

# UM11988

SC16IS750/760 demo board

Rev. 2.0 — 6 February 2024

User manual

## Document information

Information	Content
Keywords	SC16IS750, SC16IS760, OM6270, SC16IS750/760 SPI/I2C to UART bridge demo board
Abstract	The SC16IS750/760 is a slave I2C-bus/SPI interface to a single-channel high performance UART. This user manual describes the setup, configuration and operation of the OM6270 (SC16IS750/760 SPI/I2C to UART bridge demo board)



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## 1 Introduction

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The SC16IS750/760 is a slave I<sup>2</sup>C-bus/SPI interface to a single-channel high performance UART. It offers data rates up to 5 Mbit/s and guarantees low operating and sleeping current. The SC16IS750 and SC16IS760 also provide the application with 8 additional programmable I/O pins. The device comes in very small HVQFN24, TSSOP24 (SC16IS750/760) packages, which makes it ideally suitable for handheld, battery operated applications. This family of products enables seamless protocol conversion from I2C-bus or SPI to and RS-232/RS-485 and are fully bidirectional.

## 2 Finding kit resources and information on the NXP web site

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NXP Semiconductors provides online resources for this evaluation board and its supported device(s) on <http://www.nxp.com>.

The information page for the OM6270 (SC16IS750/760 demo board) is at <https://www.nxp.com/products/analog-and-mixed-signal/bridges/spi-ic-to-uart-bridge-demo-board-sc16is750:OM6270>.

## 3 Getting ready

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Working with the OM6270 (SC16IS750/760 demo board) requires the kit contents, additional hardware, and a Windows PC workstation with installed software.

