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1. Introduction

1.1. Purpose

This is a guide to help companies implementing the Upstream Integration Model (UIM) version 2.2 and the GS1 eCom XML v2.5 message standards for electronic communication.

The main audience are the implementers of integration projects. The aim is to share best practices and points to consider during implementation. Therefore this guide is a living document to be updated with best practices gained from UIM implementations by companies involved in the Global Upstream Supply Initiative (GUSI). To keep this guide general it covers the most common practices. However, there might be exceptions per Manufacturer and/or Material Supplier and these need to be addressed and documented separately in their specific projects.

1.2. Recommended reading

Recommended reading: GS1 XML Technical User Guide for release 2.

1.3. Overview

This guide consists of detailed guidelines and explanations on:

- GS1 Keys: Explanation on how to include the GS1 keys in the messages.
- Referencing documents: Explanation on how to refer from one message to another.
- Envelope layers: Explanation on how to apply the envelope layers of the message.
- Date Time formats: Explanation on the W3C date time format as used in the GS1 standards.
- UN/ECE Codelists: Explanation on the UN/ECE codelists for measurement units, package types and Incoterms.
- MIG Schemas: Explanation on the use of the MIG schemas as implementation tool when implementing the GS1 Standard schemas.

2. How to apply the GS1 Keys

2.1. Trade Item Identification

The trade item identification always has the following structure:



The GTIN (Global Trade Item Number) is a mandatory element. Optionally, one or multiple additional identifiers may be specified.

In messages where multiple trade item identifications are used, the name of the TradeItemIdentification element is replaced with a more specific name. However, the structure and names of the underlying elements remain the same.

Example:



Points to consider

- For systems / parties that do not (yet) support GTINs any alternate keys can be provided in the AdditionalTradeItemIdentification element.
- In situations where no GTIN is yet available a value of '00000000000000' must be used. This should be treated as a temporary solution since it is in violation of the GS1 Standards.

2.2. Party Identification

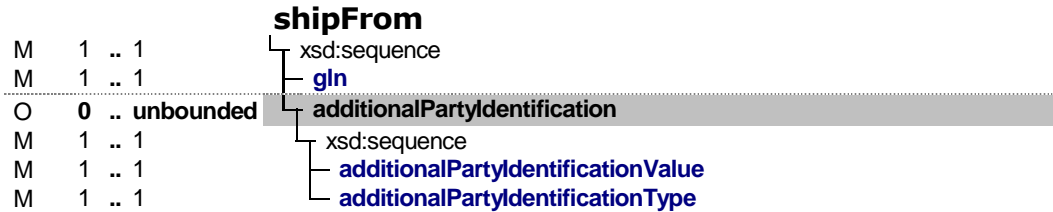
The party identification always has the following structure:



The GLN (Global Location Number) is a mandatory element. Optionally multiple additional identifiers may be specified.

In most messages multiple party identifications are used. Therefore the name of the PartyItemIdentification element is usually replaced with a more specific name. However, the structure and names of the underlying elements remain the same.

Example:

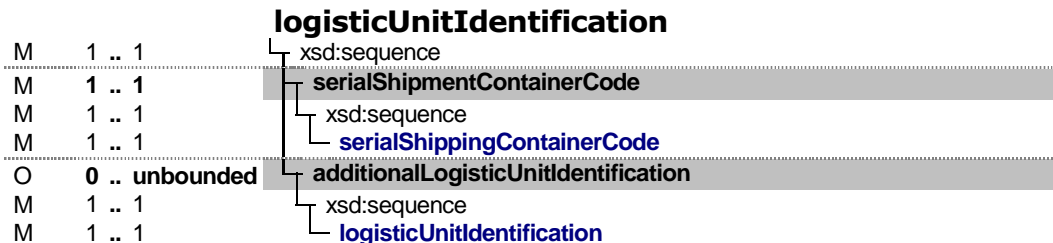


Points to consider

- For systems / parties that do not (yet) support GLNs any alternate keys can be provided in the additionalPartyIdentification element.
- In situations where no GLN is yet available a value of '000000000000' must be used. This should be treated as a temporary solution since it is in violation with the GS1 Standards. At least one additional ID must be identified in this exceptional case: Valid for GTIN / GLN

2.3. Logistic Unit Identification

The logistic unit identification always has the following structure:



The serialShippingContainerCode (SSCC) is a mandatory element. Optionally multiple additional identifiers may be specified.

