I-7560U/7561U/7563U
User Manual

USB to RS-232/422/485 Converters Ver. 1.0, Dec. 2013



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Chapter 1

Introduction



The following is a brief overview of the I-756xU series modules, including the features and applications.

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1.1 Overview

What is USB?

The Universal Serial Bus (USB) is an industry standard connectivity specification developed by computer and telecommunication industry members and is used to attach external peripherals to computers. USB was designed to standardize the connection of peripherals and eliminate the need to open the computer case in order to install additional interfaces needed for certain devices. USB is designed to meet the Microsoft Plug and Play (PnP) specifications, meaning that users can install and hot-swap external devices without requiring lengthy installation procedures and reducing the need to reboot the computer.

The I-756xU USB to RS-232, RS-485 or RS-422 converter is a smart and convenient accessory that allows RS-232/RS-422/485 serial devices to be connected to a USB-equipped Windows or Linux host computer. The I-756xU provides a bridge connection that includes a standard DB 9-pin male serial port connector at one end and a standard Type-A USB plug connector at the other. Simply attach the serial device to the serial port on the cable and insert the USB connector into the USB port on the PC. This provides a convenient method of adding serial connections to the PC without having to install an additional serial card or perform the necessary configuration associated with a traditional port connection.

This USB to Serial adapter is ideal for connecting modems, cellular phones, PDAs, digital cameras, card readers and other serial devices to your computer. It provides serial connections up to 1 Mbps of data transfer rate. And since USB does not require any IRQ resource, more devices can be attached to the system without the previous hassles of device and resource conflicts.

The I-756xU USB-to-Serial adapter is fully compliant with the USB specifications and therefore supports advanced power management, such as suspend and resume operations as well as remote wakeup. I-756xU USB-to-Serial products are designed to work on Linux, Windows 98/ME/2000 and 32 and 64-bit Windows XP/Vista/7/8 operating systems.

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I-7560U



The I-7560U adaptor provides a Windows serial COM port via its USB connection and is fully compatible with both current and legacy RS-232 devices. The I-7560U features a full set of RS-232 modem data and control signals (TxD, RxD, RTS, CTS, DSR, DTR, DCD, RI and GND) on its PC compatible DB-9 male connector. It also features a high-speed transmission rate of 921.6 kbps and is powered from the USB bus, meaning that no additional power supply is required.

I-7561U and I-7563U



The I-7561U/I-7563U module is a cost-effective solution for transferring serial data via USB allowing serial devices to be connected to systems that use a USB interface. By connecting the I-7561U/I-7563U module to a PC, a single RS-232 or RS-422/485 port can be accessed. Both modules contain a "Self-Tuner" chip that automatically tunes the Baud Rate and Data Format to the RS-485 network. The modules are powered from the USB bus, meaning that an additional power adaptor is not required.

The I-7563U is a USB-to-single channel RS-485 converter with a 3-way RS-485 Hub. Each channel contains discrete RS-485 driver IC, providing support for star-shaped wiring network topology.

Comparison of I-756xU Devices:

Model	RS-232	RS-422/485	RS-485	Baud Rate	Isolated	Serial Port	
I-7560U	1	-	-	921.6 kbps	-	9-wire RS-232	
I-7561U	1			921.6 kbps	2500 V_{DC}	3-wire RS-232	
						4-wire RS-422	
						2-wire RS-485	
I-7563U	-	-	3	921.6 kbps	2500 V_{DC}	Channel 1 ~ 3	2-wire RS-485
							2-wire RS-485
							2-wire RS-485

9-wire RS-232: TxD, RxD, RTS, CTS, DSR, DTR, DCD, RI and GND

3-wire RS-232: TxD, RxD and GND

4-wire RS-422: TxD+, TxD-, RxD+, RxD-

2-wire RS-485: Data+, Data-

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1.2 Features

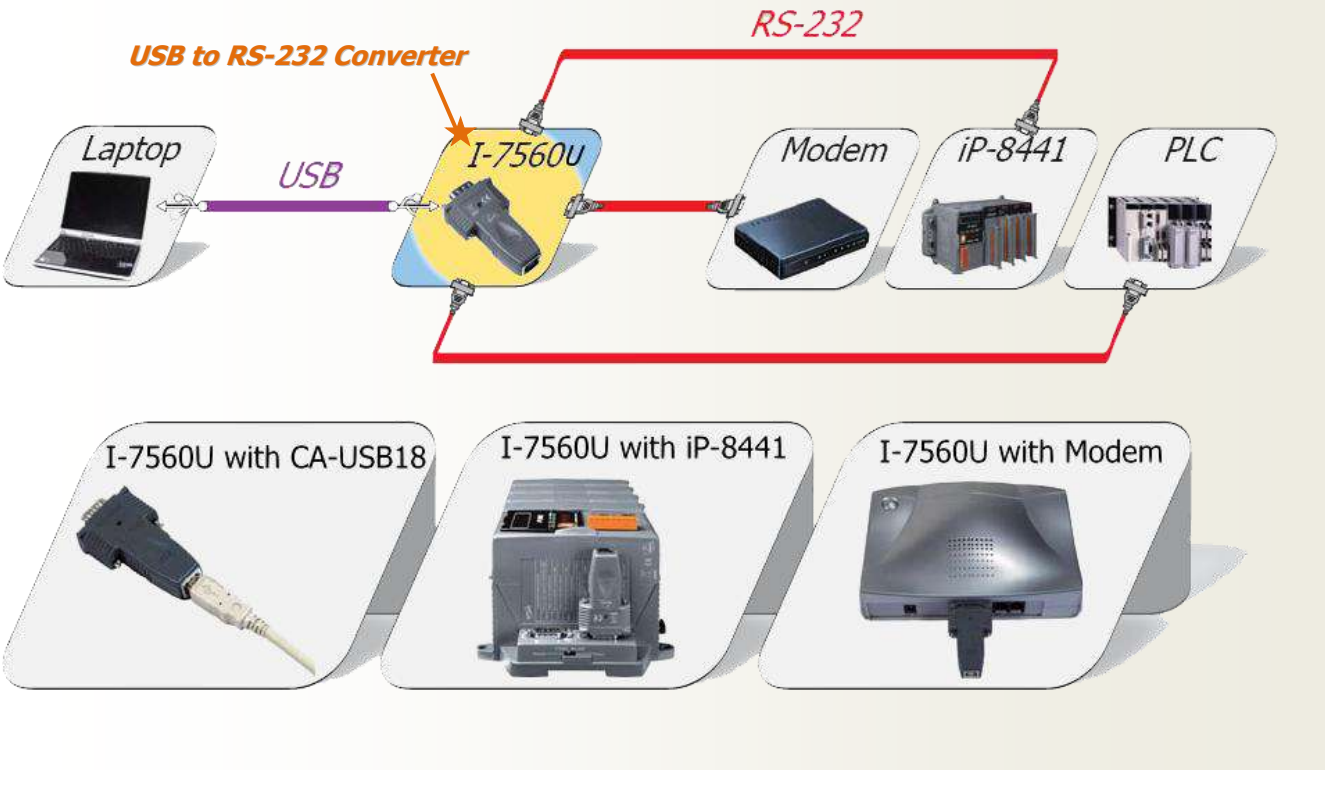
- Fully Compliant with the USB 1.1, 2.0 and 3.0
- No External Power Supply required
- Driver Supports Linux, Windows 98/ME/2000 and 32-/64-bit Windows XP/Vista/7/8
- Operating Temperatures, -25 °C to +75 °C
- Made from fire-retardant materials (UL94-V0 Level)

[I-7561U/I-7563U only]

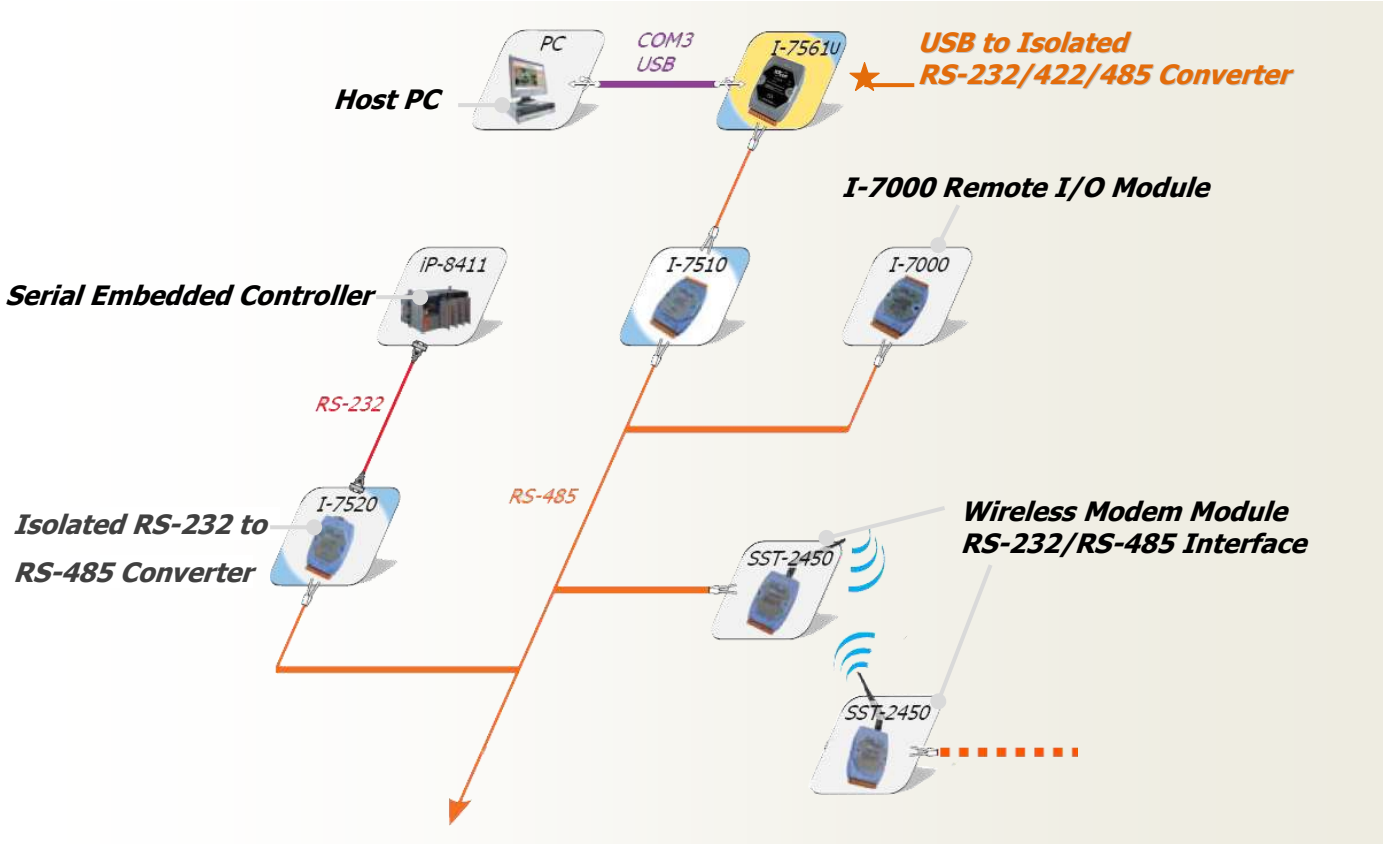
- 2500 V_{DC} Isolation Protection
- ESD Protection
- Automatic RS-485 Direction Control
- DIN-Rail Mounting

