Instruction

Smart Start Production control (Programming, QR, Label, Print)

Document No.:	INS13975
Version:	3
Description:	Data format for generating QR codes, controlling label layouts and the time for printing.
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Restrictions:	None

Approved by:

Date	CET	Initials	Name	Justification
2018-03-05	14:40:27	NTJ	Niels Thybo Johansen	

REVISION RECORD

Doc. Rev	Date	By	Pages affected	Brief description of changes
1	20170613	ABR	ALL	First revision
2	20180305	BBR	All	Added Silicon Labs template

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1 ABBREVIATIONS

Abbreviation	Explanation

2 INTRODUCTION

This document defines a data format for build-time and production-time control of label printing for Smart Start DSK and QR code.

2.1 Audience

Z-Wave Alliance Partners

3 QR CODE STRING

3.1 Syntax (design-time)

To comply with this specification, a manufacturer MUST generate a QR Code definition string complying with the following syntax when planning production of a Smart Start product:

```
<LeadIn>,<Version>,<Checksum>,<RequestedKeys>,<DSK>,        // QR Code header
<TLV_Type1>,<TLV_Len1>,<TLV_Value1>,                        // QR Code data
<TLV_Type2>,<TLV_Len2>,<TLV_Value2>,
…,
<TLV_TypeN>,<TLV_LenN>,<TLV_ValueN>
```

All elements following the <LeadIn> element MUST comply with the formatting requirements defined in SDS13937 and SDS13944.

The design-time label definition string SHOULD be composed of symbolic constants to improve readability.

Below is seen an example:

```
ZW_QR_LEADIN,ZW_QR_VERSION_01,ZW_QR_CHKSUM,ZW_S2_REQ_KEYS,ZW_QR_DSK,
ZW_QR_TLVTYPE_PRODUCTTYPE,ZW_QR_TLVLEN_PRODUCTTYPE,ZW_QR_TLVVAL_PRODUCTTYPE,
ZW_QR_TLVTYPE_PRODUCTID,ZW_QR_TLVLEN_PRODUCTID,ZW_QR_TLVVAL_PRODUCTID,
ZW_QR_TLVTYPE_UUID16, ZW_QR_TLVLEN_UUID16,ZW_QR_TLVVAL_UUID16
```

Legend

Green: Design time
Blue: Design time
Yellow: Production time (1)
Purple: Production time (2)

3.2 Substitution (build-time)

At build-time, symbolic constant identifiers MUST be substituted with the actual values and all delimiters MUST be removed.

Information that is only known at production time MUST be represented by markers defined in Table 1 and Table 2.

Example - after value substitution:

```
90,01,%CHKSUM%,003,%DSK%,
00,10, 1638700768,
02,20, 65521010000001700288,
06,42, %UUID16FORMAT%%UUID16%
```

- and after delimiter removal:

```
9001%CHKSUM%003%DSK%00101638700768022065521010000001700288 06%UUID16FORMAT%%UUID16%
```

3.3 Validation (production-time)

Production-time validation MUST take place in several runs to ensure all values are correct before the checksum is calculated.

Run 1 MUST replace the markers defined in Table 1 with the relevant values for the actual product.

Table 1, Production-time value markers, run 1

Marker	Description
%DSK%	Replace this marker with the actual DSK represented as 40 decimal digits
%UUID16FORMAT%	Replace this marker with 2 decimal digits for the UUID presentation format
%UUID16%	Replace this marker with the 16 bytes UUID also written to NVR

All substitutions defined in Table 1 MUST be completed before continuing to run 2.

Example - after Run 1 validation:

9001%CHKSUM%00351525354554142434445313233343521222324250010163870076802206552101000000170028806420021222324254142434445111213141531323334 35

Run 2 MUST replace the markers defined in Table 2 with the relevant values for the actual product.

Table 2, Production-time value markers, run2

Marker	Description
%CHKSUM%	Replace this marker with an updated 5 decimal digit SHA-1 checksum according to SDS13937

Example - after Run 2 validation:

900126114003515253545541424344453132333435212223242525001016387007680220655210100000017002880642002122232425414243444511121314153132333435

This string is used to generate the QR code:

QR code error correction level “L” is used to limit the number of dots in the code, enabling the printing of physically small QR codes.

3.4 Examples

This section lists a short summary of the QR code examples found in SDS13937

3.4.1 Acme Light Dimmer

The production control string found in ZwSmartStart.csv is:

9001%CHECKSUM%003%DSK%00100435301537022065520001000000300578

If the DSK is set to 515253545541424344453132333435212223242 5, the Checksum becomes 32782.

