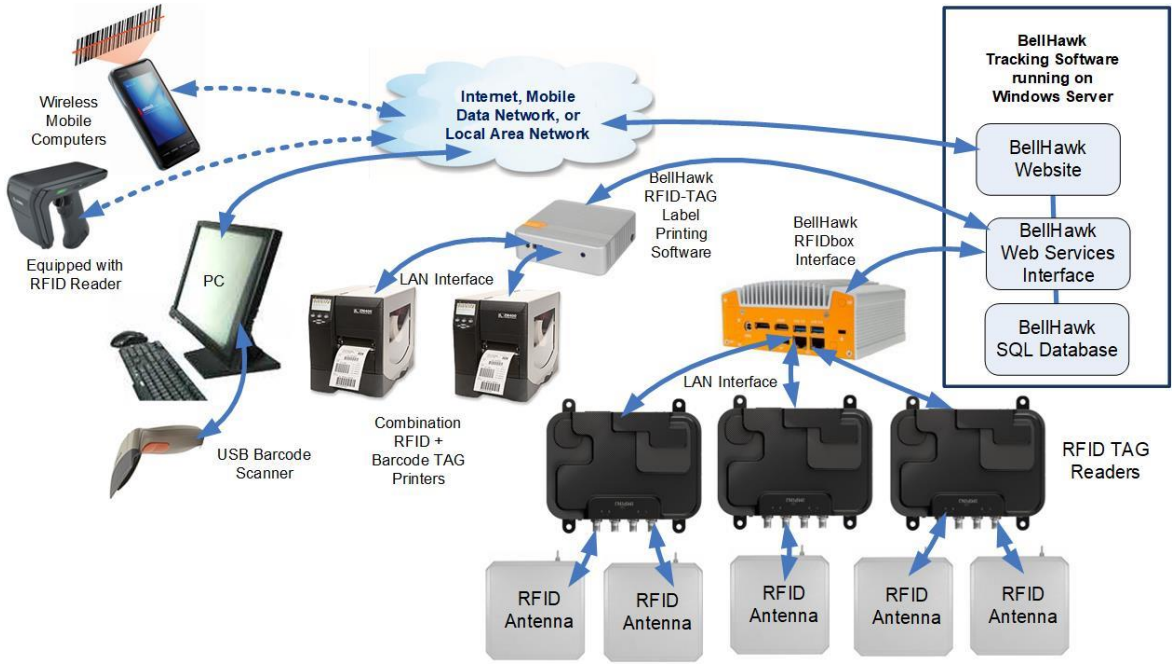
BellHawk RFID Data Sheet

Adding RFID to BellHawk



BellHawk is an integrated barcode and RFID tracking system which enables the location of containers, assets, and individual items to be tracked using both their attached barcodes and RFID tags.

This is made possible because the BellHawk software uses the principle of License-Plate-Number (LPN) tracking using either the unique EPC embedded in an RFID tag by its manufacturer or an attached unique tracking barcode, which may have different tracking numbers.

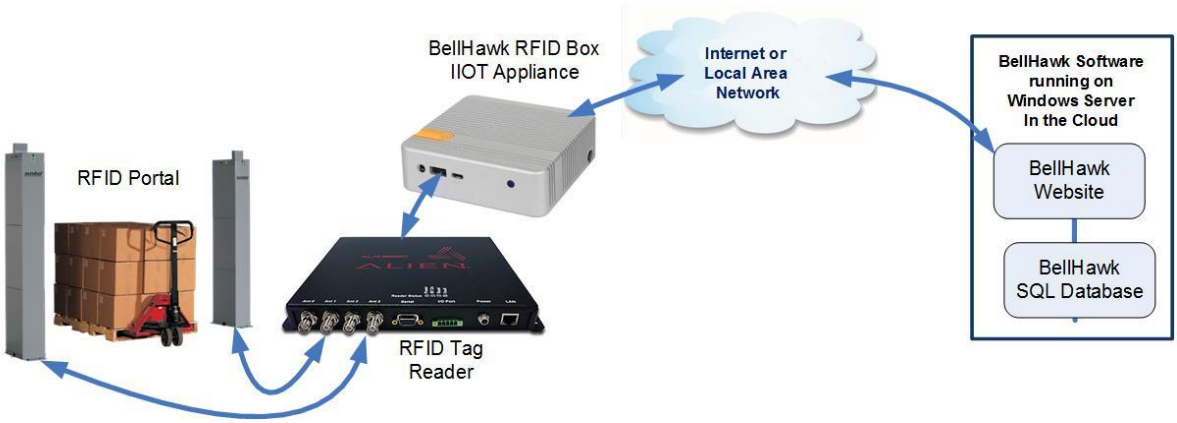
Through its barcode label printing appliance (BLPA), BellHawk can print out tracking barcodes on a wide variety of barcode label printers, in each manufacturing plant, over the Internet. This includes printing combination tracking barcode (2) and RID tags (1) on a combination barcode label printer and RFID tag encoder.

