TI DSP, MCU 및 Xilinx Zynq FPGA 프로그래밍 전문가 과정

- BM5611 -

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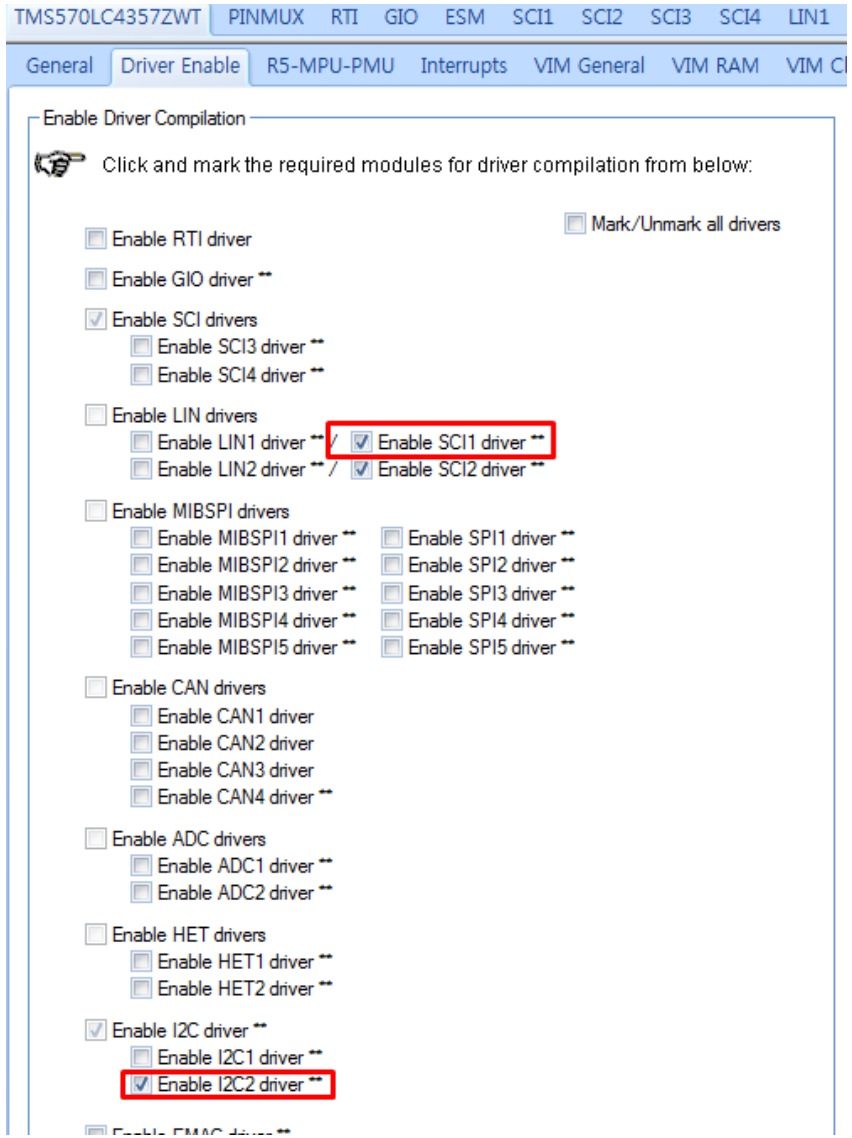
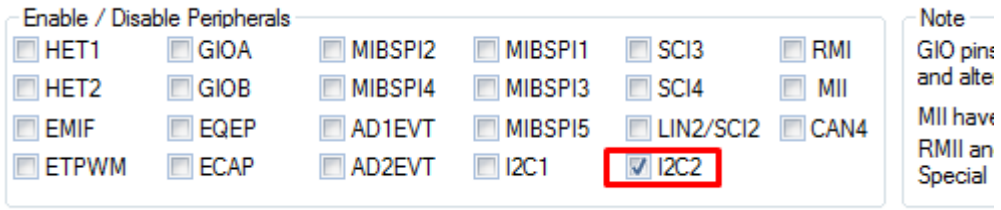
목차