The QR Code string becomes:

900032782003515253545541424344453132333435212223242500100435301537022065520001000000300578

(Error Correction Level “L”)

3.4.2 Oscorp Door Lock w. UUID

The production control string found in ZwSmartStart.csv is:

9001%CHECKSUM%007%DSK%00101638700768022065521010000001700288064 2%UUID16FORMAT%%UUID16%

If the DSK is set to 515253545541424344453132333435212223242 5,
the UUID format is set to 00 and
the UUID is set to 212223242541424344451112131415313233343 5, the Checksum becomes 34623.

The QR Code string becomes:

900134623007515253545541424344453132333435212223242500101638700768022065521010000001700288064200212223242541424344451112131415313233343 5

(Error Correction Level “L”)

3.4.3 Acme Light Dimmer (S2 only – not SmartStart)

The production control string found in ZwSmartStart.csv is:

9001%CHECKSUM%003%DSK%00100435301537022065520001000000300578

If the DSK is set to 515253545541424344453132333435212223242500100435301537022065520001000000300578, the Checksum becomes 32782.

The QR Code string becomes:

900032782003515253545541424344453132333435212223242500100435301537022065520001000000300578

(Error Correction Level “L”)

4 PRODUCTION CONTROL FILE (.CSV)

A Production Control file is a machine-readable document which defines how Smart Start label printing is to be carried out in production.

A Z-Wave product developer produces a unique Production Control file for each Z-Wave product variant that is to be manufactured. The Production Control file is then sent, along with other binary images, to the production department/facility.

The Production Control file defines the following:

- Z-Wave parameters to classify the product and identify the manufacturer and product
  - This information is encoded into the QR string and printed labels
- How many labels are to be printed
- The layout of each individual label

When manufacturing a Z-Wave Smart Start product, a production control file SHOULD be provided for production programming facilities along with other binary images for the Z-Wave Smart Start product. If a production control file is provided, it SHOULD comply with the following requirements.

4.1 Z-Wave Smart Start Production Control File Format

In the following, the Z Wave Smart Start Production Control File is referred to as “the file”.

The file MUST have the file name extension “.csv”.
The file MUST have a unique file name which allows it to be recognized a given product variant.

The file MUST carry lines with two elements separated by a comma (,).
Spaces MUST NOT follow directly after “,”.
Strings MUST NOT be enclosed in double quotes (“).

The first element MUST declare the property of the second element.
The first element MUST be declared in upper case ASCII characters.

The file MUST contain the following elements:

- DESCRIPTION
- RELEASEDATE
  - Must be formatted as yyyymmdd-hhmm
- AUTHOR
  - Must identify the software designer of the product
- UUID16FORMAT
  - Must be present if a UUID is specified in the QR code definition string.
    Value must comply with “UUID Presentation Format” as defined in SDS13944.
    Value must be copied into the %UUID16FORMAT% field of the QR code definition string
- QRCODE
  - Must comply with section 3 of this document.
- LABELCONTROL
  - There may be more than one of these elements
  - Each element causes one label to be printed
  - Each element points to a template file which controls the layout of one label
- MANUFACTURERNAME
  - Must reflect QR code contents

- PRODUCTNAME
  - Must reflect QR code contents
- PRODUCTVERSION
  - Must reflect QR code contents

Examples are found in the following sections:

4.2 Acme Light Dimmer – 1 label

ZwSmartStart.csv contents:

```
DESCRIPTION,This file contains the production control string for a Z-Wave Smart Start product
RELEASEDATE,20170811
QRCODE,9001%CHECKSUM%003%DSK%00100435301537022065520001000000300578
LABELCONTROL,LABEL_QR_PIN.txt
PRODUCTNAME,SuperDimmer
MANUFACTURER,Acme Corp.
PRODUCTID,00003
PRODUCTVERSION,2.42
AUTHOR,John Doe
```

This file causes the following label to be printed:

QR_PIN:

4.3 Oscorp Door Lock w. UUID – 3 labels

ZwSmartStart.csv contents:

```
DESCRIPTION,This file contains the production control string for a Z-Wave Smart Start product
RELEASEDATE,20170821-1348
AUTHOR,John Doe
UUID16FORMAT,02
QRCODE,9001%CHECKSUM%003%DSK%00100435301537022065520001000000300578064 2%UUID16FORMAT%%UUID16%
LABELCONTROL,LABEL_QR.txt
LABELCONTROL,LABEL_QR_DSK.txt
LABELCONTROL,LABEL_QR_DSK_UUID.txt
PRODUCTNAME,DoorLock
MANUFACTURER,Oscorp inc.
PRODUCTID,00017
PRODUCTVERSION,1.20
```

