RMV-531 User's manual

Warranty

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

Warning

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Table of Contents

1. Introduction

RMV-531 is an intelligent multiport serial to 2G/3G gateway for industry M2M applications. It is designed for linking RS-232/485 devices to a GPRS/WCDMA network. The user-friendly Axiom Driver/Utility and VxServer allow users to easily turn the built-in COM ports of the RMV-531 into standard COM ports on a PC. By virtue of its protocol independence, a small-core OS and high flexibility, the RMV-531 is able to meet the demands of every network-enabled application. In addition, the RMV-531 also supports GPRS/WCDMA network automatic re-connection function when the RMV-531 is broke the GPRS/WCDMA network by something happened. M2M solution will improve the service quality and reduce operating costs. Many application areas can be improved by using RMV-531.
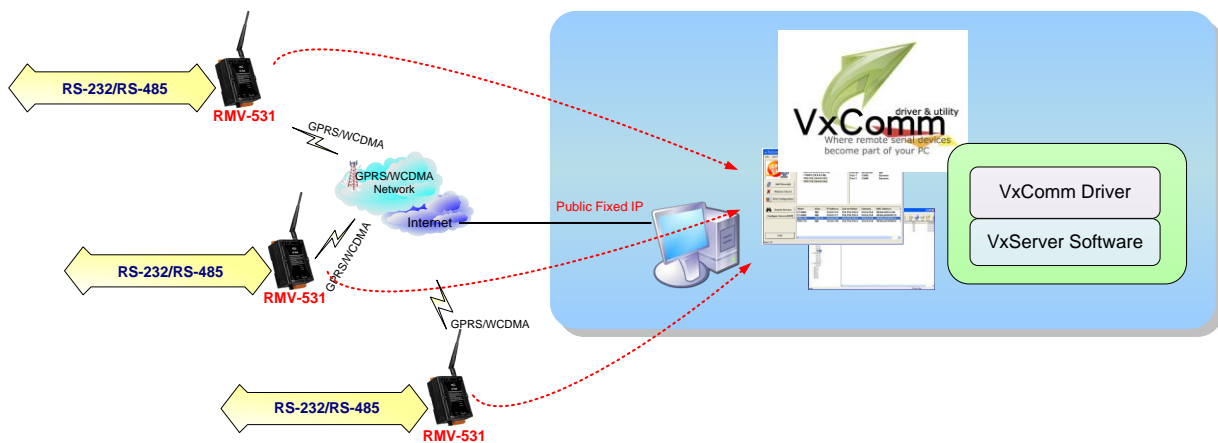

1.1 Features

- Support GPRS/WCDMA network automatic re-connection function
- Support remote maintenance PLC devices that used serial communication as Siemens S7-200 series, Siemens S7-300 series, WP-8000, LP-8000, iP-8000 and XP-8000
- Support WCDMA 850/900/1900/2100 MHz frequency
- Support GPRS 850/900/1800/1900 MHz frequency
- Virtual COM Extend Real COM Ports via GPRS/WCDMA
- Remote Configuration by Virtual COM
- 1 x RS-232 port and 1 x RS-485 port for Virtual COM. 1 x Utility port for Configuration
- Built-in Watch-dog Function
- Power Reverse Polarity Protection
- Power supply +10 VDC ~ +30 V_{DC}
- DIN-Rail mountable

1.2 Applications

➢ PLC remote maintenance application
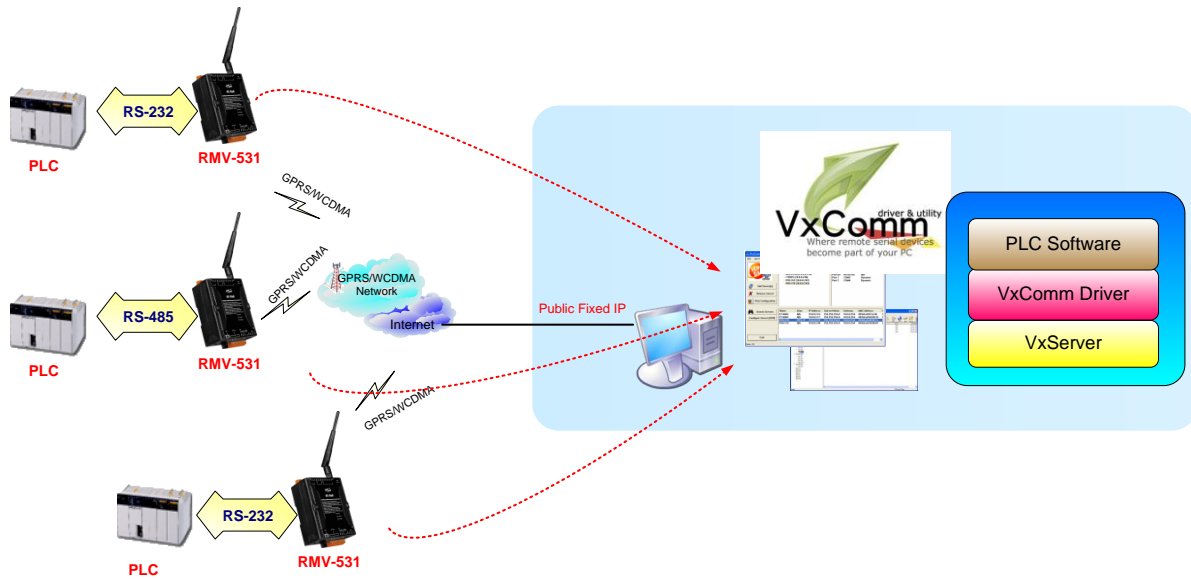

➢ Remote serial devices monitor application
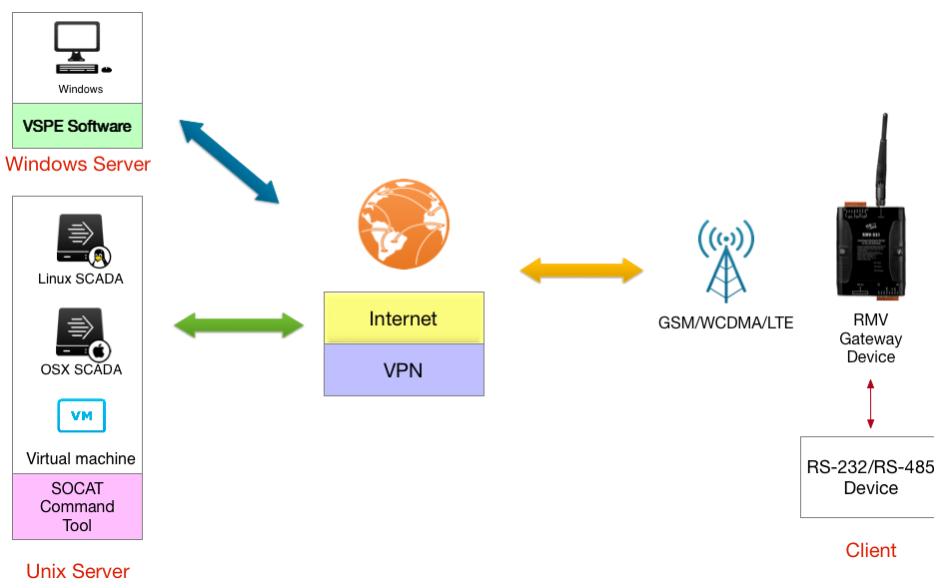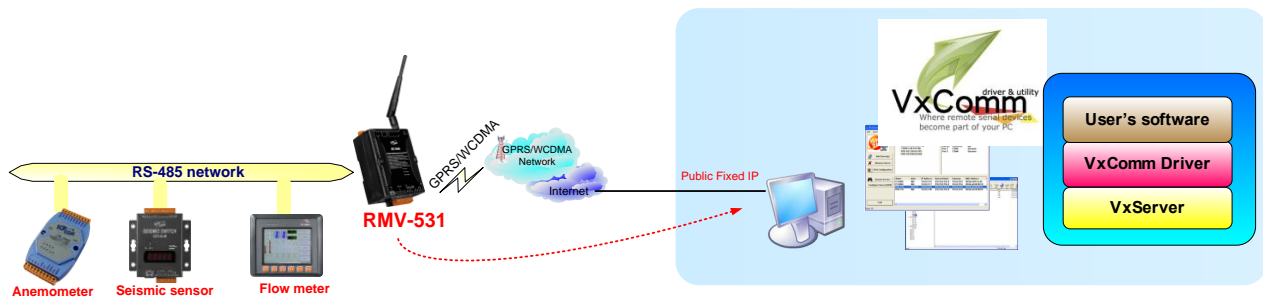
2. Hardware

2.1 Specifications

System	
CPU	ARM Microprocessor
SRAM	32 Kbytes
Flash Memory	512 Kbytes
WDT(watchdog)	Yes
2G system	
Frequency Band	850/900/1800/1900 MHz
Power class	Class 4 (2 W @ 850/900 MHz)
	Class 1 (1 W @ 1800/1900 MHz)
3G system	
Frequency Band	850/900/1900/2100 MHz
Power class	Class 3(250mW @ WCDMA/HSPA)
Serial ports	
Utility port	RS-232: TxD, RxD, GND (use for device configuration and debug)
COM1	RS-232: TxD, RxD, GND (use for communication with other devices)
COM2	RS-485: D+, D- (use for communication with other devices)
Baud Rate	2400、4800、9600、19200、38400、57600 and 115200 bps
Power	
Protection	Reverse polarity protection
Frame Ground Protection	ESD, Surge, EFT, Hi-Pot
Required Supply Voltage	+10 VDC ~ +30 VDC
Mechanical	
Casing	Plastic
Flammability	UL 94V-0 materials
Dimensions (W x L x H)	91 mm x 132 mm x 52 mm
Installation	DIN-Rail
Environmental	
Operating Temperature	-25 ℃ ~ +75 ℃
Storage Temperature	-30 ℃ ~ +80 ℃
Ambient Relative Humidity	5 ~ 95% RH, non-condensing

2.2 Appearance and Pin Assignments
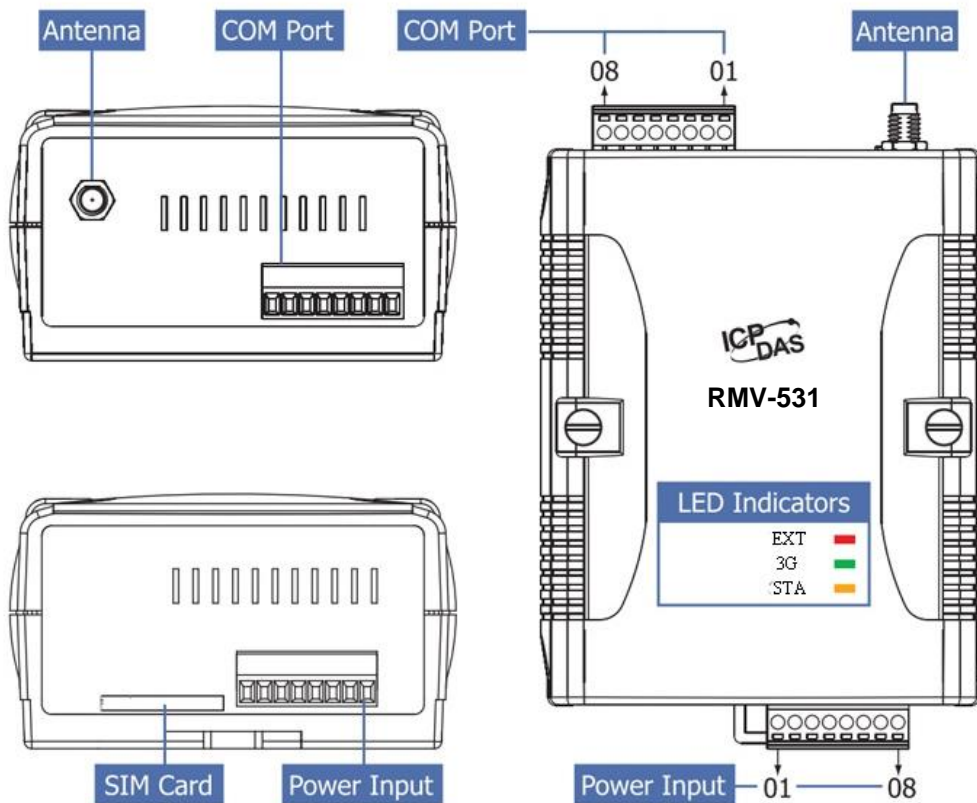
Power Input		
Terminal No.		Pin Assignment
N/A	01	N/A
	02	N/A
	03	N/A
Initial.GND	04	Init.GND
Initial	05	Init
Power Input: 10 ~ 30 V_{DC}	06	DC.+VS
	07	DC.GND
Frame Ground	08	F.G.

