User Manual

For the

AR-3HU / SR-3HU / S4N-3HU / KT-3HU

Vehicle Tracking Device

April 20, 2016

R1.1

| Author	Revision	Changes	Date
Hao	1.1	Initial version	2016-04-20

Contents

1   Introduction

The AR-3HU / SR-3HU / S4N-3HU / KT-3HU is a self-Contained vehicle tracking device that combines GPS location with GSM/GPRS connectivity.

The AR-3HU / SR-3HU / S4N-3HU / KT-3HU appears to a user or a server application as a single endpoint device. It can be queried, updated and configured either through a serial connection, or an over the air GPRS or WCDMA IP connection, or through SMS messaging. The AR-3HU / SR-3HU / S4N-3HU / KT-3HU presents itself over these connections as an enhanced cellular modem with attached functional elements. These elements include:

- GPS location engine
- 2 General Purpose Bidirectional I/O (GPIO) pins
- 1 Relay drive pin output
- Serial UART port
- Input voltage monitor (optional)
- Timers
- Watchdog lockup protection (Dedicated watchdog circuit is optional)
- Factory load option for motion detection

Access to these elements and general purpose interfaces is done through an extended AT command set as defined herein.

Application scene:
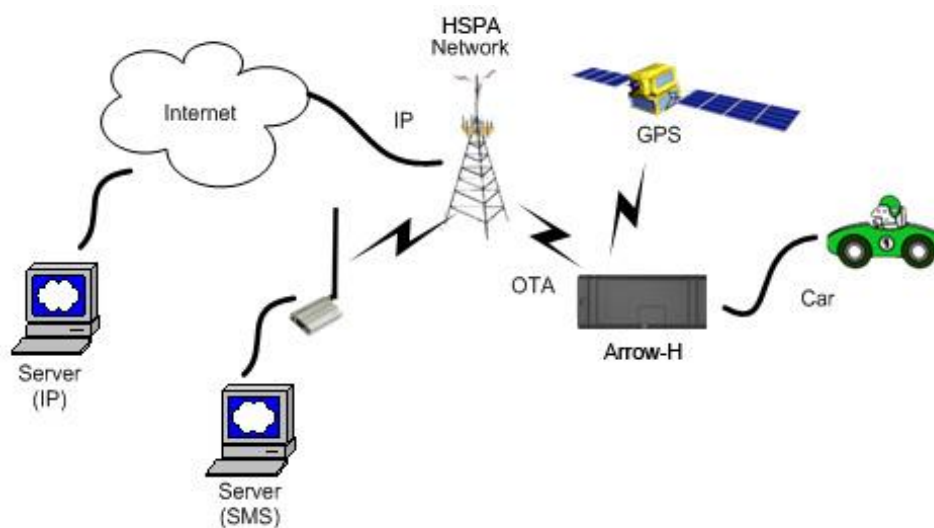
This product will be designed based on the 2G or WCDMA wireless data/MT6276 Baseband chipset, which includes GPS functionality, ARM CPU and GPRS protocol. This baseband internal connection 8M serial flash, GSM 850M/1900M RF Transceiver and GPS receiver, and RF Front end circuit.

The device will use one dual band antenna （GSM850&PCS1900）and one dedicate GPS antenna.

2 Hardware Design

2.1 Basic Hardware

Items	Requirement
Baseband Chipset	MT6276A
RF 2G Transceiver	RF3235
RF 3G Transceiver	RF7411TR7
Memory	MCP_NAND 1Gb(x16) / mobile DDR 512Mb(x16)
Air Interface	Support for WCDMA, Class 12 GPRS, GPS
Frequency	2G band support : 850MHz & 1.9GHz Support for 12 class GPRS 3G band support : Band 2 & Band 5
Antenna	Internal Antenna[850M&1900M]
GPS Antenna	Dedicate high performance ceramic antenna
UIM requirement	No-UIM mode, GSM card connector optional
Interface	UART TX
	UART RX
	12V DC Input（1A current）
	Relay Drive (12V Output ,500mA current)
	GPIO1
	GPIO2
Battery Monitor	internal analog input scaled (Optional)
Build in battery manager	Supported
Dedicate Timers	No
Watchdog	Supported
Motion Detect	Optional（GPS/Sensor）
LED	2 LED Supported 2 LEDs(one is RED，one is Green)
Battery	Built in battery（80MAH Lion）
Working Time	4 hours
Power switch	No
Power Cable color	8 colors
Power Cable connector type	8 pin
Power Consumption	< 5Watts