This file causes the following labels to be printed:

QR:

QR_DSK:

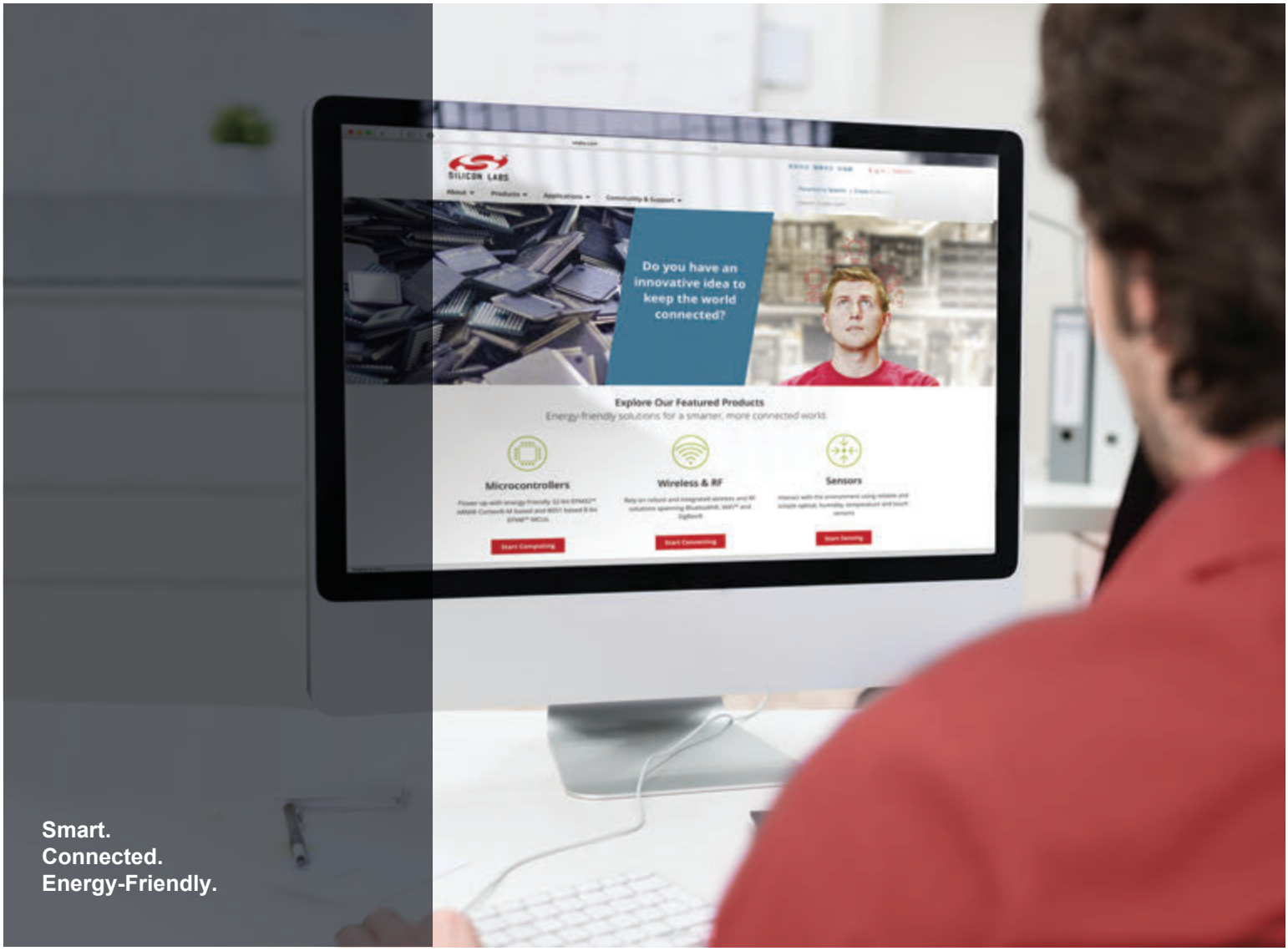
DSK: 51525-35455-41424-34445-
31323-33435-21222-32425

QR_DSK_UUID:

DSK:51525-35455-41424-34445-31323-33435-21222-32425
sn:52E67EA9A1D0868D2B717AB77A5B829B

REFERENCES

[1] SDS13937, Node Provisioning QR Code Format
[2] SDS13944, Node Provisioning Information Type Registry
[3]



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