COM Port		
Terminal No.		Pin Assignment
COM2 RS-485	01	D-
	02	D+
COM1 RS-232	03	TxD1
	04	RxD1
	05	GND
N/A	06	N/A
Utility Port RS-232	07	TxD
	08	RxD

2.3 Dimensions
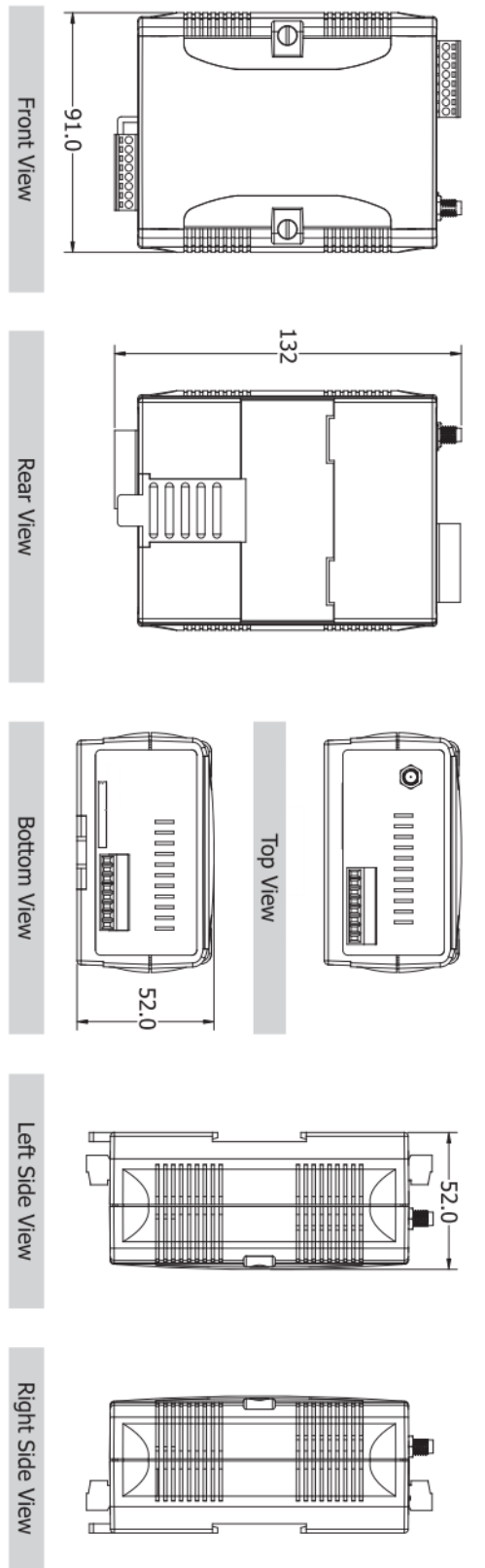
2.4 LED Indicators

There are three LED indicators to help users to judge the various conditions in the RMV-531. The description is as the following:

(1) EXT (Red): The External Power LED indicated status whether the power is supplied or not. The description is as the following:

| The Power is active	The Power is not active
ON	OFF

(2) 3G : The modem LED(Green) can indicate the status

Modem normal	Modem fail
Blanking pre 3 sec (2G network)	OFF
Twinkling twice per 3 sec (3G network)	

(3) STA (Orange): The system LED indicated whether the RMV-531 is normal of failed

First Use	No connected	Connected	Wrong PIN/PUK code
OFF	Blinking (0.5 sec)	Blinking (1 sec)	Blinking (50 ms)

2.5 Install the antenna and SIM Card

(1) Antenna installation
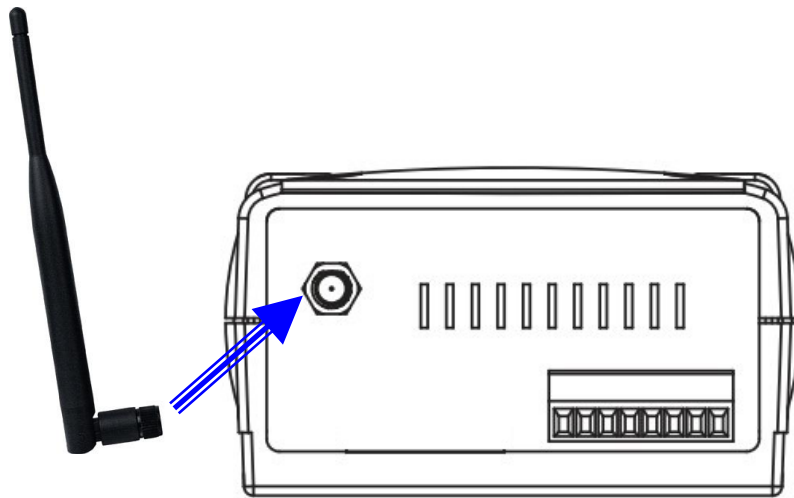
(2) SIM card installation
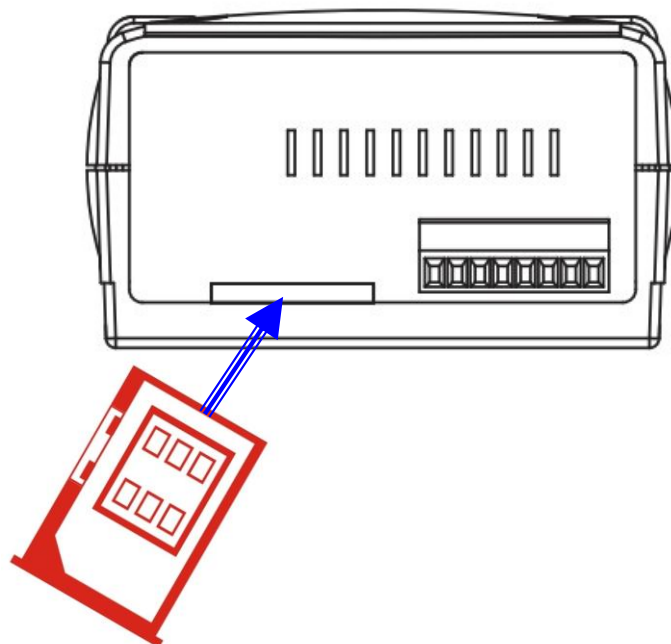
3. Installing the RMV-531 Utility

3.1 Installing .NET Framework

It needs the runtime environment with .NET Framework 2.0 or above to execute the RMV-531 Utility in the PC. If there has .NET Framework 2.0 or above in the PC, the section 3.1 can be omitted.
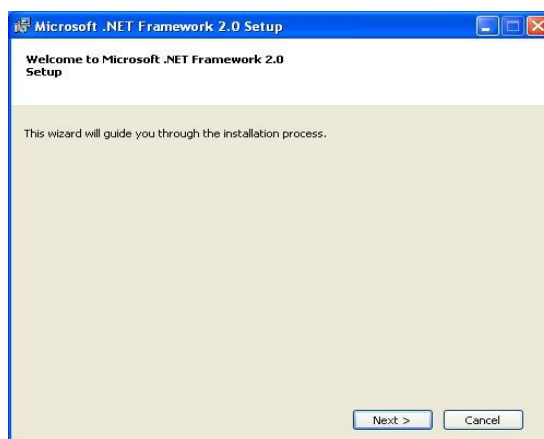
◆ Microsoft .Net Framework Version 2.0:

http://www.microsoft.com/downloads/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5&DisplayLang=en

◆ Microsoft .Net Framework Version 3.5:

http://www.microsoft.com/downloads/details.aspx?familyid=333325FD-AE52-4E35-B531-508D977D32A6&displaylang=en

(1) Press "Next" to the next step.

(2) Select the "I accept the terms of the License Agreement" and "Install" to the next step.
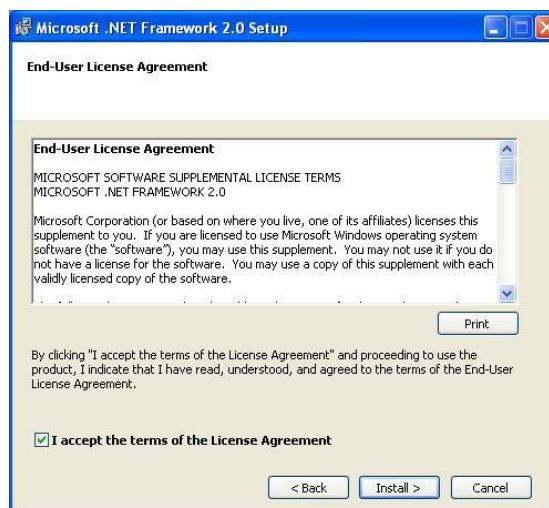
(3) The installation process would be going
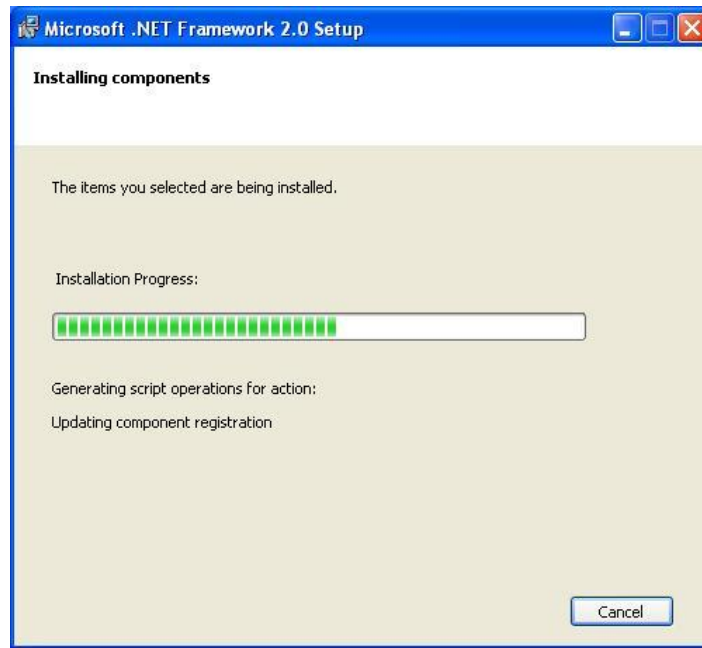
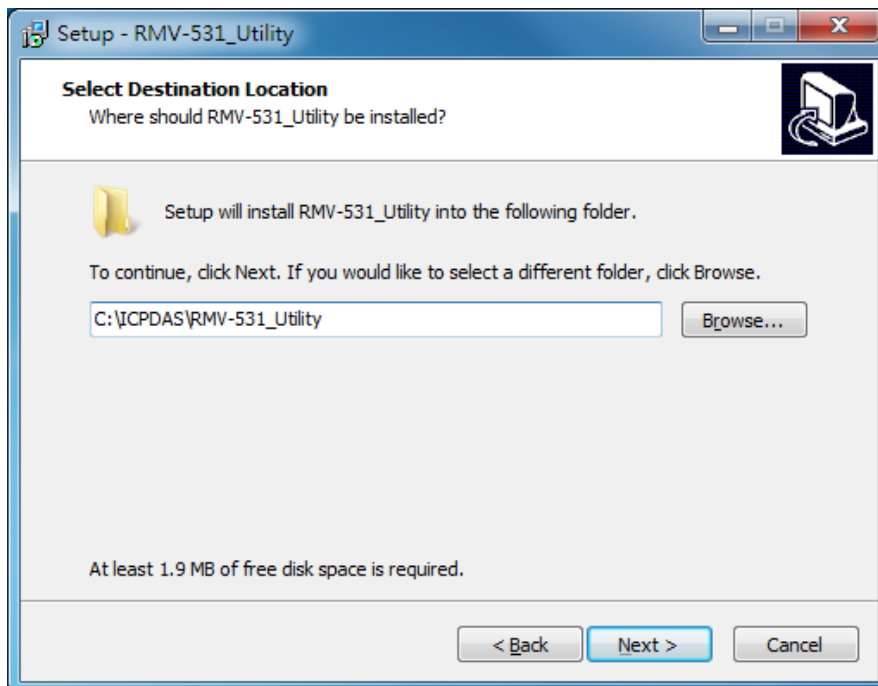(4) After finishing the installation, press "Finish" to exit the program.
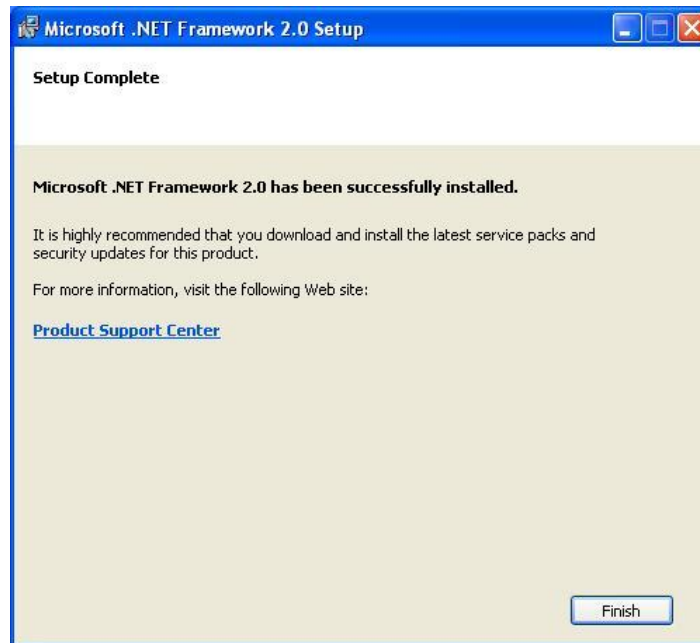
3.2 Installing the RMV-531 Utility

