

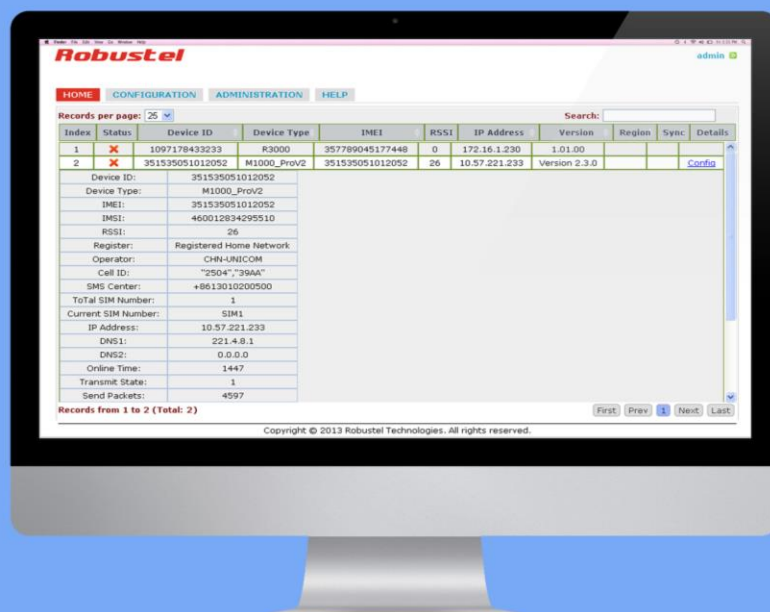
# Robustel Centre Manager RobustLink

## Centralized M2M Management Platform

### For GoRugged Series Router & Gateway

## User Guide

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# Robustel

www.robustel.com

## About This Document

This document describes the software of Robustel RobustLink, Centralized M2M Management Platform.

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## Revision History

Updates between document versions are cumulative. Therefore, the latest document version contains all updates made to previous versions.

Release Date	RobustLink Version	Doc Version	Details
2013-12-12	1.00	v.1.0.0	First release

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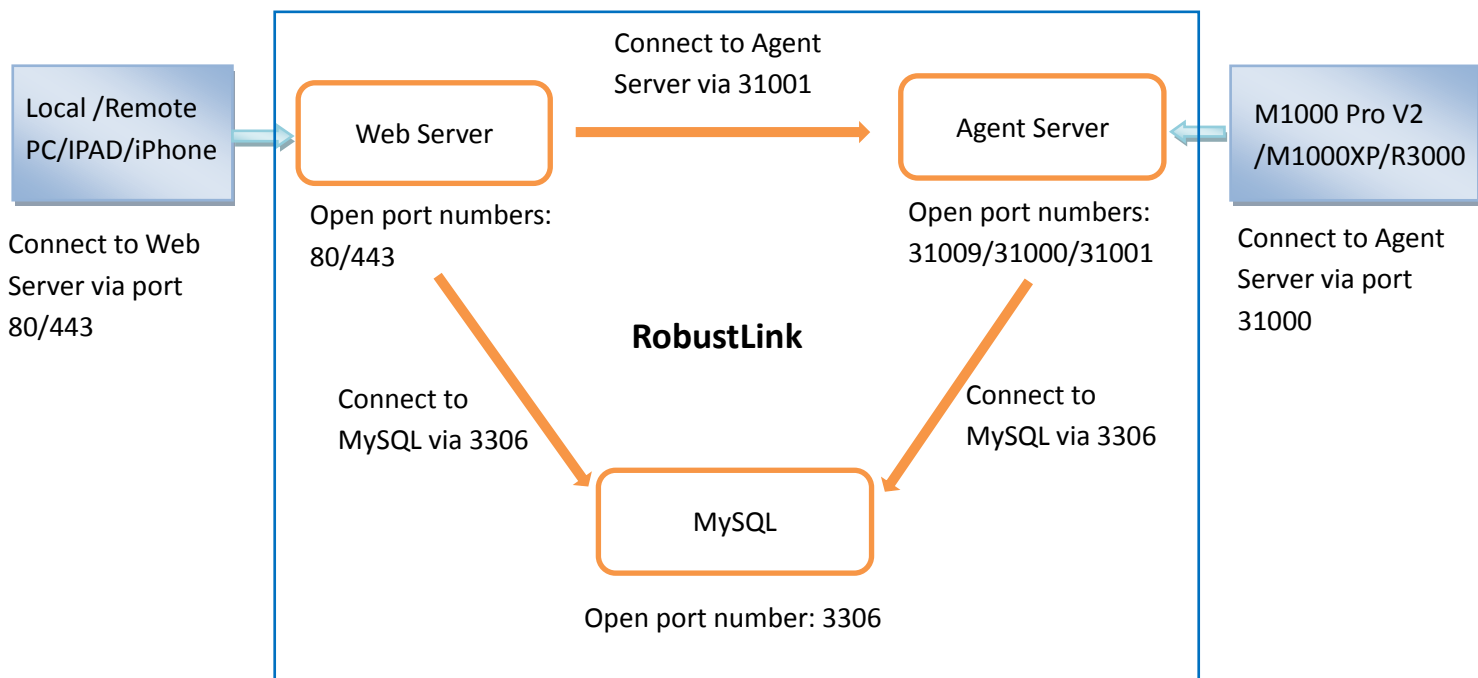
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# Chapter 1. Product

## 1.1. Overview

Robustel RobustLink is an industrial-grade centralized management and administration system for Robustel GoRugged series router & gateway, including R3000, M1000 XP and M1000 Pro V2.

RobustLink consists of three parts: Web Server (Apache), Agent Server and MySQL. Users can configure relevant parameters of RobustLink via Web Server; Agent Server is platform for data communication which will process all the data coming from slave device, or via vice; MySQL is a database used to store parameters and transaction data. Three parts should work together to ensure all the functions of RobustLink.



RobustLink allows user to monitor, configure and manage large numbers of remote devices on a private network over the web.

It mainly has following features:

- Remote Monitoring
- Remote Configuration
- Remote Firmware Updates
- Data Forwarding
- Number of Devices: 1000+
- Management: Web

## 1.2. Selection and Ordering Data

Please refer to corresponding RobusLink datasheet.

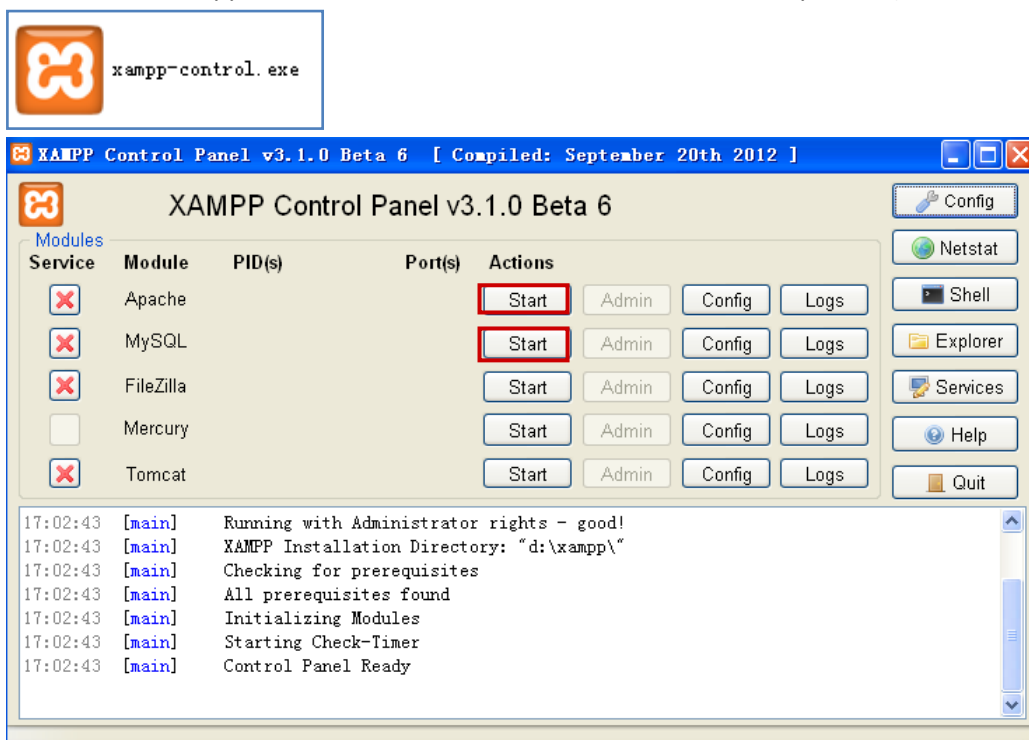
## Chapter 2. Installation

### 2.1. System requirement

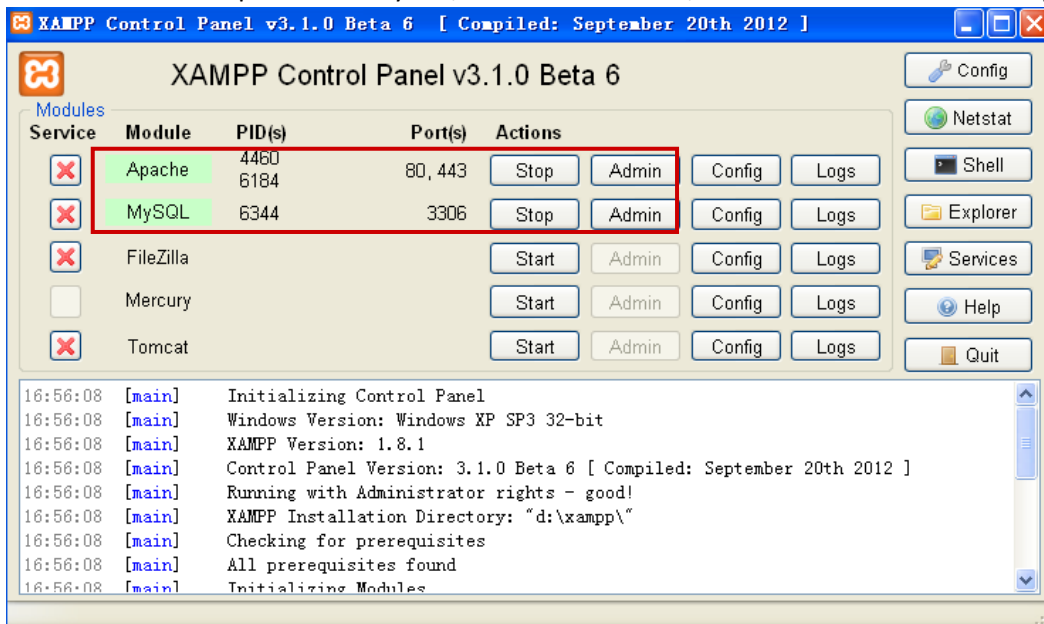
Windows 7 (32/64), Windows Vista (32/64), Windows 2008 (32/64), Windows 2003 (32/64), Windows 2000, Windows XP (32/64)

### 2.2. Installation steps

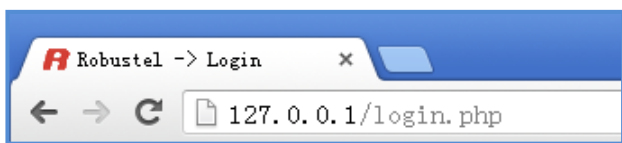
- 1 Download RobustLink installation packet *xampp.rar* via link: <https://app.box.com/s/e7p0lrx3o3mv6csgech8>.
- 2 **Extract *xampp.rar* to computer's root directory**, non-system root directory will be advised, such as D hard dish, and then the path will be "D:\xampp".
- 3 Close software applications which will use port 80, 443 and 3306. Normally, Skype.exe will occupy port 80, so please close Skype.exe every time before you start RobustLink.
- 4 Double click "*xampp-control.exe*" --> click "Start" to enable both "Apache" (Web Server) and "MySQL".



- 5 If succeed to start Apache and MySQL, Characters like “80, 443” and “3306” will show up.



- 6 Open the browser, such as Opera, Google Chrome and Firefox --> enter <http://127.0.0.1/login.php> or <http://localhost/login.php> in the address bar.



- 7 Enter password **123456** in the new page to install MySQL (database), other parameters stay default.

MySQL Database Installing...

Host Name:

User Name:

Password:

Database Name:

Database Port:

- 8 Double click “RobustLink\_start.bat” (Agent Server). If connect to MySQL (database) successfully, it will show the following diagram.



```

C:\WINDOWS\system32\cmd.exe
Please dont close Window while Robustlink is running
Robustlink Agent Server is trying to start
Please wait ...
open config file config.bin fail
use default parameters
2013-11-05 15:27:13 [I] connect to database success
2013-11-05 15:27:13 [I] connect to database success
2013-11-05 15:27:13 [I] connect to database success
2013-11-05 15:27:13 [I] connect to database success
2013-11-05 15:27:13 [I] connect to database success
2013-11-05 15:27:13 [I] connect to database success
2013-11-05 15:27:13 [I] connect to database success
2013-11-05 15:27:13 [I] connect to database success
2013-11-05 15:27:14 [I] start telnet service on port 31009
2013-11-05 15:27:14 [I] <952> start tcp server on port 31000
2013-11-05 15:27:14 [I] <936> start tcp server on port 31001

```

- 9 Enter: <http://127.0.0.1/login.php> or <http://localhost/login.php> in the address bar again --> Username “admin” --> Password “admin” --> click “Login”.

User authentication required. Login please.

Username:

Password:

Language:

Don't have an account? [Sign up](#)

- 10 After successfully login, you can see Web Server of RobustLink.

