

# **G-4513 RTU**

## **User's Manual V1.1.0**



**High Quality, Industrial Data Acquisition, and Control Products**

## Warranty

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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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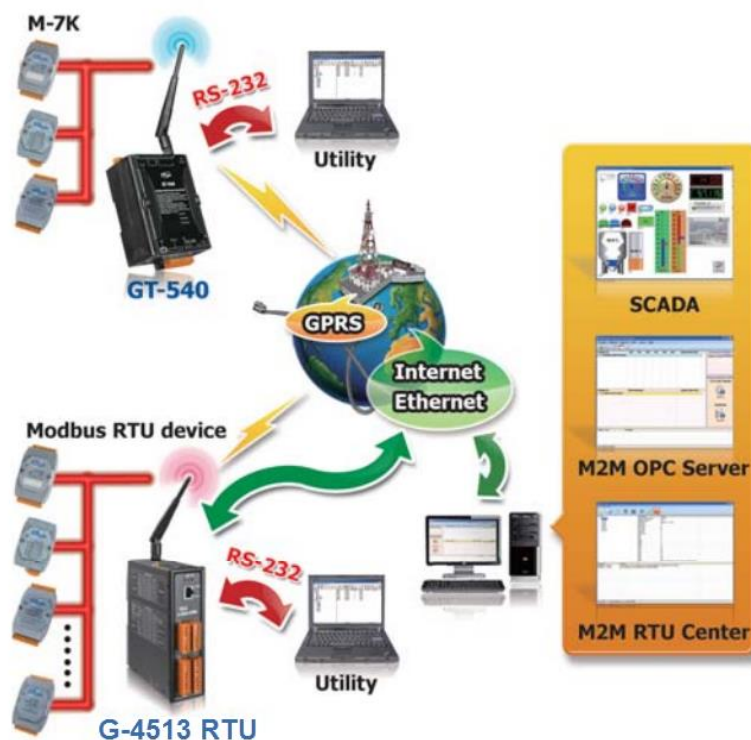
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# 1. Introduction

## 1.1 Overview

The G-4513 RTU is an intelligent Active 2G/3G Remote Terminal Unit which is built-in the specified firmware in G-4513 series. Within the high performance CPU, the G-4513 RTU series can handle a large of data and are suit for the hard industrial environment. They feature 2G/3G module, Ethernet interface, optional GPS module, 3 digital inputs, 3 digital outputs, 8 analog inputs, 1 relay output, 2 RS-232 and 1 RS-485 ports. That can be used in various application fields to transfer data by 2G/3G or Ethernet. G-4513 RTU is suited for Remote data acquisition in various harsh environments. It is designed for communicating with Modbus RTU devices and provides active data transmission via 2G/3G connection. Except for the Modbus RTU's data, the built-in I/O and GPS data also can be transferred to RTU Center software by the defined period or DI/AI trigger. With the built-in redundancy communication paths of 2G/3G and Ethernet in G-4513 RTU, the data would be guaranteed to transfer to host. When 2G/3G or Ethernet connects failed, it will immediately switch to a different connection method in order to achieve data monitoring sustainability. Furthermore, G-4513 RTU provides simple I/O linkage control and the built-in I/O recorders in SD card.

We also provide M2M RTU center software with friendly graphic interface to manage the 2G/3G RTU products easily. Users can monitor the I/O data and status of 2G/3G RTU devise by the interface on PC. By using the M2M RTU API tool and M2M RTU center software, any remote monitoring system can be achieved easily and efficiently. For SCADA system, the M2M.OPC server is provided to connect to SCADA by OPC interface.



### ► **Easy to establish 2G/3G network applications**

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It is a big headache for engineers to establish the 2G/3G applications because the dynamic IP management is required. Applying G-4513 RTU and M2M RTU center software, the dynamic IP addresses can be managed between them. The remote 2G/3G RTU product would connect to M2M RTU Center automatically. Therefore, all remote 2G/3G RTU devices can be managed by a single centralized M2M RTU Center software with a fixed IP address. Moreover, there are M2M API tool and OPC server for engineers to develop the 2G/3G applications by VB, VC or SCADA development tools conveniently without any IP address management effort.

### ► **Active data transmission**

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G-4513 RTU devices with active I/O transmission mechanism can raise the communication. Unlike the traditional poll communication, G-4513 RTU would transfer the data by the defined time, DI trigger or AI hi/lo alarm. In addition to improve the way of communication, that can also reduce the AP effort.

### ► **Redundant communication paths in GPRS and Ethernet**

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There are 2G/3G and Ethernet communication interfaces in G-4513 RTU. Through the setting in G-4500 RTU Utility, you can set the primary and backup paths to communicate with M2M RTU Center. When the primary path is failed, G-4513 RTU can use the backup path to communicate to M2M RTU Center to ensure the data can transfer to PC. That can raise the reliability of communication effectively.

### ► **Modbus RTU device connectivity**

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The G-4513 RTU is built-in Modbus RTU protocol. That can make any Modbus RTU device connect to G-4513 RTU. By the way of G-4513 RTU, Modbus RTU devices can be used in 2G/3G remote system.

### ► **Simple Local I/O link Control**

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There are I/O built-in 2G/3G RTU devices of ICP DAS. Therefore, these products can be the 2G/3G I/O devices. Expect for these local I/O data can be sent to the host PC, the I/O link function of them help users to do the simple control in local field. For example: the DI trigger or high/low AI alarm can driver the DO channel.

### ► **Simple Local I/O link Control**

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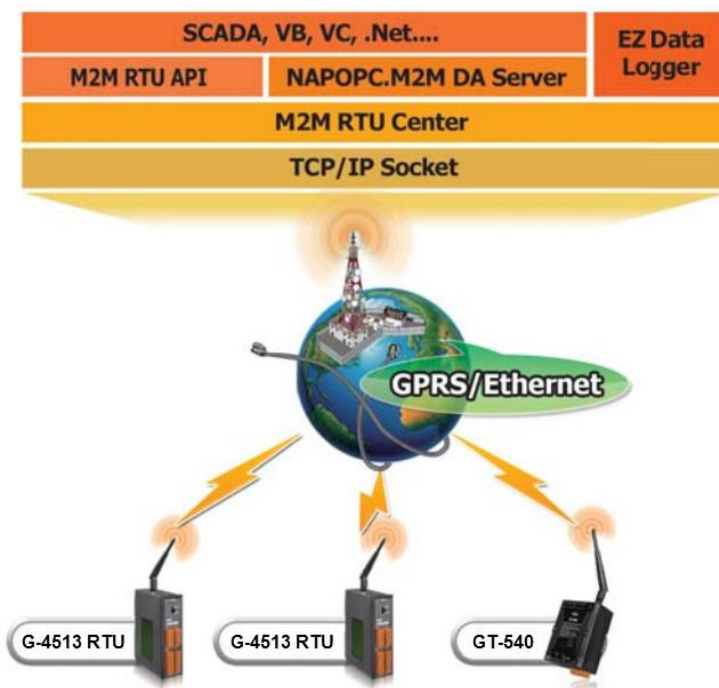
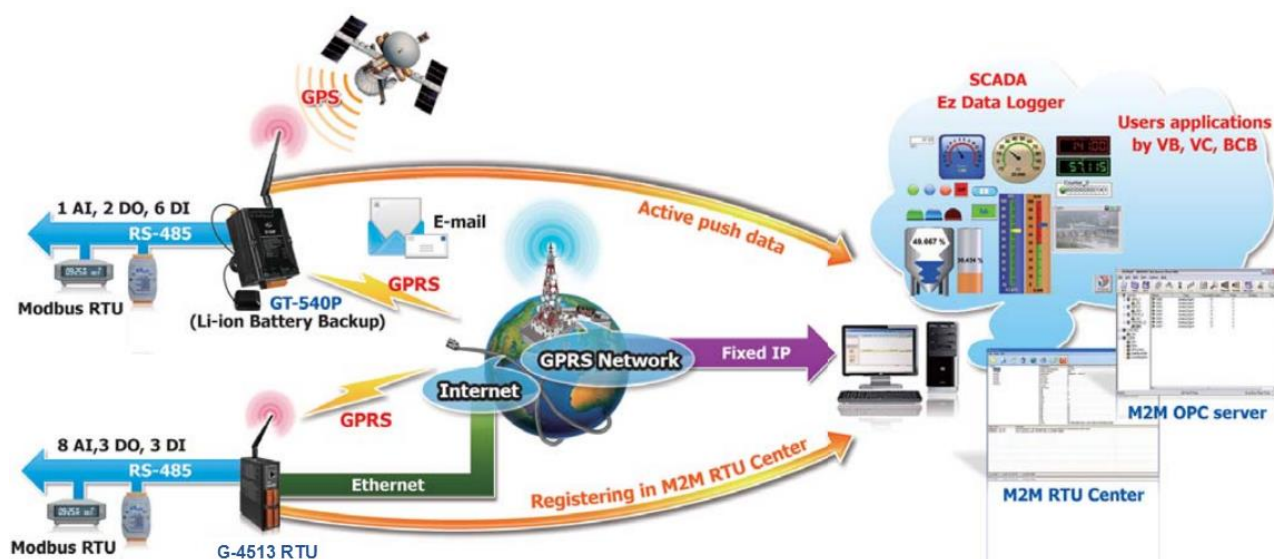
2G/3G RTU products provide an external SD interface. Users can set which built-in I/O need to record in SD memory card for one day in a single file.

## 1.2 Features

- Automatic/continuous 2G/3G Link Management
- Support Modbus RTU protocol to connect to Max 10 Modbus RTU devices via RS-485 port
- Support M2M OPC server for SCADA system
- Easy-to-use API tool for users to develop their applications by various program development tools
- Built-in I/O make 2G/3G RTU be the 2G/3G I/O devices
- Support LCD display in G-4513(P)D-3GWA
- I/O data recorded in SD card
- Ethernet and 2G/3G redundant communication paths
- Local I/O linkage function to make the simple local control
- Power supply 10 ~ 30 VDC
- Power-Saving Mode to extend battery life

### 1.3 Communication and Software Architecture

The cellular service provider often assigned dynamic IP with private IP address on 2G/3G network. That often causes the problem of communication with the host PC in most traditional solutions. To resolve this issue, they often use the high-cost public, static IP addresses for each device, DDNS solution, or buy VPN service. Instead of the above solutions, ICP DAS provides the active transmission method in G-4513 RTU devices. Each G-4513 RTU device would register and send data to M2M RTU Center automatically. That just needs a fixed IP in the Host PC for M2M RTU Center and M2M OPC server or other program can exchange data with M2M RTU Center. It is a good way to eliminate the IP management issue for users than the traditional solution.



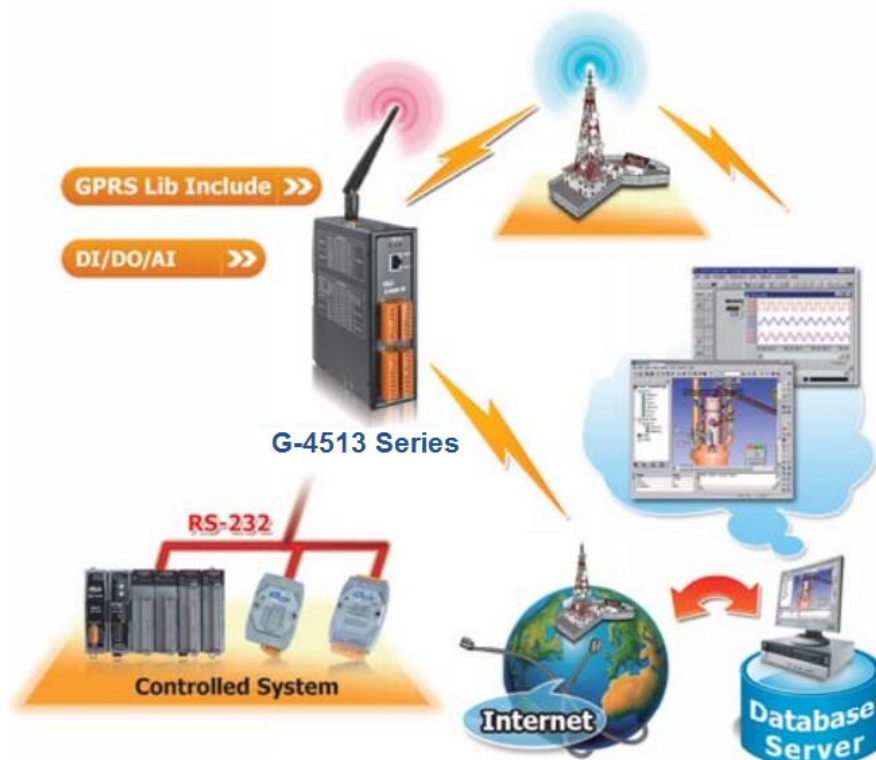


## 1.4 Applications

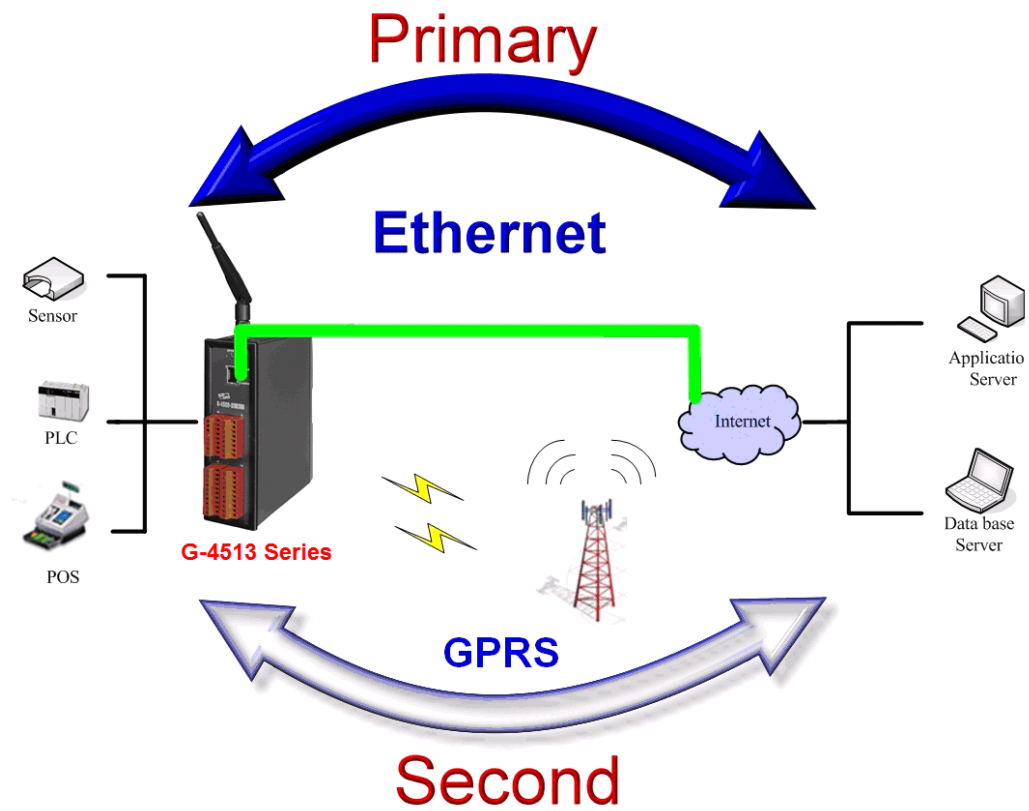
- Energy Management
- HVAC & Refrigeration
- Security & Access Control
- Vehicle tracking system



