



UID QUARTERLY: WINTER 2009

INTRODUCTION

Welcome to the UID Quarterly Winter 2009 Edition, brought to you by A2B Tracking Solutions as an educational service. You will find a great deal of practical and useful information here. Read each article carefully. You are sure to reach a deeper understanding of UID.

What you'll find in this issue:

UID Solutions - A2B provides a must read tutorial on the concept, the how-to and the payoff for uniquely identifying top level assets as well as their embedded parts.

Opinion - Metalcraft President Steve Doerfler shares his views on matching UID nameplates and labels to their environmental exposure, as well as choice of material, marking process, attachment methods and verification.



Vendor's Corner - Microscan Product Manager Kyle O'Brien clarifies some misunderstandings about MIL-STD-130 releases and the verification standards that apply, along with a summary of the parameters measured by applicable standards.

UID Education - View a full schedule of UID Web Seminars, sponsored by A2B Tracking and hosted by Data Capture Institute President and bar code pioneer David Collins.

News from A2B Tracking - Read all the news from A2B and learn where we'll be exhibiting.

UID SOLUTIONS:

Don't Forget the Children



In the Fall 2008 Edition of UID Quarterly, we spoke of going back to UID basics and the need to create a UID Compliance and Implementation Plan. We also spoke of some pitfalls to avoid. Every UID Plan should start with decisions about what needs to be marked. While marking at the top level of end item deliverables may be apparent, the marking of subassemblies or components that make up those end items is less clear. This article should help clarify the question: "How deep do you need to mark, and why?"

The reasons for the marking and tracking of embedded items (children) are many, resulting in great efficiencies and ultimately superior support of the warfighter. One could argue that without the ability to track embedded items the benefits of UID are severely limited. Those benefits include, in addition to the ability to track top level items over time, the transparency to track the "children" for a myriad of data such as maintenance records, failure patterns and readiness for deployment. Additional benefits include support for establishing financial culpability and auditing.

Basic embedding

Embedding is the creation and reporting of the parent/child relationships that occur as an assembly is created. The

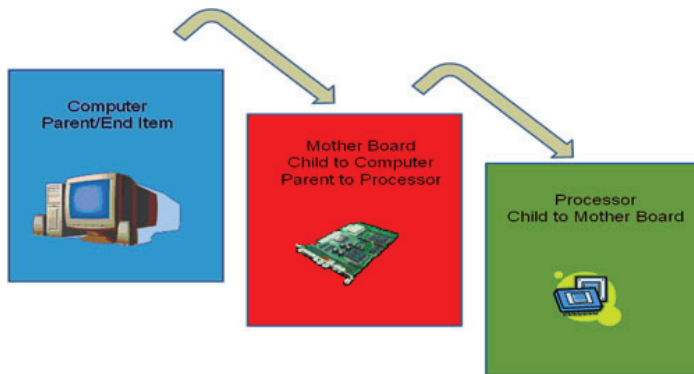
idea is to keep track of not only the top level item, but the key components to those items. Let's look at a Humvee, by way of example. The finished vehicle would be considered the top level or end item, but what about the engine, the transmission and the wheels? All of these component parts may be candidates for marking.

From an inventory perspective it is essential to know not only how many Humvees there are overall but also where they are located. That information takes on a whole new dynamic when a maintenance tech is able to identify what parts are available, where they are located, how often they have been repaired, etc. The key to this transparency is unique identification of all the components.



*Note: This is meant as an example only.

All top level items that are delivered to the DoD are the parent items. The subassemblies or components that make up those top levels are the children. How far each manufacturer goes down the tree really depends on the importance of each of those parts. A computer presents a good example of embedded components. The computer is the parent while the mother board would be the child. At the same time, the processor would be the child to the mother board. This illustrates a multi-level assembly.



The point here is that UID is more than the top level or even the next level down. With UID, embedded relationships run through the entire configuration, often to the lowest repairable unit or LRU.

Prime to Sub

Best practice would have prime contractors who rely on subcontractors for components to push down the UID marking requirement to their subs. The prime's responsibility under contract is to deliver items to the DoD that have been marked with properly verified and validated IUIDs and to register the data with the IUID Registry. Requiring subs to mark components, however, is well within the purview of the prime.

