Section 7.0:

System Processing in EDP Applications

Table of Contents

7.1 Introduction

The purpose of entering data transmitted from a reading device into a system is to record a transaction. In the EAN.UCC System, a transaction is an electronic message to be processed according to the meaning and content of the data fields contained in the message. This should be possible without requiring any human intervention to determine the data's meaning and content.

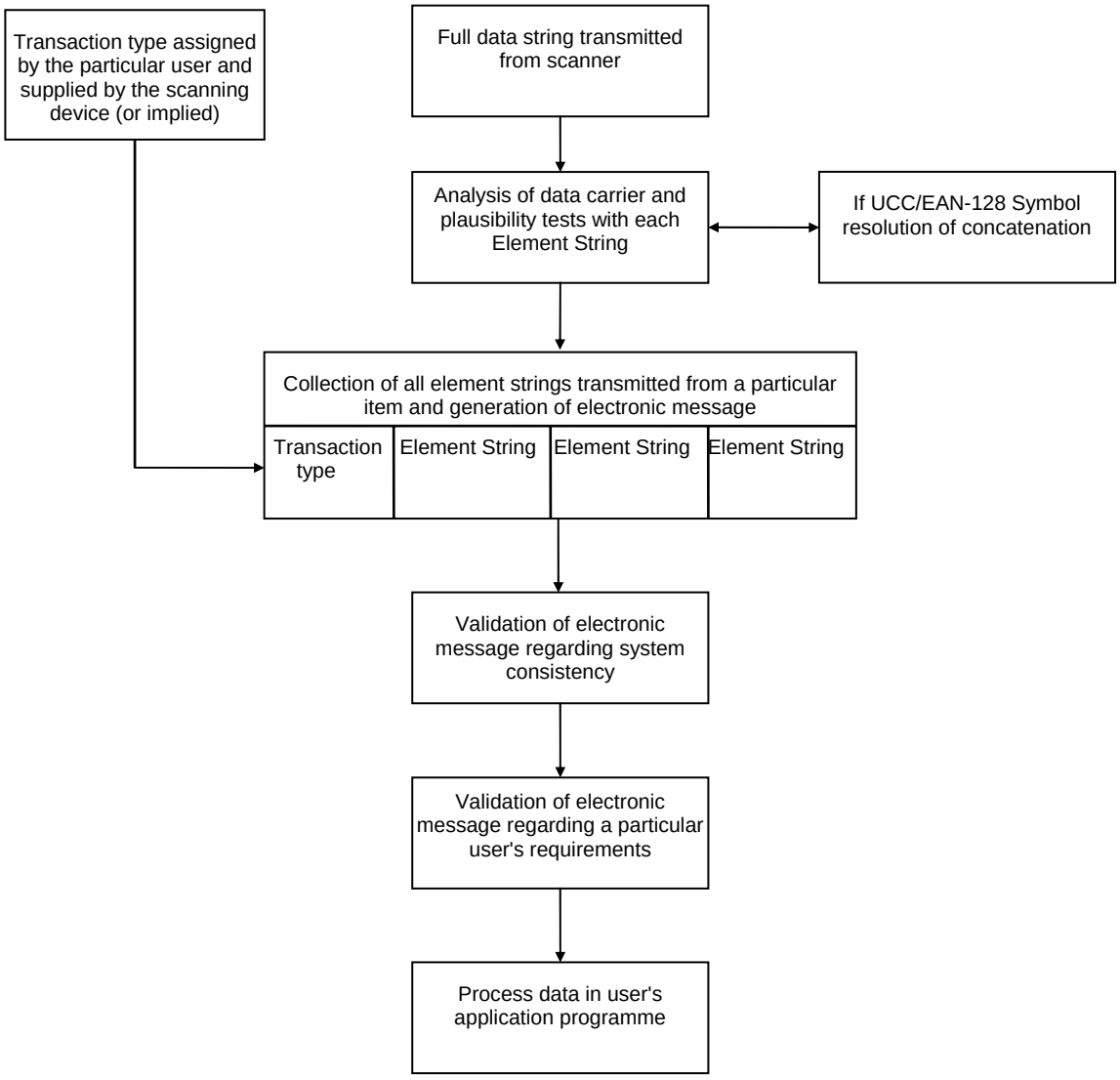
The standardised Element Strings of the EAN.UCC System are the basis for the identification of items of every kind. They identify a particular item in an unambiguous manner and supply relevant attribute information.

When these Element Strings are printed on items, the scanned and transmitted data refers to that item and identifies its physical presence at a given location. When the message read from the scanned data carrier is coupled with an internally assigned designation of the type of item movement (e.g., warehouse entry, stock taking, sales), it is possible to automatically record data related to each movement of items. This provides security in two ways. First, an item must be physically present in order to produce a bar code reader message about the item, and, second, only the data in the bar code on the item and, therefore, relevant to it, can be recorded. False notification of movements is thereby largely eliminated.

When Element Strings are used in administrative areas (e.g., in order entry) they also can be used for automatic, error-free data capture. Because of the considerable length of many EAN.UCC System ID numbers, automatic reading has great significance. By using a Check Digit, a digit that ensures the data has been correctly composed; the accuracy of the reading can be verified.