The AR-3HU /SR-3HU / S4N-3HU / KT-3HU provides support for specialized hardware features through extended AT commands. The features supported include the following.

GPS
The major functionality of the GPS module is to compute the correlation results between the

incoming signal and the selected PRN code based on certain Carrier Doppler Frequency, Code Doppler Frequency, code phase, carrier phase, and the particular satellite the module is tracking or acquiring.

GPIO

Two GPIO pins, GP1 and GP2, are presented to the external environment on the main connector. They are general purpose bidirectional lines capable of providing system interrupts to generate a report or drive logic levels to external devices. These lines are 2.8V logic level and are 16V tolerant. These pins default to input. GP1 is pulled down representing 0 when disconnected; GP2 is pulled up representing logical 1 when disconnected. They should be asserted to a known value if used. GP1 is intended to use for Ignition Sensing.

LED's

Two LED status indicators are provided to verify correct installation and operation. The status LEDs are color coded and directly convey the status of the cellular and GPS subsystems as described in the table below. Their valid operation also indicates operational status and power.

LED	Function	Status
Red	GPS	**On: GPS satellites acquired and Locked** **Flash Slow**: GPS satellite search is in progress **Off: No power or GPS subsystem fault**
Green	GSM/GPRS Connection	**On: Indicates GPRS connection is made** **Flash Slow**: GPRS subsystem initialized but no connection **Flash Fast**: GPRS initialization in process **Off: No power or GSM subsystem fault**

The AR-3HU /SR-3HU / S4N-3HU / KT-3HU provides user control allowing the LEDs to be extinguished once installation is verified. This feature reduces power and further conceals the AR-3HU /SR-3HU / S4N-3HU / KT-3HU Tracker from untrained parties wishing to defeat its operation.

UART

A UART port is provided for AT command and data interaction and optionally for application specific control.

Relay Driver

A 500mA sink capable output pin is provided. This pin is meant to drive a relay coil indented to interrupt the starter solenoid relay for the ignition circuit to a car.

Battery Monitor

The battery monitor is internal analog input scaled such that the DC value of the power input pin to the AR-3HU /SR-3HU / S4N-3HU / KT-3HU system is measured. This value is scaled to span the most significant 8 bits of the A/D and consequently covers a scale from 0 to 25.5 Volts.

Timers

Timers resident on the GSM baseband chip generate periodic interrupts for power down wakeup, watchdog support, report generation and other timer related functions. Report timers are supported by related AT command and cause generation of periodic reports.

Watchdog

MT6261D chipset provide internal software Watchdog, and a physically dedicate Watchdog circuit requirement is optional.

Motion Detect (Option)

A factory populates option for motion detector is provided. If populated at the time the AR-3HU /SR-3HU / S4N-3HU / KT-3HU is manufactured, this option will work with firmware power down options to keep the AR-3HU /SR-3HU / S4N-3HU / KT-3HU in a very low power down state until motion is detected. Upon wakening, a report can then be generated.

