BellHawk User Defined Parameter User Manual

Introduction

This manual describes how to use the User Defined Parameter (UDP), Item Configuration, and Composite Part Number capabilities of BellHawk to enable users to tailor BellHawk to their specific needs without the need to create custom code.

Contents

UDP Data Capture Capabilities

The UDP capability enables clients to specify additional user defined parameters to be captured on the following setup screens:

1. Company
2. Customer
3. Container Type (only available with SMTS and RTOPS base systems)
4. Customer address (only available with SO option)
5. Sales order entry (only available with SO option)
6. Work order - to appear on traveler header (only available with SPTS and RTOPS)
7. Work order step - to appear on the traveler (only available with SPTS and RTOPS)

The UDP capability also enables additional data to be captured on the following transactions (which are only available with SPTS and RTOPS base systems)

- Scan out of work order step
- End work order step

This data, along with the other UDP data described above can then be incorporated into custom reports and Excel exports. It can also be used to pass data to other systems, such as ERP, EDI and shipping systems.

Item Configuration Capabilities

The following capabilities are only available to users of the SMTS and RTOPS base systems:

The item configuration capability enables the capture of Item specific data such as length, width, color, size, hardness and PH. This data can be captured:

1. On the Item Master record - as a default
2. When sales order lines and purchase order lines are entered
3. When materials are received or entered into inventory
4. When materials are produced by work order operations
5. When pick orders are generated

This item configuration data is carried into the UDP field of each container record so that it can be used for reporting purposes as well as for Excel exports and barcode labels generated by the TAG module for labels to be attached to the containers.

A major use of the Item Configuration data is to minimize the number of Item Master records that have to be created for custom products that are available in many sizes, colors, and shapes.

Instead of creating a separate Item master record for each size, color and shape, in BellHawk (and also the attached ERP or accounting system) clients can simply specify a limited number of Item Master part numbers, such as one for each shape. They can then use BellHawk's Item Configuration UDP capabilities to record customer orders, production, picking, packing and shipping of the products, using a base part number for each shape and UDP parameters for the color and size.

This dramatically reduces the amount of setup work required. It also makes it easy to add or remove options from the product line, simply by changing the color and size choices.

One of the big benefits of being able to setup user defined parameters for item configuration is the ability to use a single part number to represent items which have many different sizes, colors or other options. This is especially beneficial for make-to-order organizations, as well as distributors, who make or distribute common products in many different sizes and colors. It is also very useful for tracking the inventory of off-cuts returned from manufacturing processes.

User defined parameters are also useful in food processing where they can be used to capture data such as harvester, where harvested, and when harvested for each container of ingredients.

Composite Part Numbers

These are only available for users of the SMTS and RTOPS base systems.

While the use of user defined item configuration data can make it much easier for make-to-order manufacturers to setup and manage part numbers for their custom products, it does bring with it an issue in reporting inventory that the use of composite part numbers solves.

When UDP is used, we can track parts by their Item Number and by their UDP parameters. This is carried through to:

- Containers
- Purchase Order Lines
- Pick Orders
- Work Orders
- Ship Order Lines

This works well as it enables the attributes to be set and modified independent of the item master part number. We also are able to make sure, for example, that a part picked against a pick order has, at a minimum, the attributes required on the pick order. The part picked may have other attributes but, as long as it matches the required attributes on the pick order, it may be selected.

The problem comes with Inventory receiving, shipping and production reports and Excel exports as well as:

- Receiving sheet

- Ship Order acknowledgement
- Picking sheet
- Work Order traveler
- Packing Sheet
- Bill-of-Lading
- Load Report

In these reports BellHawk needs to show each part on a separate line for each item number and UDP parameter combination.

For example, it is not very useful to show how many T-shirts that we have in stock. Instead we need to show how many small blue T shirts and large red T shirts we have.

This problem is solved by enabling the user to define Composite Part Numbers, such as "TShirt-S-B" and "TShirt-L-R" as composite part number variations on the base "TShirt" item master part number.

Once this is done then inventory and other reports, Excel exports, and other documents will list the parts by composite part number rather than just by the base part number.

Where a composite part number is not defined then the part number defaults to the base part number and BellHawk works as described in other user manuals.

The Nature of UDP Data

UDP data is of the form of name:value pairs, such as `Width:30, Color:Blue`, etc.

UDP data is stored in a single Varchar(MAX) column added to each table and named UDP. The UDP data is stored in industry standard JSON format, which looks like:

```
{"Width":"30", "Color":"Blue"}
```

In this way we are able to store a wide variety of user defined data within a standard BellHawk database.

BellHawk enforces the rule that the Parameter Name, like all Parameter names in BellHawk, must obey the BellHawk TEXTID rules which limit the parameter name to alpha-numeric characters plus a few other characters, such a hash sign and a dash. Generally punctuation characters, non-printing characters and any characters not in the standard ASCII set cannot be used.

The BellHawk XML Metadata for these UDP fields is of type JSON. This allows BellHawk to check that the UDP data is correctly formatted before it is stored away. Also, while the JSON format allows for complex nested hierarchy trees, BellHawk limits its representation to a simple array of name:value pairs.

Please also note that only parameters with values are stored in the UDP field to conserve space. If a checkbox for an option is not checked then that parameter is not stored in the UDP field.

Setting up User Defined Data Object Parameters

User Defined Parameter data capture is setup using the BellHawk DEXEL Setup mechanism by the BellHawk Systems Administrator importing an Excel setup file like that shown below. Note that this is best done by using DEXEL to export an empty Object Parameters file and then filling in this Excel spreadsheet before importing this again.

