GS1 DataMatrix – Reference Documentation

Purpose

The purpose of this reference document is to describe the GS1 DataMatrix feature that is supported in IPGScan and to outline the procedure to define a GS1 DataMatrix in IPGScan.

Requirement

IPGScan can generate ECC200 DataMatrix barcodes in GS1 format based on the user's input data string. IPGScan does not restrict what users input as the data string. Users need to make sure that the input data string follows the specifications per GS1 DataMatrix Guideline.

GTIN and GTIN Check Digit

In the case where a GTIN is to be specified in the data string, it must be the first field of the string and of this form: '01' + 13-digits of the GTIN. IPGScan will generate the 14th digit (the check digit) of the barcode if the option is checked in its user interface.

IPGScan supports all GTIN formats as listed in Figure-1. Note that GTIN-8, GTIN-12 and GTIN-13 require prepending zeroes to the GTIN in the barcode string so that it is a total (including the IPGScan-added check digit) of 14 numeric characters in length.

Figure-1 Format of GTIN String (Figure 3.3.2-1 quoted from GS1 DataMatrix Guideline)

Figure 3.3.2-1. Format of the element string

	GS1 Application Identifier	Global Trade Item Number (GTIN)													Check digit
		GS1-8 Prefix or GS1 Company Prefix								Item reference					
(GTIN-8)	0 1	0	0	0	0	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8
(GTIN-12)	0 1	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}
(GTIN-13)	0 1	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}
(GTIN-14)	0 1	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}

Note - whatever comes after the GTIN and the check digit in the data string is not checked by IPGScan for formatting purposes and is passed on to the barcode generation library for construction into a GS1-format Data Matrix barcode.

For example, a user input data string is '0112345678912341722123121B123456789', which is in the format of '01 + 13-digit GTIN + 17 + 6-digit Exp Date + 21 + 9-digit Component ID' per the GS1 specification. If the user requests IPGScan to add a check digit, IPGScan will insert the GTIN check digit as requested and use the resulting string (e.g. '01 + 13-digit GTIN + CheckDigit + 17 + 6-digit Exp Date + 21 + 9-digit Component ID') to generate the GS1 DataMatrix barcode.

Procedure

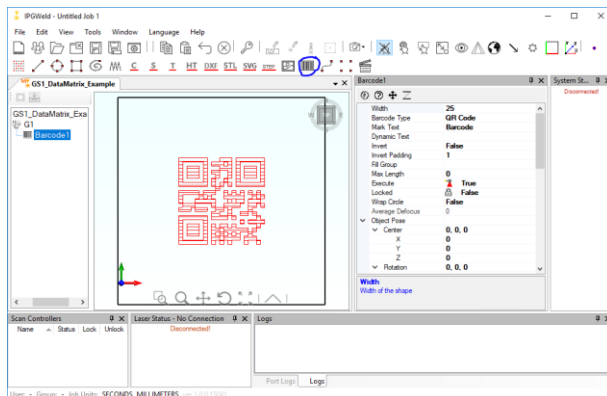Users can follow the steps below to create a GS1 DataMatrix in IPGScan.

