UC00A Rev3.0
Cytron USB to UART Converter

User's Manual

V1.1

December 2018

Information contained in this publication regarding device applications and the like is intended through suggestion only and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. No representation or warranty is given and no liability is assumed by Cytron Technologies Incorporated with respect to the accuracy or use of such information or infringement of patents or other intellectual property rights arising from such use or otherwise. Use of Cytron Technologies' products as critical components in life support system is not authorized except with express written approval by Cytron Technologies. No licenses are conveyed, implicitly or otherwise, under any intellectual property rights.

Index

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 provides 5V power supply from USB port. This is User's Manual for UC00A Rev3.0

Traditional Method
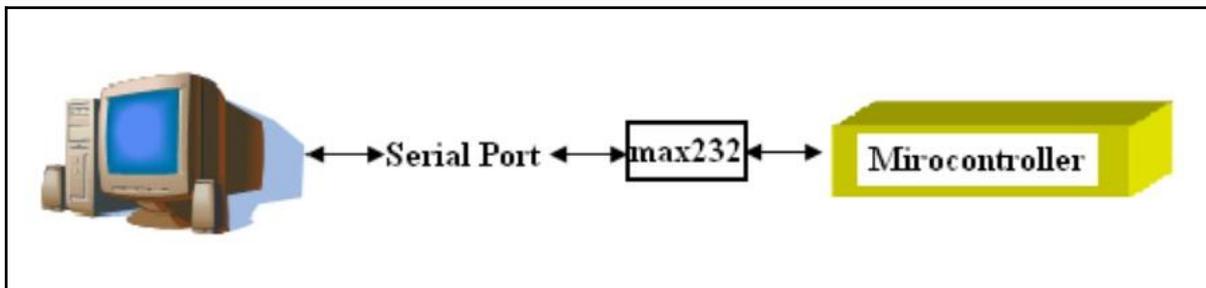
(a) PC (Serial Port)
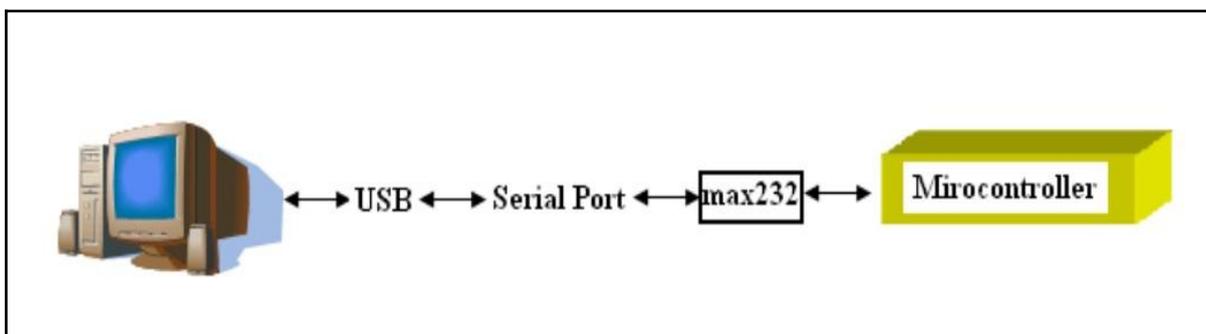
(b) PC (USB)

Using UC00A Method

UC00A R3
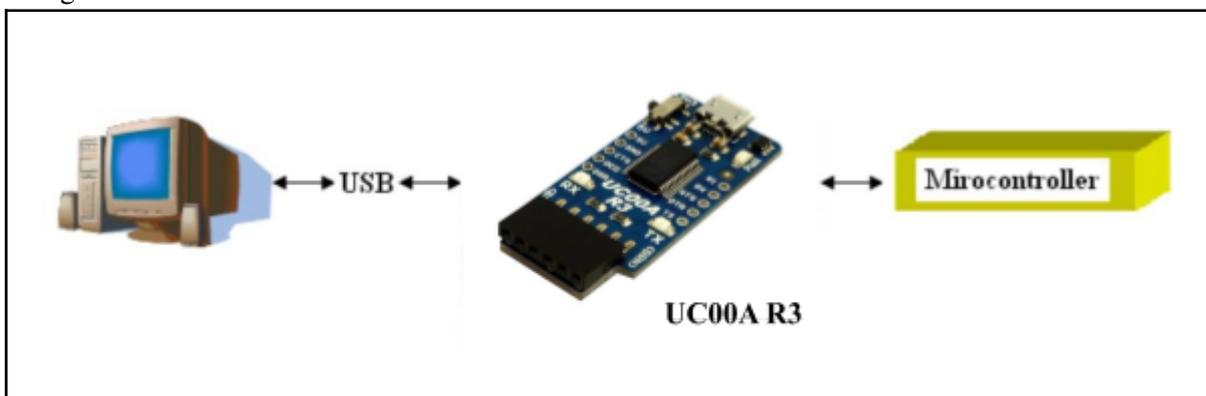
The UC00A offers low cost, easy to use USB to UART converter.