OBJECTPARAM	ParCode	ObjectParamName	Keyword	SeqNo	ParameterLabel	DataType	Min	Max	IsRequired
	DBA1	UCC	DBA	1	UCC/GS1 Company Code	NUMCHAR	7	11	Y
	DBA2	SLID	DBA	2	Source Location ID	NUMCHAR	4	30	Y
	DBA3	SGLN	DBA	3	Source Global Location Number	NUMCHAR	13	13	N
	DBA4	MLID	DBA	4	Manufacturers Location ID	NUMCHAR	4	30	Y
	DBA5	MGLN	DBA	5	Manufactuers Global Location Number	NUMCHAR	13	13	N
	CU1	CUSTEDI	CUSTOMER	1	Customer EDI ASN	OPTION	1	1	N
	CA1	DLID	CUSTOMERADDR	1	Destination Location ID	NUMCHAR	4	30	N
	CA2	DGLN	CUSTOMERADDR	2	Detination Global Location Code	NUMCHAR	13	13	N
	CA3	ISOCC	CUSTOMERADDR	3	ISO Country Code	TEXTID	1	3	N
	CA4	CUSTADDREDI	CUSTOMERADDR	4	Customer Address EDI ASN	OPTION	1	1	N
	SO1	DMODE	SO	1	Delivery Mode	CHOICES	1	2	Y
	ITEM1	GTIN	ITEM	1	Global Trade Identification Number	NUMCHAR	14	14	Y
	CTYPE1	PTYPE	CTYPE	1	Pallet Type	CHOICES	1	2	N
	CTYPE2	PTYPE	CTYPE	2	Pallet Type	CHOICES	1	2	N
	EMPOUT1	PERCOMP	EmpOut	1	Percentage Complete	INTEGER	0	100	N
	ENDJS1	PERCOMP	EndJobStep	1	Percentage Complete	INTEGER	0	100	N

1 2 3 4 5 6 7 8 9

IsSetup	IsTransactional	IsInherited	Identifier1	Identifier2	Identifier3	Identifier4	Identifier5	Identifier6
Y	N	N	MYCOMPANY					
Y	N	N	MYCOMPANY					
Y	N	N	MYCOMPANY					
Y	N	N	MYCOMPANY					
Y	N	N	MYCOMPANY					
Y	N	N						
Y	N	N						
Y	N	N						
Y	N	N						
Y	N	N						
Y	N	N						
Y	N	N						
Y	N	N	Pallet					
Y	N	N	ShipPallet					
N	Y	N						
N	Y	N						

10 11 12 13

Each row in this spreadsheet, after the header row, defines a user defined parameter that will be requested on the specified data input screen. As with all BellHawk setup data objects, the column headers are identifiers, and so must be reproduced as shown.

Identifier7	Identifier8	Choices	Values
		Air, Expedited Truck, Customer Pick-Up, Backh	A,E,H,K,L,LT,R,S,SR,T,TT
		Aluminum, DOT Spec, Metal, Standard, Steel, V	1,2,3,4,5,6,7,8,9,10,11,12,13
		Aluminum, DOT Spec, Metal, Standard, Steel, V	1,2,3,4,5,6,7,8,9,10,11,12,13

14 15

The meaning of each of the columns is as follows:

1. OBJECTPARAM (1) – this is the keyword for User Defined Object Parameter (UDP) capture definition data.
2. ParCode (2) – this is a unique identifier for the entry. It can be used to edit or delete entries, using the BellHawk DEXEL import mechanism.
3. The ObjectParamName (3) is the parameter name that will appear in the JSON string in the UDP field for the captured value. Please note that a UDP field in any one table may have only one parameter with a specified name and so it is important to ensure that entries intended for separate purposes do not use the same name. These should be kept short to conserve space in the UDP field.
4. Keyword (4) identifies the data entry screen(s) on which the data is collected. Please see the section of this manual on Data Collection Details for details about the actions for specific keywords. For setup objects we use the BellHawk metadata keyword names but for the transaction screens we use Keywords representative of the screens.
5. The SeqNo (Sequence Number) column (5) identifies the order that the parameters are displayed and requested on a page.
6. The ParameterLabel column (6) is the label that will be used on the screen to collect the data for the parameter.
7. The DataType column (7) is the BellHawk Metadata data type that will be used to check the entered data for correct format. It can be one of the following:
    a. CHOICES – allowing the user to select from a drop-down list.
    b. OPTION - generates a checkbox – results in a Y for the value of the JSON parameter in the UDP field.
    c. TEXTID – any alphanumeric string of ASCII characters
    d. TEXT – Any extended ASCII characters except non-printing characters
    e. NUMCHAR – a string of numbers
    f. FLOAT – a floating point number in scientific format
    g. INTEGER – a positive or negative integer number
    h. DECIMAL – a decimal number
    i. DATE – a date in one of a number of standard formats set by the operating system geographic locale.
    j. DATETIME – a DATE followed by hh:mm:ss
8. Min and Max (8) are used to check:
    a. The length (number of characters) of text data

b. The minimum and maximum value of numeric data

9. IsRequired (9) sets whether the user will be required to provide a value for the specified parameter or not.
10. IsSetup (10) indicates that this is to appear on the setup screen. The action is specific to the Keyword.
11. IsTransactional (11) indicates that this is to appear on transaction screens. The action is specific to the Keyword.
12. IsInherited (12) is used in conjunction with the Item Configuration Option to indicate that item configuration data is inherited. This is specific to the Item keyword.
13. Identifier1 through Identifier8 (13). These are used to set the conditions under which data is collected. Their meaning is keyword specific.
14. Choices (14) is a comma delimited list of TEXTID entries that will appear in the resultant drop-down list presented to the user.
15. Values (15) is a corresponding comma delimited list of TEXTID values that will be used for the value entered in the JSON name:value pair in the UDP field.

