

BellHawk Data Sheet TAG Rules-Based Barcode Label Generation Module

Purpose

While BellHawk can track materials using pre-printed rolls of License-Plate-Number LPN tracking barcodes, such as that shown here, users often required to apply barcode labels with human readable information, in addition to a unique LPN tracking barcode, and possibly other barcodes.

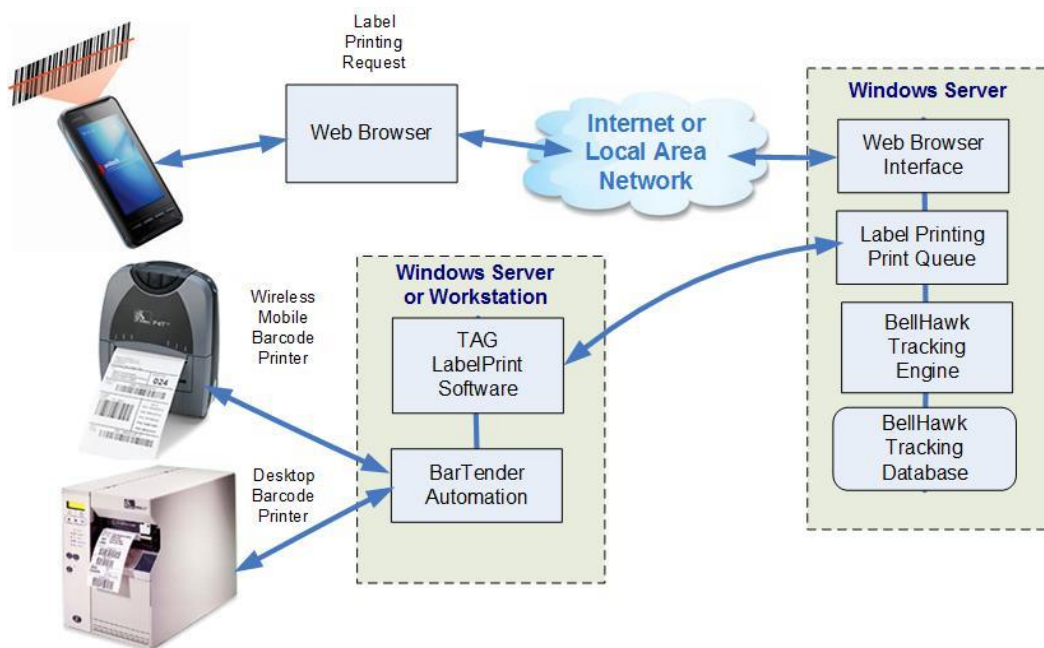


Such labels could be generated using a barcode label printing program by manually generating a unique tracking barcode and entering the other data before selecting a printer and manually printing out the required label. This is a time consuming and error prone process which can be automated using the optional BellHawk TAG module.

The purpose of the optional BellHawk TAG module is to reduce the time and eliminate mistakes in generating labels on barcode label printers for attachment to raw, intermediate and finished materials, as well as to assets and to shipping containers.

TAG does this by automatically selecting the correct label and printer for each specific situation, based on user defined rules. TAG then automatically fills in the data fields with the correct data from the BellHawk database. This eliminates errors resulting from selecting the wrong label format and manually filling in the wrong data.

How TAG Works



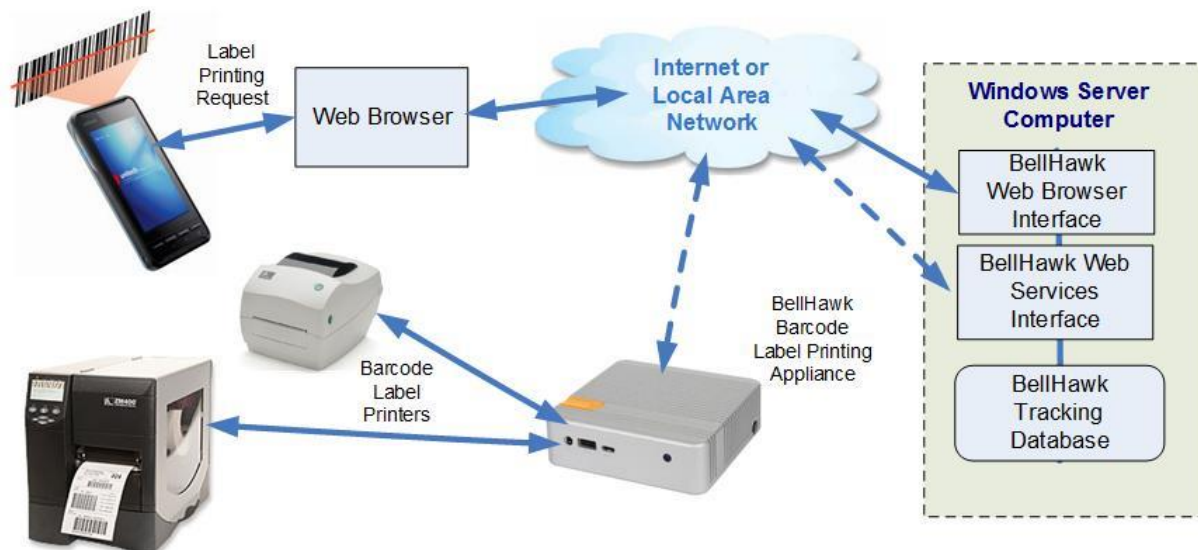
When an item or container of materials is being entered into inventory, a user can request that a tracking label be printed for the item or container. This is based on selecting a button on the screen of the device they are using, after entering the data about the item or container. This causes BellHawk 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 (LabelPrintS) is being run on the same server as BellHawk then LabelPrintS is launched as a background process by BellHawk. The LabelPrintS 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.

If label printing is being performed in a facility that is geographically remote from BellHawk then the TAG remote label printing software (LabelPrintR) is run on a Windows Workstation in the remote plant. LabelPrintR then monitors the Label Printing Queue remotely using the BellHawk web-services interface to get its print commands over the Internet.

The TAG LabelPrint software uses the BarTender Automation SDK (which must be running on the same computer) 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. BarTender 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.

The TAG LabelPrintR and BarTender Automation software are typically run in an IIOT box called a BellHawk Label Printing Appliance (BLPA) which can be shipped to each facility pre-configured. In this case the BLPA “calls home” when connected to the Internet and is able to function as a guest print server on the local area network without needing any security “holes” the facilities Internet firewall.



An important advantage of TAG is that it can ensure that all the LPN tracking barcodes are unique, even across multiple geographically separated facilities, using a separate BLPA in each plant. Also, TAG can ensure that the labels all conform to GS1 standards.

BellHawk Rules

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.

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.

The optional 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.

TAG can also drive combined barcode and RFID tag printers to create LPN tracking labels with embedded RFID tags which can be automatically interrogated to record the movement of containers from one location to another.



Preprinting Labels

As well as printing barcode labels on-demand, as described above, TAG does support pre-printing of labels using a PC. 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.

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 all the information stored with the label is transferred to the data entry transaction screen, thus saving duplicate data entry.

BellHawk Barcode Label Printing Structure

The TAG software consists of two components. The first is embedded within BellHawk. It uses user-defined rules to collect 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 Automation 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.

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 partners 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.

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 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.