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.
- Standard 6 pin interface: DTR, TX, RX, GND, CTS and VCC.
- 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.
- New! Utilize USB Micro-B socket.
- New! Selectable Switch 5V and 3.3V.
- **Dimension:** 4.4cm x 2cm

NOTE: UC00A are compatible for Window XP, Vista,Win 7,8 and 10. It appears as Virtual COM port on computer.

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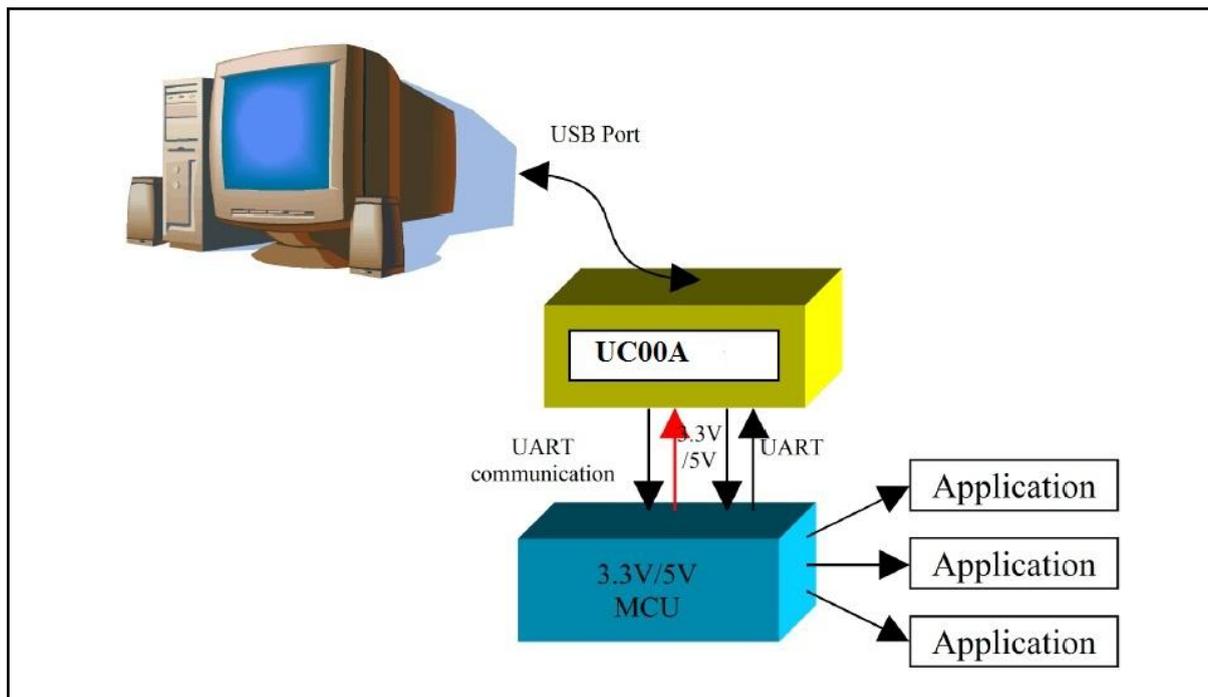
Cautions: "Vsel" and "5V" on UC00A is supply directly from USB of computer; it is advised not to use this power source to power application circuit or device. Wrong connection such as wrong polarity, wrong voltage, shorted might permanently damage computer.

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.io immediately.

1. 1 x UC00A Rev3.0.

Optional accessories:
- USB Micro B Cable
- USB driver and User's Manual should be downloaded from Cytron Website.