Entering UDP Data

When User Defined Parameters (UDPs) are setup to be requested on a screen, specified by the Keyword, such as for the host company, the Parameters feature is activated.

If there are more than three parameters plus dimensions to be collected, the top three parameters are listed (1) and a Parameters button (2) appears.

If there are three or less parameter values to be collected then these appear in-line in location (1)

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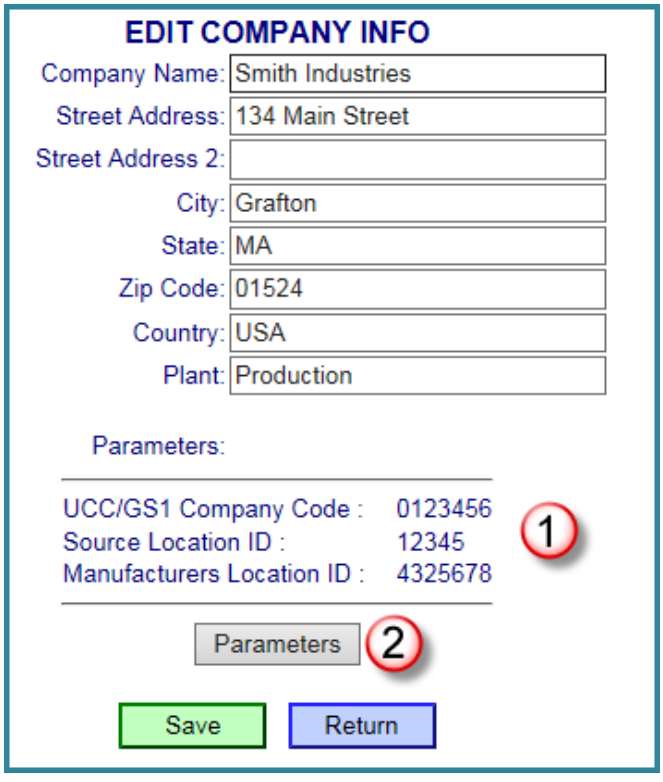
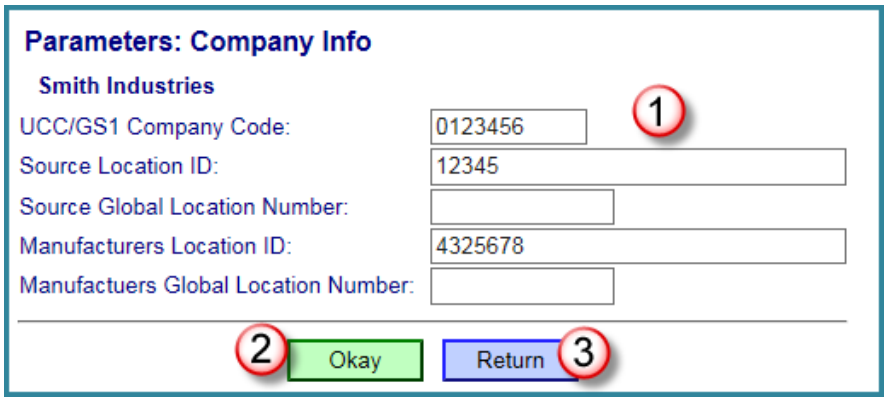


When the [Parameters] button is selected then the parameters sub-screen is shown:



Here data values can be entered or changed (1). When Okay (2) is selected, the values are saved in the in-memory UDP field for the data object and a return is made to the main setup screen for the data object if all the required data fields have been filled in and are of the correct data type and length. If the Return button (3) is selected the edited values will not be saved but the user will be warned if they have not filled in required values.

The UDP data will not be saved to the BellHawk database until the Save/Submit button is selected on the main data object edit screen. When just using Return, the user will be warned if they have not saved any changes they have made to the parameters and will be given the opportunity to save them before returning.

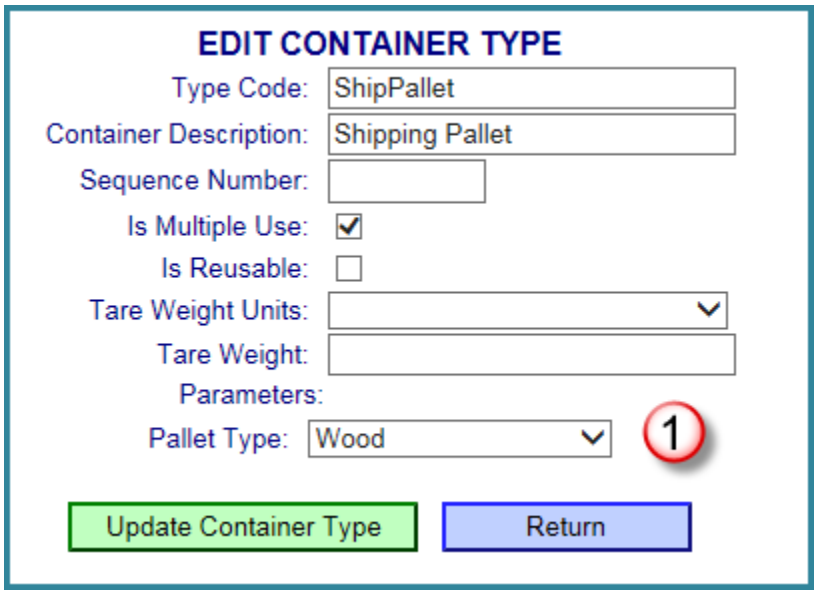
Please note that data entry boxes are shown for all possible parameters but only those with values are saved in the UDP field.

