

SQRL Codes: Standardized Quick Response for Logistics

Standard Version 0.26

July 5, 2016

Dr. Ronald S. Lembke, Ken Jacobsen

Co-Chairs, Standards Committee, Reverse Logistics Association

Contact Information: ronlembke@unr.edu, office: (775) 682-9164, cell: (775) 303-6535



University of Nevada, Reno



Contents

| | |
|--|----|
| Contents | 2 |
| 1 Overview | 3 |
| 2 Why is a standard necessary? | 3 |
| 3 Expandability | 4 |
| 3.1 Companies Can Develop Their Own Fields Any Time | 4 |
| 3.2 Revisions to Standard | 4 |
| 3.3 Fair Use | 5 |
| 4 Companies Decide Who Has Access to Each Data Field | 5 |
| 4.1 C Designation for Consumer Information | 5 |
| 4.2 P Designation for Professional Reader | 5 |
| 4.3 M Designation for Manufacturer | 6 |
| 4.4 Encryption | 6 |
| 5 Implementation Technologies | 6 |
| 5.1 QR Codes on Products and Packaging | 6 |
| 5.2 Not Only for QR Codes | 7 |
| 5.3 Modifying Contents in Electronic Storage | 7 |
| 6 Code Reading Software | 8 |
| 7 Structure of Tags | 8 |
| 7.1 Code Headers | 9 |
| 7.2 Encryption Record | 10 |
| 7.3 Environment Records | 10 |
| 7.4 Data Records | 11 |
| 8 RL Code Taxonomy | 11 |
| 8.1 General information | 12 |
| 8.2 Item Specific Information | 12 |
| 8.3 Warranty | 12 |
| 8.4 Retail Marketing Information | 12 |
| 8.5 Reverse Logistics Codes | 12 |
| 8.5.1 Item Condition Codes | 13 |
| 8.5.2 End Customer Return Codes | 13 |
| 8.5.3 Retail Logistics Reason Codes | 14 |
| 8.5.4 Destination Codes | 14 |

| | | |
|-------|------------------------------------|----|
| 8.5.5 | Testing Process Codes..... | 14 |
| 8.5.6 | Testing Results Codes..... | 15 |
| 8.5.7 | Processing Codes..... | 15 |
| 8.5.8 | Disposition Codes..... | 15 |
| 8.6 | Recycling information | 16 |
| 8.7 | Other Standards..... | 17 |
| 8.8 | Other industry Specific Tags | 18 |
| 8.9 | | 18 |

1 Overview

This document provides an overview of a framework for organizing product-embedded and packaging-embedded information for pre-sales support, marketing, customer service, technical support, reverse logistics, refurbishing, disposition, and product disposal. We are calling the fields created under this standard SQRL codes: Standardized Quick Response for Logistics. The following document outlines the standard, as adopted by the ANSI MH10 Subcommittee on RL codes.

These standards are intended to provide a framework so that all manufacturers, OEMS, distributors, retailers, processors and recyclers can have a common system for organizing, storing and retrieving information that may be helpful to themselves, customers, or any other parties. The intent is to allow customers and supply chain partners the ability to easily access any information that may be required by the other parties, and for the creators of the information to control who has access to that information, in a way that minimizes duplication of effort and reduces the total effort required to share this information.

Each company can choose which information fields (described below) to make available. Some information is available to customers, some is only available to service professionals, and some is available only to the manufacturer, depending on the access granted by the manufacturer.

For example, a customer may scan the QR code on the back of their TV to find and download a quick-start guide for how to hook up their cable TV and external speakers. A different customer may return that same model of TV to the retailer, where a customer service employee will scan the QR code to find out which cables and accessories were originally included in the box. A third customer may someday take their TV in to a factory authorized service center, where the employees will scan the QR code to access information needed to complete the repairs.

2 Why is a standard necessary?

QR codes are an open standard, so there is nothing to stop any manufacturer from creating its own labeling system—except the fact that if everyone develops their own system of tags, every customer and supply chain partner will need a different reader for every manufacturer, and those who do not have the reader will be locked out.

Most QR code readers currently available to customers only take the user to a website. In order for customers and supply chain partners to access the information stored in the QR code, the SQRL reader has to look at the information stored in the tag and know what it is, so it can be displayed properly:

- The name of the manufacturer and the product name might be displayed as text
- If the code contains a link to download a manual, the app needs to display it as an HTML link
- If the code contains a phone number, the user needs to be able to click on it to make a call

With standardized codes, boxes traveling under a scanner in a distribution center can easily be read, and it is easy for the scanner to extract the manufacturer's name and the product's name and model number from each SQRL code, because every supplier will use the same system for identifying "this is the product name, this is the model name, this is the model number." If each supplier used its own system for labeling the information, the task for the distribution center would be infinitely more complicated.

