

BRADY DOD UID WHITEPAPER

PART 1: THE 5 STEPS TO A DOD UID PROGRAM



Brady DoD UID Whitepaper

Part 1: The 5 Steps to a DoD UID Program

Learn what the DoD's UID Program is and how to comply

Step 1: Understanding the DoD Item Unique Identification System

The U.S. Department of Defense (DoD) launched Unique Identification (UID) to improve the management of personal property, real property, personnel, and roles.

Item Unique Identification (IUID), which is part of the UID program, focuses on DoD's personal property. IUID is a mandatory DoD requirement on all solicitations issued on or after January 1, 2004.¹

Qualifying items are marked with a permanent 2-D Data Matrix that is encoded with the Unique Item Identifier (UII). The UII is made up of unique data elements to distinguish an item from all others. The 2-D Data Matrix is marked on items according to MIL-STD-130N. The UII is then stored in the IUID Registry.²

Storing the UII in the IUID Registry allows easy access to information about the DoD's possessions. Other benefits include:

- Item Visibility
- Access to Data throughout an Item's Life
- Improved Inventory Management³

Step 2: Determining Which Items Require Item Unique Identification

If you are a subcontractor for the DoD, or if you manufacture equipment for the DoD, you may be wondering if Item Unique Identification applies to you. If your contract has a clause that refers to DFARS 252.211-7003, Item Identification and Valuation, then yes, you need to comply with UID, according to MIL-STD-130N.

DFARS clause 252.211-7003, Item Identification and Valuation (JUN 2005) with updated rules in April 2008, provides definitions for what items need IUID markings.

It states that solicitations, contracts, or delivery orders for tangible items delivered to the Government require IUID or a DoD recognized unique identification equivalent for:

- "All delivered items for which the Government's unit acquisition cost is \$5,000 or more."
- "Items for which Government's unit acquisition cost is less than \$5,000, when identified by the requiring activity as serially managed, mission essential, or controlled inventory."
- "Items for which the Government's unit acquisition cost is less than \$5,000, when the requiring activity determines that permanent identification is required."
- "Regardless of value-
 - Any DoD serially managed subassembly, component, or part embedded within a delivered item; and
 - The parent item (as defined in 252.211-7003 (a)) that contains the embedded subassembly, component, or part."⁴

¹ "Item Unique Identification 101 The Basics", January 2006, <http://www.acq.osd.mil/dpap/UID/attachments/iuid-101-20060130.pdf>.

² Defense Procurement and Acquisition Policy, "About Unique Identification," 9 November 2007, <http://www.acq.osd.mil/dpap/pdi/iuid/about.html>.

³ Defense Procurement and Acquisition Policy, "About Unique Identification," 9 November 2007, <http://www.acq.osd.mil/dpap/pdi/iuid/about.html>.

⁴ "Item Unique Identification, The Basics," May 2010.

Step 3: Creating the Unique Item Identifier

Now that you have determined that your items qualify for Item Unique Identification marking, as mandated by DFARS 252.211-7003, let's understand the Unique Item Identifier (UII).

UII - According to DFARS 252.211-7003, the UII is, "a set of data elements marked on items that is globally unique and unambiguous."⁵

This is the set of data elements that is encoded into the 2-D Data Matrix and marked on the item.

The method used to construct the UII determines the set of data elements that are encoded into the Data Matrix.

According to MIL-STD-130N, the UII may be encoded by using one of the following:

- 1) **UII Construct #1:** Serial number is unique within the enterprise.
- 2) **UII Construct #2:** Serial number is unique within the original part, lot, or batch number, which is unique within the enterprise.
- 3) **DoD IUID Equivalent:** Complete value in commercial use to serve as the UII, and recognized by the DoD.⁶

According to DFARS 252.211-7003, the enterprise is the "entity (manufacturer or vendor) responsible for assigning unique item identifiers to items." The enterprise identifier is a "code that is uniquely assigned to an enterprise by an issuing agency."⁷

Construct #1: Serialization Unique within the Enterprise

Serialization unique within the enterprise means that the serial number assigned to an item is unique from all other items produced by that enterprise. This serial number is never used again.⁸

Achieving Unique Identification Using Construct #1 includes a combination of:

- 1) **Issuing Agency Code (IAC)** - Assigned by the Registration Authority for ISO/IEC 15459-2, Registration Procedures. The Issuing Agency issues the enterprise identifier. The IAC can be derived from the data qualifier for the enterprise identifier and it does not need to be marked on the item.
- 2) **Enterprise Identifier (EID)** - Code assigned to an enterprise by a registered Issuing Agency.
- 3) **Serial Number** - Must be unique within the enterprise.

The enterprise identifier and serial number (unique within the enterprise identifier) provide identification of the item for its life.⁹

Construct #2: Serialization within the Part, Lot, or Batch Number

Serialization within the part, lot, or batch number means that each item of a part, lot, or batch number is assigned a unique serial number within that part, lot, or batch group.¹⁰

WHICH ENCODING METHOD SHOULD I BE USING?