For data integrity, the prime should ensure their subcontractors are using a reputable system for creating IUIDs and also that items are marked properly. Subcontractors should also be required to submit a report of the IUIDs for use within the prime's UID compliance system, along with the inventory of items. This will allow the prime to associate the items with their end item parents, and register the appropriate information. The prime should also require a validation/verification report to ensure the subcontractor has performed the marking correctly. At the end of the day, it is the prime who is responsible for marking integrity.

How Maintenance Utilizes Embedded Items

Let's shift our focus to the maintenance depots within the services. How does embedding affect those operations? In the beginning there is a bit of additional work, but the benefits far outnumber the investment in time. Those extra

steps include either scanning assets as they come in for repair or IUID marking them if they were not previously identified. (Once all the items in the inventory are marked, this step will be much easier.) As the maintenance depot scans in items, they can take note of the original construction of the assembly. When asset components are tested, repaired, or replaced changes in parent/child relationships are scanned in, and new configurations are uploaded to the Registry. This methodology gives transparency to what parts are where. With this information, better predictive maintenance models will be put into effect and failure rates will be better tracked. But this all starts with uniquely identifying all the assets and embedded parts so that the configuration and history of each asset and part is available for review.

For the sake of clarity let's say a fleet of trucks is experiencing a spate of transmission failures. The type or model of trucks will become quickly visible when UID methodology is utilized in a maintenance facility. Because the transmissions are embedded items and IUIDs are scanned at the time of repair, not only is the transmission problem quickly identified, but so are the model, age and manufacturer of the problem transmissions. This granular visibility is what UID and embedded relationships is all about.

Is embedding in your contract?

Perhaps by now you agree that embedding is not only a good idea but essential to the success of UID. But how do you know what embedded items to mark? Fundamental UID marking requirements include the following: value of \$5000 or more, serially managed items and mission critical items. According to the DoD's Guide to Uniquely Identifying Items version 2.0, released Oct 1, 2008, all embedded items that a prime contractor is responsible for must be called out in a contract.

There are other considerations to take into account, in addition to contractual obligations. For example, if your company has a spares contract for engines as well as the full contract for Humvees, you would be responsible for marking those engines anyway. Why not then mark all as a better business practice? Wouldn't it be more efficient to mark all the engines and use those marks in your own manufacturing processes?

Conclusions

UID and the marking of embedded items are not just make-work projects. Utilizing the data available from those embedded items provides a window into each item's whereabouts, its repair history and its availability. This is a window that has never been open before, and it provides business efficiencies that will change business practices forever. Organizations that want a competitive edge will adopt these changes sooner rather than later.

OPINION:

Matching the Mark to the Application

by Steve Doerfler



The first sentence of Section 4.3 of MIL-STD-130N is rather daunting, “Direct identification marking and identification plates, identification bands, identification tags or identification labels used shall be as permanent as the normal life expectancy of the item and be capable of withstanding the environmental tests and cleaning procedures specified for the item to which it is affixed.” Obviously durability of the mark is a priority and deserves attention when looking at UID compliance. Depending on the type of item being marked it might be more desirable to use a label or nameplate. When selecting the nameplate or label the following are key considerations:

1. Label/nameplate material.
2. Process of producing the Ull mark.
3. Attachment methods.
4. Verification of the Ull mark.

When selecting the label material, it’s important to understand the environmental exposure. Will the label be subjected to heat, abrasion, chemicals, caustics, UV, etc.? This information should be part of a standard qualification process by the label/nameplate producer. Once the environmental exposure has been identified and qualified, a specific material may be selected. For example, should anodized aluminum or polyester be used for a Ull mark that is exposed to 375°F three to four times per week for 20 minutes per cycle? While polyester is stable to temperatures of 300°F, consistent exposure to 375°F requires a more durable material such as anodized aluminum. For extremely harsh environments where the Ull mark is subjected to extreme heat or caustics, ceramic-coated stainless steel may be the best option.

If the environmental conditions are mild in comparison to the above example with minimal exposure to abrasion and no exposure to UV, heat or chemicals, then polyester is a more cost effective solution.