**Robustel** admin

HOME CONFIGURATION ADMINISTRATION HELP

Records per page: 25 Search:

Index	Status	Device ID	Device Type	IMEI	RSSI	IP Address	Version	Region	Sync	Details
No records to display										

0-0/0

First Prev Next Last

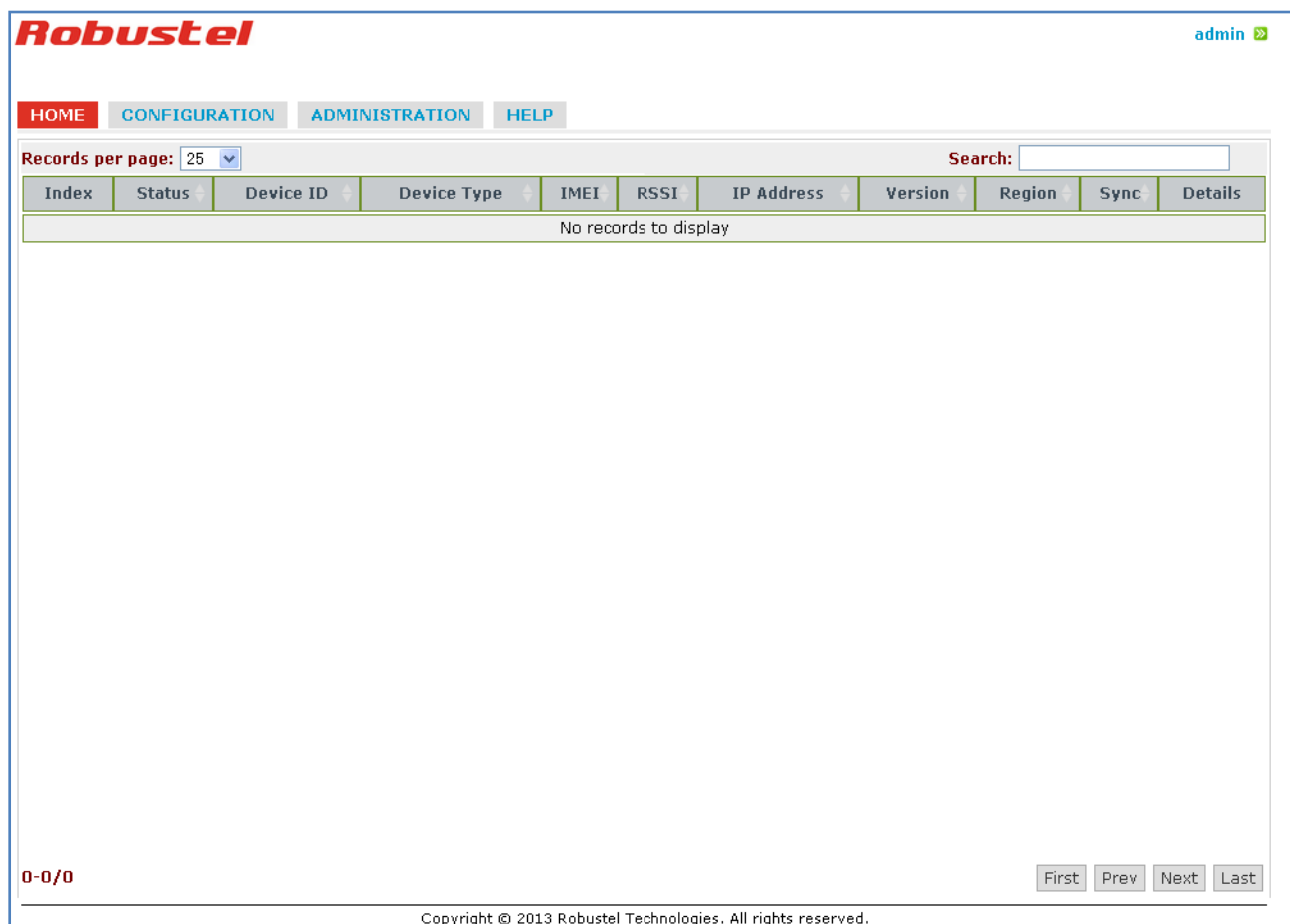
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## Chapter 3. Configuration settings over web browser

### 3.1. Control Panel

User can click “admin” --> “Logout” to logout web browser of RobustLink.



**Robustel** admin

HOME CONFIGURATION ADMINISTRATION HELP

Records per page: 25 Search:


Index	Status	Device ID	Device Type	IMEI	RSSI	IP Address	Version	Region	Sync	Details
No records to display										

0-0/0 First Prev Next Last

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### 3.2. HOME




This section shows status of slave devices which had ever logged in RobustLink, or the devices which are connecting to RobustLink.


admin

[HOME](#)
[CONFIGURATION](#)
[ADMINISTRATION](#)
[HELP](#)

Records per page: 25
Search:

Index	Status	Device ID	Device Type	IMEI	RSSI	IP Address	Version	Region	Sync	Details
1		300513060001	R3000	357789045177448	10	10.56.114.138	1.01.00			
2		1097167457505	M1000_ProV2		0					<a href="#">Config</a>
3		1097178433233	M1000_ProV2		0					<a href="#">Config</a>
4		111111111300012	R3000		0	172.16.2.186	1.01.00			
5		351535051012052	M1000_ProV2		0					<a href="#">Config</a>

HOME	
Item	Description
Records Per page	Selected from “10”, “25”, “50”, “all”, user can set how many devices are wanted to show in one page.
Search	User can enter characters to search specific information. For example, when enter “R3000”, all information relevant to R3000 will show up.
Index	Show the index of devices.
Status	Show the status of devices. If device login to RobustLink, it will show “  ”, or it will show “  ”.
Device ID	Show the ID of device.
Device Type	Show the type of device: M1000 XP, M1000 Pro V2 or R3000.
IMEI	Show the IMEI number of device’s wireless module.
RSSI	Show device’s current signal level.
IP Address	Show device’s current IP address.
Version	Show device’s firmware version.
Region	Show specific region information of device.
Sync	Show whether the device information is synchronous with RobustLink. It shows blank while synchronous, If not it will show symbol “  ”.
Details	Show note information. User can click “Config” to open another configure web page. <b>Note:</b> It’s only available for M1000 XP and M1000 Pro V2.

### 3.3. CONFIGURATION -> Basic Setting

This section allows user to do basic settings of RobustLink.

HOME	CONFIGURATION	ADMINISTRATION	HELP
<div> <div> <input checked="" type="checkbox"/> AS Configuration           <div> <a href="#">Basic Setting</a> <a href="#">Data Forwarding</a> </div> </div> <div> <input checked="" type="checkbox"/> Batch Configuration           <div> <a href="#">XML</a> </div> </div> </div>			
<h3>Agent Server Basic Setting</h3> <div> Device Login Password: <input type="text"/> </div> <div> Heartbeat Interval (s): <input type="text" value="60"/> </div> <div> <input type="checkbox"/> Enable Data Forwarding </div> <div> <input type="checkbox"/> Forward Data By Modbus Address (Modbus TCP) </div> <div> <input type="button" value="Apply"/> </div>			

Basic Setting		
Item	Description	Default
Device Login Password	Set devices login password. Devices need to enter this password before login RobustLink.	Null
Heartbeat Interval(s)	<p>When using GPRS/UMTS with a session running, most ISPs will monitor the traffic flow. If there is none for a predetermined period of time then it will shut the connection down at either the DHCP server or the APN, this is performed so that system resources are not taken up unnecessarily. To stop this happening you will need to send periodic Heartbeat bytes to keep the TCP connection always online.</p> <p>This item allows user to time interval between two Heartbeat packets. Setting from 10 to 3600 secs.</p>	60
Enable Data Forwarding	<p>Click to enable data forwarding function.</p> <p>After enable this function, RobustLink is acted as a data forwarding platform preparing to receive data from slave sites (M1000XP, M1000 Pro V2 or R3000). If the modem or router also enable data forwarding function and register to RobustLink, then all the data will be forwarded from slave sites to RobustLink. And RobustLink will forward the data to other site (user can configure the destination site in tab "Configuration" --&gt; "Data Forwarding"). User can check data record in Agent Server (RobustLink_start.bat) which will show what data has been sent to RobustLink.</p>	Disable
Forward Data By Modbus Address (Modbus TCP)	<p>Click to allow RobustLink to forward data according to Modbus Address of slave devices.</p> <p><b>Note:</b> If user clicks to enable this function, "Enable Data Forwarding" will be enabled automatically, this function should be enabled together with "Enable Data Forwarding".</p>	Disable
Apply	Click to apply above configurations.	

### 3.4. CONFIGURATION -> Data forwarding

This section allows user to do data forwarding configurations. For example, port number of RobustLink, Modbus Start and End address. Clicking anywhere of records page will pop up a new subpage "Data Forwarding" (blue color

characters).

Index	Device ID	Port	Modbus Start Addr	Modbus End Addr
1	300513060001	0	0	0
2	1097167457505	0	0	0
3	1097178433233	0	0	0
4	11111111300012	0	0	0
5	351535051012052	0	0	0




Data forwarding		
Item	Description	Default
Records Per page	Selected from “10”, “25”, “50”, “all”, user can set how many devices are wanted to show in one page.	25
Search	User can enter characters to search specific information. For example, when enter “R3000”, all information relevant to R3000 will show up.	Null
Index	Show the index of each device.	/
Device ID	Show the ID of device.	/
Port	Show the local port number assigned to each device which have logged in RobustLink. Default port number is “0”. In the new subpage “Data Forwarding”, user can assign each device a new local idle port whose range is 0-65535. Please avoid using famous ports which often spread over 0-1023. For example, “80” is for Web browser. So we recommend you to use the ports above 5000.	0
Modbus Start Addr	Show Modbus start address (ID) of slave device. In the new subpage “Data Forwarding”, user can assign a new Modbus Start Address (ID) to each device.	0
Modbus End Addr	Show Modbus End address (ID) of slave device. In the new subpage “Data Forwarding”, user can assign a new Modbus End Address (ID) to each device.	0
Apply	Click to apply above port forwarding settings.	/
Cancel	Click to cancel above port forwarding settings.	/
<b>Note:</b> There are 2 ways to do data forwarding. One is to enable “Enable Data Forwarding”, then RobustLink will forward data from different slave devices to different ports according to device ID; the other is to enable “Forward		


*Data By Modbus Address (Modbus TCP)” and define a range of Modbus Address basing on the settings of “Port”, “Modbus Start Addr” and “Modbus End Addr”, then RobustLink will forward data from different devices to **one port** or **different ports** according to the range of Modbus Address. It depends on the users whether use one port or different ports to accept data from different range of Modbus Address.*

### 3.5. CONFIGURATION -> XML

This section allow user to import configuration file of R3000 for batch configuration. This function only available for R3000.

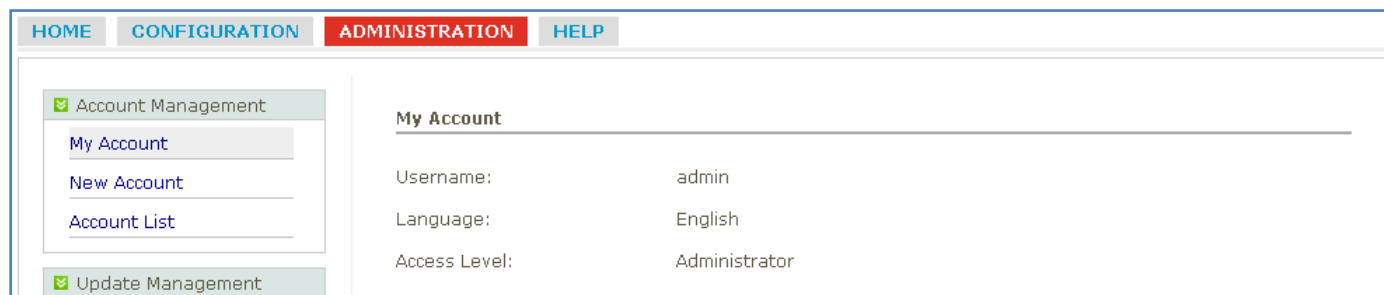
The screenshot displays the 'Batch Configuration List' page in the RobustLink Central Manager. The interface includes a navigation bar with 'HOME', 'CONFIGURATION' (highlighted), 'ADMINISTRATION', and 'HELP'. On the left, there are two main configuration sections: 'AS Configuration' (with sub-links for 'Basic Setting' and 'Data Forwarding') and 'Batch Configuration' (with a sub-link for 'XML'). The main content area shows a table with one record for a device with Index 1, Status 'Success' (green checkmark), Device ID '300513060001', Device Type 'R3000', IMEI '357789045177448', and Version '1.01.00'. Below the table, there are controls for 'Records per page' (set to 25), a 'Search' field, and pagination buttons (First, Prev, 1, Next, Last). At the bottom, there is a checkbox for 'Reboot devices after configure.', a file upload button labeled '浏览...' (Browse) with the text '未选择文件。' (No file selected), and a 'Batch Configuration' button.

XML		
Item	Description	Default
Records Per page	Selected from “10”, “25”, “50”, “all”, user can set how many devices are wanted to show in one page.	25
Search	User can enter characters to search specific information. For example, when enter “R3000”, all information relevant to R3000 will show up.	Null
Index	Show the index of each device	Null
Status	Show the status of devices. If device login to RobustLink, it will show “  ”, or it will show “  ”.	Null
Device ID	Show the ID of device.	Null
Device Type	Show the type of device. For example, “M1000 XP”, “M1000 Pro V2” or “R3000”.	Null
IMEI	Show the IMEI number of device.	Null
Version	Show the firmware version of device.	Null
	Click to select the device you want to do batch configuration.	Null
Reboot devices after configure	Click to reboot device after configuration.	Null
Browse	Click to upload configuration file (XML).	/

Batch Configuration	Click to do batch configuration. <b>Note:</b> before click to do batch configuration, please click “  ” to select the device.	/
---------------------	---	---

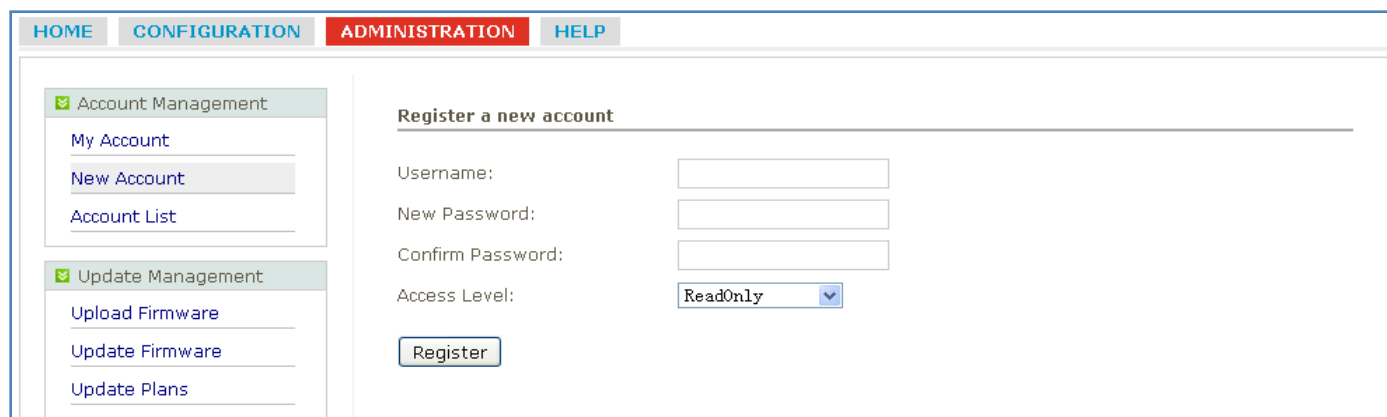
### 3.6. ADMINISTRATION -> My Account

This section allows user to check current account which has logged in RobustLink.



### 3.7. ADMINISTRATION -> New Account

This section allows user to add new accounts.



New Account		
Item	Description	Default
Username	Enter a new username here. The range of data length is from 5 to 64.	Null
New Password	Enter a new password here. The range of data length is from 5 to 64.	Null
Confirm Password	Enter again the password as what you set in “New Password”. The range of data length is from 5 to 64.	Null
Access Level	Selected from “ReadOnly”, “ReadWrite”, “Administrator”. ReadOnly: User can read the status of tab “HOME”, “CONFIGURATION” and “ADMINISTRATOR”, but can’t change the settings. ReadWrite: User can read the status of tab “HOME”, “CONFIGURATION”	ReadOnly

	and “ADMINISTRATOR”, also can change the settings of “CONFIGURATION -> Basic Settings”, “CONFIGURATION ->Data Forwarding”, “CONFIGURATION -> XML” and “ADMINISTRATOR -> Device Register”. Administrator: User have highest authority to access RobustLink, can read and change the settings of all configuration items.	
Register	Click to register the new account.	