Here is an example of a drop-down list selecting the type of Shipping Pallet and the resultant value setting.

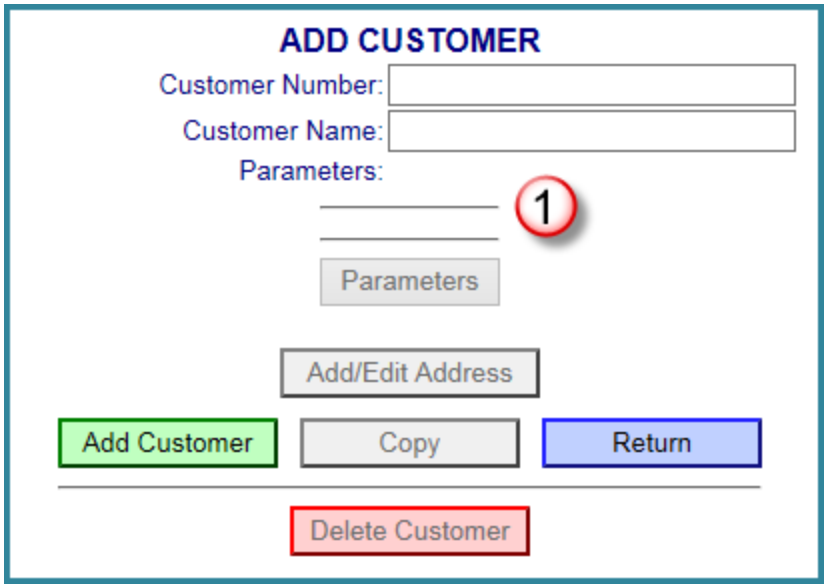
Here there is only a single value to be collected so that it appears in-line (1) on the setup screen.

This shows the use of a Choices data type to create a drop-down list. When the page is revisited, the currently selected choice is shown.

Please note that in the case of a Choice entry, it is the corresponding Value that is placed in the UDP field, not the Choice text string itself.



When entering data for a setup screen, such as for a new customer, then the Parameters are shown as blank (1) and the [Parameters] button as grayed out, as shown here, until the information about the data object is saved.

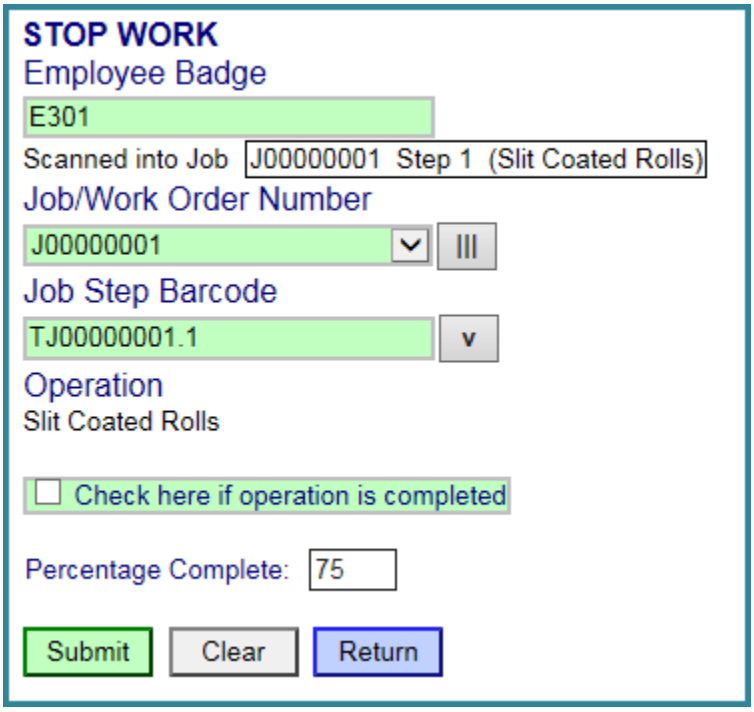


This is because the parameters for which data is to be collected are not known until the new setup data object is saved or added as they may, as in this example, be conditioned on the specific customer. In other cases they may be conditioned on a number of standard data entry fields.

This also applies to data collected for new sales orders, purchase orders, and jobs, unless these are inherited Item parameters, when using the Item Configuration option.

Once the data object is inserted into the database, by saving, adding or submitting, then the parameters to be collected appear in line or the [Parameters] button appears, depending on the number of parameters to be collected.

This does not apply to transactional data collection, where the data is directly requested, as shown in this example.



UDP Data Capture Setup

Company Setup Screen

Keyword = DBA

Conditions:

- Identifier1 = Company Code or blank to capture data for all DBA (Doing Business As) entries in the doing business as table in BellHawk. The company code for the default host company for the BellHawk website/database is MYCOMPANY. There may be other DBA entries, if the Private Label option is licensed.

The data captured is placed in the UDP field in the BellHawk doing-business-as table..

Customer Detail Screen

Keyword = CUSTOMER

Conditions:

- Identifier1 = Customer Number or blank for all

Results are placed in the UDP field of the BellHawk customers table

Customer Address Detail screen

Keyword = CUSTOMERADDR

Conditions:

- Identifier1 = Customer Number or blank for all
- Identifier2 = Customer Address Code or blank for all

Results are placed in UDP field of the BellHawk customer address table.

