



Synapse QR Label Standard

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	<i>REF-QR STANDARDS (NAME CHANGE: REV’S A-K FORMERLY 801-000012-000)</i>
	Revision: L-0

Revision History:

Revision	Revised By	Date	Change Description
DRAFT	Brent Deason	6/20/2016	Initial draft
DRAFT2	Brent Deason	6/27/2016	Made changes suggested by Glenn Ray and Grant Patten and Brent Humphries
A000	Brent Deason	7/13/2016	Releasing as preliminary to doc control
B000	Brent Deason	8/25/2016	Made note about initial mistake in E20 labels, changed E12 and SNAP Link codes slightly. Removed "Preliminary" watermark.
B001	Glen Ray	8/26/2016	Revised #5 descriptor
B002	Brent Deason	8/26/2016	Made suggested changes by Bill Curtis and Russ Dickerson. Added radio QR code information.
B003	Bill Curtis	8/31/2016	Update to limit SALES LEVEL PART NUMBER to 20 characters.
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E-0	Chris Browning	06/16/2017	Added #08 field, clarified #02
F-0	Esther Naholowaa	02/13/18	Added #09 field, IIoT products
G-0	Esther Naholowaa	2/15/19	Add AX revision to QR labels
H-0	Esther Naholowaa	4/19/19	Add CBSv3 and WSN-DPM #20
J-0	Esther Naholowaa	8/13/19	Add SS450 serial number/QR label for outer box
K-0	Esther Naholowaa	10/21/19	Remove Sense 420 from #09 and add to #11 (reformatting for serial number traceability, AX field can only hold first 20 characters), and remove approval requirements from page 3
L-0	Robert Cobbs	3/5/2020	Change document name and reformat for QR Type/Format standardization

Approvals:

Revision	Approved By	Date
B004	Brent Deason	9/12/2016
B004	Glenn Ray (for Manufacturing)	9/13/2016
B004	Bill Curtis	9/12/2016
B004	Russ Dickerson	9/12/2016
B004	Patricia Forrest (for Creative Solutions)	9/13/2016
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N/A	Approvals are received during ECO process, additional approvals on this page no longer required	

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1.0 Overview

This document shall be considered THE overriding document for QR code formatting and QR label sizes for Synapse products. This document does not dictate that every product have a label, this document only dictates the data in the QR code and the label size if there is a QR code label on a Synapse product.

The purpose of this document is to ensure that all Synapse products use a standardized QR code format and label size. Several departments within Synapse need to be aware of the different formats used for each product to ensure that each new product meets a certain format standard. Manufacturing uses a QR code reader to scan all of our products and thus needs all of our products to be designed in an agreed upon format. Software groups need to be aware of the QR code formats to ensure that QR code readers can properly commission our products. Product engineers need to make sure that their product labels fit within the standards in this document for these purposes.

The amount of data in each QR code will dictate the minimum size of the QR code. Some products are much smaller than other products and they might require a smaller amount of data in the QR code, while other products that have plenty of space for a label might opt for a QR format that has many data fields.

1.1 References

ISO/IEC 18004:2015 QR Code bar code symbology specification

2.0 QR Code Label Types

QR codes consist of ASCII data that is formatted into a 2 dimensional digital array as shown in figure 1.



Figure 1: QR code example

The QR code graphic format shall conform to the QR Code Model 2 format as defined in the ISO Standard ISO/IEC 18004:2015.

Each QR code on Synapse products shall have the three leading characters “#XX” where the XX indicates the format of the rest of the data in the fields as indicated below.

2.1 Standard Size Label

2.1.1 Label Size

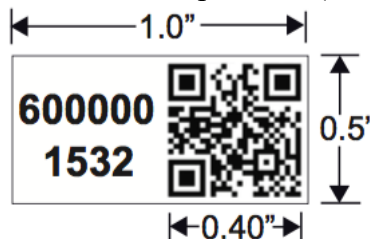
The label size shall be 1.0” wide by 0.5” high. An example of an acceptable label conforming to this size is Brady part number THT-5-423-10.