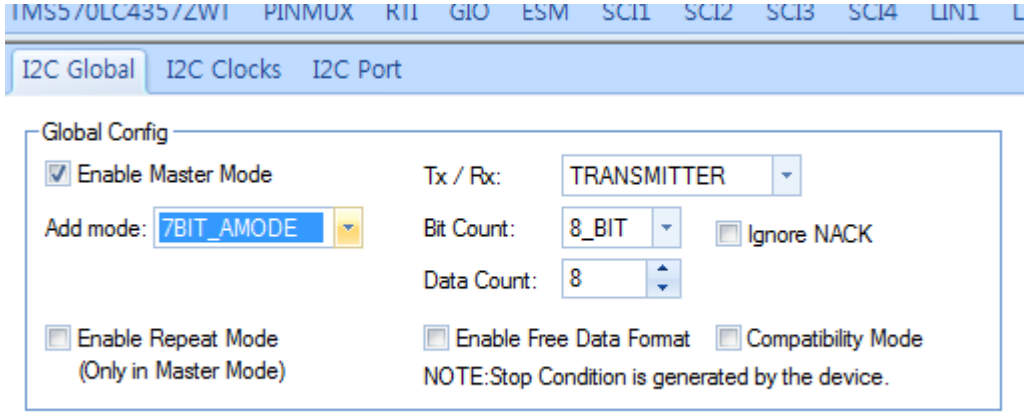
BM5611

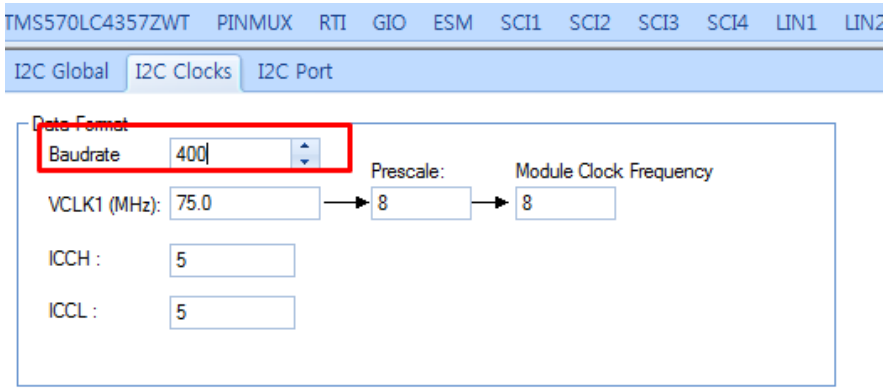
ps. MPU9250 datasheet, zip파일의 추가된 코드와 MPU9250.h를 참고하여 꼭 같이 보세요.

1. HALCOGEN 설정









2. Register

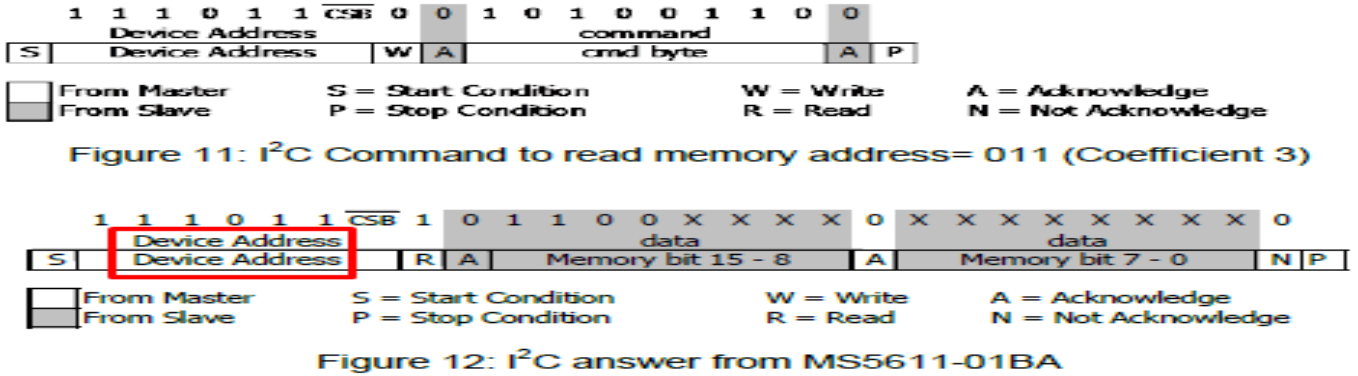


Figure 11: I²C Command to read memory address= 011 (Coefficient 3)