Plug in the shipment CD into the PC, Execute RMV-531_Utility_Setup_Vx.xx.exe. The installation figure is as follows:
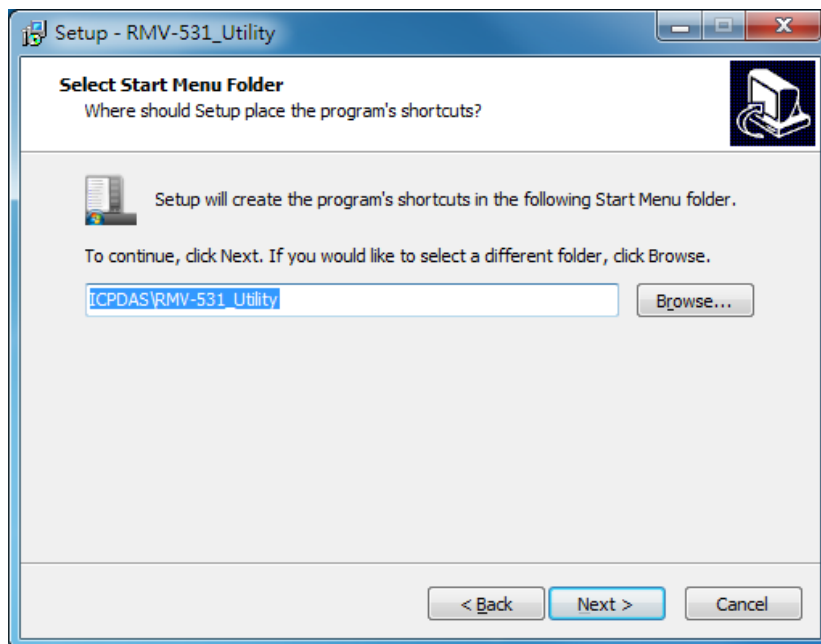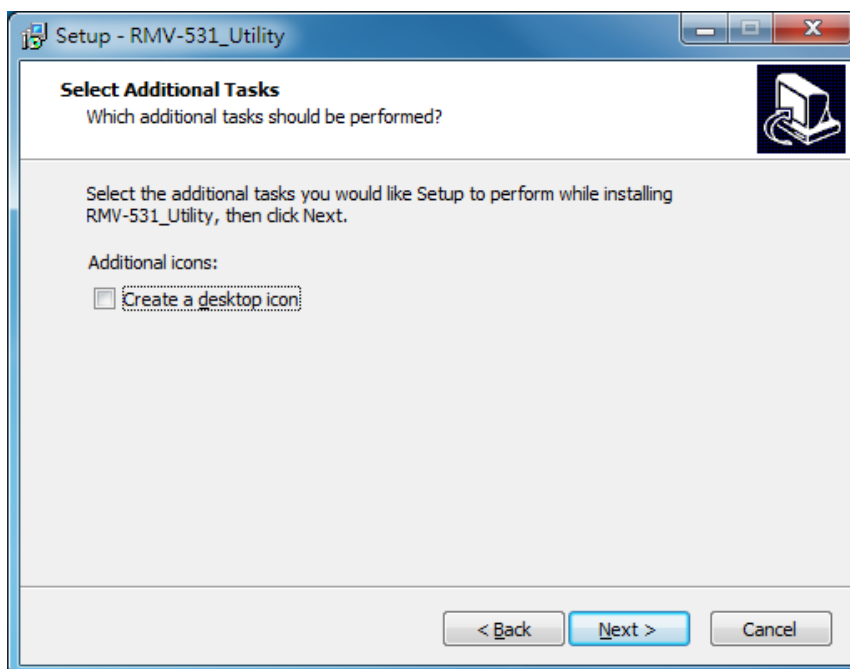
(1) Press "Next" to start the installation procedure.
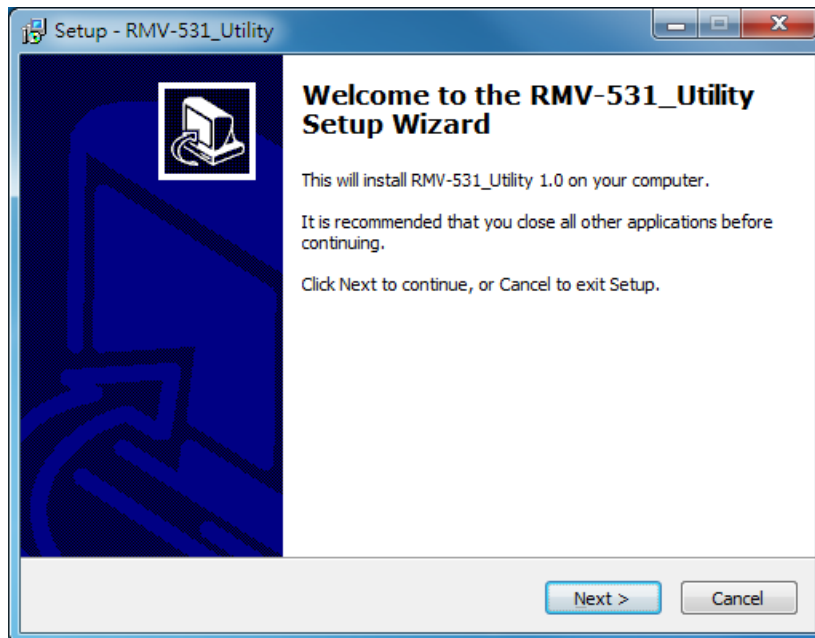
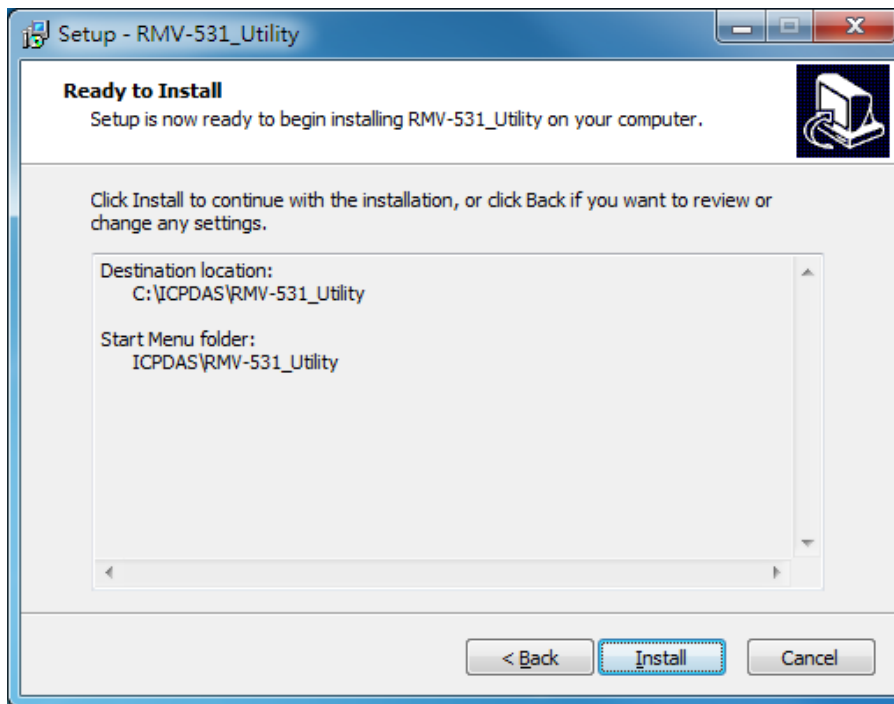(2) Select the installation path. The default path is " C:\ICPDAS\RMV-531_Utility". Press "Next" to the next step.

(3) Select the "Start Menu Folder", Press "Next" to the next step.

(4) Select additional tasks. Press "Next" to the next step

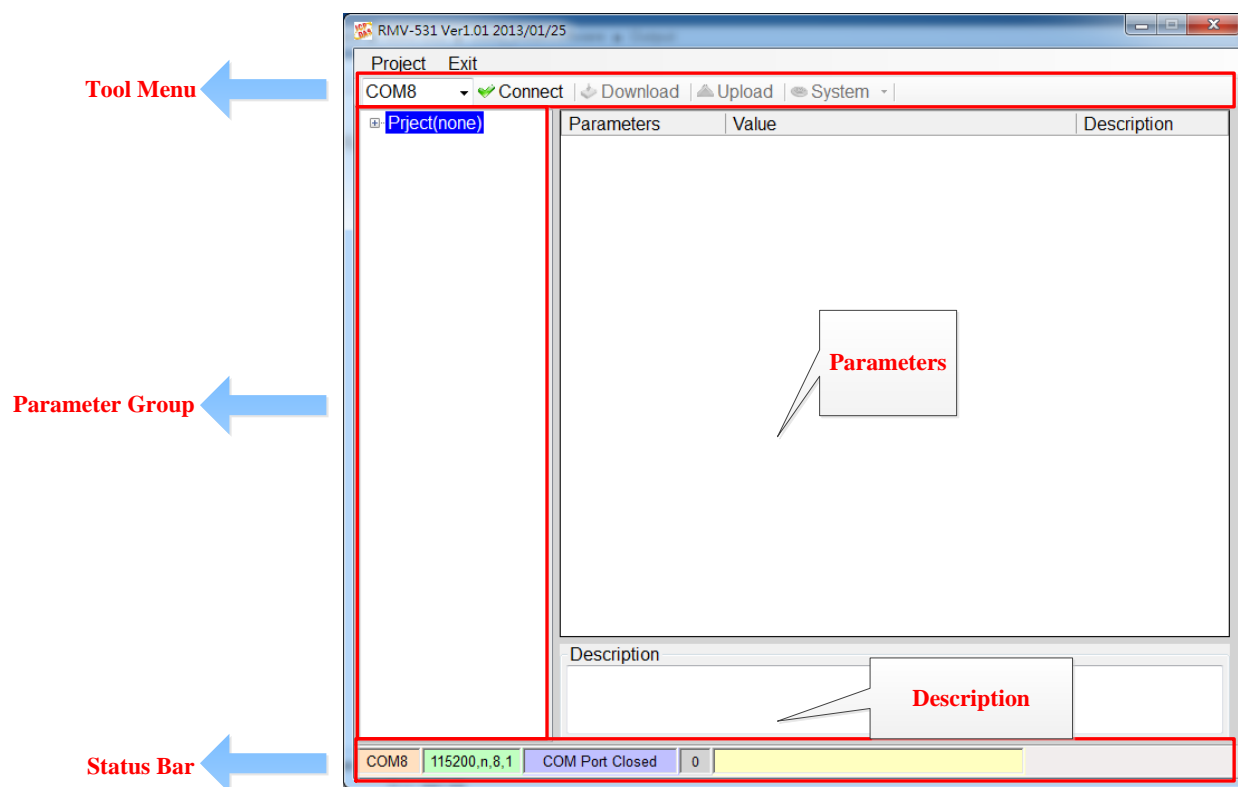(5) Click "Install" to start to install the RMV-531 Utility

(6) Click "Finish" to finish installing RMV-531 Utility
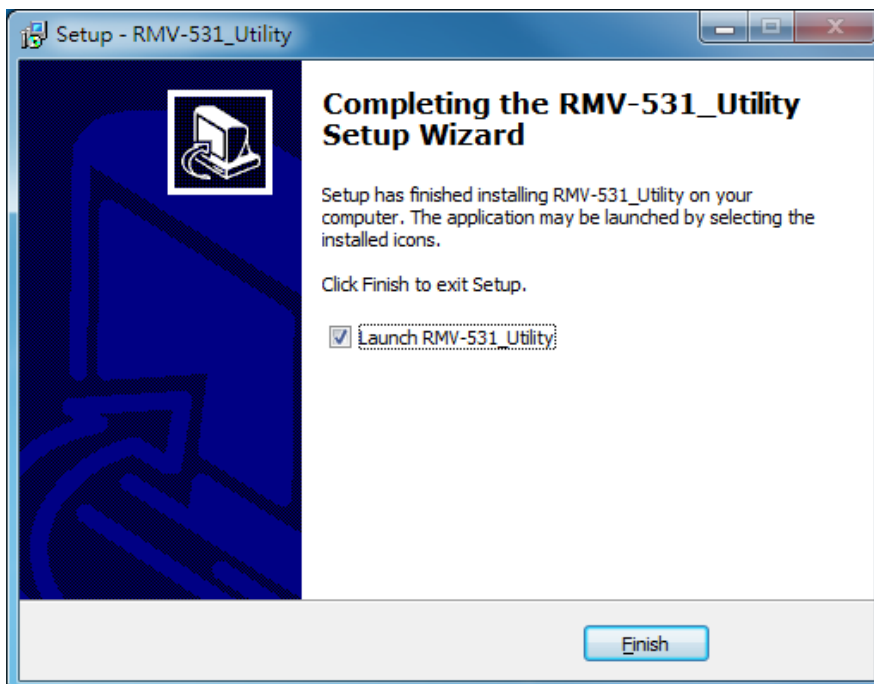
4. The RMV-531 Utility operation description

4.1 Main Menu

The main menu of RMV-531 Utility includes the following sections:

(1) Tool Menu:

These tools include all the function operation of the RMV-531 Utility. The description is as the following:

◆ Project: The parameters of the RMV-531 can be saved as the project file. The operation functions include "New", "Open", "Save", "Save as…", and etc...

