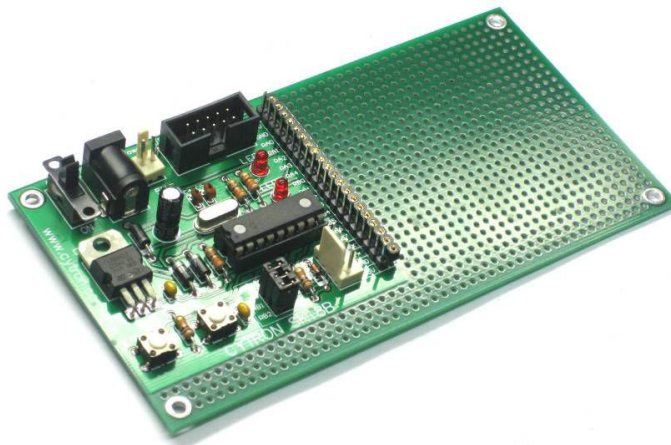




## **SK18B 18 Pins PIC START-UP KIT**



### **User's Manual V1.0 August 2009**

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## INTRODUCTION AND OVERVIEW

SK18B is another version of SK18A. SK18B is designed to offer an easy to start board for PIC MCU user. However, all interface and program should be developed by user. This board comes with basic element for user to begin project development. It offers plug and use features. This kit is designed to offer:

- Nice outlook
- Industrial grade PCB
- Every board is being tested before shipped to customer
- Compact, powerful, flexible and robust start-up platform
- Suitable for hobbyists and experts
- Save development and soldering time
- No extra components required for the PIC to function
- **11 I/O pins are nicely labeled (PIC16F)** to avoid miss-connection by users
- Connector for UIC00A (low cost USB ICSP PIC Programmer) offer simple and fast method to load program
- No more frustrated work plugging PIC out and back for re-programming
- Perfectly fit for **18 pins PIC16F MCU**
- With UIC00A, program can be loaded and verified in less than 4 seconds
- **Dimension:** 13.3cm x 6.9cm

SK18B come with:

**New!** Now comes with UART interface for easier communication between the user's circuit (or PC) and SK18B.

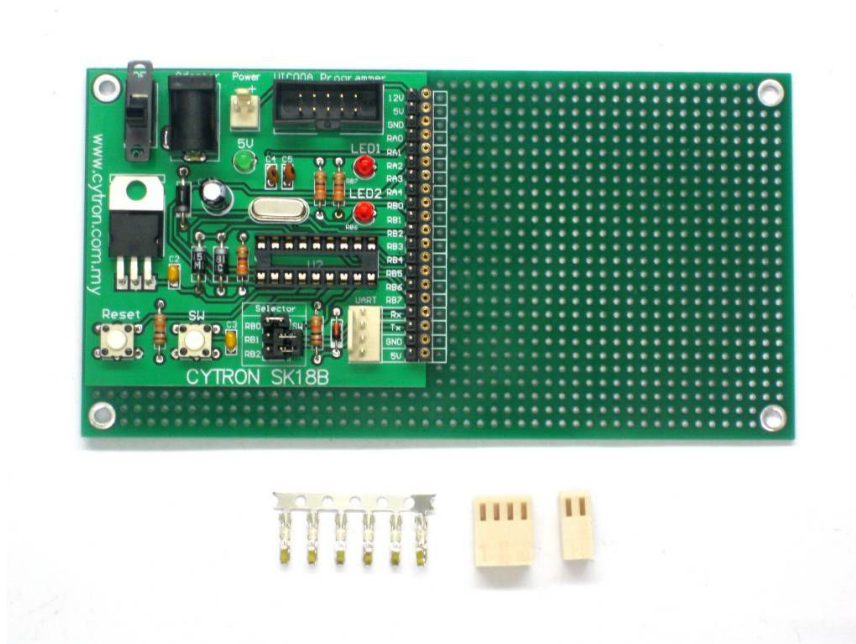
- Box header for UIC00A (low cost USB ICSP PIC Programmer) offer simple and fast method to load program
- 5V voltage regulator (1A max)
- 20MHz oscillator
- Reset button
- 1 x programmable general purpose push button connected to RB0 via removable jumper
- 2 x programmable LED indicator at RB6 and RB7
- UART connector from RB1 and RB2 via removable jumper
- USB power the circuit if UC00A is used
- On/Off switch for main power
- DC adaptor socket as power input
- Extension header pin and turn pin for PIC pins
- Four PCB stand or screw mounting holes
- And all the necessities to eliminate users difficulty in using PIC

Users are able to utilize the function of PIC by directly plugging in the I/O connectors in whatever way that is convenient to user. With UIC00A connector on board, user can start developing projects and have fun with this kit right away. This kit comes **WITHOUT** PIC microcontroller to give the freedom for user to choose PIC type.

This document explains the method to use SK18B.

## 2. PACKING LIST

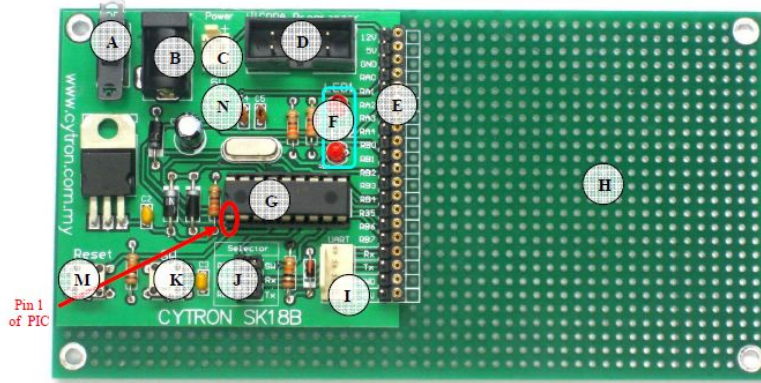
Please check the parts and components according to the packing list. If there are any parts missing, please contact us at [sales@cytron.com.my](mailto:sales@cytron.com.my) immediately.



