

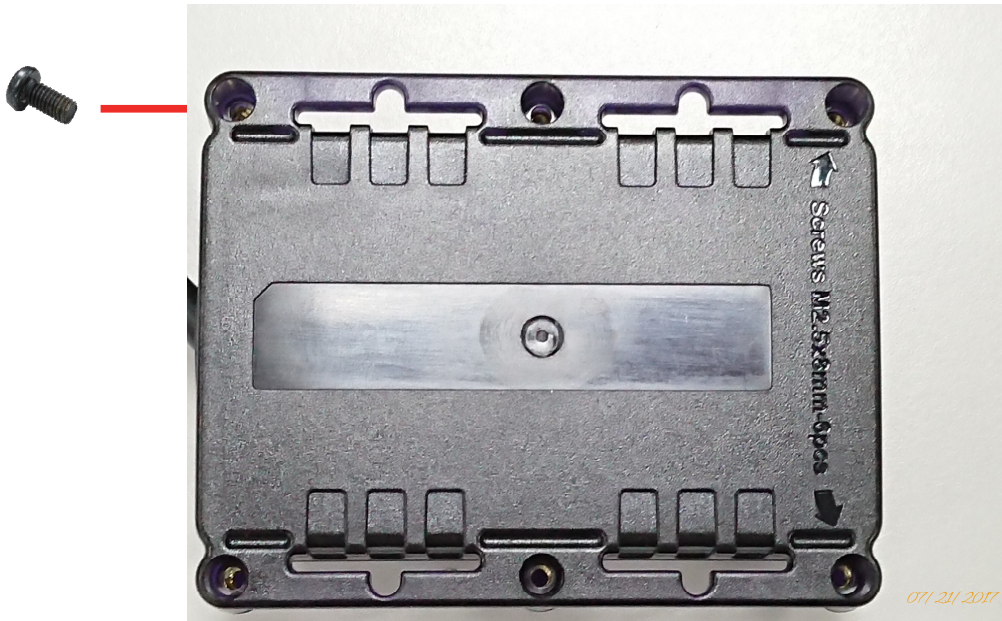
Chapter 3. Getting Started with CAREU UW1

To install the the CAREU UW1 device, follow the instructions below for basic operations.

3.1 Hardware Installation

1. SIM Card Installation

- Remove the screw at the bottom of the device to open it. Then you will find the SIM card slot inside.



- Insert your SIM card into the device with SIM card's gold area down and the notched corner toward the notched edge of the SIM card socket. Make sure it is installed correctly in place. Reinstall the cover.



SIM Card



3.2 LED Indicator

1. GPS LED Indicator

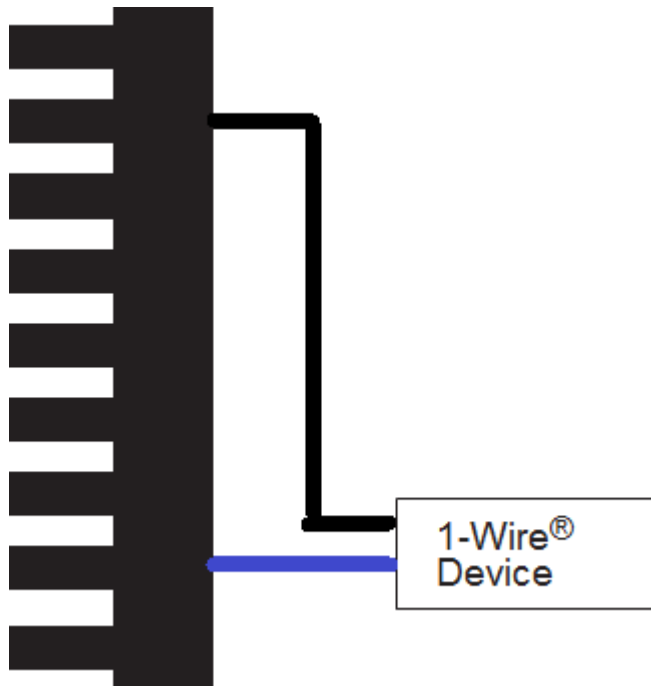
Power Mode	GPS Status	GPS LED
Power Off	Off	Off
Low Power	Off	Off
Full Power	Acquiring	Flash Red (five times/second)
Full Power	Tracking	Solid Red

2. GSM LED Indicator

Power Mode	GSM/GPRS Status	GSM LED
Power Off	Off	Off
Low Power	Off	Off
Full Power	Acquiring	Flash Red (three times/second)
Full Power	Registered	Solid Red

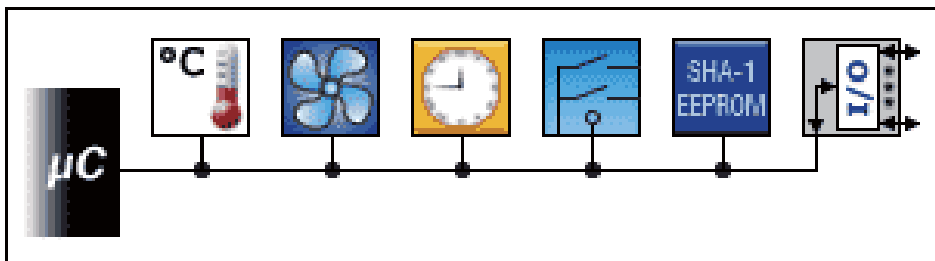
3.3 1-Wire[®] Solution

With both power and communication delivered over the serial protocol of the CAREU UW1, the 1-Wire[®] interface provides combinations of memory, mixed signal and secure authentication functions via a single contact serial interface of the CAREU UW1 .

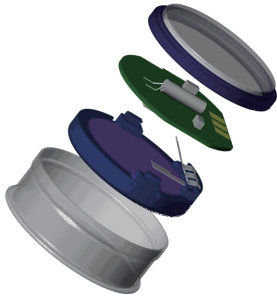


Benefits:

- Single Contact Sufficient for Control and Operation
- Unique ID Factory-lasered in Each Device
- Power Derived from Signal Bus ("Parasitically Powered")
- Multidrop Capable: Supports Multiple Devices on Single Line
- Exceptional ESD Performance



