AIO3.0 USER'S MANUAL

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REVISION CONTROL SHEET

Rev	Date	Comments
-	04/22/2015	Initial Release
1	5/14/15	
2	7/2/15	Updated Section 3 to include USB charger access port
3	7/15/15	Updated Introduction - Added Sold In US statement, operating frequency band with TX power limits and max duty cycle statement
4	7/21/15	Updated FCC Exposure paragraph with correct antenna gain values

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1.0 INTRODUCTION

This Operator's Manual is designed to provide instructions for the operation of the Presidio Advanced Generation Tracker 3.0 (AIO3.0). The AIO3.0 is sold exclusively in the United States and is FCC compliant and carrier approved.

In addition, this manual describes how to install and operate the device. The devices are manufactured by Presidio, located at 5337 Millenia Lakes Blvd, Suite 300; Orlando, FL 32839.

FCC Compliance:

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

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC RF Exposure Information:

Warning: The antenna supplied with this device must be used for installation and operation. The manufacturer must approve substitution of other antennas for compliance to radiation safety limits, where the antenna gain should not exceed 1.8 dBi for < 1GHz and 1.5 dBi for > 1 GHz.. The mounting of this device and antenna must be installed to ensure that the user or nearby persons will maintain at separation of 20 cm from the antenna in normal use.

Warning:

All persons must maintain a minimum separation of 20 cm from modem antenna when the transmitter is operating to meet FCC RF exposure compliance.

2.0 OVERVIEW

The AIO3.0 tracking device is one of several device types along with proprietary mapping software that make up Presidio's asset tracking solution. A tracking device can be quickly and covertly attached to a vehicle or other asset that one wishes to track. The devices receive and send GPS coordinates and command and control messages to the mapping applications which in turn provide the user Georeferenced addresses plotted on Google maps. All messages are transferred using the AT&T wireless network

2.1 AIO3.0 AGENT HARDWARE

The AIO3.0 tracking device consists of a small Black PC/ABS plastic enclosure that can be covertly installed on a vehicle or other asset which provides latitude and longitude position data to a proprietary mapping applications using the AT&T GSM network.

The tracking device utilizes the newest technology in wireless modules, integrated GPS and cellular antennas, an internal Li-Ion rechargeable battery and a specially designed proprietary microcontroller to manage battery and modes or operation. The device is designed with an internal rechargeable Li-ion battery for short deployments and can operate with an external battery pack for extended operation times and also has I/O connectivity capability that allows the user to manage or monitor external events. The devices are capable of surviving and functioning while exposed to environmental conditions (heat, humidity, dirt, rocks), power interruptions, vibration, and shock that are common in vehicle and obscure installation locations. The unit has an operating temperature range of -40 degrees to +70 degrees centigrade. Figure 1 represents an overall block diagram of the AIO3.0 tracking device and Figure 2 and 3 shows the hardware.