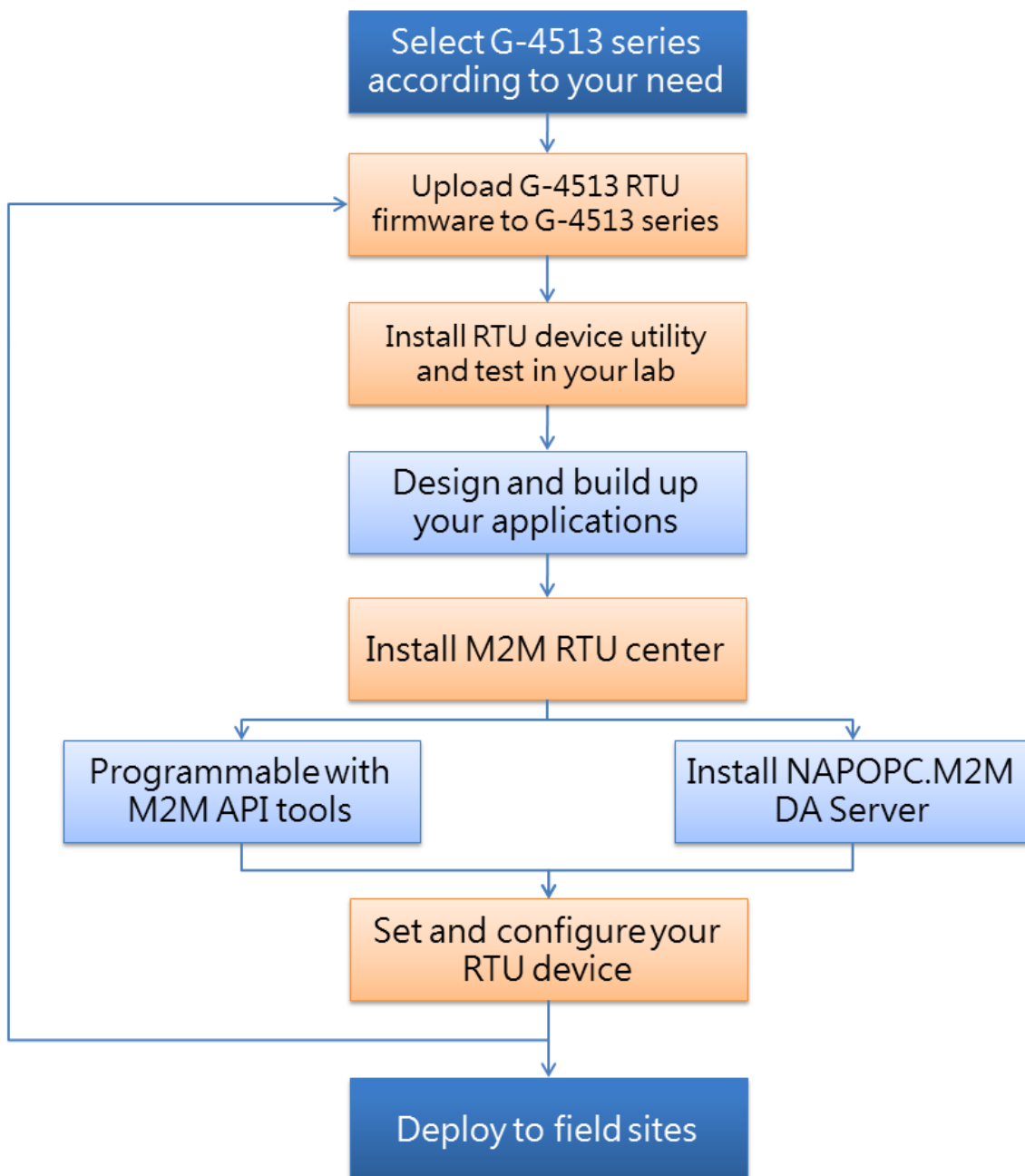
- Remote Control/Monitor System



- Redundant Communication System



## 1.5 How to use G-4513 RTU



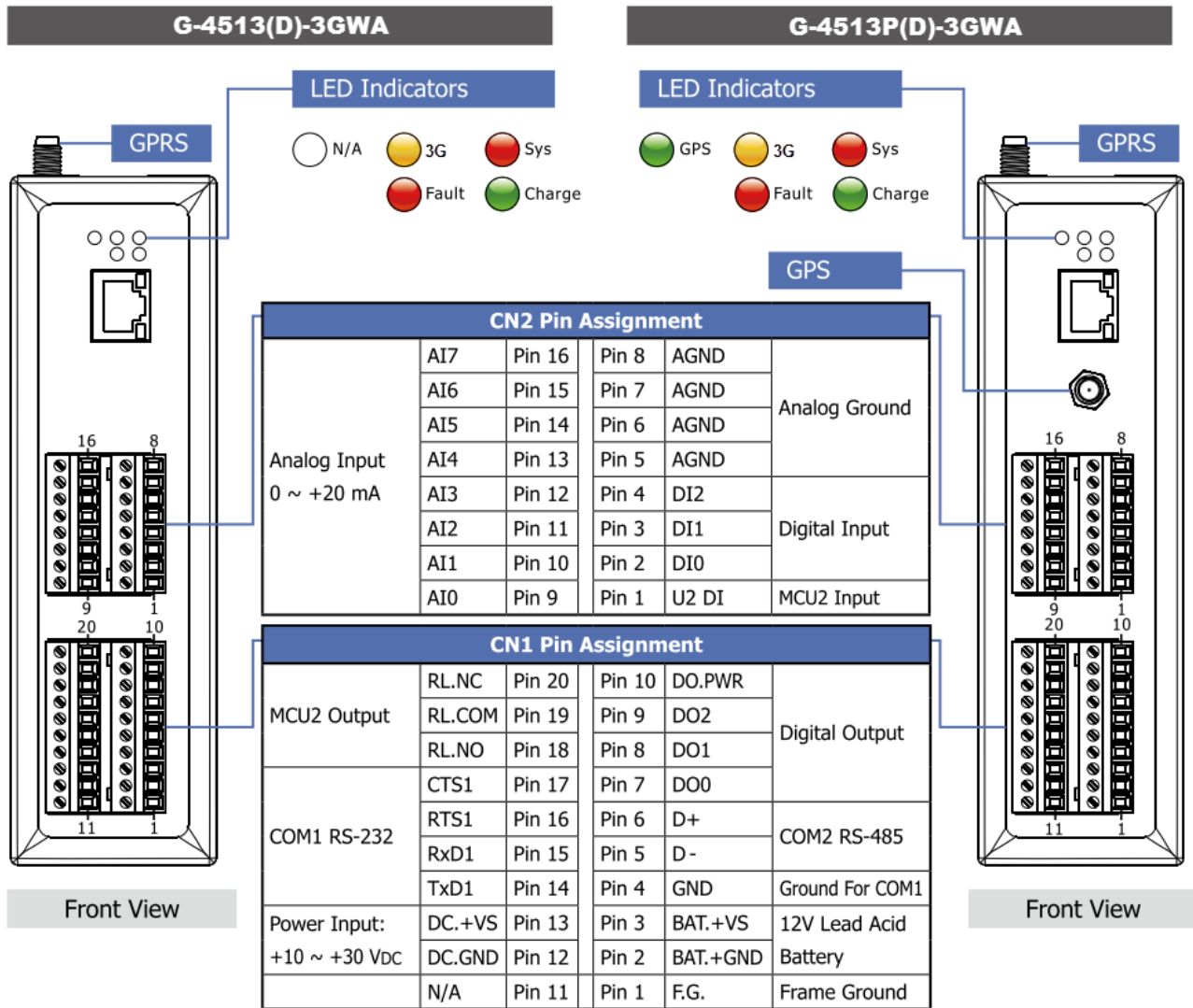
## 2. Hardware

### 2.1 Supported Product

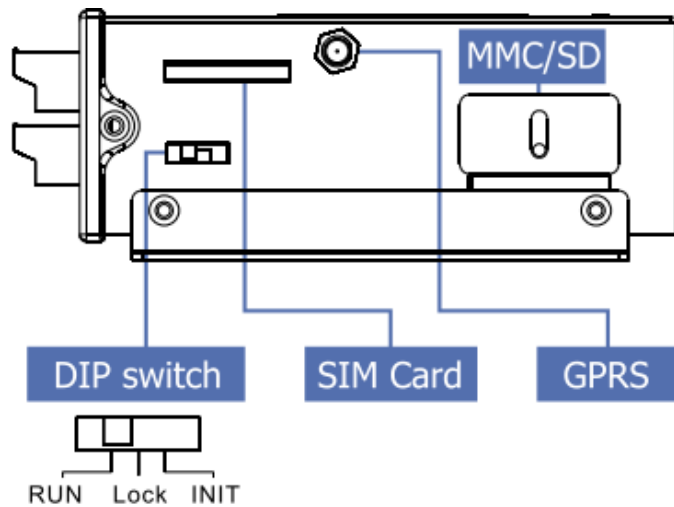
The G-4513 RTU is an intelligent Active 2G/3G Remote Terminal Unit which is built-in the specified firmware in G-4513 series.

Product Type	Description
<b>G-4513-3GWA CR</b>	3G WCDMA Power Saving PAC with Solar charger (RoHS)
<b>G-4513D-3GWA CR</b>	3G WCDMA Power Saving PAC with Solar charger and LCD display (RoHS)
<b>G-4513P-3GWA CR</b>	3G WCDMA Power Saving PAC with Solar charger and GPS Function (RoHS)
<b>G-4513PD-3GWA CR</b>	3G WCDMA Power Saving PAC with Solar charger, LCD display and GPS Function (RoHS)

## 2.2 Pin Assignments




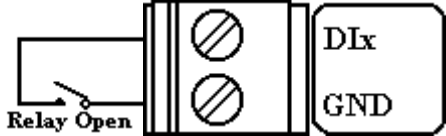
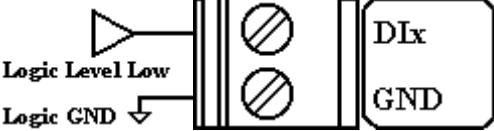
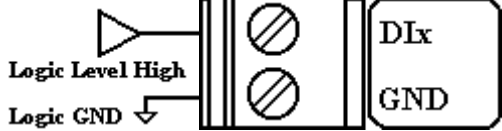
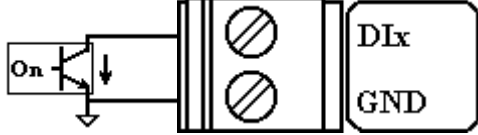
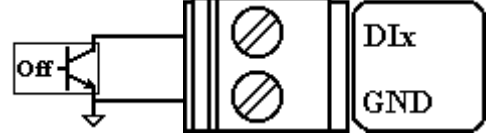
## 2.3 Operation Mode Switch



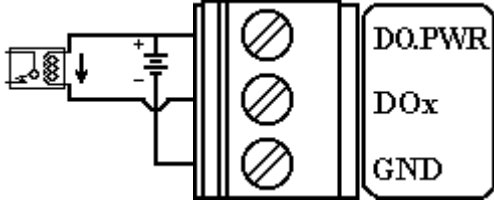
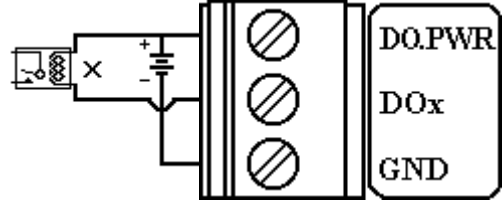
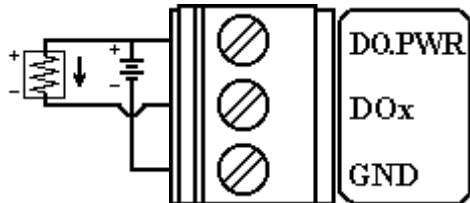
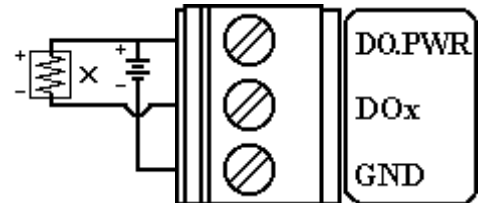
Operation Mode Switch	
RUN	OS can execute autoexec.bat
	Flash can be read/write.
Lock	OS can execute autoexec.bat
	Flash is read only (lock).
INIT	OS can not execute autoexec.bat
	Flash can be read/write.

## 2.4 Wire Connection

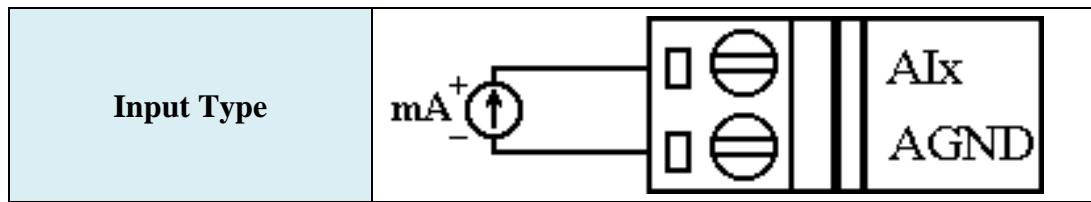
### ➤ Digital Input Wire Connection

Input Type	ON State DI value as <b>0</b>	OFF State DI value as <b>1</b>
Relay Contact		
TTL/CMOS Logic		
Open Collector		

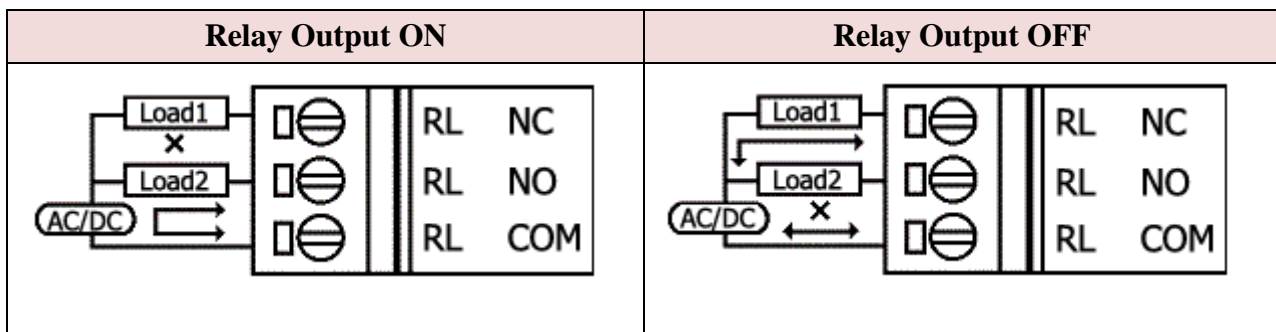
### ➤ Digital Output Wire Connection

Input Type	ON State DO value as 1	OFF State DO value as 0
Drive Relay		
Resistance Load		

➤ Current Input Wire Connection

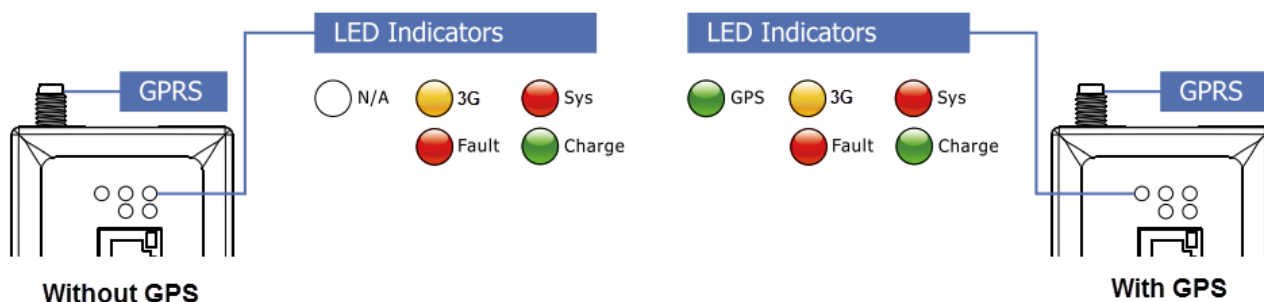


➤ Relay Wire connection





## 2.5 LED Indicators



There are five LED indicators to help users to judge the various conditions of G-4513 Series. The description is as follows:

A. Sys (Red): System LED is to indicate if the G-4513 RTU is normal or fail.

Connected	Linking	3G module fail or hardware initialization	PIN code error
Blinking per 1 sec	Blinking per 2 sec	Always ON	Blinking per 50 ms

B. 3G (Yellow): The modem LED can indicate the status of 3G module.

3G module normal		3G module fail
2G Mode	Blinking per 2 sec	OFF or Blinking (not 3 sec)
3G Mode	Blinking twice per 2 sec	

C. GPS (Green)(Option): The GPS LED can indicate the status of GPS module.

GPS Fail	Search GPS	Receive GPS data
Always OFF	Always ON	Blinking (1 sec)

D. Charging (Green): Charging status indicator.

Charging	Not Charging
Always ON	Always OFF

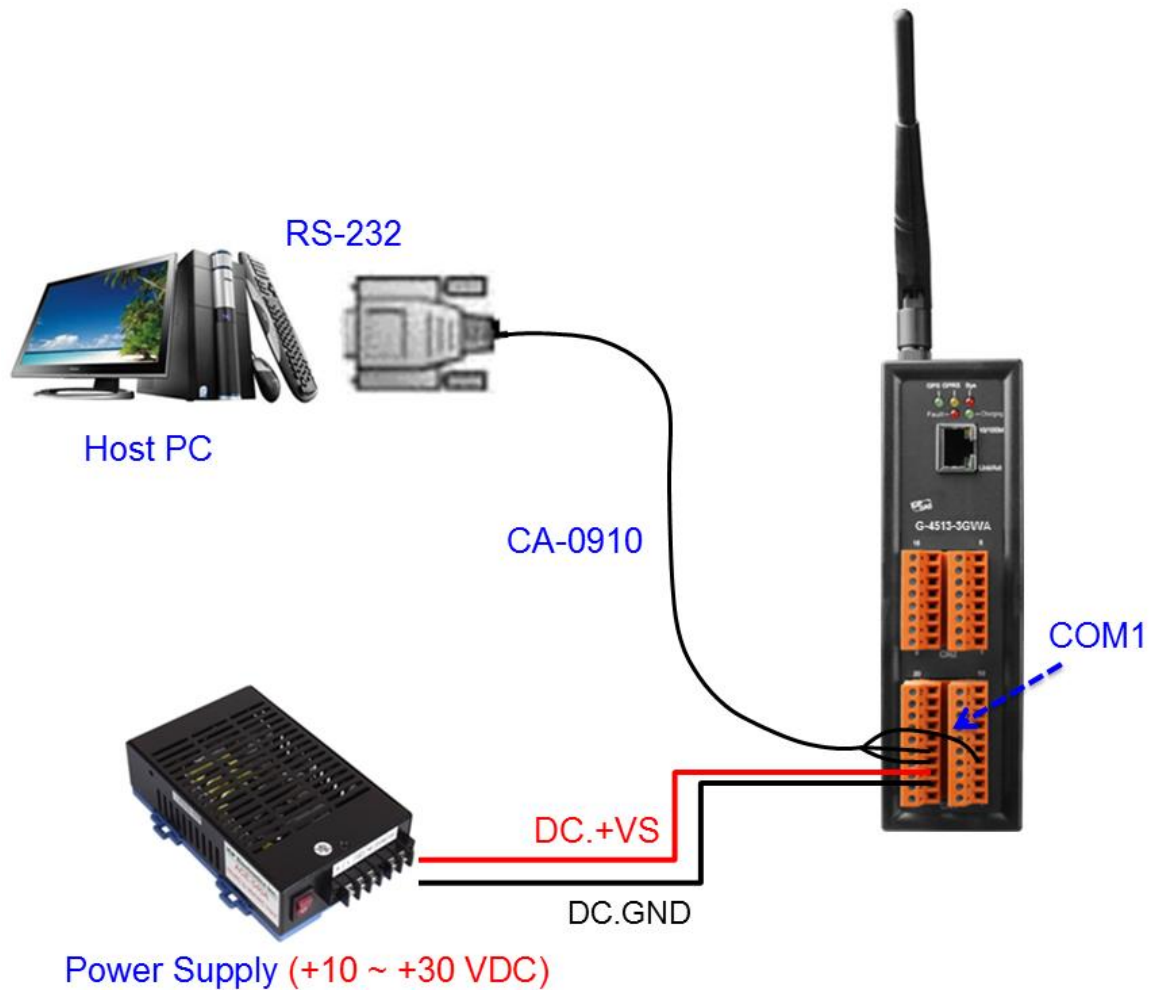
E. Fault (Red): Charging Fault indicator.

Normal	Fault
Always OFF	Always ON

### 3. Upload RTU Firmware to G-4513 Series

#### 3.1 Hardware Connection

When users want to use G-4513 RTU, they need to upload G-4513 RTU firmware to G-4513 series hardware. There are 2 kinds of interfaces which are RS-232 and Ethernet ports to download the firmware. Use the COM Port of Host PC connects to G-4513 series with cable CA-0910. Please refer to the below picture.



- Turn the dip switch to **INIT** mode and **restart** the G-4513 series power.



## 3.2 Upload Firmware

- Download the MiniOS7 Utility software

[http://ftp.icpdas.com/pub/cd/8000cd/napdos/minios7/utility/minios7\\_utility/](http://ftp.icpdas.com/pub/cd/8000cd/napdos/minios7/utility/minios7_utility/)

- MiniOS7 Utility user's manual

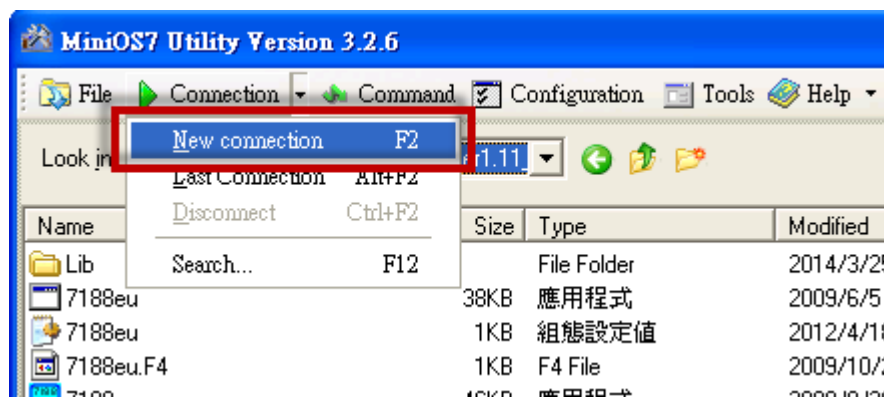
[http://ftp.icpdas.com/pub/cd/8000cd/napdos/minios7/utility/minios7\\_utility/minios7\\_utility.pdf](http://ftp.icpdas.com/pub/cd/8000cd/napdos/minios7/utility/minios7_utility/minios7_utility.pdf)

- Download G-4513 RTU Firmware

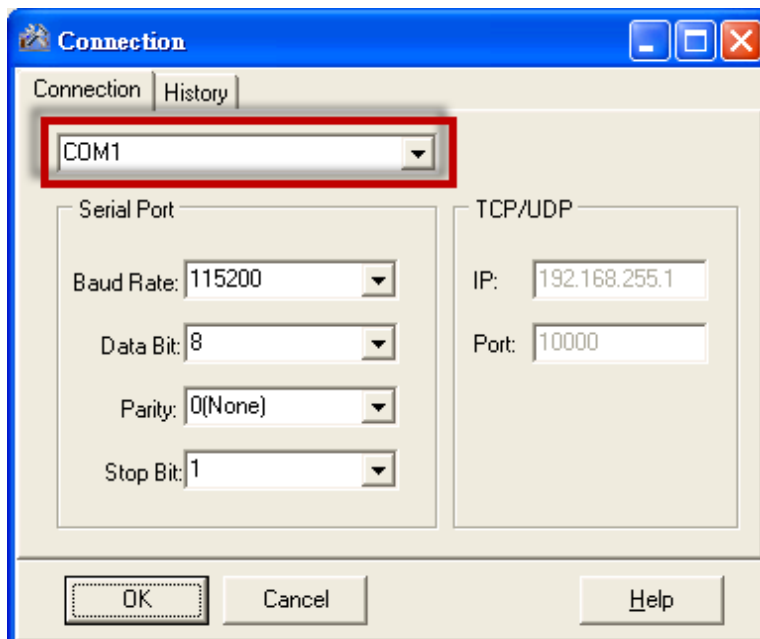
<http://ftp.icpdas.com/pub/cd/usbcd/napdos/g-4513-3gwa/software/rtu/software/firmware/>