SQRL codes will also be very useful for end customers, who will scan them to get information about their product and for technical support. If each retailer and manufacturer developed its own reader, few customers would collect specialized readers from each and every manufacturer. Having a standard makes the codes much more useful and valuable to the end consumers.

Standardization is critical to the success of any labeling schema that is designed to communicate information to consumers. The Reverse Logistics Association is providing the arbitration services so that label-readers can be created that will work on any label.

3 Expandability

The SQRL standard is extremely flexible, and can easily be expanded for companies' own internal use, and a process is in place for expanding the standard.

3.1 Companies Can Develop Their Own Fields Any Time

The set of fields is intended to be wide enough to meet the needs of any manufacturer and its many partners. If, at any time, companies determine that the existing set of fields is missing something, they are welcomed and encouraged to develop additional fields for their own internal usage.

In addition, a special designation is provided for manufacturers to encode proprietary information that is encrypted such that each manufacturer may control access to the information (see the section below, Code Readers). Manufacturers may do this for as many fields as they desire.

However, instead of generating fields that are unique and used only by their closest trading partners, companies are recommended to suggest new fields to be created for general usage, so that all of their supply chain partners may access them.

3.2 Revisions to Standard

If companies discover shortcomings in the Framework, they are encouraged to suggest improvements to the Committee to make the Framework as useful as possible.

It is easy to generate new fields. For fields that are of public universal utility, the RLA standards committee will assign new field designations upon request and review. The proposal must include a

field title, data type, description of the information that would be visible on the reader screen, and a simple argument for the need for the field.

Modifications, extensions and revisions to the standard may be proposed at any time by contacting the Standards Committee Chair. Proposed changes will be circulated for discussion amongst Committee Members and Associates for comment and a public review period. The Committee may make suggestions for clarifying and refining the intended role for the new fields, to minimize confusion and duplication between the proposed and existing tags. After all, a standard is only valuable if everyone understands the meaning of the information to be stored in the fields, and when to use which field. But the intention of the Committee is to make the standard as flexible and useful as possible for those implementing it.

After time for comment by Committee Members, the changes will be voted on by the Members. Once approved, the Standards Committee will publish revisions to the Standard, as needed, on a quarterly basis. Upon acceptance, the published field will be disseminated to all registered users as an update to the library.

3.3 Fair Use

Companies are free to use the standard, but the RLA controls the list of tags, and maintains the exclusive right to authorize creation of software for the generation of fields.

4 Companies Decide Who Has Access to Each Data Field

A critical component of this standard is the ability of each manufacturer to classify each field of information with one of three designations: C for consumer, P for professional or M for manufacturer's proprietary information.

It is realized that the number of fields potentially available in this schema is relatively unlimited. This can be overwhelming to the normal consumer who has a relatively limited set of concerns when decoding a label created under this standard. Reader software must be well-designed to make it as easy as possible for consumers and professionals alike to find and access the information they are looking for.

4.1 C Designation for Consumer Information

Different code readers are being developed for use by each level of user. If a consumer uses a QR code reader, NFC device (or any other means, discussed above) to access the information about a product, they will only be allowed to view the fields with a C designation. Examples of codes likely to have the C designation would be basic product information (manufacturer's name, retailer's name, customer support information, etc.). But the manufacturer is free to choose to make any fields Consumer fields that they feel will be useful for the consumer.

4.2 P Designation for Professional Reader

Fields with a P designation will only be accessed by supply chain partners such as retailers, distributors, refurbishers, repairers, disposal facilities, etc. P class users will also have access to all P-designated fields. The Professional Reader will also be able to access all fields with the C designation.

The professional readers will enable users to prioritize and filter fields of information to decode and display information relevant to their query. For example, a field repair agent may access information that will aid in the diagnosis and repair of the product. A customer service agent will need to access

consumer fields, such as the product model number, etc. But the customer service agent may also need to access other information not available to the consumer, like information about whether the item is to be returned to stock, returned to the vendor, etc.

4.3 M Designation for Manufacturer

Fields with an M designation will only be accessed by the manufacturer. M class users will have access to the C and P class information. This is the highest level of access, and only used for any information that the manufacturer doesn't want available to anyone else.

4.4 Encryption

It is important to note that the manufacturer may choose to encrypt any of the fields of their choosing. But the rest of fields will not be encrypted, and are stored in what is essentially a flat text file. If a consumer were determined to read the other fields, they would undoubtedly be able to find, somewhere on the internet, some software that would let them view the fields that they would not normally have access to.