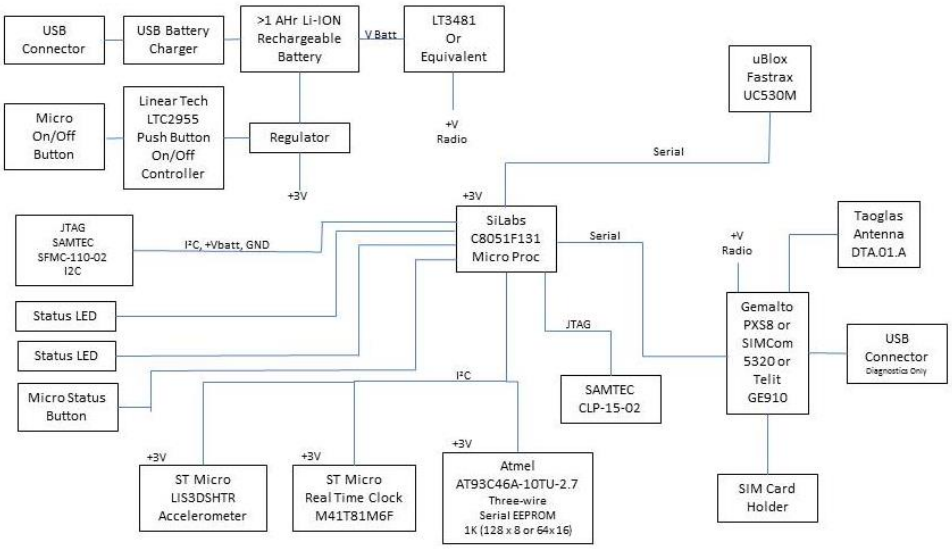


Figure 1 AIO3.0 AGenT System

The microcontroller firmware within the AIO3.0 implements the operating modes requested by the Mapping application and can independently collect, store and transmit data. It monitors and performs the following functions:

a) The flow of data to and from the wireless modem and GPS receiver
b) Communications to and from the USB serial link,
c) LED status and switch monitoring
d) Power and motion detection monitoring

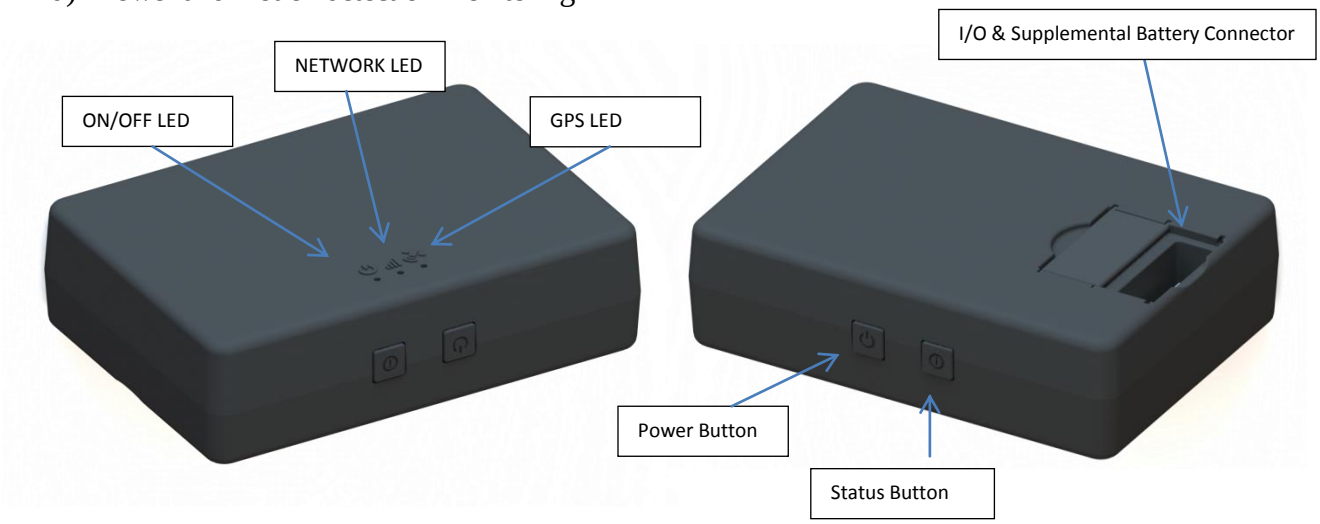


Figure 2 – AIO3 Tracking Device

The AIO3 enclosure is a PC/ABS plastic material that provides protection to the subassemblies. The enclosure includes On/Off and Status push button switches and three status LED's. The LED's indicate the GPS status (navigating no navigating), network status and the on/off state of the device. The device includes a secondary enclosure that provides an IP68 rated enclosure along with magnets used for attaching the device to a vehicle.

There is an integrated connector which allows the device to be electrically connected to an external battery pack or user defined I/O type devices.

The AIO3.0 AGenT microcontroller board includes a microprocessor a Telit HE910 wireless modem along with memory, a 3 axis accelerometer and power management logic.

The Telit wireless module include a GPS receiver that outputs standard NMEA 0183 messages and operates at L1 (1575.42 MHz) frequency. The battery back-up for the almanac retention is supplied by the on board power management design. Both the GPS and the wireless modem can be power managed to turn on/off independent of each other for maximum battery life.