SK18B comes with:

- 1 x SK18B board with all components shown soldered
  - 1 x 2510-04 Connector
  - 1 x 2510-02 Connector
  - 6 x Iron Pin
  - 3 x mini jumper
- 
- **PIC MCU** – Not included, please purchase separately from Cytron website
  - **UIC00A** – Not included, please purchase separately from Cytron website
  - **User's Manual** – Not included, please download from Cytron website
  - **UC00A** – Not included, please purchase separately from Cytron website

### 3. BOARD LAYOUT



Label	Function	Label	Function
A	Slide switch for main power supply	H	Development area
B	DC power adaptor socket	I	UART Connector
C	Battery connector	J	Mini jumper selector
D	Box Header for UIC00A Programmer	K	Programmable Push button
E	Header pin and turn pin	L	Reset button
F	Programmable LEDs from PIC MCU	M	5V Voltage Regulator
G	18 pin IC socket for PIC MCU ( <b>PIC MCU not include</b> )	N	Power indicator LED

**A** – Slide switch to On/Off the power supply from DC adaptor or Battery connector.

**B** – DC power adaptor socket for user to plug in DC adaptor. The input voltage should be ranged from 7 to 15V.

**C** – 2510 2 way connector for battery input. The battery voltage should be between 7 to 15V. Please ensure the polarity of voltage is correctly plugged before power up SK18B. The “+” and “-” is have been labeled at the side of connector.

**D** – 2x5 box header for UIC00A, USB ICSP PIC Programmer.

**E** – 14 lines of header pin and turn pin. It is fully compatible between SK18B. Turn pin offer simple way to check voltage with multi-meter probe. 14 pins of PIC MCU are extended out to these pin except OSC (connected to crystal), RB6 and RB7 (connected to LEDs and UIC00A box Header). These 14 pins of header pin and turn pin are only compatible with 18 pin PIC16F MCU (8 bit). It is not compatible with 18pin PIC18F MCU.

**F** – 2 LEDs (connected to RB6 and RB7) as active High output for PIC MCU. These LEDs are controllable from PIC MCU.

**G** – 18 pin IC socket for user to plug in any 18 pin PIC16F MCU (8 bit). Of course the IC package should be PDIP. Please ensure the first pin is at the top side.

**H** – Development area for user to solder electronic components as input or output for PIC MCU.

**I** – 2510- 4 ways connector for UART communication.

**J** – Mini jumper as a selector to select SW or UART. If UART communication is used, jump RB1 and RB2 pin to connect with RX and TX pin. If SW jumper connected, RB0 will connect to the SW.



**K** – A programmable push button where user may use the push button as an input of PIC MCU.

**L** – A push button with the function of Reset for PIC MCU.

**M** – 5V voltage regulator 1A maximum.

**N** – On board 5V indicator LED. It will light ON as long as the input power is correctly connected and the slide switch is ON.

#### **4. PRODUCT SPECIFICATION**

SK18B is designed to offer starting up platform for development, the specification of PIC MCU used should be referred.

Absolute Maximum Rating

Symbol	Parameter	Min	Max	Unit
Vcc	Operating voltage	7	15	V

Battery or DC adaptor can be used.

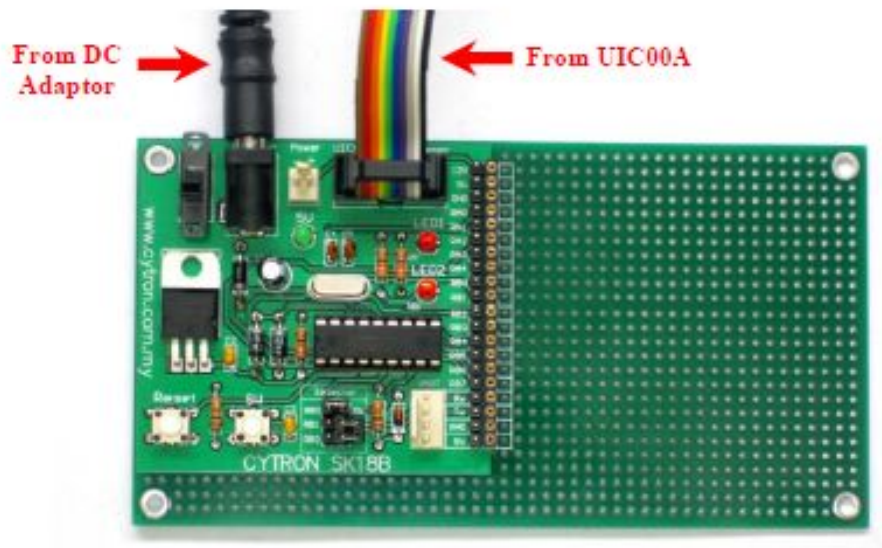
Note: Only 1 power supply should be provided to SK18A.

## INSTALLATION (HARDWARE)

SK18B come with UIC00A - ICSP USB programmer connector to offer simple way for downloading program. From user feedback and experience, using UIC00A ICSP programmer is very easy and save plenty of development time.

### 5.1 Loading Program Using UIC00A Programmer

Connect SK18B as shown in following figure.



SK18B should be powered either from battery or DC adaptor. Plug 18 pins PIC16F microcontroller. Please ensure the first pin of microcontroller is plugged correctly. Power up SK18B by turning the slide switch to “ON”. Now, the hex code is ready to be loaded to SK18B. For the usage of UIC00A, please refer to UIC00A User's Manual.

RB7 and RB6 have been connected to UIC00A connector; both these pins are used for ICSP. **User is advice not to use these pin as input.** Even when using as output, RB7 or RB6 pin are recommended to be used in controlling non critical device such as LED, LCD, 7 segments or buzzer. It is recommended to isolated ICSP signals from application circuit by using series resistor (range 220 ohm and above). Please refer to UIC00A User's Manual for further details. Hence, in SK18B, RB7 and RB6 is being connected to active High LED.