### 3.8. ADMINISTRATION -> Account List

This section allows user to check the list of current account.

Account List

Records per page: 25 Search:

Index	Username	Access Level	
1	admin	Administrator	
2	robustel	Read-Write	✗
3	robustel2	Read-Only	✗

Records from 1 to 3 (Total: 3) First Prev 1 Next Last

**Note:** click “✗” to delete an account.

### 3.9. ADMINISTRATION -> Upload Firmware

This section allows user to upload firmware of different type of device to RobustLink. And when need to update, user can select proper firmware to update.

Firmware Name List Of Devices


Records per page: 25 Search:

Index	Device Type	Firmware Name	
1	R3000	R3k.1.01.00.03_130703	✗
2	R3000	R3k.1.01.00.02_130530	✗
3	R3000	R3k.1.01.00.02_130513	✗
4	M1000_ProV2	M1000ProV2_V2.4.0.bin	✗

Records from 1 to 4 (Total: 4) First Prev 1 Next Last

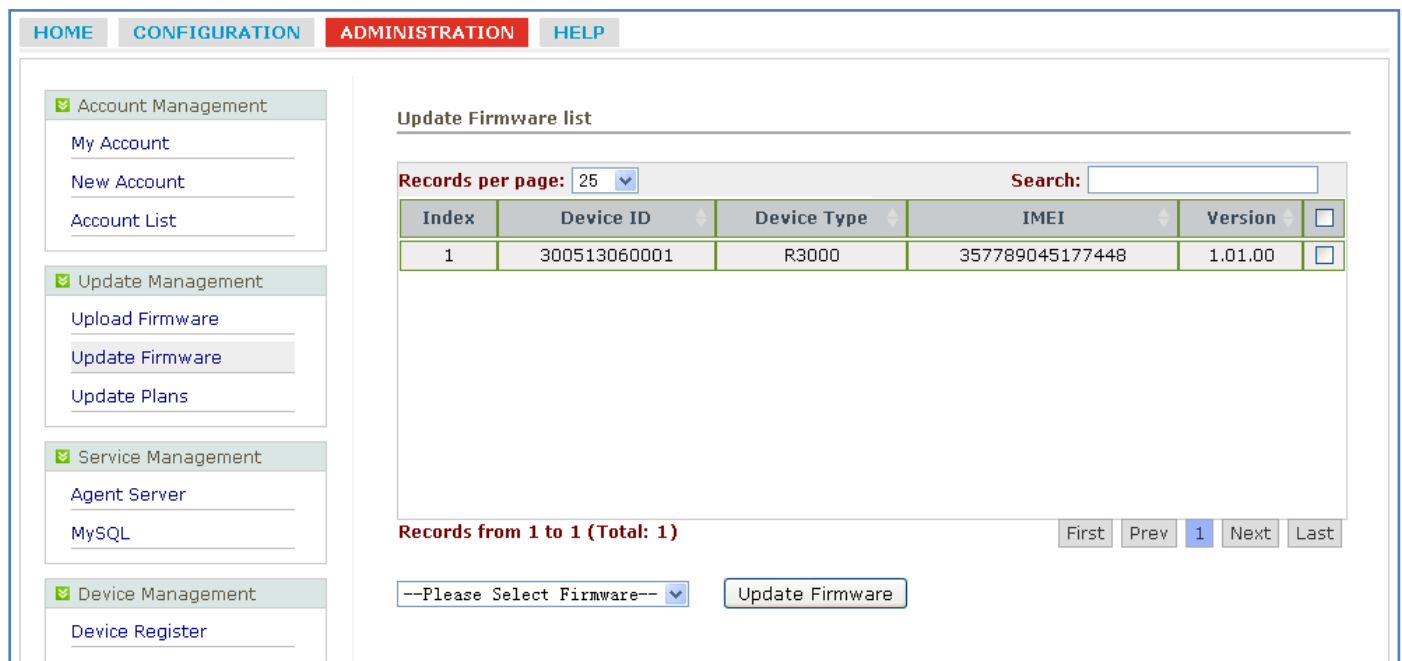
--Please Select Device Type--

Upload Firmware		
Item	Description	Default

Records Per page	Selected from "10", "25", "50", "all", user can set how many devices are wanted to show in one page.	25
Search	User can enter characters to search specific information. For example, when enter "R3000", all information relevant to R3000 will show up.	Null
Index	Show the index of each device	/
Device Type	Show the type of each device. For example, "M1000 XP", "M1000 Pro V2" or "R3000".	/
Firmware Name	Show the name of firmware.	/
Please Select Device Type	Click to select the device type the firmware belong to. Selected from "M1000 XP", "M1000 Pro V2" and "R3000".	/
Browse	Click to choose the firmware you want to upload to RobustLink.	/
Upload Firmware	Click to upload firmware.	/
<b>Note:</b> click "  " to delete the uploaded firmware.		

### 3.10. ADMINISTRATION -> Update Firmware

This section allows user to update firmware to RobustLink. And when need to update, user can select different firmware relevant to different device types.



HOME CONFIGURATION **ADMINISTRATION** HELP

Account Management  
My Account  
New Account  
Account List

Update Management  
Upload Firmware  
Update Firmware  
Update Plans

Service Management  
Agent Server  
MySQL

Device Management  
Device Register

Update Firmware list

Records per page: 25 Search:


Index	Device ID	Device Type	IMEI	Version	<input type="checkbox"/>
1	300513060001	R3000	357789045177448	1.01.00	<input type="checkbox"/>

Records from 1 to 1 (Total: 1) First Prev 1 Next Last

--Please Select Firmware--

Update Firmware		
Item	Description	Default
Records Per page	Selected from "10", "25", "50", "all", user can set how many devices are wanted to show in one page.	25
Search	User can enter characters to search specific information. For example, when enter "R3000", all information relevant to R3000 will show up.	Null
Index	Show the index of each device	/
Device ID	Show the ID of device.	/



Device Type	Show the type of device. For example, "M1000 XP" and "M1000 Pro V2" or "R3000".	/
IMEI	Show the IMEI number of device.	/
Version	Show the firmware version of device.	/
	Click to select the device you want to upgrade the firmware.	/
Please Select Firmware	Click to select one firmware which is uploaded in tab "Upload Firmware".	/
Update Firmware	Click to update the firmware you have selected.	/

### 3.11. ADMINISTRATION -> Update Plans -> New Plans

This section allows user to set firmware update plans according to the time. Different firmware has to match correspond device. For example, firmware of M1000 Pro V2 has to match M1000 Pro V2, cannot match R3000.

[HOME](#)
[CONFIGURATION](#)
[ADMINISTRATION](#)
[HELP](#)

Account Management

[My Account](#)
[New Account](#)
[Account List](#)

Update Management

[Upload Firmware](#)
[Update Firmware](#)
[Update Plans](#)









[New Plans](#)
[Plans List](#)

Service Management

[Agent Server](#)

Devices list for adding to update plans



Records per page: 25
Search:



Index	Status	Device ID	Device Type	IMEI	Version	
1		300513060001	R3000	357789045177448	1.01.00	
2		1097167457505	M1000_ProV2			
3		1097178433233	M1000_ProV2			
4		351535051012052	M1000_ProV2			

Records from 1 to 4 (Total: 4)

First
Prev
1
Next
Last

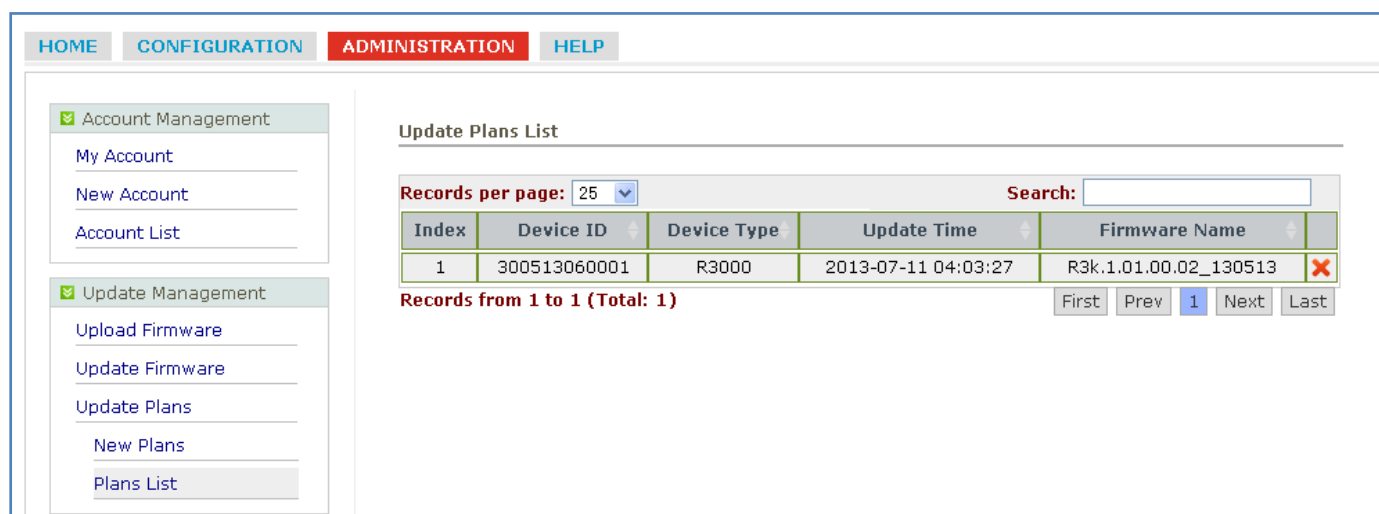
--Please Select Firmware--
2013-7-13 4:2:13
Add To Update Plans


New Plans @ Update Plans		
Item	Description	Default
Records Per page	Selected from "10", "25", "50", "all", user can set how many devices are wanted to show in one page.	25
Search	User can enter characters to search specific information. For example, when enter "R3000", all information relevant to R3000 will show up.	Null
Index	Show index of each device	/
Status	Show the status of devices. If device login to RobustLink, it will show "  ", or it will show "  ".	/
Device ID	Show the ID of device.	/
Device Type	Show the type of device. For example, "M1000 XP", "M1000 Pro V2" or "R3000".	/
IMEI	Show the IMEI number of device.	/
Version	Show the firmware version of device.	/

	Click to select the device you want to upgrade the firmware.	/
Please Select Firmware	Click to select one firmware which is uploaded in tab "Upload Firmware".	/
 2013-07-11 04:03:27	Set a specified time. RobustLink will upgrade firmware automatically if reach this time.	/
Add to Update Plan	Click to add a new plan.	/

### 3.12. ADMINISTRATION -> Update Plans -> Plans List

This section shows the list of firmware update plans.



Plans List @ Update Plans		
Item	Description	Default
Records Per page	Selected from "10", "25", "50", "all", user can set how many devices are wanted to show in one page.	25
Search	User can enter characters to search specific information. For example, when enter "R3000", all information relevant to R3000 will show up.	Null
Index	Show the index of each device.	
Device ID	Show the ID of device.	
Device Type	Show the type of device. For example, "M1000 XP", "M1000 Pro V2" or "R3000".	
Update Time	Show the time you which you have set in tab "New Plans".	
Firmware Name	Show the firmware version which you have set in tab "New Plans".	
<b>Note:</b> click "  " to delete an update plan.		

### 3.13. ADMINISTRATION -> Agent Server

This section allows user to set parameters of Agent Server.

[HOME](#)
[CONFIGURATION](#)
[ADMINISTRATION](#)
[HELP](#)

☒ Account Management
 

[My Account](#)
[New Account](#)
[Account List](#)

☒ Update Management
 

[Upload Firmware](#)
[Update Firmware](#)
[Update Plans](#)
[New Plans](#)
[Plans List](#)

☒ Service Management
 

[Agent Server](#)
[MySQL](#)

### Agent Server Connection

Agent-Server Address:

Port:

Protocol:

Timeout (s):

Agent Server		
Item	Description	Default
Agent-Server Address	Set IP address of Agent Server. For example, when Agent Server is installed in the same IP address of MySQL and Apache, user can enter "localhost", "127.0.0.1" in this filed; If Agent Server is set away from MySQL and Apache, not in the same IP address, user should enter the IP address of Agent Server. For example, when Agent Server is installed in remote server (PC), its IP address is 120.197.58.89, and then we shall enter "120.197.58.89" in this filed.	Localhost
Port	Set a local port number of Agent server.	31001
Protocol	Set transport layer protocol which device used to connect to Agent Server. <b>Note:</b> can't be selected yet.	tcp
Timeout(s)	Set timeout when slave device connect to Agent Server. For example, if "Timeout" is set as "30", when device keep on connecting Agent Server, after 30 seconds but still can't succeed to connect to Agent Server, log information will show connection timeout. Data range is from 5 to 60 seconds.	30
Connect	Click to update settings to Agent Server after above settings.	/

### 3.14. ADMINISTRATION -> MySQL

This section allows user to set parameters of MySQL.

[HOME](#)
[CONFIGURATION](#)
[ADMINISTRATION](#)
[HELP](#)

Account Management

[My Account](#)
[New Account](#)
[Account List](#)

Update Management

[Upload Firmware](#)
[Update Firmware](#)
[Update Plans](#)
[New Plans](#)
[Plans List](#)

Service Management

[Agent Server](#)
[MySQL](#)

MySQL Connection

Hostname:localhost

Username:root

Password:.....

Port:3306

DataBase Name:robustel

☒ Enable MySQL persistent connection (Recommend)
 ☒ Notify connection setting to Agent-Server (Recommend)

Connect

MySQL		
Item	Description	Default
Hostname	Enter the IP address where MySQL is installed in. For example, if MySQL is installed in the same PC of Web Server, user can enter "localhost" or "127.0.0.1" in this filed; if MySQL is installed in different location (120.197.59.63 for example) from Web Server, user shall enter "120.197.59.63" in this filed.	localhost
Username	Enter user name of MySQL.	root
Password	Enter password of MySQL. <b>Note:</b> Username and Password are used to login MySQL, we suggest user do not change the settings of Username and Password.	123456
Port	Enter port number of MySQL.	3306
Connect	Click to update settings to MySQL after above settings.	/
DataBase Name	Set name of MySQL.	robustel
Enable MySQL persistent connection (Recommend)	Click to connect MySQL to Web Server persistently. If do not enable this function, Web Server will just connect to MySQL if needed. For example, add new account to RobustLink.	Enable
Notify connection setting to Agent-Server (Recommend)	Click to send "MySQL Connection" information such as "Hostname", "Username", "Password", etc to Agent Server, and then Agent Server can be able to connect to MySQL according to this information. <b>Note:</b> when you change the MySQL Connection information, remember to click "Connect" to let Agent Server know the credentials of MySQL.	Enable
Connect	Click to update settings to Agent Server after above settings.	/

### 3.15. ADMINISTRATION -> Device Register



This section allows user to set parameters of Device Register.

