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1 Purpose

This document specifies delivery requirements of electronic components for SICK. The regulations made here supplement the specifications of the general Delivery Guideline of SICK.

2 ESD protection (electrostatic discharge)

ESD sensitive components must be packed and supplied in suitable ESD packaging material with a corresponding labeling.
ESD sensitivity is indicated by standardized icons on each packaging unit (e.g. reel, stick, tray) and is signed by the mention "ESD" or the ESD icon in the delivery note next to the delivery item.

Figure 1: ESD icons

3 Moisture sensitive components (Dry Packing Process)

Moisture sensitive components or modules (MSL higher than 1) must be packed in vacuum sealed dry bags together with a drying agent and humidity indicator. Dry bags may not exhibit holes, cracks or signs of damage of any kind, which could influence the packaged material or the moisture-protection characteristics of the packaging material. Humidity-protection packaging must comply with the IPC/JEDEC J-STD 033 standard in relation to packaging and labeling.
Usage of blue gel (cobalt chloride) (CAS number: 7646-79-9, Index number: 027-004-00-5, EC number: 231-589-4) as a drying agent is prohibited.

4 Labeling the smallest packaging unit

The smallest packaging unit (e.g. reel, stick, tray, parcel) must be tagged by using a unique label. This chapter specifies the requirements regarding appearance and arrangement of the label as well as the structure of its code.

4.1 Standards and Regulations

The structure and content of the ECC200 DataMatrix code are aligned with the following standards:

- DataMatrix 2D-Label Specification (according to EN62090)
- Code syntax according to ISO/IEC 15434
- Data identifier according to ANSI MH10.8.2
- Country code according to ISO 3166 (A2)
- Moisture sensitivity level according to J-STD-020D

4.2 Code Structure

4.2.1. General

Coding must be carried out in the format according to ISO/IEC 15434.
The data string starts with the six characters []> RS 06 and ends with the two characters RS EOT.

In order to identify each of the combined fields, GS and the corresponding data identifier (for example, 1P, Q, 1T) must be used before the corresponding data elements.
The below provided example illustrates the structure.

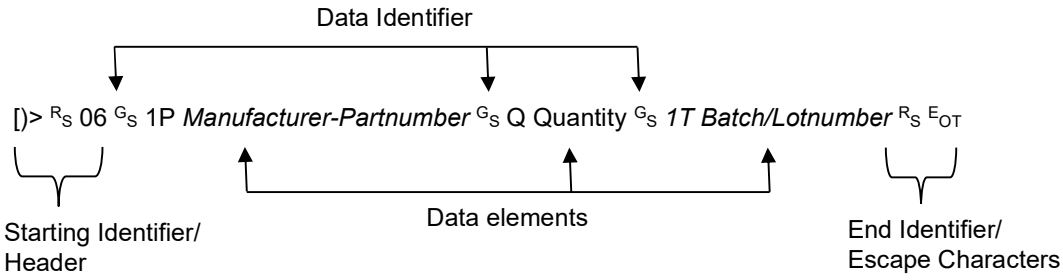

Figure 2: Explanation of the basic code structure

The character string (without blanks) is fundamentally structured as follows:
[)> RS 06 GS **1P** Product ID GS **Q** Quantity GS **1T** Traceability ID RS EOT

Character	Decimal	Hexadecimal
EOT	4	04
GS	29	1D
RS	30	1E

Table 1 Position of RS, GS and EOT in ASCII-Table

RS, GS, EOT are non-printable Characters. Position in ASCII-Table is listed in**Table** .

4.2.2. Structure of the Character String
Header: [)> RS 06
Data element: GS **Data Identifier** Data
Terminator: RS EOT
Data identifiers can be put in a non-specified order. The order specified in section 4.2.3 is the preferably used. Additional data elements can be inserted according to