## **GETTING STARTED**

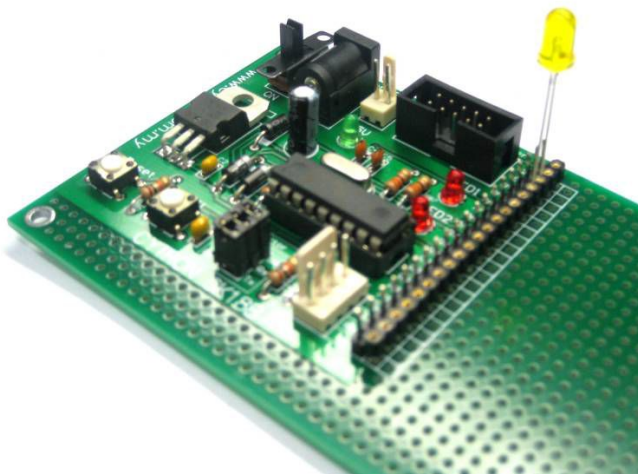
To get started with SK18B, no extra driver or software is necessary. SK18B is ready to be plug and use. For the use of UIC00A, please install the necessary driver or configure the correct setting in window. SK18B is ready be used to start the electronics interface.

### **6.1 I/O port (to electronic components)**

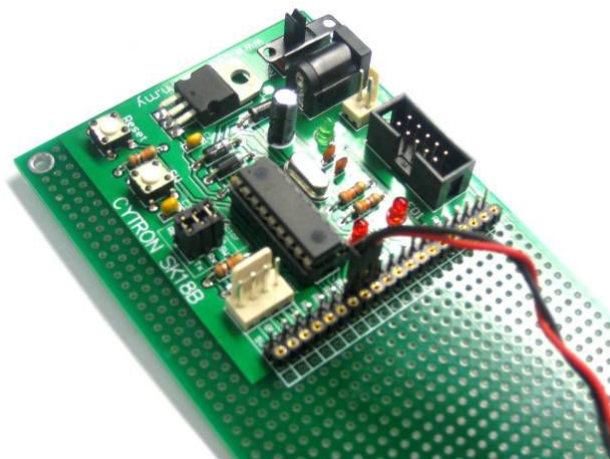
Sample source code can be downloaded from SK18B product page. User may use this sample source code to blink LED1 and LED2 when SW is pressed. Please refer UIC00A User's Manual to load hex code into PIC of SK18B.

The I/O of the microcontroller can be accessed through few methods:

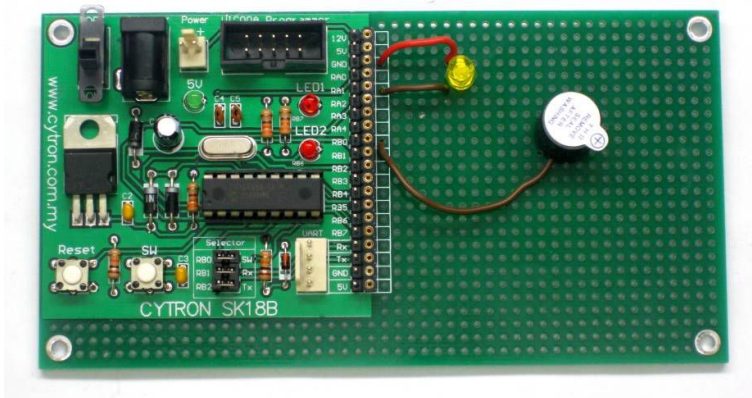
- a. Connect the components that are needed onto the I/O port



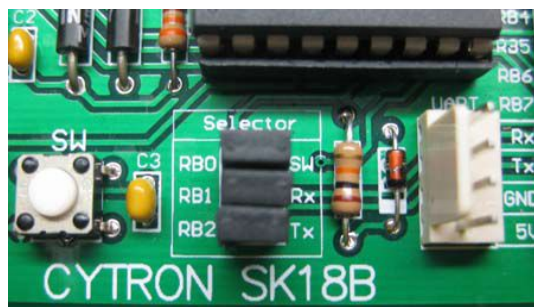
- b. Connect the electronic device to PIC MCU I/O port through Header pin.



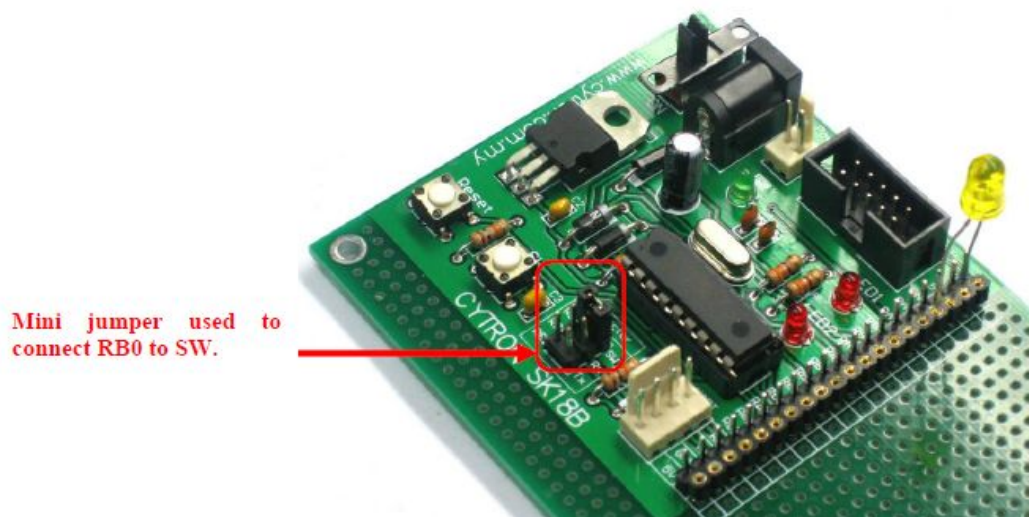
- c. Extend the I/O port to development area using jumper wire. User may also solder the necessary interface to PCB like ordinary donut board.



Pin selector used if user use push button (SW) and UART. Using mini jumper SW will connect to RB0 and RX, TX connect to RB1 and RB2 respectively.



- d. Using SW as an input of microcontroller to activate LED. The SW is connected to Port RB0.



