

GT-541 User 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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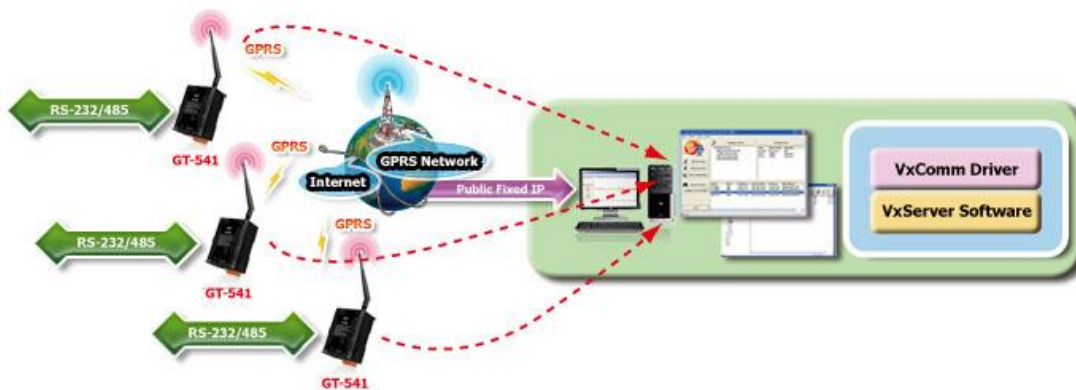
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1. Introduction

GT-541 is an intelligent multiport serial to GPRS gateway for industry M2M applications. It is designed for linking RS-232/485 devices to a GPRS network. The user-friendly Axiom Driver/Utility and VxServer allow users to easily turn the built-in COM ports of the GT-541 into standard COM ports on a PC. By virtue of its protocol independence, a small-core OS and high flexibility, the GT-541 is able to meet the demands of every network-enabled application. In addition, the GT-541 also supports GPRS network automatic re-connection function when the GT-541 is broke the GPRS network by something happened. M2M solution will improve the service quality and reduce operating costs. Many application areas can be improved by using GT-541.

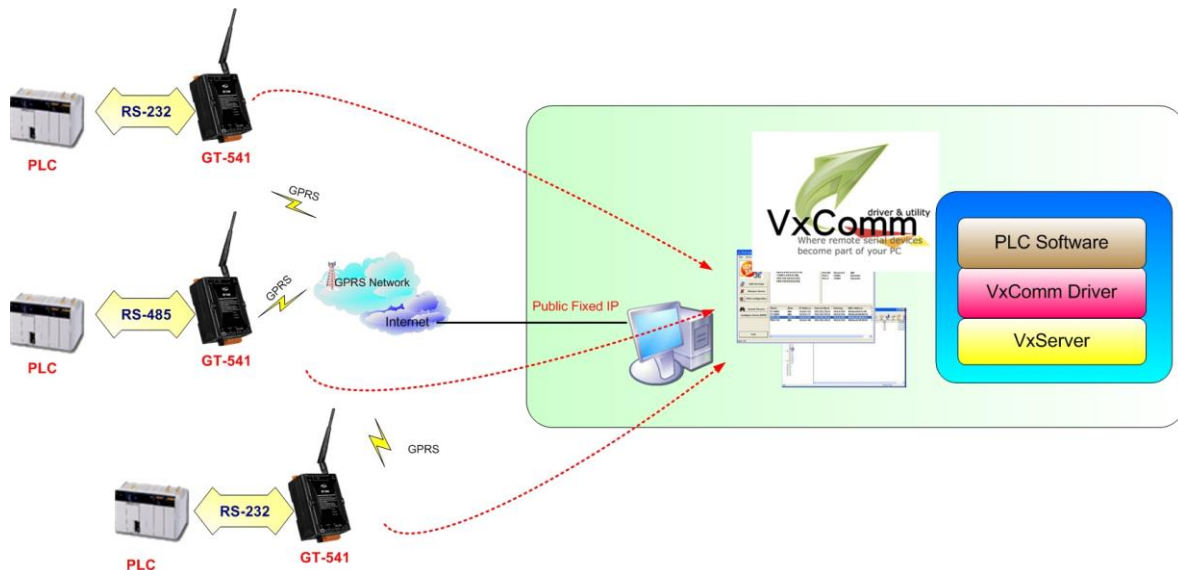


1.1 Features

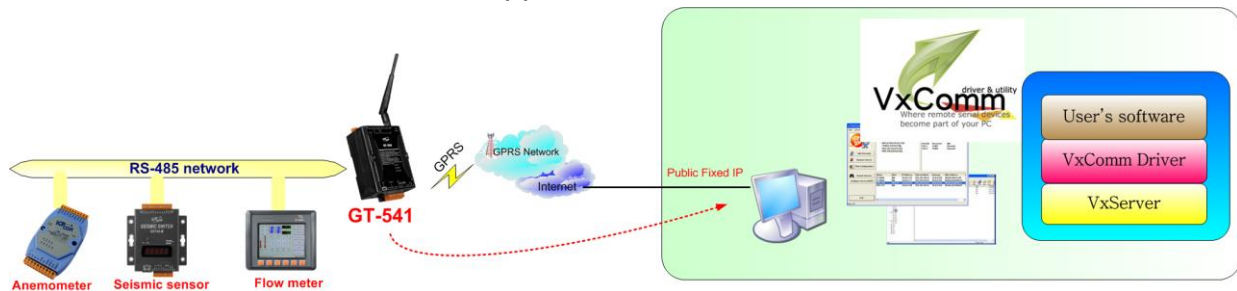
- Support GPRS network automatic re-connection function
- Support remote maintenance PLC devices that used serial communication as Siemens S7-200 series, Siemens S7-300 series, WP-8000, LP-8000, iP-8000 and XP-8000
- Quad-band 2G Modem Operating of 850/900/1800/1900 MHz
- Virtual COM Extend Real COM Ports via GPRS
- Remote Configuration by Virtual COM1 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 VDC
- DIN-Rail mountable

1.2 Applications

➤ PLC remote maintenance application



➤ Remote serial devices monitor application



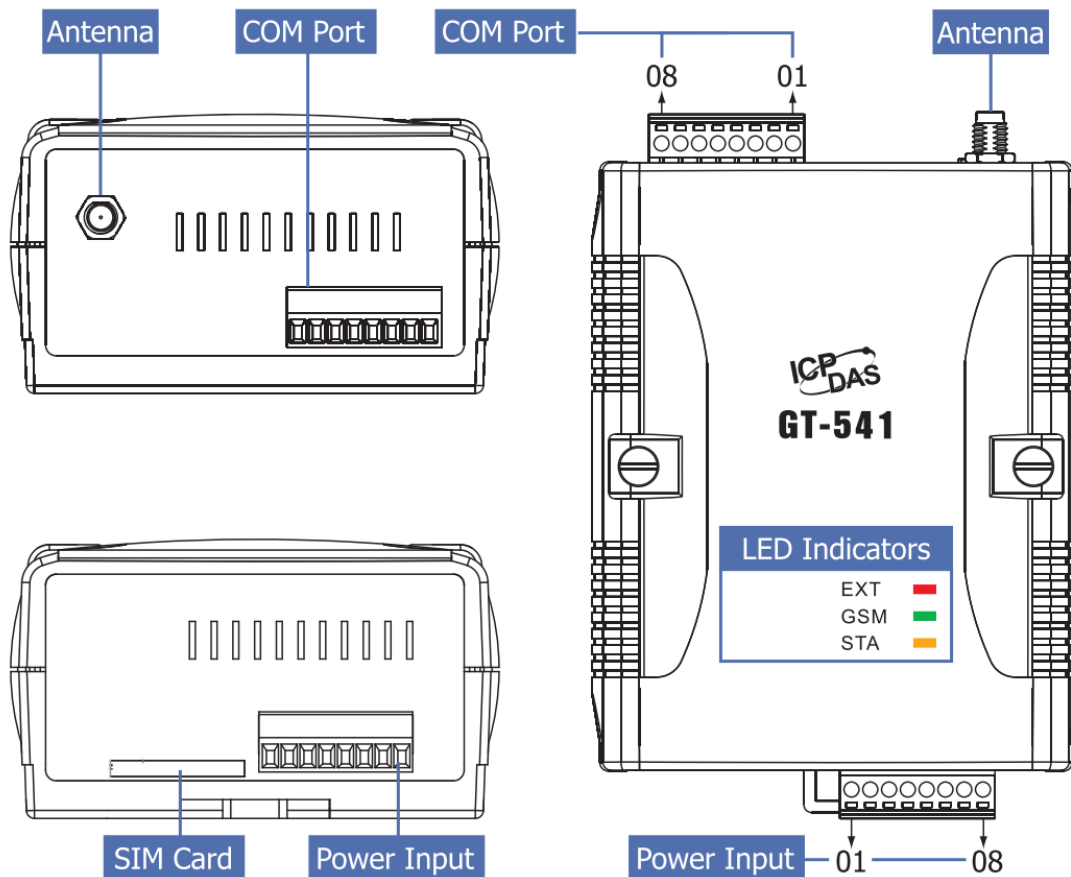
2. Hardware

2.1 Specifications

System	
CPU	ARM Microprocessor
SRAM	32 Kbytes
Flash Memory	512 Kbytes
WDT(watchdog)	Yes
2G system	
Frequency Band	Quad-band: 850/900/1800/1900 MHz
Compliant with GSM Phase 2/2+	Class 4 (2 W @ 850/900 MHz); Class 1 (1 W @ 1800/1900 MHz)
Coding Schemes	CS 1, CS 2, CS 3, CS 4
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	RS-232 : TxD,RxD,GND for communication with other devices
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