### 3.2.1 Upload Firmware to G-4513 Series via COM Port

- Choose Menu Bar > Connection, and click new connection



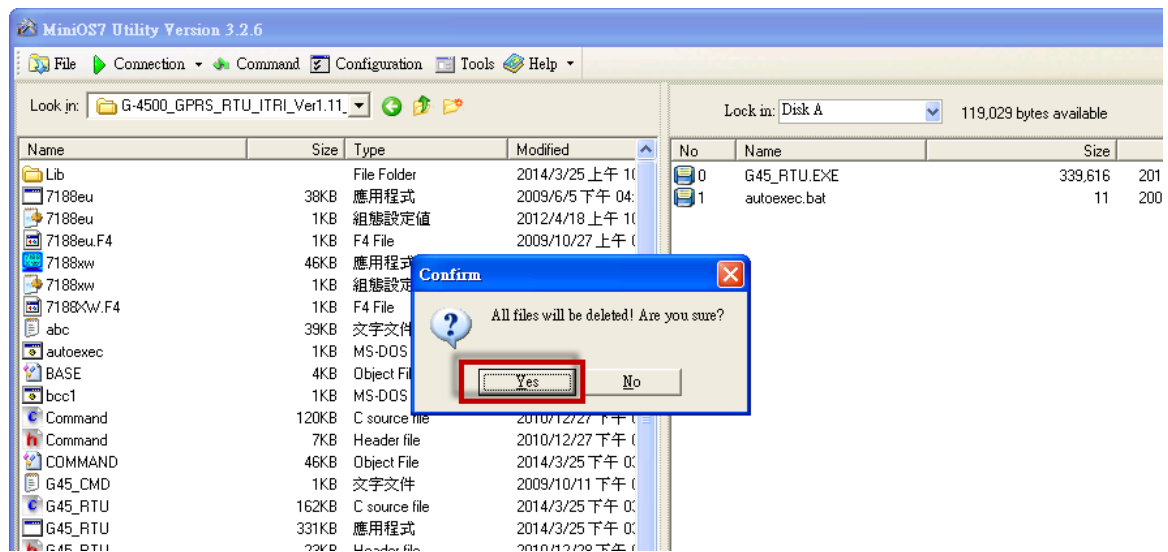
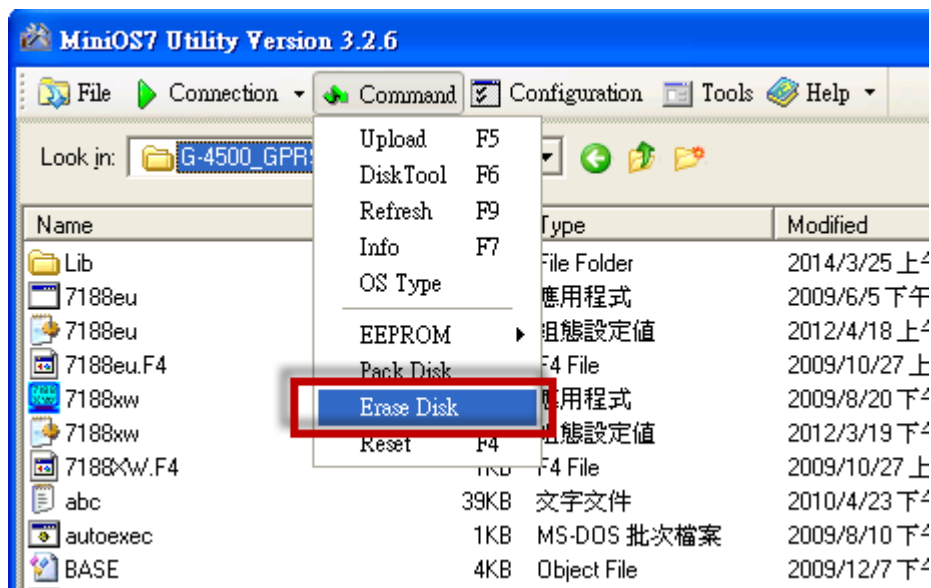
- Select your number of COM port



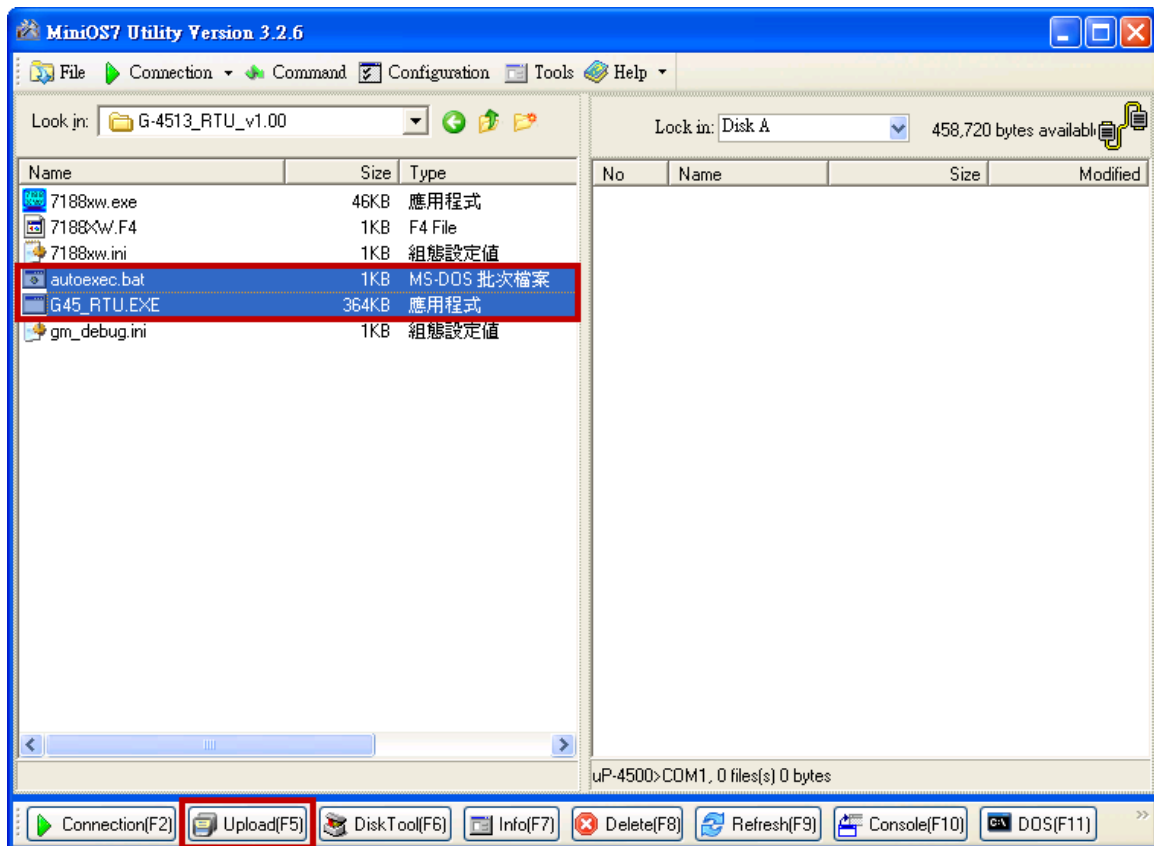
Com port parameters (Fixed)

Baud Rate	115200
Data Bit	8
Parity	0 (None)
Stop Bit	1

(3) Choose Menu Bar > Command, and click “Erase Disk”



- (4) Select the **G45\_RTU.exe** and **autoexec.bat**, click the “Upload” button to upload the firmware



- (5) Turn the dip switch to **RUN** mode and **restart** the G-4513 series power after upload the firmware successfully

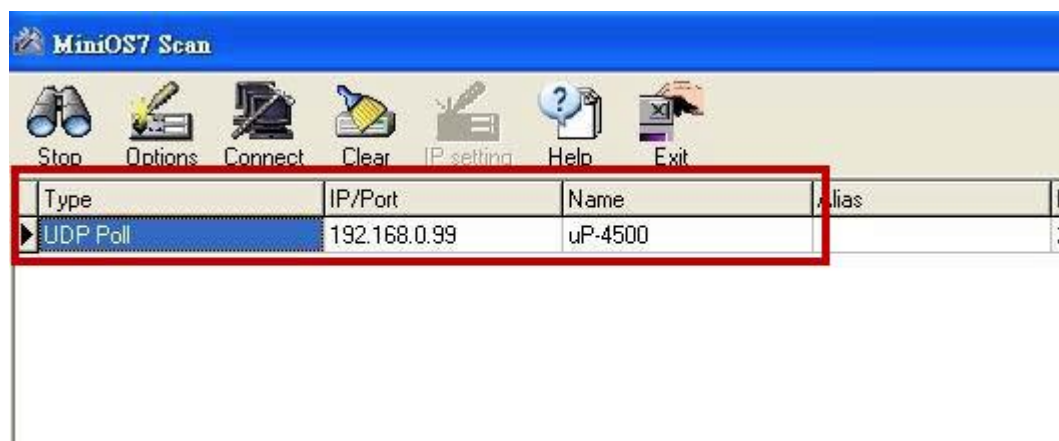


### 3.2.2 Upload Firmware to G-4513 Series via Ethernet

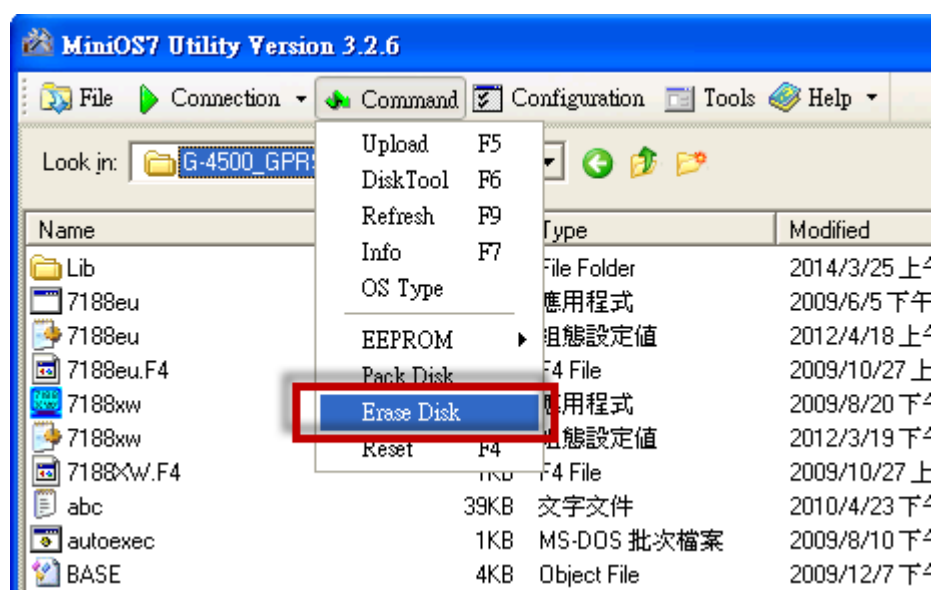
- (1) Choose Menu Bar > Connection, and click search

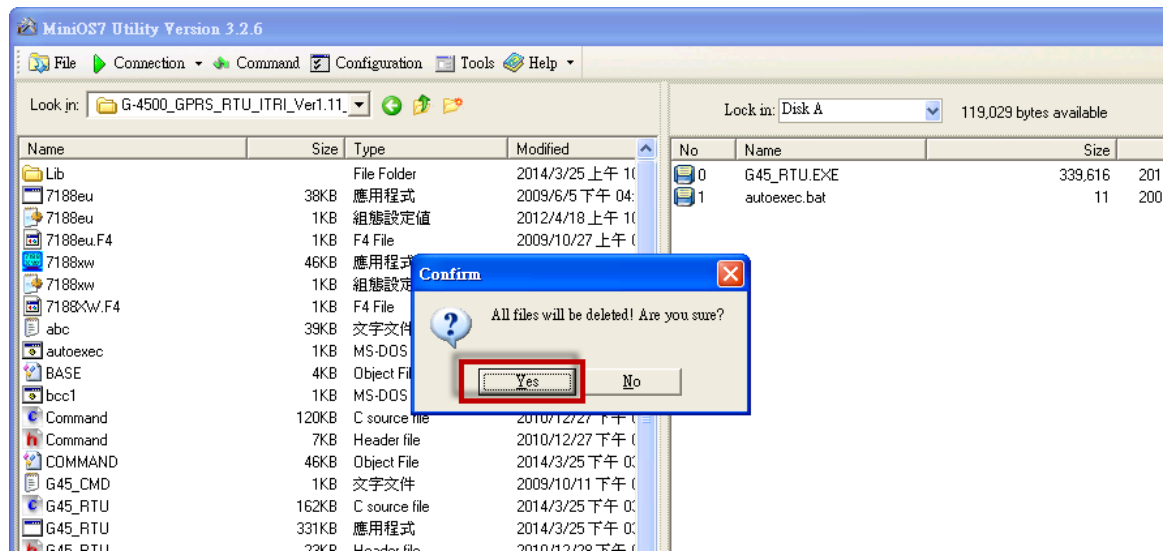


- (2) Double-click your G-4513 series.

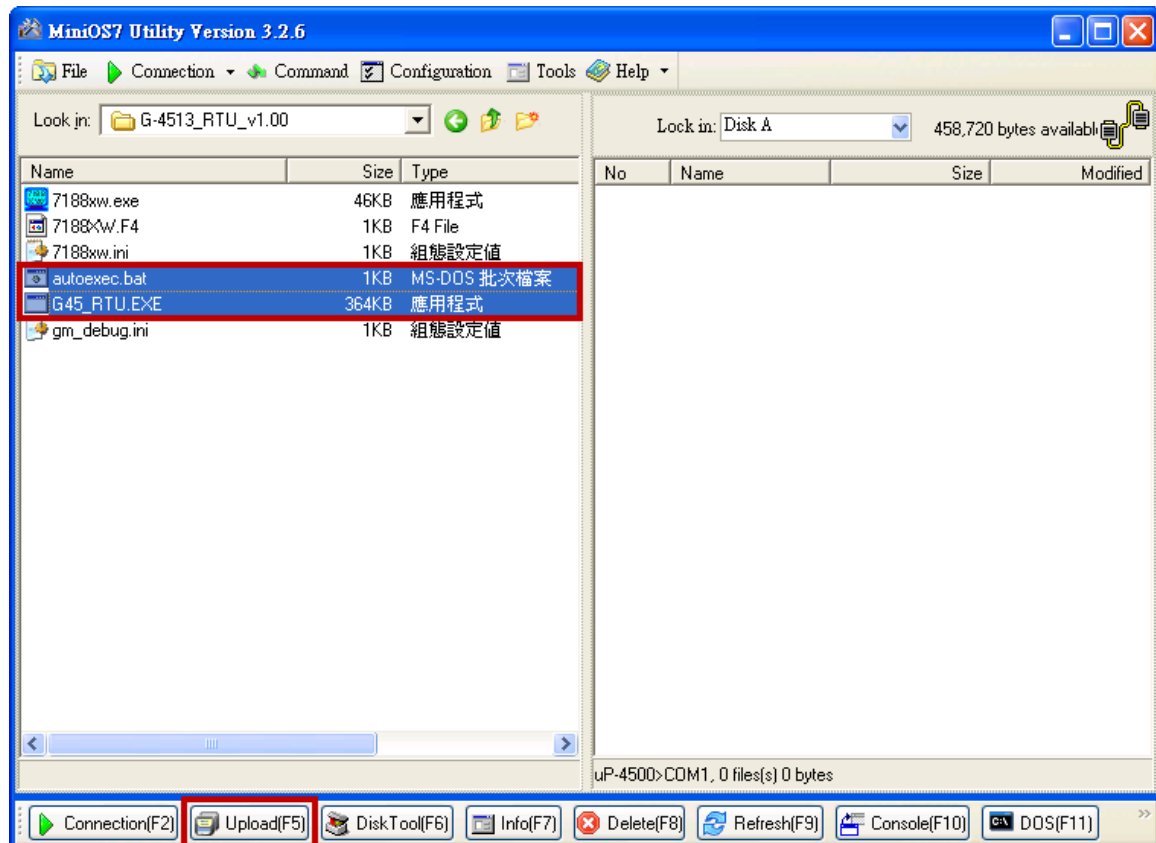


- (3) Choose Menu Bar > Command, and click "Erase Disk"





- (4) Select the **G45\_RTU.exe** and **autoexec.bat**, click the “Upload” button to upload the firmware



- (5) Turn the dip switch to **RUN** mode and **restart** the G-4513 series power after upload the firmware successfully





## 4. Installing G-4513 RTU Utility

### Tips & Warnings



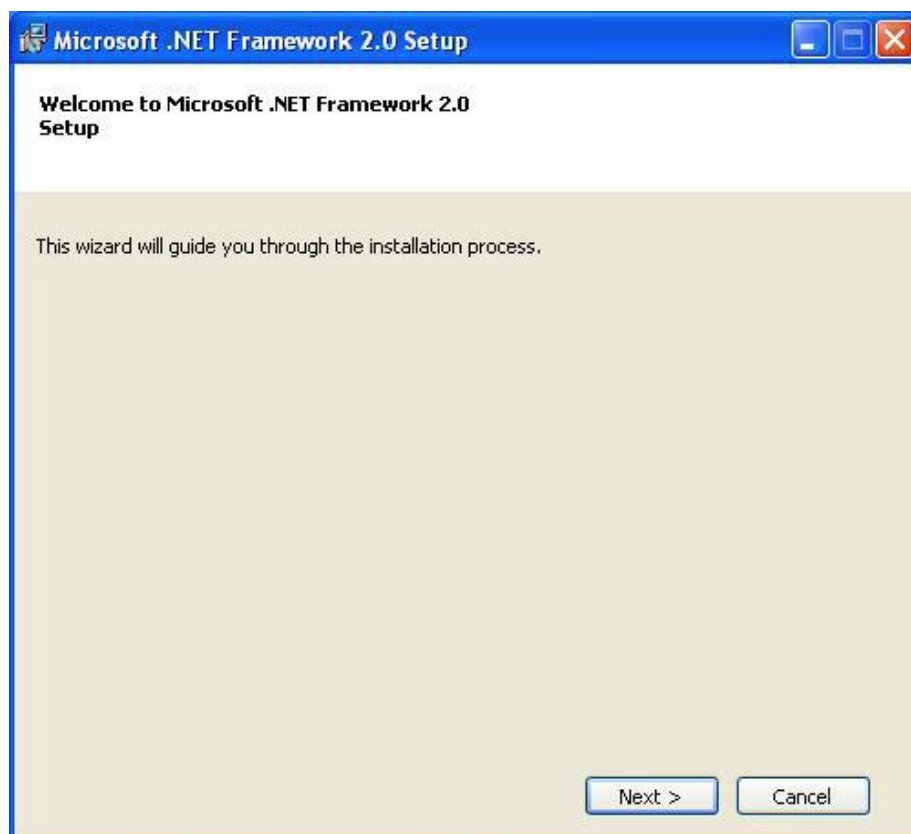
It needs the runtime environment with .NET Framework 2.0 or above to execute the G-4500 RTU Utility in the PC. If there has .NET Framework 2.0 or above in the PC, the section 4.1 can be omitted.

