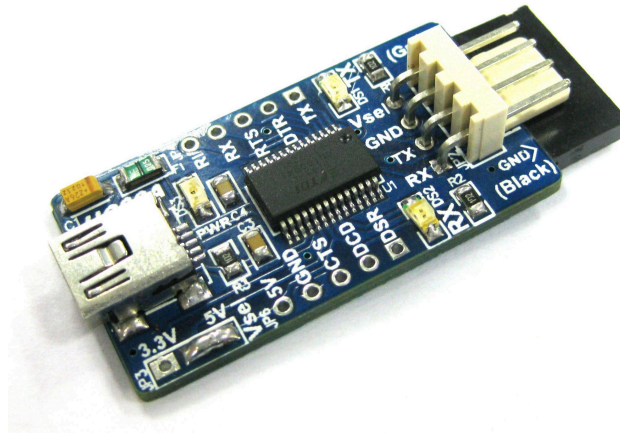




UC00A Rev2.0 Cytron USB to UART Converter



User's Manual

V1.0

July 2012

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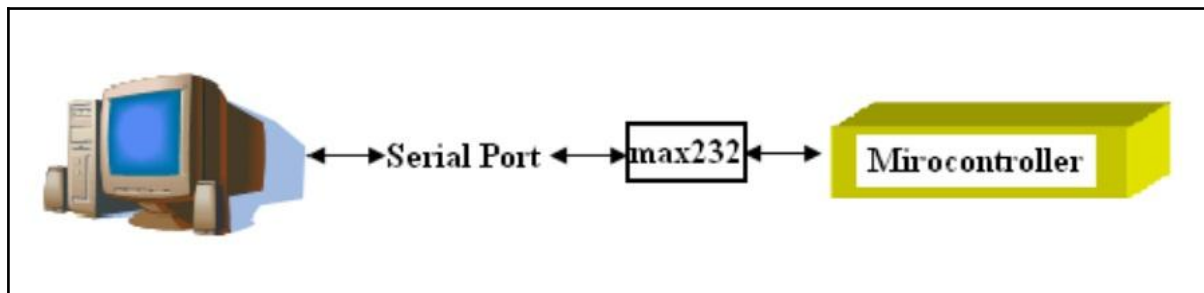
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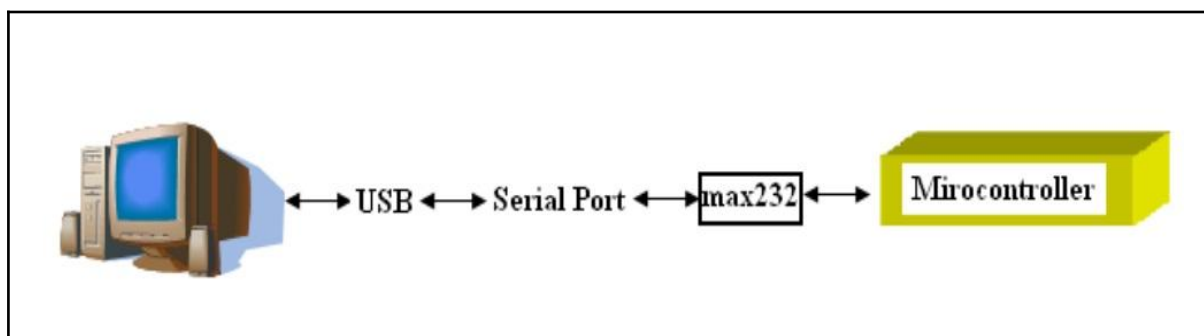
1.0 INTRODUCTION

Serial communication is most popular interface between devices and this applies to microcontroller and computer. UART is one of those serial interfaces. Classically, most serial interface from microcontroller to computer is done through serial port (DB9) or sometime is called RS232. However, since computer serial port used RS232 protocol and microcontroller used TTL UART, a level shifter is needed between this interface. Recently, serial port of computer have been phase out, it has been replaced with USB. Of course most developer chooses USB to serial converter to obtain virtual serial port. The level shifter is still necessary for UART interface. Thus, Cytron decided to develop a USB to UART converter which offers USB plug and play, direct interface with microcontroller and it provide low current 5V supply from USB port. This is User's Manual for [UC00A Rev2.0](#)

Traditional Method

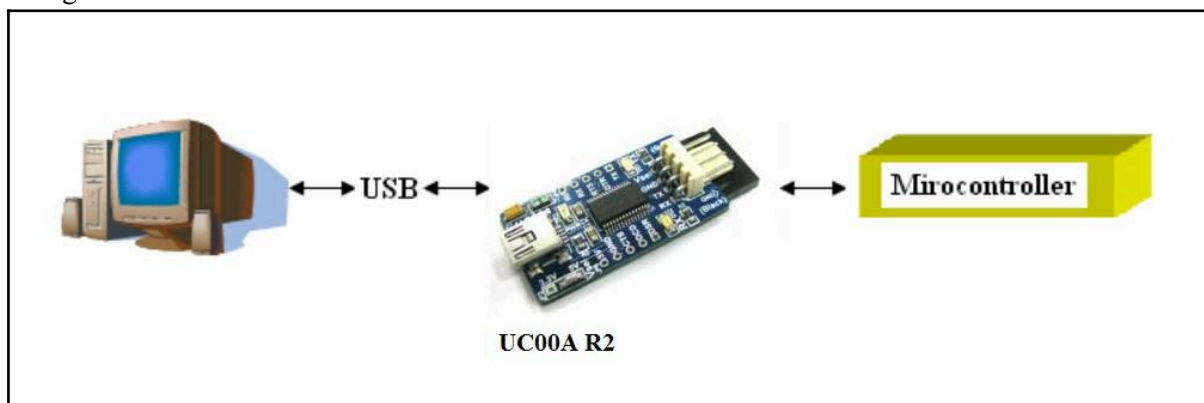


(a) PC (Serial Port)