2.2 AIO3.0 AGENT FIRMW*A*RE

The firmware has the basic functional capabilities listed below. Refer to Map Agent User's Guide for complete functionality and how to set operating parameters.

a) Control Wireless Module Communications
   Monitor status of the wireless module
   Receive and transmit data via the wireless module
   Control on/off power of the wireless module
   Monitor wireless module signal strength

b) Control GPS
   Monitor status of the GPS
   Receive binary data and NMEA-0183 messages from the GPS Initialize, and set messages for the GPS
   Control on/off power and reduced power modes of the GPS receiver

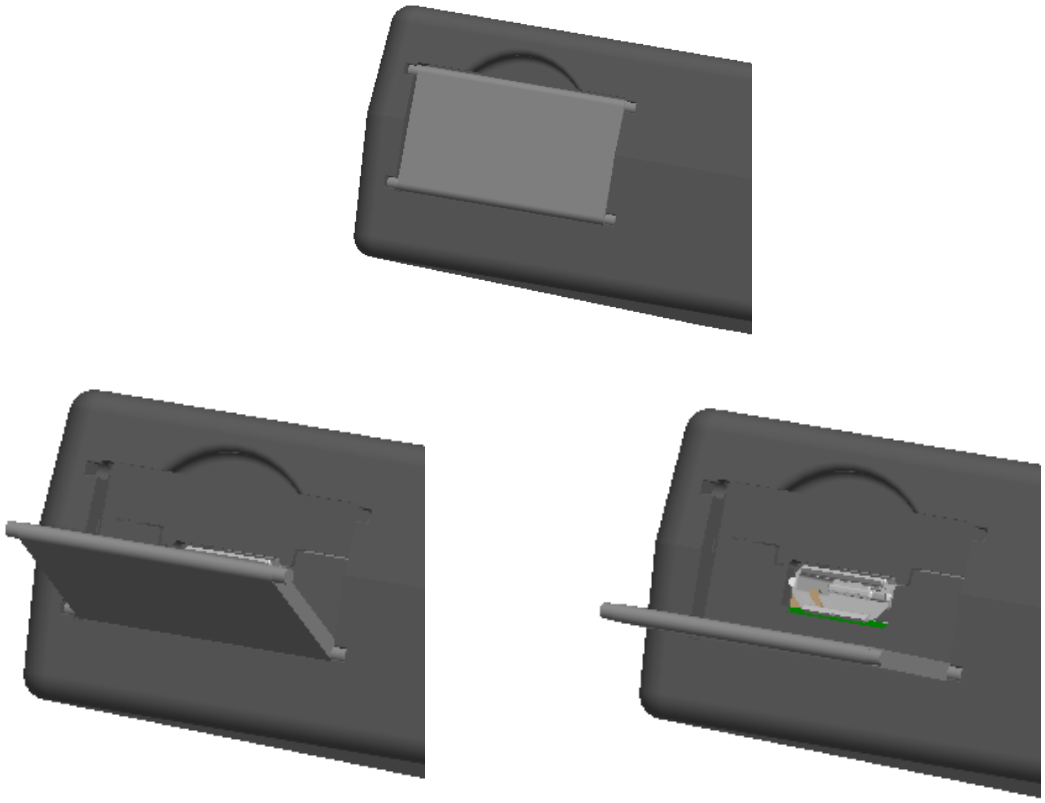
c) Monitor System Selected Operating Parameters
   Monitor tracking device internal temperature
   Monitor voltage level of the primary power connection

d) Perform System Operations
   Store and recall status data in memory
   Parse GPS messages and store/recall position data and or messages in memory
   Store/recall program modes and mode parameters in memory

3.0 SYSTEM OPERATIONS

The following paragraphs describe how to test, set-up and operate each device. Following these procedures ensures that the device is fully operational after the device is installed.