The screenshot shows the 'ADMINISTRATION' tab selected. The left sidebar contains the following menu items:

- Account Management**
  - My Account
  - New Account
  - Account List
- Update Management**
  - Upload Firmware
  - Update Firmware
  - Update Plans
- Service Management**
  - Agent Server
  - MySQL
- Device Management**
  - Device Register

The main content area is titled 'Device Register List'. It includes a 'Records per page' dropdown set to 25 and a 'Search:' input field. Below this is a table with columns: Index, Status, Device ID, Device Type, IMEI, and Version. The table body is empty, displaying 'No records to display'. At the bottom of the table area, it shows '0-0/0' and navigation buttons: First, Prev, Next, Last. Below the table are three buttons: 'Browse...', 'Batch Register', and 'Export'.

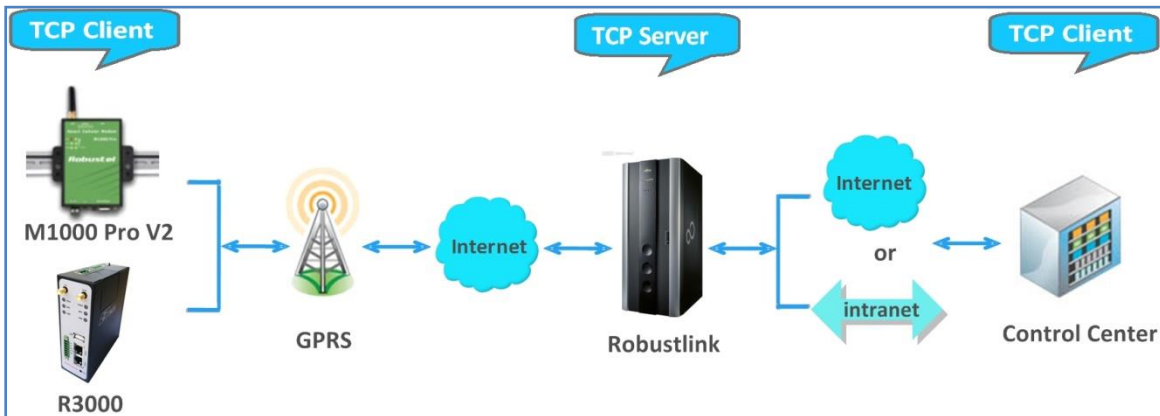
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Device Register		
Item	Description	Default
Records Per page	Selected from "10", "25", "50", "all", user can set how many devices are wanted to show in one page.	25
Search	User can enter characters to search specific information. For example, when enter "R3000", all information relevant to R3000 will show up.	Null
Index	Show index of each device	/
Status	Show the status of devices. If device login to RobustLink, it will show "  ", or it will show "  .	/
Device ID	Show the ID of device.	/
Device Type	Show the type of device. For example, "M1000 XP", "M1000 Pro V2" or "R3000".	/
IMEI	Show the IMEI number of device.	/
Version	Show the firmware version of device.	/
Browse	Click to upload register file.	Browse
Batch Register	Click to start registering devices to RobustLink.	/
Export	Click to export register file: <i>device_register.xls</i> , user need to fill in device's information such as "Device Type" and "Device ID" in this file. Device ID of M1000 XP/M1000 Pro V2 is its IMEI number which will be found in the back label, or you can check this in ModemConfigurator -> NMS -> M2M Platform -> Device ID.	/

	<p>Device ID of R3000 is its SN number which will be found in the side label of R3000, or you can check this SN number in R3000's Web GUI -&gt; Status -&gt; System -&gt; Router Information -&gt; Serial Number.</p> <p><i>Note: section 4.2.1 and section 4.3.1's step 1 to step 4 will show how to register devices.</i></p>	
--	---	--

## Chapter 4. Examples

### 4.1. Application Diagram for Introduction

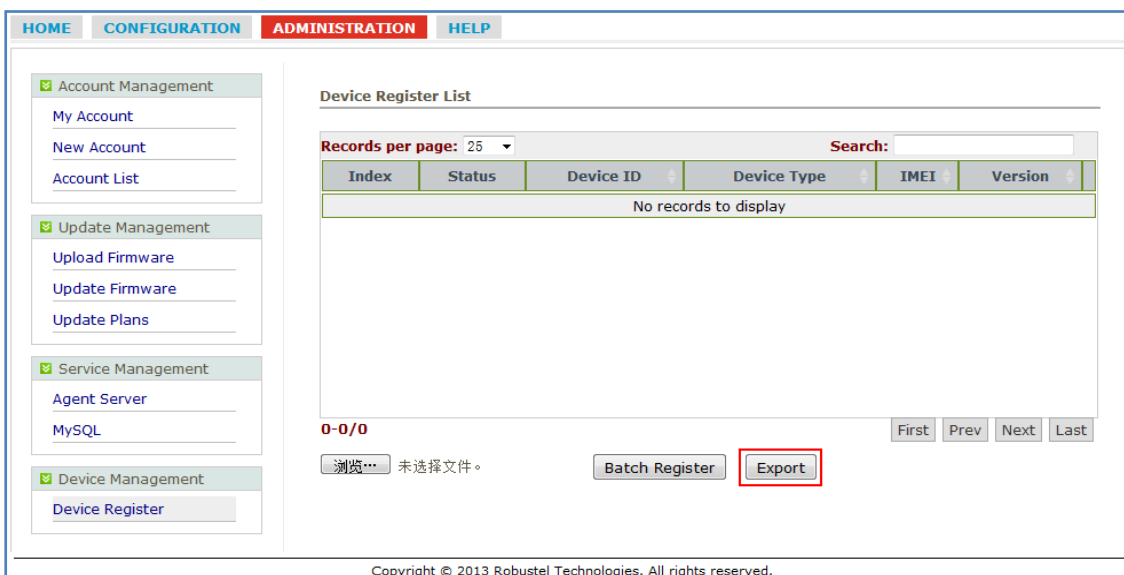


1. M1000 Pro V2/ R3000 works as TCP Client with any IP which can access to Internet.
2. RobustLink works as TCP Server with fixed public IP or dynamic IP with domain name.
3. Another TCP Client site, Control Center for example, works as another TCP Client which connects with RobustLink via intranet (LAN port) or via Internet.

### 4.2. Manage M1000 Pro V2 via RobustLink

#### 4.2.1. Connect M1000 Pro V2 to RobustLink

1. Login RobustLink Web GUI, go to tab "ADMINISTRATION" -> "Device Register", click "Export" to export register file: device\_register.xls.



2. Open device\_register.xls, enter IMEI number of M1000 Pro V2 in tab “Device ID” and **M1000\_ProV2** in tab “Device Type”, and then save this file. Section 3.15 -> “Export” will show how to find IMEI number of M1000 Pro V2.

	A	B	C	D
1	Device ID	Device Type	Region	Phone Number
2	351535051960474	M1000_ProV2		
3	351535051012052	M1000_ProV2		
4	351535052002730	M1000_ProV2		
5	357804048811578	M1000_ProV2		
6	00300513060001	R3000		
7				

**Note:** In tab “Device Type”, make sure enter **M1000\_ProV2**, any other format like **M1000 ProV2** or **M1000\_Prov2** will be unavailable.

3. Click tab “Browse” to import file device\_register.xls which you have filled in “Device ID” and “Device Type” of M1000 Pro V2.

Device Register List

Records per page: 25 Search:

Index	Status	Device ID	Device Type	IMEI	Version
No records to display					

0-0/0 First Prev Next Last

浏览... 未选择文件。 Batch Register Export

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4. Click “Batch Register”.

Device Register List

Records per page: 25 Search:

Index	Status	Device ID	Device Type	IMEI	Version
1	✗	00300513060001	R3000		✗
2	✗	00300913080058	R3000		✗
3	✗	351535051012052	M1000_ProV2		✗
4	✗	351535051960474	M1000_ProV2		✗
5	✗	351535052002730	M1000_ProV2		✗
6	✗	357804048811578	M1000_ProV2		✗

Records from 1 to 6 (Total: 6) First Prev 1 Next Last

浏览... device\_register.xls Batch Register Export

Row[2]: Register a new device successfully.  
Row[3]: Register a new device successfully.  
Row[4]: Register a new device successfully.

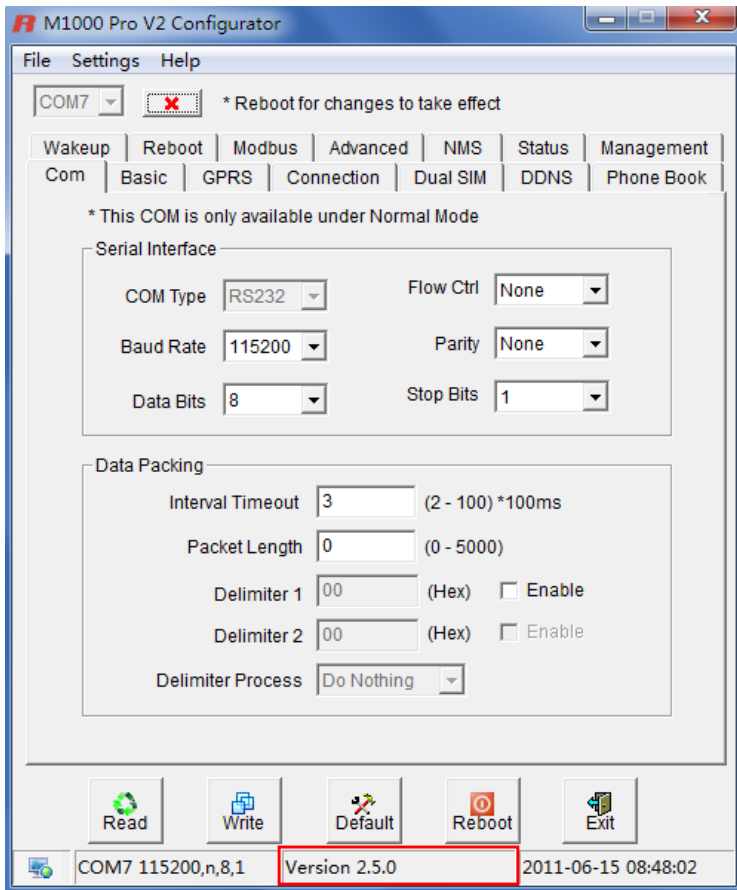
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5. Regarding of M1000 Pro V2: install an antenna -> insert SIM card into one of the SIM card slots -> connects M1000 Pro V2 to the PC's serial port -> switch to **Config Mode** -> power on M1000 Pro V2.



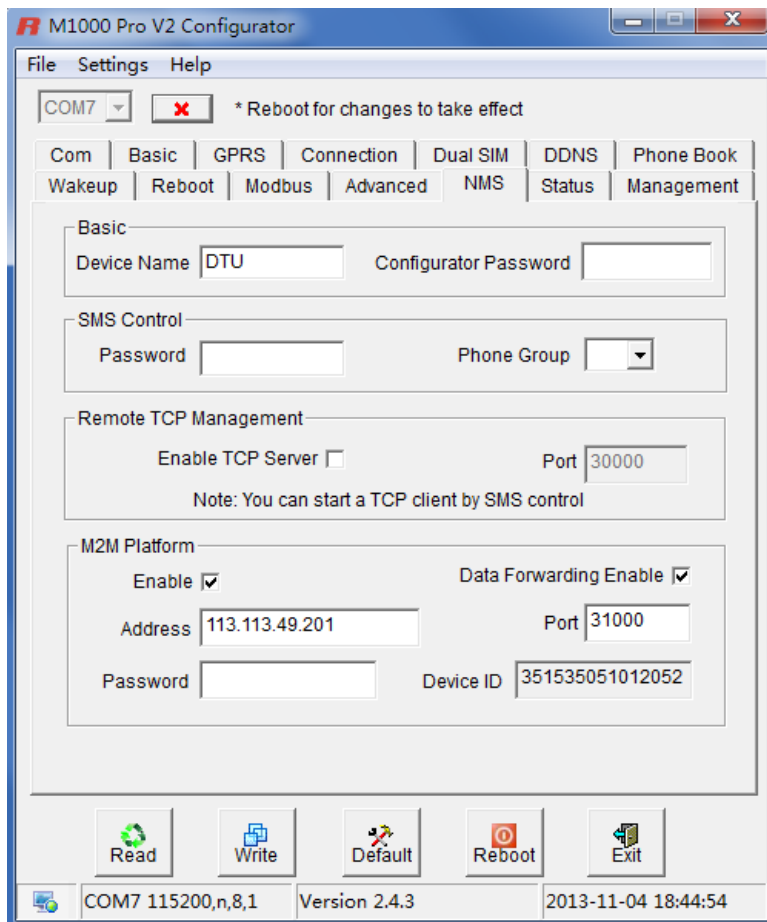
6. Run M1000 Pro V2 Configurator, Upgrade M1000 Pro V2's firmware to "Version **2.5.0**" (firmware version greater than or equal to version 2.3.3, such as version 2.5.0, will support RobustLink function), and then use M1000 Pro V2 Configurator V2.5.0.exe to configure.



**Note:** Please check the firmware version at the bottom of the Configurator to confirm that it is newer than Version 2.3.3. If not please let us know what your firmware version is, we will provide you the proper firmware and configurator.

7. Go to tab "**COM**", select relevant com Type and Baud Rate. For example, COM type RS232, Baud Rate 115200, Data Bits 8, Flow Ctrl None, Parity None, and Stop Bits 1.
8. Go to tab "**GPRS**" --> enter relevant ISP information, for example APN, User Name, etc. Make sure M1000 Pro V2 can establish PPP connection successfully.
9. Go to tab "**Connection**" --> go to item "Connection Control" --> select "Always Online" mode. Other settings stay default.
10. Go to tab "**NMS**"-->M2M Platform, click Enable to allow M1000 Pro V2 connect to RobustLink --> enter IP address and Port number of RobustLink's in item "Address" and "Port"--> enter a password which set in the

RobustLink's Web in item "Password" --> click to enable data forwarding in item "Data Forwarding Enable".

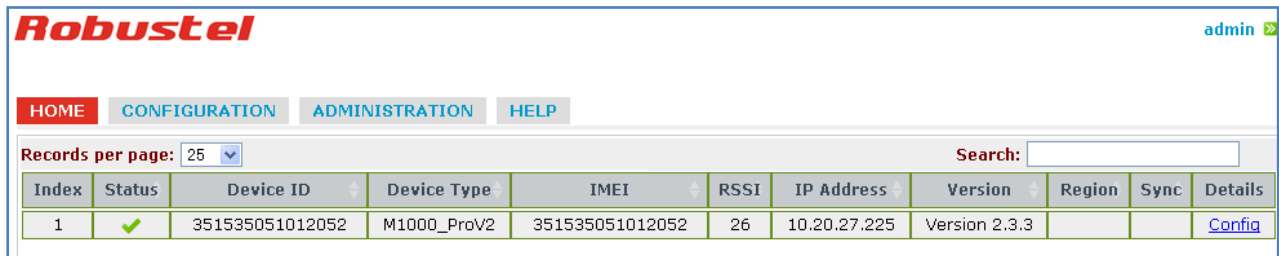


**Note:**

- **Address:** This address is RobustLink's IP address, which should be a public IP address or domain name. For example, 113.113.49.201, the address of USB dongle we use for test in this document.
- **Port:** This port number is the local port number of Agent Server (default port number is 31000), and then enter this number in this field. If Agent Server's port number is changed to another port number basing on the real application, 11021 for example, please enter 11021 in this field. Then go to xampp folder and find out file "RobustLink\_start.bat" -> right click and select "edit" --> change line 7 "RobustLink.exe" to "**RobustLink.exe -p 11021**" --> save and quit.
- **Password:** This password is configured in the RobustLink. This item shall be same with the password set in the RobustLink. Please refer to section **3.3 CONFIGURATION -> Basic Setting -> Device Login Password**.
- **Device ID:** This item let you know the default single ID number of M1000 Pro V2, can't be changed.
- **Data Forwarding Enable:** Click to enable data forwarding, the topology is: data from M1000 Pro V2 (TCP client) --> RobustLink (TCP server) --> another TCP Client. At this time tab "Connection"--> "Socket Application" can't be configure. If you disable this tab, data will not be forwarded via RobustLink, they will be sent normally as you set in tab "Connection"--> "Socket Application". But RobustLink still can manage and monitor the status of M1000 Pro V2. Whether Data Forwarding should be enabled depends on customer (user). "Data Forwarding Enable" will be enabled for instruction in this document.

