

UID JOURNAL
Unique Item Identification

UID Journal Institute

Presents:

Automatic Identification and Data Capture

Thirty Three Lectures

Seven System Design Labs and Eight Equipment Labs

Seven Self-Focused Learning Exercises

**Utilization of UID label printing & Asset Management Design
Software**



National University

San Diego

December 1-3

Please share this brochure with your colleagues

SYLLABUS:

This AIDC course covers **all of the aspects** of AIDC technologies. Equipment labs, system design workshops and self focused exercises are scattered throughout the course to enhance learning. Your instructors have over forty years of combined experience in the AIDC industry.

The AIDC course is broken down into three segments over a 3 day period. **101** concentrates on Bar Code Technologies and the U.S. Department of Defense (“DoD”) requirement for **UID Unique Identification** UID on Serial Controlled assets with the mandate beginning Sept. 2007. **201** looks at RFID and how it is used throughout industry to increase productivity. **301** combines both UID / Bar Code and RFID in system design applications. You will also be able to perform a cost justification and system design for your AIDC application. Students will receive a certificate of completion for completing the course.

WHO SHOULD ATTEND:

- Logistics
- Inventory
- Warehousing
- Transportation
- Industrial/Design/Quality Engineering
- Supply Chain Management
- Product Engineering/Management
- Distribution
- Procurement Managers
- Telecom Central Office
- Management Information Systems



Students performing system design workshops

Segment 101 Bar Code / UID

Day 1:

MODULE 1 - General Introduction to AIDC

This module contains a general understanding of the history and benefits to industry of AIDC technologies. Bar Code 1D and 2D, RFID, Biometrics and other AIDC technologies will be discussed.

Bar Code 1D and 2D

1D 2D Matrix

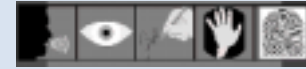
Biometrics:

Voice Recognition
Signature Recognition
Fingerprint Recognition

RFID Passive and Active

Passive / Active Tags

Eye Retina
Hand Geometry



Other Technologies

Smart Cards
VisiDot Technology

Contact Memory

Module 2 - Bar Code Standards

Learn the latest International ISO standards, which are now being used throughout the AIDC industry. Learn how to take advantage of the industrial and retail standards for product, package and shipping applications. 2D requirements for the DoD, telecommunications and other industries will also be covered. The most popular global standards will be reviewed.

- ANSI MH10
- GS1
- ATIS (Telecommunications)
- Mil-Std 130
- ISO/IEC JTC1/SC31
- ISO TC 122
- Electronics
- Mil-Std 129

MODULE 3, 3A, 3B - Bar Code 1D / 2D / Matrix

The most popular 1D, 2-D and Matrix symbologies, which are in use throughout the world, will be covered in detail.

1D Linear Symbologies

- Code 39
- Code 128
- GS1 (EAN & UPC)
- Interleaved 2 of 5

2D and Matrix Symbologies

- PDF 417
- Data Matrix
- MicroPDF-417
- MaxiCode
- Composite Codes
- QR Code

1. Self-Focused Learning Exercise



Module 4 - Printing Techniques

Selection of the proper printing technology for your application is imperative for successful implementation of a bar code system. Explore the options of producing media on-site or through a service bureau.

Learn a variety of technologies used to create bar code labels or direct part marking and select the best technology for your application.

Traditional

Dot Matrix
Ink Jet
Laser
Data Plates

Chemical or Laser etching
Thermal transfer
Dot Peen

Substrates: Paper, Polyester, Aluminum, Stainless Steel

2. Self-Focused Learning Exercise

Lab 1 Printing and Label Design

Each student will download label design software in order to design and print a variety of industrial label designs.

Module 5 - Verification of 1D/ 2D / Matrix codes

Most bar code application standards today require verification of the bar code in accordance with the ISO/IEC 15415 (or ANSI X3.182 Print Quality Guideline) and the AIM DPM specifications. This is in order to obtain the highest readability of the bar code.

You will learn why and how to establish a bar code verification program within your organization.

Failure Causes Corrective Actions

3. Self-Focused Learning Exercise

Lab 2 Verification Lab

A demonstration of Verification equipment will be utilized allowing each student to understand the process.

Module 6 - Scanning and Data Collection Terminals

A major decision is the selection of the right type of scanning and data collection devices for a particular application. How these devices function in order to capture vital information will be covered within this module. Also covered will be all of the major data collection terminals and scanning methods, which are in use today and how they are used in various applications. RFDC 802.11 and Bluetooth and Infra-red technologies will be covered in detail.

