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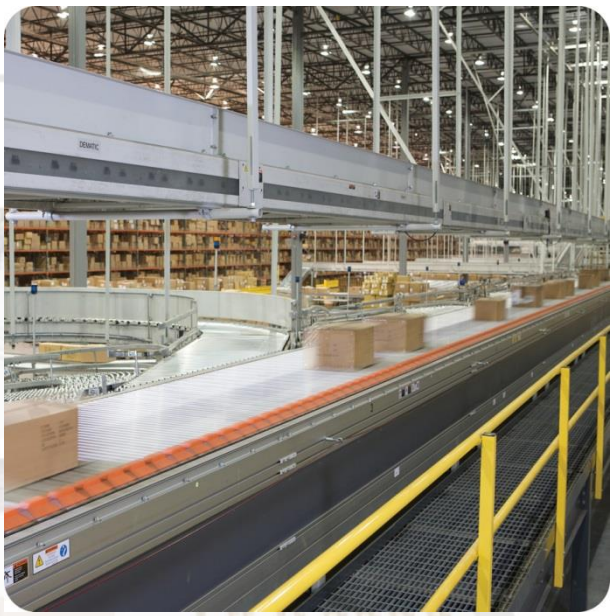
# HelloFresh

Barleben, Germany
The Hybrid Line

# Dematic iQ

Host Interface Specification V2.9
2023-10-25




We Optimize Your Supply Chain | DEMATIC

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# Release Dates

| Version | Release Date | Description | Authored By / Revised By |
|---|---|---|---|
| 2.7 | 23-Dec-2022 | Official Release after rework according to HelloFresh review | E.Alalami |
| 2.8 | 21-Feb-2023 | Remove orderConfirm | E.Alalami |
| 2.9 | 25-Oct.2023 | Remove shippingLabelPrint | |

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# Contents

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# 1 Introduction

## 1.1 Purpose

This document describes the interface between Dematic iQ Optimize and the customer's Warehouse Management System (WMS) or Enterprise Resource Planning (ERP) system, which is commonly referred to as the host.

## 1.2 Audience

This host interface specification is for Dematic project teams to use as needed in working with high automation customers and warehouse partners to assist in designing and implementing an interface to their systems.

## 1.3 Scope

This document focuses on the format of high automation messages that are uploaded and downloaded between Dematic iQ Optimize and the host. This document includes only the aspects of the Dematic host interface that needs to be known by external partners who intend to communicate with Dematic iQ Optimize. It does not include interfaces to systems of the controls layer, such as PLCs.

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## 1.4 Acceptance Certificate

The Host Interface Specification V2.9 identified by release date: 2023-10-25 for HelloFresh meets the requirements under the terms of the valid contract and replaces all former specifications and side letters in the form of protocols, email, or verbal definitions.

HelloFresh and Dematic have verified this document for accuracy and completeness and agree. This host interface specification is – in terms of contractual commitments – the exclusive basis for realization of host interface

Later changes, enhancements, or deletions require agreement between HelloFresh and Dematic.

DocuSigned by:
Enio Rolando Alburez Gutierrez
FD72A46CC0144C1...

10/25/2023

HelloFresh, Project Manager Software – Enio Alburez Date

DocuSigned by:
Essam Alalami
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10/25/2023

Dematic, Software Project Lead – Essam Alalami Date

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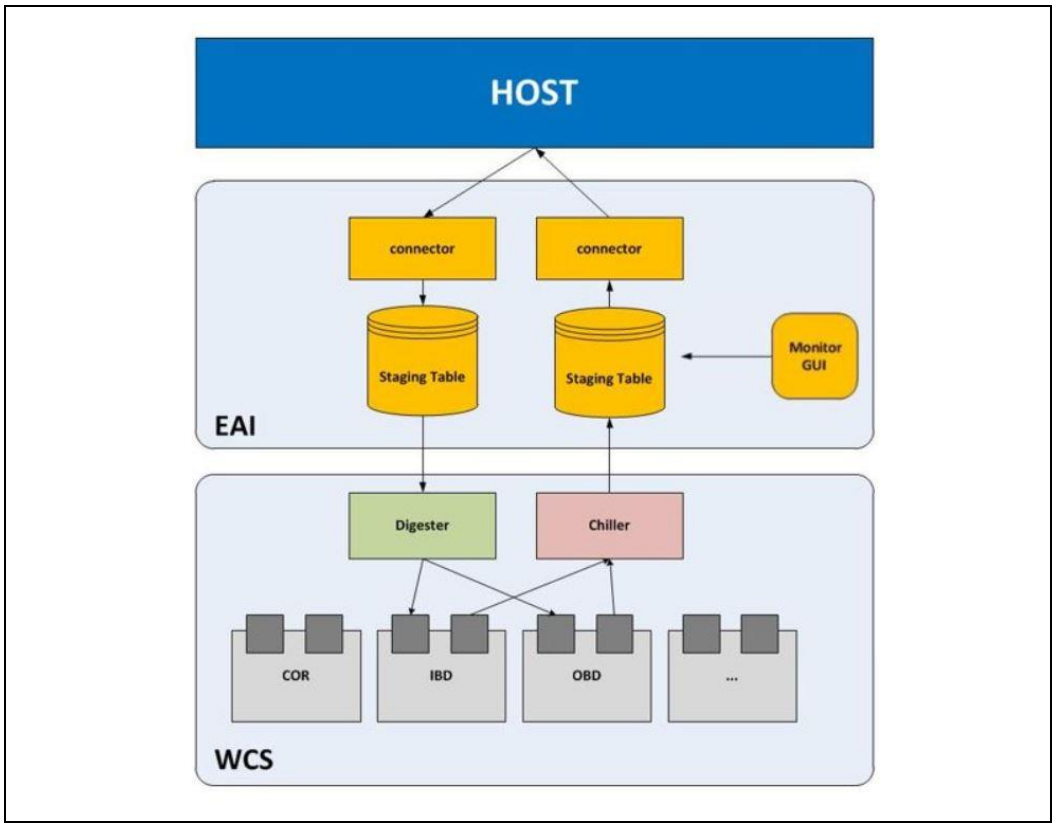
# 2 Interface Architecture

This chapter describes the elements of the interface architecture that Dematic iQ Optimize and external systems use to communicate with each other.

The following diagram shows the interface connector architecture:




**Staging tables**: Staging tables provide a standard table structure for data that Dematic iQ Optimize exchanges with external IT systems. All data that Dematic iQ Optimize receives from or sends to an external system is buffered in staging tables and processed by the WCS using transaction security.

In case of simultaneous communication with multiple external systems, a distinct pair of tables is used for every communication partner. For more information, see Staging Tables on page 5.

**Connectors:** Connectors transfer data from external systems to the Dematic iQ Optimize EAI staging tables and for transferring data from the staging tables back to the external systems. They provide mechanisms for ensuring transactional security across system boundaries.

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Dematic iQ Optimize supports different types of connectors for different data transfer mechanisms.

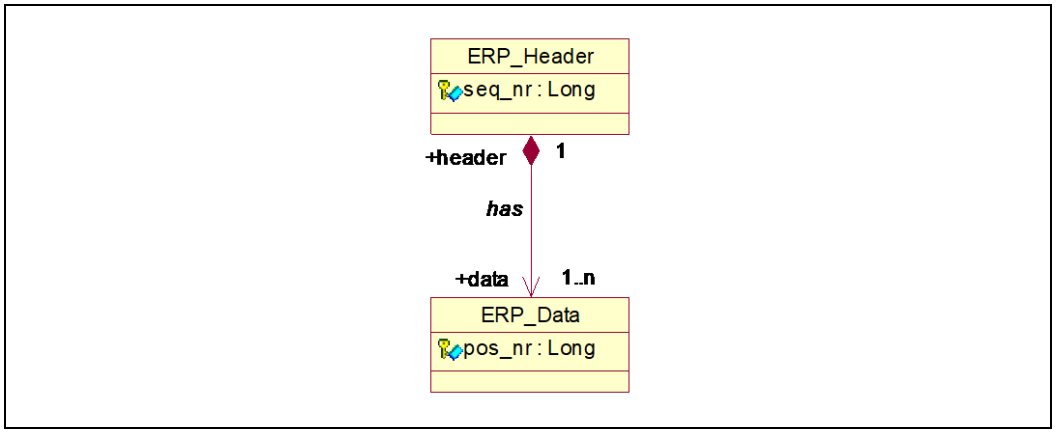
**Digester:** The Digester module processes the messages received from an external system and creates, modifies, or deletes Dematic iQ Optimize data objects according to the type and content of the messages.

**Chiller:** The Chiller module creates messages in the staging tables whenever a Dematic iQ Optimize business event occurs that requires data transmission to an external system.

## 2.1 Staging Tables

Staging tables provide a standard table structure for data that Dematic iQ Optimize exchanges with external IT systems. All data that Dematic iQ Optimize receives from or sends to an external system is buffered in staging tables and processed by the WCS using transaction security.

In case of simultaneous communication with multiple external systems, a distinct pair of tables is used for every communication partner. The ERP_HEADER table contains meta information related to the entire message. The ERP_Data table allows storage of one or multiple data segments for every message.




Tables for inbound messages are named: ERP_HEADER_IN*nn* and ERP_DATA_IN*nn,* where *nn* is a numerical suffix that lets you distinguish between different communication partners.

Tables for outbound messages are named ERP_HEADER_OUT*nn* and ERP_DATA_OUT*nn,* where *nn* is a numerical suffix that lets you distinguish between different communication partners.

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## 2.1.1 Table Structures

In the following tables, the Source column represents the data source. A value of I represents an internal attribute for Dematic iQ Optimize (external systems initialize with default values) and a value of E represents an external attribute provided by the external system.