11. Go to tab "**Status**" --> go to item "TCP/IP", if succeed to establish PPP connection and TCP connection, "PPP Status" will show "Up" and "TCP Status" will show "Connected".

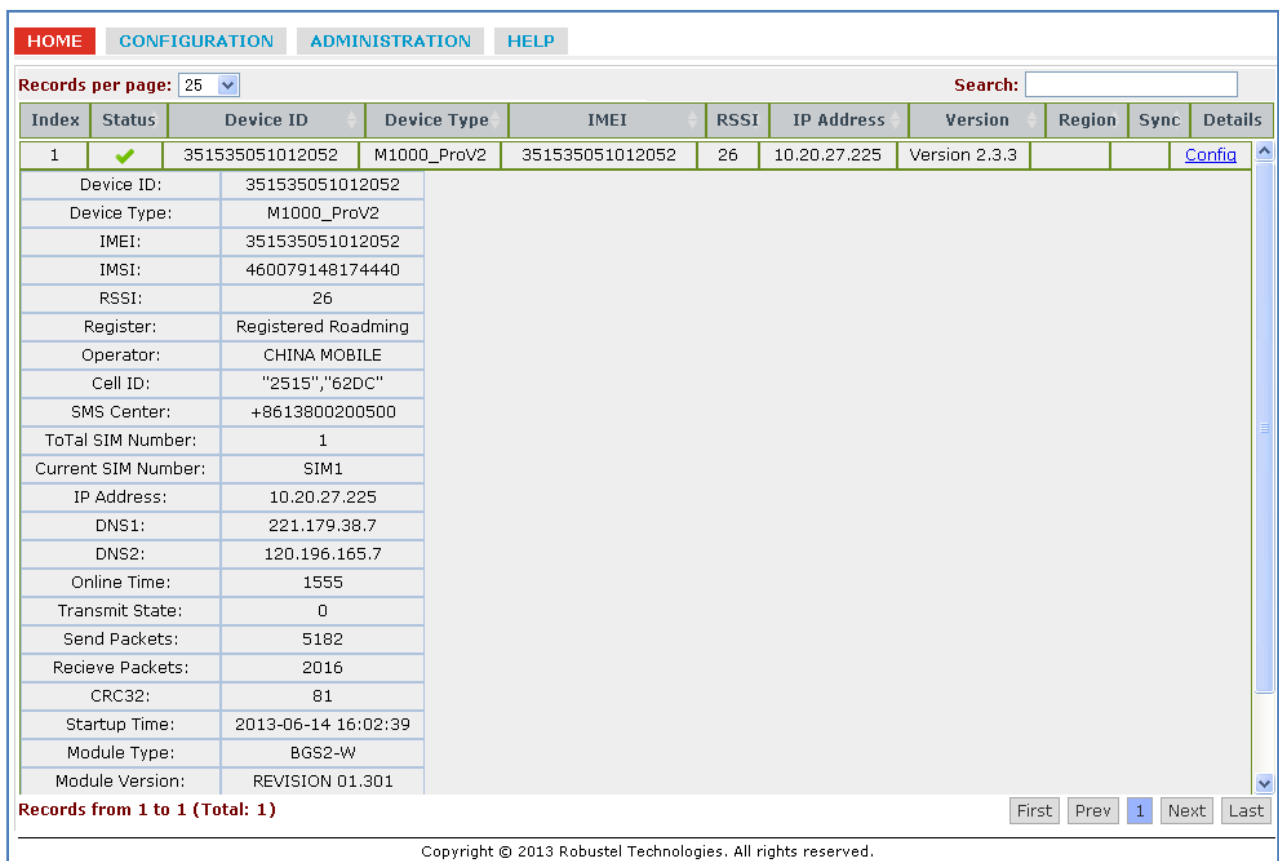
12. Other tabs stay default. Click **“Write”** to save the settings --> click **“Reboot”**.
13. Switch to **Normal Mode** (data transmission mode).
14. If M1000 Pro V2 login RobustLink successfully, it will show the following diagram.



The screenshot shows the RobustLink web interface. At the top is the Robustel logo and a user profile 'admin'. Below are navigation tabs: HOME, CONFIGURATION, ADMINISTRATION, and HELP. A 'Records per page' dropdown is set to 25, and there is a search bar. A table displays device records with columns: Index, Status, Device ID, Device Type, IMEI, RSSI, IP Address, Version, Region, Sync, and Details. The first record (Index 1) has a green checkmark status and a 'Config' link in the Details column.

Index	Status	Device ID	Device Type	IMEI	RSSI	IP Address	Version	Region	Sync	Details
1	✓	351535051012052	M1000_ProV2	351535051012052	26	10.20.27.225	Version 2.3.3			<a href="#">Config</a>

15. If click the any place of Index 1, it will show the status information of M1000 ProV2.



The screenshot shows the detailed status information for device Index 1. The interface is similar to the previous one, but the 'Details' column for Index 1 is expanded, showing a list of device parameters and their values. At the bottom, there are pagination controls and a copyright notice.

Index	Status	Device ID	Device Type	IMEI	RSSI	IP Address	Version	Region	Sync	Details
1	✓	351535051012052	M1000_ProV2	351535051012052	26	10.20.27.225	Version 2.3.3			<div> <div>Device ID:</div> <div>351535051012052</div> </div> <div> <div>Device Type:</div> <div>M1000_ProV2</div> </div> <div> <div>IMEI:</div> <div>351535051012052</div> </div> <div> <div>IMSI:</div> <div>460079148174440</div> </div> <div> <div>RSSI:</div> <div>26</div> </div> <div> <div>Register:</div> <div>Registered Roadming</div> </div> <div> <div>Operator:</div> <div>CHINA MOBILE</div> </div> <div> <div>Cell ID:</div> <div>"2515","62DC"</div> </div> <div> <div>SMS Center:</div> <div>+8613800200500</div> </div> <div> <div>ToTal SIM Number:</div> <div>1</div> </div> <div> <div>Current SIM Number:</div> <div>SIM1</div> </div> <div> <div>IP Address:</div> <div>10.20.27.225</div> </div> <div> <div>DNS1:</div> <div>221.179.38.7</div> </div> <div> <div>DNS2:</div> <div>120.196.165.7</div> </div> <div> <div>Online Time:</div> <div>1555</div> </div> <div> <div>Transmit State:</div> <div>0</div> </div> <div> <div>Send Packets:</div> <div>5182</div> </div> <div> <div>Recieve Packets:</div> <div>2016</div> </div> <div> <div>CRC32:</div> <div>81</div> </div> <div> <div>Startup Time:</div> <div>2013-06-14 16:02:39</div> </div> <div> <div>Module Type:</div> <div>BGS2-W</div> </div> <div> <div>Module Version:</div> <div>REVISION 01.301</div> </div>

Records from 1 to 1 (Total: 1)

First Prev 1 Next Last

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#### 4.2.2. Forward data from M1000 Pro V2 to RobustLink

1. Open RobustLink, go to tab **“CONFIGURATION”** --> **“Basic Settings”** --> click **“Enable Data Forwarding”**--> click **“Apply”** to activate these settings.

HOME CONFIGURATION ADMINISTRATION HELP

AS Configuration

Basic Setting

Data Forwarding

Batch Configuration

XML

Agent-Server Link Checked for Devices

Device Login Password:

Heartbeat Interval (s):

☒ Enable Data Forwarding

☐ Forward Data By Modbus Address (Modbus TCP)

☐ Enable Safe Login

Apply

Configuration successfully applied.

2. Go to tab "CONFIGURATION"--> "Data Forwarding".

HOME CONFIGURATION ADMINISTRATION HELP

AS Configuration

Basic Setting

Data Forwarding

Batch Configuration

XML

Device Data Forwarding Setting

Records per page: 25 Search:

Index	Device ID	Port	Modbus Start Addr	Modbus End Addr
1	351535051012052	10000	0	0

3. Click the any place of Index 1, show details of Data Forwarding information. Set an idle port number, for example 22233. Then click "Apply".

HOME CONFIGURATION ADMINISTRATION HELP

AS Configuration

Basic Setting

Data Forwarding

Batch Configuration

XML

Device Data Forwarding Setting

Records per page: 25 Search:

Index	Device ID	Port	Modbus Start Addr	Modbus End Addr
1	351535051012052	10000	0	0

**Data Forwarding**

Device ID:

Port:

Modbus Start Addr(1-247):

Modbus End Addr(1-247):

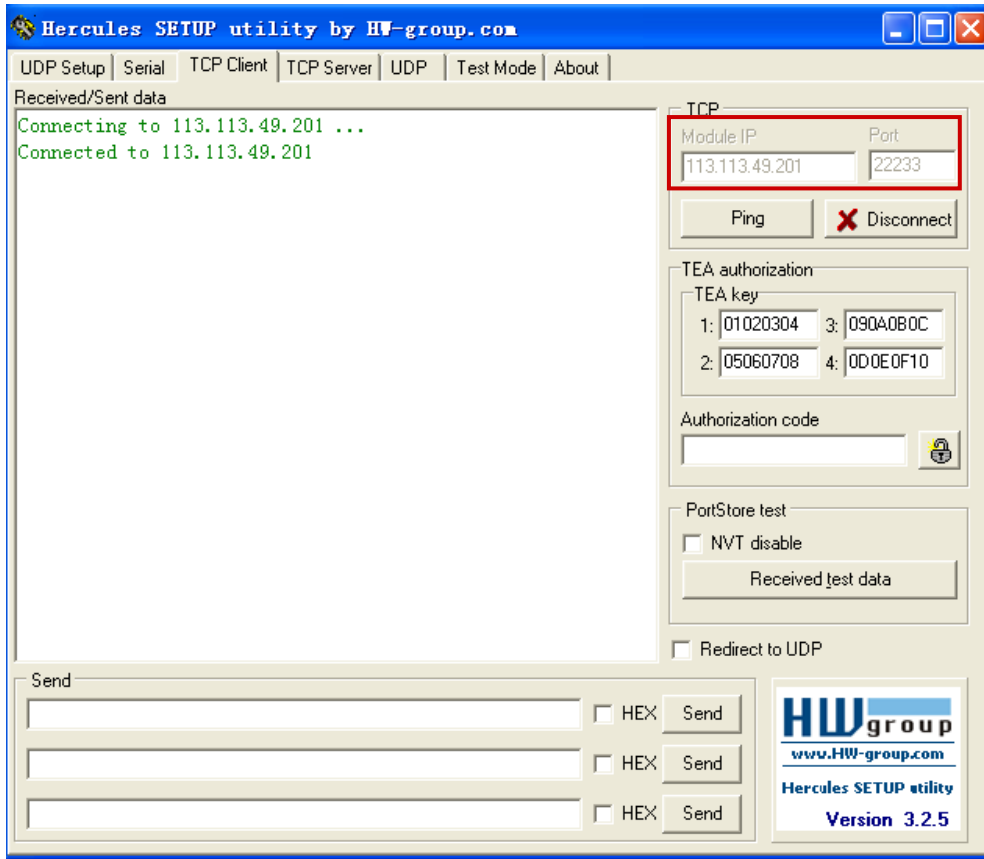
Apply Cancel

Records from 1 to 1 (Total: 1)

