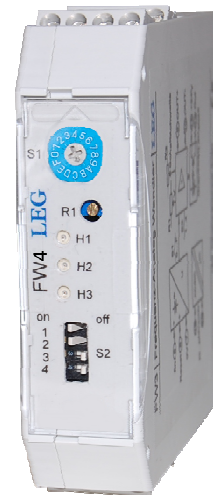


PWM / Analog – Converter

FW5

Characteristics:

- Linearity error < 0,2%
- PWM input frequency 20Hz to 2kHz
- PWM limits adjustable
- Output voltage/current switchable
- Status display of the input frequency
- Monitoring of PWM limits / frequency
- Supply 20...253V_{ac}
- Mountable on 35mm cap rail TS35
- Clear terminal labeling
- Narrow design
- Shape 22,5mm
- High reliability, 5 years warranty



Description:

The devices of the series FW5 PWM-analog converter have been developed for proportional converting of PWM square wave signals with frequencies of PWM 20Hz to 2kHz into norm signals 0...10V or 0/4...20mA. The mark-to-space ratio in the range of 3...97% and 20...80% is adjustable via potentiometer or rotary switch.

The limits of the PWM signal as well as the input frequency are monitored, in case of a deviation it is signaled via a fault signal output and an LED (H3) in the front panel.

The nominal input level is 24V, the PWM signal form is limited to square wave pulses.

Via control input „ENABLE“, the function of the device is enabled. In closed condition the analog output and the fault signal output is set to „0“.

Via Dip-switch S2 the analog output is switched to usual norm signals 0...10V and 0/4...20mA. The LED's H1 and H2 are signaling the state of the input frequency or enable input.

Adjustment of the desired measurement range:

Option 1: Fixed ranges set by rotary switch according to table

Option 2: freely configurable via potentiometer R1 as follows:

- a) Rotary switch on position „0“
- b) Release the device via „ENABLE“.
- c) Connect the minimum on / off time ratio on PWM-input (for example. 4%)
- d) Level out the analog output with potentiometer R1 to 0V.
- e) Level out finished.
- f) The on / off time ratio of the measurement range is now 4....96%

Application:

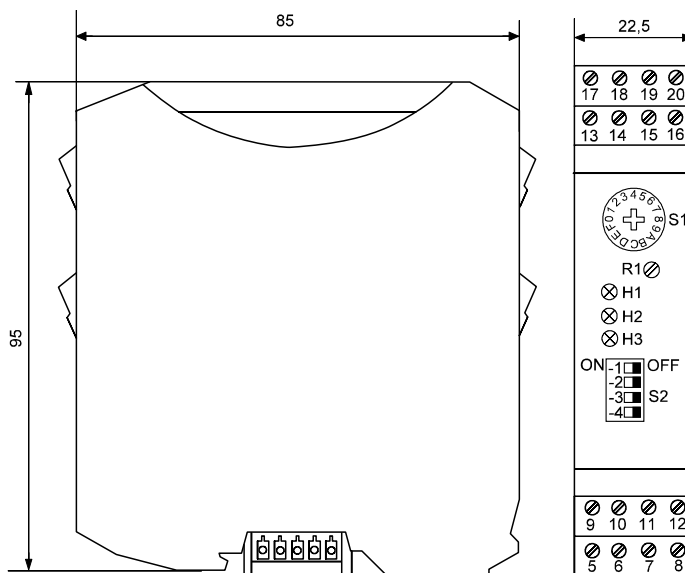
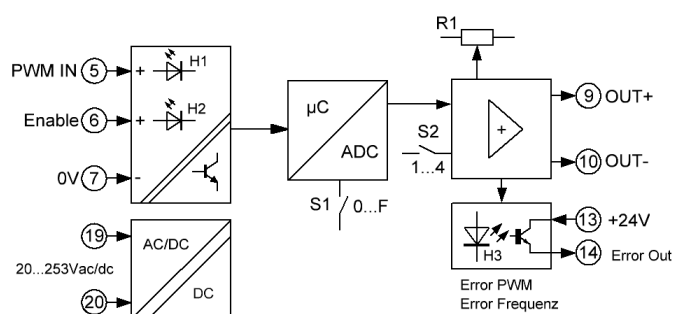
Aerator monitoring

Rotary switch S1

| Switch position S1 | Measurement range PWM |
|--------------------|---------------------------------|
| 0 | Adjustable via potentiometer R1 |
| 1 | 3...97% |
| 2 | 5...95 % |
| 3 | 6...94 % |
| 4 | 7...93 % |
| 5 | 8...92 % |
| 6 | 10...90 % |
| 7 | 12...88 % |
| 8 | 13...87 % |
| 9 | 14...86 % |
| A | 15...85 % |
| B | 16...84 % |
| C | 17...83 % |
| D | 18...82 % |
| E | 19...81 % |
| F | 20...80 % |

Dip-switch S2

| Output | S2 - 1 | S2 - 2 | S2 - 3 | S2 - 4 |
|----------|--------|--------|--------|--------|
| 0...10V | On | On | Off | Off |
| 0...20mA | Off | Off | On | Off |
| 4...20mA | Off | Off | On | On |



Technical data

Auxiliary power:

| | | |
|---------------------|---|-------------------------|
| Supply voltage | : | 19...255V _{uc} |
| Current consumption | : | 1W...2,5VA |

Inputs:

| | | |
|---------------------|---|---|
| Signal amplitude | : | 24V (16, 8...30V) |
| Signal power | : | 5...8mA |
| PWM frequency | : | 20Hz to 2 kHz |
| On / off time ratio | : | 3...97 to 20...80% adjustable See table "switch position S1" |
| Signal form | : | Square wave |
| Setting time | : | 1 / measurement frequency + 800µs |

Analog output:

| | | |
|----------------|---|---------------------------------------|
| Voltage output | : | 0...10V / max. 20mA |
| Current output | : | 0(4)...20mA / load resistor max. 500Ω |

Digital output:

| | | |
|-----------------|---|--|
| Optocoupler | : | 24DC / 100mA, conditionally short circuit proof < 2s |
| Fault signal if | : | |
| PWM | : | in deviation of the on / off time ratio ±1% |
| Input frequency | : | <19, 5 Hz or >2150 Hz |

Accuracy:

| | | |
|---------------------------|---|-------------|
| Linearity error | : | < 0, 2% |
| Measurement resolution: | : | 12 Bit |
| Temperature coefficient : | : | < 50ppm / K |

General data:

| | | |
|-----------------------|---|---|
| Operating temperature | : | 0...50°C |
| Storage temperature | : | -25...+85°C, condensation before putting into operation is not allowed |
| MTBF | : | 130 years Mean Time Between Failures – according to EN 61709 (SN29500). 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 | : | 22,5mm adjoin body, 22,5x114,5x104,5mm (with terminals) |
| Material | : | PA / V0 |
| Protection category | : | IP20 |
| Fixing | : | M3-screw-type terminal 0, 14 - 2,5mm ² , flexible or inflexible |
| Fixing | : | Snap-on mounting for norm rail TS35 |
| Weight | : | 120g |

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.