This document describes the specifications for barcode labels that can be read by the various Qualstar libraries, including the TLS, legacy (5U) RLS, RLS-8350/8500 and XLS models.

Introduction:

Barcode labels sold by Qualstar or sold for Qualstar libraries may or may not contain a check digit character. Most industry barcode labels such as those conforming to the IBM LTO barcode label specification, do not include the check digit character. All Qualstar libraries include a user-configurable parameter to allow them to read either type of label.

Qualstar TLS and legacy (5U) RLS-(4xxx, 5xxx, 6xxx, 81xxx, 82xx and 84xx) libraries were shipped with Check Digit Verification (CDV) enabled, which means that, by default, they expected a check digit on the barcode label. Instructions for setting the CDV parameter are included below.

In contrast, the XLS and RLS-8350/8500 libraries are shipped with CDV disabled.

Qualstar no longer offers barcode labels. Most label manufacturers can supply either type of label.

What is CDV?

The check digit is a character that is generated by a mathematical formula that uses all of the other characters in the barcode to create a unique character, which is included as an additional character within the barcode. The check character is within the barcode, but is not printed as a "human readable" character, nor returned to the application. The barcode reader in the library uses the same mathematical formula to generate the check digit, then compares the check digit it generated to the character read from the barcode. If the two characters match, there is a very high probability that the barcode was read correctly.

When I order additional labels, should I order labels with a check digit or without a check digit?

It is important to be consistent. If you currently have labels with check digits, then specify that the new labels have a check digit. If you currently have non-check digit labels, then continue with non-check digit labels.

How do I know whether I have check digit labels?

The easiest way is to check the Label Check Character parameter on the TLS or legacy RLS library, or the Checksum Required parameter on an XLS, or the barcode policy screen on an RLS-8350/8500 library. If it is "yes" and your application is displaying all of the barcodes, then you have barcode labels with a check character. If the parameter is "yes" and the application is not displaying the barcodes, then you probably have non-check digit labels and need to turn off the parameter (see below).

If the parameter is "no" then you need to make sure that the barcode displayed by the application matches the printed "human readable" barcode. If the label displayed in the application matches the barcode exactly, then you have non-check digit labels. If there is an extra character displayed by the application on all of the labels, then you have check digit labels, but are not utilizing the CDV feature. If some match and some have an extra character, then you should order non-check digit labels, since you are in a mixed environment.

What do I do if I have a mix of previously written cartridges, some of which have a label with check digit and others with non-check digit barcode labels?

In this case, if the two sets of tapes need to be in the same library, or the same library partition in the case of the XLS and RLS-8350/8500, then CDV should to be disabled. That way, all barcode label characters will be returned. The data returned from check digit labels will have an additional character—the check digit. Some applications can

be set to only look at the first 8 characters of a barcode. If these are previously written tape cartridges, the other challenge is how to let the application know that the barcode is different. That is typically accomplished by having the application either inventory the tape(s) or using a re-catalogue function. Doing an inventory is usually the quickest method, since the application will read the header on the tape and realize that the tape has a new barcode.

How do I find the IBM LTO Ultrium Cartridge Label Specification?

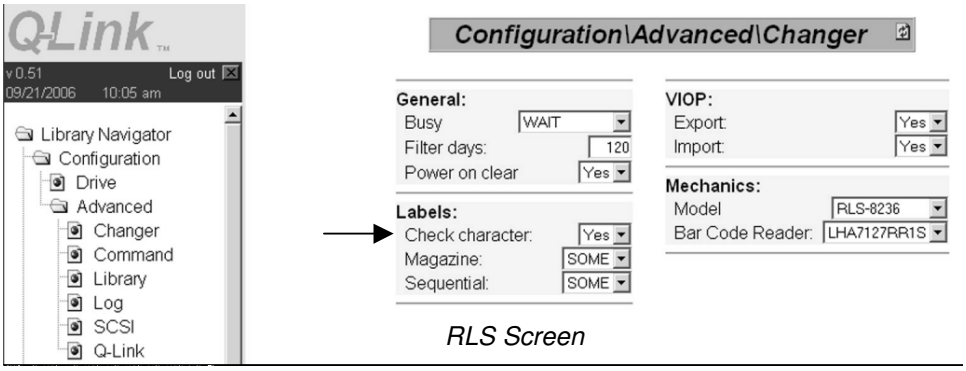
As of this writing, here's the link:

http://www-1.ibm.com/support/docview.wss?uid=ssg1S7000429

If the link does not resolve successfully, try doing a search on the title, above.

