Introduction to BellHawk User Manual

Introduction

BellHawk is an advanced integrated real-time production operations and license-plate materials tracking system that enables manufacturers, food and pharmaceutical processors, engineering, test and repair, and other industrial organizations to save money and prevent mistakes by automating the real-time tracking of their operations and inventory using barcode and mobile data collection technologies.

This Introductory Manual gives common information needed by all management and staff users of the BellHawk software. It also contains some information that supervisors may wish to share with their device users who do transactional data entry, as part of their training.

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BellHawk Editions and Organization of Manuals

BellHawk is available in three base systems:

- RT-OPS - Real-Time Operations Tracking System - tracks the receipt and put-away of raw materials, their transformation into finished products through a series of operations, and the packing and shipping of finished products. This includes tracking order status and work-in-process materials in real-time as well as capturing labor and materials costs.
- LP-MTS –License-Plate Materials Tracking System - a subset of RT-OPS limited to tracking materials including raw, intermediate, and finished goods inventory, work-in-process, and assets.
- SPTS – Simple Production Tracking System - a subset of RT-OPS that tracks the status of work orders for making a batch of products and the labor required for each operation.

In addition there are a significant number of optional modules to extend the capabilities of these editions and bundles.

The sequence of manuals includes:

1. Introductory Manual – overall concepts in how to use BellHawk
2. System Administrator Manual – how to administer BellHawk
3. Work Order and Labor Tracking User Manual - for RT-OPS and SPTS
4. Materials Tracking User Manual – for RT-OPS and LP-MTS
5. Advanced Production Tracking User Manual – for tracking manufacturing, assembly, and test/repair work orders using RT-OPS.

In addition there are user manuals for each of the optional modules.

Systems Architecture

BellHawk uses a web-browser interface for data capture. It can be used with most desktop computers and Laptops as well mobile computers, iPads, Android tablets, or smart phones that support a web-browser interface.

BellHawk runs on a Windows Server computer using the IIS webserver. It uses a SQL Server database to host the tracking database. The web-browser interface can be accessed like any other website over the Internet, or a mobile-phone data network.

Setup and data and operational rules, can be imported into BellHawk, over the Internet, using Excel spreadsheets. Operational data can also be exchaged with BellHawk using Excel spreadsheets. Many "reports" are also available in the form of Excel spreadsheets.

BellHawk can be run stand-alone or can automatically exchange data with a wide range of accounting, ERP or E-Commerce systems using its web-services interface. A DEXbox IIOT appliance is also available to provide a simplified data exchange interface between systems in a plant and the BellHawk database.

For transactional (barcode scanning) data entry, users will need to use a PC, or Android tablet, or similar device equipped with an external barcode scanner. Alternately, mobile computers equipped with integral barcode scanners can be used. These mobile computers will need to be equipped with a wireless LAN card so they can access BellHawk over the plant's wireless LAN.

BellHawk does not need a barcode printer to work. It can use rolls of pre-printed tracking barcodes for tracking materials. Also BellHawk can print out barcoded tracking sheets and reports on any office printer connected to the same LAN as the PC.

When needed, BellHawk can efficiently print out labels on barcode label printers in the local plant using a BellHawk Barcode Label Printing Appliance (BLPA).

User Categories and Roles in the BellHawk Software

Users of BellHawk are divided into four categories:

1. The system administrator who sets up users, their categories, roles and privileges. The system administrator also sets up system wide parameters, such as the company name and address.
2. Device users who do transactional (barcode scanning) data entry using device logins. These material handlers, machine operators, and other production workers do not have their own logins but are identified by scanning a barcode on their badges when they do transactional data entry.
3. Staff users who perform a series of roles, such as setting up work orders or managing materials. Staff users have their own user name and password and can carry out functions in the tracking system according to their assigned roles and privileges.
4. View only users – who have their own logins through which they can selectively access the Status reports and screens. Access can be restricted to only inbound, production, or outbound activities and for all companies or a specific company.

The staff available roles are:

- Purchasing Role. Enables this person to enter and edit purchase orders (if the Purchase Order Receiving module is licensed).
- Sales Role. Enables this person to enter and edit sales orders (if the Sales Order module is licensed).
- Production Management Role. Enables this person to setup jobs and work orders.
- Materials Management Role. Enables this person to perform inventory auditing functions.
- Setup Role. Enables this person to setup and import item master records, locations, etc.
- Quality Assurance role. Enables this person to perform quality assurance and control functions (if the Quality Assurance module is licensed).
- Manager Role. All staff members are able to view reports relevant to their role. Managers can view all reports plus certain reports containing confidential information. They are also able to export operational data in the form of Excel spreadsheets for subsequent analysis.

Staff members can be assigned more than one role. They can also be "Scan Enabled" to perform transactional data entry under their own login (as opposed to using a device login).

Users can be also be granted special privileges, such as the ability to adjust inventory and the ability to designate containers of material as having passed or failed QC inspection.