1-Wire® Accessory: iButton®



Wear tested
for 10 year



16 mm Diameter



5mm Thick for F5
3mm Thick for F3

1. DS1990A-F5+

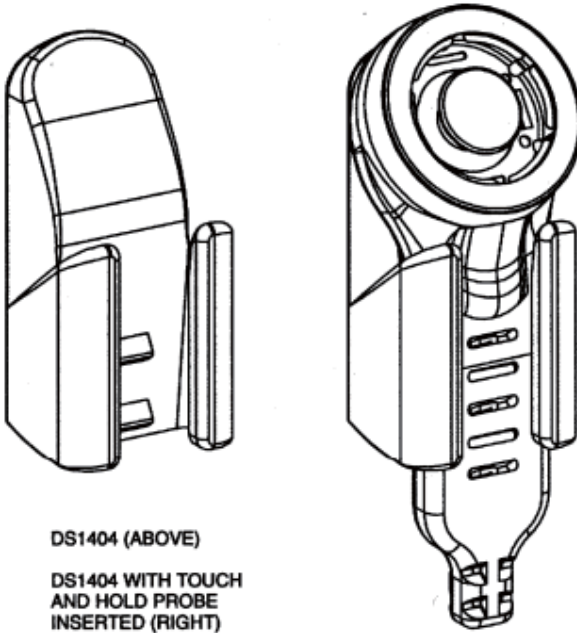
The DS1990A serial number iButton® is a rugged data carrier that serves as an electronic registration number for automatic identification. Data is transferred serially through the 1-Wire® protocol, which requires only a single data lead and a ground return. Every DS1990A is factory layered with a guaranteed unique 64-bit registration number that allows for absolute traceability. The durable stainless-steel iButton package is highly resistant to environmental hazards such as dirt, moisture, and shock. Its compact coin-shaped profile is self-aligning with mating receptacles, allowing the DS1990A to be used easily by human operators. Accessories enable the DS1990A iButton to be mounted on almost any object, including containers, pallets, and bags.

2. Touch and Hold Probe & Cradle

Using four basic types of connectors, 1-Wire[®] RJ-11, iButton[®], Touch-and-Hold Probe, and Blue Dot™ Receptor, the DS1402 series of 1-Wire[®] network cables provides connectivity for iButton[®]. The cables are designed to connect any USB, serial, or parallel port 1-Wire[®] adapter to any iButton[®]. Both, the iButton[®] probe cables and the Blue Dot receptor cables can touch any iButton[®], but can only hold the F5 version iButtons. The DS1402-BR8+ is the only cable that connects to the DS1401 iButton[®] Holder.

CRADLE

PROBE

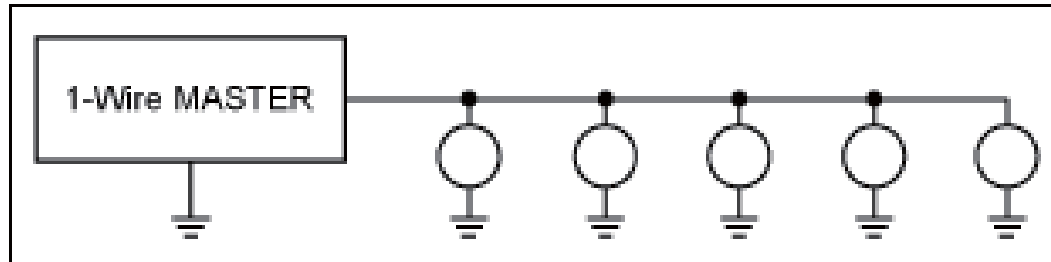


(BOTH PICTURES ARE APPROXIMATELY ACTUAL SIZE)

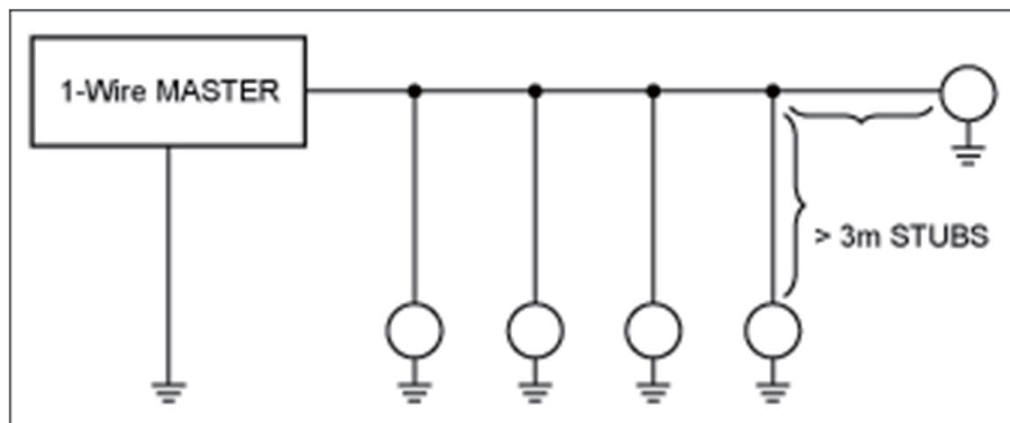
3. 1-Wire® Network Topologies

Although 1-Wire® networks are often quite "free form" in structure, they usually fit into a few generalized categories, based on the distribution of the 1-Wire® slaves and the organization of the interconnecting wires.

- 1) Linear topology. The 1-Wire® bus is a single pair, starting from the master and extending to the farthest slave device. Other slaves are attached to the 1-Wire® bus with insignificant (<3m) branches or "stubs."



- 2) Stubbed topology. The 1-Wire® bus is a single main line, starting at the master and extending to the farthest slave. Other slaves are attached to the main line through branches or stubs 3m or more in length.



4. The Commands to Configure and Operate Accessory Operation

AT\$RFIDC		RFID control
Description	This command is used to set/query RFID control configuration. Once the RFID reader senses the tag and Input 1 (Ignition) is ON, the <Output ID> will keep ON until Input (Ignition) OFF for <Delay Time>.	
Syntax	Write Command:	
	AT\$RFIDC=<Action>[,<Output ID>,<Delay Time>]	
Parameters	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 4 – Output Control When the RFID sense the tag, the specific output port would be enabled.
	<Output ID>	Output ID 1 – Output 1 2 – Output 2 3 – Output 3 4 – Reserve 5 – Reserve 6 – Reserve 7 – Reserve 8 – Reserve
	<Delay Time>	Delay time in 100ms for Output control (1~255)
Return Value	Write Command: OK : RFIDC Read Command: OK : RFIDC \$RFIDC=<Action>,<Output ID>,<Delay Time> Error Response: ERROR : RFIDC	
Example	T\$RFIDC=3,1,10 OK : RFIDC	
Note	RFID Report Format: <u>AsynchronousPosition Message</u> + <RFID Data>	

