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Labels & Labeling Systems

Encoding RFID Tags using Legitronic Label Printing Software Version 3.6.X

With the release of Legitronic Label Printing Software Version 3.6.0, encoding RFID tags for both the retail and the DoD (*Department of Defense*) markets has become as easy as encoding a barcode. Just like in bar-coding, the end user should have already provided the supplier (or vendor) the information needed for the tag and/ or label to comply with the standard they are using. For retail this is usually the latest EPC standard. For the DoD it is the latest DoD standard. You can obtain the latest standards specification at www.gs1.org, for EPC and www.dodrfid.org for The Department of Defense. Some companies, like Wal-Mart, have their own standards that are located in password protected, vendor only web sites. In any case, the vendor company needs to have these data before any labels can be encoded.

Part of the data encoded is a non-repeating serial number. The use of a Tracking Serial Number on the label will manage that task automatically.
See www.webermarking.com/html/faq.html for information on Tracking Serial Numbers.

For purposes of demonstration, we will encode a generic retail EPC tag followed by a DoD example. And as different companies require different printing on the label or don't care what is printed, we will not show examples of the printed format. We will restrain the scope of this paper to the RFID data only.

Retail EPC

Let's suppose your company, ACME Cartoon Gags, want to encode RFID tags to apply to product you will be delivering to one of your customer's, Wiley Coyote, distribution centers. You apply to GS1 for an EPC Manager Number. This is similar to the old UCC Manufactures Number (Places 2-6 of a UPC Barcode). And let's say they issue you a number of 23456. If you wanted to barcode a product, say the 1 gallon, plastic container of, 3-D Fake Cave Paint, so that it could be scanned at a POS station, you might create a UPC Barcode containing data like this: 0123456789012. The first position is The System Code, positions 2-5 are your UCC Manufacturers Number, positions 7-11 are the description of the product, and the twelfth position is the check digit. To encode the EPC number for a case of the same paint, you follow a similar process, but use a different combination of values. Follow along as we create the EPC Number.

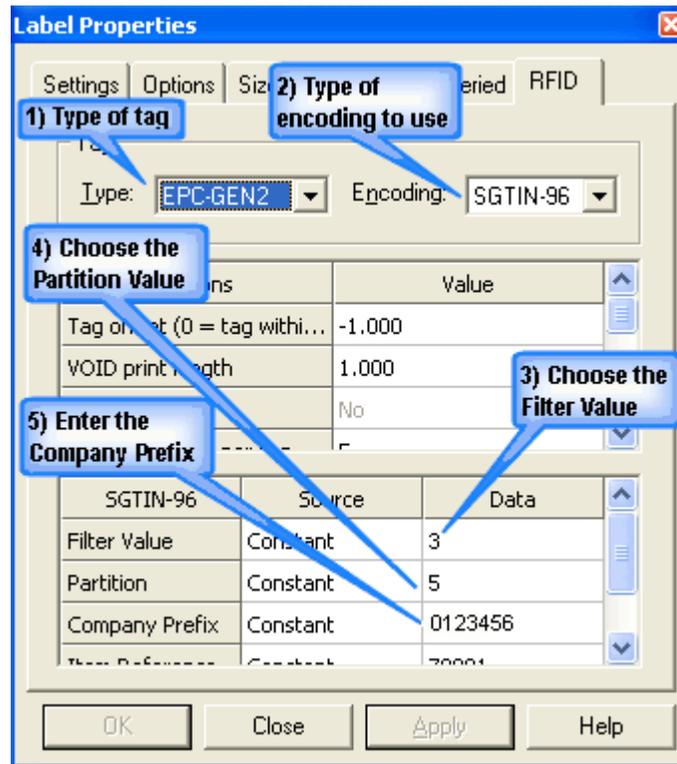Open the Label Properties and choose the RFID tab. See Figure 1

Figure 1

1. Choose the type of tag you want to encode, in this case, EPC-GEN2.
2. Choose the encoding schema to use, in this case SGTIN-96.
3. Enter the Filter Value (sometimes called the *Indicator Digit*). A value of 3 indicates a case and a value of 4 indicates a pallet. Our example uses 3, because we are encoding a case tag.
4. Enter the Partition Value. At the time of this writing (May 2007) there were seven values defined in the EPC Tag Data Standards, 0-7. We would get this value from Acme's EPC Manager. Our example uses 5, which gives us a Company Prefix of seven digits and an Item Reference of six digits.
5. Enter the Company Prefix (sometimes called the *EPC Manager Number*). We would also get this value from Acme's EPC Manager.