This is not a major reason for concern, however, as the information contained in the P and M fields would not be of a proprietary or competitive nature, but rather information that would not be of interest or use to the end consumer. These fields will generally contain information about where and when the item was produced, and the presence or absence of certain materials.

However, because the use of P and M designations are not, by themselves, enough to truly prevent unauthorized parties from accessing the information, companies can encrypt all fields they desire, as discussed below in the section on Encryption.

5 Implementation Technologies

The first technology that is being used to implement this framework is the QR code, but this framework is in no way limited to only QR codes. QR codes are just a very compact way to store printed information. Many other methodologies can be used to store the information from the fields.

5.1 QR Codes on Products and Packaging

In a QR implementation, the QR code will be printed onto the packaging or product and accessed by a QR code reader (as described below).

The maximum number of characters that may be stored in a QR code is currently 4,296 alphanumeric characters. This means that a tremendous amount of information may be stored in a current QR code, and as the resolution of lenses and cameras in cellphones improve, the number of characters that can be stored is only likely to increase.

There is a tradeoff to be made, however, in that as the amount of information stored in the tag increases, the number of squares in the QR code increases linearly, which means that the QR code will have to take up more space on the product. QR codes are most frequently seen printed onto paper or plastic labels, but they can also be laser-etched into metal, plastic, and even wood.

Companies may choose to put one QR code on the outside of the packaging that provides a potential customer with information about the product, and maybe basic warranty information, but may not have detailed information about placing a warranty claim, for example. But a QR code on the back of the

product, (or some less visible location like the inside of the battery compartment) may provide the consumer with detailed information for acquiring a Returned Material Allowance, calling technical support, etc.

5.2 Not Only for QR Codes

The standard can be used not only for QR codes, but implemented in other storage and retrieval technologies, such as NFC, internal memory, or any other means companies may want to use to store and or transmit the information. This allows companies to store the information in one format across all storage platforms. Because we believe QR codes will be the first technology to be widely implemented, we speak throughout this document about scanning QR codes, but nothing in this standard requires the use of QR codes.

As we have said above, we are developing a common way for manufacturers and retailers to share product information with supply chain partners and customers. If customers want to relay that information via black and white dots (i.e. QR codes), or any other technology that the recipients can understand, that is perfectly fine with us.

For example, in the future, it is possible that all of the electronic devices a person interacts with will be connected to the Internet (Internet of Things), or be able to communicate directly with the user via NFC, Bluetooth, WiFi, USB, or some other method. The manufacturer can store whatever information it wants to, and share it with the end user via the same or a similar app.

The fields are platform-independent, and may be stored in any of a variety of formats, including, but not limited to:

- Graphical images: QR codes/2D barcodes
- Flash/Random-Access Memory
- Read-only memory
- Other methods as new technologies are developed.

Depending on the storage medium used, the information may be accessed by the user by:

- Scanning with 2D/QR code scanner
- Connecting via direct (e.g. USB, FireWire, Ethernet) wired connection
- Wireless connection (Wifi, NFC, Bluetooth)
- Other methods as new technologies are developed.

If the tag information is being stored in an electronic medium, the character restrictions of the QR code are no longer relevant. However, the need for a standardized system for organizing the information remains relevant.

5.3 Modifying Contents in Electronic Storage

In QR codes and ROM storage, the fields will be created when the tag is created, and accessed via software. Alternatively, if a re-writable form of memory is used, the company may give itself the ability to modify the contents of the fields after the item has been sold. As above, for digital storage, the number of characters is limited only by the amount of data storage capacity that the manufacturer wants to allocate to the Fields.

6 Code Reading Software

In different situations, different users will want to access different information, and different software readers will be created to allow the different users to access the software as quickly and easily as possible. As described above, manufacturers will work with retailers to decide what C, P or M designation to give to each field.

When customers access the tag, they will be able to use the software to navigate to find the information that they are looking for. Supply chain partners may use different software that takes their employees directly to the fields that are most useful for the given situation.

In the case of QR codes, customers and employees will be using different QR code readers to receive the information, which will control which information they will see, as described above in section 4. Codes that customers are most likely to want to access will be given the C designation and be readily available, and codes they are less likely to want to access will be less readily available (with P and M designations).

Those same QR codes may also be used by professionals to access other information, information that is important for them to do their jobs, but not useful to the consumer. Any fields that companies have defined which are unique to a particular company (with the M designation) will not be available to end users but will be available to employees. Any fields that are only for service professionals or the manufacturer will not be accessible via the consumer version of the software.