## 6.2 Using UART Communication

UART (Universal Asynchronous Receiver Transmitter) can be used to communicate between:

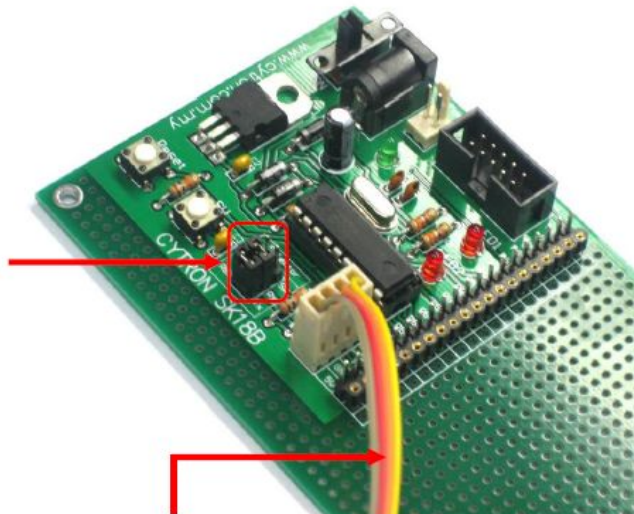
- i. SK18A – Computer/Laptop
- ii. SK18A – Microcontroller

There are a few things needed to take note by user before use UART.

- PIC microcontroller used.

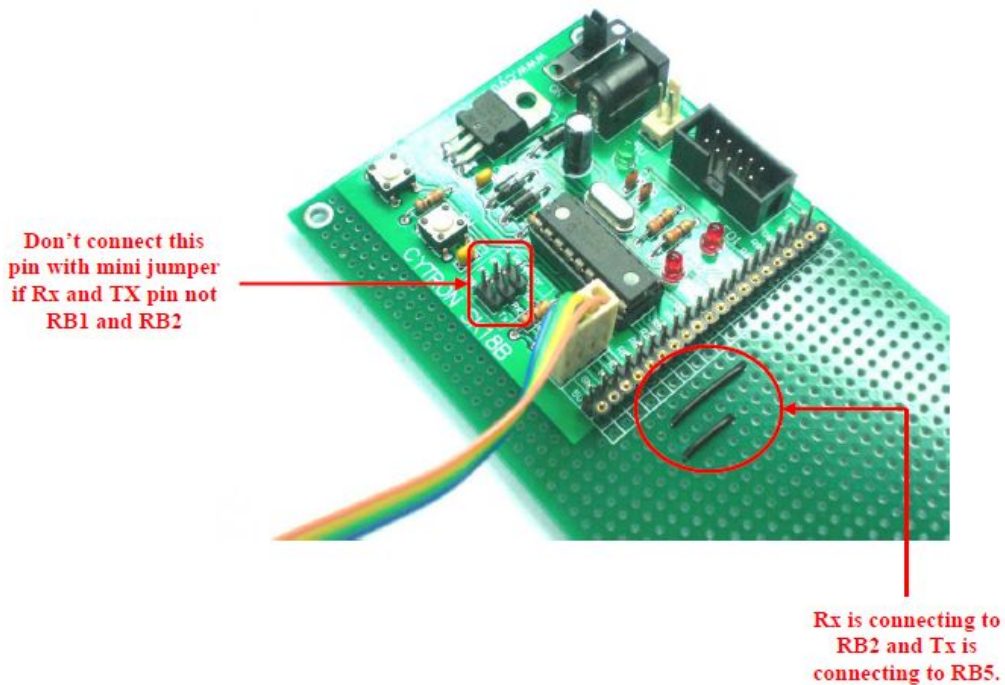
Choose microcontroller which have RX and TX pin at RB1 and RB2 I/O of microcontroller. It is because using mini jumper, RX and TX pin automatically will connect to RB1 and RB2 pin of microcontroller. Example microcontroller can be use is PIC16F627, PIC16F628, PIC16F648A and etc. If user doesn't use UART and does not connect mini jumper at RX and TX pin, RB1 and RB2 may be used as I/O of microcontroller.

Mini jumper used to connect RB1 to RX pin and RB2 to TX pin.



- RX and TX pin of PIC microcontroller.

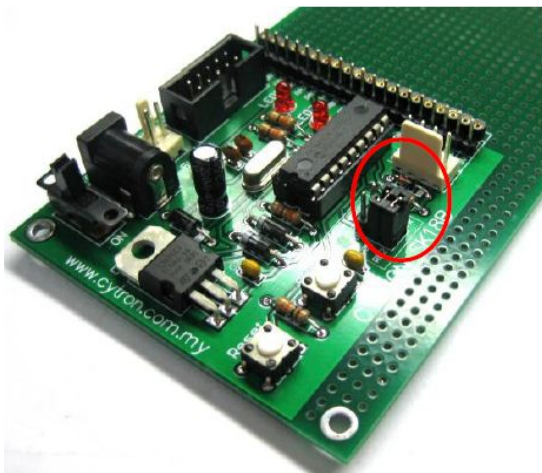
If users use other type of PIC, identify the RX and TX pin for that microcontroller. Then connect the I/O port of TX and RX to UART connector. For example RX pin for PIC16F88 is RB2 and TX pin is RB5. Then, connect RB2 I/O port to RX pin and RB5 I/O port to TX pin of UART connector. User may use jumper wire or solder like ordinary donut board to make that connection. And ensure no mini jumper at RX and TX pin selector.



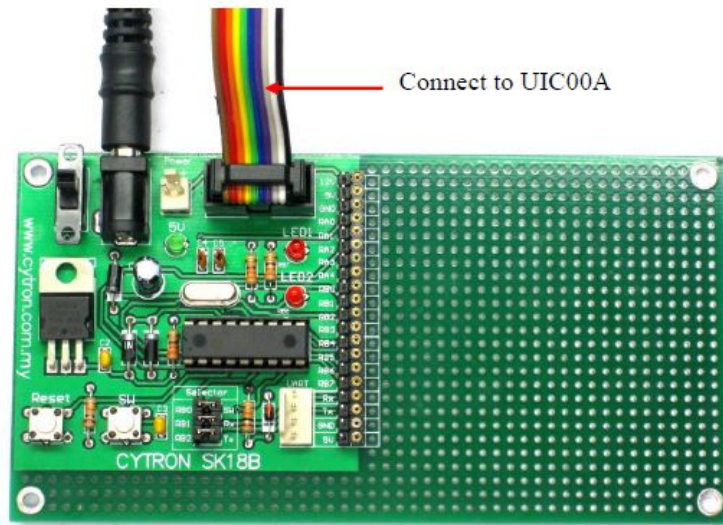
### 6.2.1 Using UART to Computer

UC00A is a USB to UART converter which can be used for UART communication between SK18A and Computer/Laptop. Please refer UC00A User's Manual for details. We have provided a sample source for UART communication between SK18B to Computer. To communicate SK18A to Computer/Laptop:

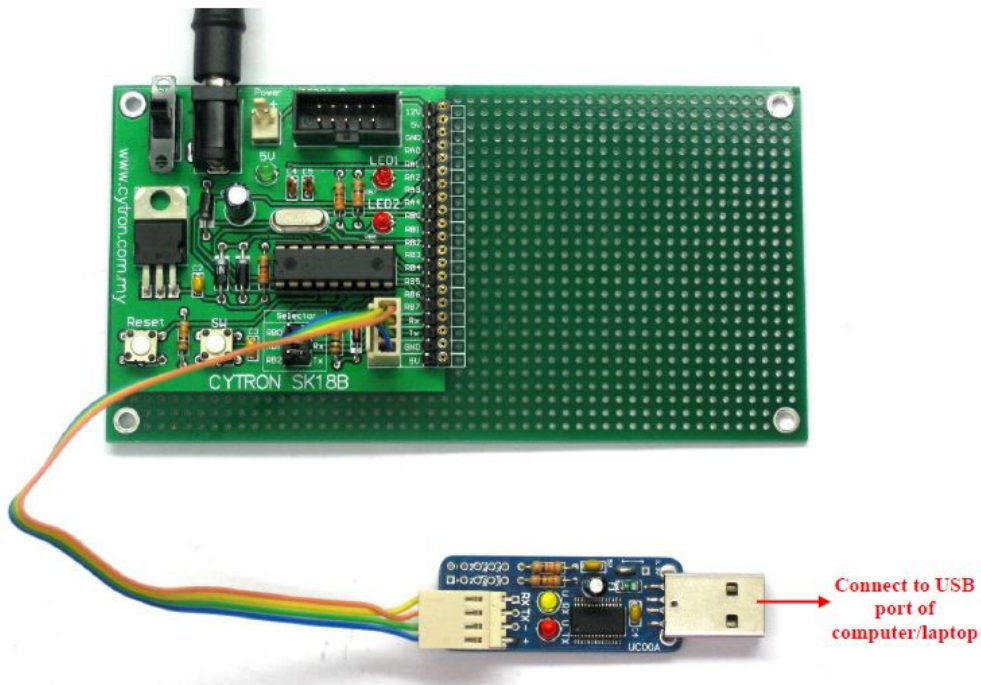
1. Ensure UART pin for microcontroller. No restriction to what type of 18pin PIC16F MCU can be used for SK18B, as long as it has UART peripheral. But ensure the UART pin is correctly connected. This sample schematic use PIC16F628 which is Rx pin is RB1 and Tx pin is RB2.
2. At pin selector, connect RX pin to RB1 and TX pin to RB2 using mini jumper.



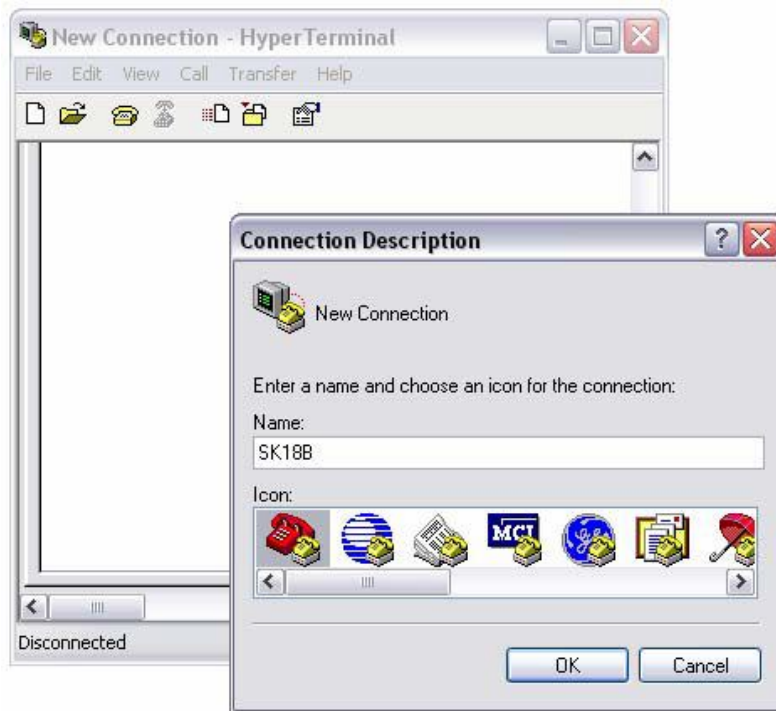
3. Connect UIC00A to SK18B and load the hex code for UART into PIC microcontroller. Please refer UIC00A User's Manual to load hex code into PIC.



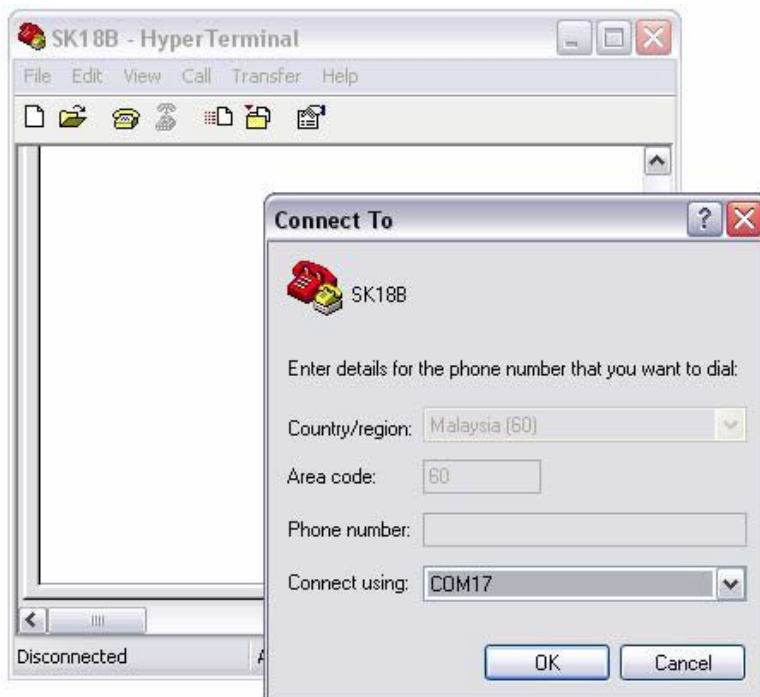
4. Connect UC00A to SK18B and Computer. Switch on the power.