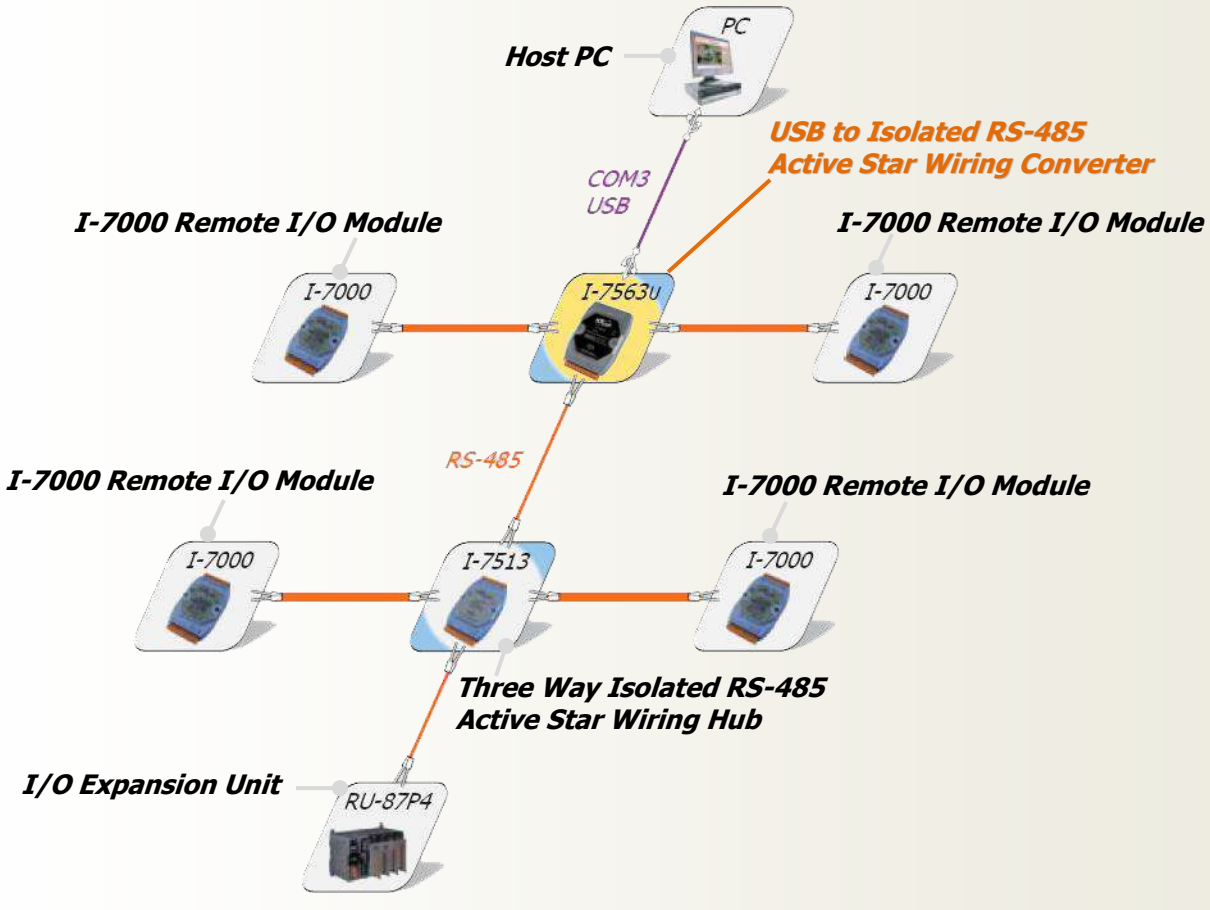


1.3 Applications



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Chapter 2

Hardware Information



This chapter provides a detailed description of the front and back panel, the hardware specifications, the pin assignments, wiring notes, the internal I/O structure and the dimensions for the I-756xU series modules.

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2.1 Front and Back View

2.1.1 I-7560U

Front and Back View



1 Robust insulated and fire retardant case

2 Serial COM Port

The I-7560U adaptor is equipped with a male DB-9 connector that is used to connect to an RS-232 device. For more detailed information regarding the pin assignments, refer to Sec. 2.4 "Pin Assignments".

3 USB Jack

The I-7560U adaptor is equipped with a Type B USB jack that is used to connect to the USB port on the Host PC via a USB cable.

The I-7560U adaptor will accept a power input of +5 V_{DC} from the USB bus.

4 LED Indicator

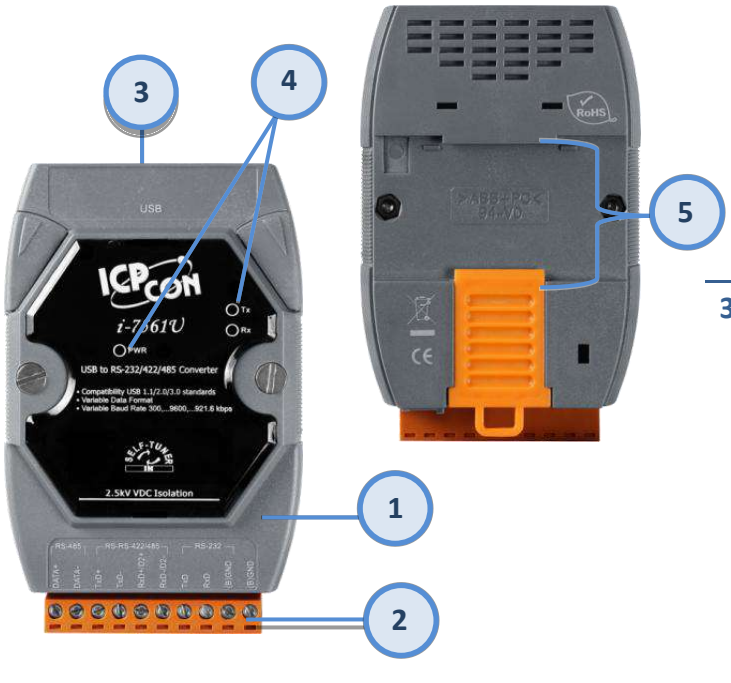
Once power is supplied to the I-7560U, the LED indicator will be illuminated as follows:

LED Behavior	Function
ON (Red)	Indicates that the power is ON
Blinking (Yellow)	Indicates that the serial port is busy

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2.1.2 I-7561U and I-7563U

Front and Back View



1 Robust insulated and fire retardant case

2 Serial COM Port

The numbers of serial COM ports depends on the type of I-7561U/I7563U module. For more detailed information regarding the pin assignments for the serial COM ports, refer to Sec. 2.4 "Pin Assignments".

3 USB Jack



I-7561U/I-7563U modules are equipped with a Type BUSB jack that is used to connect to the USB port on a Host PC via a USB cable.
The I-7561U/I7563U modules will accept a power input of +5 V_{DC} from the USB bus.

4 LED Indicator

Once power is supplied to the I-7561U/7563U, the LED indicator will be illuminated as follows:

Name	LED Behavior	Function
PWR	ON (Red)	Indicates that the power is ON
Rx	Blinking (Orang)	Indicates that the serial port is busy
Tx	Blinking (Green)	

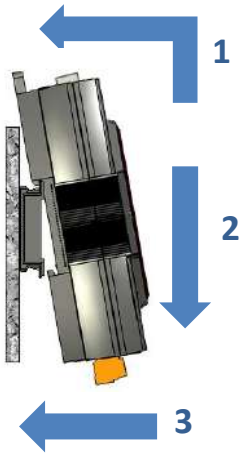
5 DIN-Rail Mounting

I-7561U/7563U modules include simple rail clips on the bottom of the chassis that allow them to be reliably mounted on a DIN-Rail or a wall, or they can be piggybacked to another module. For more detailed information regarding DIN-Rail Mounting, refer to the illustration in figure below.

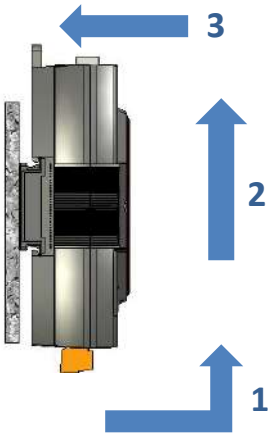
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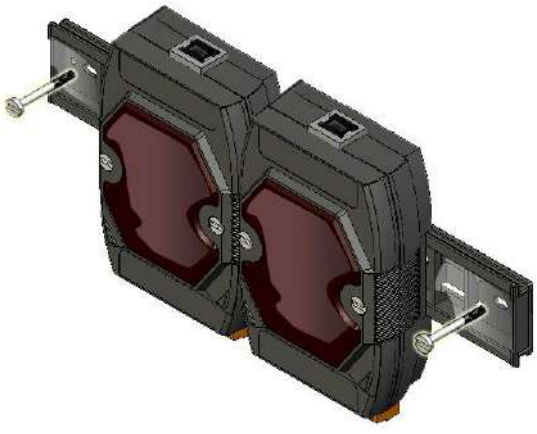
DIN-Rail Mounting

Mounting on a DIN-Rail



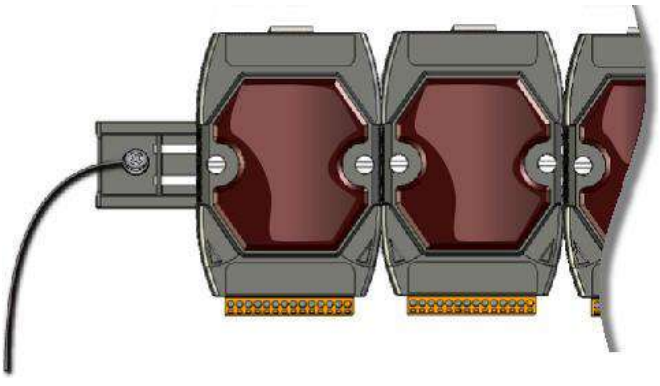
Dismounting from a DIN-Rail





Mountable DIN-Rail Models

DIN-Rail mounts are available in three size, and enable a variety of ICP DAS devices to be mounted. Each is made of stainless steel and has a ground wire attached at one end.