If a person tries to scan a sQRI code using a standard QR code reader, instead of taking them to a website, (like they expect) it will give them a long string of text which will not be at all useful to them. As described below, in this case, the tag has to contain information which directs the user to an app store where they can download a sQRI code reader, in order to access all of the information stored in the tag.

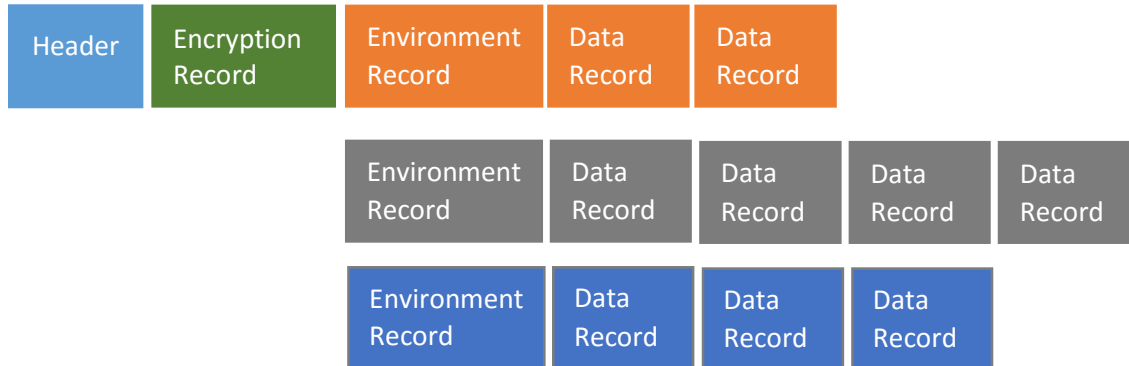
The software also needs to know the user's preferred language and weight system. European customers will prefer to have information presented in the metric system, US customers will prefer the Imperial system. Information may be stored in tags in multiple languages, and the software needs to know which language is preferred by the user.

7 Structure of Tags

Regardless of the technology used to store the information, the whole collection of information is referred to as a Tag.

The information in each Tag is stored in a series of Data Records, the individual pieces of information (model number, weight, etc.).

At the start of the Tag there is a Header which specifies which version of the standard was used to create the Tag. If a person uses a simple QR reader to scan the sQRL code, the Header also contains the information that will cause the simple QR reader to send the user to the relevant App Store to download a sQRL code reader, so they can access the information in the SQRL code.



After the Header, there is an (optional) Encryption Header which allows the creator of the code to control access to the information in the code, using encryption.

The records are grouped together with other Data Records that share the same measurement system (e.g. Metric) and language, etc. An Environment Record specifies things like language, measurement system, currency, etc., and all of the Data Records that come after an Environment Record will have those attributes in common.

Visually, we may represent the information in the tag as shown in the Figure above. The light blue Header is the first item in the tag, followed by the (optional) Encryption Record, whose information applies to all Records in the tag. After those two items, there are a series of Environment Records, each followed by the Data Records which use the same language, currency, etc. In the picture, all of the orange Data Records share the same attributes as specified by the orange Environment Record, all of the dark grey Data Records share the same attributes as specified by the grey Environment Record, etc.

For the purposes of the Figure, the different environments and records were shown on separate lines because they could not all be displayed together on one line of this document. In practice, of course, the fields are all written consecutively within the tag, one after the other, as in the following Figure.



7.1 Code Headers

Over time, the SQRL schema will grow and be modified, and it seems likely that revisions to the standard, may, at some point, lead to changes in the way fields are stored or displayed. The Code Header will contain information about which version of the standard was used to develop the tag.

When a customer scans a SQRL code, if the person is using a SQRL reader, it will offer them options for accessing the information they are looking for. However, if a customer does not have a SQRL code-enabled QR code reader, all of the fields and tags might be read by this less advanced reader as

gibberish, because it will have no idea what to do with all of this information. For this reason, the SQRL code must be developed to be cognizant of that fact, and the first 100 characters are reserved for a header to prevent this.

Generally, most of the less-advanced QR code readers will expect to find a URL when scanning a QR code. SQRL codes must begin with a Header that contains a URL. These simpler readers will, by default, take the consumer to a website that tells them that this QR code contains much more information than a typical QR code, and in order for them to enjoy the benefits of this enhanced QR code, they need to click on the button they are shown to go to the App Store (Apple, Google, etc.) to download the reader for free.

