

## Intelitag Technical Product Description (FCC)

### 1 - General

The **Intelitag**<sup>TM</sup> electronic tagging system, also distributed under the ParSec trade name, is a radio based short to long range tagging system for the protection and monitoring of assets and the management of personnel movement. The system operates at a nominal frequency of 418MHz as a Low-Power, Non-Licensed Transmitter in accordance with FCC Part 15 Subpart C for intentional Radiators (TAGs) and Subpart B for unintentional radiators (Reader). The system is also type approved to MPT-1340 licence exempt frequency band by the UK Radiocommunications Agency. Approval number 13422 refers.

The basic system comprises a range of **tags** - compact radio frequency transmitters that communicates with a **universal reader**. The reader interprets the data received from a tag transmitting within its field of reception and, in turn, passes this data on to a controller or computer.

Using a combination of two power levels and differing data patterns, the universal reader is able to distinguish between 'long range' and 'short range' Intelitags. Long range tags are read at a nominal distance of up to 75m in free space, depending on the characteristics of the ambient RF environment, regardless of their proximity to the reader. The reader only detects short-range tags when they enter its short-range zone, which is adjustable from a few cm to 25m in free space. It is the combination of short and long-range detection within a single reader, which, in conjunction with the properties of the different tag types described below, which gives the Intelitag system its unique performance characteristics.

Every tag has a unique identity, which it transmits in conjunction with additional data relating to its operational status. Thus an asset or individual equipped with a tag can be uniquely identified by the system. The Intelitag system has been designed primarily for security applications although its use can also be extended to a wide range of asset tracking and management tasks.

A regular 'reporting' transmission from asset Intelitags provides both a security confidence check and an additional asset management (inventory) facility. Asset Intelitags incorporate anti-tamper switches, which are detected at long range.

## 2 - Tag Types

The **Static Intelitag (SAT)** has been designed primarily to protect equipment such as computers and their internal components, and all other types of static office equipment. However, the SAT is highly versatile and can be used to protect any static article including hospital and laboratory equipment, works of art and any item of significant value. The SAT incorporates a movement sensor and can be detected at a range of up to 75m in clear space.

The **Portable Intelitag (PAT)** has been designed to allow the movement of mobile assets within a controlled area or building, whilst denying or monitoring the removal from, and re-entry of the assets into the area. The PAT is normally detected when it enters the short range zone of a universal reader; however its other transmissions, including tamper, will be detected by a reader at long range.

## 3 - Tag Operating Modes

Intelitags operate in several predetermined transmission modes of high and low power. High power transmission is approximately -28 dBm and low power is -33 dBm.

The transmitted data packet duration is constant for all tags at 22.75 milliseconds (all packets are identical in length). The power of the transmission and transmission repetition rates are determined by the tag type and its operating mode. The various operating modes for each tag are described below.

### Static Intelitag (SAT)

1. Tamper mode
2. Wake mode
3. Routine report mode
4. Low battery mode

### Portable Intelitag (PAT)

1. Tamper mode
2. Wake mode
3. Routine reporting mode
4. Low battery mode

### Range Adjustment Intelitag (RAT)

1. See
2. Find
3. Plus range
4. Minus range

## 4 - Operating Mode Descriptions

### **TAMPER MODE** (manually triggered transmission)

Tamper mode is triggered by the forcible removal of a **SAT** or **PAT** tag from the item to which it is attached. A micro switch is open circuited by the removal of the tag. The tag software continuously monitors the condition of the switch; when it changes to the ON state, the tag transmits continuously in high power every 0.6 seconds. The transmission is turned off by returning the switch to its OFF state.

### **WAKE MODE** (manually triggered transmission)

When a **PAT** tag is disturbed, the change of state of its shock sensor causes the software to transmit packets every 0.6 seconds in low power. The duration of the transmission is 3.2 seconds. If, during the 3.2 second period, the shock sensor is disturbed again the transmission restarts.

When a **SAT** tag is disturbed, the change of state of its shock sensor causes the software to transmit packets every 1.2 seconds in high power. The duration of the transmission is 3.6 seconds (3 cycles). If, during the 3.6 second period, the shock sensor is disturbed again the timed transmission restarts.

### **ROUTINE REPORTING** (automatic transmission)

The PAT routine report comprises 5 packet transmissions at 0.6 second intervals in high power, repeated hourly. The hourly timer is reset if interrupted by movement of the PAT.

The SAT routine report comprises 5 packet transmissions at 1.2 second intervals in high power, repeated hourly.

### **LOW BATTERY** (automatic transmission)

The setting of a status flag during any report transmission, including routine reporting indicates the low battery condition of a tag; detection of low battery does not trigger a special transmission. The battery is tested every 12 minutes and, if low, reported at the next transmission.

### **RANGE ADJUSTMENT** (manual transmission)

The RAT is used after a Universal Reader has been installed to calibrate its short read range. All RAT transmissions are made in low power. During operation, the RAT transmits packets every 0.6 seconds whilst one of its 4 functional buttons is held depressed.