

# RFID

## eLearning Courses



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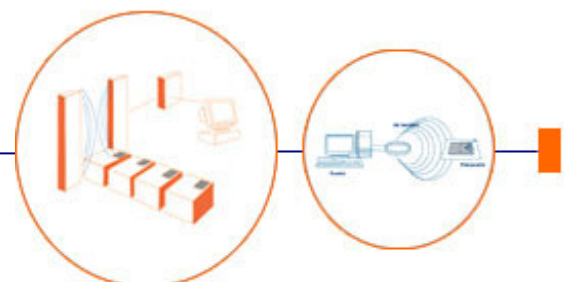
**RFID4u**<sup>®</sup>

Be one of the first to train **online** for your RFID certification and other cutting edge RFID courses! Whether you're a novice or a seasoned RFID Pro, RFID4U offers self-paced training that is convenient, effective, and affordable. Our online training portal gives you access to many libraries full of engaging, interactive course content, assessment features, and additional resources to maximize your learning. These e-Learning courses are designed to provide maximum learning in minimal time and offer a visually engaging, guided learning experience with highly interactive features, including assessments, rich simulations, and labs for practice.

### CompTIA RFID+™ Certification eLearning Package



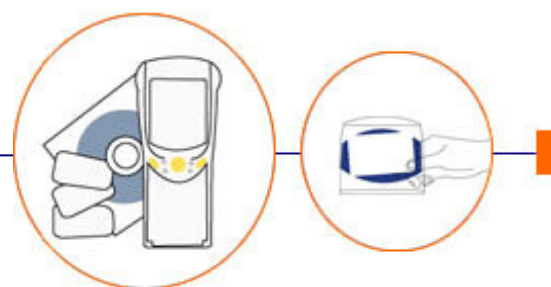
CompTIA Radio Frequency Identification RFID+ certification validates the knowledge and skills of professionals who work with RFID technology. It is an international, vendor-neutral credential that recognizes a professional's ability to install, maintain, repair, and troubleshoot the hardware and software functionality of RFID products. Although not a prerequisite, it is recommended that CompTIA RFID+ candidates have a minimum of six to twenty-four months of RFID technology experience.



CompTIA RFID+ Certification package is a suite of courses and learning tools, which prepare you for taking and passing the CompTIA RFID+ Certification exam. It is available in two options RFID500 or RFID600 package. The suite of courses maps into the nine CompTIA RFID+ Certification Exam objectives, where each course is related to one objective. Although the courses follow the sequence of CompTIA objectives, for the most optimized learning, we suggest you take the courses in the following order:

	Code	Exam	Objective
1	RFID601	CompTIA RFID+:	Interrogation Zone Basics
2	RFID604	CompTIA RFID+:	<b>Tag Knowledge</b>
3	RFID608	CompTIA RFID+:	<b>RF Physics</b>
4	RFID609	CompTIA RFID+:	<b>RFID Peripherals</b>
5	RFID603	CompTIA RFID+:	<b>Standards and Regulations</b>
6	RFID607	CompTIA RFID+:	<b>Site Analysis</b>
7	RFID605	CompTIA RFID+:	<b>Design Selection</b>
8	RFID606	CompTIA RFID+:	<b>Installation</b>
9	<b>RFID602</b>	<b>CompTIA RFID+:</b>	<b>Testing and Troubleshooting</b>

The package also includes the RFIDQ<sup>®</sup> - Practice Test CD/Software, which should be used throughout the learning process to review the topics of each objective in form of quiz questions. Another learning tool included in this bundle is the RFID+ Passport Book authored by RFID4U, which includes all information needed for the CompTIA RFID+ certification exam. Each chapter is followed by quiz questions. The book also contains a CD with additional 81 practice questions. We suggest that you use the book in conjunction with the e-learning courses and work through each chapter after you successfully completed each e-learning module in order to supplement the information and reinforce the subject. Once you are prepared for the certification exam, you can schedule your test at Pearson VUE testing center with the VUE Testing Voucher, which is also a part of this package (RFID600 only).