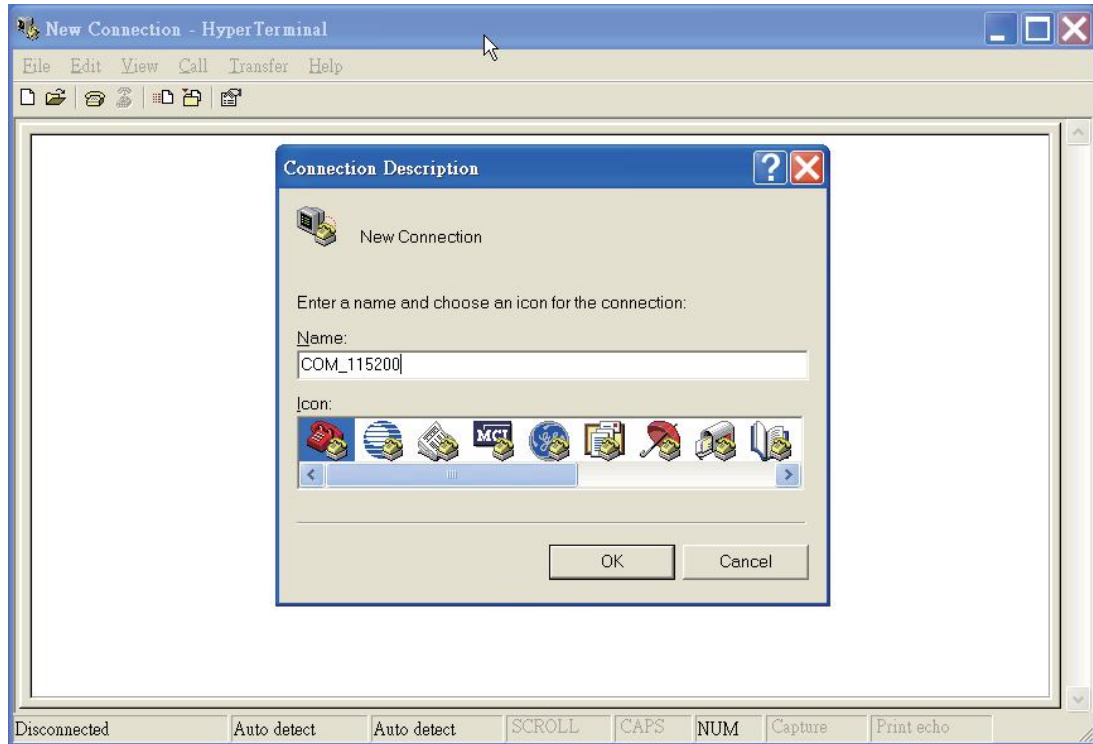
AT\$IDRM Detect RFID											
Description											
Syntax	<p>Write Command: AT\$IDRM=<Enable>,<IDCheckInterval>,< Output ID >,< Output Duration >,<Output Toggle></p> <p>Read Command: AT\$IDRM?</p>										
Parameters	<table border="1"> <tr> <td><Enable></td> <td>0 – Disable 1 – Enable</td> </tr> <tr> <td><IDCheckInterval></td> <td>(1~65535).</td> </tr> <tr> <td>< Output ID ></td> <td>1 – Output 1 2 – Output 2 3 – Output 3</td> </tr> <tr> <td>< Output Duration ></td> <td>Output duration in 100 millisecond. (0 .. 65535)</td> </tr> <tr> <td><Output Toggle></td> <td>The times from its current state to its alternate state and back again. (0~255)</td> </tr> </table>	<Enable>	0 – Disable 1 – Enable	<IDCheckInterval>	(1~65535).	< Output ID >	1 – Output 1 2 – Output 2 3 – Output 3	< Output Duration >	Output duration in 100 millisecond. (0 .. 65535)	<Output Toggle>	The times from its current state to its alternate state and back again. (0~255)
	<Enable>	0 – Disable 1 – Enable									
	<IDCheckInterval>	(1~65535).									
	< Output ID >	1 – Output 1 2 – Output 2 3 – Output 3									
	< Output Duration >	Output duration in 100 millisecond. (0 .. 65535)									
<Output Toggle>	The times from its current state to its alternate state and back again. (0~255)										
Return Value	<p>Write Command: OK : IDRM</p> <p>Read Command: OK : IDRM \$IDRM=<Enable>,<IDCheckInterval>,< Output ID >,< Output Duration >,<Output Toggle></p> <p>Error Response: ERROR : IDRM</p>										
Example	<p>AT\$IDRM=1,10,1,5,10 OK : IDRM</p>										

AT\$TREPORT Temperature sensor report configuration											
Description	This command is used to set/query 1-Wire [®] temperature sensor configuration. The 1-Wire [®] Temperature sensor is for DS18B20 sensor only.										
Syntax	<p>Write Command: AT\$TREPORT=<Temp Sensor ID>,<Trigger Mode>,<Action>,<Min Value>,<Max Value>,<Duration>,<Output ID>,<Output Control></p> <p>Read Comand: AT\$TREPROT?</p>										
Parameters	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">< Temp Sensor ID></td> <td style="padding: 5px;"> 1 – Temperature Sensor 1 2 – Temperature Sensor 2 3 – Temperature Sensor 3 4 – Temperature Sensor 4 </td> </tr> <tr> <td style="padding: 5px;">< Trigger Mode ></td> <td style="padding: 5px;"> 0 – Disable 1 – Inside range of <Min Value> and <Max Value> 2 – Outside range of <Min Value> and <Max Value> </td> </tr> <tr> <td style="padding: 5px;">< Action ></td> <td style="padding: 5px;"> 1 – Logging: When all defined report conditions are true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling: When all defined report conditions are true, send the latest GPS position to the remote base station. 4 – Set Output: When all defined conditions are true, it set the state of the assigned output port number. When any defined condition becomes false, the assigned output port number backs to the original state. </td> </tr> <tr> <td style="padding: 5px;">< Min Value ></td> <td style="padding: 5px;"> The minimum degrees centigrade of the effective detecting range. Unit 0.1 degrees centigrade (-100 ~ +850) </td> </tr> <tr> <td style="padding: 5px;">< Max Value ></td> <td style="padding: 5px;"> The maximum degrees centigrade of the effective detecting range. Unit 0.1 degrees centigrade (-100 ~ +850) </td> </tr> </table>	< Temp Sensor ID>	1 – Temperature Sensor 1 2 – Temperature Sensor 2 3 – Temperature Sensor 3 4 – Temperature Sensor 4	< Trigger Mode >	0 – Disable 1 – Inside range of <Min Value> and <Max Value> 2 – Outside range of <Min Value> and <Max Value>	< Action >	1 – Logging: When all defined report conditions are true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling: When all defined report conditions are true, send the latest GPS position to the remote base station. 4 – Set Output: When all defined conditions are true, it set the state of the assigned output port number. When any defined condition becomes false, the assigned output port number backs to the original state.	< Min Value >	The minimum degrees centigrade of the effective detecting range. Unit 0.1 degrees centigrade (-100 ~ +850)	< Max Value >	The maximum degrees centigrade of the effective detecting range. Unit 0.1 degrees centigrade (-100 ~ +850)
	< Temp Sensor ID>	1 – Temperature Sensor 1 2 – Temperature Sensor 2 3 – Temperature Sensor 3 4 – Temperature Sensor 4									
	< Trigger Mode >	0 – Disable 1 – Inside range of <Min Value> and <Max Value> 2 – Outside range of <Min Value> and <Max Value>									
	< Action >	1 – Logging: When all defined report conditions are true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling: When all defined report conditions are true, send the latest GPS position to the remote base station. 4 – Set Output: When all defined conditions are true, it set the state of the assigned output port number. When any defined condition becomes false, the assigned output port number backs to the original state.									
	< Min Value >	The minimum degrees centigrade of the effective detecting range. Unit 0.1 degrees centigrade (-100 ~ +850)									
< Max Value >	The maximum degrees centigrade of the effective detecting range. Unit 0.1 degrees centigrade (-100 ~ +850)										

