LEG Industrie-Elektronik **GmbH**
D- 41751 Viersen-Dülken · Textilstr.2
☎ +49 (0) 2162-5030621 ✉ +49 (0) 2162-5030629
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Wire Breakage Monitoring – Short Circuit Monitoring DW4
Wire Breakage Monitoring for Flashlights and Sirens

Characteristics:

- **For load current 5mA - 3A**
- **Monitoring also in idle condition**
- **Optimized for flashlights and sirens**
- **Short circuit proof, 30s**
- **Status display in front panel**
- **Fault signal output, N/C, analog switch**
- **Supply 24VDC**
- **Mountable on 35mm cap rail TS35**
- **Clear terminal labeling**
- **Narrow design**
- **Shape 17,5mm, super low**
- **PB - Power-Bus compatible**
- **High reliability, 5 years warranty**

Description:

The devices of the wire breakage detector series DW4 have been developed for monitoring of both driven as well as non-driven consumer wires. They correspond in their functioning to the series DW2, but they were optimized especially for flashlights and sirens. (They also can be used for other consumers as for example magnetic valves or resistive loads). Because they have a pulsating current consumption during operation, a wire breakage during driven condition will be signaled after a delay time of ca. 6 seconds, during non-driven operation there is no delay of the report.

Functionality:

The flowing current of the connecting wire is monitored, an error message will be reported at lower deviation or exceeding of the nominal value.

During the idle condition a small measuring current will be send via the wire through the consumer. If the connected load is not accepting the measuring current, e.g. electronic loads as flashlights and sirens, there has to be switched a resistor parallel to the consumer (see connecting examples). In purely resistive loads this is not necessary.
To keep the power loss small because of the additionally occurring load during driven condition, there are separate measuring circuits for the driven condition (JP1: 1+2+3) and the non-driven condition (JP1: 3+4+5) available. So the jumper JP1 can be placed according to the selected parallel resistor.

Example:
Range of load 80...400mA / idle current circuit 7, 2…12,6mA
Selected parallel resistor 4,7kΩ (according to technical data).Via the wire
This results in: JP1:3 for the load current circuit and JP1:4 for the idle current circuit.

The proper condition of the wire is caused by a potential free contact (analog switch), loadable with 30V/100mA signaled, which switches off in cause of malfunction or voltage failure (idle current circuit). A LED in the front panel signals the faultless condition of the wire. In case of a short circuit the output will be switched off and checked again for short circuit at an interval of 10sec.

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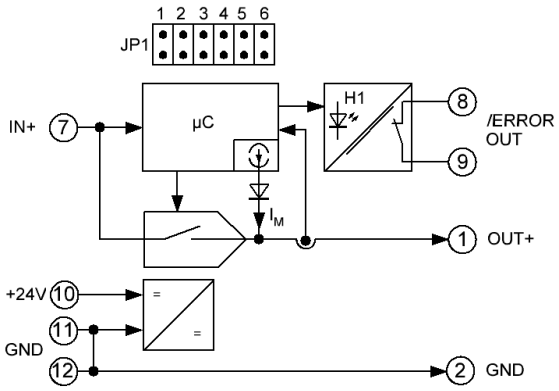
The devices of the series DW4-1are extracting the load current directly from the driven output. Whereas the modules DW4-2 have an additional power amplifier, which supplies the current from the devices supply. The driving of the DW4-2 is therefore nearly without power.
Therefore this devices can be used as a power driver for SPS-outputs.

