

GSM/GPRS/WCDMA/HSPA

GPS Mini Tracker

MT-900C



USER MANUAL

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MADE IN TAIWAN

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1. Introduction

The MT-900C is a portable compact tracking device for personal safety and asset monitoring. It combines high sensitivity GPS and 3G mobile interface to perform the powerful security application.

The MT-900C can, based on quad band GSM/GPRS and WCDMA/UMTS/HSPA network and GPS satellite positioning system, track far-way objects conveniently by Short Message or internet. With the compact size and powerful functions, it can be used for child protection, anti-kidnapping, vehicle tracking, pets go out tracking, panic assistant for the aged, and much more.

2. Features

- ❖ 3.75G WCDMA/UMTS/HSPA communications
- ❖ Available Quad band GSM/GPRS 850/900/1800/1900 MHz
- ❖ GPS 50 channels all-in-view tracking with AGPS supported.
- ❖ GPS high sensitivity -162 dBm.
- ❖ Real time dynamic reporting based on time interval.
- ❖ Data logger capability built in with 4Mega bytes flash memory to record time stamp, position and event status.
- ❖ 3D G-sensor to report motion sensing, accident from ±4G.
- ❖ Remote command control by SMS or GPRS/EDGE/3G network (supporting TCP/UDP).
- ❖ Cell ID positioning supporting
- ❖ Emergency call and notification, plus SMS sending location.
- ❖ Geo-fence capability with out of fencing notification.
- ❖ Over speed notification capability.
- ❖ Low battery notification capability.
- ❖ Power management for low power consumption.
- ❖ Surrounding audio monitoring capability.(option for MT-900CE, CA, not CF)
- ❖ Mini USB for charging and data exchanging.
- ❖ Personal service center program support.
- ❖ Over the air(OTA) firmware update

3. Applications

- ❖ Personal safety
- ❖ Security – safety of security guard, locate asset
- ❖ Asset unauthorized movement detection
- ❖ Child care – locate missing kids, track whereabouts of children
- ❖ Disables' safety – seniors' safety

- ❖ Vehicle tracking
- ❖ Outdoor recreation – travel, hiking, bike riding
- ❖ Animal tracking – track pets' location

4. Version Compliant Information

- (1) Hardware: 0.1 (or last version).
- (2) Firmware: MT900C Standard version 1.0.0 (mt900c_std_v1.0.0).

5. Electrical Specifications

5.1 General Specification

Parameter	Specification
Operating Voltage	3.4 V
Operating Temperature	-20 ~ +60
Storage Temperature	-40 ~ +85
Power Consumption	Normal 180 mA
	Idle mode < 3mA (with mobile idle)
Battery	500mAh
USB Power Input	5V, 500mA
Battery Voltage	Min:3.4V, Typ:3.7V, Max:4.2V
SIM card type	1.8V, 3V
SIM card Holder type	Push-Push type
LED Status Indicator	Charge/Power/ Mobile/GPS
Dimension	53 x 37 x 20 mm
Weight	39g

5.2 Wireless Interface Specification

Parameter	Specification
UMTS/WCDMA/HSPA	900/2100 MHz (MT-900CE) 850/1900 MHz (MT-900CA) 800/850/900/1700/1900/2100MHz (MT-900CF) Up to 5.76 Mb/s uplink, 7.2 Mb/s downlink
GSM	850 / 900 / 1800 / 1900 Mhz Class B Mobile Station PBCCH, USSD support
GPRS	Multislot Class 12, CS1-CS4 up to 85.6 kb/s
EDGE	Multislot Class 12, MCS1-MCS9 up to 236.8 kb/s
SMS	MT/MO, Text and PDU mode supported
Protocol support	TCP/UDP
Current consumption (at VCC=3.8V)	Idle mode :<2 mA GSM:< 250 mA GPRS < 660mA EDGE < 460 mA HSDPA < 670 mA

5.3 GPS Specification

Parameter	Specification
Protocol	NMEA 0183 Ver2.3
Receiver channels / Fixing method	50 channels all in view
Acquisition sensitivity	-148 dBm
Tracking sensitivity	-162 dBm
Receiver frequency	1575.42MHz L1 C/A Code
Accuracy (1)Position (2)Datum	2.5m CEP WGS-84
Time To First Fix (1)Cold start (2)Hot start	26 Sec(typ) 1 Sec(typ)
Dynamic condition	4G (39.2m/sec ²)

6. Device Description



Picture 1

- (1). Strap Hole
- (2). Mini USB Slot and Power Switch Button
- (3). SIM card Slot
- (4). SOS Button
- (5). GPS Status Indicator
- (6). Mobile Status Indicator
- (7). Power Indicator
- (8). Charging Indicator
- (9). MIC Receiver (Option)

7. Battery Charging and USB Interface

7.1 Battery Charging

NOTE: Please turn off the power while mini tracker is on charging. If you keep the power on, the battery is not able to be fully charged.

