PR9200 Application Note:

PR9200 Serial Interface

PHYCHIPS

Revision History

Version	Date	Description
01	2014-03-18	Initial release
02	2016-05-18	Modified pin information of UART, SPI and I^2C Added SPI timing information
03	2016-09-02	Added I2C slave address information
04	2018-04-20	Modified mode change of SPI
05	2020-11-01	Modified SPI Interface

Document Summary

- PR9200 can support three digital interface to HOST: UART, SPI, I2C.
- Default interface is UART.
- As modifying firmware a little bit, user can easily change interface method to SPI or I2C.

UART Interface (1/2)

- Pin Information
  - P00: UART0 RXD
  - P01: UART0 TXD
  - P10 or P16: IRQ*
    - P10: for PRM92x20 and PRM92x30
    - P16: for RED4 and RED5

  *Output, this pin is controlled by PR9200

- PR9200 firmware for UART
  - For change serial interface or baudrate, reprogram new firmware after modify and compile the firmware
  - How to modify firmware
    - File: config.h

```
051 // RCP Path
052 //#define __FEATURE_GPIO_SIO_SEL__
053 #define __FEATURE_UART_RCP__
054 //#define __FEATURE_SPI_SLAVE_RCP__
055 //#define __FEATURE_I2C_SLAVE_RCP__
```

Remove comment!

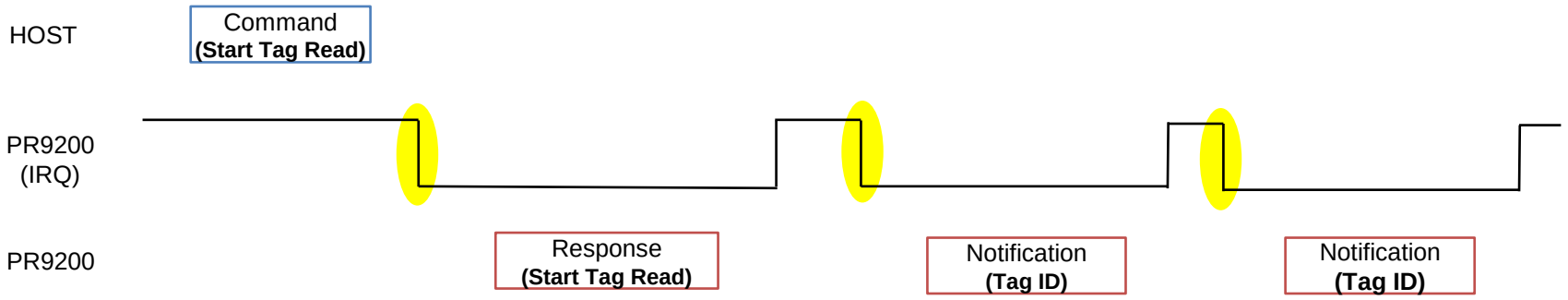
  - How to change baudrate
    - File: config.h

```
073 ////////////////////////////////////////////////////////////
074 // UART Feature
075 ////////////////////////////////////////////////////////////
076 #define UART0_BAUDRATE  (115200)
```

Modify baudrate!

UART Interface (2/2)

- Message Exchange (ex. Tag Read)



- IRQ Pin (Optional)
  - Slave changes IRQ to low when there is packet that slave response to master after command processing

SPI Interface (1/3)

- Pin Information
  - P04: SPI TXDS
  - P05: SPI RXDS
  - P06: SPI CLK
  - P07: SPI SEL
  - P10 or P16: IRQ*
    - P10: for PRM92x20 and PRM92x30
    - P16: for RED4 and RED5