7.2 Synopsis of Message Processing

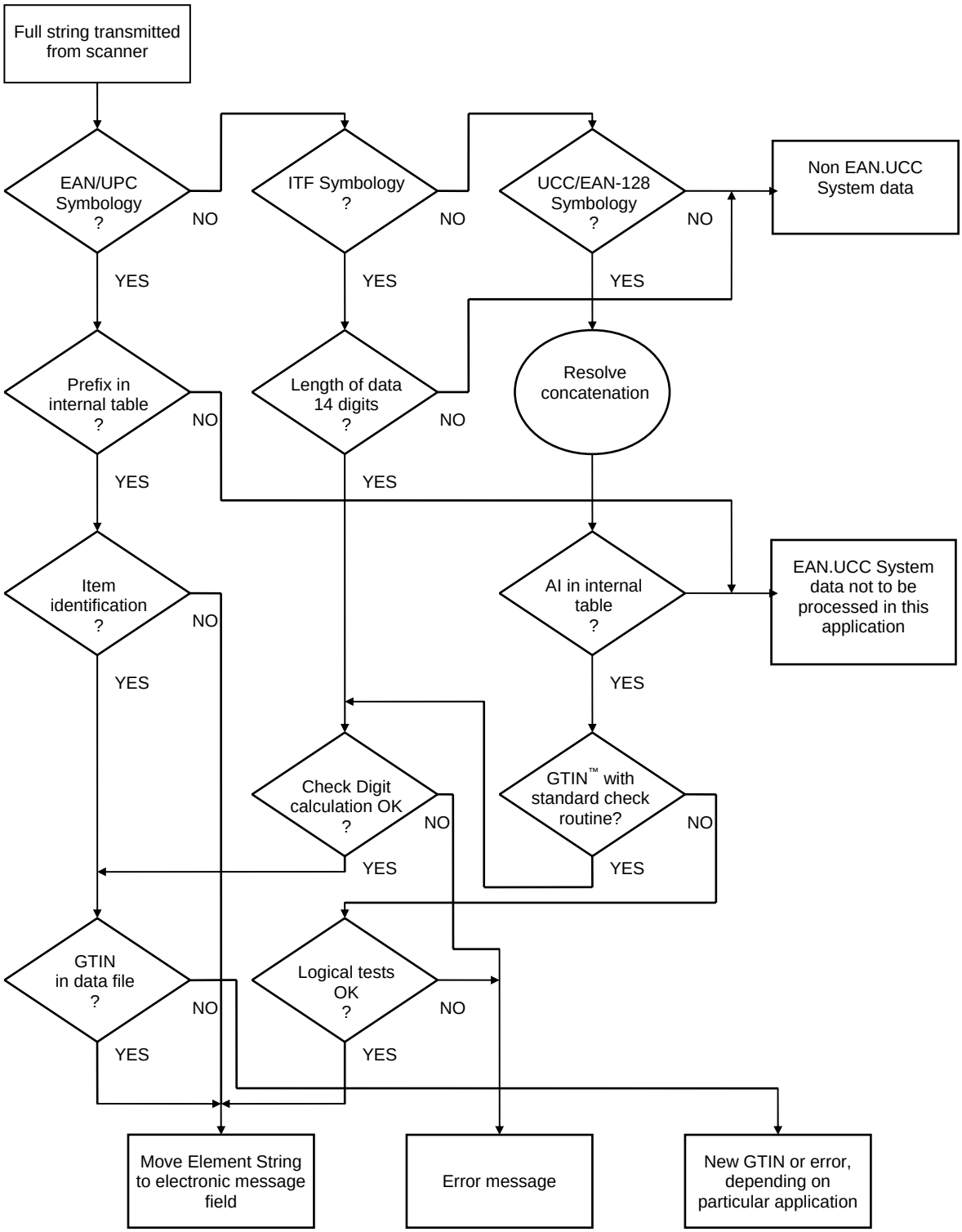
Figure 7.2 – 1



For details on any of the actions in Figure 7.2 – 1, see the following subsections.

7.2.1 Analysis of the Data Carrier and Plausibility Tests for Element Strings

Figure 7.2.1 – 1



For details on any of the actions in Figure 7.2.1 – 1, see the following subsections.

7.2.1.1 Symbology Identification

Each transmitted full string consists of a symbology identifier and one or more Element Strings (see Section 3.0). The identifiers of bar code symbologies are stated in Section 5.0.

7.2.1.2 Prefix in Internal Table

System users may generate an internal table showing the EAN.UCC Prefixes of Element Strings they wish to process. This table also serves to sort out the Element Strings representing item identification numbers in order to check their presence in the data file. Details on the respective prefixes are stated in Section 3.0.

7.2.1.3 Item Identification

The symbols in the EAN/UPC Symbology family contain identification data for trade items and special data structures (e.g., coupons). Whether an Element String contains the identification of a trade item is determined by the EAN.UCC Prefix. System users must determine the specific structure and meaning of prefixes 20 to 29 as defined by their EAN Member Organisation.

7.2.1.4 Application Identifier (AI) in Internal Table

The Element Strings using Application Identifiers cover a wide range of applications. In order to keep the amount of programming on a reasonable level, it is possible to ignore processing of unwanted Element Strings. This is achieved by establishing an internal table with only the Application Identifiers intended for processing.

7.2.1.5 Length of Data 14 Digits

ITF-14 Bar Code Symbols are used to represent trade item identification numbers. They have 14 Human Readable Interpretation characters, which can be printed above or below the symbol. In the EAN.UCC System, Global Trade Item Numbers™ (GTINs™) are stored in the GTIN Format, a 14-digit reference field in computer files that is used to ensure the uniqueness of the identification numbers.

