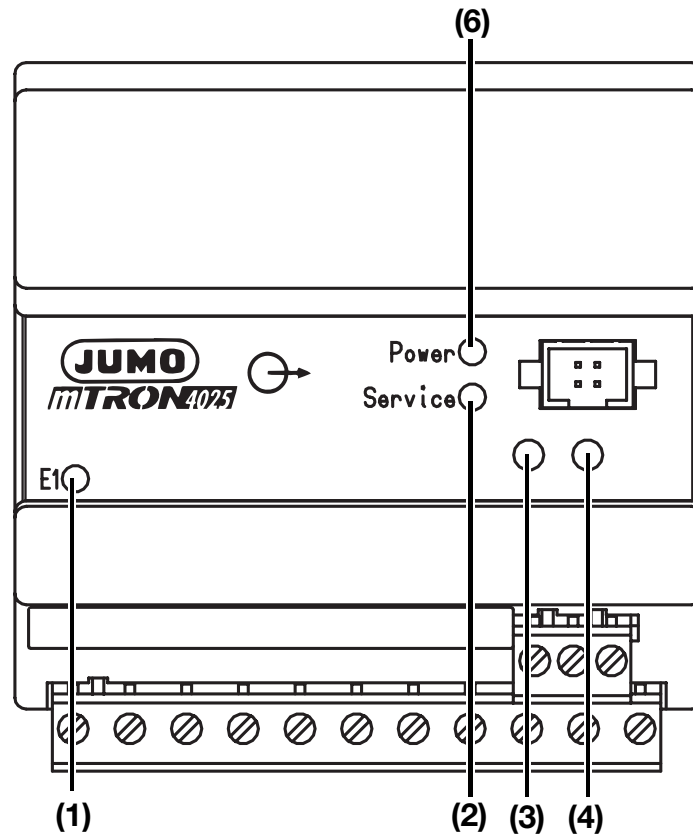
Type	Code
110 – 240V AC +10/-15%, 48 – 63Hz	23
20 – 53V AC/DC 48 – 63Hz	22

Neuron-ID

Each module has a 12-digit number, by which it can be also clearly identified in the JUMO mTRON iTOOL project design software. It can be found next to the label.

1 Introduction

2 Displays and controls



LEDs

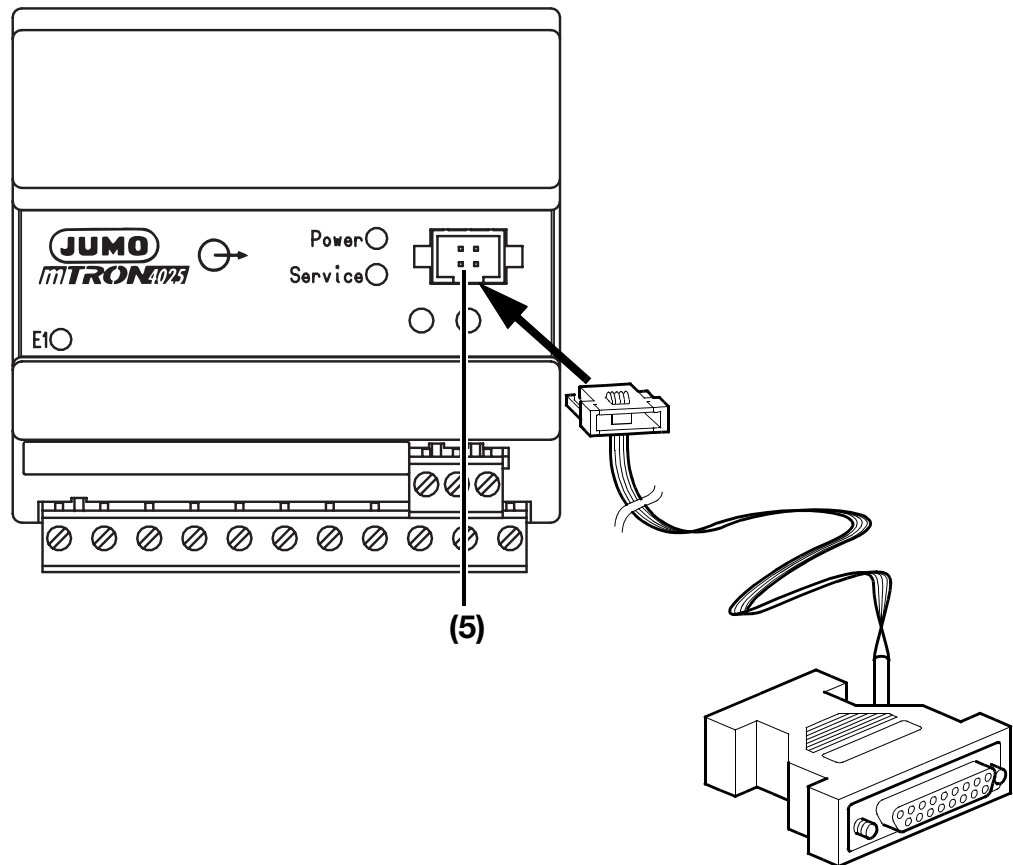
(1)	<p>Status LED, yellow lights up when the floating contact at the logic input E1 is closed</p>
(2)	<p>Service LED, red</p> <ul style="list-style-type: none"> - lights up/ blinks continuously at one second intervals on operating fault ★ replace module - blinks at one second intervals for 10 sec when the network connection from the JUMOmTRON-iTOOL project design software or the operating unit is tested by a test signal ("wink"). - long blink pulses (3 sec on, 1sec off) when a Plug & Play error has occurred - blink pulses (2sec on, 2 sec off) when the instrument is in calibration mode
(6)	<p>Power LED, green lights up when the supply is switched on</p>