The URL they are taken to may also give them the option to not download the app, but proceed directly to the manufacturer's customer service website. If the manufacturer so desires, in addition to pointing the consumer towards a source for the SQRL reader, the URL could be a fixed website containing all of the information that is stored in the tag. If the manufacturer chooses to do this, the manufacturer will be responsible for maintaining the URL, and the manufacturer should keep in mind that these SQRL codes will, in some cases, remain visible on the sides and backs of items that will continue to exist for years or even decades, probably far longer than any one company will be interested in maintaining the integrity of a website devoted to the product.

7.2 Encryption Record

After the Header, there is an optional Encryption Record, which can be used to set encryption for all information within the tag. Using this encryption record, all users within an organization may be given visibility to all records within the tag. Symmetric encryption will be used, with all the members within the organization having access to the key.

As described below, there are other processes to encrypt individual records, but the use of an optional encryption record can simplify the process of allowing all users within the company to access all of the records.

The record must contain information about which encryption method was used.

7.3 Environment Records

Within a tag, the company can specify the units that are being used for the fields that follow. For example, are Metric units being used, or Imperial? If the company so chooses, it can put in one environment variable specifying that the units are in the Metric system, and the fields that follow will be displayed using Metric terminology, and then it can put in a second environment variable, changing to the Imperial system, and the fields that follow will be displayed using Imperial terminology.

For example, a company may want to list the thickness of a piece of plastic film in mm, but display the dimensions of the box the roll comes in using feet and inches. The company would have one environment record specifying the metric system, and then insert a tag for the thickness of the product (in mm), and maybe a tag for the width of the product (perhaps also in mm), and maybe a tag for the weight of the product (grams per square meter, perhaps), perhaps ending with a tag for the weight of the material (in kg) and the weight of the entire packaged product (also in kg). Then they could put in another environment record specifying the Imperial system, with tags for the height, width, length and weight of the package in inches and ounces.

Environment Records are also used indicate the language being used. Companies may want to present product information in multiple languages, and a separate environment record would be used for each language. For example, one would be used before a series of tags giving product information in English, and then a second tag could be used to give that same information in Spanish, etc.

Environment Records also indicate which currency is to be used, and a separate record is needed each time the currency is changed.

Lastly, an Environment Record can be used to protect the following tags via encryption.

7.4 Data Records

Each Data Record contains one piece of information, although that may be many individual words, separated by spaces.

Each data record begins with an RL code, like, for example RL001, which is the Code for the product name.

A Visibility designator may follow after the three numerical digits. This can be a C, P, or M, which indicate that the data in the field is to be viewable by Consumers, Professionals, or the manufacturer only, as described above.

After the Visability designator, a Units designator indicates the units that the information is stored in. For example, if the RL code is warranty length, an “A” means that the warranty is given in years. A “B” means it is given in months, a “C” means it is given in weeks, etc. If the RL code is giving weight, the “A” may refer to tons, “B” might be kilograms, “C” could be grams, etc. The exact details of these designators is still under discussion.

Finally, after the Units designator may follow an Encryption designator, which indicates whether the subsequent record has been encrypted. A lack of any Encryption designator means, by default, that the information has not been encrypted.

8 RL Code Taxonomy

Below is a list of the RL Codes that have currently been defined, but the list expected to grow quickly as the number of implementations increase.

Companies are free to use as many or as few of these Records as meets their needs. However, a small list of Records is being developed which are recommended as the minimal set of Records to be used for any Tags that will be end-user facing, and this list is currently still in development. For use within their own facilities, companies may as many as or few tags as they desire.

In many of the following fields, manufacturers have a choice about how the information is to be displayed: for example, using text information or a URL linking to a website. The company is encouraged to remember that often people may not have an internet connection when trying to access the information in the QR code, and is recommended to make as much information as possible available without an Internet connection.

8.1 General information

These codes are for general information about the product that is applicable to all items produced. This is the minimal information that should be included in each RL encoded label.

| | | | | |
|----|----|--------------------|--------------|--------------------|
| RL | 00 | Manufacturer Name | Alpha | Manufacturer |
| RL | 01 | Product Name | Alpha | Product Name |
| RL | 02 | Model Number | Alpha | Model Number |
| RL | 03 | Product Data Sheet | alpha or URL | Product Data Sheet |

8.2 Item Specific Information

This information may be specific to each particular item, like a serial number, or to all items produced in one factory, or for one distributor or retailer. The manufacturer chooses which, if any, of these fields to include. Each field can be designated as available for consumers, available to professions or proprietary. Companies are recommended to remember that many users may not have access to the internet at all times, and so whenever possible, are encouraged to make as much information as possible not dependent on internet access.

