gps_movement_tracker.c

This program works with the TD1205P module from TDNEXT. The aim is to detect if this device is in motion. If there is movement, it will send some information every T1 period. If there is no movement, it will send information every T2 period (longer than T1). A keepalive message is sent at every boot.

Useful information

- For configuring the environment, use the tutorial: http://www.instructables.com/id/Sigfox-GPS-Tracker/
- This example is only built and tested for TD1205P module.
- In order to see the received messages, use Sigfox backend: https://backend.sigfox.com

General message format

For transceiving information on the Sigfox network, this program uses a 12 bytes format. Message is formed by using some code from the tutorial:

- 4 bytes: GPS longitude or free
- 4 bytes: GPS latitude or free
- 1 byte: voltage
- 1 byte: temperature
- 2 bytes: free

The baud rate which is used here for serial communication is 9600 bits/s. The frequency for retrieving accelerometer data is 10 Hz. The scale which is used for detecting accelerometer events is 2G. It detects movements on all axis (x, y and z).

Commands

Users can change some parameters of the program using serial communication. Indeed, it is possible to communicate with the module thanks to putty.exe, a free and open-source terminal emulator and serial console. Commands must be typed during the 3 minutes after the launching of the program. Indeed, serial communication is stopped after 3 minutes in order to save power. In that way, the module doesn't wait for serial connection, so it doesn't consume energy for that. If you don't want to stop serial communication, in order to see some messages after the 3 minutes, comment this line in the delayed_start function:

```
// Stop the use of serial communication
TD_UART_DisableExtended(out_stream);
```

AT$MODE=

- Used for choosing GPS Power mode.

- 0 for *TD_GEOLOC_OFF* mode: with this mode, there is no RAM retention, everything is off, there is no consumption. The module doesn't store any information about the fixing and the satellites.

- 1 for *TD_GEOLOC_HW_BCKP* mode: with this mode, there is RAM retention. The module can store the last information about the fixing and the satellites in the RAM. It means that the fixing time for finding GPS data will be significantly shorter the next time the GPS will wake up in order to get data.

- Default value: *TD_GEOLOC_HW_BCKP.*

AT$INTERVAL=

- This interval T1 is the time between two consecutive messages when the module is in motion.

- If empty, it prints the current value.

- When there is a positive value after this command, this value become the new interval T1 in seconds. Don't forget that Sigfox supports 140 messages a day!

- Default value: 3600 seconds (1 hour).

AT$T2PERIOD=

- This interval T2 is the time between two consecutive messages when the module is not in motion.

- If empty, it prints the current value.

- When there is a positive value after this command, the new interval T2 will be the interval T1 multiplied by this number.

- Default value: 3.

AT$TIMEOUT=

- This data is the duration during which the GPS tries to find satellites in order to have GPS coordinates.

- If empty, it prints the current value.

- When there is a positive value after this command, this number will be the new timeout.

- Default value: 120 seconds.

AT$TYPE=

- Possibility to change the type of message sent by the module when there is no movement.

- If empty, it prints the current value and the type of message.

- 0: the device will only send temperature and voltage. The first eight bytes will be 0x00.

- 1: the device will send the last GPS coordinates, temperature and voltage. In this case, the device will not do a new measure for GPS coordinates: it will send the last GPS latitude and longitude which were measured when there was movement. If the device doesn't make measurement for GPS since the last reset, the first eight bytes will be 0x00.

- Default value: 0.