◆ Exit: Exit the RMV-531 Utility.

◆ COM Port: The COM Port number of the host PC connecting to the RMV-531.

◆ Connect: Connecting to the RMV-531.

◆ Download: Downloading the settings to the RMV-531 device.

◆ Upload: Uploading the settings from the RMV-531 device to RMV-531 Utility.

◆ System: Providing some system operations including "Signal Quality"、"Reboot RMV-531"、"Recover Default Settings"、"Firmware Version"、"Input PIN/PUK".

(2) Parameter groups:

There are four parameter groups in the RMV-531 Utility including: "System" and "COM Port".

(3) Parameters:

Show or set the parameters.

(4) Description:

A particular or minute account.

(5) Status Bar:

This bar can show the operation procedure of the RMV-531 Utility. From left to right, they are:

1. The used com port number.
2. Communication configuration of the COM Port.
3. The current status of the COM port.
4. The address of the RMV-531.
5. The result for operating the functions.

4.2 File Menu

This tool provides users to operate the project file. It can save the RMV-531 configuration as the file or upload the settings from the file. It is convenient to manage a lot of RMV-531s. The explanation is as the following:
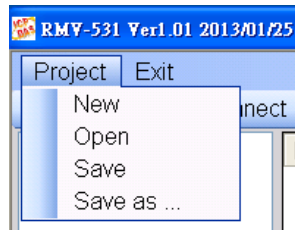
◆ New: Opening a new file.
◆ Open: Opening a exited file.
◆ Save: Saving the file. If the parameters are changed or save the uploading parameters from the RMV-531, you can use this function to save these configurations.
◆ Save as: Saving the file as another name.

4.3 Connecting to the RMV-531

For connecting to the RMV-531, you can follow the steps below.

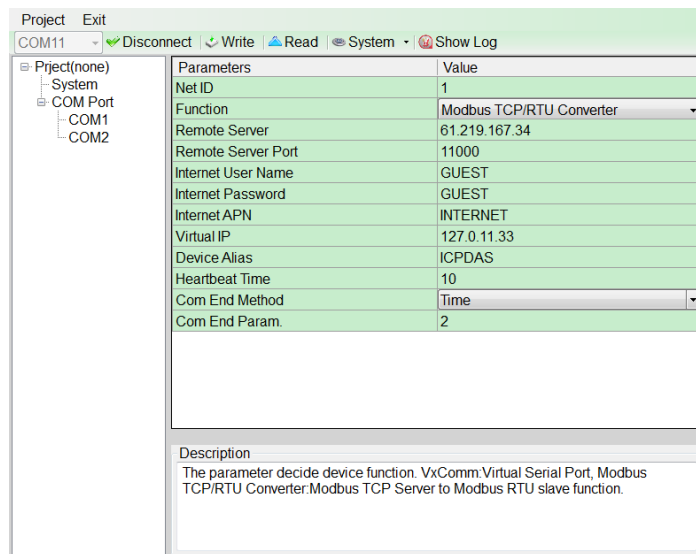I.　Select the COM port of the host PC and connect to the Utility port of RMV-531.
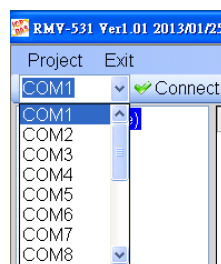
II. Press "Connect" to connect to the RMV-531. If the connection is failed, check the COM port settings and wiring.
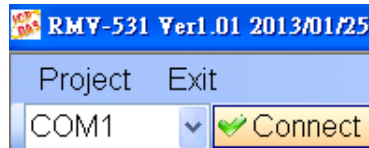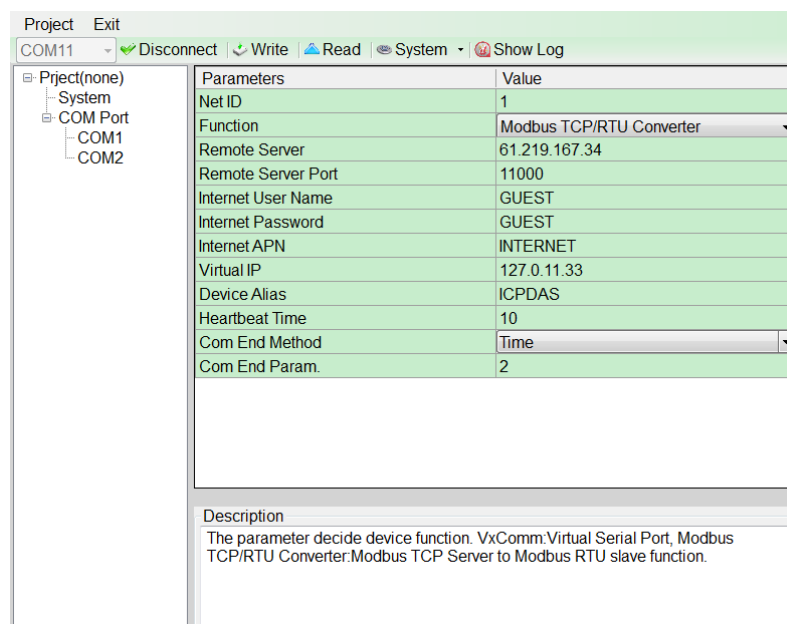

4.4 Parameters

The parameters would be shown in the right of the windows if click the tree field in the left side of the RMV-531 Utility. Press the parameters' "Value" filed can change these parameters as the following figure.

1.1.1 System

There are 12 items in the system field below.

Parameters	Description
Net ID	RMV-531 ID. Read only
Function	VxComm function or Modbus TCP to RTU function or VSPE func.
Remote Server	The remote VxServer/VSPE server's IP or domain name
Remote Server Port	The remote VxServer/VSPE server's Port
Internet User name	Internet user name
Internet password	Internet password
Internet APN	Internet APN (access point name)
Virtual IP	Virtual IP. Range: 127.0.0.1~127.255.255.254，This parameter can't be the same with other device.
Module Alias	Module Alias. (max. 7 character)
Heartbeat Time	Heartbeat time. Range: 10 sec. ~ 65535 sec.
Com End Method	

|	Com End Method	Com End Param.	Remark
Com End Param.	Time: Fixed Time. It is as complete a data when no data came at a fixed time	2 ms~ 65535 ms	The RMV-531 will transmit a data when there is a data more than 1000 bytes.
	Length: Fixed Length，It is as complete a data when the length of a data more than fixed length	1 ~ 1000	
	2: Fixed end byte. It is as complete a data when receives the fixed end byte. Like "CR" (0x0d)	0 ~ 255	

4.4.2 COM Port

The parameters of COM Port (Read only)

| Parameters	Description
Port	COM Port name
Data Bit	7 or 8 bits
Stop Bit	1 or 2 bits
Parity Bit	None, Even, Odd
Baudrate	2400、4800、9600、19200、38400、57600 and 115200 bps

4.5 Download/Upload Parameters

I. Download parameters

As the configuration is finishing, the function can download the parameters to the RMV-531 by clicking "Download" as the following figure.
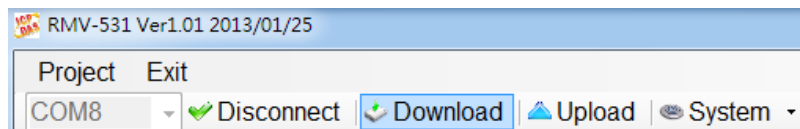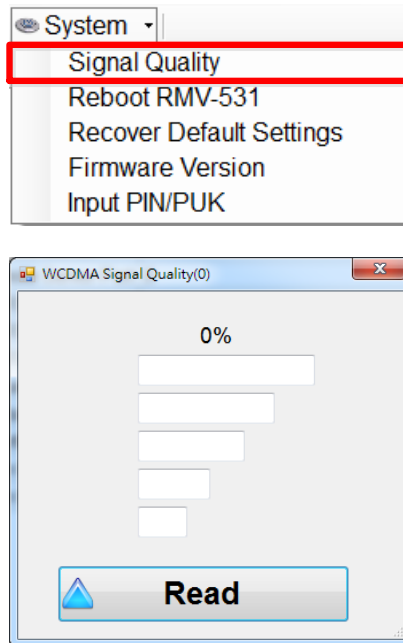

II. Upload Parameters

"Uploading" button can upload the parameters from the RMV-531 as the following figure.
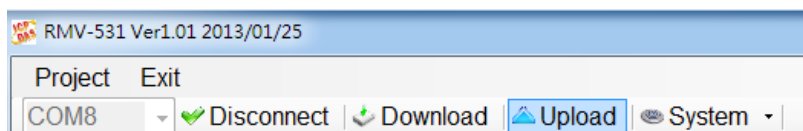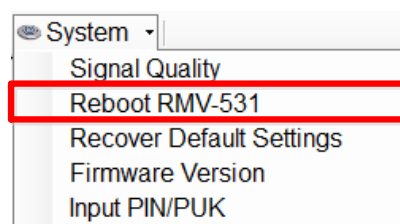
4.6 System

4.6.1 Signal Quality

Click "System->Signal Quality" can show the signal quality windows to know the GSM signal strength.

◆ Field Description: The strength is divided into 5 sections shown in percentage.
◆ Operation: Read：Read the GSMWCDMA signal strength from the RMV-531.

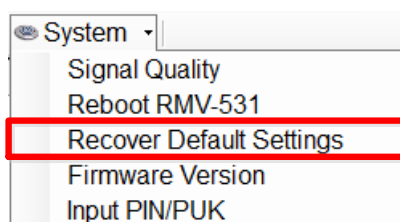### 4.6.2 Reboot the RMV-531

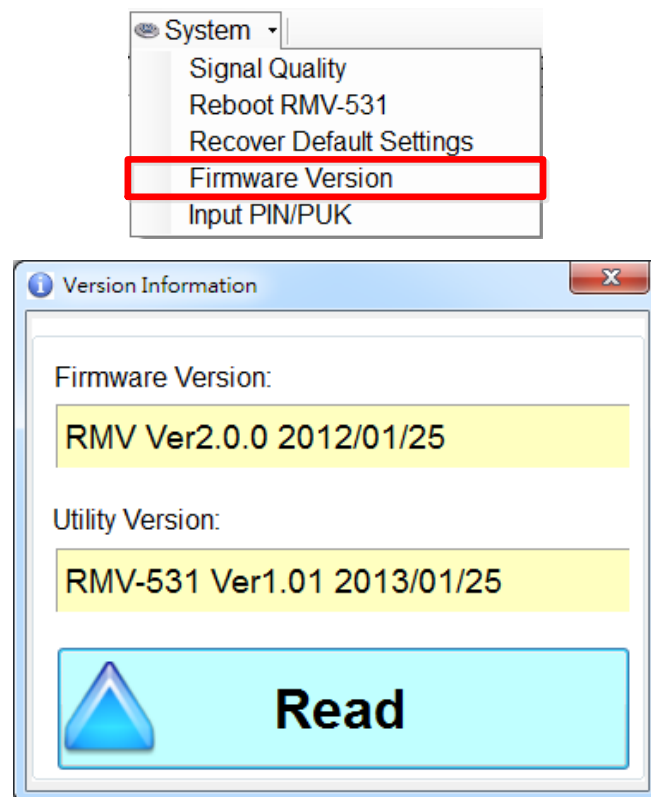Clicking "System->Reboot RMV-531" button can reset the RMV-531 as follows.