7.2.1.6 Check Digit Calculation

In EAN/UPC Symbology, the Check Digit verifies reading and decoding of bar code symbols as well as Global Trade Item Numbers™ (GTINs™). This is performed automatically by the bar code reader.

Bar code readers processing ITF-14 Symbols may be programmed to verify the Check Digit as well. If this recommended verification has been performed, it is indicated by the symbology identifier] I 1 (see Section 5.0). Data transmitted from ITF-14 Symbols with symbology identifier] I 0 must be verified.

UCC/EAN-128 Bar Code Symbols have an integral Symbol Check Character that verifies correct decoding of scanned data. If an Element String encoded in UCC/EAN-128 includes a Check Digit, the Check Digit will not be verified by the bar code reader. While the data security provided by the UCC/EAN-128 Symbol Check Character guarantees proper decoding of the entire Element String, correctness of the contained identification number is achieved by having the application software verify the ID number's Check Digit. Logical Tests

Logical tests check for reasonable data content, such as verifying:

- Data field ranges (e.g., month < 13 and > 00)
- The maximum length of a variable length Element String
- Alphanumeric characters in numeric-only fields

- Correct EAN.UCC Prefixes in given applications

7.2.1.7 Move Element String to Message Field

Several Element Strings may be scanned in a single transaction. In order to verify the correctness and completeness of the transmitted data, each Element String is transferred to a message record. If an Element String does not include an Application Identifier, verification of the message is simplified if an Application Identifier is internally assigned. Global Trade Item Numbers™ (GTINs™) that are carried by EAN-13, UPC-A, UPC-E or ITF-14 bar code symbols may be denoted with an internally assigned AI (01). Other Element Strings may be assigned "ghost" Application Identifiers

7.3 Validation of the Electronic Message Regarding System Consistency

The EAN.UCC System enables system users to process scanned data without human intervention. This implies that the electronic message generated from data scanned and transmitted from data carriers needs to substitute all human activities during a particular transaction. In other words, the transmitted data must provide all information required for its correct processing.

The EAN.UCC System is designed to fulfil these requirements. Section 4.0 describes the association of Element Strings to form valid messages.

Validation of system consistency refers to the verification of the correct composition of the electronic message by a system processing the transaction messages. Whether the message is adequate in business application terms is dealt with by the application software.

Only messages containing a valid set of Element Strings defined in the EAN.UCC System can be unambiguously processed. The processing of invalid messages may lead to data file errors because the meaning and relationship of the Element Strings are not defined. This is illustrated in Figures 7.3 – 1 and 7.3 – 2.

Figure 7.3 – 1

Examples of Valid Messages			
Element Strings in Message			Comment
AI 00	AI 33nn		Identification of a logistic unit + logistic weight
AI 00	AI 01		Identification of an entity as a logistic unit and as a Fixed Measure Trade Item
AI 00	AI 01 '9'	AI 31nn	Identification of an entity as a logistic unit and as a Variable Measure Trade Item
AI 00	AI 02	AI 37	Identification of a logistic unit and its contained Fixed Measure Trade Items
AI 01	AI 10	AI 15	Identification of a trade item + lot number + best before date
AI 00	AI 401		Identification of a logistic unit as part of a consignment
AI 01 '9'	AI 31nn	AI 33nn	Identification of a Variable Measure Trade Item + logistic weight
AI 00	AI 01	AI 33nn	Identification of an entity as a logistic unit and a Fixed Measure Trade Item; the logistic weight is associated with the identification number of the logistic unit

Figure 7.3 – 2

Examples of Invalid Messages			
Element Strings in Message			Comment
AI 00	AI 01	AI 37	Invalid identification of an entity as a logistic unit and as a Fixed Measure Trade Item; AI 37 (quantity of items contained) must be used with AI 02 only
AI 01	AI 10	AI 33nn	Invalid identification of a Fixed Measure Trade Item + lot number; AI 33nn is incorrect because logistic measures of a Fixed Measure Trade Item are fixed attributes stored in the data file
AI 01'9'	AI 33nn		Invalid identification of a Variable Measure Trade Item + logistic weight; the mandatory Element String with a trade measure is missing
AI 00	AI 11		Invalid identification of a logistic unit; AI 11 is incorrect because a production date must be associated with the identification number of a trade item
AI 00	AI 01	AI 02/37	Invalid identification of an entity as a logistic unit and as a Fixed Measure Trade Item; AI 02/37 must not be associated with AI 01
AI 01	AI 30		Invalid identification of a Fixed Measure Trade Item; AI 30 must only be associated with the identification number of a Variable Measure Trade Item
AI 02	AI 37		Invalid identification of the fixed measure trade units contained in an unidentified logistic unit; AI 00 is missing
AI 00	AI 02		Invalid identification of a logistic unit and of the contained Fixed Measure Trade Items; AI 02 requires the mandatory presence of AI 37 to complete the identification of the content

7.4 Validation of the Electronic Message Regarding User Requirements

Some industry groups and organisations specify the use of particular Element Strings for attributes and other information not directly identifying the item. Contrary to the validation of messages for system conformity, the Uniform Code Council (UCC™) and EAN International do not define the rules for the validation and application of these particular Element Strings. Validation of messages containing these Element Strings in these environments (e.g., trade item identification with best before date and batch number) is left to the discretion of the particular system user community.