Figure 12: I²C answer from MS5611-01BA

	Command byte								hex value
Bit number	0	1	2	3	4	5	6	7	
Bit name	PRM	COV	-	Typ	Ad2/ Os2	Ad1/ Os1	Ad0/ Os0	Stop	
Command									
Reset	0	0	0	1	1	1	1	0	0x1E
Convert D1 (OSR=256)	0	1	0	0	0	0	0	0	0x40
Convert D1 (OSR=512)	0	1	0	0	0	0	1	0	0x42
Convert D1 (OSR=1024)	0	1	0	0	0	1	0	0	0x44
Convert D1 (OSR=2048)	0	1	0	0	0	1	1	0	0x46
Convert D1 (OSR=4096)	0	1	0	0	1	0	0	0	0x48
Convert D2 (OSR=256)	0	1	0	1	0	0	0	0	0x50
Convert D2 (OSR=512)	0	1	0	1	0	0	1	0	0x52
Convert D2 (OSR=1024)	0	1	0	1	0	1	0	0	0x54
Convert D2 (OSR=2048)	0	1	0	1	0	1	1	0	0x56
Convert D2 (OSR=4096)	0	1	0	1	1	0	0	0	0x58
ADC Read	0	0	0	0	0	0	0	0	0x00
PROM Read	1	0	1	0	Ad2	Ad1	Ad0	0	0xA0 to 0xAE

1. 기존에 많이 보던 register를 설정하고 command 값을 보내는 방식이 아니라, 슬레이브 어드레스만 넣으면 값을 가져올 수 있다.

2. Write시에 register + cmd가 아닌 write + cmd 방식이다.

3. I2C는 안타깝게도 뚜렷한 표준은 없기 때문에 데이터 시트를 참고해야 함.

4. 더 자세한 부분은 MS5611.h를 참고

3. CODE

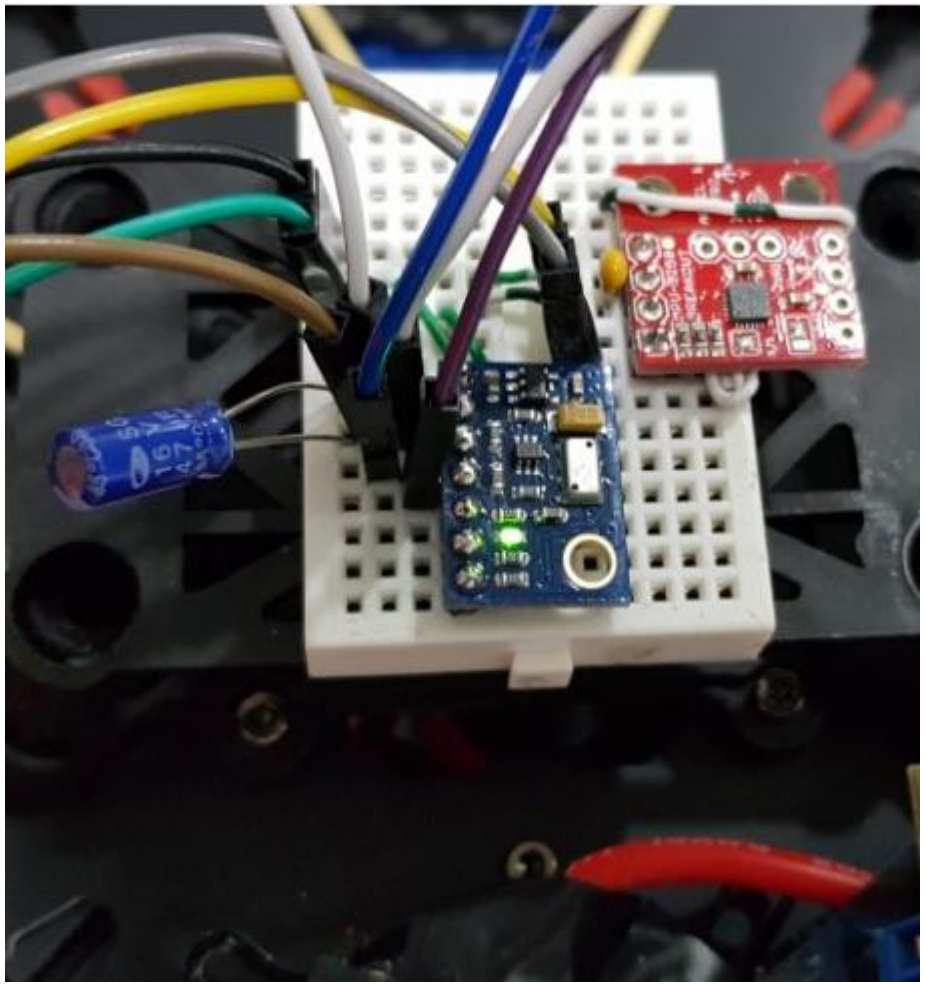
```c
#include "MS5611.h"

int main(void)
{
    char txt_buf[256] = {0};
    unsigned int buf_len;
    long pressure =0;
    double temp =0;
    double altitude =0;
    sciInit();
    disp_set("SCI Configuration Success!!\n\r\0");
    i2cInit();
    wait(10000000);
    disp_set("I2C Init Success!!\n\r\0");

    Init_MS5611(MS5611_STANDARD);

    disp_set("Init MS5611 Success!!\n\r\0");

    for (;;)   // loop()
    {

        temp = readTemperature(true);
        pressure = readPressure(true);
        altitude = getAltitude(pressure, 101110); // 서울의 해수면 높이

        sprintf(txt_buf, "altitude = %lf \t pressure = %ld \t temperature = %lf \n\r\0",
                altitude,  pressure, temp );

        buf_len = strlen(txt_buf);
        sciDisplayText(sciREG1, (uint8 *) txt_buf, buf_len);
        wait(3000000);
    }
}
```

```c
typedef enum
{
    MS5611_ULTRA_HIGH_RES = 0x08,
    MS5611_HIGH_RES = 0x06,
    MS5611_STANDARD = 0x04,
    MS5611_LOW_POWER = 0x02,
    MS5611_ULTRA_LOW_POWER = 0x00
} ms5611_osr_t;
```