- (1) Charging by a computer USB port:

Connect the supplied USB cable between the computer USB port and the mini USB connector of the MT-900C device.

- (2) Charging by a cigarette lighter power adapter:

- a. Plug the USB connector of the supplied USB cable to the USB connector of the cigarette lighter power adapter.
- b. Connect the mini USB plug of the USB cable to the mini USB port of the MT-900C device.

(3) Charging by AC adapter:

Connect the supplied AC adapter to the mini USB port of the MT-900C device.

7.2 Parameters Setting

Connect the supplied USB cable between the computer USB port and the mini USB connector of the MT-900C device.

The USB interface is also a command and data interface which allows users to download the firmware and set configurations. Users can use “Mini Tracker setting program” to change setting, send commands or upgrade firmware.

8. Button/Switch Indication

(1)Slide switch

A micro switch for turning on or turning off MT-900C.

(2)Panic Button

Press and hold the Panic button for 3 seconds to activate the device to perform the emergency notification and followed the pre-defined setting (Emergency alarm).

9. LED Indication

9.1 Power On/Off and Idle status

For the power status indicator through green LED, detailed information is shown in the following table

LED mode	Operation status
OFF	POWER OFF or IDLE mode
ON	POWER ON

9.2 GPS Status

For the GPS status indicator through green LED, detailed information is shown in the following table

LED mode	Operation status
OFF	un-fixed
FLASH	fixed

9.3 Mobile Status

For the WCDMA/GPRS/GSM status indicator through blue LED, detailed the information is shown in the following table.

LED mode	Operation status
OFF	WCDMA/GPRS/GSM is not running
FLASH	Indicates WCDMA/GPRS/GSM data transfer:

9.4 Charging Status

For the charging status indicator through Red LED, detailed information is shown in the following table

LED mode	Operation status
ON	Charging
OFF	Charging finish
Flashing	Emergency Alarm

9.5 Emergency Alarm

For the Emergency Alarm indication, the power, GPS, and GPRS LEDs will light on for 3 seconds.

LED mode	Operation status
Power, GPS, GPRS light ON 3seconds	SOS emergency alarm

10. Device Installation

10.1 How to insert SIM card

- (1) Lift SIM card cover and rotate it by the direction of the mark (See Picture 2), and the Status Indicator and MIC receiver should be on the upper side.
- (2) To face up the chip side of SIM card, and the notch should be on the upper-right side as Picture 3.
- (3) Insert the SIM card and push it to the end of slot and put on the cover.

10.2 How to take out SIM card

1. Lift and rotate SIM card cover .
2. Push SIM card and it will pop out from the slot.



Picture 2



Picture 3

NOTE:

- (1) Before installing the SIM card, make sure your SIM card is not locked by any PIN Code, if it is was locked, please use a cell phone to unlock the card's PIN Code.
- (2) Please note that the folded corner of the SIM card should be on the Upper Right side when you install the card. (See Picture 3)
- (3) You can use prepaid cards or normal subscription cards. If you use prepaid cards then make sure it can't be drained without automatic refill so you do not risk losing communication with the tracker.
- (4) The SIM card is not included in the package. An appropriate SIM card is available from the user's local operator.