How do I check and/or change the state of CDV in TLS and legacy (5U) RLS Libraries?

If you have Q-Link installed, this parameter can be changed in the Configuration/Advanced/Changer screen within the General portion of the screen.



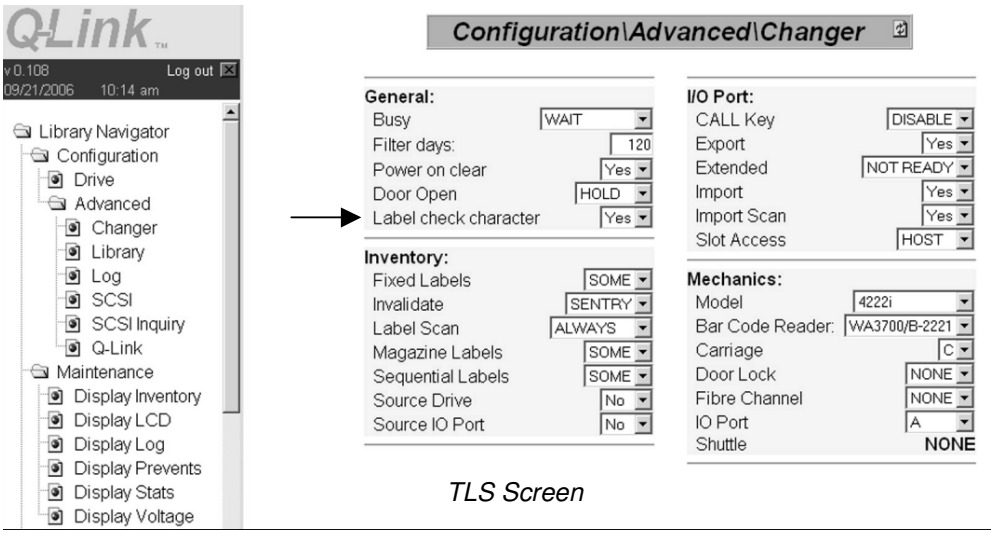


Figure 1 CDV as shown in Q-Link

LabelCheckChar will either be set to Yes or No. Yes means that the CDV is enabled. No means that the CDV is disabled.

Here are the steps to enable/disable the CDV in any **TLS** Series library from the maintenance panel:
Press the MENU key on the front of the Qualstar library to display the **Top Menu**.
Press the ENTER key to enter the **Configuration Menu**.

```
Top Menu
➔•Configuration
 •Maintenance
 •Operation
```

Press the ENTER key to enter the **Advanced Menu**.

```
•••••••Configuration
➔•Advanced
 •Drive
 SCSI ID:        dd
 •Security
 SET TO DEFAULTS
```

Press the ENTER key to enter the **Changer Menu**.

```
C••••••••••••Advanced
➔ •Changer
 •Control Panel
 •Library
 •Log
 •SCSI
 •SCSI Left
 •SCSI Right
 •SCSI Inquiry
```

Scroll to LabelCheckChar.

```
C•Advanced•••Changer
 Busy:          WAIT
 •Door Lock
 Door Open:    ABORT
 Filter Days     ddd
 •Inventory
 •I/O Port
➔ LabelCheckChar:YES
 •Mechanics
 Power On Clear:YES
 UsePrivateSlot:YES
```

LabelCheckChar will either be set to Yes or No. Yes means that the CDV is enabled. No means that the CDV is disabled.
Change LabelCheckChar to the desired setting and press the EXIT key. Press the MENU key twice to exit the Qualstar menu system.

Here are the steps to enable/disable the CDV in any legacy **RLS** series library:

Press the menu key on the front of the library.

