



## **Brady DoD UID System Whitepaper**

A Guide for Understanding DoD's UID Program- What it is and How to Comply

### **Item Unique Identification- Improved Accounting & Valuation of Items for the DoD**

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.<sup>1</sup>

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.<sup>2</sup>

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 Management<sup>3</sup>

### **What 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) provides definitions for what items need IUID markings.

According to DFARS 252.211-7003, solicitations, contracts, or delivery orders for tangible items delivered to the Government require IUID or a DoD recognized unique identification equivalent for:

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

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

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

- “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 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.”<sup>4</sup>

### **Understanding 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.”<sup>5</sup>

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.<sup>6</sup>

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.”<sup>7</sup>

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<sup>4</sup> “Item Unique Identification 101 The Basics”, January 2006, <<http://www.acq.osd.mil/dpap/UID/attachments/iuid-101-20060130.pdf>>.

<sup>5</sup> “DFARS Clause 252.211-7003,” June 2005, <<http://www.acq.osd.mil/dpap/UID/attachments/Clause-JUN2005.pdf>>.

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

<sup>7</sup> “DFARS Clause 252.211-7003,” June 2005, <<http://www.acq.osd.mil/dpap/UID/attachments/Clause-JUN2005.pdf>>.

### **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.<sup>8</sup>

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.<sup>9</sup>

#### **When to Use Construct #1:**

Often used when company makes one product and the serial numbers never repeat.

### **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.<sup>10</sup>

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.<sup>11</sup>

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<sup>8</sup> “DFARS Clause 252.211-7003,” June 2005, <<http://www.acq.osd.mil/dpap/UID/attachments/Clause-JUN2005.pdf>>.

<sup>9</sup> “Item Unique Identification 101 The Basics”, January 2006, <<http://www.acq.osd.mil/dpap/UID/attachments/iuid-101-20060130.pdf>>.

<sup>10</sup> “DFARS Clause 252.211-7003,” June 2005, <<http://www.acq.osd.mil/dpap/UID/attachments/Clause-JUN2005.pdf>>.

<sup>11</sup> “Item Unique Identification 101 The Basics”, January 2006, <<http://www.acq.osd.mil/dpap/UID/attachments/iuid-101-20060130.pdf>>.

### **When to Use Construct #2:**

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

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 telephones<sup>12</sup>

### **Naming the Data Elements**

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:

- **Data Identifiers (DIs) (Format 06)** in accordance with ISO/IEC International Standard 15418, Information Technology- EAN/UCC Application Identifiers and ANSI MH 10 Data Identifiers and ANSI MH 10 Data Identifiers and Maintenance.
- **Application Identifiers (AIs) (Format 05)** in accordance with ISO/IEC International Standard 15418, Information Technology- EAN/UCC Application Identifiers and ANSI MH 10 Data Identifiers and ANSI MH 10 Data Identifiers and Maintenance.
- **Text Element Identifiers (TEIs) (Format 12)**<sup>13</sup>

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.

### **Encoding the UII Data**

The UII may be encoded into the 2-D Data Matrix using a software program, such as BradySoft™ Ultimate. The 2-D Data Matrix that must be used is the Data Matrix

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<sup>12</sup> "Item Unique Identification 101 The Basics", January 2006, <<http://www.acq.osd.mil/dpap/UIID/attachments/iuid-101-20060130.pdf>>.

<sup>13</sup> "DFARS Clause 252.211-7003," June 2005, <<http://www.acq.osd.mil/dpap/UIID/attachments/Clause-JUN2005.pdf>>.

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

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.

[><sup>R</sup><sub>S</sub> 12<sup>G</sup><sub>S</sub> CAG A3309<sup>G</sup><sub>S</sub> SER 1234567<sup>R</sup><sub>S</sub> <sup>E</sup><sub>O</sub>T

The above example uses Construct #1 with TEI Format Indicator.<sup>15</sup>

#### **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.

#### **Methods of Applying the UII Mark, 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.<sup>16</sup>

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<sup>14</sup> 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>>.