### 4.1 Installing .NET Compact Framework

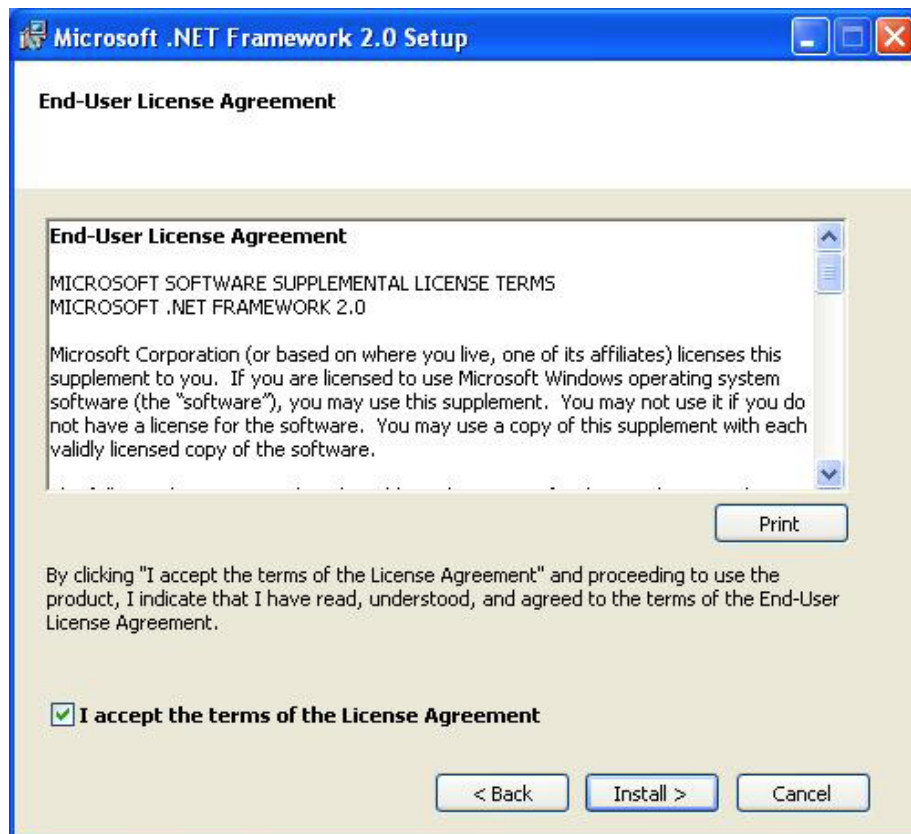
- Download Microsoft .NET Framework Version 3.5  
<http://www.microsoft.com/en-us/download/details.aspx?id=21>

- The install figure as follows

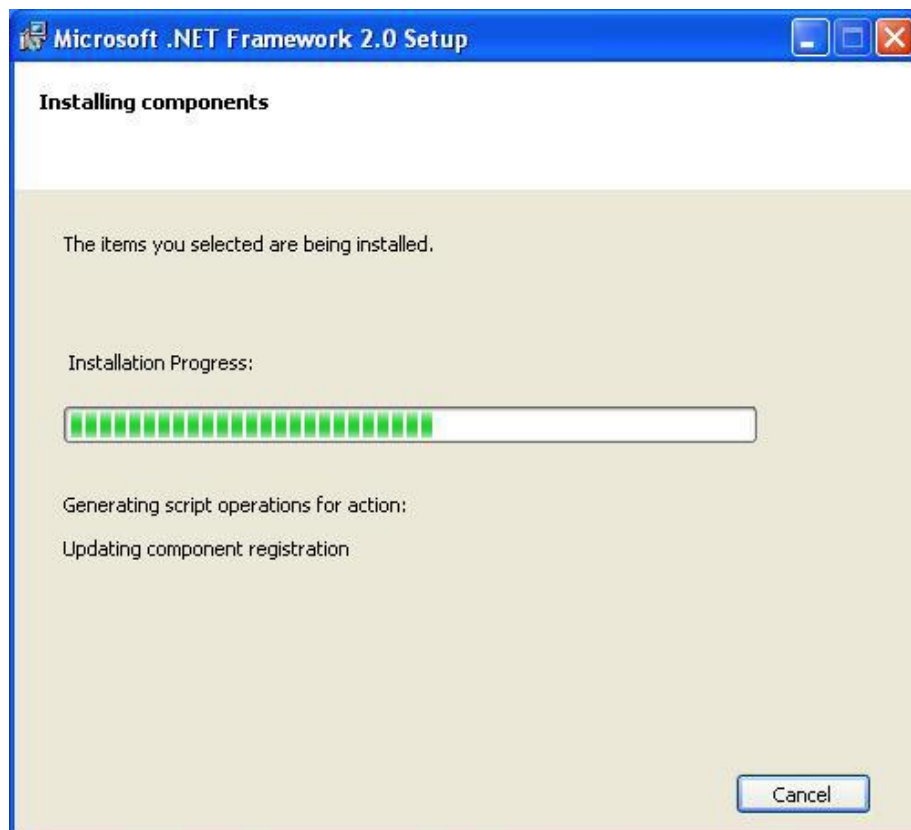
- (1) Press “Next” to the next step



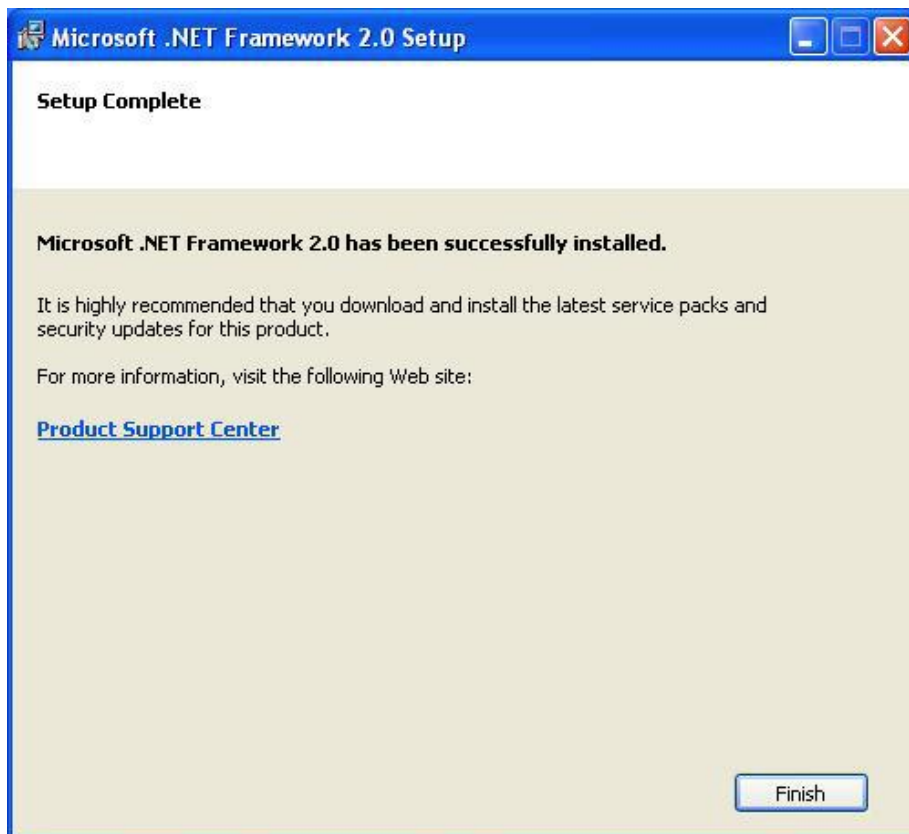
- (2) Select the "I accept the terms of the License Agreement" and "Install" to the next step



- (3) The installation process would be going



- (4) After finishing the installation, press “Finish” to exit the program



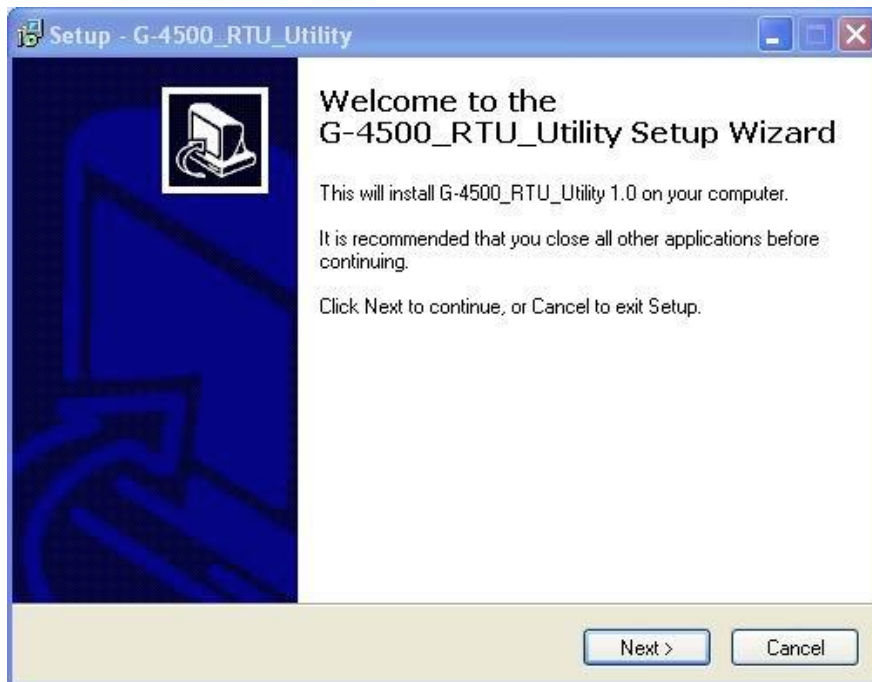
## 4.2 Installing G-4513 RTU Utility

- Download G-4513 RTU Utility

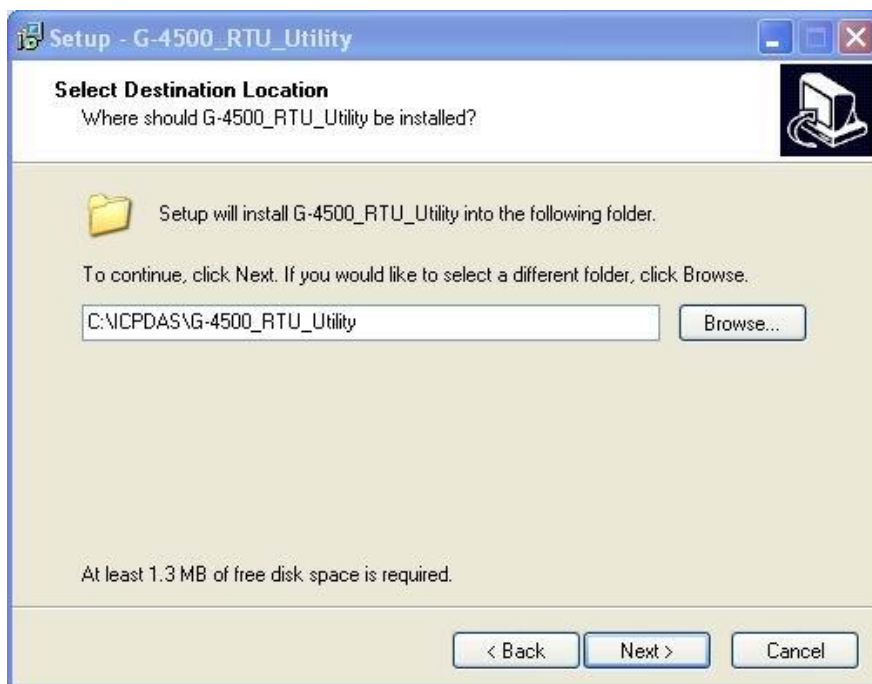
<http://ftp.icpdas.com/pub/cd/usbcd/napdos/g-4513-3gwa/software/rtu/software/utility/>

- The install figure as follows

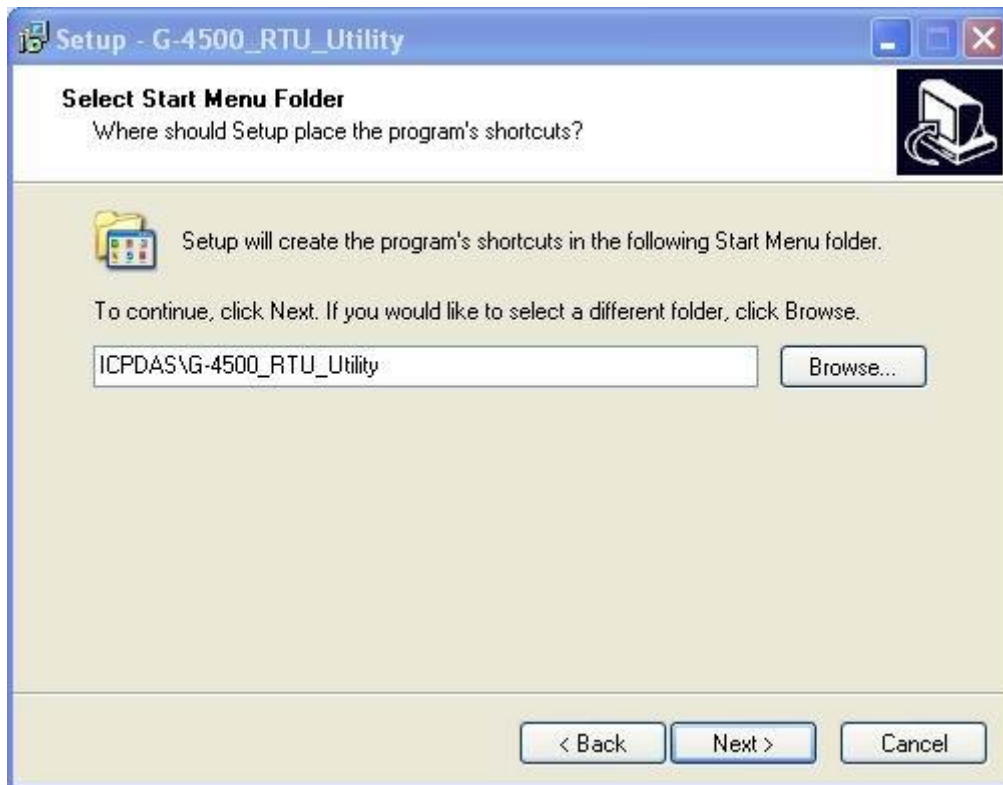
- (1) Press “Next” to start the installation procedure



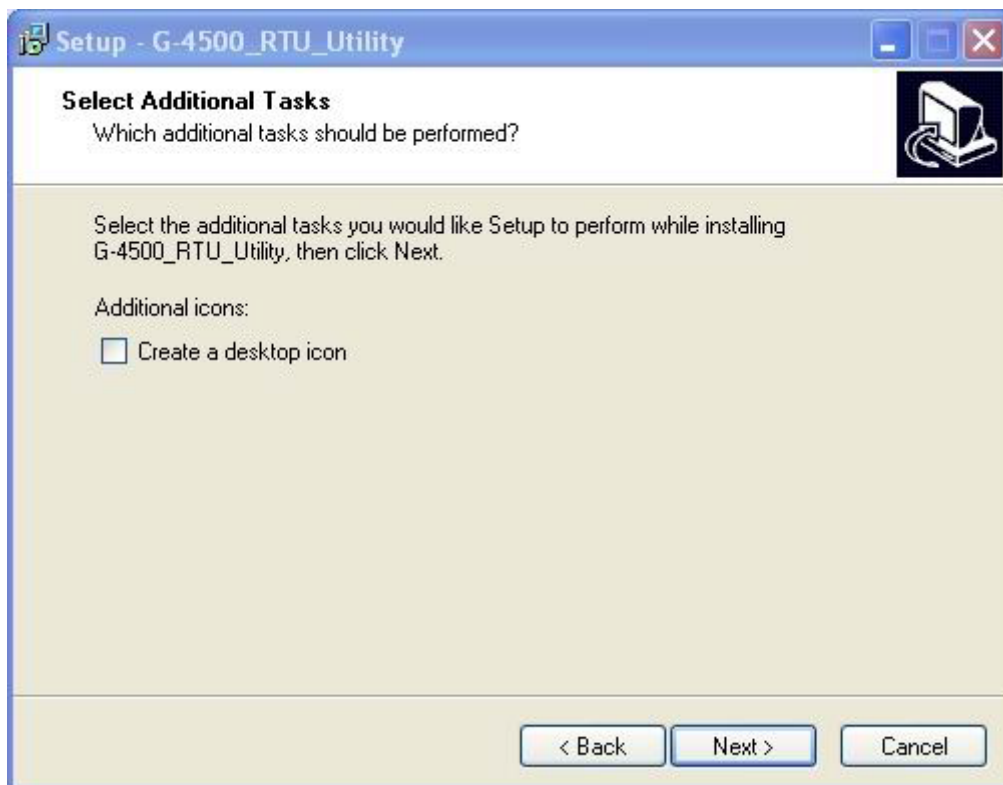
- (2) Select the installation path. The default path is “C:\ICPDAS\G-4513\_RTU\_Utility”.



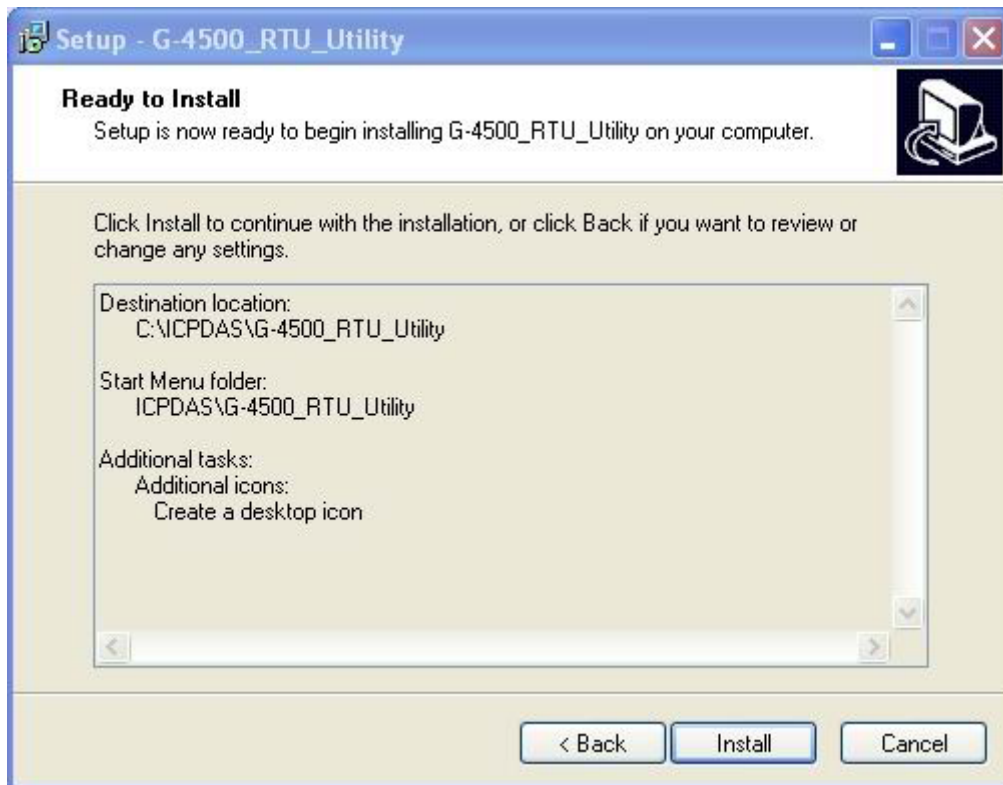
- (3) Select the start menu folder path. The default path is “ICPDAS\G-4513\_RTU\_Utility”.