| | | | | |
|----|----|-----------------------|---------|-----------------------------|
| RL | 04 | Date of Manufacture | date | Date of Manufacture |
| RL | 05 | Product Serial Number | a-n | Serial Number |
| RL | 06 | Product Configuration | alpha | Configuration |
| RL | 07 | Product Support | url | Support (click here) |
| RL | 08 | Product Documentation | url | Product Documentation |
| RL | 09 | Phone Product Support | phone # | Call Product Support (dial) |

8.3 Warranty

This information should generally be accessible to consumers. It should include a link to register the warranty.

| | | | | |
|----|----|-----------------------|----------------|----------------------------------|
| RL | 0A | Warranty Terms | url or alpha | Warranty Terms |
| RL | 0B | Length of Warranty | url or numeric | Length of warranty |
| RL | 0C | Warranty Registration | url | Click to register your warranty |
| RL | 0D | Extended warranty | url | How to get an extended warranty? |

8.4 Retail Marketing Information

These codes are for to help a potential customer find information about a product before purchase.

| | | | | |
|----|----|-------------------------------------|------|-------------------------------|
| RL | 0E | Presale questions to mfg from cons. | Chat | Contact sales support |
| RL | 0F | Manufacturer Web site | url | Manufacturers web site |
| RL | 10 | Accessory Products | url | Accessory Products click here |

8.5 Reverse Logistics Data Identifiers

When products are returned by customers to a retail location, or sent by a retail location back to a retail distribution facility or by a retail location for repositioning, information is

8.5.1 Item Condition Data Identifiers

Describe the current status of the item. All fields are binary, and the default assumption is that if the DI appears, the value is true. However, a value of True or False can be set, as in RL15 F would imply that the garment has not been worn.

| | |
|-------|--------------------------------------|
| RL 11 | Unopened packaging |
| RL 12 | All parts present |
| RL 13 | Unused |
| RL 14 | Has been powered on (electronics) |
| RL 15 | Worn (garments) |
| RL 16 | Washed (garments) |
| RL 17 | Old/obsolete packaging style |
| RL 18 | Past date code |
| RL 19 | Less than one month before date code |

8.5.2 End Customer Return Data Identifiers

When products have been returned, the more information that is captured about the reason for the return, the less time that will be needed for testing, which means less labor cost and the faster the items can move toward their ultimate destination. All DIs are binary.

| | |
|-------|--|
| RL 1A | Customer changed mind |
| RL 1B | Customer bought too many |
| RL 1C | Found lower price elsewhere |
| RL 1D | Cosmetic defect |
| RL 1E | Damaged packaging |
| RL 1F | Clothing does not fit correctly |
| RL 20 | Clothing does not go with other clothes |
| RL 21 | Product does not work with other products as expected |
| RL 22 | Instructions too difficult to understand |
| RL 23 | Customer could not get product to work |
| RL 24 | Product did not arrive in time for intended use |
| RL 25 | Damaged in shipment |
| RL 26 | Missing pieces/components (list missing items) |
| RL 27 | Product does not turn on |
| RL 28 | Product does not work correctly (list of symptoms, from 8.5.5) |
| RL 29 | Product stops intermittently (list of components: screen, etc., from 8.5.6, Components needing repair) |
| RL 2A | Product too close to date code |
| RL 2B | Product Expired |
| RL 2C | Product Recalled |
| RL 2D | Product obsolete |
| RL 2E | Incorrect product ordered |
| RL 2F | Incorrect quantity ordered |
| RL 30 | Incorrect product shipped |

| | |
|-------|----------------------------|
| RL 31 | Incorrect quantity shipped |
| RL 32 | Incomplete shipment |
| RL 33 | Duplicate order |
| RL 34 | Duplicate shipment |
| RL 35 | Miscellaneous |

8.5.3 Retail Logistics Reason Data Identifiers

Product may be leaving a retail location even though it has never been sold to an end customer

| | |
|-------|--|
| RL 36 | Product shelf-worn (cosmetic packaging damage) |
| RL 37 | Product too close to date code |
| RL 38 | Product expired |
| RL 39 | Product damaged |
| RL 3A | Packaging damaged |
| RL 3B | Product damaged in transit |
| RL 3C | Too many units on hand |
| RL 3D | Product not selling |
| RL 3E | Product needed at another location |
| RL 3F | Product recalled |

8.5.4 Destination Data Identifiers

Information is required about where the product should be sent next. These codes identify the facility that the product should be sent to. From one of these facilities, the product may next be sent to another of the facilities, so the code may contain information stating which Returns Center the product should go to, as well as which refurbishing center it will go to.

