User Manual

---Apply to RT600 4G/3G RTU

V1.5

http://www.wlink-tech.com

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Caution

Due to product updates or functional upgrading, we may renew the content of this file, and this file only for reference. All statement, information, suggestion .etc in this file do not compose any form of guarantee and we WLINK reserves the right of final explanation.

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1 Product Introduction

1.1 Product Overview

RT600 offers two serial ports and I/O ports, enabling it to connect to a variety of fields devices. With PPP, TCP/IP protocol, it could convert user serial port data to mobile 4G/3G/2G IP network data and transmit the data to customer's data master via transparent TCP/UDP protocol. DI ports support various of digital signal such as door sensor and smoke detector. AI ports support 4~20mA/0~5V signal such as temperature sensor and humidity sensor. Especially, WL-RT600 is programmable for users to customize DI/AI ports and Modbus properties according to various application requirements.

1.2 Typical Application Diagram

RT600 4G/3G RTU widely used in Cold Chain Logisitcs, Oil&Gas, Power, Environment Protection, Water Conservancy and Lighting control monitoring and other industries fields.

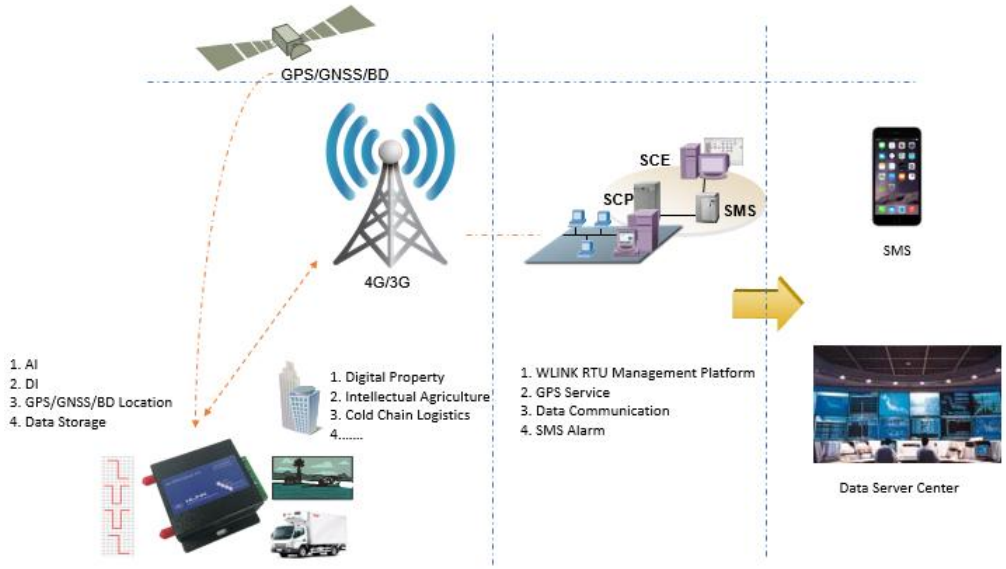


Figure 1-1 Network Topology

1.3 Features

- Integrated 4G/3G/2G cellular communication
- Support programmable function
- Standard PPP, TCP/UDP/IP and Modbus-RTU protocol
- Industrial pluggable terminal block
- RS232 port for Configuration
- RS485 port for data transmission
- 2 Analog inputs and 1 Digital inputs
- 1 DC OUTPUT(12VDC)
- Memory data storage optional
- Built-in GPS optional
- Built-in RTC, support real-time clock
- Optimized EMC design
- Support APN and VPDN private network
- Support short message service (SMS)
- Support transparent data transmission
- Support data service center with dynamic IP address
- Support LED status indication
- Wide range voltage input
- External power on/off control

2 Hardware Installation

This chapter is mainly for installation introduction, there would be some difference between the scheme and real object. But the difference doesn't have any influence to products performance.

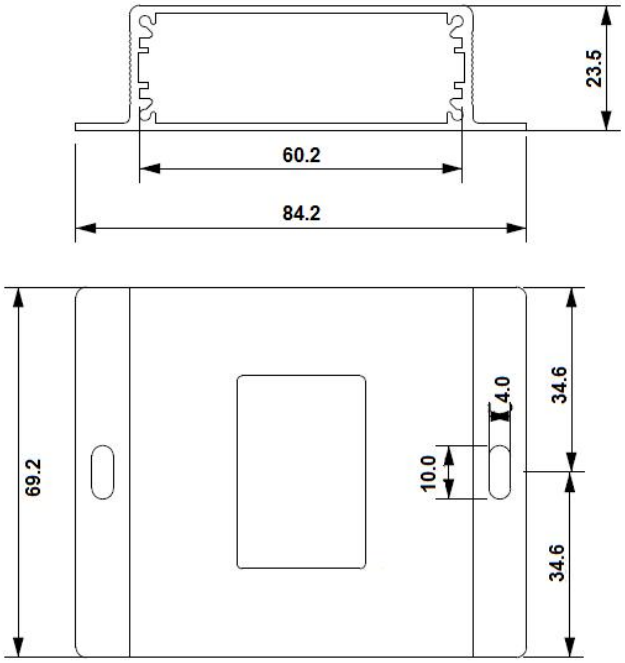
2.1 LED Status

LED indicator Status

silk-screen	color	status	Indication
NET	Red	Weak Signal	CSQ<21
	Green	Good Signal	CSQ≥21
		Fast Blinking	Self-checking

silk-screen	color	status	Indication
		Light on 1s,Light off 2s	Standby
		Light on 2s, Light off 1s	Online
PWR	Green	Light on	RTU running
GPS	Green	Light on	GPS enabled

2.2 Dimension



2.3 How to Install

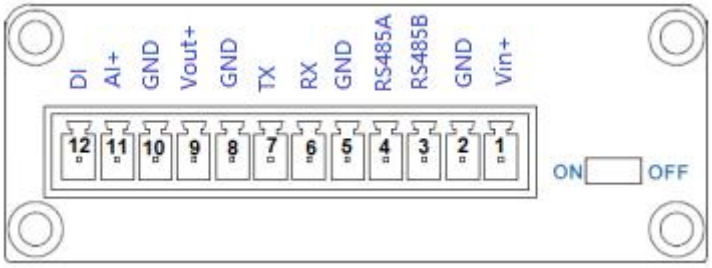
2.3.1 SIM/UIM card installation

Insert Micro SIM/UIM card.