4.0 BOARD OR PRODUCT LAYOUT
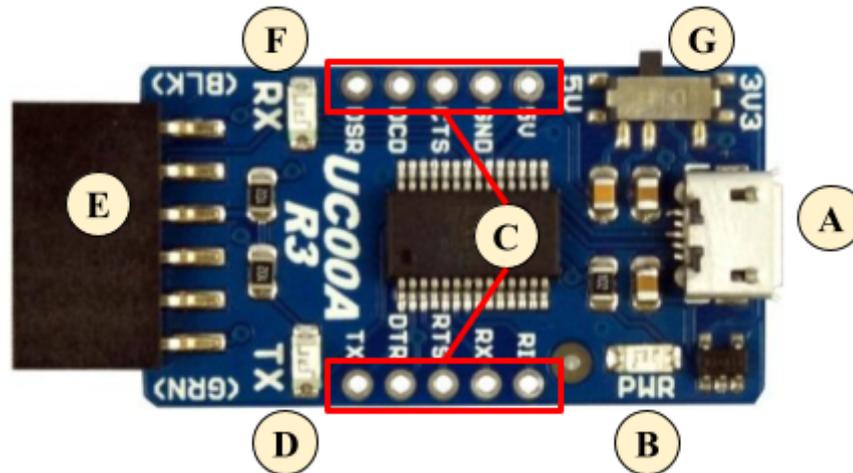
Label	Function
A	MicroB USB socket
B	Power LED
C	Extra UART pin
D	FTDI's TX indicator LED
E	Standard 6-way header socket
F	FTDI's RX indicator LED
G	Vsel, VCC and UART pin logic level (3.3V or 5V) selectable Switch

MicroB USB socket

MicroB USB port socket at "A" is for USB connection to PC desktop or laptop. Please connect the MicroB USB cable to this socket.

Power LED

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

Extra UART pins

JP4 and JP6 at "C" is extra UART pin. User may use these pin if needed. The pin logic level (5V or 3.3V) will base on "Vsel" slide switch at "G". "5V" will always be 5V from USB port.

TX LED

LED at "D" is FTDI's TX indicator LED. This LED is to indicates the transmit activity from FTDI chip, or transmit activity from computer virtual COM port. It will only work if UC00A is connected to PC or laptop.

Standard 6-way header socket

Header socket at "E" is breakout of pins which are commonly used for loading program to Arduino PROMini, BBFuino, Fio and others.

RX LED

LED at "F" is FTDI's RX indicator LED. This LED is to indicates the receive activity from FTDI chip, or receive activity at computer virtual COM port. It will only work if UC00A is connected to PC or laptop.

Vsel, VCC and Logic selectable Switch

Vsel at "G" is a slide switch to determine voltage option for TTL level of UART interface pins, and also the voltage at VCC pin at header socket at "E". User may choose either 3.3V or 5V. If 5V is chosen, all the interface pins include TX, RX, DTR, CTS, RTS, DSR will be in 5V TTL logic and the VCC at "E" will be 5V too. On the other hand, if Vsel at "G" is 3V3, all interface pins will be in 3.3V TTL logic and VCC at "E" will be 3.3V too.

5.0 PRODUCT SPECIFICATION

UC00A is designed to ease serial communication between microcontroller and PC. The specifications are as listed below:

5.1 6 ways header socket

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

5.2 Extra UART pin feature

Label	Definition	Function
5V	5V Power output from UC00A	5V supply from USB, optional for user to power external device, maximum current is limited from USB port, normally is 900mA. This is constant 5V from USB. It will not be affected by Vsel slide switch at 'G'.
GND	Ground or negative	Ground of power and signal. This pin should be connected to device's GND pin, common ground.
CTS	UC00A's Clear To Send pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel slide switch at 'G'.
DCD	UC00A's Data Carrier Detect pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel slide switch at 'G'.
DSR	UC00A's Data Set Ready pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel slide switch at 'G'.
RI	UC00A's Ring Indicator pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel slide switch at 'G'.
RX	UC00A's 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 slide switch at 'G'.
RTS	UC00A's Request To Send pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel slide switch at 'G'.
DTR	UC00A Data Terminal Ready pin	This pin is unused under normal UART operation. TTL level will be determined by Vsel slide switch at 'G'.
TX	UC00A's 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 slide switch at 'G'.

