Assignment 04 Report
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In this assignment we were tasked with reading the values of two HC-SR04 distance sensors and then recording the values in an 24FC256 EEPROM IC. In order to do this we created two instances of an HC-SR04 driver and an instance of an 24FC256 driver.

During initialization of the program, two threads are created, each reading the values from one of the sensors and then writing the values the EEPROM. Each thread starts suspended, until the Start command is used in the Shell module. The Start command instructs the applicable sensor thread to resume operations, and suspends the other one if necessary.

Each thread runs at a strict period of 60ms, the minimum period recommended by the datasheet. The thread records its measured values to a buffer, exactly one EEPROM page in length. When this buffer is full, another thread is dispatched to write the buffer to the EEPROM, all at once. This is the maximum efficiency of writing, as the EEPROM only allows one page of sequential data to be written at a time. While the EEPROM thread is running, the sensor is allowed to continue, writing to an alternative buffer, as dual buffers are used.

If a sensor driver’s callback function fails to release it’s semaphore within 30 ms, the driver assumes that it’s never going to happen and falls through to release it.