Project: “mavlink-acc1”

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GENERAL

This example reads the accelerometers of the STM32-DISCOVERY board and send it to the MAVLINK message “ATTITUDE” that can be read by the QGC using an USART connection (using PB6 & PB7 pin).

USART is set to 57400baud. A FDTI cable is required.

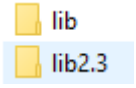
CW CONFIGURATION

CW libraries version

Must use the v3.6

Check if CW libraries are the correct.

Debe estar asi: (lib 3.6)



Heap Size

Hay que implementar el “heap Size” a 18432 bytes.

User Includes libraries

```
.
includes/cmsis
includes/peripheral-library\inc
includes/peripheral-library\src
tm_stm32f4_usart
tm_stm32f4_gpio
includes/mavlink/common
includes/mavlink
tm
```

MAVLINK

We send two messages: HEARBEAT and ATTITUDE

The accelerometers meassurement from STM32-DISCOVERY supply +-1000. Attitude sent float(Roll), etc so we need to adapt it.

ATTITUDE (#30)

The attitude in the aeronautical frame right-handed, -down, X-front, Y-right .

Field Name	Type	Description
time_boot_ms	uint32_t	Timestamp (milliseconds since system boot)
roll	float	Roll angle (rad, -pi..+pi)
pitch	float	Pitch angle (rad, -pi..+pi)
yaw	float	Yaw angle (rad, -pi..+pi)
rollspeed	float	Roll angular speed (rad/s)
pitchspeed	float	Pitch angular speed (rad/s)
yawspeed	float	Yaw angular speed (rad/s)

ACCELEROMETER ON STM32F4-DISCOVERY BY TM

simple library which supports both devices. Library automatically recognize connected device, if there is any. You just have to check which is on board, because different devices have different possible settings. Both devices uses the same pinout on board. They use SPI for communication with STM32F4.

USANDO LAS LIBRERIAS “TM”

Añadir la linea siguiente en main.c (para usar la board: “stm32f407VG”)

```
#define TM_DISCO_STM32F4_DISCOVERY
```

LIS302DL/LIS3DSH	STM32F4-Discovery	Description
MOSI	PA7	Master out, Slave in for SPI1
MISO	PA6	Master in, Slave out for SPI1
SCK	PA5	Serial clock for SPI1
CS	PE3	Chip select

Identificar que acelerómetro tiene mi placa e inicializarlo

Mi placa tiene el: “Device_LIS302DL”, old **LIS302DL** has only 2 scales: 2.3g / 9.2g

(Ver código en main.c . Usa la librería de definiciones "tm_stm32f4_lis302dl_lis3dsh.h"

SERIAL PERIPHERAL INTERFACE (SPI)

The SPI interface provides two main functions, supporting either the SPI protocol or the I2S audio protocol. By default, it is the SPI function that is selected

The serial peripheral interface (SPI) allows half / full-duplex, synchronous, serial communication with external devices.

MEMS OF STM-DISCOVERY (VER UM 4.9)

The LIS302DL is present on board MB997B (PCB revision B)

The **LIS302DL** are both an ultra compact low-power three-axis **linear accelerometer**.
It includes a sensing element and an IC interface able to provide the measured acceleration to the external world through I2C/**SPI** serial interface.
The LIS302DL has dynamically user selectable full scales of +-2g/+-8g and it is capable of measuring acceleration with an output rate of 100Hz to 400Hz.

The STM32F4 controls this motion sensor through the **SPI** interface.