### 2.1.1.1 ERP_HEADER Table

| Field Name | Oracle Data Type | Mandatory/ Optional | Source | Description |
|---|---|---|---|---|
| SEQ_NR | NUMBER | M | I | A unique ID for every message in a staging table (table key). For outbound messages, the Chiller module creates unique IDs. For inbound messages, the respective connector generates unique IDs. If multiple connectors feed the same staging table, all messages must have unique IDs. |
| UNIT_ID | VARCHAR2(30) | M | I/E | The ID of the message in the sending system (logical key) |
| UNIT_TYPE | VARCHAR2(40) | M | E | The message type. Every message has a message type that must be explicitly provided in the message. |
| CONTROL_DATA | VARCHAR2(1000) | O | I/E | Optional meta information about the message, for example, revision of the message, test or production environment, language, creation date for sender, and so on.<br>For inbound, external messages, control data can be used within the transformation layer to control parsing and interpretation of data. |
| STATE | VARCHAR2(1) | M | I | The processing state of a message. A state is maintained only at the message header level and assumes that all data elements of the message are processed in one transaction. The following states are possible:<br>N (New): The message is newly created by the external system (through the connector) or by the Chiller module.<br>R (Running): The message is being processed. Normally, this state is used only within a transaction and is invisible outside of a transaction.<br>C (Completed): Message processing successfully completed.<br>E (Error): Message processing caused an error. An error key and error parameters are available in the corresponding fields of the ERP_HEADER table. |

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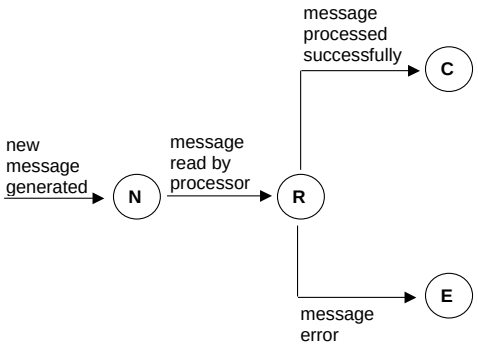
| Field Name | Oracle Data Type | Mandatory/ Optional | Source | Description |
|---|---|---|---|---|
| | | | | The following state diagram shows the life cycle of inbound messages:<br>  <br> |
| CREATION_DATE | TIMESTAMP | M | I | Time when the table entry was created (which is not the same as the time when the sender created the message). |
| CHANGE_DATE | TIMESTAMP | M | I | Times when the table entry was last changed. |
| SENDER | VARCHAR2(18) | M | I/E | A unique name for the sender. You can get information about the sender from the message or from the context in which the message was received. For external partners, the host adapters must be able to identify all necessary parameters for the communication channel from the sender.<br>When confirmations or replies are sent in response to a message, the receiver information is usually identical to the sender information of the original message. |
| RECEIVER | VARCHAR2(18) | M | I/E | A unique ID for the receiver. For outbound messages, the receiver is usually a unique ID for the external system. For inbound messages, the receiver ID is identical to the ID of the EAI system. |
| ERR_KEY | VARCHAR2(8) | O | I | The error code for messages with status "E" which could not be processed successfully. |
| ERR_PARAM | VARCHAR2(2000) | O | I | Additional error parameters for messages with status "E" which could not be processed successfully. |

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| Field Name | Oracle Data Type | Mandatory/ Optional | Source | Description |
|---|---|---|---|---|
| ERR_LONG | VARCHAR2(2000) | O | I | Expanded error message in system language. ERR_KEY and ERR_PARAM allow internationalization of a message in all supported languages of a system (for example, within the Dematic iQ Optimize user interface), the expanded error message can be used by an external system that has no direct access to the Dematic iQ Optimize internationalization resources. |

#### 2.1.1.2 ERP_DATA

| Field Name | Oracle Data Type | Mandatory / Optional | Source | Description |
|---|---|---|---|---|
| SEQ_NR | NUMBER | M | I | A sequence number uniquely identifying the header record. |
| POS_NR | NUMBER | M | I | The position number of the data record. The position number is part of the technical key and is determined internally when messages are stored in the staging tables. |
| UNIT_POS_NR | VARCHAR2(20) | O | E | The position number of the data element provided by the sending system. |
| DATA_TYPE | VARCHAR2(10) | O | E | The type of data, for example, XML. |
| DATA_HEADER | VARCHAR2(255) | O | E | The header data of the message, which contains optional meta information about the data element.<br>For messages with hierarchical segment structures, header data might include segment name, parent segment, or hierarchical level.<br>For inbound external messages, header data that is provided by the sender can be used within the transformation layer to control parsing and interpretation of data elements. |
| DATA | VARCHAR2(2000) | M | E | The message data. |

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# 2.2 REST Services

**Overview**

Dematic iQ Optimize provides an Integration Infrastructure by which various APIs and services are made available for external access through standard REST calls with JSON encoding.

For access of APIs and services provided by external partners, Dematic iQ Optimize includes infrastructure and definitions for specifying the endpoints which shall be accessed.

The Integration Infrastructure includes also a set of client utilities as well as request and response POJOs which can be used by external JAVA clients.

## 2.2.1 Endpoints for Inbound REST Calls

### 2.2.1.1 HTTP Request Method

The Dematic iQ Optimize Integration Infrastructure uses the following operations:

| Operation | Purpose |
|---|---|
| GET | Retrieve existing data |
| POST | For creation of new data, update of existing data or any endpoint using a request object |
| DELETE | Delete existing data |

For the host interface, POST is used for all endpoints.

**URI**

The URI of the request is built as

```
URI ::= https://<server><resourcePath>
```
or
```
URI ::= http://<server><resourcePath>
```

depending on the protocol.

### 2.2.1.2 Server

All requests must be directed to a specific Dematic iQ Optimize server and port. You will have to know the name (or IP address) of the server as well as the SSL port (usually 8081).

The server will be identified as

```
server ::= <hostname>:<port>/<domain>
```

where <domain> is the name of the domain under which the Dematic iQ Optimize application is deployed.

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Example:

```
<server> = localhost:8080/demo
```

#### 2.2.1.3 Resource Path

The resource path always begins with /resources and is followed by a version number such as /v1.0 followed by the specific path for that particular resource:

```
resourcePath ::= /resources/v<version>/<hostId>/<resource>
```

Example:

```
<resourcePath> = /resources/v1.0/Native/skuInsertUpdate
```

| Element | Description |
|---|---|
| <version> | Version of the endpoint.<br>(e.g. “1.0”)<br>Endpoint definition and request/response POJOs are versioned in order to ensure compatibility across Dematic iQ Optimize releases.<br>Clients using the published endpoints are guaranteed compatibility regardless of Dematic iQ Optimize upgrades. |
| <resource> | The resource is typically one of the EAI commands described in chapter 3.<br>(e.g. “skuInsertUpdate”) |
| <hostId> | For all messages to the HelloFresh host hostId=HFB, for all to Ricoh hostId= EHF |

#### 2.2.1.4 URL Query Parameters

The Dematic iQ Optimize Integration Infrastructure specifically does not allow input data to be passed in a URL with a query string (name value pairs following the "?" in the URL).

The query string is not used for the following reasons:

- the length of a URL is typically limited by server implementations
- only certain characters can be included in a URL which requires other characters to be specially encoded

#### 2.2.1.5 Request Input Data

Input data required by the endpoint may be simple or complex but is always represented using JSON encoding and is passed in the body of the request.

The structure of the input data is described for each EAI command in chapter 3.

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The characteristics for each command also show JSON example files which can be used to set up the input data for each EAI command.

#### 2.2.1.6 Response HTTP Status

Every request returns an HTTP status code. The usual status codes that you could encounter are:

| Status | Description |
|---|---|
| 200<br>OK | The request was processed by Dematic iQ Optimize.<br>Make sure you check the messageKey of the response data to see if the request was successful (APP-II-0000) or if it failed (some other message key value). |
| 401<br>Unauthorized | The user could not be authenticated. |
| 403<br>Forbidden | The user was not authorized to call the endpoint. |
| 500<br>Internal Server Error | Something went wrong when Dematic iQ Optimize tried to process the request. This is an abnormal situation and typically is an indication of a bug. The messageKey of the response data as well as the messageText will offer some clues as to what the problem was. |

#### 2.2.1.7 Response Output Data

Output data returned by the endpoint may be simple or complex but is always represented using JSON encoding and is returned in the body of the response. The response data always includes the following elements:

**messageKey**

This element contains a standard Dematic iQ Optimize "exception key".

The messageKey has a value of APP-II-0000 when the request has been carried out successfully.

When a request fails, the messageKey contains a specific exception key which describes why the request failed.

**messageText**

This element contains a textual description for the messageKey.

The messageText has a value of “OK” when the request has been carried out successfully.

When a request fails, the messageText contains a description of why the request failed.

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**totalTimeInMS**

(Included in responses where the status code was 200 - OK)

The number of elapsed milliseconds of time it took to perform the endpoint including the overhead of the Integration Infrastructure.

**processTimeInMS**

(Included in responses where the status code was 200 - OK)

The number of elapsed milliseconds of time it took to perform the actual business logic of the endpoint and does not include the overhead of the Integration Infrastructure.

**originalResponseGeneratedOn**

(Included in responses where the status code was 200 - OK)

A timestamp (in milliseconds) representing the point in time that the response was generated on.

**isOriginalResponse**

(Included in responses where the status code was 200 - OK)

A Boolean value indicating whether or not this is an original request.

### 2.2.1.8 Authentication

#### 2.2.1.8.1 Initial Request

All REST endpoints require that the client "logs into" Dematic iQ Optimize as part of making the request. You will specify the user name and password for the user making the request using HTTP Basic Authentication.

The user must be already known to the Dematic iQ Optimize system.