<sup>15</sup> 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>>.

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

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

**UII Limitation:**

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

**Lettering:**

All letters must be capitals without serifs (sans-serifs). 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)

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.<sup>17</sup>

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 Quadrus® Verifier, found in many of the Brady DoD UID System packages.

### **Putting It All Together**

Let's take a look at how to put together a DoD UID label, given the following example.

Company "A" does not have unique serial numbers; therefore they must use Construct #2. Construct #2 will be used, so then they may include their part number, in order to create a unique UII.

For Construct #2, Company "A" needs:

- Issuing Agency Code
- Enterprise Identifier
- Part Number
- Serial Number

The Issuing Agency that assigned Company "A" their Enterprise Identifier was Allied Committee 135. Knowing this, we have the following information.

- 1) Issuing Agency Code: D
- 2) Enterprise Identifier: 2D671
- 3) Part Number: F100200300400AP
- 4) Serial Number: ABC333-001

\*Remember that the Issuing Agency Code does not need to be marked on the item.

Using Data Identifiers DI- Format 06-

17V: The Data Qualifier for the Enterprise Identifier

1P: The Data Qualifier for the Part Number

S: The Data Qualifier for the Serial Number

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



The Enterprise Identifier is encoded into the first Linear Bar Code above.  
 The Part Number is encoded into the second Linear Bar Code above.  
 The Serial Number is encoded into the third Linear Bar Code above.

**Putting Together the Message Syntax:**

**(This is put together in formulas in a template, such as in BradySoft™ Ultimate)**

$[ ] >^R_s 06^G_s 17V2D671^G_s 1PF100200300AP^G_s SABC333-001^R_s E_{OT}$

**When you add the Issuing Agency Code, the concatenated UII is:**

D2D671F100200300APABC333-001

This Concatenated UII is encoded into the 2-D Data Matrix, towards the right-hand side of the label.

Now you can see that the specific Data Qualifiers tell the imaging device which piece of information is being read.

Ex- 17V indicates the Enterprise Identifier

**The IUID Registry- Submitting Your Data**

The IUID Registry is located at <https://www.bpn.gov/iuid>. UIIs and other pertinent information are stored in the IUID Registry, which is maintained by the Defense Logistics Information Service. According to DFARS 252.211-7003, the Contractor reports at the time of delivery the following information:

- Concatenated UII or an IUID Equivalent.
- Unique Item Identifier Type
- Issuing Agency Code
- Enterprise Identifier
- Original Part Number
- Lot or Batch Number
- Current Part Number
- Current Part Number Effective Date
- Serial Number



- Unit Acquisition Cost
- Unit of Measure
- Description<sup>18</sup>

### **How is Data Submitted?**

Options include:

- Wide Area Work Flow (WAWF)
- XML or Flat File through Global Exchange Service (GEX)
- Manually at <http://www.bpn.gov/iuid>

For more information on submitting data to the IUID registry, please visit the IUID website at <http://www.acq.osd.mil/dpap/iuid>.

### **Brady DoD UID System**

Brady's DoD UID System provides users with the ability to

- Create and Print Labels for UID Compliance
- Read and Validate UII constructs on labels
- Verify and Grade UID Labels.

To make it simple, Brady has created a variety of Brady DoD UID System packages, so you can have everything you need for DoD UID compliance.

## **Brady DoD UID System- Ultimate**

### **BP-UID-6X-CR3-SV**



Bradyprinter™ X-Plus II- 600 dpi High Volume Thermal Transfer Printer

BradySoft™ Ultimate

Code Reader 3500™ with Bluetooth, Bluetooth Modem and Charging Cradle

Microscan LDP Compliance Verifier

Brady DoD UID System On-Site Training- Two Days

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<sup>18</sup> "DFARS Clause 252.211-7003," June 2005, <<http://www.acq.osd.mil/dpap/UID/attachments/Clause-JUN2005.pdf>>.

