Fitness Low Power

Application Note

GNSS Module Series

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About the Document

History

Revision	Date	Author	Description
1.0	2015-08-21	Connie ZHOU	Initial

Contents

1 Introduction

Fitness low power (FLP) is an optimized solution for wearable, fitness and tracking device. It provides a FLP mode for Quectel GPS modules to reduce power consumption with tiny accuracy trading-off. The FLP mode can be easily set by using a specific message.

In FLP mode, the module has good route consistence in walking and running scenarios, and can switch dynamic duty operation automatically. It will come back to normal mode in difficult environment to keep good accuracy as well, thus realizing maximum performance with the lowest power consumption.

This document is applicable to Quectel GPS modules.

2 Power Consumption

The average current for FLP mode is only 5mA in static receiving, which is about 40% of normal mode. The power consumption may increase a little bit in dynamic scenario. The average current in different open sky scenarios for FLP mode and normal mode is shown in the table below.

Table 1: Average Current for FLP Mode and Normal Mode

Scenario	In FLP Mode (mA)	In Normal Mode (mA)
Static	5.036	12.783
Walking	5.374	12.249
Running	5.469	12.975
Driving	8.479	12.663

3 Quectel NMEA Packet Protocol

This chapter introduces the Quectel NMEA packet protocol, which is a set of extension messages of the standard NMEA packet protocol. This message is used to control the module to enable or disable FLP mode. The following table shows the structure of a Quectel NMEA packet.

3.1. Quectel NMEA Packet Format

Preamble	TalkerID	PktType	DataField	*	CHK1	CHK2	CR	LF

*The maximum length of each packet is restricted to 255 bytes.

Packet Contents:

● **Preamble:** One byte character: '**$**'

● **TalkerID:** Two bytes character string: "**PQ**"

● **PktType:** 1-10 bytes character string. An identifier used to tell the decoder how to decode the packet.

● **DataField:** The DataFileld has variable length depending on the packet type. A command symbol ',' must be inserted ahead of each data field to help the decoder to process the DataField.

● *** :** 1 byte character. The star symbol is used to mark the end of DataField.

● **CHK1,CHK2:** Two bytes character string. CHK1 and CHK2 are the checksum of the data between Preamble and '*'.

● **<CR><LF>:** Each NMEA message ends with 'CR' and 'LF'.

3.2. Packet Type: PQBAUD   Set NMEA Port Baudrate

PQBAUD Set NMEA Port Baudrate	
Write Command **$PQBAUD,W,<baudrate>*Checksum<CR><LF>**	Response $PQBAUD,W,OK*Checksum<CR><LF> If error:

	$PQBAUD,W,ERROR*Checksum<CR><LF>
Reference	

Parameter

<baudrate>	NMEA port baudrate
	Could be set to 4800, 9600,14400,19200, 38400, 57600, 115200

Example

$PQBAUD,W,115200*43   //Set NMEA port baudrate as 115200
$PQBAUD,W,OK*40   // Set successfully

NOTES

1. The command will be effective immediately after setting.
2. Parameter is automatically saved.

3.3. Packet Type: PQFLP   Set the Module into FLP Mode

PQFLP Set the Module into FLP Mode	
Write Command $PQFLP,W,<mode>,<save>*Checksum<CR><LF>	Response $PQFLP,W,OK*Checksum<CR><LF> If error: $PQFLP,W,ERROR*Checksum<CR><LF>
Read Command $PQFLP,R, *Checksum<CR><LF>	Response $PQFLP,R,<mode>*Checksum<CR><LF>
Reference	

Parameter

<mode>	Module operation mode	
	0	Normal mode
	1	FLP mode
<save>	Save operation	
	0	Parameter is not saved, ineffective after restart
	1	Parameter is saved in flash, effective after restart

Example

$PQFLP,W,1,1*20	//Switch to FLP mode
$PQFLP,W,OK*08	//Set successfully
$PQFLP,R*25	//Query the working mode
$PQFLP,R,1*38	//The modules is in FLP mode

NOTE

The command will be effective immediately after setting.

4 Enter into or Exit from FLP Mode

You can follow the steps below to enter into or exit from the FLP mode:

Step 1: Download new FW to the module, then the module is still in normal mode;

Step 2: Send the command **$PQBAUD,W,115200*43**, and the module responds **$PQBAUD,W,OK*40** which indicates the command is executed successfully;

Step 3: Send the command **$PQFLP,W,1,1*20**, and the module responds **$PQFLP,W,OK*08** which indicates the command is executed successfully;

Step 4: Wait for at least 5 minutes for the module to completely enter into FLP mode;

Step 5: You can send the command **$PQFLP,W,0,1*21** and **$PQFLP,W,OK*08** is returned, the module will exit from the FLP mode.

NOTES

1. It is recommended that some necessary commands are set before the module enters into FLP mode. If you need to send commands, please exit from FLP mode first.
2. When the module enters into FLP mode, 1PPS function will not be supported.
3. When the module enters into FLP mode, EASY function was disabled. You can send command to enable EASY function after the module exits from the FLP mode.
4. When the FLP mode is enabled, the SBAS will be affected.
5. High dynamic performance will have a little impact on FLP mode.
6. The module supports 4800bps~115200bps baud rate and 1HZ-10HZ frequency. It is recommended that 115200bps baud rate and 1HZ frequency are set before the module enters into FLP mode.
7. The modules will automatically come back to the normal mode in difficult environment to keep good accuracy.