11. Device Configuration

11.1 USB driver installation procedure

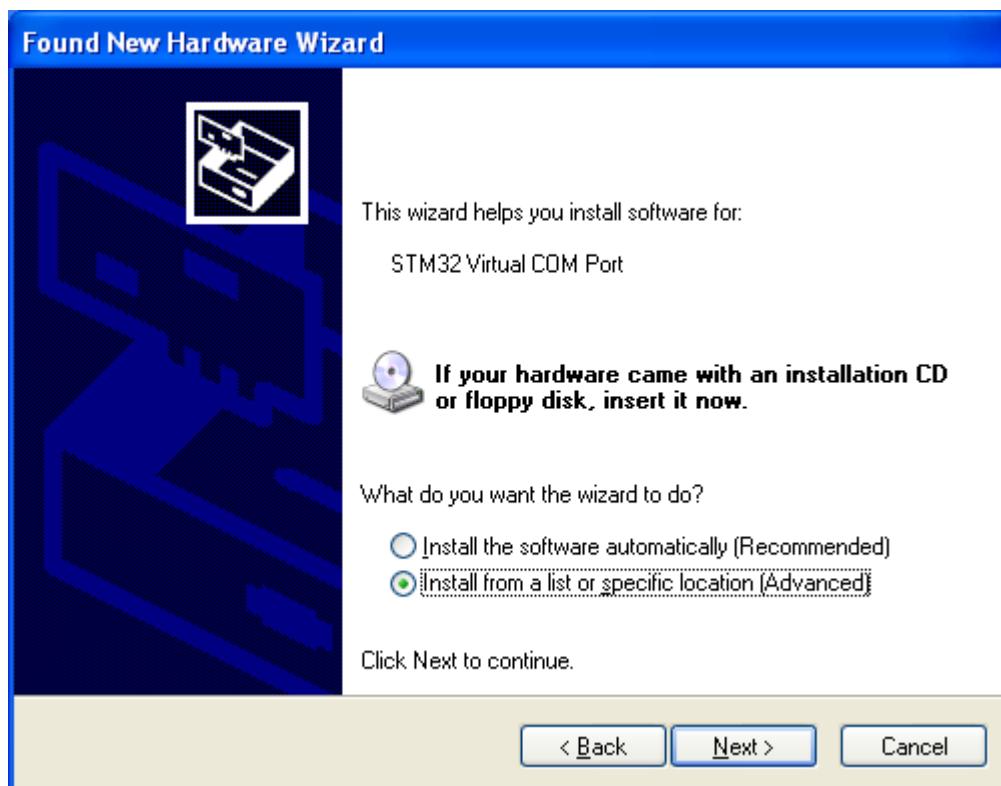
Connect MT-900C device to PC, choose “No, not this time”