Validation of the correctness of a message may be performed differently for each Global Trade Item Number™ (GTIN™), and instructions must be stored in the data file. System users should include the Application Identifiers and their specific application rules in the stored instructions.

Validation of the user requirements must be performed after validation of system consistency. Missing elements in consistent messages may be by-passed or completed in given instances. Inconsistent messages can never be processed properly.

7.5 Conversion of Weights and Measures in User Applications

All weights and measures that are encoded in the Element Strings with the Application Identifiers (31nn) to (36nn) are structured according to the same mathematical rules. The determination of basic units of measurement and the freedom to choose the number of decimal positions will lead to variations in data representation. Suppliers will choose the value that best suits the respective trade item in terms of weight/size and the degree of accuracy required (e.g., grams) for the representation of weights and measures in the six-position data field.

The recipient of such goods also may want to store these details in a standardised form in his data file. This requirement is easily fulfilled through programming with the conversion formula shown below.

As described in Section 3.0, the Application Identifier in position A_4 denotes the position of the implied decimal point, called the Inverse Exponent.

The three-step formula to convert weights and measures is as follows:

1. Define the company's internal Inverse Exponent in accordance with the basic unit of measure of the company's internal field structure (e.g., for an AI expressing weight in kilograms, Inverse Exponent 0 could signify kilograms and Inverse Exponent 3 could signify grams).

2. Subtract the company's internal Inverse Exponent from the value of the position A_4 of the Application Identifier in the decoded Element String. Call the result X.

3. Divide the amount of the six-digit applicable value field from the decoded data string by 10^X. The result is the value required in the company's data structure.

In the examples in Figure 7.5 – 1, the company's system uses internal weight fields eight digits in length (format: nnnnnnn.n) with a unit of measure equal to grams. Thus, the company uses the internal Inverse Exponent of 3.

Figure 7.5 – 1

Decoded Data String					**Conversion**	**Internal Weight Field**							
Application Identifier A_1 A_2 A_3 A_4				Weight		Eight-Digit Data Field Defined as Grams with One Decimal Position							
3	1	0	0	005097 (= 5097 kg)	Step 2: X = 0 minus 3 = -3 Step 3: 005097 divided by 10^{-3} (.001) =	5	0	9	7	0	0	0	
3	1	0	2	005097 (= 50.97 kg)	Step 2: X = 2 minus 3 = -1 Step 3: 005097 divided by 10^{-1} (.1) =	0	0	5	0	9	7	0	
3	1	0	3	045250 (= 45.250 kg)	Step 2: X = 3 minus 3 = 0 Step 3: 045250 divided by 10^{0} (1) =	0	0	4	5	2	5	0	
3	1	0	4	012347 (= 1234.7 g)	Step 2: X = 4 minus 3 = 1 Step 3: 012347 divided by 10^{1} (10) =	0	0	0	1	2	3	4	7

↑ Decimal point

In the examples in Figure 7.5 – 2, the company's system uses internal weight fields eight digits in length (format: nnnnn.nnn) with a unit of measure equal to kilograms. Thus the company uses an internal Inverse Exponent of 0.

Figure 7.5 – 2

Decoded Data String					**Conversion**	**Internal Weight Field**							
Application Identifier A_1 A_2 A_3 A_4				Weight		Eight-Digit Data Field Defined as Kilograms with Three Decimal Position							
3	1	0	0	005097 (= 5097 kg)	Step 2: X = 0 minus 0 = 0 Step 3: 005097 divided by 10^0 (1) =	0	5	0	9	7			
3	1	0	2	005097 (= 50.97 kg)	Step 2: X = 2 minus 0 = 2 Step 3: 005097 divided by 10^2 (100) =	0	0	0	5	0	9	7	
3	1	0	3	045250 (= 45.250 kg)	Step 2: X = 3 minus 0 = 3 Step 3: 045250 divided by 10^3 (1000) =	0	0	0	4	5	2	5	
3	1	0	4	012347 (= 1234.7 g)	Step 2: X = 4 minus 0 = 4 Step 3: 012347 divided by 10^4 (10000) =	0	0	0	0	1	2	3	5

Decimal point

Position rounded

7.6 Linkage of GTINs™ in a Database

A trade item is any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain. Trade items may be a single item, part, unit, product, or service, or a pre-defined multiple or grouping or combination of such items. A separate Global Trade Item Number™ (GTIN™) identifies each of these items unambiguously, irrespective of the applied data structure. This also applies to identification numbers for restricted distribution in a closed environment.

Information about the hierarchical structure of trade items is an important issue in a business. Section 7.6.1 illustrates an example of how the required links can be established by using a relational database.

7.6.1 The Principle

The hierarchy for the example in Figure 7.6.1 – 1 is basic product = A; 10 x A = product B; 5 x B = product C.