### 3.1 Kit contents

- Assembled and tested evaluation board in an antistatic bag

# 4 Getting to know the hardware

## 4.1 Schematic

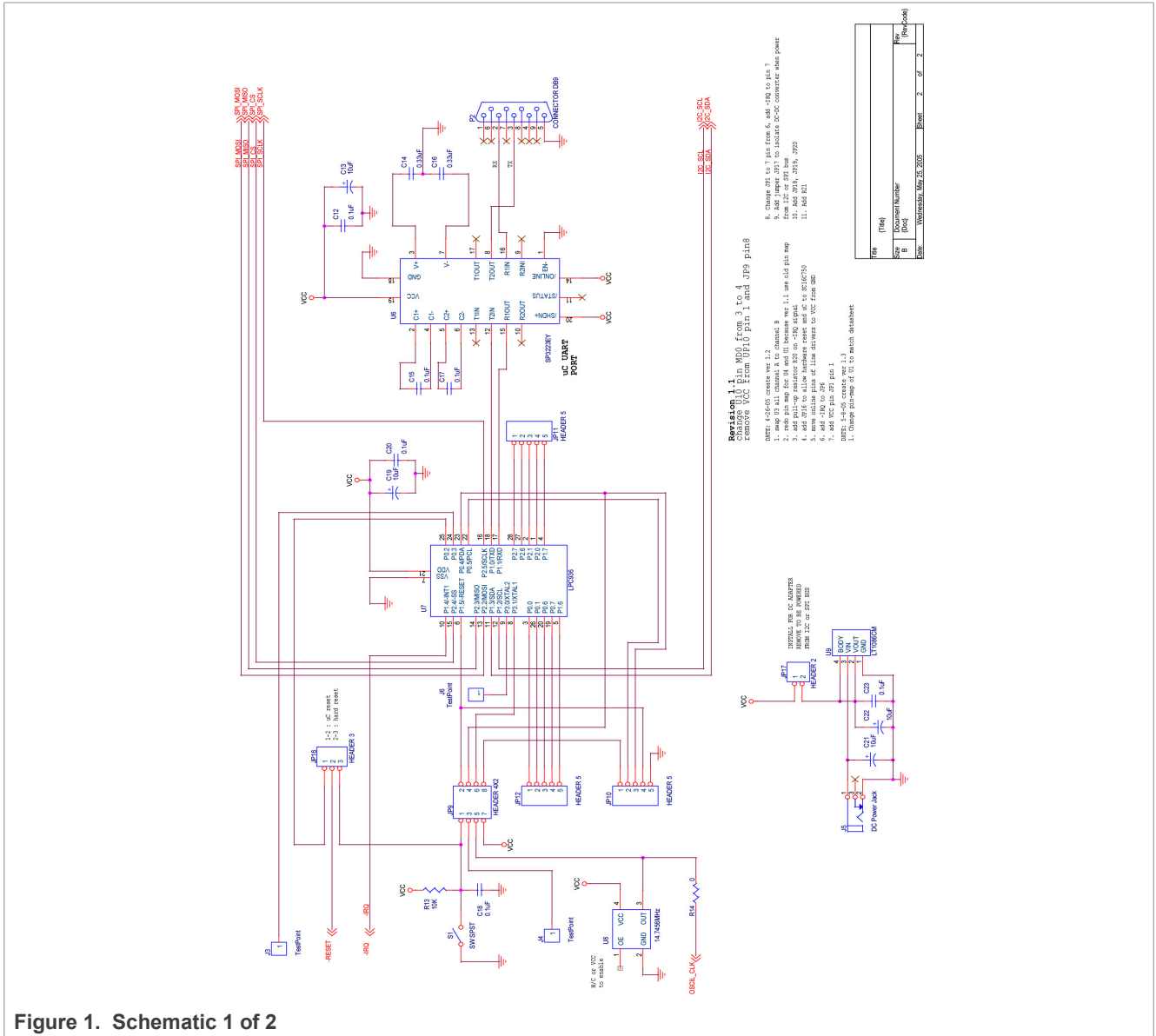


Figure 1. Schematic 1 of 2

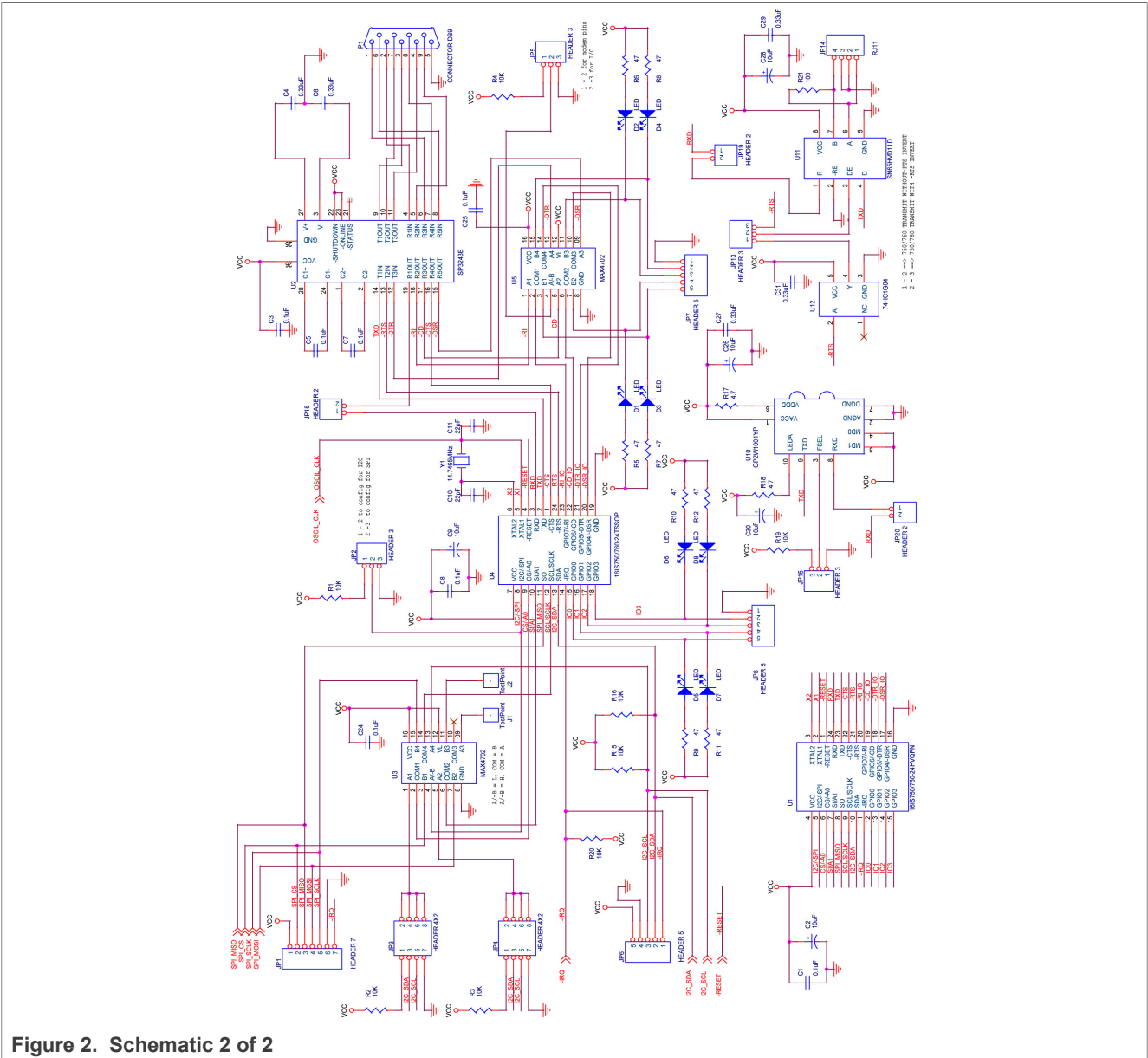


Figure 2. Schematic 2 of 2

## 5 Configuring the hardware

The demo board has an on board microcontroller (U7) which is used to control the SC16IS750/760 through the microcontroller I2C bus. This microcontroller is configured at power up to receive the data through the IrDA port (U10), and the received data are sent back out through the uC's UART port (P2). The on-board microcontroller can be removed from its socket; this allows the SC16IS750/760 to be controlled through the SPI header (JP1) or the I2C header (JP6). Please refer to the schematics for more detail of the headers' pin map.

When the external controller is selected (U7 is removed), a ribbon cable can be made to connect the external controller's I2C or SPI bus to the demo board. This option allows the user to control the SC16IS750/760 directly with the external controller, and it also allows the user to quickly develop his software without modify his system to add the 16IS750/760 and the necessary components.