Points to consider

- For systems / parties that do not (yet) support SSCCs any alternate keys can be provided in the additionalLogisticUnitIdentification element.

3. How to refer to other documents?

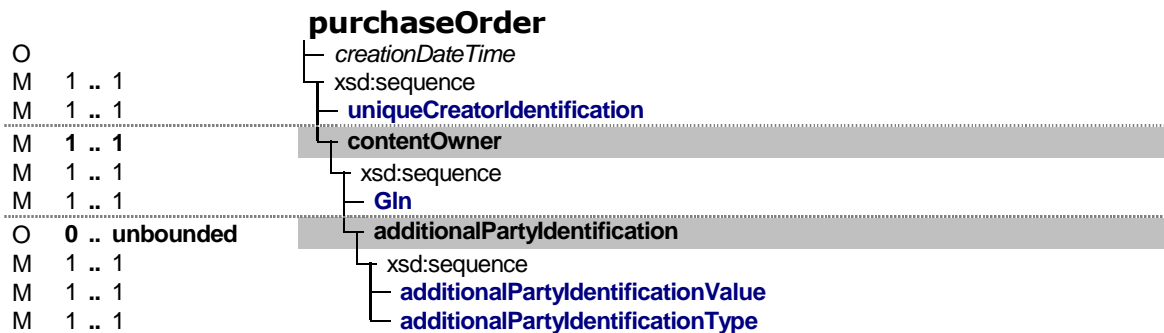
3.1. How to refer to another GS1 business message(line)?

There are three options when referring to another GS1 business message:

1. To refer to the document
2. To refer to the document line.
3. To refer to the either the document or the document line

3.1.1. Referencing a document

For referencing a document we use the following structure:



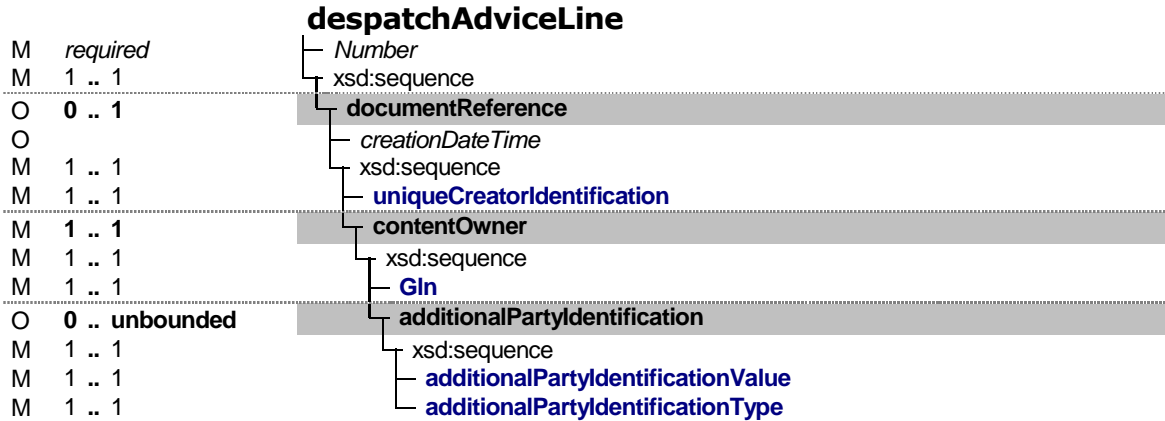
In the example above the reference is to a Purchase Order message. Besides having to specify the document ID (`uniqueCreatorIdentification`) it is also required to specify the party (content owner) responsible for assigning the ID. This ensures an unambiguous link to the message that is being referred to.

Points to consider

- Usually the content owner of the referred document is one of the parties in the message, e.g. the buyer or the seller.

