

Peregrine

AssetCenter

Bar-code Inventory



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This product includes software developed by the Apache Software Foundation (<http://www.apache.org>).

This edition applies to version 4.1.0 of the licensed program

AssetCenter

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Introduction (Bar-code inventory)

PREFACE

Who is the Bar-code inventory module intended for?

The Bar-code inventory module is intended for any company that keeps an inventory using bar codes (whether this is an initial inventory or follow-up inventories).

In general, this module is used by the following people:

- The asset manager.
- The inventory manager.
- Inventory technicians.

What does the Bar-code inventory module do?

The Bar-code inventory module enables you to:

- Quickly and reliably make an inventory of your company's assets in order to build the AssetCenter database.

- Uniquely identify each of the company's assets in order to keep track of changes in your inventory. This makes it easy to detect movements, acquisitions, loss or theft.

We selected bar codes for several reasons:

- Attaching a bar-code label on each asset enables you to identify your assets individually. This labeling is necessary to control asset movements (addition, change of location, disappearance) in your company when making regular inventories.
- Bar codes can be read very quickly with a bar-code reader. The reliability of bar-code readers is nearly perfect.
- Bar-code technology can also be used to facilitate asset description. Using bar-code catalogs you can read the major features of each asset, and later manage this information in AssetCenter.

How to use this guide

This guide was designed to help you prepare and perform a bar-code inventory and to quickly learn about the tools provided. The guide is written for the inventory manager or others interested in the advantages of bar-code inventories. Please note that uppercase characters in square brackets denote keys on the bar-code reader itself.

Chapter Overview: Inventory methodology

This chapter explains the principles of an inventory and provides advice on the various steps involved in preparing and making the inventory. This is not a set of directions to be followed to the letter, but advice that should be adapted to each particular case.

Chapter Installation

This chapter deals with the installation before the inventory.

Chapter Initial inventory

This chapter describes the tools used to perform the initial inventory. These tools are presented in chronological order according to their use. The sample database included with AssetCenter and some real-life examples included in the appendixes will let you practice the initial inventory before the real thing.

Chapter Practice case: Entering an asset step by step

To better explain the Bar-code inventory module, we created a practice case to perform in the AssetCenter demonstration database.

Read the Practice case: Entering an asset step by step chapter to easily familiarize yourself with the Bar-code inventory module.

Chapter Glossary (Bar-code inventory)

The terminology specific to the Bar-code inventory module is quite specialized. We provide a glossary defining the key terms used throughout this guide and the AssetCenter application.

Read this glossary to gain a better understanding of these terms.

Chapter References (Bar-code inventory)

This chapter contains exhaustive and systematic reference information.

Read this chapter to learn about all the components of AssetCenter associated to the Bar-code inventory module. You can also access advanced or supplementary information in this chapter.

1 | Overview: Inventory methodology

CHAPTER

The inventory process includes five steps:

- 1 Preliminary study
- 2 Preparation of the data-entry books.
- 3 Pilot inventory: tests, selecting people to perform inventory.
- 4 Initial inventory: collecting data on site.
- 5 Creation of the AssetCenter database.

Preliminary study

The preliminary study is undoubtedly the key part of the inventory. Decisions made during this study will influence the entire inventory process, and the final make-up of your AssetCenter file.

During the preliminary study you will:

- 1 Define and classify the asset models you want to count in your inventory.

- 2 Decide which information relating to each asset will be collected during the inventory.
 - Location, user, model, status of the asset, brand of the model.
 - The features of the model: color, dimensions, etc.
- 3 Estimate the number of assets.
- 4 Create location codes.
- 5 Prepare and order the labels.
- 6 Define label positioning.
- 7 Recruit and test inventory technicians.
- 8 Plan for and order the necessary material.
- 9 Plan the inventory process.
- 10 Prepare the administrative procedures.

Models to inventory

First you must decide what types of models you want to manage with AssetCenter. The assets corresponding to these models must be classified according to the hierarchical classification of the models. For more information, refer to the **Portfolio** guide.

The best place to obtain an initial estimate of your company's inventory is often the accounting department. Study the file of fixed assets and invoices to obtain an initial overview of the various types of models your company has acquired. This survey of the accounting file will also help you make an initial rough estimate of the size of the company's portfolio.

The next step involves selecting the assets in your company's portfolio that will be inventoried. The bar-code inventory does not necessarily need to cover all your company's assets. Some assets are too large or complex to be labeled, while others are not of sufficient value.

We have created a standard hierarchy to help you with this process. It is included in the demonstration database delivered with AssetCenter. You can adapt it according to your requirements.

A quick visit through your premises will let you refine this hierarchy and add certain models you may have forgotten or which do not appear clearly in the accounting files.

