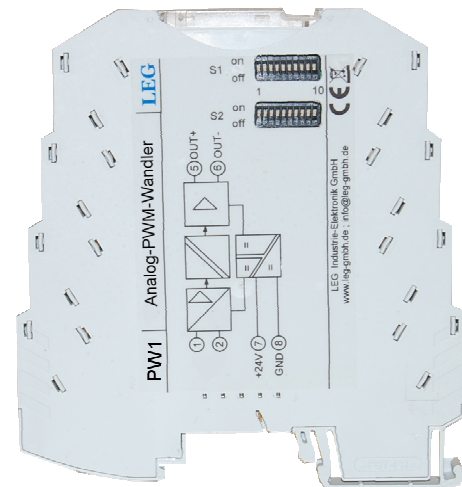


Analog – PWM – Converter

PW1

Characteristics:

- PWM frequency configurable 10Hz...5kHz
- PWM Measurement range configurable 0...100% / 30...70%
- galvanic 3-way isolation between
Input - Output - Power supply
- Current or voltage input configurable
- Fault alarm output
- Supply 24VDC
- for rail mounting TS35
- clear terminal marking
- Device width 6.2mm
- high reliability, 5 years warranty



Description

The analog PWM converter is used to convert an analog standard signal of 0/4...20mA, 0/2...10mA or 0/2...10V, 0/1...5V into a proportional PWM signal with frequencies from 10 Hz to 5 kHz and pulse-pause ratios from 0...100% to 30...70%. The measuring range can be configured by the user, via DIP switches (according to table). An optocoupler output and a red LED on the front of the housing indicate when the measuring range is exceeded or undershot. A yellow LED indicates that the module is ready for operation. To activate the configuration via the integrated USB interface, all dip switches must be set to "off". Furthermore the LEG parameterization software "LEGset" and a USB cable (Micro USB) are required, an additional adapter is NOT necessary.

Input, output and auxiliary power are isolated from each other by a 3-way galvanic isolation.

For the supply of the measuring transformer an auxiliary power of 24V is required. The devices are housed in a space-saving plastic housing only 6.2 mm wide and are suitable for mounting on TS35 mounting rails.

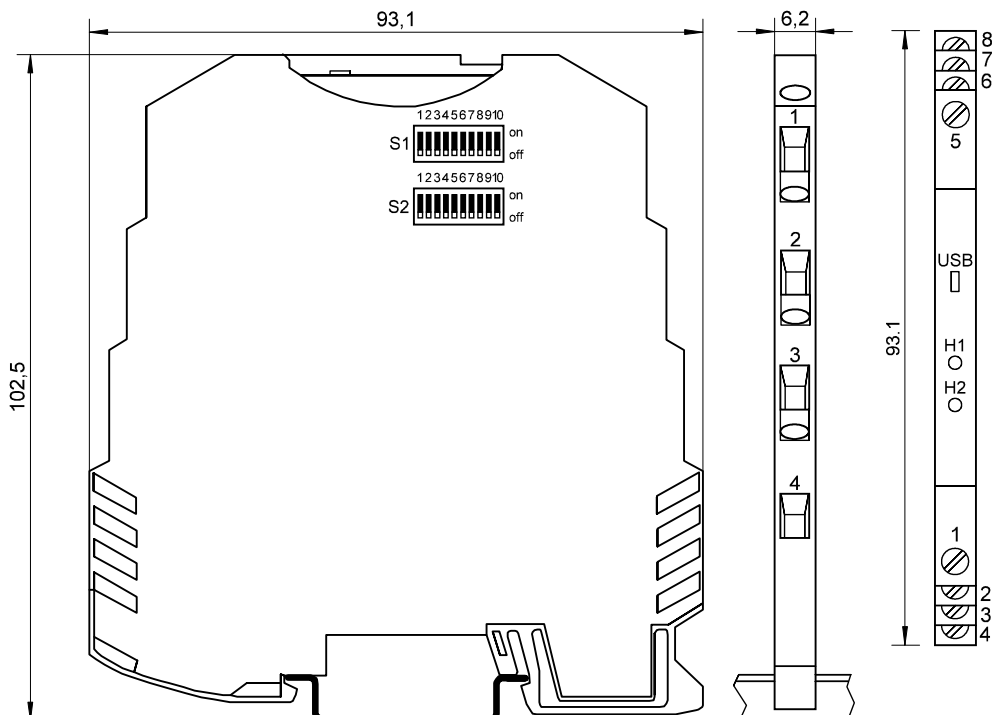
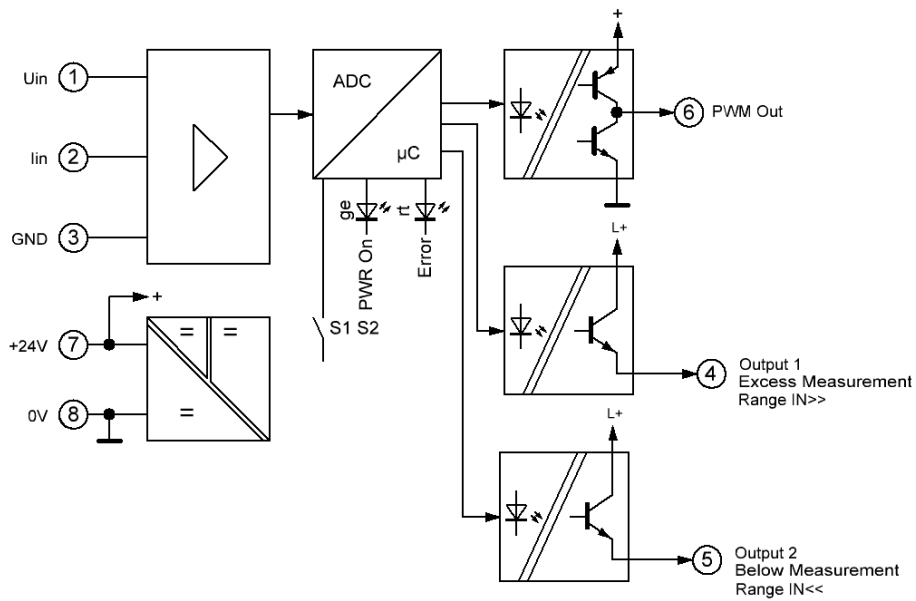