4.6.3 Recover to the Factory Settings

It can recover the RMV-531 to the default settings by clicking "System->Recover Default Settings".

4.6.4 Inquiring Firmware Version

Press "System->Firmware Version" in tool menu, and the window would show the versions of the RMV-531 Utility and firmware.
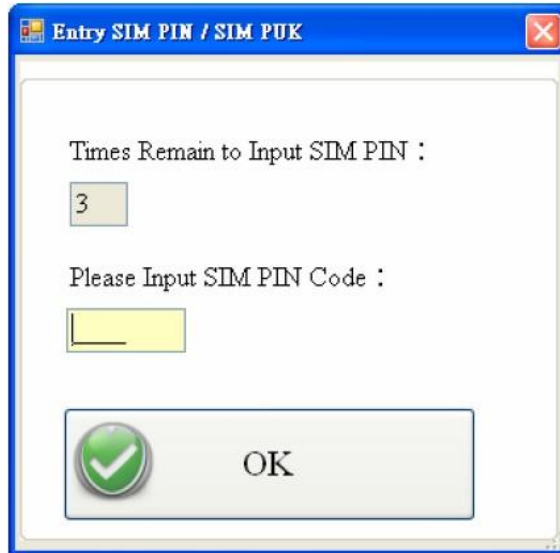

4.6.5 Inputting the PIN/PUK Code

When the RMV-531 starts and the STA LED is blanking per 50 ms, it is needed to input the PIN or PUK code in the RMV-531. In this condition, click "System->Input PIN/PUK" button to set the PIN/PUK code.
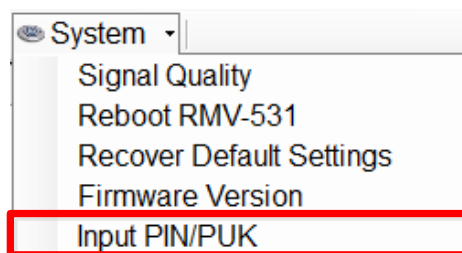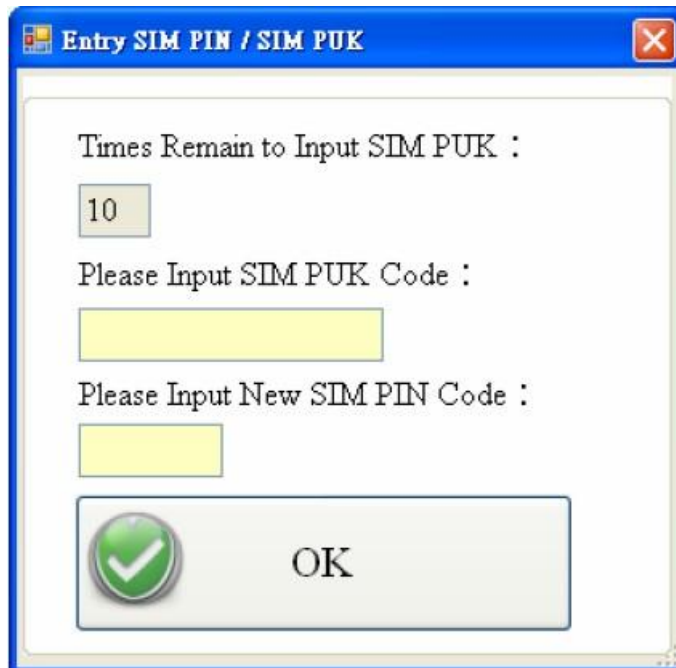

(1) Asking for inputting PIN code:

If the PIN code is effective, the "Enter SIM PIN/SIM PUK" window would pop-up as follows. If the number of times for inputting the wrong PIN code is more than the allowed number, the PIN code would be ineffective. And the "PUK code" window would pop up.
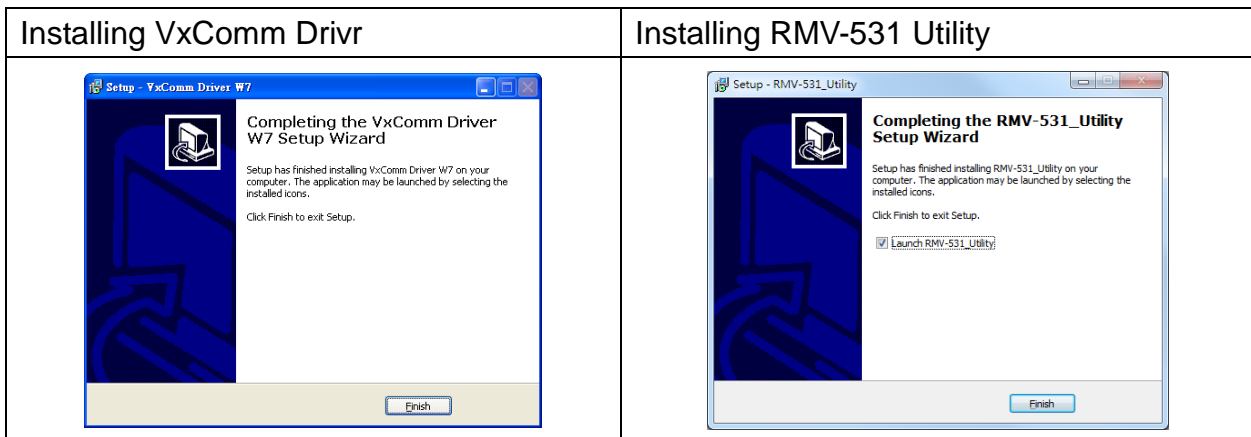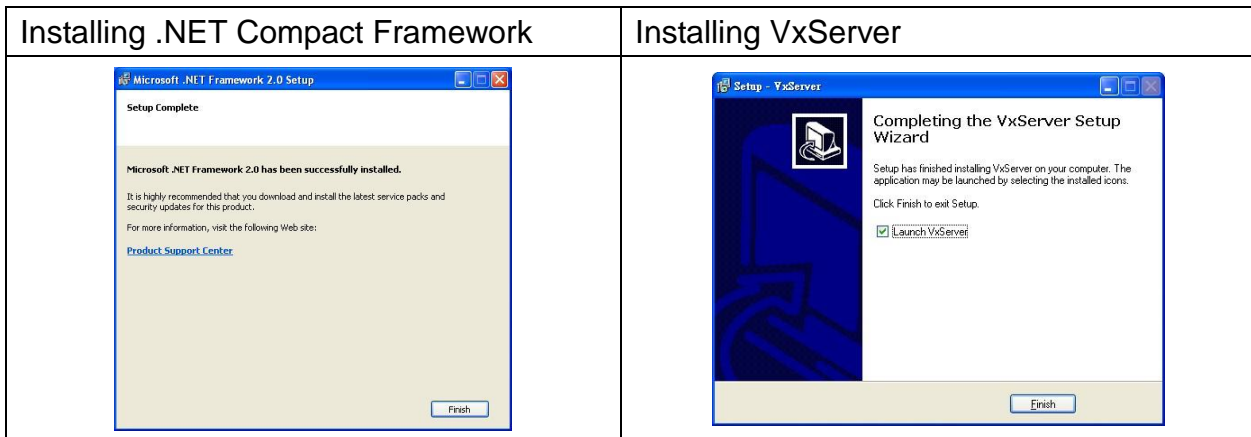
(2) Asking for inputting PUK code

If the PIN code is ineffective, the "PUK code" window would pop-up as follows. As the number of times for inputting the wrong PUK code is more than allowed number, the SIM card would be ineffective forever. Therefore, it is important to input the correct PUK code.

5. Virtual com to access remote the parameters

5.1 The necessary software installed

Installing .NET Compact Framework	Installing VxServer

Installing VxComm Drivr	Installing RMV-531 Utility

◆ Download Microsoft .Net Framework Version 2.0:

http://www.microsoft.com/downloads/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5&DisplayLang=en
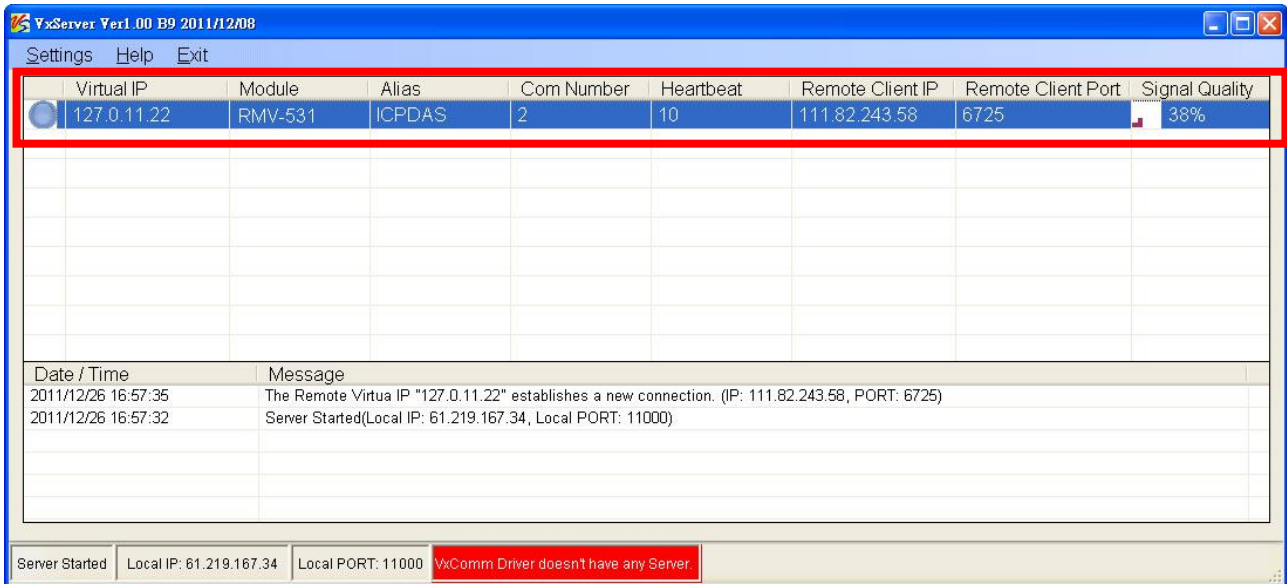
◆ Download VxServer software:

http://m2m.icpdas.com/VxServer.html

◆ Download VxComm Driver software:

http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/vxcomm_driver/2k/
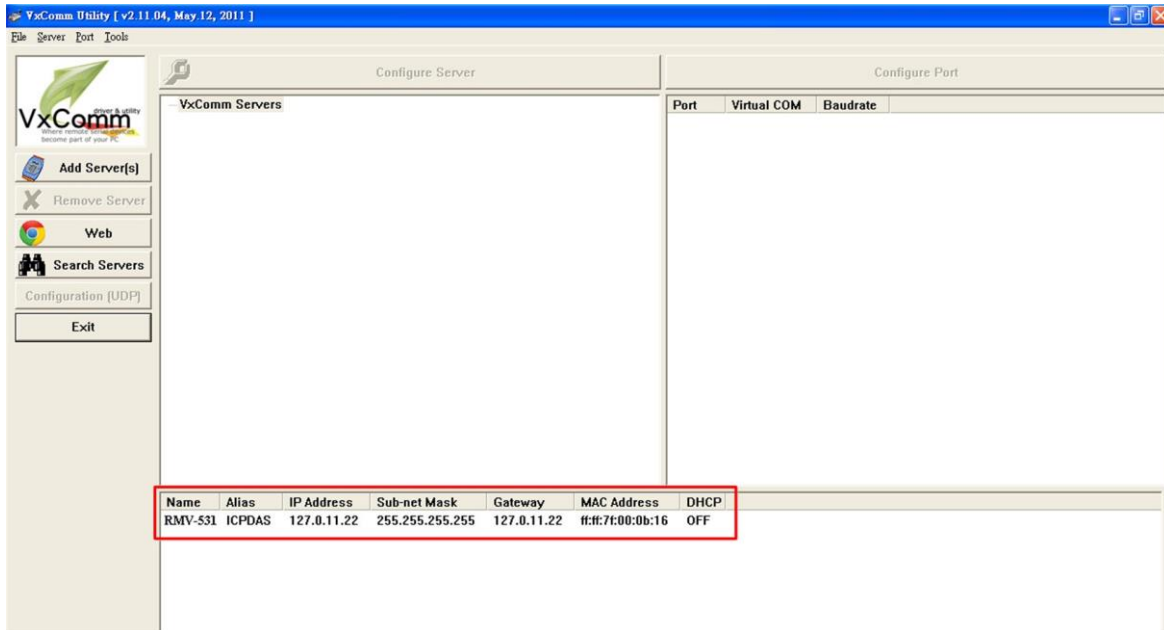
5.2 Setting the VxServer and VxComm Driver
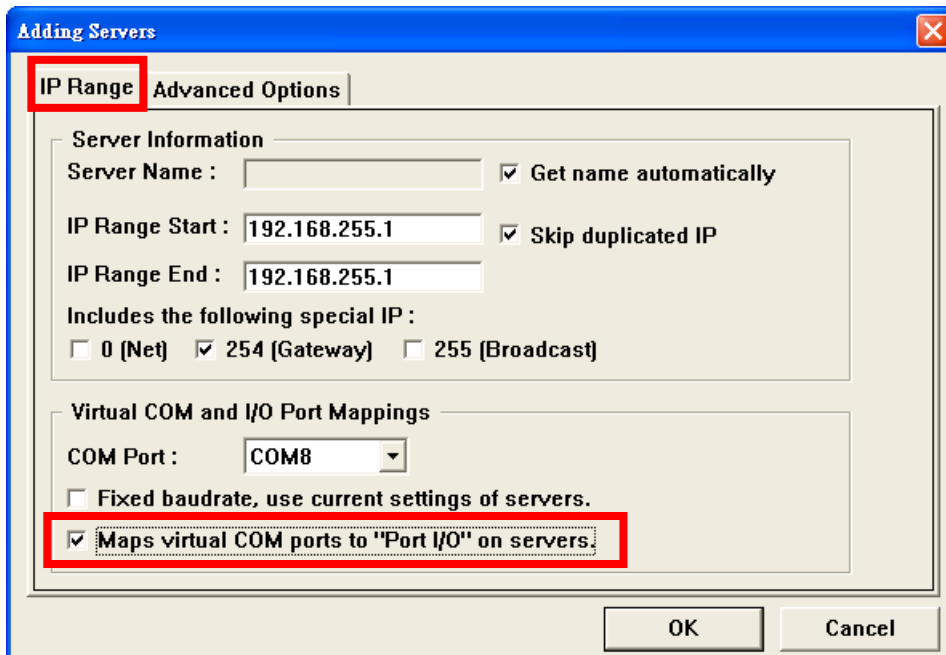
(1) Verify that the device has been connected up