2.1.2 QR Code Size

The QR code size shall be at least 0.40” (square). Larger sizes are preferred.

2.1.3 Label Layout

The label shall include the QR code on the right side of the label and the human readable text on the left side of the label. The human readable text shall include the last 6 characters of the SNAP MAC address and the 4-digit date code. An example label (with dimensions) is shown below:



2.2 Mini Size Label

2.2.1 Label Size

The label size shall be 0.75" wide by 0.75" high. An example of an acceptable label conforming to this size is Brady part number THT-50-423-10.

2.2.2 QR Code Size

The QR code size shall be 0.450" (square).

2.2.3 Label Layout

The label shall include the QR code on the upper left corner of the label and the human readable text on the left side of the label. The human readable text shall include the last 6 characters of the SNAP MAC address and the 4-digit date code. The Device Identification/Product Name will be printed along the right edge. An example label (with dimensions) is shown below:



2.3 Supplementary Label

2.3.1 Label Size

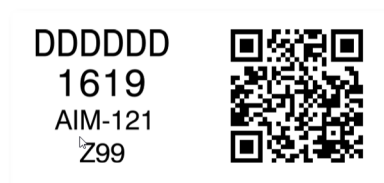
The label material type shall be a thermal transfer polyester label with a matte finish. The label adhesive shall be a permanent rubber-based adhesive that is designed for high adhesion to textured metals and low surface energy plastics. The label size shall be 2.0" wide by 1.0" high. An example of an acceptable label conforming to this size and type is Brady part# THT-17-489-3.

2.3.2 QR Code Size

The QR code size shall be between 0.60" and 0.90" on a side (square).

2.3.3 Label Layout

The label shall include the QR code on the right side of the label and the human readable text on the left side of the label. The human readable text shall include the last 6 characters of the SNAP MAC address, the 4-digit date code and the controller type and the AX revision. The human readable text shall use a font and font size that maximizes the readability of the text in the available space for text. An example label is shown below:



2.4 Gateway Outer Carton Label

2.4.1 Label Size

The label size shall be 2" wide by 1" high. An example of an acceptable label conforming to this size is Brady part number THT-53-489-3 (or equivalent UL 969 PGJI2 label).

2.4.2 QR Code Size

The QR code size shall be between 0.60" and 0.90" on a side (square).

2.4.3 Label Layout

The label shall include the QR code on the top right side of the label and the human readable text on the bottom left side of the label. The human readable text shall include the Serial Number. An example label is shown below:



2.5 Gateway Product Label

2.5.1 Label Size

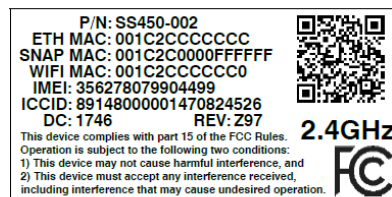
The label size shall be 2" wide by 1" high. An example of an acceptable label conforming to this size is Brady part number THT-17-489-3 (or equivalent UL 969 PGJI2 label).

2.5.2 QR Code Size

The QR code size shall be at least a 0.450" (square).

2.5.3 Label Layout

Examples:



Note: Products without cell should print "None" for IMEI and ICCID

2.6 SimplySNAP Site Controller Password Label

2.6.1 Label Size

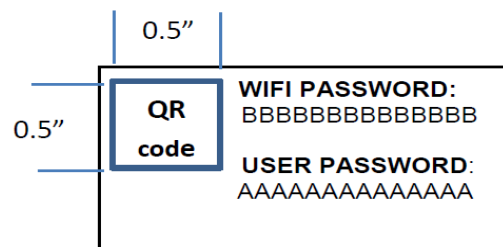
The label size shall be 2" wide by 1" high. An example of an acceptable label conforming to this size is Brady part number THT-53-489-3 (or equivalent UL 969 PGJI2 label).

