

8. PWM Input

The PWM input is a unidirectional Signal input which can be used to control the pump speed.

8.1. Input frequency

The frequency of the PWM signal can be in the following range:

Range: 50 to 1000 Hz

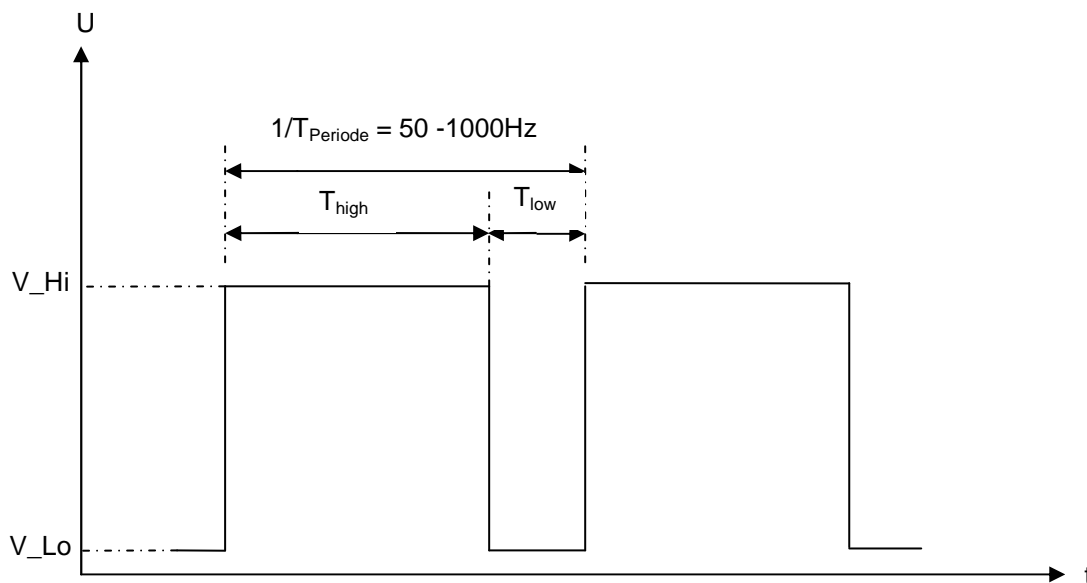
Note: To make sure that the pump awakes under PWM controlling, an uninterrupted high pulse of at least 3ms is necessary at the PWM input. For example: this is automatically achieved at a PWM frequency of 150 Hz and a duty cycle of 50% or above.

8.2. Duty cycle

The percentage duty cycle (DC) is represented by the ratio of T_{high} to $T_{periode}$:

$$DC[\%] = T_{high} / (T_{low} + T_{high})$$

Fig. 10: definition of the duty cycle



8.3. Input level PWM

Signal description	Max	Min
V_Hi	$U_B + 3V^*$ max.28V (60s)*	$0,6 U_B$
V_Lo	$0,4 U_B$	GND -3V*

U_B = Power supply

* absolut maximum ratings !

8.4. Schematic of PWM interface

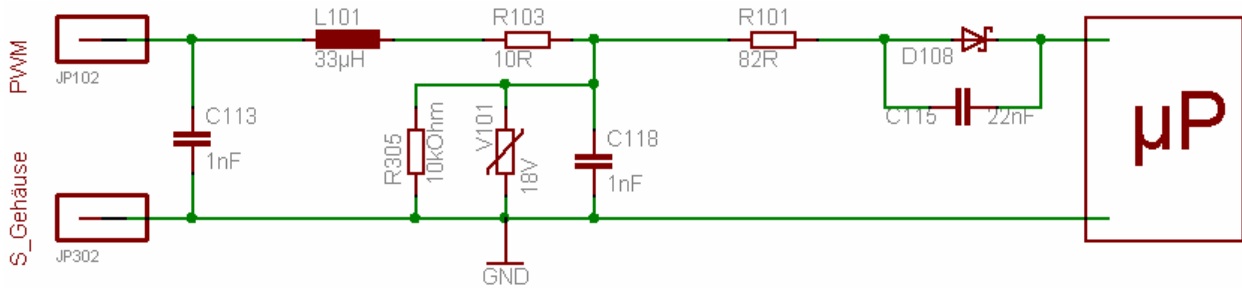


Fig. 11: schematic of PWM-Interface

8.5. Ratio between duty cycle and speed

The ratio between duty cycle and speed is shown in the following diagram.

Fig. 12: duty cycle versus speed

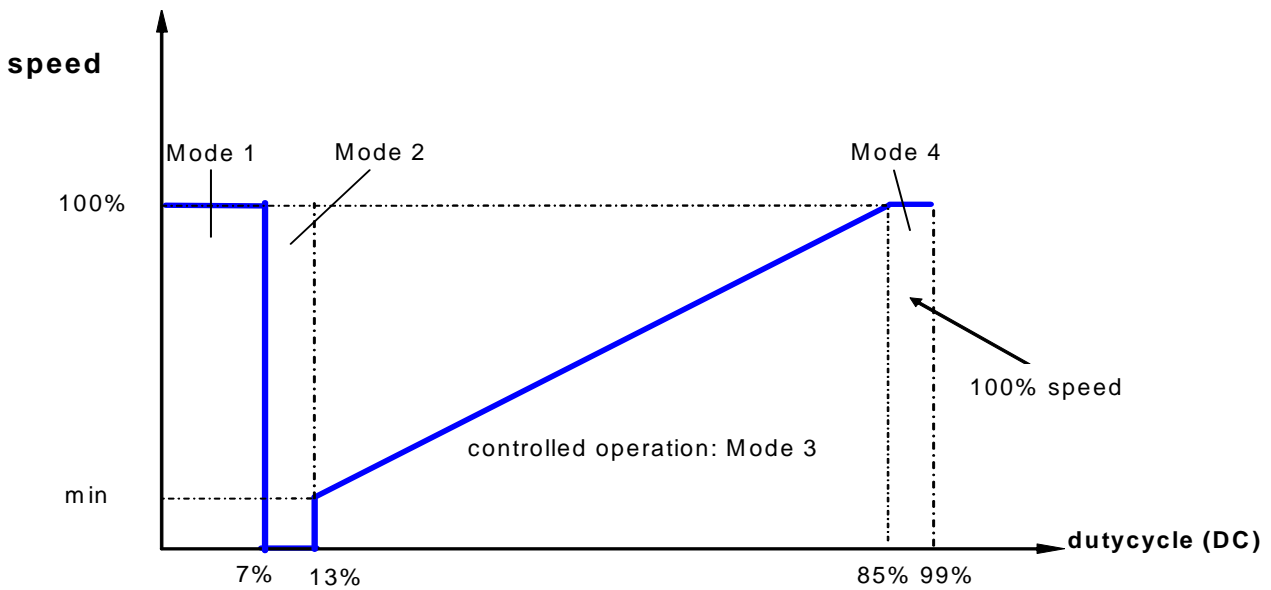


Table 3: PWM modes:

Mode	Dutycycle (DC)	speed	description
1	0% - 6%	Max or 0	MAX if BSD = high; 0 if BSD = 0
2	8% - 12%	0	Stop and error reset
3	14% - 85%	Min – Max	Controlled operation. The characteristic is linear
4	85% - 100%	Max	Full speed

The tolerance of the pumps interpretation of the PWM signal can vary of +/- 1% of the duty cycle.