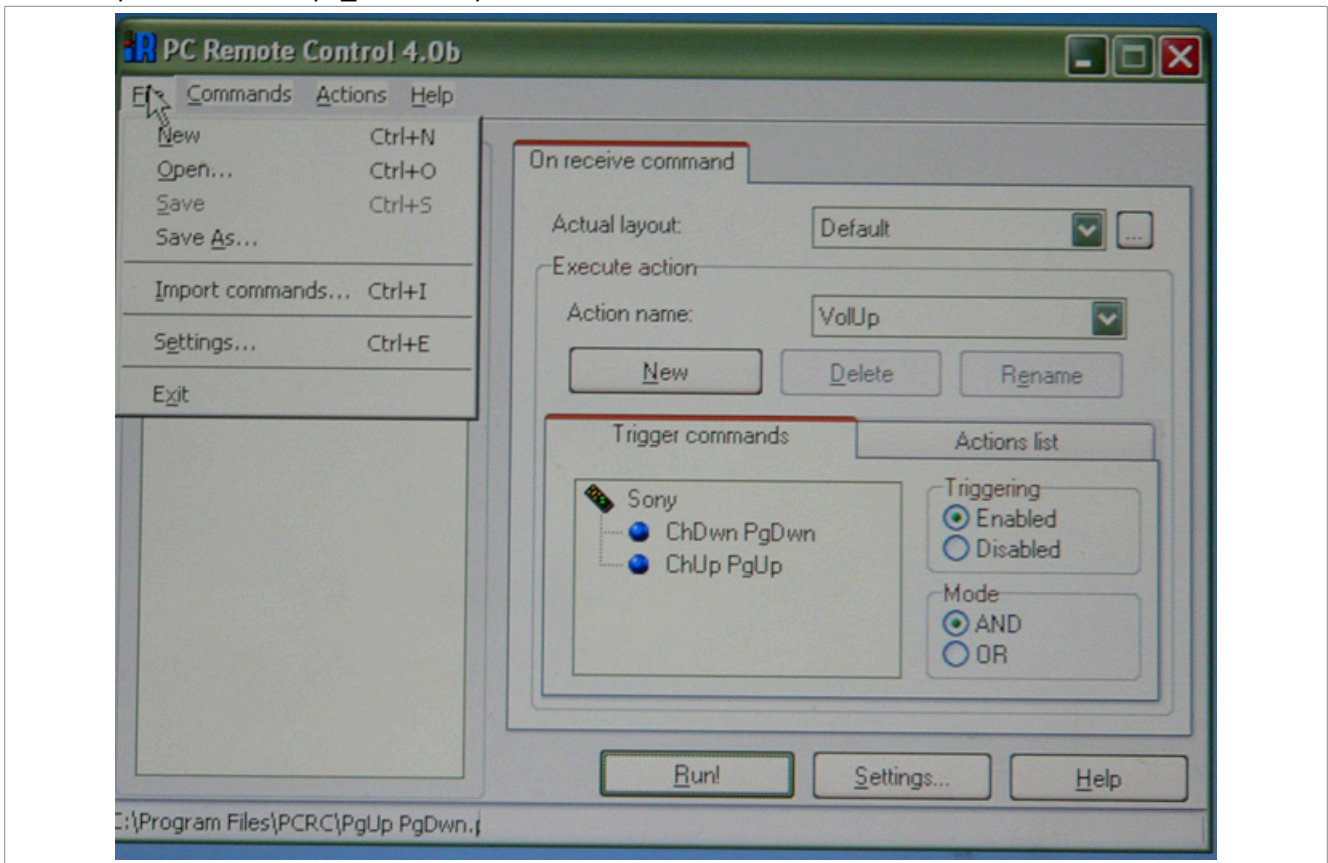
**5.1 Demo modes**

The demo modes can be choose by the jumper on JP8 pin 1 and 2 (IO3). If the jumper is missing the datapath is between IrDA port and uC serial port. In this mode if any data received by SC16IS750/760 through the IrDA port will be send out to P2.

If the jumper is installed between JP8 pin 1 and 2, the SC16IS750/760 is in software loop back mode. Any data received through P1 will be read by the on-board uC and the uC automatically sends the data back to P1 port.