  *Output, this pin is controlled by PR9200

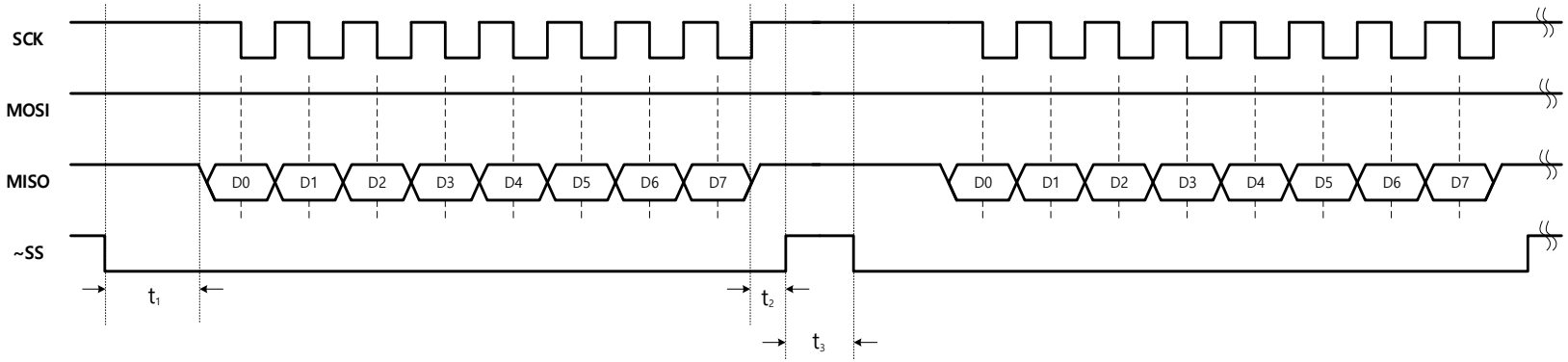
- PR9200 firmware for SPI
  - For change serial interface, reprogram new firmware after modify and compile the firmware
  - How to modify firmware
    - File: config.h

```
051  // RCP Path
052  //#define __FEATURE_GPIO_SIO_SEL__
053  //#define __FEATURE_UART_RCP__
054  #define __FEATURE_SPI_SLAVE_RCP__
055  //#define __FEATURE_I2C_SLAVE_RCP__
```

Remove comment!

SPI Interface (2/3)

- SPI timing information



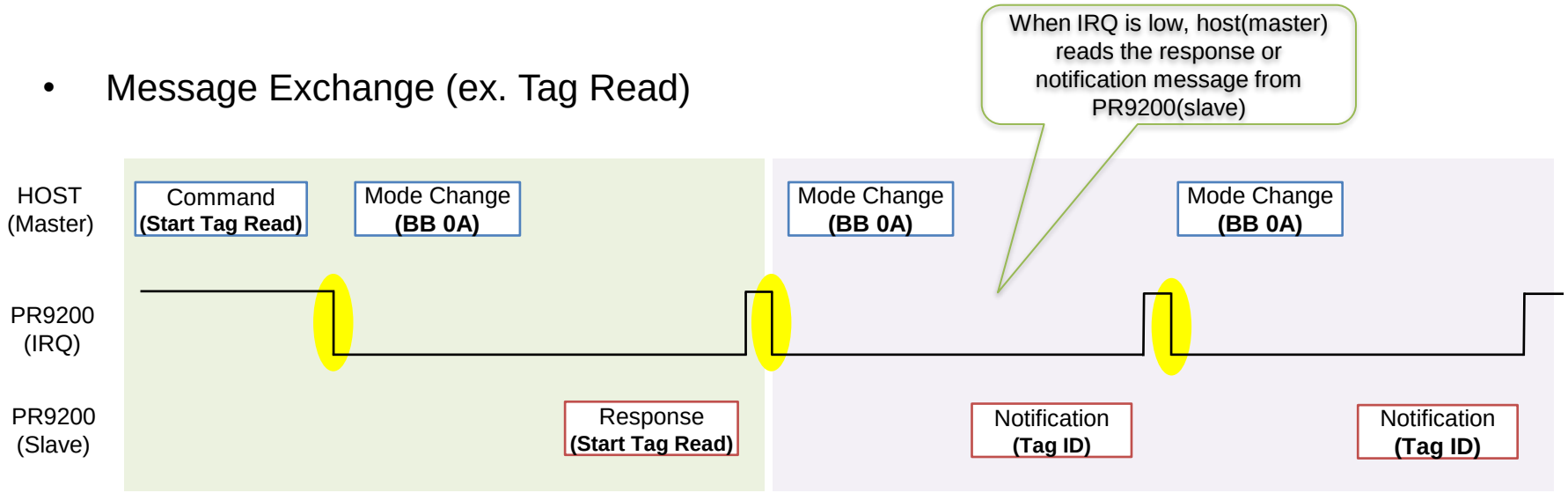
Time	Min.	Max.
t_1	SCK 2 cycle	SCK 3 cycle
t_2	0	
t_3	SCK 1 cycle	