Keys/Switches

(3)	<p>Switches (termination resistance)</p> <p>⇒ System Manual Part 1 "General section", Section 4.2 "Network connection"</p>
(4)	<p>Installation key the module reports to the JUMOmTRON-iTOOL project design software</p>

2 Displays and controls

Interface



(5) Setup interface

for the setup interface line which links the module to the PC. The parameters can be set via this connector not only for the analogue output module, but also for **all the modules connected to the LON bus.**

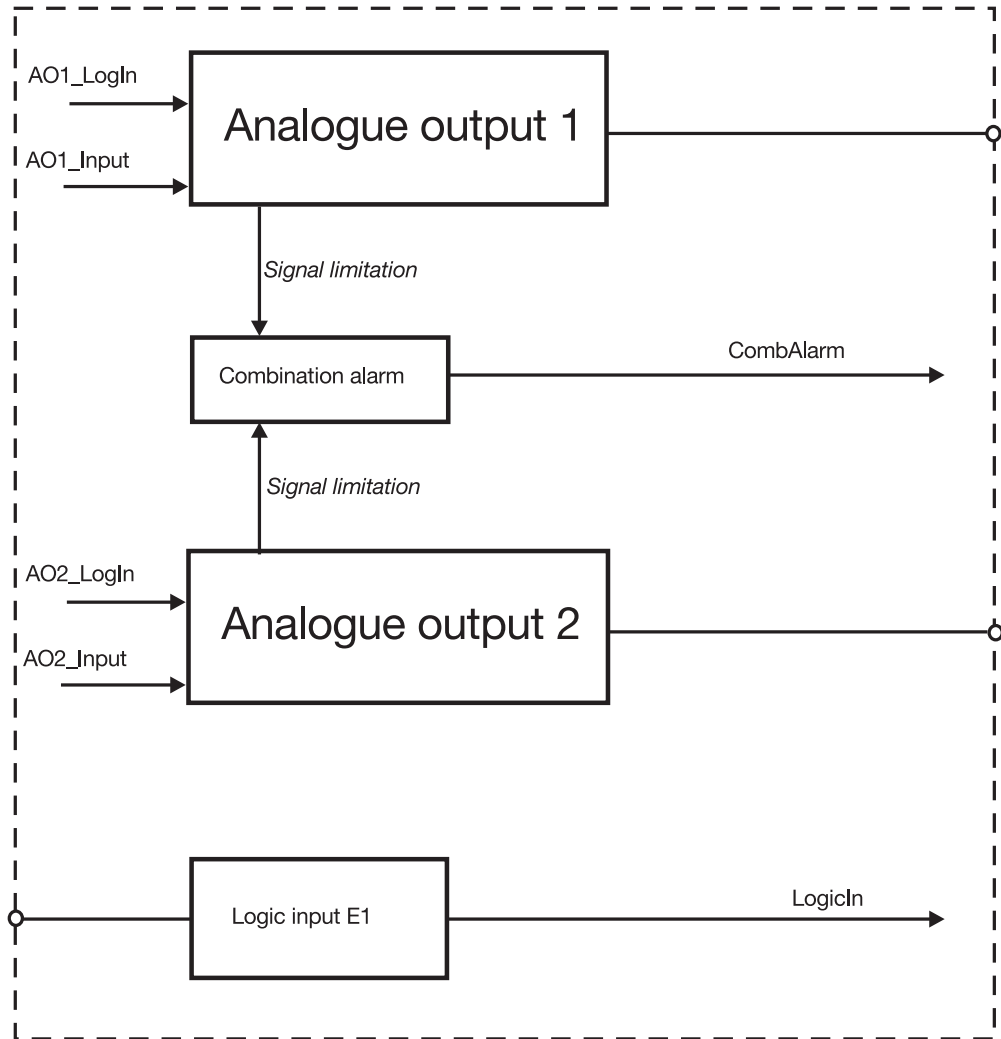


When the setup interface line is connected, the module has the sole function of a PC-LON interface converter. All other module functions are switched off!

