



RFID (Radio Frequency Identification) is an exciting topic when it comes to leading edge Asset Tracking Solutions. WiseTrack and the Research and Development Team have been working with RFID Technologies extensively since 1997. There is a great deal to know about the types of RFID Technologies on the market and we try to stay current with our best-of-breed technology partner integration.

**WiseTrack works with a number of RFID Technologies and companies, this paper represents one RFID Technology supported and a scenario of how it will work with Asset Tracking.**

### **Active RFID Asset Tracking using WiseTrack**

This section will explain the breakdown of components and what role each one plays in the Asset Tracking Solution: In a typical Scenario, RFID Asset Tags are applied to an asset. The assets as the roam around the organization come within the range of an Activator. The Activator sends a signal to the tag telling it to beacon or send its tag value into the airwaves. Located in strategic positions, throughout the organization, are antennas. The tag's value is received by the antenna and entered into the WiseTrack Database. WiseTrack acts immediately on the incoming data by updating the assets location or launching a security alert. Many features; such as, a floorplan viewer to show where the asset is located can reduce time searching for assets in facilities such as; Hospitals, Law firms, warehouses, Technology Firms, Military Stations, Schools, etc.

### **RFID Asset Tags**

An Asset Tag is a small transponder that remains in a sleep state until activated. When the Tag receives a special Very Low Frequency (VLF) signal from the Activator, the Tag wakes up and emits an Ultra High Frequency (UHF) radio signal. The Tags signal is typically its pre-programmed identification number and the Activators identification number – but could include other data as well. The signal is generally used for detection, identification and location of people or objects. The Receiver accepts the Tags transmitted information and forwards it to a PC or control device.

Tags are specifically designed for assets, vehicles and mobile inventory applications. In addition, Personnel Tags can provide hands-free identification of personnel for access control, people tracking and resource management applications. The Tag can be personalized by affixing a standard PVC identity card into a recess in the tag case.

The Asset Tag can be mounted to an asset for effective protection and monitoring. Multiple tags can be read simultaneously so that both the asset and its carrier can be identified. This allows the asset to be linked to one or more owners, thus providing maximum security with greater freedom of movement. WiseTrack includes real-time security alert system for this action types. The Vehicle Tag can be mounted in the vehicle for automatic, hands-free vehicle identification, tracking or access control. Vehicle Tags are optimized for high-speed reads in vehicle applications such as access control (residential and commercial gates), equipment tracking and fleet management.

**1.800.263.0000**

**[www.wisetrack.com](http://www.wisetrack.com)**

## **RFID Activator**

The Activator broadcasts an activation signal via the transmit antenna to wake up the tag. The transmitting antenna attaches to the BNC connector on top of the Activator. The wakeup signal writes the Activators ID Number to the tag.

## **Asset Tag Receiver**

The Receiver has the following functions:

- Decode the signal received from the Tag via the receive antenna. The Receiver converts the data to a format usable by a computer or Wiegand control panel for further processing of the information.
- Filter Tag information according to its configuration settings.
- Send the data to a control device or a computer.
- Output control signals for activation TTL outputs or alarm points on panels.

## **Filters**

The Receiver can be configured to report only selected Tag data. For example, the Receiver can be programmed to respond to specific Activators in a multi-Activator environment. Configuration filters also determine what information is reported via the Wiegand interface.

## **Serial Output**

The Receiver communicates using RS-232C. It can connect to a communications port on a computer or any device that accepts RS-232C data.

## **Wiegand Output**

The Receiver can be configured to send Security Industry Association (SIA) 26-bit Wiegand data to control panels. The Receiver connects to the Wiegand port on the control panel by three wires – Data One, Data Zero and Ground.

## **IP Output**

The Receiver can be configured to connect to an IP network using an integral Network Interface Unit (NIU) to convert data from serial to Ethernet TCP/IP format.

## **Transmit Antennas**

Because Tags receive and transmit at different frequencies, different antennas are used for each leg of the communication. Antenna design is related to its frequency wavelength (or fraction thereof). The receive antenna supplied with the Receiver is designed for the UHF spectrum and is only seven inches tall. The VLF transmit antennas used by the Activator are loop antenna designs of varying lengths of wire based on the application.

### **Types of Transmit Antennas**

#### Bar Antenna

The Bar Antenna has a VLF transmitting antenna in an enclosure that is approximately 2 feet long, 5 inches wide and 1 inch thick. It can be mounted indoors near a door or above the ceiling tiles and is primarily used for personnel identification, access control or tracking applications.

#### Picture Frame Antenna

The Picture Frame Antenna has a transmitting antenna built into its frame. The antenna may be mounted unobtrusively on interior walls. The front frame and glass are hinged so that the picture can be changed easily without removing the frame from its permanent wall mount position.

#### Road Loop

The Road Loop Antenna is a large VLF transmitting antenna most often used for activating Tags in vehicles or mobile equipment. The Road Loop Antenna is permanently installed in the road surface and is typically used in the gate access applications. Its activation field is capable of covering one or more lanes.

#### Other Antennas

Wire loops of varying size and length can be constructed to activate tags for a variety of applications. For example, a loop of wire inside plastic conduit can be hung above a hallway to activate tags passing below.