
TN8000.14

Technical Note

How to interface an SPI EEPROM with the XE8000 microcontrollers family

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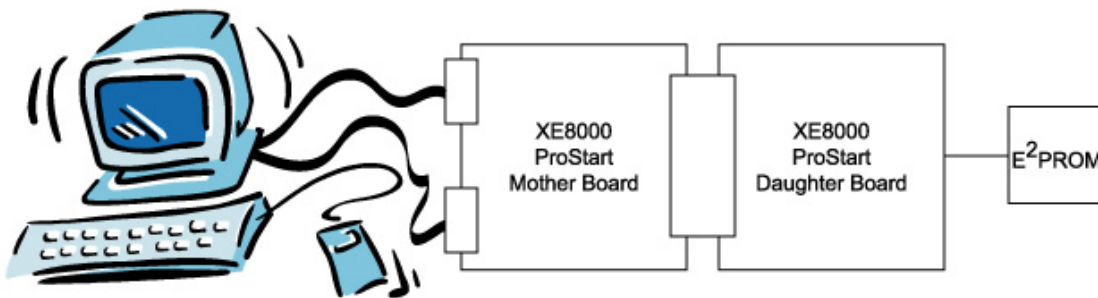
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1 Introduction

This document shows how to connect and drive an SPI EEPROM with an XE8000 microcontroller. The application reads information from an SPI EEPROM and sends it to the UART or gets data from the UART and sends it to the EEPROM.

2 How does the example work?

The software example implements an interface between a PC (Personal Computer) and an SPI EEPROM through any of the XE8000 family microcontrollers.



You can find the software example code in zip format on the XEMICS web site. The zip file is named eeProm_spi.zip.

In this example, the program starts by initialising two arrays with data. After this initialisation, it writes one of the arrays to the EEPROM. Then it reads the contents of the EEPROM to the other array and sends it to the PC. Once this initialisation is finished the software is waiting for a command from the PC.

The PC can send 3 types of commands to the microcontroller:

- Connection Test
- Write EEPROM
- Read EEPROM

The PC communicates with the microcontroller through the UART peripheral using a very simple protocol. Once the microcontroller has received all the data it sends them to the SPI EEPROM.

The microcontroller software project is divided into two major parts.

1. PC communication handling.
 - The RS232CommHandler.c file contains all the functions that are necessary to handle the protocol between the PC and the microcontroller.
2. I2C EEPROM communication handling
 - The eeProm_spi.c file contains the High-level functions for the SPI EEPROM protocol.
 - The eeProm_spi.h file contains pin assignments, defines and macros.

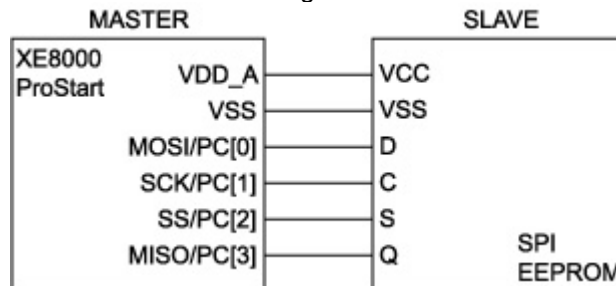
The Initialisation.c file is necessary to initialise the different microcontroller peripherals such as ports clock and UART.

To communicate with the UART, one must set the RC Oscillator frequency with a precision better or equal to 5%. The DFLLDriver.c file does this.

The software starting point is located in the Main.c file.

3 Instructions on how to use the eeProm_spi software

1. Connect the SPI EEPROM to the ProStart according to the illustration.



2. Unzip the eeProm_spi.zip file to your hard disk.
3. Load the project eeProm_spi.PRJ in RIDE.
4. Compile the Project
5. Upload the program to the ProStart.
6. **Note** : For a correct SPI function on the XE8000 daughter boards you need to disconnect the LEDs connected to PortC/D [0] to [3] by removing the corresponding jumpers.
7. You need to have a RS232 Hexadecimal terminal. You can download a RS232 Hexadecimal terminal from the following address: <http://www.viddata.com/>. This program is a shareware.
8. Set the following parameters in you terminal:
 - Baud rate : 19200
 - Bit length : 8
 - Parity : None
 - Stop bits : 1
 - Handshaking : none
9. You need to type the following commands (without spaces):

```

Connection Test : 24 43 10 04
uC Answer      : 24 61 10 04

EEPROM Read    : 24 52 10 04
uC Answer      : 24 XX XX XX XX XX XX XX XX XX XX 61 10 04

EEPROM Write   : 24 57 XX XX XX XX XX XX XX XX XX XX 10 04
uC Answer      : 24 61 10 04
  
```

Where XX are the contents of the EEPROM or the values that you want to write.

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