The first step in using BellHawk is for the Administrator to setup the system wide parameters and to setup the device and staff logins, as well as to enter all the device users who will use the system, as described in the BellHawk Systems Administrator’s User Manual.

Using BellHawk

Logging In

All order management, transactional data entry and reporting in BellHawk V7.8 is performed using a web-browser.

To use BellHawk, simply point a web-browser to the URL or network address of the server on which BellHawk is being hosted and you will see the "splash" screen shown to the right.

Simply click on the "Please Click Here link to Continue" link to login using the screen shown below.

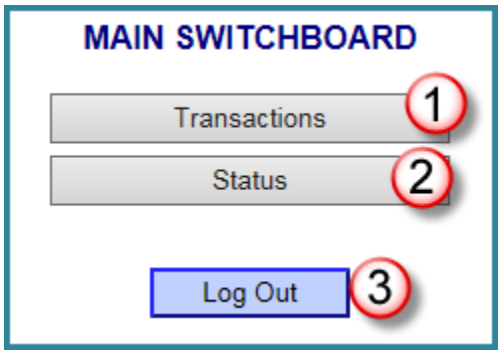
If you are a device user then enter the name of the device you are using in box (1) and the password for the device in box (2). If you are a staff member then enter your own user name and password.

Then select the Device Type (3). The Device Type is selected from a drop-down list and is used to give hints to BellHawk as to the best way to display its screens on the device. Finally click on the Log In button (4) to complete logging in.

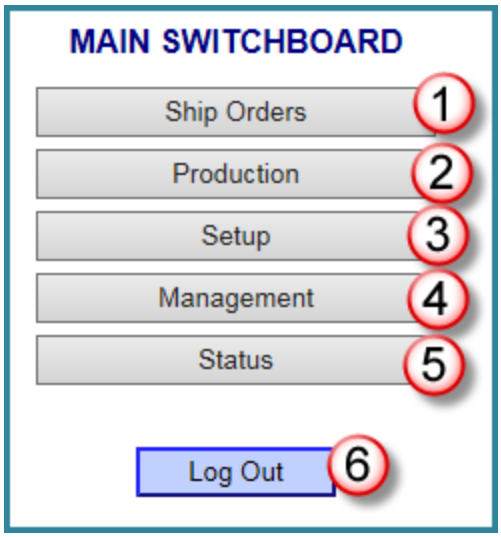
Main Switchboard

Once logged in you will be presented with the Main Switchboard. This is the main branching point for all the user interaction with BellHawk.

If you are a device user, you will see the screen shown at right with a button (1) that leads to the transactional data entry screens and a Status button (2) that enables you to view some useful reports, such as where inventory is located. There is also a Log Out button (3) that you use to log the device out from BellHawk.



If you are a staff user then you will see a different set of options, depending on the staff roles for which you were setup by the systems administrator.



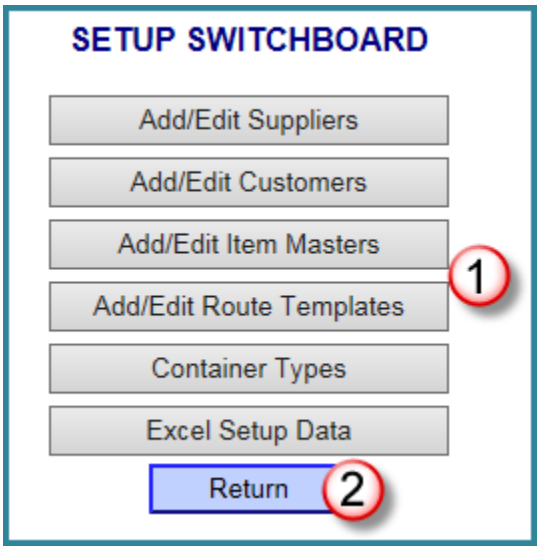
With a standard BellHawk tracking System you may see buttons shown at right for:

1. Ship Orders (1) to setup Customer Names and, optionally, Customer Addresses and Ship Orders.
2. Production (2). This is used to issue and manage all the work orders in BellHawk.
3. Setup (3). This is used to set up the knowledge base for BellHawk, either by direct data entry or importing data by means of Excel spread sheets.
4. Management (4). This leads to a series of reports and Excel exports that managers can view to see the real-time status of their inventory and operations. This is a superset of the reports and exports available in other roles (through their specific switchboards) and may contain sensitive cost information.
5. Status (5). This is the set of reports that everyone has access to.
6. Log Out (6). To log out when you are finished using BellHawk.

Additional buttons will appear for Transactions, Materials Management, Sales, Purchasing, Customer Orders and Quality Assurance if these options are licensed and you are setup for these roles.

Subsidiary Switchboards

Clicking on one of the buttons on the main switchboard will then bring you to a switchboard appropriate to the function you are performing, such as the staff Setup Switchboard shown here.



As with all the role or function specific switchboards, you will be able to select buttons for specific actions (1) and also be able to select the Blue Return button (2) to return to the prior page.

