# DR-00 Technical Manual

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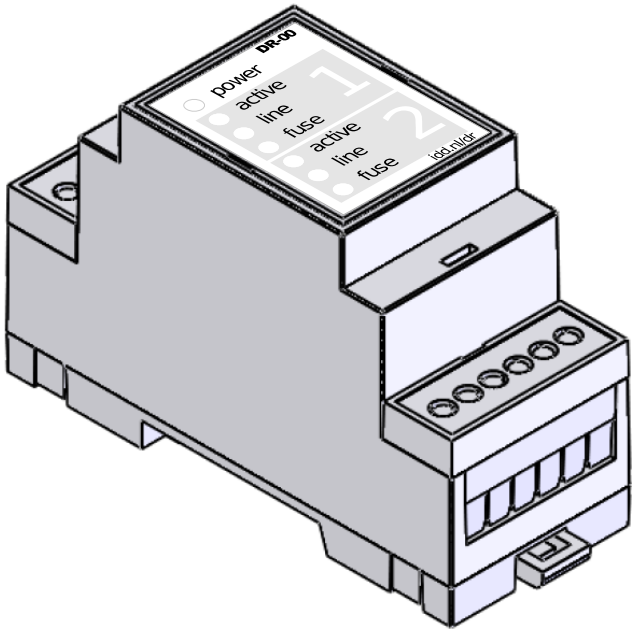


# Contents

# 1. Introduction

The DR-00 dual channel output interface is a component in alarm systems where monitoring of line integrity is required, such as fire, smoke and gas alarms.

## Features:

- 24V operating voltage
- Two independent channels
- Relay outputs capable of switching 1.5A load
- Active line monitoring (open or short) using polarity inversion (-12V)
- Overcurrent protection and fault monitoring
- Status indication with LEDs on frontpanel
- Isolated current loop Fault output (4mA idle, 2mA fault)
- Isolated SPDT relay Fault output

# 2. Pin description

| Pin | Name | Description |
|---|---|---|
| 1 | GND | Power ground (connected to 2, 11) |
| 2 | GND | Power ground (connected to 1, 11) |
| 3 | +24V | Supply voltage (connected to 4) |
| 4 | +24V | Supply voltage (connected to 3) |
| 5 | Out1+ | Output 1 supply (connected to +24V when active, GND when inactive) |
| 6 | Out1- | Output 1 ground (connected to GND when active, -12V when inactive) |
| 7 | Out2+ | Output 2 supply (connected to +24V when active, GND when inactive) |
| 8 | Out2- | Output 2 ground (connected to GND when active, -12V when inactive) |
| 9 | In1 | Input 1 |
| 10 | In2 | Input 2 |
| 11 | GND | Signal ground (connected to 1, 2) |
| 12 | CL- | Current loop output negative terminal |
| 13 | CL+ | Current loop output positive terminal |
| 14 | NO | Normally open relay output (connected to 15 when Fault) |
| 15 | COM | Common relay terminal (connected to 16 when OK, 14 when Fault) |
| 16 | NC | Normally closed relay output (disconnected from 15 when Fault) |

# 3. Operation

The DR-00 dual channel output interface is operated from a +24V power supply.

The two inputs accept nominally 0/+24V input signals. Outputs are DPDT relay contacts switched to the supply voltage when the corresponding input is activated (+24V).

When the inputs are deactivated, the outputs are switched to a negative (-12V) voltage through a 10k internal resistor. The external wiring should be terminated by a separate 10k resistor, to enable line monitoring. External loads should be connected in series with a diode, large enough to pass the maximum load current (eg. 1N5401 or equivalent), or have an internal diode.

While the input is activated, the output state is continuously monitored. If the output fuse is tripped as a result of a short circuit or over current, this fault condition is detected and will activate the Fault state.

When the line is open or shorted while the input is deactivated, the line monitoring circuit will detect this fault condition and activate the Fault state.