6. Scroll down in the upper dialog box to enter the next set of values. Figure 2.
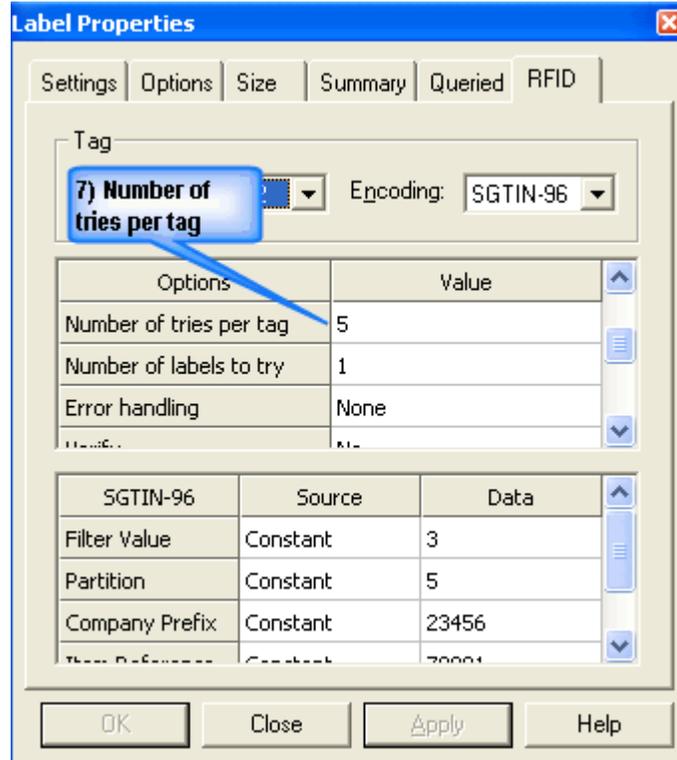
Label Properties

Settings | Options | Size | Summary | Queried | RFID

Tag

7) Number of tries per tag   Encoding: SGTIN-96

Options	Value
Number of tries per tag	5
Number of labels to try	1
Error handling	None

SGTIN-96	Source	Data
Filter Value	Constant	3
Partition	Constant	5
Company Prefix	Constant	23456

OK   Close   Apply   Help

Figure 2

7. Enter the number of tries per tag. This is the number of attempts the printer will make to encode the tag. Start at five and you can tweak this setting later to optimize label throughput. The same tuning can be done on the Number of Labels to Try setting found, right below.

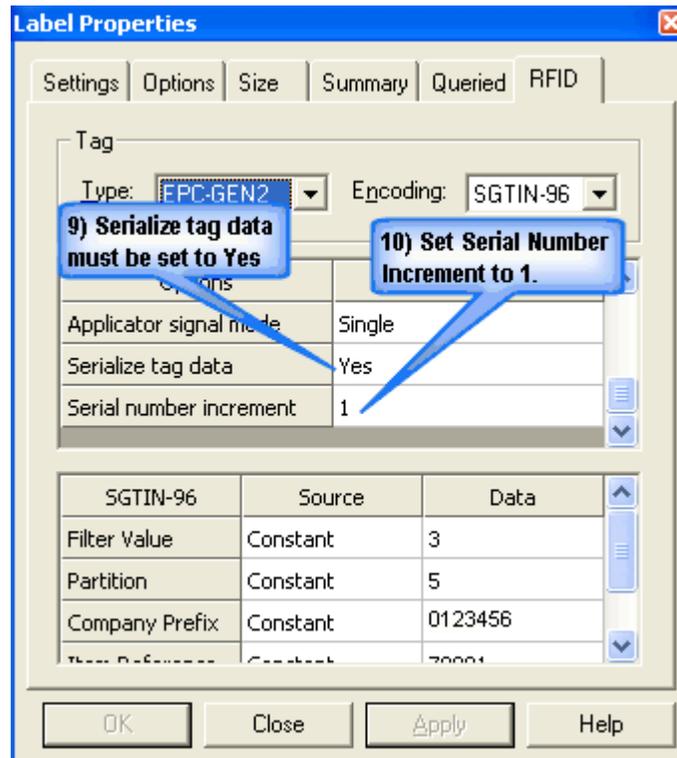8. Scroll down in the upper dialog box to enter the next set of values. Figure 3.