2.6.2 QR Code Size

The QR code size shall be 0.5" (square).

2.6.3 Label Layout

Example:



2.7 E12 Product Label

2.7.1 Label Size

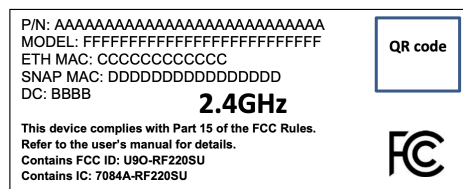
The label size shall be 2" wide by 1" high. An example of an acceptable label conforming to this size is Brady part number THT-17-489-3 (or equivalent UL 969 PGJI2 label).

2.7.2 QR Code Size

The QR code size shall be at least a 0.450" (square).

2.7.3 Label Layout

Example:



2.8 CBS Product Label

2.8.1 Label Size

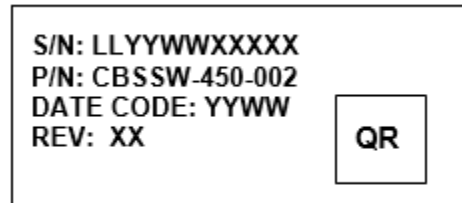
The label size shall be 2" wide by 1" high. An example of an acceptable label conforming to this size is Brady part number THT-17-489-3 (or equivalent UL 969 PGJI2 label).

2.8.2 QR Code Size

The QR code size shall be at least a 0.450" (square).

2.8.3 Label Layout

Example:



2.9 Twist Lock Product and RoHS Label

2.9.1 Label Size

The label size shall be 2" wide by 0.5" high. An example of an acceptable label conforming to this size is Brady part number THT-53-423-3 (or equivalent UL 969 PGJI2 label).

2.9.2 QR Code Size

The QR code size shall be at least 0.40" (square). Larger sizes are preferred.

2.9.3 Label Layout

Example:



2.10 Sense 4-20 Product Label

2.10.1 Label Size

The label size shall be 2" wide by 1" high. An example of an acceptable label conforming to this size is Brady part number THT-17-489-3 (or equivalent UL 969 PGJI2 label).

2.10.2 QR Code Size

The QR code size shall be at least a 0.450" (square).

2.10.3 Label Layout

Example:



3.0 QR Formats

When designing new products, it is strongly preferred to use an existing label format. If you determine that you need a new QR code format, then get with engineering and a new format can be added to this list.

- NOTE: Synapse Radios use **Data Matrix** codes (not QR codes) and consist only of the SNAP MAC address and contain no #XX Format unless otherwise documented.

3.1 QR Format #01

- Supported Label Types
 - Standard
- Example
 - #01: 600000:1532:DIM10-250-11

QR Format Data String		
Field	Data	Description
Header Delimiter	#	
Header Field	01	
Payload Delimiter	:	
SNAP MAC Address (Last 6 Characters)	600000	This is a 6-character alphanumeric field that represents the SNAP Mac address (last 6 characters of the 16-character SNAP Mac address, 600000 shown as an example)
Payload Delimiter	:	
Manufacturing Date Code (4 Characters)	1532	This is a 4-character numeric field that represents the manufacturing date code (first two digits are year, second two digits are week, 1532 is shown as an example)
Payload Delimiter	:	
Model Number (Variable Length)	DIM10-250-11	This is a variable length alphanumeric field that represents the model number of the product. (DIM10-250-11 is shown as an example)

3.2 QR Format #02 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.3 QR Format #03 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.4 QR Format #04

- Supported Label Types
 - E12 Product Label
- Example
 - #04:SC012-010:1610: 00078006DE35:001C2C1B26605BA5:0:E12:

QR Format Data String		
Field	Data	Description
Header Delimiter	#	
Header Field	04	
Payload Delimiter	:	
Sales Level Part Number (up to 20 characters)	SC012-010	This is a variable length alphanumeric field (up to 20 characters) that represents the model number of the product. (SC012-010 is shown as an example)
Payload Delimiter	:	
Manufacturing Date Code (4 characters)	1610	This is a 4-character numeric field that represents the manufacturing date code (first two digits are year, second two digits are week, 1610 is shown as an example)
Payload Delimiter	:	
Ethernet MAC Address (12 characters)	00078006DE35	Hex String (12 characters)
Payload Delimiter	:	
SNAP MAC Address (16 characters)	001C2C1B26605BA5	Hex String (16 characters)
Payload Delimiter	:	
Buffer Payload	0	Just a 0. (this location was probably reserved for the WiFi MAC that doesn't exist)
Payload Delimiter	:	
Model Number (up to 26 characters)	E12	This is a variable length alphanumeric field (up to 26 characters) that represents the model number of the product. (E12 is shown as an example)
Payload Delimiter	:	

3.5 QR Format #05

- Supported Label Types
 - SimplySNAP Site Controller Passwords
- Example
 - #05:Sassy\$Suzzyq78:Silent&Tim45:

QR Format Data String		
Field	Data	Description
Header Delimiter	#	
Header Field	05	
Payload Delimiter	:	
Default Password for User Access (12-20 characters)	Sassy\$Suzzyq78	This is a variable length alphanumeric field (12-20 characters, Sassy\$Suzzyq78 is shown as an example)
Payload Delimiter	:	
Default Password for WiFi Access (12-20 characters)	Silent&Tim45	This is a variable length alphanumeric field (12-20 characters, Silent&Tim45 is shown as an example)
Payload Delimiter	:	

3.6 QR Format #06 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.7 QR Format #07 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.8 QR Format #08 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.9 QR Format #09 (Unused)

3.10 QR Format #10 (Unused)

3.11 QR Format #11 (PREFERRED FORMAT)

- Supported Label Types
 - Mini
 - Supplementary
- Example
 - #11:600000:1619:DIM10-087-00:Z99:

QR Format Data String		
Field	Data	Description
Header Delimiter	#	
Header Field	11	
Payload Delimiter	:	
SNAP MAC Address (Last 6 characters)	600000	This is a 6-character alphanumeric field that represents the SNAP MAC address (last 6 characters of the 16-character SNAP MAC address, 600000 shown as an example)
Payload Delimiter	:	
Manufacturing Date Code (4 characters)	1619	This is a 4-character numeric field that represents the manufacturing date code (first two digits are year, second two digits are week, 1619 is shown as an example)
Payload Delimiter	:	
Model Number	DIM10-087-00	This is a variable length alphanumeric field that represents the model number of the lighting controller (DIM10-087-00 is shown as an example)
Payload Delimiter	:	
AX Revision (2-3 Characters)	Z99	This is a variable length alphanumeric field that represents the AX Revision. It is 2 or 3 characters long, values from A0 to Z99 (Z99 is shown as an example).
Payload Delimiter	:	

3.12 QR Format #12 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.13 QR Format #13 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.14 QR Format #14 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.15 QR Format #15 (Unused)

3.16 QR Format #16 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.17 QR Format #17 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.18 QR Format #18 (PREFERRED FORMAT FOR GATEWAYS)

- Supported Label Types
 - Gateway Product Label
- Example
 - #18:SC020-020:1619:618B80:08527E:00078006DE35:356278079904498:89148000001081675984:A0:

QR Format Data String		
Field	Data	Description
Header Delimiter	#	
Header Field	18	
Payload Delimiter	:	
Sales Level Part Number (up to 20 characters)	SC020-020	This is a variable length alphanumeric field (up to 20 characters) that represents the model number of the product. (SC020-020 is shown as an example)
Payload Delimiter	:	
Manufacturing Date Code (4 characters)	1610	This is a 4-character numeric field that represents the manufacturing date code (first two digits are year, second two digits are week, 1610 is shown as an example)
Payload Delimiter	:	
Ethernet MAC Address (6 characters)	618B80	Hex String (6 characters)
Payload Delimiter	:	
SNAP MAC Address (6 characters)	08527E	Hex String (6 characters)
Payload Delimiter	:	
WiFi MAC Address (12 characters)	00078006DE35	Hex String (12 characters)