When SCK is 250kHz

Time	Min.	Max.
t_1	8 us	12 us
t_2	0	
t_3	4 us	

SPI Interface (1/3)

- Message Exchange (ex. Tag Read)



- Mode change message (mandatory)
  - Length: 2bytes
  - Use for Read/Write mode change
    - Master: Write → Read
    - Slave : Read → Write
  - For read response: 0xBB 0x0A (No CRC)

- IRQ Pin (Optional)
  - Slave changes IRQ to low when there is packet that slave response to master after command processing.

***For the detail information, refer to ACP document**

I2C Interface (1/2)

- Pin Information
  - P11: I2C SDA
  - P12: I2C SCL
  - P10 or P16: IRQ*
    - P10: for PRM92x20 and PRM92x30
    - P16: for RED4 and RED5

  *Output, this pin is controlled by PR9200

- I2C Slave Address : 0x49

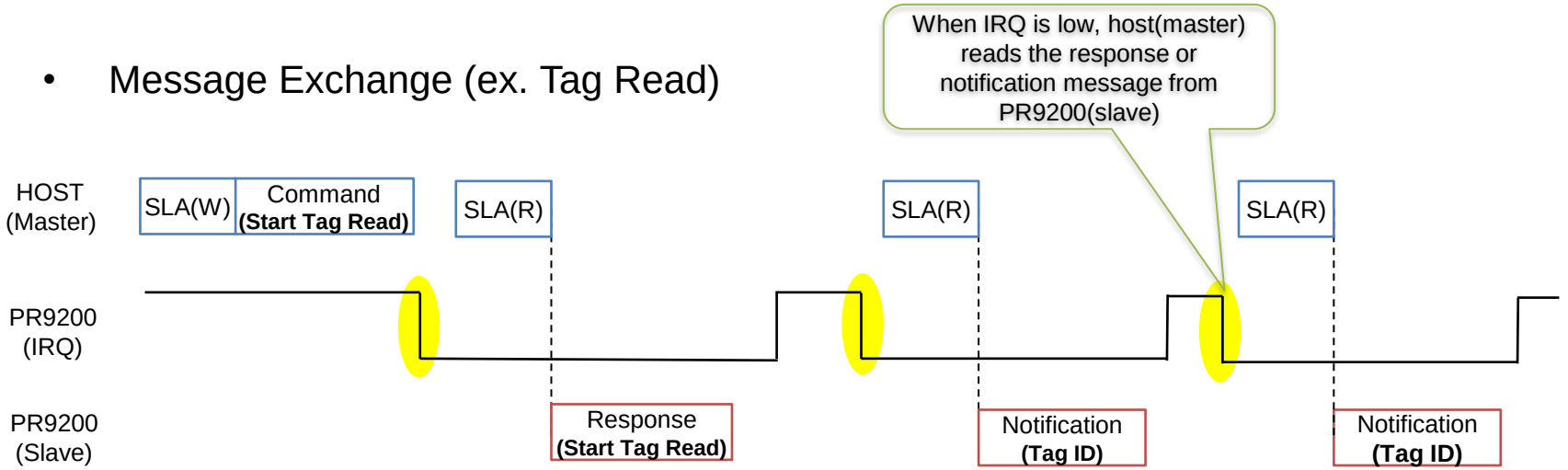
- PR9200 firmware for I2C
  - For change serial interface, reprogram new firmware after modify and compile the firmware
  - How to modify firmware
    - File: config.h

```
051 // RCP Path
052 //#define __FEATURE_GPIO_SIO_SEL__
053 //#define __FEATURE_UART_RCP__
054 //#define __FEATURE_SPI_SLAVE_RCP__
055 #define __FEATURE_I2C_SLAVE_RCP__
```

Remove comment!

I2C Interface (2/2)

- Message Exchange (ex. Tag Read)



- Mode change
  - SLV(Slave address) + R/W (R: Read, W: Write)
    - Slave address : 0x49
- IRQ Pin (Optional)
  - Slave changes IRQ to low when there is packet that slave response to master after command processing.

***For the detail information, refer to ACP document**

Address information

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