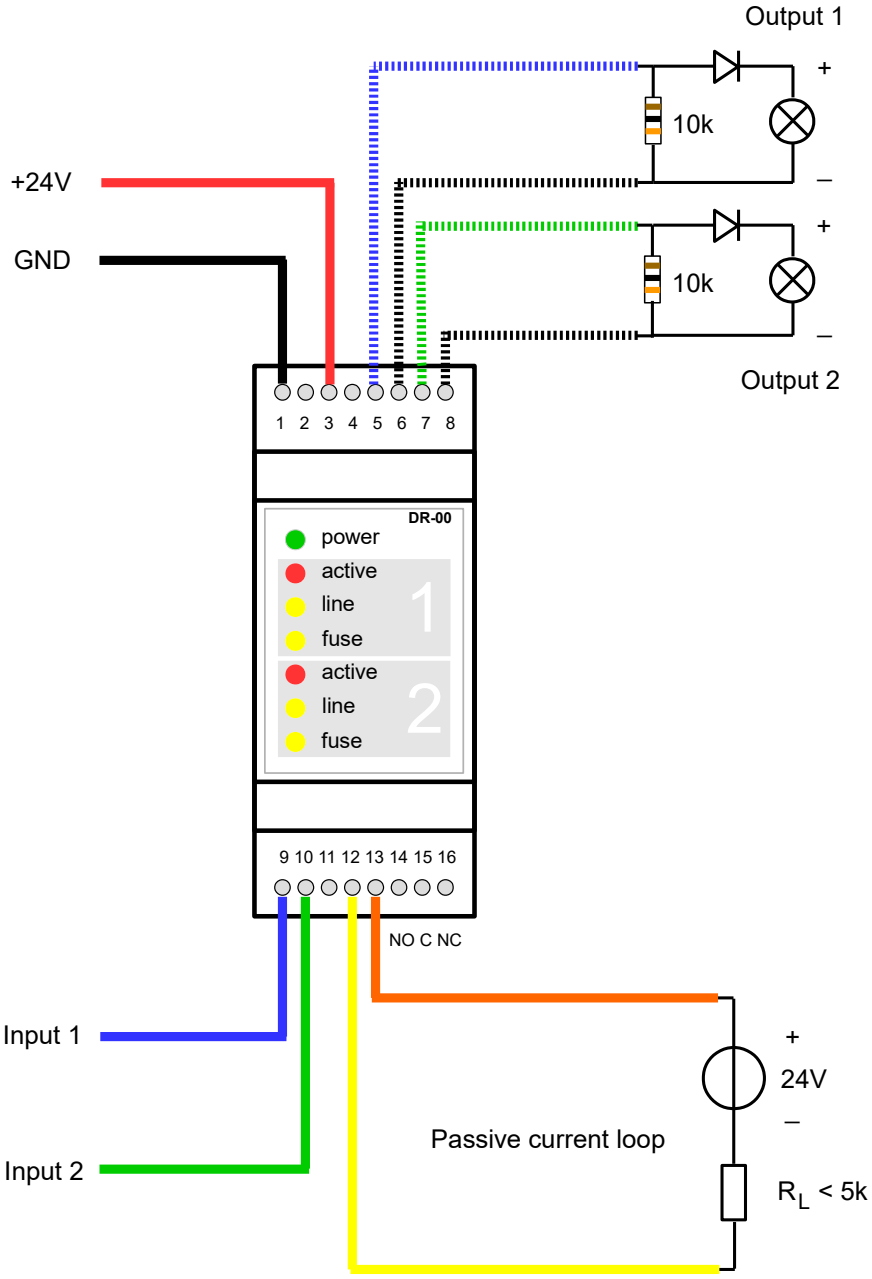
When either channel is in fault condition, the Fault state is indicated by a yellow LED on the frontpanel, and also by a 2mA current level on the current loop output. Morever, the Fault relay is powered off, so that the NC terminal is disconnected, and instead the NO terminal is connected to the COM terminal.

In idle state, the current loop will draw 4mA, and the NC terminal is connected to the COM terminal, while the NO terminal is disconnected.