(b) PC (USB)

Using UC00A Method

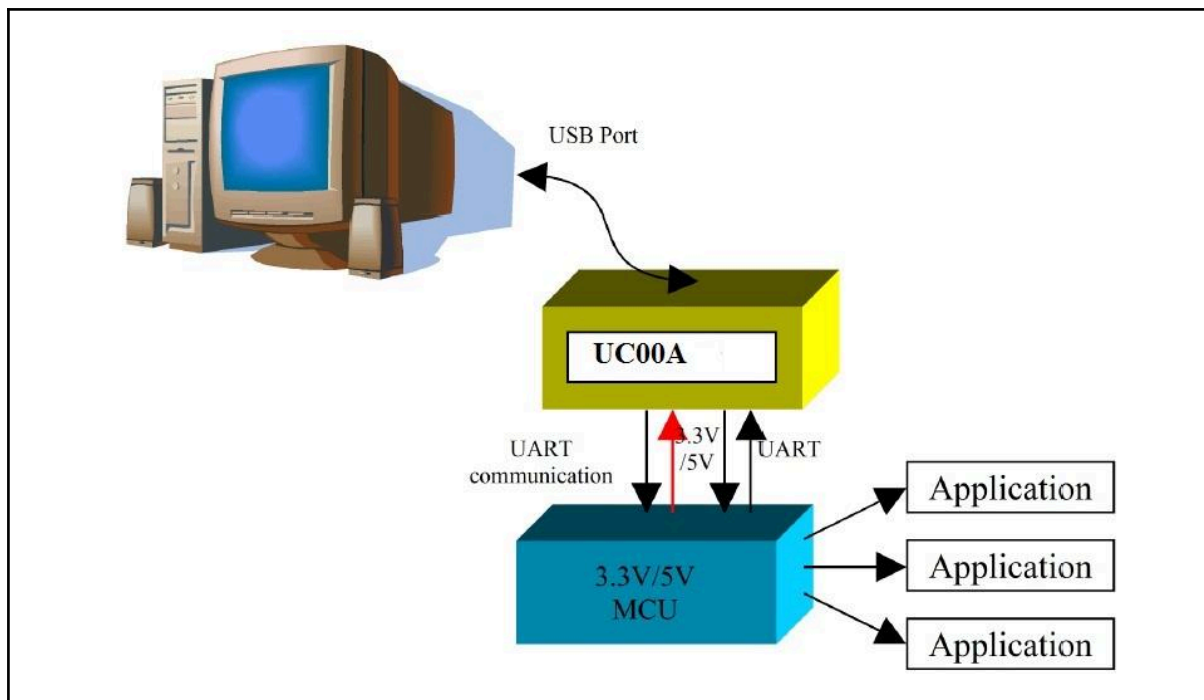


The [UC00A](#) offers low cost, easy to use USB to UART converter.
It has been designed with capabilities and features of:

- Develop low cost USB to UART converter.
- Easy to use USB to UART converter, aiming development between computer and microcontroller, 3.3V or 5V logic.
- USB powered, no external source is required to use this converter
- 5V from USB port is available for user.
- Configurable for 3.3V/5V UART interface.
- Easy to use 4 pin interface: Tx, Rx, Gnd and 5V.
- CTS, RTS, DTR and DSR is pull out to standard 1x5 header pin solderable PCB pad.
- Compatible with Bootloader for Arduino board such as BBFuino, Boarduino, Arduino Mini Pro, etc.
- Plug and Play, driver is needed for 1st time user only.
- **Dimension:** 3.9cm x 2cm

NOTE: UC00A are compatible for Window XP, Vista and Win 7. It appears as Virtual COM port on computer.

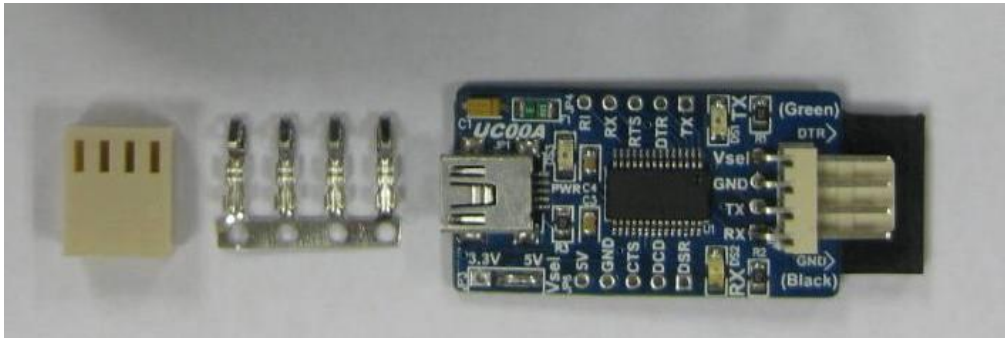
2.0 SYSTEM OVERVIEW



Cautions: “Vsel” and “5V” on UC00A is supply directly from USB of computer; it is advised not to use this power source to power application circuit or device. Wrong connection such as wrong polarity, wrong voltage, shorted might permanently damage computer.