- (4) Press “Next” to the next step



- (5) Press “Next” to the next step

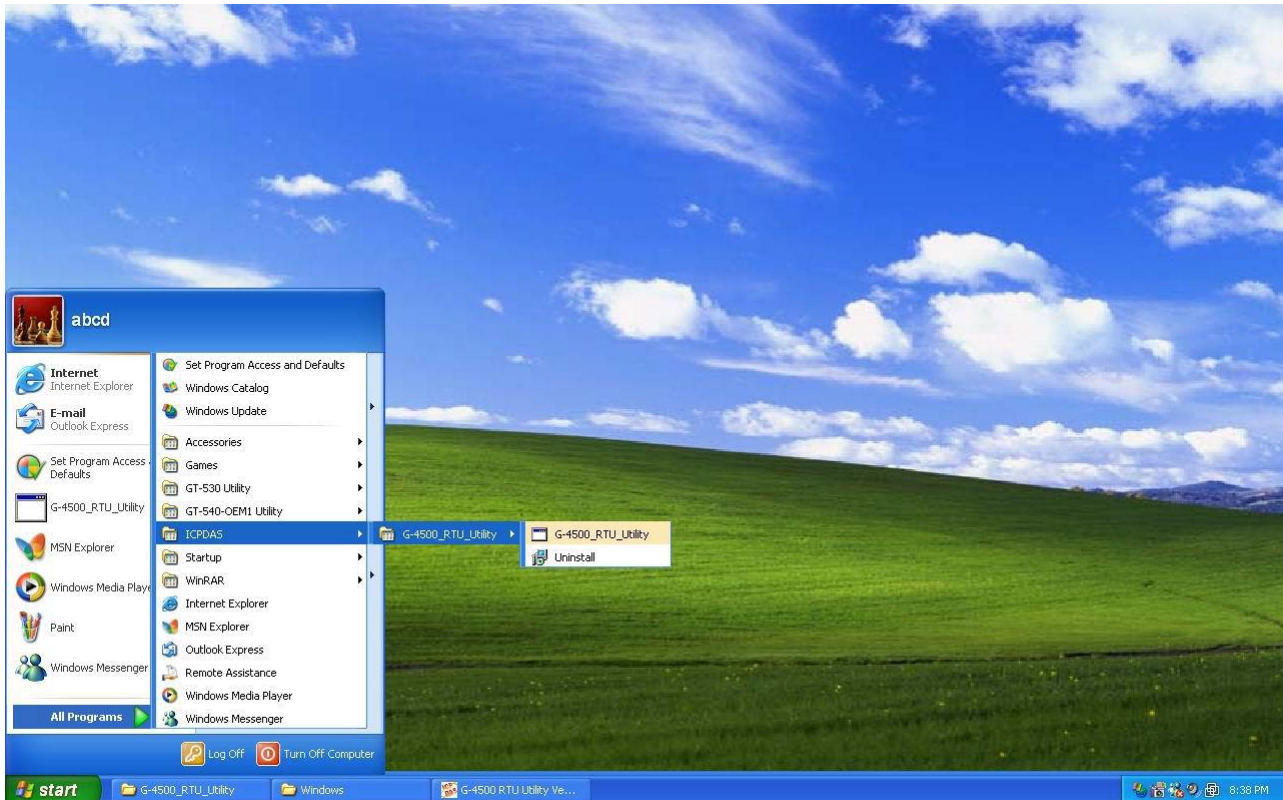


- (6) Press “Finish” to finish the installation procedure





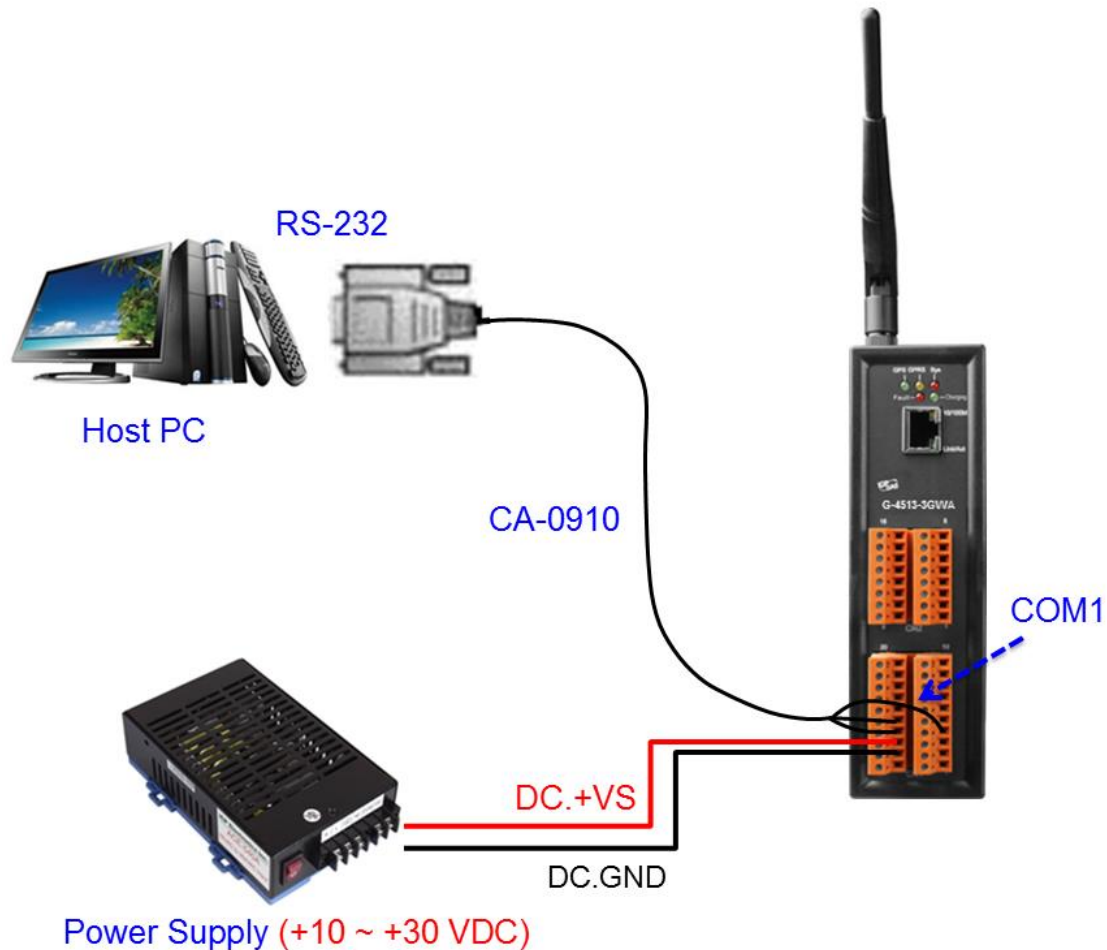
- (7) Execute G-4513 RTU Utility from the start menu “Start > All Programs > ICPDAS > G-4513\_RTU\_UTILITY > G-4513\_RTU\_UTILITY”



## 5. G-4513 RTU Utility Operation

### 5.1 Hardware Connection

When you want to configure G-4513 RTU with G-4513 Utility, using the COM Port of Host PC connects to G-4513 series with cable CA-0910. Please refer to the picture below.



- Turn the dip switch to **RUN** mode and **restart** the G-4513 series power

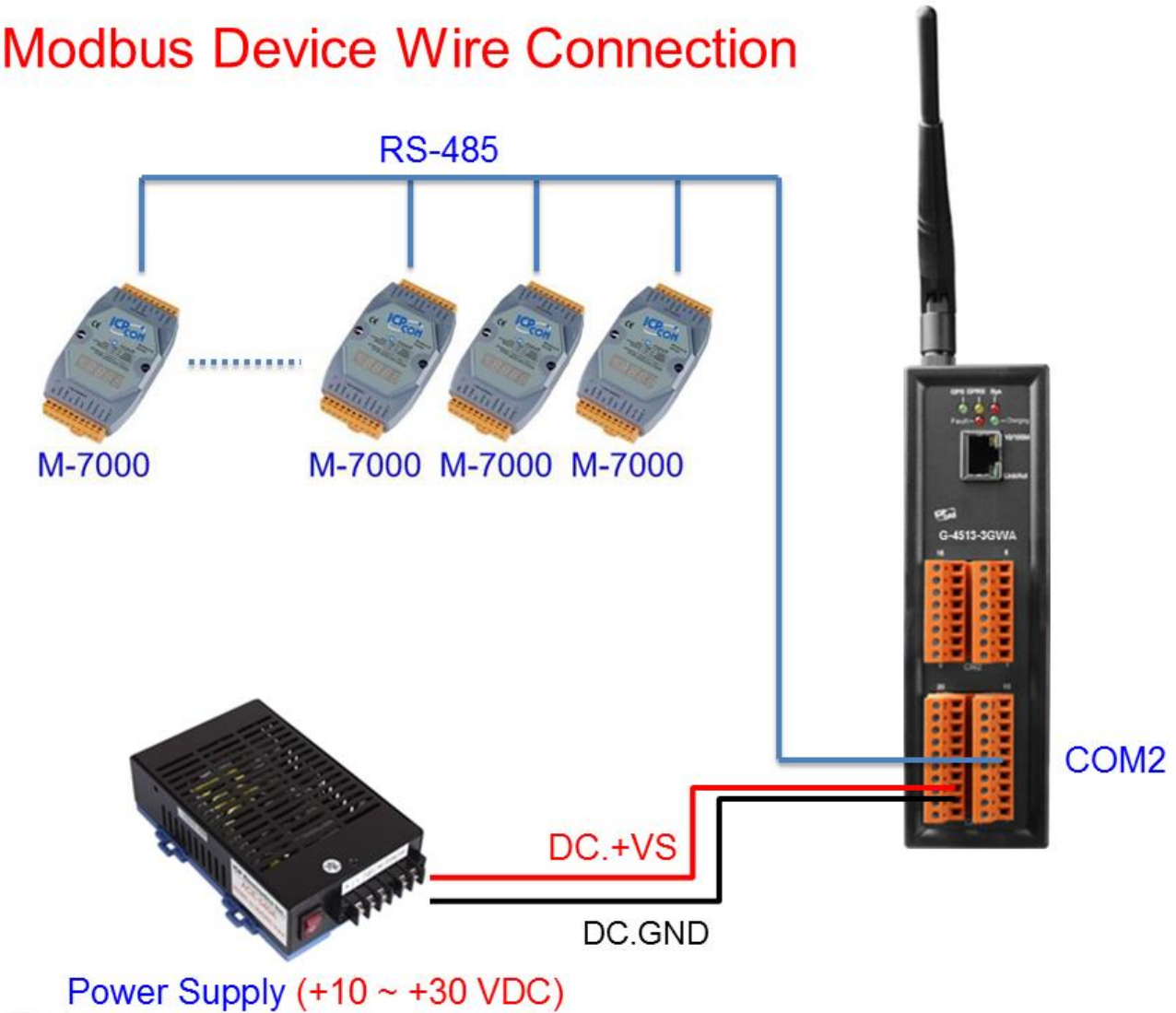




## 5.2 Modbus Device Wire Connection

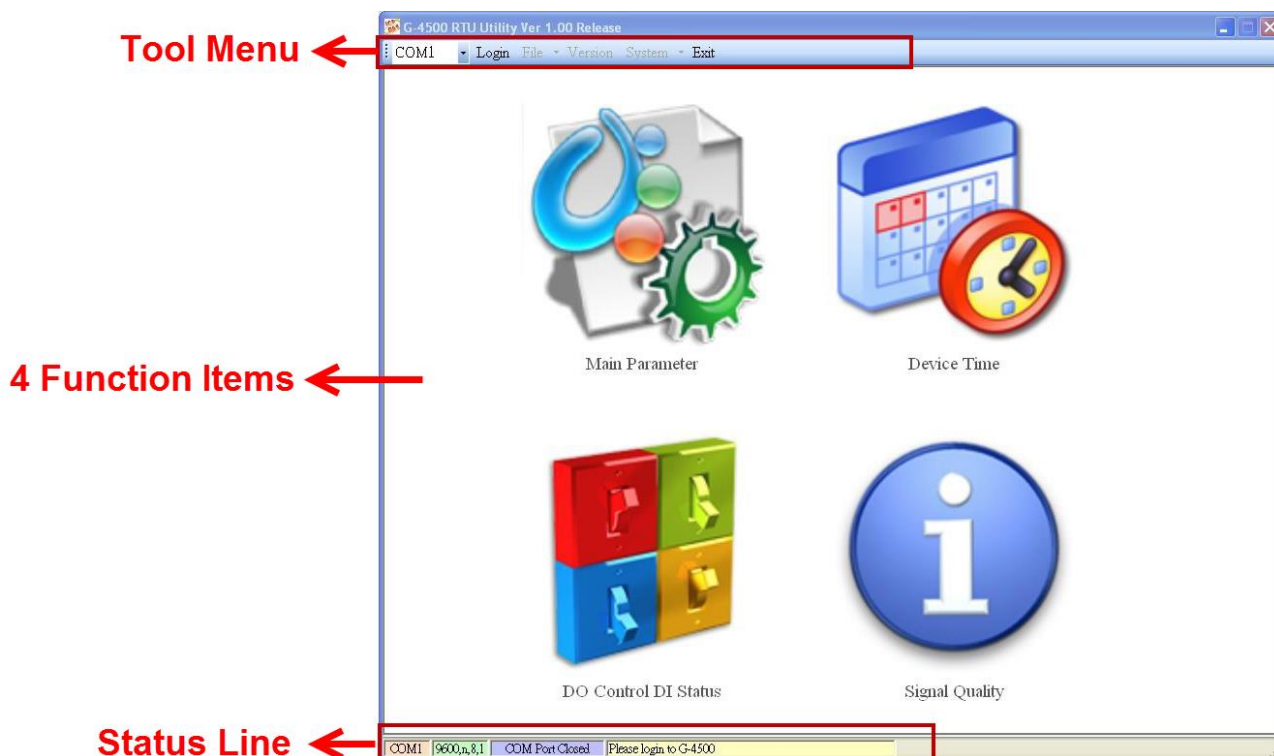
G-4513 RTU provides Modbus RTU Master Protocol to connect to Modbus RTU Devices by RS-485 port (COM2) of G-4513 series.

### Modbus Device Wire Connection



## 5.3 Main Menu

The main menu of G-4513 RTU Utility includes the following sections



### A. Tool Menu

1. COM: Set the COM port number in PC connecting to G-4513 series
2. Login/Logout: Login G-4513 series
3. File: There are import and export functions in "File" item. The functions would be enabled when "Main parameters" window is open
  - (1) Import: The parameters would be shown in "Main parameters" window from the specific .par file
  - (2) Export: The function can export the parameters as .par file from the "Main parameters" windows
4. Version: Including the firmware and Utility version information
5. System: Provide users for recovering G-4513 RTU to factory and resetting
6. Exit: To exit G-4513 RTU utility

### B. 4 function items

1. Main Parameter: The main parameter setting of G-4513 RTU includes Station ID, GPRS Username, GPRS Password, GPRS APN, Remoter server IP, Remote server Port, Local Ethernet IP, Local Ethernet Mask, Local Gateway, 10 Modbus device...etc.
2. Device Time: Display and set the RTC time of G-4513 RTU.
3. DO Control/DI Status: Display the status of I/O and control the DO output
4. Signal Quality: Show the 2G/3G signal strength

### C. Status Line

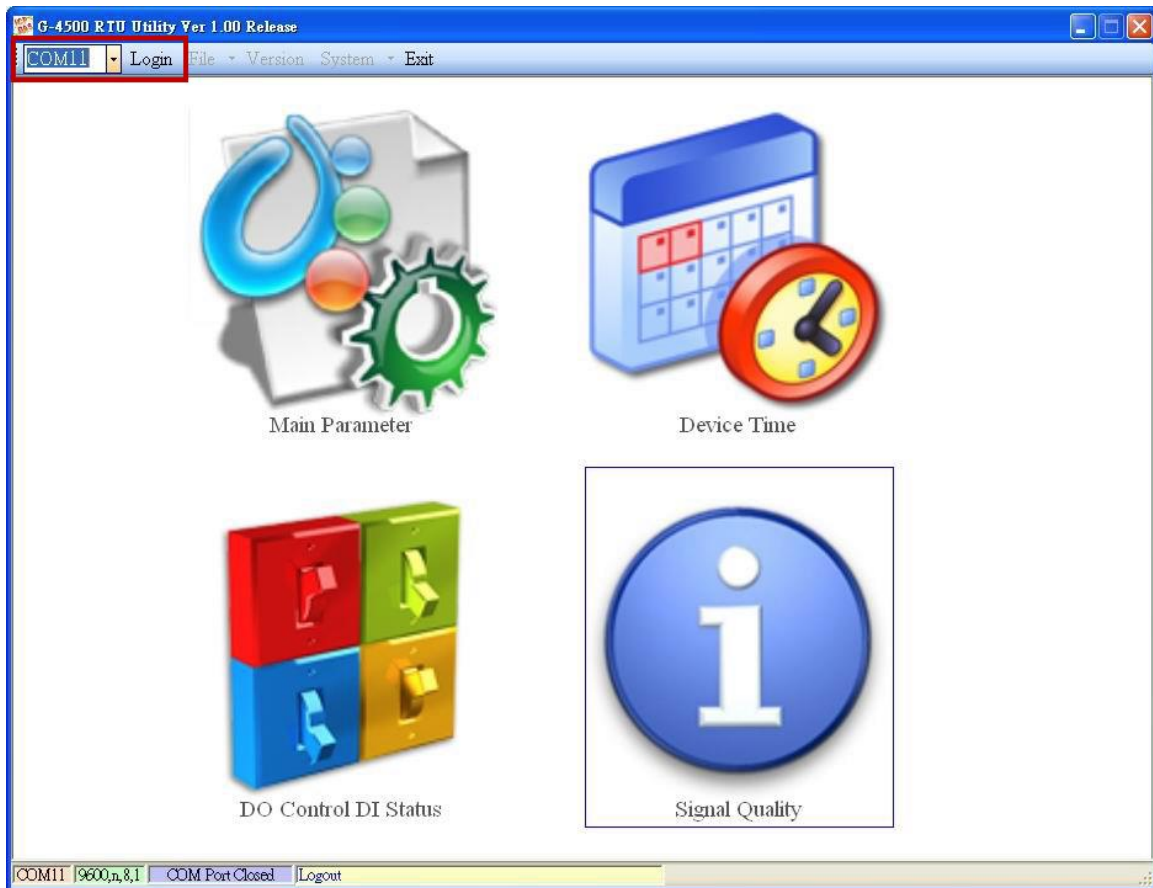
Show the related information during the operation procedure including

1. The com port number of PC
2. The communication setting of COM Port
3. The status of COM Port
4. The result of Utility operation

## 5.4 Login

It needs to login into G-4513 RTU to set its parameters. The description is below:

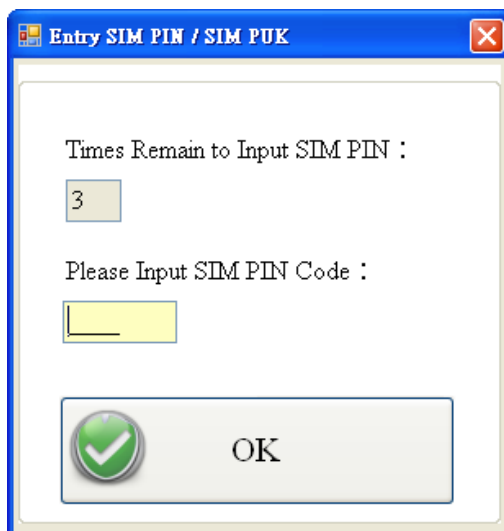
- (1) Select the COM port number of PC.
- (2) Press the “login” button



If the pin code in G-4513 RTU is not correct, the SYS led would be blanking per 50 ms and G-4513 utility would ask for users to input PIN or PUK code.

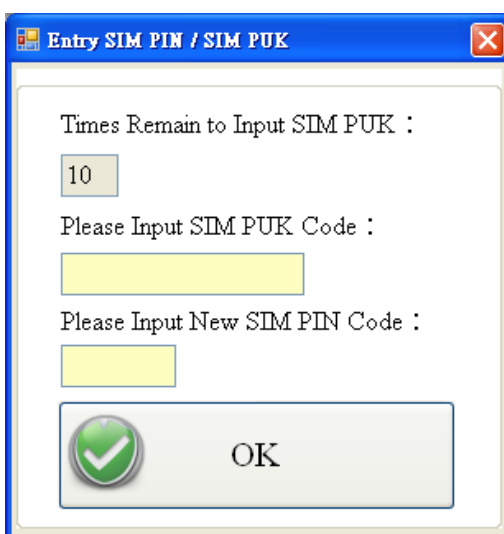
(1) Asking for inputting PIN code

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.



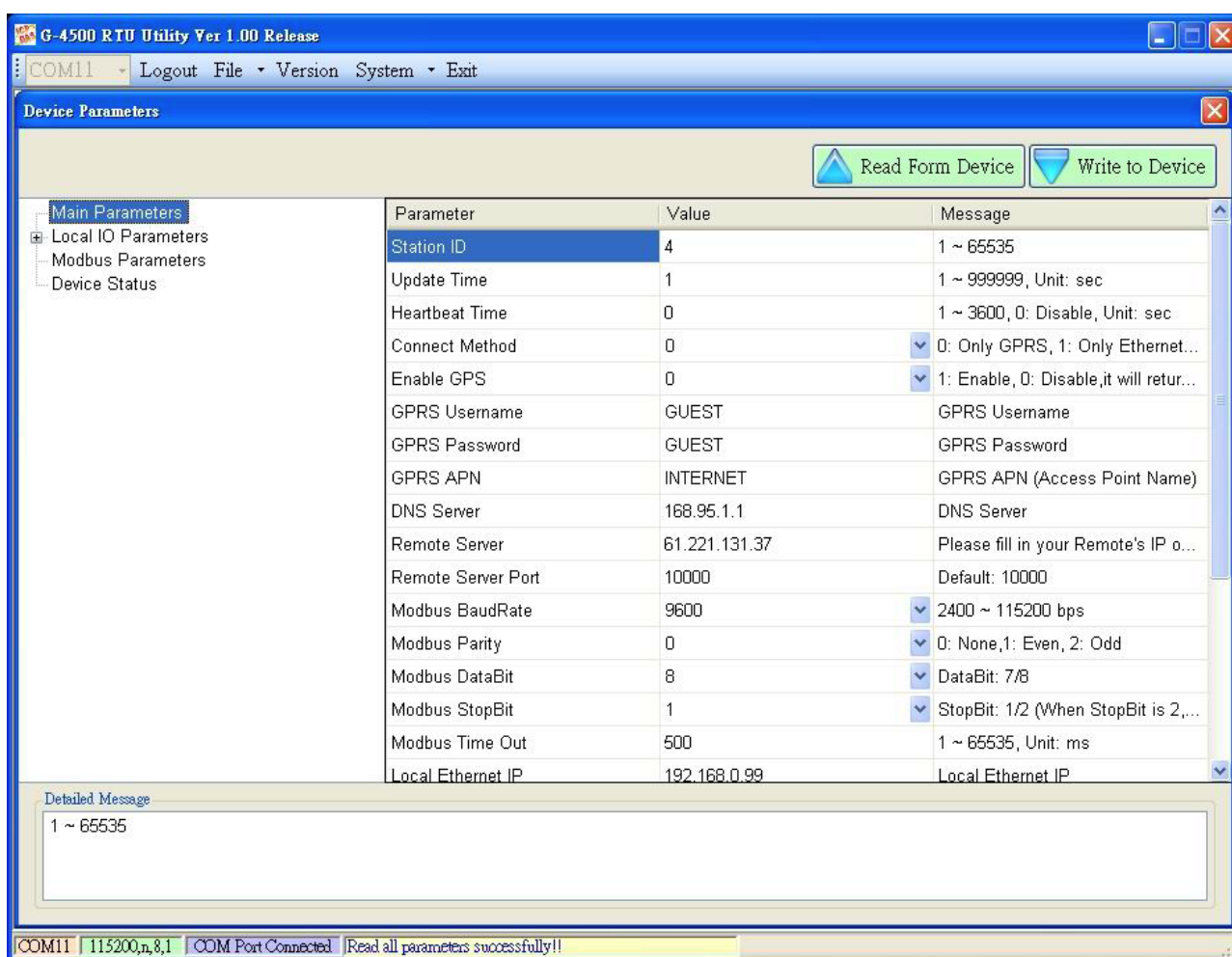
If the PIN or PUK code is correct, the STA led would blank per second. Users can operate other function of G-4513 in this utility.

