Personal Tracker (WTGAT) V1.13 Manual

Index

1.Basic first startup and testing

The WTGAT has been designed to make installation, testing and configuration simple. Please note that you can only use the special serial cable supplied for USB communication.

CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS

Important before you start:

**** PLEASE MAKE SURE YOU ALWAYS USE THE SAME CONFIGURATION MENU PROGRAM THAT IS INCLUDED WITH ANY NEW OR UPDATED FIRMWARE. WHEN NEW OPTIONS ARE ADDED YOU MUST USE THE NEW OR UPDATED CONFIGURATION MENU SOFTWARE.**

- The power switch is specifically designed to be difficult to switch on/off. Once the unit is on, please always keep it on. **MAKE SURE THE POWER IS OFF WHEN INSTALLING THE SIM CARD!**
- The SIM card being used in the unit should have the default PIN numbers, “0000”, or have no PIN numbers.
- While connecting a charger cable to the unit, the red charger LED will be on if battery is charging. The charger LED will turn off once the battery is fully charged. **Please use external battery charger (wall charger) for optimal charging time.**
  It is possible to charge using USB port on computer system, but charging time will be a lot longer or battery may not be able to charge to maximum as power output from the USB port is limited.
- When the battery is low the red battery low LED will be on.
- When you start the "GPS tracking configuration WTGAT" program, there is an upload configuration button on the main menu. You need to click on it to upload the original configuration from WTGAT before you start. Then, please simply change the fields that need to be changed.
- Please make sure that all the blanks in the configuration window are filled in, apart from SMSC, base phone no. 2/3, dial- up phone no. and New Password parts.
- The SMSC number in the configuration window is the phone no. of the Short Message Centre (GSM provider). It is usually pre-set in the SIM card. If you are not sure about it, please leave it blank.
- APN (Access Point Name) and GPRS login name & password are case sensitive. Please check with your GSM provider first.
- Port Settings (in Hyper Terminal)

1. Bits per second: 9600
2. Data bits: 8

3. Parity: None
4. Stop bits: 1
5. Flow control: None

- While downloading system firmware to the unit with Hyper Terminal, please set to “Xmodem.”

On a windows based computer you will be able to use ‘Hyperterminal’ (free with Windows). For PDA or Pocket PC you can use several communication programs that can be downloaded from the internet like ‘ZTERM for Pocket PC’ (http://www.coolstf.com/ztermppc).

When you receive the unit, we recommend configuring the unit functions and setup using the Personal setup configuration program. The WTGAT has many functions that will allow the unit to operate for different user applications including security and continues tracking using SMS or GPRS.

VERY IMPORTANT:

Before you can start using the WTGAT the battery will need to be charged. The battery can be charged with the unit powered on or off. The power on switch is located on the side off the unit.
Disconnect external battery charge or communication cable first before powering down the unit.

The build in battery charger automatic charges the battery whenever you connect to the battery charger.

When you power on the unit 3 leds will flash for about 1-2 seconds.
At startup the WTGAT will test memory, GPS module, GSM module and if sim card is installed.
The WTGAT cannot operate without sim card installed.

The 5 leds on the WTGAT have the following functions:

Yellow led
This is the GSM status led.
The LED will be OFF when there is NO GSM signal.
The LED will be ON if the GSM module OK and has GSM signal or is in sleep mode (except deep sleep mode).
If blinking the GSM module is in test mode.
During diagnostic startup the GSM led will flash.

Green led
This is the GPS status led.
If off the GPS module is powered down.

If on then the GPS module has power, but non-valid GPS location.
If blinking the GPS module has power and valid GPS location.

Red led1
This is the Battery status led.
If off and charger is connected then battery is fully charged.
If on then battery is charging.

Blue led
This is the Park, Motion or status LED when Panic input is configured to pickup and hang up Voice call (Park or Motion function can be configured using the configuration menu program).
If off the Park, Motion or 24H no movement detection is off.
If ON then Park, Motion or 24H no movement detection is on.
If flashing then Voice call active or Panic input activated.

Red led2
This is the low Battery status led.
If off then battery power OK.
If on then battery power is low.

Sim card and battery Installation (BACK VIEW)

- **MAKE SURE THE POWER IS OFF WHEN INSTALLING THE SIM CARD!**

Please Note : ONLY USE THE SUPPLIED BATTERY WITH THE UNIT

- For the first time when you install a new sim card the pin number (if configured) must be set to “0000” or disabled. **MAKE SURE THE PIN NUMBER IS CORRECT BEFORE INSTALLING SIM CARD. READ SETUP SIM PIN CODE INSTRUCTIONS FIRST!**

	SIDE VIEW

USB/Serial/Charger Cable connection (ONLY USE THE CABLE SUPPLIED WITH THE UNIT)	

*** It takes about 1 Minute or less for the WTGAT to startup (If battery voltage is very low it may take several minutes).**

2. Getting started, use Hyper Terminal to test WTGAT

Step 1

Connect WTGAT with your PC using the USB port. You may need to install the USB driver that is supplied with the unit. This driver will install a USB serial port on your computer.

Step 2

Using Hyper Terminal

The PC will need to be running **HYPERTERMINAL,** which is a free program that comes with Windows.

If HyperTerminal is not currently installed on the PC you will need to do the following:

1. Go to ***Start/Settings/Control Panel.***
2. Go to ***Add/Remove Programs/Windows Setup Tab.*** This will bring up a list of components that can be installed.
3. Put a tick in the ***Communications Check box*** and double click. This will bring up a list of components that can be installed. Put a tick in the box next to HyperTerminal. You may need to insert your Windows Disk to install the program.
4. You may need to restart your computer after the program has installed.
5. Remember to connect the serial port on the unit to the serial port on the PC.

Once HyperTerminal is installed and running you will need to set the **Baud Rate to 9600 Baud** and set the **Com Port** (usually Com 4 on a laptop) to the USB serial port created.

We strongly recommend that the unit be tested using a computer as this allows all options to be tested quickly and easily. The operating system/or a new or modified operating system can only be uploaded (in x-modem format) if the unit is connected to a serial port on a computer.

Step 3

Power up the unit. The Yellow, Green and Blue led will flash for 1-2 seconds.
Please make sure you have charged the battery and sim card is installed.

Startup Personal Tracker WTGAT
Testing Memory
-PASS
Operating System Checksum
-PASS
Testing Real Time Clock
-PASS

Current Time: 00:00:02
Current Date: 01-01-00

Testing GPS module
Non valid GPS location
Testing GSM module
-PASS
Testing Sim Card present
-PASS
Press M to enter Diagnostic menu
(If M is not pressed within 5 seconds the WTGAT will start normal running mode)

Step 4
Get into Diagnostic Menu
Pressing the **M** key will then take you to the **Diagnostic Main Menu**.

The following are the options in the Diagnostic Main Menu:

DIAGNOSTICS MAIN MENU :
Current Operating System :Personal Tracker WTGAT 18-07-2007
Press 0 to upload operating system (X-MODEM format)
Press 1 to test GSM module and Sim card
Press 2 to read GSM signal strength
Press 3 to test GPS module and GPS location
Press 4 to read Battery voltage level
Press 5 to Read Input Signals
Press 6 to output GPS sentences to serial port
Press 7 to Display/Enter time and date
Press 8 to direct connect to GSM modem
Press 9 to test Vibration sensor and Buzzer
(Press M to Return to MAIN MENU)
Press Q to Quit

Test 1 Test GSM module and SIM card on board
This will test if the tracking unit can communicate with the GSM modem and that a SIM card is installed. The tracking unit will not work if there is no SIM card installed.
After testing you will return to the Diagnostic Main Menu.

Test 2 Test GSM signal strength
The signal strength will be shown in HyperTerminal as:
Low
Medium or
High

Test 3 Test GPS module and GPS location
The following will appear on screen in HyperTerminal:
Testing GPS module
Non-valid GPS location
Press M to Return to MAIN MENU
Non-valid GPS location
Press M to Return to MAIN MENU
Non-valid GPS location
The GPS location will always be either:
Valid or
Non-valid
It may take several minutes for the GPS receiver to find the satellites and return a valid location. Remember the GPS will only find a satellite if the WTGAT is outside and the signal is blocked by metal (unit must face open sky).

Test 4 Read battery voltage level.
Press M to Return to MAIN MENU
Current battery level:80%

Test 5 to Read input signals

Current input signals
Panic button
- NOT Activated

Park Switch
- NOT Activated
AUX1 Digital
- NOT Activated
AUX2 Analog
- NOT Activated
Press M to Return to MAIN MENU

Test 6 Test output GPS sentences to serial port

The GPS sentences are directly sent from the unit to the serial port.
Press M to return to main menu.

$GPGSA,A,3,01,05,14,22,25,11,20,30,,,,,2.1,1.2,1.7*33
$GPGSV,3,1,10,25,60,317,42,01,58,224,41,14,53,136,45,22,40,053,45*70
$GPGSV,3,2,10,30,28,104,44,11,24,251,42,05,16,129,45,20,10,226,38*74
$GPGSV,3,3,10,18,03,050,18,47,46,005,40*7E
$GPRMC,213113.000,A,4100.7769,S,17053.1331,E,0.05,49.11,230206,,*2F
$GPGGA,213114.000,4100.7769,S,17053.1331,E,2,08,1.2,44.6,M,25.8,M,0.8,0000*5D
$GPGSA,A,3,01,05,14,22,25,11,20,30,,,,,2.1,1.2,1.7*33
$GPGSV,3,1,10,25,60,317,42,01,58,224,41,14,53,136,45,22,40,053,45*70
$GPGSV,3,2,10,30,28,104,44,11,24,251,42,05,16,129,45,20,10,226,38*74
$GPGSV,3,3,10,18,03,050,15,47,46,005,40*73
$GPRMC,213114.000,A,4100.7769,S,17053.1331,E,0.06,40.44,230206,,*22
$GPGGA,213115.000,4100.7769,S,17053.1331,E,2,08,1.2,44.6,M,25.8,M,0.8,0000*5C

(If no key is pressed the GPS sentences will stop after 1 minute and return to main menu).

Test 7 to Display/Enter time and date

Current Time: 11:07:55
Current Date: 08-08-07
Press 0 to change Time
Press 1 to change Date
Press M to Return to MAIN MENU

The WTGAT has internal time clock and battery backup. An internal battery backup will keep this time running for up to 5-10 years. Please configure your current time and date for the first time when you receive the WTGAT. The Time and Date will not be lost if power or battery is removed!

Test 8 direct connect to GSM modem

This test will allow you to test communication using AT commands between your computer and the GSM modem.
The AT command ‘AT comstop’ <enter> or if no command has been send to the modem for more then 60 seconds the direct modem connection test will end.

For GPRS we recommend you do manual test first to test if your GPRS setup is correct. (See GPRS section for information about the GPRS Testing).

Press Q to exit!!
By pressing Q you will exit the Diagnostic Main Menu and return the unit to normal operation. If you do not press Q or any other option within 2 minutes the unit will return to normal operation.
The unit will display the GSM Modem information, IMEI number and GPS info directly after you Quit the Diagnostic Main Menu.

To return from normal operation to the Diagnostic Main Menu press X (or x). Keep pressing X until the Diagnostic Main Menu appears. Please note that this make take several seconds or more if the WTGAT is sending or receiving data!

Please always press “Q” after finish tests to exit diagnostic menu.

Modem information:
When you quit the 'DIAGNOSTICS MAIN MENU:' the tracking unit will report information about your GSM modem:

Sample:

Modem Info:
ATI
SIMCOM_Ltd
SIMCOM_SIM300
Revision:1008B09SIM300M32_SPANSION

OK

IMEI:
AT+GSN
351525018440223

OK
GPS Info:
$GPTXT,01,01,02,u-blox ag - www.u-blox.com*50
$GPTXT,01,01,02,ANTARIS ATR062x HW 80040001*26
$GPTXT,01,01,02,ROM CORE 5.00 Jan 09 2006 12:00:00*76
$GPTXT,01,01,02,LIC 1EBF-BD07-E83D-6BE1-0F7A*50
$GPRMC,,V,,,,,,,,,,N*53
$GPVTG,,,,,,,,,N*30

connect

Please Note:
During normal running mode the WTGAT will output GSM modem communication.

When the WTGAT is in normal operating mode the WTGAT requires the four-digit password code (can be configured in the GPS Tracking configuration menu. Default is ‘1234') to return to Diagnostic mode after it receives the **'X'** or **'x'** command from the serial port.
The password must be entered after the tracking unit sends the **'OK0'** or **'OK1'** command. The correct password must be followed by <CR> (ENTER) to confirm password entered. You must enter the correct password within 8 seconds or the tracking unit will return to normal operating mode.

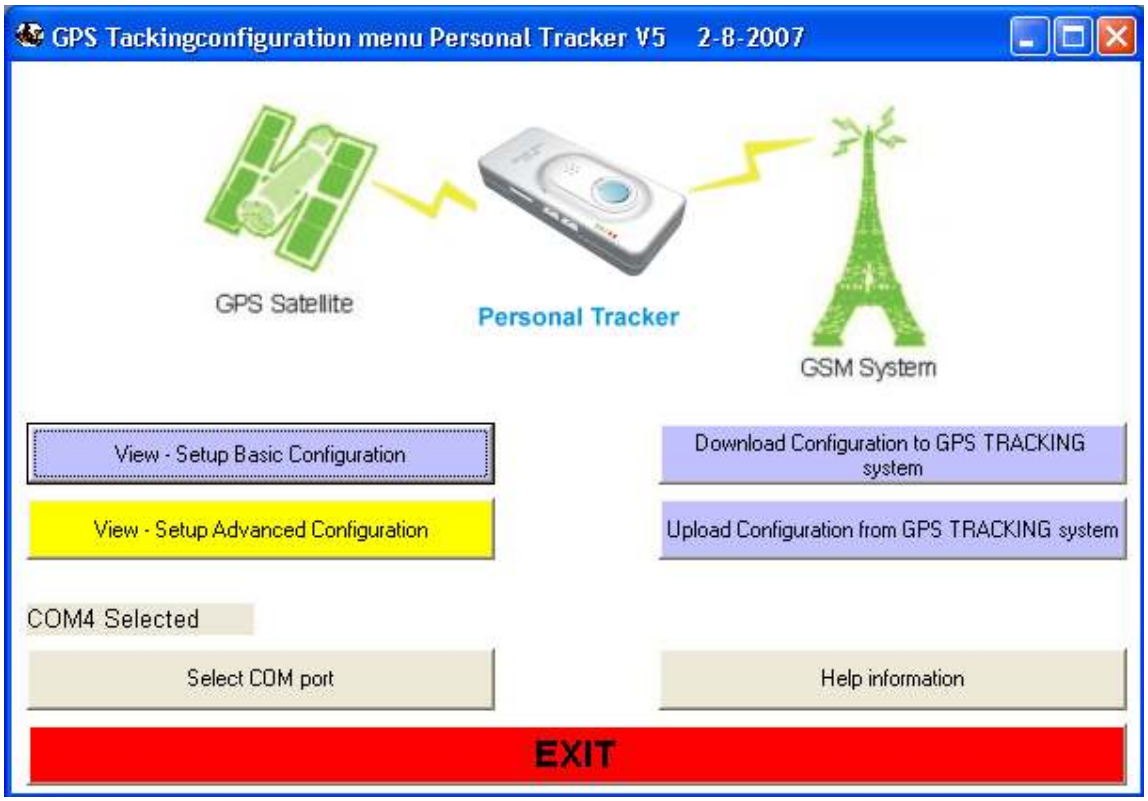
3. Configuration and setup :

When the tracking unit powers up it will enter the 'Diagnostic menu' first. If no key is pressed for 5 seconds the unit will enter normal operating mode.
Only change the settings that you require different, leave all other settings the same.

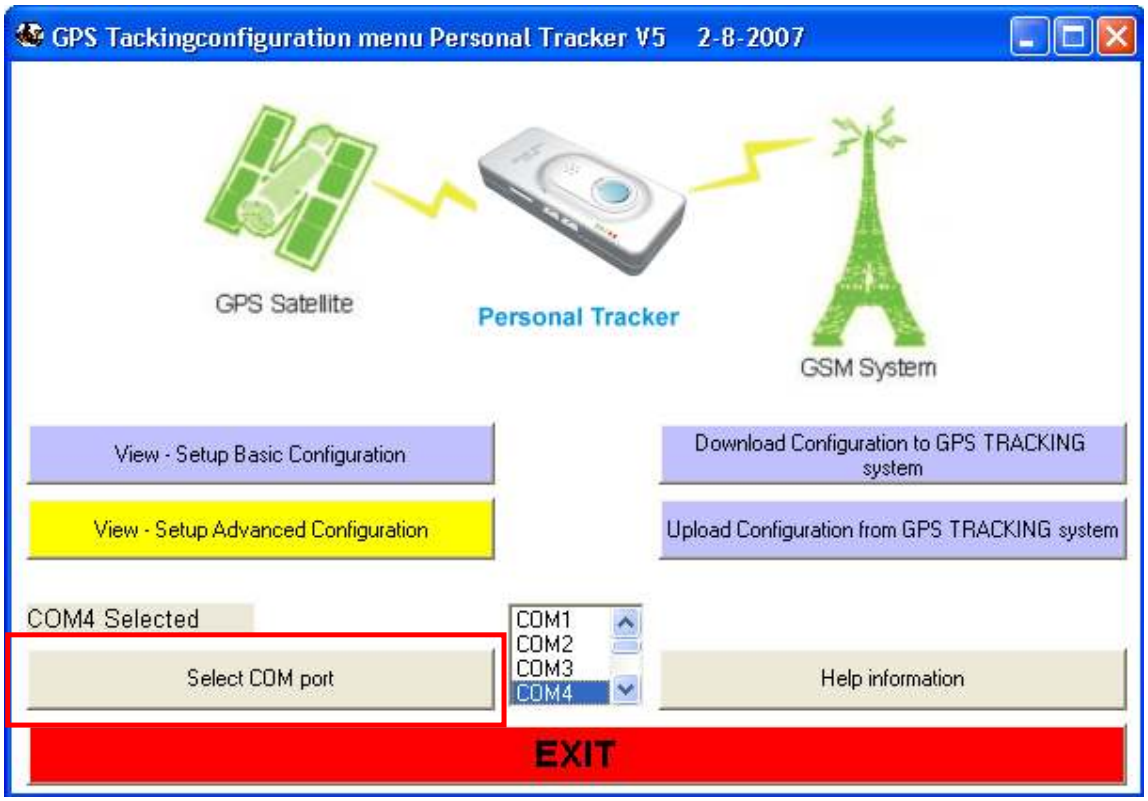
Please note : The 'WTGAT-setup.exe' program can only access the tracking unit if the unit is working in normal operating mode !!!! So after Power ON you must wait +/- 1 minute or wait until the Yellow (GSM status LED) is flashing.

After power up you must wait until the unit passes the Diagnostic test. In Diagnostic test mode you cannot connect to the tracking unit and you must wait at least 1+ Minutes before connecting.
In normal running mode (after diagnostic mode) the tracking unit may also be busy in other processes and the unit will only response to the configuration software after finishing the process.
Therefore, when upload or download configuration, it may need to wait for few minutes especially the unit was setup for real time tracking already.
The best timing to upload the configuration is right after quit from diagnostic menu with hyper terminal."