6.0 INSTALLATION

6.1 Software Installation

UC00A used USB to UART chip and it requires USB driver to be installed (1 time) on computer. Thus, this section, user may refer to document name "Driver Installation Guide" and "Driver Installation Guide for Win 7" which provides users a simple procedure for installing drivers for this device driver. All the documents are available in the product page. You can also refer to this link for installation guide available for Win/Mac/Linux. Latest driver for Win/Mac/Linux are available here.

7.0 GETTING STARTED

This section will shows 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 shows 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 has 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 straightforward.

a. User will need to connect the RX and TX pins of SKPS to UC00A. Of course, these two pins should be cross connected to UC00A. In other words:
    a. RX of SKPS should be connected to UC00A's Transmitter pin (TXO)
    b. TX of SKPS should be connected to UC00A's Receiver pin (RXI).
    c. No extra component is necessary between these connections.
b. Please refer to document named "Driver Installation Guide" for driver installation. This is mentioned in section 6.1, software installation.
c. After plug in the UC00A to computer and installation of driver, user is ready to test the functionality of SKPS. Open the HyperTerminal. Enter a name and choose an icon for connection as picture below then click OK.
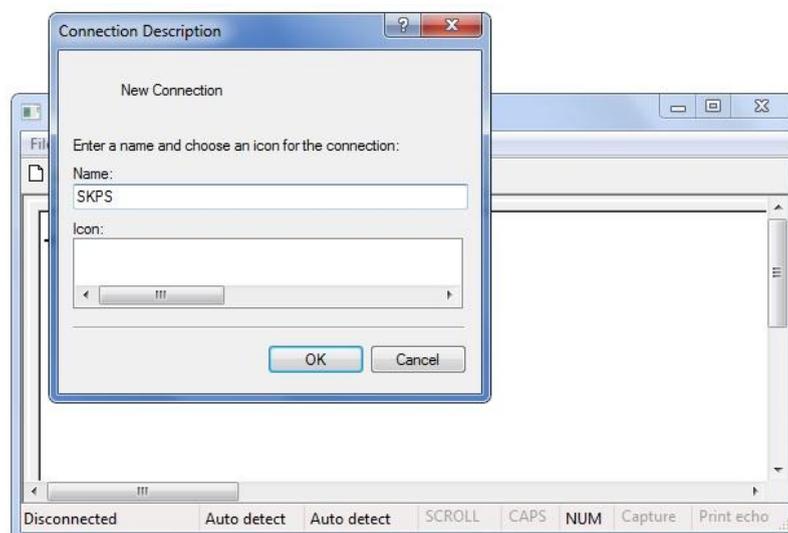
d. Connect using USB Serial Port. Select COM port for UC00A. Please follow step from (f) to (g) if the COM port number is not confirmed.