Figure 7.6.1 – 1

Trade Item Database

GTIN™ (14 digits)	Item Characteristics	Relation Up	Relation Down
A	(as applicable)	YES	NO
B		YES	YES
C		NO	YES

Upper Relations

GTIN in Database	GTIN of Relation
A	B
B	C

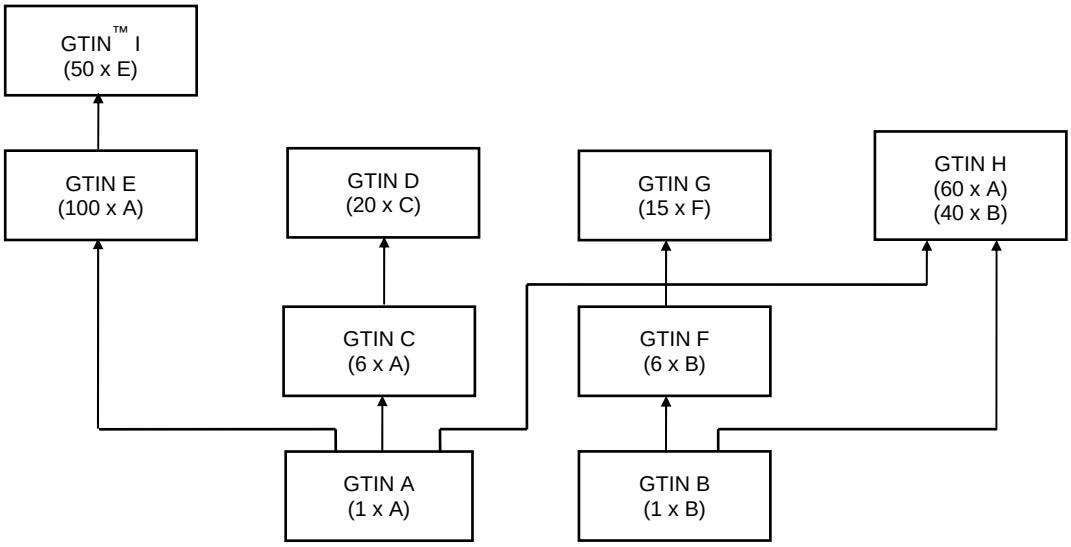
Lower Relations

GTIN in Database	GTIN of Relation
B	A
C	B

See Figure 7.6.2 – 1 for the mechanism of linkage for the various types of trade items.

7.6.2 Extended Example of a Trade Item Hierarchy

Figure 7.6.2 – 1



Note: For reasons of simplicity, Global Trade Item Numbers™ (GTINs) are expressed in letters in this example, signifying that they may be of any standardised structure.

Figure 7.6.2 – 2

Trade Item Database			
GTIN™ (14 digits)	Item Characteristics	Relation Up	Relation Down
A	(as applicable)	YES	NO
B		YES	NO
C		YES	YES
D		NO	YES
E		YES	YES
F		YES	YES
G		NO	YES
H		NO	YES
I		NO	YES

Upper Relations				Lower Relations			
GTIN in Database	GTIN of Relation	Quantity of Items Contained	Relation is Mixed Trade Item	GTIN in Database	GTIN of Relation	Quantity of Items Contained	Relation is Mixed Trade Item
A	C	6*	NO	C	A	6**	NO
A	E	100	NO	D	C	20	NO
A	H	60	YES	E	A	100	NO
B	F	6	NO	F	B	6	NO
B	H	40	YES	G	F	15	NO
C	D	20	NO	H	A	60	NO
E	I	50	NO	H	B	40	NO
F	G	15	NO	I	E	50	NO

*Quantity of items numbered A contained in item C

**Quantity of items numbered A contained in item C

Note: The columns "GTIN in Database" and "GTIN of Relation" are sufficient to establish the links between the different items. The column "Quantity of Items Contained" provides additional information, which may be useful in particular business applications. The column "Relation is Mixed Trade Item" provides the relations pointing to all trade items contained in a mixed trade item.

7.6.3 Linkage of GTINs™ in a Non-Relational Database by Trade Item Manufacturer

Many types of items are produced and distributed in fixed measure standard nested packaging configurations (e.g., consumer unit, carton, case, pallet) with fixed quantity relationships. The various packaging configurations are often broken into lower levels at various points in the supply chain, and, therefore, each level of the packaging may be a trade item. Computer systems must be capable of understanding the relationships of the units or trade items in the configuration and treating inventory of all levels of the configuration as one SKU (Stock Keeping Unit).

Use of the first digit Indicator (values 1 to 8) of the EAN/UCC-14 Data Structure can be used to identify levels of a standard packaging configuration. This allows digits 2 to 13 to remain constant for all levels of the standard packaging configurations for an item. If this method of numbering item configurations is used when necessary to support business processes or when driven by system constraints, the non-relational database construct defined below may be appropriate.

The item database is constructed with a base item record (table) and segments (tables) for each level of the item packaging configuration. Properly designed, this type of system can support pricing, ordering, and shipping of any level of the packaging configuration (trade item) with appropriate dimension and weight information. It enables inventories to be maintained by packaging level and in total for the base item. It also provides channel partners or customers the choice of ordering and invoicing units. Meeting these requirements often makes this approach a good business solution for manufacturers, because it meets the most critical needs in the supply chain and is practical to implement, particularly in distributed and small systems where performance is critical.

Using the EAN/UCC-14 Data Structure, the base item record contains the base EAN/UCC-8, UCC-12, or EAN/UCC-13 ID Number (digits 2 to 13) as a key, with all information relating to the base unit and the item in total (including total inventory balance). Each of the packaging segments contains information unique to the respective packaging configuration (e.g., Indicator, Check Digit, quantity relationship to next lower level of the configuration, dimensions, weight, prices). After accessing the item record using the GTIN of the base item (digits 2 to 13), the packaging segments are accessed using the Indicator (first digit).