Part Number	Maximum Number of Modules	Dimensions
DRS-125	2	125 mm x 35 mm
DRS-240	3	240 mm x 35 mm
DRS-360	5	360 mm x 35 mm

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2.2 Specifications

2.2.1 I-7560U Specifications

Interface		
USB		Fully Compliant with the USB 1.1, 2.0 and 3.0
RS-232		TxD, RxD, RTS, CTS, DSR, DTR, DCD, RI and GND; Non-isolated
Speed		300 to 921.6 kbps
Connector	**RS-232**	9-Pin Male D-Sub
	USB	Type B
Cable Included		CA-USB18 (1.8 m Cable) x 1
LED Indicators		
Power		Yes
Power		
Input Voltage Range		+5 V_{DC} from USB
Power Consumption		0.3 W
Mechanical		
Casing		Plastic
Flammability		Fire retardant Materials (UL94-V0 Level)
Dimensions (W x H x D)		33 mm x 60 mm x 15 mm
Environment		
Operating Temperature		-25 °C to +75 °C
Storage Temperature		-30 °C to +75 °C
Humidity		10 to 90% RH, Non-condensing

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2.2.2 I-7561U Specifications

Interface			
USB		Fully Compliant with the USB 1.1, 2.0 and 3.0	
Serial Interface	**RS-232**	3-wire RS-232: TxD, RxD, GND 4-wire RS-422: TxD+, TxD-, RxD+, RxD- 2-wire RS-485: Data+, Data-	RS-232, RS-422 and RS-485 cannot be used simultaneously
	RS-422		
	RS-485		
Transmission Distance		Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Note that these measurements are based on tests using Belden 9841 2P twisted-pair cable. If different cables are used, the transmission distance may change.)	
Embedded Self-Tuner ASIC (RS-485)		Yes	
Speed		300 to 921.6 kbps	
Connector	**RS-232/422/485**	Removable 10-Pin Terminal Block	
	USB	Type B	
Cable Included		CA-USB18 (1.8 m Cable) x 1	
LED Indicators			
Power		Yes	
Power			
Input Voltage Range		+5 V_{DC} from USB	
Power Consumption		0.5 W	
Mechanical			
Casing		Plastic	
Flammability		Fire retardant Materials (UL94-V0 Level)	
Dimensions (W x H x D)		72 mm x 115 mm x 35 mm	
Installation		DIN-Rail Mounting	
Environment			
Operating Temperature		-25 °C to +75 °C	
Storage Temperature		-30 °C to +75 °C	
Humidity		10 to 90% RH, Non-condensing	

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2.2.3 I-7563U Specifications

Interface			
USB		Fully Compliant with the USB 1.1, 2.0 and 3.0	
RS-485		Data1+, Data1-	3 channels: For active star wiring applications
		Data2+, Data2-	
		Data3+, Data3-	
Transmission Distance		Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Note that these measurements are based on tests using Belden 9841 2P twisted-pair cable. If different cable are used, the transmission distance may change.)	
Embedded Self-Tuner ASIC (RS-485)		Yes	
Speed		300 to 921.6 kbps	
Connector	**RS-485**	Removable 10-Pin Terminal Block	
	USB	Type B	
Cable Included		CA-USB18 (1.8 m Cable) x 1	
LED Indicators			
Power		Yes	
Power			
Input Voltage Range		+5 V_{DC} from USB	
Power Consumption		0.5 W	
Mechanical			
Casing		Plastic	
Flammability		Fire retardant Materials (UL94-V0 Level)	
Dimensions (W x H x D)		72 mm x 115 mm x 35 mm	
Installation		DIN-Rail Mounting	
Environment			
Operating Temperature		-25 °C to +75 °C	
Storage Temperature		-30 °C to +75 °C	
Humidity		10 to 90% RH, non-condensing	

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2.3 JP3: Output Type Selection (I-7561U Only)

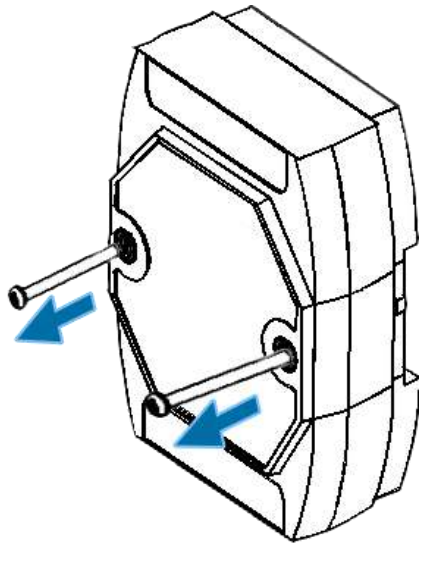
The I-7561U module supports four different output types:

- **Type 1:** 1-channel RS-485 output
- **Type 2:** 1-channel RS-422 output
- **Type 3:** 2-channel RS-485 output (This type supports star wiring network)
- **Type 4:** 1-channel RS-232 output

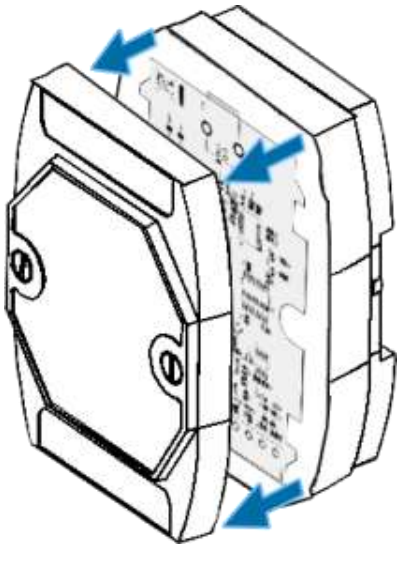
Note: that the RS-232, RS-422 and RS-485 output types cannot be used simultaneously, meaning that only one output type can be selected at any one time.

The JP3 jumper is used to select the different output types. To select the **Type 1 (1-channel RS-485) and Type 2 (1-channel RS-422)**, pins2 and 3 must be shorted (factory default settings). To select the **Type 3 (2-channel RS-485)**, pins1 and 2 must be shorted. To adjust the output type follows the procedure illustrated below:

Step 1: Removing both screws from the casing.



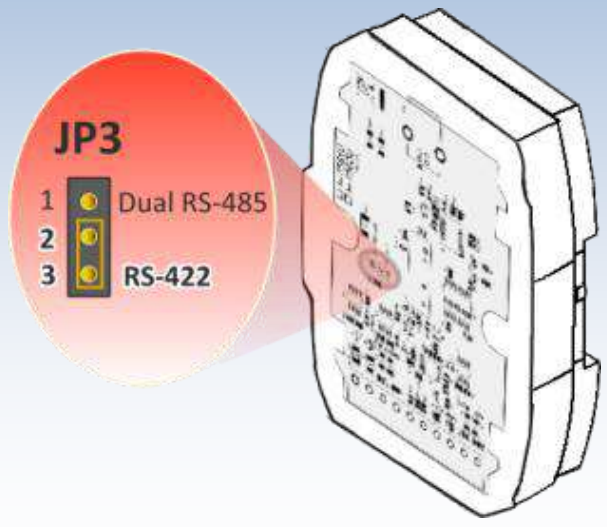
Step 2: Remove the top half of the shell casing.



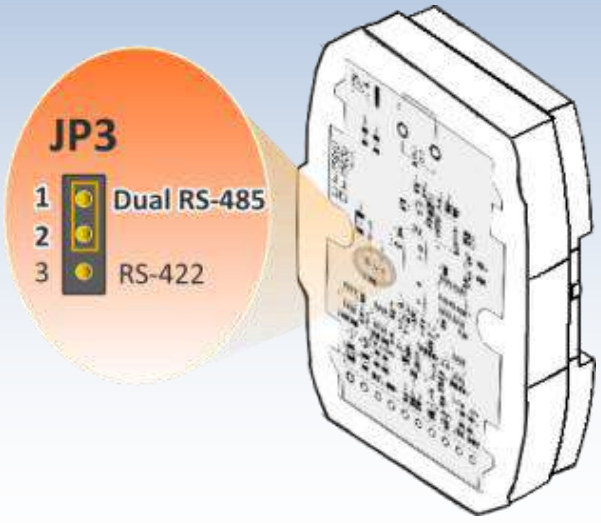
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Step 3: To adjust the JP3 jumper to the position indicated.

To use **Types 1 and 2 (1-channel RS-422 and 1-channel RS-485)**, adjust the jumper to the position indicated **(Pins 2 and 3 – Factory default settings)**.



To use **Type 3 (2-channel RS-485)**, adjust the jumper to the position indicated **(Pins 1 and 2)**.



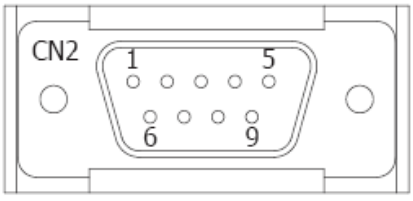
Note:

1. **There is no need to reboot the module once the jumper settings have been adjusted.**
2. **For more detailed information regarding the pin assignments, refer to Sec. 2.4.2 "I-7561U Pin Assignments".**

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2.4 Pin Assignments

2.4.1 I-7560U



Pin	Signal		Mode
01	DCD	Data Carrier Detect	Input
02	RxD	Receive Data	Input
03	TxD	Transmit Data	Output
04	DTR	Data Term Ready	Output
05	GND	Ground	--
06	DSR	Data Set Ready	Input
07	RTS	Request To Send	Output
08	CTS	Clear To Send	Input
09	RI	Ring Indicator	Input

2.4.2 I-7561U

Pin Assignments for Type1 and Type2



Terminal No.		Pin Assignment
RS-485	01	DATA+
	02	DATA-
RS-422	03	TxD+
	04	TxD-
	05	RxD+
	06	RxD-
RS-232	07	TxD
	08	RxD
	09	(B)GND
	10	(B)GND

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Pin Assignments for Type3



Terminal No.		Pin Assignment
RS-485	01	DATA1+
	02	DATA1-
RS-485	03	--
	04	--
	05	DATA2+
	06	DATA2-
RS-232	07	TxD
	08	RxD
	09	(B)GND
	10	(B)GND

Note: For detailed information regarding the output type settings, refer to Sec. 2.3 "JP3: Output Type Selection (I-7561U Only)" .

2.4.3 I-7653U



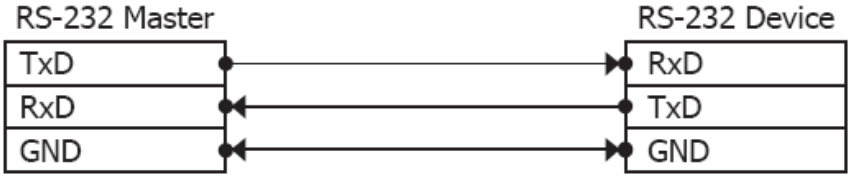
Terminal No.		Pin Assignment
RS-485	01	DATA3-
	02	DATA3+
	03	--
RS-485	04	DATA2-
	05	DATA2+
	06	--
	07	--
	08	--
RS-485	09	DATA1-
	10	DATA1+

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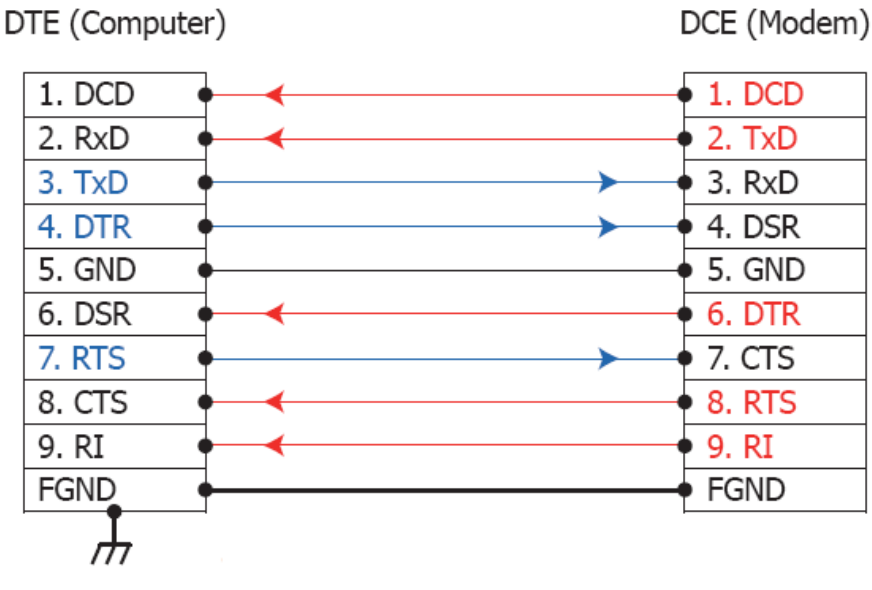
2.5 Wiring Notes

