



### Your Advantages

- Widely used measuring and automation protocol
- Compact structure
- Easy installation
- Easy appliance
- Pluggable clamps
- TWIN- connection terminals to loop auxiliary supply and Bus

### Features

- According to IEC/EN 61131-2
- Modbus RTU-interface
- 8 digital inputs for DC 24 V
- 4 Relay outputs ( 3 x 8 A, 1 x 16 A)
- 3 potentiometer for setting the modbus adress and baud rate
- 15 LEDs for status indication
- Width: 22.5 mm

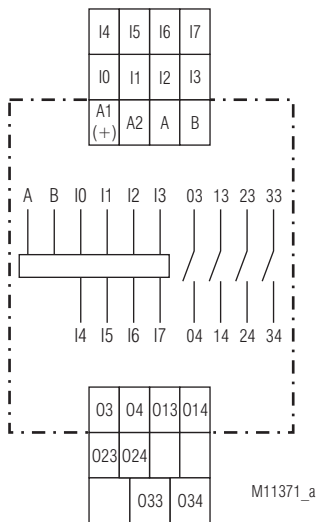
### Product Description

The I/O module UG 9460 has 8 digital 24V inputs and 4 relay outputs. Via Modbus the inputs can be read and the outputs can be set individually.

### Approvals and Markings



### Circuit Diagram



### Applications

The digital input modules collect signals of a control circuit from limit switches, push buttons, sensors etc. and can be read via Modbus and the outputs can be switched also via Modbus e.g. to activate actuators (e. g. contactors, valves etc.).

### Indicators

- Green LED "On": permanent on - Supply connected
- Red LED "ERR": flashing - Failure code of the device
- Yellow LED "Bus": flashing - When receiving or transmitting Modbus data
- Yellow status-LEDs "I<sub>0</sub> ... I<sub>7</sub>": On, when input active
- Yellow status-LEDs "O<sub>0</sub> ... O<sub>3</sub>": On, when output relay active
- Failure code : 9 - Modbus communication failure
- 9\*) = Number of flashing pulses in sequence

### Connection Terminals

Terminal designation	Signal description
A1 (+)	Auxiliary voltage + DC 24 V
A2	Auxiliary voltage 0 V, inputs 0V
A	Modbus signal A
B	Modbus signal B
I <sub>0</sub> ... I <sub>7</sub>	Digital inputs 0 ... 7
O3, O4	Relay outputs 0
O13, O14	Relay outputs 1
O23, O24	Relay outputs 2
O33, O34	Relay outputs 3

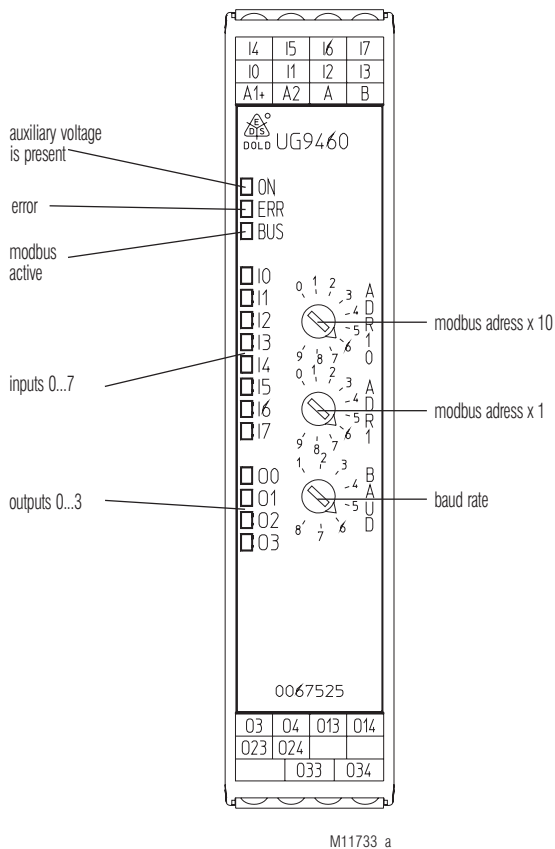
### Reset Function

By sending a reset command a reset can be operated via Modbus

### Modbus RTU

For communication between input / output module and a supervising control the Modbus RTU protocol according to Specification V 1.1b3 is used.