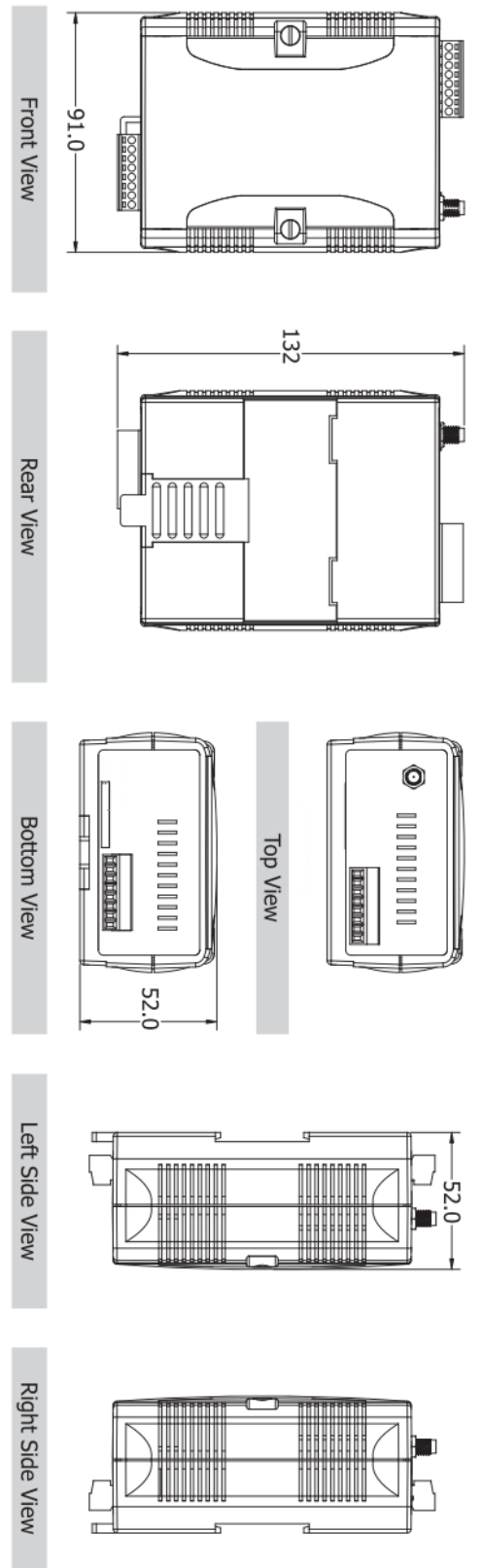
Pin assignments of GT-541



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 GT-541. 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) GSM (Green): The modem LED can indicate the status of GSM module.

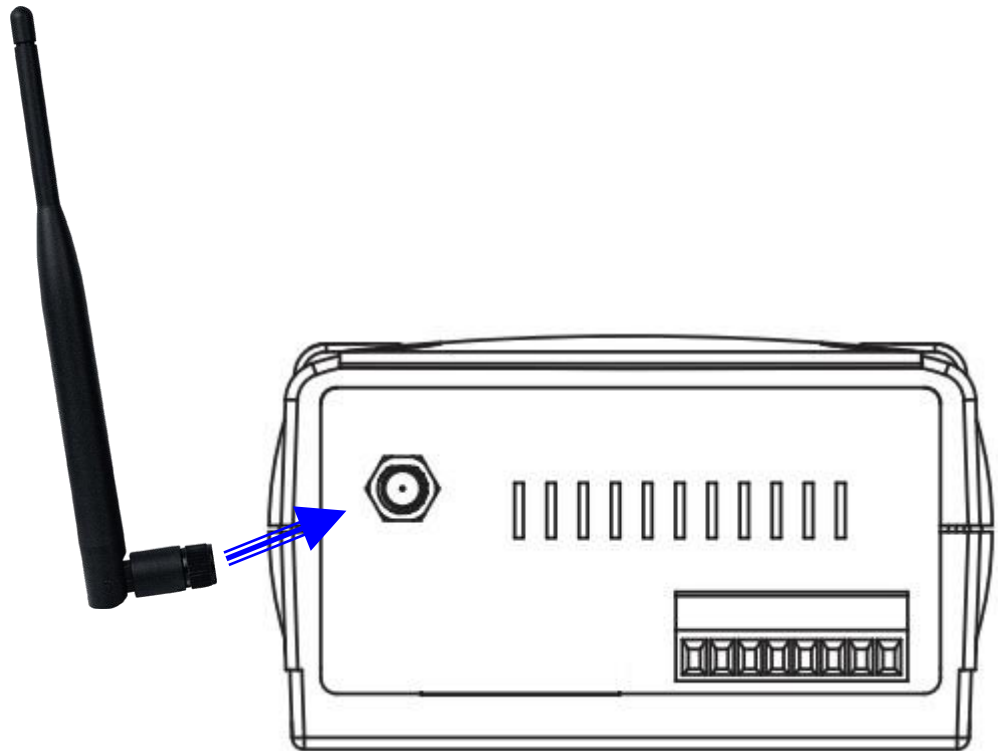
GSM module normal	GSM module failed
Blinking (3 sec)	Off Or Blinking (not 3 sec)

(3) STA (Orange): The system LED indicated whether the GT-541 is normal or failed.

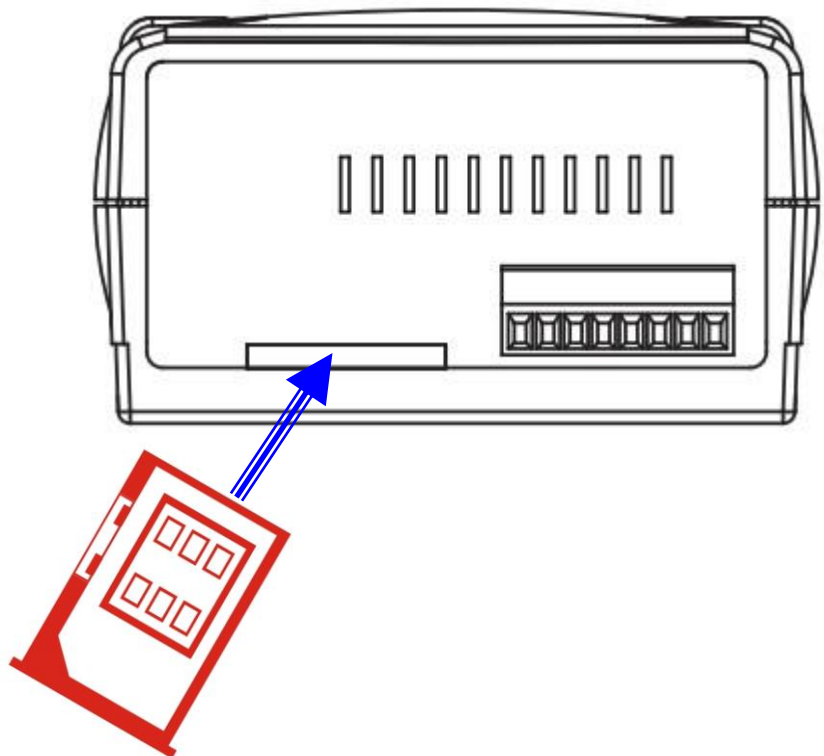
First Use	No connected to VxServer	Successful connection	Wrong PIN/PUK code
Off	On	Blinking (1 sec)	Blinking (50 ms)

2.5 Install the antenna and SIM Card

(1) Antenna installation:



(2) SIM card installation



3. Installing the GT-541 Utility

3.1 Installing .NET Framework

It needs the runtime environment with .NET Framework 2.0 or above to execute the GT-541 Utility in the PC. If there has .NET Framework 2.0 or above in the PC, the section 3.1 can be omitted.