(2) Execute VxComm Utility, then click "Search Servers"
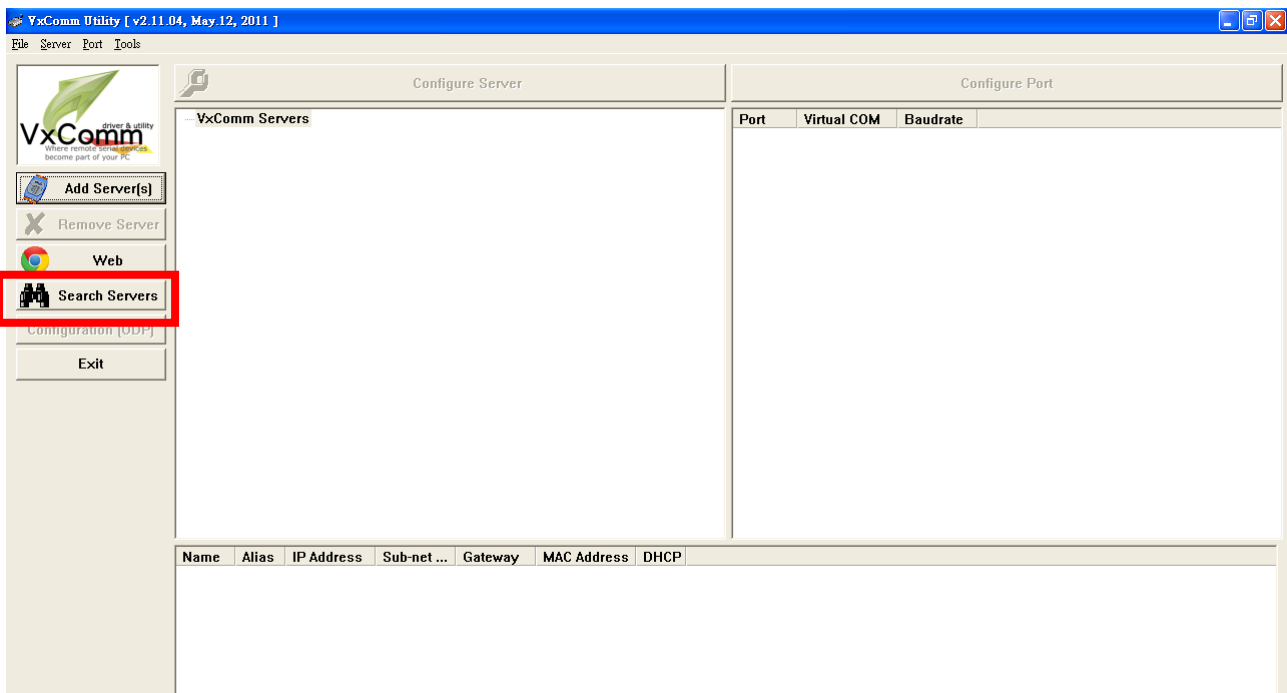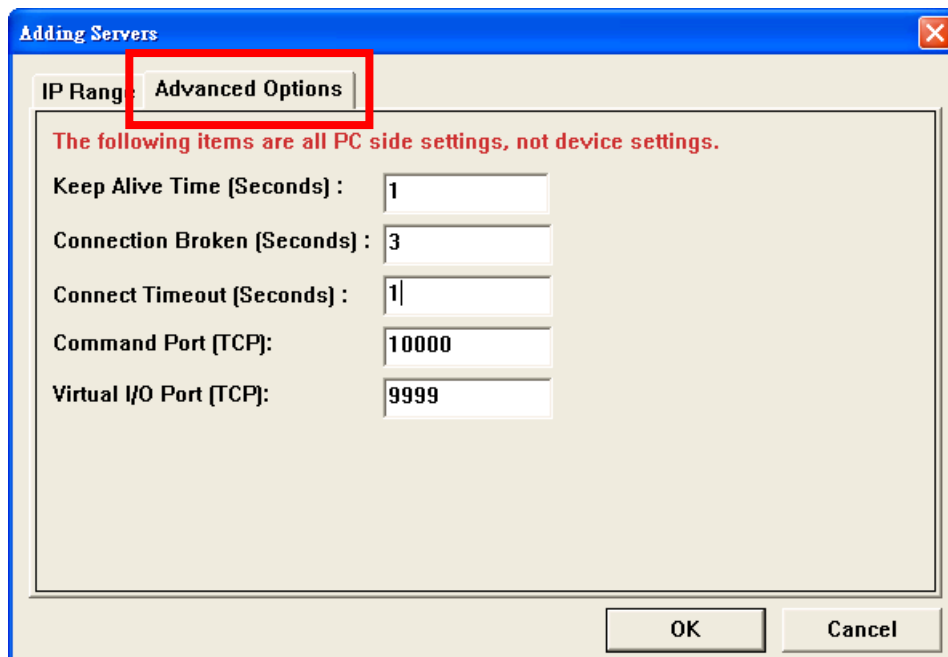
(3) Select your device, then click "Add Server(s)"

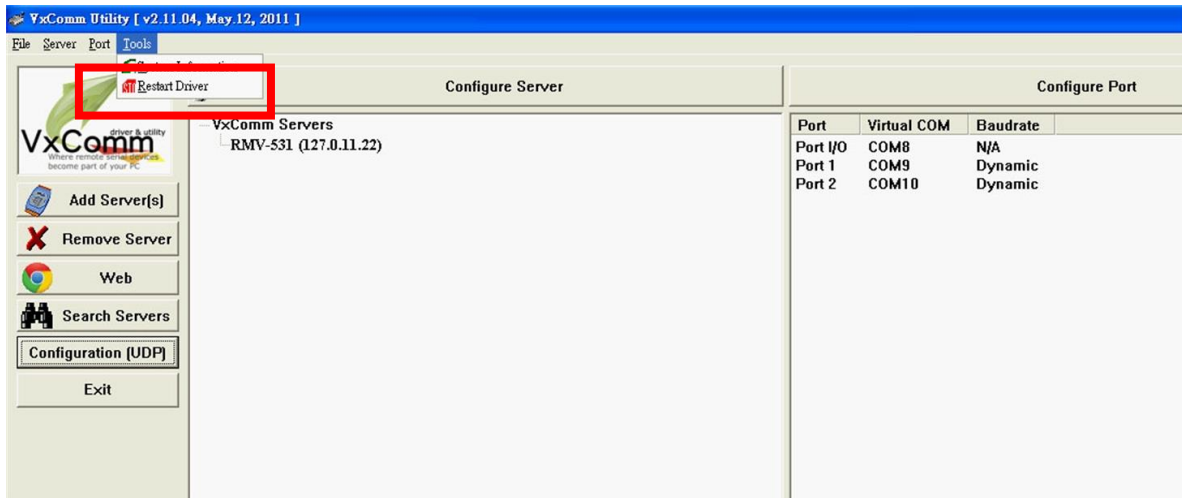(4) IP Range=> check "Maps virtual COM ports to "Port I/O" on servers.

(5) Advanced Options, please follow the below parameter settings

Parameters	Fixed value
Keep Alive Time	1
Connection Broken	3
Connect Timeout	1
Command Port	10000
Virtual I/O Port	9999

Adding Servers

IP Rang: **Advanced Options**

The following items are all PC side settings, not device settings.

Keep Alive Time (Seconds) : `1`

Connection Broken (Seconds) : `3`

Connect Timeout (Seconds) : `1`

Command Port (TCP): `10000`
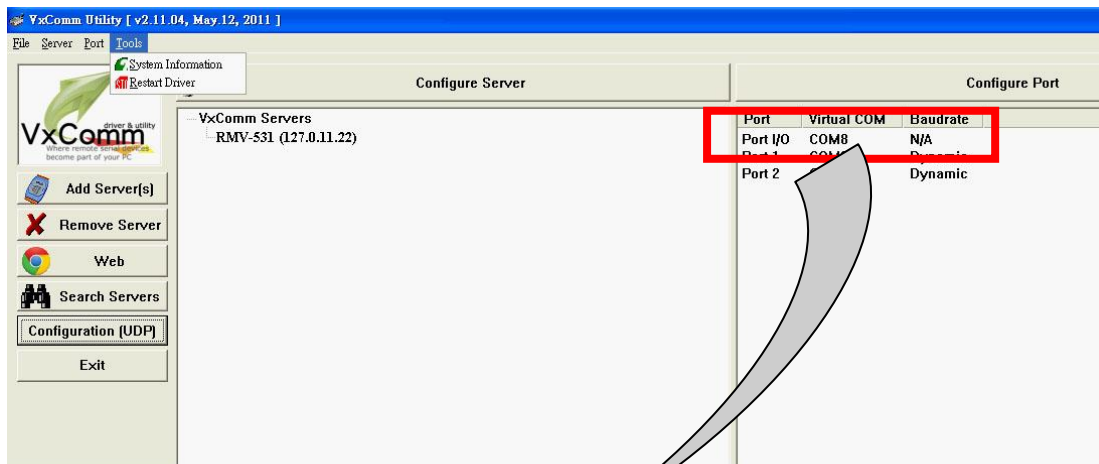
Virtual I/O Port (TCP): `9999`