## Setting



M11733\_a

Position	1	2	3	4	5	6	7	8
Potentiometer BAUD								
Baud rate Baud	1200	2400	4800	9600	19200	38400	57600	115200
Response Time	< 50 ms	< 25 ms	< 10 ms	< 5 ms	< 5 ms	< 5 ms	< 5 ms	< 5 ms

## Technical Data

### Auxiliary voltage

<b>Auxiliary voltage <math>U_H</math> A1/A2:</b>	DC 24 V
<b>Voltage range:</b>	0.8 ... 1.1 $U_H$
<b>Nominal consumption:</b>	2.6 W DC 24 V

### Inputs

<b>Inputs:</b>	8 digital inputs	IEC/EN 61131-2
<b>Input voltage:</b>	DC 10 ... 30 V	

### Outputs

Contacts	4 NO contacts	
<b>UG 9460:</b>	3 NO contacts	
<b>Relay-outputs</b>	3 NO contacts	1 NO contact
Limiting continuous current $I_{th}$	O3, O4; O13, O14; O23, O24: 8 A	O33, O34: 16 A
Rated insulation voltage	AC 250 V	AC 250 V
Switching capacity min/max	0.1 / 2000 VA	4 / 4000 VA
Switching capacity min/max	0.1 / 120 W	35 / 500 W
Switching capacity to AC 15 to DC 13	AC 230 V / 3 A	AC 230 V / 10 A DC 24 V / 1 A
Operate time	20 ms	40 ms
Release time	15 ms	30 ms
Electrical life	1,5 x 10 <sup>5</sup> switch.cycl. at AC 230 V 5 A cos $\varphi$ = 1	1,5 x 10 <sup>5</sup> switch.cycl. at AC 230 V 16 A
Mechanical life	> 10 <sup>8</sup> switch.cycles	30 x 10 <sup>8</sup> switch.cycl.

## Technical Data

### General Data

<b>Operating mode:</b>	Continuous operation	
Operation:	- 20 ... + 50 °C (see derating curve)	
Storage:	- 25 ... + 75 °C	
<b>Relative air humidity:</b>	93 % at 40 °C	
<b>Altitude:</b>	< 2000 m	
<b>Clearance and creepage distances</b>		
Overvoltage category / contamination level between		
Output contact and logic:	6 kV / 2	IEC 60664-1
Output-output:	4 kV / 2	IEC 60664-1
<b>EMC</b>		
Electrostatic discharge:	8 kV (air)	IEC/EN 61000-4-2
HF-irradiation		
80 MHz ... 1.0 GHz:	10 V / m	IEC/EN 61000-4-3
1.0 GHz ... 2.5 GHz:	3 V / m	IEC/EN 61000-4-3
2.5 GHz ... 2.7 GHz:	1 V / m	IEC/EN 61000-4-3
Fast transients:	4 kV	IEC/EN 61000-4-4
Surge voltage between		
Wires for power supply:	1 kV	IEC/EN 61000-4-5
Between wire and ground:	2 kV	IEC/EN 61000-4-5
HF wire guided:	10 V	IEC/EN 61000-4-6
Voltage dips	IEC/EN 61000-4-11	
<b>Interference emission</b>		
Wire guided:	Limit value class B	IEC/EN 61131-2
Radio irradiation:	Limit value class B	IEC/EN 61131-2
<b>Degree of protection</b>		
Housing:	IP 40	IEC/EN 60529
Terminals:	IP 20	IEC/EN 60529
<b>Housing:</b>	Thermoplastic with V0 behaviour according to UL subject 94	
<b>Vibration resistance:</b>	Amplitude constant 3,5 mm, Frequency 5 ... 8.4 Hz, Acceleration constant 1.0g Frequency 8.4 Hz ... 150 Hz IEC/EN 61131-2 20 / 050 / 04 IEC/EN 60068-1 DIN 46228-1/-2/-3/-4	
<b>Climate resistance:</b>		
<b>Wire connection:</b>		
<b>Removable terminal blocks</b>		
<b>Relay connection 8 A</b>		
Pluggable cage clamp terminals (PC):	0.25 ... 1.5 mm <sup>2</sup> solid or 0.25 ... 1.5 mm <sup>2</sup> stranded wire with sleeve	
Insulation of wires or sleeve length:	12 mm	
<b>Relay connection 16 A</b>		
Pluggable screw terminal (S):	0.25 ... 2.5 mm <sup>2</sup> solid or 0.25 ... 2.5 mm <sup>2</sup> stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
<b>Wire connection:</b>		
Bus and auxiliary supply pluggable Twin-cage-clamp-terminal (PT):	0.25 ... 1.5 mm <sup>2</sup> solid or 0.25 ... 1.5 mm <sup>2</sup> stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
<b>Fixing torque:</b>	0.5 ... 0.6 Nm	
<b>Mounting:</b>	DIN rail	IEC/EN 60715
<b>Weight:</b>	220 g	