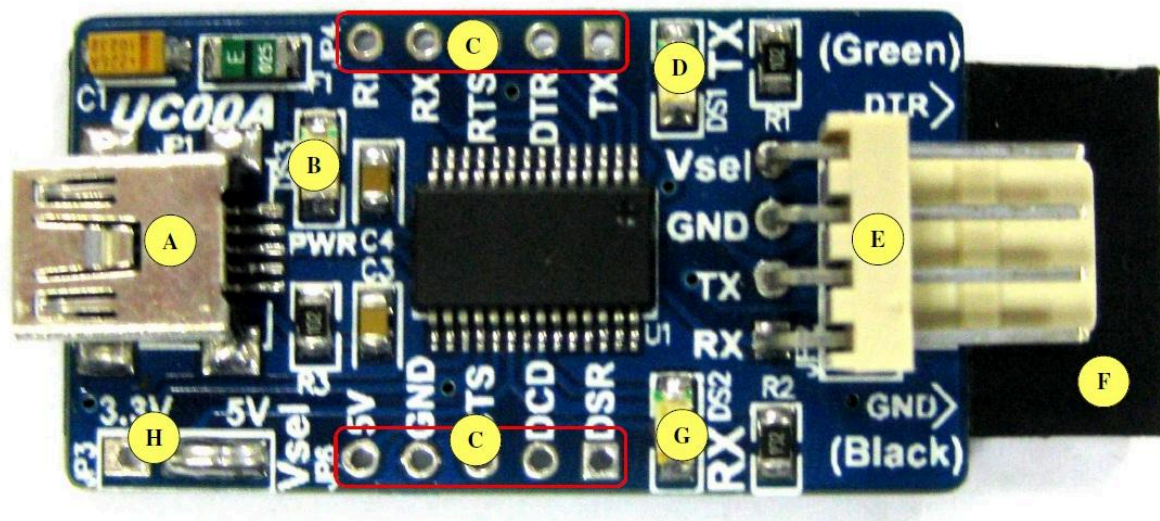
3.0 PACKING LIST

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 immediately.



1. 1 x [UC00A Rev2.0](#).
2. 1 x [2510 4 ways connector](#).
3. 4 x [2510 terminal pins](#).
4. USB driver and User's Manual should be downloaded from [Cytron Website](#).

4.0 BOARD OR PRODUCT LAYOUT



Label	Function	Label	Function
A	Mini USB socket	E	4 ways 2510 connector for interface to microcontroller
B	Power LED	F	Header socket, for Arduino board
C	Extra RS232 pin	G	RX LED
D	TX LED	H	Vsel pad

Mini USB port socket at “A” is for USB connection to PC desktop or laptop. Please connect the mini header of USB cable to this socket.

Green LED at “B” is used to indicate the main power supply of UC00A. It should ON once USB connection from UC00A to computer or laptop is ready.

JP4 and JP6 at “C” is extra RS232 pin. User may use this pin if needed. The pin TTL level (5V or 3.3V) will base on “Vsel”. “5V” will always be 5V from USB port.

LED at “D” is TX LED. This LED is to indicates the transmit activity. It will only work if UC00A is connected to PC or laptop through USB mini cable.

4 ways 2510 connector at “E” is for interface UC00A to microcontroller. Please refer to hardware installation for more detail connection.

Header socket at “F” is reserved for loading program to Arduino Mini Pro, BBFuino, Fio and others.

LED at “G” is RX LED. This LED is to indicates the receive activity. It will only work if

UC00A is connected to PC or laptop through USB mini cable..

Vsel at “H” is voltage option to determine the TTL level of UART interface pins. UC00A to microcontroller. User may choose either 3.3V or 5V. If 5V is chosen, all the interface pins which include TX, RX, DTR, CTS, RTS, DSR will be in 5V TTL logic and the Vsel at “E” and “F” will be 5V too. On the other hand, if Vsel at “H” is 3V3, all interface pin will be in 3.3V TTL logic and Vsel at connectors will be 3.3V too.

5.0 PRODUCT SPECIFICATION

[UC00A](#) is designed to ease communication between microcontroller and PC. The specifications are as listed below:

5.1 4 ways 2510 header pin

Label	Definition	Function
Vsel	3.3V or 5V power output from UC00A, and also the TTL logic level of UART pin..	Power output from UC00A to connect to microcontroller. The optional power output is 3.3V or 5V. If 5V is selected, it can supply up to 250mA of current. If 3.3V is selected, it can only supply 50mA of current. It also determine the TTL level of UART pin such as TX, RX, CTS, RTS, etc.
GND	Ground or negative	Ground of power and signal. This pin should be connected to target device's GND pin.
TX	UC00A UART Transmit pin	This is UC00A transmitter pin (TTL will follow Vsel). It should be connected to target device's receiver pin.
RX	UC00A UART Receive pin	This is UC00A receiver pin (TTL will follow Vsel). It should be connected to target device's transmitter pin.

5.2 6 ways header socket

Label	Definition	Function
DTR	UC00A Data Terminal Ready pin	In Arduino compatible board, this pin is use for auto-reset.
RX	UC00A UART Receive pin	This is UC00A receiver pin. It should be connected to device's transmitter pin.
TX	UC00A UART Transmit pin	This is UC00A transmitter pin. It should be connected to device's receiver pin.
Vsel	3.3V or 5V power output from UC00A	Power output from UC00A to connect to microcontroller. The optional power output is 3.3V or 5V. If 5V is selected at Vsel jumper, this pin will supply 5V to target device.
CTS	UC00A Clear To Send pin	Hardware Hand-shacking pin.
GND	Ground or negative	Ground of power and signal. This pin should be connected to device's GND pin.