3.1.2. Referencing a document line

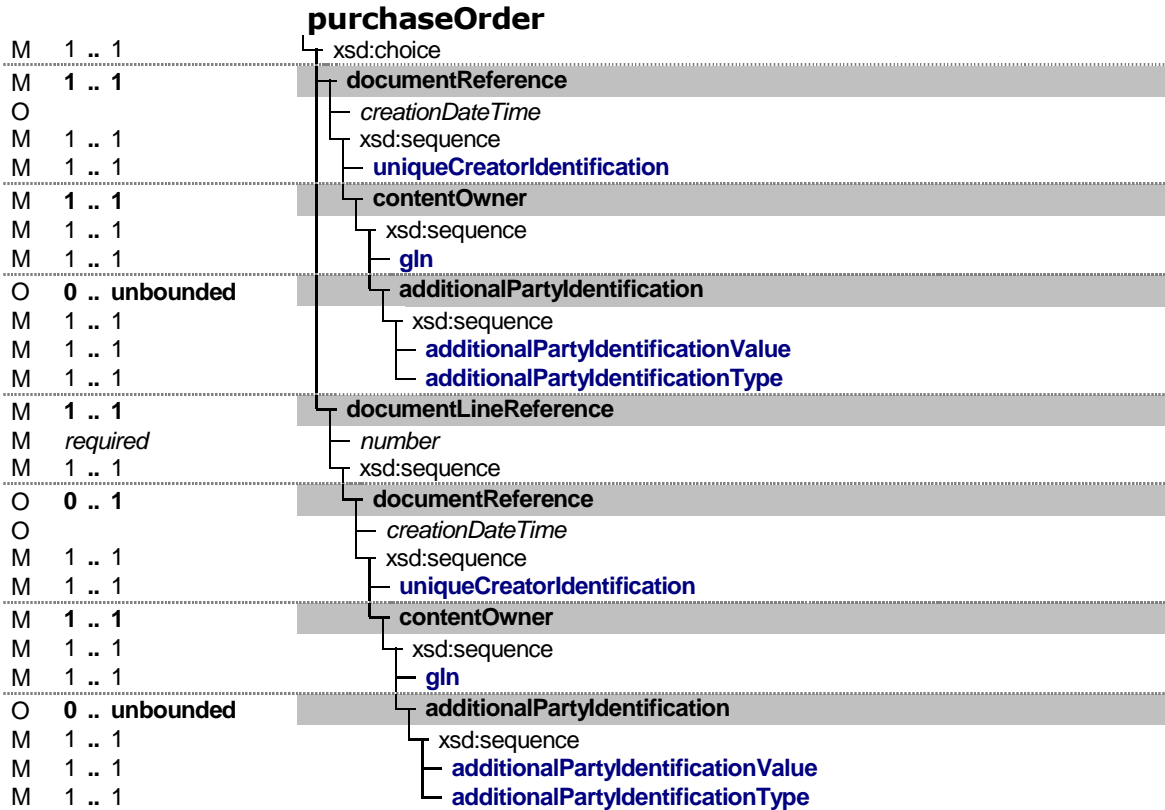
For referencing a line in the document we use the following structure:




In the example above the reference is to a Line Item in a Despatch Advice message. This structure is identical to the previous one, with one addition: the Line Item Number can now be specified as well, by using the *Number* element.

3.1.3. Referencing a document or document line

In some cases it is allowed to refer to either the document or the document-line. In that situation we use the following structure:



In the example above the reference is to a Purchase Order message or to a line in that message. This structure consists of a choice between structures 1 and 2.

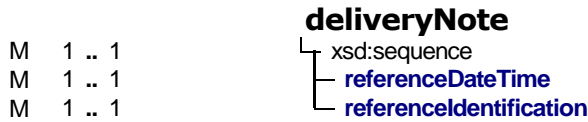
- 
Note: A message component guide is available only for the structure described in paragraph 3.1.3 (this guideline encapsulates the other two structures).

3.2. How to refer to an external document(line)

There are two options when referring to external documents:

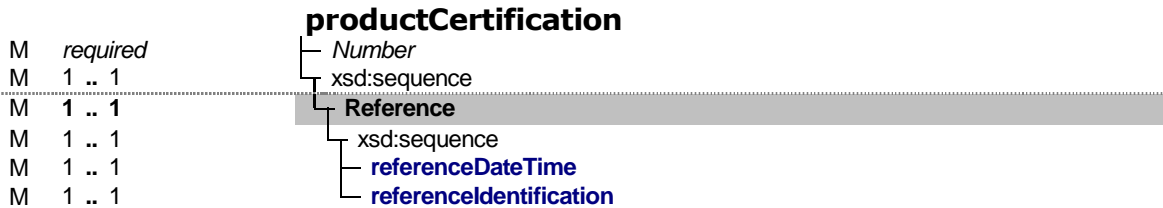
1. To refer to the document
2. To refer to the document line.