Information to gather

Next you must determine the level of detail you need when describing your assets. The AssetCenter bar-code solution is very flexible in this area.

Information collected during the inventory can be:

- Common to all models.
- Specific to an asset.

For information common to all categories, answer the following questions:

- Do you want to record the name of the person using the asset?
- Do you want to record the asset location?
- Do you want to record the asset's serial number?
- Do you want to record the asset condition?

What is left over is that information specific to an asset:

A chair does not have the same features as a photocopier. Therefore, each AssetCenter model is associated with a list of features that describe the corresponding assets. Use the category list defined in the previous section to create a list of the features used for each model. Then you must specify which features should be recorded on site.

The following table summarizes the results of this part of the study:

Models and sub-models	Features of the model	Features for the inventory
Chairs	Arm rests	Arm rests
	Back	Back
	Color	Color
	Base (wheels or sliding)	Base (wheels or sliding)
	Cover	
Photocopiers	Height	Height
	Width	Width

Models and sub-models	Features of the model	Features for the inventory
	Depth	Depth
	Number of copies/minute	
	Zoom	

Studying locations

During the inventory and within the AssetCenter program, each asset's location in the company is specified. You must devise a system to designate every room and area within your premises. AssetCenter enables you to describe your company's sites in a hierarchical table. Study the floor plans to determine how you want to divide, structure and encode your locations:

- Site
- Building
- Floor
- Area
- Room

If floor plans are not available, you must draw them. Each inventory technician will need a floor plan during the inventory. Open-space offices and floor spaces can create problems. You must try to identify landmarks such as pillars, windows, etc. or create areas without any precise information.

You have two methods for entering these locations during the inventory:

- You can label each location:
 - 1 Starting with the locations and their codes entered in AssetCenter, create a set of specific labels either directly in AssetCenter (on a laser printer) or by subcontracting this job to a specialist (contact Peregrine Systems for a list of partners).
 - 2 The inventory manager should be the person who attaches these labels. This task requires a thorough knowledge of the premises. You should not delegate this job to an inventory technician; it is preferable that the inventory technicians concentrate on making the asset inventory.

- Or you can choose to print a document containing the list of these location codes, and give a copy to each inventory technician. In this case, when making the inventory the technician reads the location's bar-code number from the list.

This second method is less reliable and may cause errors, especially if the inventory technician is from an outside company, and is not familiar with the premises.

Labels

For furniture:

Choose a polyester photoset label with glue guaranteed for 10 years.

Label quality for outdoor locations or materials in more severe conditions:

Choose metallic labels with pre-punched holes that may be riveted in place if necessary.

Using prefixes

To inventory an asset on site, you read the descriptive bar codes in sequence and finally read the bar-code number on the label. Because it is not easy to distinguish between bar codes, you should use a prefix. This prefix will provide extra, distinguishable information during entry and for additional verifications.

A prefix is a letter positioned before the code. If you use different prefixes for each type of bar code, the bar-code reader can verify that you are not entering a location code instead of a product code, for example.

Since you are free to encode assets and locations as you see fit, it is your responsibility to specify whether or not you use prefixes and if so, which ones. Be careful: do not use the letters S or B because they are reserved by AssetCenter as the prefixes for statuses and brands.

You can choose different prefixes for generic models. For example: F for furniture, T for industrial tools, etc. We advise against using several prefixes during a single inventory tour, however, as this can create labeling errors and requires the inventory technician to carry several rolls of labels.

Creating asset and location codes

Asset labels are numbered sequentially, from 1 to x. The system uses type 39 codes.

For type 39 codes, the information to be encoded may include any number of upper-case letters, numbers and the symbols +, -, /, ., \$, %, [space]. You must enclose this information between * symbols, and then transcribe the data into a series of bars and spaces as specified by code 39.

If you decide to label your locations, the location codes may be:

- Automatically assigned by an AssetCenter counter.
- Entered manually by the inventory manager. These codes are normally easier to understand and memorize. For example, it is easy to remember that LADM2023 represents office 23 on the second floor of the administration building. The automatic coding system would have assigned code L35. If you choose to enter codes manually, we suggest you use a single prefix for all locations (L, for example).

Format

If you decide to label your locations, you must define at least two label formats: one for assets; the other for locations.

For each type of label you must decide:

- How many characters are included in the asset and location codes?
- Is there a legend? (The meaning of the bar code appears in normal letters along with the bar code.) We suggest you use legends.
- Is there a logo?
- Will you use colors?
- How long do you expect the labels to last?

- How many assets and locations do you have to label?

Your labels should be discreet, and they must be attached to all assets or at all locations. You must find the best compromise between label size and readability.

The logo, additional text and maximum number of characters will influence the size and cost of your labels.