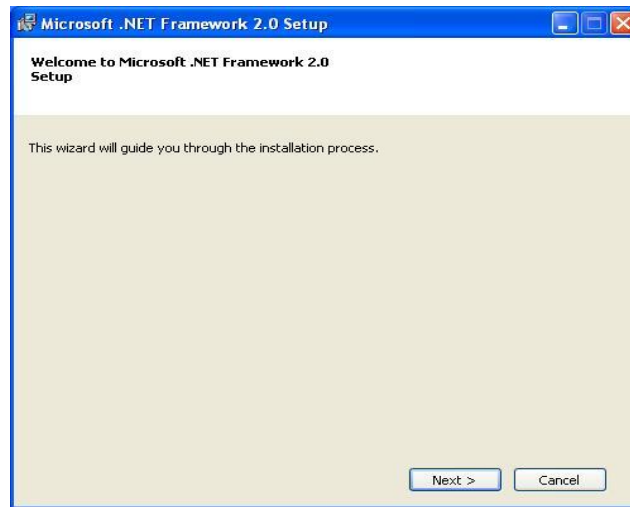
◆ Microsoft .Net Framework Version 2.0:

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

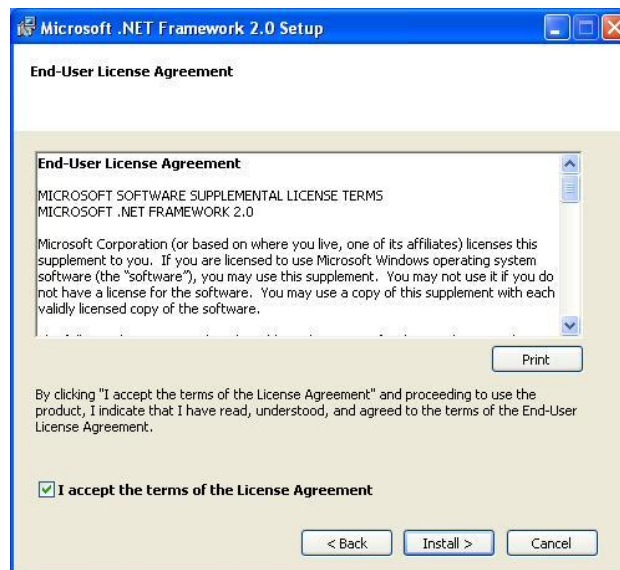
◆ Microsoft .Net Framework Version 3.5:

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

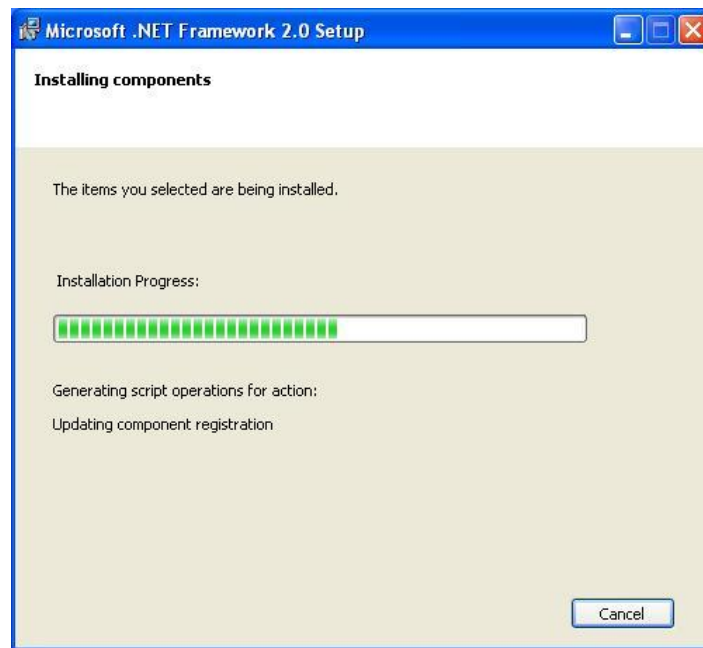
1. Press “Next” to the next step.



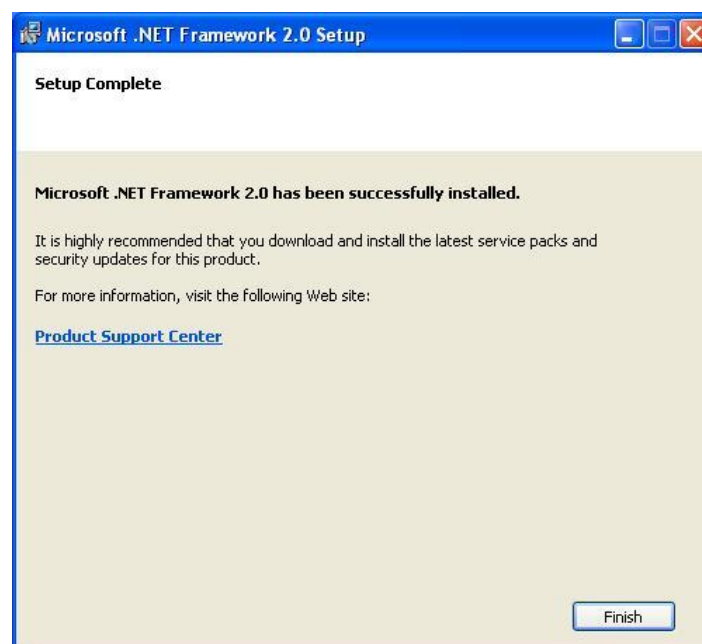
2. Select the “I accept the terms of the License Agreement” and “Install” to the next step.



3. The installation process would be going



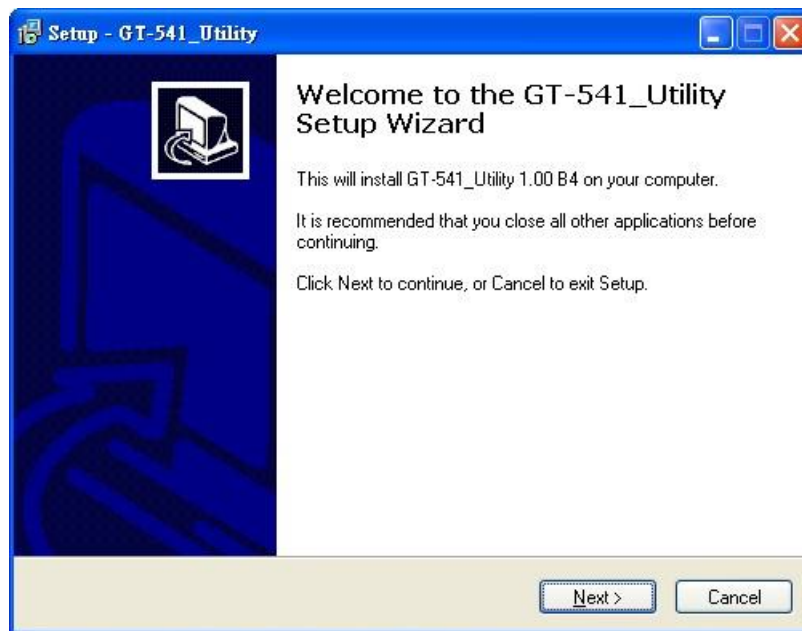
4. After finishing the installation, press "Finish" to exit the program.



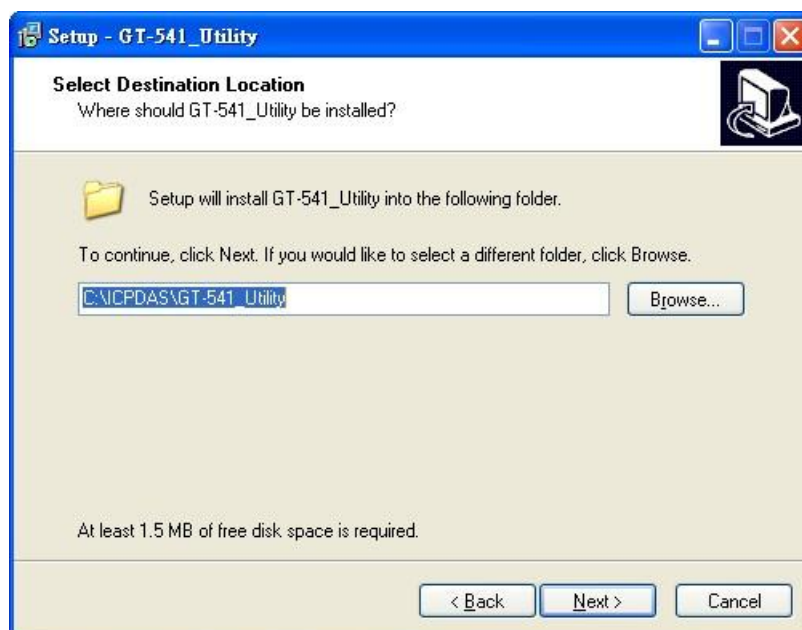
3.2 Installing the GT-541 Utility

Plug in the shipment CD into the PC,
Execute \GT-541\Software\GT-541_Utility_Setup_Vx.xx\Bx.exe. The installation figure is as follows:

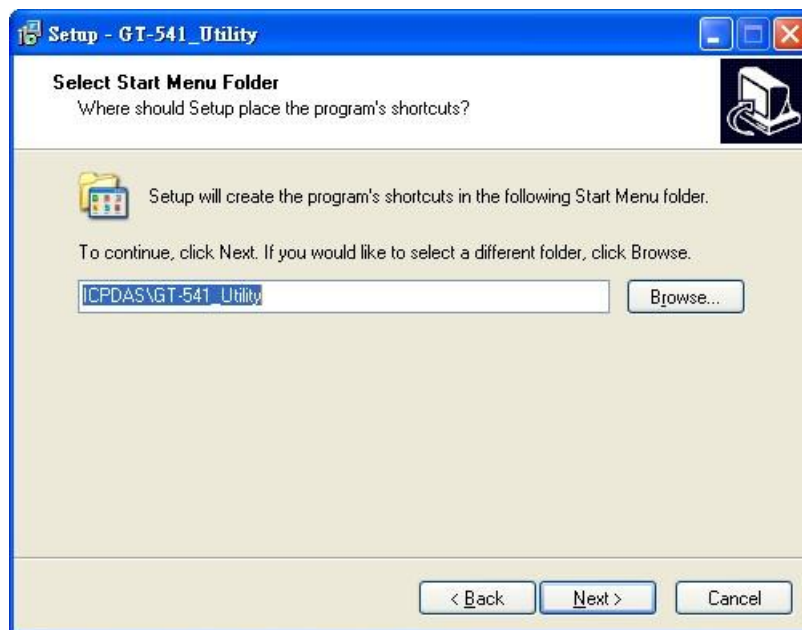
1. Press “Next” to start the installation procedure.