Scanning Technologies

Fundamentals	Decode Functions
Wand	CCD
Image Technology	Laser
Industrial Scanners	

Data Collection Terminals

- Wedge Scanner RFDC Terminals
- 802.11 / Blue Tooth / Infrared
- RF site survey and Access Point locations
- Shop Floor Terminals
- Bar Code Readers
 - Hand Held
 - Fixed
- PDA Technologies

4. Self-Focused Learning Exercise

Lab 3 Scanning Lab

Scanning of 2D bar code labels.



Module 7 - Understanding UID (Unique Identification)

What is UID/UID/UID?

Who is required to adhere to UID

- Controlled Inventory
- Serially Managed
- Mission Essential
- Items over \$5,000

Syntax and Semantics

- Construct 1 and 2
- Data Qualifier

Data, Application and Text elements

UID structure ISO 15434

RFID on Packaging

5. Self-Focused Learning Exercise

Module 8 - DoD Registry

Once the UID mark is read and validated for both structure and quality, the data is sent to the DoD registry. This module will cover how to get the UID data into the registry.

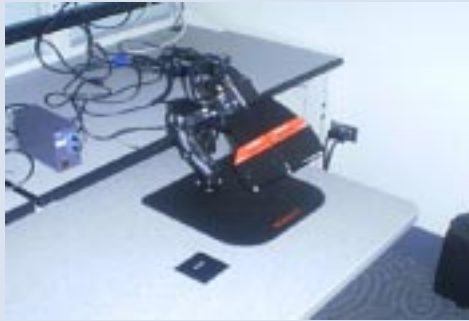
- Pedigree Information
- File Transfer Protocol
- Wide Area Work Flow (WAWF)
- EDI (Electronic Data interchange)
- Global Exchange Service (GEX)
- Government Furnished Property (GFP)



YAG laser etching equipment used to etch UID data plates

Lab 4-UII Printing, Verification and Reading

Students will utilize a Direct Part Marking printer, Verification equipment and readers to verify UII Data Plates. Software will also be used to create UII Data Plates and labels.



Verification Equipment used to verify UII mark

Module 9 - Potential Industrial Applications

Bar code technology is a fast and accurate means of capturing data in a large variety of applications today. Industrial applications will be covered showing a variety of solutions.

Industrial Applications

Inventory	Tool Crib
Time & Attendance	Incoming Inspection
Shipping	Document Tracking
Receiving	Fixed Assets
Shop Floor	Transportation

Module 10 - Case Studies

Case studies will portray the opportunity, the solution and benefits obtained from a bar code systems. Five case studies will portray the opportunity, the solution and benefits obtained from an AIDC system. Learn the approach these companies used and the types of equipment selected for their application.

Bar Code and UID Interim Examination

Segment 201 RFID

Day 2:

Module 11 - RFID Standards

Learn the latest ISO RFID standards that govern the frequencies and application of RFID.



Module 12 - Radio Frequency Identification RFID

RFID tags speeds the collection of data in dirty, oily, wet or harsh commercial as well as industrial environments. RFID continues to emerge as a major automatic identification technology. RFID is often embedded in systems with other technologies, such as bar code and RFDC (802.11) data collection. Unlike bar code, RFID tags are virtually impossible to copy. The technology is ideal for confidential identification of goods or assets. RFID is fast: Tags and readers communicate in some cases up to 1000 times per second. RFID will read through dirt, paint and cement. Learn how RFID works and whether to select a Passive or Active system. (Select the right reader and transponder for your application)

How RFID Works:

What is RFID?

The Physics of RFID

Wireless Communication and Air Interface

Frequency / Data Read Rate / Applications

Transponders/Tags

- Active Tags

- Semi-Active / Semi-Passive Tags

- Battery Assist Passive Tags

- Passive Tags

 - Storage Capacity

 - Environmental Controls

 - Anti-Collision Capability

Readers / Antenna Configurations

- Duplicate Removal (filtering)

Smart Label Printers

Programming

Physical Packaging

6. Self-Focused Learning Exercise

Module 13 - Physics of RFID

Electrical and Magnetic Fields

Frequency and Wavelength

RFID Components

RFID Tag Transponder / Integrated Circuit (Chip)

- Passive Tag Antennas / Coupling / Resonance

 - Antenna Shape and Tuning

- Reader Antenna Systems / Reader (Transceiver)

- Reader Interface Layer

Read Distance / Number of tags read

Security of Data / Gen2 Memory

Potential Interference /Air Interface Protocol

7. Self-Focused Learning Exercise

Lab 5: Students will have the opportunity to test various RFID tags

Module 14 - EPC, EPC Information System (EPCIS) and the Global Data Synchronization Network (GDSN)

This module explains what an Electronic Product Code (EPC) is, how the data from the tag can be used in the EPC Information System and how Data Pools relate to the Global Registry in the Global Data Synchronization Network (GDSN) for tracking an EPC tag through its lifetime.