2.2 Basic RF Performance

Items	Requirements	Remark
TRP free space	>= 20 dBm	TRP free space
TIS free space	<= -104dBm	TIS free space
Antenna loss	<= -3 dB	TRP-TX Power Conducted
Antenna Loss	<= -3 dB	RX receive sensitivity conducted – TIS

Board RF Specification	
Cellular Band RX	
2G Frequency range	869MHz～894MHz/1930MHz~1990MHz
Sensitivity	-108dBm (FER≤0.5%)
Dynamic range	-25～-108dBm (FER≤0.5%)
Single tone Desensitization	-102.4dBm(FER≤1%,-30dBm@±900KHz)
Intermediation Spurious Response Attenuation	-102.4dBm(FER≤1%,-43dBm@±900 KHz/±1800KHz)
	-91.4dBm(FER≤1%,-32dBm @±900 KHz/±1800KHz)
	-80.4dBm(FER≤1%,-21dBm @±900 KHz/±1800KHz)
Conducted Spurious Emission	<-76dBm/1MHz（RX band）
	<-61dBm/1MHz（TX band）
	<-47dBm/30KHz（other frequency）
Cellular Band TX	
2G Frequency range	824MHz～849MHz/1850MHz～1910MHz
Maximum Frequency error	±200KHz
Maximum output power	33 dBm for Band 850, 29 dBm for Band 1900.
Minimum controlled output power	<-50dBm
Standby output power	<-61dBm
Code domain power	The code domain power in each inactive code channel shall

	be 23 dB or more below the total output power measured on both the I and Q data channel combined.
Time reference	±1.0uS
Waveform quality	>0.944
Range of open loop output power	（test1：－25dBm/1.23MHz）－47.7±9.5dBm
	（test2：－60dBm/1.23MHz）－7.7±9.5dBm
	（test3：－93.5dBm/1.23MHz）20.3±9.5dBm
Conducted spurious emission	-42dBc/30Khzor-54dBm/1.23MHz （|Δf|:1.25MHz~1.98MHz）
	-50dBc/30Khzor-54dBm/1.23MHz （|Δf|: 1.98MHz~4.00MHz）
	<-36dBm/1kHz （|Δf| > 4MHz, 9KHz < f < 150KHz,）
	<-36dBm/10kHz （|Δf| > 4MHz, 150kHz<f<30MHz,）
	<-36dBm/100kHz （|Δf| > 4MHz, 30MHz<f<1GHz）
	<-30dBm/1MHz （|Δf| > 4MHz, 1GHz<f<12.75GHz）
WCDMA Band 2 & 5 RX	
3G Frequency range	869MHz～894MHz/1930MHz~1990MHz
Maximum Frequency error	±200KHz
Maximum output power	21～23 dBm
Minimum controlled output power	<-50dBm
Standby output power	<-61dBm
Error Vector Magnitude	<17.5%
WCDMA Band 2&5 TX	
3G Frequency range	824MHz～849MHz/1850MHz～1910MHz
Maximum Frequency error	±200KHz
Maximum output power	23dBm
Minimum controlled output power	<-50dBm
Standby output power	<-61dBm
Error Vector Magnitude	<17.5%

GPS	
AGPS Support	Embedded AGPS software supporting an internal GPS subsystem solution E911 FCC mandated phase 1 and phase 2 (optional1)
Frequency Support	L1-band (1.57542GHz) Channels: 210 PRN，66 Search，22 Simultaneous tracking
Sensitivity	Sensitivity (UHIS): Tracking: -156dBm Reacquisition: -153dBm Acquisition: -144dBm
Tracking Time Requirement	Acquisition time: Hot: <2s Warm: <15s Cold: <60s Reacquisition: 2s - 10s Depends on signal level

2.3 Certification and Safety

Items	Requirement
Drop Design	1.2meter 6 direction standard drop test
Temperature Range	-20 to 40°C Operation -50 to +100° C Storage
Humidity:	20% to 90% Operation 10% to 95% Storage
Altitude:	-500 to +18,000m
Vehicle ISO Test	ISO 7637-2-2004; ISO 7637-3-2007; ISO 10605-2008; ISO 16750-2-2010
FCC Certification	FCC 47 CFR Part 2&22&24
Safety	UL Listing
Others Operator Requirement	Industry Canada/ AT&T (optional)
ESD Requirement	10KV non-Conductive