e. 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.
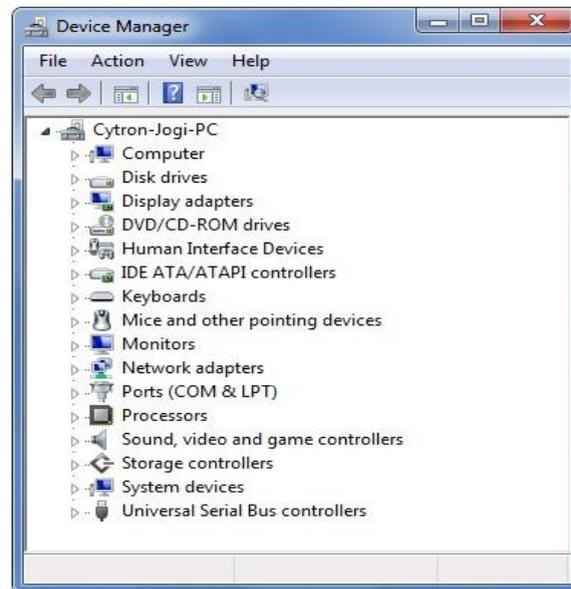
f. At Device Manager Table, choose Ports (COM & LPT) and USB Serial Port COM will be visible. The Serial Port COM is "COM142" in this case. The COM port number will differ from computer to computer, please do check the COM port of your own computer.
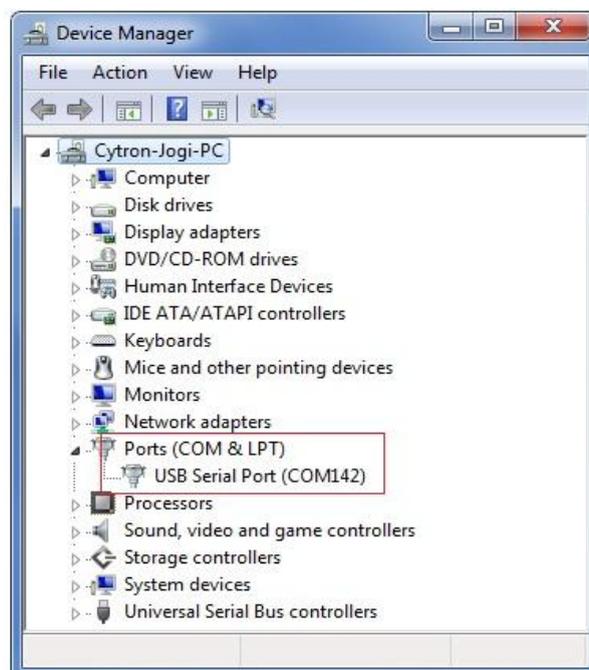
g. Set the Port Setting as picture below. Bits per second must be same with SKPS Baud Rate and Flow control must be set to none. After finish setting, click Apply and then click OK.
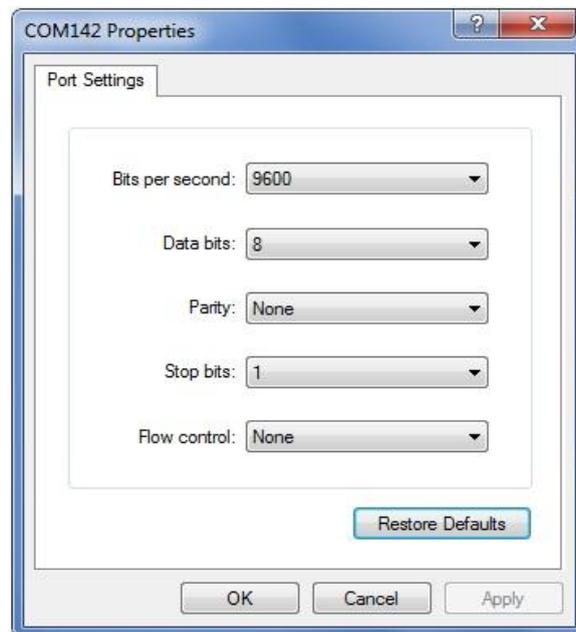
h. Go to File and select Properties. SKPS Properties table will be shown. Choose Setting tab and click ASCII Setup tab. Click on "Echo typed characters locally" and then click OK.
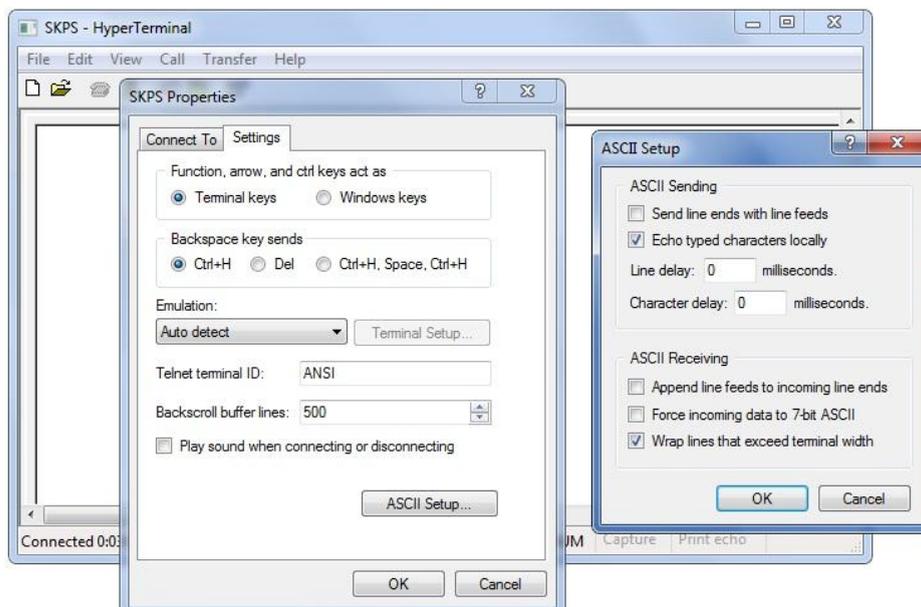
    i.   After all settings are complete, now SKPS is ready to communicate with PC and the communication will be shown on HyperTerminal. Do refer to User's Manual of SKPS for further information. Easiest way is to type "ae" at HyperTerminal and try to press buttons and joystick on PS2 Controller.

