# Using the Bluetooth HC-06 Module

# Spring 2018

### Introduction

The HC-06 Module allows one to use simple UART protocols over Bluetooth. This example runs through communicating through a HC-06 module to a computer serial terminal with the PSoC. Due to variances in suppliers, the default baud rate and discoverable name may vary from module to module. This examples assumes a default name of 'HC-06' and a default baud rate of 9600.

#### Software

Firstly, open up a new PSoC Creator project, setup for your desired PSoC variant (this example is using a CY8CKIT-059). Drag a UART block and a Control Register block into the 'TopDesign.cysch' file. The UART block can be found under 'Communications' in the 'Components Catalog'. The Control Register block can be found under 'Digital'->'Registers'.



Now, modify the UART block settings to have a baud rate of 9600 and leave all other settings as default (shown below).

ame: UART_1	
Configure Advar	red Ruitin db
Mode	
Full UART (TX +	RX)   RX only
Half duplex	TX only
Bits per second:	9600 👻
Data bits:	8
Parity type:	None 👻
	API control enabled
Stop bits:	1
Flow control:	None

Add digital output pins for the control register. Wire them up to the control register outputs

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Now, in the design wide resources file, add pin definitions for every created pin as shown below.

	Name /	Port		Pin		Lock
l	Pin_1	P3[0]	•	29	•	
	Pin_2	P3[1]	•	30	•	
l	Pin_3	P3[2]	•	31	•	
	Pin_4	P3[3]	•	32	•	
	Pin_5	P3[4]	•	33	•	
	Pin_6	P3[5]	•	34	•	
	Pin_7	P3[6]	•	36	•	
	Pin_8	P3[7]	•	37	•	
	Rx_1	P1[7]	•	19	•	
	Tx_1	P1[6]	•	18	•	

Build the program so that PSoC creator includes the necessary API's (which allows for auto-completion when writing the following code). In the 'main.c' file, we need to initialize the UART module and then on every loop iteration check if a message is available. If a message is available, we echo it back to the sender and output the received byte to the control register.

```
11: - */
12 #include <project.h>
13
14 int main()
15 🖂 {
16
        CyGlobalIntEnable; /* Enable global interrupts. */
17
        /* Place your initialization/startup code here (e.g. MyInst_Start()) */
18 内
19
        UART 1 Init();
20
        UART_1_Start();
21
22
        for(;;)
23
        {
24
            /* Place your application code here. */
25 -
            if (UART 1 GetRxBufferSize() > 0) {
                uint8 c = UART 1 GetChar();
26
27
                UART 1 PutChar(c);
28
                Control_Reg_1_Write(c);
29
            }
30
        }
31 }
32
33 - /* [] END OF FILE */
34
```

## Hardware

To wire up the HC-06 Module you need to wire VCC to 5V, TXD to whichever pin was assigned to Rx\_1, RXD to the pin assigned to Tx\_1, and connect grounds. **Ensure that your PSoC is operating at 3.3V or that you are using a level shifter in between the PSoC and HC-06**. In this example we'll be using Windows 7 and PuTTY to communicate, but any OS with Bluetooth support and any terminal emulator should be usable. Power up your circuit and navigate to your Bluetooth settings. Click 'Add a device' and you should see a screen similar to the one below appear. Add the HC-06 device and use a device pin of '1234' (your module may have a different default pin, also try '0000').

0	Add a device	
	Select a device to add to this computer	
	Windows will continue to look for new devices and display them here.	
	HC-06 Bluetooth Other	
1		
	What if Windows doesn't find my device?	
	Next Cancel	

If the device is successfully added, you now have to wait for Windows to fetch the drivers. Once it finishes, you should be able to go to 'Device Manager' (Go->Search 'Device Manager') and under 'PORTS (COM & LPT)' you should see one or two new devices related to Bluetooth. Only one of them will work, so you'll need to go through some trail and error. In this case, COM10 is the correct port.

	Standard	Serial over	Bluetooth	link	(COM10)
<b>?</b>	Standard	Serial over	Bluetooth	link	(COM12)

Now, open up PuTTY, or your terminal emulator of choice, and connect to your port (COM10) with a baud rate of 9600. As you type in the terminal you should see the characters echoed back and the pins connected to the control register should match the ASCII code of the sent character. If this occurs, congratulations, you are successfully using the HC-06 Module! When connected, the red LED should stop blinking and become solid.

PuTTY Configuration	×
Category:	
E Session	Basic options for your PuTTY session
····· Logging ⊡··· Terminal ···· Keyboard	Specify the destination you want to connect to Serial line Speed COM10 9600
Features	Connection type: Raw Telnet Rlogin SSH Serial
Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin	Load, save or delete a stored session Saved Sessions Default Settings Load Save Delete
⊕ SSH Serial	Close window on exit:
About	Open Cancel

## Troubleshooting

- No characters echoed back and pins not changing
  - First, try using the second COM port if it is available
  - Make sure your baud rates match and you are using 8 data bits, no parity, and 1 stop bit
  - Ensure your code matches the provided code exactly
  - Ensure Rx\_1 is connected to TXD and vice-versa
- Nonsense output on serial terminal emulator
  - Ensure correct baud rates are being used
- Cannot find HC-06 Module on 'Add a device' screen
  - Try restarting both the computer and the device
  - Begin searching for devices shortly after HC-06 has turned on