5.3 Extra RS232 pin feature

Label	Definition	Function
5V	5V Power output from UC00A	5V supply from USB, optional for user to power external device, maximum current 250mA. This is constant 5V from USB. It will not be affected by Vsel jumper at 'H'..
GND	Ground or negative	Ground of power and signal. This pin should be connected to device's GND pin.
CTS	UC00A Clear To Send pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel jumper at 'H'.
DCD	UC00A Data Carrier Detect pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel jumper at 'H'.
DSR	UC00A Data Set Ready pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel jumper at 'H'.
RI	UC00A Ring Indicator pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel jumper at 'H'.
RX	UC00A UART Receive pin	This is UC00A receiver pin. It should be connected to target device's transmitter pin. TTL level will be determined by Vsel jumper at 'H'.
RTS	UC00A Request To Send pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel jumper at 'H'.
DTR	UC00A Data Terminal Ready pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel jumper at 'H'.
TX	UC00A UART Transmit pin	This is UC00A transmitter pin. It should be connected to target device's receiver pin. TTL level will be determined by Vsel jumper at 'H'.

6.0 INSTALLATION

6.1 Software Installation

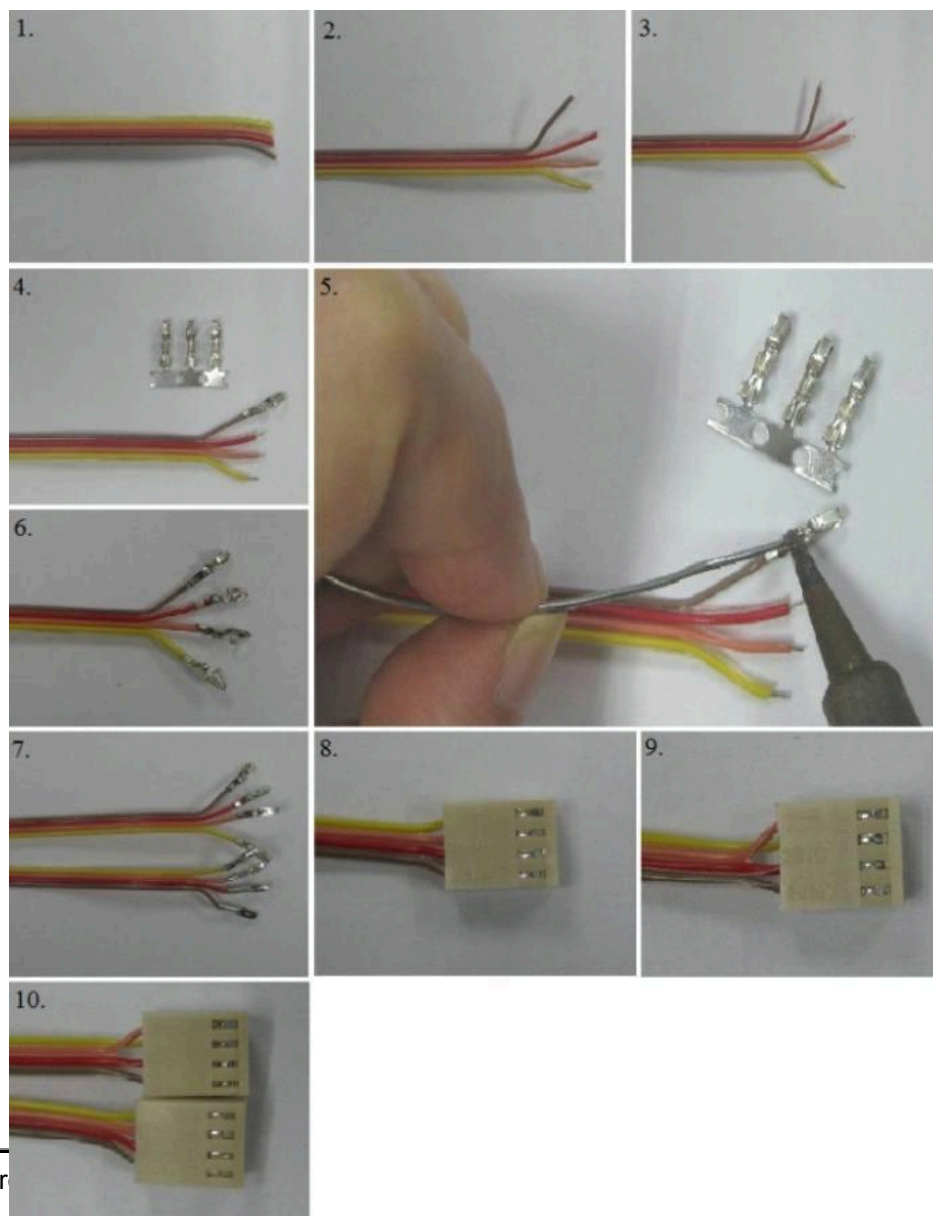
[UC00A](#) used USB to UART chip and it require USB driver to be installed (1 time) on computer. Thus, this section, user may refer to document name “Windows XP Installation Guide” which provides users a simple procedure for installing drivers for this device driver under Windows XP.

6.2 Hardware Installation

For interface with hardware or microcontroller, user need a cable to plug between UC00A and hardware. Below are the picture and method of making 4 ways cabel.

