DMAC example using z64 processor

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1 Project

1.1 Requirements

Let `TIMER` be a peripheral of the z64 processor programmed by the same for send a stop request every 10 milliseconds. The service associated with interrupt request is as follows: the processor must check whether the value recorded in the peripheral interface register `TEMPERATURE` is greater than 40 degrees (temperature is expressed unsigned using 8 bits). In positive case, the processor programs the DMAC to send an alarm message to a `MONITOR` interfaced to DMAC. The message is stored in memory.

At the end of the transfer through the DMAC the processor reactivates `TIMER`.

Design the `TIMER` and `TEMPERATURE` interfaces. Also, implement the software to activate `TIMER`, program the DMAC and manage the request `TIMER` interruption. In the solution we assume that service management associated with interruptions is non-interruptible.

1.2 Implementation

1.2.1 Hardware

The `TIMER` peripheral is represented as following:

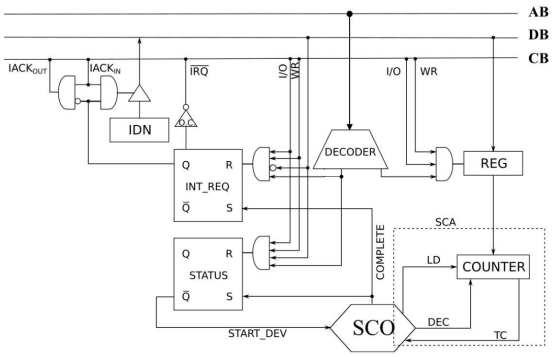

Figure 1. The `TIMER` peripheral

The `TEMPERATURE` peripheral is represented as following:

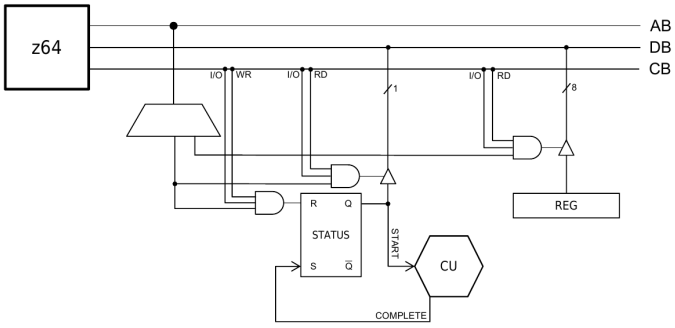

Figure 2. The `TEMPERATURE` peripheral

1.2.2 Firmware

So, a possible *firmware implementation* can be found here.