1. In the IPGScan job file, click the Barcode button ▥ on the menu bar. A default barcode will appear on the canvas.

Figure-2 Barcode button in IPGScan

2. To change the format of the barcode to GS1 DataMatrix, first choose 'Barcode Type' to 'ECC 200 Data Matrix', input the desired data string in the 'Mark Text' field, and set 'GS1 Format' to 'True'.
   a. If users do not require the GTIN Check Digit to be added by the software (i.e if there is no GTIN in the barcode to be generated), set 'GTIN Check Digit' to 'False'.
   b. If users require the GTIN Check Digit to be added, set 'GTIN Check Digit' to 'True'. Make sure the input string is correctly configured (in the format '01' + 13-digit GTIN, as described in the requirements section). In the example shown in Figure-3, the data string is 011234567891234172212312IB123456789, since there is a GTIN in the barcode string and it does not already contain a check digit, the user needs a GTIN check digit to be added.
   c. In the case when GTIN check digit is set 'True', but the software finds the barcode has fewer than 15 digits, an error message of 'Barcode (GTIN) length is too small' will be reported in the Logs window (Figure-4) and no DataMatrix barcode will be generated. If non-numeric characters are found in the GTIN, an error message of 'GTIN (Gtin string) character out of range at position N' will be reported in the Logs window (Figure-5).
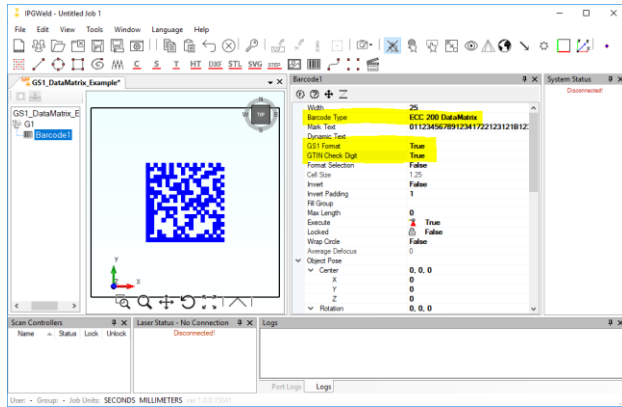
Figure-3 Set 'GS1 Format' in IPGScan

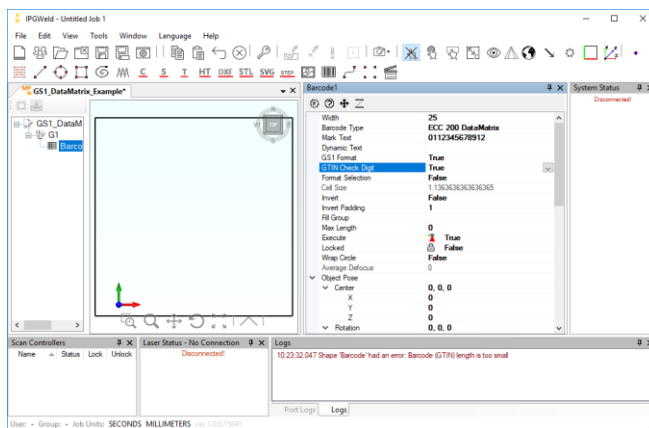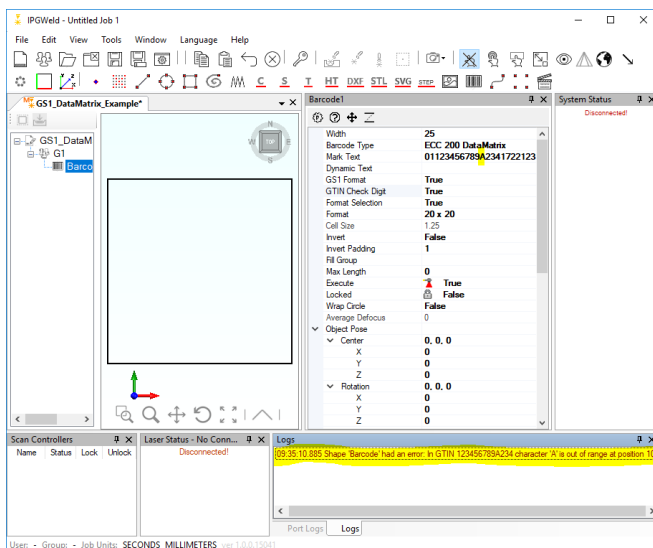*Figure-4 Error message of 'Barcode (GTIN) length is too small'*

Figure-5 Error message when a non-numeric character is found in GTIN and GTIN Check Digit is true

3. IPGScan also allows users to define the 'format' of the Data Matrix in terms of how many row cells and how many column cells. The default 'format' is 20 cells by 20 cells. If users want the

Data Matrix in a different 'format' than the default, set 'Format Selection' to 'True'. The field 'Format' will then be shown and users can select the desired 'Format' in the drop down list, for example, 24 x 24.

Figure-6 Define the 'Format' of GS1 DataMatrix

The above procedure completes the creation of a GS1 DataMatrix barcode in IPGScan. The user can now proceed with setting other parameters of the barcode (e.g. dimension, location, laser parameters, etc.) based on application needs.