Use Construct #1 if...

your company makes one product and the serial numbers never repeat.

Use Construct #2 if...

you do not have unique serial numbers. You need to use Construct #2 to add the part, lot, or batch number in order to achieve Unique Identification.

Use the DoD IUID Equivalent if...

you've already been provided a identifier that the DoD recognizes as a UII.

⁵ "DFARS Clause 252.211-7003," August 2008, <http://www.acq.osd.mil/dpap/dars/dfars/html/current/252211.htm#252.211-7003>.

⁶ Department of Defense, "MIL-STD-130N," 17 December 2007, <http://www.ide.wpafb.af.mil/engdat/docs/MIL-STD-130N.pdf>.

⁷ "DFARS Clause 252.211-7003," August 2008, <http://www.acq.osd.mil/dpap/dars/dfars/html/current/252211.htm#252.211-7003>.

⁸ "DFARS Clause 252.211-7003," August 2008, <http://www.acq.osd.mil/dpap/dars/dfars/html/current/252211.htm#252.211-7003>.

⁹ "Item Unique Identification, The Basics," May 2010, http://www.acq.osd.mil/dpap/pdi/uid/docs/IUID_101_The_Basics_v3_05_2010_v2.pdf.

¹⁰ "DFARS Clause 252.211-7003," August 2008, <http://www.acq.osd.mil/dpap/dars/dfars/html/current/252211.htm#252.211-7003>.

Achieving Unique Identification using Construct #2 includes a combination of:

- 1) **Issuing Agency Code (IAC)** - Assigned by the Registration Authority for ISO/IEC 15459-2, Registration Procedures. The Issuing Agency issues the enterprise identifier. The IAC can be derived from the data qualifier for the enterprise identifier and it does not need to be marked on the item.
- 2) **Enterprise Identifier (EID)** - Code assigned to an enterprise by a registered Issuing Agency.
- 3) **The Original Part, Lot, or Batch Number** - A number assigned by the enterprise to a group of items (a lot or batch).
- 4) **The Serial Number** - The serial number is within the original part, lot or batch number. It is assigned by the enterprise to an item that differentiates that item from all others.

The enterprise identifier, original part, lot or batch number and serial number within the original part, lot or batch number provide identification of the item for its life.¹¹

Achieving Unique Identification Using a DoD recognized IUID Equivalent: One of the following recognized IUID Equivalents may be used:

- 1) **GIAI** - The EAN.UCC Global Individual Asset Identifier
- 2) **GRAI** - The EAN.UCC Global Returnable Asset Identifier
- 3) **VIN** - ISO Vehicle Identification Number
- 4) **ESN** - Electronic Serial Number for cellular telephones¹²

Step 4: Naming the Data Elements

How to formulate the complete UII

Now that you understand what types of data elements are needed to create the UII, let's learn about naming the data.

Data qualifiers name each data element, telling the imaging devices whether UII Construct #1, Construct #2, or an IUID Equivalent is being read. It is the company's preference of which data qualifier to use, although it is often based on which Issuing Agency assigns the enterprise identifier.

According to DFARS 252.211-7003, there are three types of data qualifiers:

- 1) **Data Identifiers (DIs) (Format 06)** in accordance with ISO/IEC International Standard 15418, Information Technology- EAN/UCC Application Identifiers and Fact Data Identifiers and Maintenance and ANSI MH 10.8.2 Data Identifier and Application Identifier Standard.
- 2) **Application Identifiers (AIs) (Format 05)** in accordance with ISO/IEC International Standard 15418, Information Technology- EAN/UCC Application Identifiers and Fact Identifiers and Maintenance and ANSI MH 10.8.2 Data Identifier and Application Identifier Standard.
- 3) **Text Element Identifiers (TEIs) (Format 12)**¹³

When deriving the concatenated UII, the data qualifiers are eliminated from the final number.

Please refer to Table VI in MIL-STD-130N to find common Data Qualifiers for IUID usage.

¹¹ "Item Unique Identification, The Basics," May 2010, http://www.acq.osd.mil/dpap/pdi/uid/docs/IUID_101_The_Basics_v3_05_2010_v2.pdf.

¹² "Item Unique Identification, The Basics," May 2010, http://www.acq.osd.mil/dpap/pdi/uid/docs/IUID_101_The_Basics_v3_05_2010_v2.pdf.

¹³ "DFARS Clause 252.211-7003," August 2008, <http://www.acq.osd.mil/dpap/dars/dfars/html/current/252211.htm#252.211-7003>.