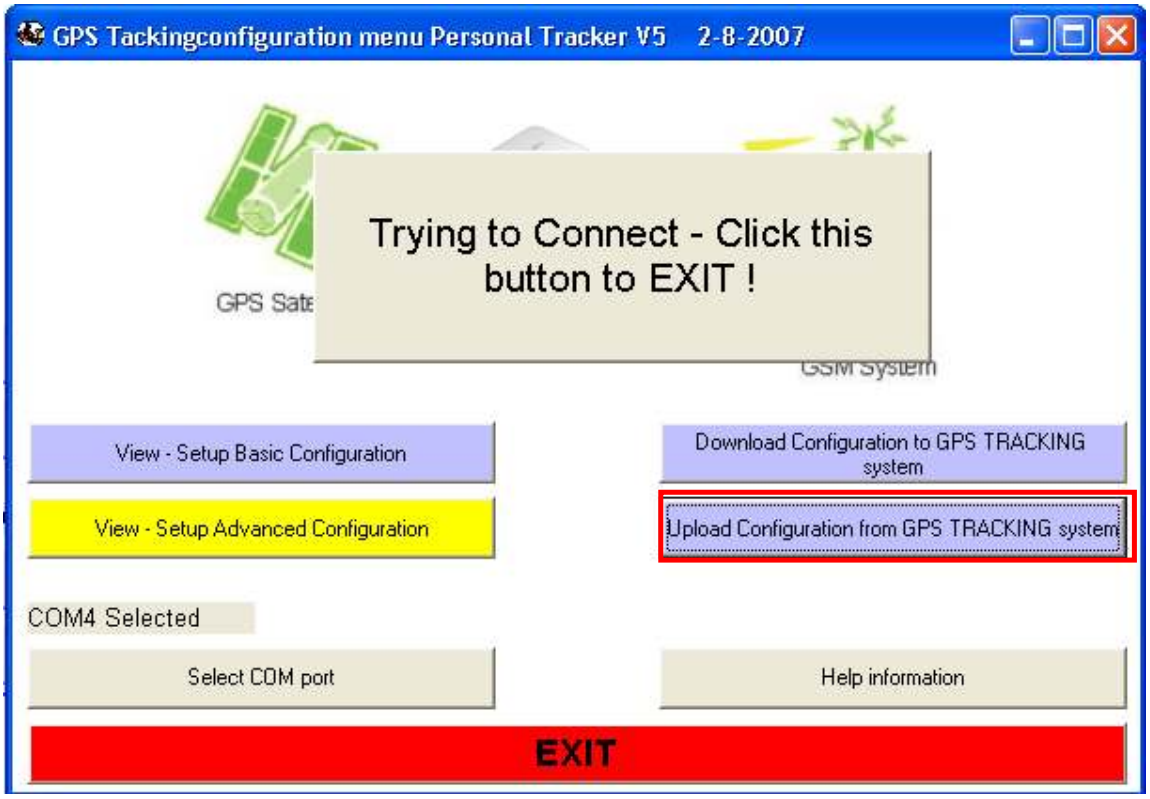
Start up the file WTGAT-setup.exe file



Select Com port

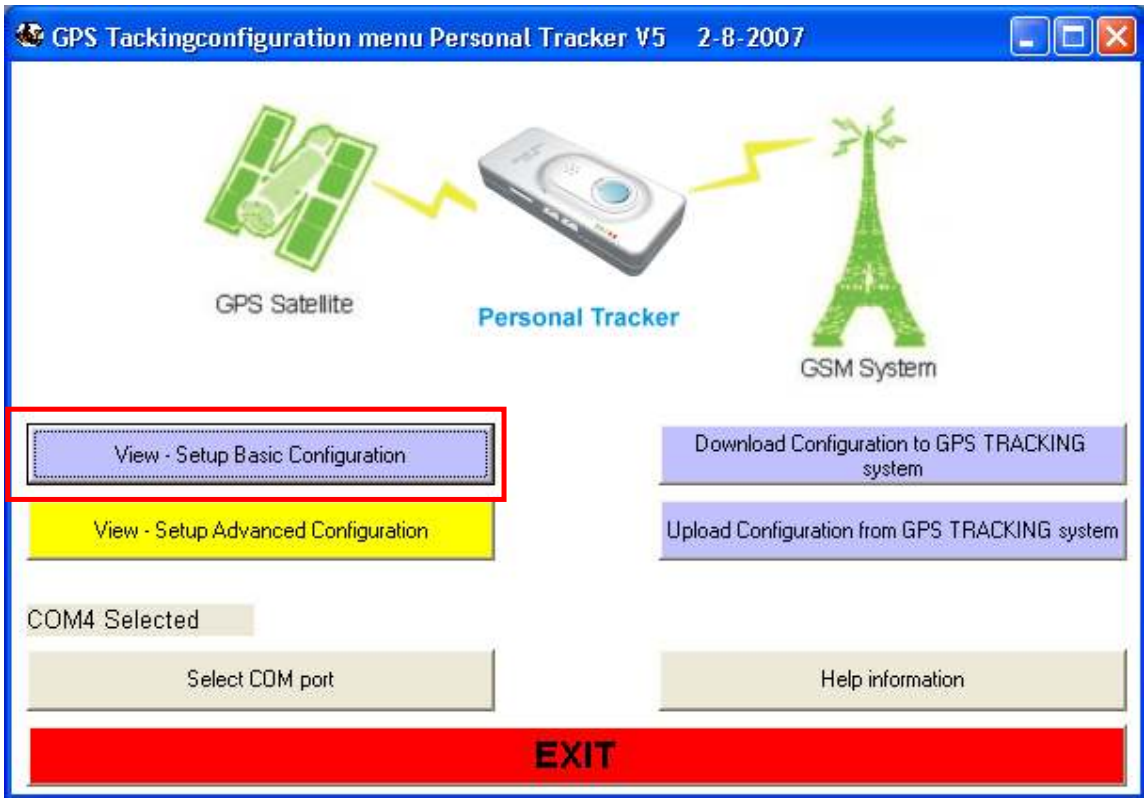

GPS Tackingconfiguration menu Personal Tracker V5 2-8-2007
GPS Satellite
Personal Tracker
GSM System
View - Setup Basic Configuration
View - Setup Advanced Configuration
Download Configuration to GPS TRACKING system
Upload Configuration from GPS TRACKING system
COM4 Selected
Select COM port
COM1
COM2
COM3
COM4
Help information
EXIT

Upload configuration from WTGAT

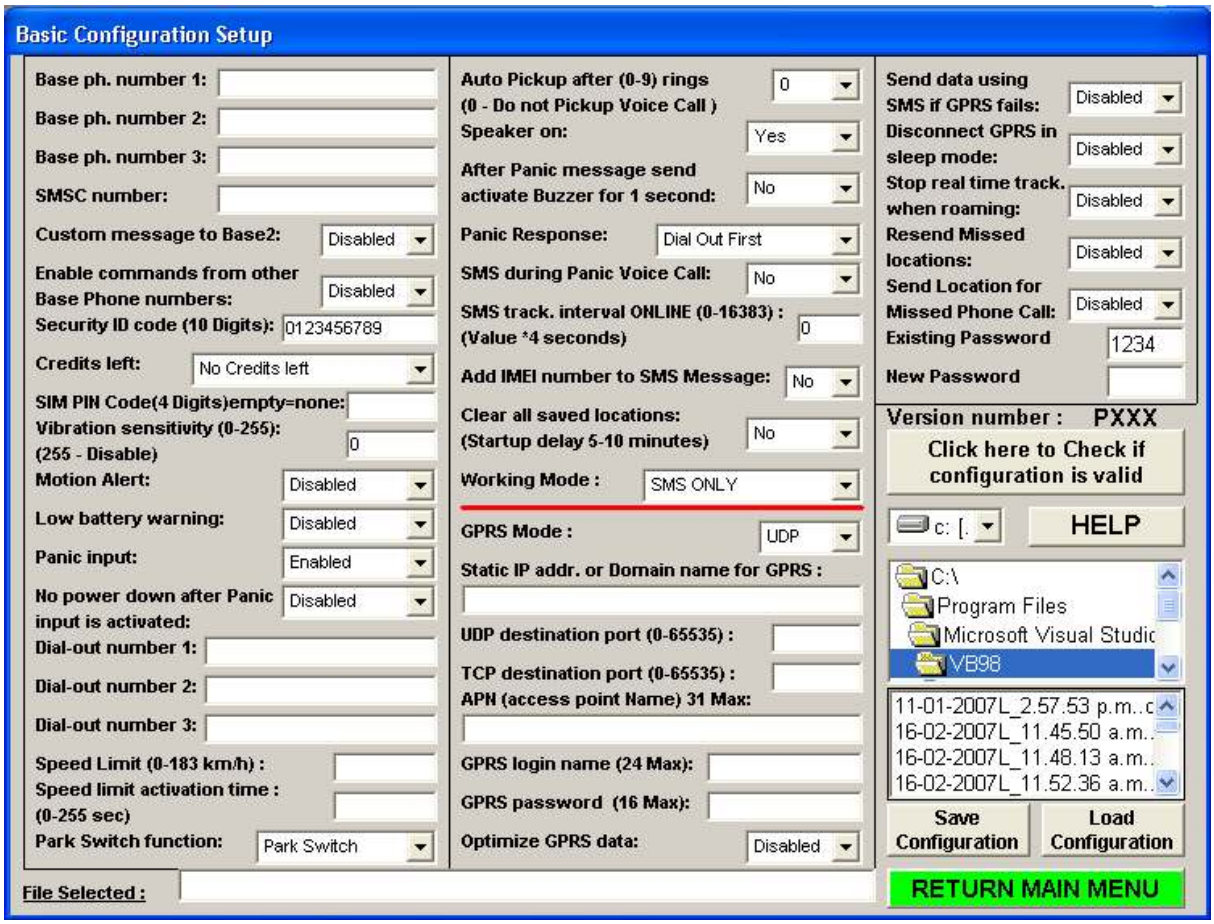


Always upload the current configuration from the WTGAT first. This way it is easy to configure and the setup the unit. You must use the correct WTGAT firmware version. The configuration file cannot be uploaded if the version is incorrect.

After upload select View –Setup Basic Configuration



Basic configuration



Overview (ONLY CHANGE OPTIONS THAT NEED TO BE DIFFERENT)

Settings	Description
Base phone number 1:	Setup the control center base 1 station number (*)
Base phone number 2:	Setup base 2 phone number (*)
Base phone number 3:	Setup base 3 phone number (*)
SMSC number:	Setup SMSC number if required
Custom message to Base Phone number 2:	Option can be enabled or disabled (2)
Enable commands from other Base Phone numbers	Option to receive messages from other base stations (if enabled). By default the option is enabled. (*)
Security ID code	Security ID code to receive messages from other base stations.
Credits left:	Disable or enable all out going messages
SIM PIN Code:	SIM Pin access code. Default is: 0000 (4)
Vibration sensitivity	Adjust the sensitivity of motion sensor (lower value will be more sensitive). Enter zero(0) and the WTGAT will never enter sleep mode. Enter 255 and the WTGAT vibration detection is disabled. The WTGAT will not wake up if vibration is detected.
Motion Alert:	Enable or disable motion alert (6)
Low battery warning:	Enable or disable to receive message when battery power low. Battery power left cannot be checked when the

	WTGAT is in sleep mode.
Panic input:	Disable or enable panic button input **(5)**
Panic Response	Select to dial-out first or send SMS first when Panic Input is activated.
SMS during Panic Voice Call:	Receive SMS location message(s) during Panic Voice call. This will send every 10 seconds 1 SMS message as long as the Voice call is connected. Only 1 SMS is send if GPS location is NON-Valid and up to 3 messages when GPS location is valid. **Please note that not all GSM providers allow sending SMS when connected to Voice call. Please check with your GSM provider first.**
Dial-out number 1:	When entered this number will be dialed automatic when panic button is activated. **(3)**
Dial-out number 2:	When entered this number will be dialed automatic when panic button is activated. **(3)**
Dial-out number 3:	When entered this number will be dialed automatic when panic button is activated. **(3)**
Speed limit:	Over the speed limit will send out message **(1)**
Speed limit activation time:	Time of the speed keep over speed limit **(1)**
Park Switch Function:	Select function for Park switch.
Auto Pickup after (0-9) rings	Setup if the unit will auto pickup incoming voice call '0' zero will not enable any incoming voice calls
Speaker on	Select if build in Speaker will be activated for incoming phone call.
After Panic message send activate Buzzer for 1 second	Select to activate the internal buzzer for 1 second when Panic button is activated and SMS message sending was successful.
Panic Response:	Select 'Dial out' or send SMS/GPRS message first.
SMS tracking interval online	For SMS or GRRS mode and WTGAT is activating.
Add IMEI number to SMS messages	The GSM IMEI number can be added to every SMS message received except multiple location messages. The IMEI number is added at the end off the message.
Clear all saved locations:	This will clear all saved GPS locations from memory
Working mode	Switch between SMS only mode and SMS+GPRS mode
----------	----------
GPRS Mode:	Select between UDP or TCP protocol
Static IP Addr. Or Domain name for GPRS:	Enter static IP address or Domain name to receive GPRS data
UDP destination port	UDP port for GPRS data
TCP destination port	TCP port for GPRS data
APN name	Access point name for GPRS data) **(case sensitive)**
GPRS login name	For setup GPRS connection
GPRS password	For setup GPRS connection
Optimize GPRS data	The 'location message' when using GPRS will be reduced by about 25% to save data communication costs. Remove comma, points and other exclamation from GPRS data.
Send data using SMS if GPRS fails	This will send the data as SMS message if the GPRS connection fails or is not available. As soon as GPRS is available again the tracking unit will continue sending data using GPRS (for real time tracking only).
Disconnect GPRS when in sleep	When the unit enters sleep mode it will disconnect from

mode	GPRS
Stop real time tracking when roaming	When the unit enters a roaming area it stop sending Real time tracking locations (they are saved to memory – 'Resend Missed locations is enabled'). When the unit returns to non- roaming area the real time tracking will restart (missed messages will be send back).
Resend Missed locations	When enabled any activation or 'Real time tracking' messages will be automatic resend.
Send Location for Missed Phone Call	The current or last know location can also be requested from the WTGAT after missed Phone call (the call is not picked up by the WTGAT). If the WTGAT picks up the call no location message is returned. Only for missed calls **(#)**
Existing password	To connect to unit via com port
New password	To change the password
Check configuration is valid	Check if the setting is valid (This check can only check basic setup errors)
Select directory	Select the directory of setting saved file
Select file	Select the setting saved file to load
Load configuration	Load the setting from computer file
Save configuration	Save the settings into computer file
File selected	The selected file will show in this window
Return to main menu	Return to main menu

(1) If activated the unit will try to send SMS or GPRS message (depending on settings) back to base with the current speed and location. The speed displayed in the message may not be the activation speed, but whenever the option is activated the speed was more then the speed limit configured for the set time.

(2) Base Phone number 2 must be configured.

(3) There are 3 dial-out numbers that can be configured when the Panic button is activated. The WTGAT will start dialing from the first number. If no connection can be made within 30 second the next number will be dialed. The WTGAT will continue to try all three numbers (if configured) for up to 3 times. If any number connects then no more other numbers will be dialed.

(4) Make sure that the pin code is correct configured for your sim card. If the pin code is incorrect the sim card may get 'blocked'.

(5) The Panic status LED (BLUE LED) will be ON once the WTGAT detects that you have pressed the Panic input button. To activate the Panic input the user must press the panic input until the Blue LED is ON.

(6) If MOTION alert is enabled you must move (vibration) the WTGAT at least one time every 1 minute. If no movement or vibration is detected the internal buzzer will beep for 30 seconds. You must then move the WTGAT within the 30 seconds.

If not the WTGAT will send 'Motion alert activated' and or location message. Once Motion alert has been activated it will automatically deactivate.

(#) You must configure the 'Auto Pickup after (0-9) rings' for a value 3 or more. As soon as you hear the first ring tone you must hang up. If not no message will be returned. (May not work with all GSM providers or SIM cards)

Important (*):

Base Phone number 1 must be different then Base Phone number 2 and Base Phone number 3. So all Base phone numbers must be different from each other.

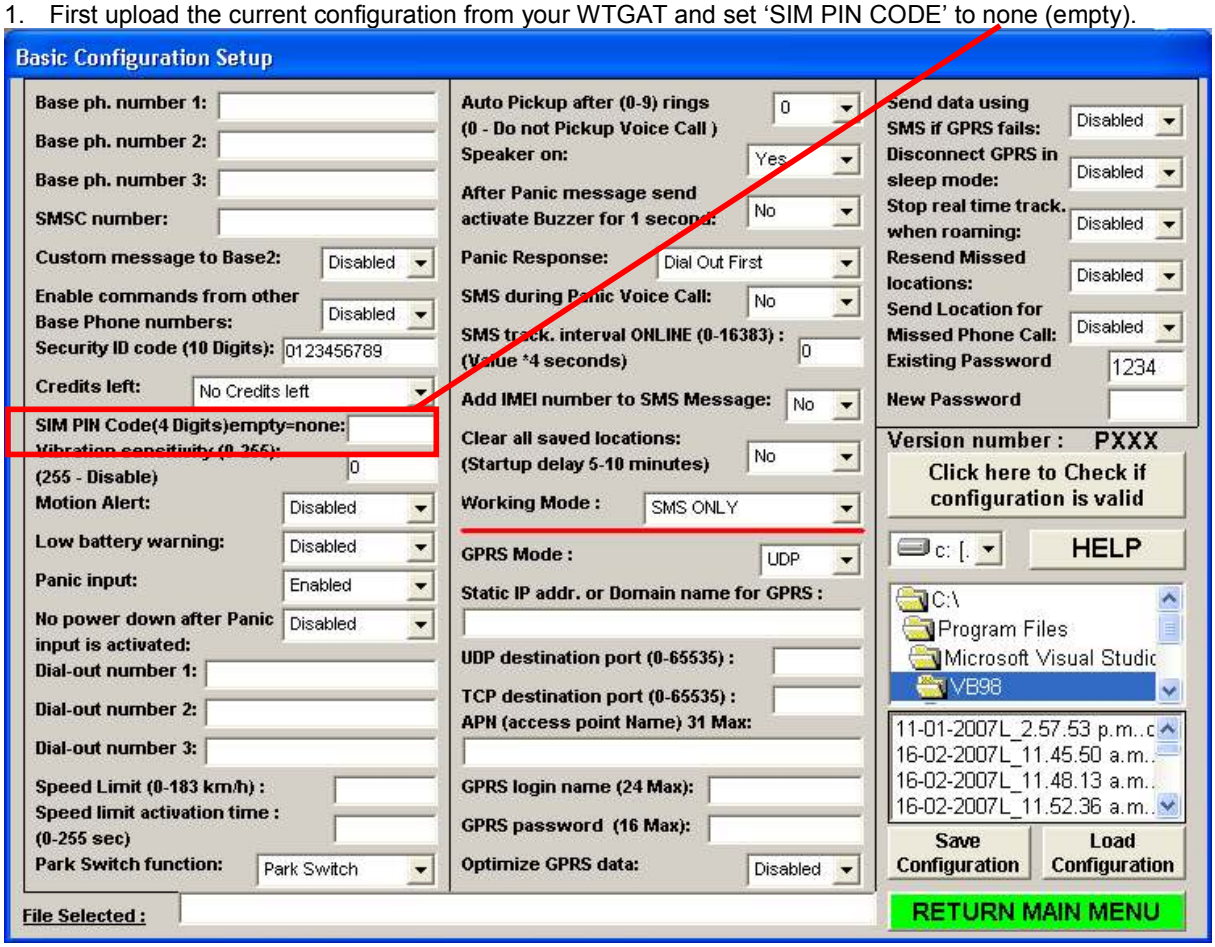
Installing SIM card with different PIN NUMBER then 0000 or None:

The default configuration after operating system upload or when you receive the WTGAT for the first time is NO SIM PIN number or SIM PIN number is 0000 (4 * zero). If you cannot remove SIM PIN number make sure that your SIM PIN is configured for 0000.