## Brady DoD UID System- Advanced

### BP-UID-6IP-CR3-SV



- Brady IP™ Printer- 600 dpi General Industrial Thermal Transfer Printer
- Brady360 IP™ 600 Advanced 2 YR Protection Plan
- BradySoft™ Ultimate
- Code Reader 3500™ with Bluetooth, Bluetooth Modem and Charging Cradle
- Microscan LDP Compliance Verifier
- Brady DoD UID System On-Site Training- Two Days

### BP-UID-BBP-CR3-SV



- Brady **BBP81** Label Printer- 300 dpi Thermal Transfer Printer
- Brady360 **BBP81** Advanced 2 YR Protection Plan
- BradySoft™ Ultimate
- CodeReader 3500 with Bluetooth, Bluetooth Modem and Charging Cradle
- Microscan LDP Compliance Verifier
- Brady DoD UID On-Site Training: Two Days

## Brady DoD UID System- Standard (300 or 600 dpi)

### BP-UID-3IP-CR12, BP-UID-6IP-CR12



- Brady IP™ Printer- 300 or 600 dpi General Industrial Thermal Transfer Printer
- Brady360 IP™ Basic 2 YR Protection Plan
- BradySoft™ Ultimate
- Code Reader 1200™ with 6' USB Cable
- Brady DoD UID System On-Site Training- Two Days

### BP-UID-BBP81-CR12



- Brady **BBP81** Label Printer- 300 dpi Thermal Transfer Printer
- Brady360 **BBP81** Basic 2 YR Protection Plan
- BradySoft™ Ultimate
- Code Reader 1200™ with 6' USB Cable
- Brady DoD UID On-Site Training: Two Days

## Brady DoD UID System- Verifier

### BP-UID-SV



- Microscan LDP Compliance Verifier
- Brady DoD UID System On-Site Training- One Day



### **Brady DoD UID System Suggested Materials**

According to MIL-STD-130N, UID identification is to be as permanent as the life of the item being identified.<sup>19</sup> Brady offers a variety of label materials that offer outstanding performance in any environment. Suggested materials are listed below. Other materials are available for UII labeling. Please contact Brady to find the label material to meet your UID labeling needs.

#### **B-489: Brady B-489 Matte White Polyester Thermal Transfer Printable Label Stock**

- Ultra aggressive adhesive
- Recommended Ribbon: R4300 Series  
THT-59-489-10 (1.00”W X .500”H)  
THT-17-489-3 (2.00”W X 1.00”H)  
THT-19-489-1 (3.00”W X 2.00”H)  
\*other sizes available

#### **B-457: Brady B-457 Glossy White Thermal Transfer Printable Polyimide Label Stock**

- Great for printed circuit board and electronic component preprocess labeling
- Recommended Ribbon: R6000 Series  
THT-13-457-10 (1.250”W X .250”H)  
THT-48-457-10 (2.00”W X .250”H)  
THT-59-457-10 (1.00”W X .500”H)  
\*other sizes available

#### **B-483: Brady B-483 Glossy White Thermal Transfer Printable Label Stock**

- Ultra aggressive adhesive
- Recommended Ribbon: R6000 Series or R4900 Series  
THT-59-483-10 (1.00”W X .500”H)  
THT-17-483-3 (2.00”W X 1.00”W)  
THT-19-483-1 (3.00”W X 2.00”H)  
\*other sizes available

#### **B-966B: Brady B966B Clear Polyester Overlaminates**

- For that extra abrasion and solvent resistance

### **Additional Resources**

Additional resources and information on DoD’s UID program may be found at <http://www.acq.osd.mil/dpap/pdi/uid/index.html>.

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<sup>19</sup> Department of Defense, “MIL-STD-130N,” 17 December 2007, <<http://www.ide.wpafb.af.mil/engdat/docs/MIL-STD-130N.pdf>>.