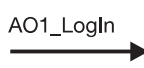


3 Overview of functions

Block structure

This overview of functions shows the relationship between the individual functions and the assignment of the network variables.



Explanation of the symbols

Symbol	Meaning
	Network variable ⇒ Chapter 4 "Network variables"
	Hardware input
	Hardware output

3 Overview of functions

4.1 Input network-variables

Input network-variables can be used to transfer values and operating signals from other modules to the analogue output module via the network.

If a linked network-variable is no longer being updated, the NV combination alarm is activated automatically.

List of input network-variables



Name	Type	Default setting	Explanation
AO1_LogIn	logic	0	"0" activates signal limitation 1 for analogue output 1 "1" activates signal limitation 2 for analogue output 1 ⇒ Section 5.2 "Analogue outputs"
AO1_Input	float value	0	Value for analogue output 1
AO2_LogIn	logic	0	"0" activates signal limitation 1 for analogue output 2 "1" activates signal limitation 2 for analogue output 2 ⇒ Section 5.2 "Analogue outputs"
AO2_Input	float value	0	Value for analogue output 2

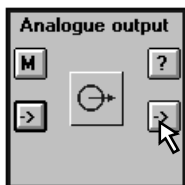
Default setting:

Value of the input network-variable in the event of faulty communication and in unlinked condition.

4.2 Output network-variables

Using the output network-variables, values and operating signals can be transferred from the analogue output module to other modules via the network.

List of output network-variables

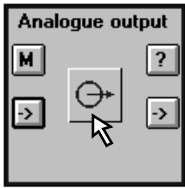


Name	Type	Explanation
CombAlarm	logic	Logic level of the combination alarm output ⇒ Section 5.3 "Combination alarm"
LogicIn	logic	Logic level of the logic input E1: "0" if the logic input is open "1" if the logic input is closed by a floating contact (yellow LED lights up).

4 Network variables

5 Parameter setting

Basic menu



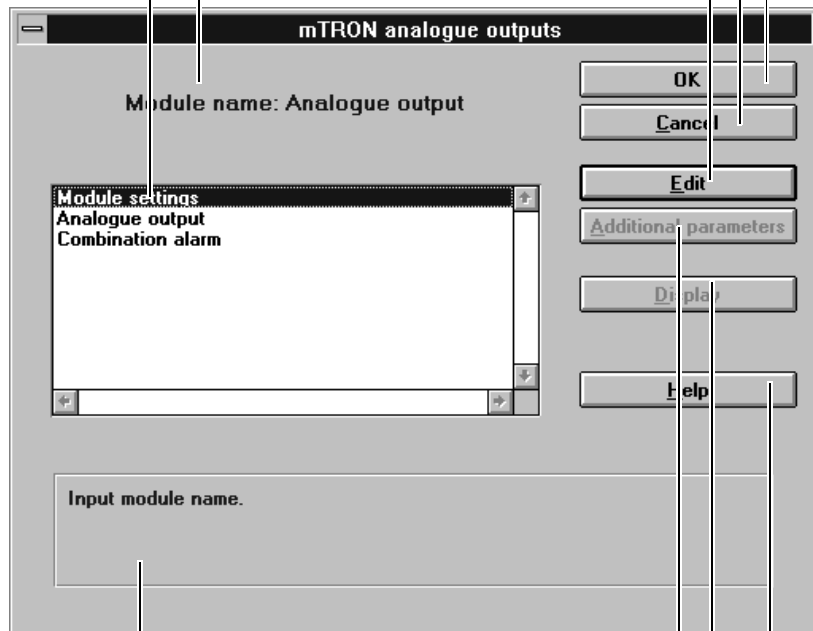
Module name
Name of the module

Setup dialog
The functions of the module are assigned to setup dialogs

OK
for entering and storing all inputs

Cancel
for aborting inputs. The data are not stored

Edit
for editing parameters in the setup dialog which is marked



Additional parameters
Further settings can be made here when there are differences between the versions of module software and setup program

Display
Using this function, individual parameters can be removed from the operating unit (parameter level)

Info text
provides information on the setup dialog which is marked

Help
calls up help text for the basic menu

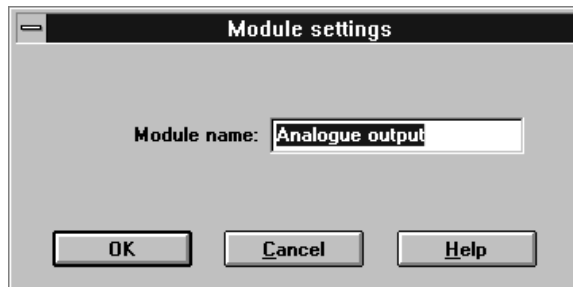
5 Parameter setting

5.1 Module settings

Setup dialog



A characteristic designation for the task of the module in the process simplifies work on the project.