## CompTIA RFID+™ Certification e-Learning Package

### 9 Course Modules

- ✓ CompTIA RFID+: Interrogation Zone Basics
- ✓ CompTIA RFID+: Tag Knowledge
- ✓ CompTIA RFID+: RF Physics
- ✓ CompTIA RFID+: RFID Peripherals
- ✓ CompTIA RFID+: Standards and Regulations
- ✓ CompTIA RFID+: Site Analysis
- ✓ CompTIA RFID+: Design Selection
- ✓ CompTIA RFID+: Installation
- ✓ CompTIA RFID+: Testing and Troubleshooting

### Practice Test CD



Exam Voucher worth of \$251  
(in RFID600 only)



### Passport Book



### Obtain More

- Interactive, 'Hands-on' Simulations
- Mentoring Support
- Summary After Each Module
- Progress Tracking
- Comprehensive Glossary
- Sample Tags

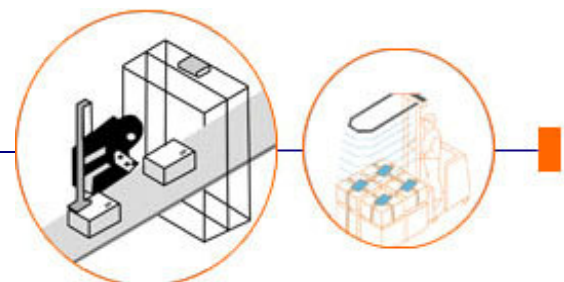
## Course Outline

### ❖ RFID Physics

To understand the factors affecting the performance of an RFID system, implementers need to comprehend the nature and behavior of radio waves. This course describes how radio waves travel through space, or “propagate,” and how their effectiveness changes as they travel. It also discusses various communication methods between interrogators and tags, as well as characteristics of antennas, such as gain, directivity, polarization and impedance. A section of the course is dedicated to numerous types of antennas, their usage and the different kinds of antenna cable and connectors used to attach antennas to RFID interrogators. Furthermore, this course explains Effective Radiated Power (ERP) and Effective Isotropically Radiated Power (EIRP) calculations.

#### **This course maps to the following CompTIA objectives for RF Physics:**

- ✓ Identify RF propagation/communication techniques
- ✓ Describe antenna field performance /characteristics related to reflective and absorptive materials
- ✓ Given a scenario, calculate radiated power output from antenna based on antenna gains, cable type, cable length and interrogator transmit power



## ❖ RFID Tags

This course explains the RFID tag's components and subassemblies, types of tags and the reason for having various tag types, different tag performance parameters and tag selection criteria. A tag's behavior changes according to the material to which it is attached, as well as the condition of the surrounding environment. Therefore, selecting an appropriate tag for the object material, and properly applying it to the object, is the most important factor in the successful deployment of an RFID system.

### **This course maps to the following CompTIA objectives for Tag Knowledge:**

- ✓ Classify tag types
  - Select the RFID tag best suited for a specific use case.
    - Pros and cons of tag types
    - Tag performance
      - Tag antenna to region/frequency
  - Identify inductively coupled tags vs. back-scatter
  - Identify the differences between active and passive
- ✓ Given a scenario, select the optimal locations for an RFID tag to be placed on an item.
  - Evaluate media and adhesive selection for tags
  - Tag orientation and location
    - Tag stacking (shadowing)
  - Package contents
  - Packaging
    - Items
    - Tags
    - Labels
    - Inserts
  - Liquids
  - Metal
  - Polarization

## ❖ Interrogation Zone Basics

This course describes the various types of RFID interrogators (readers), their components and the functionality of RFID interrogators. You will also learn about interrogator antennas: their types, polarization and function. A section of this course is dedicated to interrogator operation, including air interface and data protocols, dense reader mode, anti-collision and other tag management practices. The last section of the course discusses interrogation zone configuration, as well as interference problems that can arise while optimizing the system.