then click Next button

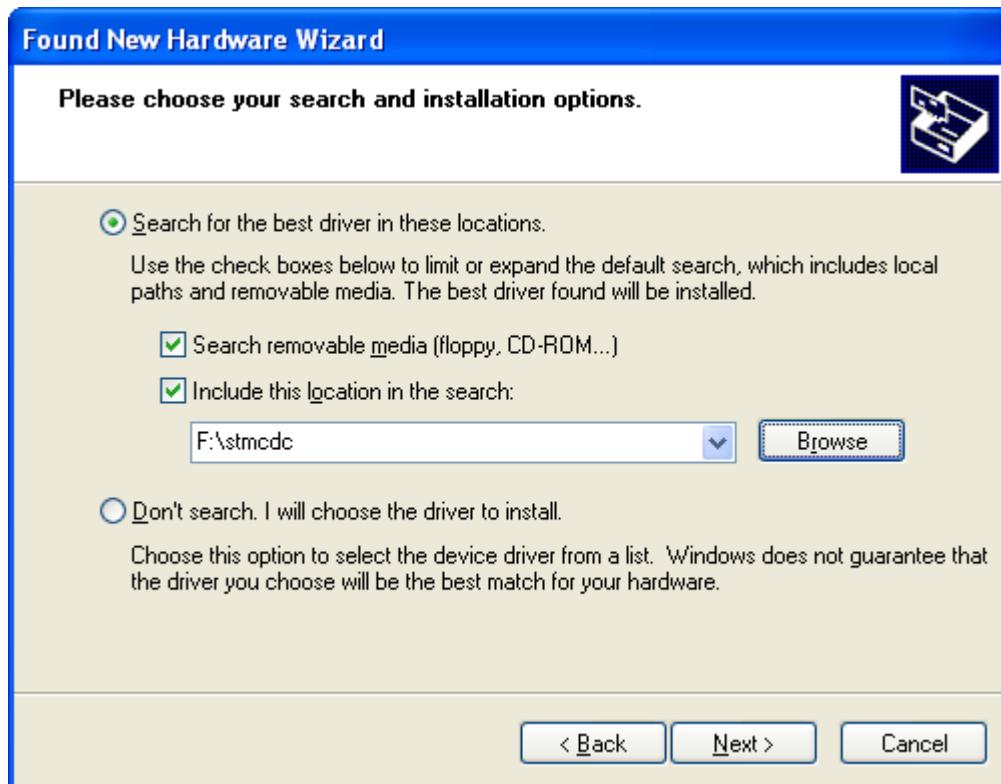


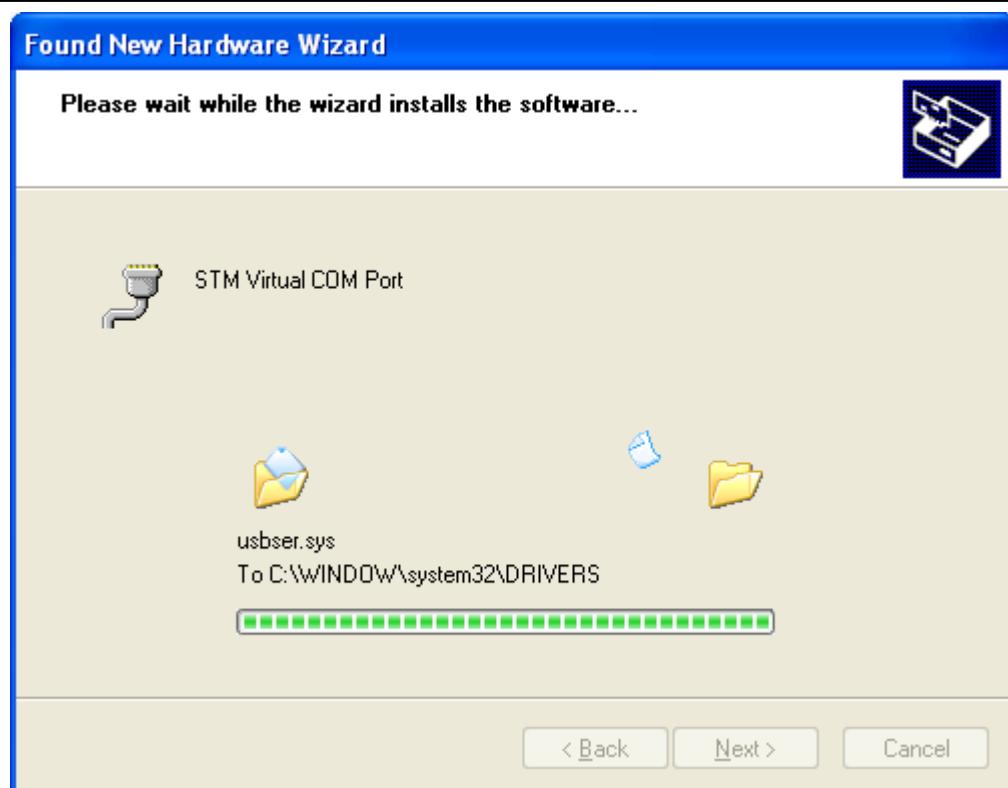
Choose “install from a list or specific location(Advanced)”,

then click Next button



Click the Browser button to search the installation file, then click Next button to install USB driver