The process of producing the Ull mark is directly related to the selected material. In the above example of anodized aluminum, photo imaging the 2D code along with other data seals it within an anodic layer thereby making it more durable than a surface print process where the printed image resides on top of the surface and lacks the protection of a sealed image (see diagram). With polyester labels, a high resolution (greater than

800 DPI) subsurface printing process may be used to provide additional protection to the image. High resolution digital printing ensures a quality 2D code that will meet and exceed the verification specification.

The most durable attachment method is determined by the material selected. With a polyester label the attachment method centers around selecting the adhesive, while if a thicker aluminum material is selected the options include mechanical fasteners (rivets, screws, etc.), adhesive or mechanical fasteners/adhesive. Attachment methods are much more versatile when using a thicker nameplate.

Surface conditions are another important factor to consider in order to ensure maximum adhesion for the Ull mark. Is the surface bare metal (clean, bare metal is generally regarded as the best surface for adhesion), plastic or painted? Is the surface smooth or rough, flat or radius? There are a number of commercial adhesives with acrylic and silicone, which provide the greatest durability. In the above photo anodized example, if the surface is extremely rough a thicker .010” adhesive is best suited in comparison to a smooth surface where a .005” thick adhesive provides very good surface-to-surface contact and bond. Temperature is also a factor, and for an application exposed to 600°F, a silicone adhesive performs better than an acrylic adhesive. Often, for extreme applications, mechanical fasteners and adhesive will be used providing greater permanence.

Material and process selection also affects verification of the quality grade per MIL-STD-130N, Section 5.2.7.2. Material selection highly influences the “symbol contrast” grade since it measures the reflective state in the symbol, namely light and dark. Materials that are white with a black image typically have a higher symbol contrast than a black image on an aluminum surface, although matte anodized aluminum provides the necessary symbol contrast to meet specification. The print or image process also highly influences “modulation,” which is a measure of the uniformity of reflectance of dark and light modules, respectively. A high resolution/print process provides greater print consistency, minimizing print growth or loss and providing a high grade. A lower resolution image

Anodic Layer

The glass-clear, sapphire-hard anodized layer resists chemicals, abrasions, and dirt.

Sealed Image

Black graphics are metallic silver particles that hold up to harsh environmental conditions.

Aluminum Layer

The rigid aluminum base will not peel, crack or delaminate.



process coupled with a material that provides low symbol contrast could very well produce a label/nameplate with a failed grade not meeting MIL-STD-130N.

While there may be debate on which is more important – label/nameplate material, process or attachment method – these criteria are highly interrelated as one without the other will ultimately compromise durability and performance. Furthermore, the verification grade is based upon material and process, so in order to ensure a readable UII mark, material and process must be considered. The value of a UID nameplate and label supplier is evidenced by making this process as seamless as possible collecting environmental information, attachment considerations, and recommending a product that will ultimately provide a cost effective solution that

meets and exceeds MIL-STD-130N. A UID nameplate or label is more than just a “sticker!”

Steve Doerfler is President of Metalcraft and most recently accepted a position on the Board of Directors for AIM North America. Doerfler is also a member of the AIM USA Committee, which was developed for the sole purpose of encouraging our legislative bodies regarding enforcement the UID mandate. Doerfler is also a member of NPMA (National Property Management Association).

Metalcraft has been a leader in identification products industry since 1950, specializing in the production of customized nameplates and labels for harsh environments including UID compliant products, including consecutive numbers, constant copy or variable data using bar code and/or RFID technologies.

VENDOR'S CORNER:

Lights, Camera, Verification

by Kyle O'Brien

Product Manager for Microscan Systems, Nashua, NH

Which MIL-STD-130 Do I Use?

With my experience as a Government Contract Manager, I am often asked by customers implementing UID solutions, “Under which MIL-STD-130 do I need to comply?” and “What verification standard should I use?” These are both good questions, and in fact are quite simple to answer.

The History of MIL-STD-130

The table below shows the history and high lights the changes in MIL-STD-130 Department of Defense, Identification Marking of U.S. Military Property.

Since the initial release of the UID mandate, MIL-STD-130 has progressed along with Data Matrix verification standards to help ensure that best quality measurements are used to grade UID marks. The most recent release of MIL-STD-130N in December 2007 includes the complete set of suggested lighting from the AIM DPM-1-2006 Quality Guideline. AIM DPM-1-2006 is the most recent industry verification guideline published for Direct Part Marking.