The response object from every call includes an authentication token which is valid for 15 minutes. This authentication token can be used (before it expires) for the authentication of a subsequent request. Using the authentication token is much faster than passing the user name and password for authentication.

#### 2.2.1.8.2 Basic Authentication

The user name and password are encoded as a property named "Authorization" in the HTTP request header with the value constructed as follows:

- the constant 'Basic '
- base 64 encoding of:
  - user name
  - the constant ':'
  - password

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#### 2.2.1.8.3 Subsequent Authentication Using Tokens

Each response object includes an authentication token which is valid for 15 minutes. Provided your subsequent call is made within this time limit, the authentication token can be used. Using the authentication token is preferred because the authentication processing is much faster with the token than it is with the user name and password.

The token is a special unique string which can vary in length. It is possible that the token can be several thousand bytes in length.

Using the token for authentication replaces the HTTP Basic Authentication mechanism described above.

For token authentication, the token is encoded as a property named "Authentication" in the HTTP request header with the value constructed as follows:

- the constant 'Bearer '
- the token value itself

Since every response object includes an authentication token valid for another 15 minutes, you can simply use the last returned token and keep making subsequent calls provided each call is made within 15 minutes of the last one forever.

## 2.2.2 Outbound REST Calls

### 2.2.2.1 REST Service Configuration

**OutboundDataForwarder**

Whenever Dematic iQ Optimize needs to call a service on an external system, this is done by call of the *forward()* method of a specific implementation the *OutboundDataForwarder* class.

Every Dematic iQ Optimize subsystem has its own *host resource type* and its own *OutboundDataForwarder* with its specific implementation.

**Host Systems**

Each OutboundDataForwarder can be specifically configured for the different host systems (identified by their host ID) to which Dematic iQ Optimize needs to communicate.

The host system can be specified individually for each client and each message type (EAI command).

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**Configuration Settings**

| Parameter | Description |
|---|---|
| Use Secure Connection | Enables or disables a secure connection to the host |
| Host Server Address | Name and port of the ERP host <hostname: port><br>e.g. “localhost:9081” |
| Host Server Resource Path Prefix | Prefix for the resource path of the server<br>e.g. “erpsystem/resources/v1.0” |
| User Name | ERP user to be used for this connection |
| Password | ERP user password |
| Host Character Set | Character set to be used for this connection<br>e.g. “UTF-8” |
| Host Resource Type | Host Resource type for which this configuration will be used.<br>e.g. “IBD” |
| Message Types | A list of message types for which this configuration will be used |

#### 2.2.2.2 REST Service Endpoints

It is expected that the implementation of the REST services on the side of the external partner follow the same principles which are used in the Dematic iQ Optimize Integration Infrastructure.

DiQ outbound endpoint format: server, port, domain, host is configurable.

Example for HFB messages:
http://hostname:1337/hfb/resources/HFB/messageName

Example for Ricoh messages:
http://hostname:15080/restapi/1.0/EHF/messageName

Each method in the interface is defined as returning void and cannot, by definition, return any specific data.

### 2.2.3 Utilities

The Integration Infrastructure includes a set of client utilities as well as the request and response POJOs for Dematic iQ Optimize endpoints which can be used by external Java clients calling into Dematic iQ Optimize endpoints.

The client utilities are available in the following class:
com.dematic.wms.app.integrationinfrastructure.util.ClientUtilities

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#### 2.2.3.1 Generate and Set the UUID in an Idempotent Request

This method takes an idempotent request object as a parameter and then generates and sets the UUID element into the request object.

```
public void
generateAndSetUUID(IntegrationInfrastructureIdempotentRequest
request);
```

#### 2.2.3.2 Call a REST Endpoint

There are two methods which you can use to call a REST endpoint. The compact version can be used provided you don't need logging or error handling callouts. Both methods take the following parameters:

- **httpMethod**
  the operation, one of HttpMethod.GET, HttpMethod.POST, HttpMethod.PUT, HttpMethod.DELETE
- **urlString**
  the full URL of the endpoint
- **requestObject**
  the request object to include in the body (which will be sent as a JSON encoded string) - optional
- **username**
  the user name for authentication - optional
- **password**
  the password for authentication - optional
- **responseClass**
  the class of the response object (if the endpoint returns a JSON encoded string in the response body then this is the class of that object) - optional
- **responseCharsetName**
  the character set of the response (usually UTF-8)
- **timeout**
  the timeout value in milli-seconds or 0 if the call should block indefinitely

The full version also includes the following additional parameters:

- **loggerContext**
  the user defined context for the logger - optional
- **logger**
  the request logger - optional
- **exceptionHandlerContext**
  the user defined context for the exception handler - optional

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- **exceptionHandler**
  the request exception handler – optional

If a logger is specified, then it will be called immediately before the outbound REST call is made.

If an exceptionHandler is specified and the REST call is not made successfully then it will be called.

After calling the endpoint, this method returns a response object which includes the following data:

- **getStatusCode()**
  return the status of the call, one of the following values:
  - SUCCESS - the call completed successfully
  - BAD_URL - there was something wrong with the URL
  - CANNOT_OPEN_CONNECTION - a connection to the endpoint could not be made
  - INVALID_REQUEST_METHOD - the request method is invalid
  - CANNOT_SERIALIZE_REQUEST_OBJECT - the request object could not be serialized (into JSON)
  - CANNOT_SET_REQUEST_OBJECT - the request object could not be put into the body of the request
  - COULD_NOT_GET_RESPONSE - could not get the response object from the body of the response
  - NOT_AUTHORIZED - the user is not authorized to call the endpoint (HTTP status code 401)
  - BAD_METHOD - there is no endpoint to call (HTTP status code 405)
  - INTERNAL_SERVER_ERROR - there was an error on the server (HTTP status code 500)
  - UNKNOWN_RESPONSE_CODE - some other error occurred
- **getErrorText()**
  if the status is other than SUCCESS, the error text describes what went wrong
- **getResponseObject()**
  if the status is SUCCESS, NOT_AUTHORIZED, or INTERNAL_SERVER_ERROR the response object is returned

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### 2.2.4 REST Service Calls and Staging Tables

The Dematic iQ Optimize support for REST services within the host interface logs all exchanged messages (except inbound REST calls with HTTP status <> 200, see 2.2.1.6) in the ERP tables in the same way as for other connectors.These logs are visible in the “Host In” and “Host Out” UI

Errors resulting in a message key <> “APP-II-0000” (see 2.2.1.7) are logged as error code and error parameters in the respective entry.

In case of an error, also an alarm will be raised as UI alarm.

If a host system is not able to repeat a correct message or if the failure of message processing was due to, for example, missing configuration settings in Dematic iQ Optimize, the failed messages could be activated from the ERP tables.

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# 3 Message Descriptions WMS-ERP

This chapter describes the different EAI Commands (message types) required for communication between the Dematic iQ Optimize WES/WCS and the WMS/ERP.

| Message | Direction | Description/Use Case |
|---|---|---|
| skuInsertUpdate | Host > DiQ | SKU master data |
| orderInsertUpdate | Host > DiQ | order data to create orders |
| orderStatus | DiQ > Host | Required when an order get new status, e.g. pending, released, in QC, in OoS, .. etc. |
| orderQuery | DiQ > Host (Ricoh) | Check the availability of print out data before order release |
| queryResponse | Host > DiQ (Ricoh) | printout is ready to dispense |
| printRequest | DiQ > Host(Ricoh) | Send from DiQ to trigger print out |
| pickComplete | DiQ > Host | Send for each confirmed pick |
| setOrderOnHold | Host > DiQ | Hold an order from being released |
| outOfStock | DiQ > Host | Channel of picking workstation is marked as out of stock |
| crateDepleted | Host > DiQ | Box has been taken out of the Multishuttle by replenishment process |
| replenishmentComplete | Host > DiQ | Replenished box is located in picking workstation slot. |
| adviceInsertUpdate | Host > DiQ | Send to store box in Mealkit buffer |
| adviceConfirm | DiQ > Host | Send when box stored successfully in DMS |
| workstationStatus | DiQ > Host | Send when the status of a workstation changed, e.g active manned, closed, ..etc. |
| orderCancel | Host > DiQ | Cancellation of an order on the host level |
| orderLineChange | DiQ > Host | Send when SKU is not needed for the order or is substituted |

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Every command description contains a block with attribute descriptions including the following details:

- **Attribute Name:** The name of the attribute as specified in the XML schema
- **M:** An indicator for mandatory attributes

  **Y:** Attribute is mandatory
  **N:** Not in use by the project, but available in structure and can be sent as empty element. Sending this attributes is not needed and only an option.

  **O**: Attribute is optional. HelloFresh can sent and receive the attribute if needed

  Mandatory attributes must be sent in host message, otherwise the message will be rejected by DiQ. It is not necessary to send the non-mandatory or optional attributes in host message. Those can be sent if HelloFresh want to store such fields in DiQ.

- **Type:** The data type of the attribute:
  - A: Alphanumeric (default is 255 unless otherwise mentioned)
  - D: Date (yyyy-MM-dd)
  - DT: DateTime (yyyy-MM-ddTHH:mm:ss.fff-TimeZoneoffset e.g: 2021-01-31T16:00:00.000-05:00) (Time offset from UTC)
  - T: Time
  - N: Numeric
  - B: Boolean (true/false)
  - CMPLX: Complex Type
  - Array: list of alphanumeric values separated with comma “,”
- **Type-Info:** Detailed information related to the type, such as maximum length of alphanumeric attribute values or format of numeric attribute values
- **Description:** A description of the attribute.

In the sections below, transfer methods include recommended methods only. All messages can be transferred by any of the available methods.

**Note:** In general, one-to-many relationships are handled by having the parent be the field name, followed by individual complex types being the same name but not plural.

During project customization, the specific methods used in the project shall be specified.

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# 3.1 EAI Command: skuInsertUpdate

### Purpose

Product master data are usually maintained on an WMS level.