Parameters

Parameter	Selection/settings	Explanation
Module name [16 characters]	Analogue output	Name of the module (16 characters)

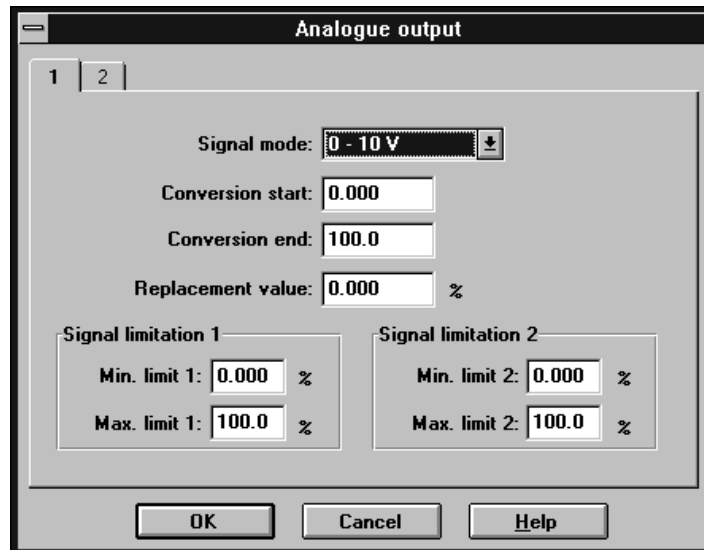
■ = factory-setting [] = Short name in the operating unit

5.2 Analogue outputs

Setup dialog



There are 2 analogue outputs available which are operated via network variables.



Parameters

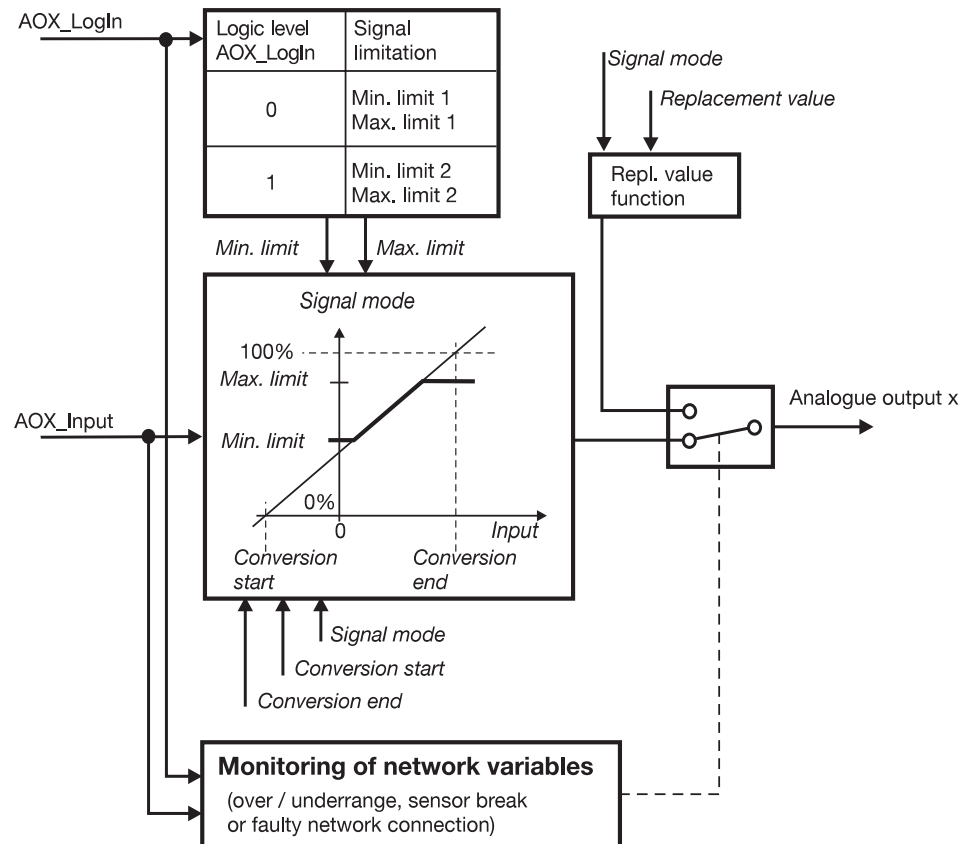
Parameter	Selection/settings	Explanation
Analogue output [AnalogOut X]	X = 1–2	Selection of analogue output 1– 2
Signal mode [SignalMode]	0– 20mA ¹ [0/20 mA] 4– 20mA ¹ [4/20mA] 0– 10V [0/10V] 2– 10V [2/10V]	Output signal with which the network variable is output at the analogue output.

