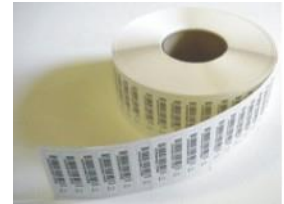


Preventing Barcode Label Printing Errors

Purpose

The BellHawk software can perform all its tracking and traceability functions using pre-printed rolls of license-plate tracking barcodes, such as shown here, in combination with barcoded receiving, pick order, and work order sheets that can be printed on office printers.



As a result, clients using BellHawk do not need to purchase barcode label printers or train their employees in how to use or maintain these printers. Instead they can purchase these rolls of pre-printed sequentially numbered barcodes in a wide variety of formats and materials at economical prices from manufacturers who specialize in making these.

However, there are circumstances when more than just a simple license-plate tracking barcode may need to be applied to containers of material. These include:

- Raw materials which need labels attached showing data such as part number, description, lot number, expiration date, and possibly hazardous materials data.
- Finished products, where the information may also include serial numbers and other unit specific information as well as GTIN and other supply chain related barcodes.
- Pallets of finished products that may need their own SSCC (Serialized Shipping Container Code) barcode labels as well as possibly GTIN labels and a description of the contents of the pallet in human readable form.

It is recognized that such labels can be printed out using a variety of barcode label generation software and then supplemented by simply attaching license-plate tracking barcodes to the outside of containers for materials tracking and traceability purposes.

At the same time, it is recognized that manually entering the label data into a form and printing the label on the right printer loaded with the correct media can be an error prone and time consuming process.

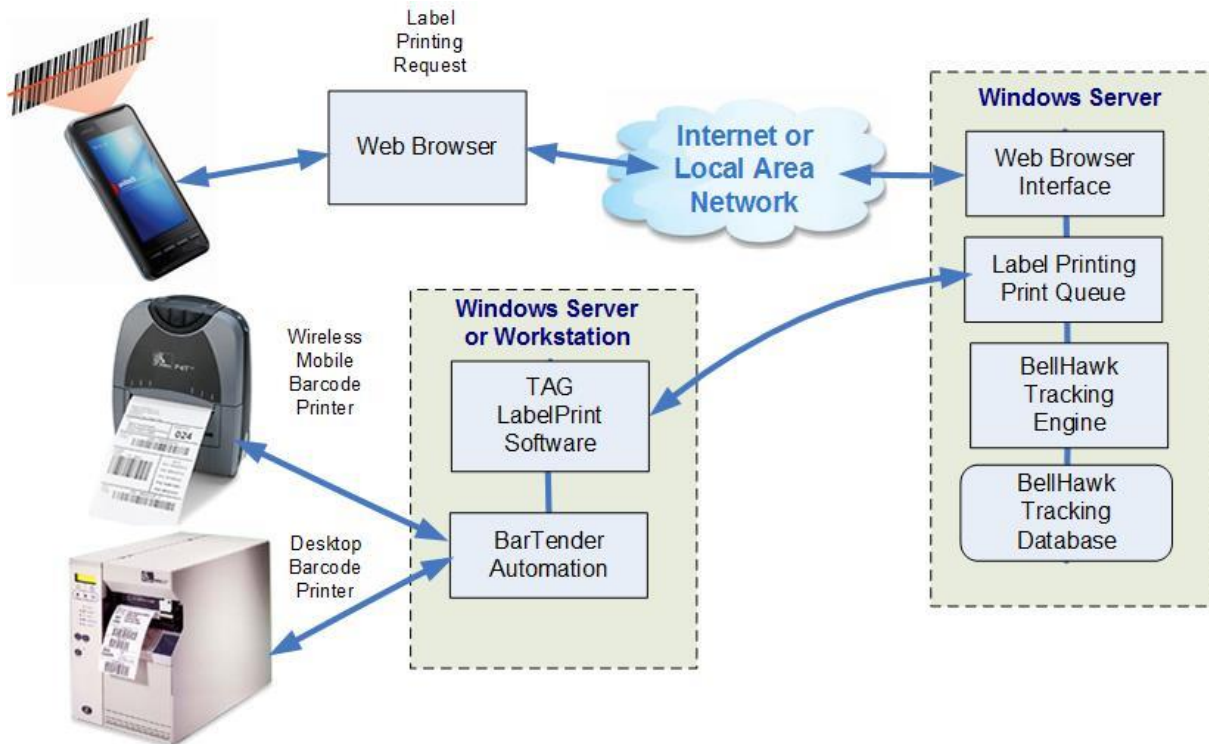
For this reason, BellHawk Systems provides the TAG option to BellHawk. TAG provides the ability to automatically select the correct user-defined label format, automatically fills in all the appropriate data fields, and then prints out the label on the correct barcode label printer loaded with the correct media. This is done using user-defined rules, which are setup using Excel imports into BellHawk.