Press the ENTER key to enter the **Configuration Menu**.

```
Top Menu
→•Configuration
 •Maintenance
 •Operation
```

Press the ENTER key to enter the **Advanced Menu**.

```
•••••••Configuration
→•Advanced
 •Drive
 •Fibre Channel
 •Q-Link
 SCSI ID:        dd
 •Security
 SET TO DEFAULTS
```

Press the ENTER key to enter the **Changer Menu**.

```
C••••••••••••Advanced
→ •Changer
 •Command
 •Control Panel
 •Fibre Channel
 •Library
 •Log
 •SCSI
```

Press the ENTER key to enter the **Labels Menu**.

```
C•Advanced•••Changer
 Busy:          WAIT
 Filter Days     ddd
→•Labels
 •Mechanics
 Power On Clear:YES
 •VIOP
```

CheckCharacter will be set to Yes or No. Yes means that the CDV is enabled. No means that the CDV is disabled.

```
CA•Changer••••Labels
→CheckCharacter:YES
 Fixed:         SOME
 Magazine:      SOME
 Sequential:    SOME
```

Change CheckCharacter to the desired setting and press the Exit key. Press the menu key twice to exit the Qualstar menu system.

How do I check and/or change the state of CDV in RLS-8350/8500 Libraries?

Here are the steps to enable/disable the CDV in any **RLS-8350/8500** library. From the Home page press either the left or right arrows at the top right of the page until you reach the Configuration page.

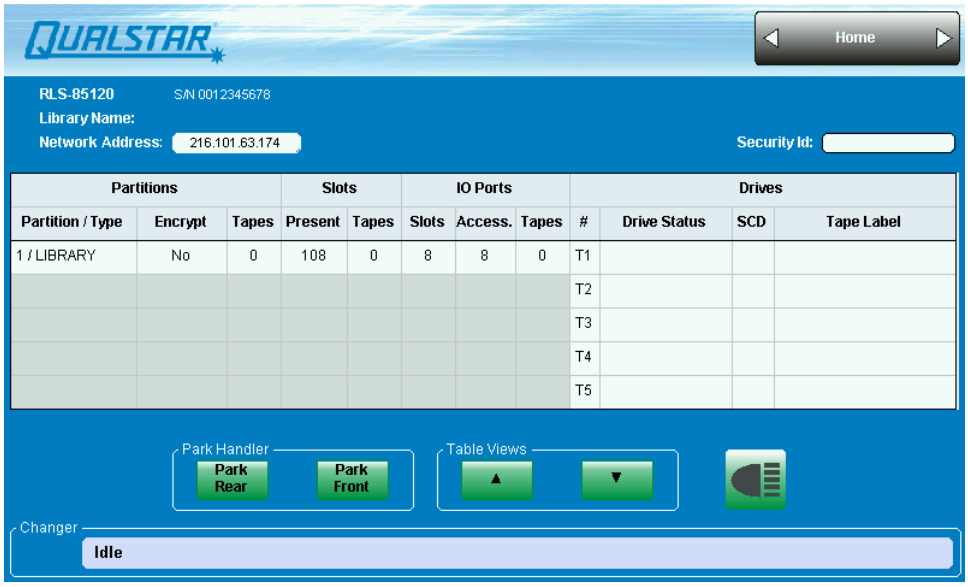


Figure 2 The Home Page

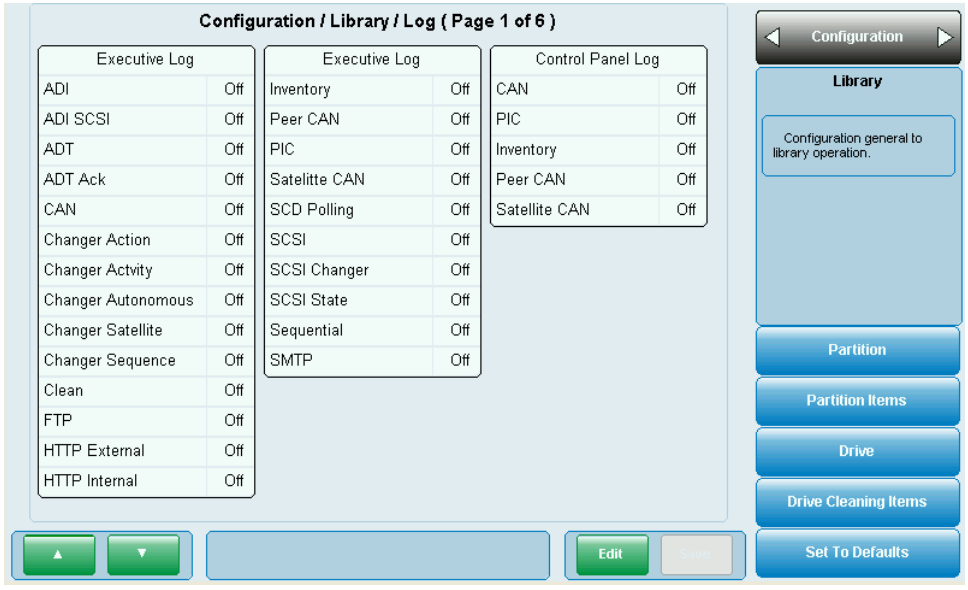


Figure 3 The Configuration Page

Press the down arrow in the bottom left corner of the page until reaching Page 5 of 6.