3.2.1. Referencing an external document




In the example above the reference is to a delivery note.

3.2.2. Referencing an external document line



In the example above the reference is to a specific line in an external Product Certification document.

- 
Note: A message component guide is available only for the structure described in paragraph 3.2.2 (this guideline encapsulates the other structure)

4. How to use the envelope layers?



Note: A detailed message component guide is available describing the information structure of the layers: **MIG Envelope Layers**.

4.1. Standard Business Document layer

The Standard Business Document Header (SBDH) is the UN/CEFACT standard, containing information about the routing and processing of the business document. In the EAN.UCC XML 2 architecture, the SBDH replaces the Envelope layer used in previous releases of XML standards.

The SBDH layer is mandatory and provides essential address information, assuring that a message will be delivered from a sender to a receiver. In addition, it identifies the message set that is sent together with one SBDH as well as the version number of the document or documents contained.

Furthermore, the SBDH provides a Business Scope where the business domain within which the transaction is executing is identified. The Business Scope, describing the complete business environment in which the SBDH and SBD will be processed, provides a basis for determining which rules are applicable to the transaction.

4.2. Message layer

The message layer defines actions that should be performed on the specific document or documents by the receiving application. Those tasks are defined as commands.

Use of this layer allows a reduction in the number of messages needed to perform an efficient exchange of business messages. The same message can be used with different commands. Hence no separate messages like 'Add Item', 'Change Item', 'Correct Item' or 'Delete Item' are needed. The same 'Item' message can be sent with the relevant command, e.g. 'add', 'change', 'correct' or 'delete'.

Besides identification of the message (uniqueCreatorIdentification), the Message layer contains two main components: transaction and command. Each message sent can contain several transactions and every transaction can hold multiple commands concerning one or more documents. Commands are used by a trading partner to instruct the receiving application about an action that should be performed on a given document.

This kind of layered architecture allows greater flexibility of business information exchange.

4.3. Transaction layer

A transaction provides functionality for submitting multiple commands simultaneously. It allows the users to process the group of messages together. If one of them fails, a rollback of the succeeded messages will be forced.

The Transaction schema contains two main components: identification of the parties that created the set of commands and the one that is the owner of the message content. The second component are the commands themselves.

4.3.1. Identification of the Transaction

The Transaction is identified by the combination of two identifier elements. The first one is the 'uniqueCreatorIdentification'. It is an identifier assigned by the party creating the transaction. The second identifier, the 'contentOwner', is the one specifying the assigning party itself.

Both those identifiers are mandatory, in order to make the Transaction identification really unique.

Unlike the previous release of EAN.UCC XML, the Content Owner can only be identified by a GLN and an optional additional identifier. The use of an alternate identifier to identify the Content Owner is no longer allowed (see the Transaction semantics for more detail).

4.4. Command

The 'command' element is a container, where one or multiple commands that form one transaction can be inserted.

Commands are used by a trading partner to instruct the receiving application about an action that should be performed on a given document. All commands are transitive and are discarded after executing the task.

Some of the actions to be performed are defined by the command itself, while other ones are defined by an attribute of the command.

The 'command' is an abstract element, extended by the following elements: 'documentCommand', 'documentIdentificationCommand' and 'linkCommand', defined in DocumentCommand.xsd, DocumentIdentificationCommand.xsd and LinkCommand.xsd, respectively. As the manufacturer currently only uses the DocumentCommand, this will be the only extension described below.

4.4.1. Document Command

The Document Command is used to instruct the recipient of that command to perform a particular action related to the documents within the command. The document in question has to be present. The actions which can be performed on it include 'Add', 'Refresh' and 'Delete'.

The Document Command is an extension of the abstract Command. It contains two main components: the 'documentCommandHeader' and 'documentCommandOperand'.

