

## FreescalE MQX Example Guide

### MMA8451Q Generic example

This document describes the MMA8451Q component Generic part example application. It shows how to work with the component and how to use API functions.

### Running the example

Start a terminal application on your PC and set the serial connection for 115200 baud, 8 data bits, 1 stop bit, no parity and no flow control.

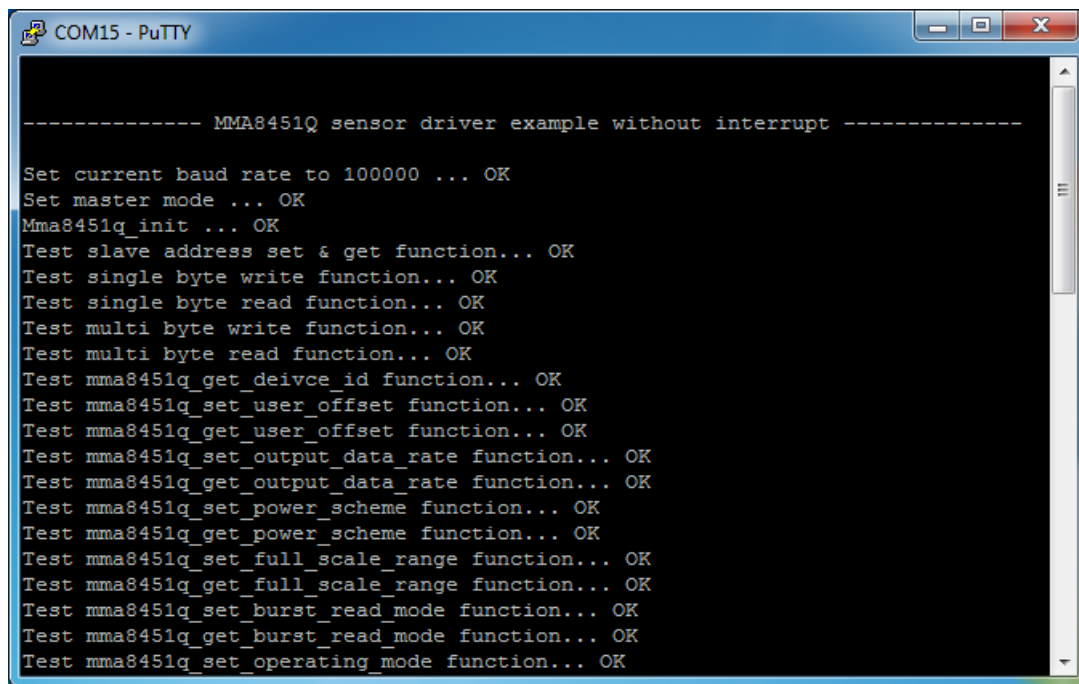
Start the MMA8451Q Generic example on the target platform. For instructions about how to do that in different IDEs and for different debuggers, see the MQX documentation (<MQX installation folder>/doc/tools).

There are two mode of mma8451q generic function example:

One is generic example with interrupt; the other is generic example without interrupt.

The working mode of generic example can be configured using macro USE\_INTERRUPT in mqx\examples\sensor\mma8451q\generic\main. Comment it to use example without interrupt and vice versa.

After starting the example without interrupt, you will see the printed message as the following.



```
----- MMA8451Q sensor driver example without interrupt -----  
Set current baud rate to 100000 ... OK  
Set master mode ... OK  
Mma8451q_init ... OK  
Test slave address set & get function... OK  
Test single byte write function... OK  
Test single byte read function... OK  
Test multi byte write function... OK  
Test multi byte read function... OK  
Test mma8451q_get_deivce_id function... OK  
Test mma8451q_set_user_offset function... OK  
Test mma8451q_get_user_offset function... OK  
Test mma8451q_set_output_data_rate function... OK  
Test mma8451q_get_output_data_rate function... OK  
Test mma8451q_set_power_scheme function... OK  
Test mma8451q_get_power_scheme function... OK  
Test mma8451q_set_full_scale_range function... OK  
Test mma8451q_get_full_scale_range function... OK  
Test mma8451q_set_burst_read_mode function... OK  
Test mma8451q_get_burst_read_mode function... OK  
Test mma8451q_set_operating_mode function... OK
```

Figure1.