5. Open HyperTerminal. Enter a name and choose an icon for connection as picture below then click OK.



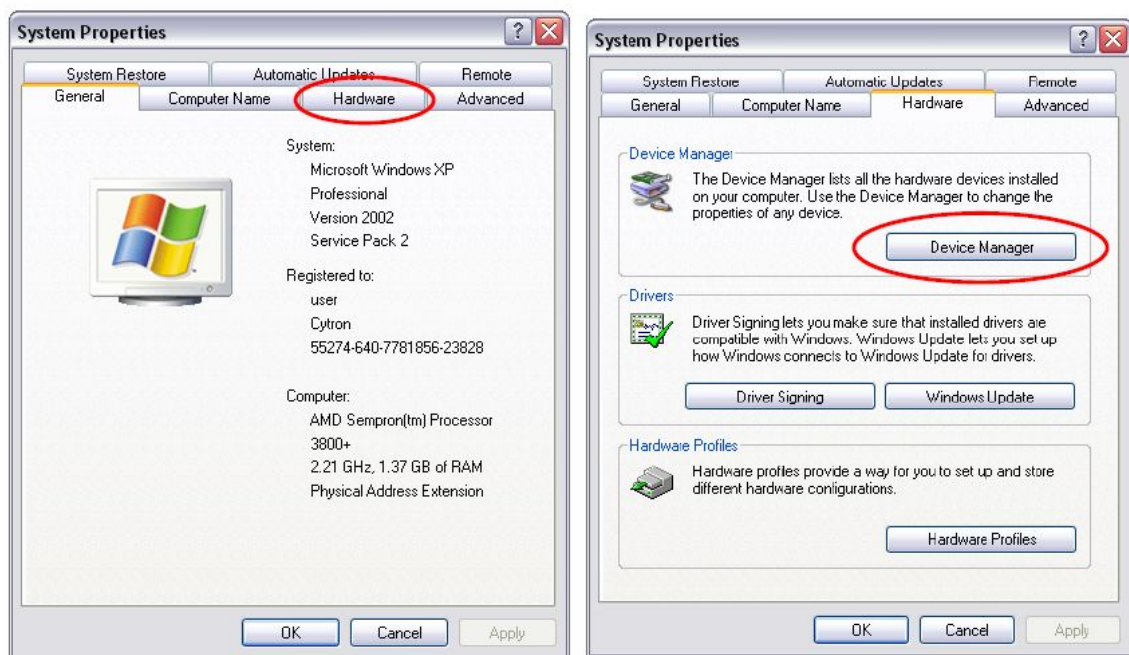
6. Select COM port.

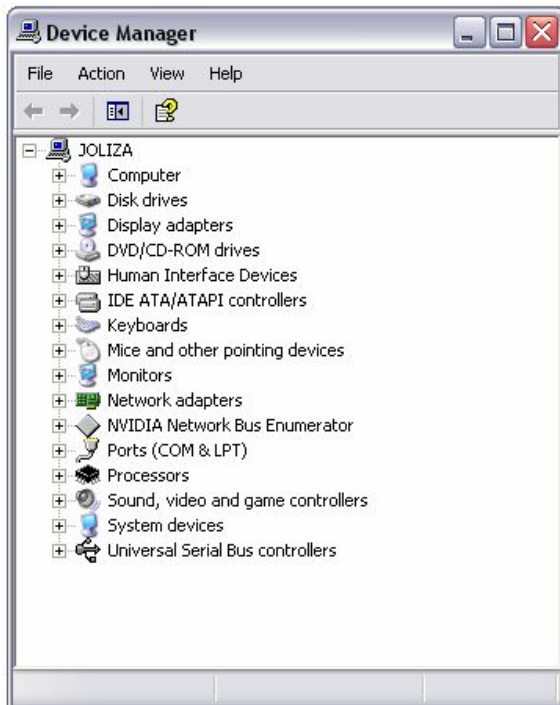


- Please follow step (8) to (10) if the COM port number is not confirm.
- Go to Start, right click on My Computer and choose Properties.

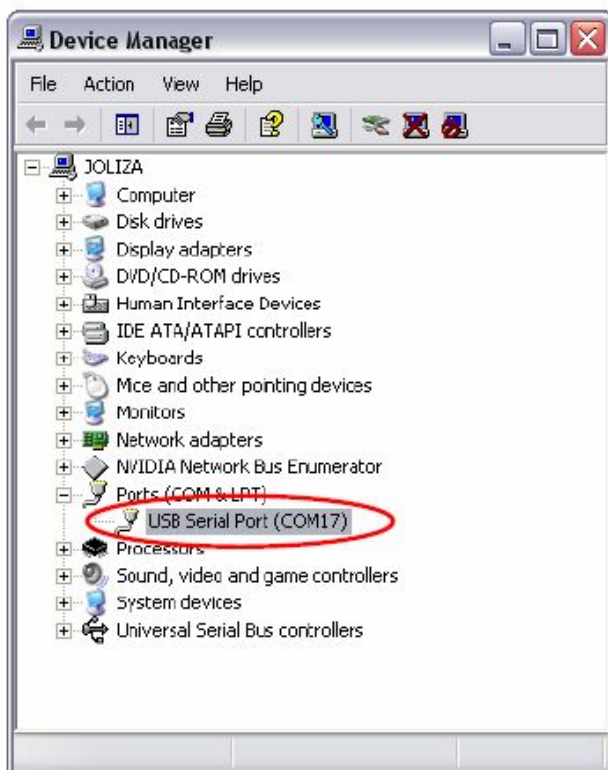


- At System Properties, choose Hardware and click on Device Manager. Device Manager will pop up.