1. Init_MS5611 함수를 호출하여 resolution 설정

2. 나머지 함수들은 header 참고

4. SIMULATION



```
altitude = 47.413504    pressure = 100543    temperature = 27.170000
altitude = 47.413504    pressure = 100543    temperature = 27.170000
altitude = 47.413504    pressure = 100545    temperature = 27.170000
altitude = 47.816391    pressure = 100537    temperature = 27.170000
altitude = 47.246880    pressure = 100545    temperature = 27.170000
altitude = 47.497317    pressure = 100542    temperature = 27.170000
altitude = 47.664944    pressure = 100540    temperature = 27.170000
altitude = 47.329692    pressure = 100544    temperature = 27.170000
altitude = 47.329692    pressure = 100544    temperature = 27.170000
altitude = 47.497317    pressure = 100542    temperature = 27.170000
altitude = 47.329692    pressure = 100544    temperature = 27.170000
altitude = 47.413504    pressure = 100543    temperature = 27.170000
altitude = 47.581130    pressure = 100541    temperature = 27.170000
altitude = 47.246880    pressure = 100545    temperature = 27.170000
altitude = 47.748759    pressure = 100539    temperature = 27.170000
altitude = 47.246880    pressure = 100545    temperature = 27.180000
altitude = 47.581130    pressure = 100541    temperature = 27.170000
altitude = 47.162070    pressure = 100546    temperature = 27.180000
altitude = 47.664944    pressure = 100540    temperature = 27.170000
altitude = 47.329692    pressure = 100544    temperature = 27.170000
altitude = 47.329692    pressure = 100544    temperature = 27.170000
altitude = 47.329692    pressure = 100544    temperature = 27.170000
altitude = 47.664944    pressure = 100540    temperature = 27.170000
altitude = 47.581130    pressure = 100541    temperature = 27.170000
altitude = 47.832574    pressure = 100538    temperature = 27.170000
altitude = 47.816391    pressure = 100537    temperature = 27.170000
altitude = 47.664944    pressure = 100540    temperature = 27.170000
altitude = 47.916391    pressure = 100537    temperature = 27.170000
altitude = 47.664944    pressure = 100540    temperature = 27.180000
altitude = 47.748759    pressure = 100539    temperature = 27.170000
altitude = 47.329692    pressure = 100544    temperature = 27.170000
altitude = 47.413504    pressure = 100543    temperature = 27.170000
altitude = 47.497317    pressure = 100542    temperature = 27.170000
altitude = 47.329692    pressure = 100544    temperature = 27.170000
```

주의사항 – 전원이 안정하지 않으면 ultra high resolution 과 같은 것은 사용할 수 없으므로 전원 안정화가 중요.