



# **SPI Interface On GPS Receiver A2100-A/B**

## **Application Note**

**Version 1.0**

## Revision History

Rev.	Date	Description
1.0	04-23-11	First release
	mm-dd-yy	

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# 1 Introduction

The purpose of this document is to help the customers take advantage of the A2100 module's SPI interface which including the hardware connection circuit and software development guide .

## 2 SPI interface

### 2.1 SPI application

The host interface SPI is a slave mode SPI:

- Supports both SPI and Microwire formats
- An interrupt is provided when the transmit FIFO and output serial register (SR) are both empty
- The transmitter and receiver each have independent 1024B FIFO buffers
- The transmitter and receiver have individual software-defined 2-byte idle patterns of 0xB4, 0xA7
- SPI detects synchronization errors and is reset by software
- Supports a maximum clock of 6.8MHz

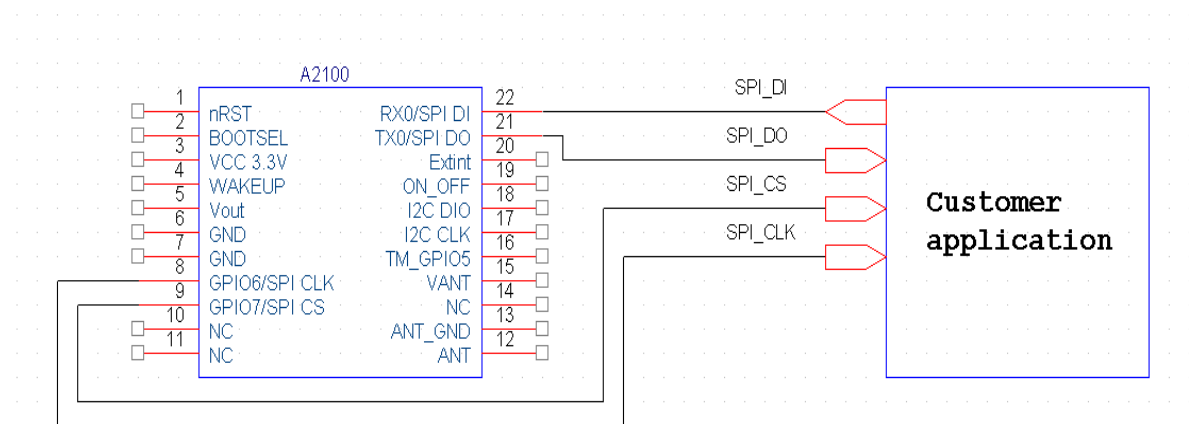


Fig. 1 Example of SPI bus application

## 2.2 SPI Software control

### 2.2.1 SPI Timing diagrams

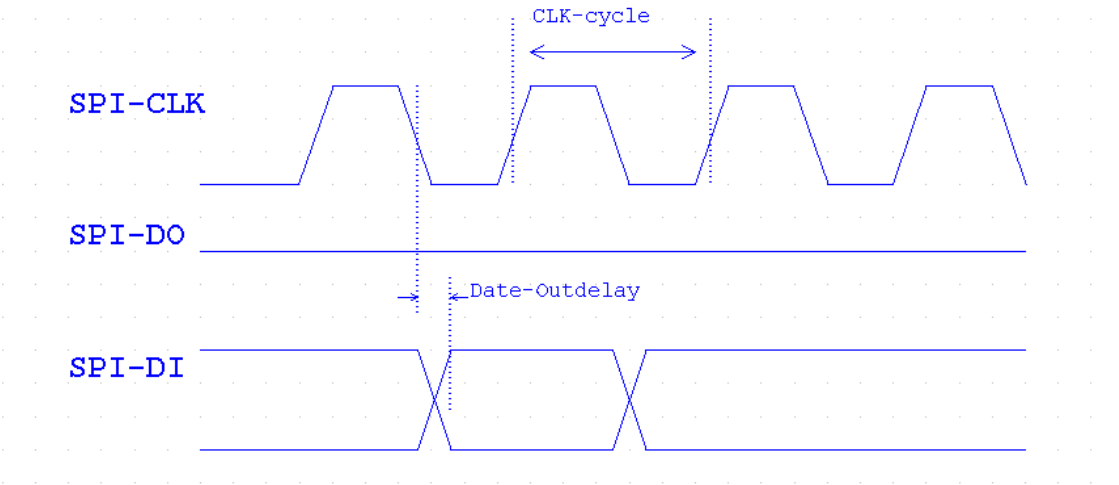


Fig. 2 SPI Timing diagrams, Mode 1, Master, 4 wires

Signal	Description	Minimum	Typ	Maximum	Unit
CLK-cycle	SPI Clock frequency			6.8	MHz
Data-out delay	Data out read delay time		8		us

### 2.2.2 software development guide

1. Correctly connect the circuits and configure to SPI mode 1 (CPOL:0,CPHA:1, Default) , Shift out MSb first.
2. After power on and getting the clock signal which sending from the master unit , the GPS module will send out NMEA data.
3. The NMEA data need be read one by one byte,the time interval between every two bytes must be more then 8us , otherwise it might send some error bytes.
4. When GPS module do not send any NMEA data , we will not be able to get NMEA data from the SPI interface, only receive 0xB4,0xA7. For example, the GPS module send 100 bytes per second into SPI FIFO, there will be total 100bytes "0xB4, 0xA7" with the 100bytes NMEA data when your program read 200 bytes per second.

Note:

1. Be careful to control of the each byte reading speed
2. Be careful to control of the rate of updated GPS NMEA data .

### 2.2.3 Example of appearing “ 0xB4, 0xA7”

If your program read faster than the refresh rate of GSP module's sending out NMEA data, below error codes or other error codes (i.e. B4 A7 in hex character) will be appearing.

#### NMEA format:

\$GPGGA,000050.058,,,,,0,00,,,M,0.0,M,,0000\*5E



## 3 Related Information

### 3.1 Contact

This manual was created with due diligence. We hope that it will be helpful to the user to get the most out of the GPS module.

Anyway, inputs about errors or mistakable verbalizations and comments or proposals to Maestro, HongKong, for further improvements are highly appreciated.

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### 3.2 Related Documents

- GPS Receiver A2100 (Maestro)