2.5.1 RS-232

3-wire RS-232 Wiring



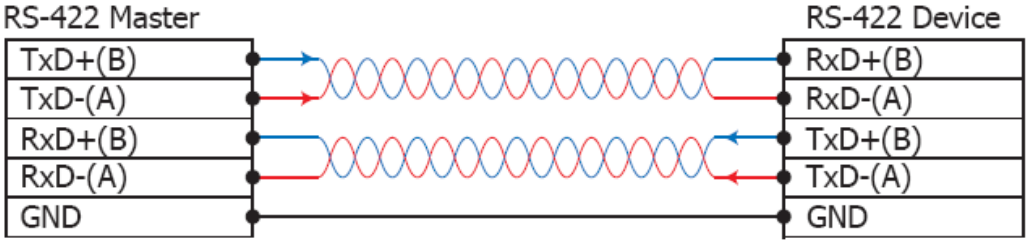
9-wire RS-232 Wiring



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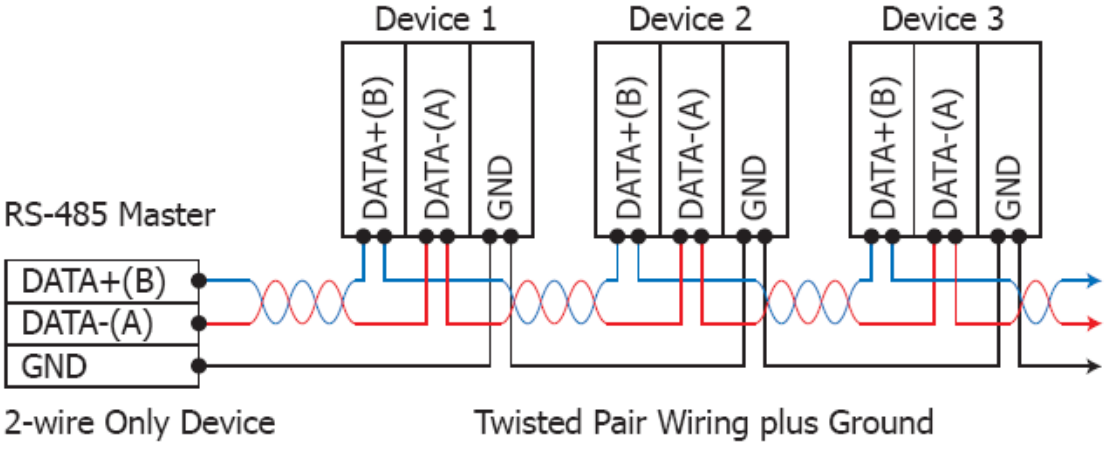
2.5.2 RS-422

4-wire RS-422 Wiring



2.5.3 RS-485

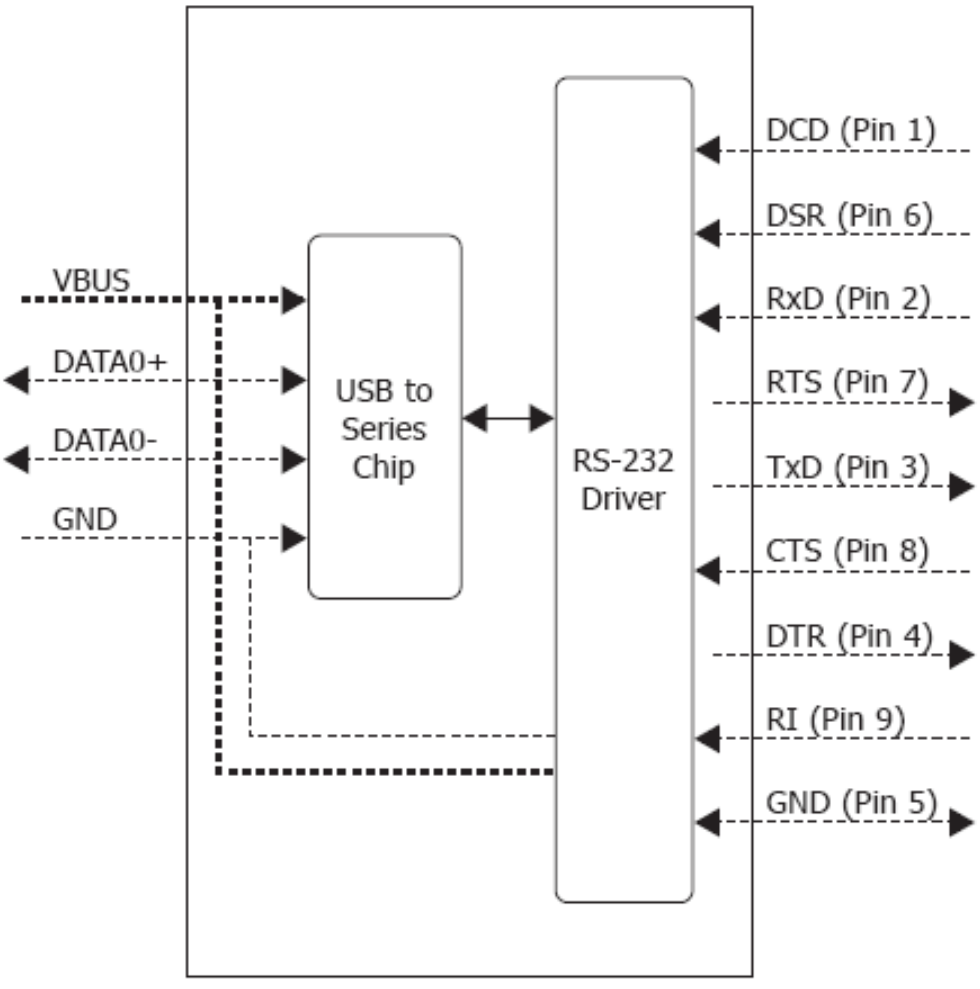
2-wire RS-485 Wiring



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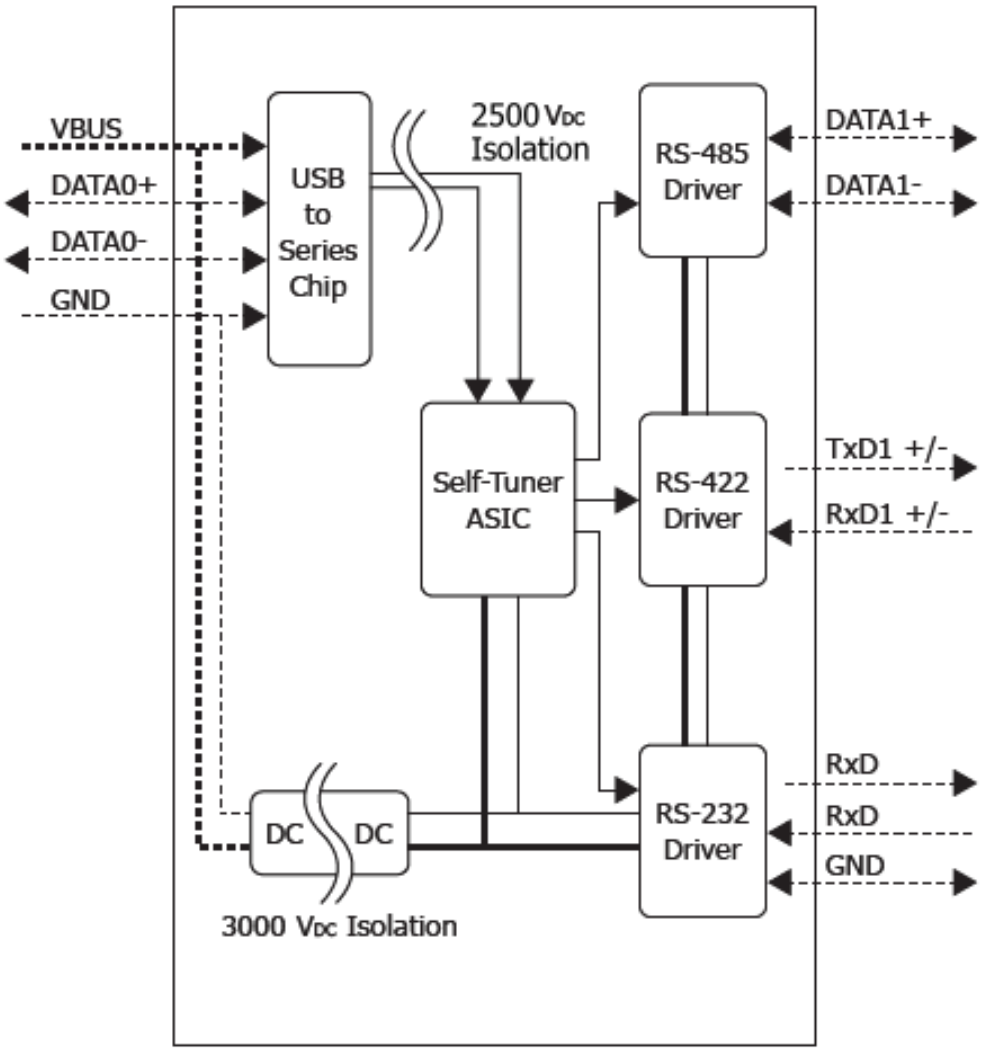
2.6 Internal I/O Structure

2.6.1 I-7560U



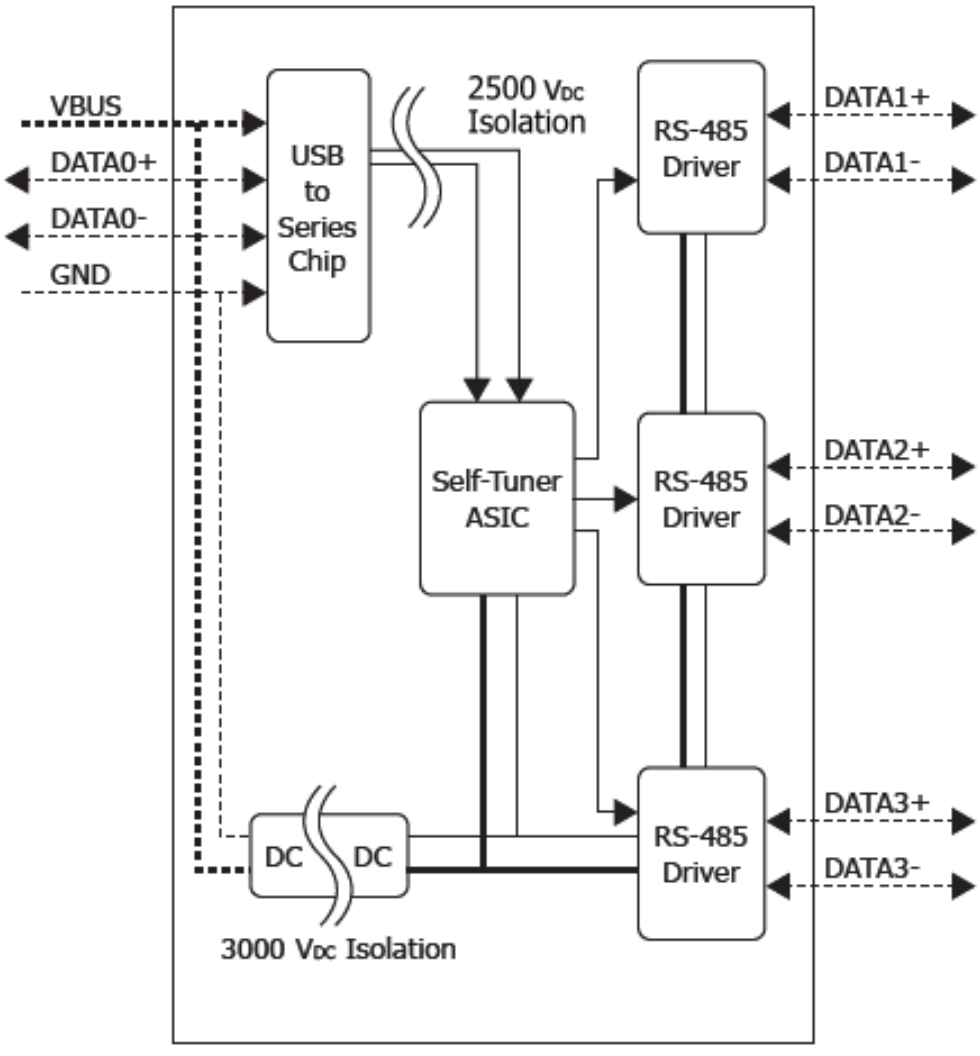
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2.6.2 I-7561U