## 5.5 Main Parameter

After configuring those pages, press “Write to Device” button to save these settings to G-4513 RTU. Then, reset G-4513 series to enable these settings.

The “Read Form Device” button can help users to read back these settings from G-4513 RTU. In addition, these setting would be read from G-4513 RTU when the “Main Parameter” window pops up from the main menu.

### 5.5.1 Main Parameters



Parameter	Description
<b>Station ID</b>	The device Station ID would be shown in the RTU Center software. It can identify the different G-4513 device in the Remote OPC Server. (Range: 1 ~ 65535)
<b>Update Time</b>	Set report time interval. The G-4513 RTU will send the data to M2M RTU Center by the update time. (Range: 1 ~ 999999, unit: sec)
<b>Heartbeat Time</b>	Set heartbeat time interval. When the G-4513 update time is

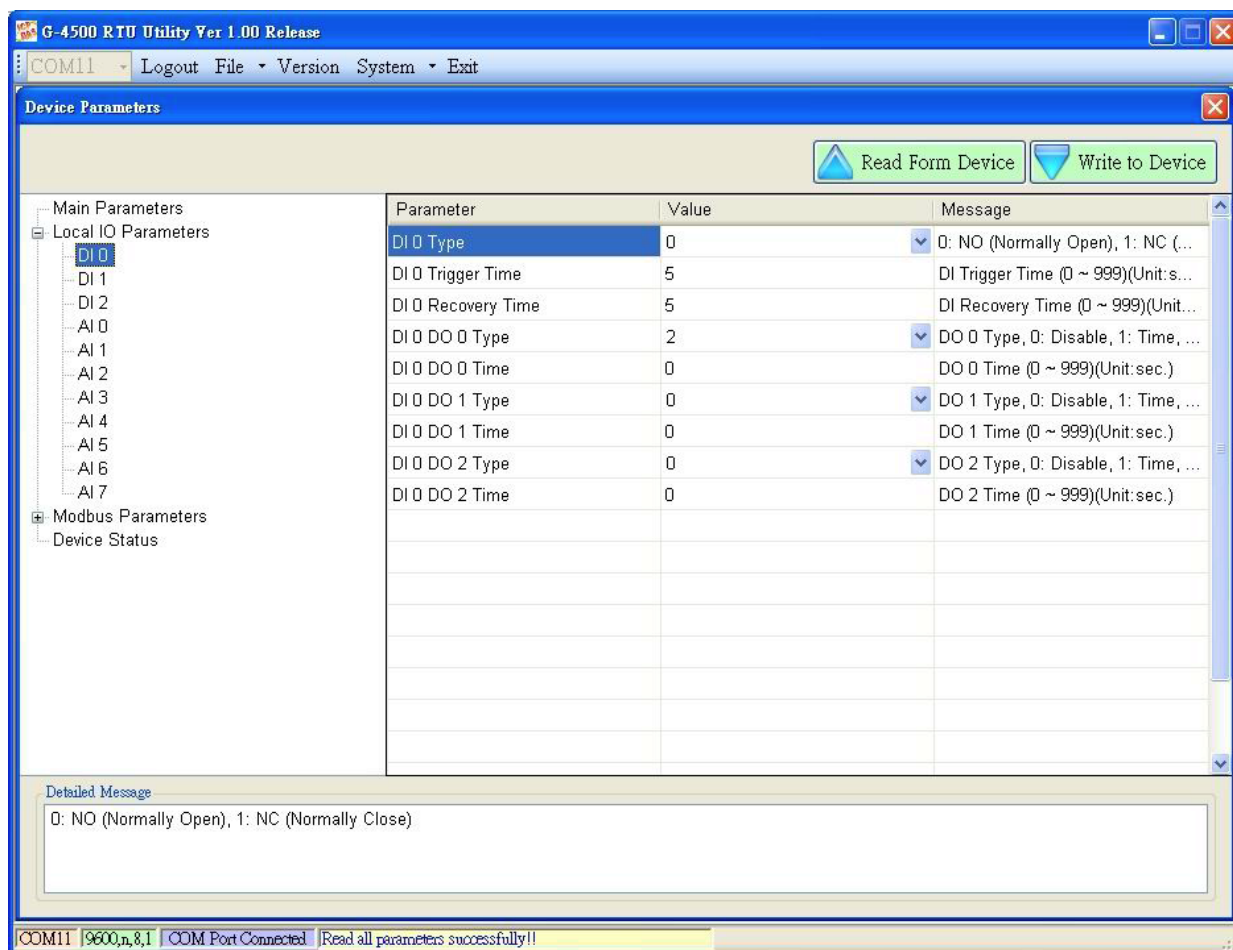
	<p>too long to terminate the GPRS connection by ISP, the heartbeat time will report smaller package to keep GPRS connection. (Range: 1 ~ 3600, unit: sec)</p> <p>Note: Some ISP companies would terminate the GPRS connection when the GPRS connection has any data flow for some time.</p>
<b>Connect Method</b>	<p>Four methods are supported for G-4513 RTU to connect to Remote server.</p> <ol style="list-style-type: none"> <li>1) Only GPRS</li> <li>2) Only Ethernet</li> <li>3) GPRS Master, Ethernet Slave (Redundancy system)</li> <li>4) Ethernet Master, GPRS Slave (Redundancy system)</li> </ol>
<b>Enable GPS</b>	<p>Enable: Enable the GPS function</p> <p>Disable: Disable the GPS function</p> <p>That would report \$GPRMC format.</p>
<b>GPRS Username</b>	The setting is important factor when connecting to a GPRS network. Check with your GPRS service provider for details.
<b>GPRS Password</b>	The setting is important factor when connecting to a GPRS network. Check with your GPRS service provider for details.
<b>GPRS APN</b>	<p>The setting is important factor when connecting to a GPRS network. Check with your GPRS service provider for details.</p> <p>Access point name (APN) is the name used to identify a general packet radio service (GPRS) bearer service in the GSM mobile network. The APN defines the type of service that is provided in the packet data connection. You can get this APN by ISP.</p>
<b>DNS Server</b>	The Domain Name System (DNS) is a hierarchical naming system for computers, services, or any resource connected to the Internet or a private network. You must give this value which is DNS server IP if you want to connect remote server by domain name.
<b>Remote Server</b>	Connect to assignable remote server. It can be remote server's IP or remote server's Domain name.
<b>Remote Server Port</b>	Connect to assignable remote server port.
<b>Modbus BaudRate</b>	<p>COM 2 of G-4513 baud rate.</p> <p>(Range: 2400 ~ 115200 bps)</p>
<b>Modbus Parity</b>	<p>COM 2 of G-4513 parity.</p> <p>(0: None, 1: Even, 2: Odd)</p>

<b>Modbus DataBit</b>	COM 2 of G-4513 data bit. (Data Bit: 7/8)
<b>Modbus StopBit</b>	COM 2 of G-4513 stop bit. (Stop Bit: 1/2)  Note: When Stop Bit is 2, the data bit must be 7 bit
<b>Modbus Time Out</b>	Set the timeout of connecting to Modbus Device. (Range: 1 ~ 65535, unit: sec)
<b>Local Ethernet IP</b>	Local Ethernet IP of the G-4513
<b>Local Ethernet Mask</b>	Local Ethernet Mask of the G-4513
<b>Local Ethernet Gateway</b>	Local Ethernet Gateway of the G-4513
<b>Enable LCD</b>	The setting can enable or disable LCD function of G-4513 RTU. If enable, the LCD show information about G-4500 status.
<b>Enable SD</b>	The setting can enable or disable SD function of G-4513 RTU. If enable, the G-4513 record the data into SD card. (* .csv data format)
<b>Interval Time of Modbus command</b>	Users can control interval time of Modbus command by themselves. (0 ~ 1000, unit: ms) 0: Use system default value Other: User define
<b>Power-Saving Cycle Time (Power-Saving Mode)</b>	Set the cycle time of Power-Saving Mode. 0: Disable Power-Saving Mode Other: Unit min  Note: This parameter is not less than the sum of Register/Connect Timeout and GPS Timeout and Control Time.
<b>Connect Timeout (Power-Saving Mode)</b>	Set the timeout of connecting in Power-Saving Mode.  (Range: 30 ~ 65535, unit: sec)
<b>GPS Timeout (Power-Saving Mode)</b>	Set the timeout of getting valid GPS data. (Range: 30 ~ 65535, unit: sec)
<b>Control Time (Power-Saving Mode)</b>	Users can control G-4513 during the time after reporting. (Range: 0 ~ 65535, unit: sec)



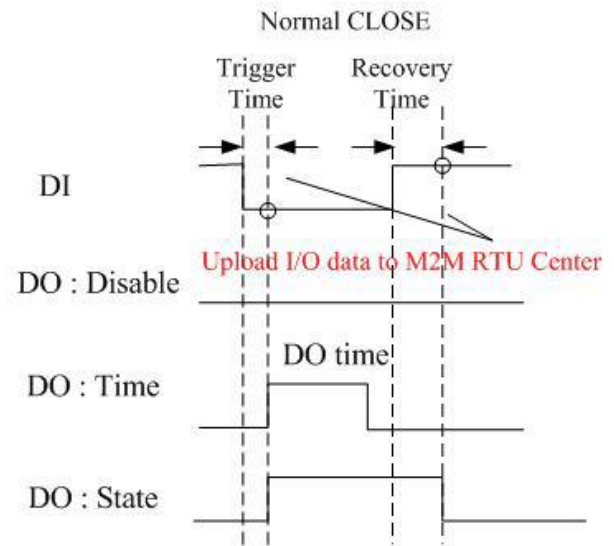
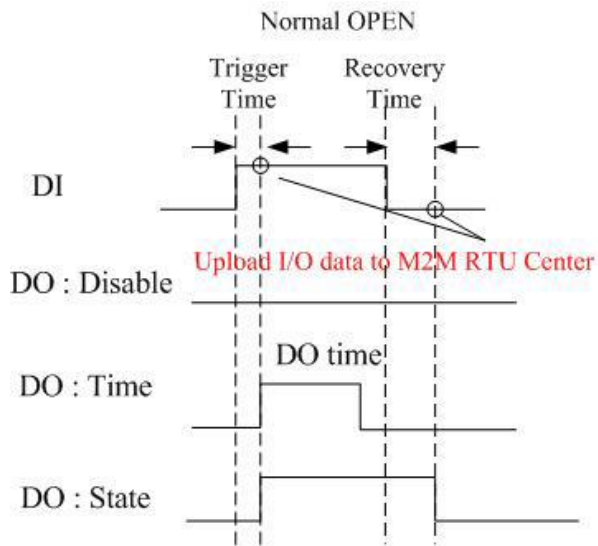
## 5.5.2 Local I/O Parameters (I/O Linkage)

- DI linkage

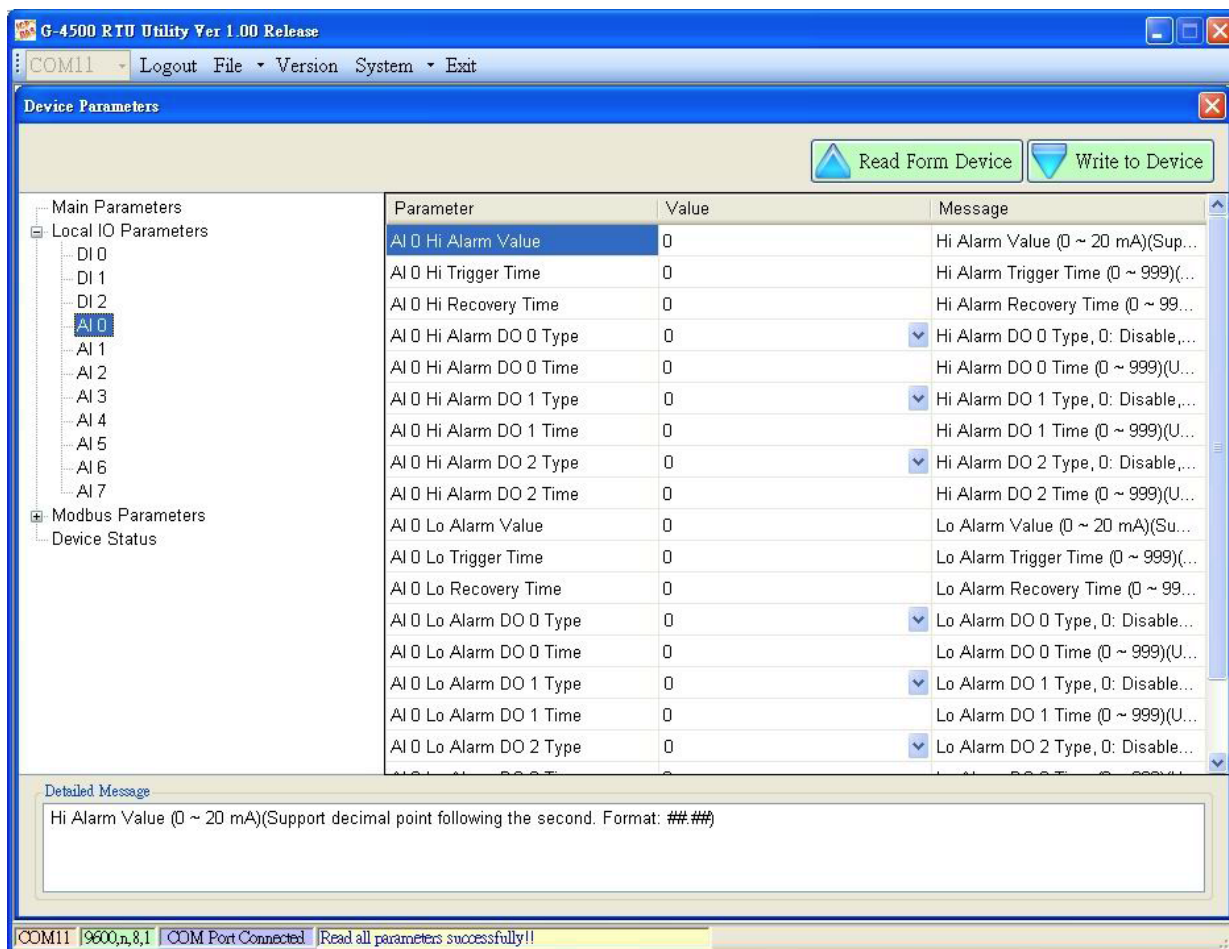


Parameter	Description
<b>DI Type</b>	0: NO (Normally Open), 1: NC (Normally Close)
<b>DI Trigger Time</b>	Range: 0 ~ 999, unit: sec
<b>DI Recovery Time</b>	Range: 0 ~ 999, unit: sec
<b>DO 0 Type</b>	There are 3 types to set: 0: Disable, Disable the DO 0 function. 1: Time, when the DI n has different status, the DO 0 would output during DO 0 Time. 2: State, changes with the DI state
<b>DO 0 Time</b>	DO 0 outputting time (Range: 0 ~ 999, unit: sec)
<b>DO 1 Type</b>	There are 3 types to set: 0: Disable, Disable the DO 1 function. 1: Time, when the DI n has different status, the DO 1 would output during DO 1 Time. 2: State, changes with the DI state

<b>DO 1 Time</b>	DO 1 outputting time (Range: 0 ~ 999, unit: sec)
<b>DO 2 Type</b>	There are 3 types to set: 0: Disable, Disable the DO 2 function. 1: Time, when the DI has different status, the DO 2 would output during DO 2 Time. 2: State, changes with the DI state
<b>DO 2 Time</b>	DO 2 outputting time (Range: 0 ~ 999, unit: sec)

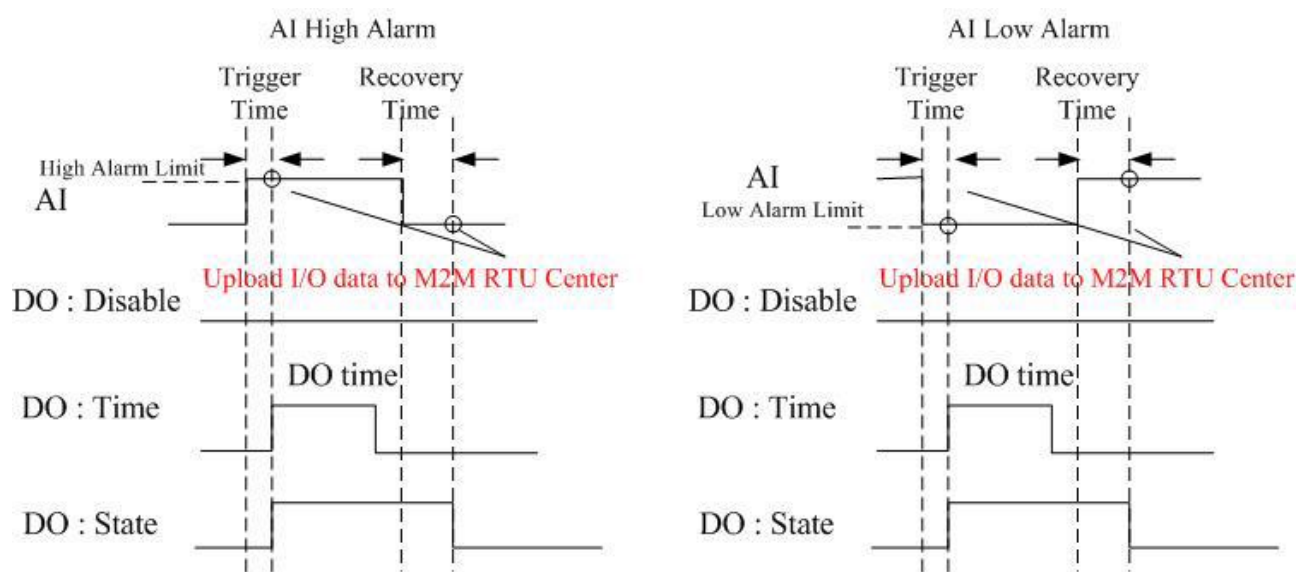


● AI linkage



Parameter	Description
<b>AI n Hi Alarm Value</b>	0 ~ 20 mA
<b>AI n Hi Alarm Trigger Time</b>	Range: 0 ~ 999, unit: sec
<b>AI n Hi Alarm Recovery Time</b>	Range: 0 ~ 999, unit: sec
<b>AI n Hi Alarm DO 0 Type</b>	There are 3 types to set: 0: Disable, Disable the DO 0 function. 1: Time, when the DI n has different status, the DO 0 would output during DO 0 Time. 2: State, changes with the DI state
<b>AI n Hi Alarm DO 0 Time</b>	DO 0 outputting time (Range: 0 ~ 999, unit: sec)
<b>AI n Hi Alarm DO 1 Type</b>	There are 3 types to set: 0: Disable, Disable the DO 1 function. 1: Time, when the DI n has different status, the DO 1 would output during DO 1 Time. 2: State, changes with the DI state
<b>AI n Hi Alarm DO 1 Time</b>	DO 1 outputting time (Range: 0 ~ 999, unit: sec)
<b>AI n Hi Alarm DO 2 Type</b>	There are 3 types to set:

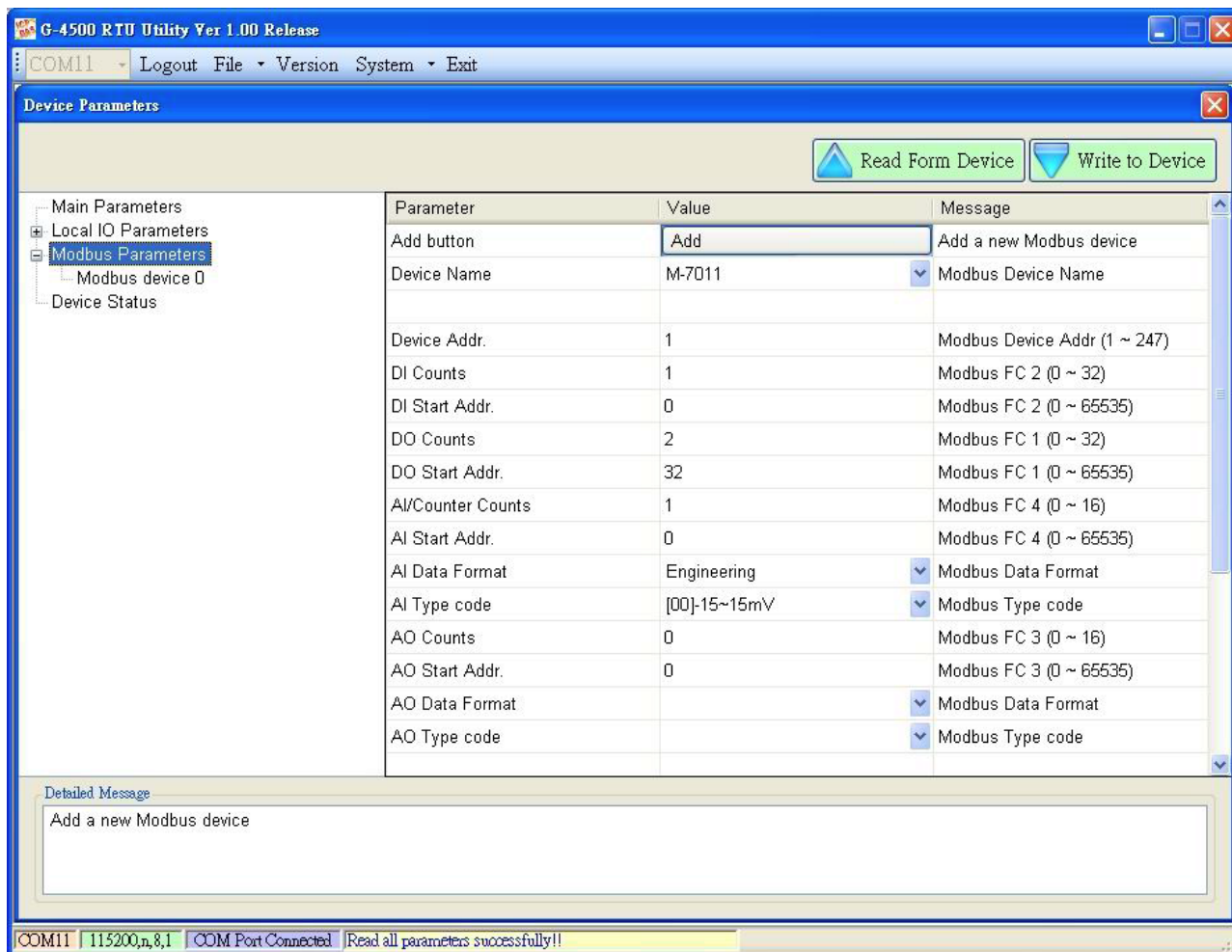
	0: Disable, Disable the DO 2 function. 1: Time, when the DI <sub>n</sub> has different status, the DO 2 would output during DO 2 Time. 2: State, changes with the DI state
<b>AI n Hi Alarm DO 2 Time</b>	DO 2 outputting time (Range: 0 ~ 999, unit: sec)
<b>AI n Lo Alarm Value</b>	0 ~ 20 mA
<b>AI n Lo Trigger Time</b>	Range: 0 ~ 999, unit: sec
<b>AI n Lo Recovery Time</b>	Range: 0 ~ 999, unit: sec
<b>AI n Lo Alarm DO 0 Type</b>	There are 3 types to set: 0: Disable, Disable the DO 0 function. 1: Time, when the DI <sub>n</sub> has different status, the DO 0 would output during DO 0 Time. 2: State, changes with the DI state
<b>AI n Lo Alarm DO 0 Time</b>	DO 0 outputting time (Range: 0 ~ 999, unit: sec)
<b>AI n Lo Alarm DO 1 Type</b>	There are 3 types to set: 0: Disable, Disable the DO 1 function. 1: Time, when the DI <sub>n</sub> has different status, the DO 1 would output during DO 1 Time. 2: State, changes with the DI state
<b>AI n Lo Alarm DO 1 Time</b>	DO 1 outputting time (Range: 0 ~ 999, unit: sec)
<b>AI n Lo Alarm DO 2 Type</b>	There are 3 types to set: 0: Disable, Disable the DO 2 function. 1: Time, when the DI <sub>n</sub> has different status, the DO 2 would output during DO 2 Time. 2: State, changes with the DI state
<b>AI n Lo Alarm DO 2 Time</b>	DO 2 outputting time (Range: 0 ~ 999, unit: sec)



### 5.5.3 Modbus Parameters

This page can help users to configure the parameters of Modbus devices connected to G-4513 RTU. The maximum number of Modbus devices connected to G-4513 RTU is 10.

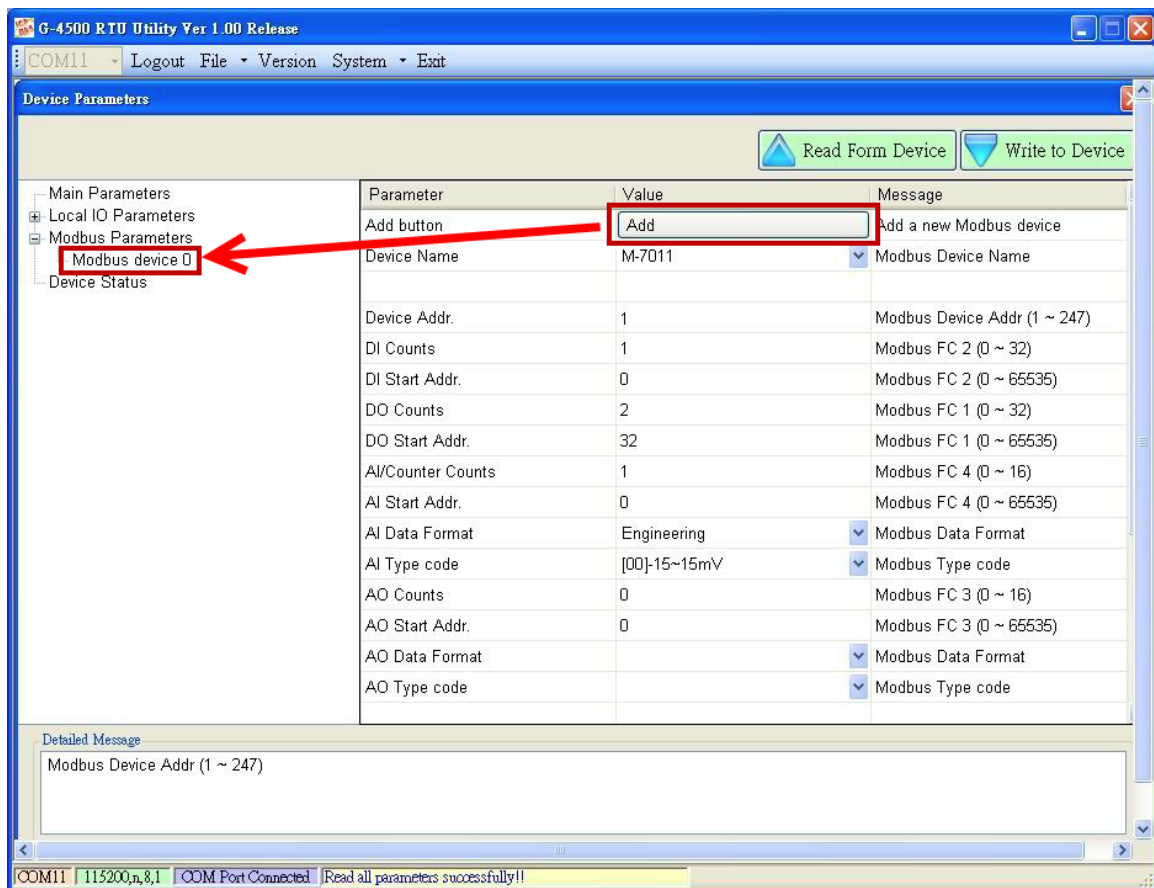
- Add a new ICP DAS's Modbus device



Parameter	Description
<b>Add button</b>	Add a new Modbus device
<b>Device Name</b>	Select Modbus device
<b>Device Addr.</b>	Modbus device address (Range: 1 ~ 247)
<b>DI Counts</b>	Range: 0 ~ 32
<b>DI Start Addr.</b>	Range: 0 ~ 65535
<b>DO Counts</b>	Range: 0 ~ 32
<b>DO Start Addr.</b>	Range: 0 ~ 65535
<b>AI Counts</b>	Range: 0 ~ 16
<b>AI Start Addr.</b>	Range: 0 ~ 65535
<b>AI Data Format</b>	AI Data Format

	Note: If not ICP DAS Modbus product, the value is 255
<b>AI Type code</b>	AI Type code
<b>AO Counts</b>	Range: 0 ~ 16
<b>AO Start Addr.</b>	Range: 0 ~ 65535
<b>AO Data Format</b>	AO Data Format Note: If not ICP DAS Modbus product, the value is 255
<b>AO Type code</b>	AO Type code

After finishing setting a Modbus Device, press “Add” button to add the Modbus device to G-4513 RTU





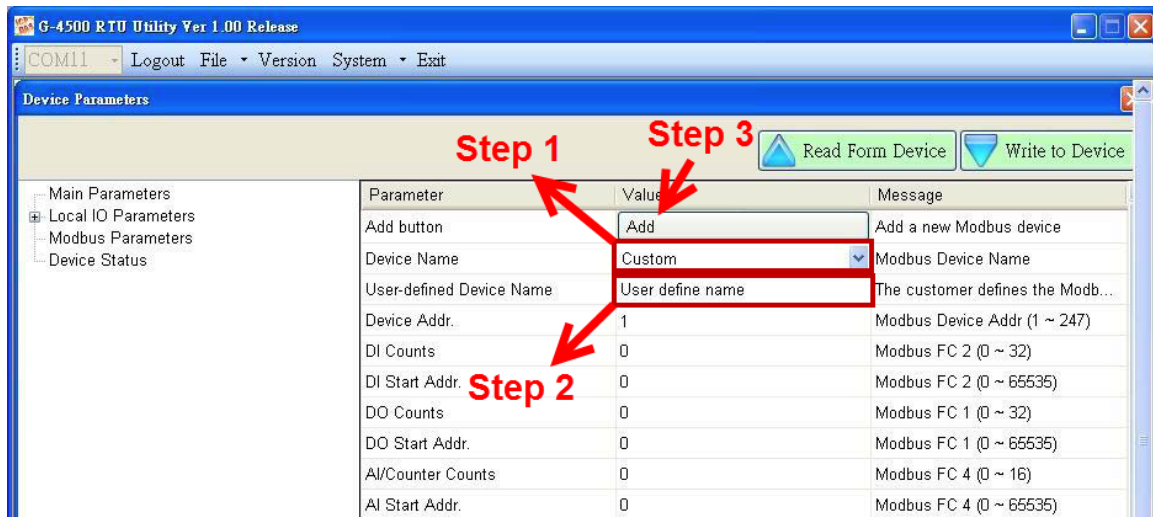
- Add other company's Modbus device

Except for Modbus products of ICP DAS, G-4513 RTU can connect to any Modbus RTU devices. Users can follow the steps to do that.

Step 1: Select "Custom" in Device Name item

Step 2: Input your device name in User-defined Device Name item (Max. 20 character)

Step 3: Press "Add" button



- Modify a Modbus device

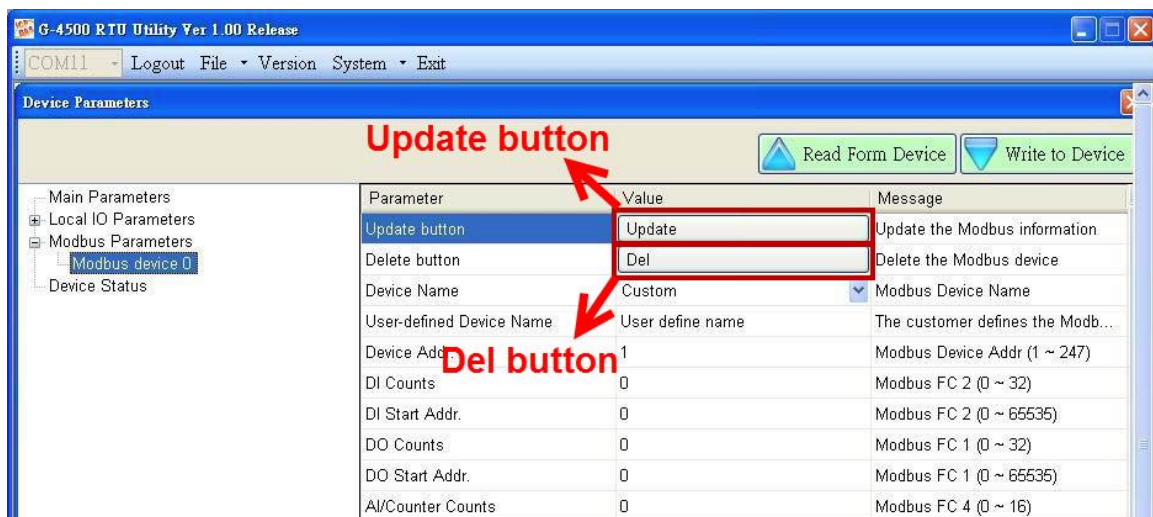
Step 1: Select the Modbus device you want to modify in the left tree windows.

Step 2: Select the Update button after modifying your parameters

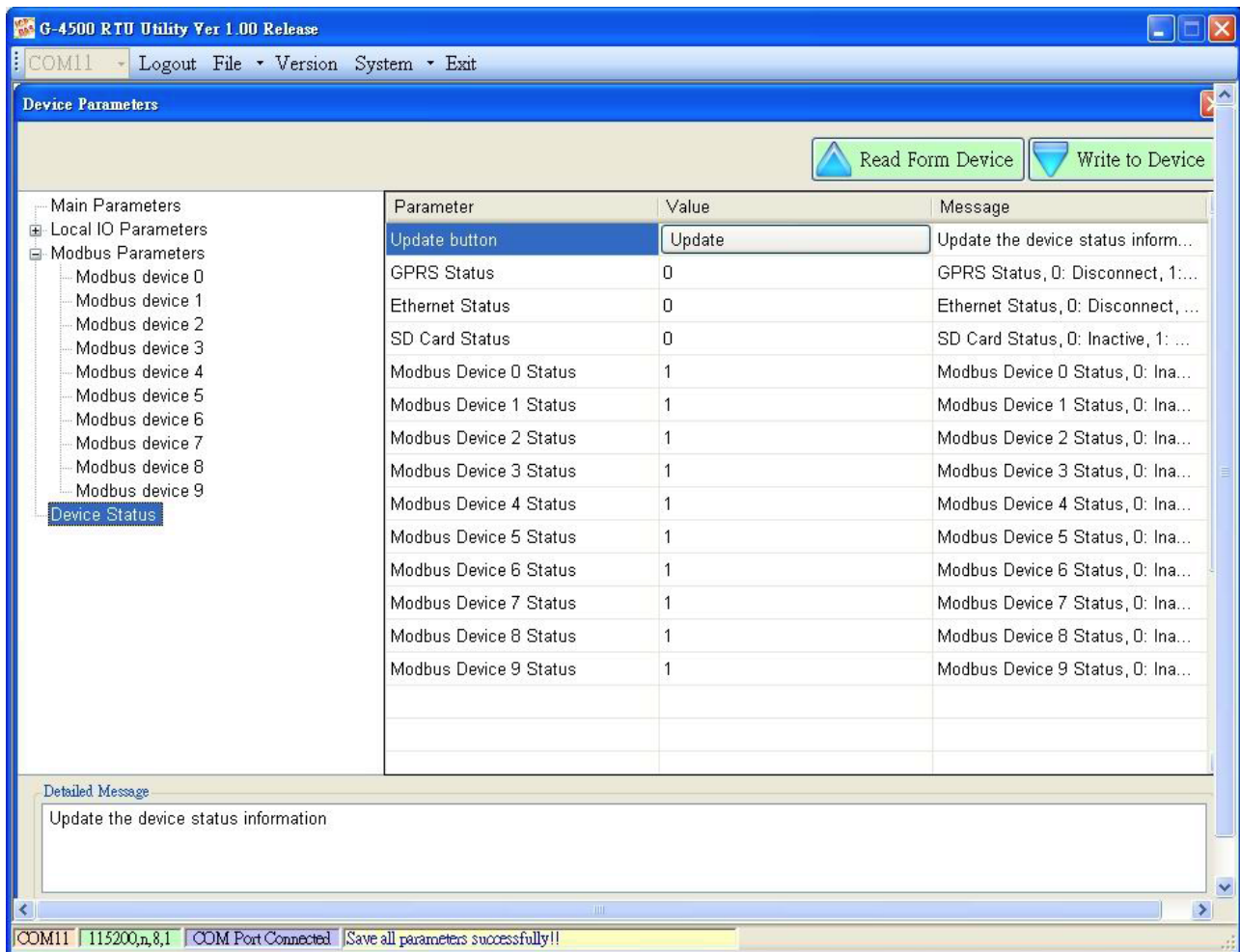
- Delete a Modbus device

Step 1: Select the Modbus device you want to delete

Step 2: Select the Del button.



## 5.5.4 Device Status



Parameter	Description
<b>Update button</b>	Update the device status information
<b>GPRS Status</b>	0: Disconnect 1: Connect
<b>Ethernet Status</b>	0: Disconnect 1: Connect
<b>SD Card Status</b>	0: Inactive 1: Active
<b>Modbus Device n Status</b>	n: 0 ~ 9 0: Inactive 1: Active



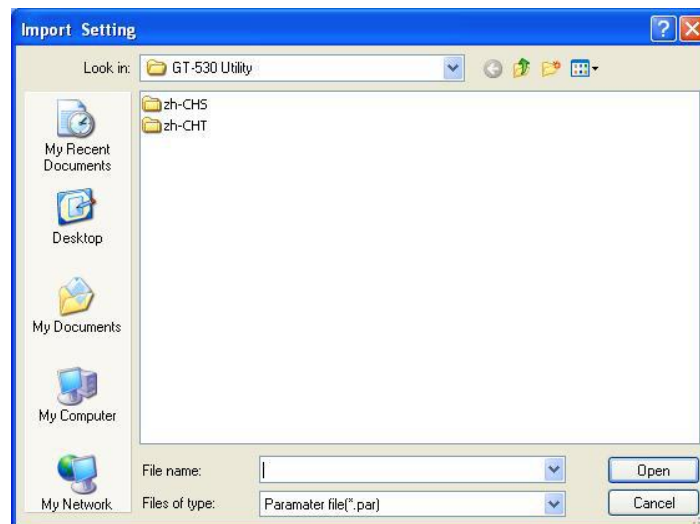
## 5.6 Import/Export Parameters

Users can use the import and export functions from the menu bar. This function would be enabled when the “Main Parameter” window is open. The explanation is below:



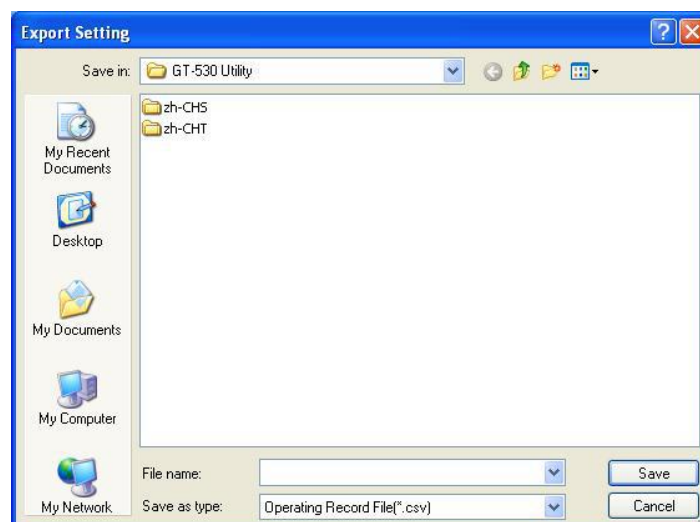
- **Import Parameters**

This function is used for reading back the setting of device parameters from .par file and displaying in “Main parameter” window. When pressing “import” button, a file selection window would pop up for users to choose the .par file.