Application:

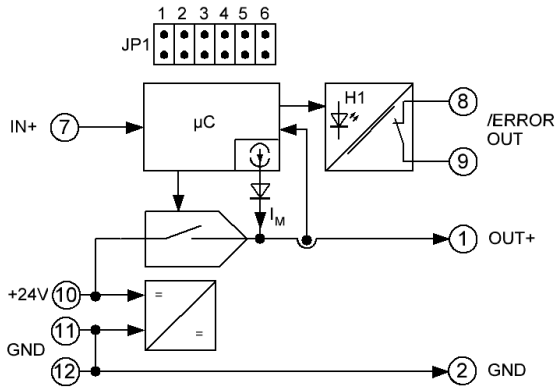
Monitoring of 24VDC PLC- / SPS-outputs, safety- technology
Monitoring of alarm devices / extinguishing systems
Monitoring of flashlights and sirens

Order code: Output:

DW4-1	5…400mA
DW4-2	0, 32…3A



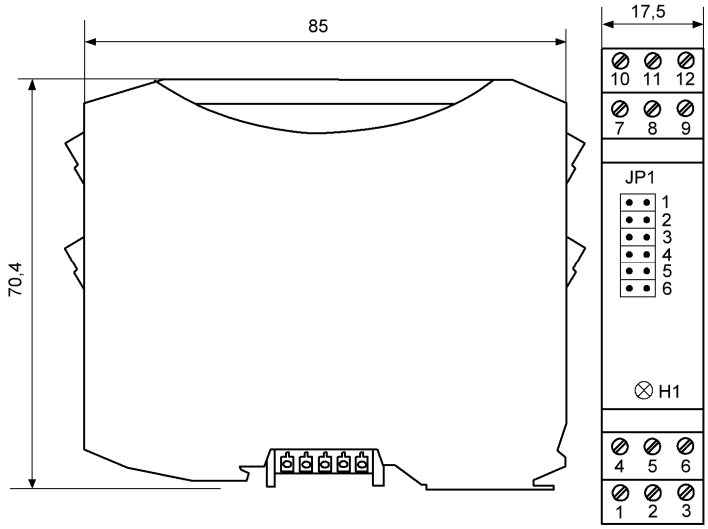
DW4-1



DW4-2

Notice:

For the type DW4-1 the adjustment for the load range by means of jumper JP1 -1, -2, -3 and for the closed current circuit by means of JP1 -4, -5, -6. They have to be plugged accordingly to the above table. Only if it is necessary to have a resistance parallel to the load (to let the measurement current flow), it is allowed to plug the jumper JP1 for the closed current circuit (-4, -5, -6), corresponding to the chosen resistance, deviating from the table. (cf. technical data).