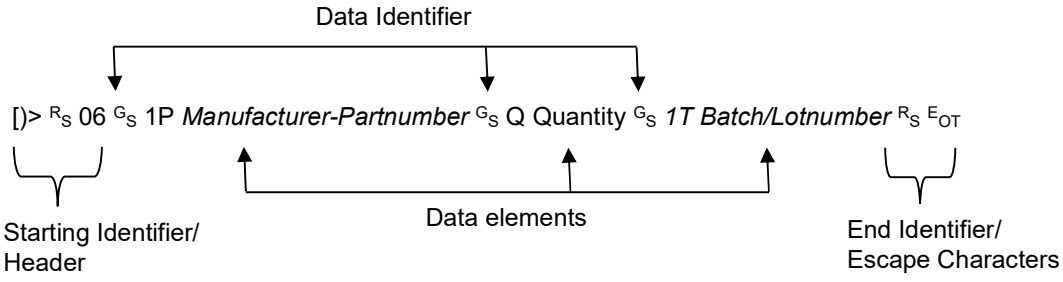

Figure 2. Thereby used data identifiers have to be chosen according to ANSI MH10.8.2. Values that cannot be output issued have to be blank, element separator GS and the data identifier must be provided in the code structure.

For example:

[)> $^{R}_{S}$ 06 $^{G}_{S}$ **1V**Supplier $^{G}_{S}$ **V**53815 $^{G}_{S}$ **K**450000081500010 $^{G}_{S}$ **P**6020015 $^{G}_{S}$ **2P** $^{G}_{S}$ **20P**^{GS}**Q**0005000 $^{G}_{S}$ **Z**00000151 $^{G}_{S}$ **T**6020015@53815-00000151 $^{G}_{S}$ **10D**1232 $^{G}_{S}$ **4L**DE $^{G}_{S}$ **14D** $^{G}_{S}$ **1T** $^{G}_{S}$ **6D**20120512**011** $^{G}_{S}$ **12V**XYZ $^{G}_{S}$ **1P**25XYZ25TR $^{G}_{S}$ **30P**2a $^{G}_{S}$ **E**Y $^{R}_{S}$ $^{E}_{OT}$

4.2.3. Data Identifiers and Data Elements Used

Table 1 provides a list of the data identifiers and data elements to be used, along with an explanation of their meaning, information about how they are to be displayed, whether they are mandatory.

It is not mandatory to maintain the order organized according to position. The order listed in Table 1 shall be used preferably (cf. clause 4.2.1).

Pos.	Relevance		Data element	Maximum number of characters	Format example	Data identifier	Requirements for human-readable text on label	Mandatory use of the data		Remarks
	Component	PCB[1]						Component	PCB	
1	X	X	Vendor name	an0 to an10	Supplier	**1V**	No	No	No	Under discretion of the vendor
2	X	X	Vendor code	n5 or n6	500321	**V**	No	Yes	Yes	according specification of SICK
3	X	X	Purchase Order Number	n15	450004458800010	**K**	Yes	Yes	No	As shown in purchase order; Combination of order number and position with leading zeros.
4	X	X	Product/ item number	n7	6035021	**P**	Product number in human-readable text (bold letters)	Yes	Yes	according specification of SICK
5	X	X	Revision level	an4	W955	**2P**	Revision level in human-readable text	Yes	Yes	As shown in purchase order
6	X		Sick manufacturer number	H+n6	H500075	**20P**	No	No		As shown in purchase order
7	X	X	Quantity	n8	00005000	**Q**	No	Yes	Yes	Pack size or original quantity
8	X		Serial number	n8 to n10	00000001	**Z**	No	Yes		Sequential, unique serialnumber refering to one packaging unit only
9	X		Unique packing unit ID	n7 + "@" + n5 or n6 + "-" + n8 to 10 composed of: P@V-Z	6012030@53019-00000123	**T**	Yes	Yes		Additionally in barcode 128 and human-readable text (see example)
10	X	X	Date code	an4	YYWW	**10D**	Date code in human-readable text	Yes	Yes	number of production week in which unit was produced by manufacturer
11	X	X	Country of origin	an2	DE	**4L**	No	No	No	Country code according to ISO 3166 (A2)
12	X	X	Expiry Date	an8, or blank	YYYYMMDD	**14D**	Expiry date in human-readable text	Yes	Yes	Field is set blank in case item does not have any expiry date
13	X	X	Batch/lot number	an1 to an25	an1..an25	**1T**	Batch /lot number in human-readable text	No	Yes	According to specifications of manufacturer
14	X	X	Shipping date	n8+an3	6DYYYYMMDD011	**6D....011**	No	Yes	No	Shipping date of vendor
15	X	X	Name of manufacturer	an1...an10	XYZ	**12V**	Name of manufacturer in human-readable text	Yes	Yes	
16	X		Manufacturer part number	an1...an25	25XYXZ25TR	**1P**	Manufacturer part number in human-readable text	Yes		According to specifications of manufacturer
17	X		Moisture sensitivity level	1 or 2 or 2A or 3 or 4 or 5 or 5A or 6	2A	**30P**	Moisture sensitivity level in human-readable text	Yes		According to specifications of manufacturer
18	X	X	ROHS compliant (**Y**es or **N**o or **0** unknown)	an1	Y	**E**	RoHS in human-readable text	Yes	Yes	According to specifications of manufacturer