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2.6.3 I-7563U



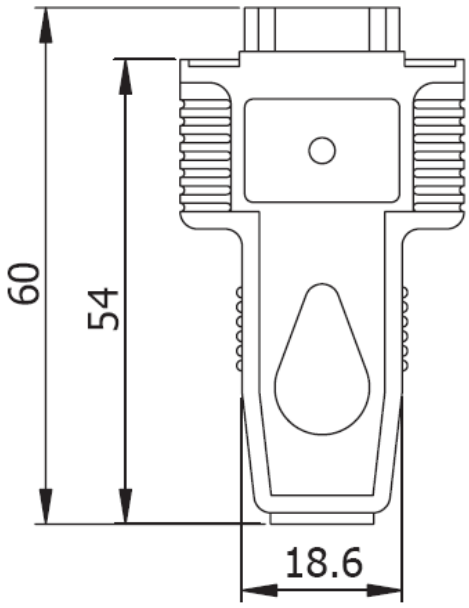
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2.7 Dimensions

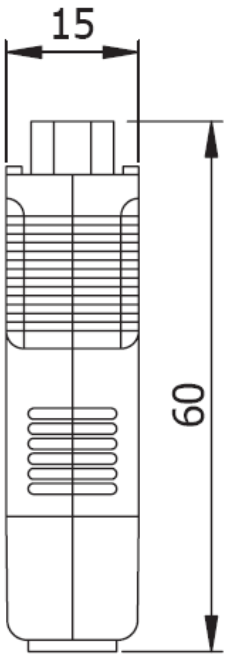
2.7.1 I-7560U

Unit: mm

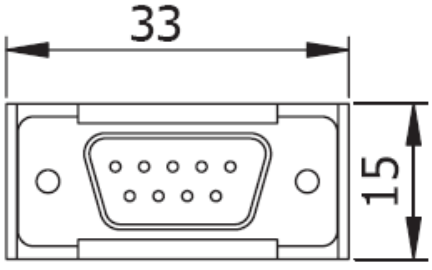
Front View



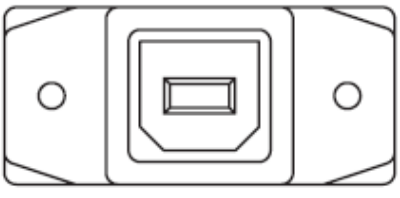
Right Side View



Top View



Bottom View

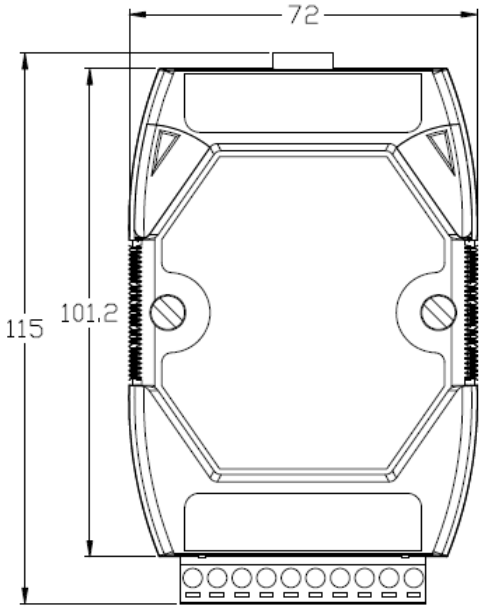


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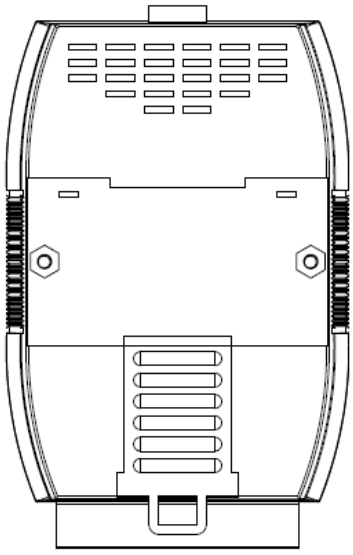
2.7.2 I-7561U and I-7563U

Unit: mm

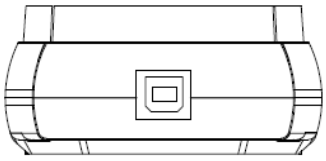
Front View



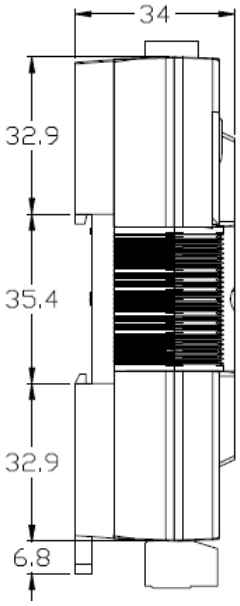
Rear View



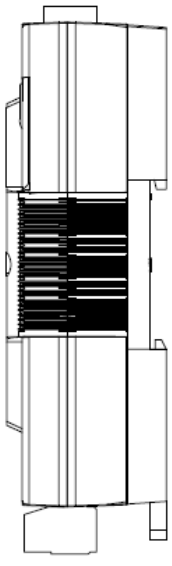
Top View



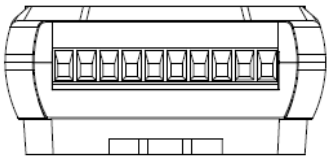
Left Side View



Right Side View



Bottom View



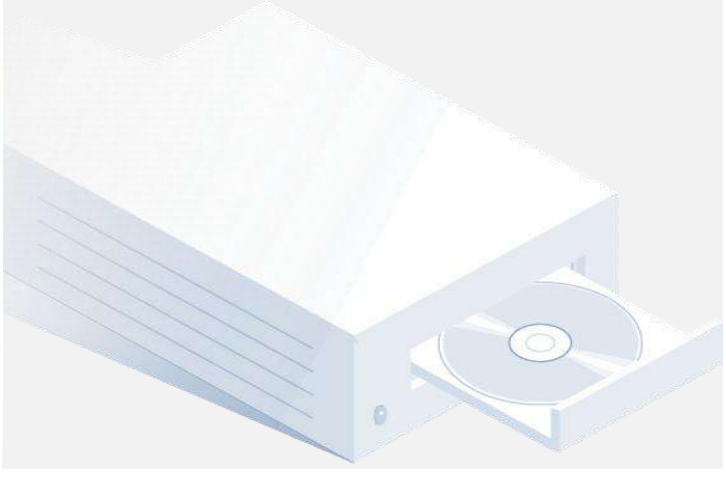
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Chapter 3

Software Installation



This chapter provides a detailed description of the process for installing the I-756xU series driver and how to verify whether the I-756xU was properly installed.

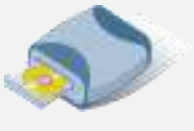


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3.1 Obtaining the Driver Installer Package

I-7560U/7561U/7563U modules can be used on Linux and Windows 98/ME/2000 and 32-/64-bit XP/Vista/7/8 based systems, and the drivers are fully Plug and Play (PnP) compliant for easy installation.

The driver installer package for the ICP DAS I-756xU series can be found on the supplied CD-ROM, or can be obtained from the ICP DAS FTP web site. The location and addresses are indicated in the table below:

	**CD:\\ NAPDOS\UsbConverter\I-756xU_series**
	**ftp://ftp.icpdas.com/pub/cd/Usb_tM/NAPDOS/UsbConverter/I-756xU_series/**
	**http://ftp.icpdas.com/pub/cd/usb_tm/napdos/usbconverter/i-756xu_series/**

Install the appropriate driver for your operating system, as follows:

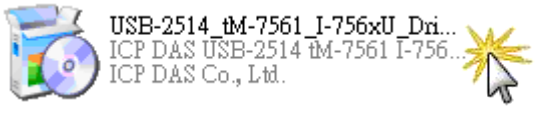
Name	OS
USB-2514_tM-7561_I-756xU_Driver_xxxx.exe	**For Microsoft Windows 98/ME/2000 and 32/64-bit XP/Vista/7/8.**
I-756x_Linux_Manual	**For detailed information regarding installation of the Linux driver, please refer to I-756x_Linux_Manual.pdf.**

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3.2 Installing the I-756xU Series Drivers

To install the I-756xU series drivers, follow the procedure described below:

Step 1: Double click the "**USB-2514_tM-7561_I-756xU_Driver_xxxxx.exe**" to execute the driver installer application.

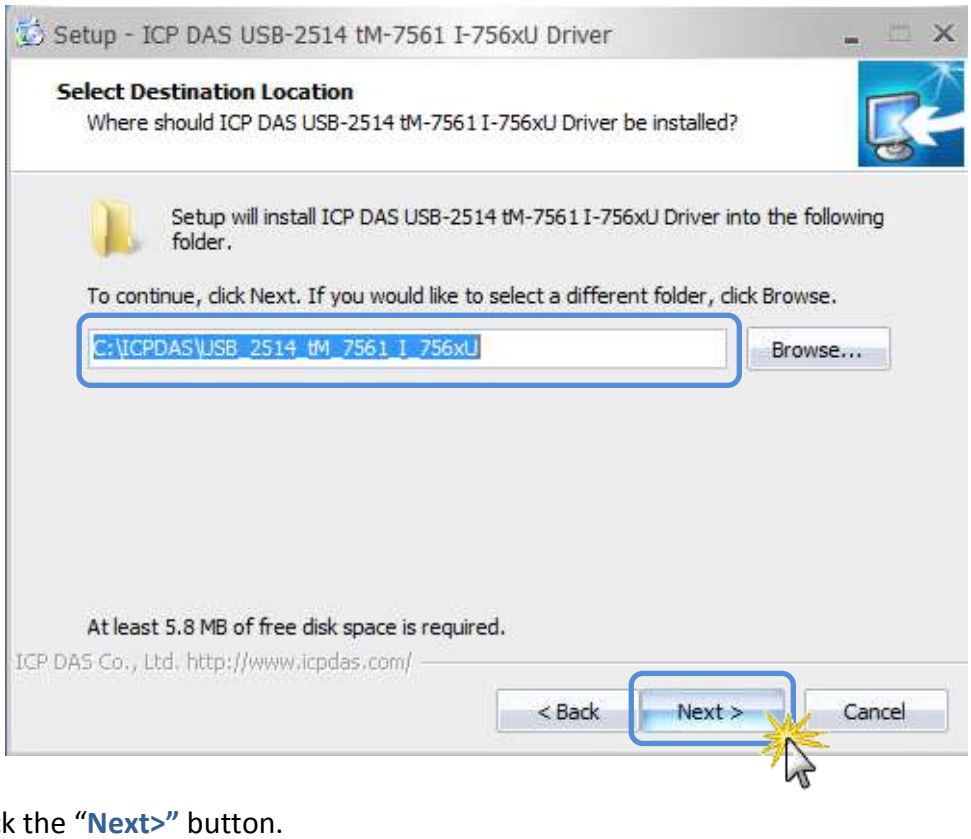


Step 2: Click the "**Next>**" button to start installation.