The WTGAT will first test if SIM PIN number is required. If the SIM card requires PIN number then the WTGAT will try to access the SIM card using the default pin number 0000 (4* zero).

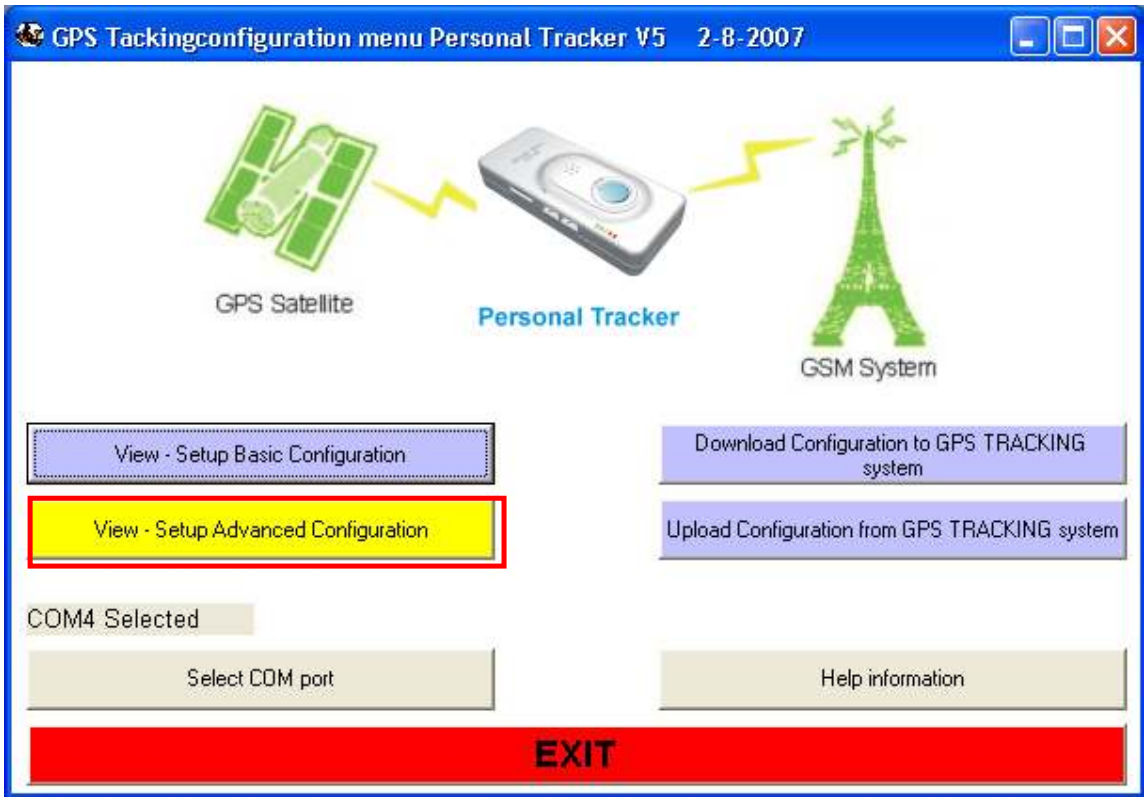
To change the SIM PIN number you must follow the following instructions.

1. First upload the current configuration from your WTGAT and set 'SIM PIN CODE' to none (empty).

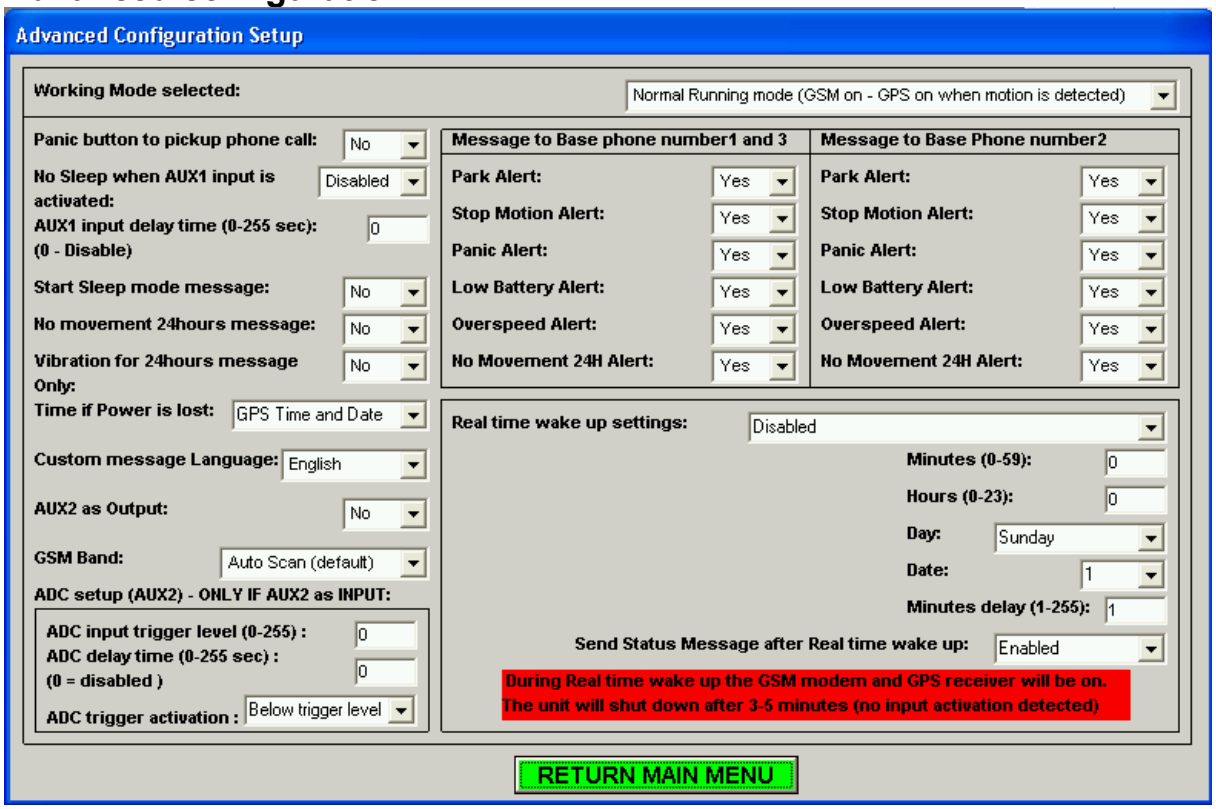


2. Then download the settings to your WTGAT.
3. Switch off the WTGAT and remove SIM card.
4. Use your normal mobile phone to change the SIM pin number.
5. Insert the SIM card back into the WTGAT and switch on the WTGAT.
6. Wait for about 1 minute before using the configuration menu program.
7. Upload the configuration from the WTGAT.
8. Set the PIN CODE to the new PIN code you have configured (using your mobile phone).
9. Download the configuration to the WTGAT
10. DONE.

View - Setup Advanced Configuration



Advanced configuration



Overview (ONLY CHANGE OPTIONS THAT NEED TO BE DIFFERENT)

Settings	Description
Working Mode selected:	Three different working modes can be selected. Depending on your applications the working mode selected can save power consumption. **See (1) for more details.**
Panic button to pickup phone call	Use the Panic input button to pickup incoming voice call. **See (4) for more details.**
No Sleep when AUX1 input is activated	If enabled the WTGAT will NOT enter sleep mode when AUX1 is low (activated). The AUX1 input delay function is automatic disabled when this function is enabled.
AUX1 input delay time:	Configure delay time before AUX1 is activated
Start Sleep mode message:	Send location message when entering sleep mode.
No movement 24hours message:	Send location message when no movement is detected for 24 hours. **See (3) for more details.**
Vibration for 24hours message Only:	When enabled the Vibration sensor is disabled for WTGAT wake up. It only detects vibration for the 24h message alert.
Time is Power is lost:	Select to use GPS time and date if real time clock is not configured or time and date is lost
Custom message Language:	Select different Language for custom message send to Base phone number2.
AUX2 as Output :	AUX2 can be used as digital output (0 –3.3Volt) or analog input. If selected as output the ADC settings are automatic disabled. (See ’38’ command code when using AUX2 as output).

GSM Band	Select manual GSM Band. This will force the GSM modem to only scan and use the selected GSM band. **Normally no need to select manual mode as the GSM modem will auto scan all GSM bands.**
ADC setup (AUX2):	Configure ADC input trigger level, delay time and trigger activation.
Message to Base phone number 1 and 3	Select if message need to be send to Base phone number 1 and 3 when selected input is activated.
Message to Base pone number2	Select if message need to be send to Base phone number 2 when selected input is activated.
Real time wake up settings:	Select time for WTGAT to wake up after the WTGAT enters sleep mode.
Minutes (0-59):	Select minute to wake up the WTGAT. If selected the WTGAT will wake up when minutes match. **See (2) for more information.**
Hours (0-23):	Select hour to wake up the WTGAT. If selected the WTGAT will wake up when hours match. **See (2) for more information.**
Day:	Select day to wake up the WTGAT. If selected the WTGAT will wake up when day match. **See (2) for more information.**
Date:	Select date to wake up the WTGAT. If selected the WTGAT will wake up when date match. **See (2) for more information.**
Send Status Message after Real time wake up:	When the WTGAT wakes up during 'Real time wake up' it will try to get valid GPS location (if enabled). Once valid GPS location is found a status message will be send. If no valid GPS location is found after 5 minutes then status message with the last valid GPS location message will be send. After message is send the WTGAT will wait 3 minutes for any messages received by SMS or GPRS.

(1) The WTGAT has 3 different working modes. What mode selected depends on your application. To explain how the WTGAT works we use 'Normal working mode' and 'Sleep mode'. In normal running mode the WTGAT can be activated by any inputs and will process any SMS messages or incoming phone calls.

-Normal Running mode (GSM on - GPS on when motion is detected)
This mode will use most power when selected. The WTGAT will enter normal running mode when movement or motion is detected and automatic enter sleep mode after no movement or motion detected for more then 5 minutes. SMS messages and incoming phone calls will automatic wake up the WTGAT to enter normal running mode. When the WTGAT enters sleep mode only ADC input activation cannot be detected. In sleep mode the GSM led will be on. All other leds will be off unless battery is charging or battery is low.
-Basic Sleep mode (GSM off - GPS off - Motion/Timer/AUX1/ Panic)
In this mode the WTGAT will not receive any SMS messages, incoming phone calls or check ADC input for activation.
The WTGAT will wake up to enter normal running mode when motion, Real time timer time is expired, AUX1 input is activated or Panic input is activated.
The WTGAT will enter sleep mode after 5 minutes if no inputs are activated.
In 'Basic sleep mode' all leds will be off unless battery is charging or battery is low.
-Deep Sleep mode (GSM off - GSM off - Timer/ Panic input)

In this mode the WTGAT main power is switched off. The WTGAT will not use any power from the main battery. The build in backup battery will supply power to the low power timer chip. Maximum power savings can be archived to allow the WTGAT to work for several years(*) without battery charge or battery change.
The WTGAT will enter sleep mode after 5 minutes if no inputs are activated.
Park or motion switch will not work when the WTGAT enters 'Deep Sleep mode'.
In 'Deep sleep mode' all leds will be off unless battery is charging or battery is low.

In 'Deep Sleep mode' there are only three ways that the WTGAT will wake up.
- **The Panic input is activated for more then 4 seconds.**
- **The low power timer time is expired.**
- **Wire loop connected to the Panic input is broken (cut) if connected for more then 4 seconds.**

(*) This assumes that the battery has negligible self-discharge

(2) In Sleep mode the WTGAT can wake up when minutes, hours, day or date matches the internal time or date depending on the 'Real time wake up settings' selected.

The following 'Real time wake up settings' can be selected from the menu:

- **Disabled**
- **When minutes match**
- **When hours and minutes match**
- **When day, hours and minutes match**
- **When date, hours and minutes match**
- **After configured minutes delay**

Disabled
When selected the WTGAT will not wake up by low power timer.

When minutes match
When selected the WTGAT will wake up when minutes selected match the low power minutes.
Example:
Minutes configured in the configuration menu is 22.
When the low power timer minutes is also 22 then the low power time will wake up the WTGAT to resume operation in normal running mode.

When hours and minutes match
When selected the WTGAT will wake up when hours and minutes selected match the low power hours and minutes.
Example:
Hours configured in the configuration menu is 8.
Minutes configured in the configuration menu is 22
When the low power timer hour is 8 and minutes is 22 then the low power time will wake up the WTGAT to resume operation in normal running mode.

When day, hours and minutes match
When selected the WTGAT will wake up when Day, hours and minutes selected match the low power Day, hours and minutes.

Example:
Day configured is Monday.
Hours configured in the configuration menu is 8.
Minutes configured in the configuration menu is 22
When the low power timer Day is Monday and hour is 8 and minutes is 22 then the low power time will wake up the WTGAT to resume operation in normal running mode.

When date, hours and minutes match
When selected the WTGAT will wake up when Date, hours and minutes selected match the low power Date, hours and minutes.
Example:
Date configured is 19.
Hours configured in the configuration menu is 8.
Minutes configured in the configuration menu is 22
When the low power timer Date is 19 and hour is 8 and minutes is 22 then the low power time will wake up the WTGAT to resume operation in normal running mode.

After configured minutes delay
When selected the WTGAT will wake up after the configured delay in minutes expires.
Example:
Minutes delay configured is 20.
Just before the WTGAT enters sleep mode the minutes delay time configured is added to the current time for the next wake up. If the current time is say 12:35:19 then 20 minutes will be added to give next wake up at 12:55:00 (seconds are NOT added!).
The WTGAT will then resume normal running mode.

Please note that when the WTGAT is in basic sleep mode the 'Send Location for missed phone call' may not respond on the first phone call (GSM modem is on). We suggest making another phone call about 1 minute after the first call if no message is received.

(3)
If the WTGAT is configured for 'Deep sleep mode' then movement will only be detected if the WTGAT wakes up if wake up interval is configured for 'Real time wake up settings' or if Panic input is activated. During 'Deep sleep mode' no movement can be detected.

(4)
This options works as follows:
Once incoming call is received you can use the Panic input to pickup the voice call. The Panic status (Blue LED) will be ON once the WTGAT has detected that you have pressed the Panic input button.
Once the call is connected you can use the Panic button again to disconnect the phone call. The Blue LED will go OFF once the WTGAT has disconnected the call.
The user has to release the Panic button after the call has been disconnected to prevent that Panic activation is detected.

4. SMS commands accepted by the tracking unit:

The unit will only process SMS commands sent to the unit. If the unit is configured in SMS and GPRS mode then any confirm, update or location message is sent back using GPRS.
The unit can read and sent any SMS messages without disconnection from the GPRS connection.

When sending SMS commands please make sure that the message has the correct data format. Some commands may require a fixed length. Command message must NOT contain any extra spaces, commas or any other characters. This is very important to make sure the Rover processes the correct command messages.

11, (Request Current Status, Version , GPS location)
Example: 05*827,11,0

12, -> SMS only mode (default)
Example: 05*827,12,0

13, -> SMS and GPRS mode
Example: 05*827,13,0

14,xxxxxx, -> Update Dail-out number 1 (Max 16 Char)
Example: 05*827,14,+3124435355,0

15,xxxxxx, -> Update Dail-out number 2 (Max 16 Char)
Example: 05*827,15,+3125111221,0

16,xxxxxx, -> Update Dail-out number 3 (Max 16 Char)
Example: 05*827,16,+310093325,0

17,xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx, -> APN for GPRS (31 locations max)
(Default 'internet')
Example: 05*827,17,vodafone,0

18,x, (x = 0 to 9) -> Pickup phone call after x rings.
0 = disable (do not pickup phone call)
Example: 05*827,18,3,0 (Pickup after 3 rings)

19,x, (x = 0 UDP mode)
(x = 1 TCP mode)
Example: 05*827,19,1,0 (switch to TCP mode)

20, -> Disable Park function
Example: 05*827,20,0

21, -> Enable Park function.
Will activate if more then 3 vibrations are detected within 30 seconds or speed is more then 5 km/h.
Example: 05*827,21,0

22, -> Disable Motion alert!
Example: 05*827,22,0

23, -> Enable Motion alert!
Example: 05*827,23,0

24,xxxxx, -> TCP Destination Port (6082 decimal – Default – from 0 to 65535)
Example: 05*827,24,6082,0 - TCP Destination Port !

25,xxxxx, - > UDP destination Port (6080 decimal – Default- from 0 to 65535)
Example: 05*827,25,6080,0 - UDP Destination Port !

26,xxxxxxxxxxxxxxx, -> ISP login name (24 locations max)
Example: 05*827,26,guest,0
27,xxxxxxxxxxxxxxx, -> ISP password name (16 locations max)
Example: 05*827,27,guest,0

28,x -> (x= 0 No location message for missed phone call)
(x= 1 Request location message for missed phone call)

Example: 05*827,28,1,0 (Request current or last known location message for missed phone call)
(May not work with all GSM providers or SIM cards)

29,xxxxxxxx, -> IP Destination Address or domain name in ASCII code MAX 32 Char
Example: 05*827,29,www.newtrack.com.tw,0

30,x, (x = 0 Power down after Panic input activated (default))
(x = 1 Do NOT power down after Panic input activated)
Example: 05*827,30,0,0 (Messages to Base 1)

31, (Erase all GPS locations saved in Memory)
Example: 05*827,31,0 (Clear all GPS locations)
THIS COMMAND MUST NOT BE USED IN COMBINATION WITH OTHER COMMANDS!
NO CONFIRM MESSAGE WILL BE RETURNED!
This command will reset your WTGAT and startup will be delayed between 30 to 60 seconds.