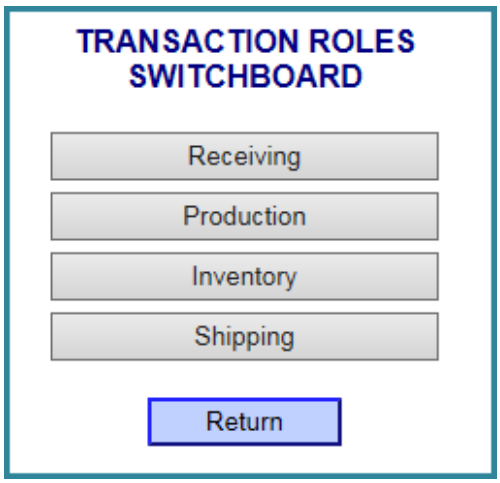
Please note that in the BellHawk thin-client interface, the web-browser back button is disabled. If you succeed in enabling and using the back button, you will find that BellHawk does not work properly as it remembers the user's state from screen to screen and this will be lost if you use the web-browser back button.

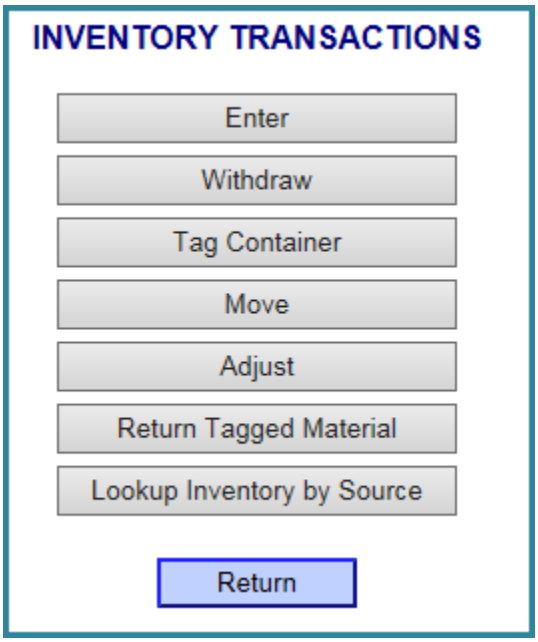
Details of the actions that may be carried out using these function or role specific switchboards are described in separate User Manuals for the role or function.

Transaction Switchboard

The Transactions button on the Main Switchboard leads to the Transaction Roles Switchboard shown here. From here device users can select the role that they will be acting in and see just the transactions that are appropriate to that role.

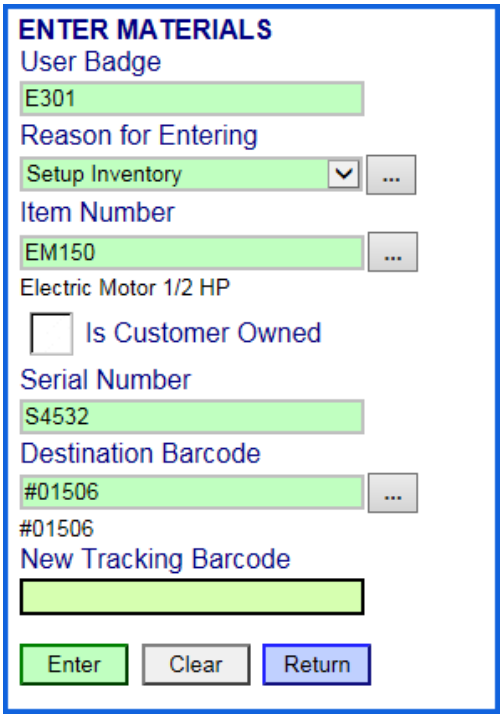
This makes the system easier to use as it eliminates searching through a long list of transactions to find a specific transaction.





An example, at left, of a role specific set of transaction choices is shown at left. Each button leads to a screen for a specific transaction.

A Typical Transaction Screen



When a device user selects a transaction for data entry, they will be presented with a screen, such as that shown here at right.

On these screens, the recommended next data entry box is shown in bright green. Other possible data entry boxes are shown in a lighter shade of green.