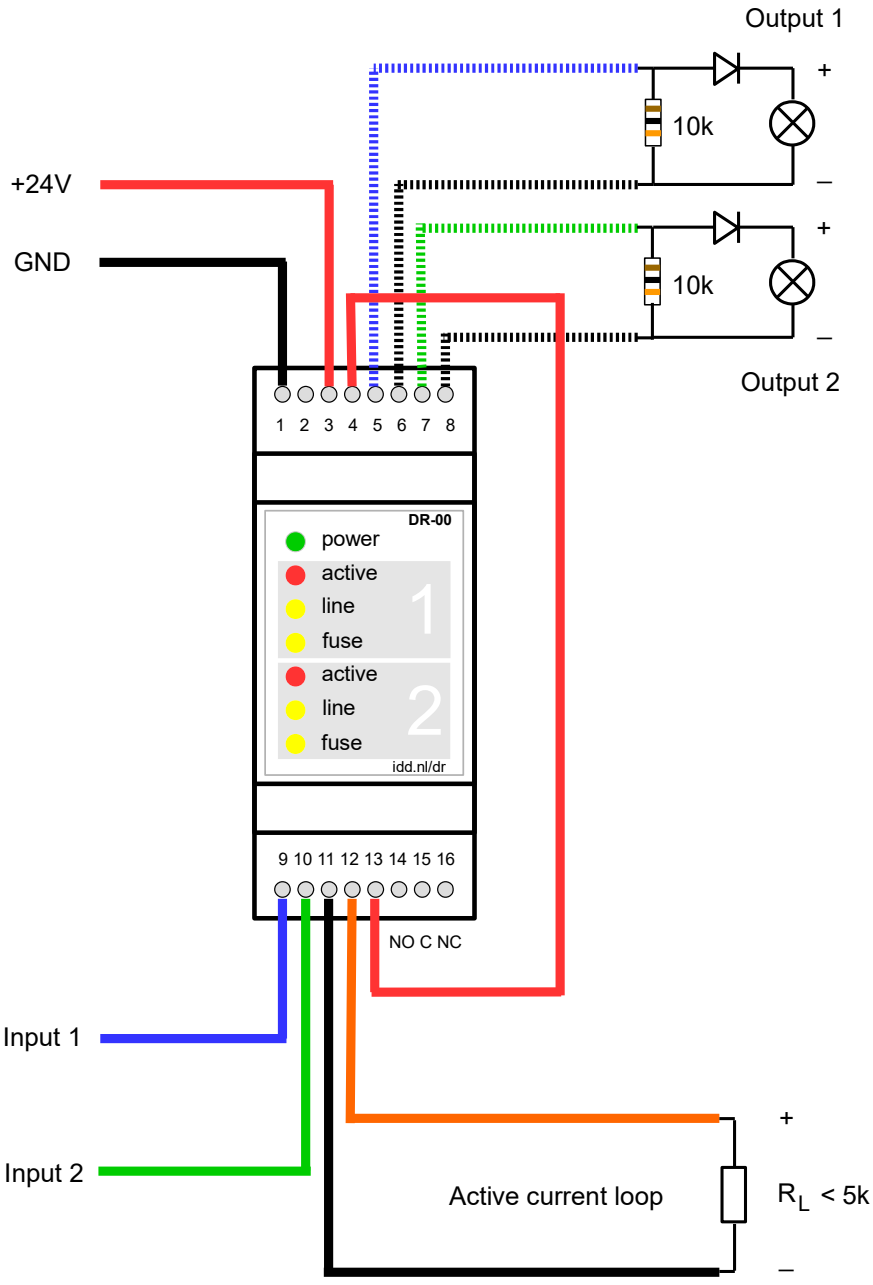
If the power supply level falls below operating conditions, the Fault state is also activated. Active current loop output however is not guaranteed under those conditions, depending on the supply voltage level (active current loop requires at least 5V supply level with a 500 ohm load).