32,x, (x = 0 No battery low warning message)
(x = 1 Battery low warning message when battery <20%)
Example: 05*827,32,0,0 (disable low battery warning message)

33,x, (x = 0 No resend for messages that cannot be sent)
(x = 1 Resend messages that cannot be sent)
Example: 05*827,33,1,0 (Resend messages that cannot be sent)

34,x, (x = 0 Do NOT add IMEI number to SMS messages)
(x = 1 Add IMEI number to SMS messages)
Example: 05*827,34,1,0 (Add IMEI number to SMS message)

35,x, (x = 0 Use GPS Time and Date if low power timer time and date is lost)
(x = 1 Do not update Time and Date using GPS Time and Date if lost)
Example: 05*827,35,0,0 (Use GPS Time and Date if low power timer time and date is lost)
*** Time and date can only be updated to GPS time and date after Valid GPS location and WTGAT running in 'Normal' running mode.**

36, (Request 'Real time clock' time and date)
THIS COMMAND MUST NOT BE USED IN COMBINATION WITH OTHER COMMANDS!
Example: 05*827,36,0
Will return:
05*827,CONFIRM,36,<time>,<date>,0 <,IMEI optional if enabled>
(05*827,CONFIRM,36,12:23:01,12-08-07,0)

37, (Request location sequence)
Will return 4 locations messages (if valid locations) or 1 single location if invalid or last known.
Example: 05*827,37,0

38,x, (Activate or deactivate the AUX2 output)
(x = 0 Deactivate the AUX2 output (low))
(x = 1 Activate the AUX2 output (high))

Example: 05*827,38,1,0 - Activate the AUX2 output (high)

*** PLEASE NOTE THAT THE AUX2 OUTPUT MUST BE CONFIGURED AS OUTPUT OTHERWISE THE FUNCTION WILL NOT WORK**

If power is lost or the WTGAT enters deep sleep mode the output will deactivate (no power on output).
At power startup the output will be low (0). The AUX2 output will return to activate high or low depending on the status before power down. You can test the AUX2 as output in normal running mode by pressing the 'B' or 'b' key. The following messages will be displayed.
'AUX2 as output active HIGH' (AUX2 will be active high for 5 seconds)
'AUX2 as output active LOW' (AUX2 will be active low for 5 seconds)

After 10 seconds the WTGAT will return to normal running mode.

40,x, - > **Real time wake up settings:**
(x=0 -> Disabled)
(x=1 -> When minutes match)
(x=2 -> When hours and minutes match)
(x=3 -> When day, hours and minutes match)
(x=4 -> When date, hours and minutes match minutes match)
(x=5 -> When added minutes delay match)

Example: 05*827,40,1,0 - Wake up when minutes match

41,xx, Configure minutes for 'Real time wake up' – MUST be 2 DIGITS!
Where 'xx' must be between 00 and 59.
Example: 05*827,41,15,0 - Select 15 minutes as minute wake up time.

42,xx, Configure hours for 'Real time wake up' – MUST be 2 DIGITS!
Where 'xx' must be between 00 and 23.
Example: 05*827,42,03,0 - Select 3 AM as hour wake up time.

43,x, Configure Day for 'Real time wake up'
Where 'x' must be between 1 and 7.

Where:

1	Sunday
2	Monday
3	Tuesday
4	Wednesday
5	Thursday
6	Friday
7	Saturday

Example: 05*827,43,3,0 - Select Tuesday as wake up time.

44,xx, Configure Date for 'Real time wake up' up' – MUST be 2 DIGITS!
Where 'xx' must be between 01 and 31.
Example: 05*827,44,23,0 - Select 23 as Date wake up time.

45,x, - > (x=0 -> Send status message after Real time wake up (default)*
(x=1 -> Do NOT send status message after 'Real time wake up')
Example: 05*827,45,0,0 - Send status message after 'Real time wake up'
*** Status message is send when valid GPS location is found. If no valid GPS location is found during 'Real time wake up' then status message will be send after 5 minutes. After message is send the WTGAT will wait another 3 minutes for any SMS messages returned before returning to sleep mode.**

46,xx, - > Configure wake up delay time in minutes when entering sleep mode.
Must be in Hex format (01 to $FF) – MUST be 2 DIGITS!
When configured the WTGAT will wake up when the configured delay time expires.

Example: 05*827,46,2A,0 - Wake up after 42 (Hex 2A) minutes.

Just before the WTGAT enters sleep mode the wake up delay time will be added to the current time from the real time clock. As example the current time is 12:05:20 (before entering sleep mode) and the wake up delay time in minutes is 46 (as example above) then the WTGAT will wake up at 12:47:00. Every time the WTGAT enters sleep mode the wake up delay time is added to the current time.

5,xxxxxx..x, (xxxxx.x New Base1 Phone number for Tracking unit) -16 Digits max.
Example: 05*827,5,+6790887676,0 - new Base1 Phone number is +6790887676.

51,x, - > (x=0 -> Normal running mode – GSM on when in sleep mode)
(x=1 -> Basic sleep mode – GSM and GPS off)
(x=2 -> Deep sleep mode – GSM and GPS off)
Example: 05*827,51,1,0 - Enable Basic sleep mode

52,aa,bb,c,
aa = Delay time ADC input (in Hex from 00 to FF) - 00 = disabled - MUST BE 2 DIGITS!
bb = ADC input trigger level (in Hex from 00 to FF) - MUST BE 2 DIGITS!
c = 0 - Below trigger level
1 - Above trigger level
Example: 05*827,52,2F,5B,1,0 - Delay time is 47 seconds, Trigger level is 91 and trigger above value.

53,xxxxxx..x, (xxxxx.x New Base2 Phone number for Tracking unit) -16 Digits max.
Example: 05*827,53,+8932324,0 - new Base2 Phone number is +8932324.
To configure empty (none) phone number use the '05*827,53,,0' command

55,x, (Custom message to Base2)
x=0 -> Disabled
x=1 -> Enabled
Example: 05*827,55,1,0 - Custom message enabled to Base2.

56,xxxxxx..x, (xxxxx.x New SMSC number) - (16 Digits max).
Example: 05*827,56,+12232443,0 - new SMSC number is +12232443
To configure empty (none) phone number use the '05*827,56,,0' command

57,xxxxxx..x, (xxxxx.x New Phone number for Third Tracking base Phone)- (16 Digits max).
Example: 05*827,57,+12232443,0 - new Base3 Phone number is +12232443
To configure empty (none) phone number use the '05*827,57,,0' command

58,x, - > (x=0 -> Speaker on (default)
(x=1 -> Internal and external (if connected) Speaker off)
Example: 05*827,58,1,0 - Internal and external (if connected) Speaker off

59,x, (x=0 -> Do not activate buzzer for 1 second after Panic message send successful)
(x=1 -> Activate buzzer for 1 second after Panic message send successful)
Example: 05*827,59,1,0 - Activate buzzer for 1 second after Panic message send successful

60,x, (x=0 -> Dial out first if Panic input is activated (if Dial out numbers are configured)
(x=1 -> SMS/GPRS message(s) first)
Example: 05*827,60,1,0 - Send any SMS/GPRS messages first before dialling out.

63,xx, AUX1 input delay time in HEX from 00 to FF (xx=00 AUX1 input disabled) – MUST be 2 DIGITS!
Example: 05*827,63,1B,0 - Send message when activated for more then 27 seconds.

64,xx,yy,
(xx= speed limit from 00 to FF (255 hex) max – MUST be 2 DIGITS! – VALUE in Knots !!!!)
(yy=00 Speed check disabled)
(yy=01 to FF (255 hex) seconds above speed limit before activation– MUST be 2 DIGITS!)
Example: 05*827,64,35,05,0 - Send message when speed more than 100 km/h for 5 seconds
(1 knot is 1.852 km/h)

67,x, -> Panic input enabled / disabled
(x=0 Disabled)
(x=1 Enabled - Default)
Example: 05*827,67,1,0 - Panic input Enabled!

68,xx, -> Vibration Sensitivity - Enter value in Hex – MUST BE 2 DIGITS!
(x=64 (hex)-> Default)
(x=FF (hex)-> MAX)

* Less will make the vibration switch more sensitive. Zero (0) will disable vibration detection and the WTGAT will not enter sleep mode! Max value (FF (hex) – 255 Decimal) will disable vibration detection. The WTGAT will not detect any vibration and will not wake up from vibration.

Example: 05*827,68,64,0

79,xxxx, -> Real time tracking interval – SMS or GPRS -> configured in Hex! for ONLINE mode
MUST BE 4 DIGITS!
-> Real time tracking interval -> configured in Hex!
(xxxx = 0000 -> NO Real time tracking! - Default after operating system update or Reset)
(xxxx = 0001 -> Send 1 message every 4 seconds)
(xxxx = 0002 -> Send 1 message every 8 seconds)
(xxxx= 0003 -> Send 1 message every 12 seconds)
(xxxx = 0004 -> Send 1 message every 16 seconds)
etc. Max xxxx = 3FFF (hex)
(xxxx = 3FFF (hex) -> Send 1 message every 65532 seconds max)
Example: 05*827,79,0005,0 - Send 1 message every 20 seconds

9x, Enable or disable communication from tracking unit.
The unit will still accept update messages, but no locations messages or input activations messages are send.
(x=0 Disable Tracking unit ; x=1 Enable Tracking unit)
Example: 05*827,91,0 - Enable tracking unit.

A0,x -> Enable commands from other Base phone numbers
x=0 -> Disable
x=1 -> Enable

Example: 05*827,A0,1,0 (Enable commands from other Base phone numbers)

A1,xxxxxxxxxx -> Security ID code (Must be 10 Digits)
xxxxxxxxxx -> 10 Digit security code (can be any numbers or letters)

Example: 05*827,A1,Ab1245678a,0 (Change ID code to 'Ab1245678a')

A2,x -> (x=0 Stay connected to GPRS in sleep mode)
(x=1 Disconnect from GPRS in sleep mode)

Example: 05*827,A2,1,0 (Disconnect from GPRS in sleep mode)

A confirm message will be returned.

A3,x -> (x=0 Do not stop real time tracking when roaming)
(x=1 Stop real time tracking when roaming)

Example: 05*827,A3,1,0 (Stop real time tracking when roaming)
When enabled will stop sending real time data when SIM card is roaming. All other messages are still sent.

A confirm message will be returned.

All return messages are send-using Base1, 2 or 3 depending on the command received and your configuration settings.
The message received does not have to start with '05*827'.

Example:

Message sent: justtesting@rovertest.com 05*827,0123456789,11,0
Will be accepted and processed.

WARNING:

Default security code is '0123456789' and the option is automatic disabled after operating system upload. We strongly recommend for your network to keep secure to change the 'Security ID code' first and do not leave it set to '0123456789'.
Base phone number 2 can receive the following End user text messages:

- Park Alert Activated
- Stop MOTION Alert Activated
- PANIC Button Activated
- Low Battery Voltage
- OVERSPEED Alert No Movement 24 Hours Alert

The configuration menu allows to choose different language for custom message to Base phone number 2. Default language is English.

Unit activation and sleep Mode:
The tracking unit has a build in 'motion' sensor that detects any movement and g-force change.
The WTGAT will enter 'sleep' mode after 5 minutes if no 'motion' is detected. In sleep mode the GPS module is powered down, but the unit will still process any incoming and outgoing SMS messages if 'Normal' running mode is selected.
When the unit is in 'Normal' and 'Basic sleep mode' it will take several seconds to 'wake up' to normal running mode after motion is detected. Motion is normally detected when you move the unit.
A valid GPS location can take several seconds to several minutes (depending if the WTGAT had valid GPS location before and the time when there was last valid GPS location) after the unit is operating in normal running mode (GPS aerial has clear sky view).

Software and hardware lock-ups:
The unit has an internal hardware timer that detects 'lock-up'.
If the unit is 'locked' in it automatic 'reset' after 5-10 minutes.

5. Uploading the Operating System to the WTGAT

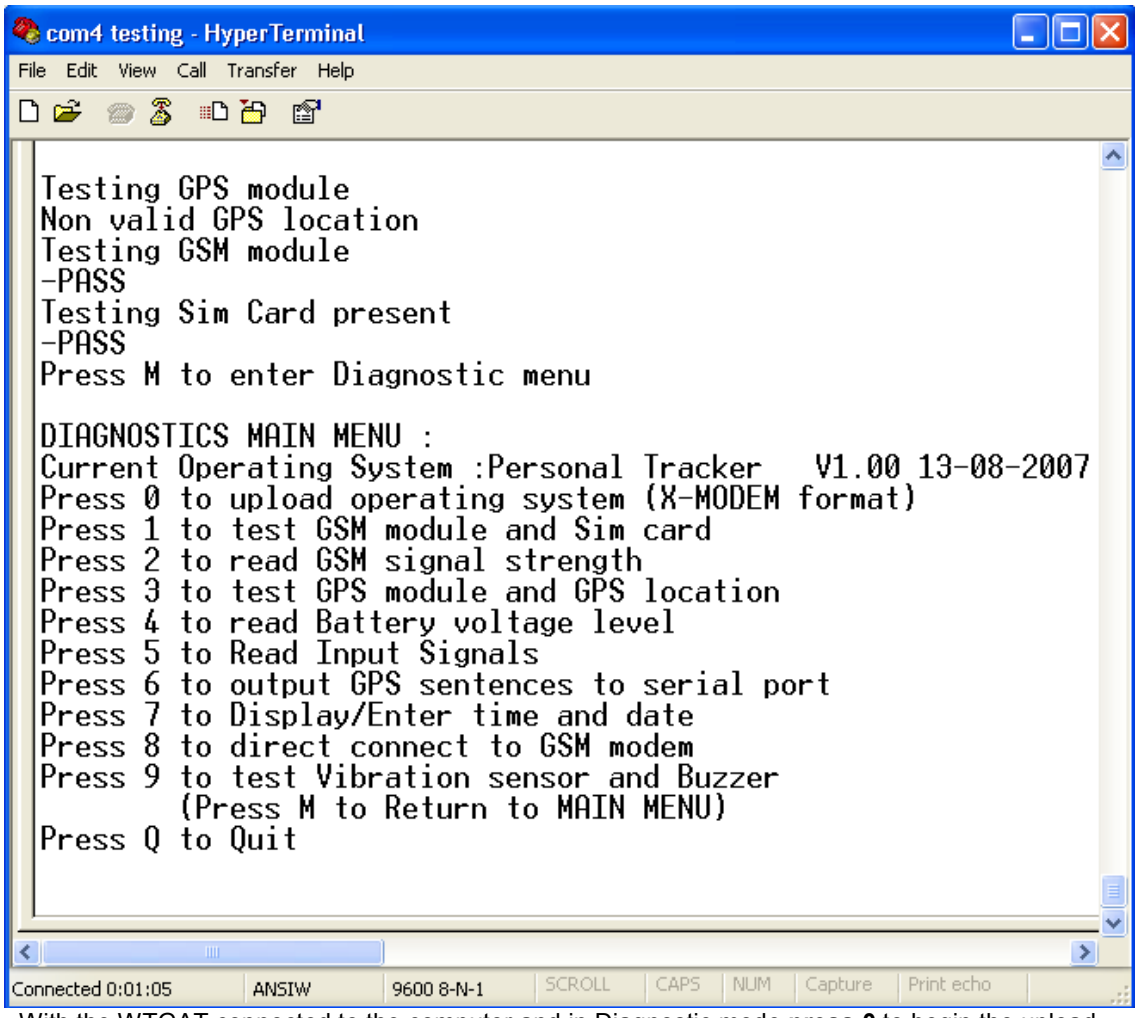
The firmware file should have an extension file name **".s19".**

When the Rover module is connected to the serial port of a computer and it is in **Diagnostic mode**,

A new or modified **Operating System** can be uploaded to the Rover module by pressing **0**.

The new or modified Operating System will be distributed in the **X-Modem** format. It will be a small file that is capable of being distributed to installers by email.

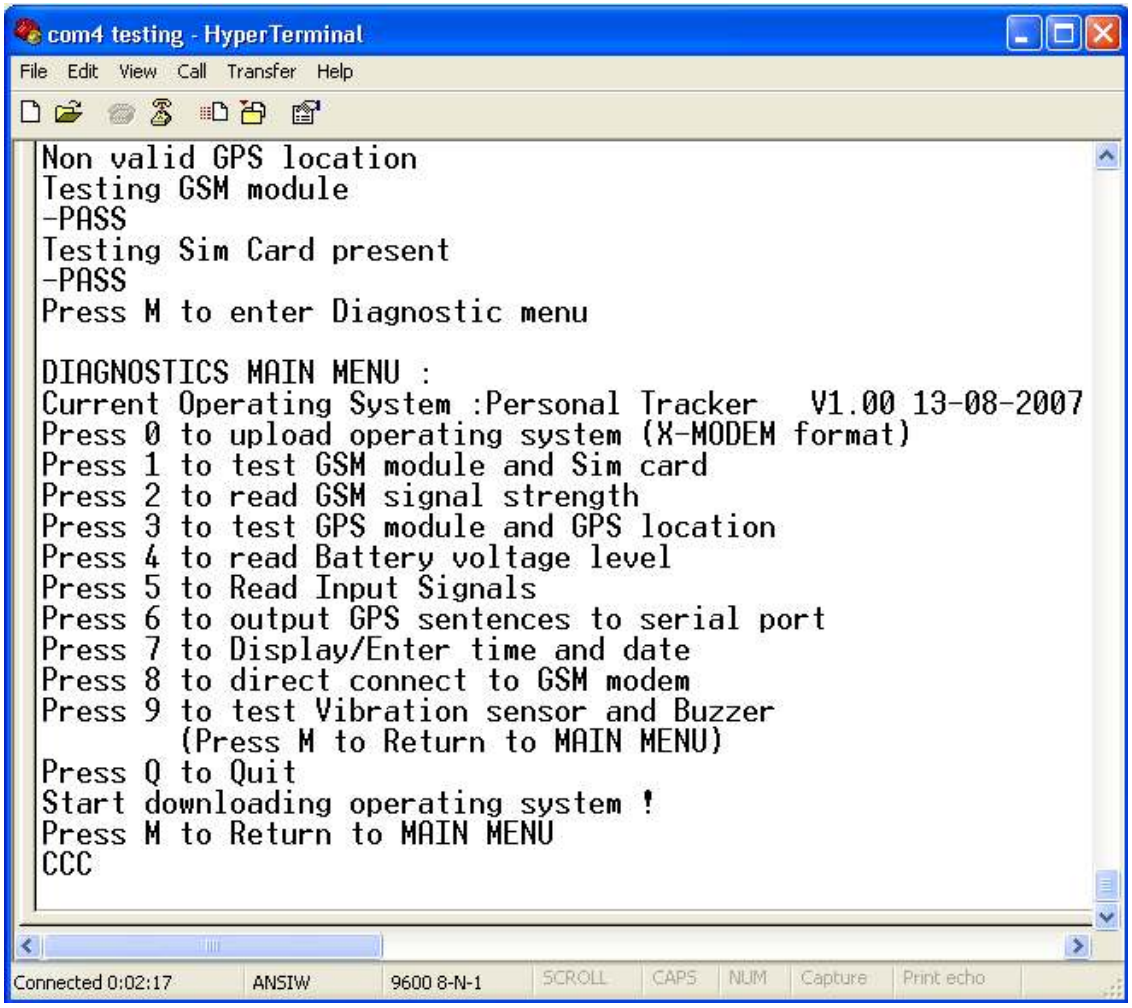
Once you have received the new operating system by email place it in a new folder on your computer (we would recommend calling the folder WTGAT).