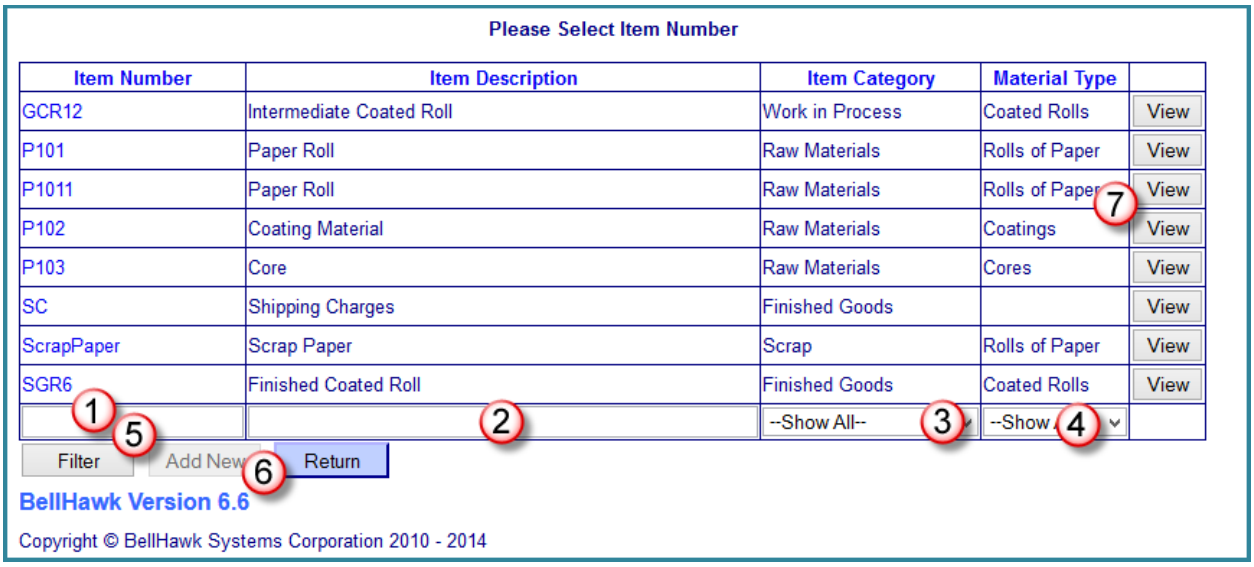
Generally it is a good idea to enter the data in top to bottom order as the form can change dynamically depending on the selections made.

All screens of this type have a green submit button with an appropriate name such as [Enter] that is used to submit the data for entry into the BellHawk database. Many also have a [Clear] button that simply clears all the data entered so far so as to permit "starting again".

All transactional data entry forms require that a user scans the barcode on their badge as a way of identifying who did the transaction. So it is important that all device users have their badge barcodes setup in BellHawk by the Administrator.

Other fields are entered directly from the keyboard or selected from a drop-down list or simply selected by clicking on a checkbox. Many entries have an ellipses [three dots] button, which takes the user off to a selector screen, from which the entry may be selected.

These selector or list screens take the form shown below:



These screens show a list of whatever objects are being selected (in this case Item Master Part numbers). If the number of entries in the list is greater than 20, it will be broken down into separate pages with 20 entries on each page, along with a set of controls that enable the user to move from selector page to selector page.

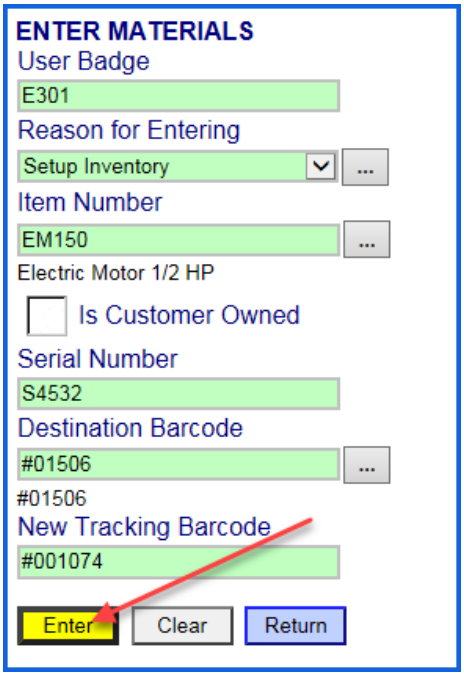
To make it easy to find a specific entry, a user can enter a string to match in the filter boxes, (1) and (2) above or can make selections from the selector boxes, (3) and (4) above.

Then clicking on the Filter button (5) will select and show just the filter row entries. Clearing the filter boxes and resetting the filter selectors to Show All and clicking the Filter button will reset the screen to show a list of all entries that match the column filters.

The filter boxes use a % wild card. Thus %Salad% will match anything containing “Salad”, Finished% will match anything starting with Finished, and %Plastic will match anything ending in Plastic.

The list screens may have an Add New button (6), which will only be active if the user has permission to add new items. This takes the user to a screen on which they can add new entries to the list.

Similarly they may have Edit buttons (7) which will take the user to a screen where they can edit the selected entry. Again this can only be accessed by users who have permission to edit the entries. [View] appears on the screen for the user except when the Admin gives permission to the user to [Edit] or create new item numbers.



If the list is being used for selection purposes then clicking on the link identifying the entry, such as the item number or customer number, will select that entry and return to the prior screen with that item selected.

Once all the data has been entered into the form, the user selects the "Submit" button, such as [Enter] and it turns yellow to indicate that the data has been submitted to the BellHawk server. Once a response has been received from the server the button turns green again, with appropriate data fields cleared on the form so that data can be quickly entered for the next container.