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. Recommended to use Male to Male jumper wire to link the header socket and connect to UC00A, and simply plug it to each PC. The connection should be:
    a. RXI of UC00A on Computer A to TXO of UC00A on Computer B
    b. TXO of UC00A on Computer A to RXI of UC00A on Computer B
    c. GND of UC00A on Computer A to GND of UC00A on Computer B
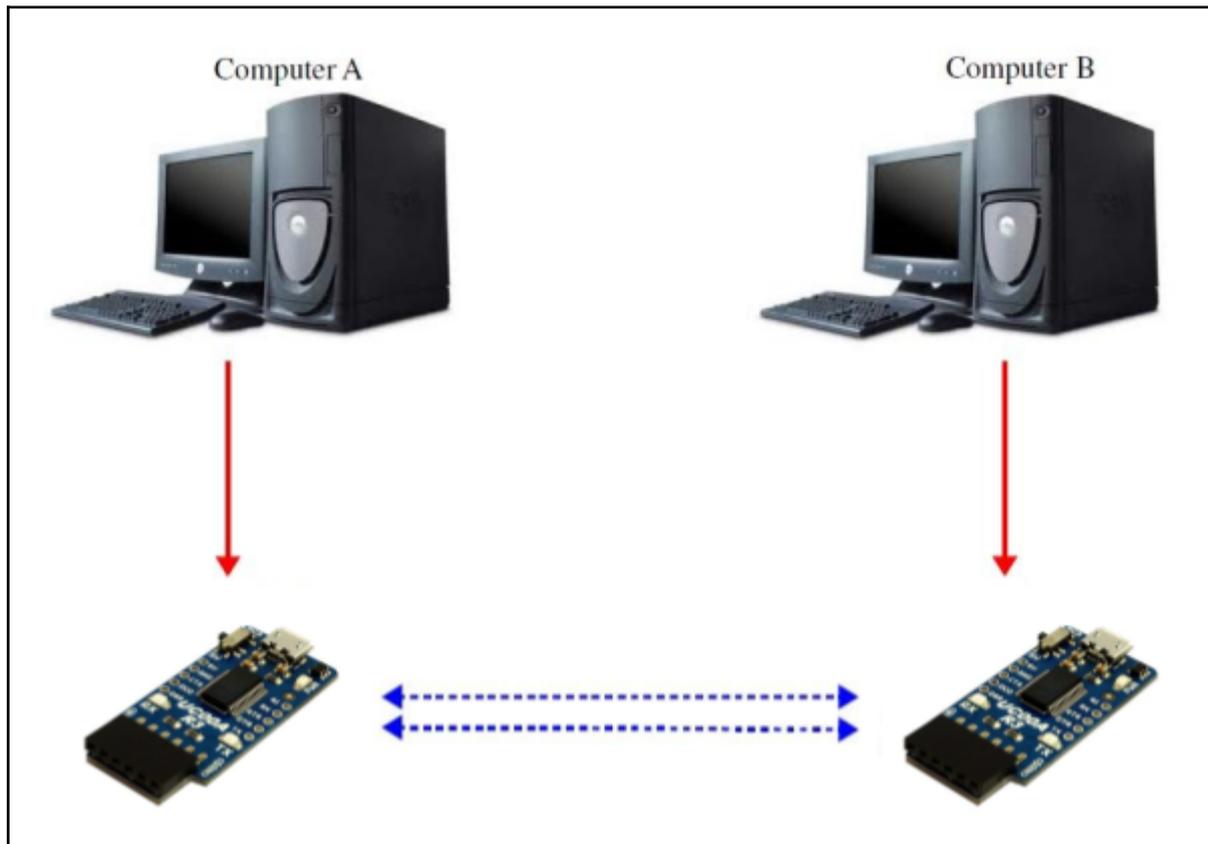
b. Upon completion of connection, open HyperTerminal in each PC. Follow steps mentioned in Section 7.1 (c) to (i). The baud rate for each PC must be same.

