

Figure 1 Motor control signal (with acceleration but no constant speed)

1. motor must be enabled before we start sending motor movement signal.
2. at this point we start sending signal. First item (1/0) comes from timer registers values, not from DMA. So, we must write 1st item waveform values into timer registers ourselves.
3. motor movement is happening on a falling edge of a signal.
4. starting at this point waveform is generated using DMA (in burst mode). Note that we must initialize DMA length as number of items to be generated by DMA plus one. This is because DMA transfer complete interrupt happens after value is written from memory to timer registers but before waveform is generated.
5. at this point DMA transfer complete signal gets generated. So, we start decelerating. To do this we must write timer registers with new values at this point as they are going to keep last loaded DMA values otherwise. Also, we configure DMA at this point. Like (4) we must configure length as number of items to be generated by DMA plus one.
6. At this point we are done; we need to stop generating motor movement signal and need to disable motor asap.



Figure Motor control signal (with acceleration and constant speed)

1. at this point DMA finished generating signal. We disable DMA channel and timer will continue generating constant speed (period) signal until we stop it.
2. at this point we need to start decelerating. This point is determined using slave timer which is counting number of waveforms generated by the master timer.