Related to products, Dematic iQ Optimize requires information of Stock Keeping Units (SKU) with information about their identification, their logistically relevant variants as well as their properties as far as they are used within the warehouse.

### Characteristics

| | |
|---|---|
| **Message Type** | skuInsertUpdate |
| **Direction** | inbound |
| **Purpose** | Creates a new Stock Keeping Unit (SKU) or updates an existing SKU. |
| **Transfer Methods** | REST |
| **Triggers** | ● Creation or modification of product data on ERP level |
| **JSON Example File** | skuInsertUpdate.json |

### Processing

- If the SKU, specified in the message, does not yet exist, a new SKU is created using the data contained in the message
- If the SKU exists already, the SKU data are updated according to the data specified in the message.
- Special restriction: weight data is only taken from the skuInsertUpdateMessage when an SKU is created but they are ignored for updates.

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| clientId | Y | A | <=10 | Owner of the Stock Keeping Unit.<br>Fixed, always send: “HFB”. |
| skuId | Y | A | <=50 | Unique identifier of the Stock Keeping Unit for a client. |
| description | O | A | | Description of the Stock Keeping Unit. |
| productCode | N | A | <=14 | Code identifying the Stock Keeping Unit according to productCodeType. Typically barcode content for the base unit. |
| productGroupId | N | A | String | |
| mainProductRangeId | Y | A | ENUM | Main product range for classification of SKUs:<br>* Chilled<br>* Non-Chilled<br>* PrintOut |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| productRangeId | N | A | | Product range to which the SKU belongs |
| fragilenessClassification | N | A | | Fragileness classification |
| supplierId | N | A | <=50 | ID of the preferred supplier from whom the SKU is received. |
| velocityClassification | O | A | ENUM | Velocity classification for the SKU according to the ERP system.<br>Possible values: FAST, MEDIUM, SLOW |
| hazardClassification | N | A | | Hazardous classification for the SKU. |
| preferredLoadUnitType | N | A | <=30 | Preferred load unit type for storage of base units of the SKU. |
| quantityDeterminationMethod | N | A | ENUM | Specifies the preferred method for counting inventory for this SKU. |
| serviceQualifier | N | A | ENUM | Special handling hint for the DCD. Project specific. Default-Values: DEFAULT or ONLY_FULLPALLETS |
| baseQuantityUnitId | Y | A | <=10 | ID of the quantity unit used base units of this SKU. Must be one of the available Quantity Units for the SKU.<br>Fixed, always send “PCS” |
| handlingHint | N | A | | Hint which is displayed to the user during operations (e.g. picking) on inventory of this SKU. |
| dispatchPackingGroup | N | A | | Classifies the SKU with respect to packing or palletizing. The value provided here is used within an affinity matrix to determine which SKUs can be palletized on the same pallet. |
| availableQuantityUnits | Y | CMPLX | SEQ (1, *) | A set of SKU Quantity Units which are allowed for this SKU. If this set is specified, it must contain all allowed quantity units.<br>Type: CMPLX-> skuQuantityUnit (see below for details)<br>UNIQUE: quantityUnitId<br>FIELD NAME: availableQuantityUnit<br>For HF there is only one entry needed, which has the same quantityUnitId as given in baseQuantityUnitId and FactorToBase is always 1. |
| storingConditionIds | N | A | <=30<br>SEQ (0, *) | A set of IDs for Storing Conditions which are required for this SKU. If a set is specified, it must contain all valid storing conditions. |
| hostPlantConfigurations | N | CMPLX | SEQ (0, *) | A set of skuHostPlant configurations which specify ERP-based configuration details for an SKU. If a set is provided, it must contain all available configurations.<br>Type: CMPLX-> skuHostPlant<br>UNIQUE: hostPlantId<br>FIELD NAME: hostPlantConfiguration |
| batchMandatoryForHost | N | B | | Flag which specifies whether or not inventory for this SKU requires specification of a lot. |
| stocktakingExcluded | N | B | | Flag which indicates whether this SKU is excluded from stocktaking. |
| splitCaseAllowed | N | B | | Flag which specifies whether split case picking is allowed for this SKU. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| weightTracking | N | B | | Flag which specifies whether weight tracking is required for this SKU. |
| cycleCountingThreshold | N | N | >=0 | When the stock level on a load unit or location for this SKUThreshold falls below the given threshold, perpetual stocktaking is requested. A value of 0 indicates that perpetual stocktaking will never be requested. |
| weightedAccessFrequency | N | N | >=0 | This attribute contains the weighted absolute access frequency (considering the accesses in different time periods) of the SKU as result of last velocity class analysis. |
| maximumUnitsPerPick | N | N | >=0 | Specifies the maximum quantity of the Pick Quantity Unit which can be picked at once. |
| shelfLife | N | N | >=0 | The shelf life specifies the number of days a product can stay in the warehouse before the Best Before Date |
| brand | O | A | | Brand of SKU. For this project it relates to the brand of the box being produced. For Example: HF, GC, etc. The brand of box is only for HelloFresh internal usage and has no functional impact |
| block | O | B | | Mark a SKU as unavailable for order fulfillment. |

### 3.1.1 Complex Type: skuQuantityUnit

**Attribute Descriptions**

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| quantityUnitId | Y | A | <=10 | Identifier of the quantity unit for the SKU. This can be the base quantity unit or any packaging type.<br>Fixed, always send “PCS” |
| unitOfMeasure | N | B | | Flag which indicates whether the quantity unit corresponds to a unit of measure. If this true, the ID must be identical with one of the configured Units of Measure (e.g. m, kg).<br>Will be set to false indirectly by DiQ. |
| totalWeight | Y | N | >0<br>17,2 | Total weight of the SKU Quantity Unit in units of hostWeightUnitId. For HF this is the wiehgt that will be used to check in the scales.<br>The weight unit for this project is always grams. |
| netWeight | O | N | >0<br>17,2 | Net weight of the SKU Quantity Unit in units of hostWeightUnitId.<br>The weight unit for this project is always grams |
| totalVolume | N | N | >0<br>17,2 | Total volume of the SKU Quantity Unit in units of hostVolumeUnitId. |
| length | N | N | >0<br>17,2 | Length of the SKU Quantity Unit in units of hostLengthUnitId. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| width | N | N | >0<br>17,2 | Width of the SKU Quantity Unit in units of hostLengthUnitId. |
| height | N | N | >0<br>17,2 | Height of the SKU Quantity Unit in units of hostLengthUnitId.<br>The length unit for this project is always milimeters |
| quantityPerGrab | N | N | >0 | A grab is one reach into an inventory tote and placement into an order container. Defines how many items of this QU can be picked at once and is used in the work effort calculation |
| hostWeightUnitId | N | A | <=3<br>ENUM | ID of the unit in which weights are specified.<br>The weight unit for this project is always grams |
| hostVolumeUnitId | N | A | <=3<br>ENUM | ID of the unit in which volumes are specified. |
| hostLengthUnitId | N | A | <=3<br>ENUM | ID of the unit in which length are specified.<br>The length unit for this project is always milimeters |
| salesQuantityUnit | N | B | | Flag which specifies whether this SKU Quantity Unit is the default quantity unit used for shipping of the SKU. This configuration may be overruled by a -> Host Plant Configuration of a SKU, if a corresponding configuration exists. |
| orderQuantityUnit | N | B | | Flag which specifies whether this SKU Quantity Unit is the default quantity unit used for receiving of the SKU. This configuration may be overruled by a -> Host Plant Configuration of a SKU, if a corresponding configuration exists. |
| pickQuantityUnit | N | B | | Flag which specifies whether this SKU Quantity Unit is the default quantity unit used for picking of the SKU. This configuration may be overruled by a -> Host Plant Configuration of a SKU, if a corresponding configuration exists. |
| defaultPickQuantityUnit | N | B | | Flag which specifies whether this SKU Quantity Unit is the default quantity unit used as default quantity unit for picking of the SKU. This configuration may be overruled by a -> Host Plant Configuration of a SKU, if a corresponding configuration exists. |
| supplierQuantityUnit | N | B | | Flag which specifies whether this SKU Quantity Unit is the default quantity unit when the SKU is delivered from a supplier. This configuration may be overruled by a -> Host Plant Configuration of a SKU, if a corresponding configuration exists. |
| factorToBaseQU | N | N | >0 | The number of base quantity units which are included in this SKU Quantity Unit.<br>For BaseQuantityUnit (used for HelloFresh) it is always 1.<br>DiQ sets automatically fixed to “1” |
| preferredLoadUnitTypeId | N | A | <=30 | The ID of the Load Unit Type which is preferred for storage of this SKU Quantity Unit. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| skuLoadUnitCapacities | N | CMPLX | SEQ (1, *) | Capacities of different Load Unit Types for this SKU Quantity Unit<br>Type: CMPLX-> skuLoadUnitCapacity<br>FIELD NAME: skuLoadUnitCapacity |
| preferredFulfillmentZoneId | N | A | <=40 | During order fulfillment, inventory is preferably searched in this zone. |
| defaultPackageBreakdownId | N | A | <=10 | ID of the SKU Quantity Unit which is the default packaging inside the packaging of the actual SKU Quantity Unit (e.g. Pallet -> Carton -> Box -> Item) |
| toDelete | O | B | | When set to true, deletion of this SKU Quantity Unit is requested. Deletion is executed when there are no references to this SKU Quantity Unit. |
| preferredFulfillmentHandlingType | N | A | ENUM | The Fulfillment Handling Type defines how units are handled during order fulfillment. |
| labeled | N | B | | This flag specifies whether or not packages of this SKU Quantity Unit are labeled with barcodes which can be used for identification. |
| productCodeList | N | CMPLX | | This flag specifies whether or not packages of this SKU Quantity Unit are labeled with barcodes which can be used fr identification.<br>Type: CMPLX-> productCodeList |
| skuImageList | N | CMPLX | | List of SKU Images<br>Type: CMPLX-> skuImageList |
| sortationQuantityUnit | N | CMPLX | | Sortation Quantity Unit (required for sortation fulfillment handling types)<br>Type: CMPLX-> sortationQuantityUnit |

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## 3.2 EAI Command: orderInsertUpdate

### Purpose

This command is used by the ERP system to transfer order details to Dematic iQ Optimize.