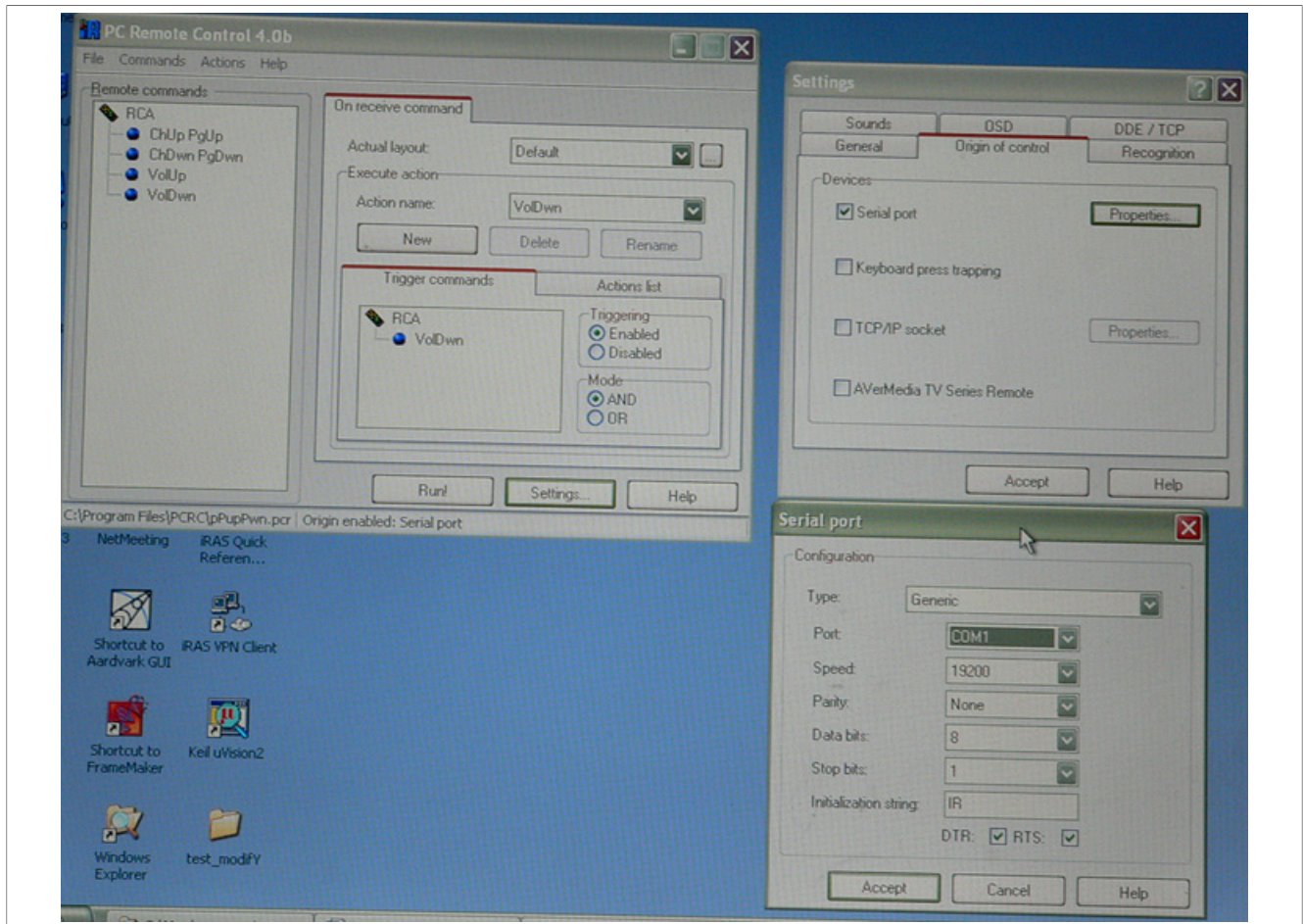
**5.1.1 Demo modes setup instructions**

1. IrDA demo
  - a. Get this shareware program - PCRemoteControl from this web site: [www.pcremotecontrol.com](http://www.pcremotecontrol.com)
  - b. Install the shareware program on your PC
  - c. Run the program.
  - d. Open the file: Philips\_Universal.pcr on the disk