The items needed to create a cable for UC00A are:

- 4 x [2510 terminal pin](#)
- 1 x [CN-2510H-04](#)
- 4 ways rainbow cable



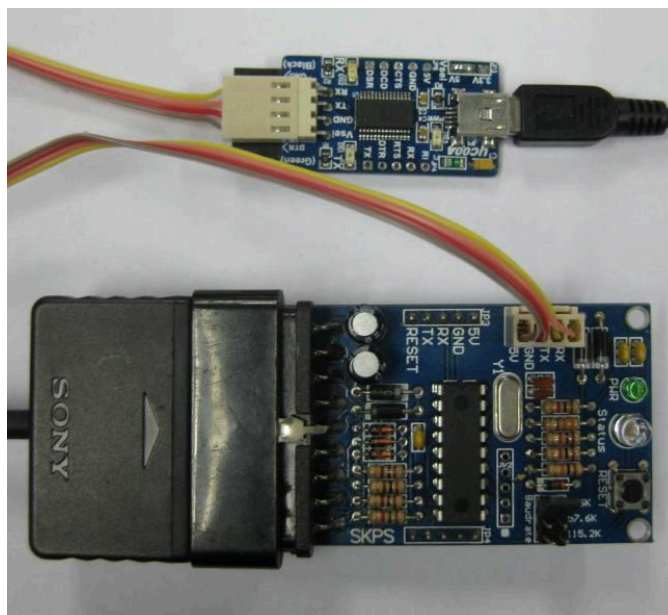
7.0 GETTING STARTED

This section will show example on how to use [UC00A](#). Generally, there are 2 methods to use UC00A. It can be used to connect any 3.3V/5V UART device to computer, or between 2 computers. Bare in mind that UC00A can be connected to any device which offer 3.3V/5V UART interface, this includes microcontroller, [RFID reader](#), [XBee](#), [Bluetooth](#), [WiFi](#), wireless module and more.

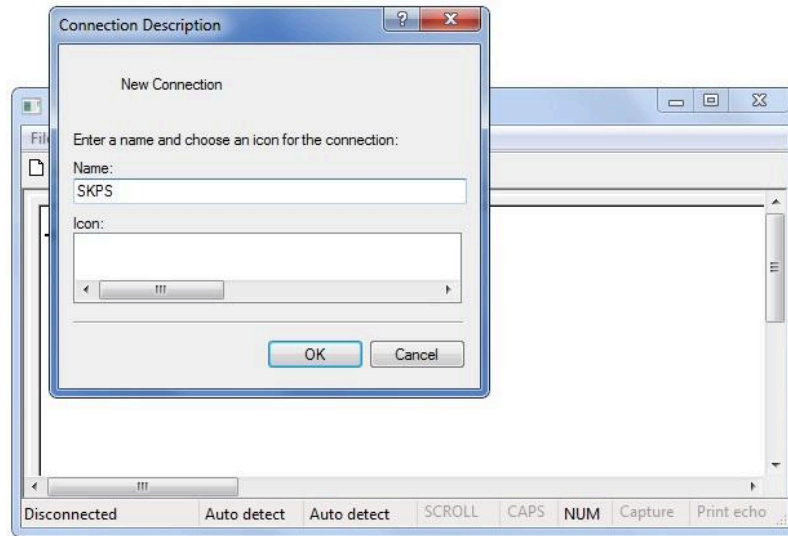
7.1 Using UC00A with microcontroller

This section will show an example using UC00A. UC00A will be connected to [SKPS](#). SKPS is a SONY PS2 Controller Converter developed by Cytron Technologies. SKPS can be connected to PC for functionality test. Normally, user will need to develop RS232 level shifter for communication to serial port. This introduce additional work just to check the functionality of SKPS. Furthermore, laptop and computer nowadays have phase-out the serial port, USB have replaced it. Using UC00A, no extra work is required. Simply plug SKPS to UC00A and USB port of computer (PC or Laptop), install driver (1 time work) and there is an extra virtual COM port ready for SKPS. Checking functionality is simple and straight forward.

- a. Simply connect UC00A to SKPS using the rainbow wires you created (4 ways), another end (USB mini type) of UC00A to PC via the USB cable provided as shown in following figure. User will need to connect the RX and TX pin of SKPS to UC00A. Of course, these two pins should be cross connected to UC00A. In other words, RX of SKPS should be connected to UC00A's Transmitter pin (Tx), while TX of SKPS should be connected to UC00A's Receiver pin (Rx). No extra component is necessary between these connections.



for connection as picture below then click OK.



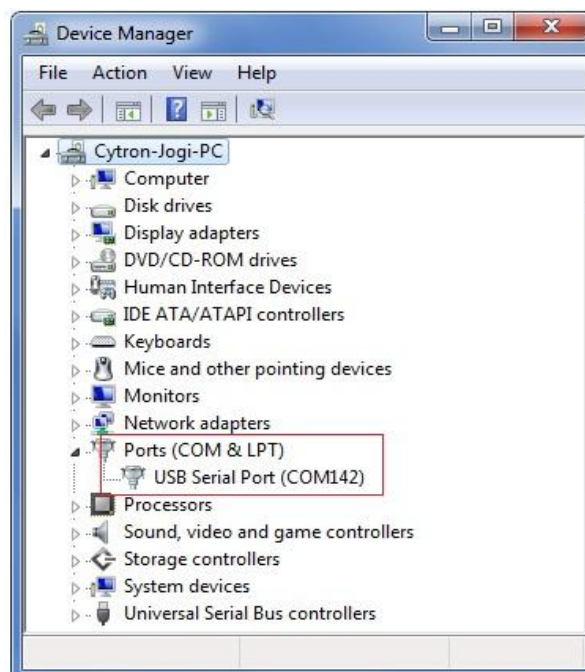
- e. Connect using USB Serial Port. Select COM port for UC00A. Please follow step from (f) to (g) if the COM port number is not confirmed.