CAUTION

Before connecting, please disconnect any power resource of RTU

2.3.2 Interfaces



Pin	Interface	Description
1	V+	Power Vin+, Anti reverse
2	GND	Power GND
3	RS485-B	RS485 B, 9600bps as default
4	RS485-A	RS485 A
5	GND	GND for RS232 communication
6	RX	RS232 RX,115200bps as default
7	TX	RS232 TX
8	GND	Power GND
9	Vout+	Power Output, +7.5 ~ 32V DC.
10	GND	Short to DI
11	AI+	Analog Inputs, 4~20mA or 0~+5V, 12 bits resolution
12	DI	Digital Input , Dry contact

2.3.3 Power Supply

In order to get high reliability, adapt wide voltage input: +7.5V～+32VDC, support hot plug and complex application environment.

2.3.4 Review

After insert the Micro SIM/UIM card, connect serial cable, necessary antenna, then connect power cable.

2.3.5 Cable Connection

RS232 Connector (for configuration):

GREEN - TX

YELLOW - RX

BLACK – GND

POWER Cable Connector:

RED - V+

BLACK - GND

CAUTION

Please connect the antenna before connect the power cable, otherwise because of impedance mismatching, the signal maybe poor.

Notice:

Step 1 Check antenna connection.

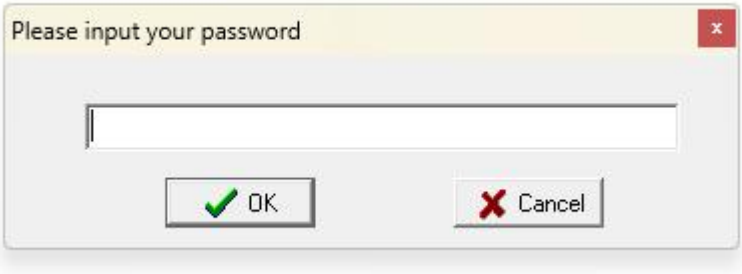
Step 2 Check Micro SIM/UIM card, configure SIM/UIM card is available.

Step 3 Power on RTU

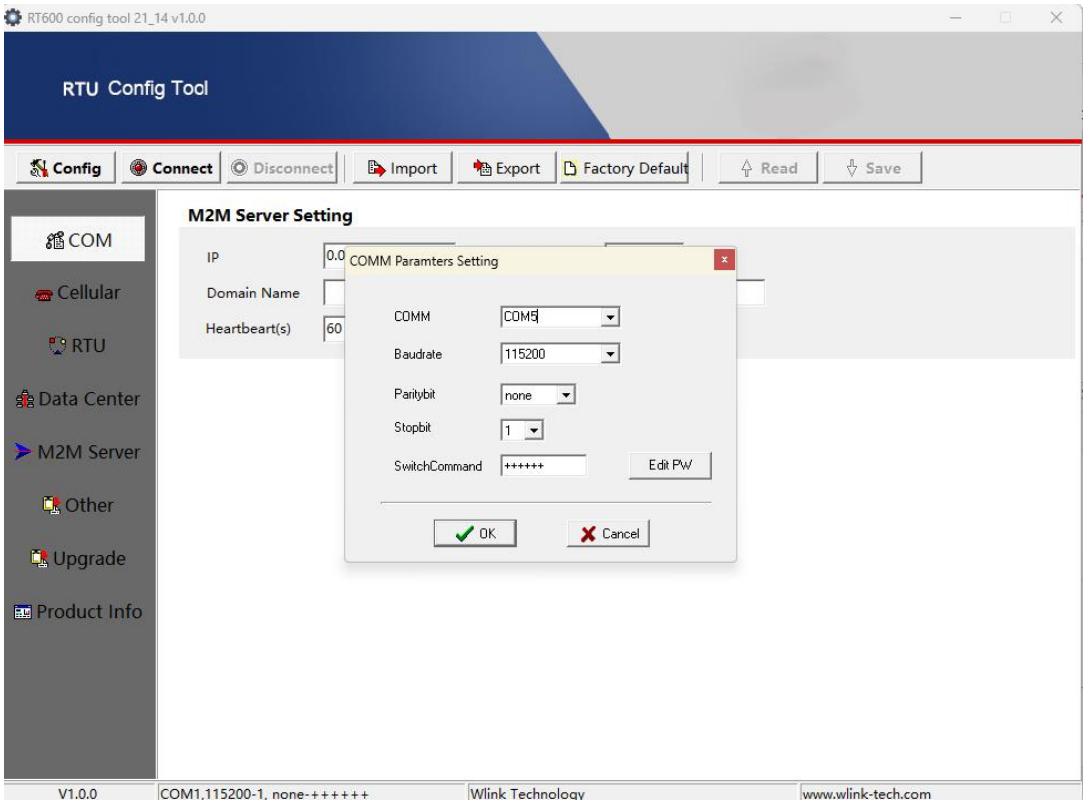
3 RTU Configuration

3.1 RT600 Config Tool Serial Port Settings

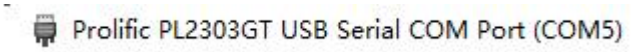
Run RTU Config Tool, Enter the password "admin" and click OK.



click Config button to setup serial port parameters as below (PC to RTU).



COMM: Input the connected COM port number as your computer, for example:

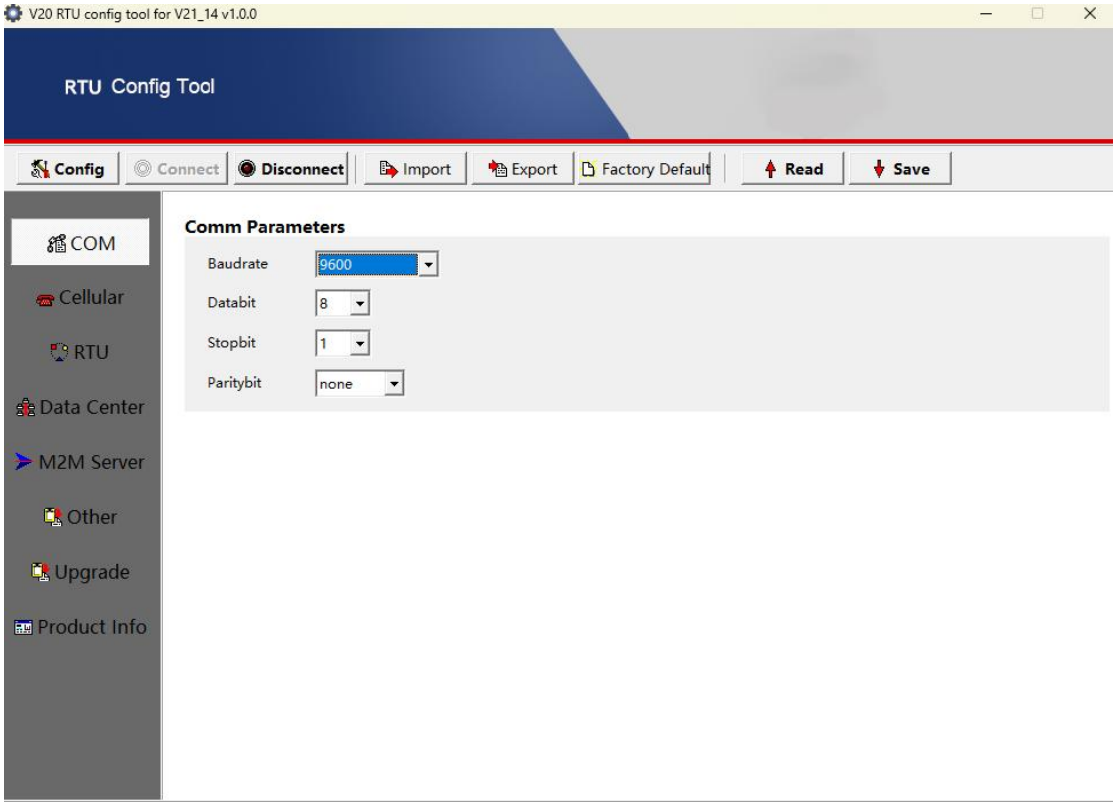


Baud Rate: 115200bps
Data Bit: 8bit
Parity: None
Stop Bit: 1bit

Change the password by clicking "Edit Pw"

NOTE

Click Connect button, RTU will be connected to the tool and enter configuration mode. If the connection is successful, it will display Connected RTU dialog box as below. Click "Read" will get current device configuration.

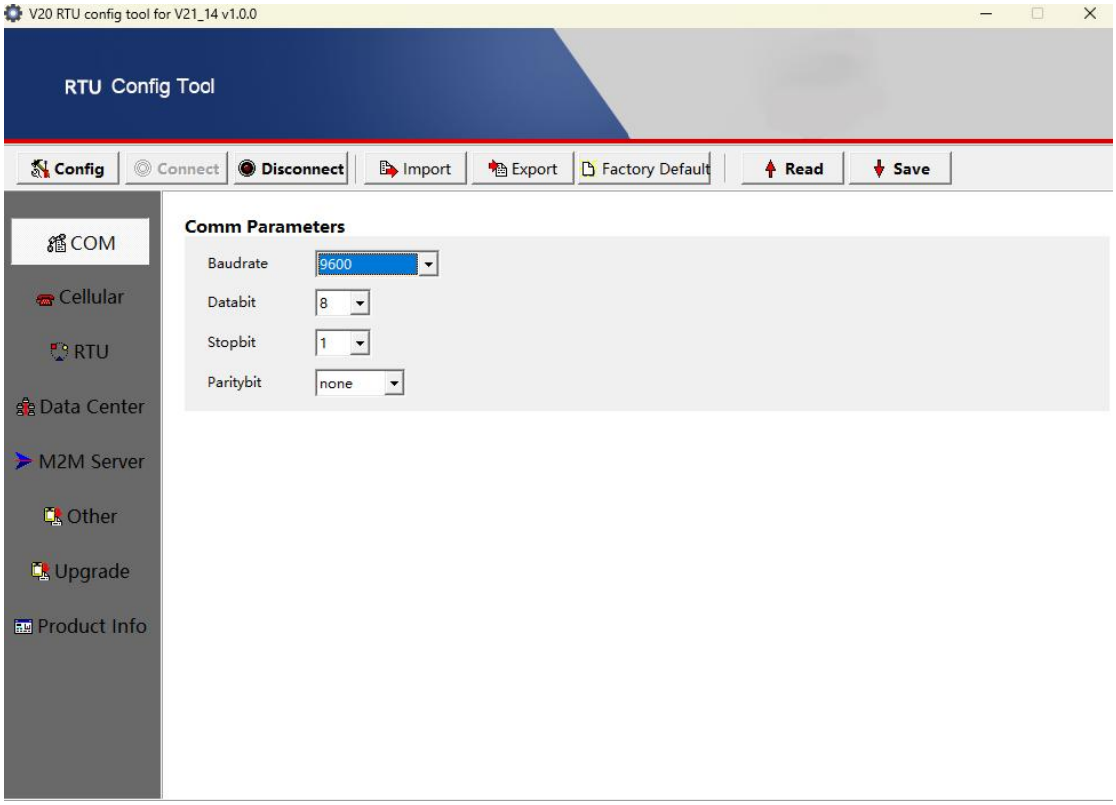


【Config】Tool Serial port configuration.
【Connect】Connect RTU.
【Disconnect】Close serial port to leave configuration mode.
【Import】Import configuration file into Config tool.
【Export】Export current settings to file. It's convenient for butch setup.
【Default】Setup RTU to default settings.
【Read】Inquiry current RTU setting.
【Save】Save settings to RTU.

3.2 RTU Configuration

3.2.1 RTU COM Settings

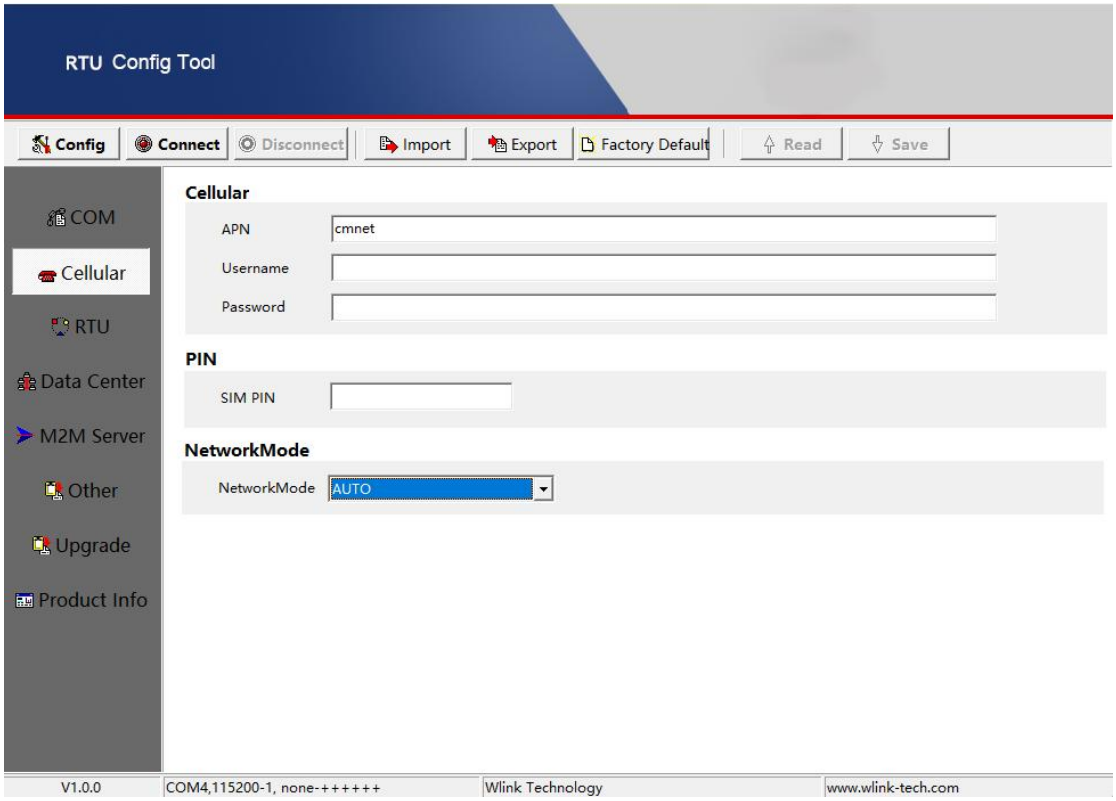
The RS485 port Setting (RTU to Sensor/Meter)