This construct demands that:

- the trade item must be fixed in measure
- there must be a single Global Trade Item Number™ (GTIN™) for the base item of the related packaging configurations that is an EAN/UCC-8, UCC-12, or EAN/UCC-13 ID Number
- each related packaging configuration is limited to eight levels of packaging for the base item using Indicator values 1 to 8

When storing EAN/UCC-8, UCC-12, or EAN/UCC-13 ID Numbers in a 14-digit reference field or 14-digit data carrier, they must be stored based on rules that ensure their uniqueness. When a GTIN is stored in the GTIN Format, a 14-digit reference field represented in computer files, the uniqueness of the ID number is ensured.

The GTIN Format is intended to support the uniqueness management process for the construction of GTINs and not for the receiving process. Companies that receive trade items with GTINs must be able to process the complete GTIN without regard to how it was constructed.

7.7 Element Strings Represented in Data Carriers

Scanned Element Strings are decoded as a full string by the reading device and are then transmitted for processing in the application software. The full string is composed of a symbology identifier and one or more Element Strings. The meaning of an Element String is also determined by the data carrier in which it is represented.

A synopsis by data carrier of the Element Strings described in these specifications is shown in Figure 7.7.1 – 1, which also provides an overview of the sequential number range of trade items by data carrier.

7.7.1 GTINs™ Represented in EAN.UCC System Data Carriers

Figure 7.7.1 – 1

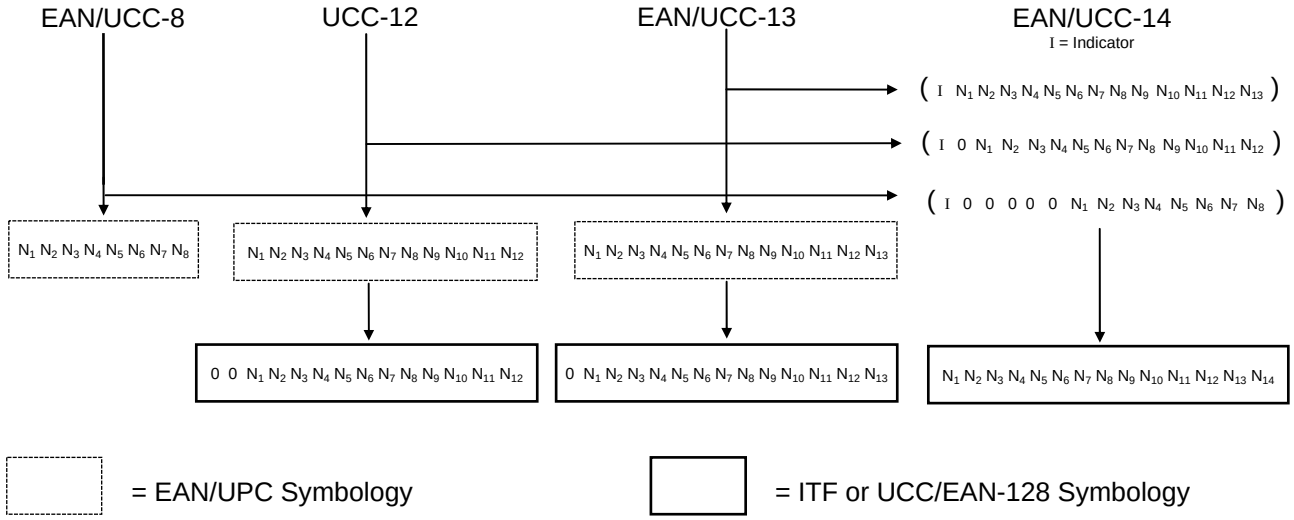
	ITF-14 or UCC/EAN-128 Bar Code Symbol													
		EAN-13 Bar Code Symbol												
			UPC-A or UPC-E Bar Code Symbol											
							EAN-8 Bar Code Symbol							
2.	*	*	*	*	*	*	00	09	09	09	09	09	09	CC
1.	*	*	*	*	*	*	11	03	09	09	09	09	09	CC
2.	*	*	*	*	*	*	22	09	09	09	09	09	09	CC
1.	*	*	*	*	*	*	39	06	09	09	09	09	09	CC
1.	00	00	00	00	00	19	09	09	09	09	09	09	09	CC
2.	*	*	00	00	17	09	09	09	09	09	09	09	09	CC
1.	00	00	01	09	89	09	09	09	09	09	09	09	09	CC
4.	*	00	22	09	09	09	09	09	09	09	09	09	09	CC
1.	00	00	33	09	09	09	09	09	09	09	09	09	09	CC
2.	*	00	44	09	09	09	09	09	09	09	09	09	09	CC
5.	*	00	55	09	09	09	09	09	09	09	09	09	09	CC
1.	00	00	69	09	09	09	09	09	09	09	09	09	09	CC
1. 8.	00	11	03	09	09	09	09	09	09	09	09	09	09	CC
2. 4.	00	22	09	09	09	09	09	09	09	09	09	09	09	CC
1. 8.	00	39	06	09	09	09	09	09	09	09	09	09	09	CC
7.	*	99	77	79	09	09	09	09	09	09	09	09	09	CC
5. 6.	*	99	88	02	09	09	09	09	09	09	09	09	09	CC
5.	*	99	99	09	09	09	09	09	09	09	09	09	09	CC
1.	18	00	00	00	00	00	11	03	09	09	09	09	09	CC
1.	18	00	00	00	00	00	39	06	09	09	09	09	09	CC
1. 3.	19	00	00	00	00	19	09	09	09	09	09	09	09	CC
1. 3.	19	00	01	09	99	09	09	09	09	09	09	09	09	CC
1. 3.	19	00	33	09	09	09	09	09	09	09	09	09	09	CC
1. 3.	19	00	69	09	09	09	09	09	09	09	09	09	09	CC
1. 3.	19	11	03	09	09	09	09	09	09	09	09	09	09	CC
1. 3.	19	39	06	09	09	09	09	09	09	09	09	09	09	CC