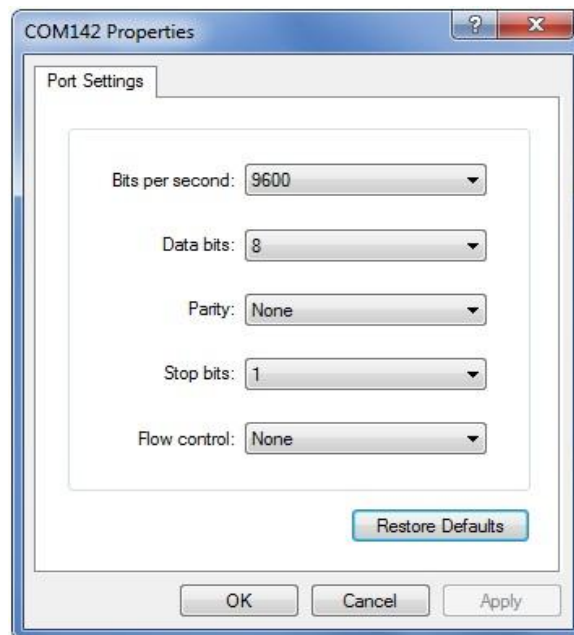
- f. If you do not know which COM port to select, go to Start Menu, right click on My Computer and choose Properties. At System Properties Table, click on Device Manager. Device Manager Table will show out.



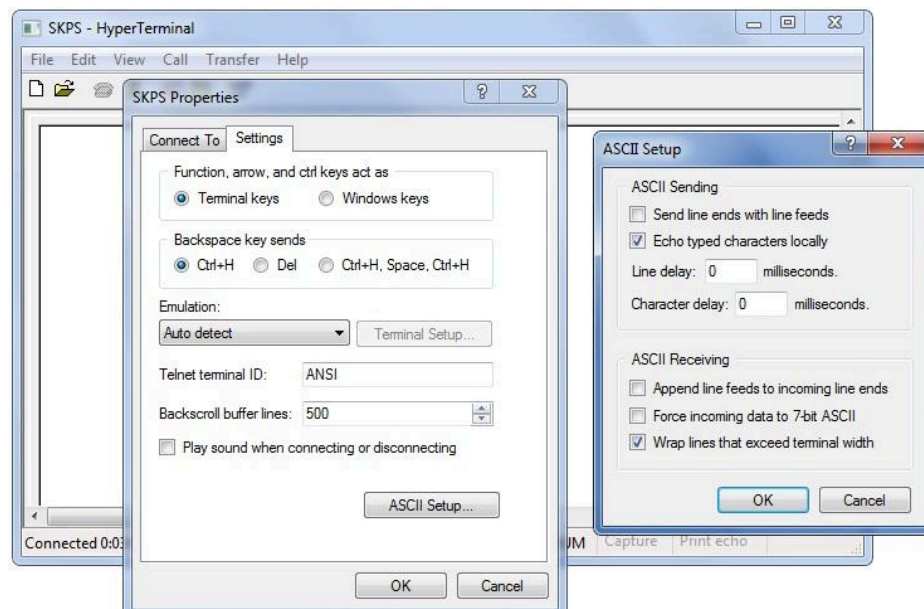
- g. At Device Manager Table, choose Ports (COM & LPT) and USB Serial Port COM will be visible. The Serial Port COM is "COM142" in this case. The COM port number will differ from computer to computer, please do check the COM port of your own computer.



- h. Set the Port Setting as picture below. Bits per second must be same with SKPS Baud Rate and Flow control must be set to none. After finish setting, click Apply and then click OK.



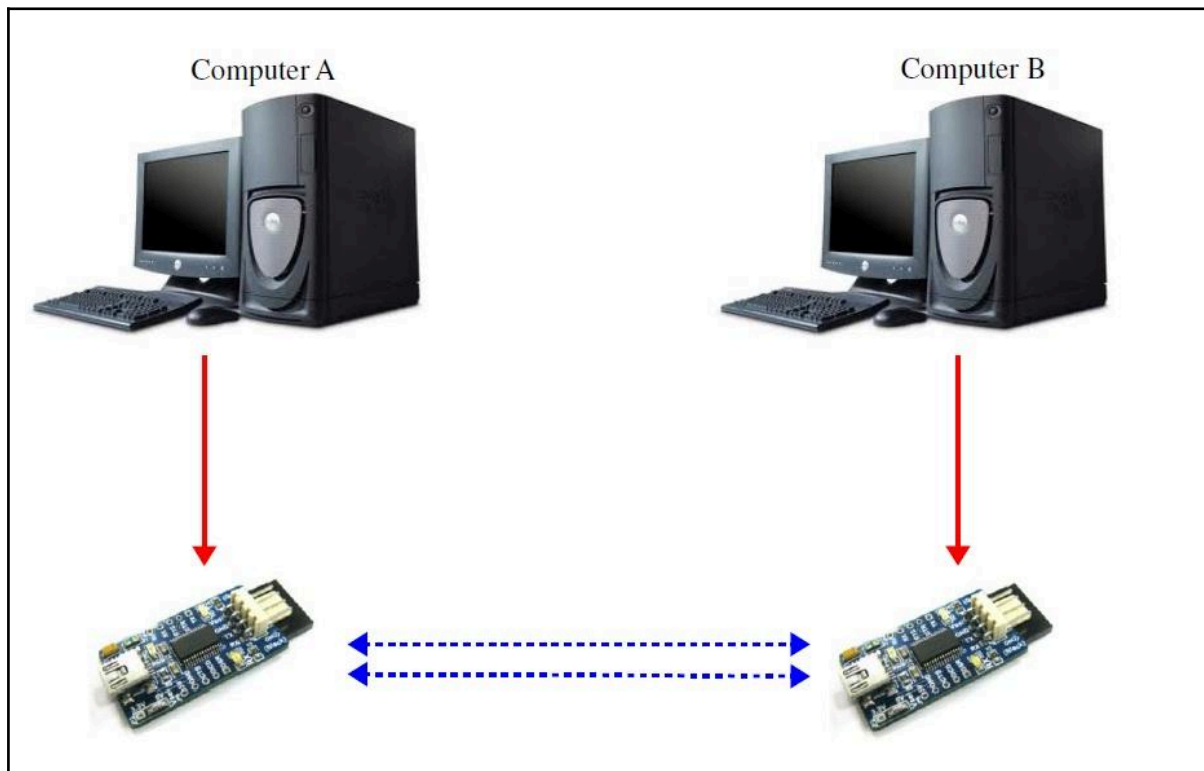
- i. Go to File and select Properties. SKPS Properties table will be shown. Choose Setting tab and click ASCII Setup tab. Click on "Echo typed characters locally" and then click OK.