Sales Order Detail Screen

Keyword = SO

Conditions:

- Identifier1 = Customer Number or blank for all

Results are placed in the UDP field of the BellHawk Ship Order table.

Container Type Detail Screen

Keyword = CTYPE

Conditions:

- Identifier1 = Container Type

Results are placed in UDP field of the BellHawk container types table.

Work Order Setup

Keyword = WOSetup

Conditions:

Identifier1 = Item Number for item being made or blank for all items

Identifier2 = Item Category for item being made or blank for all item categories

Identifier3 = Material type for item being made or blank for all material types

All the work order setup parameters will appear in the traveler header (in two columns) and on the work order detail screen along with Item Configuration parameters. If this is being used with SPTS then leave the Identifier fields blank in the OBJECTPARAM setup.

Work Order Route Step Parameters

The function of this set of parameters is to allow for setting up work order route step parameters for a work order such that these parameters will appear on the work order traveler for the step. The purpose is to provide specific setup parameters to a machine operator.

Keyword = WOStepParams

Conditions:

- Identifier1 = Item being made or blank for all
- Identifier2 = Item being made Category or blank for all
- Identifier 3 = Item being made Material Type or blank for all
- Identifier4 = Work Center or blank for all
- Identifier5 = Operation Code or blank for all

These parameters can be setup on the Item Master route step, in which case these parameter values are inherited by a work order route step created by copying the Item Master route. Alternately, the parameters can be setup directly on the work order step.

The parameters with values appear on the traveler for the work order under each work order step in two columns.

For use with SPTS leave Identifier 1 through 3 blank.

Employee Start Work Order Step Transaction Screen

Keyword = EmpIn

Conditions:

- ID1 = Work Center for Operation or Blank for All
- ID2 = Operation Code for Operation or Blank for All
- ID3 = Specific Item Code Being Made by Work Order or Blank for All
- ID4 = Specific Item Category Being Made by Work Order or Blank for All
- ID5 = Specific Material Type Being Made by Work Order or Blank for All
- ID6 = Is Completed or Blank for both (Y N Bool)

Results are placed in UDP field of the employee and work order history tables.

Please note that a new record is created in the employee history table whenever the employee scans out from the work order step whereas a record in the job history table represents the status of a work order step.

Thus, if values are changed several times over the course of a work order step, such as for percent complete, the incremental values are retained in the employee history but just the latest value for the work order step is retained in the work order history table. This latest value is shown as the default when an employee scans back into the work order step, such as after a break

Employee Stop Work Order Step Transaction Screen

Keyword = EmpOut

Conditions:

- ID1 = Work Center for Operation or Blank for All
- ID2 = Operation Code for Operation or Blank for All
- ID3 = Specific Item Code Being Made by Work Order or Blank for All
- ID4 = Specific Item Category Being Made by Work Order or Blank for All
- ID5 = Specific Material Type Being Made by Work Order or Blank for All
- ID6 = Is Completed or Blank for both (Y N Bool)

Results are placed in UDP field of the employee and work order history tables.

Please note that a new record is created in the employee history table whenever the employee scans into the work order step whereas a record in the job history table represents the status of a work order step.

Thus, if values are changed several times over the course of a work order step, such as for room temperature, the incremental values are retained in the employee history but just the latest value for the work order step is retained in the work order history table. This latest value is shown as the default when an employee scans back into the work order step, such as after a break.

End Job Step Screen

Keyword =EndWOStep

Conditions:

- ID1 = Work Center for Operation or Blank for All
- ID2 = Operation Code for Operation or Blank for All
- ID3 = Specific Item Code Being Made by Work Order or Blank for All
- ID4 = Specific Item Category Being Made by Work Order or Blank for All
- ID5 = Specific Material Type Being Made by Work Order or Blank for All

Results are placed in UDP field of the employee and work order history tables.

Please note that when the end of a work order step is recorded, the UDP values are recorded in the UDP field of the work order history table. Also, if any employee is scanned into the work order step then these UDP values are also written into the employee history table for each employee still working on the job.

Material Out from Work Order Step Transaction Screen

The purpose of this is to capture data related to materials placed in a container and to write the resultant parameter data into the UDP field in the record being created in the Containers table. This only applies to Type 1 (single use) containers and to individually barcoded items. It does not apply to loose material placed directly in locations or into Type 2 (multi-use) containers.

Keyword = WOMaterialOut

Conditions:

Identifier1 = Item being recorded out or blank for all

Identifier2 = Category of Item being recoded out or blank for all

Identifier3 = Material Type of Item being recorded out or blank for all

Identifier4 = Container Type of Item being recorded out or blank for all

Identifier5 = Work Center or blank for all

Identfier6 = Operation Code or blank for all

This data will be in addition to inherited item configuration data saved in the Container UDP record as a result of using the Item Configuration parameters.

This is not available for use with SPTS. Please use the "end job step" or "employee out of work order step" UDP data capture setup.