The BellHawk RFIDBox remotely connects BellHawk to a set of RFID tag readers within a plant or warehouse, each of which can support 4 or 8 antennas, up to 100 feet from the reader.

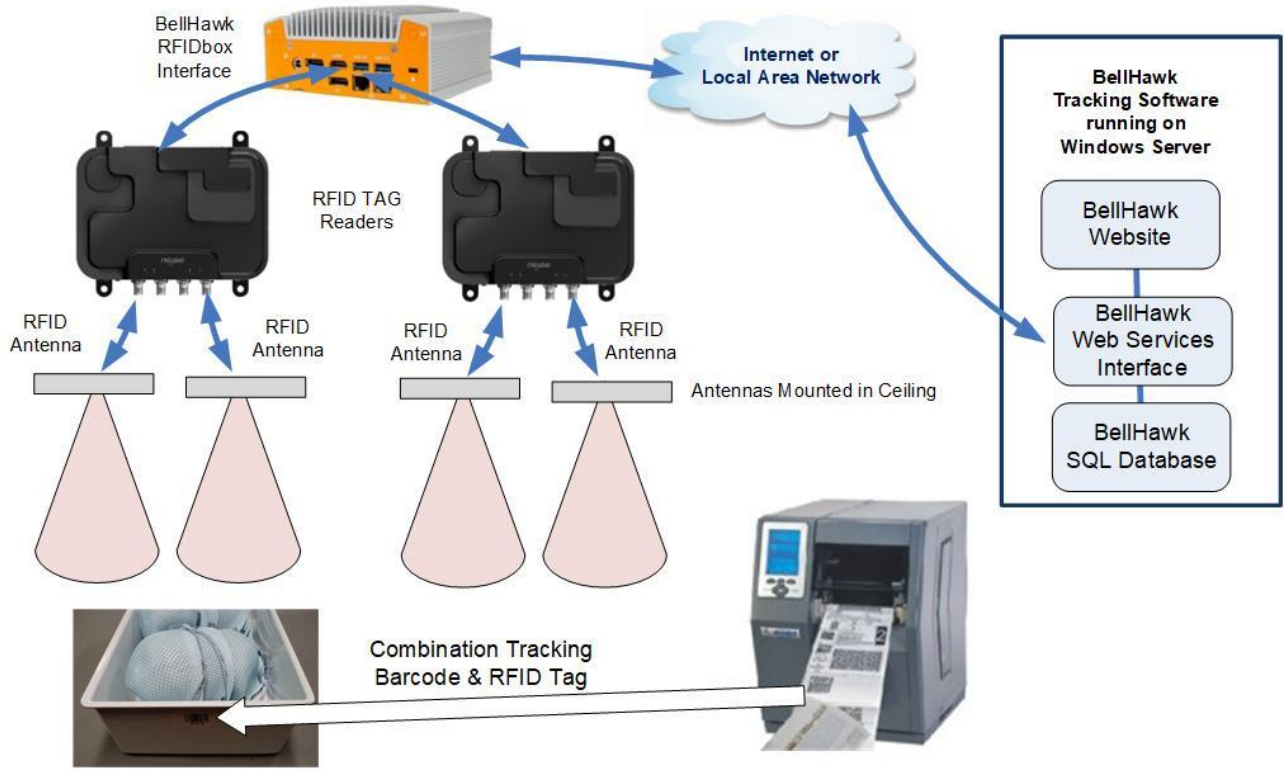
When an RFID tag comes within range of an antenna, the unique EPC code within the RFID tag is read automatically, and then translated by the RFIDBox into the movement of the container or item, to which the Tag is attached, to its movement to the location (such as a work-center) where the antenna is.

In this way, as a container moves through a plant or warehouse, its movement can be tracked as the Tag is “seen” by different antennas. This movement is used to update the BellHawk tracking database so the location of materials can be tracked in real-time whether the tracking is done by barcode or RFID tag scanning or a mixture of both.

With BellHawk, antennas can be organized into a portal doorway, which is typically done when we want to track the loading of pallets onto trucks/trailers to make sure that the pallets get loaded onto the right truck. Or into the right trailer



But in most cases, it is much more convenient to place the Antennas in the ceiling and track the movement of the RFID tags as they move into and out of the beams.



Limitations of RFID

An antenna will detect all RFID tags in its beam, so its is not very good at differentiating the location of each specific tag very precisely. RFID is great if what you want to do is to know which work station the tag is in. It will not detect where in the work-cell each tag is located.

Barcoding is very precise. I can scan a single item out of many in the same location, and precisely identify the item and its location down to a few inches (such as in a bin on a shelf). RFID cannot do this. But no one needs to, or can forget to, do barcode scanning.