| | |
|------|-------------------------------|
| RL40 | Send to Returns Center |
| RL41 | Send to Distribution center |
| RL42 | Send directly to customer |
| RL43 | Send to other retail location |
| RL44 | Send to outlet store |
| RL45 | Send to online sales |
| RL46 | Send to in-house refurbishing |
| RL47 | Send to external refurbishing |
| RL48 | Send to broker |

8.5.5 Testing Process Data Identifiers

At any point in the logistics process, it may be determined that variety of tests and evaluations are required.

| | |
|------|-------------------|
| RL49 | Full system scan |
| RL4A | Remove spyware |
| RL4B | Remove ransomware |
| RL4C | Remove viruses |

| | |
|------|---------------------|
| RL4D | Test hard drive |
| RL4E | Test memory |
| RL4F | Test Ethernet jack |
| RL50 | Test USB ports |
| RL51 | Test power jack |
| RL52 | Test headphone jack |
| RL53 | Test mic jack |
| RL54 | Test Speakers |
| RL55 | Test mic |

8.5.6 Testing Results Data Identifiers

Following are binary (T/F) defects:

| | |
|-------|----------------------|
| RL 56 | NFF – No Fault Found |
| RL 57 | spyware |
| RL 58 | ransomware |
| RL 59 | viruses |
| RL 5A | hard drive |
| RL 5B | memory |
| RL 5C | Ethernet jack |
| RL 5D | USB ports |
| RL 5E | power jack |
| RL 5F | headphone jack |
| RL 60 | mic jack |
| RL 61 | Speakers |
| RL 62 | Mic |
| RL 63 | Skin/case |

8.5.7 Processing Data Identifiers

When the product arrives at a facility, the facility needs to know what actions need to be done to the product.

| | |
|-------|---|
| RL 64 | Replace components (using component codes from above) |
| RL 65 | Upgrade components |
| RL 66 | Secure shredding (computer) |
| RL 67 | Secure shredding (paper) |
| RL 68 | Repackage |

8.5.8 Disposition Data Identifiers

When a product has been evaluated, a decision is made about what is supposed to be done with the product.

| | |
|-------|---------------------------|
| RL 69 | Sell as new |
| RL 6A | Sell as is |
| RL 6B | Repackage and sell as new |

| | |
|-------|---|
| RL 6C | Repackage and sell as second quality |
| RL 6D | Recondition/refurbish and sell as refurbished |
| RL 6E | Return to vendor |
| RL 6F | Sell on secondary market/salvage market |
| RL 70 | Donate to charity |
| RL 71 | Recycle as is |
| RL 72 | Harvest parts |
| RL 73 | Destroy |
| RL 74 | Secure destruction |
| RL 75 | Landfill |

8.6 Recycling information

These items are specific to the disposal and recyclability of the product and its packaging. Generally, these instructions are fairly generic and most likely points to a standardized url for instructions. It is recommended that if the product contains hazardous materials at RL10 be displayed to consumers.

| | | | |
|-------|-----------------------------|-----|---|
| RL 11 | Contain Hazardous Material? | y/n | (If yes only) This product contains hazardous materials |
| RL 12 | Contain user data? | y/n | (If yes only) This product contains customer data storage |
| RL 13 | Disposal instructions | url | Disposal instructions |
| RL 14 | Flammable? | y/n | This product is (is not) flammable. |

In addition, there are a number of optional fields to provide more detailed product recycling or refurbishing information. NOTE for Printers: cartridges may be described either or both in RL 10 and RL17. At least one should be readable by consumers.

| | | | |
|-------|------------------------|-------|--------------------|
| RL 15 | Types of plastic | alpha | Plastics: |
| RL 16 | Types of metals | alpha | Metals: |
| RL 17 | Types of batteries | alpha | Batteries: |
| RL 18 | Printer cartridge type | alpha | Printer Cartridge: |

It is recognized that manufacturers may require additional information that may be proprietary and encrypted such as manufacturing plant or location, cost of goods, or other competitive information which should only be accessible to authorized readers. The RLA will work with manufacturers to establish unique encryption algorithms to allow such information to be encoded into the label. We are providing five such fields. These fields are designated as MP (manufacturer proprietary) rather than RL. Consumer readers will not even recognize their presence, but professional readers will see that encrypted information is available, but not know the subject of the information.