Item Configuration Setup

Keyword = ITEM

Conditions:

- Identifier1 = Item Code or blank for all
- Identifier2 = Item Category or blank for all
- Identifier3 = Material Type or blank for all
- IsSetup = Y:
    - Capture on Item Master Setup Screen
    - Place in UDP field of Item Master Table
- IsInherited = Y
    - Capture Item parameter data on Ship Order Line setup screen and put in the UDP field of the Ship Order Lines table.
    - Capture parameter data for primary Item being made on Work Order setup screen and put in Traveler Header UDP field.
    - Capture UDP parameter data for Item on Part-in and Part-out records on Item Master Route, Work Order Route, and Template Routes. Transfer from Template Route and/or Item Route parameters to Work Order Route parameters when work order route is created from template route or Item route.
    - Transfer data from Ship Order Line to Work Order, when work order is created from Ship Order, and put in Traveler Header UDP field.
    - If is IsTransactional is Y, transfer parameters from Work Order to Container produced and put in UDP field of record in Containers table on “Record Material Out from Work Order Step” transaction. Show and allow modification on this transaction.
    - Capture parameter data on PO Line setup screen and put in Purchase Order Line Items UDP field.
    - When creating a Pick Order from a Ship Order, transfer UDP data from Sales Order Lines to Pick Order Lines and put in UDP field of Pick Order Line table. Used to validate UDP parameters of picked material from containers matches the user defined parameters for the pick order line item.
    - If IsTransactional is Y then Item UDP parameters are captured on Enter and simple Receive transactions and put in UDP field of record created in the Containers table. Shows UDP default values from Item Master and allows modification on these

transaction. The same applies to “Return Material from Job Step” transactions where original container is not identified.

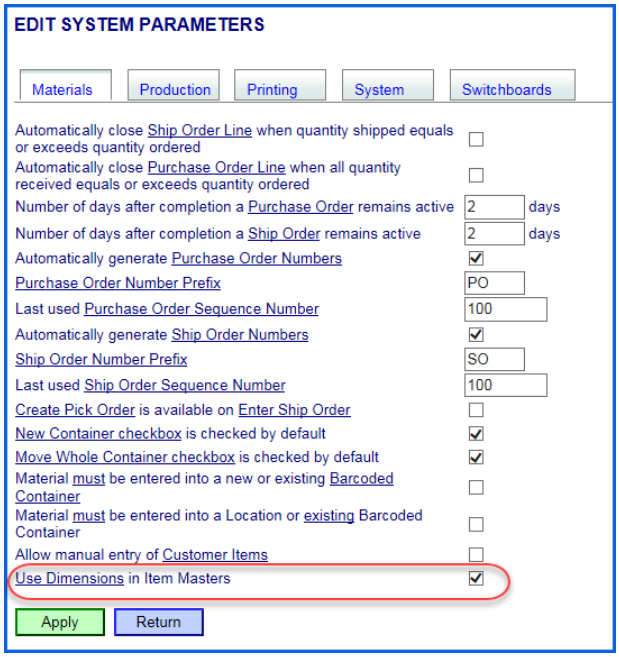
- If IsTransactional is Y then capture Item parameters on PO Lines in “Receive against PO” transactions and put these UDP parameters in the record created in the containers table. Show Item default parameters values and allow modification on this transaction.

- IsTransactional =Y:
  - On “Return Material from Job Step” transaction with original container identified, then display original container values and allow modification to these before updating record in the containers table.
  - On “Return Material” transaction with original container identified, then display original container value and allow modification to these before updating record in the containers table.

Please note that Length, Width, and Thickness parameters are treated as Item Parameters having IsSetup, IsInherited, and IsTransactional being true.

Turning on Capture of Item Dimensions

By default, the use of dimensions is turned off. This can be turned on using the System Administrators System-Parameters Screen, Inventory Tab, as shown below.

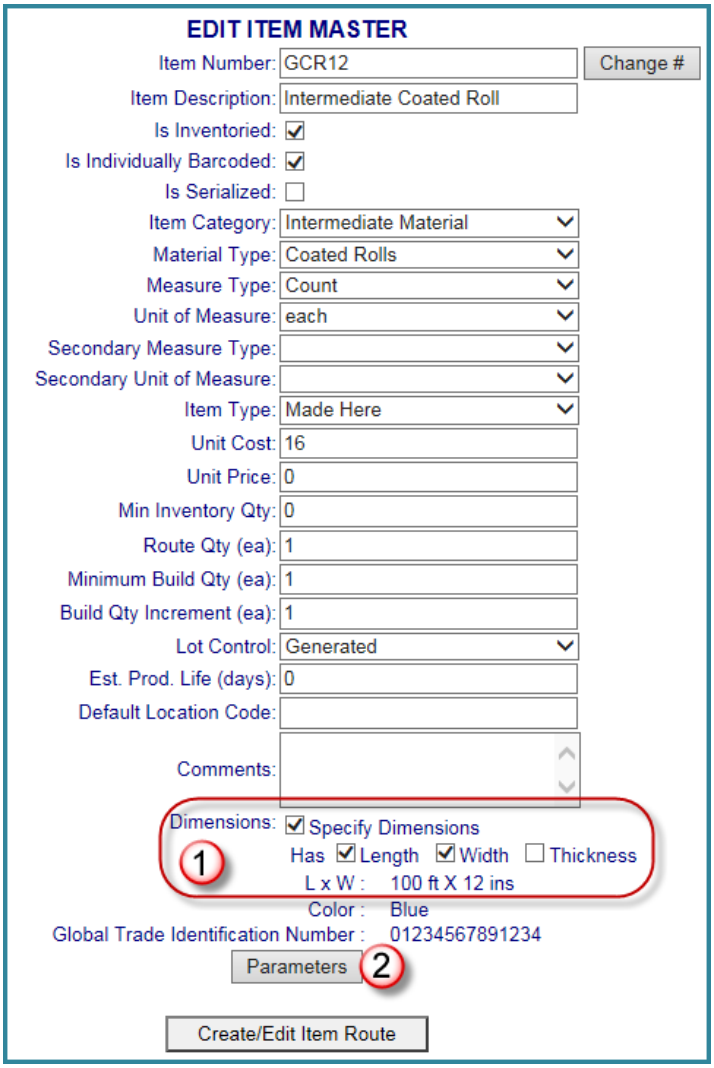


To turn dimensional data capture on check the checkbox for Use Dimensions. By default it is unchecked.