TAG works in conjunction with BarTender Automation from Seagull Scientific, which can be used by clients to create their own label formats. BarTender also provides drivers for a wide range of thermal transfer, thermal, and color ink-jet printers.

As part of the labels being printed, TAG can insert a uniquely numbered license-plate tracking barcode, GS1 standard barcodes such as SSCC and GTIN barcodes, as well as data drawn from the BellHawk database, including user defined parameters, such as color, and dimensions.

How TAG Works

When an item or container of materials is being entered into inventory, a user can request that a tracking label be printed for the item or container. This is based on selecting a button on the screen of the device they are using, after entering the data about the item or container. This causes BellHawk to collect the appropriate data from the BellHawk database and place the resultant data in a label printing print queue in the BellHawk database.



If the TAG label printing software (LabelPrint) is being run on the same server as BellHawk then LabelPrint is launched as a background process by BellHawk. The LabelPrint program then retrieves the printer name, the label format file name, and the data to fill into named fields on the label, from the print queue.

LabelPrint then uses the BarTender SDK (must be running on the same computer as the LabelPrint software) to populate the selected label format with the correct data and to cause the BarTender software print it to the appropriate printer on the local area network. The BarTender Automation software provides printer drivers for a wide range of barcode label printers as well as providing a tool for laying out the barcode label format, including specifying names for label fields.

If BellHawk is being run at a remote data center then LabelPrint and BarTender Automation need to be installed on a Windows Workstation in the remote plant. In this case, LabelPrint remotely polls the print queue, using the BellHawk web services interface, until it finds a print request. It then retrieves the print request data from the queue and then calls BarTender Automation, as described above, to print the label.

In BellHawk, TAG rules can be imported using Excel spreadsheets. These rules can be used to specify which printer and label format should be used along with how the named fields on the label relate to standard and user-defined parameter values for the container or item to which the label will apply.

These rules can be based on a number of factors, such as:

- Mobile device being used for data entry and the transaction being performed
- Part number, category, or material type or user defined characteristics such a hazardous materials rating
- Type of container being used (box, bottle, pallet etc.)
- Customer to which the container or item will be shipped
- Quality Control status (passed or failed inspection)

These rules can also control how many duplicate labels and how many sequentially numbered labels (for different items or containers) are to be printed at a time.

Please note that for speed of barcode label printing, it is important that BarTender Automation be on the same local area network as the printers to which it is printing. These barcode label printers can be connected via the plant LAN or wireless network. They can also be plugged into PCs connected to the plant LAN or wireless network.

Preprinting Labels

As well as printing barcode labels on-demand, as described above, TAG does support pre-printing labels. This is so that barcode labels to be attached to containers or items can be printed ahead of time in an office environment.

While printing labels on-demand at time of application can help prevent errors due to placing labels on the wrong containers, there are situations where it is beneficial to print labels ahead of time. These include situations where:

1. The location where labels are to be applied would be hazardous to barcode labels printers due to dust, moisture, acidic, or explosive atmospheric conditions.
2. Large numbers of identical labels need to be applied to essentially identical containers by operators with limited skills to manage the reloading of media into barcode printers and fixing any jams that may occur.

The TAG module can print out a wide range of information onto labels. This includes all the parameters associated with containers or individually barcoded items, such as part number, quantity, unit of measure, lot number, serial number, expiration date. It can include customer and supplier names and address information. TAG can also be used to print out user defined parameters, such as sizes, colors, and hazardous equipment markings onto labels.

Transactions

TAG supports print-on-demand and pre-printing of labels with the following material transactions:

1. Enter or receive material into inventory
2. Receive against purchase order
3. Record material out of work order step/operation
4. Return material from operation
5. Tagging pallets, totes, or other containers with a license-plate tracking barcode
6. Packing materials into containers, such as boxes, and packing these boxes onto pallets
7. Picking and packing materials for customer orders
8. Shipping materials to customers.