If you click on a "submit" button and it does not change and the form does not change (such as by clearing fields such as the serial number that will not apply to the next container) then all you have done is to move the browser's focus of attention to the selected button and you need to click on the button again to send the data.

If the button remains yellow for a prolonged time then this means that the update got lost on the way to the server, such as due to the network connection being lost, and you should resubmit the data.

Please note that this only applies to transactions. Manager/staff screens use pop-up acknowledgements to confirm data transmittal. Responding to acknowledgements, however, slows down transaction data entry too much and has been replaced with the above mechanism.

Device Users

Each user that does transactional data entry must be setup by your administrator in BellHawk and must have a user badge barcode.

Some clients already have barcodes with employee numbers on their badges. Others simply take a unique tracking barcode from a pre-printed roll and attach it to the back of existing badges. Yet other clients simply take rectangles of plastic, write the user's name on the plastic with permanent marker and attach a tracking barcode.

You can be as simple or as fancy as you like. What matters is that each user who is going to do transactional data entry has their own unique badge barcode.

Reports

BellHawk comes with a range of reports and Excel exports that can be used to monitor and review inventory and production operations. The reports that any user can view are dependent on their role.

Please note that from a reporting point of view, BellHawk tracks:

1. The real-time status of every container of material in the plant. From this BellHawk is able to report on current levels of inventory and work-in-process in great detail.
2. A history of all material, labor, machine, and production transactions. From these it is able to derive materials traceability and job costing reports.

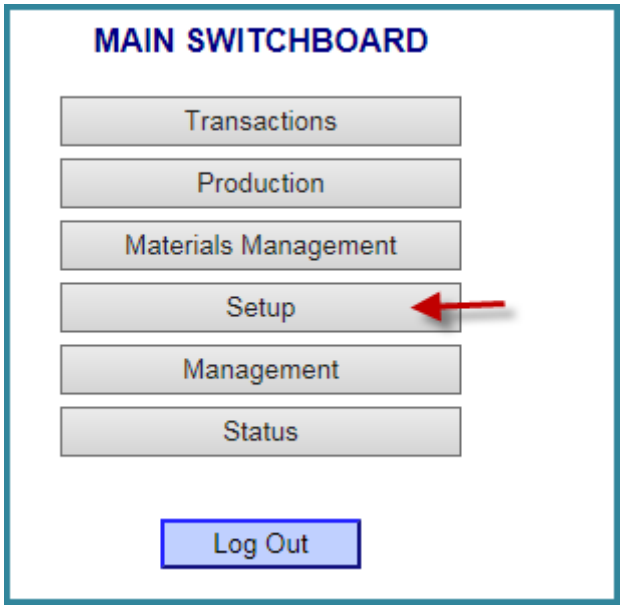
BellHawk does not track the history of what inventory was in stock at the end of a particular day or month. For such historical reporting the real-time transactional data needs to be exported to an ERP system or to a history database from which such reporting can be performed. Such exports are normally performed automatically using BellHawk Systems MilramX automated data exchange software.

Setting up the BellHawk Knowledge Base

In order to setup the knowledge base, you will need to have the system administrator assign you setup privileges, in order to access the Setup Switchboard. The exceptions to this are the Customers and the Suppliers which can also be accessed by staff with Sales and Purchasing privileges.

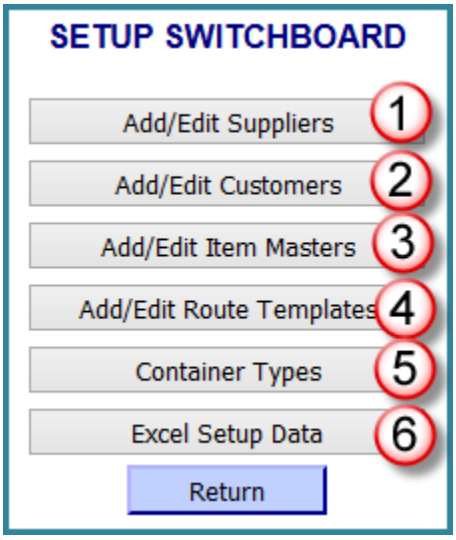
Knowledge base data that only changes infrequently, such as locations, is setup by importing the data from Excel spreadsheets whereas data that changes all the time, such as adding new item master records, suppliers and customers can be performed using setup screens or Excel spread sheets.

A staff person who has been setup by the Administrator to be authorized to setup customers, suppliers, and item master records will see the a Main Switchboard screen similar to that shown at right with a Setup button, through which the setup functions are accessed.



The Main Switchboard screen will only display the buttons for activities the person is authorized to perform. Staff members who are also authorized to enter customers, suppliers and to manage shipping and receiving will also see buttons appropriate to their roles. Other buttons, such as Transactions, Production, Materials Management and Management, shown here, will only be shown for staff members authorized by the systems administrator for that role.