| | | | |
|-------|---------------------------------|-------|---------------------------------|
| MP 10 | Manufact. Proprietary Encrypted | Encr. | Example: Place of Manufacturer |
| MP 1A | Manufact. Proprietary Encrypted | Encr. | Example: Cost of Goods |
| MP 1B | Manufact. Proprietary Encrypted | Encr. | Example: Country of destination |
| MP 1C | Manufact. Proprietary Encrypted | Encr. | Example: supplier |

| | | | | |
|----|----|---------------------------------|-------|------------------------------|
| MP | 1D | Manufact. Proprietary Encrypted | Encr. | Example: Channel destination |
|----|----|---------------------------------|-------|------------------------------|

8.7 Other Standards

Finally, this standard recognizes that information contained in other industry standards is relevant to the expedition of product life cycles. We therefore expect that this labeling protocol can and will be used to encode the content of other standards. Our protocol therefore has built-in recognition of other standards. We will add extensions as requested by either manufacturers or standards bodies. The most significant of these, of course, are certifications:

| | | | | |
|----|----|-------------------------|-----|-------------------------|
| RL | 1E | RoHS | a-n | RoHS |
| RL | 1F | WEEE | a-n | WEEE |
| RL | 20 | FCC Certification level | a-n | FCC Certification level |
| RL | 21 | FDA Certification level | a-n | FDA Certification level |
| RL | 22 | CE Certification | a-n | CE Certification |

Some special information fields are also acknowledged: Manufacturers may have obtained certain certifications or designations from other groups such as the various RFID standards bodies, or Earth911 which track carbon footprints. Manufacturers participating in such programs may wish to encode certain information into the label. Provisions are made for this.

| | | | | |
|----|----|---------------------------|-------|-------------------------|
| RL | 23 | Product UID for RFID | phone | Product Identification: |
| RL | 24 | UID Validation (for RFID) | url | RFID validation |
| RL | 25 | Earth911 | | Recycling information |

Also common are ratings and certifications from other bodies:

| | | | | |
|----|----|-------------------------------|-----|-----------------------------|
| RL | 26 | EPEAT Level | a-n | EPEAT Level |
| RL | 27 | Energy Star Rating | a-n | Energy Star Rating |
| RL | 28 | Energy Consumption (CEA R7.8) | a-n | CEA Energy Consumption Data |

Finally, while our protocol is focused on information related to product repair, returns, refurbishing and recycling, known as reverse logistics, another group, GS1 has focused on issues related to forward logistics. They have a number of AI codes (Application Identifiers) that are relevant to reverse logistics. Manufacturers may wish to encode information relevant to their GS1 codes into our protocol. The following are recommended relevant fields:

| | | | | |
|-----|----|----------------------------|---------|----------------------------|
| GS1 | 29 | UPC Code | numeric | UPC Code |
| GS1 | 2A | GTIN Trade Item Number | numeric | GTIN Trade Item Number |
| GS1 | 2B | GTIN-8 Trade Item Number | numeric | GTIN-8 Trade Item Number |
| GS1 | 2C | GTIN-12 Trade Item Number | numeric | GTIN-12 Trade Item Number |
| GS1 | 2D | GTIN-13 Trade Item Number | numeric | GTIN-13 Trade Item Number |
| GS1 | 2E | GTIN-14 Trade Item Number | numeric | GTIN-14 Trade Item Number |
| GS1 | 2F | GLN Global Location Number | numeric | GLN Global Location Number |
| GS1 | 30 | GSCC Logistics Units | numeric | GSCC Logistics Units |

| | | | | |
|-----|----|---------------------------------|---------|----------------------------------|
| GS1 | 31 | GSIN Grouping of Logistic Units | numeric | GSIN Grouping of Logistics Units |
| GS1 | 32 | GINC Grouping of Logistic Units | numeric | GINC Grouping of Logistic Units |
| GS1 | 33 | GIAI Individual Assets | numeric | GIAI Individual Assets |
| GS1 | 34 | GRAI Returnable Assets | numeric | GRAI Returnable Assets |
| GS1 | 35 | GSRN Service Relationships | numeric | GSRN Service Relationships |
| GS1 | 36 | GDTI Document Types | numeric | GDTI Document Types |
| GS1 | 37 | GCN Coupons | numeric | GCN Coupons |
| GS1 | 38 | GPID Component and Parts | numeric | GPID Component and Parts |

While a manufacturer may choose to make the above information accessible to consumers, it is suggested that this data is most appropriate for professionals.

8.8 Other industry Specific Tags

| | | | | |
|----|----|-----------------------------------|---------|--------------------------------------|
| RL | 39 | Ideal Storage Temp Range | degrees | Upper and Lowest storage temperature |
| RL | 3A | Refurbished Product Serial Number | a-n | Serial Number |
| RL | 3B | Stored Original Serial Number | a-n | Original Serial Number |