Data sheet DW4 Stand: 07 – 2015

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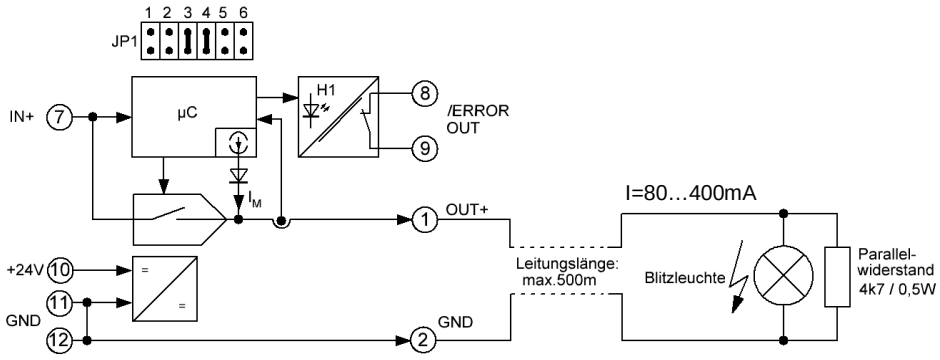
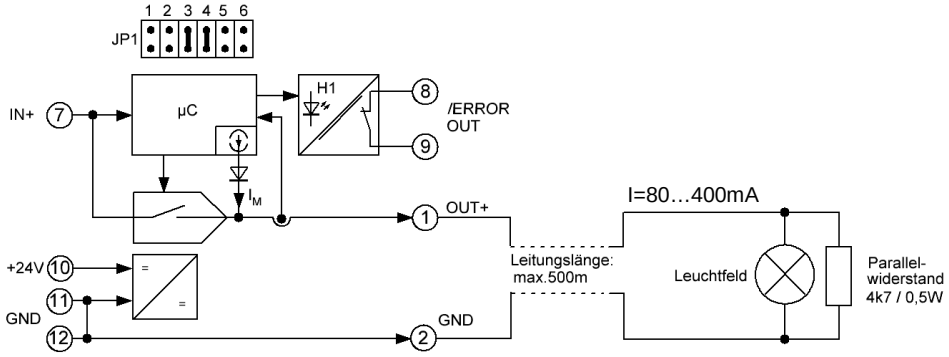
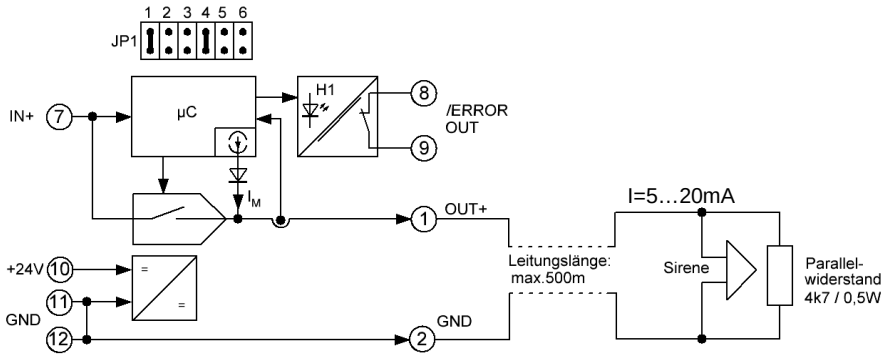
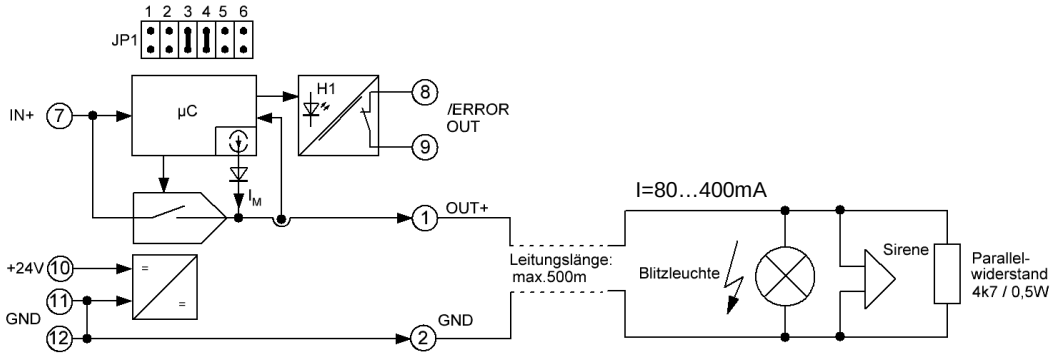
Connection examples:









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Technical data

Auxiliary power:

Supply voltage	:	19…30VDC
Current consumption	:	<0,5VA + measurement current + load current

Inputs

Control voltage	:	19…30VDC (terminal 7)

Measurement current output circuit: (Optional) **parallel resistance**

DW4-1	:	0, 5…0,8mA	range 5...20mA	4,7kΩ / 0, 5 W, JP1 = 4
		1, 9...3mA	range 20...80mA	1,2kΩ / 2 W, JP1 = 5
		7, 2...12,6mA	range 80...400mA	1,2kΩ / 2 W, JP1 = 5 or
				optional 4,7kΩ / 0,5W, JP1 = 4
DW4-2	:	20…25mA		75Ω / 10W, JP1 = 6
	:	1, 5…2,5mA		1,2kΩ / 2 W, JP1 = 5

Output load circuits:

Voltage output DW4-1	:	Control voltage minus 0,5V
Voltage output DW4-2	:	Vcc – 0,2V
Power output	:	DW4-1 5…400mA, short- circuit proof max. 30s
		DW4-2 0, 32…3A, short-circuit proof
Switch delay	:	Type: 50ms / max. 70ms
Switch frequency max.	:	R-load 15Hz, L-load1Hz
Wire length	:	max. 500m
Wire resistance	:	max. 39Ω

Output resistance :

	in closed circuit*	in load circuit	measurement range
DW4-1	4,7kΩ	47Ω	5...20mA
	1,2kΩ	10Ω	20...80mA
	270Ω	2,7Ω	80...400mA
DW4-2	150Ω	0,022Ω	0, 32...3A

*this will be switched intern to a voltage reference of 4, 3 V to generate the measurement current.