### Vibration resistance:

### Climate resistance:

### Wire connection:

### Removable terminal blocks

### Relay connection 8 A

### Pluggable cage clamp terminals (PC):

0.25 ... 1.5 mm<sup>2</sup> solid or  
0.25 ... 1.5 mm<sup>2</sup> stranded wire with sleeve

### Insulation of wires or sleeve length:

12 mm

### Relay connection 16 A

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### Insulation of wires or sleeve length:

8 mm

### Fixing torque:

0.5 ... 0.6 Nm

### Mounting:

DIN rail

IEC/EN 60715

### Weight:

220 g

### Dimensions

**Width x height x depth:** 22.5 x 105 x 120.3 mm

## Standard Type

UG 9460.04PM DC 24 V 8DI/4DO

Article number: 0067525

- With Modbus RTU interface

- 8 digital inputs

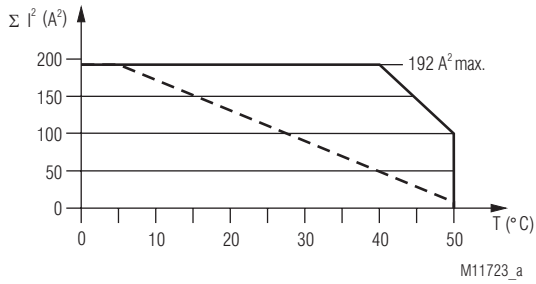
- 4 relay outputs

- Auxiliary voltage  $U_H$ : DC 24 V

- Adjustable baud rate

- Width: 22.5 mm

## Characteristics

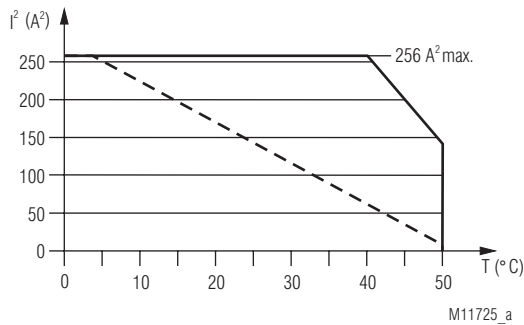


— device mounted on distance max. current at 50°C over contact path 03/04, 013/014, 023/024 =  $3 \times (6A)^2 = 108A^2$

- - - device mounted without distance heated by devices with same load, max. current at 50°C over 3 contactrows 03/04, 013/014, 023/024 =  $3 \times (1A)^2 = 3A^2$

$$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2$$

$I_1, I_2, I_3$  - current in contactrows 03/04, 013/014, 023/024



— device mounted on distance max. current at 50°C over contact path 033/034 =  $1 \times (12A)^2 = 144A^2$

- - - device mounted without distance heated by devices with same load, max. current at 50°C over contact path 033/034 =  $1 \times (2A)^2 = 4A^2$

$$I^2 = I_4^2$$

$I_4$  - current in contactrow 033/034

## Setting Facilities

- Potentiometer ADR10: - Unit address x 10
- Potentiometer ADR1: - Unit address x 1
- Potentiometer BAUD: - Baud rate

The module address and baud rate is only read after connecting the auxiliary supply!

## Setting and Adjustment

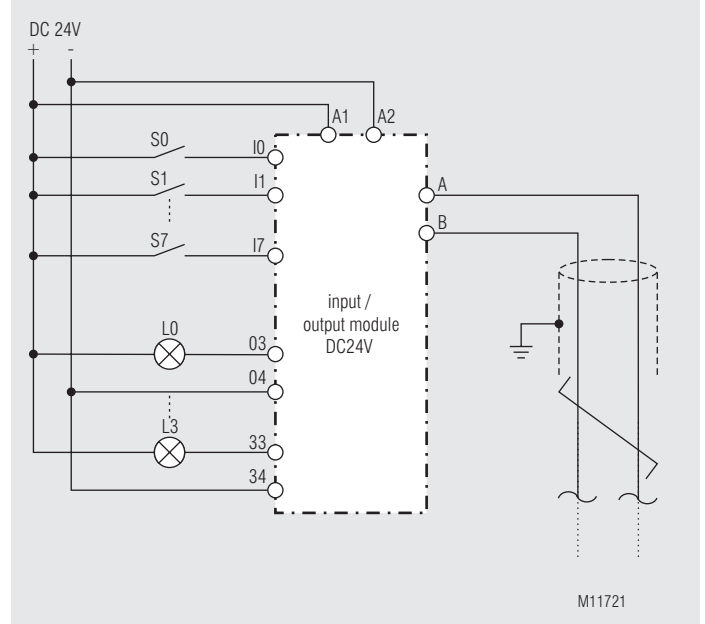
### Set-up procedure

1. Connect device according to application example.
2. Setting unit address and Baud rate via potentiometer.
3. Power up the unit.