Date	MIL-STD-130	Standard	Application
Oct. 10, 2003	MIL-STD-130L	ISO/IEC 16022	All marks
Dec. 21, 2004	MIL-STD-130L, Change 1	AS9132/IAQG or ISO/IEC15415	AS9132 for DPM ISO/IEC 15415 for labels
Dec. 2, 2005	MIL-STD-130M	ISO/IEC 15415 then AS9132	No rotational averaging Contrast and Modulation allowed to go to "C" Lighting requirement 660nm Use ISO/IEC 15415 first then AS9132
Jun. 15, 2007	MIL-STD-130M, Change 1	AIM DPM-1-2006	For DPM, all lights except Dome, added 45° light from ISO/IEC 15415
December 2007	MIL-STD-130N	AIM DPM-1-2006	Addition of AIM DPM -1-2006 Dome Illumination for curved parts.

Read the Contract

The MIL-STD-130 release you need to comply with depends upon the date of the contract that you are working under.

In other words, the date of your contract determines the date of the MIL-STD-130 release applicable to that contract. A contract date of January 1, 2006, therefore, would have MIL-STD-130M, and a contract date of January 1, 2008 would have MIL-STD-130N applicable. Contracts can be



Microscan UID DPM Verifier
Includes 10 illumination setting for AIM DPM



Microscan LDP Verifier
Designed for Labels and Data Plates

amended to include more recent releases of MIL-STD-130, however this often requires a contract amendment and approval from the Contracting Officer. For this reason a company with multiple contracts with UID requirements needs to ensure the UID verifier they choose is compatible to with all MIL-STD-130 releases. Both Microscan DPM and LDP Verifiers pictured below provide for easy compliance to all of the MIL-STD-130 releases.

Which verification standard do I use?

Which verification standard you should use depends on the release of the MIL-STD-130 you are trying to comply with, since not all of the MIL-STD-130 releases allows for the use of all the verification standards. A contractor could not use AIM DPM-1 2006, AS9132, or ISO/IEC 15415 until the release of MIL-STD-130M, Change 1. Because of the different parameters measured by the verification system, different verification standards are more suited for the specific type of UID mark being measured. This is true for AS9132, and ISO/IEC 15415, however because of parameters measured by AIM DPM-1-2006 it is an appropriate verification type for all UID marks regardless of the marking technology used.

The table below illustrates the different parameters measured for each of the verification types allowed in MIL-STD-130.

medium angle 45° lighting from ISO/IEC 15415) The image below illustrates the ten illumination settings.

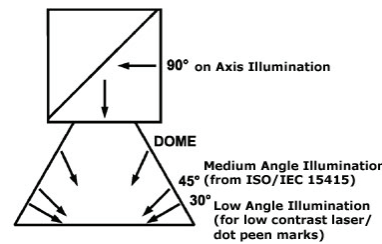
Standard/Date	Parameters Measured													Applicability MIL-STD-130			
	Angle of Distortion	Axial Non-uniformity	Cell Size	Dot Center Offset	Dot Size Offset	Fixed Pattern Damage	Grid Non-uniformity	Matrix Size	Minimum Reflectance	Cell Modulation	Module Fill	Nominal Module Size	Ovality		Print Growth	Reference Decode	Symbol Contrast
ISO/IEC 16022 May 2000																	Labels MIL-STD-130L
ISO/IEC 15415 June 2004																	Some DPM MIL-STD-130L Chg.1/130M
AS9132 Laser Etch Feb. 2002																	Laser DPM MIL-STD-130L Chg.1/130M
AS9132 Dot Peen Feb. 2002																	Dot Peen DPM MIL-STD-130L Chg.1/130M
AS9132 Electrochem Etch Feb. 2002																	Electro-Chem Etch DPM MIL-STD-130L Chg.1/130M
AIM DPM-1-2006 Dec. 2006																	ALL MIL-STD-130M Chg.1/130N

The 30° low angle illumination has seven discrete lighting configurations. 30° quadrant from four directions, 30° twin from both north/south and east/west, and 30° single from each quadrant independently (north/south/east/west). Because of the specific

The parameters measured by AIM DPM-1-2006 include:

- Cell Contrast
- Axial Non-Uniformity
- Grid Non-Uniformity
- Unused Error Correction
- Fixed Pattern Damage
- Cell Modulation
- Reflectance Decode
- Minimum Reflectance

parameters measured and the different illumination settings specified, AIM DPM-1-2006 is the best overall Data Matrix verification type allowed in MIL-STD-130 today.