### Characteristics

| | |
|---|---|
| **Message Type** | orderInsertUpdate |
| **Direction** | inbound |
| **Purpose** | Creates a new order or updates an existing order. |
| **Transfer Methods** | REST |
| **Triggers** | ● |
| **JSON Example File** | orderInsertUpdate.json |

### Processing

Create new order or updates an existing order with the paramters from the host system. In case of update an existing order, if one order line is not exisitng in the new message, this order line will be deleted from DiQ.

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| clientId | Y | A | <=10 | Owner of the Stock Keeping Unit.<br>Fixed always “HFB”. |
| orderId | Y | A | <=50 | Unique identifier for the order. |
| priority | O | N | >0 | The priority specifies the relative urgency of an order and is usually an integer value between 1 and 1000. The lower the value, the higher the priority. |
| customerId | N | A | <=50 | ID of the customer. Must be unique for the client. |
| addresses | N | CMPLX | SEQ (1, *) | A list of addresses for the order. If addresses are not specified through customers, this list can be used to specify relevant addresses for the order<br>Type: CMPLX-> address<br>FIELD NAME: address |
| additionalHostData | N | A | | Contains all the data which are transferred by the Host and which are not used by Dematic iQ but for confirmation. These data are kept as a raw set of data (usually an xml stream). |
| additionalTexts | N | CMPLX | SEQ (0, *) | A set of texts which may be used on a project specific way, e.g. for label printing.<br>Type: CMPLX-> additionalText<br>FIELD NAME: additionalText |
| defaultDestinationId | N | A | <=100 | Unique identifier of the location where to send the load units. This default value is used if no destination is set in the order lines. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| defaultIntermediateDestinationId | N | A | <=100 | Id of the default Intermediate Destination |
| earliestStartTime | N | DT | | Earliest date and time at which the fulfillment of the order can be started. |
| latestStartTime | N | DT | | Latest date and time at which the fulfillment of the order can be started. |
| startPickingDeadline | N | DT | | This the deadline for starting the picking. |
| pickDate | N | D | | Nominal date when the order will be picked. |
| earliestStagingTime | N | DT | | Earliest date and time at which the material can be delivered to the staging area. |
| latestStagingTime | Y | DT | | Latest date and time limit for transportation. It is also called 'Pick-By Time'. According to HelloFresh requirement this field can be in the past. |
| loadingTime | N | DT | | Date and time when the load is planned to start. |
| shippingTimeTarget | N | DT | | Date and time before shipping should have been done. |
| deliveryTime | N | DT | | Required arriving date and time at the customer site. |
| documentationDetails | N | A | | Information to be printed on documents produced by the system for this order. |
| loadingSequence | N | N | | Loading sequence for all load units of the order within the same route into the shipping resource (e.g. truck). For a given loading sequences for a route, shipment transports consider the loading sequence. Loading sequence is the reverse of the externally defined unloading sequence of route related orders. |
| shippingCondition | N | A | | Specific conditions dedicated to shipping. Example: used to say that the customer will come to the warehouse to get the goods. |
| hostShippingPoint | O | A | | Data used for informational and organizational purposes to support the shipment operations. |
| unloadPoint | O | A | | Data used for informational and organizational purposes to support the shipment operations. |
| customerOrderReference | N | A | | The customer order reference is an external identifier for the order. It can be sometimes the same as the DCD internal order id. |
| customerOrderType | N | A | ENUM | This is the order type used by the customer. |
| route | Y | A | <=255 | This is the ID of a route. Routes contain data required for the transportation of the goods to the customer like a list of stops, etc. |
| reason | N | A | | A reason or a motivation is sometime necessary for the order, it depends on its type. |
| waveId | N | A | <=50 | The wave groups orders for collective disposition and execution for picking and shipping purposes. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| waveExclusion | N | B | | Flag which indicates whether or not the order has to be excluded from wave planning. If this flag is set, the order must not be included into a wave. |
| preferredLuType | Y | A | | Considered while retrieval strategies determine the optimal load units to be delivered and as default proposal for the pick container types during pick operations.<br>Type of the box, which is to use for this order.<br>Possible values are<br>* XS,<br>* S,<br>*M<br>* L |
| palletizerMixingRuleId | N | A | | ID of a mixing rule which shall be applied for palletizing of the order. Mixing rules are configured within Dematic iQ. |
| orderLines | Y | CMPLX | SEQ (1, *) | Collection of order lines<br>Type: CMPLX-> orderLine<br>FIELD NAME: orderLine |
| neededQC | Y | B | | Flag that requires a box to go to the QC station always before going to lidding |

### 3.2.1 Complex Type: orderLine

**Attribute Descriptions**

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| orderLineId | Y | A | <=20 | Unique identifier of an order line within an order.<br>This identifier is generated by the host and must be unique within an order. |
| hostOrderType | N | A | ENUM | There are different kinds of host orders depending on the host. This value shows the type given by host for this order line. |
| criteriaUsed | N | A | ENUM | Type of criteria that is used for the line. This property defines which mode will be used to retrieve what is needed for the line.<br>For HelloFresh only “INVENTORY_CRITERIA” is used.<br>Always set by DiQ automatically to “INVENTORY_CRITERIA” |
| inventoryCriteria | Y | CMPLX | | The inventory criteria is used to select inventory units for this order line. This attribute is required if inventory criteria are used.<br>Type: CMPLX-> inventoryCriteria |
| locationId | N | A | <=100 | ID of the location from which inventory shall be retrieved. This attribute is required when location ctriteria are used |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| loadUnitId | N | A | <=22 | ID of the load unit which should be used for the order line. This attribute is required if load unit criteria are used. |
| finalDestinationLocation | N | A | <=100 | This field allows setting a final destination for an order line |
| additionalHostData | N | A | | Contains all the data which are transferred by the Host and which are not used by Dematic iQ but for confirmation. These data are kept as a raw set of data (usually an xml stream). |
| additionalTexts | N | CMPLX | SEQ (0, *) | A set of texts which may be used on a project specific way, e.g. for label printing.<br>Type: CMPLX-> additionalText<br>FIELD NAME: additionalText |
| holdOption | N | A | ENUM | Parameter set by the Host to handle hold on inventory during order processing. |
| hostMoveReason | N | A | | This attribute contains the reason of a host relevant inventory change. |
| hostMoveType | N | A | | This is an ID of inventory movement type which represents the type of a host relevant inventory change. |

## 3.2.2 Complex Type: inventoryCriteria

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| clientId | Y | A | <=10 | Owner of the Stock Keeping Unit.<br>Fixed, always send: “HFB”. |
| skuId | Y | A | <=50 | Unique identifier of the Stock Keeping Unit for a client. |
| batch | N | A | | Defines the batch for the inventory units which should be used for the order line. |
| hostStorageLocation | N | A | | HostStorageLocation of the announced inventory. The entire quantity of the order line has the same HostStorageLocation. |
| holdReasonId | N | A | | The hold reason id specifies if the advised inventory has to be set on hold during creation and for what reason. |
| fulfillmentRequirement | N | A | ENUM | Defines fulfillment requirements for an order line. |
| quantityBaseTargetHost | Y | N | >0 | Requested quantity in base quantity units. |
| quantityUnit | N | A | <=10 | ID of the SKU quantity unit used for this order line. Is always PCS<br>Always set by DiQ automatically to “PCS” |
| unlimitedOverdeliveryAllowed | N | B | | Flag which indicates if overdelivery is allowed without any limit. Useful if only full load units are requested, regardless of quantity.<br>Always set by DiQ automatically to “True” |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| overdeliveryTolerance | N | N | >=0 | The overdelivery tolerance is the factor to that overdelivery is allowed. |
| underdeliveryTolerance | N | N | >=0<br><=100 | The underdelivery tolerance is the factor to that underdelivery is allowed. |
| specialInventoryMark | N | A | ENUM | A special inventory mark can classify an inventory unit to have special requirements for the usage for customer orders. An inventory unit without a special inventory mark can be used freely to satisfy customer orders. |
| specialInventoryReferenceId | N | A | | The special inventory reference id can be used to link the inventory marked as special inventory to a corresponding object. Example: Inventory on commission could be identified by the commission id. |
| bestBeforeDate | N | D | | The best before date is the date before that it is recommended to consume the inventory. Best Before Date of the announced inventory in format YYYYDDMM. |
| minQuantityPerLU | N | N | >=0 | An inventory is not selected, if there is less available quantity (in base quantity units) on one base load unit. |
| roundingMethod | N | A | ENUM | The rounding method defines how the quantity to be reserved on inventory units matching a given inventory criteria shall be rounded within the boundaries of over delivery and under delivery tolerance. |
| minimumRestQuantity | N | N | >=0 | If less than the minimum rest quantity (in base quantity units) would remain free after the reservation on a source inventory unit the complete free quantity is reserved within the boundaries of over delivery and under delivery tolerance. |

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# 3.3 EAI Command: orderStatus

### Purpose

Dematic iQ Optimize changes the status of the order

### Characteristics

| | |
|---|---|
| **Message Type** | orderStatus |
| **Direction** | outbound |
| **Purpose** | Changes the status of the order. |
| **Transfer Methods** | REST |
| **Triggers** | When the order status or flag changed |
| **JSON Example File** | orderStatus.json |

### Processing

- During the order processing the order gets several statuses according to the current step of fillfilment. DiQ informs the host system about each status changes.