## Safety Notes

- Never clear a fault when the device is switched on
- The user must ensure that the device and the necessary component are mounted and connected according to the locally applicable regulations and technical standards (VDE, TÜV, BG).
- Adjustments may only be carried out by qualified specialist staff and the applicable safety rules must be observed.
- Touch proof security is only provided when the power connection terminals are plugged into the unit.

## Application Examples



## Bus Interface

Protocol	Modbus Serii RTU
Address	1 bis 99
Baudrate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 Baud
Data bit	8
Stop bit	2
Parity	None

More information about the interface, wiring rules, device identification and communication monitoring can be found in the Modbus user manual.

## Function-Codes

At UG 9460 the following function codes are implemented:

Function-Codes	Name
0x01	Read Coil
0x02	Read Discrete Inputs
0x03	Read Holding Registers
0x04	Read Input Registers
0x05	Write Single Coil
0x06	Write Single Register
0x10	Write Multiple Registers

**Parameter tables**

## Coils

Register-Address	Protocol-Address	Name	Value range	Initial value	Description	Data type	Access rights
1	0	Reset	0x0000 0xFF00	0x0000	No function Error acknowledgement device error	BIT	write / read
2	1	Device reset	0x0000 0xFF00	0x0000	No function Device restart	BIT	write / read
3	2	WriteKonfig to EEPROM	0x0000 0xFF00	0x0000	No function Save parameter	BIT	write / read
4	3	Factory setting (after device restart)	0x0000 0xFF00	0x0000	No function Factory setting of the parameters	BIT	write / read
5	4	Reserved	0x0000 0xFF00	0x0000	-	BIT	-
6	5	Fault memory Rel 1	0x0000 0xFF00	0x0000	No function Fault memory acknowledgement relay 1	BIT	write / read
7	6	Fault memory Rel 2	0x0000 0xFF00	0x0000	No function Fault memory acknowledgement relay 2	BIT	write / read

## Discret Input

Register-Address	Protocol-Address	Name	Value range	Description	Data type	Access rights
10001	0	Input 0	0 ... 1	0: Input without voltage 1: Input with voltage	BIT	read
10002	1	Input 1	0 ... 1	0: Input without voltage 1: Input with voltage	BIT	read
10003	2	Input 2	0 ... 1	0: Input without voltage 1: Input with voltage	BIT	read
10004	3	Input 3	0 ... 1	0: Input without voltage 1: Input with voltage	BIT	read
10005	4	Input 4	0 ... 1	0: Input without voltage 1: Input with voltage	BIT	read
10006	5	Input 5	0 ... 1	0: Input without voltage 1: Input with voltage	BIT	read
10007	6	Input 6	0 ... 1	0: Input without voltage 1: Input with voltage	BIT	read
10008	7	Input 7	0 ... 1	0: Input without voltage 1: Input with voltage	BIT	read

## Input Registers

Register-Address	Protocol-Address	Name	Value range	Description	Data type	Access rights
30001	0	Device failure	0 ... 9	0: No failure 9: Communication fault Modbus	UINT16	read
30002	1	State of device	0 ... 2	0: Device initialize 1: Device ready 2: Error mode	UINT16	read
30003	2	Inputs	0 ... 255	Bit 0 = Input 0 ... Bit 7 = Input 7	UINT16	read

## Holding Registers

Register-Address	Protocol-Address	Name	Value range	Initial value	Description	Data type	Access rights
40001	0	Control word 1	0 ... 1	0	Bit 0 = Reset	UINT16	write / read
40002	1	Control word 2	0 ... 15	0	Bit 0 : Relay 0 Bit 1 : Relay 1 Bit 2 : Relay 2 Bit 3 : Relay 3	UINT16	write / read
40003	2	Timeout release	0 ... 1	0	Bit 0 = Enable	UINT16	write / read
40004	3	Timeout	100 ... 10000 0 ... 10000	1000	Timeout value in ms (write) Timeout value in ms (read)	UINT16	write / read