	< Duration >	Duration in seconds which temperature sensor is triggered inside/outside the specific range. (1~255)
	< Output ID >	The unit hardware output number. Outputs are numbered 1 through 3. (For model U1: Output ID = 1~3)
	<Output Control>	0 – Set output inactive. 1 – Set output active.
Return Value	<p>Write Command: OK : TREPORT</p> <p>Read Command: OK : TREPORT \$TREPORT=<Analog Input ID>,<Trigger Mode>,<Action>,<Min Value>,<Max Value>,<Duration>,<Output ID>,<Output Control>,<Temperature in 0.1deg.C></p> <p>Error Response: ERROR : TREPORT</p>	
Example	<p>AT\$TREPORT=1,1,7,230,260,2,1,1 OK : TREPORT</p>	

3.4 Device Configuration

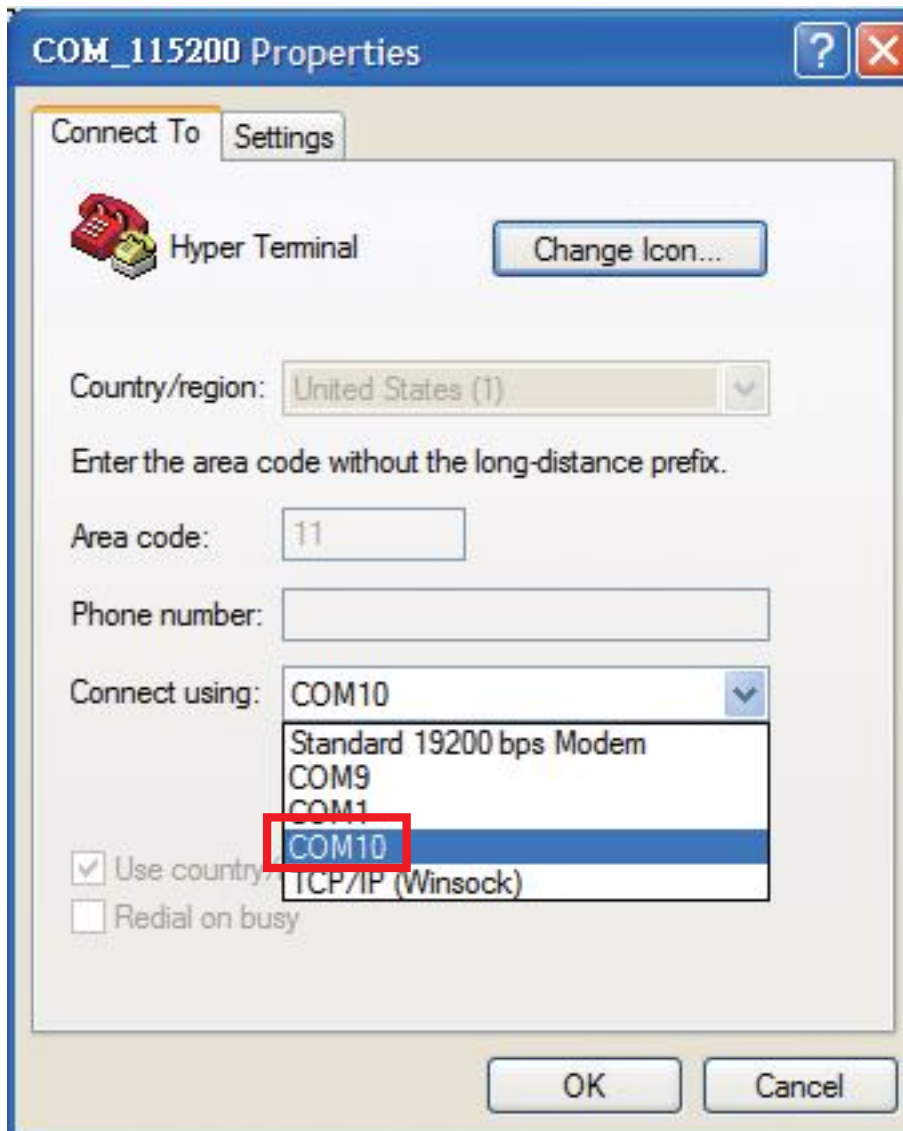
1. In Windows XP desktop, click **Start | All Programs | Accessories | Communications | HyperTerminal**.
2. If you are prompted to input the information of your location, complete them to proceed.
3. On the **File** menu of **HyperTerminal**, click **New Connection**.
4. In the **Name** box, type a name that describes the connection. In the **Icon** box, click an appropriate icon. Press the **OK** button to proceed.