If Use Dimensions is turned on, then whether to use dimensions can be setup for each item as described in the next section.

Item Configration Data Entry

If "Use Dimensions" is checked, as described in the prior section, then the dimensional setup fields appear on all item master screens as shown at right (1).

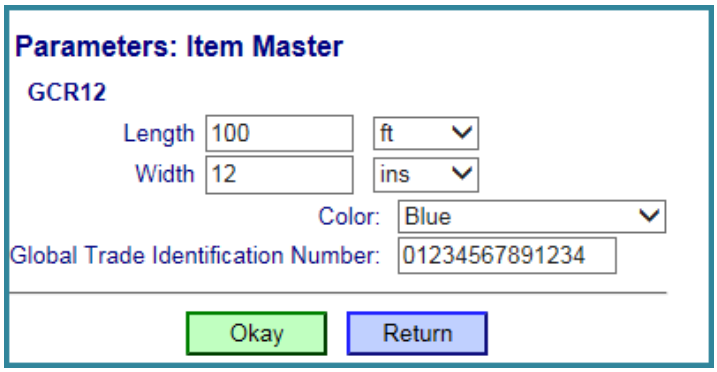


Please note that dimensions are not specified in the object parameters definitions Excel setup file but are setup on each individual item master.

Selecting an item as dimensional causes the dimensions to be requested on purchase order lines, enter and receipt transactions, jobs to make an item, material out of jobs and returned from jobs, sales order lines, and pick orders, as well as on POs and Sales order acknowledgements and packing slips.

Dimensions are also inherited from Items to Sales Order Lines to Make-to-Order Jobs to Containers of Material made from those jobs, but can be changed at every step along the way. Pick transactions for sales orders also check that dimensions (as well as parameters such as Color) for picked containers match those required by the Sales Order lines.

When the [Parameters] button (2) - above right - is selected, the values for these parameters can be specified:



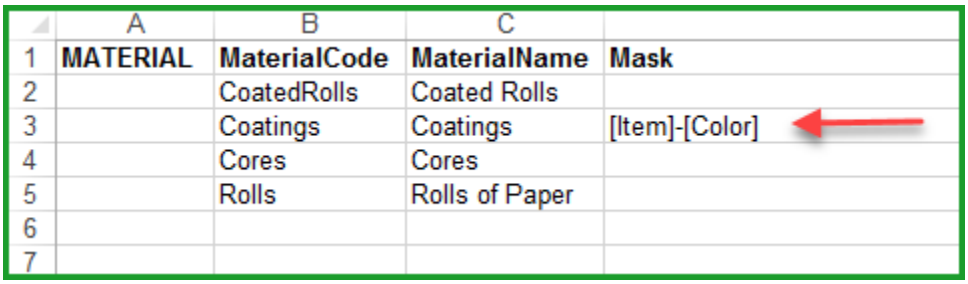
Note that the length, width and thickness units of measure are saved in the UDP field. These are selected from the available LENGTH type units of measure.

Dimensions are treated just like any other object parameters but appear at the top of the list of parameters on data entry pages.

Setting up Composite Part Numbers

The HLDO for setting up Material Types contains a Mask column, which is not used unless composite part numbers are being setup.

This mask column is used to specify that all parts with the specified Material Code will be represented in reports by composite part numbers. It also specifies the format of the composite part numbers.



	A	B	C	
1	**MATERIAL**	**MaterialCode**	**MaterialName**	**Mask**
2		CoatedRolls	Coated Rolls	
3		Coatings	Coatings	[Item]-[Color]
4		Cores	Cores	
5		Rolls	Rolls of Paper	
6				
7				

The Mask column contains entries such as "[Item]-[size]-[color,3]", where:

- [Item] is a predefined pseudonym for the item number - can be omitted
- [size] is a the parameter value for the part UDP parameter "size".
- [color,3] is a parameter value for the part UDP parameter "color" with a maximum number of characters of 3. If the UDP parameter value exceeds the designated number of characters, after eliminating any spaces, then the field will be truncated, by dropping trailing characters, to the designated number of characters.
- Everything else in the Mask is separator characters, which will appear in the composite part number. These must be valid TEXTID data type parameters. It is not necessary to use separators but these may help clarity.

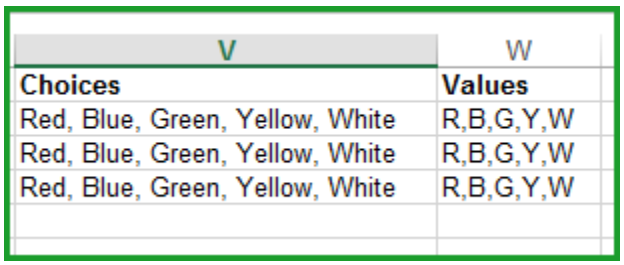
When generating a report that lists items, such as "Items in Stock", BellHawk first generates an in-memory data set containing all the active containers records in inventory that meet the pre-selector criteria, such as Item Number, Category, or Material Type. As it is reading each record from the containers table, BellHawk will replace the Item Number column with the composite part number for each container based on the Item and the UDP parameters specified in the Mask for Item Material Type.

The data set will have columns for length and width. If the Item is dimensioned then BellHawk will add in the values for length and/or width, if specified.