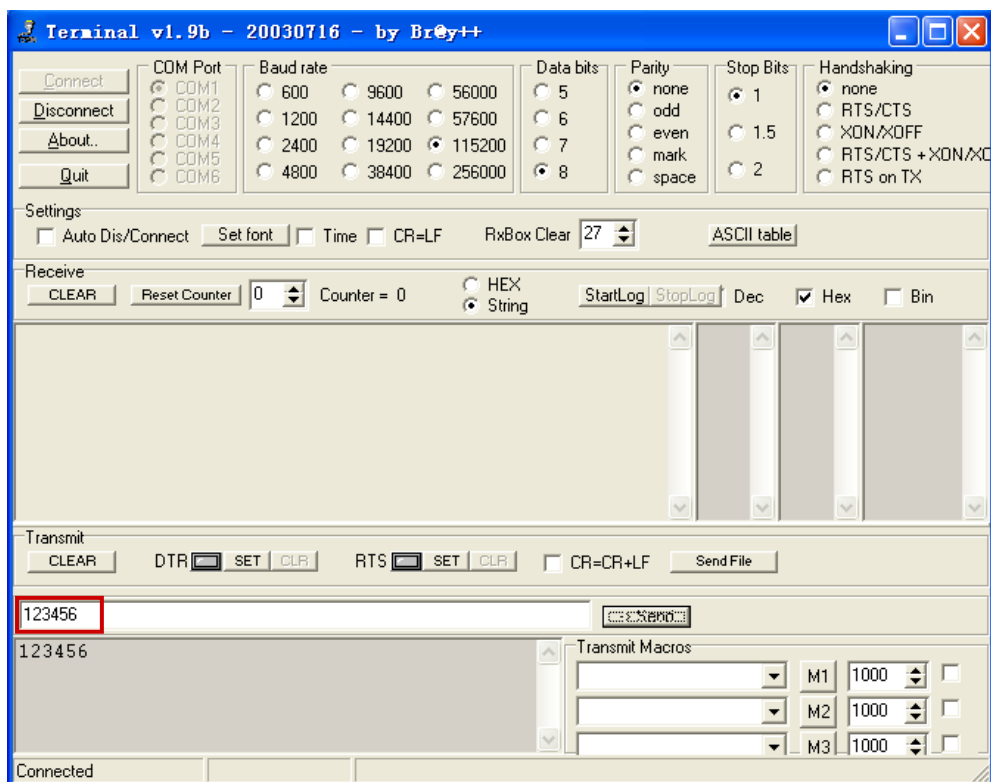
First Prev 1 Next Last

**Note:** Now RobustLink agent has become a TCP server, IP address is 113.113.49.201, local port number is 22233.

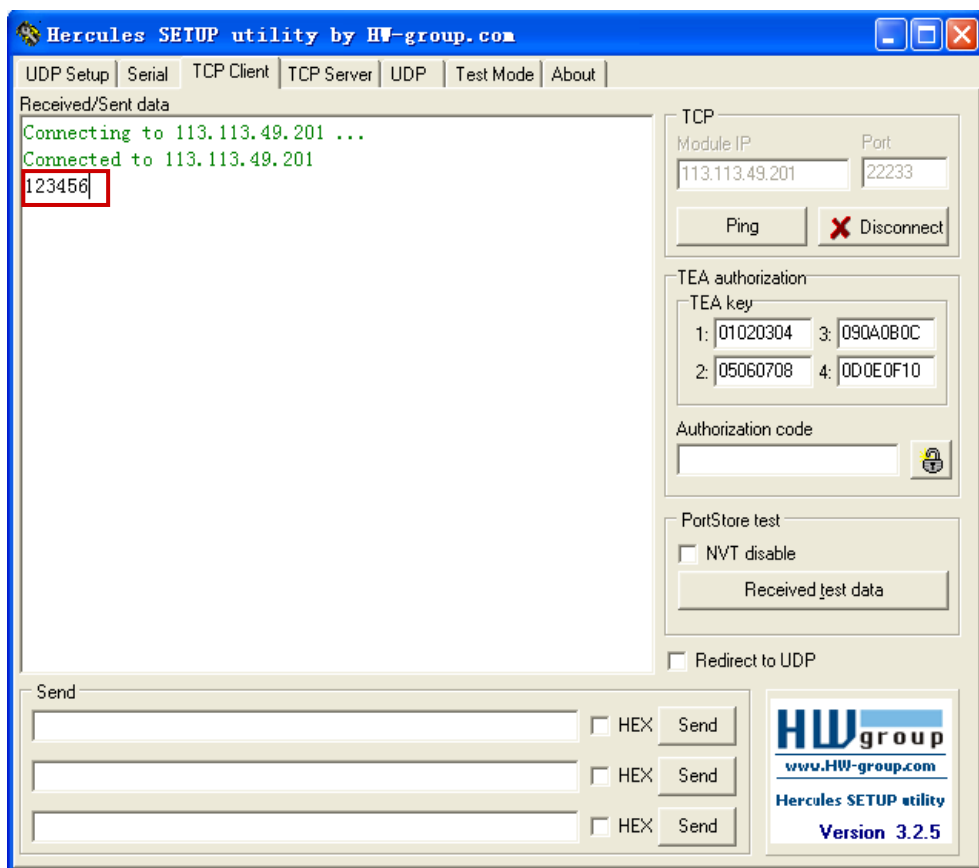
4. Run Hercules (download via link [http://www.hw-group.com/products/hercules/index\\_en.html](http://www.hw-group.com/products/hercules/index_en.html) ) --> go to tab "TCP Client" --> enter IP address and Port number of above TCP server which has been created in RobustLink --> click "Connect". If succeed to connect to the TCP Server, in this document, it will show up message "Connecting to 113.113.49.201 ...  
Connected to 113.113.49.201".



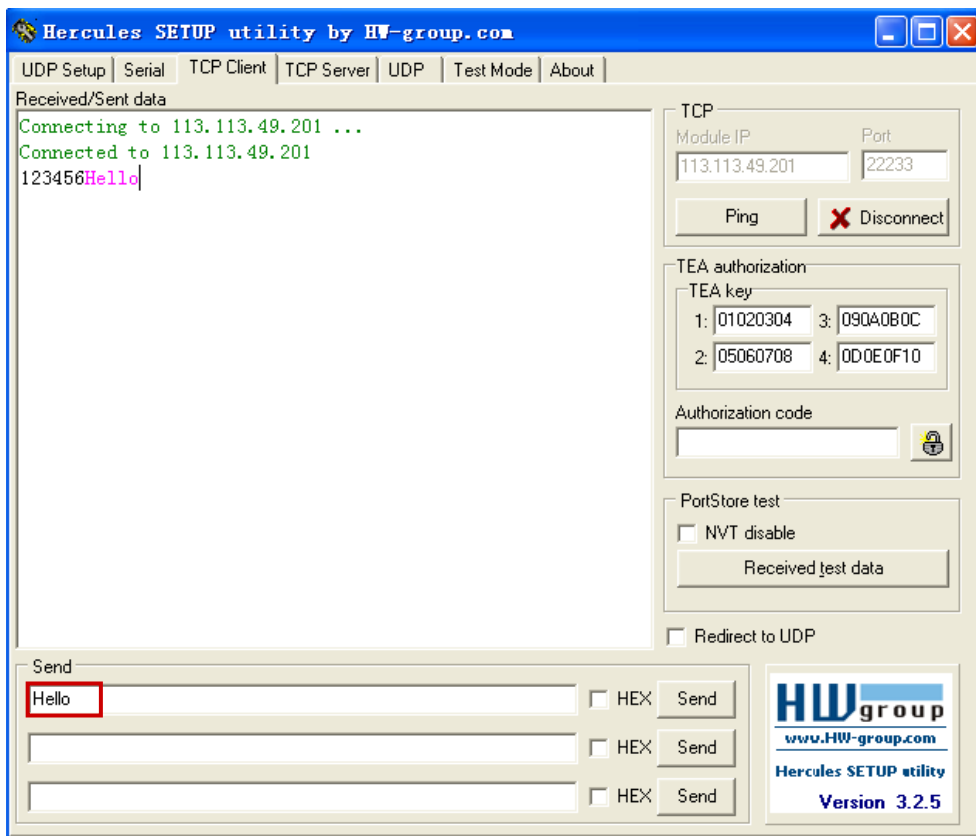
5. Run Terminal exe (download via link <https://www.box.com/s/67a68jraki9k1r0lijuz> ) --> select the same serial port settings of M1000 Pro V2: COM 1, Baud Rate 115200, Data Bits 8, Parity none, Stop Bits 1, Handshaking none --> click "Connect" --> enter characters like "123456" --> click "Send".



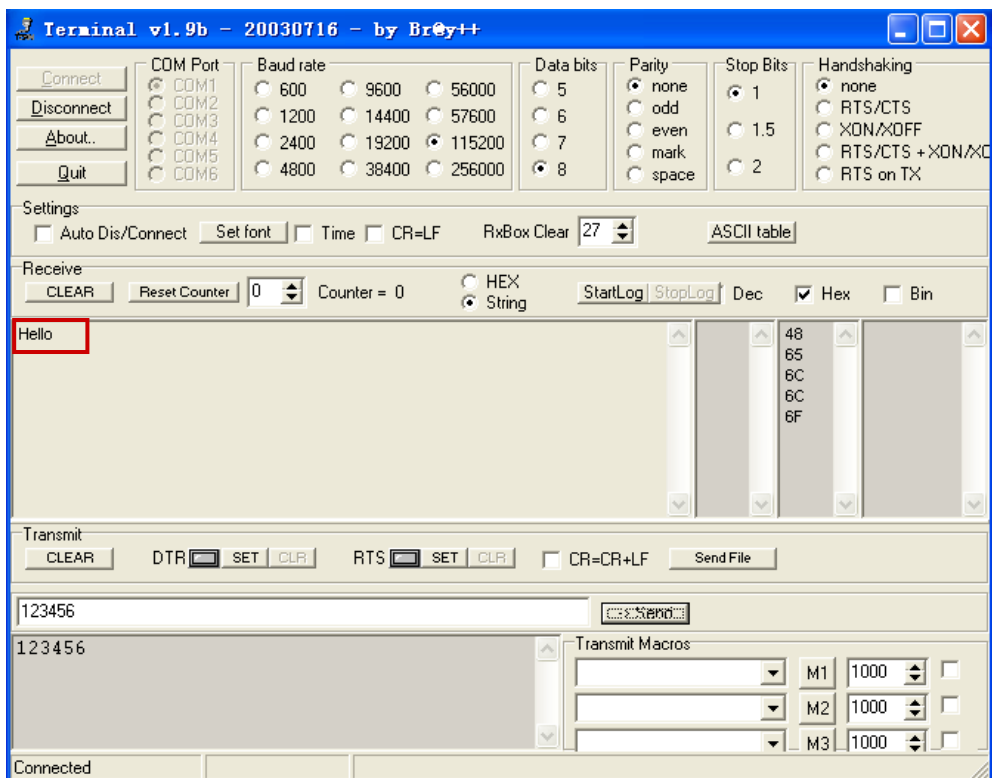
6. Check Hercules, if data “123456” shows up, that means RobustLink succeed to forward data “123456” sent from M1000 Pro V2.



7. Enter characters “Hello” in Hercules --> click “Send”.



8. Check Terminal.exe, if data “Hello” shows up, that means RobustLink succeed to forward data “Hello” which is sent from Control Center.



## 4.3. Manage R3000 via RobustLink

### 4.3.1. Connect to RobustLink

There are two ways for R3000 to connect to RobustLink, one is R3000 connect to Internet through cellular network (GPRS), then connect to RobustLink; the other is to connect to Internet through Ethernet (broadband), then connect to RobustLink. In this document we use the first method.

1. Login RobustLink Web GUI, go to tab “ADMINISTRATION” -> “Device Register”, click “Export” to export register file: device\_register.xls.



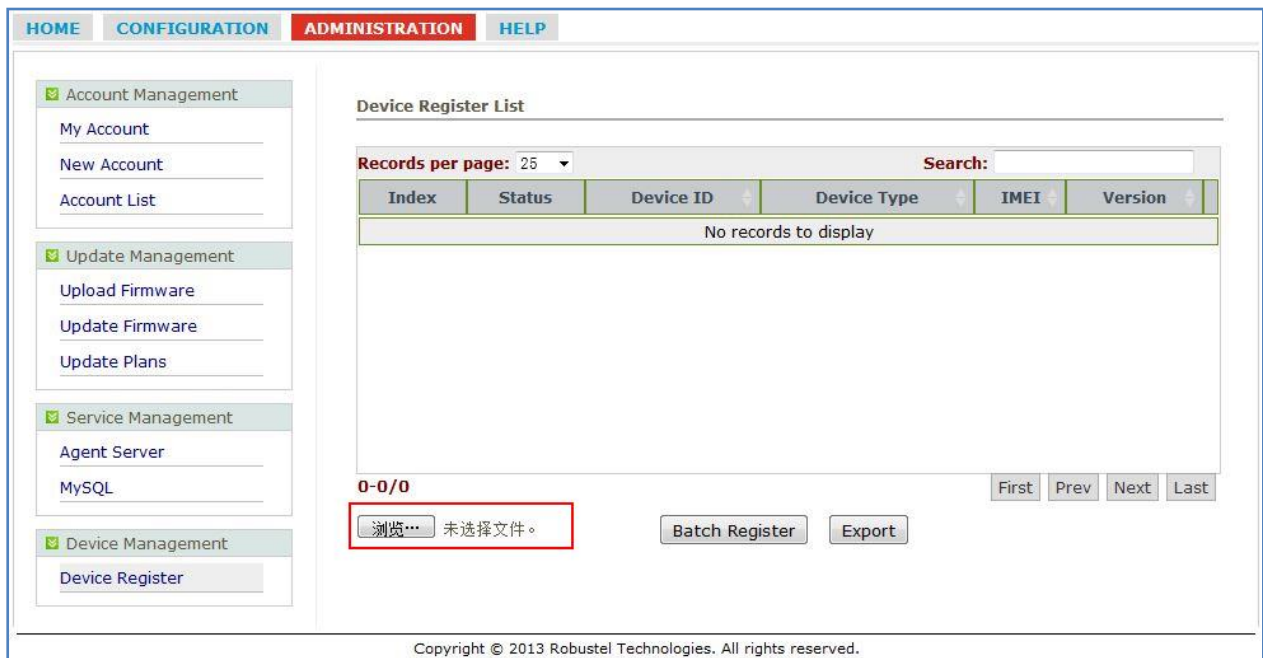
2. Open device\_register.xls, enter SN number of R3000 in tab “Device ID” and **R3000** in tab “Device Type”, and then save this file. Section 3.15 -> “Export” will show how to find SN number of R3000.

	A	B	C	D
1	Device ID	Device Type	Region	Phone Number
2	351535051960474	M1000_ProV2		
3	351535051012052	M1000_ProV2		
4	351535052002730	M1000_ProV2		
5	357804048811578	M1000_ProV2		
6	00300513060001	R3000		
7				

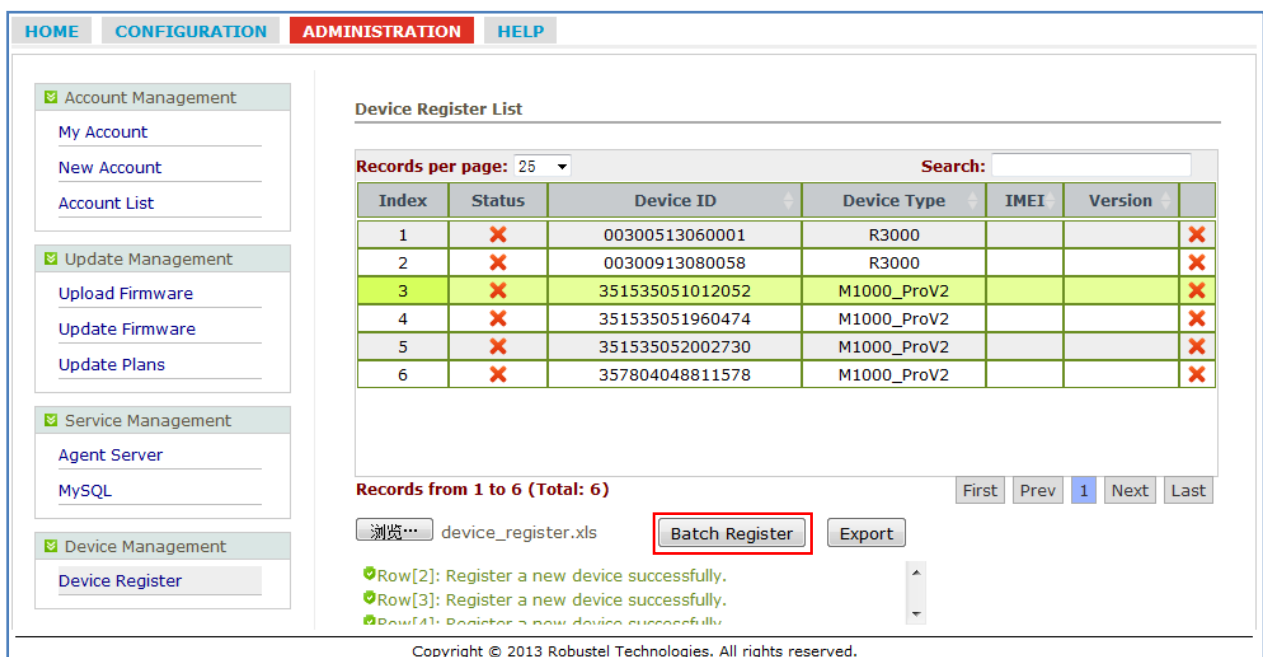
**Note:** In tab “Device Type”, make sure **R3000** is entered, any other format like **R 3000** or **r3000** will be unavailable.

3. Click tab “Browse” and import file device\_register.xls which you have filled in “Device ID” and “Device Type” of R3000.





#### 4. Click "Batch Register".



#### 5. Regarding of R3000, Install an antenna, insert SIM card into one of the card slot. Power on R3000, login R3000's Web GUI page.

User authentication required. Login please.

Username:

Password:

Language:

Please enter your login username and password.