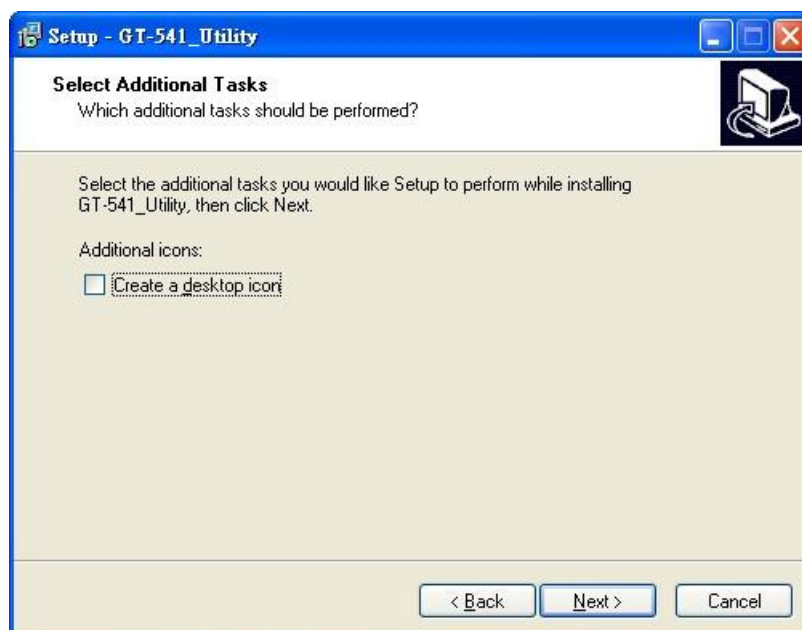
2. Select the installation path. The default path is " C:\ICPDAS\GT-541_Utility". Press “Next” to the next step.



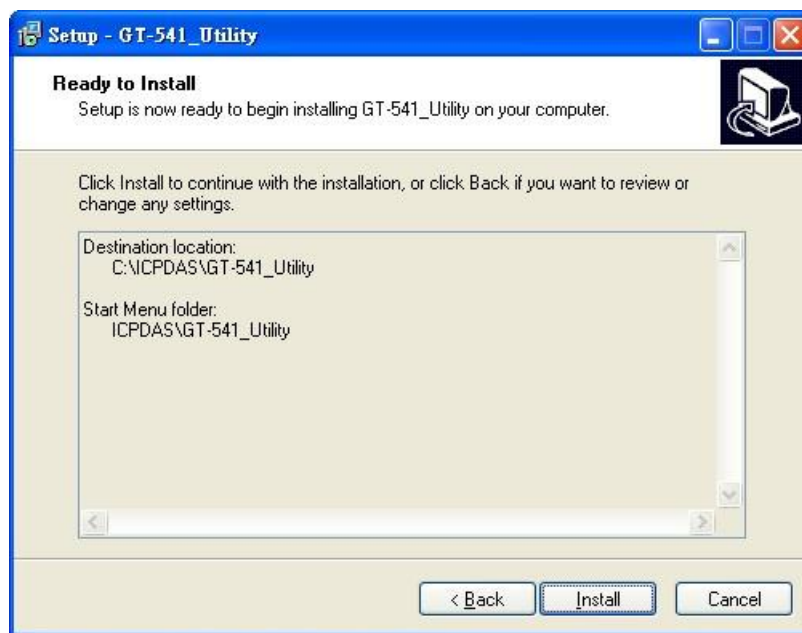
3. Select the “Start Menu Folder”, Press “Next” to the next step.



4. Select additional tasks. Press “Next” to the next step



5. Click "Install" to start to install the GT-541 Utility



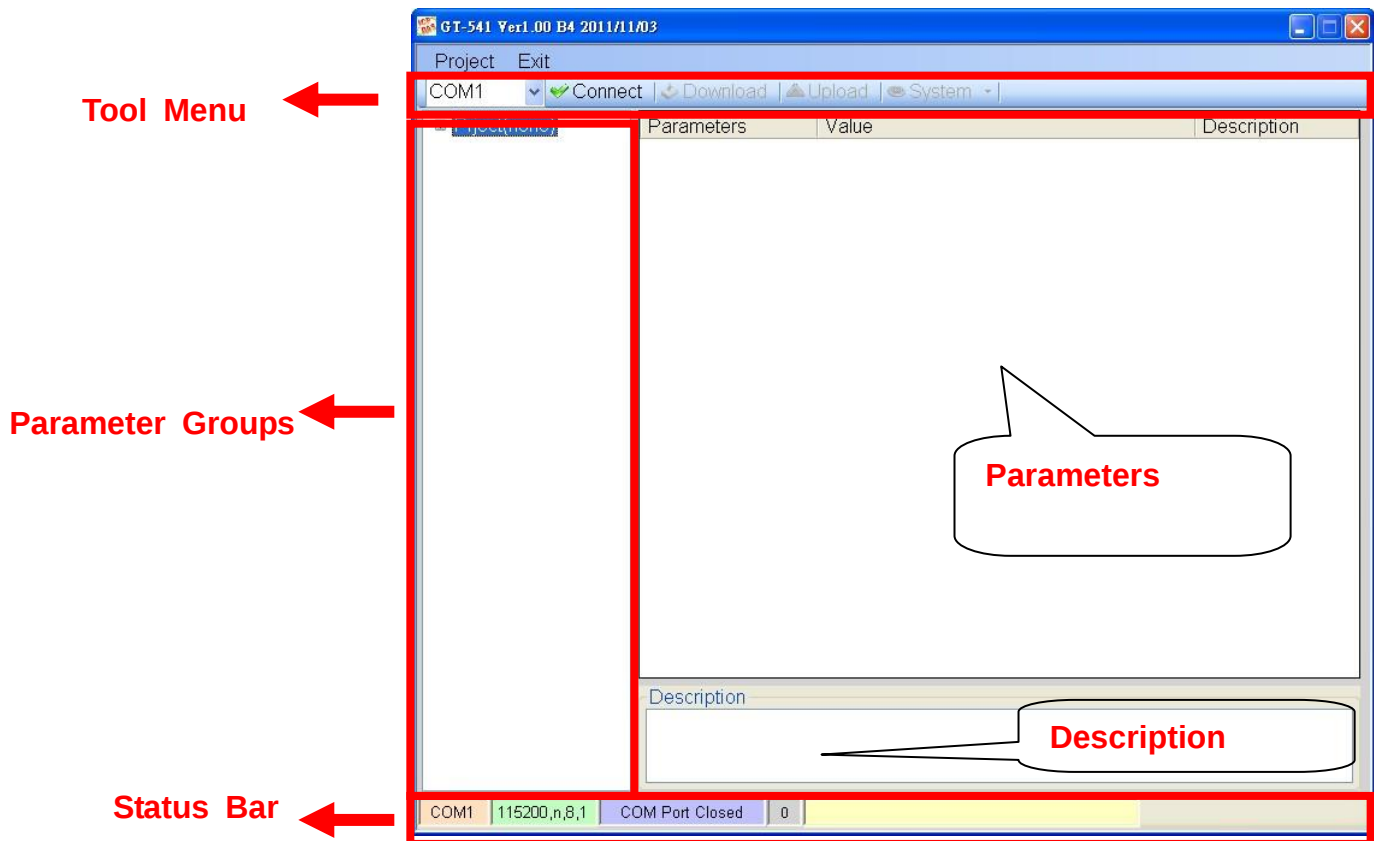
6. Click "Finish" to finish installing GT-541 Utility



4. The GT-541 Utility operation description

4.1 Main Menu

The main menu of GT-541 Utility includes the following sections:



(1) Tool Menu:

These tools include all the function operation of the GT-541 Utility. The description is as the following:

1. Project::

The parameters of the GT-541 can be saved as the project file. The operation functions include “New”, “Open”, “Save”, “Save as...”, and etc...

2. Exit:

Exit the GT-541 Utility

3. COM Port:

The COM Port number of the host PC connecting to the GT-541.

4. Connect:

Connecting to the GT-541.

5. Download:

Downloading the settings to the GT-541 device.

6. Upload:

Uploading the settings from the GT-541 device to GT-541 Utility.