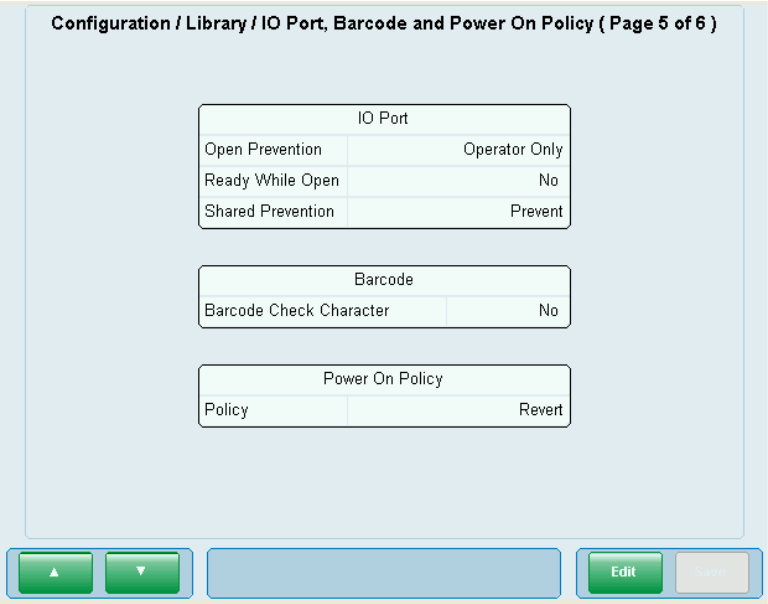


Figure 4 Configuration/Library/IO Port, Barcode and Power On Policy Screen

This page contains the Barcode Check Character field, which allows the CDV to be set to Yes or No. Yes means that the CDV is enabled. No means that the CDV is disabled. Press the Edit button to enable editing of the field. Press the Save button to have the changes take effect or Cancel if no setting changes are desired.

How do I check or change the state of CDV in XLS Libraries?

For XLS libraries, follow these steps:

1. For each logical library, access the Library Specifications page in X-Link.
2. If the barcode labels used in the logical library partition include a check digit, select **Checksum characters required**. Or, if the barcode labels do not include a check digit, deselect **Checksum characters required**.

IMPORTANT: If you select **Checksum characters required**, all labeled cartridges in the logical library must include a check digit as the last character on the barcode.

Note that you can configure this parameter separately for each logical library partition.