RTU Serial port settings instruction.

Parameters	Description	Instruction	Default
Baud rate	Serial port properties	300/600/1200/2400/4800/9600/19200/38400/57600/115200 optional.	9600
Data bits		8	8
Stop bits		1/2	1
Parity		NONE/ODD/EVEN	NONE
Modbus Slave Address	The address for Modbus slave address which is connected to RT600	.	

3.2.2 Cellular Settings

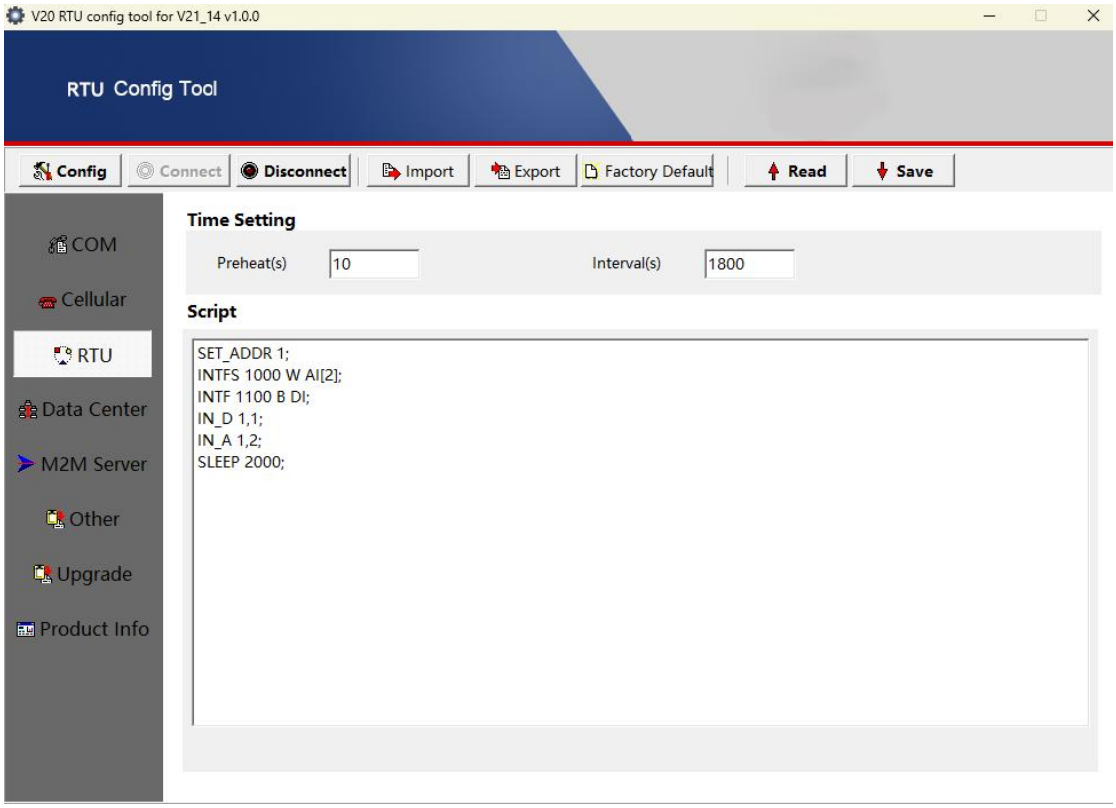


RTU Network settings instruction (In most cased, SIM card will obtain it automatically, no need to setup up)

Parameters	Description	Instruction	Default
APN	SIM information for dial up	1~63bytes	cmnet
User name		0~63bytes	NULL
Password		0~63bytes	NULL
PIN Code	SIM card PIN Lock	If SIM card is configured PIN Code, it need to configure PIN code so in RTU so that RTU can identify SIM card. It need to check PIN code correctly, if not, the SIM card will be damaged if configure error PIN code.	
NetworkMode	Network Type	AUTO/4G/3G/2G/CAT M/NB	AUTO

3.2.3 RTU Settings

RTU setting is used for data collection from RS485/MODBUS,AI and DI interface.