■ = factory-setting [] = short name in the operating unit

5 Parameter setting

Parameter	Selection/settings	Explanation
Conversion start [ConvStart]	-1999 – 9999 0.000	Start and end of the output signal range: If “0” has been set for the start of conversion and “100” for end of conversion, then network values from 0 – 100 are output with the setting 4 – 20 mA at the analogue output.
Conversion end [ConvEnd]	-1999 – 9999 100.0	
Replacement value [ReplVal]	0 – 110 0.000	Combination alarm can be set if these values are exceeded or not reached. ⇒ Section 5.3 “Combination alarm”
Replacement value [ReplVal]	0 – 110 0.000	Value for the output signal in % on errors of communication or when the “Out of Range” signal (invalid value) is sent via the network. ⇒ Chapter 6 “Specific module conditions”
Signal limitation 1		
Min. limit 1 [MinLimit1]	0 – 100% 0.000%	Additional start and end limitation of the output signal in %, depending on the network variable AOX_LogIn and the signal mode
Max. limit 1. [MaxLimit1]	0 – 100% 100.0%	
Signal limitation 2		
Min. limit 2. [MinLimit2]	0 – 100% 0.000%	Additional start and end limitation of the output signal in %, depending on the network variable AOX_LogIn and the signal mode
Max limit 2. [MaxLimit2]	0 – 100% 100.0%	

■ = factory-setting [] = short name in the operating unit



1. For current output, a replacement value can be set in the range of 0 – 110% so that a current of 22 mA can be output.

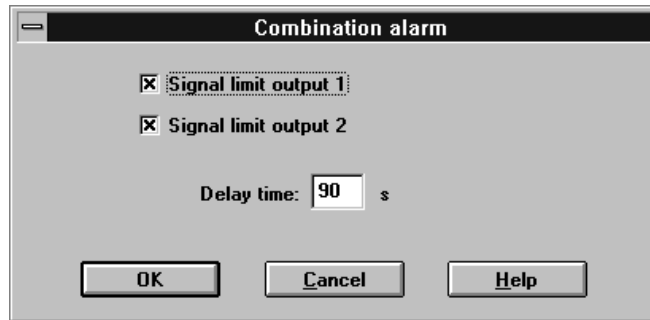
5 Parameter setting

5.3 Combination alarm

Setup dialog



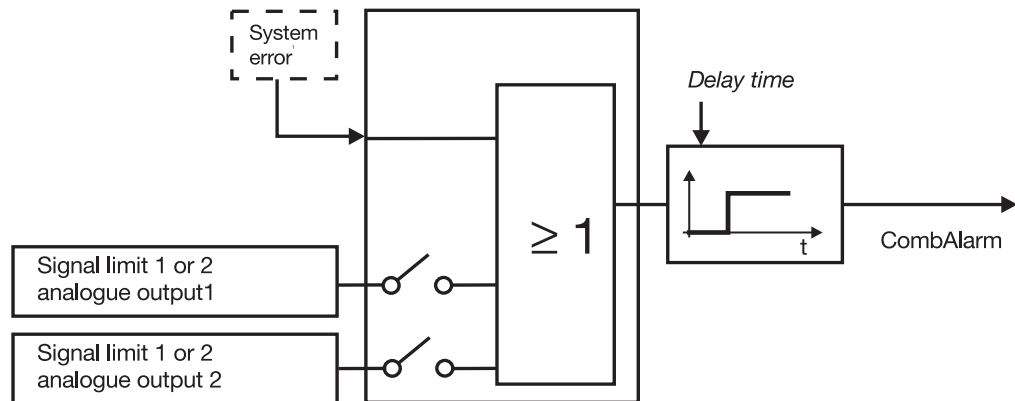
If the signal limit or the limits for conversion are exceeded or not reached, the module outputs a combination alarm which can be turned off or delayed. It is, for example, possible to operate an alarm window on the operating unit via the network variable "Combination alarm".



Parameters

Parameter	Selection / settings	Explanation
Signal limit output 1 [LimOutp1]	combination alarm output no combination alarm output	A combination alarm is output if the signal limit is exceeded or not reached.
Signal limit output 2 [LimOutp2]	combination alarm output no combination alarm output	
Delay time [Delay]	000–255 s 90 s	The combination alarm signal only becomes effective after the delay time which has been set.