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| orderId | Y | A | <=50 | Unique identifier for the order. |
| loadUnitCode | O | A | <=22 | Box barcode (LPN). This field will be sent empty for status pendin, onHold, preparedOnHold and prepared because the LPN is not yet applicated to the box |
| status | Y | A | ENUM | Status of the order.<br>Possible order status are:<br>*pending<br>*onHold<br>*preparedOnHold<br>*prepared<br>*released<br>*active<br>*inQC<br>*inOos<br>*shippingLabelApplied<br>*completed<br>*finished<br>*canceled |

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## 3.4 EAI Command: orderQuery

### Purpose

Dematic iQ Optimize needs to check the availability of printout in print on demand area as a precondition for order release

### Characteristics

| | |
|---|---|
| **Message Type** | orderQuery |
| **Direction** | outbound |
| **Purpose** | Check availability of printout |
| **Transfer Methods** | REST |
| **Triggers** | Requests confirmation about availability of printout DATA in Ricoh for order |
| **JSON Example File** | orderQuery.json |

### Processing

- When the order is selected from order pool, DiQ check the availability of printout by sending this message to RICOH
- If RICOH confirms the availability of printout, DiQ release the order. Otherwise the order will stay in order pool until all preconditions are met

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| orderId | Y | A | <=50 | Unique identifier for the order. |

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# 3.5 EAI Command: queryResponse

### Purpose

Host (Ricoh) informs Dematic iQ Optimize when the digital media for a specific order is available.

### Characteristics

| | |
|---|---|
| **Message Type** | queryResponse |
| **Direction** | inbound |
| **Purpose** | Informs DiQ when the printout is ready to dispense |
| **Transfer Methods** | REST |
| **Triggers** | Response for orderquery |
| **JSON Example File** | queryResponse.json |

### Processing

- RICOH response with this message to the orderQuery telegram to infrom Dematic iQ Optimize about the avialabilty of digital media for the a specific order in print on demand area
- Based on this response Dematic iQ Optimize descide the next step of order fufillment

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| orderId | Y | A | <=50 | Unique identifier for the order. |
| status | Y | A | ENUM | The response of host if the printout is available for the order or not.<br>Possible values:<br>• AVAILABLE<br>• UNAVAILABLE |
| reason | O | A | | Free text explaining the reason sent from Ricoh. E.g., PDF not available, Processing, Order not found, etc. |

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# 3.6 EAI Command: printRequest

### Purpose

Dematic iQ Optimize triggers a printout after the box is assigned to the order.

### Characteristics

| | |
|---|---|
| **Message Type** | printRequest |
| **Direction** | outbound |
| **Purpose** | Triggers the printout at release order carton |
| **Transfer Methods** | REST |
| **Triggers** | Release of order carton |
| **JSON Example File** | printRequest.json |

### Processing

- If the box is erected and connected to the order, Dematic iQ Optimize releases the oder and triggers the print of receipts in print on demand area
- Beside OrderID Dematic iQ Optimize informs the host about the LineID. RICOH triggers the print on one printer on the determined line.

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| orderId | Y | A | <=50 | Unique identifier for the order. |
| printerLane | Y | A | <=10 | Line Id where the carton will start |
| loadUnitCode | Y | A | <=22 | Box barcode |

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# 3.7 EAI Command: pickComplete

### Purpose

Notifies the host of a completed pick event.

### Characteristics

| | |
|---|---|
| **Message Type** | pickComplete |
| **Direction** | outbound |
| **Purpose** | Notify the host for a completed pick after confirmation of operator by Pick by Light |
| **Transfer Methods** | REST |
| **Triggers** | • Pick complete event |
| **JSON Example File** | pickComplete.json |

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| clientId | O | A | <=10 | Client Id of the SKU |
| orderId | O | A | <=50 | Order Id for this pick was made |
| orderLineReference | O | A | <=50 | Unique identifier of the Order Line |
| pickerPk | Y | A | <=20 | Unique identifier of the Picker.<br>For HelloFresh this is the UUID from the RFID card |
| terminalId | O | A | <=30 | Unique identifier of Terminal where the pick was done |
| quantityPicked | Y | N | | Quantity picked for this Pick.<br>QuantityPicked will be always > 0. For short picking wih quantityPicked = 0 pickComplete message will not be sent |
| quantityTarget | O | N | | Quantity Target for this Pick |
| quantityUnitId | O | A | <=10 | Unique identifier of the Quantity Unit of the Pick |
| sourceLoadUnitId | O | A | <=22 | Unique identifier if the Source Load Unit |
| destinationLoadUnitId | O | A | <=22 | Unique identifier if the Source Load Unit<br>For HelloFresh this is the barcode of the box |
| pickConfirmationCode | O | A | <=50 | Type of the Pick Confirmation Code |
| pickConfirmationReason | O | A | <=50 | Type of the Pick Confirmation Reason |
| startTime | Y | DT | | Start Time of the pick |
| endTime | Y | DT | | Start Time of the pick |
| skuId | Y | A | <=50 | Sku id of the replenished SKU |
| locationId | Y | A | <=255 | SKU rack channel. |

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| | | | | |
|---|---|---|---|---|
| | | | | If an alias is provided the alias will be sent, otherwise the DiQ internal naming convention will be sent. |

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# 3.8 EAI Command: setOrderOnHold

### Purpose

Host sets the order on hold

### Characteristics

| | |
|---|---|
| **Message Type** | setOrderOnHold |
| **Direction** | Inbound |
| **Purpose** | Host sets the order on hold |
| **Transfer Methods** | REST |
| **Triggers** | |
| **JSON Example File** | setOrderOnHold.json |

### Processing

- HelloFresh need to to have the possibility to postpone the release of one order.
- Host sends Dematic optimize iQ this message to set or remove the hold for order
- Once order is in status prepared (status >= prepared) setting on hold is not possible anymore
- Setting and removing orders on hold is done exclusively using this telegram or by the super user
- By default all order are not onHold
- Many orders can be sent in the same telegram using a JSON file and there is no limit on number of orders.
- JSON payload can contain several objects for different orders. Orders with incorrect status (>= prepared) and not existing orders in DiQ will be skipped

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| orderId | Y | Array | | Array of unique identifier for the order. |
| onHold | Y | B | | True if order sets on hold, otherwise false |

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# 3.9 EAI Command: outOfStock

### Purpose

Notifies the host when the stock has run out from one location of picking station.

### Characteristics

| | |
|---|---|
| **Message Type** | JSON |
| **Direction** | Outbound |
| **Purpose** | Notifies the host when the stock has run out. |
| **Transfer Methods** | REST |
| **Triggers** | When the stock has run out from one location during picking or if operator manually deactivates the out of stock |
| **JSON Example File** | outOfStock.json |

### Processing

- Operator realizes changes about the status of SKU concerning of out of stock
- Operator activates/ deactivates out of stock by Pick by Light
- DiQ sends this message to host system

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| pickerPk | Y | A | <=30 | Picker Id of the picker triggers out of stock |
| workstationId | Y | A | <=225 | The alias of workstation |
| locationId | Y | A | <=255 | Location Id of the location which marked as out of stock<br>If an alias is provided the alias will be sent, otherwise the DiQ internal naming convention will be sent. |
| status | Y | A | ENUM | The status of out of stock.<br>Possible values are:<br>*ACTIVE<br>*DEACTIVE |
| pressTime | Y | DT | | Time stamp of the trigger of button by the user |

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# 3.10 EAI Command: crateDepleted

### Purpose

Host informs Dematic optimize iQ about replenishment of one crate from Multishuttle

### Characteristics

| | |
|---|---|
| **Message Type** | JSON |
| **Direction** | Inbound |
| **Purpose** | Notifies the host when the stock has run out. |
| **Transfer Methods** | REST |
| **Triggers** | When crate has been taken out of Multishuttle by replenishment process |
| **JSON Example File** | crateDepleted.json |

### Processing

- Operator picks the boxes out of Multishuttle
- Operator confirms this step by WMS
- Host confirms to Dematic optimize iQ
- Dematic optimize iQ removes the box from the system

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| loadUnitCode | Y | A | <=22 | Unique identifier if the Source Load Unit.<br>For HF this is the barcode of the crate. |
| pickTime | Y | DT | | Time of the pick |

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## 3.11 EAI Command: replenishmentComplete

### Purpose

Host notifies Dematic optimize iQ when a replenishment is completed by an operator.

### Characteristics

| | |
|---|---|
| **Message Type** | JSON |
| **Direction** | inbound |
| **Purpose** | Notifies DiQ when a replenishment is completed by an operator. |
| **Transfer Methods** | REST |
| **Triggers** | Replenishment of one box into picking workstation |
| **JSON Example File** | replenishmentComplete.json |

### Processing

- Operator put the SKU into one location in picking workstation
- Operator confirms this step by WMS
- Host confirms to Dematic optimize iQ
- Dematic optimize iQ books the confirmed SKU in determined location
- SKU is then available for orders
- following areas need replenishmentComplete message to assign a SKU

  - Cool Pouch
  - Flyer dispensers
  - Addon area
  - Ice
  - Picking lines

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### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| skuId | O | A | <=50 | Sku id of the replenished SKU.<br>In case that the location will be empty, the host sends skuId empty without a string. DiQ removes the assigned SKU from this location. |
| locationId | Y | A | <=255 | Alias of the location which is replenished |

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# 3.12 EAI Command: adviceInsertUpdate

### Purpose

Host announces deliveries of crates to the WCS through advices.