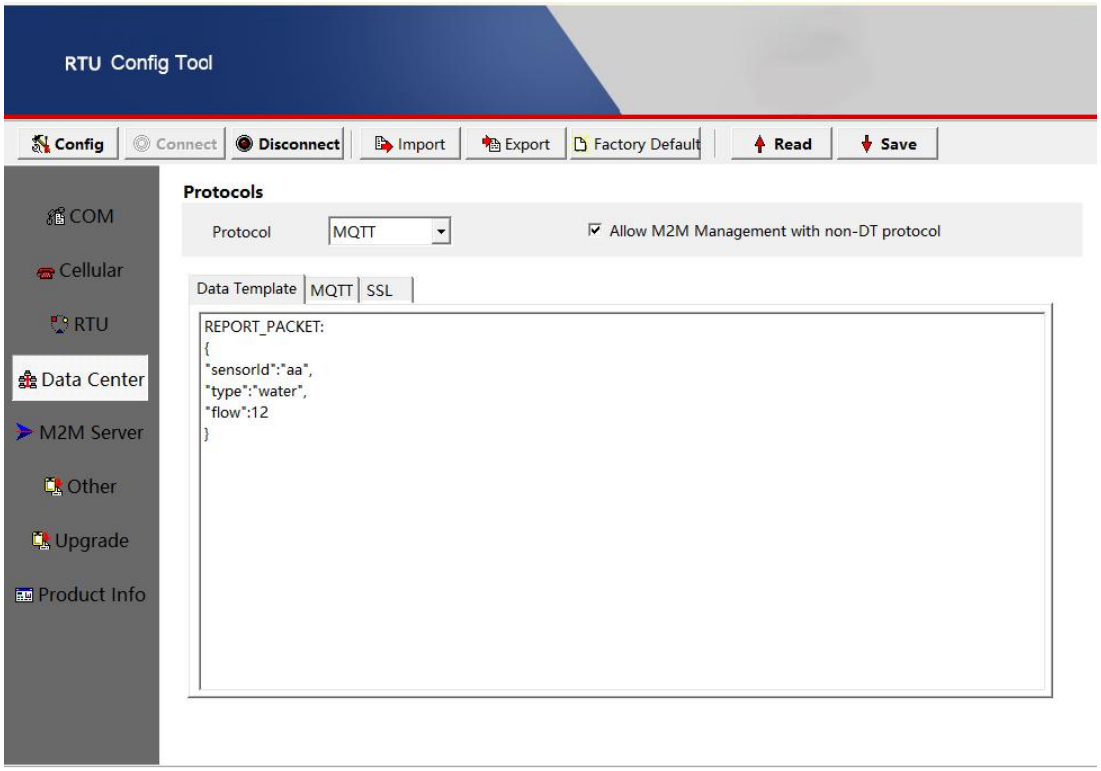


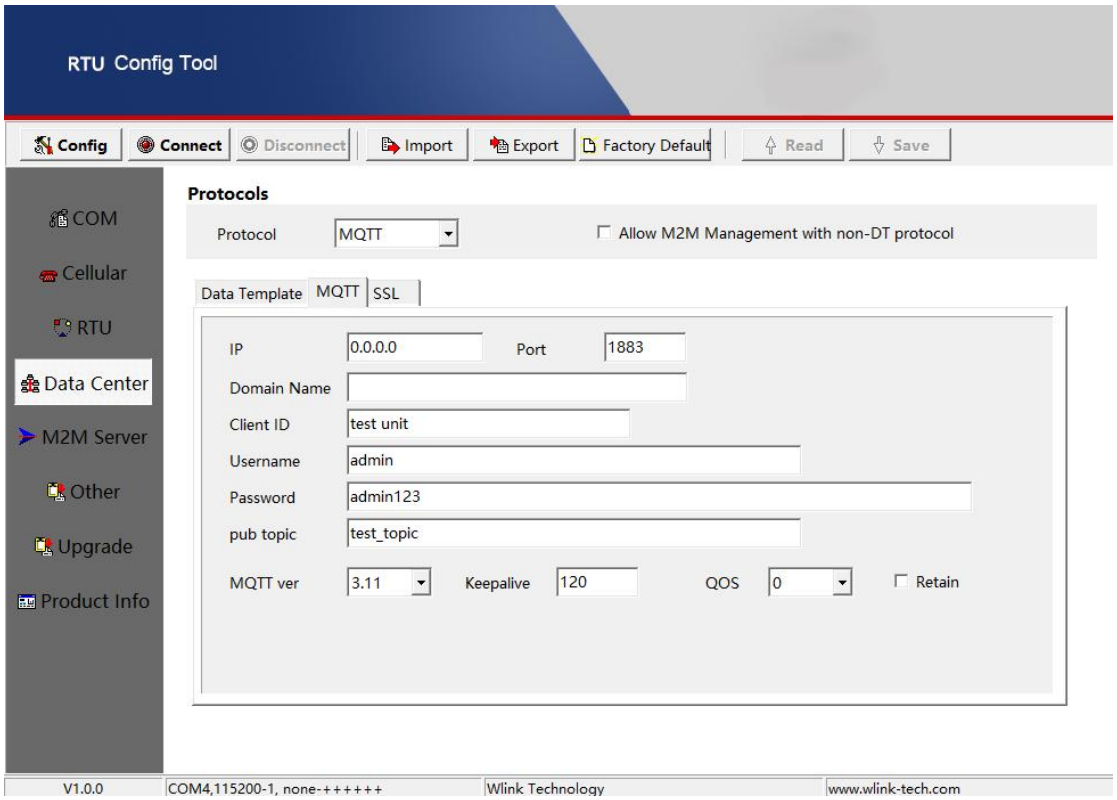
RTU Settings

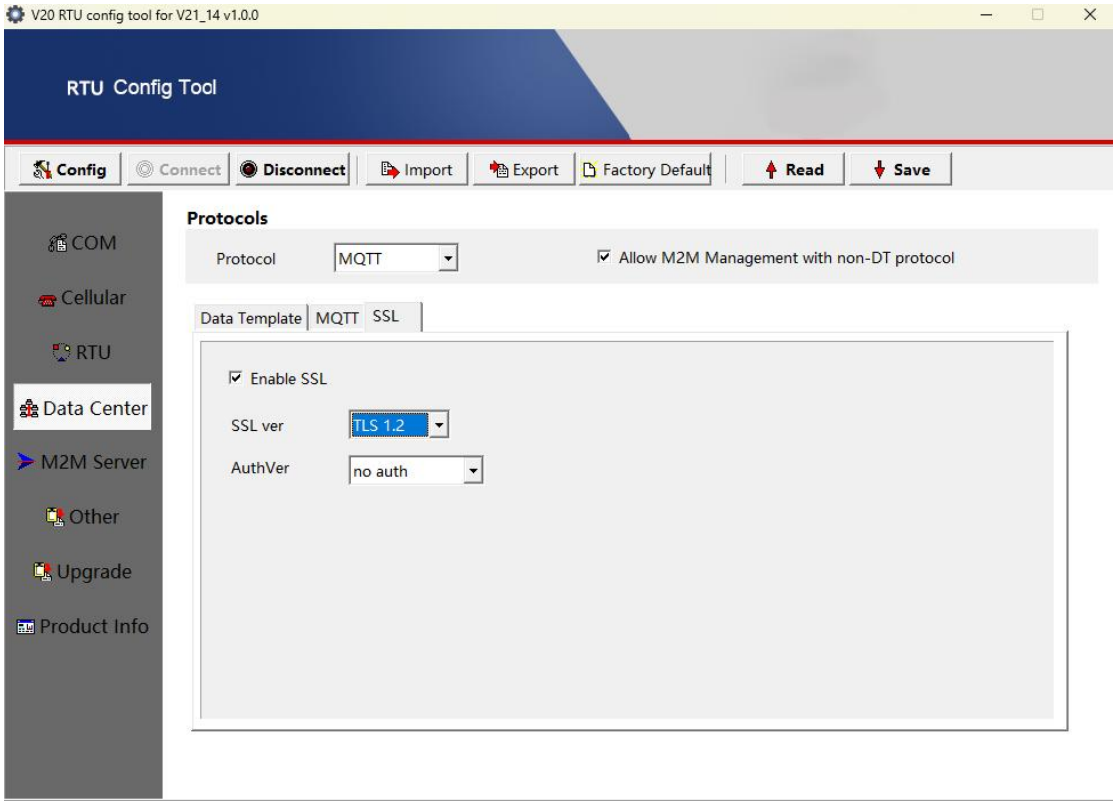
Parameters	Description	Instruction	Default
Preheat	The time betwtenn device bootup and starting collection	In seconds	10
Interval	how often data is reported to server	In seconds	30
Script	Script s are programmable to collect AI/DI and serial port Modbus data.	Different sensor with different type AI/DI,modbus format. So the command script will be different. Chapter No.4 includes an instance for temperature sensor Command script as reference. Please contact WLINK sales/FAE for script writing support.	