### **This course maps to the following CompTIA objectives for Interrogation Zone Basics:**

- ✓ Describe interrogator functionality
  - I/O capability
  - Handheld interrogators
  - Vehicle-mount interrogator
  - LAN/Serial communications
  - Firmware upgrades
  - Software operation (GUIs)
- ✓ Describe configuration of interrogation zones
  - Explain interrogator-to-interrogator interference
  - Optimization
  - System performance and tuning
  - Travel speed and direction
  - Bi-static / monostatic antennas
- ✓ Define anti-collision protocols (e.g., number of tags in the field/response time)
- ✓ Given a scenario, solve dense interrogator environment issues (domestic/international)
  - Understand how a dense interrogator installation will affect network traffic
  - Installation of multiple interrogators, (e.g., dock doors, synchronization of multiple interrogators and antenna footprints)

## ❖ RFID Peripherals

Every RFID implementation needs peripheral devices, such as RFID-enabled printers; RFID-based automated label applicators (also known as "print-and-apply" devices); feedback systems, such as light stacks, horns, LED lights or LCD displays; and triggering devices, such as light break sensors. These devices enhance the capabilities of an RFID system, control I/O devices and system timing functions, and provide on/off capabilities for various business applications. Peripherals also improve human interactions with RFID hardware by assisting with automatic data collection and increasing the safety of the system. Additionally, this course discusses RFID printers, including their installation and setup, automated label applicators, feedback systems, triggering devices and Real-Time Location Systems (RTLS).

### **This course maps to the following CompTIA objectives for RFID Peripherals:**

- ✓ Describe installation and configuration of RFID printer
- ✓ Describe ancillary devices/concepts
  - RFID printer encoder
  - Automated label applicator
  - Feedback systems (e.g., lights, horns)
  - RTLS

## ❖ Standards & Regulations

This course discusses various standards and regulations that influence the design and use of RFID systems. The course includes a brief summary of a few RFID mandates issued by some commercial and government organizations, which drive a large number of RFID implementations today.

### **This course maps to the following CompTIA objectives for Standards and Regulations:**

- ✓ Given a scenario, map user requirements to standards
  - Regulations/standards that impact the design of a particular RFID solution
- ✓ Identify the differences between air interface protocols and tag data formats
- ✓ Recognize regulatory requirements globally, as well as by region
- ✓ Recognize safety regulations/issues regarding human exposure

## ❖ Site Analysis

This course focuses on a site survey, discusses the planning that goes into the site survey, highlights various aspects that should be examined when performing the site analysis (such as site anomalies) and provides pointers regarding how to generate the site survey report.

### **This course maps to the following CompTIA objectives for Site Analysis:**

- ✓ Given a scenario, demonstrate how to read blueprints
- ✓ Determine sources of interference
  - Use analysis equipment such as a spectrum analyzer to determine if there is any ambient noise in the frequency range that may conflict with the RFID system to be installed
- ✓ Given a scenario, analyze environmental conditions end to end

## ❖ Designing an RFID system

System design is a very critical part of any RFID implementation, because without the right design and the proper hardware and software, the implemented RFID system might not function properly. With the exception of adhering to a budget, the steps of design selection and design considerations discussed in this course adhere to standards and regulations, as well as compliance with trading partner mandates, selection of operating frequency, tags, interrogators, antennas, peripherals and software.

### **This course maps to the following CompTIA objectives for Design Selection:**

- ✓ Given a scenario, predict the performance of a given frequency and power (active/passive) related to read distance, write distance, tag response time and storage capacity
- ✓ Summarize how hardware selection affects performance
  - Antenna type
  - Equipment mounting and protection
  - Cable length/loss
  - Interference considerations
  - Tag type (e.g., active/passive and frequency)

## ❖ RFID Installation

This course discusses installation techniques for successful RFID implementations, including antenna installation, portal performance and design, conveyor portal design, electrostatic discharge (ESD), grounding and cable issues, pre-installation decisions, routine installation procedures and post-installation checks. This course also includes examples of various installation types.

### **This course maps to the following CompTIA objectives for Installation:**

- ✓ Given a scenario, describe hardware installation using industry-standard practices
  - Identify grounding considerations
  - Test installed equipment and connections
- ✓ Given a scenario, interpret a site diagram created by an RFID architect describing interrogation zone locations, cable drops and device mounting locations

## ❖ Testing and Troubleshooting

This course discusses obstacles to RFID system implementations, RF field issues and variables affecting the ability to read tags consistently (such as interference), the tagged material's impact on tag performance and tag placement. Troubleshooting methods and solutions for slow reads, no reads and missed reads are further discussed.