7. System:

Providing some system operations including "Signal Quality" 、 "Reboot GT-541" 、

"Recover Default Settings" 、 "Firmware Version" 、 "Input PIN/PUK" 、

(2) Parameter groups:

There are four parameter groups in the GT-541 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 GT-541 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 GT-541
5. The result for operating the functions

4.2 File Menu

This tool provides users to operate the project file. It can save the GT-541 configuration as the file or upload the settings from the file. It is convenient to manage a lot of GT-541s. The explanation is as the following:



New: Opening a new file

Open: Opening a existed file

Save: Saving the file.

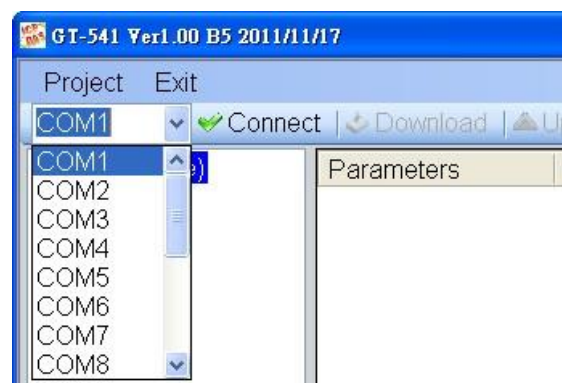
If the parameters are changed or save the uploading parameters from the GT-541, you can use this function to save these configurations.

Save as: Saving the file as another name

4.3 Connecting to the GT-541

For connecting to the GT-541, you can follow the steps below.

1. Select the COM port of the host PC and connect to the Utility port of GT-541.

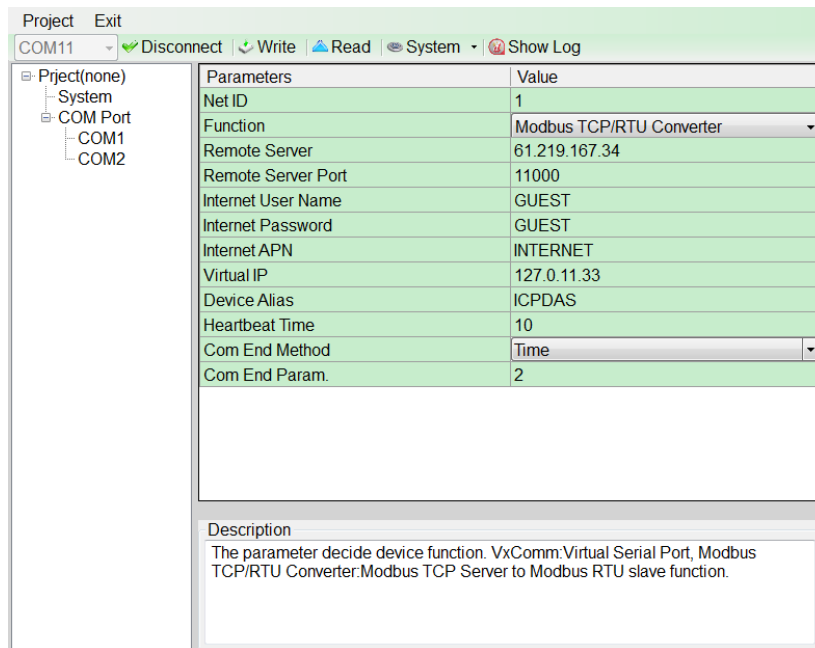


2. Press "Connect" to connect to the GT-541. If the connection is failed, check the COM port settings and wiring.



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 GT-541 Utility. Press the parameters' "Value" filed can change these parameters as the following figure.



4.4.1 System

There are 12 items in the system field below.

Parameters	Value
Net ID	1
Function	Modbus TCP/RTU Converter
Remote Server	61.219.167.34
Remote Server Port	11000
Internet User Name	GUEST
Internet Password	GUEST
Internet APN	INTERNET
Virtual IP	127.0.11.33
Device Alias	ICPDAS
Heartbeat Time	10
Com End Method	Time
Com End Param.	2

Description
The parameter decide device function. VxComm:Virtual Serial Port, Modbus TCP/RTU Converter:Modbus TCP Server to Modbus RTU slave function.

Parameters	Description
Net ID	GT-541 support protocol. Read only
Function	VxComm function or Modbus TCP to RTU function
Remote Server	The remote VxServer server's IP or domain name
Remote Server Port	The remote VxServer server's Port
GPRS User name	GPRS user name
GPRS password	GPRS password
GPRS APN	GPRS 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
	0: Fixed Time. It is as complete a data when no data came at a fixed time	2 ms~ 65535 ms	The GT-541 will transmit a data when there is a data more than 1000 bytes.
Com End Param.	1: 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 (COM1, COM2)

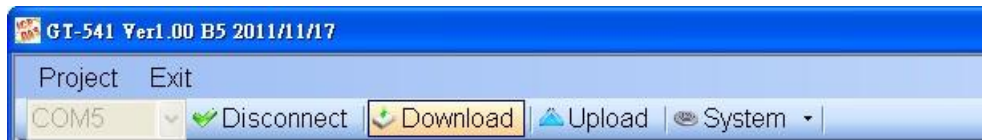
Project(none) - System - COM Port - COM1 - COM2	Parameters	Value	Description
	Port	COM1 (RS-232)	Read Only
	Data Bit	8	8 or 7
	Stop Bit	1	1 or 2
	Parity Bit	none	none,odd,even
	Baudrate	9600	bps

Parameters	Description
Port	COM Port name (read only)
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 115200bps

4.5 Download/Upload Parameters

1. Download parameters

As the configuration is finishing, the function can download the parameters to the GT-541 by clicking “Download” as the following figure.



2. Upload Parameters

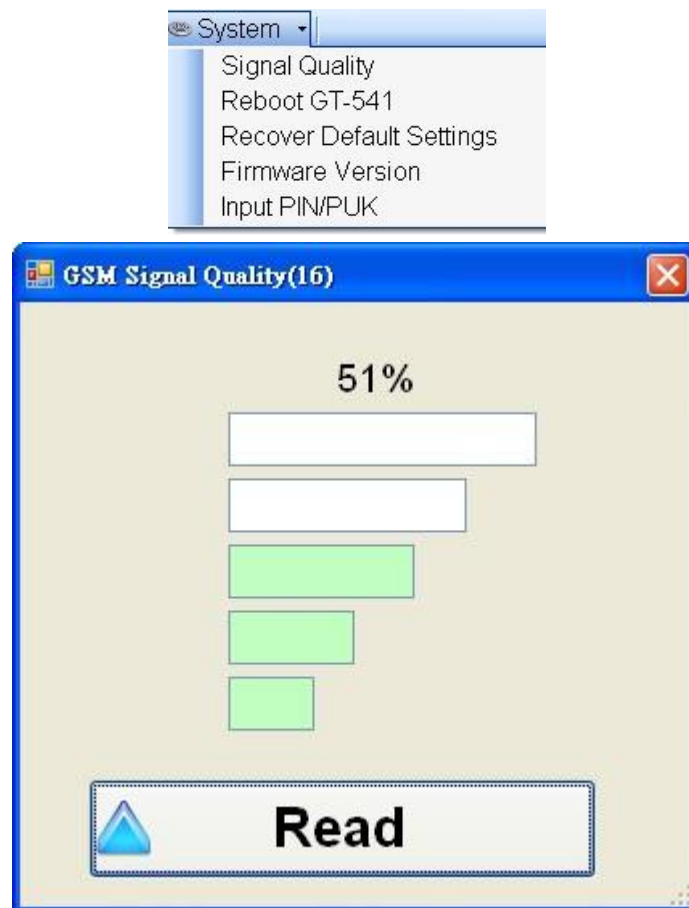
“Uploading” button can upload the parameters from the GT-541 as the following figure.



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:

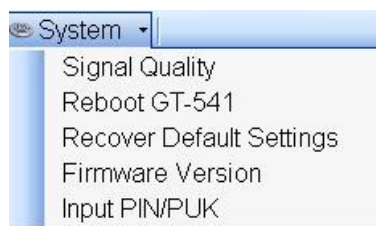
The strength is divided into 5 sections shown in percentage.

Operation:

Read : Read the GSM signal strength from the GT-541.

4.6.2 Reboot the GT-541

Clicking “System->Reboot GT-541” button can reset the GT-541 as follows.



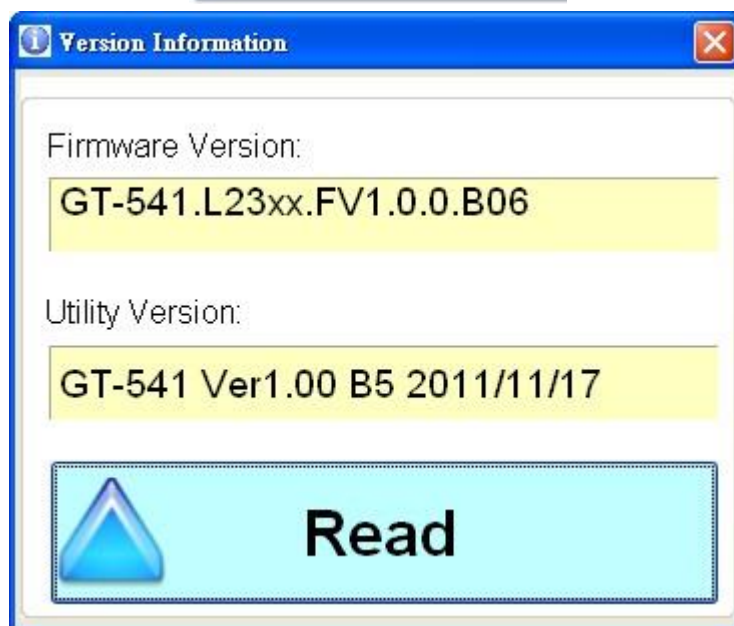
4.6.3 Recover to the Factory Settings

It can recover the GT-541 to the default settings by clicking “System->Recover Default Settings”.