# 4. Wiring diagrams

1. Passive (isolated) current loop



2. Active (non-isolated) current loop



# 5. Electrical specifications

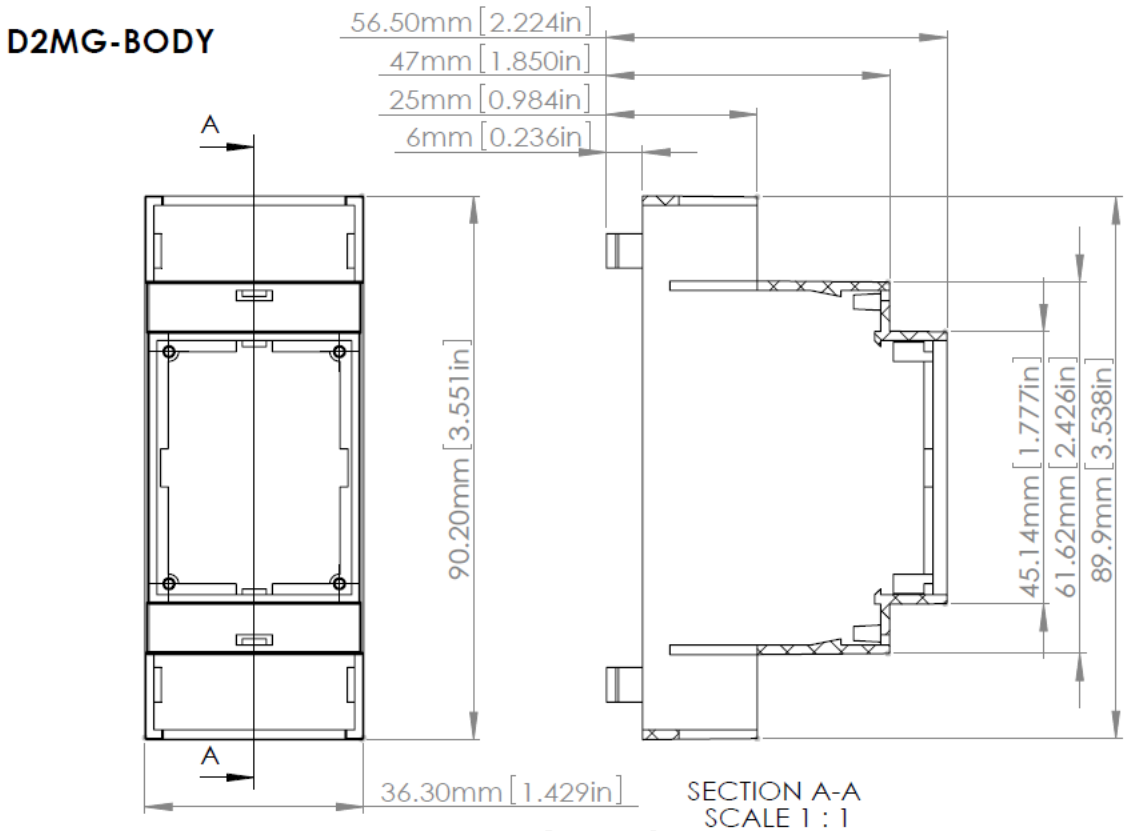
At 25 °C ambient temperature

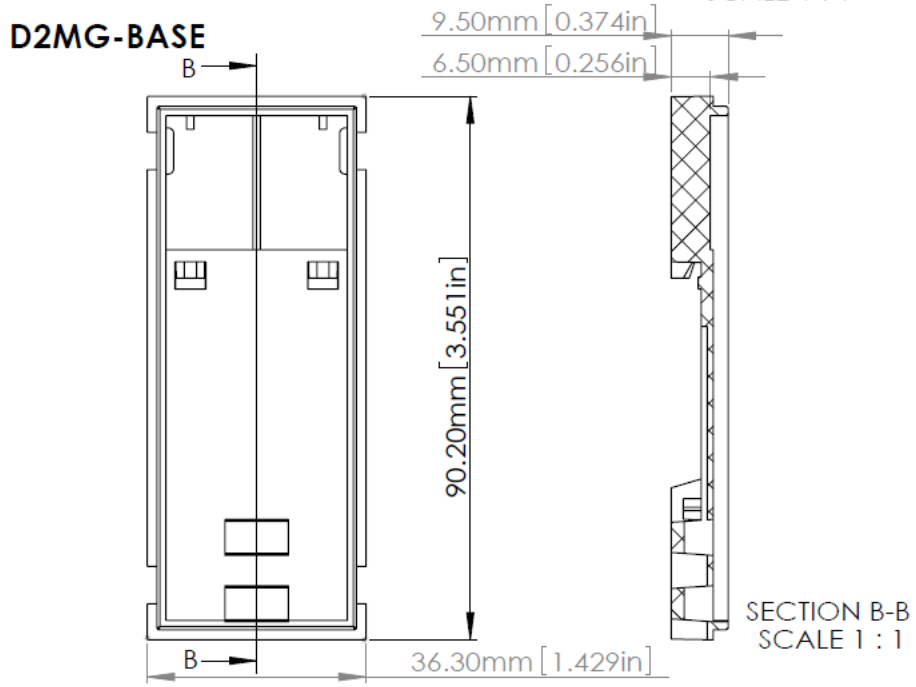
| Symbol | Description | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{sup}$ | Supply voltage | 16 | 24 | 30 | V |
| $I_{sup(idle)}$ | Supply current | | 20[1] | 75[2] | mA |
| $V_{in(low)}$ | Input voltage low | -30 | | 4 | V |
| $V_{in(high)}$ | Input voltage high | 10 | | 30 | V |
| $R_{in}$ | Input impedance | | 43 | | kΩ |
| $I_{out(max)}$ | Maximum output current | 1.5[3] | 1.8[4] | | A |
| $I_{out(trip)}$ | Output fuse trip current | | 3.6 | | A |
| $t_{trip}$ | Output fuse trip time [5] | | 6 | | s |
| $I_{out(short)}$ | Output short circuit current [6] | | 60 | | mA |
| $R_{term}$ | Line termination resistance | 8 | 10 | 12 | kΩ |
| $V_{sense}$ | Line sensing voltage [7] | | -12 | | V |
| $R_{sense}$ | Line sensing output impedance [7] | | 10 | | kΩ |
| $V_{cl}$ | Current loop operating voltage range | 5[8] | | 30 | V |
| $R_{load}$ | Current loop load resistance [9] | | | 5 | kΩ |
| $I_{cl(idle)}$ | Current loop idle state current | 3.75 | 4 | 4.25 | mA |
| $I_{cl(fault)}$ | Current loop fault state current | 1.75 | 2 | 2.25 | mA |

Notes:

1. 24V supply voltage, both inputs deactivated, idle state
2. 24V supply voltage, both inputs activated, fault state, excluding output current
3. At 40 °C ambient temperature
4. At 25 °C ambient temperature
5. At 8A output current
6. Fuse in tripped state
7. Corresponding input deactivated
8. At 500Ω load resistance
9. At 24V current loop supply voltage

# 6. Dimensions



# 7. Schematic diagram