Dshot Standard for the 32-bit KISS ESC series

Dshot is a digital signal to send datas to the KISS ESC's. A normal Dshot signal conatins 16 PWM bits. The first 11 are for the throttle signal. It gets sent with the MSB first.
The 12th bit is for the telemetry request. If it is sent as one, the ESC will send its telemetry data through its TLM pin. Default it should be zero.
Bit 13-16 are used for a simple CRC:

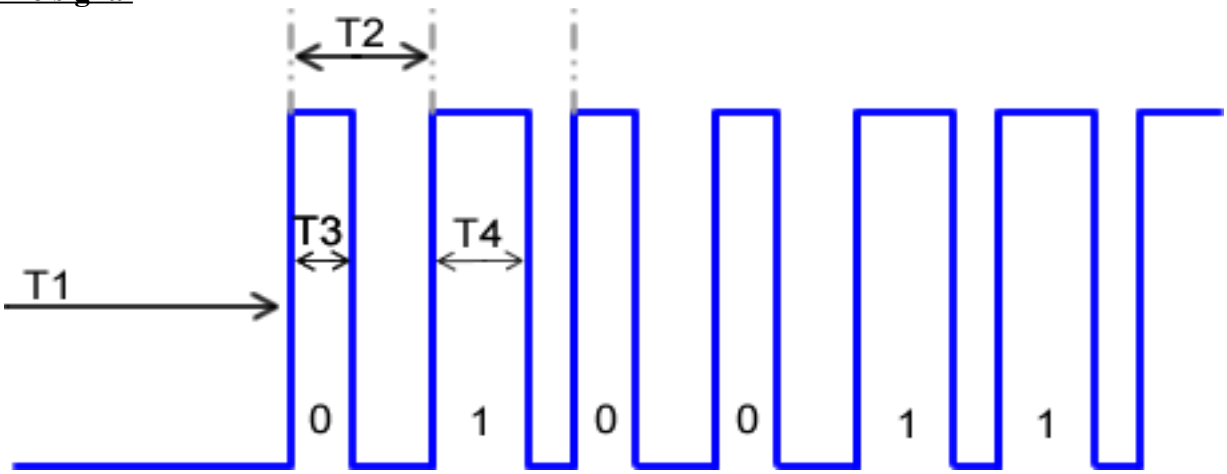
Bit 13 = Bit 1 ^ Bit 5 ^ Bit 9;
Bit 14 = Bit 2 ^ Bit 6 ^ Bit 10;
Bit 15 = Bit 3 ^ Bit 7 ^ Bit 11;
Bit 16 = Bit 4 ^ Bit 8 ^ Bit 12;

The bits are sent with a row of PWM pulses. The KISS ESC's will detect the siganl type (PWM, Oneshot or Dshot) automaticly. It will also autodetect the Dshot bitrate if it is between 100khz and 1200khz, but only once after it reads the first few signals.

Throttle range

The motor will start at 48 (of 2047), 2047 is full throttle. To arm the ESC any signal below 48 will be ok. The values 1-47 are reserverd for settings that will be explained later.

The signal



T2 = the bitrate, min. 833,33ns (1200khz) max. 10µs (100khz)
T1 = min. 1x T2 and max. 40ms. It is used to find the beginning of a frame
T4 = „1“ its duty is ¾ of T2
T3 = „0“ its duty is ½ of T4

PWM Timer & DMA Controller

The simplest way to generate such signals is to use a PWM timer feeded from a DMA controller. Like that there is almost no extra load to the MCU, compared to a normal single PWM pulse.