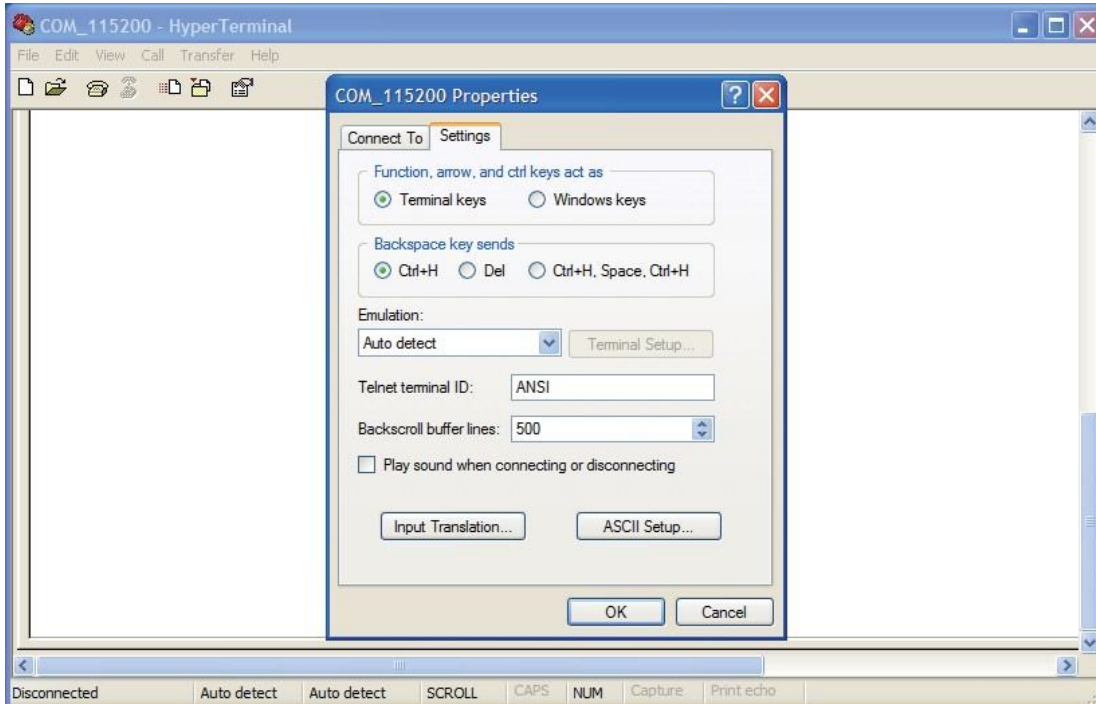
5. For Com port properties, configure as follows:

Baud Rate --> 115200 bps
Data Bits --> 8
Parity --> None
Stop Bits --> 1
Flow Control --> None

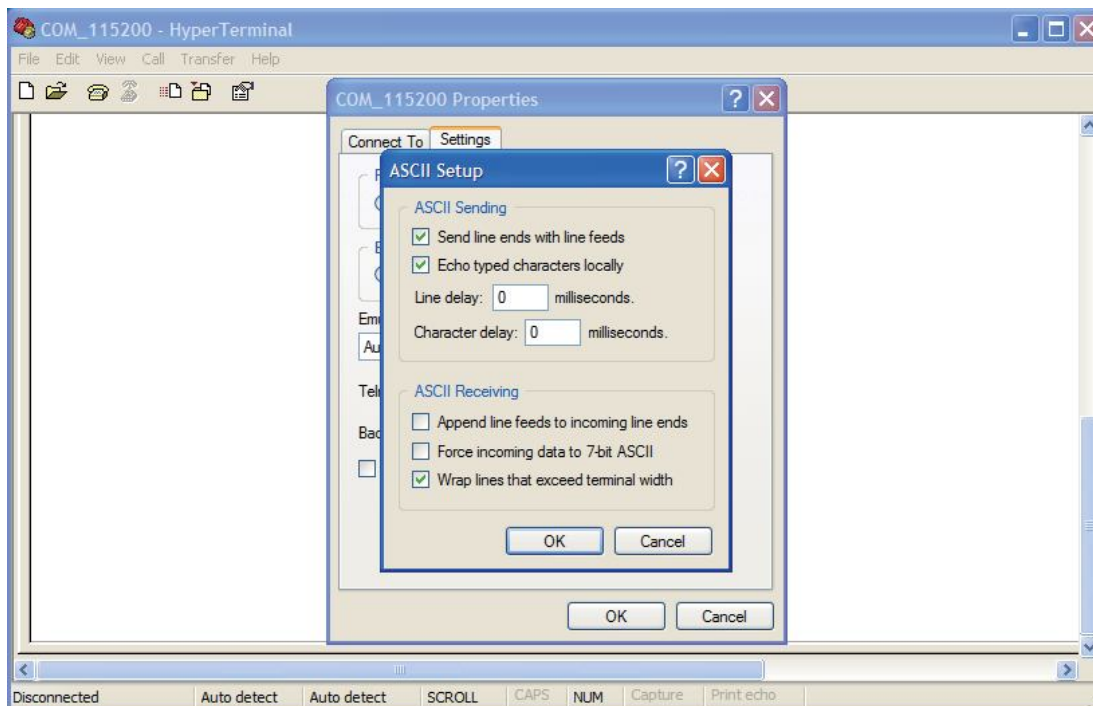
6. In the connection that you have just set up, click **File | Properties**. Select the **[Connect To]** tab. From the **[Connect using]** drop down list, select the correct com port by checking it up at Windows XP's **[DeviceManager]** as previously mentioned on page 9. Go there by clicking **Start | Control Panel | System | Hardware | Device Manager**.



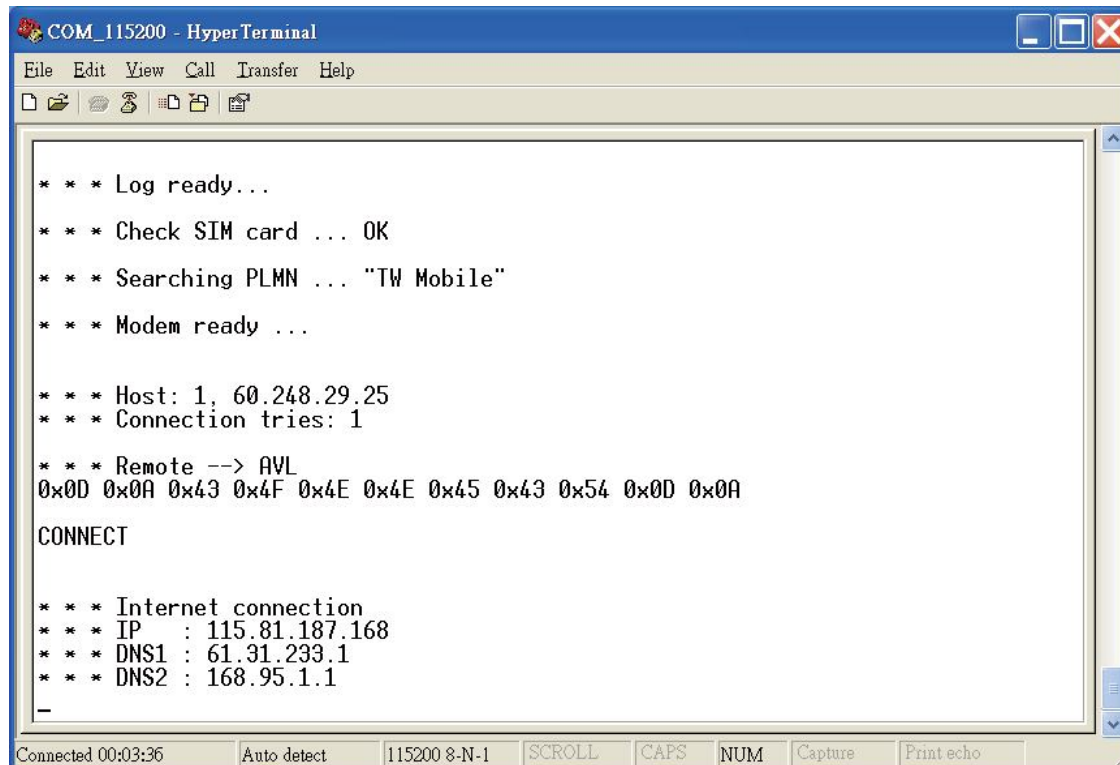
7. In the **File** menu, click **Properties**. Click the **[Settings]** tab. Press the **ASCII Setup** button.