Table 2: Description of Character Chain Format ([1]PCB = abbreviation for printed circuit board)

4.2.4. Description of Data Identifiers and Data Elements (cf. Table 1)

4.2.4.1 Identifier 1V

Specifies the vendor's name. Number of character string between 0 and 25, alphanumeric characters. No umlauts or blanks allowed. Entry is optional but must be output with data element separator $^{G}_{S}$ and data identifier in the code.
Vendor can choose any vendor name.

4.2.4.2 Identifier V

Specifies the vendor's number/ accounts payable number. SICK provides vendor with a vendor-specific number. Fixed value with five or six numeric characters.
No blanks allowed. **Entry mandatory**.

4.2.4.3 Identifier K

Specifies the order number and order item according to current purchase order. In case of release orders in scheduling agreements, the scheduling agreement number and the position are to be specified. Do not enter any purchaser group written at the front. Enter order number and order item in a row. Fixed value having 15 characters. If the order number has only eight characters add leading zeros.
No blanks allowed. **Entry mandatory.**

For example:

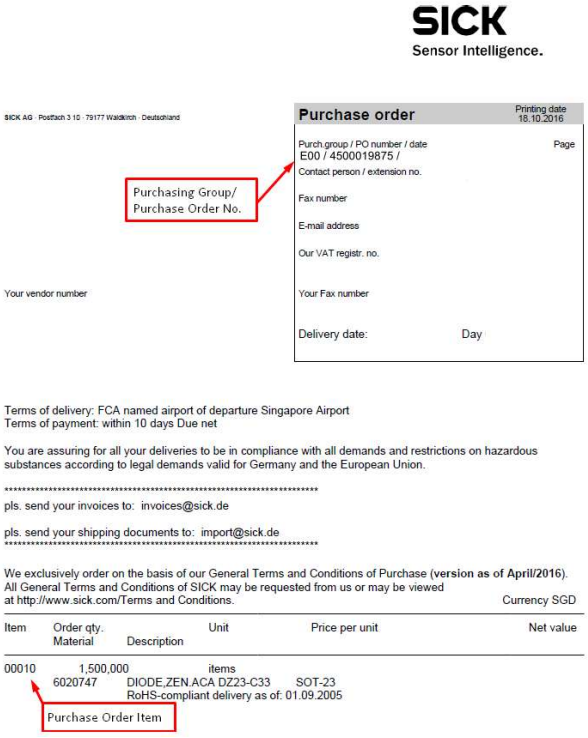

Figure 3: SICK Order

Output on label and DataMatrix code, for example: **450001987500010**

4.2.4.4 Identifier P

SICK product number according to purchase order text. Fixed value having seven numeric characters. No blanks allowed. **Entry mandatory.**

4.2.4.5 Identifier 2P

Specifies revision status for customer-specific components and drawing parts. Revision status is also provided in purchase order.
For components that are not subject to revision control, or for which no revision status is provided in the purchase order, this data element remains blank.

Entry in alphanumeric characters. Fixed value having four characters. No blanks allowed. Entry mandatory if revision status is entered.

4.2.4.6 Identifier 20P

The identifier contains the SICK manufacturer part number. This number consists of seven alphanumeric characters (for example, H018006). Entry is optional, but must be issued with data element separator GS and data identifier.

