

AMiRo-OS - Feature #589

Enhanced I/O events

2019-03-08 13:13 - Thomas Schöpping

Status:	New	Start date:	2019-03-08
Priority:	Normal	Due date:	
Assignee:		% Done:	0%
Category:		Estimated time:	4.00 hours
Target version:			
Description			
<p>Currently I/O interrupts result in I/O events and propagate the causing EXTI line via event flags (e.g. EXTI #3 propagates $(1 \ll 3) = 0x00000008$). Since EXTI lines can aggregate multiple I/O pins (e.g. PA3 and PC3) this method can result in ambiguous events, because only the EXTI line but not the actual pin is specified.</p> <p>To solve this issue, I/O events should not propagate plain <code>eventflags_t</code> data, but a struct like</p> <pre>struct { uint32_t flags : 24; // alternatively 28 uint32_t pin : 8; // alternatively 4 };</pre> <p>Since there is no EXTI hardware so far which provides more than 24 lines this solution is feasible. Alternatively the ratio can be set to 28:4 assuming that there will not be more than 2^4-1 pins aggregated in a single EXTI line. The -1 is important here, since the value of pin = 0 must be reserved to indicate ambiguity. This was the new method is compatible to plain <code>eventflags_t</code> and there might be cases where the exact pin can not be determined.</p> <p>The determination can be realized within the ISR, which is called by the EXTI driver.</p>			