Module 15 - Understanding EPC and ISO Structures

The EPC and ISO tag Structure:

- ISO Tag Layout and how EPC fits in
- Numbering System Identifier / Application Family Identifier
- Protocol Control (PC) bits
- Calculating CRC-16 for the PC bits

Module 16 - RFID Printing

In this module you will learn the techniques for printing RFID tags using Smart Label Printers.



Lab 6- An RFID Smart Label Printer will be used to print Gen-2 labels

Module 17 - RFID Readers

Portable, mobile to fixed readers will be discussed . How to locate and configure readers for a number of applications such as portals, conveyors, shrink-wrap and smart shelves.

Module 18 - Setting Up An RFID Lab

Students will learn how to establish an RFID testing lab in order to test:

- | | |
|-----------------------------|----------------------|
| Readers Performance Testing | Tag Characterization |
| Antennas Pattern Testing | Conveyor Testing |

Lab Setup and testing Exercise

Lab 7 Solution to Exercise for encoding an EPC tag.

Module 19 - RFID Strategic Plan Development

This module will be a step by step process in performing an RFID site survey from a consulting prospective.

- Site mapping
- Equipment locations
- Gathering documentation
- Process flow charting
- Cost data analysis
- Equipment configuration
- Report Generation

Module 20-20A - RFID Applications and Case Studies

Various applications and case studies using RFID in a variety of industries will be given.

- | | |
|------------------|----------------------|
| - Aerospace | - Automotive |
| - Distribution | - Quality |
| - Transportation | - Manufacturing |
| - DoD | - Telecommunications |

RFID Interim Examination

Segment 301 System Design Bar Code to RFID

Day 3:

Module 21 - Getting Started with AIDC Implementations

AIDC implementation can have a major impact on the entire organization. Learn a step by step approach in order to have a successful implementation without pitfalls. This section is a key part of the entire application process. Topics to be covered include:

- | | |
|---------------------------|-----------------------|
| Getting Started | Potential Pitfalls |
| Formation of Project Team | Training |
| Standards Development | Implementation Stages |
| Vendor Selection | Audit Process |
| Performing RF Site Survey | |

Module 22 - Host Connectivity

Covered will be the best alternatives for integrating the RFID and Bar Code peripherals into corporate computing systems. What are the advantages and disadvantages in each of these various options?

Alternatives

- | | |
|---------------------|----------------------|
| Batch | Middleware approach |
| On-line, Real -Time | Distributed Networks |

Module 23 - Cost Justification

RFID and Bar Code systems in general have a very high return on investment (ROI). Learn the techniques that companies use to justify the implementation of RFID / Bar Code systems. Learn how to prepare a cost justification analysis, Return on Investment Analysis and Rate of Return

8. Cost Justification Exercise

Module 24 - Inventory Management

RFID and Bar Code are an essential part of the inventory process in providing both accuracy and speed of data collection. These technologies enhance the entire global supply chain and have an effect on all sub systems within that process (ERP, MRP, JIT, EDI, EC).

Topics Include:

Purchasing Process
Fast receiving with RFID and bar codes
Supplier Certification
RFID and Bar Coding an ERP, EC, MRP and JIT process
Case studies
Several alternatives in designing a receiving process
RFID Antenna Locations

Module 25 - Warehousing and Distribution utilizing UID

Learn how to increase your inventory accuracy while reducing the amount of time it takes to perform inventory transactions. You will learn how to label your warehouse locations and UID packaging to provide accurate methods of inventory transactions. This section will discuss a variety of RFID and Bar Code warehousing methods, ranging from small inventory applications to very large distribution centers.

Topics will include:

Putaway transactions
Cycle Counting Methods
Picking methods
Replenishments
Batch or RFDC inventory systems

Lab 8 System Design You will participate in a workshop in which you will select the best RFID or Bar Code alternative in the automation of a warehouse.

Module 26 - Shop Floor (Production)

How are you collecting material movements, labor reporting and maintaining a Total Quality Control process? Learn how several other corporations have taken advantage of RFID and bar coding to control these processes with applications ranging from:

Time & Attendance systems
Methods of tracking material movements
Quality reporting
Labor collection and accurate time standard

Case studies will range from:

Printed Circuit Board Manufacturing
Disk Drive Manufacturing

Lab 9 System Design Workshop: At the end of this module you will have the opportunity to design a shop floor tracking system.