2.3 Certification and Safety

3 Software Features

3.1 Basic Software

Items	Requirement
RF Function	GSM 850/1900MHz/WCDMA(Band2&5); GPS
GPRS Data	Supported
IP Stack	Ipv4/IPV6
Upgrade Method	Remote update / PC tool
Remote Update	Supported
Power Modes	Supported
AT Command	Supported
Report	Supported；3000records
Driver	GPIO，LED，GPS，UART
GPIOs	Interrupt for Door Open Detect, Ignition Status
LEDs	GPS Status, WCDMA Status
Watch Dog	Supported (CBP8.2 integrated)
Reset	Soft reset
Startup Banner	Supported

3.2 Remote Update

The AR-3HU /SR-3HU / S4N-3HU / KT-3HU supports OTA field upgrades of the AR-3HU /SR-3HU / S4N-3HU / KT-3HU resident application. An over the air TFTP (Trivial File Transfer Protocol) connection is made over a UDP/IP connection. A replacement file is then transferred from a server to the AR-3HU /SR-3HU / S4N-3HU / KT-3HU and that file replaces the previous application image.

3.3 Auto Execute

The Auto Execute Utility copies the contents of file system.exf into system executable RAM and executes it from there. This file is the factory default application. Another file named custom.exf can be loaded into the file system.

Auto Execute will look first for a file named update.exf and load and execute that in place of custom.exf if it exists. If update.exf executes successfully, the previous copy of custom.exf is deleted from the file system and update.exf is renamed to custom.exf.

3.4 Power Modes

The AR-3HU /SR-3HU / S4N-3HU / KT-3HU device supports several power modes that are set by the power mode command. In full power mode the GPS is active and the cellular subsystem will maintain a persistent cellular connection whenever service is available. IP connection is maintained according to the configuration of the device.

The device can be put in low power mode whenever it runs on a backup battery or if the external battery is low or if it is not moving. In low power mode the GPS is not running and the LED's

are off. The device would return to full power whenever an event occurs that triggers a report. Those events include:

- Report timer
- GPIO change
- IP change
- Battery threshold
- Heartbeat
- Watchdog
- Power-up

Any hardware or software reset will return the device to full power mode.

3.5 AT Command

AR-3HU /SR-3HU / S4N-3HU / KT-3HU commands are AT extensions specific to AR-3HU /SR-3HU / S4N-3HU / KT-3HU devices. They are closely based on commands that are as similar as possible to other industry common devices and are essentially subsets of standard AR-3HU /SR-3HU / S4N-3HU / KT-3HU commands. Common commands used with GPRS modems supporting IP connectivity are not included within the AR-3HU / SR-3HU / S4N-3HU / KT-3HU command set extensions. These commands are left in their native structure, as defined by the respective baseband GSM chip supplier which product already in use.

Command Summary

The following commands are specific to the AR-3HU /SR-3HU / S4N-3HU / KT-3HU. They are organized by categories.

Event Setting Commands

The following set of commands enables/disables reporting of the various events and state transitions that take place in the system. The event setting commands typically include trigger(s) that indicate what event or state transition would cause an event report to be sent. Often state transitions also qualified with "debounce" time to prevent various flickers and intermittent state transitions. Examples are: (1) state change of an input pin; (2) crossing a geo-fence line for a brief period of time and then crossing it back.

As a general rule every event and state transition has its own unique event ID that is reflected in the report triggered by the said event. Refer to Table 2 – Events for the complete list of event ID's. Those default event ID's can be changed by the user to accommodate specific server implementations, by explicitly specifying what they are in the respective commands. As an example, all trip related events can be mapped to the same event ID, so there is no need to parse the specific event trigger. Following is a list of event setting commands:

1. AT+XBUBE   Backup Battery Events
2. AT+XDRI   Drive Report Intervals
3. AT+XDTS   Drive Trip Start/Stop
4. AT+XGFE   Geo-Fence Enable
5. AT+XGPL   GPS Lost/Lock