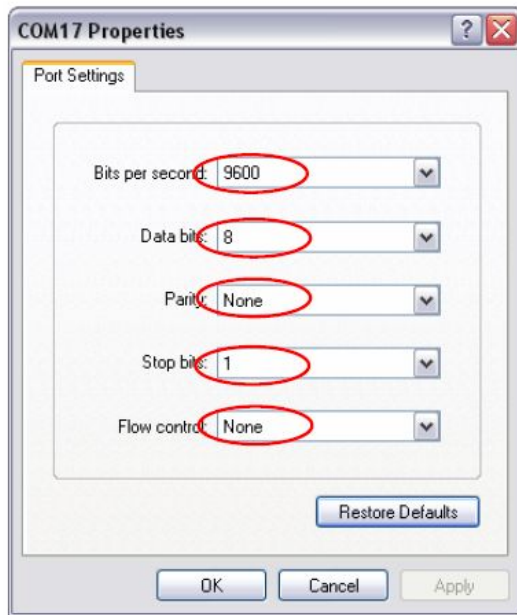


10. At Device Manager, choose (COM & LPT) and USB Serial Port COM will be visible. As an example below, COM Port for SK18B is **COM17**. The COM Port is not definitely same for each computer.

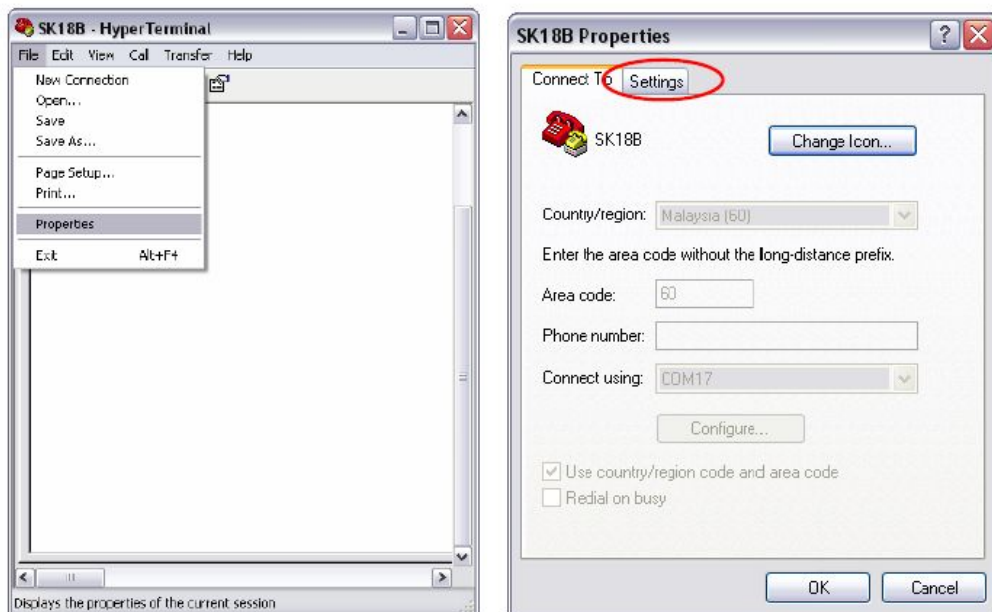


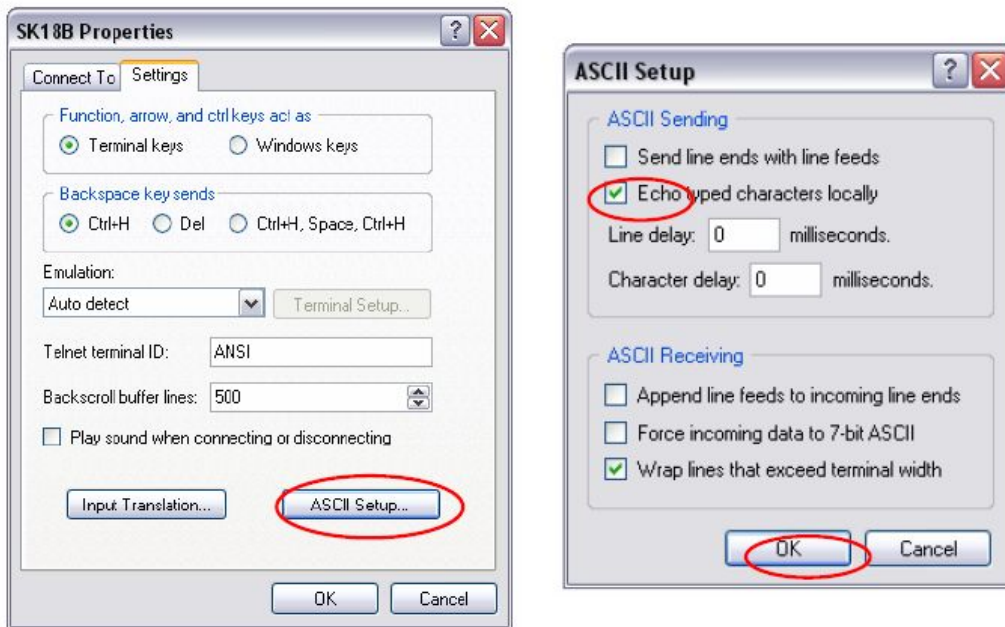


11. Set the “Port Setting” as picture below. Bits per seconds must be same with SK18B Baud Rate in programming. After finish setting, click Apply and then click OK.