When the Setup button is selected the screen shown at right appears. On this screen, the setup screens for Suppliers (1), Customers (2), Item Master Parts (3), Route Templates (4) and Container Types (5) can be setup using interactive screens. Which of these is shown depends on the BellHawk base system being used.



Other setup data can be imported using the screens accessible through the Excel Setup Data button (6). The Excel Setup Data screen can also be used to export setup data and also to import supplier, customer and item master data.

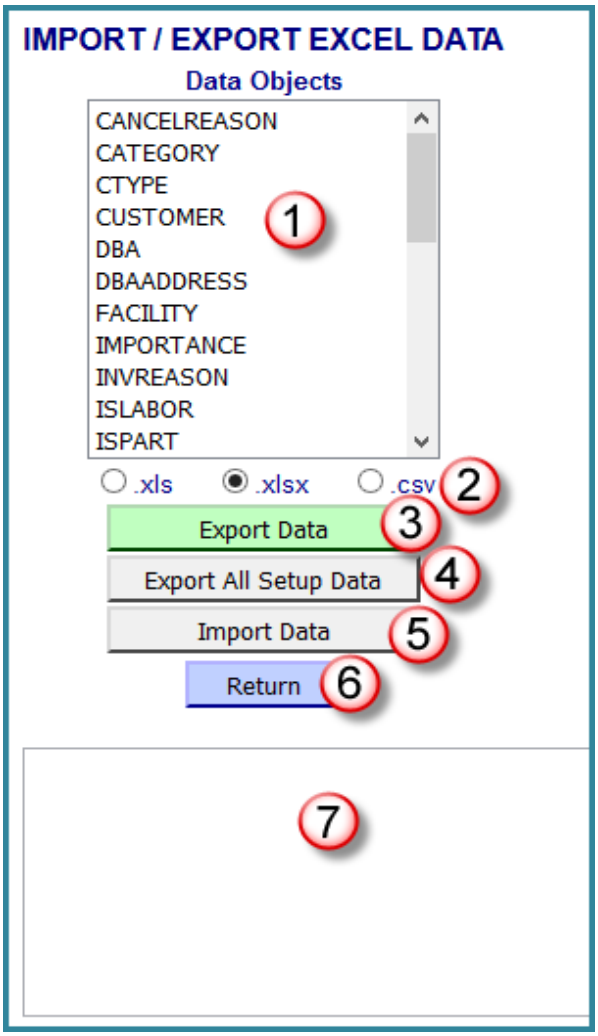
Please note:

1. Customer and Supplier Addresses can only be setup through the Supplier (1) and Customer (2) buttons, if the SO and PO modules have been licensed, respectively. Their setup is explained in the User Manuals for these modules.
2. The setup and use of Routes is explained in the Simple and Advanced Production Tracking User Manuals.

When you are finished with your setup, you can select the blue Return button to return to the prior screen.

Importing and Exporting Setup Data in Excel Spreadsheets

Import-Export Screen



From the Setup Switchboard, authorized staff persons can select the Excel Setup Data button to go to the screen shown here, which is used to import and export setup data in the form of Excel spreadsheets.

If you want to export all instances of specific class of data object, then you select the Keyword for that data object in the panel (1), then select the output format (.xls, .xlsx, or .csv) (2) and then select the green Export Data button (3).

This will export all the current instances of the selected Data Object, as shown in the next section, in the form of an Excel spreadsheet or a comma delimited file. In performing this action, Windows screens will pop-up asking whether to save or open the resultant file.

Then, if the data is to be saved, another screen will open, to ask for the file name and the folder in which to store the Excel file.

If there are errors in any export or imports, error messages are shown in the panel (7).

Please note that you can only export one class of data object at a time using the Export Data button. You cannot select multiple entries from the panel (1).

Alternately, you can export all the setup data that is appropriate to your installation using the Export All Setup Data button (4). This is very useful if you want to save and restore data on a BellHawk test system, especially when cleaning the database in between tests.