Encoding the UII Data

The UII may be encoded into the 2-D Data Matrix using a software program, such as [CodeSoft™ Labeling Software](#). The 2-D Data Matrix that must be used is the Data Matrix

ECC200 (ISO/IEC 16022), which is a 2-dimensional representation of ASCII characters. These characters are ordered according to [ISO/IEC International Standard 15434](#).¹⁴

The data elements are encoded as follows:

- **Compliance Indicator:** ASCII code for characters [,), and >.
- **Record Separator:** Follows the compliance indicator and appears at the end of the formatted data. The record separator does not have printable representation. Decimal code is 30 and hexadecimal code is 1E.
- **Group Separator:** ASCII-coded character used in UII encoding, but does not have printable representation. Separates the format code, the data qualifiers, and the data values in the remainder of the data string. Decimal code is 29 and hexadecimal code is 1D.
- **End of Transmission:** ASCII-coded character used in UII encoding, but it does not have printable representation. Data string is terminated using this character. Decimal code and hexadecimal code are 4.

Example:

)>RS 12GS CAG A3309GS SER 1234567RS EOT

The above example uses Construct #1 with TEI Format Indicator.¹⁵

The Concatenated UII:

- Add the Issuing Agency Code “D” for CAGE.
- Take out the Text Element Identifiers.

Concatenated UII is: DA33091234567

The elements of the UII above must be placed on items requiring marking by using the criteria described in [MIL-STD-130N](#).

Step 5: Applying the UII Mark

Methods for applying the UII marking according to MIL-STD-130N

According to MIL-STD-130N, the required mark may be applied to an identification plate, band, tag, or label. Marking materials that could affect the item’s performance should not be used. In addition, the marking should be applied in such a way that it does not interfere with the item’s normal use.

All markings must be permanent for the life of the item, being able to withstand environmental tests and cleaning procedures that the item endures throughout its life.¹⁶

Machine readable markings should be applied to all items subject to DFARS mandated IUID criteria.

¹⁴ Defense Procurement and Acquisition Policy, “Tips on Encoding the Unique Item Identifier (UII) Mark & Building the Concatenated UII,” 16 May 2006, <http://www.acq.osd.mil/dpap/UID/attachments/Tips%20on%20Constructing%20the%20UII.pdf>.

¹⁵ Defense Procurement and Acquisition Policy, “Tips on Encoding the Unique Item Identifier (UII) Mark & Building the Concatenated UII,” 16 May 2006, <<http://www.acq.osd.mil/dpap/UID/attachments/Tips%20on%20Constructing%20the%20UII.pdf>>.

¹⁶ Department of Defense, “MIL-STD-130N,” 17 December 2007, <<http://www.ide.wpafb.af.mil/engdat/docs/MIL-STD-130N.pdf>>.

Marking Requirements:

UII Limitation: Limited to 50 characters, in compliance with ISO/IEC 15459-4.

Lettering: All letters must be capitals without serifs (sans-serif). Fonts that may be used include Arial, Futura, Gothic, Trebuchet MS, or any other sans-serif fonts.

Numerals: All numerals should be Arabic. Roman numerals may also be used if designated by an applicable industry or Government standards.

Data Matrix: The minimum marking is a Data Matrix ECC200 symbol, in accordance with ISO/IEC 16022. Items need to be marked according to ANSI MH10.8.7. The data elements need to be encoded into the Data Matrix Symbol using the syntax of ISO/IEC 15434 with:

- Format 05 for Application Identifiers (AI)
- Format 06 for Data Identifiers (DI)
- Format 12 for Text Element Identifiers (TEI)

Module Size: The module size should be no smaller than 0.0075 inch (0.19 mm) and no larger than 0.025 inch (0.64 mm). Square symbol sizes may not exceed one inch (25.4mm).

Linear Bar Code: Linear Bar Codes may be:

- Code 39 Symbols
- Code 128 Symbols
- GS1-128

*Ratio of wide element to narrow element: within range of 2.1:1 to 3.1:1.

The narrow element dimension (X dimension) range should be: 0.0075 inch (0.19 mm) to 0.015 inch (0.38 mm).

Linear Bar Code Minimum Print Quality: 3.0/05/660, where the minimum grade is 3.0, measured with an aperture size of 0.005 inch (0.127 mm) with a light source wavelength of 660 nm in accordance with ISO/IEC 15416.

Data Matrix Symbol Minimum Print Quality: 3.0/05/650 measured with an aperture size of 0.005 inch (0.127 mm) with a light wave source wavelength of 650 nm +/- 20 nm.

- Exception: ISO/IEC 15415 parameters Modulation (MOD), Symbol Contrast (SC), or both may measure a 2.0, providing the overall ISO/IEC 15415 grade would be 3.0 if the MOD and SC grades are 3.0 or higher.¹⁷

More information of measuring print quality is specified in ISO/IEC 15415, where the grade is based on one scan. Print quality may be graded with a verifier, such as the Microscan LDP Verifier, found in many of the Brady DoD UID System packages.

¹⁷ Department of Defense, "MIL-STD-130N," 17 December 2007, <http://www.ide.wpafb.af.mil/engdat/docs/MIL-STD-130N.pdf>.

For more information about UID compliance and Brady's DoD UID system, visit www.BradyID.com/UID.

To learn more about DoD UID, look for Part 2 of this white paper: "Part 2: How to Implement a Compliant DoD UID System"

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