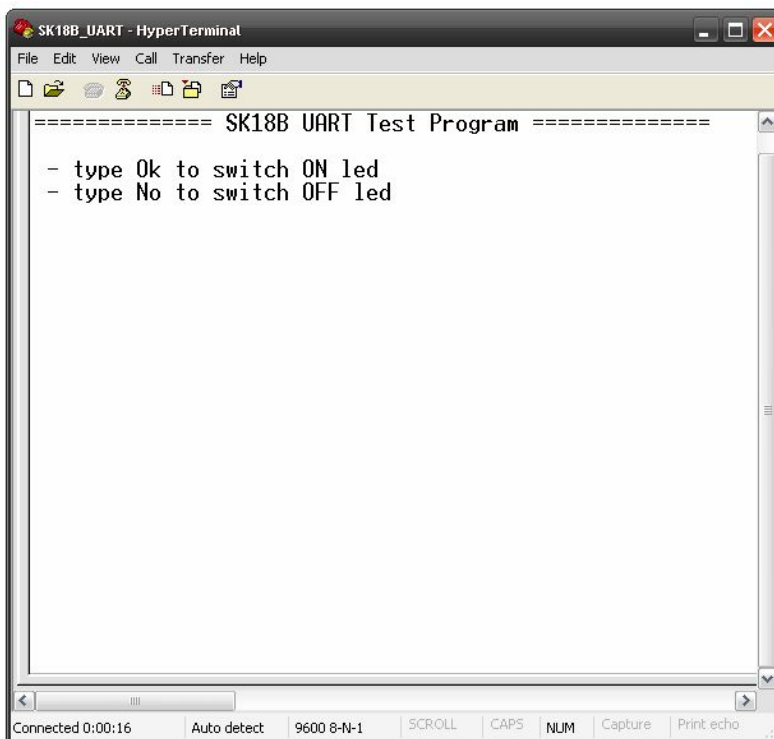


12. Go to File and select Properties. ‘SK18B’ Properties will show. Choose Setting tab and click ASCII Setup. Click on *Echo typed characters* locally and then click OK. *Echo typed characters* is to display on HyperTerminal what is pressed on keyboard. User may click or unclick *Echo typed characters*.





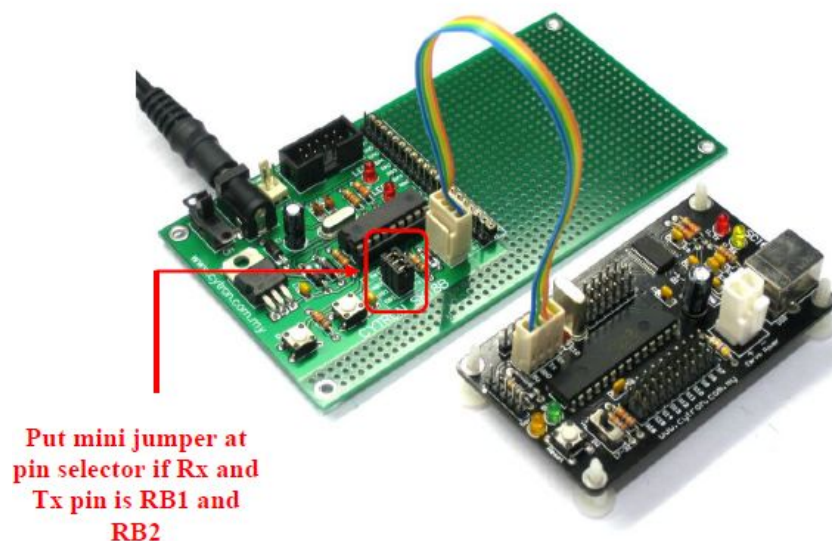
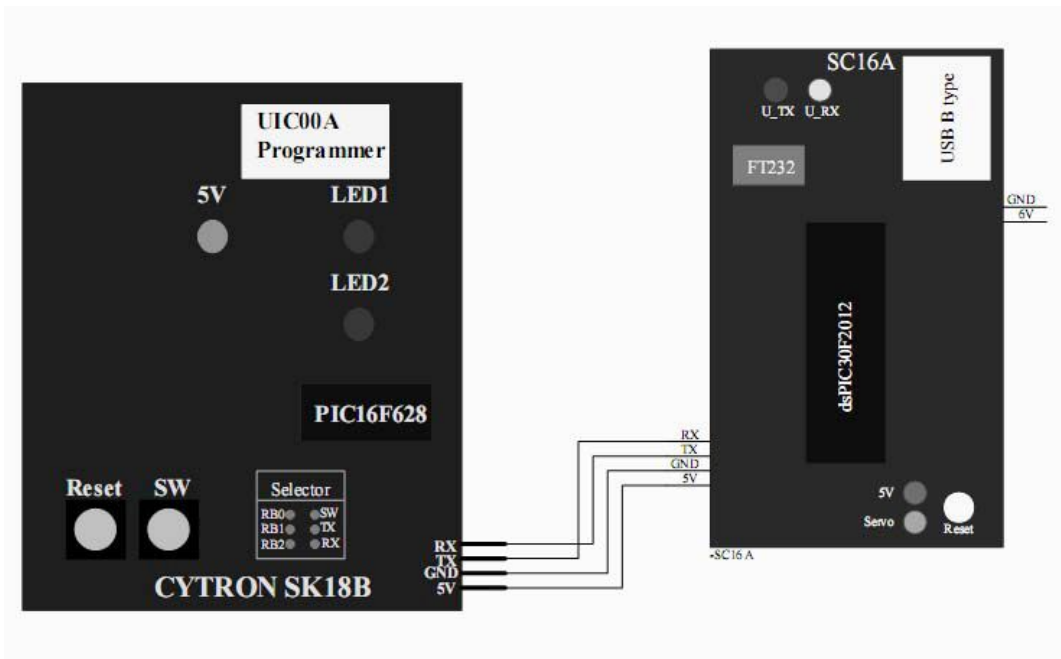
13. After all settings are complete, user may now check the functionality of SK18B UART. Below show message displayed in HyperTerminal if our sample source code used.



### 6.2.2 Connecting UART of SK18B to microcontroller

Another possible usage of UART is to communicate with another embedded system or microcontroller. For microcontroller to interface with SK18B, the minimum requirement will be TTL UART (Universal Asynchronous Receiver and Transmitter) and 5V supply. As for UART, a minimum of Receiver pin is required to receive command from SK18B.

Following sample schematic show SK18B is interface to SC16A. This sample schematic show UART pin of SK18B (PIC16F628) is connect to UART pin of SC16A. Tx pin of SK18B is connect to Rx pin of SC16A and Rx pin of SK18B is connect to Tx pin of SC16A.



## **WARRANTY**

- Product warranty is valid for 6 months.
- Warranty only applies to manufacturing defect.
- Damage caused by miss-use is not covered under warranty.
- Warranty does not cover freight cost for both ways.

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**ROBOT . HEAD to TOE**  
**Product User's Manual – SK18B**