### **This course maps to the following CompTIA objectives for Testing and Troubleshooting:**

- ✓ Given a scenario, troubleshoot RF interrogation zones (e.g., root-cause analysis)
  - Analyze less-than-required read rate
    - Identify improperly tagged items
  - Diagnose hardware
    - Recognize need for firmware upgrades
  - Equipment replacement procedures (e.g., antenna, cable and interrogator)
- ✓ Identify reasons for tag failure
  - Failed tag management
  - ESD issues
- ✓ Given a scenario, contrast actual tag data to expected tag data.

## **CompTIA RFID+ Certification Passport**

Publisher: McGraw Hill

Authored by RFID4U

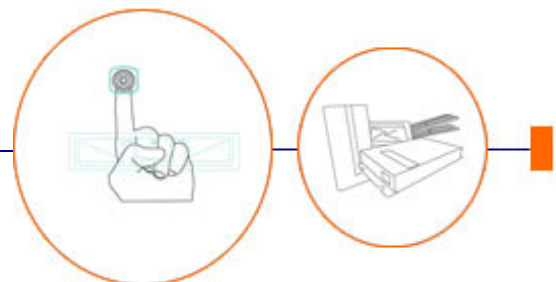
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\$39.99 • 336 pages • 75 illustrations

Get on the fast track to becoming CompTIA RFID+ certified with this affordable, portable study tool. Inside, RFID experts guide you on your career path, providing expert tips and sound advice along the way. With an intensive focus on only what you need to know to pass the CompTIA RFID+ exam, this certification passport is your ticket to success on exam day.

- Itineraries--List of official exam objectives covered
- ETAs--Amount of time needed to complete each lesson
- Travel Advisories--Expert advice on critical topics
- Local Lingo--Concise definitions of key terms and concepts
- Exam Tips—Common exam pitfalls and solutions
- Checkpoints—End-of-chapter questions, answers, and explanations
- Career Flight Path--Career options mapped out to maximize the return from your IT journey
- Practice Exam on CD



## **RFID Industry Courses**

### ➤ **RFID 700 - RFID Technology Basics** (Free Registration)

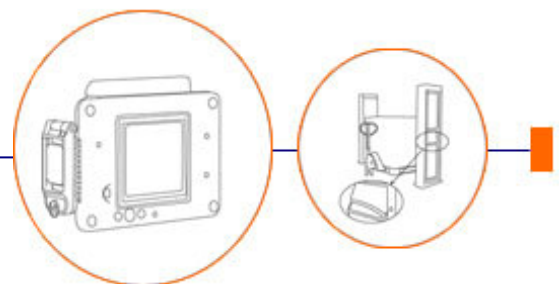
This course helps learners to understand the fundamentals of RFID technology and provides an overview of RFID hardware including different types of tags, tag frequencies, readers, antennas, and so on. The middleware as well as EPC network and current mandates are also briefly discussed. This course is an introduction to the whole suite of RFID4U e-learning courses that take you deeper into all topics mentioned here as well as provide insight into various verticals and uses of RFID technology.

#### **RFID Basics course discusses:**

- Value proposition
- RFID System components
- Comparison to other Auto-ID technologies
- RFID Hardware – Tags, Readers
- RFID Software
- EPC Network
- Mandates
- Software: drivers, middleware, enterprise applications

**Languages:** English, Spanish

**Duration:** 2hrs. +



➤ **RFID 702 - RFID and DoD/UID Compliance** (Free Registration)

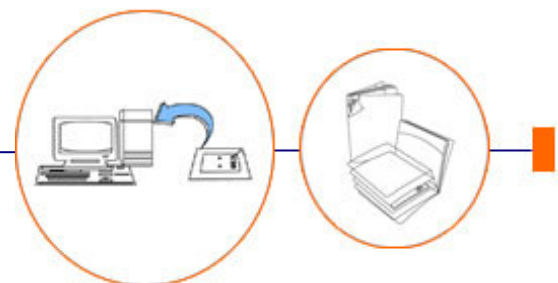
This course is essential for anyone who wants to learn more about the RFID policies and mandates U.S. Department of Defense posed on its suppliers. This course explains what UID is, how it is created and which items must be marked with UID. It also discusses the RFID mandate and explains which units need RFID tag, what type of identification should be encoded into this tag and how to submit the information through the Wide Area Work Flow. Various compliance options are presented as well as demos of popular compliance software on the market. This course also includes exercises that teach how to correctly encode a DoD construct as well as create a compliant RFID label.