3.2.4 Date Center Setting

If use WLINK M2M Platform to receive data, keep in default. If use MQTT server, UI as below.







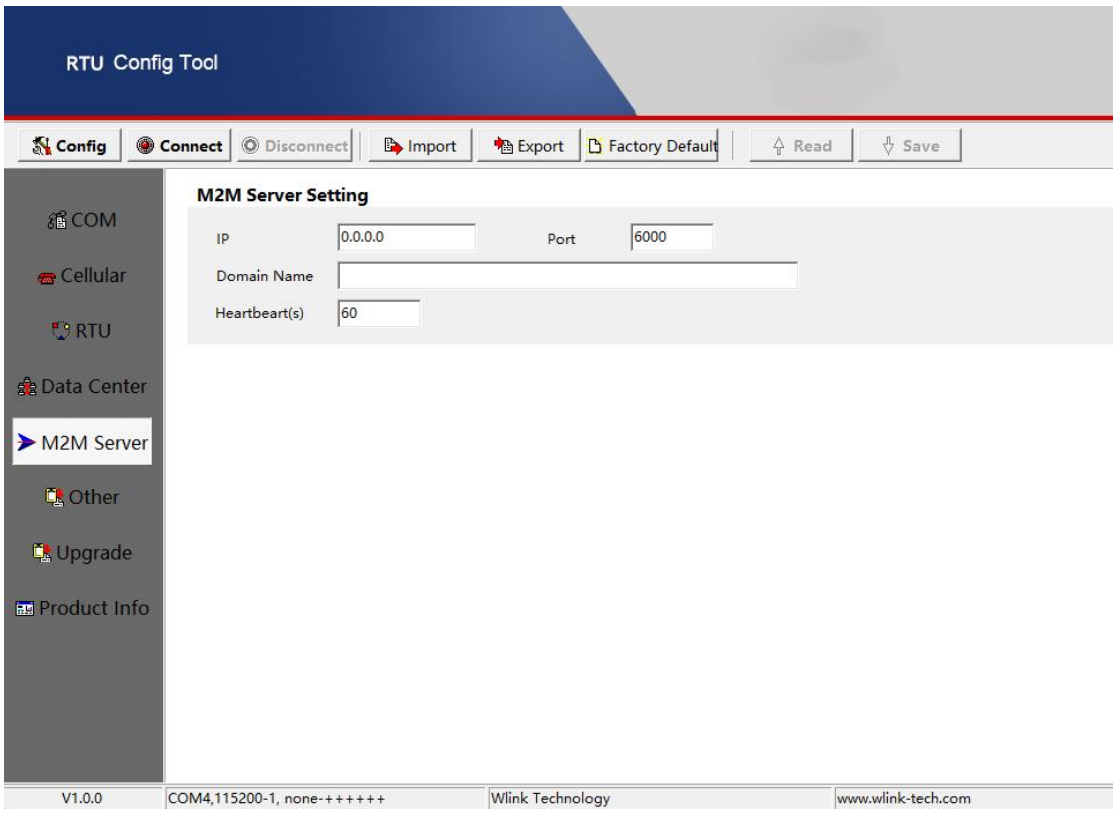
MQTT settings instruction

Parameters	Description	Instruction	Default
Protocol	Protocol used for server: 1. DT: private protocol with M2M server 2. MQTT: common MQTT	DT or MQTT	DT
Allow M2M Management with non-DT protocol	Allow M2M server to remote management while use non-DT protocol, like MQTT	Enable or disable	enable
Data Template	Template used for post to server	Customize the data packet format for reporting. The key terms are as follows: o REPORT_PACKET --- indicates the start of packet assembly. o MDS(X) --- where X represents the Modbus slave address; 0 indicates a successful response, and 1 indicates failure. o INTF(X) --- where X represents a custom register value; this key term retrieves reported variable values, which must match the preceding % sign. 'f' is for floating point, 'd' is for integer.	NULL
IP	IP address of the MQTT server..		0.0.0.0

Parameters	Description	Instruction	Default
Port	Port number of the server's address		
Domain Name	Domain name of the MQTT server	active when the main station IP address is 0.0.0.0	
Client ID	Client ID OF MQTT protocol	Used by the MQTT server to identify the client; typically a 1 to 23-byte UTF-8 string.	
Username	Username for logging into the MQTT server		
Password	Password for logging into the MQTT server.		
pub topic	The topic for publishing	It's a UTF-8 string and serves as a medium for transporting messages in the Pub/Sub model of MQTT. Note: Topic names can be custom configured to match those in the MQTT server, but the same topic information is not supported in the same configuration protocol; one topic corresponds to one function.	
MQTT ver	MQTT protocol version	The device currently supports MQTT standards 3.1 and 3.1.1	
Keepalive	MQTT parameter	The keepalive time is an interval in seconds, a 16-bit number, indicating the maximum allowable idle time between the moment a client sends a control message and the moment it sends the next message.	
QOS	MQTT parameter, Quality of Service	Service quality for reporting; controlled dynamically by a bound word variable. Values: 0 - at most once, 1 - at least once, 2 - exactly once.	
Retain	MQTT parameter	This flag determines if the broker saves the message as the last known good value to a specified topic. New clients subscribing to the topic receive the last retained message about the topic immediately after subscription. To delete a retained message for a topic, send a retained message with a zero-byte payload for that topic.	
Enable SSL	Configuration for enabling TLS/SLL encryption.	If enabled, also can shoose from server	
SSL ver	SSL protocol version	SSL3.0 TLS1.0/1.1/1.2	TLS 1.2
AuthVer	No Auth or by Server Certificate file		No Auth