4.2.4.7 Identifier Q

Specifies original quantity per individual packing unit. Entry in numeric characters. Fixed value with eight characters. Leading zeros must be included. No blanks allowed. **Entry mandatory.**

4.2.4.8 Identifier Z

Specifies the serial number. The serial number must be uniquely chosen in an eight- to ten-digit number range. An eight-digit number range with a counter in one-step increments per printed label/individual printed unit is preferred. After using all possible combinations or reaching the highest counter value in the corresponding number range, the counter is reset. It is also possible to expand the number range by one digit, to a maximum of 10 digits.
Entry in numeric characters. Fixed value having eight to ten numeric characters.
No blanks allowed. **Entry mandatory.**

4.2.4.9 Identifier T

Specifies the unique packing unit designation (unique ID). This ID is composed of the attributes **P**, **V,** and **Z**. **P** and **V** are separated by "**@**". **V** and **Z** are separated by "**-**". The entry is made with numeric characters. Separation with "**@**" and "**-**". Value consists of 22 to 24 characters.
No blanks allowed. **Entry mandatory.**
For example: 6035021@50321-00000001
SICK product number@Vendor number-Serial number

4.2.4.10 Identifier 10D

Specifies the date code/week of manufacture in the format YYWW (year of manufacture, calendar week, for example, 1232). Counting method for the calendar week in accordance with DIN 1355-1/ISO 8601.
Entry in numeric characters. Fixed value having four characters. No blanks allowed. **Entry mandatory.**

4.2.4.11 Identifier 4L

Specifies the country of origin of the product. Entry of country code according to ISO 3166 (A2)
No blanks allowed.
Entry is optional, but must be output with data element separator $^{G}_{S}$ and data identifier in the code.

4.2.4.12 Identifier 14D

Specifying the date of expiration is mandatory for all products having this criterion.
Entry in format YYYYMMDD (year, month, day, for example, 20130121).
Entry in numeric characters. Fixed value having eight characters. No blanks allowed. For products not subject to an expiration date, this data element remains blank.
However, it must be output with data element separator $^{G}_{S}$ and data identifier in the code.

4.2.4.13 Identifier 1T

Specifies the batch or lot designation according to manufacturer's specifications.
Entry is alphanumeric with between 1 and 25 characters. No blanks allowed. Entry optional, but must be output with data element separator $^{G}_{S}$ and data identifier in the code.

4.2.4.14 Identifier 6D.....011

Specifies the delivery date in the format YYYYMMDD.
Entry in numeric characters. Fixed value having eight characters. No blanks allowed. **Entry mandatory.**
For example:

6D**20120522**011
Identifier element**Date**Identifier element

4.2.4.15 Identifier 12V

Specifies the manufacturer's name according to manufacturer information.
Entry in alphanumeric characters. Character string between 1 and 10 characters.
No blanks allowed. **Entry mandatory.**

4.2.4.16 Identifier 1P

Specifies the manufacturer's order number or designation according to manufacturer information.
Entry in alphanumeric characters. Character string between 1 and 25 characters. **Entry mandatory.**

4.2.4.17 Identifier 30P

Specifies the moisture sensitivity level according to manufacturer information.
Formatting as moisture sensitivity level according to J-STD-020D.
Entry in alphanumeric characters. Fixed value of 1, 2, 2A, 3, 4, 5, 5A, or 6.
For products having no moisture sensitivity level according to J-STD-020 (for example, bent sheet metal parts such as covers), level 1 must be set.
Entry mandatory.

4.2.4.18 Identifier E

Specifies the status of RoHS compliance.

Product RoHS-compliant	=	**Y**
Product not RoHS-compliant	=	**N**
Product RoHS status unknown	=	**0**

Entry in alphabetic characters Y, N, or numeric zero. Fixed value with one character.
No blanks allowed. **Entry mandatory.**

4.2.5. Data Element Format Definition

Mandatory data elements **must** be entered in the code structure with corresponding information and in the correct format (cf. Table).

Alphabetical =	letters from A-Z (excluding letters with accents and umlauts), upper case and lower case (capital letters preferred), including special characters.
Numerical =	numbers from 0-9
Alphanumerical =	any combination of the above mentioned alphabetical and numerical signs.

4.2.6. Mandatory and Optional Entries

Mandatory data elements must be entered in the code structure with corresponding information and in the correct format (cf. Table 1).
Data elements that are not defined as mandatory should likewise also specified if the technical possibility exists and a justifiable additional expense is generated.

If these elements cannot be provided, at least the data element separator and the data identifier must be provided.