6.	AT+XHB	Heart Beat
7.	AT+XHBB	Heart Beat on BuB
8.	AT+XIA	Idle Alert
9.	AT+XIGN	Ignition
10.	AI+XIOE	I/O Event
11.	AT+XIPC	IP Changed
12.	AT+XPUP	Power Up
13.	AT+XPWLE	Power Low Event
14.	AT+XPWSE	Power Save Event
15.	AT+XRLYE	Relay Event
16.	AT+XRSTE	Reset Event
17.	AT+XSPD	Speeding
18.	AT+XTA	Tow Alert
19.	AT+XVTOE	Virtual Trip Odometer Event

Action Commands

Action commands instigate an immediate action. They cannot be included in configuration files. Following is a list of action commands:

20.	AT+XBUBX	Back-Up Battery eXit
21.	AT+XCAN	CDMA Activate Now (CDMA devices only)
22.	AT+XCC	Clear Counters
23.	AT+XCFN	CDMA FOTA Now (CDMA devices only)
24.	AT+XCPN	CDMA PRL Now (CDMA devices only)
25.	AT+XFDR	Factory Defaults Restore
26.	AT+XFDU	Factory Defaults Update
27.	AT+XDNSN	DNS Now
28.	AT+XMRN	Maintenance Report Now
29.	AT+XRN	Report Now
30.	AT+XRNE	Report Now Echo
31.	AT+XRST	Reset - soft/hard
32.	AT+XRTN	Reset all provisioning data (CDMA devices only)
33.	AT+XVO	Virtual Odometer
34.	AT+XVTO	Virtual Trip Odometer

File Update Commands

35.	AT+XUAPP	Update Application file OTA
36.	AT+XUFW	Update Firmware file OTA
37.	AT+XUIO	Update IO controller file OTA (Battery powered devices only)
38.	AT+XURP	Update Retry Policy
39.	AT+XUTF	Update Tree.xml File OTA (CDMA devices only)
40.	AT+XUUC	Update User Configuration file OTA

Periodic Action Commands (with Events)

Periodic Action commands trigger time based periodic action, such as reset, data session renewal, etc. Some actions can trigger an event report to indicate the respective action took place. Following is a list of event setting commands:

41. AT+XCFC   CDMA FOTA Configuration (CDMA devices only)
42. AT+XCPC   CDMA PRL Configuration (CDMA devices only)
43. AT+XDNSP   DNS renew Periodically
44. AT+XKA   Keep Alive
45. AT+XPST   Packet Session Timeout
46. AT+XRSTP   Reset Periodically

Configuration Commands

Configuration commands control various parameter settings of the device. For convenience they are grouped into topical settings. Following is a list of configuration commands:

Communication related settings

47. AT+XAPN   Set APN (GSM devices only)
48. AT+XCSW   Cellular Session Watchdog
49. AT+XIP   Set target server IP address and port number
50. AT+XLPORT   Set Local IP port number
51. AT+XMIP   Set Maintenance server IP address and port number
52. AT+XPRP   PxP Renewal Policy
53. AT+XSMSD   SMS Destination
54. AT+XSMSS   SMS Source
55. AT+XSPIP   Set Serial Port (A-UART) IP address and port number
56. AT+XUIP   Set Update server IP address and port number

Protocol related settings

57. AT+XRPA   Report Acknowledge
58. AT+XRPF   Report Format – Protocol, ASCII/Binary
59. AT+XRPM   Report Mask
60. AT+XRPQ   Report Queue length
61. AT+XRPSF   Report Start Frame

Drive Trip related settings

62. AT+XDDI   Drive Distance Interval
63. AT+XDHC   Drive Heading Change
64. AT+XDMES   Drive Motion End Speed
65. AT+XDMSD   Drive Motion start Distance
66. AT+XDMSS   Drive Motion Start speed
67. AT+XDMT   Drive Motion Trigger
68. AT+XDTT   Drive Trip Trigger

Peripheral related settings

69.	AT+XBUB	Back-Up Battery
70.	AT+XSPC	Serial Port Configuration
71.	AT+XGPLP	GPS Lock Parameters
72.	AT+XGPLT	GPS Lock Timeout
73.	AT+XIGM	Ignition Mode
74.	AT+XIGV	Ignition Voltage
75.	AT+XIOD	I/O Direction
76.	AT+XIOW	I/O Write
77.	AT+XLEDO	LED's Off
78.	AT+XOWM	One-Wire Mode
79.	AT+XPWL	Power Low
80.	AT+XPWM	Power Modes
81.	AT+XPWS	Power Save
82.	AT+XRLY	Set Relay