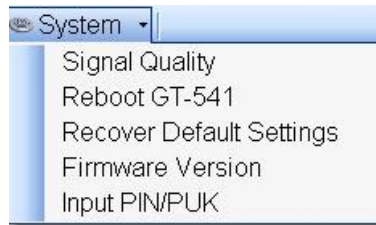
4.6.4 Inquiring Firmware Version

Press “System->Firmware Version” in tool menu, and the window would show the versions of the GT-541 Utility and firmware.



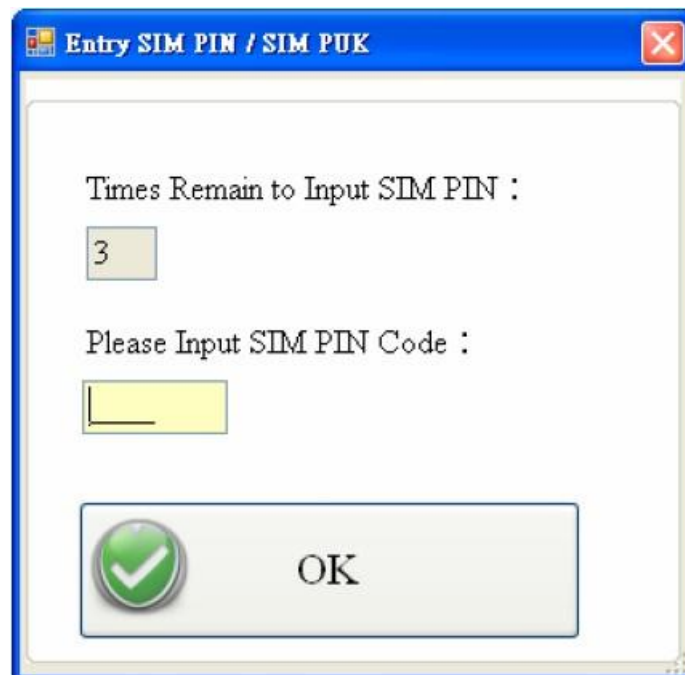
4.6.5 Inputting the PIN/PUK Code

When the GT-541 starts and the STA LED is blanking per 50 ms, it is needed to input the PIN or PUK code in the GT-541. In this condition, click “System->Input PIN/PUK” button to set the PIN/PUK code.



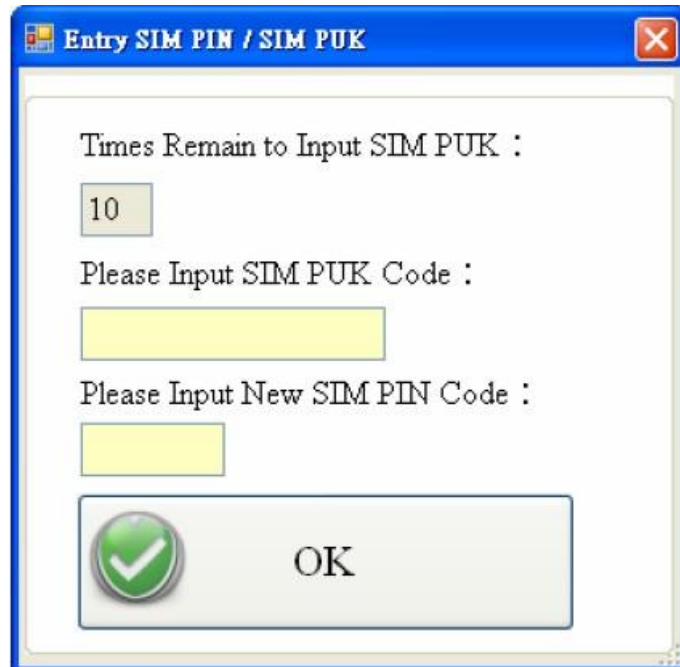
(1) Asking for inputting PIN code:

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.



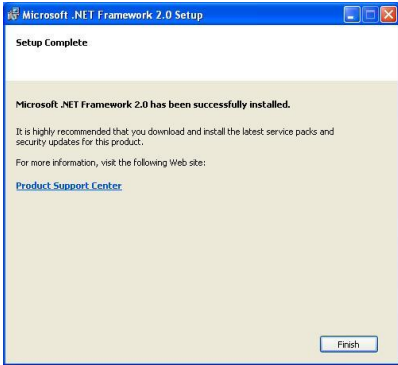
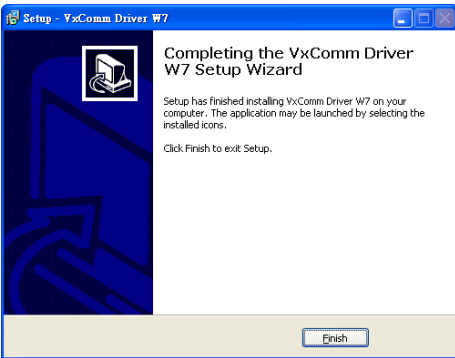
(2) Asking for inputting PUK code

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. How to use the GT-541 Utility through the Virtual com to access remote the parameters of the GT-541