OK   Cancel

(6) Tools => Restart Driver

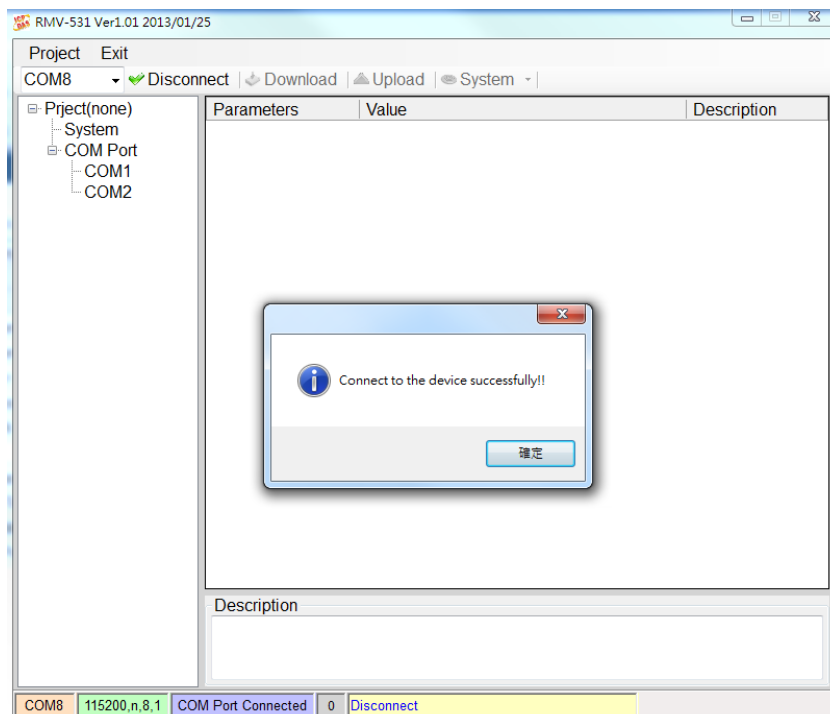(7) Click "Restart Driver"
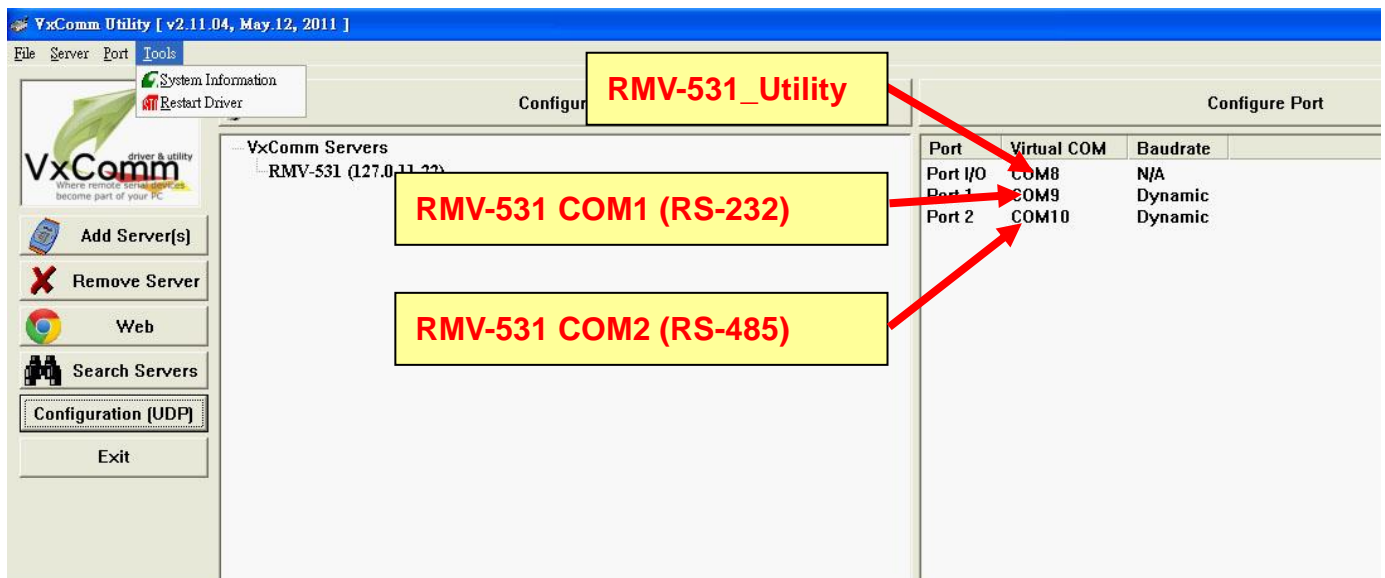
(8) According the Port I / O of VxComm Utility to select the com port of RMV-531 Utility, then click "RMV-531 Utility => Connect"
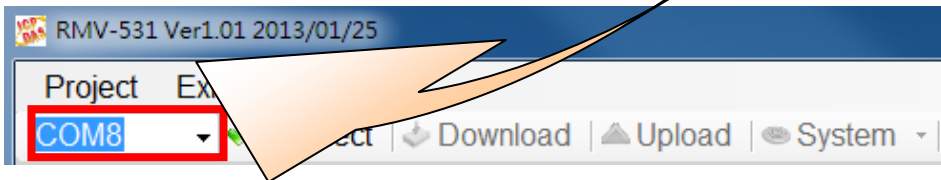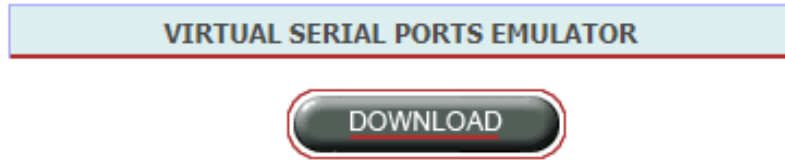

(9) The remaining steps, please refer to Chapter 4
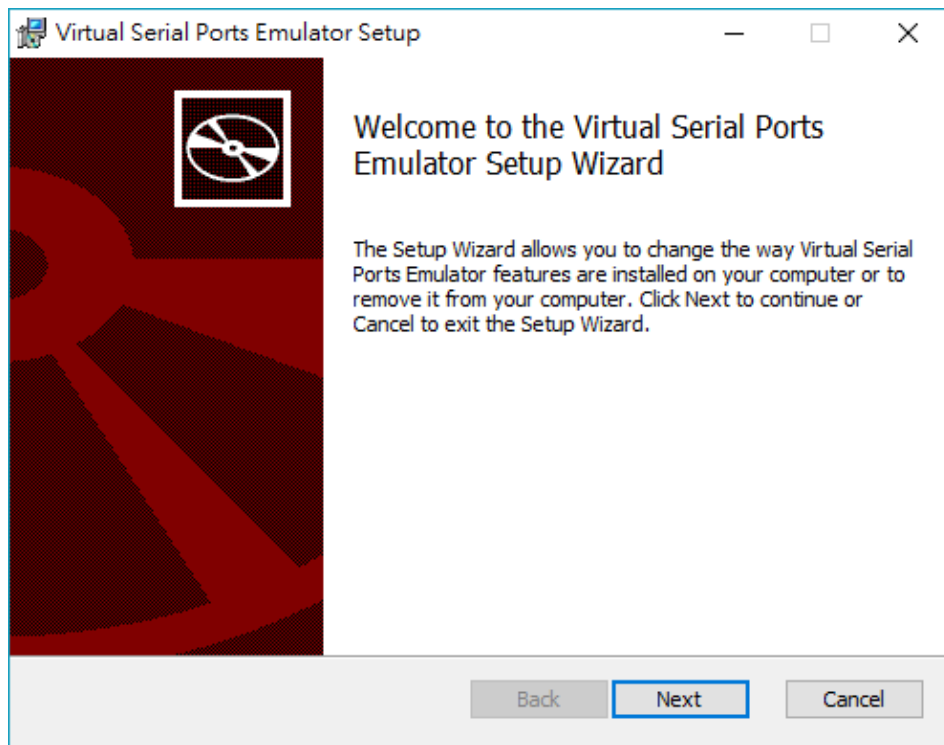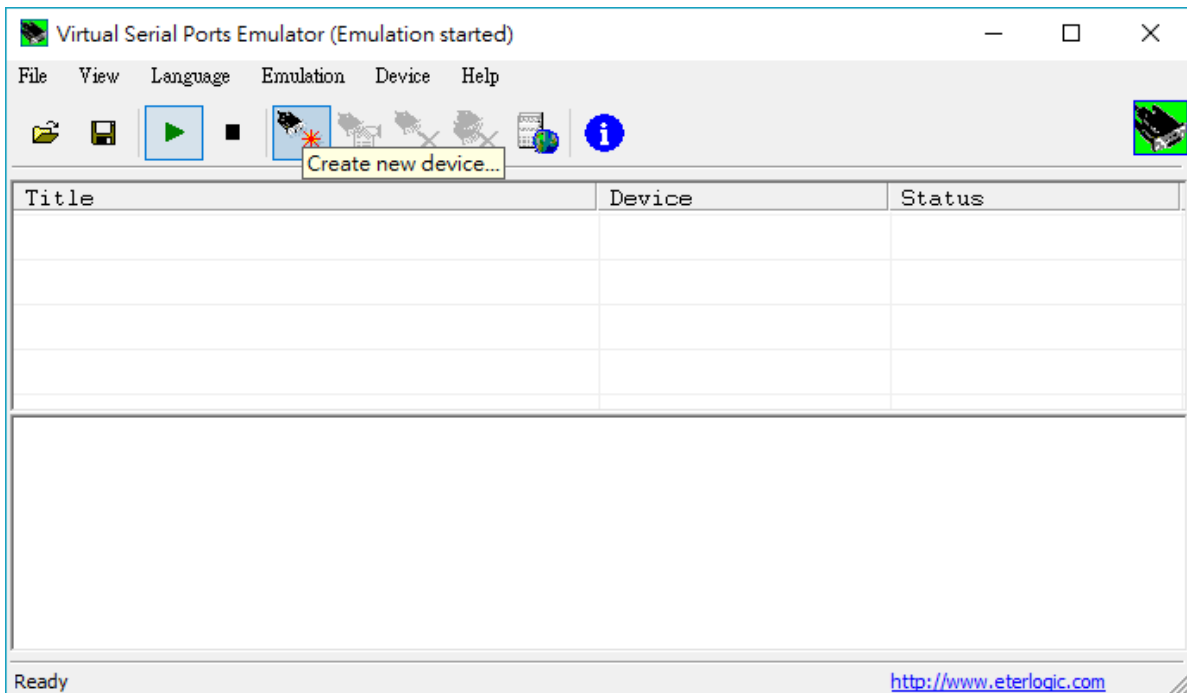
5.3 Setting the VSPE

1. Please download VSPE software first, click the URL below, click Download:
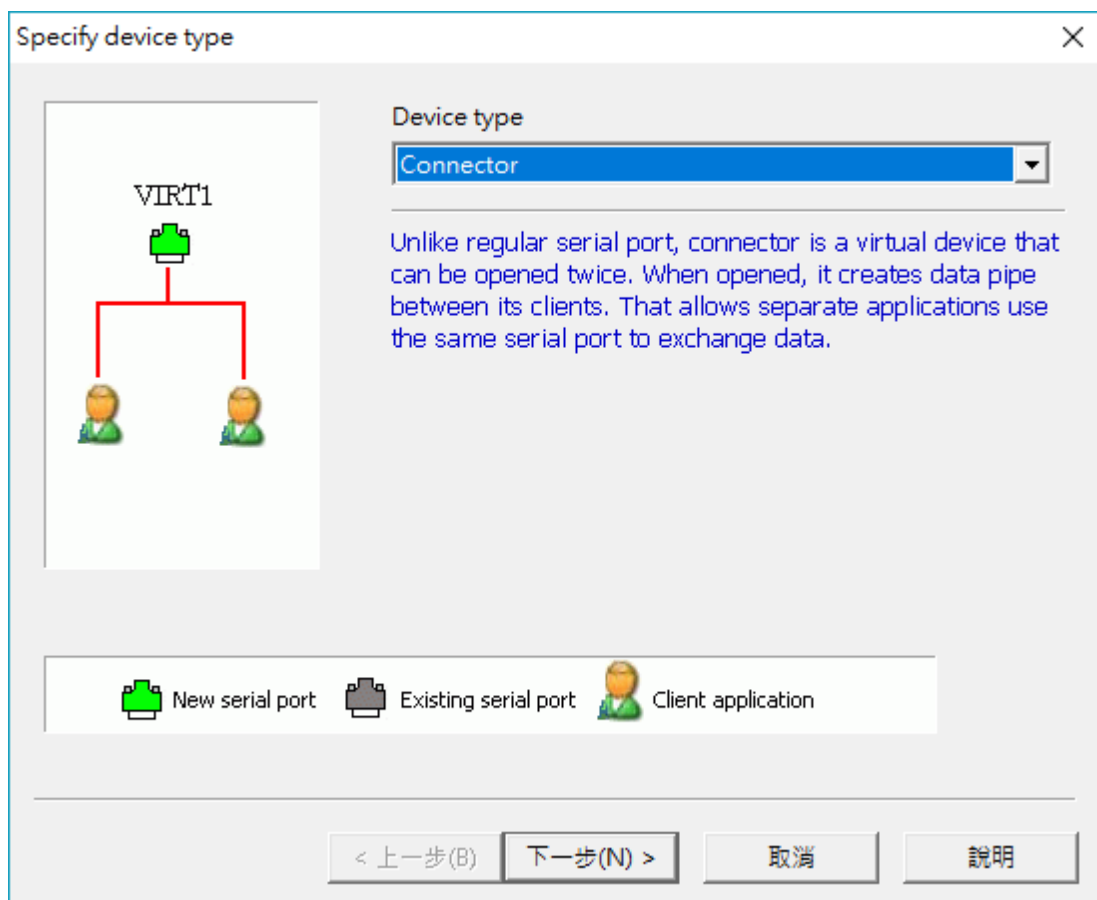   http://www.eterlogic.com/Downloads.html