Module 27-27A - Retail / Telecom Applications

You will learn AIDC solutions used in the Retail and telecommunications industry:

- Distribution
- Document Tracking
- Warehousing
- Maintenance
- RFID in dispatch, inventory & asset management

Lab 9A Design of a Retail AIDC System

Module 28 - Document Tracking and Asset Management

How do you currently track and store your documents and manage Assets? RFID and Bar Code along with GPS (Global Positioning Systems) methods will enhance this process by providing an accurate method of traceability.

Hazardous Waste Computers
Tools Office Equipment

Module 29 - System Design Workshop 3:

Students will load, create and test an Asset RFID / UID Management system. Students will be given software to load into their notebooks. They will then learn to create and then test the movement of UID / RFID assets. Image scanners, RFID readers, UID and RFID Gen2 labels will be provided. Students will then be able create their own Asset tracking system.

Lab 10: Asset Management Design Workshop using TraxFast software

Module 30 - System Design Workshop 4:

Students will undertake an inventory case study which, will allow them to design a system using RFID and or bar code technology.

Design System Perform Cost Justification
Conduct an RF site survey Design Labels
Select Hardware Define System Functionality

Lab 11: You will design an inventory RFID / Bar Code system

Final Examination



Both Instructors are members of AIDC 100: AIDC 100, a not-for-profit international organization comprising the top 100 men and women who invented, established and continue to expand the use of automatic identification and data collection (AIDC) technology:

Robert W. Rylander is President of Robert W. Rylander and Associates and has worked in the Automatic Identification industry for the past twenty five years. He is a member and the education chairman for the AIDC (Automatic Identification / Data Capture) 100 professional organization. Seven years with Symbol Technologies Inc. as Senior Manager of Consulting Services for the Worldwide Education Group and prior to that Senior Consultant, Intermec Corporation. He has worked in manufacturing for over 23 years and has held managerial positions in the Quality Assurance field for several large corporations. During the period that he was in manufacturing, he managed the implementation of Shop Floor and Inventory bar code systems for ITT, Storage Technology, and Digital Equipment Corporation. For the past several years, he has consulted for over two hundred industries in the development of AIDC Strategic Plans and AIDC Standards. Mr. Rylander was awarded first place in the Materials Handling Institutes, "Concepts for the 80's", for his total live shop floor control and bar code concepts. He conducts seminars and AIDC workshops for several organizations and universities. He has been a member of the BCSC (TCIF) / MH10 and EIA standard committees for several years, responsible for developing standards for Industry. For the past twelve years he has conducted AIDC workshops in the Pacific Rim countries of Japan, Singapore, Malaysia and Hong Kong. Robert has just completed a UID CD training program for the Department of Defense and has conducted two and three day RFID courses at several universities within Australia and the US.

Robert H. Fox has been involved with bar codes and automatic identification for the past 18 years. He currently provides consulting services for the implementation of automatic identification systems for telephone companies and equipment manufacturers.

He is a member of the AIDC (Automatic Identification / Data Capture) 100 professional organization and is CompTIA RFID+ certified. He chairs the telecommunications industry (ATIS – the Alliance for Telecommunications Industry Solutions) Bar Code/Standard Coding Committee (BCSC), which develops AIDC guidelines for product, package and shipping labels. He also participates on the Consumer Electronics Association (CEA) Automatic Data Capture Committee, which sets national standards for bar code usage for the electronics industry, on the ANSI MH10 Subcommittee 8, which sets national material handling labeling standards and on the U.S. Technical Advisory Group for international standards for bar code and two-dimensional symbol print quality, data structure, radio frequency identification (RFID) and equipment conformance. Mr. Fox has provided guidelines for specifying and selecting bar code label materials and print technology, as well as specifications and training to telecommunications companies to incorporate bar code technology; procure bar code labels; select bar code scanners, portable data collectors and bar code printers for several tracking and inventory projects. He is currently leading the telecommunications industry in the development of a guideline for the use and benefits of RFID technology in the telecommunications supply chain. He has written a white paper on RFID for the Telecommunication Industry.

Course Tuition:

\$1,995.00

25 % Early Bird Discounts before October 30th
Group Discounts Available Upon Request
Optional College Credits

Includes :

UID Journal Workbook Volume 1
Course Materials
Certificate of Completion
Continental Breakfast
Lunch

Registration:

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