The 'documentCommandHeader' specifies the action that should be performed on the given document. Those tasks, defined as the required attribute of the header element, include:

ADD	the receiving application is instructed to store the document or documents
CHANGE_BY_REFRESH	the receiving application is instructed to update the existing document or documents, by total replacement
CORRECT	the receiving application is instructed to update the existing document or documents, by total replacement, skipping certain business specific validation rules. The syntactical and content validation rules still apply. This command is used in cases where the specific validation rules would otherwise prevent the application from changing data. It can be used only if the correction does not impact the integrity of the corrected data. Otherwise, the correction should be performed by sending two commands: DELETE (with the old document) and ADD (with the new document) in one transaction.
DELETE	the receiving application is instructed to delete the document or documents

The 'documentCommandOperand' contains an abstract element that can be extended by the actual document elements, defined in the actual business message schemas. Those are the documents against which one of the actions defined in the header element should be performed like Order or Dispatch Notification etc.

4.5. Document Layer

Document layer contains the actual business documents. In these documents item and party identifiers are used, eg. GLN (for party) and GTIN (for item). Identification of item is only relevant for the document layer. The use of party identification in the SBDH layer is different than the party identification in the document layer (see the proper semantics for details).

The body always expects a GLN or GTIN. To model other codes the GLN and/or GTIN is populated with zeros where the GLN or GTIN are not available. The actual location and/or item code is then put into `additionalPartyIdentification`, and/or `additionalTradeItemIdentification`.

5. Date time and timezone formats

The EAN.UCC date time format is based on the W3C schema primitive for date time. This primitive allows the inclusion on time zone information.

Complete date plus hours and minutes:

- YYYY-MM-DDThh:mmTZD (eg 1997-07-16T19:20+01:00)

Complete date plus hours, minutes and seconds:

- YYYY-MM-DDThh:mm:ssTZD (eg 1997-07-16T19:20:30+01:00)

Complete date plus hours, minutes, seconds and a decimal fraction of a second:

- YYYY-MM-DDThh:mm:ss.sTZD (eg 1997-07-16T19:20:30.45+01:00)

where:

YYYY = four-digit year

MM = two-digit month (01=January, etc.)

DD = two-digit day of month (01 through 31)

hh = two digits of hour (00 through 23) (am/pm NOT allowed)

mm = two digits of minute (00 through 59)

ss = two digits of second (00 through 59)

s = one or more digits representing a decimal fraction of a second

TZD = time zone designator (Z (gmt) or +hh:mm or -hh:mm)

6. UN/ECE Code Lists

In this chapter the codes are listed for which UN/ECE recommendations apply. The values of these codes are not validated against in the XML-schemas. The recommendations can be found at http://www.unece.org/cefact/recommendations/rec_index.htm

6.1. MeasurementUnitCodeList

The measurement unit code values must be taken from UN/ECE recommendation 20. From the list in annex 1 the common code must be used.

6.2. IncotermCodeList

The incoterm code values must be taken from UN/ECE recommendation 5.

6.3. PackagingTypeCode

The packaging type code values must be taken from UN/ECE recommendation 21.

7. Message Implementation Guides (MIGs)

The GS1 eCom XML standard scope covers all of the CPG industry. This includes retailers, logistic service providers and other players in this supply chain. Because of the wider use of the message set, the standard messages contain parts that are not relevant to support the UIM.

To simplify the implementation process within the GUSI community, for every GS1 XML message a UIM Message Implementation Guide (MIG) has been compiled. The MIG depicts the normative message implementation of GS1 BMS for use with GUSI UIM. The MIG is a subset and further restriction of the GS1 BMS. The GS1 BMS schemas are still the schema standards that XML messages should validate towards. The MIG and associated MIG schema describe the parts that are used how they should be used.

The recommendation is to follow GUSI MIG for implementation of the UIM. However, partners can differentiate from the MIG when a justifiable business reason exists and as long as the change is still valid against the GS1 BMS. Any deviation from the MIG must be addressed to the GUSI Implementation Team for evaluation and assessment, changes that bring added value to the whole community will be integrated in next versions of the MIG.



Important: All messages must validate against the official GS1 XML message schemas.