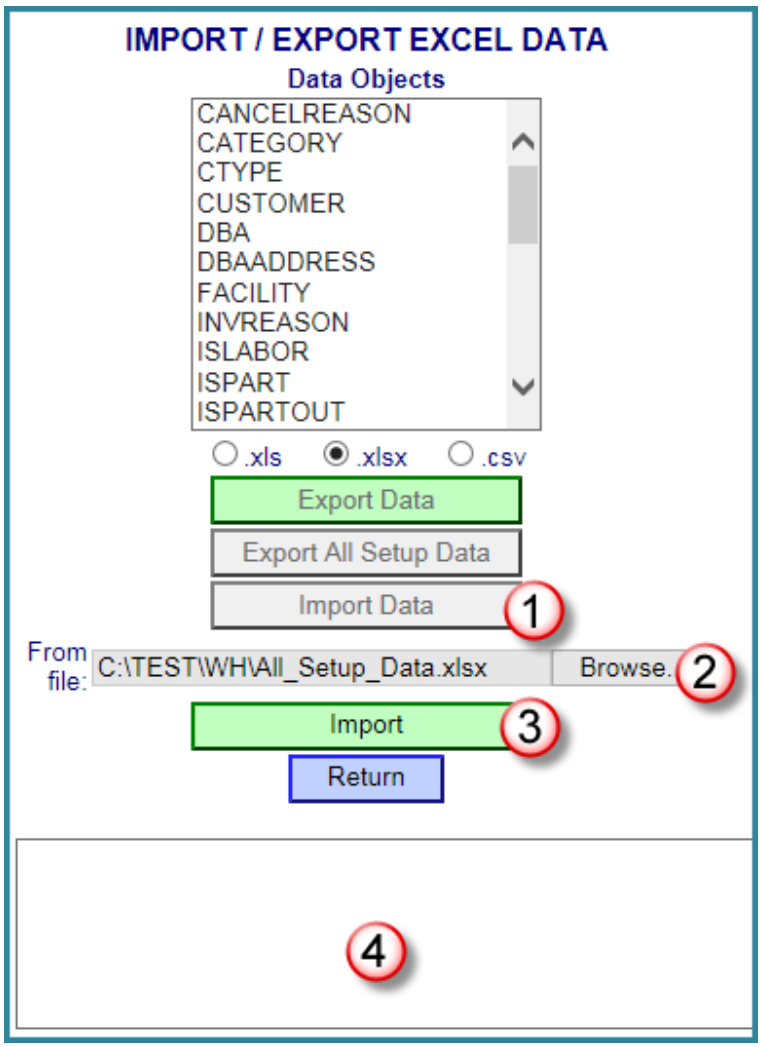
The exported Excel file will then contain multiple types of data object, each with its own header, in a single Excel file. The data that can be imported and exported through this setup screen is that which is appropriate to the intended operational usage. It does not include all BellHawk data objects or all parameters for those data objects.

The data objects and their parameters, which can be imported or exported through the setup screen, are controlled by The ExportDefs.xls file, which can be downloaded, viewed and modified by the Systems Administrator through his DEXEL system administration screens.

Please note that you cannot import or export employee or device setup data through the above Setup screen as this function can only be performed by the systems administrator through the DEXEL screens.

Data can be imported in either Excel or comma delimited format by selecting the Import Data button (5), which will ask for the file name and folder from which to read the setup data. Please note that you do not have to select the Data Object type before doing an import, as BellHawk determines the type of data being imported from the file extension.

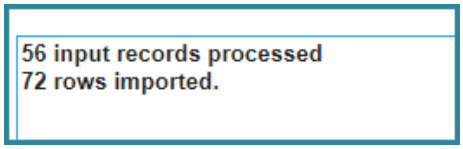
When the Import Data button (1) is selected then the following screen appears:



From this, you can then click the Browse button (2) which will bring up a Windows file selector screen. Once the file is selected then selecting the Import button (3) will cause the import to occur.

If there are any errors in the import they will be shown in the panel (4) together with, sometimes, a notation stating that the whole import was rejected if the errors are bad enough.

If the import was successful you will get a message similar to that shown here at right.



Excel File Format

The data format used for both import and export of setup data is shown below in Excel .xls format. It can also be in Excel .xlsx .csv, or comma delimited format, if coming from another system.

	A	B	C	D	E	F
1	LOCATION	LocationCode	LocationDescription	FacilityCode	IsGeneric	IsReceiving
2		#01504	Stock Room Bin #01504	StockRoom	Y	N
3		#01506	Stock Room Bin #01506	StockRoom	Y	N
4		#01513	Stock Room Bin #01513	StockRoom	Y	N
5		#01516	Stock Room Bin #01516	StockRoom	Y	N
6		MRB	Material Review Area	StockRoom	Y	Y
7		Production	Production	StockRoom	Y	N
8		QC	QC Dept	Production	Y	Y
9		Receiving	Receiving Dock		Y	Y
10		Shipping	Shipping Dock		Y	N

The spreadsheet has a header row followed by rows describing each of the data object instances. The header row contains a keyword, in this case LOCATION (1) that identifies the type of data object. This is followed by column headers (2), (3), (4), (5), (6) etc. that must be spelled exactly as exported, as they are used by the import routine to identify what data is in each column. So, if you are exporting an object type to use as a template for setting up and importing a specific data type, do not modify the header row in any way.

Formally, the keyword is the unique name that identifies the HLDO (High Level Data Object) and the column headers are the HLDO parameters.

If, on export, there is no data already in the database for the type of object you exported then there will just be the header row in the export file.

You can now edit this file and add or modify rows and then use the Import button to import the resultant setup data into your BellHawk system.

The first column should be blank unless you want to delete an existing entry, when you place a "D" in that column to mark that entry as deleted. Also you can place a "#" (by itself) in the first column if you want to use the rest of the fields on that line as a comment.