### Characteristics

| | |
|---|---|
| **Message Type** | adviceInsertUpdate |
| **Direction** | inbound |
| **Purpose** | Creates a new advice or updates an existing advice. |
| **Transfer Methods** | REST |
| **Triggers** | • Creation of a new advice<br>• Update of an advice |
| **JSON Example File** | adviceInsertUpdate.json |

### Processing

- If the specified advice does not yet exist, it is created
- If the advice exists already, it is updated

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| clientId | Y | A | <=10 | Client (inventory-owner) to whom this advice refers to.<br>Fixed, always send: “HFB”. |
| adviceId | Y | A | <=50 | Unique identifier for the advice.<br>This is a unique identifier created by the host. |
| adviceType | N | A | ENUM | Type of the advice. The type can be used to distinguish different origins of advised goods, such as SUPPLIER, PRODUCTION or RETURN.<br>Always set by DiQ automatically to “PRODUCTION” |
| referenceBarcode | N | A | <=50 | Generic identifier for the advice. |
| supplierId | N | A | <=50 | ID of the supplier from whom the delivery originates. |
| purchaseOrderReference | N | A | | Reference to a purchase order to which the advised delivery refers to. |
| expectationDate | N | DT | | Announced arrival date for the advised delivery. |
| deliveryText | O | A | | Text or instruction which shall be displayed in receiving screens for this advice. The text may be overruled by line specific texts. |
| defaultDestination | N | A | | Default destination for storage of inventory received for this advice. The destination may be overruled by line-specific default destinations. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| additionalHostData | N | A | | Additional data which a host system may require for confirmations of this advice. These data are not processed within Dematic iQ. |
| adviceLines | Y | CMPLX | SEQ (1, *) | Collection of advice lines<br>Type: CMPLX-> adviceLine<br>FIELD NAME: adviceLine |

### 3.12.1 Complex Type: adviceLine

**Attribute Descriptions**

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| adviceLineId | Y | A | <=20 | Unique identifier of an advice line within an advice. |
| skuId | Y | A | <=50 | ID of the Stock Keeping Unit announced with this advice line. |
| supplierSkuId | N | A | | ID used by the supplier to identify the announced SKU. |
| purchaseOrderLine | N | A | <=20 | |
| quantityTarget | Y | N | >=0 | Total announced quantity for the SKU, expressed in units of the 'receiving quantity unit'. |
| receivingQuantityUnit | N | A | <=10 | ID of an SKU Quantity Unit use for receiving.<br>Fixed, always send “PCS” |
| unlimitedOverdeliveryAllowed | N | B | | This flag indicates whether or not unlimited overdelivery is allowed for this advice line.<br>Always set by DiQ automatically to “True” |
| overdeliveryTolerance | N | N | >=0<br><=100 | The overdelivery tolerance is the relative factor to that overdelivery is allowed. Example: The announced target quantity is 100 and the overdelivery tolerance is 0,08. Then a delivery up to 108 is allowed. |
| underdeliveryTolerance | N | N | >=0<br><=100 | The underdelivery tolerance is the relative factor to that underdelivery is allowed. Example: The announced target quantity is 100 and the underdelivery tolerance is 0,08. Then a delivery of 92 is still allowed. |
| batch | N | A | | Batch/lot of the announced inventory. The entire quantity of the advice line has the same lot. |
| hostStorageLocation | N | A | | HostStorageLocation of the announced inventory. The entire quantity of the advice line has the same HostStorageLocation. |
| bestBeforeDate | N | D | | Best Before Date of the announced inventory in format YYYYDDMM. The entire quantity of the advice line has the same Best Before Date. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| deliveryText | O | A | | Information or handling instructions which can be shown in receiving dialogs. The deliveryText on advice line level is used prior to the deliveryText on advice level. |
| HoldReasonId | N | A | | ID of a hold reason. Inventory for this advice line will be set on hold with this reason when created during receiving. Only the predefined reason IDs may be used. |
| specialInventoryMark | N | A | ENUM | A special inventory mark can classify an inventory unit to have special requirements for the usage for customer orders. An inventory unit without a special inventory mark can be used freely to satisfy customer orders. An example for a special inventory mark is 'inventory on commission'. |
| specialInventoryReferenceId | N | A | | The special inventory reference id can be used to link the inventory marked as special inventory to a corresponding object. Example: Inventory on commission needs to be identified by the commission id. |
| qualityClassification | N | A | ENUM | Quality classification which shall be attributed to inventory created for this advice line. This allows to distinguish stock with respect to quality characteristics. Only the predefined values are allowed. |
| destination | N | A | | Destination for inventory related to this advice line. Valid dastinations are specified within a project. |
| dateOfReceipt | Y | DT | | Original date when the announced inventory was received in the warehouse. If this date is specified, it will be used instead of the date when inventory is created in Dematic iQ. |
| dateOfManufacture | Y | D | | Manufacturing date of announced inventory. |
| preferredLoadUnitType | N | A | <=30 | Load Unit type which is preferably to be used for storage if Load Units are not advised. |
| additionalHostData | N | A | | Additional data received from a host needed for confirmation can be stored using this attribute. |
| adviceLineLUs | Y | CMPLX | SEQ (0, *) | Collection of advice line Load Units on which inventory from this advice line is located. For announcing mixed Load Units, the same advice line Load Unit can appear for multiple advice lines.<br>Type: CMPLX-> adviceLineLU<br>FIELD NAME: adviceLineLU |

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## 3.12.2 Complex Type: adviceLineLU

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| loadUnitCode | Y | A | <=22 | A load unit can be identified globally using the load unit code and the load unit code type. A typical load unit type is the SSCC (Serial Shipping Container Code) from GS1 standard. For this project this is the crate barcode.<br>For HF this is the barcode of the crate |
| loadUnitCodeType | N | A | ENUM | Type of the Load Unit code. E.g. SSCC. |
| loadUnitType | Y | A | <=30 | Type of the Load Unit. Must be one of the known Load Unit Types.<br>Posible values:<br>*CRATE |
| loadUnitPosition | N | N | | Position of the load unit on its parent load unit. |
| loadUnitCodeParent | N | A | <=22 | Load Unit code of the parent load unit. In a stack, the parent load unit is hierarchically directly underneath the current Load Unit. |
| loadUnitCodeTypeParent | N | A | ENUM | Type of the Load Unit code for the parent Load Unit. |
| loadUnitTypeParent | N | A | <=30 | Type of the parent Load Unit. Must be one of the defined Load Unit types. |
| loadUnitParentPosition | N | N | | Position of the parent Load Unit on its parent Load Unit. |
| loadUnitCodeBase | Y | A | <=22 | Load Unit code for the base Load Unit. In a stack, the base Load Unit is the hierarchically lowest Load Unit.<br>Same as loadUnitCode.<br>For HF this is the barcode of the crate |
| loadUnitCodeTypeBase | N | A | ENUM | Type of the Load Unit code for the base Load Unit |
| loadUnitTypeBase | Y | A | <=30 | Type of the base Load Unit.<br>Same as loadUnitType.<br>Posible values:<br>*CRATE |
| altLoadUnitCode | N | A | <=22 | Alternative Load Unit code. This may be used as an alternative unique identifier for the load unit. For exemple, an alternative identification of the load unit by the host can be stored in this field. |
| altLoadUnitCodeParent | N | A | <=22 | Alternative Load Unit code for the parentLoad Unit. This may be used as an alternative unique identifier for the parentload unit. For exemple, an alternative identification of the parentload unit by the host can be stored in this field. The parentLoad Unit is the hierarchically next LU for the current LU. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| altLoadUnitCodeBase | N | A | <=22 | Alternative Load Unit code for the base Load Unit. This may be used as an alternative unique identifier for the base load unit. For exemple, an alternative identification of the base load unit by the host can be stored in this field. The base Load Unit is the hierarchically lowest LU in a stack. |
| quantityTarget | Y | N | >=0 | The announced quantity of inventory for this advice line Load Unit. The quantity is expressed in units of the 'receiving quantity unit' of the advice line.<br>In this project the quantity of items in the crate. |
| totalWeight | Y | N | >=0<br>17,2 | Weight of the load unit with content. The advised total weight can be used for weight based checks of the received load unit.<br>For HF project this is the theoretical wheigt of the crate with the mealkits in it.<br>Units in grams |
| fullPallet | N | B | | Flag which indicates whether the load unit contains only the inventory advised in the advice line.<br>Always set by DiQ automatically to “True” |
| packagingSkuId | N | A | <=50 | SKU ID of the packaging material. If packaging is changed during receiving, the original ID is stored in packagingSkuIdHost. |
| packagingQuantity | N | N | >=0 | The packaging quantity defines the quantity of the packaging sku used for the inventory advised with this advice line LU. It is possible to advice a packaging sku with packaging quantity null. In this case the packaging quantity is unknown. When submitted by the host, the packaging quantity equals the packaging quantity host. A user may overwrite the this quantity. |
| additionalHostData | N | A | | Additional data which a host system may require for confirmation. These data are not modified within Dematic iQ. |

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# 3.13 EAI Command: adviceConfirm

### Purpose

Dematic iQ Optimize confirms receiving of announced deliveries through confirmation of advices.

The confirmation will be sent after received units have reached their destination location.