Click Finish button to complete

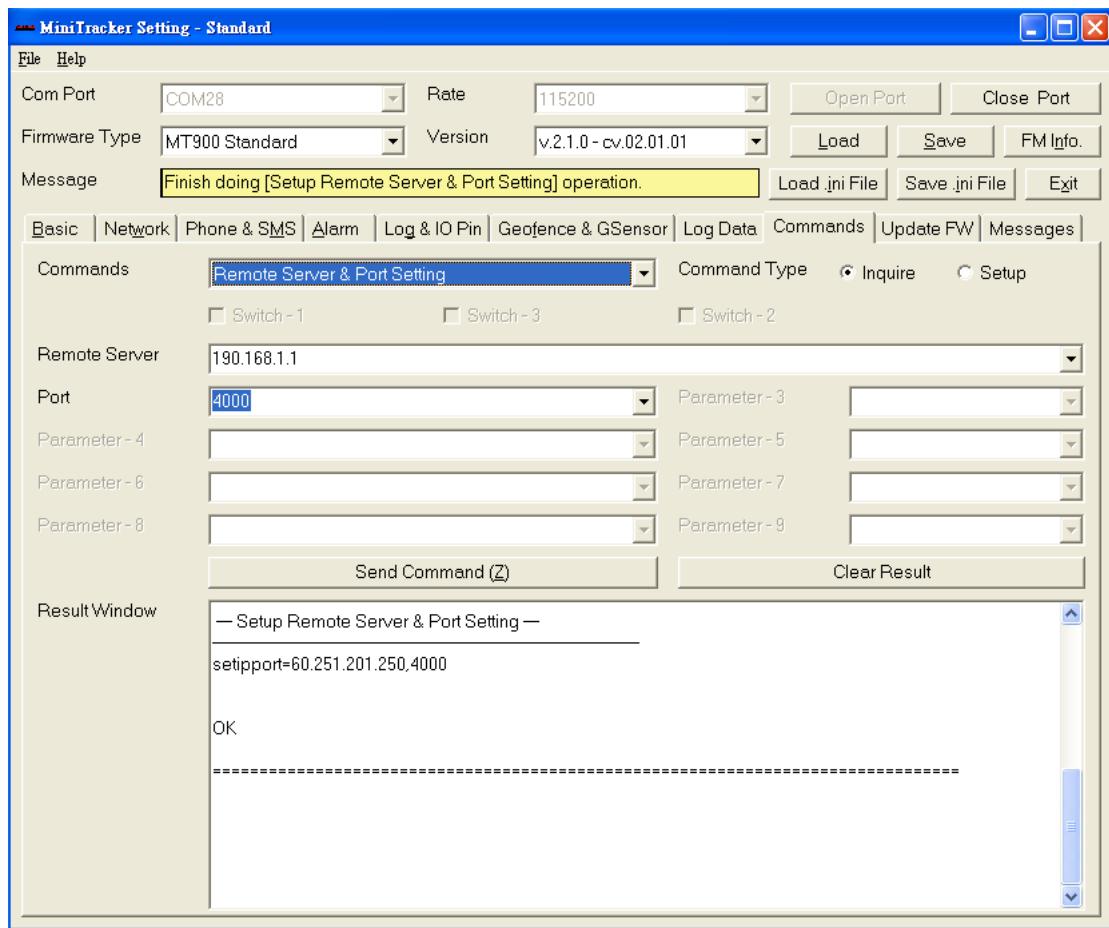


11.2 Min Tracker Setting description

(Please refer to the “user manual of mini Tracker setting program”)

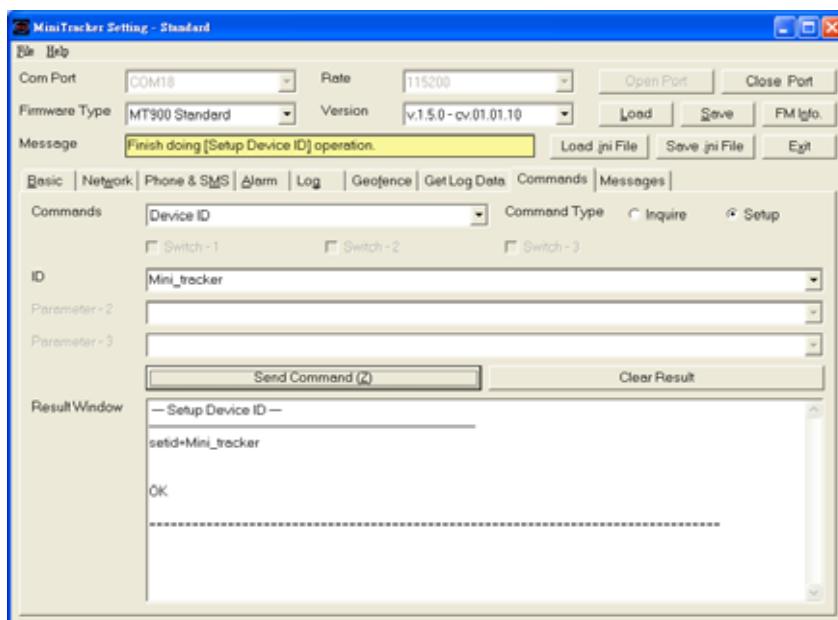
(1) Set TCP IP & Port:

Run Mini Tracker Setting tool software, then it will show the setting environment. Choose Remote Server & Port Setting in commands column. Follow the below picture setting, then click the “Send command” button, then you will see OK in Result Window.



(2) Set Device ID:

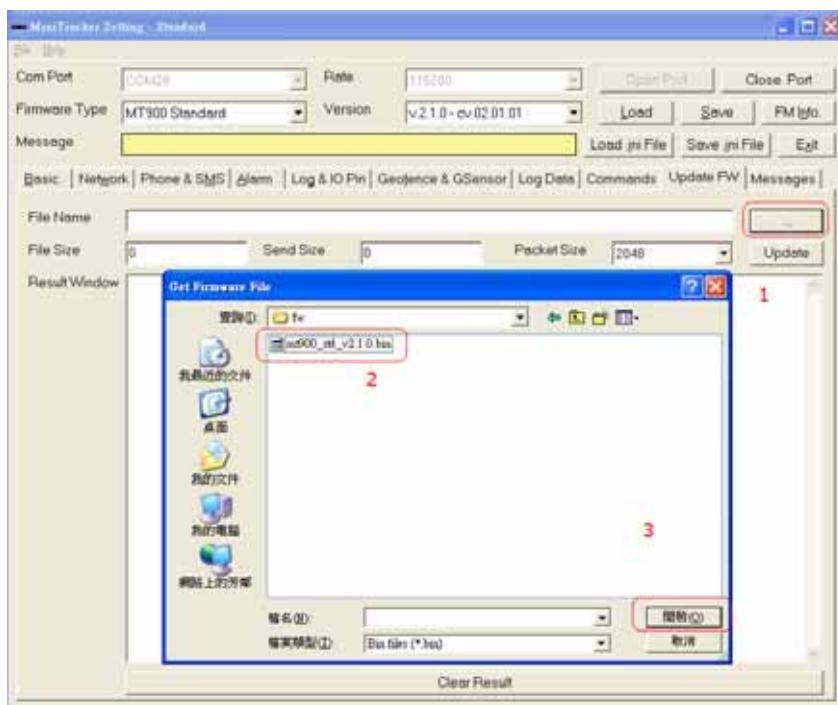
Choose Device ID in Commands column. Follow the below picture setting, then click the “Send command” button, then you will see OK in Result Window



11.3 Upgrade Firmware

(1) Using Mini tracker Setting program

- Go to "Update FW" function, and click "..." button to browse the firmware in your PC file folder.
- There will pop out a dialogue box and shows the file in the folder, you can select the firmware file.
- Click "Open" button to start update firmware procedure.



(2) Using PC Hyper Terminal tool

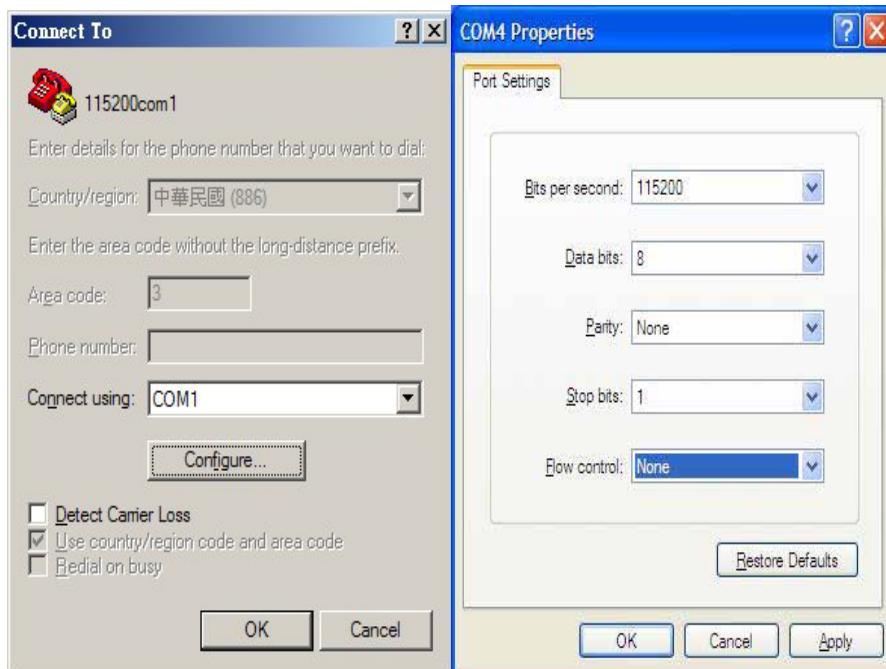
(a) Power on the device. Using USB cable connects the device with PC.

Check if the device access to the PC's COM port.

My Computer>Properties>Hardware>Device Manager>Ports (COM&LPT)

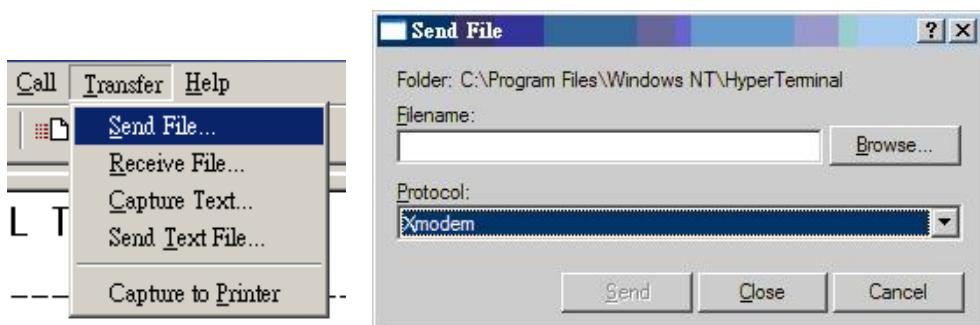
(b) Open the Hyper Terminal, and select the corresponding COM.