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Step 3: Select the destination folder. The **default path is C:\ICPDAS\USB_2514_tM_7561_I_756xU**. Verify that the destination path is correct and click the "**Next>**" button.



Step 4: Click the "**Next>**" button.

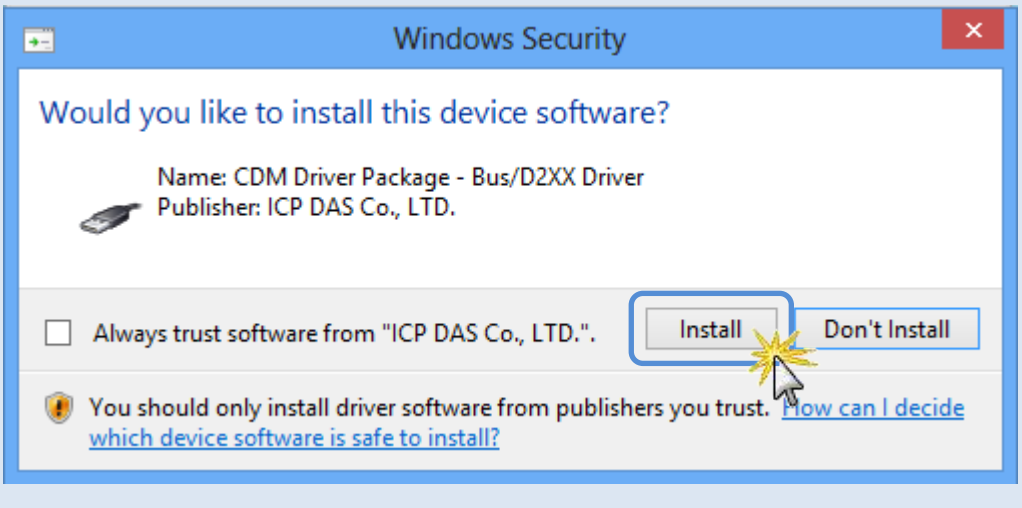


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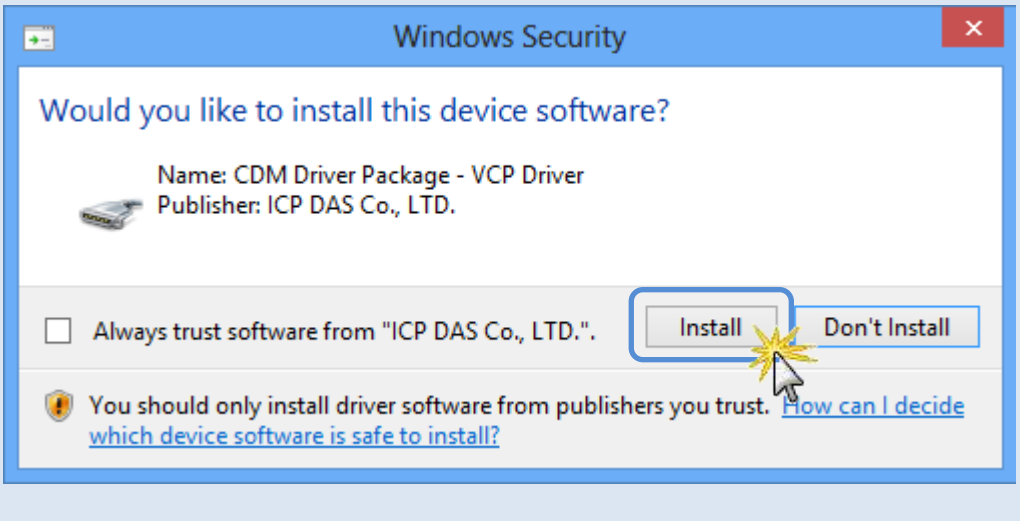
Step 5: A warning dialog box will be displayed asking you to confirm whether you want to install the device software. The type of warning that is displayed will depend on which operating system is being used. Refer to the following figures for details.

For Windows Vista/7/8 (32-/64-bit)

In the "**Windows Security**" dialog box, click the "**Install**" button to install the Bus/D2XX driver package.



In the "**Windows Security**" dialog box, click the "**Install**" button to install the VCP driver package.



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For Windows XP (32-/64-bit)

When the **"Software Installation"** warning dialog box is displayed, click the **"Continue Anyway"** button.



Note:
The "Software Installation" warning prompt will be several times. Click the "Continue Anyway" button each case.

Step 6: Click the **"Finish"** button to complete the installation.

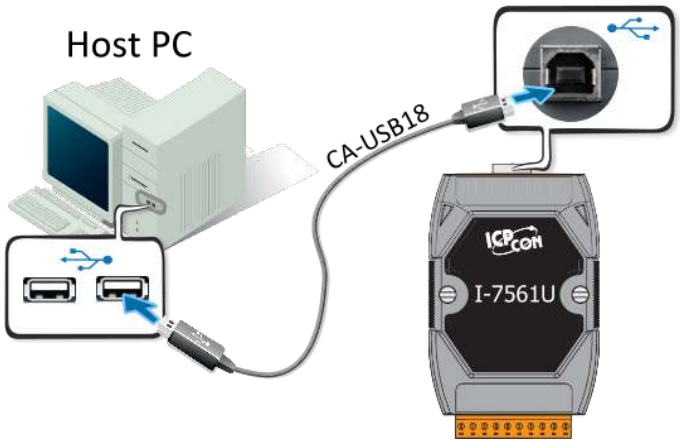


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3.3 PnP Driver Installation

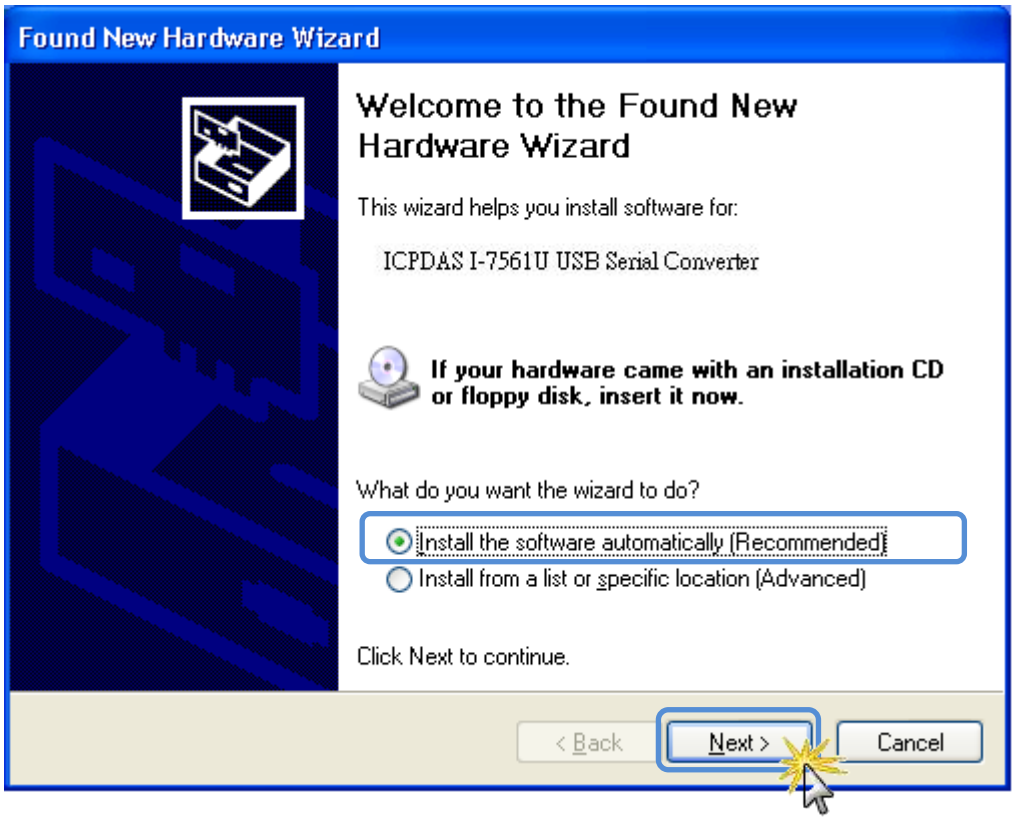
To install the PnP USB drivers follow the procedure described below:

Step 1: Locate the USB port on your computer and insert the USB cable for the I-756xU series module.



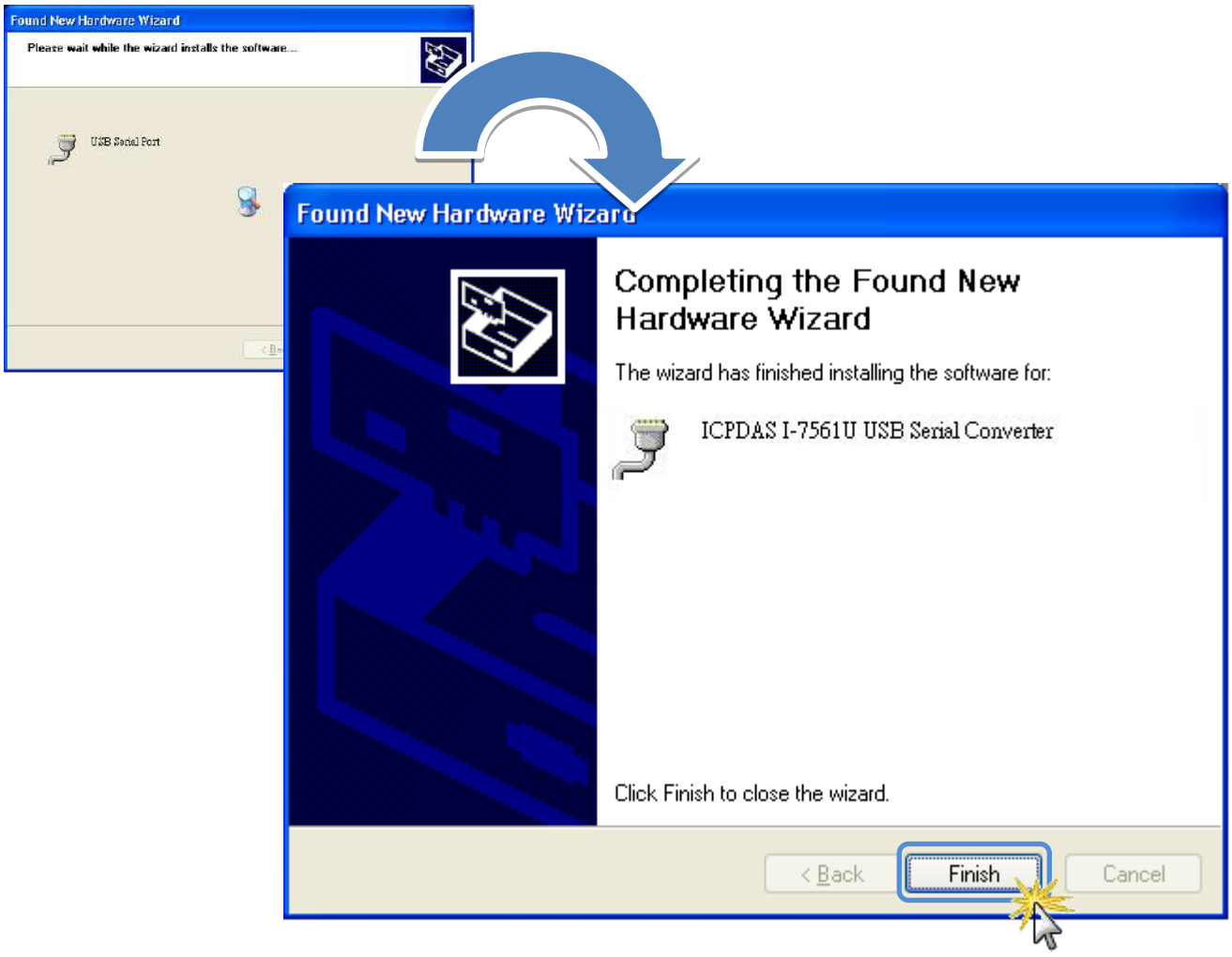
Step 2: Once connected, the operating system should detect the new hardware and then display the **"Found New Hardware Wizard"** to continue the PnP driver installation.