**RFID and UID DoD Compliance course covers:**

- DoD's RFID Policy
- UID
- Wide Area Work Flow
- Tag Data
- Compliance Options
- Compliance Software
- Quiz

**Languages:** English, Spanish

**Duration:** 2hrs. +



➤ **RFID 704 - RFID in Pharma**

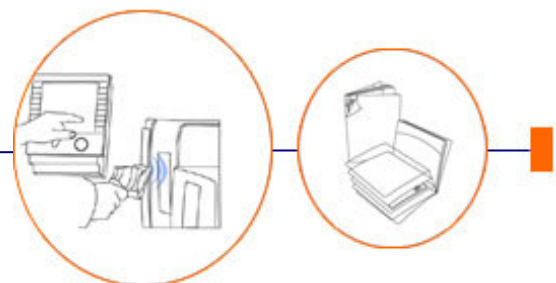
Pharmaceutical industry has been using RFID for a while but now with the increasing threat of counterfeiting as well as new FDA mandates and recommendation, Pharma companies and supply chain partners have to get serious about tracking drugs through their chains of custody. This course provides insight into the challenges for Pharma industry as well as various types of RFID technology that can help overcome these challenges. The course also includes videos to illustrate uses of near-field RFID technology as well as tag encryption.

**RFID in Pharma course discusses:**

- Value proposition
- Challenges ahead
- Solutions
- Privacy and security issues
- Integration challenges
- Costs of various solutions
- Vendors
- Mandates
- Implementation
- Case studies

**Languages:** English

**Duration:** 2hrs. +



➤ **RFID 705 - Asset Tracking Using RFID**

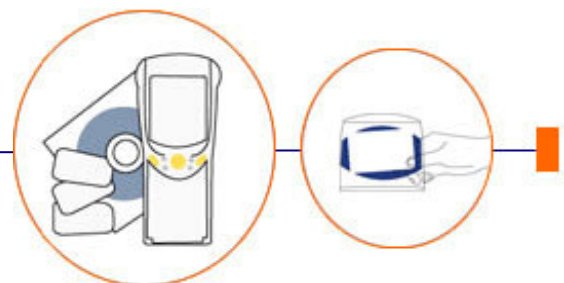
Companies need to know the location of their assets at every stage of the asset's life-cycle. This knowledge is essential to achieve efficient operation, prevent shrinkage and asset misplacement, fight counterfeiting, help with recalls, lower inventory carrying cost and prevent stock-outs. RFID can help with automated tracking of location and movement of assets, which can be accomplished in real-time or near real-time. This course takes you through examples of asset tracking using RFID and teaches how to implement such systems.

**This course covers:**

- Reasons for asset tracking
- Asset tracking in supply chain
- Hardware
- Privacy concerns
- Asset tracking in manufacturing, in pharmaceutical industry, in hospitals, and libraries
- Air cargo tracking
- Asset tracking in offices
- And the summary of asset tracking benefits

**Languages:** English

**Duration:** 2hrs. +



➤ **RFID 701 - RFID Solutions Building (For Pre Sales and Sales Engineers)**

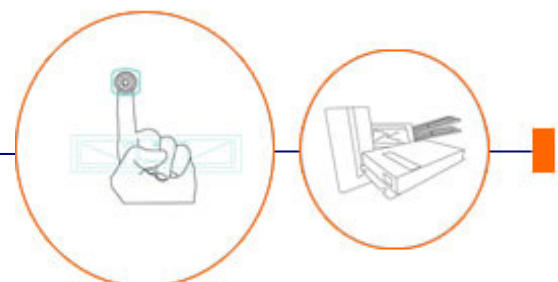
RFID Solutions Building course is intended for pre-sales and sales engineers responsible for providing solutions based on RFID technology. This course discusses all types of RFID technology, teaches how to build a solution and presents common solutions for each type of RFID technology. This information is supplemented by standards related to each technology, as well as list of current suppliers.