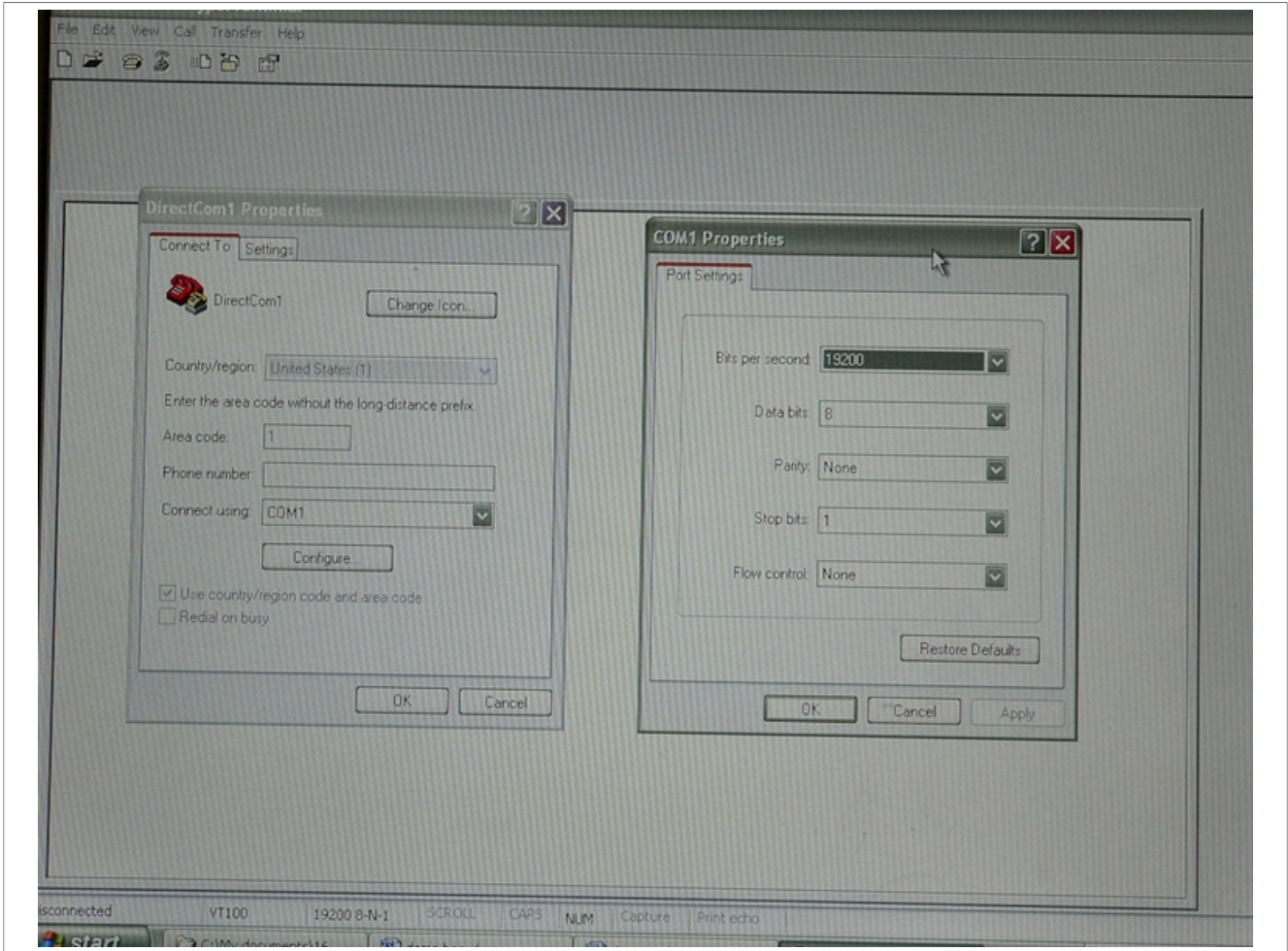


- e. Change the baud rate to 19.2 Kbps and others settings exactly as shown below (Setting # Original of control # Properties) and click on Accept.