As the inventors of the Data Matrix symbology and Data Matrix verification, Microscan is pleased to be an A2B Technology Partner. Through this partnership A2B and

Microscan are able to provide a total UID Solution with A2B's UID Comply!® software and Microscan's UID verification and reading systems.

AIM DPM-1-2006 also considers the best illumination for all types of marks. For this reason the MIL-STD-130N implementation of AIM DPM-1-2006 verification recommends ten different lighting configurations. (Nine lighting configurations from AIM DPM-1-2006, and one

For more on these verification standards download the whitepaper entitled, "*Application of Data Matrix Verification Standards*" at <http://www.microscan.com/en-us/TrainingAndResources/Resources.aspx>

UID AND RFID EDUCATIONAL WEB SEMINARS:

UID Educational Web Seminars from Data Capture Institute



In our quest to provide ongoing education to those who are implementing UID we offer the following seminar series:

David Collins, President of Data Capture Institute, has been engaged by A2B to present a series of UID Web Seminars as a non-commercial, educational service to those who are required to implement UID.

David is considered by many to be the "father of the bar code industry" having led the original bar code project, KarTrack, for Sylvania in the early 1960s and later, in 1968, founding Computer Identics Corp, the first company to design and manufacturer commercial bar code scanners. Over the years

Collins and his team have overseen thousands of bar code installations around the world. He is author of the popular 1992 book, "Using Bar Code – Why It's Taken Over" and is a frequent keynote speaker and automatic data collection seminar presenter. As a member of the UID integrated product team (IPT) he is uniquely qualified to respond to the questions and concerns of companies of all sizes, including large, multi-national enterprises as they grapple with UID implementation.

Upcoming UID Web Seminar Dates

- (Presented each day at 2:00 Eastern)
- Tuesday, March 3
- Thursday, March 19
- Tuesday, April 14
- Thursday, April 23

To register for any of these dates, email pchasse@a2btracking.com or click on this link: http://www.uidsolutions.com/webinar_signup.aspx

NEWS FROM A2B TRACKING:

Latest Press Releases

2/1/2009 - Integrity Equipment LLC Wins Third Annual Partner Excellence Award

PORTSMOUTH, RI - A2B Tracking Solutions President Peter M. Collins announced today that Integrity Equipment Sales & Service, LLC of Manchester, NH has been chosen to receive A2B's annual Partner Excellence Award...

12/9/09 - Peter Collins Named AIM North America Vice President

PORTSMOUTH, RI - A2B Tracking Solutions President Peter M. Collins was recently elected Vice President of AIM North America. Collins also serves on the AIM Board of Directors and was interim head of the UID Supplier Alliance, an AIM sub-committee...

12/15/08 - Congressman Patrick Kennedy Visits A2B Tracking Headquarters

PORTSMOUTH, RI – Congressman Patrick Kennedy (D-RI) met today with A2B Tracking Solutions' executives and greeted staff during a tour of the company's Portsmouth facility. He offered congratulations for the company's recent \$70 million award from the Air Force for UID implementation. He also received a briefing and an update on UID policy and implementation progress...



12/3/08 - A2B Tracking Solutions Founder Receives Prestigious International Award

PORTSMOUTH, RI - Peter M. Collins, Founder and President of A2B Tracking Solutions Inc., has received the prestigious ID People Leadership Award from the ID WORLD International Congress. The winners of this year's ID People Awards – the Oscars of the Auto ID industry – were revealed during the seventh ID WORLD International Congress, held in Milan, Italy in late November. Awards were presented at the annual ceremony in recognition of the contribution made by leaders, innovators and pioneering adopters who have distinguished themselves by their achievements during the past year...

A2B Travels

UID Forum



We look forward to seeing you at the UID Forum in Denver, CO on April 6-7. Stop by booth # 21 to learn about our UID products and services including the latest updates to our UID Comply!@ data management software.



NPMA Western Region Meeting

A2B's National Sales Manager, Marc Corriveau is a featured speaker at this Las Vegas, NV event on March 5-6 where we are also exhibiting.