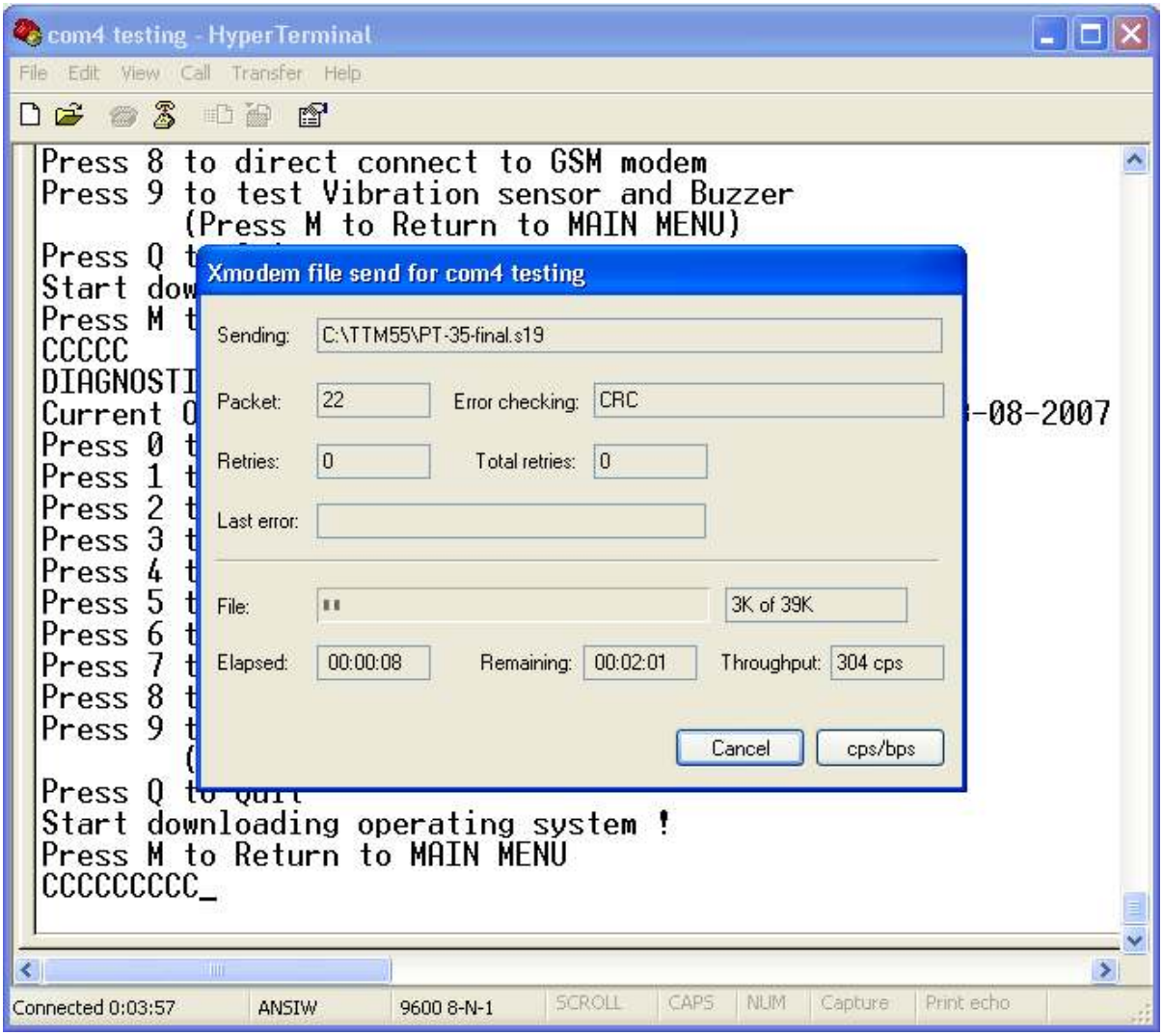
· With the WTGAT connected to the computer and in Diagnostic mode **press 0** to begin the upload.

***PLEASE NOTE**

Update the 'operating system' does not delete or change any saved GPS locations, Base phone number or dial out phone numbers.



· On the HyperTerminal main screen click on **Transfer** and then **Send File** from the drop down list.
· Click **Browse** to locate the folder that contains the **Operating System** file. Highlight the file and click **Open**.
· Then click **Send File**. The download will begin.



After upload the WTGAT unit will restart into the **Diagnostic Main Menu**. The Version and Date details of the new Operating System will be displayed.

6. Messages send by WTGAT:

Message from the WTGAT can be send using SMS or GPRS. In SMS only mode all data is sent using SMS. In SMS and GPRS mode all messages are sent using GPRS. If SMS and GPRS mode is enabled and GPRS is not available then any input activations will be sent using SMS. Whenever GPRS is available again the unit will use GPRS again. In case real time tracking is enabled in SMS and GPRS mode and GPRS is not available then the unit can send the data using SMS if enabled (see configuration menu).

If GSM signal is not available and input is activated then the tracking unit will send the alarm message as soon as there is GSM signal again. The time and date in the message is from the GPS time and date at the time the message is sent.

If real time tracking is enabled and there is no GSM signal then the information will be lost. The tracking unit will still save GPS locations using the 'GPS reading/saving interval setting' if the GPS location is valid.

1. **Location Message.**
2. **Confirm Message for Update.**
3. **Missed messages for real time tracking.**

1.Location Message:

The data length is always the same!

Sample:

05*850,000,WTGAT,A,2459.3640,N,12125.2958,E,000.0,224.8,00.8,07:47:26 09-09-05,1.00,80,3F,**353425142654345**

ID Code (6 Bytes in ASCII), Status code (3 Bytes in ASCII), Unit number, Status (A or V), Latitude, N/S indicator, Longitude, E/W Indicator, speed, Course, HDOP, GPS time lat/lon value - GPS date lat/lon value, Unit Version number, battery power level, ADC voltage level, <IMEI number if option enabled>

ID CODE:

The ID code can be 05*850 or 05*827.
05*850 is returned when the unit has received a request message from base to send a location message.
05*827 is returned if any input is activated.

STATUS CODE:
Sent in ASCII code for text message. Add $30 to First, Second and Third Code.
; **First code:**
; 1 = Battery power low <20%
; 2 = Motion alert alarm
; 4 = Park alert alarm
; 8 = Entering Sleep mode message

; Second Code:
; 1 = Panic Button Activated
; 2 = Motion detection alarm enabled
; 4 = Park detection alarm enabled
; 8 = 24 Hour no motion alarm activated

; **Third Code:**
; 1 = Vehicle traveled above MAX configured speed limit
; 2 = AUX1 input activated
; 4 = ADC activated

The ASCI conversion (samples):
First code is: 0 (ASCII code is 48)
To find the status code value subtract 48 from the ASCII code to find the status value 0.

First code is: 7 (ASCII code is 55)
To find the status code value subtract 48 from the ASCII code to find the status value 7.
First code is: = (ASCII code is 61)
To find the status code value subtract 48 from the ASCII code to find the status value 13.

ASCII table conversion used:

0 = 48	5 = 53	: = 58	? = 63	D = 68
1 = 49	6 = 54	; = 59	@= 64	E = 69
2 = 50	7 = 55	< = 60	A = 65	F = 70
3 = 51	8 = 56	= =61	B = 66	G = 71
4 = 52	9 = 57	> = 62	C = 67	H = 72

I = 73	N=78
J = 74	O=79
K= 75	
L = 76	
M=77	

Unit number:
Always 4 char: **WTGAT**

Status (A or V):
GPS status:
A = Valid GPS location
V = NON Valid GPS location

For NON Valid location the time and date is from the last time the location was valid! If location has never been valid before then time and date is time and date from the Real time Clock.

Latitude:
Always the same format xxxx.xxxx

N/S indicator:
N = North
S = South

Longitude:
Always the same format xxxxx.xxxx

E/W Indicator:
E = East
W = West

Speed:
Value in Knots.
Always the same format xxx.x

Course:
Course in degrees.
Always the same format xxx.x

HDOP:
Horizontal Dilution of Precision.
Always the same format xx.x

GPS time:
Format as hh:mm:ss
Example : 07:47:26

GPS date:
Format as dd-mm-yy
Example: 09-09-05

Unit Version number:
Format as x.xx
Example: 1.00

Battery level Status (value decimal in % from 00 to 99):

ADC voltage level:
From 00 to FF (hex)

2. Confirm Message:

A confirm message will be sent whenever the tracking unit receives a command to update a setting.

The WTGAT has 3 Base phone numbers that can be configured to allow configuration setup.

Information that is received from the 3 Base phone numbers is processed as follows:

Base 1: Master Base phone number. Accepts all command messages and update messages. Location request or configuration update messages are sent back to Master Base phone number if unit is configured for SMS only.
In combined working mode **(SMS and GPRS)** the location request or configuration update message is sent back using GPRS.

Base 2: This phone number can be used by the 'End User' to receive a 'Pager' message.
The following message(s) can be displayed:

PARK Alert Activated
Stop MOTION Alert Activated
PANIC Button Activated
Low Battery Voltage
OVERSPEED Alert
No Movement 24 Hours Alert

The 'End User' will also receive a confirm message(*) if the option is enabled or disabled by the Base 1 or Base 3 phone number.
(*) Only if option can be enabled or disabled by SMS or GPRS command.

Park Alert is activated when the WTGAT detects a speed faster then 5km/h or 3 movements within 30 seconds. After the message is send the PARK Alert function will automatic reactivate after 60 seconds (if Park switch is ON only!). Message sending when activated is delayed for 20 seconds when activated when enabled using the PARK switch. This will give the user time to switch off the PARK switch.

Base 3: Master Backup Base phone number. Accepts all command messages and update messages. Location request or configuration update messages are sent back to Master Backup Base phone number only.
In combined working mode (SMS and GPRS) the location request or configuration update

message is also sent back to Master Backup Base phone number.
The Master Backup phone number will also receive input alarm activation messages (Panic, Park, Power loss detected etc.) as 'location format' message.

Confirm message format:
05*827,CONFIRM,xx,x1,x2, ,0 <,IMEI optional if enabled>

Where xx, x1, x2 etc is the command code setting that has been updated.

The xx can have the following settings:

12,13,17,19,20,21,22,23,24,26,27,28,29,30,32,5,51,53,55,56,56,64,66,67,68,74,79,90,91,A0,A1,A2,A3

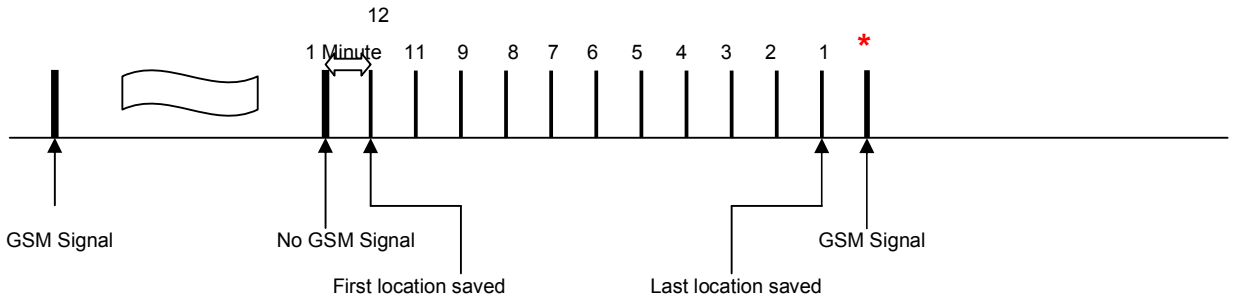
12 = Unit is configured for SMS messages only. All data is sent using SMS.
13 = Unit will work in combined GPRS and SMS mode.
14 = Dial-out number 1 updated.
15 = Dial-out number 2 updated.
16 = Dial-out number 3 updated.
17 = APN number has been updated.
18 = Pickup phone calls updated.
19 = GPRS sending data mode has been updated (UDP or TCP).
20 = Disable Park function confirm.
21 = Enable Park function confirm
22 = Disable Motion alert confirm
23 = Enable Motion alert confirm
24 = TCP data mode port updated.
26 = ISP login name for GPRS updated.
27 = ISP password name for GPRS updated.
29 = Static IP address or domain name for GPRS data updated.
30 = Messages to Base Phone number 1 ONLY updated.
32 = Battery low warning updated.
33 = Message resend has been updated.
34 = Add IMEI number to SMS messages updated.
35 = Time and Date update using GPS updated.
38 = AUX2 output activated
40 = Real time wake up settings updated.
41 = Minutes for real time wake up settings updated.
42 = Hours for real time wake up settings updated.
5 = Master Base phone number updated
51 = Sleep mode options updated (will reset the WTGAT after update)
53 = Base 2 phone number updated.
55 = Custom message settings for Base 2 updated.
56 = SMSC number updated.
57 = Master Backup Base phone number updated.
64 = Speed settings updated.
66 = Real time tracking interval settings OFFLINE updated.
67 = Panic input settings updated.
68 = Vibration sensitivity settings updated.
74 = Reset WTGAT system activated.
79 = Real time tracking interval settings ONLINE updated
90 = Tracking unit disabled.
91 = Tracking unit enabled.
A0 = Enable commands from other Base phone numbers.
A1 = Security ID code updated.
A2 = Connected to GPRS in sleep mode updated

A3 = Disconnect from GPRS in sleep mode updated.

3. Message that cannot be send:

The WTGAT will automatic save location and activation messages to memory. If 'Resend Missed locations' is enabled and the message cannot be send then the message(s) that where not send will automatic be resend.
Depending on your communication mode selected (SMS Only or SMS and GPRS) the messages are send back using SMS or GPRS.
Up to 5000+ locations can be send back.

Example:
Real time tracking is enabled and configured to send message every 60 seconds using SMS. While moving you enter a location where there is no GSM signal. You stay at that location for 12 minutes. After that you returned to a location where there is GSM signal.

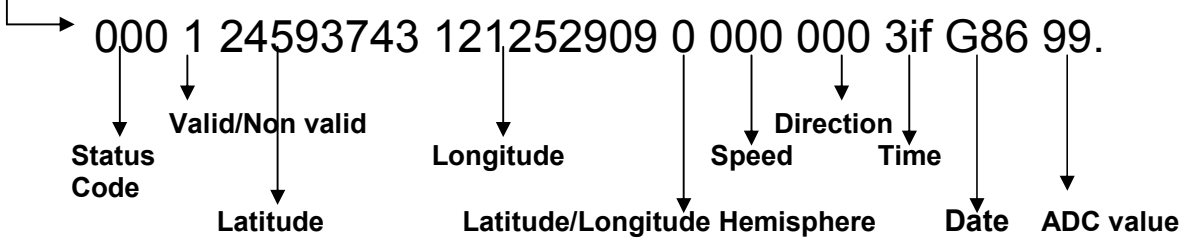


When the next real time tracking location (*) needs to be sent back and the transmission is successful the WTGAT will try to send back the missed locations. Missed locations are sent back starting from the last saved location (1). One message (SMS or GPRS) will contain 4 locations.

Example message showing 4 locations:

000124593743121252909000000003ifG8699.000124593743121252909000000003i0G8699.000124593743121252909000000003hrG8699.000124593743121252909000000003hqG8699.

The message can be decoded as follows:



STATUS CODE:
Sent in ASCII code for text message. Add $30 to First, Second and Third Code.
; **First code:**
; 1 = Battery power low <20%
; 2 = Motion alert alarm
; 4 = Park alert alarm

; Second Code:
; 1 = Panic Button Activated

; 2 = Motion detection alarm enabled
; 4 = Park detection alarm enabled
; 8 = 24 Hour no motion alarm activated

; **Third Code:**
; 1 = Vehicle traveled above MAX configured speed limit
; 2 = AUX1 input activated
; 4 = ADC activated

The ASCI conversion (samples):
First code is: 0 (ASCII code is 48)
To find the status code value subtract 48 from the ASCII code to find the status value 0.
First code is: 7 (ASCII code is 55)
To find the status code value subtract 48 from the ASCII code to find the status value 7.
First code is: = (ASCII code is 61)
To find the status code value subtract 48 from the ASCII code to find the status value 13.

ASCII table conversion used:

0 = 48	5 = 53	: = 58	? = 63	D = 68
1 = 49	6 = 54	; = 59	@= 64	E = 69
2 = 50	7 = 55	< = 60	A = 65	F = 70
3 = 51	8 = 56	= =61	B = 66	G = 71
4 = 52	9 = 57	> = 62	C = 67	H = 72

I = 73	N=78
J = 74	O=79
K= 75	
L = 76	
M=77	

Valid or Non Valid GPS location:
0 = Non Valid or last known GPS location
1 = Valid GPS location

Latitude:
Always the same format (Example: 24593743 -> 2459.3743) - (xxxx.xxxx)
values in ddmm.mmmm
dd in decimal
mm (after dd) IN MINUTES (00 to 59)
mmmm (after dot .) in decimal (0000 to 9999))

Longitude:
Always the same format (Example: 121252909 -> 12125.2909) – (xxxxx.xxxx)
values in dddmm.mmmm
ddd in decimal
mm (after dd) IN MINUTES (00 to 59)
mmmm (after dot .) in decimal (0000 to 9999))

Latitude/Longitude Hemisphere:
0 = NE , 1 = SE , 2 = NW , 3 = SW

Speed:
Value in Knots.
Always the same format xxx (first 3 digits only)

Course:
Course in degrees.
Always the same format xxx (first 3 digits only)

GPS time:
Time is compressed to 3 digits.

It can be easy converted back.
Example as shown: **3iF**

The first digit represent hour. To convert back you must use the ASCII table.
The ASCII value for '3' is 51 (Hex 32). Subtract 48 to find the number = **3**.
If the ASCII value is less then 90 (Hex 5A) then you must subtract 48 to get the number.
If the ASCII value is more then 90 (Hex 5A) then you must subtract 55 to get the number.

The second digit represent minutes. To convert back you must use the ASCII table.
The ASCII value for 'i' is 105 (Hex 69). Subtract 55 to find the number = **50**.
If the ASCII value is less then 90 (Hex 5A) then you must subtract 48 to get the number.
If the ASCII value is more then 90 (Hex 5A) then you must subtract 55 to get the number.

The third digit represent seconds. To convert back you must use the ASCII table.
The ASCII value for 'F' is 70 (Hex 46). Subtract 48 to find the number = **22**.
If the ASCII value is less then 90 (Hex 5A) then you must subtract 48 to get the number.
If the ASCII value is more then 90 (Hex 5A) then you must subtract 55 to get the number.

The time shown in the example is : 03:50:22

GPS date:
date is compressed to 3 digits.
It can be easy converted back.
Example as shown: **G86**

The first digit represent day. To convert back you must use the ASCII table.
The ASCII value for 'G' is 71 (Hex 47). Subtract 48 to find the number = **23**.
If the ASCII value is less then 90 (Hex 5A) then you must subtract 48 to get the number.
If the ASCII value is more then 90 (Hex 5A) then you must subtract 55 to get the number.

The second digit represent month. To convert back you must use the ASCII table.
The ASCII value for '8' is 56 (Hex 38). Subtract 48 to find the number = **8**.
If the ASCII value is less then 90 (Hex 5A) then you must subtract 48 to get the number.
If the ASCII value is more then 90 (Hex 5A) then you must subtract 55 to get the number.