8. In the **[ASCII Sending]** group box. Select both **Send line ends with line feeds** and **Echo typed characters locally**. Press the **OK** button.



9. Connect your the CAREU U1 PLUS device to power as mentioned in [Power, RS-232, and I/O Cable Connection on page 9](#). The device startup message will be displayed.



The screenshot shows a HyperTerminal window titled "COM_115200 - HyperTerminal". The window contains the following text:

```
* * * Log ready...
* * * Check SIM card ... OK
* * * Searching PLMN ... "TW Mobile"
* * * Modem ready ...

* * * Host: 1, 60.248.29.25
* * * Connection tries: 1

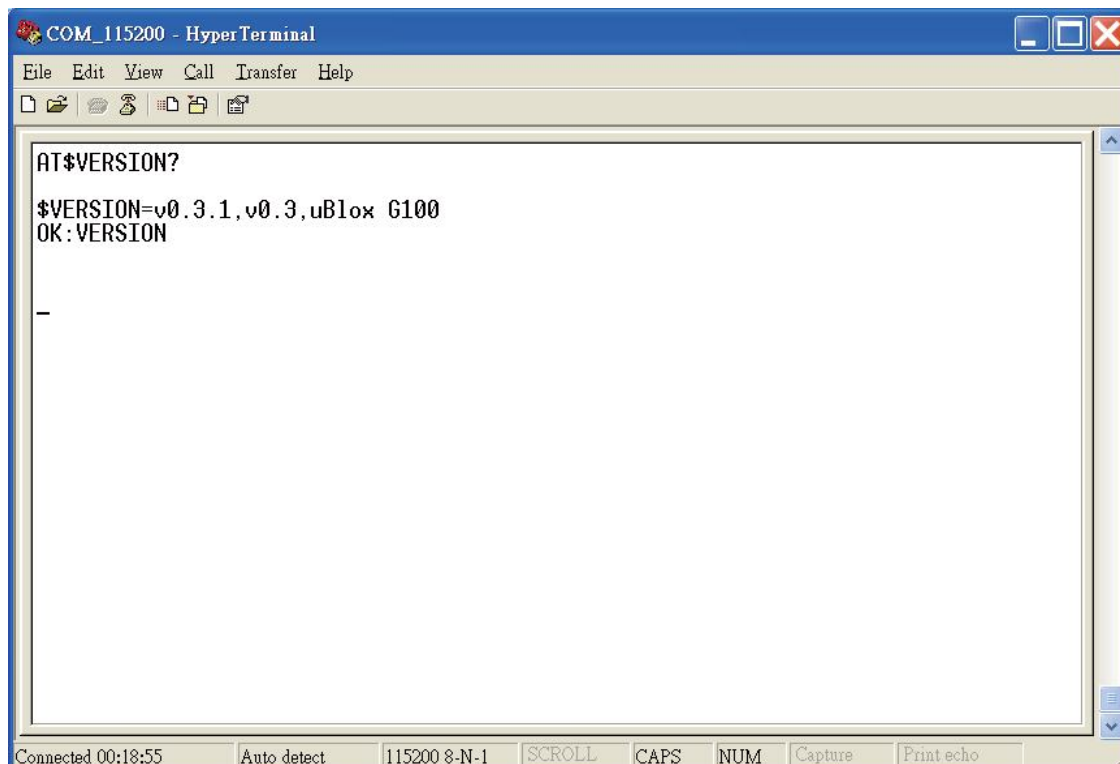
* * * Remote --> AVL
0x0D 0x0A 0x43 0x4F 0x4E 0x4E 0x45 0x43 0x54 0x0D 0x0A

CONNECT

* * * Internet connection
* * * IP : 115.81.187.168
* * * DNS1 : 61.31.233.1
* * * DNS2 : 168.95.1.1
-
```

The status bar at the bottom of the window shows "Connected 00:03:36", "Auto detect", "115200 8-N-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

10. In **[HyperTerminal]** window, type in the command "AT\$VERSION?" and press the **Enter** key. The hardware and firmware version will show. As long as your **[HyperTerminal]** window appears as the screenshot below, a connection between the device and your system has already been built up and working. It is time to send all configuration commands.



The screenshot shows a HyperTerminal window titled "COM_115200 - HyperTerminal". The window contains the following text:

```
AT$VERSION?
$VERSION=v0.3.1,v0.3,uBlox G100
OK:VERSION
-
```

The status bar at the bottom of the window shows "Connected 00:18:55", "Auto detect", "115200 8-N-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

3.5 Communication Settings

The CAREU UW1 Vehicle Tracker communicates with your control center by either SMS or GPRS (TCP/UDP). Before the device is installed into a vehicle, communication parameters should be set.

1. SMS Configuration

Use AT\$SMSDST command to set a SMS control center phone number or short code. For example, if the SMS control center phone number is +886123456789, the AT\$SMSDST command to be issued into **HyperTerminal** should be:

```
AT$SMSDST=+886123456789
```

```
OK
```

Then you can try to use cellular phone or SMS gateway to send a SMS message to the CAREU U1 PLUS device. Send a SMS message --> "AT\$MODID?"

Device will response:

```
$MODID=101000001
```

```
OK
```

This proves a successful mobile phone SMS connection.

2. GPRS Configuration

Set GPRS servers by using the following commands:

```
AT$APN=internet,username,password (APN=internet, Username=username,  
Password=password) OK
```

```
AT$HOSTS=1,0,60.148.19.10,6000
```

(Server IP address = 60.148.19.10 and Port number =6000)

```
OK
```

```
AT$RETRY=5,10 (Message retry settings)
```

```
OK
```

```
AT$IPTYPE=1 (Using TCP/IP mode)
```

```
OK
```

```
AT$GPRSEN=1 (GPRS enable)
```

```
OK
```

```
AT$HB=60,1 (Heartbeat setting)
```

```
OK
```

Please refer to the CAREU UW1 Protocol Document for more command details.