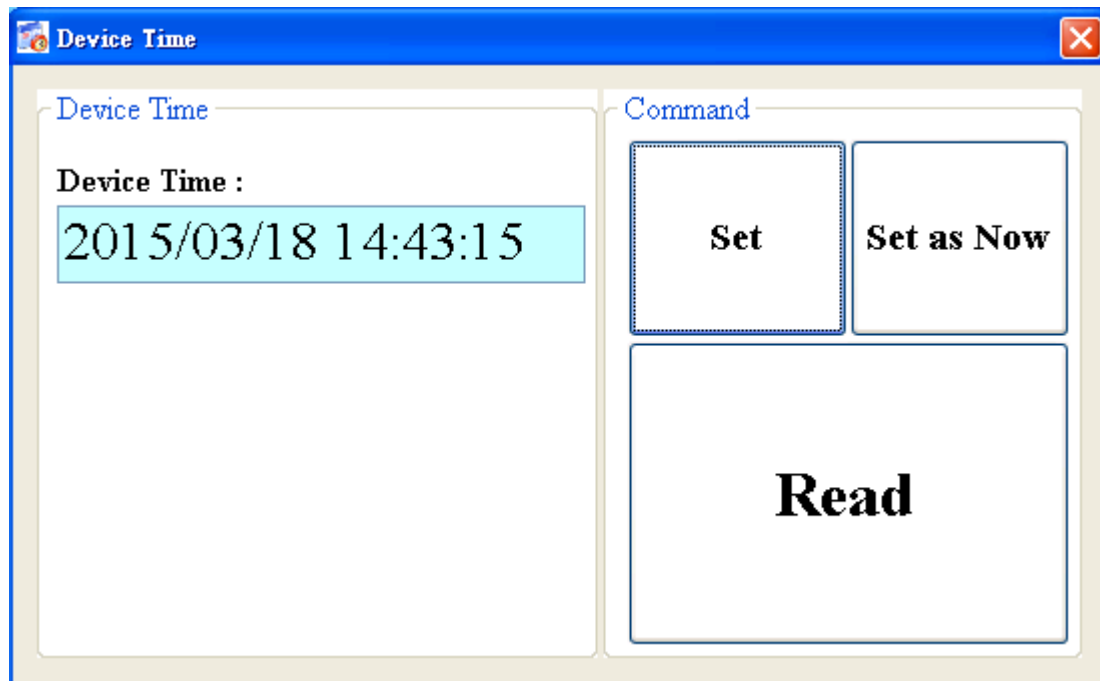
- **Export Parameters**

The function is used for saving the setting of “Main parameter” window as .par file. When pressing “Export” button, a file selection window would pop-up for users to save the setting as .par file in specific path.



## 5.7 Device Time

This window provides the function to inquire and modify the time of G-4513 RTU. Besides, the next and last report times are also shown. The text field operation is below.



### A. Text field

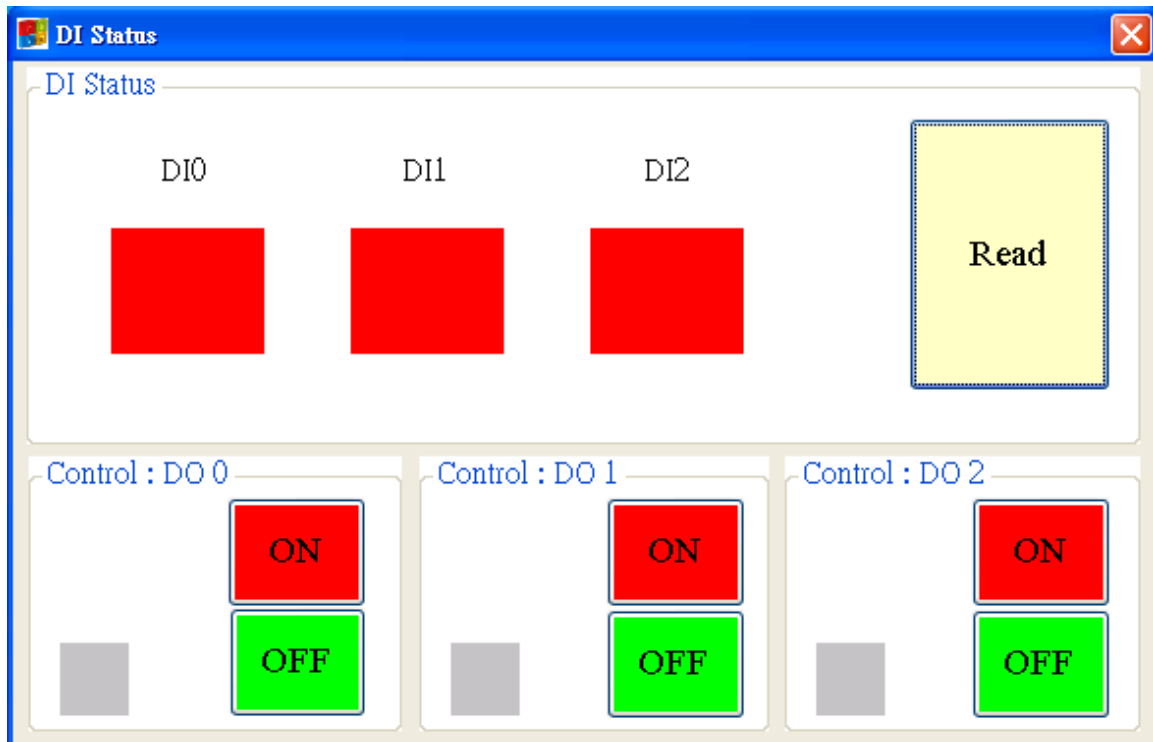
- (1) Device time: show the time of G-4513 RTU. Users also can change the time in this field to key in the specific time.

### B. Operation

- (1) Set as Now: Set the PC time to G-4513 RTU. After setting the time successfully, the information of G-4513 RTU time.
- (2) Set: Set the G-4513 RTU time according the "Device Time" field. After setting the time successfully, the information of G-4513 RTU time would be updated.
- (3) Read: Read back the time of G-4513 RTU, the next report time.

## 5.8 DO Control/DI Status

This page provides the function for controlling DO and reading the status of DIs in the Labs.



### A. Text field

(1) DI0 ~ DI2、DO0~DO2:

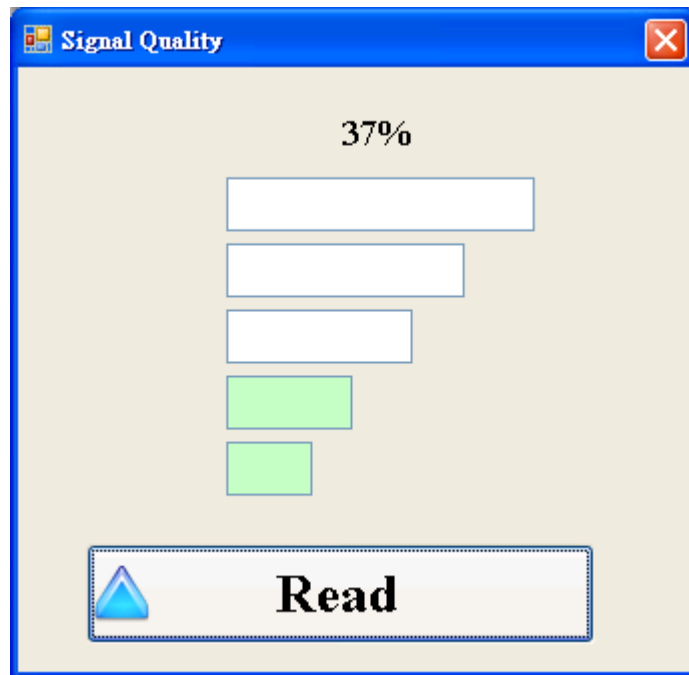
- ✧ Grey: the voltage logic is high
- ✧ Red: the voltage logic is low

### B. Operation

- (1) Read: Read back the status of DI0 ~ DI2 and DO0 ~ DO2 from G-4513.
- (2) DO0 ~ DO2 ON: Set the DO output on
- (3) DO0 ~ DO2 OFF: Set the DO output off

## 5.9 Signal Quality

This window can show 2G/3G signal strength. It is used for users to know the 2G/3G signal in Local site.



A. Text field

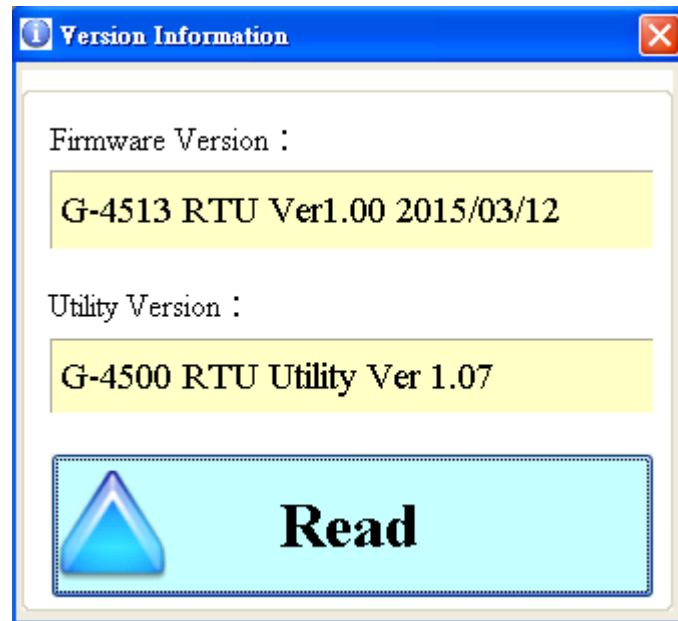
- (1) The strength is divided into 5 sections shown in percentage.

B. Operation

- (1) Read: Read the 2G/3G signal strength.

## 5.10 Version

Press "Version" in tool menu, and the window would show the version of Utility and firmware.



### A. Text field

- (1) Firmware version: Show the version information of G-4513 RTU firmware
- (2) Utility version: Show the version information of G-4513 RTU Utility

### B. Operation

- (1) Read: Read these information from G-4513 RTU

## 5.11 System

“System” menu item provide recovering factory setting and resetting G-4513 RTU functions.



- Recover to Factory Settings

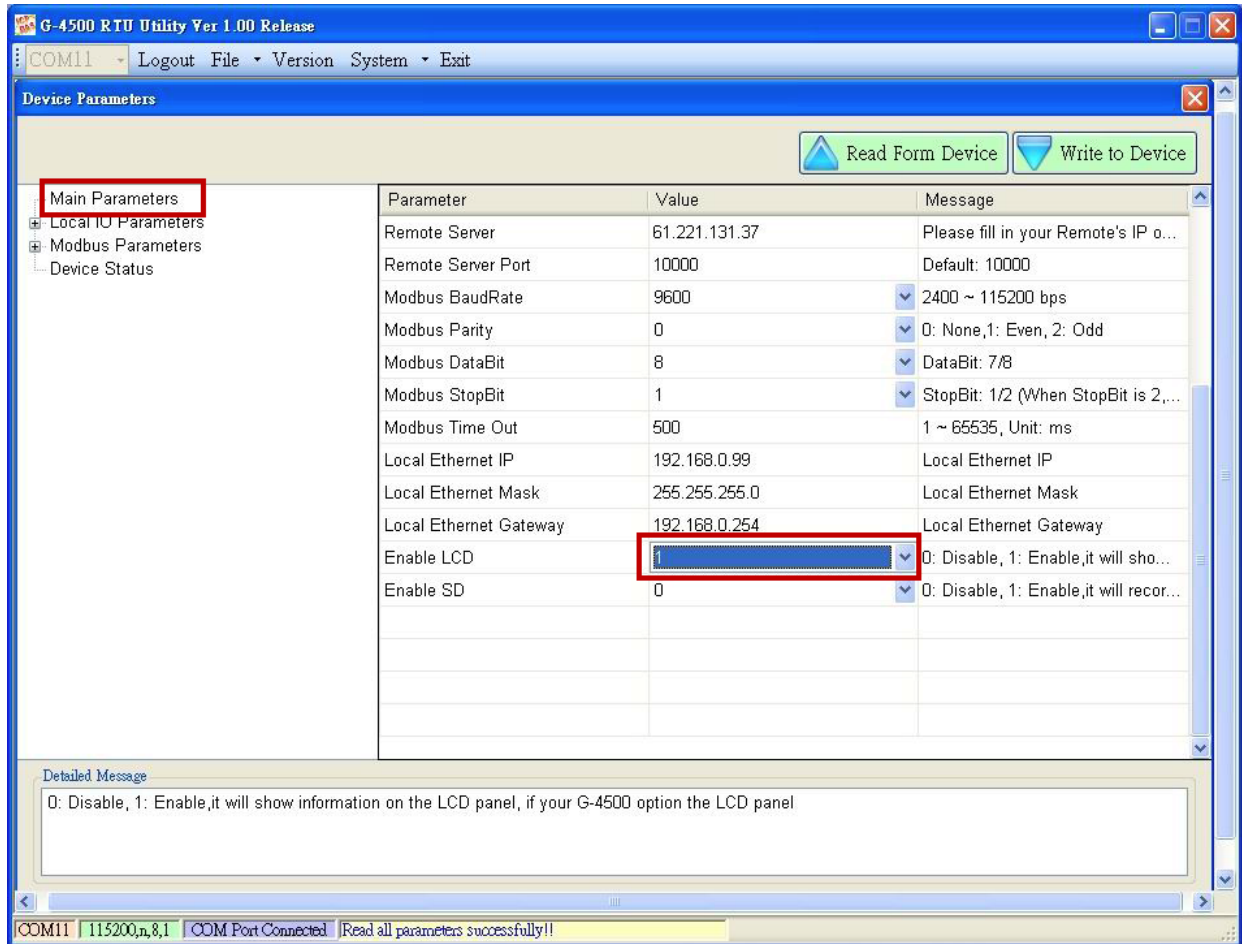
The function is used to recover G-4513 RTU as factory settings including password. Select the Recover to Factory Settings. About the factory settings, please refer Appendix A.

- Reset G-4500

The function is used to reset G-4513 by software. Select “Rest G-4513” button to reset G-4513.

## 5.12 LCD Information







If users choose the G-4513series with LCD display, they can select the LCD enable in the G-4513 RTU utility. There is system information of G-4513 RTU will be shown in the LCD panel.



- The LCD panel of G-4513 series



● Display information

Parameter	Description	
<b>Station ID:</b>	The device Station ID would be shown in the RTU Center software. It can identify the different G-4500 device in the Remote OPC Server. (Range: 1 ~ 65535)	
<b>Utime:</b>	Report time interval. The G-4513 RTU will send the data to M2M RTU Center by the update time. (Range: 1 ~ 999999, unit: sec)	
<b>Only GPRS / Only Ethernet / GPRS(M), Eth(S) / Eth(M), GPRS(S)</b>	Four methods are supported for G-4513 RTU to connect to remote server. 1) Only GPRS 2) Only Ethernet 3) GPRS Master, Ethernet Slave (Redundancy system) 4) Ethernet Master, GPRS Slave (Redundancy system)	
<b>GIP / EIP</b>	The G-4513 GPRS or Ethernet IP	
<b>GSM</b> 	<b>Status</b>	<b>Description</b>
		2G/3G signal quality: 20%
		2G/3G signal quality: 40%
		2G/3G signal quality: 60%
		2G/3G signal quality: 80%
		2G/3G signal quality: 100%
<b>SIM Card:</b>	<b>Status</b>	<b>Description</b>
	OK	SIM card is OK
	SIM Card: Err 1	SIM PIN. Module is waiting for SIM PIN
	SIM Card: Err 2	SIM PUK. Module is waiting for SIM PUK
	SIM Card: Err 3	PH_SIM PIN.
	SIM Card: Err 4	PH_SIM PUK.
	SIM Card: Err 5	SIM PIN2.
	SIM Card: Err 6	SIM PUK2.
	SIM Card: Err 7	SIM Card Error.
	SIM Card: Err 8	SIM Card not inserted.
	SIM Card: Err -5	Timeout
<b>Date:</b>	YYYY/MM/DD	
<b>Time:</b>	HH:MM:SS	
<b>SLEEP</b>	G-4513 is sleeping in Power-Saving Mode.	



## 6. Data Logger

G-4513 RTU provides an external SD interface. These local I/O and Modbus data are recorded in SD memory card for one day in a single file.

- The naming rule of logger file name

The file of I/O data logger is csv type. The naming rule is according to the time of creating file. The description is as follows.

The format of file name: YYMMDDXX.csv

1. YY: Year (2000 ~ 2099)
2. MM: Month (01 ~ 12)
3. DD: Day (01 ~ 31)
4. XX: Serial number (00 ~ 99)

- The data format of the data logger file

The content of the file apply comma char to separate the different field. The first row data is the name of the fields. After the first row data, it is I/O data. The format of I/O data is date, time, local I/O, station ID, update time, Modbus data and GPS data. Users can refer the following complete example to understand that.

Date	StationID	UpdateTime	GPS	DI0	DI1	DI2
20150101 120000	1	5	\$GPRMC,160004,...	1	1	1
20150101 120005	1	5	\$GPRMC,160009,...	1	1	1

DO0	DO1	DO2	AI0	AI1	AI2	AI3	AI4	AI5	AI6	AI7	AI Type	AI DataFormat
0	0	0	6	6	6	6	6	6	6	6	26	1
0	0	0	6	6	6	6	6	6	6	6	26	1

Module [M-7060] Addr.	DI0	DI1	DI2	DI3	DO0	DO1	DO2	DO3
1	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0

### Tips & Warnings



If the SD free space is less than 100 MB, the early files would be deleted by system until the free space is more than 100MB.

## 7. Revision History

Revision	Date	Author	Description
1.0.0	2015/03/19	William	Release version
1.1.0	2015/09/30	Tim	Added appendix B and update 5.1.1, 5.12, appendix A.

## Appendix A. G-4513 RTU Factory Settings

The following table lists the default value of system parameters.

Parameter	Default value
<b>Station ID</b>	1
<b>Update Time</b>	5
<b>Heartbeat Time</b>	0
<b>Connect Method</b>	1
<b>Enable GPS</b>	0
<b>GPRS Username</b>	GUEST
<b>GPRS Password</b>	GUEST
<b>GPRS APN</b>	INTERNET
<b>DNS Server</b>	168.95.1.1
<b>Remote Server</b>	1.2.3.4
<b>Remote Server Port</b>	10000
<b>Modbus BaudRate</b>	9600
<b>Modbus Parity</b>	0
<b>Modbus DataBit</b>	8
<b>Modbus StopBit</b>	1
<b>Modbus Time Out</b>	500
<b>Local Ethernet IP</b>	192.168.255.1
<b>Local Ethernet Mask</b>	255.255.0.0
<b>Local Ethernet Gateway</b>	192.168.0.254
<b>Enable LCD</b>	0
<b>Enable SD</b>	0
<b>Interval Time of Modbus command</b>	0
<b>Power-Saving Cycle Time</b>	0
<b>Register/Connect Timeout</b>	120
<b>GPS Timeout</b>	120
<b>Controlled Time</b>	120

## Appendix B. How to set G-4513 Power-Saving Mode

This appendix can help users to set parameters in Power-Saving Mode. If the firmware version doesn't support Power-Saving Mode, these parameters will be masked.

Parameter	Value	Message
Remote Server Port	10000	Default: 10000
Modbus BaudRate	115200	2400 ~ 115200 bps
Modbus Parity	0	0: None, 1: Even, 2: Odd
Modbus DataBit	8	DataBit: 7/8
Modbus StopBit	1	StopBit: 1/2 (When StopBit is 2,...
Modbus Time Out	500	1 ~ 65535, Unit: ms
Local Ethernet IP	192.168.4.16	Local Ethernet IP
Local Ethernet Mask	255.255.0.0	Local Ethernet Mask
Local Ethernet Gateway	192.168.0.254	Local Ethernet Gateway
Enable LCD	1	0: Disable, 1: Enable, it will sho...
Enable SD	1	0: Disable, 1: Enable, it will recor...
Interval Time of Modbus command	0	0 ~ 1000, Unit: ms. 0: Use syst...
Power-Saving Cycle Time	20	Unit: min, 0: Disable Power-Savi...
Connect Timeout	60	30 ~ 65535, Unit: sec
GPS Timeout	60	30 ~ 65535, Unit: sec
Control Time	180	0 ~ 65535, Unit: sec, Users can...

### A) Power-Saving Cycle Time:

Users can select 10 different options. If user select 10 minutes option, it means G-4513 will wake and report every 10 minutes. For example. If the G-4513 wake at 10:00:00, it will sleep until 10:10:00 after reporting .

This parameter is not less than the sum of Connect Timeout and GPS Timeout and Control Time at same unit.

### B) Connect Timeout:

Range: 30 ~ 65535, unit sec.

It will countdown from G-4513 start. The G-4513 will sleep if it isn't connecting to RTU Center within this time.

### C) GPS Timeout:

Range: 30 ~ 65535, unit sec.

It will countdown from connected. The G-4513 will sleep if GPS locating fail within this time.

If users disable GPS, this parameter will not effect.

### D) Control Time:

Range: 0 ~ 65535, unit sec.

It will countdown from connected.

Users can control(or download SD file) G-4513 after reporting so make sure there is enough time to download the files.

GPS Timeout and Control Time are counting from connected so G-4513 will select bigger one of two values to be the timeout.

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### **.Tips & Warnings**

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If you login into G-4513 RTU to set or see its parameters, please reboot the G-4513 after you exit Utility.

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