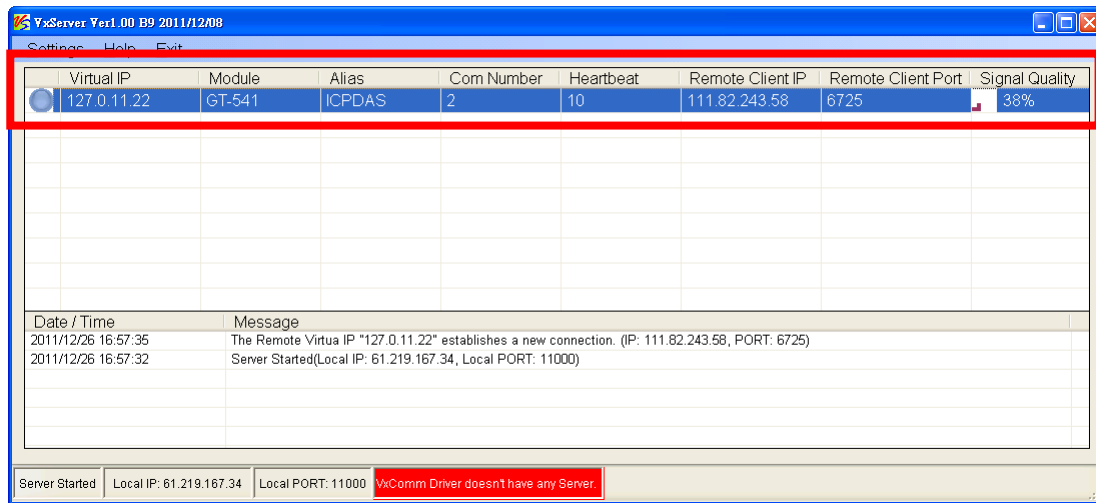
5.1 The necessary software installed

Installing .NET Compact Framework	Installing VxServer
	
Installing VxComm Driver	Installing GT-541 Utility
	

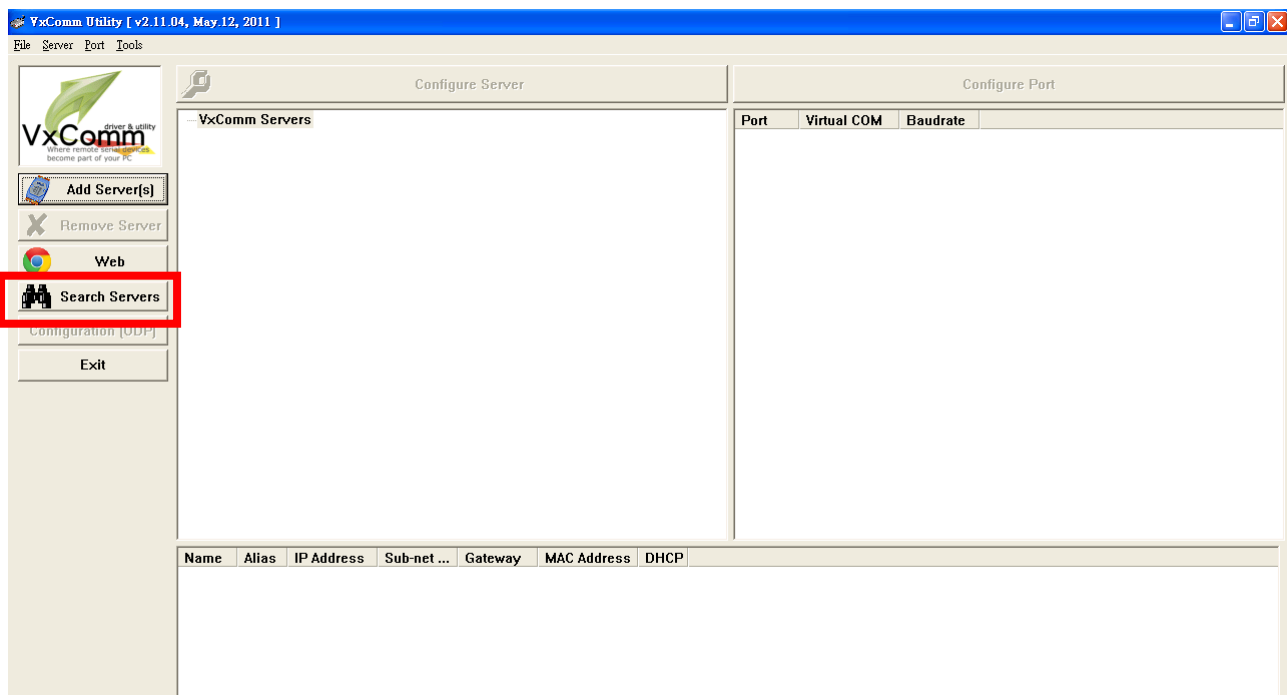
- ◆ Download Microsoft .Net Framework Version 2.0:
<http://www.microsoft.com/downloads/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-ab15c5e04f5&DisplayLang=en>
- ◆ Download VxServer software:
<http://m2m.icpdas.com/VxServer.html>
- ◆ Download VxComm Driver software:
http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/vxcomm_driver/2k/
- ◆ Download GT-541 Utility software:
<http://ftp.icpdas.com/pub/cd/usbcd/napdos/gt-541/software/>

5.2 Setting the VxServer and VxComm Driver

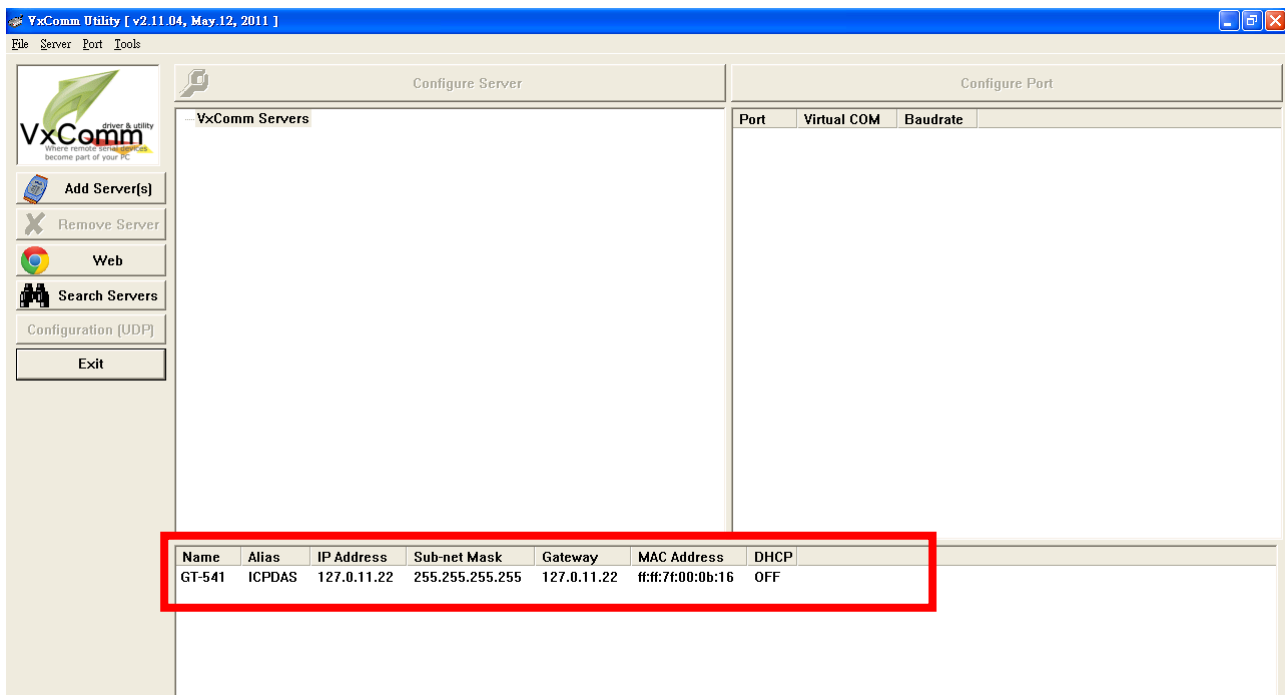
1. Verify that the device has been connected up



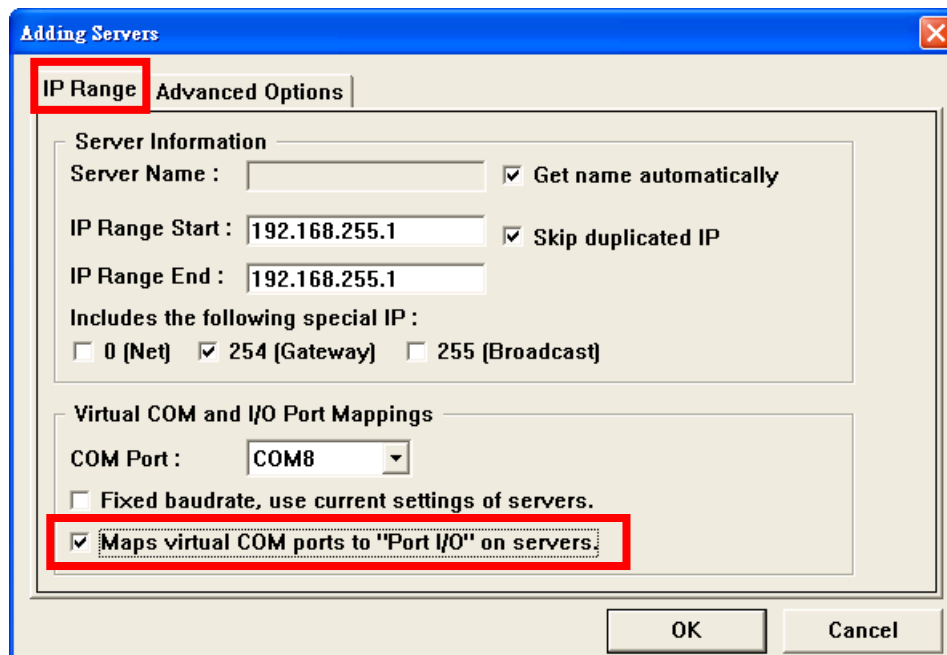
2. Execute VxComm Utility, then click "Search Servers"



3. Select your device, then click "Add Server(s)"



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



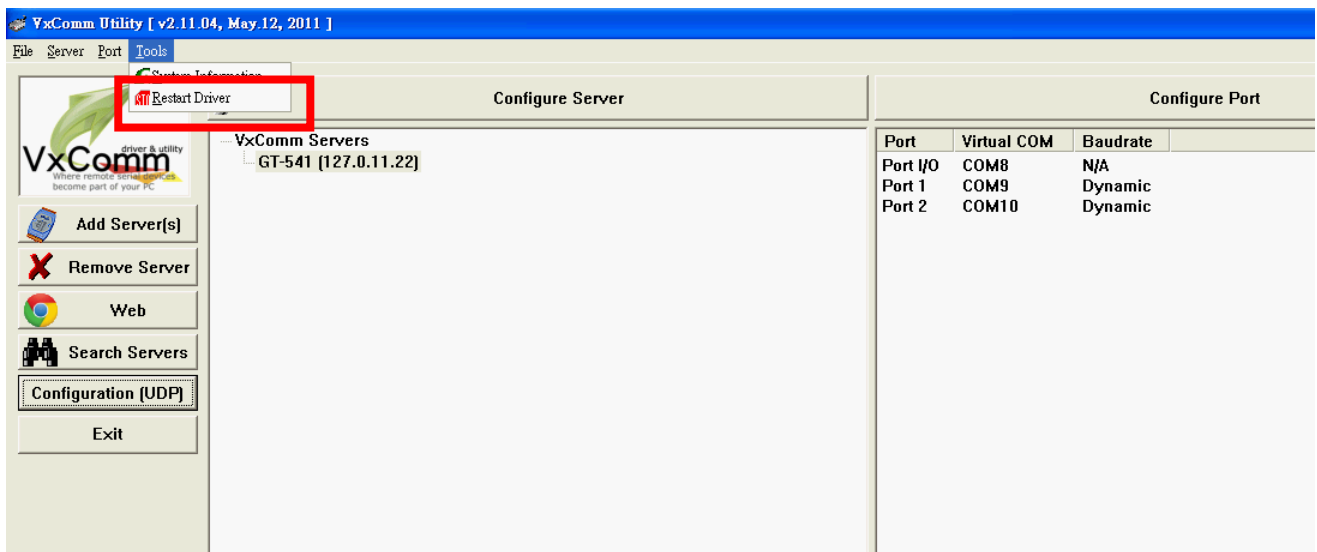
5. Advanced Options, please follow the below parameter settings