The third digit represent year. To convert back you must use the ASCII table.
The ASCII value for '6' is 54 (Hex 36). Subtract 48 to find the number = **6**.
If the ASCII value is less then 90 (Hex 5A) then you must subtract 48 to get the number.
If the ASCII value is more then 90 (Hex 5A) then you must subtract 55 to get the number.

The date shown in the example is: 23.08.2006

ADC value:
Will always be shown as 2 digits. From 00 to FF (hex).

Each location is separated by a dot (.).

The missed messages for real time tracking can have 1 to 4 locations (max) in each message.
So in the above example we will receive 3 messages that have 4 locations.
If we have only 2 saved locations we will only receive 1 message that has 2 locations.

Up to 25 messages are transmitted per real time tracking interval sending. This will allow the tracking system to process other messages in case many location messages that need to be send back to base.

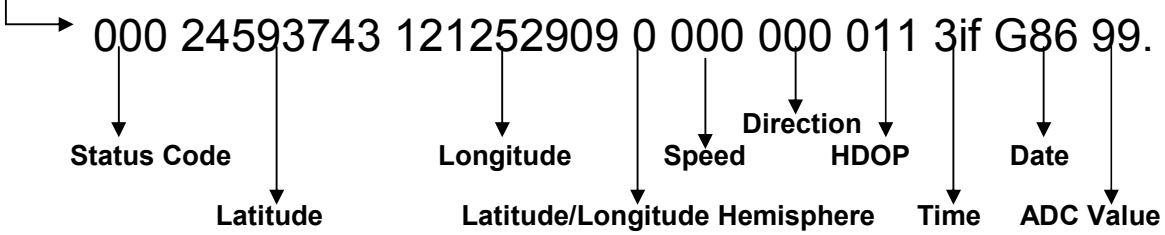
Example:
There are 130 missed messages saved to memory.
For the first real time tracking interval the unit will transmit 100 locations.
The last 30 messages will be sent after the second real time interval.

Conversion help for multiple location messages:

Example message showing 4 locations:

0002459374312125290900000000113ifG8699.0002459374312125290900000000123i0G8699.00
0245937431212529090000000000113hrG8699.0002459374312125290900000000173hqG8699.

The message can be decoded as follows:



Conversion table for Time and Date digits:

0	= 0	G	= 23	e	=46
1	= 1	H	= 24	f	=47
2	= 2	I	= 25	g	=48
3	= 3	J	= 26	h	=49
4	= 4	K	= 27	I	=50
5	= 5	L	= 28	j	=51
6	= 6	M	= 29	k	=52
7	= 7	N	= 30	l	=53
8	= 8	O	= 31	m	=54
9	= 9	P	= 32	n	=55
:	= 10	Q	= 33	o	=56
;	= 11	R	= 34	p	=57
<	= 12	S	= 35	q	=58
=	= 13	T	= 36	r	=59
>	= 14	U	= 37		
?	= 15	V	= 38		
@	= 16	W	= 39		
A	= 17	X	= 40		
B	= 18	Y	= 41		
C	= 19	a	= 42		
D	= 20	b	= 43		
E	= 21	c	= 44		
F	= 22	d	= 45		

The above sample time will be:
Time = '3if' = 03:50:22

The above sample date will be:
Date = 'G86' = 23/08/2006

7. Serial port data sending using the GSM Modem:

Serial port data sending allows any external device to use the tracking units as communication interface. As the tracking unit has the TCP/IP protocol build in the external device does not require the protocol to send and receive data using the Internet to or from any location in the world.
Simple 'AT' commands are used for all communication.

Serial port data sending:
Tracking unit must have credits to access the modem using the serial port for SMS and GPRS mode(s).
Send "S". (Capital "S")
Wait for "OK+<mode - 1 byte>" **(mode is 0 when in SMS only mode and 1 if in SMS and GPRS mode)**

Then send 4 digit password + CR ($0D).
Wait for ">" + CR($0D) + LF($0A).

The serial port has now 'direct' access to the GSM modem. Baud speed is set at 9600 and cannot be changed. Only 'AT' commands are allowed, no connection to the internet using dial-up is allowed on this port.
The tracking unit will monitor the port for data communication.
Type 'AT COMSTOP' or 'at comstop' to disconnect.
If no data is send (from the serial port to the modem) for more then 60 seconds the port will automatic disconnect.
During connection the tracking unit cannot send or process any data.

Please note:
In SMS only mode the unit will send all data using SMS. In SMS and GPRS mode the unit will send all data using GPRS.
The unit still processes SMS messages when connected to the GPRS network. The unit can process and send SMS messages without disconnecting from the GPRS network.

8. Priority of Messages:

As your tracking system processes many inputs and outputs there are several outputs and inputs that have priority above others.
In general:

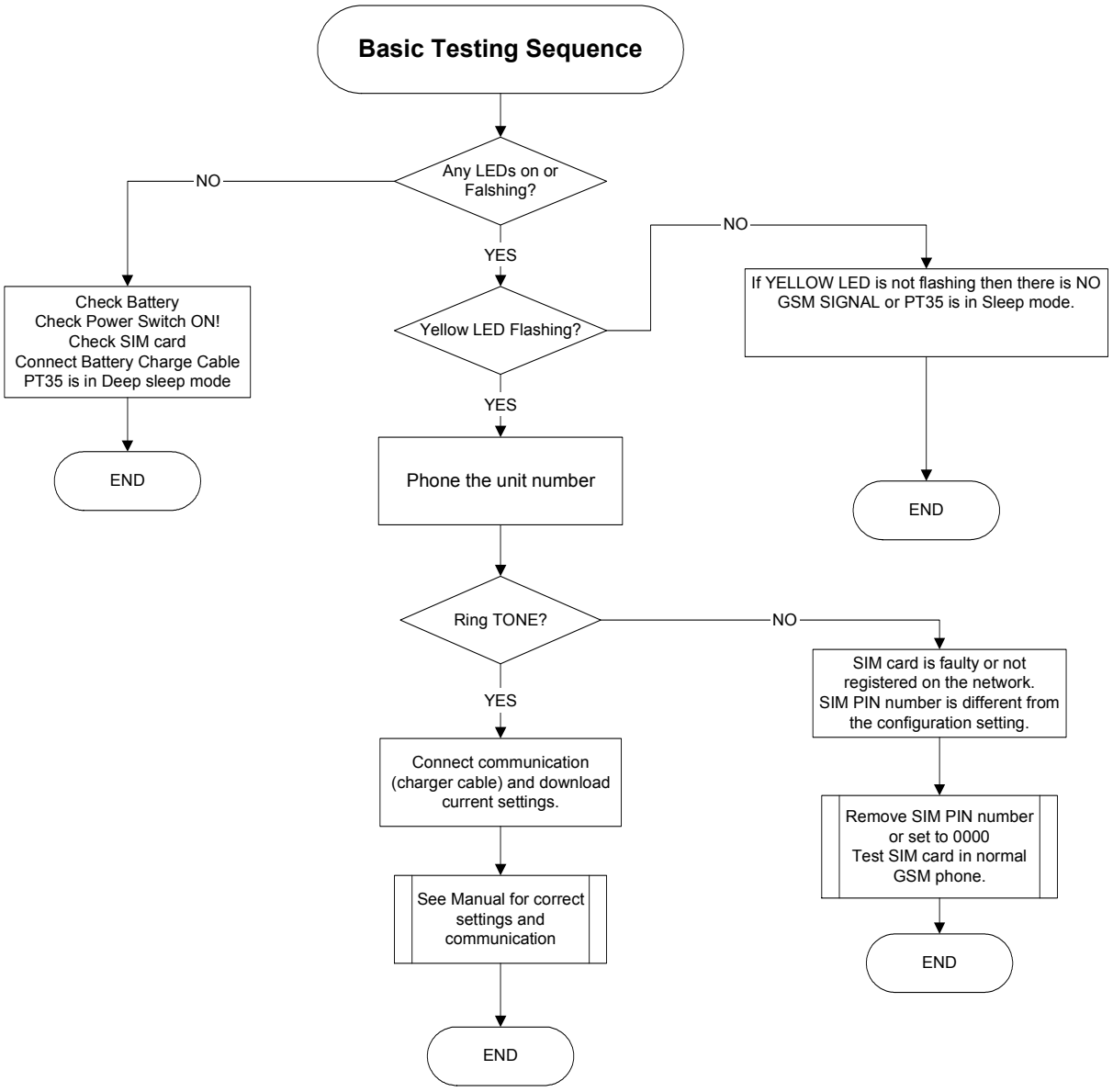
Panic Button – First Priority

All others have the same priority, but reporting of the activation may depend on what input has activated first if several inputs are activated at the same time.

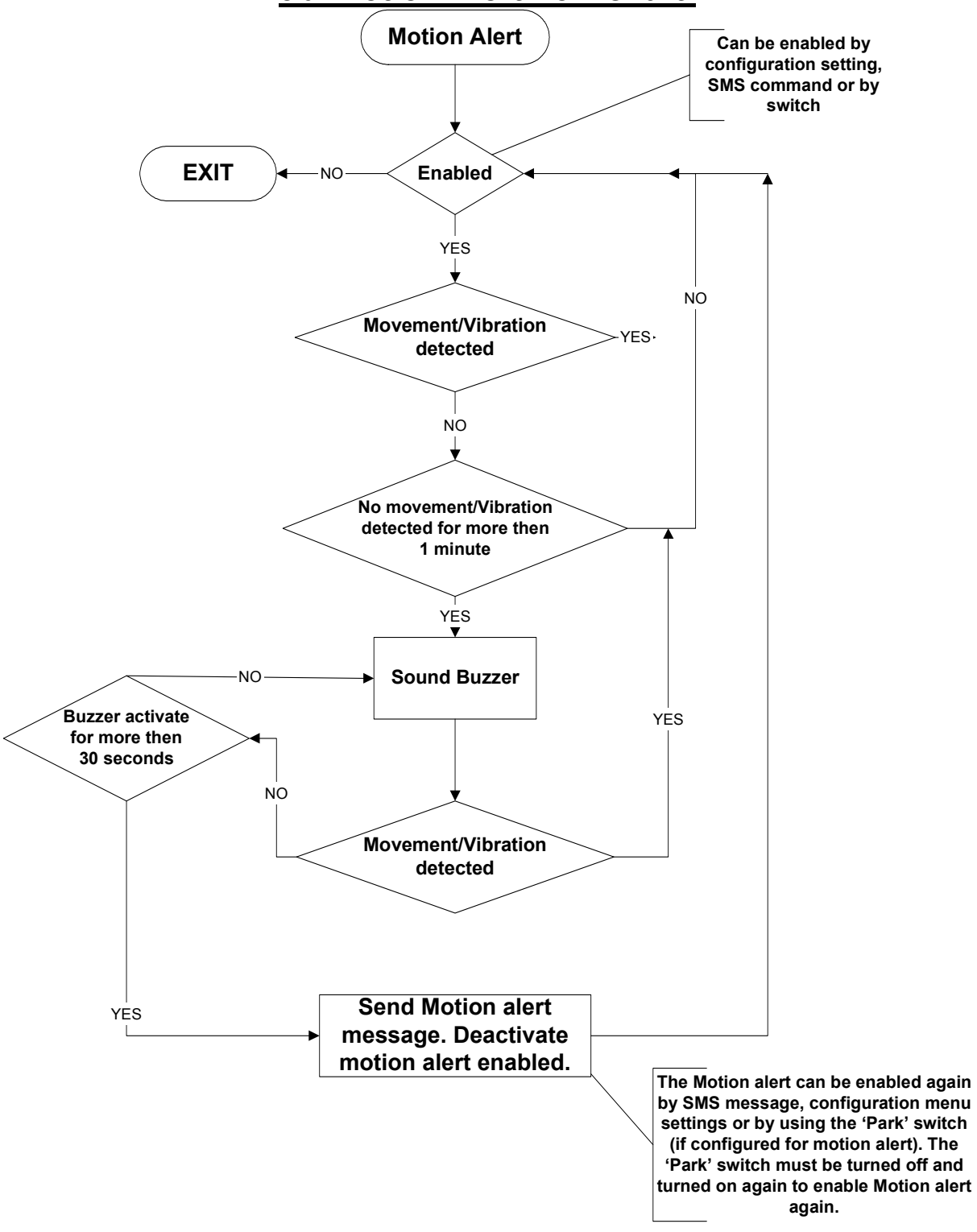
This priority setup may delay messages that have less priority.

When changing operating mode from 'SMS Only' to 'SMS+GPRS' the current active commands are completed first before changing operating mode.

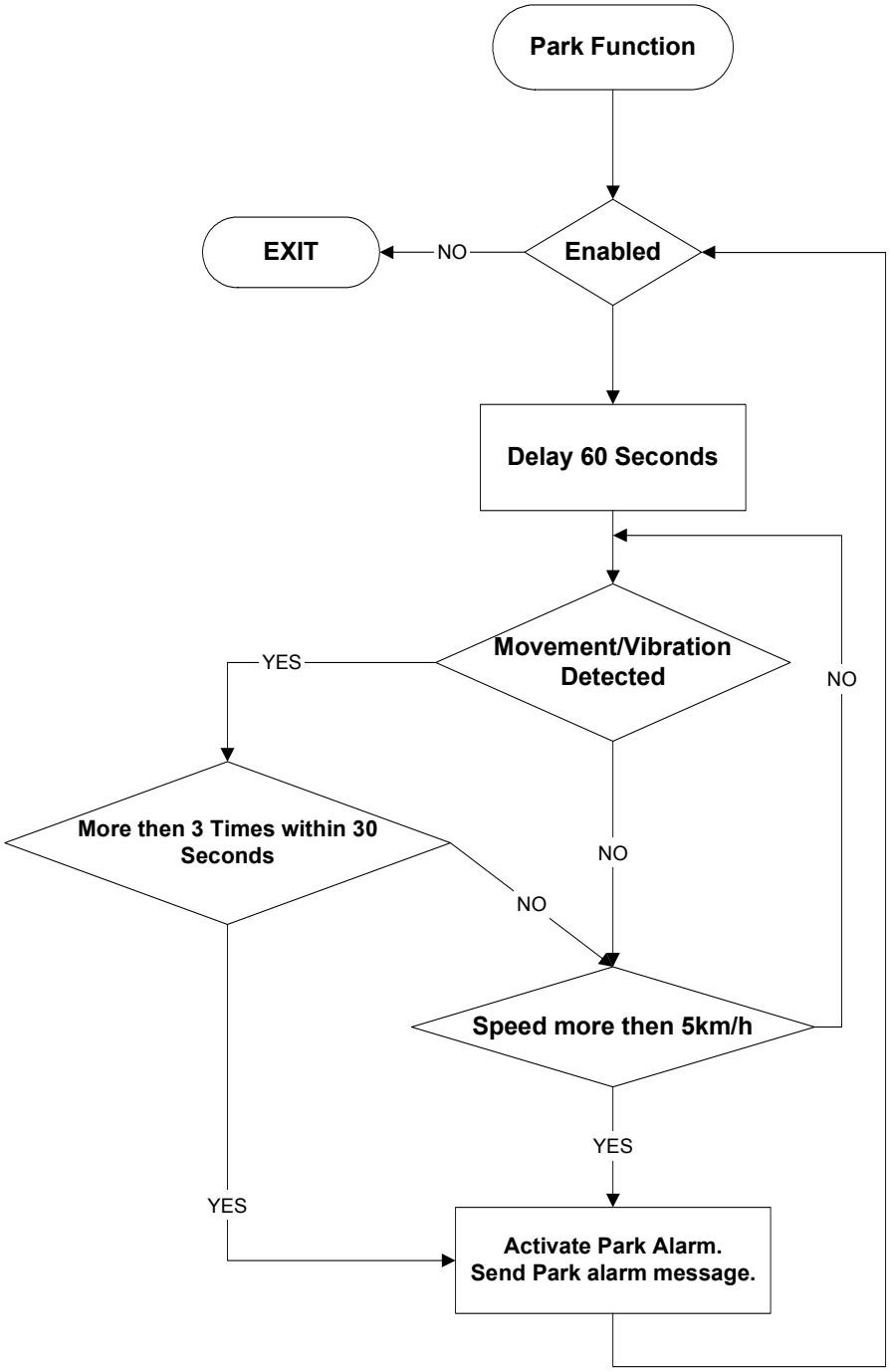
9a. Basic testing and problem solving:



9b. Motion Alert flow chart:



9c. Park Alert flow chart:



10. GPRS TESTING

Using the direct connection to the GSM modem (in test mode under 'Hyperterminal).

1. Check GSM signal

AT+CSQ <Enter>

Example: +CSQ: 21,0

2. Check SIM card registered

AT+CREG?

Example: +CREG:0,1 (registered Home network)

3. Check network connected

AT+COPS?

