Application Note: Towing Alert Enhancements

Scope
AT240, AT110, AT210, AT200

Overview
All our devices support the use of tow alerts to highlight potentially unauthorised vehicle movement by towing or loading on a trailer etc. (vehicle moving without engine running). The sensitivity criteria for a tow alert can be defined using the $TOWP command, which is described in detail in this document.

Related Documents
The following documents are recommended reading to accompany this document:

- AT240, AT110, AT200 & AT210 User Guides
- Astra Protocol Descriptions

The User Guides can be obtained from:

http://www.gps-telematics.co.uk/downloads.htm

The Protocol Description documents are available on request by emailing support@gps-telematics.co.uk

Operation of Towing Alert

A tow alert is reported when the tracking device determines that the vehicle is moving with the ignition off. There are several criteria used to determine this state, as described below:

1. Motion Sensor
   The internal motion sensor detects movement over a given threshold of acceleration. This threshold can be set to adjust the sensitivity to movement required to trigger a tow alert.

2. GPS Speed
   If the speed measured by GPS exceeds a certain threshold (kmh) for a certain time (seconds) a tow alert can be triggered. The speed threshold and time should be chosen carefully to avoid false alarms, as GPS speed is often unreliable in poor signal conditions, hence a suitably high speed and number of samples should be used to reduce the probability of rogue tow alerts.

3. Distance Moved (from ignition off location)
   Movement of a given distance from the last stop location can also trigger a tow alert. Again, care should be taken to choose the trigger distance because GPS location can wander from the true position in poor signal

conditions. This mode requires a valid GPS at the journey stop location and hence it is not used in scenarios such as underground car parks etc.

Enhancements

In the original implementation, once a tow alert was reported no further tow alerts were reported until the ignition was turned on and then off. There was a 60 second delay after the ignition was turned off before the motion sensor could trigger a tow alert.

The tow alert operation has been improved by continued reporting of speed and distance triggered tow alerts as per the configuration until the ignition is turned on. A time filter is applied to GPS fix errors such that false tow alerts are reduced when GPS indicates an incorrect location for a short period of time. In addition to the 60 second delay after the ignition is turned off before enabling motion sensor tow alerts there is a 30 second delay from motion detection to allow the ignition to be turned on before reporting a tow alert. Motion sensor triggered tow alerts will continue to be reported at a rate of no more than once every 60 seconds until the ignition is turned on.

Configuration

The tow alert thresholds are configured using the TOWP command as follows:

$TOWP,<distance_metres>,<speed_kmh>,<speed_seconds>,<motion_sensitivity>

Where:

distance_metres   distance moved from last stop to trigger tow alert
speed_kmh   speed threshold to trigger a tow alert
speed_seconds   time required above speed threshold to trigger tow alert
motion_sensitivity   motion detection to trigger tow alert (1=most sensitive)

Parameter	Minimum	Default value	Maximum
distance_metres	100	1000	65535
speed_kmh	20	50	65535
speed_seconds	1	10	65535
motion_sensitivity	1	5	10