4.3 Additional Symbols Used

Additional field for displaying the SICK production storage area on the packing unit label in human-readable text.
The required values are provided to the vendor on a regular basis upon agreement. Entry is optional and is defined by the material planner in consultation with the vendor.

Item	Additional information on label	Maximum number of characters	Format example	Requirements for human-readable text on label in bold
1	SICK production storage area/ Customer stock location	an7	P09_F25	SICK production storage area / Customer stock location

Table 3: Additional Fields Used

4.4 Label Appearance and Design

4.4.1. General

The design, size, and arrangement of the individual elements on the label are under discretion of the vendor. Elements in plain text must be easily legible (font size minimum 6pt). Machine-readable data elements should be separated from each other as much as possible.
The technical data content of a Code 128 must be displayed directly beneath the code in plain text.
A self-explanatory designator must be specified in human-readable text below each element. In addition, the associated designator/ data identifier must be in put in front in brackets (for example, (P) Material, (2P) Rev, (30P) MSL).

4.4.2. Adhesive Force

The entire label surface must be adhesive and must be in contact with the packaging unit completely. The label must not detach from the packing unit under normal handling.

4.4.3. Temperature Resistance

The label must have a temperature resistance of at least 60°C over a period of at least 5 days. Unrolling or deforming must not occur within the allowed temperature range.

4.4.4. Specifications for Machine-Readable Elements

The entire character set according to Table 1 must be output in the DataMatrix ECC200 (ISO/IEC 16022).
The character set of the element/ data identifier T is also required in Code 128 on the label.

4.4.5. Print Quality

As minimum requirements for print quality for Code 128 and ECC200, the DIN EN ISO/IEC 15415 standard must be fulfilled within the allowed temperature range.
The cell size of the ECC200 must be at least 0.25 mm and have a surrounding white space that is twice the cell size.
The height of the Code 128 must be at least 3 mm with a minimum line width of 0.2 mm.
The printing on the label must be impervious to smearing caused by moisture.

4.5 Arrangement of the Label on the Packing Unit

4.5.1. General

The label must be applied in a manner that allows it to be accessed and scanned reliably by commercial code readers.
Overlapping or covering a manufacturer's label is not allowed.

4.5.2. Reel

Each reel must be provided with a one-to-one label.
The label for components that are packaged to protect against moisture must be applied at least to the moisture protection packaging

4.5.3. Tray

Trays can be labeled individually or in groups. Groups consist of at least two trays of the same type that are filled with goods from the same batch. Multiple production batches must not combined within a group. Each group must be labeled with a one-to-one label.
The label for moisture-protected components must be applied at least to the moisture protection packaging. The labeling for non-moisture-protected components must be applied to the uppermost blank location, the tray cover.

4.5.4. Stick

Each stick must be provided with a one-to-one label.
The label for components that are packaged to protect against moisture must be applied at least to the moisture protection packaging.

4.6 Example Label

4.6.1. Appearance/ Structure

Figure 4: Example Label Electronic Components

Figure 5: Example Label Printed Circuit Board

4.6.2. Data String of the ECC200 DataMatrix Code

[)> $^{R}_{S}$ 06 $^{G}_{S}$ **1V**SUPPLIER_1 $^{G}_{S}$ **V**00000 $^{G}_{S}$ **K**005501878700010 $^{G}_{S}$ **P**6032423 $^{G}_{S}$ **2P**REV1 $^{G}_{S}$ **20P**H047258 $^{G}_{S}$ **Q**00001000 $^{G}_{S}$ **Z**00000001 $^{G}_{S}$ **T**6032423@00000-00000001 $^{G}_{S}$ **10D**1501 $^{G}_{S}$ **4L**DE $^{G}_{S}$ **14D**20161231 $^{G}_{S}$ **1T**AAAAAAABBBBBBBBBCCCCC $^{G}_{S}$ **6D**20150206011 $^{G}_{S}$ **12V**MANUFACTUR $^{G}_{S}$ 1AAAAAABBBBBBB BBBCCCCC $^{G}_{S}$ **30P**3 $^{G}_{S}$ **E**Y $^{R}_{S}$ $^{E}_{OT}$

4.6.3. Data String of the Code 128 for electronic components

6032423@00000-00000001

4.8 Data string of the Code-128 for Printed Circuit Boards

4038456_XD63