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.
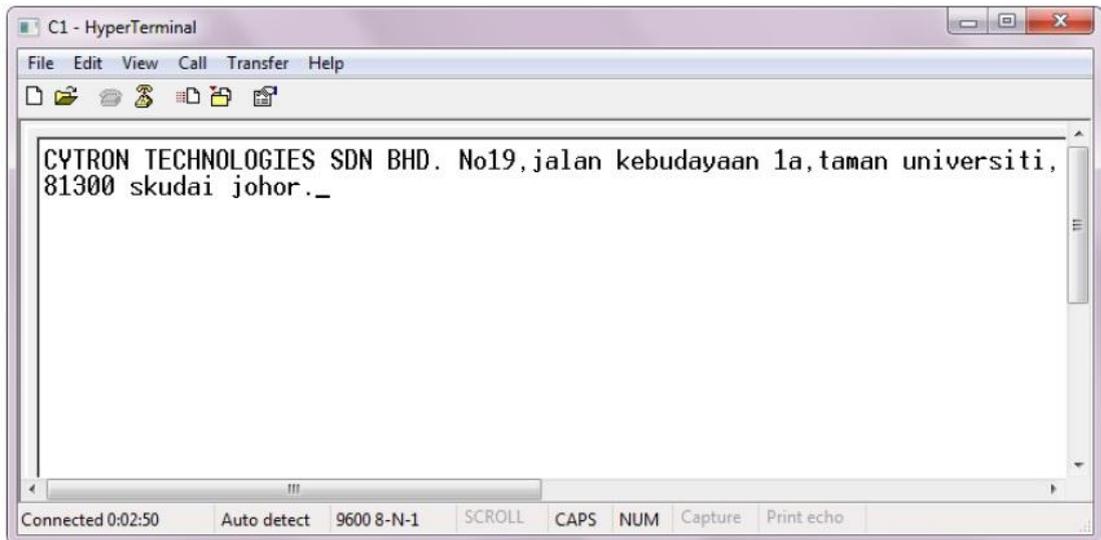
(a) C1 HyperTerminal, typed text.
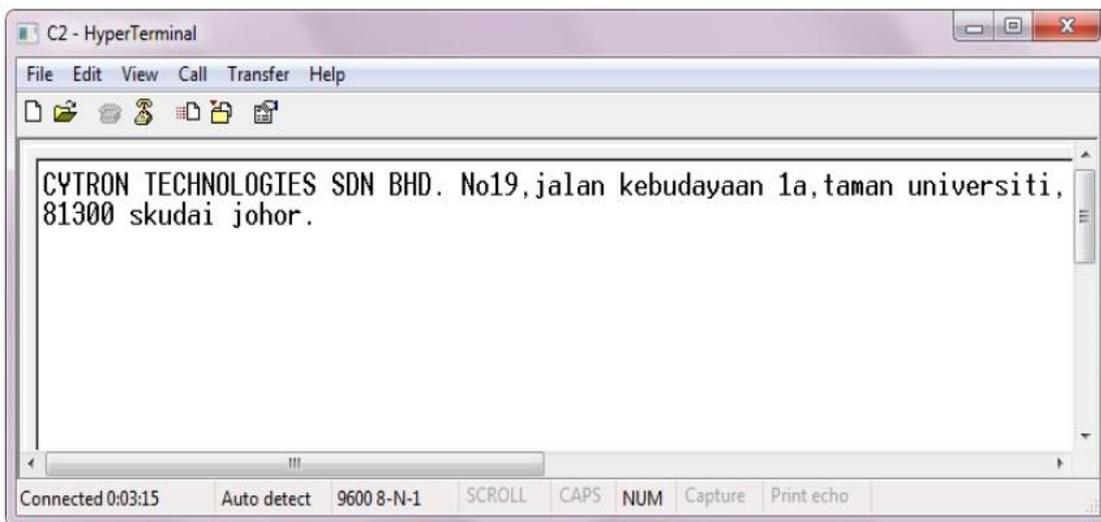
(b) C2 HyperTerminal, Received text.

