

# A TinyOS driver for FRAM

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# TinyOS driver (HIL) for FRAM

- FRAM is fast and power efficient --> suitable for WSN
- interface abstractions in TinyOS are designed for flash
- no erase/write block size resp. erase/write block size of 1
- undersized variables
- small adaptations necessary

| Comparison with respect to ...  | Type of Non-Volatile Memory               |  |
|---------------------------------|---|--|
|                                 | <i>flash</i>                              | <i>FRAM</i>  |
| Available Interfaces            | SPI/I2C/Parallel                          | SPI/I2C/Parallel   |
| Sleep Mode Current              | 1 A                                       | 1 A  |
| Data Retention                  | > 10 a                                    | > 10 a   |
| Write Cycles                    | ~ 10 <sup>5</sup>                         | ~ 10 <sup>10</sup>   |
| Capacity <sup>a</sup>           | ≤ 32 Gbit (parallel)<br>≤ 128 Mibit (SPI) | ≤ 4 Mibit (parallel)<br>≤ 2 Mibit (SPI)<br>≤ 1 Mibit (I2C) |
| Energy Consumption <sup>b</sup> | 90 nJ/bit                                 | 1.1 nJ/bit   |
| Write Speed/byte <sup>c</sup>   | ~ 10 s                                    | ~ 400 ns   |

*uint8\_t --> uint32\_t*

*uint16\_t --> uint32\_t*

*or*

*larger sector size but less flexible*

*Thank you!*