The baud rate is 115200, 8 data bits, none parity check, 1 stop bit, none flow control.



(c) Input "updmtfm" and Enter in HyperTerminal.

(d) Select the file which to be downloaded via "Transfer" -> "Send File" of the HyperTerminal as the figure.



(e) After all, press the "Send" button to download file from PC. And then you will see the download progress.

11.4 Power saving mode/Idle mode

MT-900C supports 3 idle modes for user application. The user can select the one suitable to its demand.

(1) Time Interval idle

The device will wake up to report at pre-defined time interval. The mobile module is in idle too. So the user can still call in to wake up the tracker to report.

(2) Phone/SMS idle

The device will keep under the idle mode until the user call in or send SMS to wake up the tracker to report.

(3) Gsensor idle

The device will be in idle mode until the vibration detected and meets the conditions. Then the device will wake up and report to server or mobile phone. The mobile module is in idle too. So the user can still call in to wake up the tracker to report.

Note1: The tracker will wake up to report by phone call when the user calls in and hangs on within 3 ring tone. The device will pick up the phone for remote monitoring if the ring tone over 3 times.

Note2: When the tracker is set to the idle mode, the tracker will check the alarm conditions and report only when it is during the wake up time. If there are alarms occur while system wakes up, the system will not go into idle again before all alarms clear.

11.5 Short Message Service Control

The tracker also provides another way for control access or configuration. From the Short Message Service, the user can use the defined number mobile phone to control the tracker. After received the SMS, the tracker will perform as the request command and will response to the mobile phone with SMS.

(1) Version Information:

- (a) Hardware: 0.1 (or last version).
- (b) Firmware: MT900C Standard version 1.0.0 (mt900c_std_v1.0.0).

(2) General Rule

- a) Password: pppppp, 6 alphanumeric characters.
- b) *: Start symbol.
- #: End symbol.

c) ID: Tracker Identification number, 4 ~ 16 alphanumeric characters.
 No Space character is allowed, only "," between the * and #.

d) RX: receive from mobile phone.
 TX: response to mobile phone.

e) GPS location information: the format will be:

- i) GPS fixed: [<http://maps.google.com/maps?hl=en&q=24.816848,121.025245>]
- ii) Cell ID: Cell-Info 1, Cell-Info 2, Cell-Info 3, Cell-Info 4

Cell-Info: <MCC>: Number Mobile country code, range 0-999 (3 digits).
 <MNC> :Number Mobile network code, range 0-999 (2 or 3 digits).
 <LAC>: Number Location area code, range 0h-FFFFh (2 octets).
 <CI> :Number Cell Identity, range 0h-FFFFh (2 octets).
 <RxLevServ>: Number Received signal level on the cell, range 0-63. For example:
 466,97,7664,85d6,048,466,97,7664,ffff,039,07,466,97,7664,898d,036,466,97,766
 4,898d,036

f) If the device could not get a valid date/time from GPS message, it will show
 00/00/00,00:00:00

g) Alarm SMS: ID: alarm type,[GPS location information]
 For example:
 MT-01Over Speed Warning, [<http://maps.google.com/maps?hl=en&q=24.816848,121.025245>]

h) SOS POS format: SOS, ID, Date, Time, [GPS location information]

(3) Command Description

Set Tracker ID

Function	Set up the ID into the tracker.	
Format	RX	*ID,PPPPP,setId,new ID,new ID#
Response	TX	New ID Setup OK
or	TX	Old ID Setup FAIL

Set Cellular Number

Function	Set up the phone number(s) into the tracker.	
Format	RX	*ID,PPPPP,fonsetup,phone-1,(phone-2, phone- 3)#
Response	TX	ID fonsetup OK
or	TX	ID fonsetup FAIL

Set Time Interval

Function	Set up the location response time interval into the tracker. Unit: s - second, m - minute, h - hour, d - day.	
Format	RX	*ID,PPPPPP,tintsetup,xxxxx,Unit#
Response	TX	ID tintsetup OK
or	TX	ID tintsetup FAIL