Print-on-demand labeling enables labels to be automatically generated as the operator is doing any of the listed transactions. The label format and the data on the label are automatically selected according to rules setup within the BellHawk knowledge-base by clients. TAG then uses the data entered during the transaction, along with other data in its database, to populate the fields on the label, via the print queue, including generating a unique "license-plate" tracking barcode. LabelPrint then automatically prints out the labels for the operator to apply to containers of material or individually barcoded items.

Each label contains a "license-plate" tracking barcode that uniquely identifies the container to which it is attached. This tracking barcode is then scanned to track the movement, usage, packing and shipping of the container.

With labels pre-printed through TAG, each label is printed with a pre-numbered "license plate" tracking barcode. Also the data about each container to which the label will be attached is stored in the BellHawk database. After the pre-printed label is attached to the container, the tracking barcode is scanned by the operator, and then all the information stored with the label is transferred to the data entry transaction screen, thus saving duplicate data entry.

TAG and the LabelPrint Program

The TAG software consists of two components. The first is embedded within BellHawk. It collects all the needed data for printing on the label, selects the printer and the label format to use, and then puts all the information in a label print queue in the BellHawk database. The second component, called LabelPrint, is run as a separate process. This reads the print queue entry and calls BarTender to print the label on the designated printer.

Versions of LabelPrint are available for running on the same Windows Server as BellHawk and for running on a Windows workstation in a remote plant. The server version of LabelPrint is launched as a background process by BellHawk whenever a label print request is made from a data collection device. It gets the data from the print queue and then calls a version of BarTender running on the server computer to rapidly print out labels on printers attached to the local area network to which the server is attached.

When printing labels in a remote plant, LabelPrint is run as a user process in a Windows Workstation in the remote plant. This version remotely monitors the label print queue and, when it sees a new print request, retrieves the data and calls a local copy of BarTender to print the label. As LabelPrint uses normal outgoing Internet access from the remote plant, no special firewall or security setups or VPN access are required for remote access. Also by being on the same LAN as the printers and BarTender, LabelPrint is able to rapidly print out labels on a wide variety of printers in the local plant.

TAG is designed so that multiple versions of LabelPrint can be accessing the print queue at the same time, printing out the labels on the designated printer in the appropriate facility from a common BellHawk tracking database.

Recommended Barcode Label Printers

The following Barcode Label Printers have been found to be cost effective for use with TAG. The prices shown are street prices and are shown for guidance. Firm quotes can be provided by BellHawk Systems or its partners once the details of the specifications and quantities of units are determined. These costs do not include the cost of media or ribbons, required by these printers.

Please note that while both these printers support both the use of direct thermal and thermal transfer printing, it is recommended that labels be produced using thermal transfer methods as this results in much more durable and easier to read labels.

For printing out labels for application to incoming materials and outgoing products, BellHawk recommends the use of a networked 203dpi Zebra ZT410 ruggedized industrial barcode label printer, shown at right. These units cost \$1,750 each. We highly recommend purchasing 3 year, 3 day turnaround comprehensive depot service at a cost of \$400 for each printer.



Alternately for lower volume applications the Zebra GC420, shown at left, can be used. This unit can support labels up to 4 inches wide and has a resolution of 203 dpi. It plugs into the USB port of a PC that is connected to the local area network. The price for this unit is \$420 each.

A license for the BarTender Automation software from Seagull Scientific is also required at a cost of \$745 for a 3 printer license.

This is used to provide the printer driver and the capability to layout your own labels to incorporate data from the BellHawk database.

Commentary

The LabelPrint processes are designed to be fully replaceable, as part of the BellHawk open-architecture concept. This enables clients to replace the use of BarTender Automation with different label printing software, if they already have a large investment in an alternate label printing software. This replacement can be done by the client's IT department or barcode equipment providers, if they have appropriate programming skills. Alternately, BellHawk Systems' technical staff can provide this replacement as part of a professional services task.

Please note that TAG and BarTender are not needed to print out forms, such as picking sheets with barcodes on them, from BellHawk, as these are printed on office printers with software embedded in BellHawk. Also please note that TAG is not needed for materials tracking, which can be performed using pre-printed rolls of license-plate tracking barcodes. Also BellHawk can work with barcode labels generated by other systems provided that the contents of the barcodes are appropriate and coordinated by data automated transmission to BellHawk from the system that generated the labels.

However, for those situations where printing out container specific labels in receiving, production, or packing is required, then it is generally much easier and less costly to generate the labels within BellHawk, as part of the normal transactional data entry, to save on data entry time and to prevent expensive label generation mistakes.