RFID waves are blocked by metal and carbon fiber. Also, there is a limit to how many tags can be read in a specified time. Trying to read hundreds of tags in a box as it is carried at walking speed through an RFID portal will only result in about 95% of the tags being read.

But for most location tracking applications, RFID tags stay in a work center for at least 5 minutes, resulting in a high read accuracy from an overhead antenna, even with a significant number of tags in the work center. Also, tags can be read though plastic, cardboard, leather, fabric, wood and many other materials and can be placed on the top of metal carts and the like.

Work-in-Process Tracking

One of the best uses for RFID in a manufacturing plant is tracking work-in-process.

Barcode tracking labels and/or RFID tags can be placed on individual items or on totes in which materials are placed. In the case of totes, carts, trolleys, and vehicles, with permanent tracking barcodes and RFID tags, the RFID tags are encased in plastic and metal barcodes, sometimes with glass/ceramic covers are used to make sure they are not damaged in prolonged use.

When a batch of individually tagged work-in-process is to be tracked, the process starts out by printing out the barcode/RFID tags, one for each item to be tracked. This also results in an entry for each item being created in the containers table in the BellHawk, which is associated with the work order and/or customer order for which these items are intended.

Once the batch is released for production, the tags are activated, usually using a barcode scanner attached to a PC, as the work order is released to the floor. Thereafter the individual items are tracked as they flow from work center to work center, by the RFID antennas, which are mounted in the ceiling of each work center. This enables individual components of a batch to be tracked individually, including through rework operations. We can also get a measure of how long each item spends in each work cell.

For smaller components, we place these parts in a reusable tote. When the process starts, we scan the barcode on the tote and associate it with the work order. Thereafter the location of the tote is tracked by RFID until the removal of the components of the tote is recorded by scanning the barcode on the tote.

Sometimes, such as in the manufacture of custom kitchen cabinets, parts are barcoded as they are cut out, and then placed on a cart for their further processing and assembly. Here we use barcode scanning to record the placing of barcoded parts on a cart but then use RFID to track the location of the cart, until we use barcode scanning to record the removal of materials from the cart.

Inventory Tracking in Warehouses

According to the popular press you can simply press a button and have an RFID system read every tag in your warehouse within a few seconds. This is simply not true, as the amount of energy you would have to use to do this would ionize the atmosphere in the warehouse and kill anyone in the warehouse. Fortunately, RFID emissions are limited to safe power levels but, as a result, we cannot read a large number of RFID tags in a short time.

Also, we would not be able to track which bins or shelves held which parts due to the lack of precision of RFID scanning. But, fortunately barcode scanning is ideal for this purpose.

Exceptions to this limitation include:

1. Tracking RFID tagged pallets dropped into floor locations. Here we can use overhead antennas to automatically record the location of the pallets.
2. Recording the movement of RFID tagged supersacks into and out of a building or a room using door portals.
3. Recording the loading of pallets onto trucks or trailers using door portals.

In general RFID is good for tracking the location and movement of RFID tagged big things but should not be used for tracking smaller containers or items, as putting RFID tags on these will interfere with reading the movement of big things, such as pallets, supersacks, and vehicles.

A good rule of thumb is to use barcodes to track boxes and the like going onto a pallet and then use a combination of barcode and RFID tags to track the pallets. Also, when putting materials away in a warehouse in bins or on shelves, use barcode tracking, as this will facilitate inventory auditing, which again should use barcodes, because of interference issues both from other parts and from the metal racking.

Equipment Compatibility

The BellHawk RFID capability uses UHF antennas, RFID tags, and readers, as appropriate to the country in which they are being used.

BellHawk RFID software is compatible with any fixed station RFID reader that supports the GS1 LLRP standard, such as those available from Zebra and Impinj.

BellHawk also supports printing combination barcode/RFID labels on any printer supported by BarTender Automation for this purpose.

The BellHawk barcode data capture interface can also support combination barcode/RFID mobile computers provided they support embedded combination barcode/RFID data-wedge support.

Commentary

By combining barcode and RFID we can get the best of both worlds, combining the location precision of barcode scanning with the automation of RFID scanning.

It is now often less expensive to track work-in-process (WIP) using inexpensive antennas rather than expensive mobile computers to do WIP tracking. This also results in labor savings from manual scanning and eliminates having to train employees in how to do barcode data entry.

RFID cannot record what materials were used to make a product or the labor hours required. But, if all you want to do is to track where customer orders are on the production floor, RFID is generally a big win over barcoding for many WIP tracking applications.

The use of RFID gives near real-time visibility as to the status of each customer order, even if different parts of the order are at different stages of manufacture. We can also infer which operations have been completed, and when. T

For More Information

Please contact Sales@KnarrTek.com or see www.KnarrTek.com for more details.