3.2.5 RTU Remote Management Settings

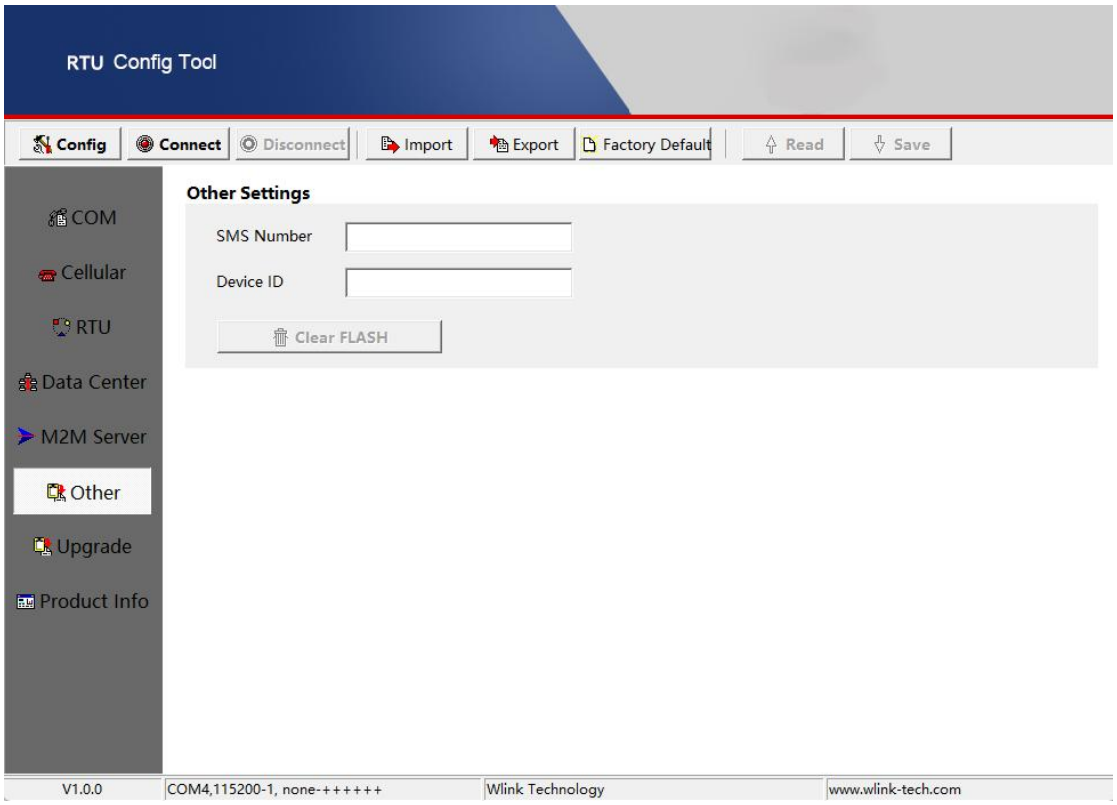
If use WLINK M2M Platform to management, input the server infor below:



RTU Remote management settings instruction

Parameters	Description	Instruction	Default
IP	Remote management software static IP address		0.0.0.0
Port		0~65535	6000
Domain name	Used for dynamic IP in HQ.	Domain name is available when the IP address is setup 0.0.0.0	NULL
Hearbeats	Interval to send heartbeat interval to keep connection alive.	0~65535s	60

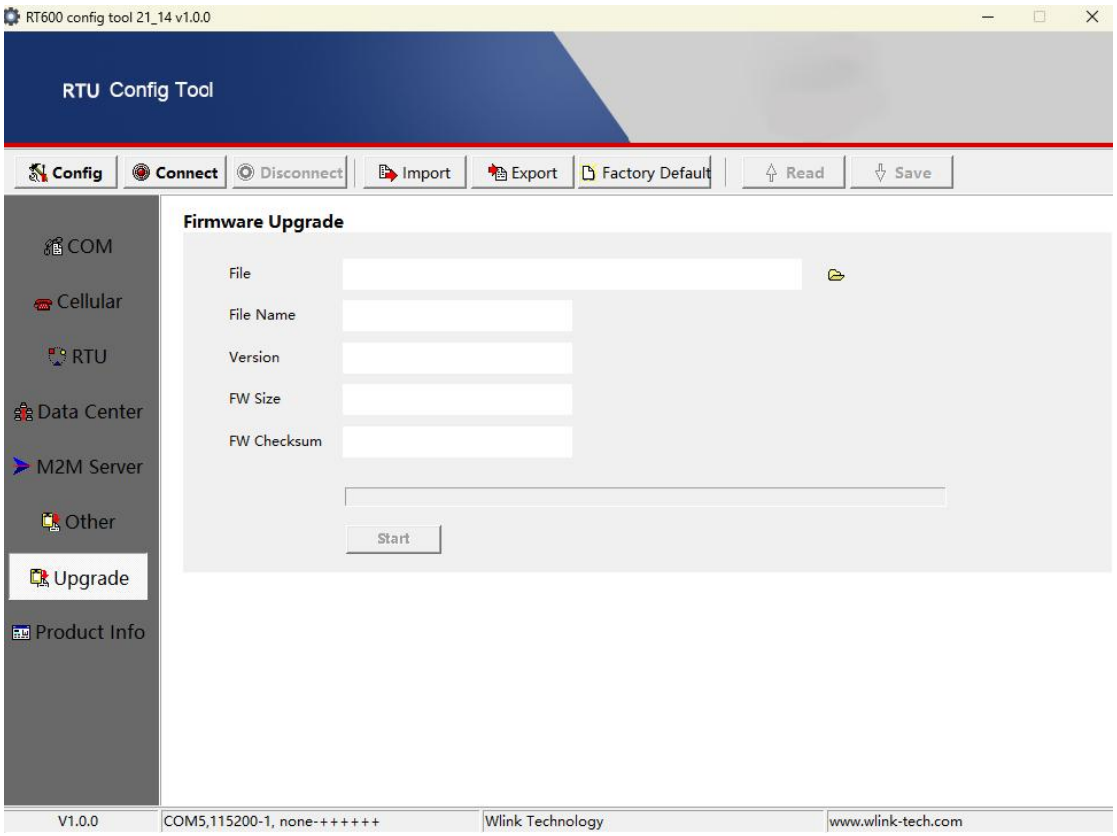
3.2.6 RTU Others Settings



RTU Other Settings instruction

Parameters	Description	Instruction	Default
SMS Number	Support to configure 11 phone number as Max	The first number acts as administration which might manage other numbers.	
Device ID	Device Id need to be remote clear by SMS		
Clear Flash	Erase collection data in Flash		