1. Fixed measure; 2. Fixed measure restricted distribution; 3. Variable measure; 4. Variable measure restricted distribution; 5. Coupons (not a GTIN); 6. Refund Receipts (not a GTIN); 7. ISBN, ISMN, and ISSN; 8. GRAI

7.7.2 Handling of Global Trade Item Numbers™ to Conform with the System

Figure 7.7.2 – 1

GTINs™ in EAN.UCC System Bar Code Symbols



As shown in Figure 7.7.2 – 1, the EAN.UCC System uses Global Trade Item Numbers™ (GTINs™) that vary in length. To avoid duplication in the GTIN Format in a computer file, it is necessary to observe some rules regarding GTIN arrangement.

Currently, the longest identification number for Fixed Measure Trade Items consists of 14 digits, which necessitates the creation of a 14-digit field. Figure 7.7.2 – 2 shows how GTINs transmitted in Element Strings are positioned in the GTIN Format.

Figure 7.7.2 – 2

Data Structure	**Positions in the GTIN Format**													
	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}	T_{13}	T_{14}
EAN/UCC-8	0	0	0	0	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8
UCC-12	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}
EAN/UCC-13	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}
EAN/UCC-14	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}

7.7.3 Element Strings Represented in UCC/EAN-128 Symbology

The Element Strings encoded in the UCC/EAN-128 Symbology are composed of an Application Identifier and one or several data fields. The Application Identifier denotes the contents and structure of the respective data fields. Full details are contained in Section 3.0.

7.8 Secondary Data for Specific Health Industry Products

Figures 7.8 – 1 and 7.8 – 2 show the correct data formats for secondary data for specific health industry products. If a column in Figure 7.8 – 3 is left blank, then that data format information is not used.

Figure 7.8 – 1

MM	two-digit expiration date month indicator (fixed length of two numeric digits)
YY	two-digit expiration date year indicator (fixed length of two numeric digits)
DD	two-digit expiration date day indicator (fixed length of two numeric digits)
HH	two-digit expiration date hour indicator (fixed length of two, G.M.T. format)
JJJ	three-digit expiration date Julian day indicator (fixed length of three numeric digits
LOT	up to 13-digit alphanumeric lot number
L	1-digit link character (GTIN Check Digit)
QQ	two-digit quantity (fixed length of two numeric digits)
QQQQQ	five-digit quantity (fixed length of five numeric digits)

The data in Figure 7.8 - 2 is used in the example in Figure 7.8 - 3.

Figure 7.8 – 2

GTIN™	10312345678903
Lot number	3C001
Link character	3
Expiration date	September 28, 1995, at 10 p.m.
Two-digit quantity	24
Five-digit quantity	00100

Quantity represents the quantity of items contained within the trade item where the inside item is assigned the GTIN™ 00312345678906.

The data formats in Figure 7.8 – 3 show all combinations of the sub-fields possible within the Element String.