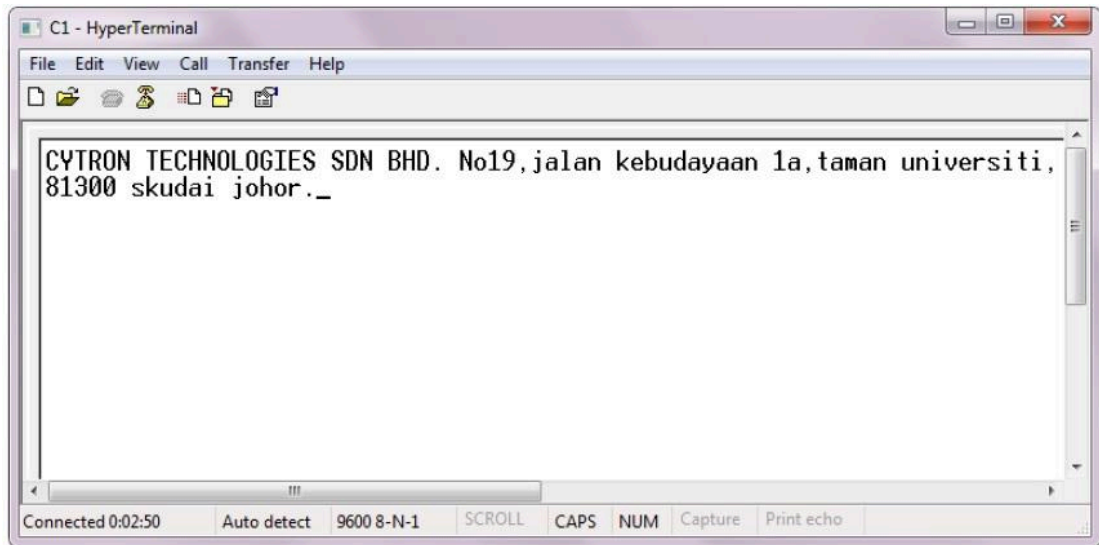
- j. After all settings are complete, now SKPS is ready to communicate with PC and the communication will be shown on HyperTerminal. Do refer to User's Manual of SKPS for further information. Easiest way is to type "ae" at HyperTerminal and try to press buttons and joystick on PS2 Controller.

7.2 Using UC00A for Communication between two PCs

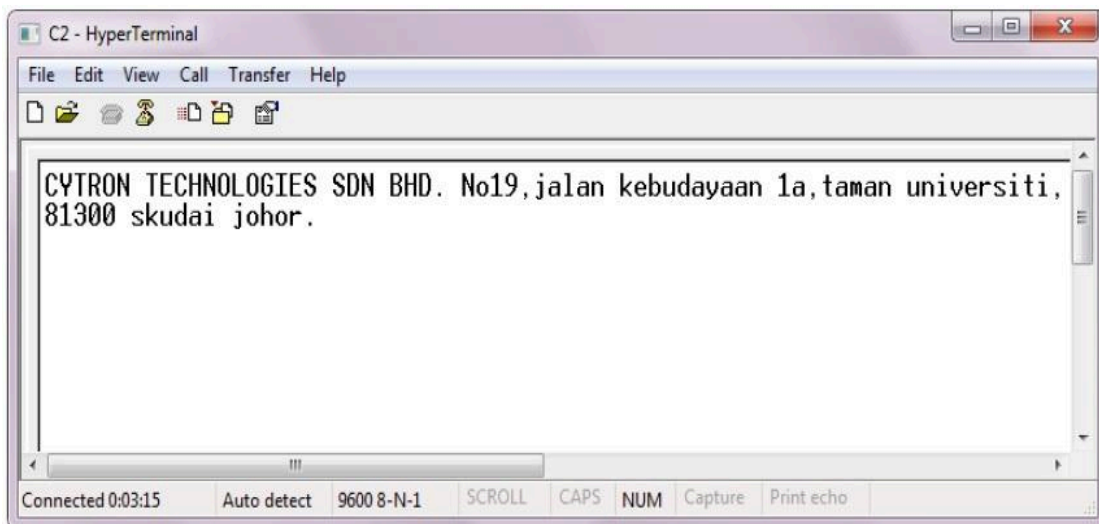
- a. Two PCs can communicate to each other by connecting them to [UC00A](#) each. Connect each PC like diagram below. Create a cable in section 6.2 and connect to UC00A, and simply plug it to each PC.



- b. Upon completion of connection, open HyperTerminal in each PC. Follow steps mentioned in Section 7.1 (c) to (i). The baud rate for each PC must be same.
- c. User may start typing any character in HyperTerminal, for example: chatting between two PCs. Example computer 1 (C1) and computer 2 (C2) are connect. Any character typed in HyperTerminal C1 will also shown in HyperTerminal C2. Pictures below show HyperTerminal for each PC.



(a) C1 HyperTerminal, typed text.



(b) C2 HyperTerminal, Received text.