Step 3: Select the **"Install the software automatically [Recommended]"** option and then click the **"Next>"** button.



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Step 4: Once the installation is complete, click the **"Finish"** button.



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3.4 Verifying the Installation

Please open the Device Manager to verify the installation. Below are the steps for entering the Device Manager in each of the major versions of Windows. Refer to appropriate for your OS, continue to complete the following steps:

3.4.1 How do I get into Windows Device Manager?

■ Microsoft Windows 2000/XP users

Step 1: Select **"Start→ Settings→ Control Panel"** and double-click the **"System"** icon.

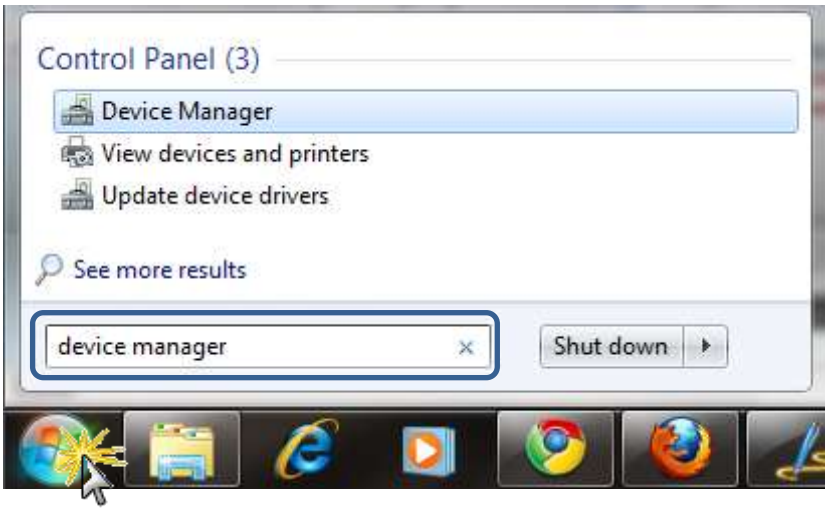
Step 2: Click the **"Hardware"** tab and then click the **"Device Manager"** button.



■ Microsoft Windows Vista/7 users

Step 1: Click on the **"Start"** button.

Step 2: In the **Start Search box type device manager** and then press enters.

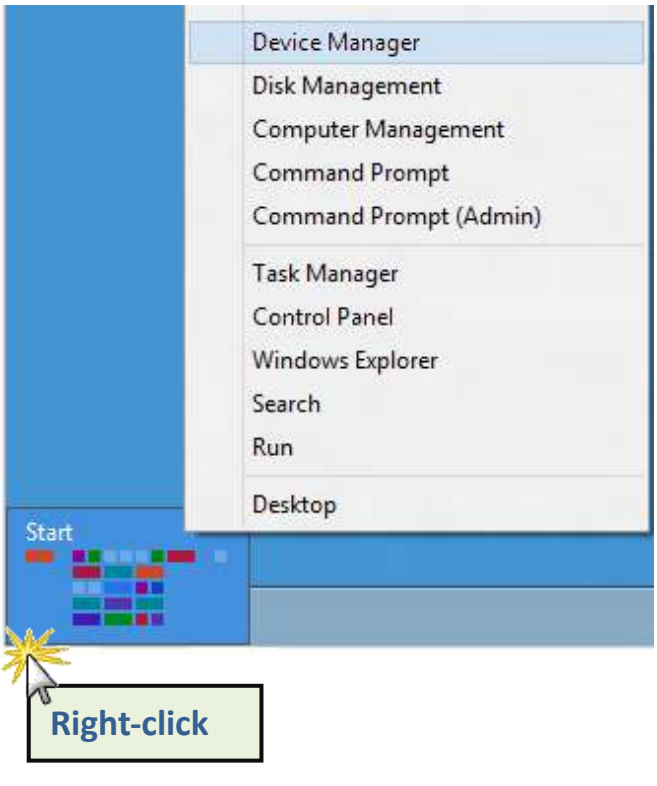


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■ Microsoft Windows 8 users

Step 1: To show the **Start screen icon** from the desktop view, simply hover your cursor over the **bottom-left corner** of your screen. (Or using keyboard shortcuts, click **[Windows Key] +[X]** to open the Start Menu.)

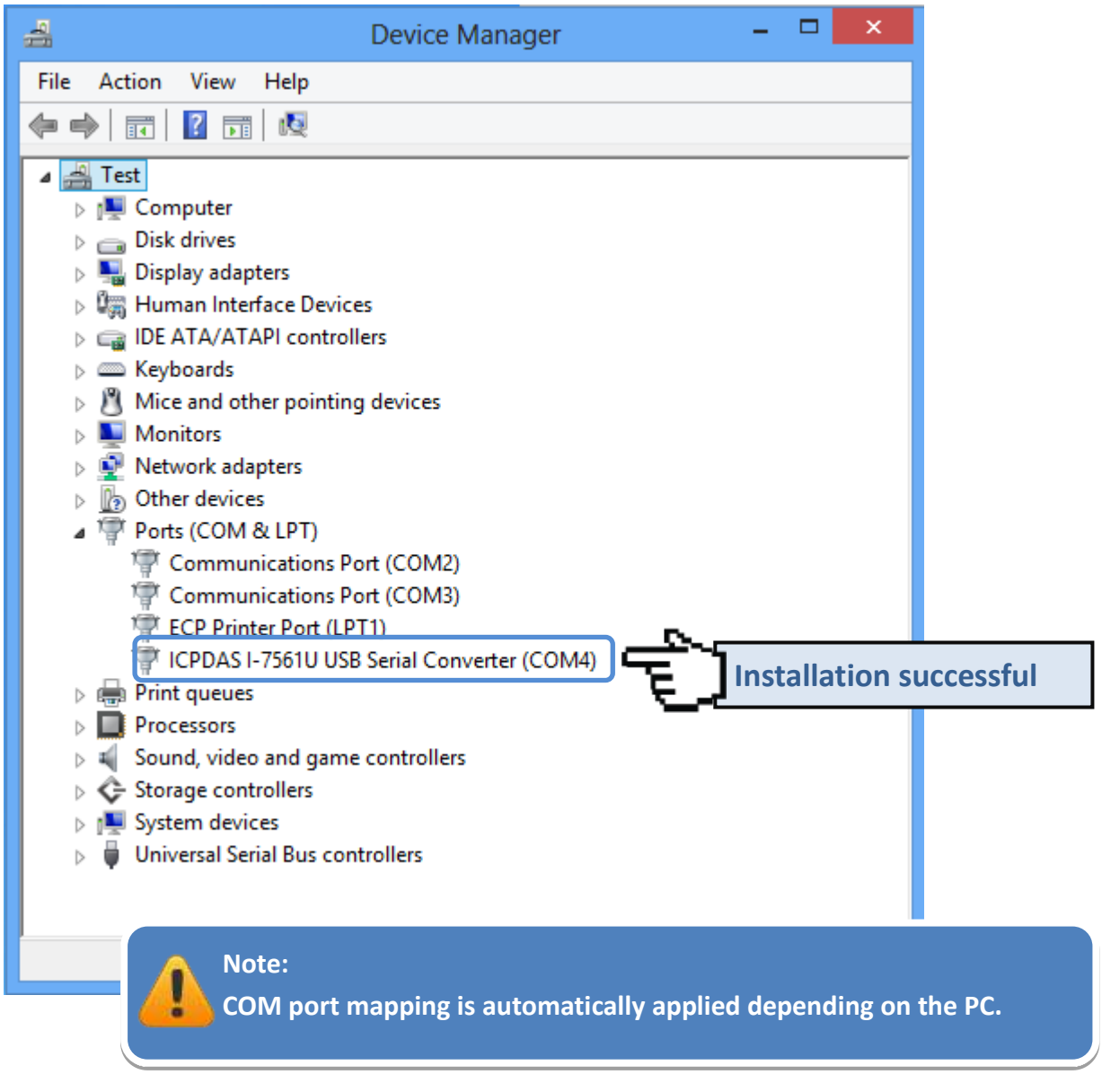
Step 2: **Right-click** on the Start screen icon then click on **"Device Manager"**.



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3.4.2 Check that the Configuration of the COM Port

Step 3: Expand the **"Ports (COM & LPT)"** section, and verify that the COM port for I-756xU USB serial converter are listed correctly.



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3.5 Uninstalling the Device Driver

The ICP DAS I-756xU series device driver includes an uninstallation utility that allows you remove the software from your computer. To uninstall the software, follow the procedure described below:

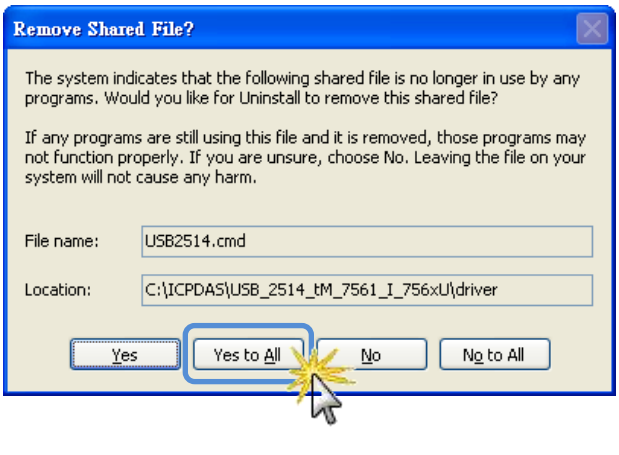
Step 1: Double click the **unins000.exe** uninstaller application, which can be found in the following folder: **C:\ICPDAS\USB_2514_tM_7561_I_756xU**.



Step 2: A dialog box will be displayed asking you to confirm that you want to remove the utility program. Click the **"Yes"** button to continue.



