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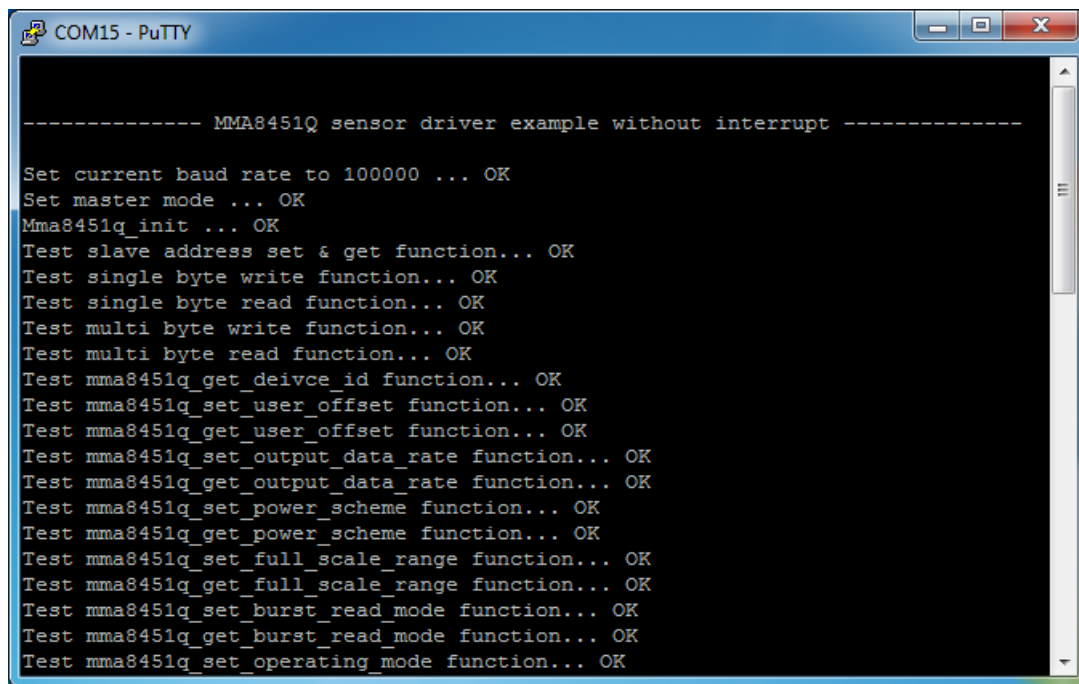
Start the MMA8451Q Generic example on the target platform. For instructions about how to do that in different IDEs and for different debuggers, see the MQX documentation (<MQX installation folder>/doc/tools).

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.

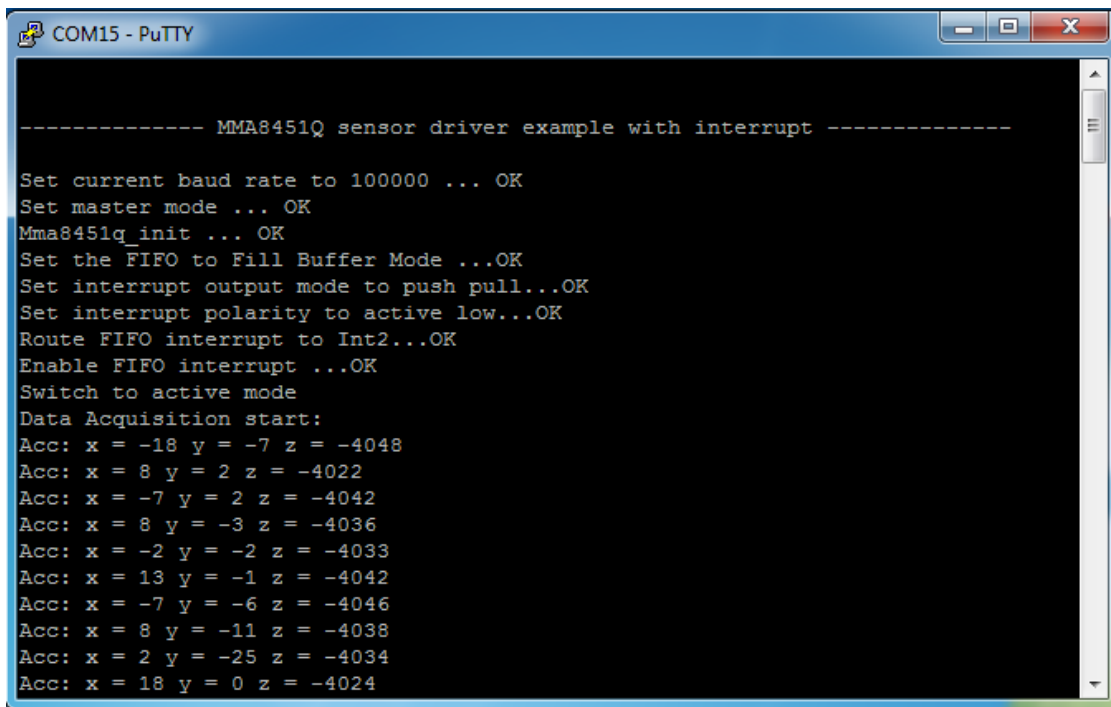

Figure1.
Example without interrupt runtime output

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_deivce_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.

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.