7.3 Using UC00A for loading program to Arduino Pro Mini

[Arduino Pro Mini](#) is a compact Arduino board and comes without on-board USB to UART chip. User may use UC00A for loading program into Pro Mini. UC00A has the socket ready (header socket) for user to easily plug into Arduino bootloader pin.

To load program, user need to extend the Arduino PRO Mini bootloader pin out. User may use right angle or straight header pin. And user may solder from bottom or from top.

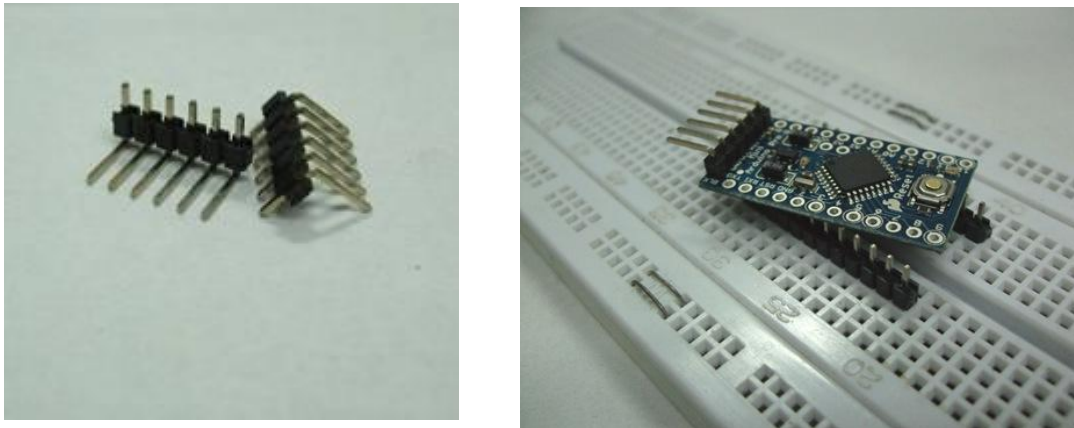
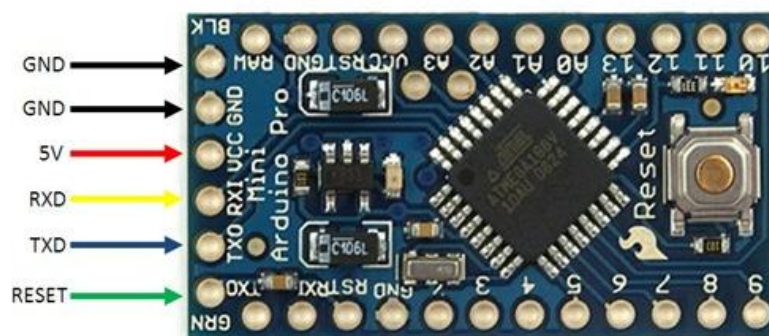
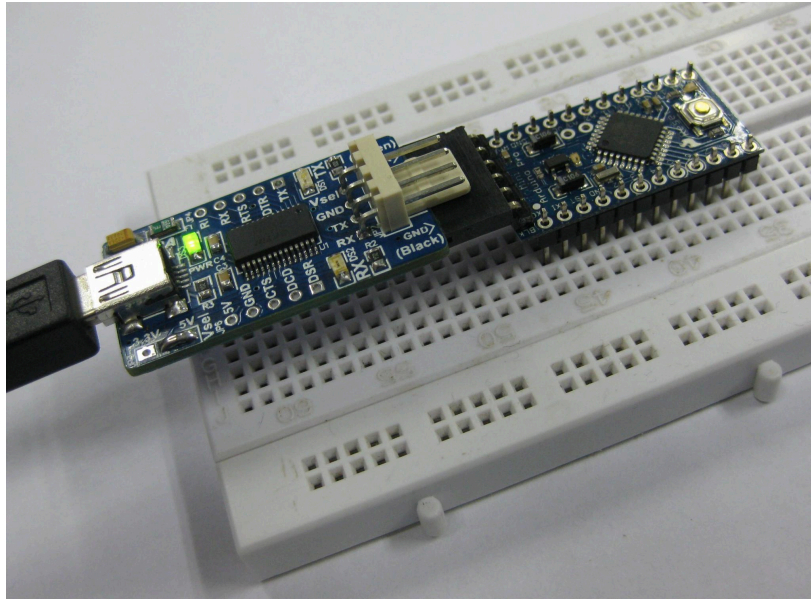


Figure below is an example of Arduino Pro Mini. Reset pad has a “GRN” label at the site, indicating Green and GND pad has a “BLK” label at the site to indicate Black.



To connect UC00A to Arduino Pro Mini, user need to ensure that Green label from UC00A is connect to “GRN” label of Arduino Pro Mini. And Black label from UC00A is connect to “BLK” label of Arduino Pro Mini. Also please do makesure the TTL logic and power is compatible with the Arduino Pro Mini as there are 5V and 3.3V version. UC00A Rev2.0 support both, but user must select the voltage from Vsel Jumper at ‘H’ in product layout section. Default Vsel is 5V.



The connection UC00A to Arduino Pro Mini is shown as below.

<u>UC00A</u>	<u>Arduino PRO Mini Bootloader</u>
---------------------	---

DTR (Green)	----- RESET
RX	----- TXD
TX	----- RXD
Vsel	----- 5V
CTS	----- GND
GND (Black)	----- GND

Besides [Arduino Pro Mini](#), [UC00A](#) can be used to load program for [Arduino FIO](#), [ArduPilot](#), [Rainbow LED Ring V3](#), [BBFuino](#). Do makesure the UART TTL level and power voltage is correctly selected.

8.0 WARRANTY

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

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