Step 3: The **"Remove Shared File?"** dialog box will then be displayed to confirm whether you want to remove any shared files. Click the **"Yes to All"** button to continue.



Step 4: After the uninstallation process is complete, a dialog box will be displayed to you that the driver was successfully removed. Click the **"OK"** button to finish the uninstallation process.



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Chapter 4

Manual Testing



This chapter provides detailed information about the "Self-Test" process, which is used to confirm that the I-756xU series module is operating correctly. Before beginning the "Self-Test" process, the driver installation must be completed. For detailed information regarding driver installation, refer to Chapter 3.

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4.1 Self-Test Wiring

4.1.1 I-7560U (RS-232 Wiring)

To test the wiring for the I-7560U module, follow the procedure described below:

Step 1: Locate the USB port on your computer and insert the USB cable for the I-7560U module.

Step 2: Use the DN-09-2 daughterboard (optional) to connect to the I-7560U module.

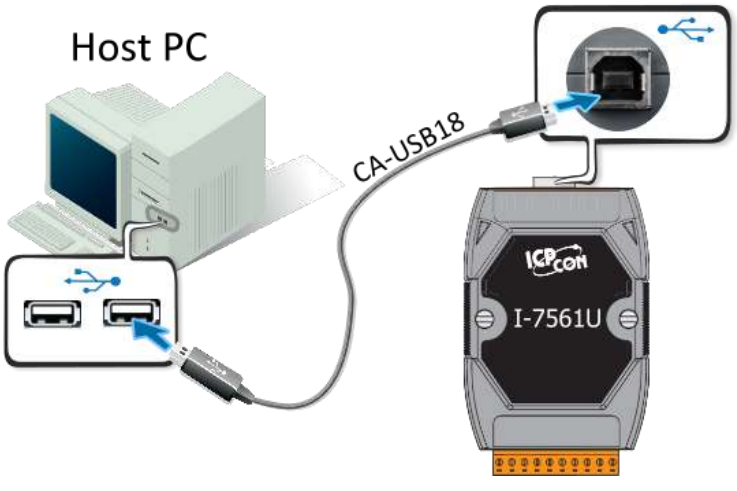
Step 3: Short the **RxD and TxD pins (Pin 02 <-> Pin 03)**. For detailed information regarding RS-232 wiring, refer to Sec. 2.5 "Wiring Notes".



4.1.2 I-7561U (RS-232 Wiring)

To test the wiring for the I-7561U module, follow the procedure described below:

Step 1: Locate the USB port on your computer and insert the USB cable for the I-7561U module.



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Step 2: Short the **RxD and TxD pins (Pin 07 <-> Pin 08)**. For detailed information regarding RS-232/422/485 wiring, refer to Sec. 2.5 “Wiring Notes”.

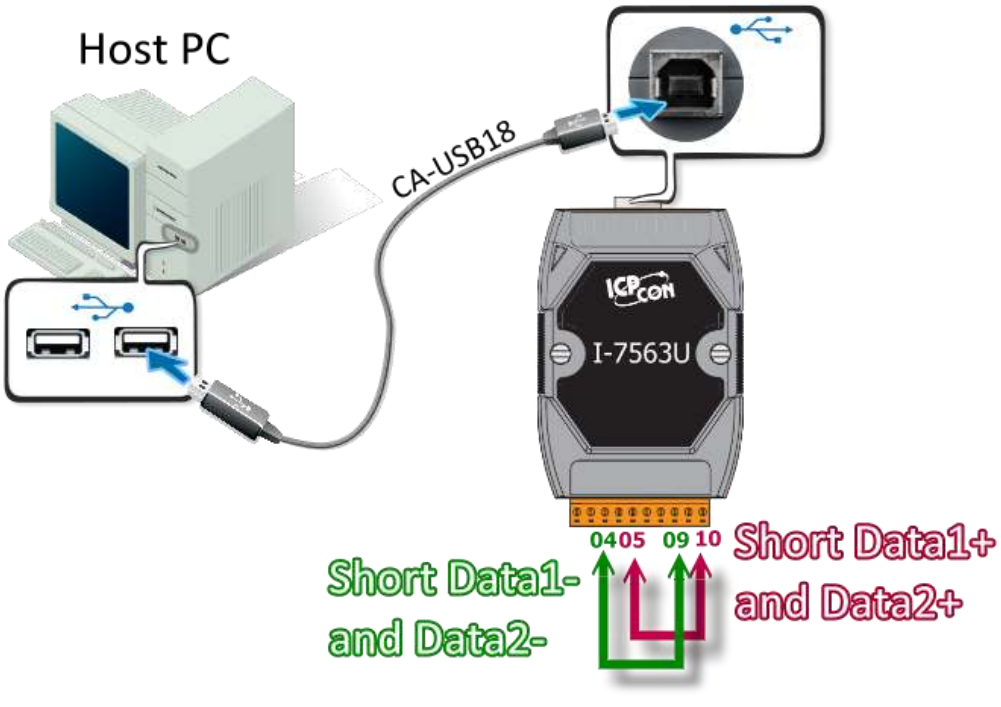


4.1.3 I-7563U (RS-485 Wiring)

To test the wiring for the I-7563U module, follow the procedure described below:

Step 1: Locate the USB port on your computer and insert the USB cable for the I-7563U module.

Step 2: Short the **Data1+ and Data2+ pins**, and **short the Data1- and Data2- pins (Pin 10 <-> Pin 05 and Pin 09 <-> Pin04).** For detailed information regarding RS-485 wiring, refer to Sec. 2.5 “Wiring Notes”.



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4.2 Testing the I-756xU Series Modules

To test the functions of the I-756xU module, follow the procedure described below:

Step 1: Execute the **Test2COM.exe** utility, which can be downloaded from:





ftp://ftp.icpdas.com/pub/cd/iocard/pci/napdos/multiport/utility/

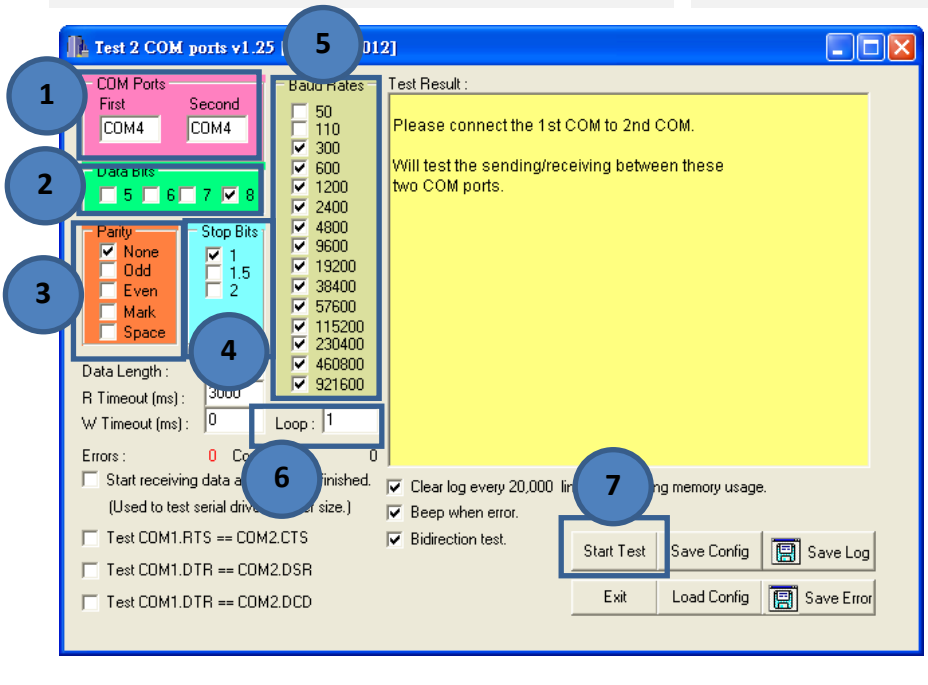


http://ftp.icpdas.com/pub/cd/iocard/pci/napdos/multiport/utility/

Step 2: Set the appropriate COM Ports, Bard Rate and Data Format, as indicated in the diagram below:

4. **COM Ports: Enter COM4 in both fields**
5. **Data Bits: 8**
6. **Parity: None**
7. **Stop Bits: 1**

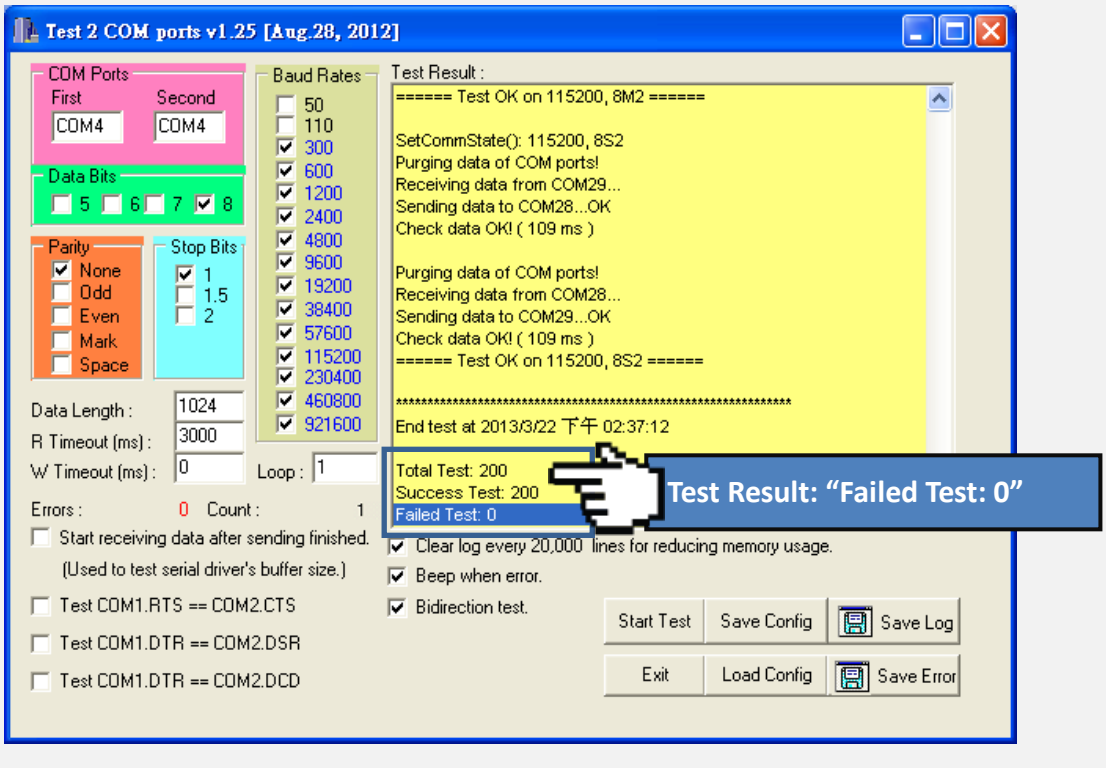
1. **Baud Rates: Check all values from 300 to 921600**
2. **Loop: 1**
3. **Click the "Start Test" button to begin the test.**



Note: COM port mapping is applied automatically depending on the PC. Confirm COM Port number for I-756xU series module in the Device Manager (see Sec. 3.4) and then use this value to test the COM Port in the Test2COM Utility.

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Step 3: Once the test is complete, verify the test results.



Step 4: If the result indicates that the test was successful, the expanded COM port is ready-to-use.



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