When you have determined the label format, contact a printer who will supply you with pre-printed labels, using the standard code 39. (Contact Peregrine Systems for a list of partners).

 **Important:**

Don't forget lead times. The lead time for printing labels is generally at least three weeks, without incurring additional charges.

Positioning labels

In order to make future inventories as quick and reliable as possible, labels must be positioned according to precise rules. You should define label positioning for each model.

A desk, for example, might have the label attached on the left-hand corner under the desktop, 2 inches from both edges.

You should also think about how to position labels for locations. For enclosed rooms, the most discreet position is on the door frames. The choice of label locations is more difficult for open-space offices. It depends on the way you divide the space: labels can be attached to window recesses, on pillars, etc.

During the preliminary study, each model is reviewed and a location for attaching labels is defined.

For example:

- Tables, desks: under the desktop, 2 inches from the right-hand corner
- Chairs: under the seat, to the right of the seat-back attachment
- Small filing cabinets on wheels: on the left-hand side, to the right of the front wheel, 2 inches from the edge

Some locations should be avoided:

- Labels do not stick to cloth or porous coverings. Make sure the locations you define will keep labels in place.
- Avoid insides of drawers or filing cabinets: they may be locked when the inventory technician does his rounds.
- Unless your inventory technicians are giants, avoid locations that are too high or that are difficult to access.

In general, you must find the best compromise between discretion and easy access.

Administrative procedures

The inventory lets you identify each of the company's assets, its location, and optionally associate it with a standard user. To avoid entering out-of-date information, it is important to define organizational procedures and processes for "incoming" and "outgoing" assets, and their "movements".

These procedures often include stopping all deliveries and asset movements during the entire inventory process.

In order to avoid frustration among co-workers, the inventory must be announced ahead of time, and the reasons for the inventory should be clearly explained:

- the advantages of sound asset management
- transparency at the top of the balance sheet
- savings on professional taxes
- savings on insurance premiums

This announcement should be accompanied by an inventory schedule for each location so everyone can organize their own schedules around the inventory, and to make the inventory process as quick as possible.

Human resources

The number of human resources required varies according to the number of assets involved in the inventory. Two roles are involved in the inventory itself:

- The inventory technician:

The inventory technician performs the work on site. Using a bar-code reader and a reference book (the data-entry book), the technician describes each asset, affixes its bar-code label and records the number. The inventory technician must work at a certain pace, which is determined during a test period. To avoid problems, in particular if an outside subcontractor is performing the inventory, no initiatives should be taken on site without the inventory manager's authorization.

The quality of the catalog and the preliminary study are of key importance during this step.

- The inventory manager:

The inventory manager organizes, manages and controls the work of the inventory technicians. The manager is responsible for maintaining the data-entry books. He or she must make sure that each inventory technician has an up-to-date catalog and a bar-code reader that is correctly programmed and configured. The manager determines the areas to be covered by each inventory technician, and sets the pace. At the end of the day or the morning, the manager recovers each reader and uploads the information to the computer. He then must check the coherency of this information before importing it into the AssetCenter database. On site, the manager verifies that the labels have been correctly positioned, and that the asset matches its description.

At this point in the study you should name the inventory manager. If possible, the manager should take part in the preliminary study. The manager should have a thorough knowledge of the assets involved in the inventory, as well as a good working knowledge of Windows and related tools.

You must also estimate the number of inventory technicians required to perform the inventory, according to the desired duration of the inventory process. You should assume that on average one person can record from 200 to 250 assets per day. The estimates will be refined during the test period, of course, according to the environment and the information to record.

Hardware resources

- Workstation

The AssetCenter program and the additional bar-code module are installed on a workstation with two serial ports (one for the mouse, the other to communicate with the bar-code reader). This workstation must have Windows installed. For more information, consult the chapter Installation, section Minimum configuration.

- Bar-code reader + cradle

The Peregrine Systems bar-code module operates with the following configurations:

- In AssetCenter version 3.01 or earlier, with the Telxon PTC 912 code-bar reader with a minimum of 512 Kbytes memory (1 MB recommended). The version level of the BIOS must be 5.2.
- In AssetCenter version 3.02 and higher, with the Telxon PTC 912 code-bar reader (the standard BIOS version 6.3 is supported and recommended) or the PTC 960 LE code-bar reader.

Each inventory technician needs a code-bar reader. Code-bar readers are available for rent from some partners (contact Peregrine Systems for the list).

 **Note:**

The base (Telxon calls it the cradle) is required to recharge the batteries. This cradle is made up of a base to hold the reader and an extra battery. It is linked to the computer with a TXRX cable (available as an option from Telxon).