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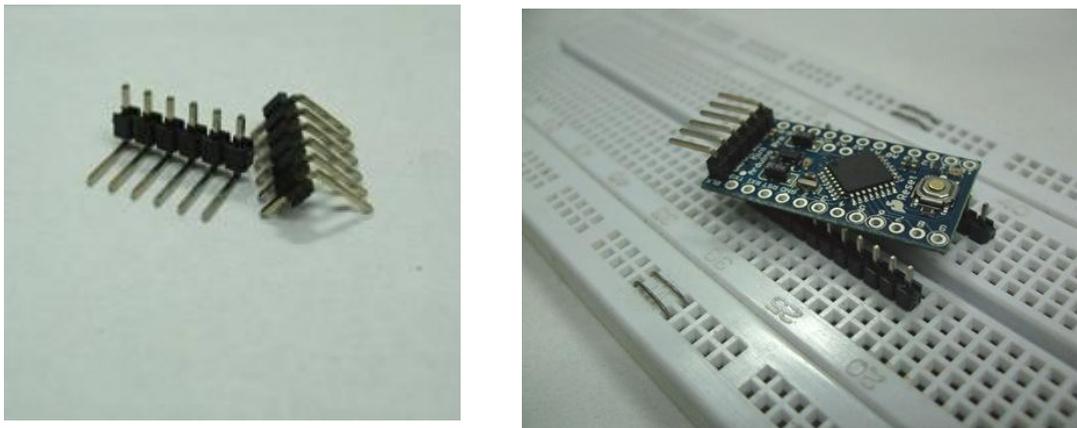
Figure below is an example of Arduino Pro Mini. Reset pad has a "GRN" label at the site, indicating Green and GND pad has a "BLK" label at the site to indicate Black.

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 make sure the TTL logic and power is compatible with the Arduino Pro Mini as there are 5V and 3.3V version. UC00A Rev3.0 support both, but user must select the voltage from Vsel slide switch at 'G' in product layout section. Default Vsel is 5V.
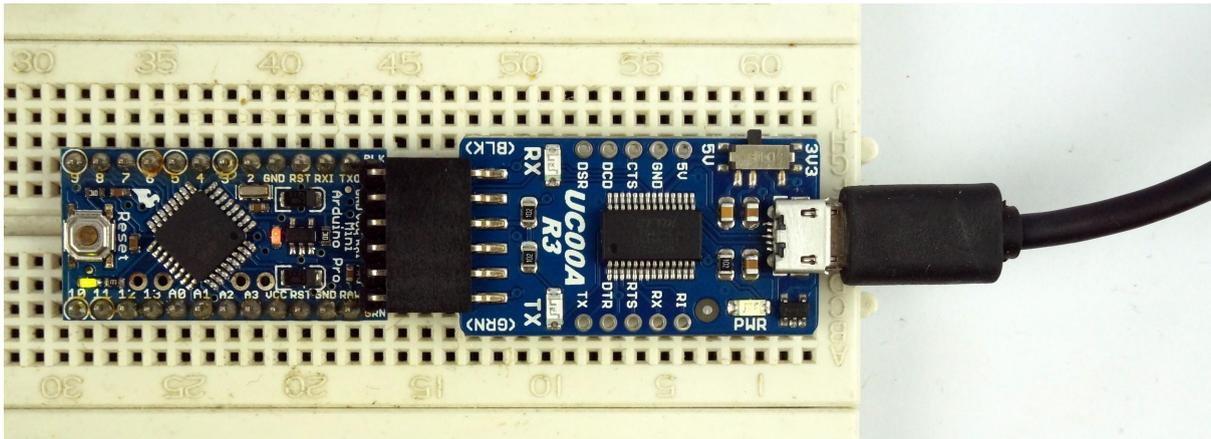
The connection UC00A to Arduino Pro Mini is shown as below.

UC00A	**Arduino PRO Mini Bootloader**
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 make sure 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.

Prepared by
Cytron Technologies Sdn. Bhd.
No.1, Lorong Industri Impian 1,
Taman Industri Impian,
14000 Bukit Mertajam,
Penang, Malaysia.

Tel: +604 - 548 0668
Fax: +604 - 548 0669

URL: www.cytron.io
Email: support@cytron.io
sales@cytron.io