At time of initial startup, there will be no initial object instances for most data objects. For others, such as item categories, there may be some initialization values that are used by BellHawk itself. Please do not delete or modify these as they may cause your BellHawk system to no longer work correctly.

When importing data, any columns, except the first (Keyword) column, may be omitted, if they contain optional data items. These columns may also appear in any order, as they are recognized by their column header. But columns that uniquely identify an entry, such as the Location Code, must be included. The HLDO Keyword and the column header entries are case sensitive.

For more information about HLDOs and their parameters and how they relate to the underlying BellHawk data structures please see the HLDO User Manual. The definitions of each HLDO and how it relates to the underlying tables and fields in the BellHawk database can be exported using the System Administrator's DEXEL screen

Constraints and Limitations of BellHawk

1. BellHawk requires the use of a modern web-browser with capabilities equivalent to Internet Explorer 6 or later. It is compatible with Internet Explorer, Edge, Firefox, Safari, Chrome and a number of other browsers. It is important to set your browser to:

    a. Set your browser to allow pop-ups for your BellHawk website. BellHawk uses pop-ups for displaying reports, warnings, and alerts.

    b. Disable auto-filling or auto-suggestion for data fields to be filled in, otherwise your browser may automatically fill in fields with previously scanned barcodes or text you typed in.

    Please use an Internet search engine to find out how to allow pop-ups and disable auto-fill or auto-suggestion for the web-browser you are using.

2. If you are using a Google toolbar on your PC then this too will attempt to prevent pop-ups by default. You need to set the Google toolbar to allow pop-ups for the BellHawk website you are using.

3. BellHawk requires that you have continuous high quality Internet and or Intranet connectivity to the BellHawk web server while performing any data entry or report generation.

4. Excel exports and reports in Excel format can only be viewed on devices that have Excel installed.

5. While BellHawk is designed to work with a wide variety of barcode data collection and printing devices, BellHawk only guarantees that its software will work out-of-the-box with equipment that is specified by BellHawk. Please test any other equipment using a BellHawk test site before purchasing the equipment.

6. Lookup fields, such as part numbers, location codes, employee numbers, vendor and customer numbers, and reason codes should not contain any punctuation or other non-alpha-numeric characters, except for the pound (#), dash(-) or underline (_) characters otherwise they will be rejected.

7. Descriptive fields can contain characters such as commas and periods but must not contain any control characters and, unless otherwise specified, must be single-line entries, otherwise they will be rejected.

8. BellHawk makes extensive use of Excel spreadsheets for importing setup data and for exporting reports. While BellHawk will work with a Macintosh or Linux based personal computer, you do need the capability to read, write and edit .xls, .xlsx, or comma delimited files.

9. On most BellHawk web pages you will find a blue Return button. This will take you back to the form from which you entered the current form. Please note that this is different from the web-browser's back button, which is disabled when BellHawk is being used.

10. Some web browsers require that a button or a link be the focus of attention before they recognize that button or link as having been clicked. As a result, sometimes you may need to click twice before a click causes an action; the first click being used to select the button or link as the focus of attention.

11. BellHawk can get confused if you have more than one BellHawk session opened in different windows using the same web-browser at a time. This is because the browser maintains only a single session key for all browser windows interacting with BellHawk and so BellHawk has no way of distinguishing input coming from the different browser screens or tabs.

12. BellHawk uses a standard Extended ASCII character set for its database. You should set the collation on your BellHawk database to accommodate this (it is the standard default in North America). BellHawk does not support the use of Unicode characters as these would double the size of the database and negatively impact the real-time performance of BellHawk.

13. Reports are now produced in a separate browser tab. This is so that users can have one or more reports open in separate tabs, while still continuing to perform other data entry actions. Some browsers treat these additional tabs as pop-ups and so you have to enable the browser on each device to allow the display of pop-ups for the BellHawk website(s) you are using.

14. We have found that the standard IE6 web browser supplied with obsolete Windows Mobile 5.x and 6.x operating systems do not correctly display the BellHawk screens. This is due to the fact that Microsoft tries to be too clever and optimizes the display for a small screen rather than just presenting the data in normal desktop mode.

15. The IE6 browser supplied with Windows CE based devices works fine as it just displays the website pixel-for-pixel, as designed, which works fine for most devices.

16. There is a special registry setting to make an IE6 web browser on Windows Mobile devices behave like the Windows CE browser – please consult your mobile device supplier or see Support Information on BellHawk website for details.

Commentary

It is important to recognize that BellHawk is designed around a specific "best-of-breed" operations tracking methodology which has been developed over a decade of practical applications experience. BellHawk has great flexibility about how it can be configured for specific applications but it is still designed around accepted and proven real-time operations tracking methods.

Some users of BellHawk have, however, been tempted to invent their own methodology for using BellHawk or try to make it work just like their old system when using BellHawk as a replacement for a previous custom system. Please be aware that this simply will not work, without making extensive and expensive changes to the BellHawk software. It is much quicker and easier to adopt the industry standard methods embodied in BellHawk.