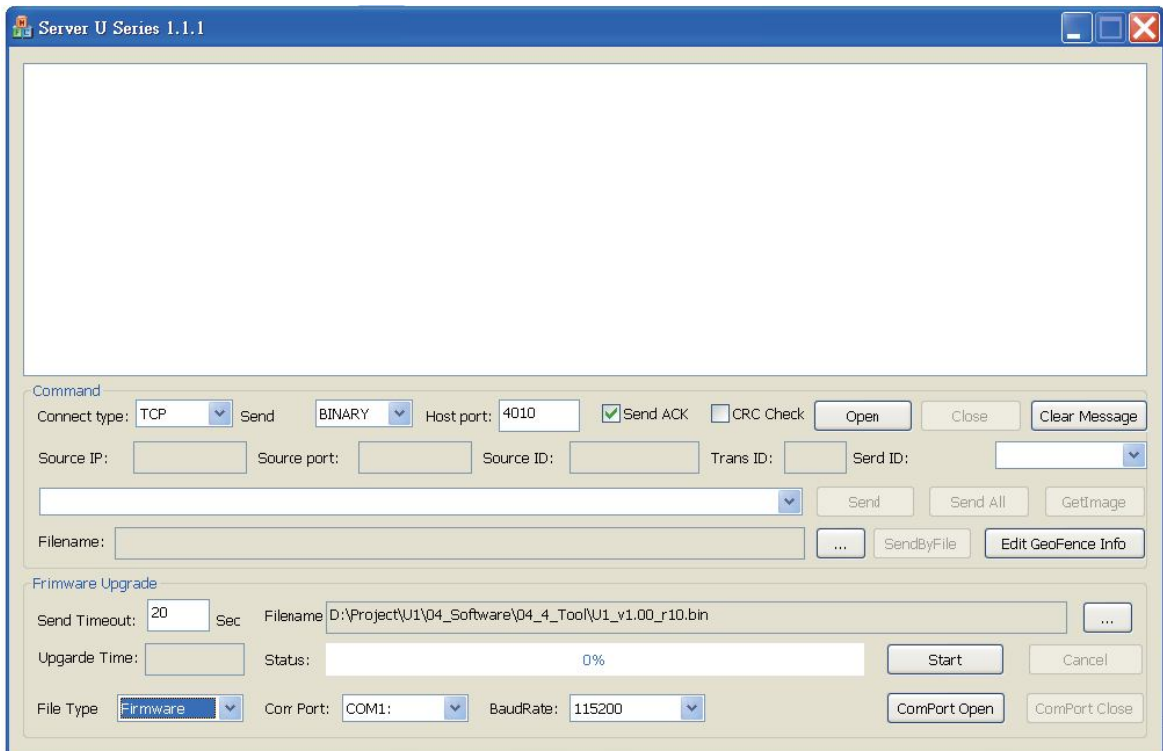
3.6 GPS Tracking Configurations

After the device communication settings are done, the remote GPS tracking is ready to function. The setting of GPS tracking can be done by using AT\$PDSR command. For example,

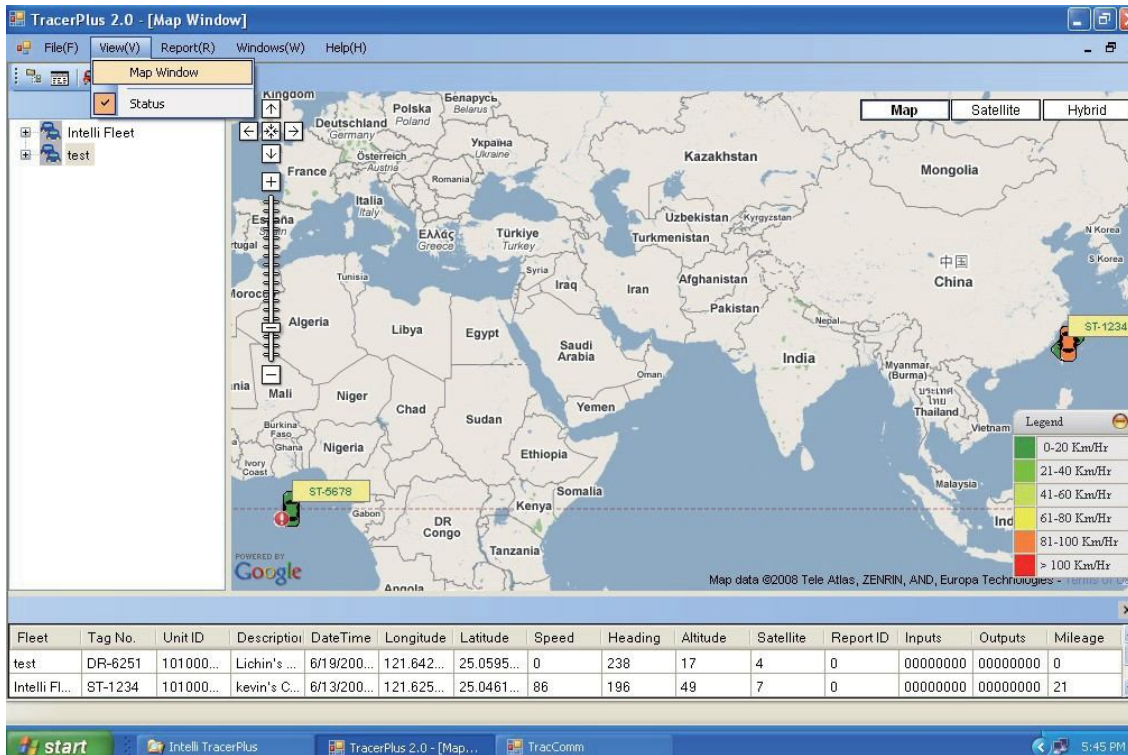
AT\$PDSR=1,30,25,0,2,0,0,1,1(Tracking through GPRS by time interval 30 seconds)

OK

For simple testing GPRS, run the TCP Server U-Series software which is provided by S&T. It is simple server software that can wait for device connection and data.



For advanced testing, you need the software Intelli TracerPlus. Please request this software through your sales contact.



You can also apply for a testing account from S&T's FleetWeb solution through your sales contact.