Table 1

DIP switch S1 (● = On)																	
PWM Output frequency										Input signal				Error handling			
1	2	3	4	5	Hz	1	2	3	4	5	Hz	6	7	8	U / I	9	10
					10				●		300				0...10V		
●					20	●			●		400	●			2...10V		
	●				50		●		●		500		●		0...5V		
●	●				60	●	●		●		800	●	●		1...5V	●	
		●			100			●	●		1 k			●	0...20 mA		●
●		●			150	●		●	●		2 k	●		●	4...20 mA	●	●
	●	●			200		●	●	●		2,5 k		●	●	0...10mA		
●	●	●			250	●	●	●	●		5 k	●	●	●	2...10mA		

*only valid for measuring ranges with an initial value >0

Table 2

Table 2

DIP switch S2 (● = On)																	
PWM Pulse-Pause ratio												Filter / Measurement cycle					
1	2	3	4	5	%	1	2	3	4	5	%	6	7	8	9	10	ms
					0...100					●	16...84	●					3
●					1...99	●				●	17...83		●				5
	●				2...98		●			●	18...82	●	●				7,5
●	●				3...97	●	●			●	19...81			●			14
		●			4...96			●		●	20...80	●		●			28
●		●			5...95	●		●		●	21...79		●	●			50
	●	●			6...94		●	●		●	22...78	●	●	●			100
●	●	●			7...93	●	●	●		●	23...77				●		200
			●		8...92					●	24...76	●			●		400
●			●		9...91	●			●	●	25...75		●		●		800
	●		●		10...90		●		●	●	26...74						
●	●		●		11...89	●	●		●	●	27...73						
		●	●		12...88			●	●	●	28...72						
●		●	●		13...87	●		●	●	●	29...71						
	●	●	●		14...86		●	●	●	●	30...70						
●	●	●	●		15...85												

Default setting

All DIP switches are set to position "off" on delivery. This is the necessary setting to configure the devices via the USB interface.	
Function	Setting
PWM Pulse-Pause ratio	10...90 %
Input	0...10 V
PWM Output frequency	100 Hz
Filter / Measurement cycle	100 ms
Error handling	High / High

Table 3

Resolution depending on measuring range	
Measuring range	Resolution
10...500 Hz	15 Bit
800 Hz	14 Bit
1 kHz	13 Bit
2...2,5 kHz	12 Bit
5 kHz	11 Bit

Technical data

Supply:

Supply voltage : $U_b = 19,2 \dots 36V$ DC
Power consumption : $< 0,7VA$

Analog Input:

Voltage input : $0(2) \dots 10V$ or $0(1) \dots 5V$ / $R_i = 220k\Omega$
Input resistance : $220k\Omega$
Input current : $0(4) \dots 20mA$ or $0(2) \dots 10mA$ / $R_i = 50\Omega$
Resolution : 11 to 15 Bit depending on PWM frequency (see Table 3)
Measuring cycle : 100ms by DIP-switch-configuration
3, 5, 7.5, 14, 26, 50, 100, 200, 400 or 800ms by Software configuration
Error handling : Signal via optocoupler

Output:

PWM output : $U_b - 2V$ / max. 100mA
Error output : $U_b - 1V$ / max. 50mA
Threshold : Error $> 1\%$ of measuring range; Hysteresis 2%
Output frequency : 10 Hz to 5kHz configurable in steps

Accuracy:

Linearity error : $< 0,2\%$
Measurement accuracy : $< 0,1\%$ full measurement range
Temperature coefficient : $< 0,01\%$ / K

General data:

Operating temperature : $0 \dots 50^\circ C$
Storage temperature : $-25 \dots +85^\circ C$, condensation before putting into operation is not allowed
Test voltage : 1,5kVAC / 50Hz / 60 sec. / between input / output / supply
MTBF : 168 years mean time between failures – according to EN 61709 (SN 29500).
Requirements: Stationary operation in clean rooms, average ambient temperature
 $40^\circ C$, no aeration, continuous operation
CE conformity : EN 61326-1, EN 61000-4-2/4/5/6*, EN 61000-6-4
* during measurements are small deviations possible

Body:

Dimension : See drawing, 6,2mm adjoin body, 6,2x93,1x102,5mm (with terminals)
Material : PA / V0
Protection category : IP20
Connection : M3-screw-type terminal 0, 14 - 2,5mm², flexible or inflexible
Fixing : Snap-on mounting for norm rail TS35
Weight : 60g

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.