Maintenance report settings

83.	AT+XMHB	Maintenance Report Heart Beat
84.	AT+XMOP	Maintenance-report On Power-up
85.	AT+XMRC	Maintenance Report Clone
86.	AT+XMRPM	Maintenance Report Mask

Miscellaneous settings

87.	AT+XGF	Geo-Fence
88.	AT+XGFH	Geo-Fence Here
89.	AT+XSLCK	SIM Lock
90.	AT+XCIN	Configuration Id Number
91.	AT+XCIV	Configuration Id Version

Information Commands

Information commands simply output various data regarding the current status of the device. They are mostly useful for troubleshooting. Following is a list of information commands:

92.	AT+XGFR	Geo-Fence Read
93.	AT+XIOR	I/O Read

Configuration reading commands

94.	AT+XCFG	Configuration
95.	AT+XCFD	Configuration file – Default
96.	AT+XCFU	Configuration file – User

Information commands

97.	AT+XINCEL	Info: Cellular
98.	AT+XINDAT	Info: Data
99.	AT+XINEVT	Info: Events
100.	AT+XINGPS	Info: GPS

101. AT+XINNET Info: Network
102. AT+XINPWR   Info: Power
103. AT+XINVER Info: Versions

Report

The AR-3HU /SR-3HU / S4N-3HU / KT-3HU captures data and forms a report record with that data. A report is a data structure containing all of the sensory and other typically useful data on the device. Reports are generated in response to specified events, such as periodic timeout, speed threshold, geo-fence crossing, etc., or in response to a Report Now command (AT+XRN).

Report Queuing

If a report trigger occurs while UDP connection is unavailable, it will be queued until connection becomes available and transmitted at such time. The only way report(s) can be lost is if too many reports are queued and the report-queue is overflowing. In such case the earliest report(s) will be discarded. The size of the queue can be configured via the Report Queue (AT+XRPQ) command.

Ack'ed Mode

UDP is not a 100% reliable connection and occasional reports or command/responses may be lost. Since all commands have responses, the server can repeat any command to which there is no response. In order to assure reliable reception of reports, Arsenal devices can be configured either in Normal or Ack'ed mode to send the reports. In the Normal mode the reports are simply sent "as is" with no acknowledgment from the server. In the Ack'ed mode every report sent is expected to be acknowledged by the server by sending back an ACK message back. If acknowledgement is not received within the specified timeout, the report is re-sent. If the report is not acknowledged after the specified number of attempts, it is queued. If acknowledgement is received after the report is queued (i.e. past timeout of the last attempt), it is ignored.
Report is not considered "complete" until its acknowledgement is received. Thus, if report X is sent and report X+1 is triggered while waiting for acknowledgement of X, report X+1 will be queued until such acknowledgement is received and only then sent. The Arrow will attempt to re-send queued report(s) every time a new report is triggered. If there is more than one report queued, the reports will attempt to be sent in the order of triggering and only once the report is acknowledged, the next report is attempted. This assures that reports are sent and received in order.

Ack'ed mode assures that all reports are received, but adds overhead in time and data. Report that is not acknowledged is sent again and eventually will be queued and sent again. The number and frequency of re-tries is configurable via the Report Acknowledgement command (AT+XRPA).

Event Report Format

Reports can be generated in either an ASCII representation of hex or as actual binary encoded hex. The reporting format is selected via Report Format (AT+XRPF) command. Note that while

the logical content of the report is the same in both representations, the size for an ASCII report is twice the size of actual numbers of bytes compared to binary representation.

3.6 Reset

There are a number of resets available on the device. Soft reset resets the baseband only by using an internal watchdog, while hard reset power cycles the whole device. There is also an option to reset the GPS sub-system only.