■ = factory-setting [] = short name in the operating unit



1. At present, no system errors are defined.

6.1 Action after a power failure

The restart time of the module is 500 msec max.

As long as the input network-variables are not being updated by a signal source (e.g. the analogue input module), the module outputs the parameterized replacement values to the analogue outputs.

⇒ Section 5.2 “Analogue outputs”

6.2 Action on errors of communication

If the linked network-variables are no longer being updated at regular intervals by the signal sources, the module outputs the parameterized replacement values after 19 sec.

⇒ Section 5.2 “Analogue outputs”

A combination alarm is output,

⇒ Section 5.3 “Combination alarm”

and a message appears on the operating unit that the module no longer has contact with the operating unit.

⇒ System Manual Part 8 “Operating unit”

6 Specific module conditions

A

action on errors of communication 6-15
analogue outputs 6-12

B

block structure 6-7

C

combination alarm 6-9, 6-14
conversion 6-13

D

delay time 6-14
displays and controls 6-5

I

input network-variables 6-9
input network-variables, list of 6-9
installation key 6-5
interface 6-6
introduction 6-3

K

keys 6-5

L

LEDs 6-5
logic input 6-9

M

module name 6-12
module settings 6-12

N

network variables 6-9
neuron-ID 6-3

O

output network-variables 6-9
output network-variables, list of 6-9
overview of functions 6-7

P

parameter setting 6-11
power failure 6-15
power LED, green 6-5
preface 6-3

R

replacement value 6-13

S

service LED, red 6-5
setup interface 6-6
signal limitation 6-13
signal mode 6-12
specific module conditions 6-15
status LED, yellow 6-5
switch (termination resistance) 6-5
switches 6-5

T

type designation 6-3

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JUMO mTRON Analogue output module

for stock items
see price list

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.

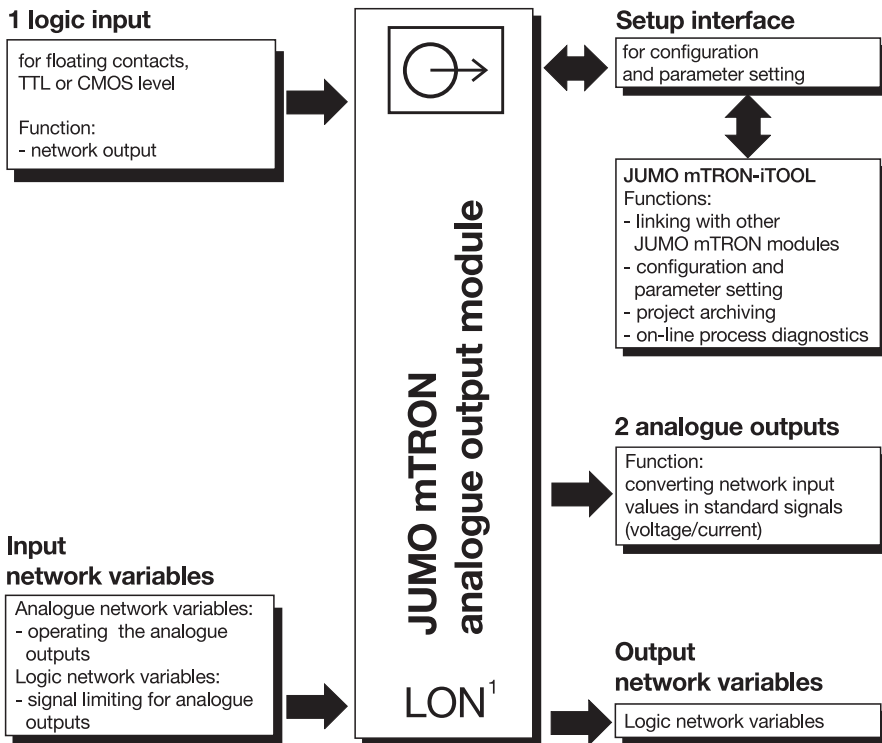
A logic input captures an external process status and passes it on to the LON network. The module has two isolated analogue outputs which are operated via the LON bus and whose output signals are adjustable.

The module is linked to other modules via the LON¹ interface. 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 set-up 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 connectors with screw terminals.



Type 704025/0-..