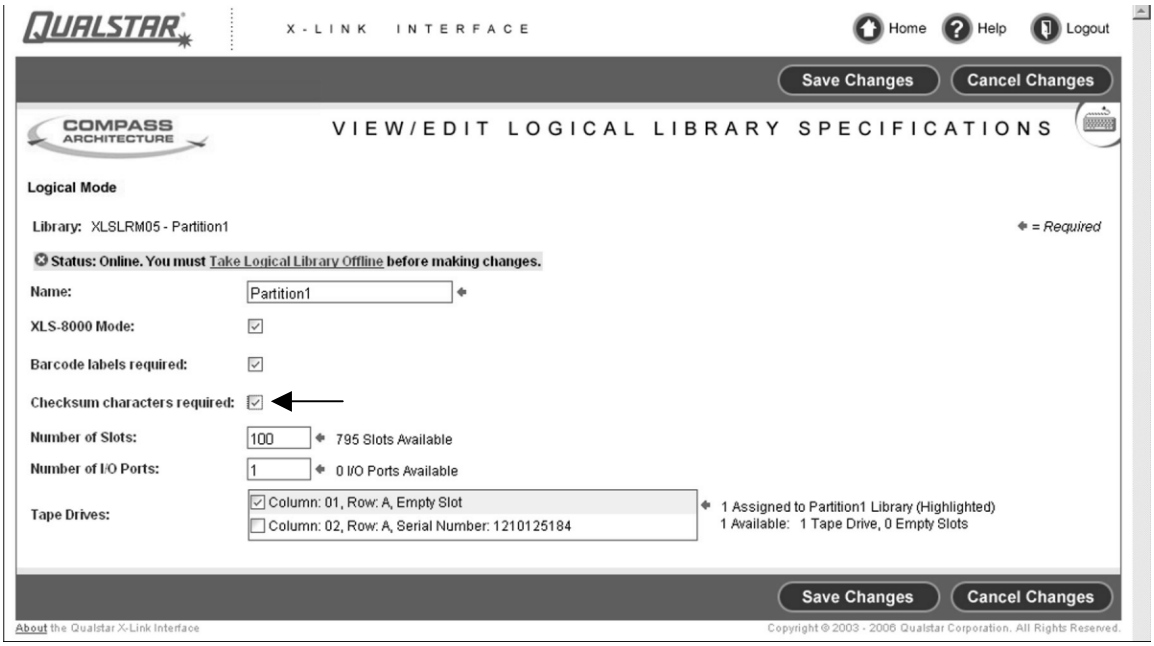
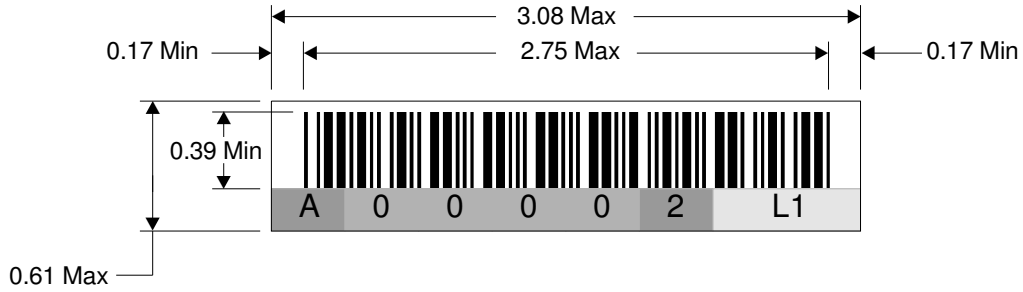


Figure 5 CDV as shown in X-Link

All barcode labels used in Qualstar tape libraries must conform to ANSI/AIM BCI-1995, Uniform Symbology Specification Code 39. The nominal narrow element width (X value) should be between 0.010 inches (.25 mm) and 0.020 inches (.51 mm). The nominal wide-to-narrow ratio (N value) should be 3.0. There must be a minimum quiet zone at each end of the barcode. The use of higher or lower densities is not recommended, as barcode reading reliability may be affected.

LTO Barcode Labels

LTO barcode labels may contain from two to eight alphanumeric characters or from two to six characters plus a media identifier symbol ("L1", "L2" ,etc.). L1 represents Ultrium 1 cartridges, L2 represents Ultrium 2 cartridges and so on. All LTO labels shall also conform to the dimensions in Figure 6 and may be left- or right-reading.



Dimensions in inches; full scale.

Dimensions in centimeters; full scale.

Figure 6 LTO Barcode Label Dimensions

SDLT Barcode Labels

These labels contain six characters plus a check character, may be left- or right-reading and must conform to the dimensions in Figure 7.