- f. Click on RUN
  - g. Connect the serial cable between P2 port of the demo board and your PC's serial port.
  - h. Remove jumper on JP8 between pin 1 and 2 (put it on JP8 pin 1 only for later use).
  - i. Make sure there is no jumper on JP18, and the jumper is on JP20.
  - j. Power up the demo board – plug in the power jack.
  - k. Open the Microsoft PowerPoint Program.
  - l. Open any presentation file
  - m. Point the remote control at the demo board's IrDA port and press Channel UP or Channel Down key, the Power Point pages will be flipped forward or backward.
2. Serial port demo
    - a. Connect the serial cable between P1 of the demo board and you PC
    - b. Open HyperTerminal program
    - c. Change the Baud Rate to 115.2Kbps if needed
    - d. Put a jumper on JP8 pin 1 and 2
    - e. Make sure the jumper is on JP18, and there should be no jumper on JP20
    - f. Power up the demo board – plug in the power jack



- g. Send any text file (the one on the disk can also be used) and the text will be automatically sent back from the on-board microcontroller.

## 5.2 SC16IS750/760 address section

This device can be configured as any of the following 16 I2C addresses by installing the jumpers:

Table 1. Address section

JP4	JP3	SC16IS750/760 I2C ADDRESS
VCC (label pin 1)	VCC (label pin 1)	0x90
VCC (label pin 1)	GND (not label)	0x92
VCC (label pin 1)	SCL	0x94
VCC (label pin 1)	SDA	0x96
GND (not label)	VCC (label pin 1)	0x98
GND (not label)	GND (not label)	0x9A (factory default)
GND (not label)	SCL	0x9C
GND (not label)	SDA	0x9E
SCL	VCC (label pin 1)	0xA0



Table 1. Address section...continued

JP4	JP3	SC16IS750/760 I2C ADDRESS
SCL	GND (not label)	0xA2
SCL	SCL	0xA4
SCL	SDA	0xA6
SDA	VCC (label pin 1)	0xA8
SDA	GND (not label)	0xAA
SDA	SCL	0xAC
SDA	SDA	0xAE

### 5.3 I2C or SPI configuration

The on-board microcontroller is programmed to control the SC16IS750/760 through I2C bus. But if the 16IS750/760 is to be controlled by an external controller through either JP1 or JP6 then the controlled bus is selectable by JP2.

I2C bus is selected by installing the jumper on pin 1 and 2 of JP2, and SPI bus is selected by installing the jumper on pin 2 and 3 of JP2.

### 5.4 Modem pins or I/O pins

Four of the 16IS750/760 I/O pins can also be programmed as normal I/O pins. When these pins are programmed as modem pins, they are routed to the serial port through JP5. This requires the jumper to be on pin 1 and 2 of JP5. When these four pins are programmed as I/O pins, they are routed to JP7 through JP5. This requires the jumper to be on pin 2 and 3 of JP5.

In addition, there are 8 LEDs on boards and can be turned on or off by the SC16IS750/760 I/O pins when programmed as outputs.

#### 5.4.1 Modem port, IrDA or RS-485 port

On this board the SC16C750/760 receiver pin can be routed from one of these three sources: IrDA Port (U10), Serial Port (P1) or RS-485 Port (JP14). Please see the table below:

Table 2. Receiver pin routing

JP18	JP20	JP19	
ON	OFF	OFF	Receive from Serial Port
OFF	ON	OFF	Receive from IrDA Port
OFF	OFF	ON	Receive from RS-485 Port

The transmitter pin from SC16C750/760 goes to all three ports, and there is no option to isolate them.

### 5.5 Power supply options

The demo board is normally powered from a 5V-7.5V DC adapter which plugs into the power jack J5. This option requires the jumper JP17 to be installed.

Additionally a 3.3V external power source can be used to supply power to the demo board. This option requires the jumper on JP17 to be removed and the external 3.3V power is connected to JP17 pin 1.

## 5.6 SC16IS750/760 hardware reset options

SC16C750/760 can be manually reset with the push switch (S1) or through the on-board uC (U7 pin25). The factory default is with the S1 switch, therefore, JP16 jumper is installed on pin 2 and 3.

## 6 Revision history

Table 3. Revision history

Document ID	Release date	Description
UM11988 v.2.0	6 February 2024	<ul style="list-style-type: none"><li>Assigned UM number and updated style of user manual to current format set forth by NXP</li></ul>

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