Block structure

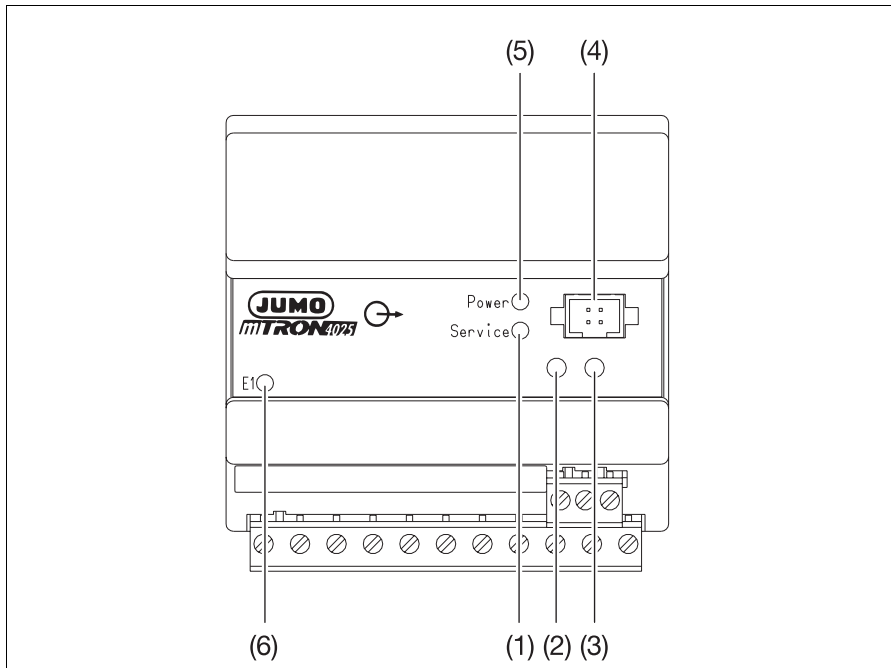


Features

- **Isolated outputs**
The analogue output module has two isolated analogue outputs (current 0 – 20mA or 4 – 20mA / voltage 0 – 10V or 2 – 10V)
- **Scaling**
The analogue network inputs can be freely scaled using two parameters
- **Limiting**
The analogue outputs can be limited through two parameters.
- **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

1. LON¹ = Local Operating Network. Registered trademark of the ECHELON Corporation.

Displays and controls



(1)	Service LED, red - lights up on operating fault - flashes when the mechanical connection to the module from JUMO mTRON-iTOOL or the operating unit is being checked by a test signal ("wink")	(4)	Setup interface for the PC interface line which links the module to the PC
(2)	Switch for the termination resistance of the LON network	(5)	Power LED, green lights up when the supply is switched on
(3)	Installation key the module reports to the JUMO mTRON-iTOOL project design software or the operating unit	(6)	Logic input, yellow lights up when the floating contact at logic input E1 is closed

General data

Environmental conditions to EN 61 010
 Operating and ambient temperature: 0 – 55°C
 Permitted storage temperature: –40 to +70°C
 Relative humidity: rH 80 % max.
 Pollution degree 2
 Overvoltage category 2

Housing

Material: plastic, self-extinguishing
 Flammability Class: UL 94 VO
 Protection: IP20 (to EN 60 529)
 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 inputs

Sampling time:
 210msec for all inputs

Logic input

activation: floating contact
 Function:
 - capturing a process status

Hardware outputs

Analogue outputs

Signal	Load/Burden
0 – 10 V	> 500Ω
2 – 10 V	> 500Ω
0 – 20mA	< 500Ω
4 – 20mA	< 500Ω

Accuracy: 0.25 %
 Resolution: 16 bit
 Function:
 - converting network input values into standard signals

Input network variables

Analogue network variables

Function:
 - operating the analogue outputs

Logic network variables

Function:
 - activating the signal limit of the analogue outputs

Output network variables

Logic network variables

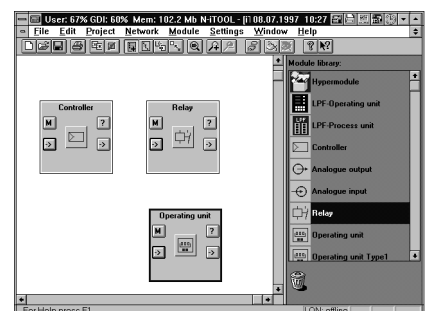
Output cycle: controlled by event, but at least every 14sec
 Function:
 - monitoring the network inputs and the range limit (combined alarm)