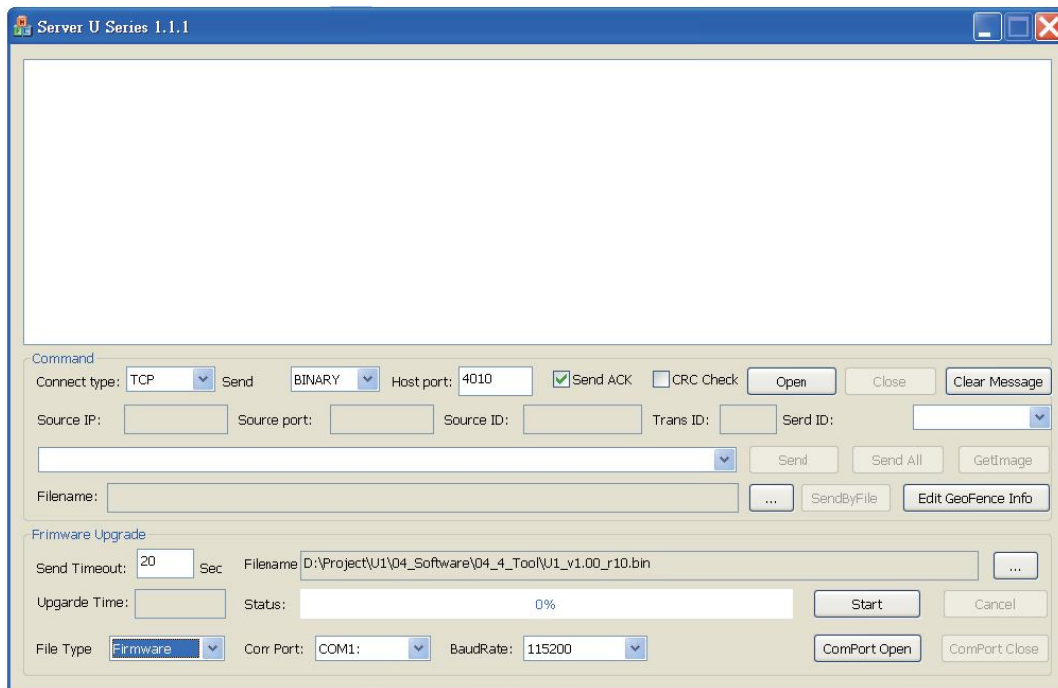
The main page of the Intelli FleetWeb appears as below:




3.12 Firmware Upgrade

The firmware of the CAREU UW1 can only be updated through USB interface. With the firmware loader tool provided by S&T, firmware update can be done for the device. Such firmware loader runs on Windows-based systems. To upgrade the firmware, follow the procedure below:

- 1). Connect the device to your PC with the RS-232 cable.
- 2). Connect the device to power.
- 3). Power on the device.
- 4). Run ServerUSeries.exe. A window displays as follows:



- 5). Press browse the button  to browse to the firmware provided by S&T.
- 6). Press the **Start** button to run the firmware program.
- 7). After the writing progresses to 100%, it takes about 20 seconds for the update to completes.
- 8). Firmware update completes.

Chapter 4. Technical Specification

Hardware Requirements	Description
CPU	ARM Cotex-M4 (84MHz)
Internal Memory	up to 512 Kbytes of Flash memory up to 96 Kbytes of SRAM
External Memory	16M bytes
Cellular	Cellullar Module: <ul style="list-style-type: none"> • Vendor: u-blox 2G Module / 3G Module /4G Module • Frequency: 850/900/1800/1900/2100 MHZ • Antenna: Internal 4G/3G/2G Antenna
GPS	GPS Module: Dual Satellite System: <ul style="list-style-type: none"> • GPS and GLONASS(Deafult) • GPS and BeiDou • GPS • Vendor: u-blox Sensitivity: -167 dB (GPS & GLONASS) -165 dB (GPS & BeiDou) -166 dB (GPS) @Tracking & Navigation Condition Time to First Fix: Cold Start: 26 Seconds at open sky (GPS & GLONASS) 27 Seconds at open sky (GPS & BeiDou) 29 Seconds at open sky (GPS) Hot Start: 1 Second
GPS Antenna	<ul style="list-style-type: none"> ● Internal PITCH Antenna ● LNA 28dB ● GPS + GLONASS Antenna ● GPS Antenna Size: 25x25x4mm Coxial Cable Type and Length 18mm

I/O(standard)	<ul style="list-style-type: none"> ● Analog Input x 1 <ul style="list-style-type: none"> A. Voltage Range: 0-48 V B. Resolution: 12 bit ● Digital Input x 3 <ul style="list-style-type: none"> A. 1 Positive Trigger(ACC) B. 2 Negative Trigger(Input 1,2) ● Digital Output x 2 Open-Collector ,Imax 300mA x2(Output 1,2)
1-wire	DS2482-100
Main power Remove detect	Yes
GPS open/plug in detect	Yes
SIM CARD	SIM Card Access: External(Full-size) support 1.8 or 1.5V
Battery	Lithium Polymer Battery Backup Battery: 900m AH Operating Temperature:Charge (0~40 °C),Discharge(-20~60 °C) Cycling life:500 Cycle Battery minimum operating voltage:3.8V (Will update at next version)
Sensor	6 axis G-sensor and Gyroscope
AGPS	Yes
Power Supplies	6-48 VDC
Power Consumption	operationI mode: 40mA (@12V working voltage, GPS position & GSM connect to server ,Without battery.) low power mode:1.5mA
Temperature	Operating: -20 °C to +60 °C(With Battery) Operating: -10 °C to +70 °C(Without Battery) Storage: -20 °C to +80°C
LED Indicator	<ul style="list-style-type: none"> • GSM:red color • GPS:orange color
Logging	150,000 positions
User Report	128 Sets
Certificate	CE & FCC & E-Mark & IP67

Note: The specification herein is subject to change without prior notice.

Systems & Technology Corp. (S&T), founded in 1987, is a market leader in Automatic Vehicle Locating (AVL) solutions, Geographical Information Systems (GIS) and navigation. It has formed a professional development team to innovate the most advanced and comprehensive GPS tracking products for the customers and has built a global service network to provide non-stop services and support.

With the well-established marketing networks of over 100 distributors in the world, S&T is your trustworthy tracking solution provider. For more product information, please contact S&T by Email, phone or fax.



Web Site	http://www.systech.com.tw
Email	avl@systech.com.tw
Phone	+886-2-2698-1599
Fax	+886-2-2698-1211

Chapter 5. Regulation

FCC Regulations:

15.19(a)(3):

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

15.105(b):

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8inches) during normal operation.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

RF Exposure Information

This device meets the government's requirements for exposure to radio waves.

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Users and installers must be provided with comprehensive installation instructions. In particular, it must be clear that suggested location for installation of this device at more than 20cm away from passengers (front or rear) or bystanders.