### Characteristics

| | |
|---|---|
| **Message Type** | adviceConfirm |
| **Direction** | outbound |
| **Purpose** | Confirms receipt of an advised delivery. |
| **Transfer Methods** | • REST |
| **Triggers** | • The advice is in status "To Confirm" |
| **JSON Example File** | adviceConfirm.json |

### Processing

- Sends an outbound confirmation message when the box is stored in Multishutle

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| clientId | Y | A | <=10 | Client (inventory-owner) to whom this advice refers to. |
| adviceId | Y | A | <=50 | Unique identifier for the advice.<br>This is a unique identifier created by the host. |
| adviceType | O | A | ENUM | Type of the advice. The type can be used to distinguish different origins of advised goods, such as SUPPLIER, PRODUCTION or RETURN. |
| supplierId | O | A | <=50 | ID of the supplier from whom the delivery originates. |
| arrivalDate | Y | DT | | Date and time when first inventory for this advice has been created. Creation of the inventory and loadUnit in DiQ (this is when the crate is scanned on the conveyor for the first) |
| additionalHostData | O | A | | Additional data which the host has sent with the advice. These data have not been modified within Dematic iQ. |
| adviceLinesConfirm | Y | CMPLX | SEQ (1, *) | Collection of advice lines<br>Type: CMPLX-> adviceLineConfirmType<br>FIELD NAME: adviceLineConfirm |

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### 3.13.1 Complex Type: adviceLineConfirmType

**Attribute Descriptions**

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| adviceLineId | Y | A | <=20 | Unique identifier of an advice line within an advice. |
| arrivalDate | Y | DT | | Date and time when the first inventory for this advice line has been created. |
| skuId | Y | A | <=50 | ID of the Stock Keeping Unit which has been received for this advice line. |
| quantityTarget | Y | N | >=0 | Total announced quantity for the SKU in units of the 'receiving quantity unit'. |
| quantityCurrent | O | N | >=0 | Actual received quantity for this advice line in units of the 'receiving quantity unit' |
| quantityDamaged | O | N | >=0 | Damaged quantity for this advice line in units of the 'receiving quantity unit' |
| receivingQuantityUnit | O | A | <=10 | ID of an SKU Quantity Unit use for receiving. |
| receivingLocationId | O | A | <=100 | ID of the location where inventory for this advice line has been received. For this project this is the Kitting line where the crate has been married. |
| receivingWorkstationId | O | A | <=40 | ID of the workstation where inventory for this advice line has been received. |
| batch | O | A | | Batch/lot of the received inventory. The entire quantity of the advice line has the same lot. |
| bestBeforeDate | O | D | | Best Before Date of the received inventory in format YYYYDDMM. The entire quantity of the advice line has the same Best Before Date. |
| holdReasonId | O | A | | ID of a hold reason. Inventory for this advice line has been set on hold with this reason when created during receiving. Only the predefined reason IDs may be used. |
| specialInventoryMark | O | A | ENUM | Special inventory mark which has been used when creating inventory for this advice line. |
| specialInventoryReferenceId | O | A | | The special inventory reference id which has been used when creating inventory for this advice line. |
| qualityClassification | O | A | ENUM | Quality classification which has been attributed to inventory created for this advice line. |
| dateOfManufacture | Y | D | | Manufacturing date of received inventory. |
| additionalHostData | Y | A | | Additional data which the host had sent with this advice line. The data have not been modified by Dematic iQ. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| adviceLineLUsConfirm | Y | CMPLX | SEQ (0, *) | Collection of advice line Load Units on which inventory from this advice line is located. For announcing mixed Load Units, the same advice line Load Unit can appear for multiple advice lines.<br>Type: CMPLX-> adviceLineLUConfirmType<br>FIELD NAME: adviceLineLUConfirm |

## 3.13.2 Complex Type: adviceLineLUConfirmType

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| loadUnitCode | Y | A | <=22 | Load Unit code for the received Load Unit. This is the unique identifier of the Load Unit within the warehouse. |
| loadUnitCodeType | O | A | ENUM | Type of the Load Unit code. E.g. SSCC. |
| loadUnitType | O | A | <=30 | Type of the received Load Unit. |
| loadUnitPosition | O | N | | Position of the load unit on its parent load unit. |
| loadUnitCodeParent | O | A | <=22 | Load Unit code of the parent load unit. In a stack, the parent load unit is hierarchically directly underneath the current Load Unit. |
| loadUnitCodeTypeParent | O | A | ENUM | Type of the Load Unit code for the parent Load Unit. |
| loadUnitTypeParent | O | A | <=30 | Type of the parent Load Unit. Must be one of the defined Load Unit types. |
| loadUnitParentPosition | O | N | | Position of the parent Load Unit on its parent Load Unit. |
| loadUnitCodeBase | O | A | <=22 | Load Unit code for the base Load Unit. In a stack, the base Load Unit is the hierarchically lowest Load Unit. |
| loadUnitCodeTypeBase | O | A | ENUM | Type of the Load Unit code for the base Load Unit |
| loadUnitTypeBase | | A | <=30 | Type of the base Load Unit. |
| altLoadUnitCode | O | A | <=22 | Alternative Load Unit code. This may be used as an alternative unique identifier for the load unit. For exemple, an alternative identification of the load unit by the host can be stored in this field. |
| altLoadUnitCodeBase | O | A | <=22 | Alternative Load Unit code for the base Load Unit. This may be used as an alternative unique identifier for the base load unit. For exemple, an alternative identification of the base load unit by the host can be stored in this field. The base Load Unit is the hierarchically lowest LU in a stack. |
| altLoadUnitCodeParent | O | A | <=22 | Alternative Load Unit code for the parentLoad Unit. This may be used as an alternative unique identifier for the parentload unit. For exemple, an alternative identification of the parentload unit by the host can be stored in this field. The parentLoad Unit is the hierarchically next LU for the current LU. |

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| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| arrivalDate | Y | DT | | Date and time when the Load unit arrived the finale destination location in multishuttle |
| errorCode | O | A | ENUM | Error code which occured during storage of this Load Unit. "OK" indicates no error. |
| errorReason | O | A | | Free text explaining the reason for an error if errorCode <> "OK". |
| logosticErrorCode | O | A | ENUM | The logistic error code specifies errors related to logistic processes or to logistic aspects of a Load Unit. |
| logisticErrorReason | O | A | | Free text explaining the reason for a logistic error. |
| lastStocktakingDate | O | DT | | Date and Time set as last stocktaking date for this Load Unit. |
| lastStocktakingOperator | O | A | | Operator who performed the last stocktaking for this Load Unit. |
| quantityTarget | O | N | >=0 | The announced quantity of inventory for this advice line Load Unit. The quantity is expressed in units of the 'receiving quantity unit' of the advice line. |
| quantityCurrent | O | N | >=0 | The actually received quantity on this Load Unit related to the advice line. The quantity is expressed in units of the 'receiving quantity unit' of the advice line. |
| receivingLocationId | Y | A | <=100 | Location where the Load unit is stored in Multishuttle<br>If an alias is provided the alias will be sent, otherwise the DiQ internal naming convention will be sent. |
| receivingOperatorId | O | A | | User ID of the user who has initiated receiving of this Load Unit. |
| receivingWorkstationId | O | A | <=40 | Workstation where this Load Unit has been created. |
| totalWeight | Y | N | >=0<br>17,2 | Weight of the load unit with content. |
| fullPallet | O | B | | Flag which indicates whether the received load unit has been considered as full pallet. |
| packagingSkuId | O | A | <=50 | SKU ID of the packaging material. |
| packagingQuantity | O | N | >=0 | The packaging quantity defines the quantity of the packaging sku used for the inventory received for this advice line LU. |
| additionalHostData | O | A | | Additional data which the host system has sent with this advice line Load Unit. The data have not been modified within Dematic iQ. |

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# 3.14 EAI Command: workstationStatus

### Purpose

Notifies the host when the status of a station changed

### Characteristics

| | |
|---|---|
| **Message Type** | workstationStatus |
| **Direction** | outbound |
| **Purpose** | Notifies the host when the status of a station changed |
| **Transfer Methods** | REST |
| **Triggers** | Status of workstation changed |
| **JSON Example File** | workstationStatus.json |

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| workstationId | Y | A | <=255 | The alias of workstation |
| status | Y | A | ENUM | New status of the station.<br>• activeManned<br>• activeNoReplen<br>• activeNoRearReplen<br>• activeNotManned<br>• closed<br>• closedWithCleardown<br>• closedWithActiveReplen |
| activeWeek | Y | A | <= 20 | Week assigned to the station in user GUI. |
| changeTime | Y | DT | | Timestamp of status change |

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# 3.15 EAI Command: orderCancel

### Purpose

The host system can cancel an order

### Characteristics

| | |
|---|---|
| **Message Type** | orderCancel |
| **Direction** | inbound |
| **Purpose** | Requests deletion of an existing order. |
| **Transfer Methods** | • REST |
| **Triggers** | • Cancellation of an order on the ERP level |
| **JSON Example File** | orderCancel.json |

### Processing

- Cancels the order.
- Important: Once the orderID is cancelled a new orderID is needed. If the same order has to be sent again it will be rejected.

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| clientId | Y | A | <=10 | Owner of the Stock Keeping Unit. |
| orderId | Y | A | <=50 | Unique identifier for the order. |

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# 3.16 EAI Command: orderLineChange

### Purpose

Dematic iQ Optimize informs about changes in Bill of Material

### Characteristics

| | |
|---|---|
| **Message Type** | orderLineChange |
| **Direction** | outbound |
| **Purpose** | Optimize informs about changes in Bill of Material |
| **Transfer Methods** | REST |
| **Triggers** | When the SKU is not needed for the order or is substituted |
| **JSON Example File** | orderLineChange.json |

### Processing

- During the order processing the superuser decide to change an orderline and send the order without or with a substitute SKU

### Attribute Descriptions

| Attribute Name | M | Type | Type-Info | Description |
|---|---|---|---|---|
| orderId | Y | A | <=50 | Unique identifier for the order. |
| loadUnitCode | Y | A | <=22 | Box barcode |
| orderLineId | Y | A | <=20 | Unique identifier of an order line within an order. |
| originalSkuId | Y | A | <=50 | identifier of the Stock Keeping Unit in order line |
| newSkuId | Y | A | <=50 | If substitution then send newID.<br>If the orderline is cancelled send NULL |
| originalTargetQuantity | Y | A | <=10 | Target quantity in Bill of materials |
| newTargetQuantity | Y | A | <=10 | Adjusted quantity in Bill of materials |