Example: +COPS: 0,0,"CHINA MOBILE"

4. Set APN (AT + CSTT)

AT + CSTT = "APN"[,"ID", "password"]

Ex.

at + cstt = "internet" <Enter> (Chun Huw，TCC)

at + cstt = "FETNet01" <Enter> (FET)

5. Attach to GPRS network (AT + CIICR)

AT + CIICR <Enter>

6. Get local IP address assign by GPRS Network（AT + CIFSR）

AT + CIFSR <Enter>

7. Start TCP/UDP connection (AT+CIPSTART)

AT + CIPSTART = "Mode","IP","Port"

Mode =TCP"or"UDP"

IP =remote server IP address

Port =remote server port

Example.

at + cipstart = "TCP","192.168.100.1","1234" <Enter>

8. DATA Send (AT+CIPSEND)

AT + CIPSEND <Enter> (Send data out by Ctrl-z)

>DATA

Ctrl Z

AT + CIPSEND = <length> <Enter> (setup Length of data and send out automatically)

9. Close connection(AT + CIPCLOSE)

AT + CIPCLOSE <Enter>

10. Shut down connect (AT + CIPSHUT)

AT+CIPSHUT<Enter>

(Enter 'at comstop' to return to main menu)

11. AT COMMANDS FOR GPRS SUPPORT

Detailed Descriptions of commands
AT Commands For (TCP/UDP)

8 AT Commands for TCPIP Application Toolkit

8.1 Overview

Command	Description
AT+CIPSTART	START UP TCP OR UDP CONNECTION
AT+CIPSEND	SEND DATA THROUGH TCP OR UDP CONNECTION
AT+CIPCLOSE	CLOSE CONNECTION
AT+CIPSHUT	DEACTIVATE GPRS PDP CONTEXT
AT+CLPORT	SET LOCAL PORT
AT+CSTT	SET APN, USER NAME, PASSWORD
AT+CIICR	BRING UP WIRELESS CONNECTION WITH GPRS OR CSD
AT+CIFSR	GET LOCAL IP ADDRESS
AT+CIPSTATUS	QUERY CURRENT CONNECTION STATUS
AT+CDNSCFG	CONFIGURE DOMAIN NAME SERVER
AT+CDNSGIP	QUERY IP ADDRESS OF GIVEN DOMAIN NAME
AT+CDNSORIP	CONNECT WITH IP ADDRESS OR DOMAIN NAME SERVER
AT+CIPHEAD	ADD AN IP HEADER WHEN RECEIVING DATA
AT+CIPATS	SET AUTO SENDING TIMER
AT+CIPSPRT	SET PROMPT OF '>' WHEN SENDING DATA
AT+CIPSERVER	CONFIGURE AS SERVER
AT+CIPCSGP	SET CSD OR GPRS FOR CONNECTION MODE
AT+CIPCCON	CHOOSE CONNECTION
AT+CIPFLP	FIX LOCAL PORT
AT+CIPSRIP	SHOW WHERE RECEIVED DATA FROM
AT+CIPDPDP	SET WHETHER CHECK STATE OF GPRS NETWORK TIMING
AT+CIPSCONT	SAVE TCPIP APPLICATION CONTEXT
AT+CIPMODE	SELECT TCPIP APPLICATION MODE
AT+CIPCCFG	CONFIGURE TRANSPARENT TRANSFER MODE

8.2 Detailed Descriptions of Commands

8.2.1 AT+CIPSTART Start up TCP or UDP connection

AT+CIPSTART	Start up TCP or UDP connection
Test command +CIPSTART=?	Response +CIPSTART: (list of supported <mode>),(IP address range),(port range) <CR><LF>+CIPSTART: (list of supported <mode>),(domain name),(port

	range) OK Parameter See set command
Set command +CIPSTART=<mode>,[<IP address>,<domain name>],<port>	Response If format is right response OK, otherwise response ERROR If connect successfully response CONNECT OK Otherwise STATE:<state> CONNECT FAIL Parameter <mode> a string parameter which indicates the connection type "TCP" Establish a TCP connection "UDP" Establish a UDP connection <IP address> remote server IP address <port> remote server port <domain name> remote server domain name <state> a string parameter which indicates the progress of connecting 0 IP INITIAL 1 IP START 2 IP CONFIG 3 IP IND 4 IP GPRSACT 5 IP STATUS 6 TCP/UDP CONNECTING 7 IP CLOSE 8 CONNECT OK
Reference	Parameter

8.2.2 AT+CIPSEND Send data through TCP or UDP connection

AT+CIPSEND Send data through TCP or UDP connection	
Test command +CIPSEND=?	Response OK
Execution command +CIPSEND response"> ", then type data for send, tap CTRL+Z to send	Response This command is used to send changeable length data. If connection is not established or disconnection: ERROR If sending successfully: SEND OK If sending fail: SEND FAIL

	Note This command is used to send data on the TCP or UDP connection that has been established already. Ctrl-Z is used as a termination symbol. There are at most 1024 bytes that can be sent at a time.
Set command +CIPSEND=<data_length>	Response This command is used to send fixed length data. If connection is not established or disconnect: ERROR If sending successfully: SEND OK If sending fail: SEND FAIL Parameter <data_length> a numeric parameter which indicates the length of sending data, it must less than 1024
Reference	Note 1. There are at most 1024 bytes that can be sent each time. 2. Set the time that send data automatically with the command of AT+CIPATS. 3. Only send data at the status of established connection, otherwise Response ERROR

8.2.3 AT+CIPCLOSE Close TCP or UDP Connection

AT+CIPCLOSE	Close connection
Test command +CIPCLOSE=?	Response +CIPCLOSE: OK
Execution command +CIPCLOSE	Response If close successfully: CLOSE OK If close fail: ERROR
Reference	Note AT+CIPCLOSE only close connection at the status of TCP/UDP CONNECTING or CONNECT OK，otherwise response ERROR, after close the connection, the status is IP CLOSE

8.2.4 AT+CIPSHUT Disconnect wireless connection

AT+CIPSHUT	Disconnect wireless connection

Test command +CIPSHUT=?	Response +CIPSHUT: OK
Read command +CIPSHUT?	Response +CIPSHUT: OK
Execution command +CIPSHUT	Response If close successfully: SHUT OK If close fail: ERROR Note Except at the status of IP INITIAL, you can close moving scene by AT+CIPSHUT. After closed, the status is IP INITIAL.
Reference	Note

8.2.5 AT+CLPORT Set local port

AT+CLPORT Set local port	
Test command +CLPORT=?	Response +CLPORT: (list of supported <port>s) Parameter See set command
Read command +CLPORT?	Response <mode>:<port> <CR><LF><mode>:<port> Parameter See set command
Set command +CLPORT=<mode>,<port>	Response OK ERROR Parameter <mode> a string parameter which indicates the connection type "TCP" TCP local port "UDP" UDP local port <port> a numeric parameter which indicates the local port
Reference	Note

8.2.6 AT+CSTT START task and Set APN、USER ID、PASSWORD

AT+CSTT Start task and Set APN、USER ID、PASSWORD	
Test command +CSTT=?	Response +CSTT: "APN","USER","PWD"

	OK
Read command +CSTT?	Response +CSTT: <apn>,<user id>,<password> OK Parameter See set command
Set command +CSTT=<apn>,<user id>,<password>	Response OK ERROR Parameter <apn> a string parameter which indicates the GPRS access point name <user id> a string parameter which indicates the GPRS user name <password> a string parameter which indicates the GPRS password
Execution Command +CSTT	Response OK ERROR
Reference	Note

8.2.7 AT+CIICR Bring up wireless connection with GPRS or CSD

AT+CIICR Bring up wireless connection with GPRS or CSD	
Test command +CIICR=?	Response OK
Execution command +CIICR	Response OK STATE: <state> ERROR Parameter <state> referred to AT+CIPSTART
Reference	Note AT+CIICR only activate moving scene at the status of IP START， after operate this command, the state changed to IP CONFIG. If module accept the activate operation, the state changed to IP IND; after module accept the activate operation, if activate successfully, the state changed to IP GPRSACT, response OK, otherwise response ERROR.

8.2.8 AT+CIFSR Get local IP address

AT+CIFSR Get local IP address	
Test command +CIFSR=?	Response +CIFSR: OK

Read command +CIFSR?	Response +CIFSR: OK
Execution command +CIFSR	Response <IP address> OK ERROR Parameter <IP address> a string parameter which indicates the IP address assigned from GPRS or CSD
Reference	Note Only at the status of activated the moving scene: IP GPRSACT、TCP/UDP CONNECTING、CONNECT OK、IP CLOSE can get local IP Address by AT+CIFSR, otherwise response ERROR.

8.2.9 AT+CIPSTATUS Query current connection status

AT+CIPSTATUS	**Query current connection status**
Test command +CIPSTATUS=?	Response +CIPSTATUS: OK
Read command +CIPSTATUS?	Response +CIPSTATUS: OK
Execution command +CIPSTATUS	Response STATE: <state> OK Parameter <state> referred to AT+CIPSTART
Reference	Note

8.2.10 AT+CDNSCFG Configure domain name server

AT+CDNSCFG	**Configure domain name server**
Test command +CDNSCFG=?	Response +CDNSCFG: ("(0,255).(0,255).(0,255).(0,255)"),("(0,255).(0,255).(0,255).(0,255)") OK
Read command +CDNSCFG?	Response +CDNSCFG: ("PRIMARY DNS"),("SECONDARY DNS")

Set command +CDNSCFG=<pri_dns>,<sec_dns>	Response OK ERROR Parameter <pri_dns> a string parameter which indicates the IP address of the primary domain name server <sec_dns> a string parameter which indicates the IP address of the secondary domain name server
Reference	Note

8.2.11 AT+CDNSGIP Query the IP address of given domain name

AT+CDNSGIP Query the IP address of given domain name	
Test command +CDNSGIP=?	Response +CDNSGIP: DOMAIN NAME LENGTH(0,100) OK
Read command +CDNSGIP?	Response +CDNSGIP: ("DOMAIN NAME") ok
Set command +CDNSGIP=<domain name>	Response OK ERROR If successful, return: <IP address> If fail, return: ERROR: <error code> STATE: <state> Parameter <domain name> a string parameter which indicates the domain name <IP address> a string parameter which indicates the IP address corresponding to the domain name <error code> a numeric parameter which indicates the error code 1 DNS not Authorization 2 invalid parameter 3 network error 4 no server 5 time out 6 no configuration 7 no memory <state> refer to AT+CIPSTART
Reference	Note

8.2.12 AT+CDNSORIP Connect with IP address or domain name server

AT+CDNSORIP	Connect with IP address or domain name server
Test command +CDNSORIP=?	Response +CDNSORIP: (list of supported <mode>s) OK Parameter See set command
Read command +CDNSORIP?	Response +CDNSORIP: <mode> OK Parameter See set command
Set command +CDNSORIP=<mode>	Response OK ERROR Parameter <mode> a numeric parameter which indicates whether connecting with IP address server or domain name server 0 remote server is an IP address 1 remote server is a domain name
Reference	Note

8.2.13 AT+CIPHEAD Add an IP head when receiving data

AT+CIPHEAD	Add an IP head when receiving data
Test command +CIPHEAD=?	Response +CIPHEAD: (list of supported <mode>s) Parameter See set command
Read command +CIPHEAD?	Response +CIPHEAD: <mode> Parameter See set command
Set command +CIPHEAD=<mode>	Response OK ERROR Parameter <mode> a numeric parameter which indicates whether adding an IP header to received data or not 0 not add IP header 1 add IP header, the format is "+IPD(data length):"

Reference	Note

8.2.14 AT+CIPATS Set auto sending timer

AT+CIPATS Set auto sending timer	
Test command +CIPATS=?	Response +CIPATS: (list of supported <mode>s) OK Parameter See set command
Read command +CIPATS?	Response +CIPATS: <mode> Parameter See set command
Set command +CIPATS=<mode>,<time>	Response OK ERROR Parameter <mode> a numeric parameter which indicates whether set timer when sending data 0 not set timer when sending data 1 Set timer when sending data <time> a numeric parameter which indicates the seconds after which the data will be sent
Reference	Note

8.2.15 AT+CIPSPRT Set prompt of '>' when sending data

AT+CIPSPRT Set prompt of '>' when sending data	
Test command +CIPSPRT=?	Response +CIPSPRT: (<send prompt>) Parameter See set command
Read command +CIPSPRT?	Response +CIPSPRT: <send prompt> Parameter See set command
Set command +CIPSPRT=<send prompt>	Response OK ERROR Parameter <send prompt> a numeric parameter which indicates whether echo prompt

	'>' after issuing AT+CIPSEND command 0 no prompt and show "send ok" when send successfully 1 echo '>' prompt and show "send ok" when send successfully 2 no prompt and not show "send ok" when send successfully
Reference	Note

8.2.16 AT+CIPSERVER Configure as a server

AT+CIPSERVER Configure as a server	
Read command +CIPSERVER?	Response <mode> OK Parameter <mode> 0 has not been configured as a server 1 has been configured as a server
Execution command +CIPSERVER	Response OK ERROR If configuration as server success, return: SERVER OK If configuration as server fail, return: STATE:<state> CONNECT FAIL Parameter <state> refer to AT+CIPSTART
Reference	Note

8.2.17 AT+CIPCSGP Set CSD or GPRS connection mode

AT+CIPCSGP Set CSD or GPRS for connection mode	
Test command +CIPCSGP=?	Response +CIPCSGP: (list of supported connection <mode>s),[(GPRS parameters <apn>,<user name>,<password>),(CSD parameters <dial number>,<user ID>,<password>,<rate>)] OK Parameter See set command
Read command +CIPCSGP?	Response +CIPCSGP: <mode> OK Parameter See set command
Set command	Response

+CIPCSGP=<mode>,[(<apn>, <user name>, <password>), (<dial number>,<user ID>,<password>, <rate>)]	OK ERROR Parameter <mode> a numeric parameter which indicates the wireless connection mode 0 set CSD as wireless connection mode 1 set GPRS as wireless connection mode GPRS parameters: <apn> a string parameter which indicates the access point name <user name> a string parameter which indicates the user name <password> a string parameter which indicates the password CSD parameters: <dial number> a string parameter which indicates the CSD dial numbers <user ID> a string parameter which indicates the CSD USER ID <password> a string parameter which indicates the CSD password <rate> a numeric parameter which indicates the CSD connection rate
Reference	Note

8.2.18 AT+CIPCCON Choose connection

AT+CIPCCON	Choose connection
Test command +CIPCCON=?	Response +CIPCCON: (list of supported <connection>s) OK Parameter See set command
Read command +CIPCCON?	Response <connection> OK Parameter See set command
Set command +CIPCCON=<connection>	Response OK ERROR Parameter <connection> a numeric parameter which indicates the chosen connection 1 choose connection as client 2 choose connection as server Note that there may exist two connections at one time: one connection is as client connecting with remote server, the other connection is as server connecting with remote client. Using this command to choose through

	which connection data is sent.
Reference	Note

8.2.19 AT+CIPFLP Set whether fix the local port

AT+CIPFLP Set whether fix the local port	
Test command +CIPFLP=?	Response +CIPFLP: (list of supported <mode>s) Parameter See set command
Read command +CIPFLP?	Response +CIPFLP: <mode> OK Parameter See set command
Set command +CIPFLP=<mode>	Response OK ERROR Parameter <mode> a numeric parameter which indicates whether increasing local port automatically when establishing a new connection 0 do not fix local port, increasing local port by 1 when establishing a new connection 1 fix local port, using the same port when establishing a new connection Note that in default mode, the local port is fixed. It can speed up the connection progress if setting to not fixed local port when establishing a new connection after closing previous connection.
Reference	Note

8.2.20 AT+CIPSRIP Set whether display IP address and port of sender when receive data

AT+CIPSRIP Set whether display IP address and port of sender when receive data	
Test command +CIPSRIP=?	Response +CIPSRIP: (list of supported <mode>s) OK Parameter See set command
Read command	Response

+CIPSRIP?	<mode>: OK Parameter See set command
Set command +CIPSRIP=<mode>	Response OK ERROR Parameter <mode> a numeric parameter which indicates whether show the prompt of where the data received are from or not before received data. 0 do not show the prompt 1 show the prompt, the format is as follows: RECV FROM:<IP ADDRESS>:<PORT> Note that the default mode is not to show the prompt.
Reference	Note

8.2.21 AT+CIPDPDP Set Whether Check State Of GPRS Network Timing

AT+CIPDPDP Set Whether Check State Of GPRS Network Timing	
Test command +CIPDPDP =?	Response +CIPDPDP:(list of supported< mode>s) OK Parameter See set command
Read command +CIPDPDP?	Response +CIPDPDP:<mode>,<interval>,<timer> +CIPCPCP: 0 OK Parameter See set command
Set command +CIPDPDP=<mode>,<interval>,<timer>	Response OK ERROR Parameter <mode> 0 not set detect PDP 1 set detect PDP <interval> 0<interval<=180(ms) <timer> 0<timer<=255

Reference	Note

8.2.22 AT+CIPSCONT Save TCPIP Aplicaton Context

AT+CIPSCONT Save TCPIP Application Context	
Read command AT+CIPSCONT?	Response TA returns TCPIP Application Context, which consists of the following AT Command parameters. SHOW APPTCPIP CONTEXT +CDNSORIP:<mode> +CIPSPRT:< sendprompt> +CIPHEAD:<iphead> +CIPFLP:<flp> +CIPSRIP:<srip> +CIPCSGP:<csgp> Gprs Config APN:<apn> Gprs Config UserId:<gusr> Gprs Config Password:<gpwd> Gprs Config inactivityTimeout:<timeout> CSD Dial Number:<cnum> CSD Config UserId:<cusr> CSD Config Password:<cpwd> CSD Config rate:<crate> +CIPDPDP:<dpdp> Detect PDP Inerval:<int> Detect PDP Timer:<timer> OK

	Parameters <mode> see AT+CDNSORIP <sendprompt> see AT+CIPSPRT <iphead> see AT+CIPHEAD <flp> see AT+CIPFLP <srip> see AT+CIPSRIP <csgp> see AT+CIPCSGP <apn> see AT+CIPCSGP <gusr> see AT+CIPCSGP <gpwd> see AT+CIPCSGP <timeout> see AT+CIPCSGP <cnum> see AT+CIPCSGP <cusr> see AT+CIPCSGP <cpwd> see AT+CIPCSGP <crate> see AT+CIPCSGP <dpdp> see AT+CIPDPDP <int> see AT+CIPDPDP <timer> see AT+CIPDPDP
Set command AT+CIPSCONT	Response TA saves TCPIP Application Context which consist of following AT command parameters, and when system is rebooted, the parameters will be loaded automatically: AT+CDNSORIP, AT+CIPSPRT, AT+CIPHEAD, AT+CIPFLP,AT+CIPSRIP, AT+CIPCSGP, AT+CIPDPDP **OK**
	Parameter

8.2.23 AT+CIPMODE Select TCPIP Application mode

AT+CIPMODE	Select TCPIP Application mode
Test command +CIPMODE=?	Response +CIPMODE: (0,1) OK
Read command +CIPMODE?	Response +CIPMODE: <mode> OK Parameter See set command
Set command +CIPMODE=<mode >	Response OK ERROR

	Parameter <mode> 0:command mode 1:transparent transfer mode
Execution Command +CIPMODE	Response ERROR
Reference	Note

8.2.24 AT+CIPCCFG Configure Transparent Transfer mode

AT+CIPCCFG Configure Transparent Transfer Mode	
Test command +CIPCCFG=?	Response +CIPCCFG: <3-8>,<2-10>,<256-1024>,<0,1> OK
Read command +CIPCCFG?	Response +CIPCCFG: <NmRetry>,<WaitTm>,<SendSz>,<esc> OK Parameter See set command
Set command +CIPCCFG=<NmRetry>,<WaitTm>,<SendSz>,<esc>	Response OK ERROR Parameter <NmRetry> number of retries to be made for an IP packet. <WaitTm> number of 200ms intervals to wait for serial input before sending the packet. <SendSz> size in bytes of data block to be received from serial port before sending. <esc> whether turn on the escape sequence, default is TRUE.
Execution Command +CIPCCFG	Response ERROR
Reference	Note

12. Receiving and sending GPRS data:

The GPRS data format for sending is identical to the message format sent using SMS except that the GPRS has a 'header' string at the start off the message. This is for all GPRS data including the 'CONFIRM' and multiple location message.
The 'header string' is the IMEI number from the tracking unit GSM modem. The IMEI number is displayed on the tracking unit or is shown when you exit the diagnostic main menu using 'Hyperterminal'.

Sample data string received in GPRS mode (without compression):
<IMEI number>,05*850,000,WTGAT,A,2459.3640,N,12125.2958,E,000.0,224.8,00.8,07:47:26 09-09-05,1.00,80,3F

Sample data string received in GPRS mode (with compression):
<IMEI number>,05*850000WTGATA24593640N121252958E000022480080747260909051008O3F

Any command message(s) can also be sent to the tracking unit in GPRS mode. The message(s) must be sent within 2 seconds after any message is received in GPRS mode. The command messages as identical to the messages sent using SMS.