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

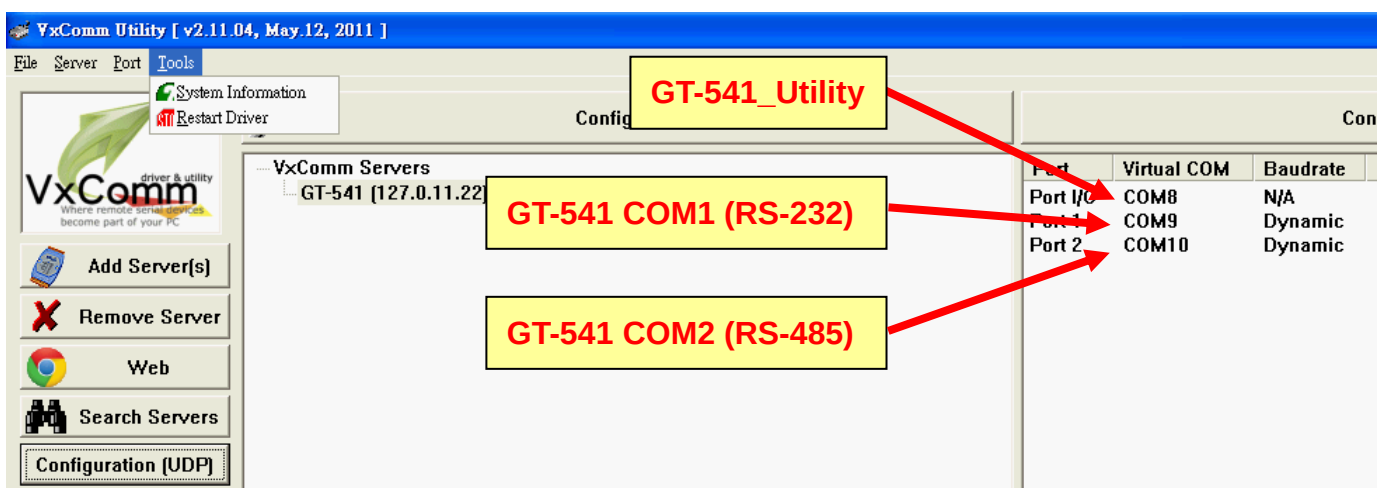
The screenshot shows a Windows-style dialog box titled "Adding Servers". It has two tabs: "IP Range" and "Advanced Options". The "Advanced Options" tab is selected and highlighted with a red rectangle. Inside the dialog, there is a red text warning: "The following items are all PC side settings, not device settings." Below this, there are five labeled input fields, each containing a fixed value: "Keep Alive Time (Seconds) : 1", "Connection Broken (Seconds) : 3", "Connect Timeout (Seconds) : 1", "Command Port (TCP): 10000", and "Virtual I/O Port (TCP): 9999". At the bottom right of the dialog are "OK" and "Cancel" buttons.

Keep Alive Time (Seconds) :	1
Connection Broken (Seconds) :	3
Connect Timeout (Seconds) :	1
Command Port (TCP):	10000
Virtual I/O Port (TCP):	9999

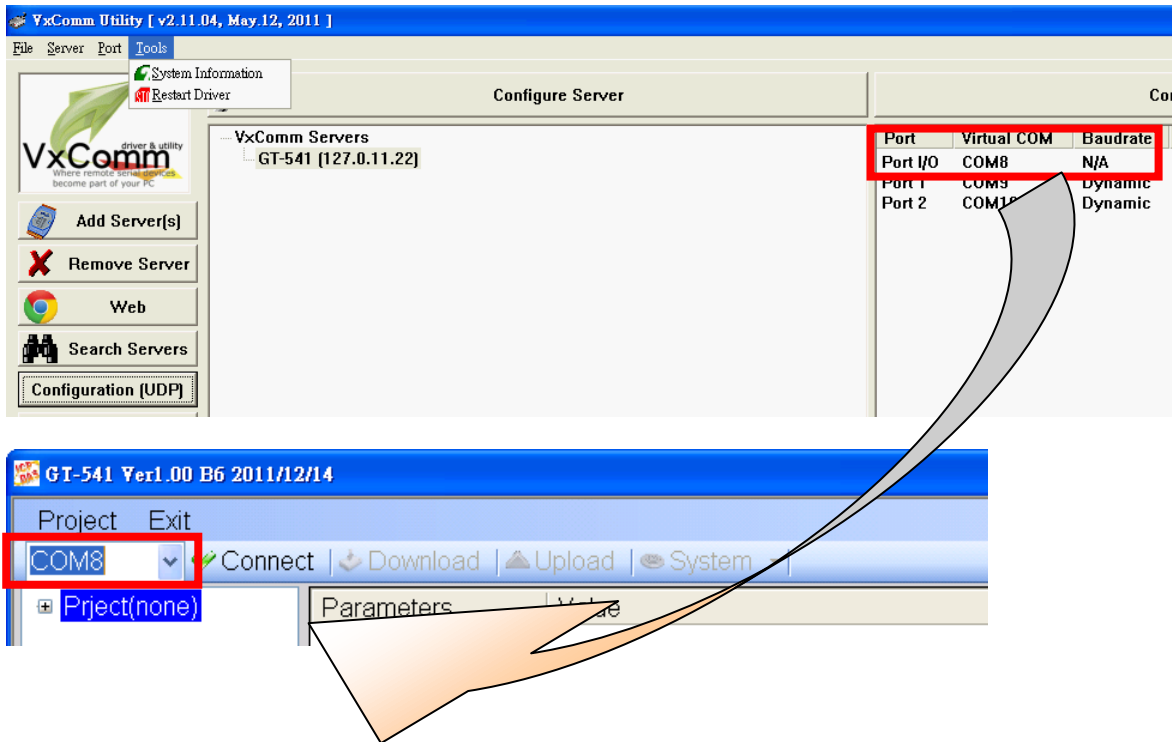
6. Tools => Restart Driver



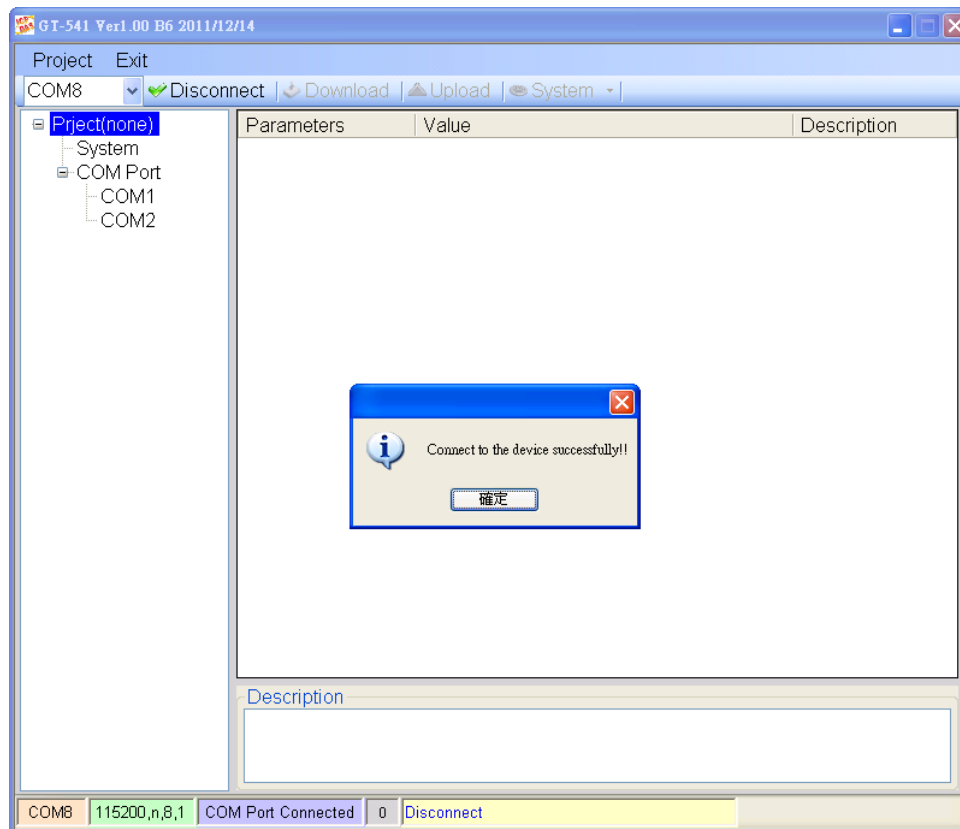
7. Click "Restart Driver"



8. According the Port I / O of VxComm Utility to select the com port of GT-541 Utility, then click “GT-541 Utility => Connect”



9. The remaining steps, please refer to Chapter 4



Version Record

Version	By	Date	Description
1.00	Yide	2011/12/13	
1.01	Yide	2011/12/26	
1.02	Yide	2011/12/28	
1.03	Yide	2012/06/29	