a) Prior to installation in a vehicle, the device should be checked for serviceability. This should begin with a thorough inspection of the exterior of the tracking device housing. The housing should have no significant signs of damage such as dents or cracks. There should be no sign of water leakage into the housing.
b) The device should be fully charged prior to deployment. The AIO3.0 connects to a standard USB connection on a PC and provides the capability to charge the internal battery. See the figures below to gain access to the USB charging port.



c) When charging the Status LED will be RED indicating the battery is being charge. If the LED does not illuminate when connected to the USB port this indicates the battery is fully charged or that there may be a problem with the USB connection to the PC.
d) Press and hold the Power On/Off button for a brief (1 second) period until the Power LED turns on. The LED will illuminate sold and then start to flash from a fast to slow

rate for several seconds. The LED will turn off which indicates the unit is on.

e) Press and Hold the Status Button for a minimum of 5 seconds. After the button is released the 3 status LED's will indicate the device status as shown below. The LED's will indicate status for up to 5 minutes and then all LED's will go out. The device is still on and operational though no LED's are illuminated.

Battery Status	LED Status
Device Off (Battery needs charged)	Permanently Off
< 25% Battery Charge	Blinking - Log off – Short on
Approximately 50% Battery Charge	Blinking - equal on and off time
>75% Battery Charge	Blinking - Log On – Short Off
100% Battery Charge	Permanently On

Network Status	LED Status
No Network	Permanently Off
Network Available however not connected to Presidio server	Blinking
Network Available, connected to Presidio server	Permanently On

GPS Status	LED Status
No Navigation	Permanently Off
Navigation	Permanently On

f) If the Status LED indicates the unit is connected to the network, the device can be pinged (monitored) from the mapping application software to confirm the overall status of the device. The user can check GPS position, internal battery status and the general signal strength from the wireless network.

3.1 INSTALLATION

3.1.1 Vehicle Installations

After confirming the device is fully functional select an intended installation location that will assure the device can be securely fastened to the vehicle and that the device has the least obstructed view of the sky. The device comes with an auxiliary mounting case that comes with internal magnets that will support most installations. For those cases where a magnet will not secure the device one can use tie-wraps or whatever other appropriate means to secure the device to the vehicle. The installation location is vehicle dependent however care should be taken that the GPs and Cellular antennas must be located facing away from the mounting structure. Position the GPS antenna (Side with the three LED's) so that it is not obstructed with metal. Some installation locations may require that the device be pointing towards the ground.

3.1.2 Non-Vehicle Installations

As above, confirm the device is fully functional before installation. Installation locations are based on the asset structure and the same care should be taken to provide the least amount of obstruction to the GPS and Cellular antennas within the device. Do not install the device within a total metal container or structure.

3.2 OPERATING PROCEDURES

After the Device has been set-up, tested, and installed it is monitored and controlled by the mapping application. Refer to the Map AGenT Users Guide for complete operating and tracking functions of the AIO3.0.

3.3 PROBLEM PROCEDURES

There are no user servable parts within the AIO3.0 device. It is imperative that the device be tested prior to deployment to ensure the unit is fully functional. If the AIO3.0 fails during deployment confirm the device is powered on and that the battery is charged. If so try to communicate with it using the mapping application, if you are successful than most likely the installation location may have caused the unit to not function properly. Select a new installation location and test unit as necessary.

3.4 MALFUNCTIONING GPS

If during deployment the device does not report a navigation report and it is known to have worked prior to deployment then in most cases the GPS antenna is blocked and the unit cannot receive adequate signal to calculate position. Several external factors can cause this issue which may or may not be resolved once the vehicle moves from its current position. If the device continues to not report position data then the device has malfunctioned and it should be removed and returned to Presidio for evaluation and/or repair.

3.5 INTERNAL BATTERY NON-FUNCTIONAL

If the Device's internal battery does not function than the device will not work. Press the power ON/OFF button and confirm the state of the Power Status LED. Refer to the table above to determine the device status based on the LED's.

3.6 AFTER USE CARE

After a Device has been removed from an installation it should be cleaned, inspected and plugged into a USB port to recharge the internal battery.