Figure 3

9. Set the Serialize Tag Data value to Yes. As of this writing Legitronic Label Printing Software requires this value.
10. Set the Serial Number Increment to 1. As of this writing Legitronic Label Printing Software requires this value.

11. Scroll down in the upper dialog box to enter the next set of values. Figure 4.
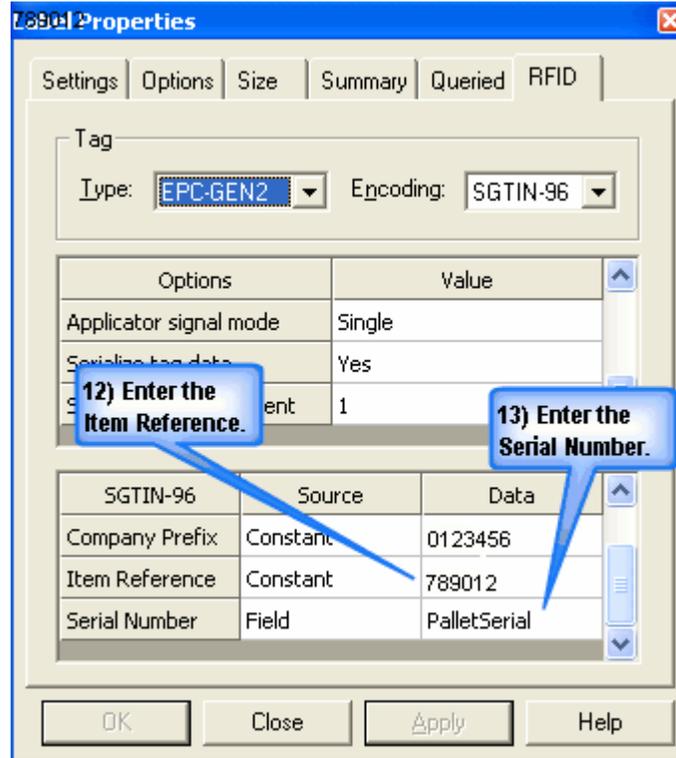

Figure 4

12. Enter the Item Reference Number. We would get this value from Acme's EPC Manager. Our example uses a Constant value of 789012, but you could reference a field on the label if you wanted to. We'll do that in the next step.

NOTE: What you have created so far is called a GTIN (*Global Trade Item Number*). This is the UPC of the RFID world. It is made up of the Filter Value, the Partition, the Company Prefix and the Item Reference Number. Now we'll move on to create an SGTIN, (*Serialized Global Trade Item Number*).

13. Enter the Serial Number value. This can be a Constant value or it can be a Referenced value. Since Wiley Coyote requires that every shipment have a unique, non-repeating EPC Number, our example uses a Reference value from a field on our label called PalletSerial. PalletSerial is the field on the label that contains the Tracking Serial Number.

14. Click Close. That's it! You've just created an RFID tag/ label format. When you print the labels, the printer will encode a unique EPC Number to each RFID Tag.

Department of Defense (DoD)

ACME Cartoon Gags also makes a product for the Department of Defense, Cannon Ball Bomb Fuses. The DoD mandates that the fuses need RFID tags in order to be received at their Distribution Depots. Encoding tags for the DoD is as simple as encoding EPC Numbers for Wiley Coyote's. Here's how.