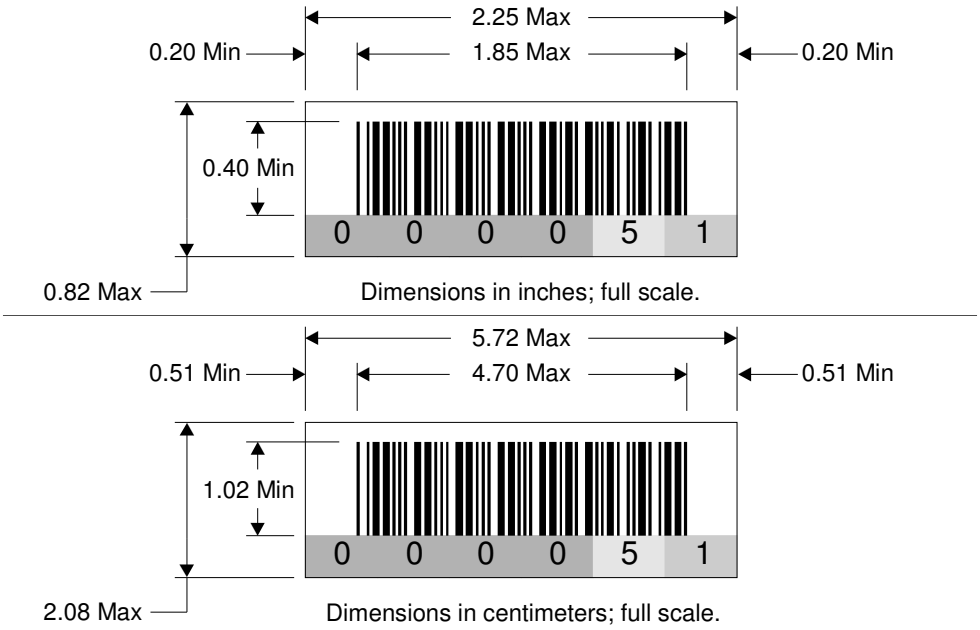


Figure 7 SDLT Barcode Label Dimensions

AIT Barcode Labels

AIT barcode labels may contain from two to six alphanumeric characters and may be left- or right-reading. The AIT label dimensions shall also conform to Figure 8.

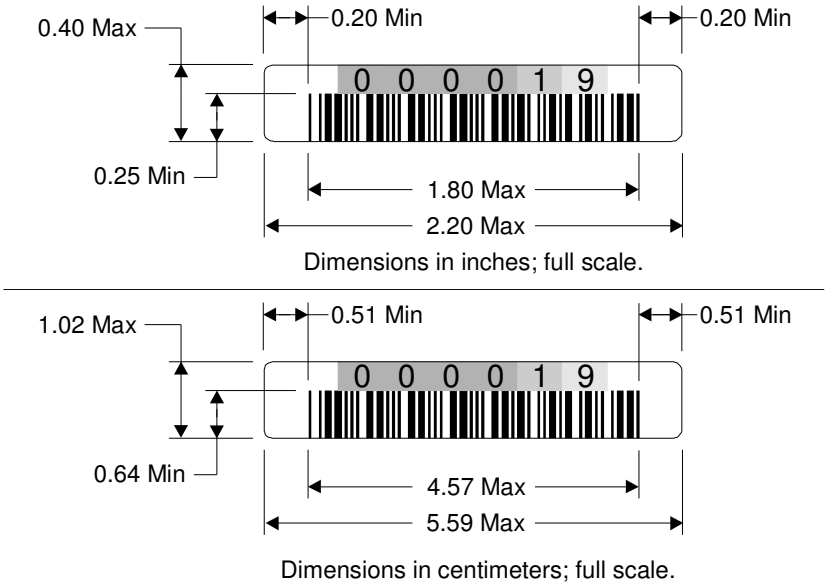
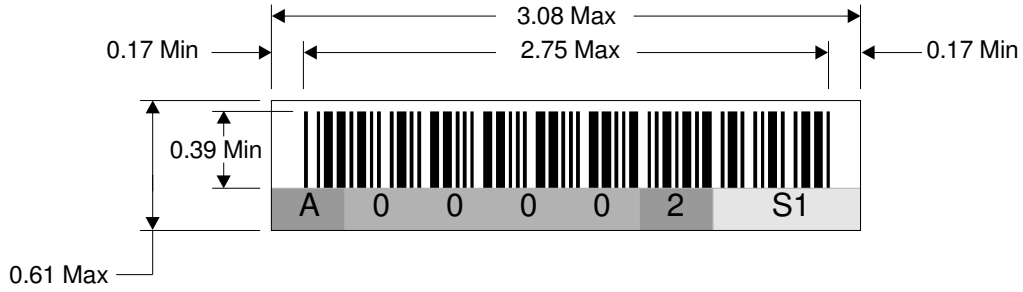


Figure 8 AIT Barcode Label Dimensions

SAIT Barcode Labels

SAIT barcode labels may contain from two to eight alphanumeric characters or from two to six characters plus a media identifier symbol ("S1"). S1 represents SAIT-1 cartridges (500 GB). All SAIT labels shall also conform to the dimensions in Figure 9 and may be left- or right-reading.



Dimensions in inches; full scale.

Dimensions in centimeters; full scale.

Figure 9 SAIT Barcode Label Dimensions