3.6.1 Context Preservation

When a reset is caused by the Network Watchdog or by the Reset command (modes 0,1), the context of the system is being preserved and is restored after the reset. The context includes all the periodic timers, the report queue, the odometer, etc. This allows to reset the unit as a troubleshooting measure either periodically or due to Network Watchdog without losing reports that are already in the queue or are pending on running timers. Note that the reset process may cause 1-2min of inaccuracy in the timers and should not be considered as very precise.

3.7 Startup Banner

After a reset a startup banner is printed through the UART only. The format and content of the banner shown below:

```
FW:<firmware version>; BIN:<bin version>; MEID/ESN:<MEID/ESN>
APN1:<apn1 name>; IP:<IP>:<port>;LPORT:<lport>
```

4 Test Method

4.1 Hardware

| Test Item	Description
Baseband Function Test	• Power Input Test • Power Consumption and Current Test • Heat Dissipation Test • UART Stability Test • GPIO Level Test • LED Stability Test • Drop Down Test • ESD Test • High/Low Temperature Test • Humidity Test
RF Test	• RF Performance Test • GPS Performance Test • Antenna Performance Test

4.2 Software Test

Test Environment Construct

➢ Message Test environment
  1. USB dongle and PC as message server
  2. Send message to AR-3HU /SR-3HU / S4N-3HU / KT-3HU
➢ UDP Test environment
  1. Connect dongle to PC and create dialup as ip server
  2. AR-3HU /SR-3HU / S4N-3HU / KT-3HU create IP connection to server
➢ UART Test environment
  1. Connect AR-3HU /SR-3HU / S4N-3HU / KT-3HU to pc with com serial cable
  2. Open Terminal tool and send at command
  3. Response can be shown at terminal window
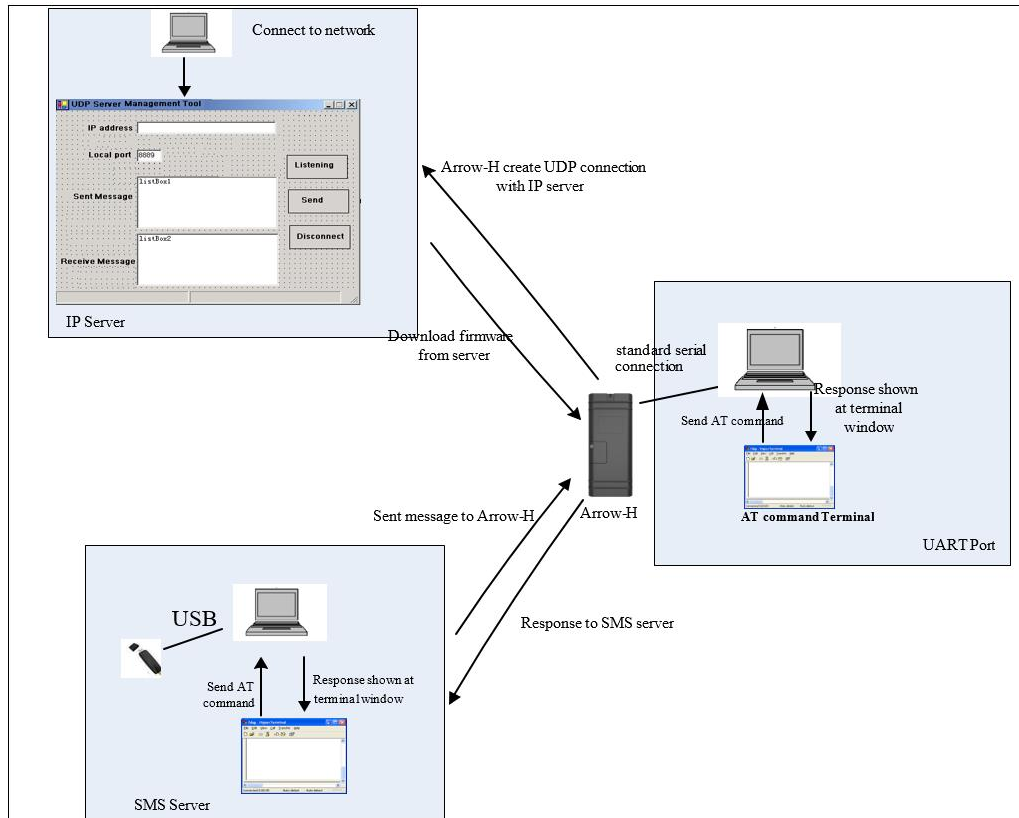
Mechanical Structure(mm)