**This course covers:**

1. Overview of each type of RFID technology
  - Passive - LF, HF, UHF, Microwave
  - Active (including RTLS)
  - Semi-passive
2. How to build a solution
  - Questions to ask
  - Hardware and software you will need
3. Common solutions for each type of technology (passive LF, HF, UHF, microwave, active, semi-passive)
  - Common Use Cases
  - Standards
  - Suppliers
  - Comparison to other technologies
  - Case Studies

**Languages:** English

**Duration:** 2hrs. +



➤ **RFID 800 - Zebra Products Training**

The suite of 5 Zebra RFID Training courses provides a unique blend of RFID fundamentals with overview of Zebra products, their installation and troubleshooting, as well as printer programming using Zebra Programming Language (ZPL).

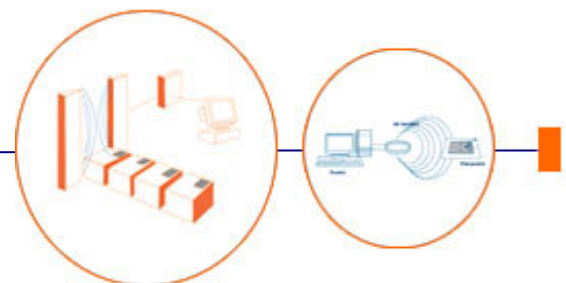
**Languages:** English

**Duration:** 10 hrs. +

✓ **Module 1: Zebra: RFID Basics**

In this course you will learn RFID basics including RF theory essentials, global RFID standards with detailed insight into EPC Gen 2 technology and role of RFID printers in the RFID systems. This course covers:

- RF Theory
  - Frequency attributes
  - Communication methods
  - Modulation
  - Path loss and noise
  - Link budget
  - Water and metal impacts
- Standards
  - FCC licensing and foreign requirements
  - Tag Reader Protocols (ISO, EPC)
  - EPC Gen 2 protocol
- RFID Printers
  - Working Principle of RFID printer
  - Printing and Encoding



## ✓ **Module 2: Zebra: Product Offering**

Zebra provides high-frequency (13.56 MHz) and ultra-high-frequency (UHF) EPC-compatible RFID smart label printers/encoders, which are designed with the flexibility to support new standards and technologies as they evolve. This course provides an overview of all Zebra product offerings including printers, smart labels and software.

This course covers:

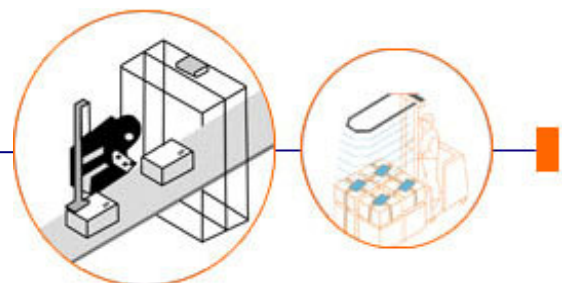
- Product Timeline
- R110Xi and R170Xi
- R110Xi HF
- R110PAX4
- R4Mplus
- R2844-Z
- Smart Labels and Supplies
- Software

## ✓ **Module 3: Zebra: Printer Installation**

This course provides a thorough guide for installation and setup of Zebra printers, including step by step instruction for tag, ribbon and media testing, media loading and printer settings adjustments.

This course discusses:

- Printer Installation
- Printer Setup
  - Tag Testing
  - Ribbon and Media Testing
  - Printer Loading
  - Tag Type and Power Settings
  - RFID Control Panel Parameters
  - Calibration
  - Sensor Adjustments



✓ **Module 4: Zebra: Printer Troubleshooting**

This course provides a troubleshooting guide for common mistakes when setting up and operating Zebra printers as well as problems that can arise during usage. The course also provides step by step instructions related to printer self tests that can help user with printer testing and configuration.

This course discusses:

- Troubleshooting
  - LCD Error Messages
  - Print Quality Problems
  - Calibration Problems
  - Communication Problems
  - Ribbon Problems
  - RFID Problems
  - Miscellaneous Printer Problems
- Self Tests

✓ **Module 5: Zebra: Printer Programming**

This course teaches printer programming basics using ZPL (Zebra Programming Language) including guide for creation of smart label formats using ZPL.

This course covers:

- ZPL for RFID including commands specific to RFID encoding
- Smart Label Creation

**Contact Details**

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