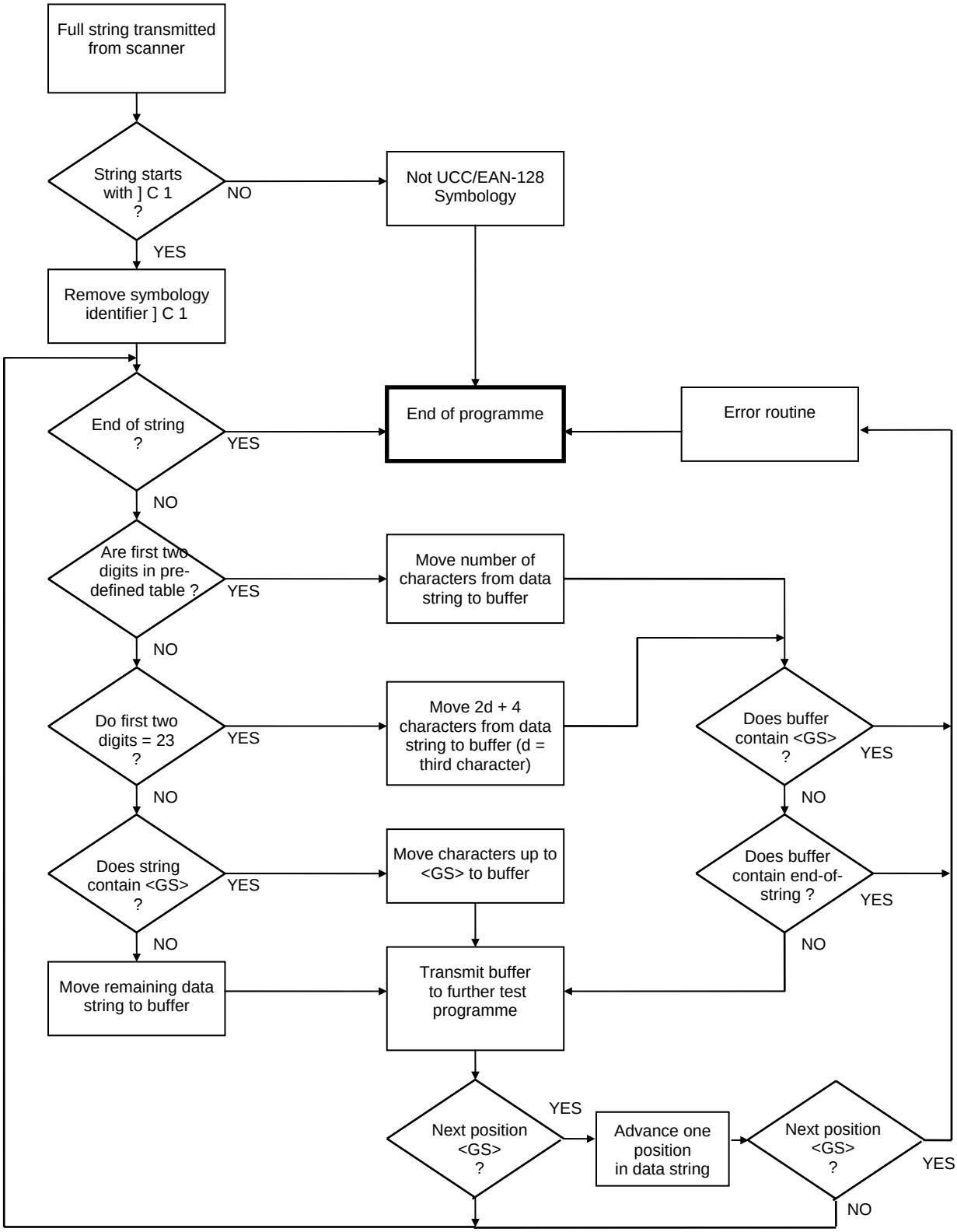
Figure 7.8 – 3

Row	Application Identifier	Quantity Format Digit	Quantity Format	Expiration Date Format Digit	Expiration Date Format	Lot Field	Link Digit	Example Data
1	22				MMYY	LOT	L	2209953C0013
2	22			2	MMDDYY	LOT	L	2220928953C0013
3	22			3	YYMMDD	LOT	L	2239509283C0013
4	22			4	YYMMDDHH	LOT	L	224950928223C0013
5	22			5	YYJJJ	LOT	L	225952713C0013
6	22			6	YYJJJHH	LOT	L	22695271223C0013
7	22			7		LOT	L	2273C0013
8	22	8	QQ		MMYY	LOT	L	2282409953C0013
9	22	8	QQ	2	MMDDYY	LOT	L	2282420928953C0013
10	22	8	QQ	3	YYMMDD	LOT	L	2282439509283C0013
11	22	8	QQ	4	YYMMDDHH	LOT	L	228244950928223C0013
12	22	8	QQ	5	YYJJJ	LOT	L	228245952713C0013
13	22	8	QQ	6	YYJJJHH	LOT	L	22824695271223C0013
14	22	8	QQ	7		LOT	L	2282473C0013
15	22	8	QQ			LOT	L	228243
16	22	9	QQQQQ		MMYY	LOT	L	2290010009953C0013
17	22	9	QQQQQ	2	MMDDYY	LOT	L	2290010020928953C0013
18	22	9	QQQQQ	3	YYMMDD	LOT	L	2290010039509283C0013
19	22	9	QQQQQ	4	YYMMDDHH	LOT	L	229001004950928223C0013
20	22	9	QQQQQ	5	YYJJJ	LOT	L	229001005952713C0013
21	22	9	QQQQQ	6	YYJJJHH	LOT	L	2290010095271223C0013
22	22	9	QQQQQ	7		LOT	L	2290010073C0013
23	22	9	QQQQQ			LOT	L	229001003

As an example, row 8 in Figure 7.8 – 3, using the required AI (01) and AI (22), would create the full string]C1 01 10312345678903 22 82409953C0013.

7.9 Processing of Data from UCC/EAN-128 Bar Code Symbols

Figure 7.9 – 1



7.9.1 General

UCC/EAN-128 Bar Code Symbols may represent several Element Strings in concatenated form (see Section 5.0). For processing as shown in Figure 7.3 – 1, it is necessary to separate each Element String, which is performed by the processing routine illustrated in Figure 7.9 – 1.

7.9.2 Element Strings with Pre-Defined Lengths using Application Identifiers

Representation of more than one Element String in a UCC/EAN-128 Bar Code Symbol requires the use of a separator character between the different Element Strings to mark their end. In UCC/EAN-128 Symbology, this is the Function Code 1 (FNC1). For details, see Section 5.0.

However, in order to enable printing of shorter bar code symbols, some Element Strings have been pre-defined in length, so that their end may be determined, and the FNC1 is not needed. These Element Strings, are shown in Figure 5.3.8.2.1

7.9.3 The Function Code 1 (FNC1)

Only when used as a separator character is the Function Code 1 (FNC1) transmitted in the decoded data string as <GS> (ASCII character 29, seven-bit character set ISO 646). All Element Strings of variable length and those of fixed length not stated in Figure 5.3.8.2.1 – 1 must be followed by an FNC1 when followed by another Element String in a single bar code symbol. An FNC1 is not required at the end of the last Element String represented in a bar code symbol.