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Explanation of the changes between RJS D4000 Firmware version A.03/A.05, version A.06/A.07, version A.08, and version A.10

The D4000 firmware A.10 has changes to both the Auto Optic and Laser from the previous A.08/A.09 (A.09 was proprietary) firmware versions:

D4000 Auto Optic - On the **printed report** (TP140A or VCIR) the Code 128 (and GS1-128) bar code encode data is now displayed in two formats:

- Previous method - 2 row format (to allow displaying compressed digit mode in subset C)
- New method - Single row format showing text on a single line (wrapping if needed) Example:

```
Inspector D4000A
Revision A.10

Single Scan Analysis

GS1-128
*F01357913574*
C102468024652*

<*C><F1>0012345678901234567542<*
*>
Mod Check is:..... 5 042
Mod Check expected:..... 5 042 PASS

Scan Profile Analysis
Reference Decode.....A
Decodability.....63%...A
Symbol Contrast.....84%...A
Refl(MIN)/Refl(MAX).....01%...A
Edge Contrast(MIN).....74%...A
MODulation.....88%...A
Defects.....19%...B

Application Compliance.....A

OVERALL SYMBOL GRADE
B/03/660      3.0/03/660

Traditional Analysis

Acceptable
-100% Tol. +100%
-----RAR+++++++

Print Contrast Signal....98% PASS
Required PCS.....75%
Element Refl.(MAX).....85% PASS
Reflectance(MIN).....01% PASS

Pass/Fail Analysis
Passing Grade Selected.....D
Final Results.....*PASS*
```

D4000 Laser or SP

- New **printed report** (TP140A or VCIR) format. This was implemented to standardize on a format similar to the D4000 Auto Optic. Example:

```
Inspector D4000L
Revision A.10

Single Scan Analysis
  GS1-128
  AI (3931)

*F00246802331357C *
C111357918912468BAD*

<*C><F1>010123456789012839311234
5678<CB>AD<**>

Mod Check is:..... 8 036
Mod Check expected:..... 8 036 PASS

Scan Profile Analysis
Decodability.....75%...A
Expected Numeric.....FAIL

Traditional Analysis

-100% Tol. +100%
-----RA-+++++++
```

- On the **printed report** (TP140A or VCIR) the Code 128 (and GS1-128) bar code encode data is now displayed in two formats:
 - Previous method - 2 row format (to allow displaying compressed digit mode in subset C)
 - New method - Single row format showing text on a single line (wrapping if needed)

The D4000 firmware A.08 has minor change from the previous A.06/A.07 firmware versions:

D4000 Auto Optic

- With the unit set to GS1-128 - if the FNC1 character is missing the results screen and print-out will display "Error Missing F1" instead of "Warn Missing F1" and an "Error" tone will be played
- With the unit set to Std 128 - if there is a FNC1 character encoded the results screen and print-out will display "Format Error" instead of "Format Warning" and an "Error" tone will be played

D4000 Laser or SP

- With the unit set to GS1-128 - if the FNC1 character is missing the results screen and print-out will display "GS1 Fmt Err F1" instead of "GS1 Fmt Warn F1" and an "Error" tone will be played
- With the unit set to Std 128 - if there is a FNC1 character encoded the results screen and print-out will display "Format Error" instead of "Format Warning" and an "Error" tone will be played

The D4000 firmware A.06/A.07 has a number of functional changes from the previous A.03/A.05 firmware versions:

- Updated Terminology - The firmware will update the terminology used in both the symbology and the sub-symbology names as listed on the Setup menu options and the printed reports
- Addition of the Decodability Percentage and Grade to the Pass/Fail Analysis Screen (Displayed after a scan is captured)
- Full GS1-128 Application Identifier Support - Current D4000 units have a limit of 32 characters, and are missing some newer Application Identifiers (AIs). The new A.06/A.07 allows for the full GS1 limit of 48 data characters to be inspected and will not impose a limit on the maximum number of AIs in the bar code.
- Improvements for Interleave 2 of 5 and Code 39 - ratio testing will be upgraded, to report ratio warnings in addition to ratio failures

Setup Menu Options (Applies to D4000 Auto Optic and Laser)

Setting	Version	
	A.03/A.05	A.06/A.07
Decode 3of9 as	USS 3of9	Code 3of9
Decode I2of5 as	Case Code	ITF14 Case Code
Decode I2of5 as	USS 2of5	Std I2of5
Decode C128 as	N/A	Std 128
Decode C128 as	N/A	GS1-128
Database Storage	0-20kb 0-20kb	N/A (all Storage)

Pass/Fail Analysis Screen (Applies to D4000 Laser ONLY)

	Version	
	A.03/A.05	A.06/A.07
Description of screen information:	<i>Displays Bar Tolerance Chart</i>	<i>Displays ISO/ANSI Decodability results</i>
Screen Examples:	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> *1234ABCD* Code 3of9 -100% Tol. +100% -----RRARR+++ </div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> *1234ABCD* Code 3of9 D/bility % .64 D/bility Grade A </div>

GS1-128 Testing (Applies to D4000 Laser with version A.06/A.07 ONLY)

Testing Parameters

The D4000 Laser will inspect all GS1 Application Identifier (AI) content and length, this includes:

- FNC1 (Variable length AIs must start with a FNC1 character)
- Multiple AI support (unlimited number of AIs in a bar code)
- Date encodation (AIs with dates will be tested for proper formatting)
- GTIN prefixes (Some AIs require a prefix digit in the GTIN),
- Linked AIs (Some AIs require another AI to be encoded in the bar code)
- Numeric requirements (Some AIs are numeric only)
- Testing to ensure 48 data characters (excludes sub-set changes) are not exceeded

FNC1 Testing

When a Code 128 symbol is decoded **AND** the first character after the Start character is **FNC1** then the symbol must follow the GS1-128 format and the verifier must have the following Code 128 sub-specifications setting:

Decode C128 as
GS1-128

When a Code 128 symbol is decoded with the Code 128 sub-specifications setting of **Std 128** but the first character after the Start character **is** a **FNC1** then the following error will be displayed:

Std 128
Format Warning

When a Code 128 symbol is decoded with the Code 128 sub-specifications setting of **GS1-128** and the first character after the Start character **is not** a **FNC1** then the following error will be displayed:

GS1-128
Format Warning

Data Content Testing

When Code 128 sub-specifications setting is GS1-128 and a GS1-128 bar code is inspected an additional screen will be inserted into the Data Analysis screens:

GS1-128
Acceptable
AI (01)

Example of a bad check digit in the GTIN:

GS1-128
Bad Mod. Check
AI (01)

Example of a too many characters in the bar code:

GS1-128
Exceeds 48 Chars
AI (10)

Data Content Testing (continued)

Example of an alpha-character in a numeric only AI:

GS1-128
Expected Numeric
AI (3931)

Note:

If a bar code has multiple errors **only** the first error will be displayed

Example of a bar code with more than 48 data characters:

GS1-128
Exceeds 48 Chars
AI (250)

Note:

If a bar code data length is exceeded, the AI that exceeded the 48 character limit will be displayed

Example of an invalid date encoded in an AI:

GS1-128
Out-Of-Range
AI (17)

Note:

For Month and Year only encodes the Day may be encoded as "00"