Login

6. Go to tab "Configuration"--> "Cellular WAN" --> enter relevant correct ISP settings --> click "Apply".

Logged in as: admin

**Basic** Advanced ISP Profile

**Cellular Settings**

	SIM1	SIM2
Status:	Not inserted	Ready
Network Provider Type:	Auto	china-mobile
APN:		3gnet
Username:		
Password:		
Dialup No.:		*99***1#
PIN code request:	Set PIN Code	Set PIN Code

**Connection Mode**

Connection Mode: Always online

Redial Interval (s): 30

Max Retries: 3

**Dual SIM Policy**

Main SIM Card: SIM1

- ☒ Switch to backup SIM card when connection fails
- ☐ Switch to backup SIM card when roaming is detected
- ☐ Switch to backup SIM card when data limit is exceeded
- ☐ Switch back Main SIM card after timeout

Apply Cancel

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7. Go to tab "Configuration"--> "RobustLink" --> enter server (RobustLink) address and local port in the item "Server Address" and "Port". If you want set a login password for RobustLink, go to item "Password", enter a password which is preseted in the RobustLink. For example, if RobustLink set password "1234", we need to enter "1234" in here --> click "Apply" --> click "Save" --> click "Reboot".

**RobustLink**

**RobustLink Settings**

- ☒ Enable RobustLink
- Server Address: 113.113.49.201
- Port: 31000
- Password:

Apply Cancel

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**Note:**

- Server Address:** This address is RobustLink's IP address, which should be a public IP address or URL. For example, 113.113.49.201, the address of USB dongle we use for test in this document.
- Port:** This port number is the local port number of Agent Server (default port number is 31000), and then

enter this number in this field.

If Agent Server's port number is changed to another port number basing on the real application, 11021 for example, please enter 11021 in this field. Then go to xampp folder and find out file "RobustLink\_start.bat" -> right click and select "edit" --> change line 7th "RobustLink.exe" to "RobustLink.exe -p 11021" --> save.

- **Password:** Enter the password which set in the RobustLink. Please refer to section 3.3 CONFIGURATION -> Basic Setting -> Device Login Password.

8. If R3000 login RobustLink successfully, it will show the following diagram.

HOME

CONFIGURATION

ADMINISTRATION

HELP

Records per page:

25

Search:

Index	Status	Device ID	Device Type	IMEI	RSSI	IP Address	Version	Region	Sync	Details
1	✓	139983585705	R3000	357789045177448	24	10.200.10.252	1.01.00			

9. If click any place of Index 1, it will show the status information of R3000.

HOME

CONFIGURATION

ADMINISTRATION

HELP

Records per page:

25

Search:

Index	Status	Device ID	Device Type	IMEI	RSSI	IP Address	Version	Region	Sync	Details
1	✓	139983585705	R3000	357789045177448	24	10.200.10.252	1.01.00			
		Device ID:	139983585705							
		Device Type:	R3000							
		IMEI:	357789045177448							
		IMSI:	460079148174440							
		RSSI:	24							
		Register:	Registered Roadming							
		Operator:	46000							
		Cell ID:	62DC							
		SMS Center:								
		ToTal SIM Number:	1							
		Current SIM Number:	SIM2							
		IP Address:	10.200.10.252							
		DNS1:	221.179.38.7							
		DNS2:	120.196.165.7							
		Online Time:	373							
		Transmit State:	0							
		Send Packets:	0							
		Recieve Packets:	0							
		CRC32:	3340456709							
		Startup Time:	2013-06-15 17:10:16							
		Module Type:	EM770W							
		Module Version:	11.126.10.81.00							

Records from 1 to 1 (Total: 1)

First

Prev

1

Next

Last

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### 4.3.2. Forward data from R3000 to RobustLink

1. Before forwarding data from R3000 via RobustLink, please check section 4.3.1 **Connect to RobustLink**, configure settings such as "Cellular WAN" and "Portal" to confirm R3000 can successfully connect to RobustLink. After that,

go to tab “Configuration” --> “Serial” --> “RS232” --> “Protocol Settings” --> “Protocol”, select “**Transparent Over Rlink**”. Other settings such as “Interval Timeout” and “Serial Port Settings” stay default --> click “Apply” --> click “Save” --> click “Reboot”.

The screenshot shows the RobustLink web interface. The top navigation bar includes links for Save, Reboot, Logout, and a language dropdown set to English. The user is logged in as 'admin'. The left sidebar shows the 'Configuration' menu with 'Serial' selected. The main content area displays the 'Serial Port Settings' for RS232. The settings are as follows:

Serial Port Settings	Value
Baudrate:	115200
Data bit:	8
Parity:	None
Stop bit:	1
Flow control:	None

Below the Serial Port Settings is the 'Protocol Settings' section:

Protocol Settings	Value
Protocol:	Transparent Over Rlink
Interval Timeout (1*10ms):	10

At the bottom right of the settings area are 'Apply' and 'Cancel' buttons. The footer of the interface states: Copyright © 2013 Robustel Technologies. All rights reserved.

- Open RobustLink, go to tab “Home”, confirm R3000 (device number is 300513060001) has logged in RobustLink.

The screenshot shows the 'HOME' tab of the RobustLink web interface. It displays a table with device status information. The table has columns for Index, Status, Device ID, Device Type, IMEI, RSSI, IP Address, Version, Region, Sync, and De. The first row shows a device with ID 300513060001, Type R3000, and Status 'Success' (green checkmark). The second and third rows show devices with Status 'Failure' (red X).

Index	Status	Device ID	Device Type	IMEI	RSSI	IP Address	Version	Region	Sync	De
1	✓	300513060001	R3000	357789045177448	23	10.143.22.144	1.01.00			
2	✗	1097167457505	M1000_ProV2		0					
3	✗	1097178433233	M1000_ProV2		0					

- Go to tab “CONFIGURATION” --> “Basic Settings” --> click “Enable Data Forwarding” --> click “Apply” to activate these settings.

HOME CONFIGURATION ADMINISTRATION HELP

AS Configuration

Basic Setting

Data Forwarding

Batch Configuration

XML

Agent-Server Link Checked for Devices

Device Login Password:

Heartbeat Interval (s):

☒ Enable Data Forwarding

☐ Forward Data By Modbus Address (Modbus TCP)

☐ Enable Safe Login

Apply

Configuration successfully applied.

4. Go to tab "CONFIGURATION"--> "Data Forwarding".

HOME CONFIGURATION ADMINISTRATION HELP

AS Configuration

Basic Setting

Data Forwarding

Batch Configuration

XML

Device Data Forwarding Setting

Records per page: 25 Search:

Index	Device ID	Port	Modbus Start Addr	Modbus End Addr
1	300513060001	0	0	0
2	1097167457505	0	0	0
3	1097178433233	0	0	0

5. Click any place of Index 1, show details of Data Forwarding information. Set an idle port number, for example 22222. Then click "Apply".

HOME CONFIGURATION ADMINISTRATION HELP

AS Configuration

Basic Setting

Data Forwarding

Batch Configuration

XML

Device Data Forwarding Setting

Records per page: 25 Search:

Index	Device ID	Port	Modbus Start Addr	Modbus End Addr
1	300513060001	0	0	0
2	1097167457505	0	0	0
3	1097178433233	0	0	0

Data Forwarding

Device ID:

Port:

Modbus Start Addr(1-247):

Modbus End Addr(1-247):

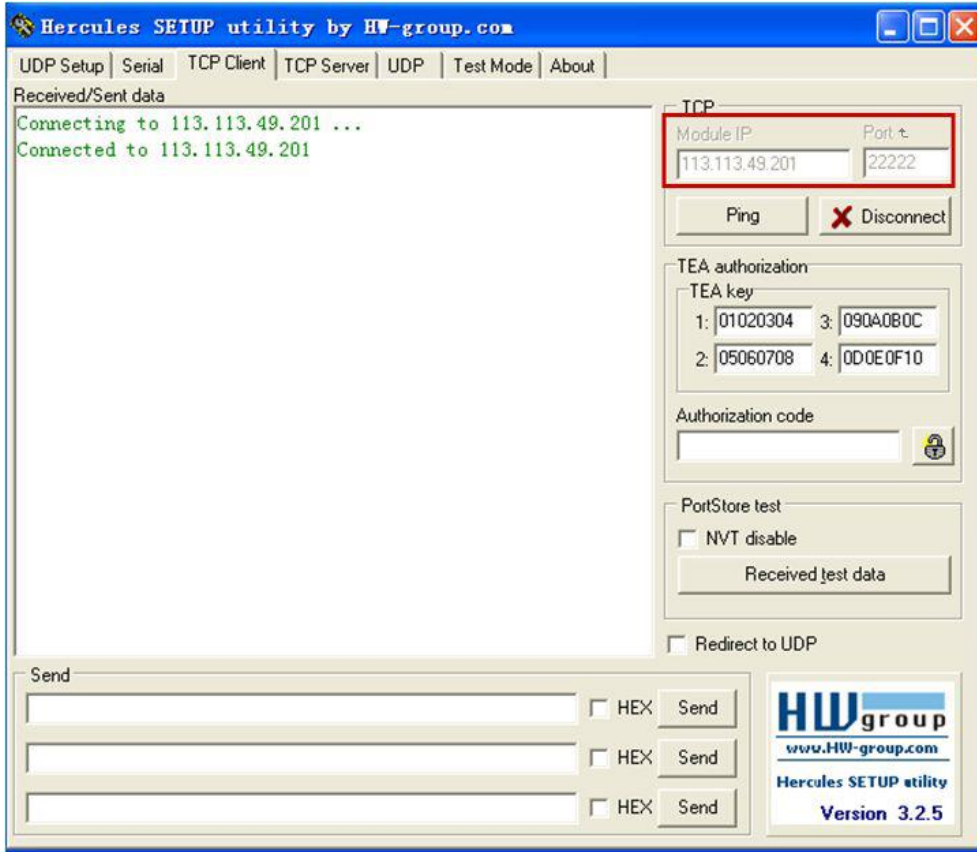
Apply Cancel

Records from 1 to 6 (Total: 6)

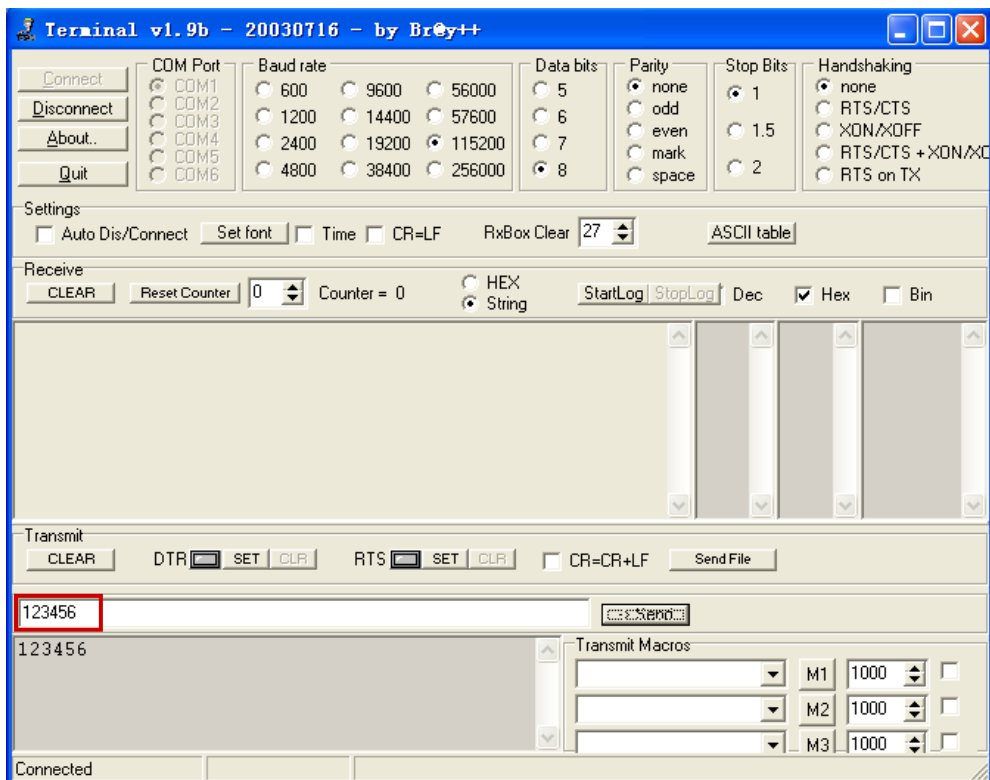
First Prev 1 Next Last

**Note:** Now RobustLink agent has become a TCP server, IP address is 113.113.49.201, local port number is 22222.

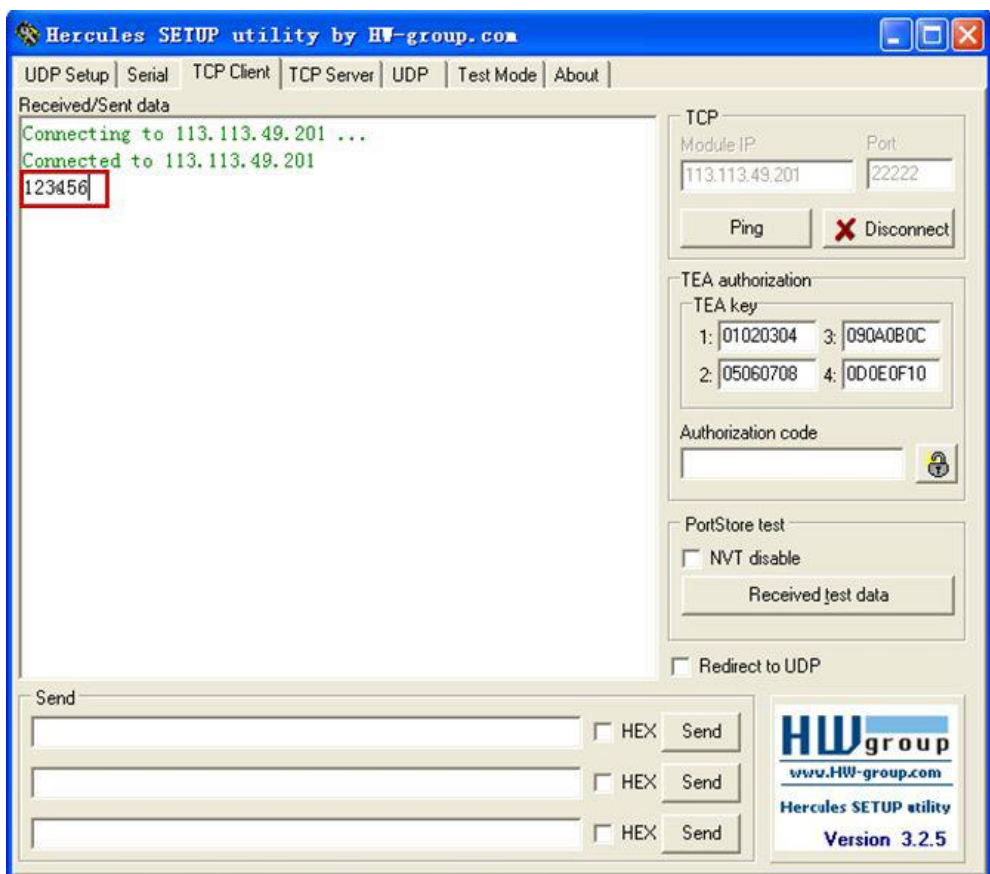
6. Run **Hercules** (download via link [http://www.hw-group.com/products/hercules/index\\_en.html](http://www.hw-group.com/products/hercules/index_en.html) ) --> go to tab "TCP Client" --> enter IP address and Port number of above TCP server which has been created in RobustLink --> click "Connect". If succeed to connect to the TCP Server, in this document, it will show up message "Connecting to 113.113.49.201 ...  
Connected to 113.113.49.201".