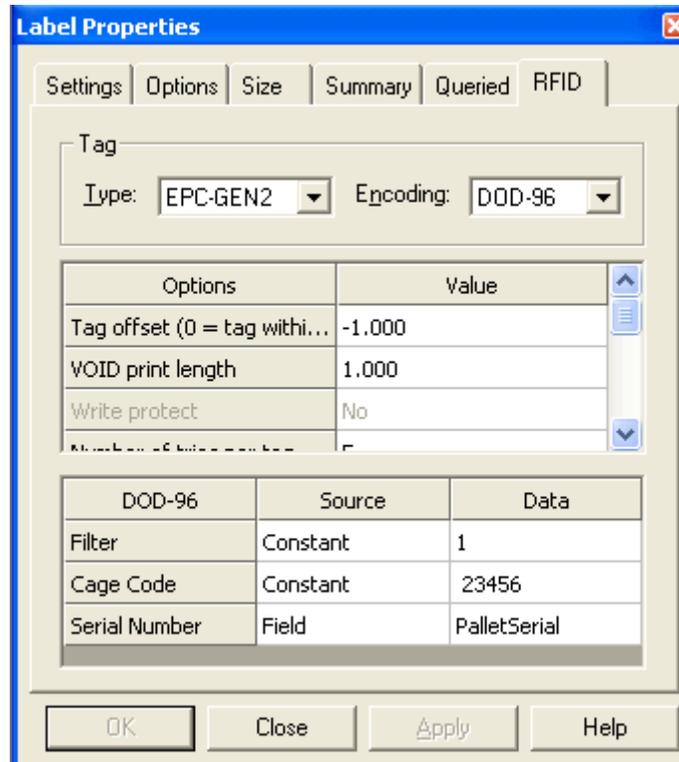Open the Label Properties and choose the RFID tab. See Figure 1

Figure 5

15. Choose the type of tag you want to encode, in this case, EPC-GEN2.
16. Choose the encoding schema to use, in this case DOD-96.
17. All the settings in the Options/ Value (upper) dialog box are the same as in the last example.
18. Enter the Filter Value. A value of 0 indicates a pallet and a value of 1 indicates a case. Our example uses 1, because we are encoding a case tag.
19. Enter the CAGE Code. We would also get this value from Acme's EPC Manager. If you already have a five digit EPC Company Prefix (from GS1) you could use it here. If you do not you would apply to the DoD for a six character CAGE Code. In either case the first character is always a space. If any characters need to be added to equal six, left pad with zero starting to the right of the space. E.g., Cage Code 1E34R would be entered as <Space>1E34R or 1234 would be entered as <Space>01234.

20. Enter the Serial Number value. This can be a Constant value or it can be a Referenced value. Since the DoD requires that every shipment have a unique, non-repeating Serial Number, our example uses a Reference value from a field on our label called PalletSerial. PalletSerial is the field on the label that contains the Tracking Serial Number.
21. Click Close. That's it! You've just created a DoD tag/ label format. When you print the labels, the printer will encode a unique number to each RFID Tag.

Legitronic Label Printing Software can additionally encode all the Tag Types and Encoding schemas shown here:
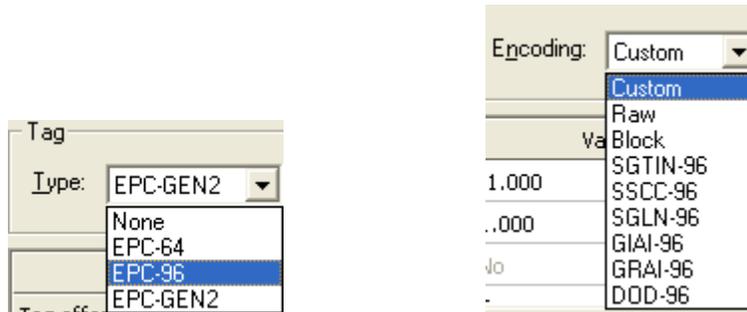
The key to successful RFID Tag encoding is knowing who your shipping to, what standard they are mandating compliance with, and getting the appropriate data from your customer and the governing body that maintains the standard being followed. Then create some sample tags and send them to your customer for prequalification and acceptance.

If you have any questions about the material covered here please contact Labeling Systems at 847.364.8500 ext 773