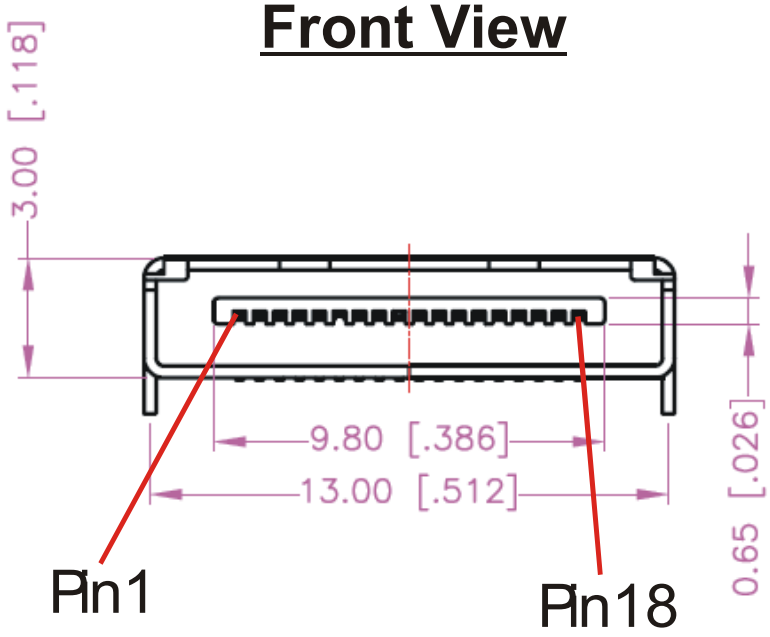
GPRS errors:

The serial port will output GSM communication and any errors when connection or sending data in GPRS mode.

13. WTGAT Connections:

The WTGAT has one multi I/O connector to connect external devices. The user serial port and charger cable will connect to this connector.
There are several other I/O pins that allow the WTGAT to be used for other applications.

Front View

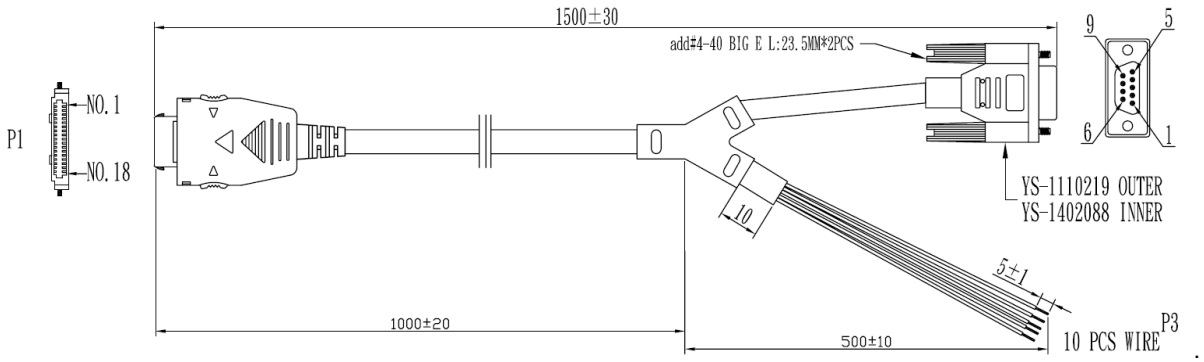


Pin Out:

Pin	Name	Function
1	Vpp	External input power. Must be between 4 and 4.7 Volt(Max) DC up to 1A. *** Internal battery must be removed!**
2	Vcpu	Power output 3.3Volt/DC – 50mA max (for ADC power)
3	Park	Park switch. To activate connect to ground.
4	AUX1	Digital input AUX1 (Max +60Vdc). To activate connect to ground.
5	AUX2	Analog input. This input is NOT protected so care must be taken before using this input. Power input between 0 and 3.3VoltDC max. We recommend to use Vcpu as power supply. Can be used to measure temperature.
6	Loop1	Loop connection1 (See 'Connecting the Wire loop cable')
7	Loop2	Loop connection2 (See 'Connecting the Wire loop cable')
8	Panic	Panic input. Connect to ground or loop2/loop1 to activate
9	Vin	Battery charge input power. Must be +5Volt/ 500mA
10	Vin	Battery charge input power. Must be +5Volt/ 500mA
11	Serial In	Serial port input 9600 Baud
12	Serial Out	Serial port output 9600 Baud
13	Speaker +	External positive Speaker connection 8 Ohm /1.2 Watt max output
14	Speaker -	External negative Speaker connection 8 Ohm /1.2 Watt max output
15	GND	Ground
16	GND	Ground
17	MIC -	External negative microphone connection
18	MIC +	External positive microphone connection

I/O cable pin out for WTGAT:

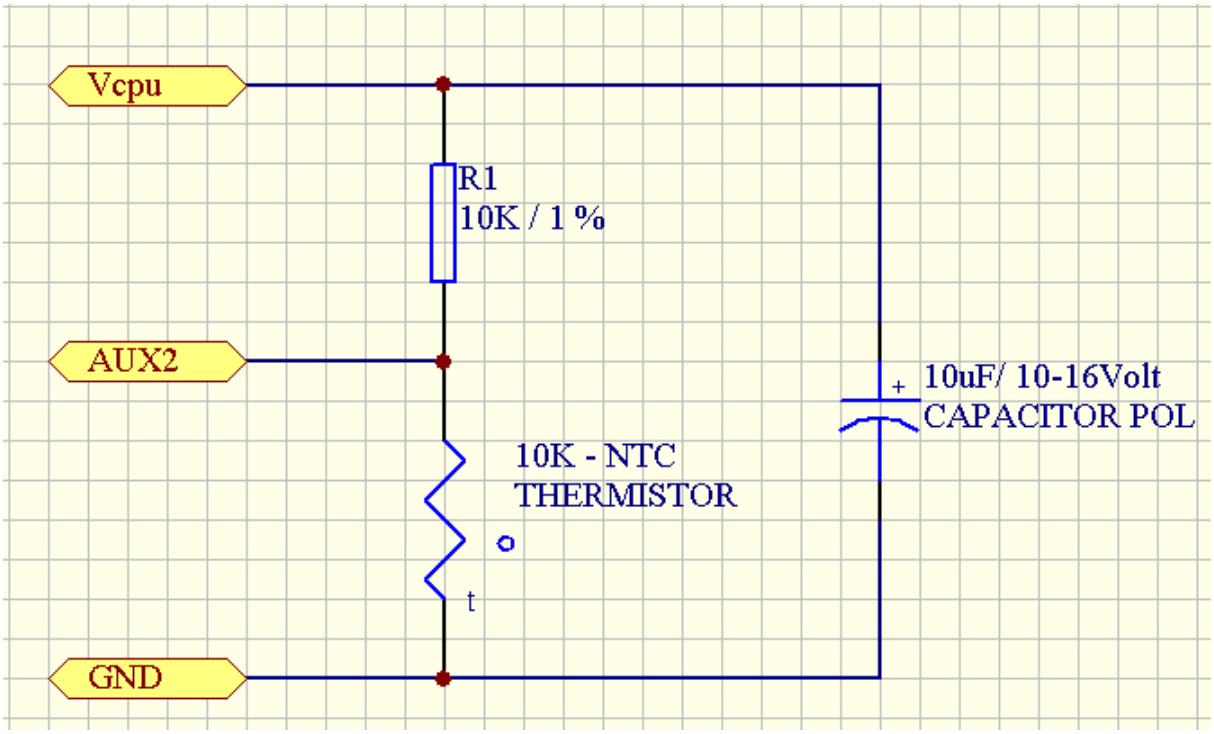
The picture below shows the WTGAT I/O cable.



Pin Out:

Pin	Name	Color
1	External input power 4~ 4.7 Volt(Max) DC / 1A.	Black
2	Power output 3.3Volt DC – 50mA Max	Brown
3	Park switch	Red
4	Digital input AUX1 (Max +60Vdc)	Orange
5	Analog input or Digital output 0 ~3.3Volt DC only	Yellow
6	Loop1	Green
7	Loop2	Blue
8	Panic input	Purple
9	Battery charge input power+5Volt/ 1A	Grey
10		
15	Ground	White
16		

Measuring temperature using the AUX2 input example:

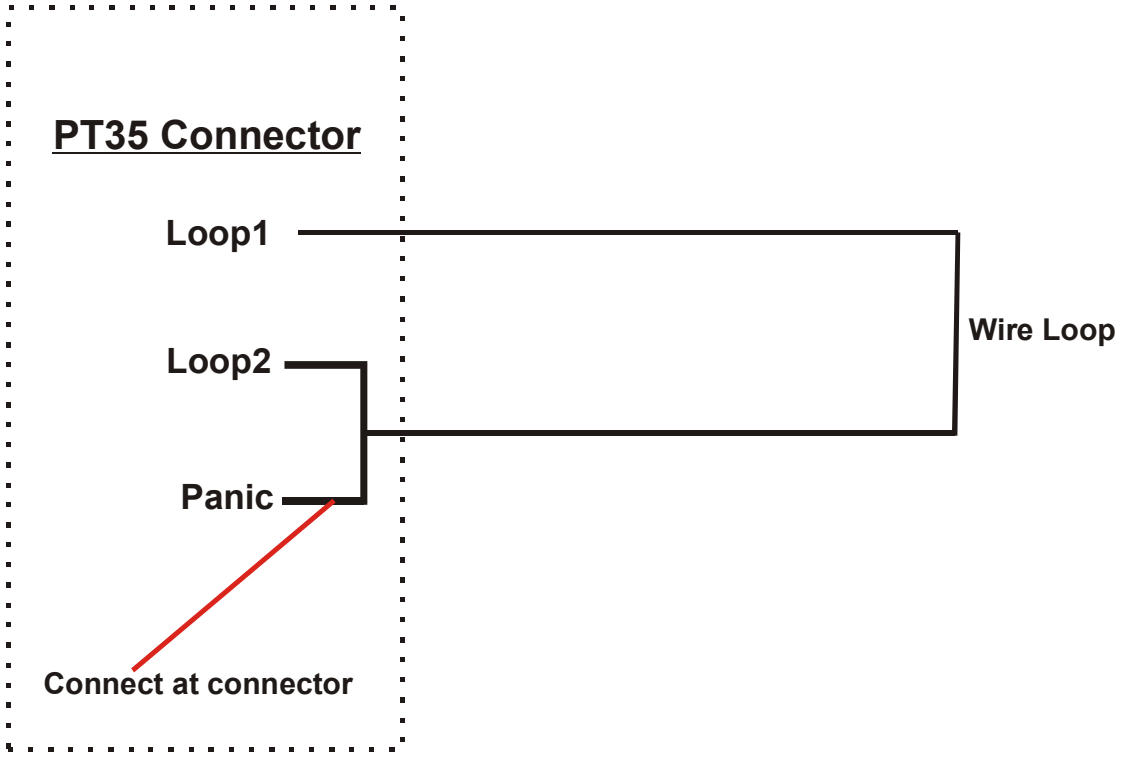


The AUX2 input voltage will change when the temperature changes. Most Thermistors are at normal resistance (in above example we use 10 K) at 25 degrees. So in our example that will be 10K.
The input voltage to AUX2 will then be 1.27 Volt (ADC value will be 128 decimal or 80 hex).

The input voltage is always included in the ‘location message’ and can be configured to activate below or above set value.

Connecting the wire loop cable:

The WTGAT has option to connect external wire. When the wire is cut the WTGAT will automatic power up. This function will activate and work in any sleep mode configured.
The wire connection must be connected as shown here:



Please Note:

If the wire loop is cut the WTGAT will power up (if not already powered up) and sent Panic activation message. Once the wire is cut the WTGAT will not power down again. The wire must be restored or connection between Panic, loop2 and loop1 disconnected. **(The wire must be open for 1+ second when working in 'normal' running mode or 3+ seconds when in sleep mode)**

14. Technical Specifications

Description:

Hardware Features:

* The GPS and GSM modules are integrated inside the tracking unit case.
* GPRS/ SMS and Voice I/O
* Up to 5.000 location / activation messages can be saved (automatic)
* Built in motion switch
* Battery charge circuit to charge 3.7 Volt Li-ion battery
* Panic input button (will power up the unit from deep sleep mode)
* Park Switch
* Super low battery use in deep sleep mode (low power timer on)
(Up to 3 years **(*)** with 3.7V/800mA battery)
* Timer circuit can wake up unit by time (hours – minutes – seconds – days Months) or any configured time or date.
* Time backup battery will last up to 5+ years without battery or external power connected.
* 18 Pin mini multi I/O connector
* One digital input (0 to 60VDC)
* One analogue input (3.3VDC Max) or Digital Output (0-3.3Volt)
(Can be selected as Input or Output using the setup configuration menu)
* External battery backup option (to connect second battery or Solar panel option)
* USB to Serial (Serial RS232 port (9600 baud Rate)) for external communication, firmware upgrade or direct access to modem (9600 baud rate).
* Build in Amplified Speaker (1.25Watt output power) and Microphone
* Build in Active high performance GPS antenna
* Unit can be activated from deep sleep mode using Panic input, wire connection (will activate the unit when wire is broken or cut) or when closed loop is opened.
* Low battery led indicator
* Status and GPS led indicator
* Build in buzzer for warning and motion detection
* External option to connect Speaker and Mic
* Operating temperature range -25 deg. C to +70 deg. C (Battery 0 – +60 Degrees C.)

*** This assumes that the battery has negligible self-discharge**

Important Note:

The PT33 is provided with a replaceable Lithium battery. Incorrect type could result in an explosion.

- **If the battery is placed in an OPERATOR ACCESS AREA, there shall be a marking close to the battery or a statement in both the operating and the servicing instructions;**
- **If the battery is placed elsewhere in the equipment, there shall be a marking close to the battery or a statement in the servicing instructions.**

This marking or statement shall include the following or similar text:

CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS

Physical Characteristics:
Unit size: LxWxH 90.4x 38.4 x 15.1 mm (18.25 max)
Plastic / Waterproof if required
Case Environmental Characteristics:
Operational Temperature: - 25 ~ + 70 °C (board temperature)
Storage temperature -40°C to +80°C
1 Multi I/O connector (18 pin with locking pins)
1 On/Off switch / 1 Park switch / 1 Panic button

Electrical Characteristics:
Input Voltage: + 5 Volt DC regulated (USB port power)
Power Consumption: Depending on operating mode between 10- hours and 3 years(*) (when using 800mA battery).

GPS Specifications:

uBlox- LEA-5S chipset version

Receiver Performance Data
Receiver Type 50-channel u-blox 5 engine
GPS L1 C/A code
GALILEO L1 Open Service (with upgrade)
SBAS: WAAS, EGNOS, MSAS, GAGAN
Max. Update Rate 4 Hz
Accuracy1 Position 2.5 m CEP SBAS 2.0 m CEP
Acquisition (Open sky, stationary requirements)
Cold starts: 29 s (Open Sky) – Can be between 1-3 minutes or more
Warm starts: 29 s
Aided starts2: <1 s
Hot starts: <1 s

Sensitivity
Tracking: - 160 dBm
Reacquisition: - 160 dBm
Cold starts: - 144 dBm

Operatl. Limits Velocity: 515 m/s (1000 knots)
Operating Temp.
-40°C to 85°C
Storage Temp.
-40°C to 85°C

Powered by the 50-channel u-blox 5 positioning engine, the module boasts a Time-To-First-Fix of under 1 second. The dedicated acquisition engine, with over 1 million correlators, is capable of massive parallel time/frequency space searches, enabling it to find satellites instantly. Innovative design and technology suppresses jamming sources and mitigates multipath effects, giving u-blox 5 GPS receivers excellent navigation performance even in the most challenging environments.

GSM Modem Specifications:

Power supply Single supply voltage 3.4V – 4.5V
Power saving Typical power consumption in SLEEP mode to 3mA

Quad-band: 900, DCS 1800, PCS 1900,EGSM 850, DCS 1800, PCS 1900
Compliant to GSM Phase 2/2+
GSM class Small MS

Transmit power Class 4 (2W) at EGSM900
Class 1 (1W) at DCS1800 and PCS 1900
GPRS connectivity
GPRS multi-slot class 10
GPRS mobile station class B

Build in TCP/IP support.

Temperature range
Operation: -25°C to +70°C
Storage temperature -40°C to +80°C

DATA
GPRS:
CSD:

GPRS data downlink transfer: max. 85.6 kbps
GPRS data uplink transfer: max. 42.8 kbps
Coding scheme: CS-1, CS-2, CS-3 and CS-4
Supports the protocols PAP (Password Authentication
Protocol) usually used for PPP connections.
Integrated TCP/IP protocol.
Support Packet Switched Broadcast Control Channel (PBCCH)
CSD transmission rates: 2.4, 4.8, 9.6, 14.4 kbps, non-transparent
Unstructured Supplementary Services Data (USSD) support
SMS, MT, MO, CB, Text and PDU mode
SMS storage: SIM card
Support transmission of SMS alternatively over CSD or GPRS.
User can choose preferred mode.
FAX Group 3 Class 1
SIM interface Supported SIM card: 1.8V ,3V

Audio features Speech codec modes:
Half Rate (ETS 06.20)
Full Rate (ETS 06.10)
Enhanced Full Rate (ETS 06.50 / 06.60 / 06.80)
Echo cancellation
Noise reduction
Phonebook management Supported phonebook types: SM, FD, LD, MC, RC, ON,
ME,BN,VM,LA,DC,SD
Application Toolkit Supports SAT class 3, GSM 11.14 Release 98
Real time clock Implemented
Timer function Programmable via AT command
Firmware upgrade Firmware upgradeable over serial interface
Coding schemes and maximum net data rates over air interface
Coding scheme 1 Timeslot 2 Timeslot 4 Timeslot
CS-1: 9.05kbps 18.1kbps 36.2kbps
CS-2: 13.4kbps 26.8kbps 53.6kbps
CS-3: 15.6kbps 31.2kbps 62.4kbps
CS-4: 21.4kbps 42.8kbps 85.6kbps

GPS/ GSM Antenna Specifications:

Build into the unit.

Power use :
Using 800mA/ 3.7Volt battery.

The WTGAT has 3 different working modes. Depending on configuration settings power consumption will be as shown here.

1. Normal running mode:
GSM on – GPS on -Timer – running – Panic – Digital input – ADC input on
Will last 10 Hours.

No movement and inputs activated for 5 minutes then:
GSM on – GPS off -Timer – running – Panic – Digital input – ADC input off
(No activation last 4 to 11 Days – Depending on GSM provider refresh rate)

2. Basic sleep mode:
GSM on – GPS on -Timer – running – Panic – Digital input – ADC input on
Will last 10 Hours.

No movement and inputs activated for 5 minutes then:
GSM off – GPS off -Timer – running – Panic – Digital input – ADC input off
Will last up to 55+ days **(*)**.

3. Deep sleep mode:
GSM on – GPS on -Timer – running – Panic – Digital input – ADC input on
Will last 10 Hours.

No movement and inputs activated for 5 minutes then:
GSM off – GPS off -Timer – running – Panic – or wire loop connected
Will last up to 3-5+ years **(*)**

*** This assumes that the battery has negligible self-discharge**

Possible applications:

- Security tracking
- Containers or Boats where no external power connection is available
- Remote locations
- Older people
- Dog tracking

15. Federal Communications Commission (FCC) Statement

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

Federal Communications Commission (FCC) Statement

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.

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

Operation is subject to the following two conditions:

1) this device may not cause interference and

2) this device must accept any interference, including interference that may cause

undesired operation of the device.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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

Updated 5-11-2008