Payload Delimiter	:	
Modem IMEI (up to 16 characters)	356278079904498	This is a variable length alphanumeric field (up to 16 characters) that represents the model number of the product. This value should be '0' for gateways without a cell modem. (356278079904498 is shown as an example)
Payload Delimiter	:	
SIM ICCID (up to 20 characters)	89148000001081675984	This is a variable length alphanumeric field (up to 20 characters) that represents the model number of the product. This value should be '0' for gateways without a cell modem. (89148000001081675984 is shown as an example)
Payload Delimiter	:	
AX Revision (2-3 Characters)	Z99	This is a variable length alphanumeric field that represents the AX Revision. It is 2 or 3 characters long, values from A0 to Z99 (Z99 is shown as an example).
Payload Delimiter	:	

3.19 QR Format #19 (Deprecated)

- Please see a previous version of 801-000012-000 for formatting details

3.20 QR Format #20 (CBS Label)

- Supported Label Types
 - Gateway Product Label
- Example
 - #20:CBSSW-450-002:JP:1915:00150:Z99:

QR Format Data String		
Field	Data	Description
Header Delimiter	#	
Header Field	20	
Payload Delimiter	:	
Sales Level Part Number (up to 16 characters)	CBSSW-450-002	This is a variable length alphanumeric field (up to 16 characters) that represents the model number of the

		product. (CBSSW-450-002 is shown as an example)
Payload Delimiter	:	
Manufacture Location (2 Characters)	JP	(HT, DD, JP, CM, PA, and this document would be updated for each new subcontractor added)
Payload Delimiter	:	
Manufacturing Date Code (4 characters)	1915	This is a 4-character numeric field that represents the manufacturing date code (first two digits are year, second two digits are week, 1915 is shown as an example)
Payload Delimiter	:	
Unit Number (5 characters)	00150	00001 THRU 99999, Incremental Number of the units produced per week. (00150 is shown as an example)
Payload Delimiter	:	
AX Revision (2-3 Characters)	Z99	This is a variable length alphanumeric field that represents the AX Revision. It is 2 or 3 characters long, values from A0 to Z99 (Z99 is shown as an example).
Payload Delimiter	:	

3.21 QR Format #21

- Supported Label Types
 - Gateway Carton Label
- Example
 - #21:06DE35: 26605BA5:1915

QR Format Data String		
Field	Data	Description
Header Delimiter	#	
Header Field	21	
Payload Delimiter	:	
Ethernet MAC Address (6 characters)	06DE35	Hex String (6 characters)
Payload Delimiter	:	
SNAP MAC Address (8 characters)	26605BA5	Hex String (8 characters)
Payload Delimiter	:	

Manufacturing Date Code (4 characters)	1915	This is a 4-character numeric field that represents the manufacturing date code (first two digits are year, second two digits are week, 1915 is shown as an example)
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4.0 References

The documents in this table are examples of labels and label information for different Synapse products.

Reference	Document #	Description
1	770-100700-120	LABEL, Supplementary QR Code for Lighting Controllers
2	770-100710-100	LABEL, QR Code - Lighting Controllers Standard Size
3	770-100720-100	LABEL, QR Code - Lighting Controllers Mini Size
4	114-001616-000	LABEL, MAC ADDRESS, E20 with CDMA
5	114-001621-000	LABEL, MAC ADDRESS, E20 Wifi Only
6	114-002261-000	LABEL, SNAP LINK, FCC ONLY
7	114-002262-000	LABEL, SNAP LINK, WITH CE