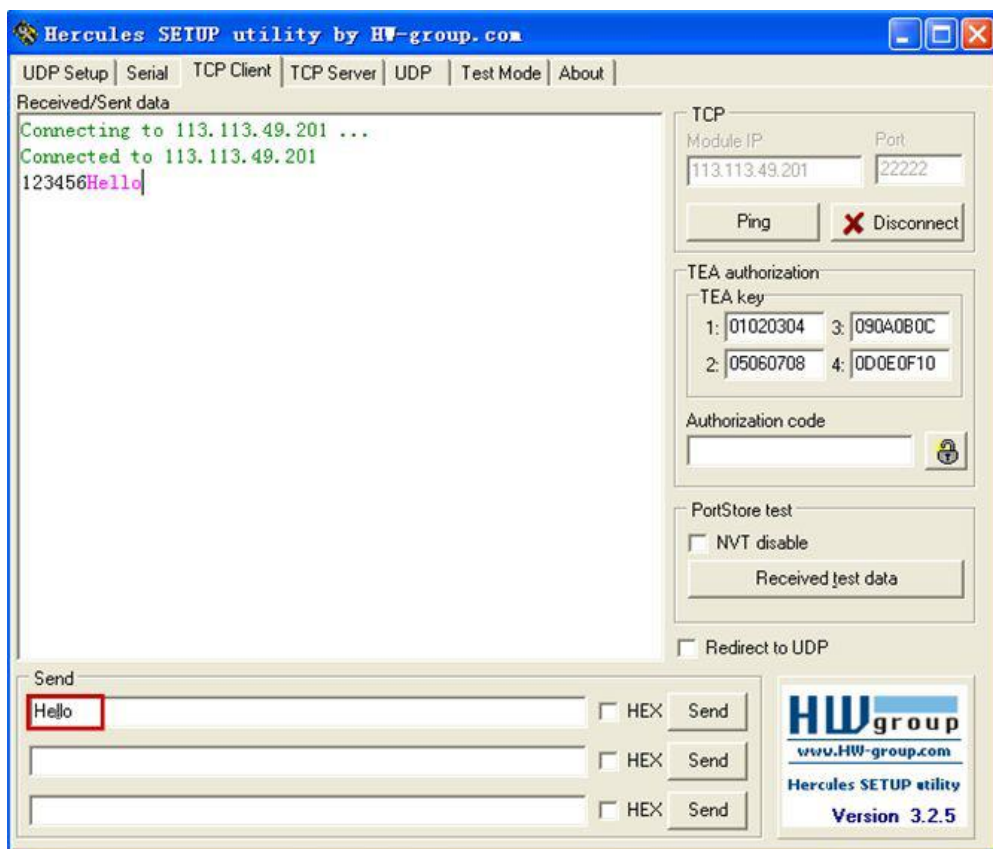
7. Run **Terminal exe** (download via link <https://www.box.com/s/67a68jraki9k1r0lijuz>) --> select the same serial port settings of R3000: COM 1, Baud Rate 115200, Data Bits 8, Parity none, Stop Bits 1, Handshaking none --> click "Connect" --> enter characters like "123456" --> click "Send".



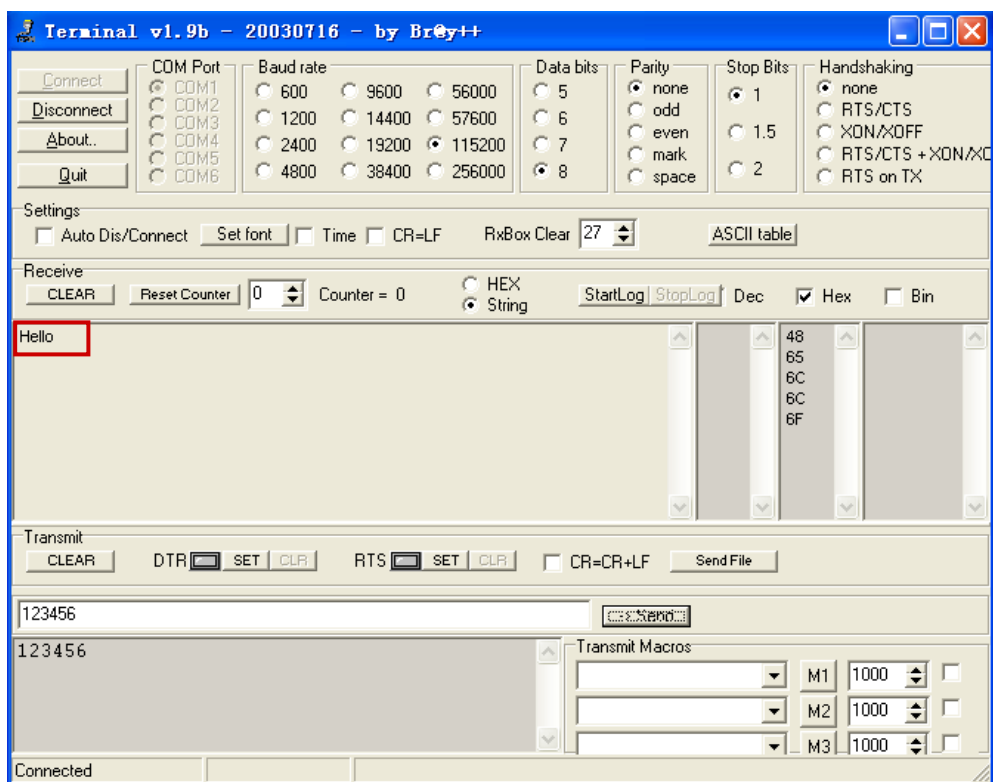
8. Check **Hercules**, if data “123456” shows up, that means RobustLink succeed to forward data “123456” sent from R3000.



9. Enter characters “Hello” in **Hercules** --> click “Send”.



10. Check **Terminal.exe**, if data "Hello" shows up, that means RobustLink succeed to forward data "Hello" which is sent from Control Center.



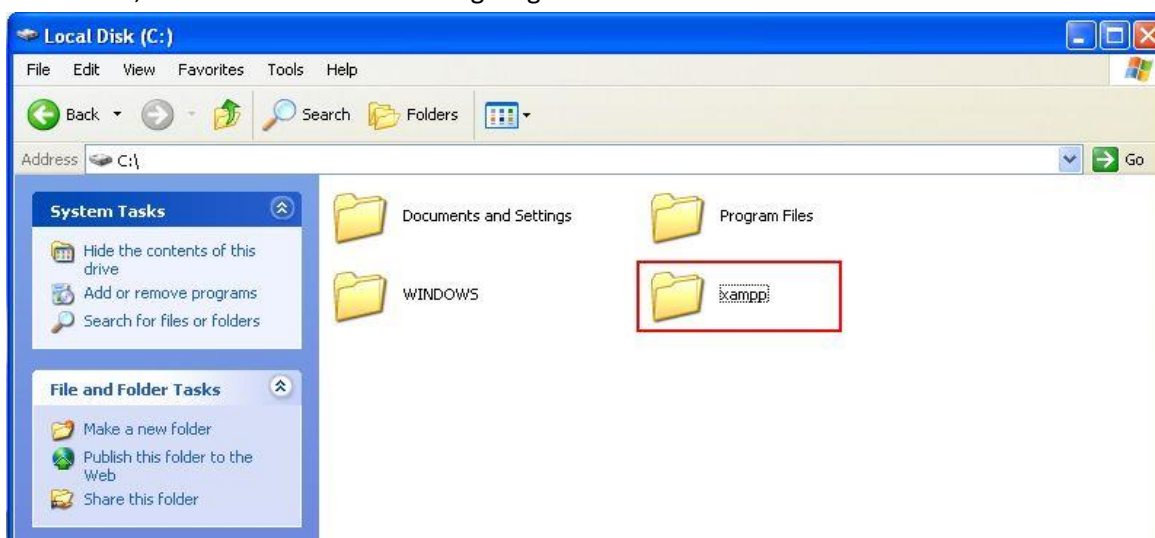


## Chapter 5. Troubleshooting

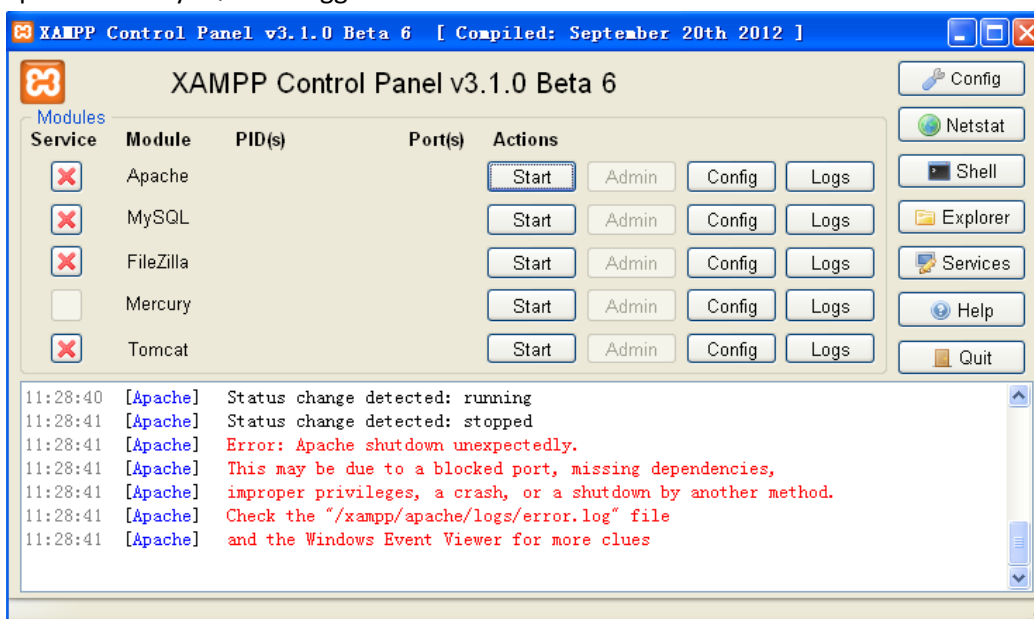
### 5.1. Troubleshooting for installing RobustLink

This section will help user to find out solutions when encounter problems in the process of installing RobustLink. For Windows XP system, pals check as follow the steps below.

1. Check if file xampp.rar has been extracted to computer's root directory. For example, if you extract xampp.rar to C hard dish, it should show the following diagram.



2. Normally port number of Apache is 80 or 443; port number of MySQL is 3306. If these ports have been used by other services, when you click "Start" to start Apache, error information will show up in red. There are two methods to solve above issue: one is to close those services, and the other is to change the port numbers of Apache and MySQL. We suggest user use the first method.



3. Go to these steps to close those services who occupy port number “80”, “443”, “3306”.

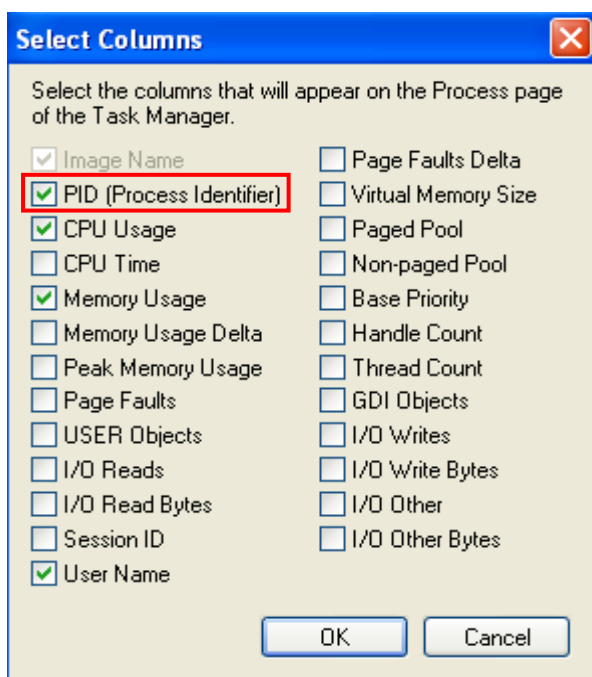
- Click “Start” --> click “Run” --> enter “cmd” and click “OK” --> enter “netstat -ano”. In the follow screenshot we can find out PID 3424 has occupied port 80 and 443.

```
C:\Documents and Settings\Administrator>netstat -ano
```

Active Connections

Proto	Local Address	Foreign Address	State	PID
TCP	0.0.0.0:80	0.0.0.0:0	LISTENING	3424
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING	168
TCP	0.0.0.0:443	0.0.0.0:0	LISTENING	3424
TCP	0.0.0.0:3389	0.0.0.0:0	LISTENING	1984
TCP	0.0.0.0:9916	0.0.0.0:0	LISTENING	608

- Open “Tab Manager” (also you can use shortcut keys: Shift+Ctrl+Esc), click “Process” --> click “View” -->select “Select Columns” --> enable “PID (Process Identifier)” --> click “OK”.



- Look for PID 3424. In this document, we find service Skype.exe has occupied port 80 and 443. Select “Skype.exe”, Click “End Process” to end service Skype.exe.

firefox.exe	5052	Administrator	00
vmware-unity...	3684	Administrator	00
conime.exe	3496	Administrator	00
Skype.exe	3424	Administrator	00
winword.exe	2736	Administrator	00
vmware.exe	2448	Administrator	00
plugin-contai...	2300	Administrator	00
RdfSnap.exe	2208	Administrator	00
svchost.exe	1984	SYSTEM	00
ctfmon.exe	1912	Administrator	00
lsass.exe	1724	SYSTEM	00
services.exe	1696	SYSTEM	00
explorer.exe	1596	Administrator	00
Foxmail.exe	1528	Administrator	00
vmware-tray.exe	1516	Administrator	00

4. If you do not want to close the service which occupies port 80, 443, or 3306, we can change these port numbers of Apache and MySQL to others. For example, change port 80 to 8080 and change 443 to 4433. Please do

following steps to modify these port numbers.

- If xampp.rar extracted to C hard dish, please try to find file: httpd.conf via route C:\xampp\apache\conf and file: httpd-ssl.conf via route C:\xampp\apache\conf\extra. You can select notepad to open these two files.
- Open httpd.conf, search "Listen 80", then change "80" to "8080" (or other idle port numbers) --> Save;
- Open httpd-ssl.conf, search "Listen 443", then change "443" to "4433" (or other idle port numbers) --> Save;
- After above modification, please add the port number at the end of IP address. For example, enter: http://127.0.0.1:8080 in the address bar

5. Click "Start" to start both "Apache" and "MySQL" again.