BellHawk will then sort these by composite part number and add up the quantities all entries with like composite part numbers and the same length and width and report the quantities of each composite part number having the same length and width values (within plus or minus .01).

Please note that:

1. If there is no Mask for the Item's Material Type then the default mask of "[Item]" will be used for the composite part number. This will ensure compatibility with systems not using UDP parameters.
2. In generating composite part numbers all spaces will be eliminated
3. Entries in the composite part number field can contain any UDP parameter. Usually this does not include Length or Width as there are treated as separated columns/
4. For Choice UDP parameters, the choice values will be used in making up the composite part numbers. Thus color choices may be "Red", "Green", and "Blue" but the composite part number color field will contain the corresponding R, G, and B values.



V	W
Choices	**Values**
Red, Blue, Green, Yellow, White	R,B,G,Y,W
Red, Blue, Green, Yellow, White	R,B,G,Y,W
Red, Blue, Green, Yellow, White	R,B,G,Y,W

5. Option type UDP parameters will appear as Y or N in the composite part number. If more meaningful values are required in the composite part number then these should be changed to Choice parameters.
6. Only parameters listed in the mask will be shown in the composite part number. There may be other parameters such as length and width that are not shown in the composite part number.
7. When forming up a composite part number, the code should:
    a. Check that the composite part number does not exceed 50 characters (same as a regular part number).
    b. Check that the composite part number is a valid TEXTID type string

If a specified parameter value in the mask is not available from the UDP field for the container record then BellHawk replace its value with a # symbol and write a warning message into the daily log file.

Parameter Storage and Retrieval

As previously noted, Parameters are saved in the UDP column of the primary table for each BellHawk HLDO. This column contains data encoded in industry standard JSON format. An example of which is shown here:

{"COLOR":"Blue","Length":"100","LUOM":"ft","Width":"12","WUOM":"ins"}

This consists of a sequence of comma separated Name : Value pairs.

Unlike a standard relational database column which only contains one type of data, the UDP column can contain many different types of data that can vary from application to application and even object instance to object instance.

Thus one organization might use a Company UDP field to contain its DUNS code, for printing on barcode labels, while another company might use a UDP field to hold its GS1company registration number and the registration number for an ISO certification, to appear on custom reports.

Please note that parameter names need to be unique, so it is important to use different names for parameters such as “Length”, “Width” and “Thickness” when setting up your own user defined parameters

As the UDP field is part of the object definition, the parameter values can be imported and exported using Excel spreadsheets, for setup purposes, using the BellHawk Excel Setup capability. They can also be exchanged with external systems, using the JSON format described above.

For parameters of DataType CHOICE in the OBJECTPARAM setup: if IsRequired for a parameter is set to “Y” in the OBJECTPARAM setup then this parameter will always appear in the UDP string with values of either “Y” or “N” depending on whether the checkbox was checked or not on the data entry screen. To minimize the size of the UDP fields, these parameters will not appear in the UDP field if IsRequired is set to “N” and the checkbox is not checked on the data entry screen.

The MilramX automated data exchange software platform has built-in capabilities to translate between column data in external systems and the UDP fields in BellHawk.

BellHawk Systems has developed a custom function extension to SQL Server called BH-JEX which enables these parameters to appear in the BellHawk database as if they were pseudo-columns in SQL Views. This enables easy extraction of a value by including, for example:

```
SELECT BH_JEX('GTIN', Item.UDP)  AS GTIN,

     From dbo.tblItems Item WHERE …….
```

in a SQL View, to extract the GTIN value for each Item for use in a custom report. This makes the GTIN value appear as a pseudo column with the appropriate values for each row instance.

Equivalent functions to BH_JEX are available as part of the BellHawk BHSDK .Net interface DLL and as part of the BCclass, which is used to write Data Transfer Objects (DTOs) as part of a MilramX interface.

User Defined Parameters and TAG label printing

UDP parameters stored in Container records in the BellHawk containers. These can be included in the labels printed by the TAG rules based barcode labeling option.

	A	B	C	D	E	F	G
1	**LABELFIELD**	**LabelFileName**	**FieldName**	**Keyword**	**ParameterName**	**UdpParameterName**	
2		CanLabel.btw	ContainerBarcode	Container	ContainerBarcode		
3		CanLabel.btw	ItemNumber	Container	ItemNumber		
4		CanLabel.btw	ItemDescription	Item	ItemDescription		
5		CanLabel.btw	Quantity	Container	PrimaryQty		
6		CanLabel.btw	UOM	Item	UOM		
7		CanLabel.btw	Color	Container	UDP	Color	
8							

Please note that:

1. The composite item number is passed to the label printing software as the item number.
2. The Choice is passed as the data to be printed on the label and not the Value, as the Value is typically truncated so as to be part of a composite part number such as "P102-B".

V	W
Choices	**Values**
Red, Blue, Green, Yellow, White	R,B,G,Y,W
Red, Blue, Green, Yellow, White	R,B,G,Y,W
Red, Blue, Green, Yellow, White	R,B,G,Y,W

Commentary

The User Defined Parameter, Item Configuration, and Composite Part Number features add significant capability to BellHawk. But they are complex to setup and require an understanding of how BellHawk stores its containers table data, as described in the Simple Materials Tracking Software User Manual.

The ability to track items by length and width and thickness, using a common part number, can dramatically simplify the tracking of off-cuts. But, please be aware that these are user defined parameters which are not, as standard, integrated with cost or unit of measure conversion computations performed by the BellHawk software.

Such conversions require customizations to be performed to the transactions.