Enable and Set up Geofence

Function	Set up the radius of the Geofence into the tracker, the unit is meters.	
Format	RX	*ID,PPPPPP,geofenceon,xxxxx#
Response	TX	ID geofence ON,xxxxx, GPS location information
or	TX	ID geofenceon FAIL

Disable Geofence

Function	Disable the Geofence function of the tracker.	
Format	RX	*ID,PPPPPP,geofenceoff#
Response	TX	ID geofenceoff OK
or	TX	ID geofenceoff FAIL

Set Tracker Password

Function	Set up the password into the tracker.	
Format	RX	*ID,PPPPPP,setpass,new password,new password#
Response	TX	ID setpass OK
or	TX	ID setpass FAIL

Inquire Current Location

Function	Inquire the location information from the tracker.	
Format	RX	*ID,PPPPPP,gpsinq#
Response	TX	ID,GPS location information
or	TX	ID gpsinq FAIL

Inquire IMEI code

Function	Inquire the IMEI code from the tracker.	
Format	RX	*ID,PPPPPP,getitemi#
Response	TX	ID [15 decimal] of IMEI
or	TX	ID getimei FAIL

Set IP and Port

Function	Set up the IP and Port of the server into the tracker.	
Format	RX	*ID,PPPPPP,ippsetup,xxx.xxx.xxx.xxx,xxxxx#
Response	TX	ID [{IP}:{Port}] OK (Try to change)
or	TX	ID ippsetup FAIL

Inquire Battery Voltage

Function	Inquire the battery voltage from the tracker.	
Format	RX	*ID,PPPPPP,batteryinq#
Response	TX	ID battery x.xxx
or	TX	ID battery FAIL

Set Notification Way

Function	Select notification from the HSPA/GPRS or SMS. HSPA/GPRS :ON/OFF or SMS :ON/OFF, 1 - ON, 0 - OFF.	
Format	RX	*ID,PPPPPP,notify,1/0,1/0 #
Response	TX	ID notify ON/OFF ON/OFF
or	TX	ID notify FAIL

Enable and Set up Over Speed Detection

Function	Set up the speed threshold for alarm detection into the tracker, the unit is kilometer.	
Format	RX	*ID,PPPPPP,overspeedon,xxx#
Response	TX	ID overspeed on,xxx
or	TX	ID overspeedon FAIL

Disable Over Speed Detection

Function	Disable the over speed detection function.	
Format	RX	*ID,PPPPPP,overspeedoff#
Response	TX	ID overspeedoff OK
or	TX	ID overspeedoff FAIL

Enable Audio Monitoring

Function	Activate the audio monitoring function.	
Format	RX	*ID,PPPPPP,moniteron#
Response	TX	ID moniteron OK
or	TX	ID moniteron FAIL

Disable Audio Monitoring

Function	Disable the audio monitoring function.	
Format	RX	*ID,PPPPPP,moniteroff#
Response	TX	ID moniteroff OK
or	TX	ID moniteroff FAIL

Get Product ID (Serial Number)

Function	Get product ID (serial number).	
Format	RX	*ID,PPPPPP,getpid#
Response	TX	ID [17 Characters] of PID
or	TX	ID getpid FAIL

Set Time Zone

Function	Set up the time zone for SMS content. Hour: -12:00~13:00 Minute: 0、15、30、45	
Format	RX	*ID,PPPPPP,setttimezone,Hour,Minute#
Response	TX	ID setttimezone OK
or	TX	ID setttimezone FAIL

Set sending SMS POS

Function	Set up sending SMS POS. Switch : 1- Yes, 0 - No. Switch-1:phone-1 SMS POS switch YES or NO.	
Format	RX	*ID,PPPPPP,setsendpos,Switch-1,Switch-2,S witch-3#
Response	TX	ID setsendpos OK
or	TX	ID setsendpos FAIL

Set Power Control

Function	Set up the system power control for the tracker to get into the sleep mode. Type: 0 - NONE, 1 - Time Interval IDLE, 2 - SMS/Phone IDLE, 3 - G-Sensor IDLE Unit: s - second, m - minute, h - hour, d - day.	
Format	RX	*ID,PPPPPP,setupwrctrl,type,xxxxx,Unit#
Response	TX	ID setupwrctrl OK
or	TX	ID setupwrctrl FAIL

FCC Warning statement

a. 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.

b. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

c. 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

FCC RF Radiation Exposure Statement:

1. This Transmitter has been demonstrated co-location compliance requirements as documented in this filing.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment for body-worn configuration in direct contact to the phantom.

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