3.2.7 RTU Upgrade

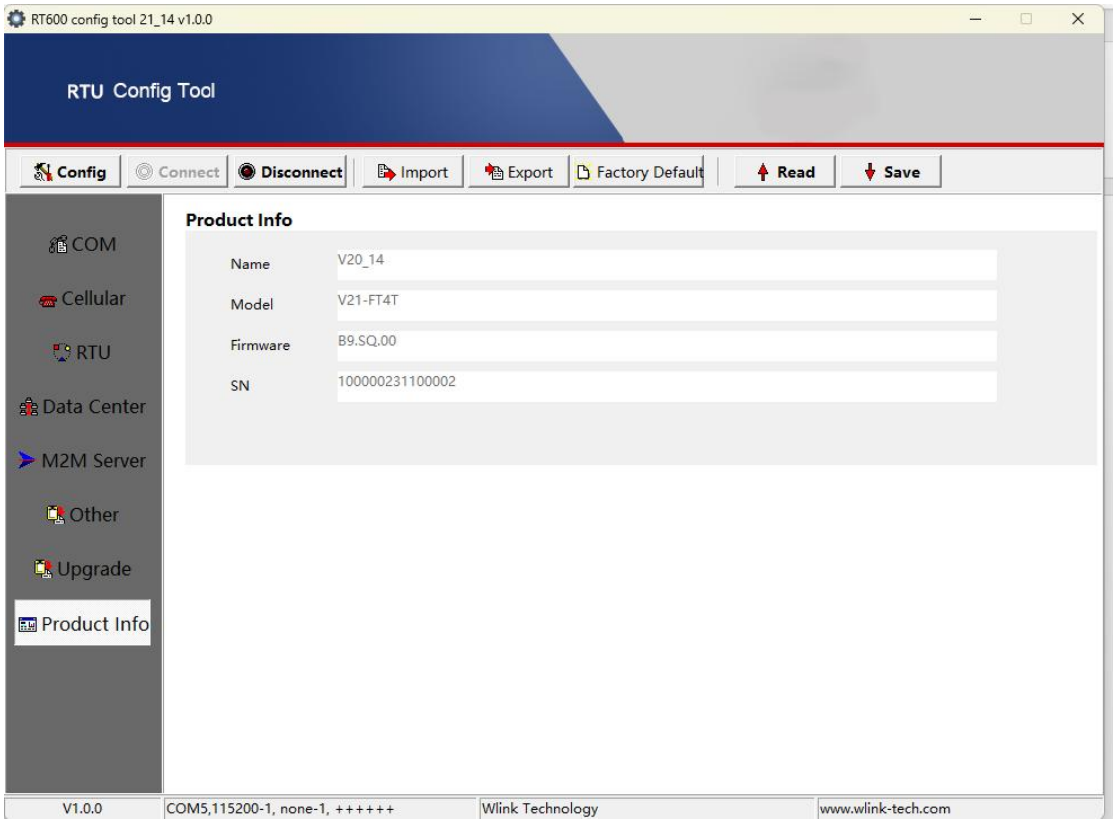


RTU Upgrade instruction

Parameters	Description	Instruction	Default
File	Choose firmware		
File Name	Firmware name		
Version	Firmware version		
FW Size	Firmware size		
FW Checksum	Firmware Verification		

Choose firmware from PC, then click “Start”.

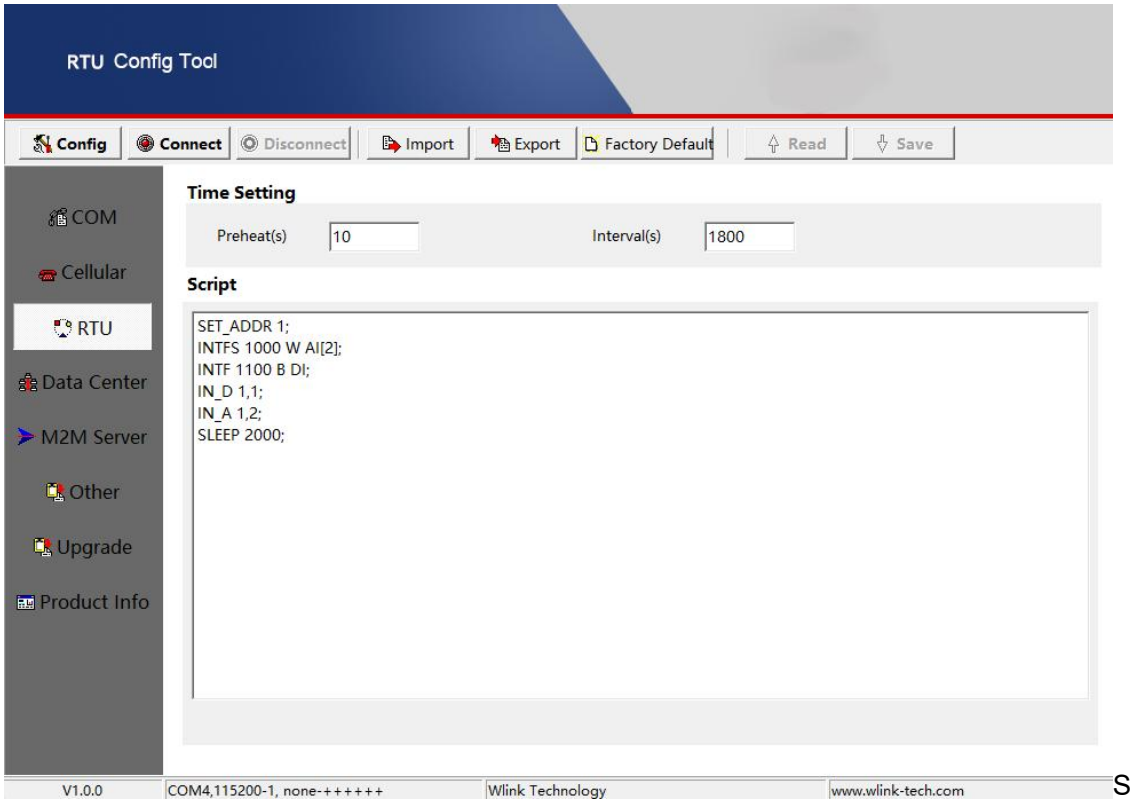
3.2.8 RTU Information



RTU Information instruction

Parameters	Description	Instruction	Default
Name	Product name		
Model	Model number		
Firmware	Firmware version		
SN	Serial Number		

4 Programmable Command Demo



SET_ADDR 1; *// Configured INTF variable Slave address for 1*

VARS W UAI[2]; *// Defined double-byte integer array for 2*

INTF 1000 U UAIV; *// Defined Unsigned four-byte integer, no vaule, register address 1000. Keep the register address 1000 as the same as RTU management platform.*

IN_UA_B UAI[1],2,020300000002A,100; *// Read 2 Analog, then save them to specified position space which is from UAI[1]. Timeout 100ms.*

CAL UAIV = UAI[1] << 16 | UAI[2]; *// calculate formula*

NOTE

Introduce parameter as below.

UAI[1] First Analog variable

2 read 2 analog in succession.

020300000002A Modbus command without CRC checksum.

100 Timeout, unit is ms. No wait if remove this value.