

Freescale MQX RTOS Example Guide

IIC slave example

This document explains the I2C slave example, what to expect from the example and a brief introduction to the API used.

The example

The example shows the usage of the IIC driver as a slave polling and interrupt driver in conjunction with the I2C example. Because the I2C protocol needs a master node and a slave node to co-work, the I2C slave example needs to be run concurrently with the I2C master example.

The I2C slave example puts the MCU into the I2C slave mode and allows it to transmit data requested by master. Also the data in the slave's memory is displayed on the output terminal as any dummy character is sent over the I2C bus initiated by slave.

Running the example

The `BSPCFG_ENABLE_I2Cx` or `BSPCFG_ENABLE_II2Cx` macro must be set to non-zero in the `user_config.h` file depending on what MCU is using prior to compilation of MQX libraries and the example itself.

The `BSPCFG_ENABLE_LEGACY_II2C_SLAVE` macro must be set to non-zero in the `user_config.h` file if the MCU has an I2C legacy module that couldn't provide I2C bus START/STOP interrupt event. If it's enabled, the i2c legacy driver will register interrupt handler to corresponding I2C SDA pin mux port vector, and please make sure your application would not register handler on same interrupt vector.

To run the example the corresponding IDE, compiler, debugger and a terminal program are needed.

Also 2 MCUs need to be connected via the 2-wire I2C bus similar to the connection in the `_README` of I2C example.

Explaining the example

The application example creates two tasks `dump_task` and `main_task`.

- **dump_task:** gets a character from user and displays the data that the master MCU sent to the slave MCU on the terminal.
- **main_task:**

- o sets up the MCU to be the slave node over the I2C bus. Also the attributes such as the I2C baud rate, slave address are assigned.
- o The status of the MCU is checked. If it is configured to receive data coming from the master, it implements reception until the master stops transfer. If it is asked to send data, it transmits data until the master stops reception.

dump_task has higher priority than main_task but it is blocked most of the time to wait for input character from user .

The following output is expected on the terminal.

```
COM14:115200baud - Tera Term VT
File Edit Setup Control Window Help

EEPROM I2C slave example - 256 byte EEPROM emulation

Please attach I2C master to appropriate I2C bus.
I2C EEPROM communication protocol should be used (e.g. 'i2c' example).

Set current baud rate to 100000 ... OK
Get current baud rate ... 100000
Set slave mode ... OK
Get current mode ... 0x01
Set station address to 0x50 ... OK
Get station address ... 0x50

Send character over terminal to dump memory contents.
a
Memory dump:
0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x10: 00 00 00 00 00 00 00 00 00 00 61 62 63 64 65 66 .....abcdef
0x20: 67 68 69 6a 6b 6c 6d 6e 6f 70 71 72 73 74 75 76 .....ghijklmnopqrstuv
0x30: 77 78 79 7a 41 42 43 44 45 46 47 48 49 4a 4b 4c .....wxyzABCDEFGHJKLM
0x40: 4d 4e 4f 50 51 52 53 54 55 56 57 58 59 5a 00 00 .....MNOPQRSTUVWXYZ..
0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xa0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xb0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xc0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xd0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xe0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xf0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

Send character over terminal to dump memory contents.
b
Memory dump:
0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x10: 00 00 00 00 00 00 00 00 00 00 61 62 63 64 65 66 .....abcdef
0x20: 67 68 69 6a 6b 6c 6d 6e 6f 70 71 72 73 74 75 76 .....ghijklmnopqrstuv
0x30: 77 78 79 7a 41 42 43 44 45 46 47 48 49 4a 4b 4c .....wxyzABCDEFGHJKLM
0x40: 4d 4e 4f 50 51 52 53 54 55 56 57 58 59 5a 00 00 .....MNOPQRSTUVWXYZ..
0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0x90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xa0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xb0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xc0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xd0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xe0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0xf0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

Send character over terminal to dump memory contents.
█
```