Operation and project design

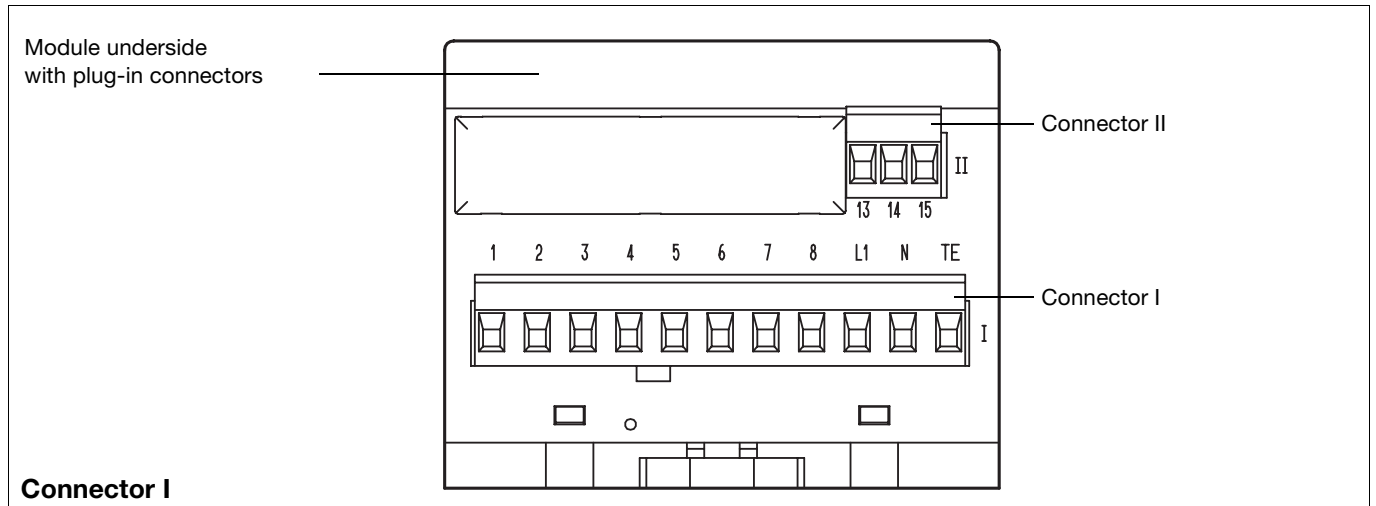
Operation, parameter setting and configuration of JUMO mTRON modules can be carried out from the JUMO mTRON operating unit.

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



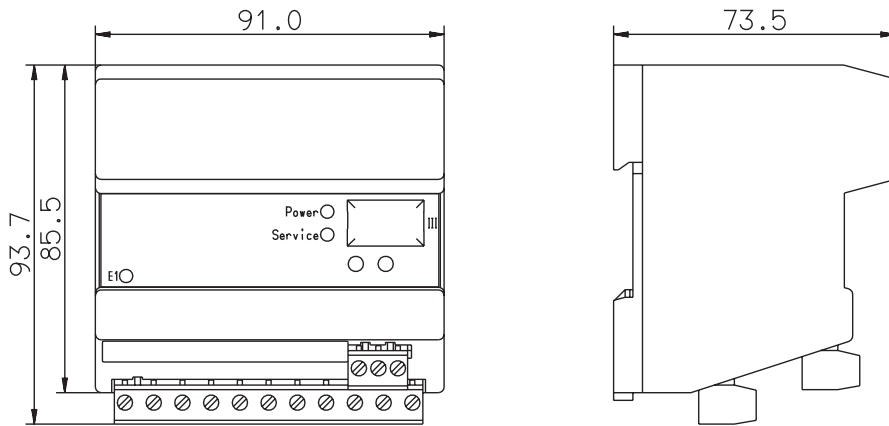
Connector I

Connection for	Terminals		Notes	Diagram
Analogue outputs	Output 1	Output 2		
0 – 10V, 2 – 10V 0 – 20mA, 4 – 20mA	I_2+ I_1-	I_4+ I_3-		
Logic input floating contact	I_5 I_6			
Supply as label	AC	DC		
	I_L1line I_Nneutral I_TEtechnical earth	I_L1ajy I_Npolarity I_TEtechnical earth		

Connector II

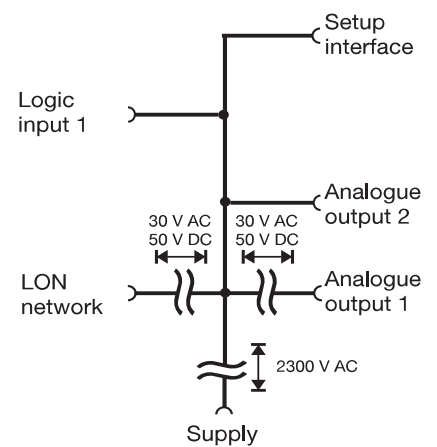
Connection for	Terminals	Notes	Diagram
LON interface	II_13 = TE	screen	
	II_14 = Net_A II_15 = Net_B	any polarity	

Dimensions



mm	inch
73.5	2.89
85.5	3.37
91.0	3.58
93.7	3.69

Isolation



Ordering details

(1)
704025/0-..

(1) Supply . .

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

Standard accessory

1 Installation Instructions M 70.4025.4

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