TOP View

RIGHT View

BOTTOM View

FRONT View
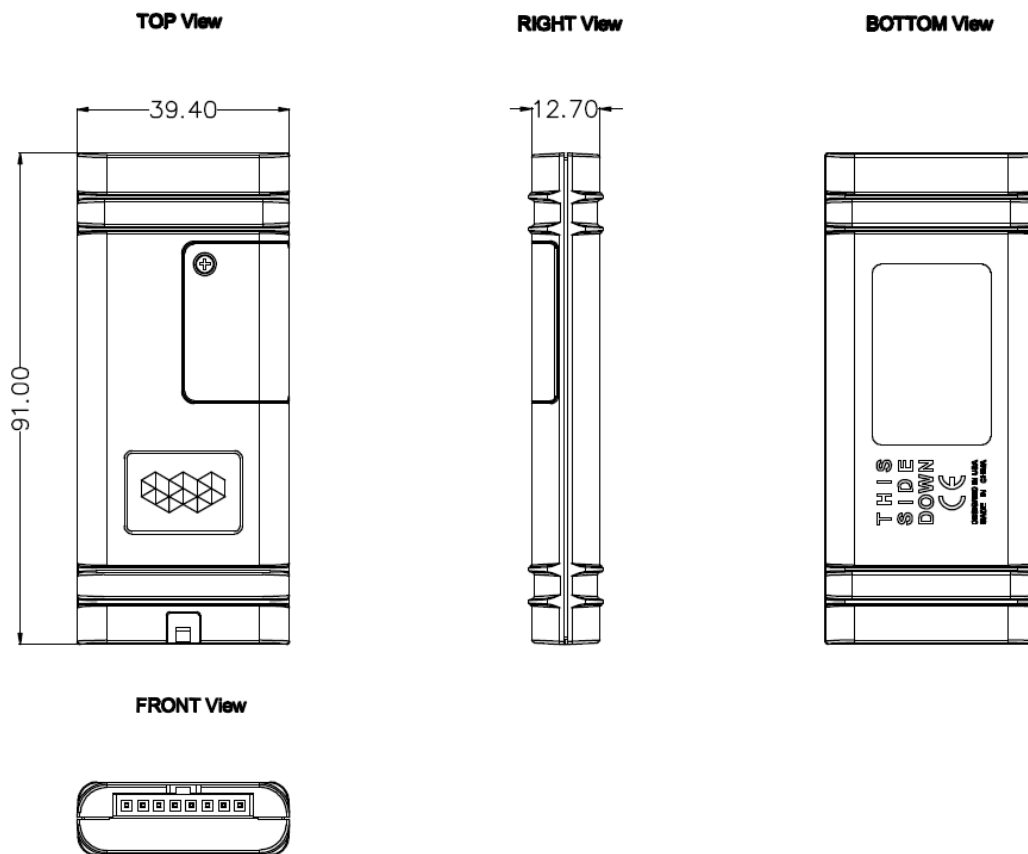
FCC Statement

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.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

RF Exposure Warning Statements:

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons during the normal operations.

IC STATEMENT

This device complies with Industry Canada licence-exempt RSS standard(s). 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

In order to avoid the possibility of exceeding the IC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

Afin d'éviter la possibilité de dépasser les limites d'exposition aux fréquences radio de la IC CNR102, la proximité humaine à l'antenne ne doit pas être inférieure à 20 cm (8 pouces) pendant le fonctionnement normal.