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GEB PWM simplified controller

Core Overview

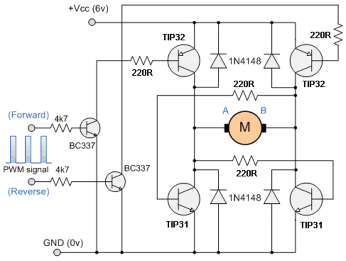
The GEB PWM simplified controller has been designed to be used in simple application where the uses of limited fpga resources is a must and the number of pwm signals that the FPGA should manage are few.

Typical application is RGB led drivers, mono directional motor controllers (bidirectional control needs a small external logic), servo motor controllers.

Functional Description

The Simplified PWM controller provides two outputs, pwm_fwd and pwm_rev. that can be used in three ways:

- Using pwm_fwd to drive a monodirectional motor through a single driver such as a MOSFET or BJT
- Using both pwm_fwd and pwm_rev to drive a bidirectional motor through a ”H-bridge” driver made by four MOSFET or BJT. The pwm_dir bit will be used to select wich output will be activated between pwm_fwd (forward) and pwm_rev (reverse)
- Using pwm_fwd without any power driver to drive the servomotors. The ip registers allow to programm both frequency a pulse witdth to meet the specification of several servomotors



Register Map

An Avalon-MM master peripheral, such as a CPU, controls and communicates with the PWM core via some registers, shown below. The registers width is always considered 32 bits in the addressing space, but only some bits will be physically presents

Offset	Register Name	R/W	Descriptions
0	PWMCLKDIV	R/W	A 20 register, here must be written the divisor value applied to the internal clock SYSCL,K it will determine the PWM clock frequency. The SYSCLK will be defined in the target system were the IP will be istantied. It goes from 50 to 200MHz with a typical value of 62.5MHz
1	PWMPW	R/W	Pulse witdth register, 20 bits, determines the value of pwm in clock cycles. It can go from 0 (The output will stay fixed to 0) and PWMCLKDIV (The output will stay fixed to 1). Between the two values the PWM output will toggle at the frequency defined from PWMCLKDIV register staying to 1 with the pulse width PWMPW/PWMCLKDIV.
2	PWMSTSCTR	R/W	D0 PWM_EN Pwm enable bit D1 PWM_DIR, PWM reverse direction bit, when 0 the formward output (pwm_fwd) will be active else the reverse one (pwm_rev) will be used

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