Operating range: **Safe fault detection:**

		Load range:	**Wire breakage:**	**Short-circuit:**
DW4-1				
Load range JP1: 1+4	:	5...20mA	< 1mA	> 40mA
Load range JP1: 2+5	:	20...80mA	< 10mA	> 160mA
Load range JP1: 3+6	:	80...400mA	< 40mA	> 800mA
JP1: -4,-5,-6	:	optional for parallel resistance (see measurement current circuit)		
DW4-2				
Load range JP1: -6	:	0, 32...3A	< 160mA	> 6A
JP1: -5	:	optional for parallel resistance (see measurement current circuit)		

Calibrated version on request!!!

Malfunction contact	:	N/O contact (analog switch) with N/C contact function, max. 30VDC/100mA
		Contact resistance: typical 0,85Ω, max. 2,5Ω
Switch delay	:	Short-circuit: Type: 100ms / max. 300ms
		Wire breakage: Type: 6s / max. 6, 5 s

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General data:

Operating temperature	:	0...50°C
Storage temperature	:	-25...+85°C, condensation before putting into operation is not allowed
MTBF	:	71 years Mean Time Between Failures – according to EN 61709 (SN 29500). Requirements: Stationary operation in clean rooms, average ambient temperature 40 ° C, no forced ventilation, continuous operation
CE conformity	:	EN 61326-1, EN 61000-4-2/3*/4/5/6*, EN 61000-6-4 * during measurements small deviations are possible

Body:

Dimension	:	See drawing, 17,5mm adjoin body, 17,5x70,4x90,5mm (with terminals)
Material	:	PA / V0
Protection category	:	IP20
Connection	:	M3-srew-type terminal 0, 14 - 2,5mm², flexible or inflexible
Fixing	:	Snap-on mounting for norm rail TS35
Weight	:	66g
Mounting position	:	As you like

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Note on safety:

Disconnect the power supply before attempting to open the unit.

During the operation of this module it is possible that parts of the module, even there is extra-low voltage, (for example shunt measurement) are under dangerous voltage! Therefore a non-observance of this caution may cause damage of property or physical injury.
Only trained qualified personnel should install or operate the unit. Before installation the qualified personnel should read the documentation and should familiarize themselves with the unit.
If there is visible damage to the body of the unit it should be immediately replaced and not put into operation.

Please ensure that there is a sufficient prevention against electrostatic discharge during installation of the unit.

Installation Information:

Pay attention and make sure the unit is far away from mounted sources that may disturb the device such as magnetic coils, transformers, frequency converters etc.

Wiring advice:

Use only shielded cables. The shield is to be connected extensively to ground. Do not mix power- and signal-wires/cables in the same cable tray.

Limited warranty:

The LEG Industrie-Elektronik GmbH warranted that the product does not have any material or processing defects in a period of 5 years after date of delivery.
It is up to the choice of LEG to repair or to exchange an inoperative unit.
Subsequent damages or any claim for indemnification above the functionality of the unit are excluded.
This limited warranty is only valid if …

1. the product was installed and put into operation according to the LEG operation documentation;
2. the technical configuration of the power supply was abided;
3. the product was not used for unintended purposes;
4. there were no unauthorized modifications or manipulations, misuse or repairs without previous agreement from LEG .

Our Terms of Trade are based on the “General Conditions for the supply of products and services of the Electrical and Electronics Industry” including the “Complementary Clause: Extended Reservation of Property” of the ZVEI e.V. (German Association of Electrical Manufacturers).

Miscellaneous:

We expressly reserve the right, without previous notice, to correct errors contained in any data of this information brochure, and to make alterations to the program and technical modifications.