Example without interrupt runtime output

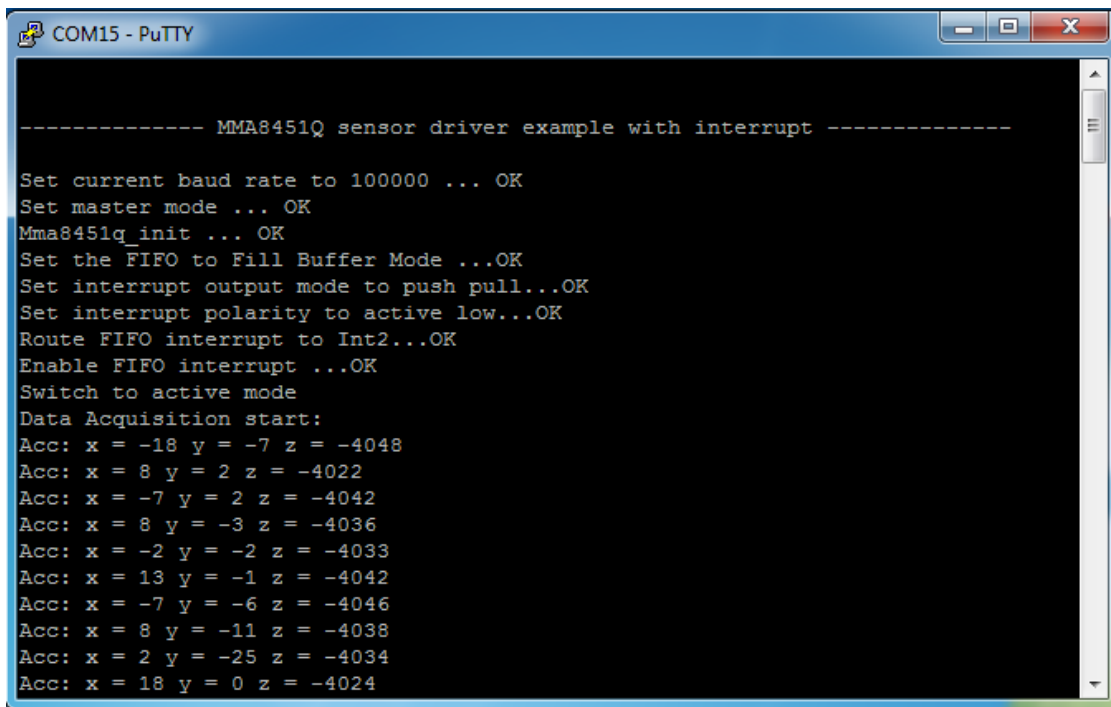
### Explanation of the example without interrupt

The example code consist of just one task (main\_task) only.

main\_task:

- Allocate buffer for received data;
- Open i2c bus, initialize its working mode and frequency;
- Initialize the MMA8451Q with the parameters set in mma8451q\_init\_str structure;
- Test configuration APIs:
  1. mma8451q\_set\_slave\_address & mma8451q\_get\_slave\_address
  2. mma8451q\_write\_single\_reg & mma8451q\_read\_single\_reg
  3. mma8451q\_write\_reg & mma8451q\_read\_reg
  4. mma8451q\_get\_device\_id
  5. mma8451q\_set\_user\_offset & mma8451q\_get\_user\_offset
  6. mma8451q\_set\_output\_data\_rate & mma8451q\_get\_output\_data\_rate
  7. mma8451q\_set\_power\_scheme & mma8451q\_get\_power\_scheme
  8. mma8451q\_set\_full\_scale\_range & mma8451q\_get\_full\_scale\_range
  9. mma8451q\_set\_burst\_read\_mode & mma8451q\_get\_burst\_read\_mode
- Switch the sensor to active mode;
- Test mma8451q\_get\_system\_mode function;
- Test Data Acquisition;
- Switch the sensor to standby mode;
- Test reset sensor function;
- Deinit mma8451q;
- Close i2c bus;
- Example finish.

After starting the example with interrupt, you will see the printed message as the following.



```
----- MMA8451Q sensor driver example with interrupt -----  
  
Set current baud rate to 100000 ... OK  
Set master mode ... OK  
Mma8451q_init ... OK  
Set the FIFO to Fill Buffer Mode ...OK  
Set interrupt output mode to push pull...OK  
Set interrupt polarity to active low...OK  
Route FIFO interrupt to Int2...OK  
Enable FIFO interrupt ...OK  
Switch to active mode  
Data Acquisition start:  
Acc: x = -18 y = -7 z = -4048  
Acc: x = 8 y = 2 z = -4022  
Acc: x = -7 y = 2 z = -4042  
Acc: x = 8 y = -3 z = -4036  
Acc: x = -2 y = -2 z = -4033  
Acc: x = 13 y = -1 z = -4042  
Acc: x = -7 y = -6 z = -4046  
Acc: x = 8 y = -11 z = -4038  
Acc: x = 2 y = -25 z = -4034  
Acc: x = 18 y = 0 z = -4024
```

Figure2.

Example without interrupt runtime output

### **Explanation of the example with interrupt**

The example code consist of just one task (main\_task) and the interrupt service routine triggered by the acc\_int pin(int\_service\_routine).

main\_task:

- Allocate buffer;
- Open i2c bus, initialize its working mode and frequency;
- Create semaphore;
- Initialize the MMA8451Q with the parameters set in mma8451q\_init\_str structure;
- Initialize MMA8451Q build-in FIFO;
- Initialize GPIO interrupt on acc\_int pin which connected to mma8451q interrupt request pin;
- Set mma8451q interrupt output mode, output polarity and route FIFO interrupt to mma8451q int2 pin;
- Enable GPIO interrupt on acc\_int pin;
- Switch mma8451q to active mode;
- Wait for FIFO interrupt;
- Print data acquired on each axis;
- After 5 FIFO full-fill detected, the example will switch the sensor to standby mode;
- Disable GPIO interrupt on acc\_int pin;
- Deinit MMA8451Q sensor;
- Destroy semaphore;
- Close i2c bus;
- Example finish.

int\_service\_routine:

- Clears interrupt flag.
- Posts semaphore.