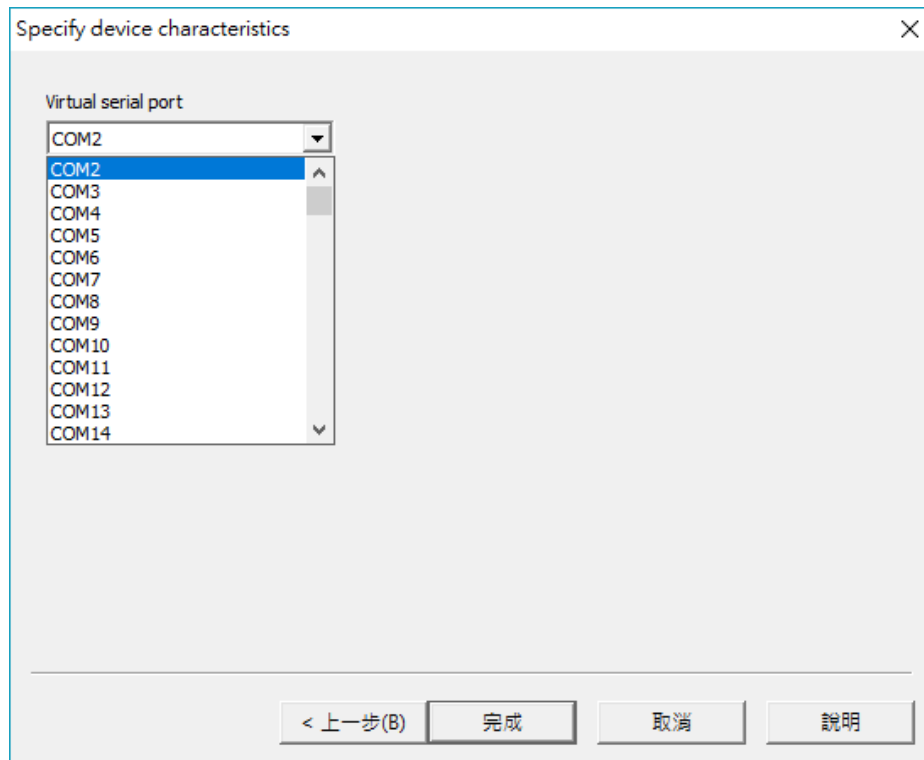2. Please decompress the compressed file and perform the installation:

1. Click on the following icon Create new device... to create a new connection:
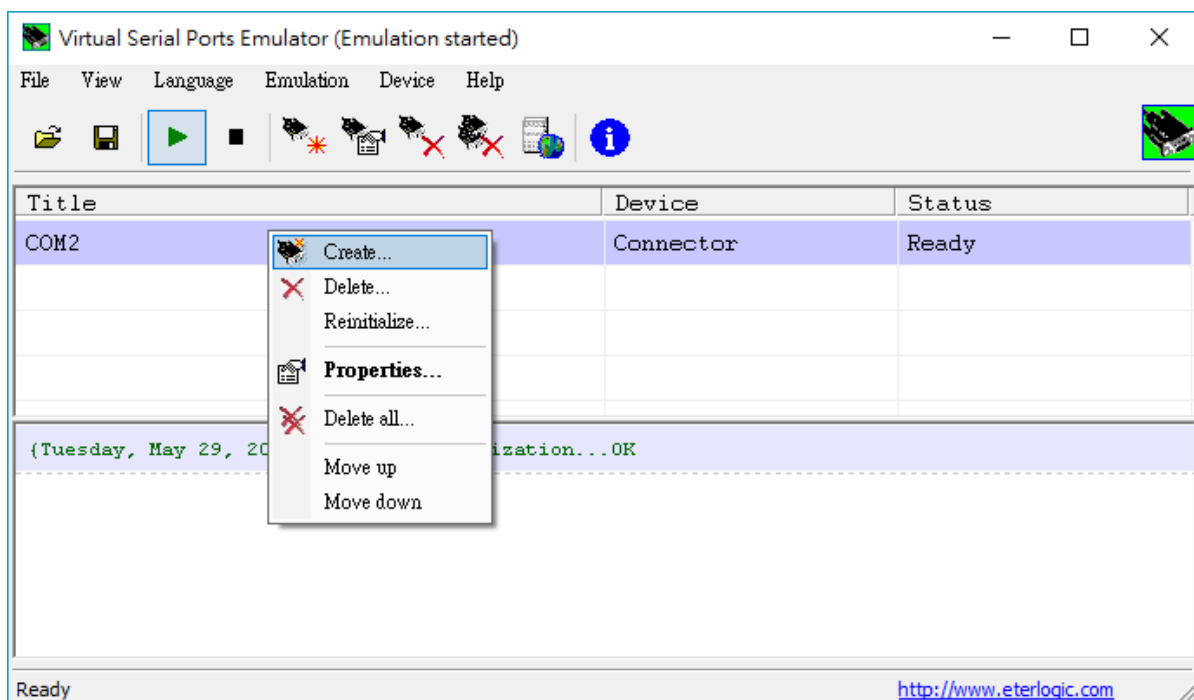

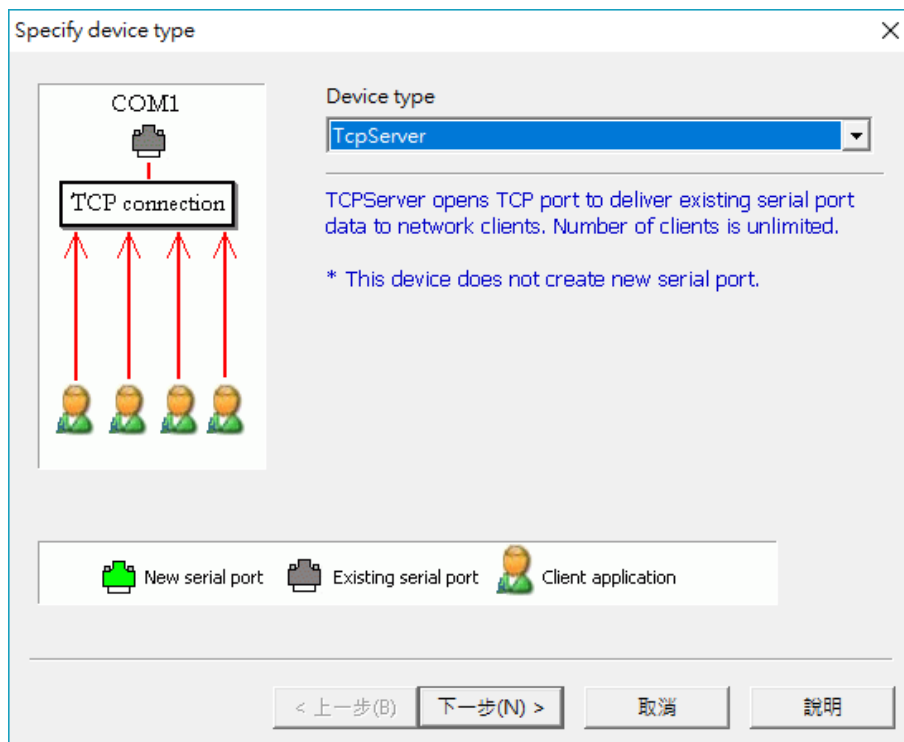2. Select the "Device type" as "Connector":

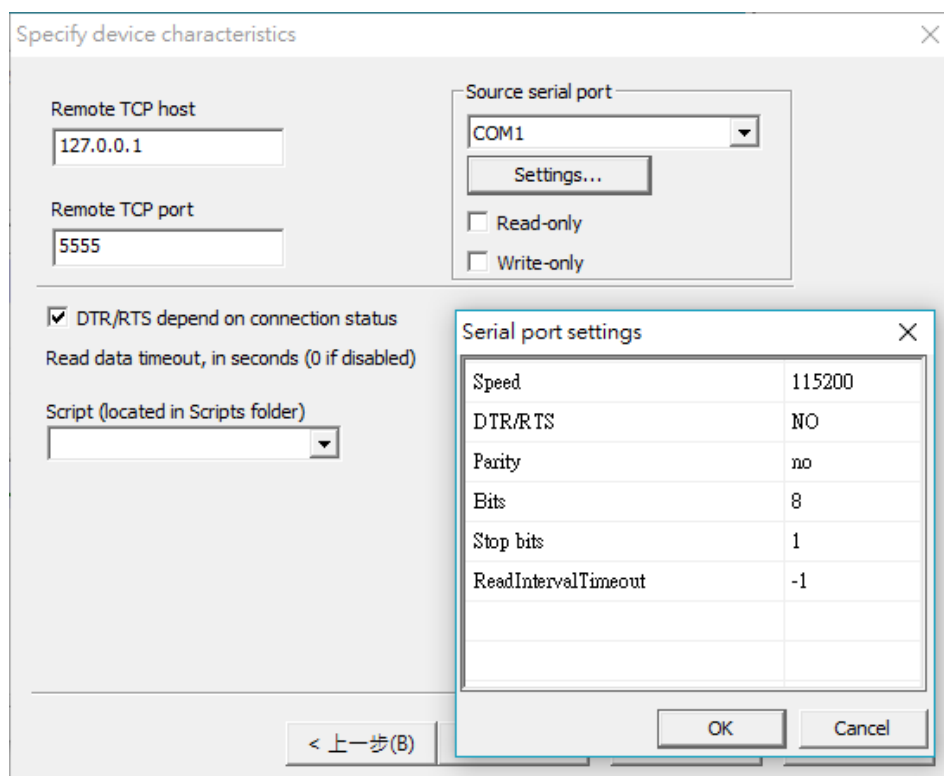3. After selecting the number of the Virtual serial port, press Finish:

4. The main screen will show a virtual serial device. Right-click this device and select "Create…" :

5. Select the Device type as "TcpServer" and click Next:

6.After setting Remote TCP host IP and Port and com port and related parameters, press Finish:

7. The setting is as shown in the figure below. When the COM port on the Server side is not connected to the Client side, the status will show waiting status (Ready):
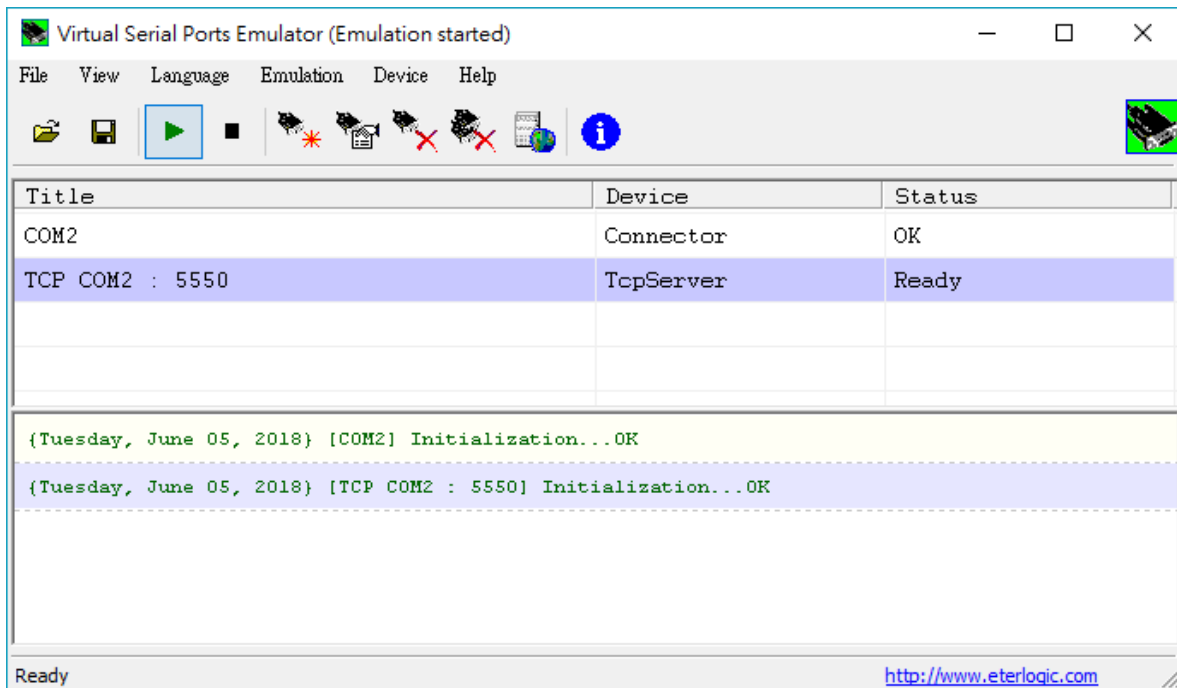
Version Record

Version	By	Date	Description
1.00	Kane	2012/01/31	Release
1.01	Kane	2013/08/01	Modify Spec.
1.02	Kane	2014/08/08	Add Modbus TCP to RTU function
1.03	Paul	2018/06/07	Add VSPE function