The schedule

You should establish a draft schedule for each inventory technician and each location, following the estimated number of assets involved in the inventory. This schedule will be revised after the pilot inventory.

Preparing the inventory

For maximum efficiency and security, the reader program makes a series of bar-code readings (corresponding to the location, user, model, feature or brand) to describe each asset before identifying it with a unique number attached to the asset and recorded in the terminal.

These descriptive bar codes are collected in a document which we call the data-entry book.

This data-entry book is created from information entered previously into AssetCenter. Once the preliminary study is finished, continue preparing the inventory in AssetCenter by:

- Entering the various reference directories: locations, departments and employees, models, features, products.
- Entering the inventory parameters into each bar-code reader.

Entering and printing the data-entry books

AssetCenter uses reference tables called "directories" to locate assets in the company and to describe them. For the inventory, each entry in these directories is automatically associated with a "bar-code" identifier.

When all the directories have been entered, you prepare the page layout and print this information to create the data-entry books. AssetCenter creates a text file which you can modify using a Windows word processor.

Configuring the terminals

The Telxon bar-code readers must undergo two processes before being handed over to an inventory technician:

- 1 The program that will manage the inventory on site must be downloaded into the bar-code reader. This operation must be performed by Peregrine Systems. All material ordered directly from Peregrine Systems is pre-programmed. If you choose to obtain your material via other means, make sure you check this point. Telxon

can perform this operation if you ask them when you place your order.

- 2 The second process configures the bar-code reader with your company's parameters and those of the inventory about to be carried out. These parameters include:
 - Information identifying the source of the files created by the inventory:
 - The number of the reader
 - The name of the inventory technician
 - The inventory date
 - Information to adapt the program to your requirements:
 - Should the asset's user name be recorded?
 - Should the status be recorded?
 - What features are required for each model?

This second process is performed by AssetCenter.

Selecting and training inventory technicians

Several inventory technicians will be required for companies with a large number of assets. These technicians, either company personnel or individuals hired especially for the inventory, rarely receive proper training for this job.

The inventory manager selects and trains the inventory technician over a 3 to 5 day period.

The tests are generally performed in a real situation during a small pilot inventory. You should take advantage of this step to:

- accurately determine the productivity of each inventory technician
- refine the schedule
- optionally complete the list of models

First inventory and marking assets

Each day the inventory manager assigns a work area to the inventory technician. The inventory is carried out room by room, area by area.

Then, for each asset the inventory technician should:

- 1 Read in turn the bar codes in the data-entry book corresponding to the information on each asset: location, user, serial number, status, model (in the **Category** field accessible via the **Prod** button), brand, features.
- 2 Attach a bar-code label to the asset in the position defined during the preliminary study.
- 3 Finally, after using the [ENTER] key to make sure the bar-code reader is set to the **Asset** field, read this barcode.
- 4 Then go to the next asset.

The data-entry book enables you to describe the asset in only a few seconds.

Before going on to the next area or room, the inventory technician should ensure that no assets have been forgotten. Here are a few tips on methodology:

- Count the number of assets for inventory as soon as you enter the room.
- If one area includes 4 or 5 different models, do not enter the assets model by model (in other words, all the chairs, then all the desks, then all the filing cabinets, etc.).
- Work as systematically as possible: from left to right or from right to left.
- Do not attach a label to an asset before it has been entered. Read the asset's bar code just before or just after attaching its label, or you can install a visual system to identify "forgotten" assets (chalk mark, colored sticker, etc.). You should not attach labels to assets before the inventory.

- When all the assets in a room have been entered, compare the number of assets entered on the bar-code reader to the number you counted when entering the room.
- If you cannot use a label (a mistake when attaching the label, bad glue, etc.), carefully write down its number. Labels are numbered sequentially. You can trace errors by checking any skips in the sequence.

Creating the AssetCenter database

Each day the inventory technicians create a text file which associates asset bar codes, model, user, etc. These text files are transferred daily from the bar-code reader to the workstation.

These files are not entered directly into the AssetCenter database. This provides time for the inventory manager to check the contents of the files. Assets are created by importing the files via the **Import** button in the **Update database** window.

This is a meticulous task requiring careful attention. It is usually performed by the inventory manager, who must:

- Check that all the files are imported correctly.
- Ensure that no records are forgotten.

AssetCenter provides a few tools to help the inventory manager with this task:

- An error recovery file for each imported file
- When the file has been imported, the system creates a printable list of assets sorted by bar-code number. Since these numbers are sequential, it is easy to find missing numbers.

You can import these files on a daily basis, or group them together at the end of the week or at the end of the inventory period.

2 Installation

CHAPTER

Minimum configuration

You will need the following to install and operate the Bar-code inventory module for AssetCenter:

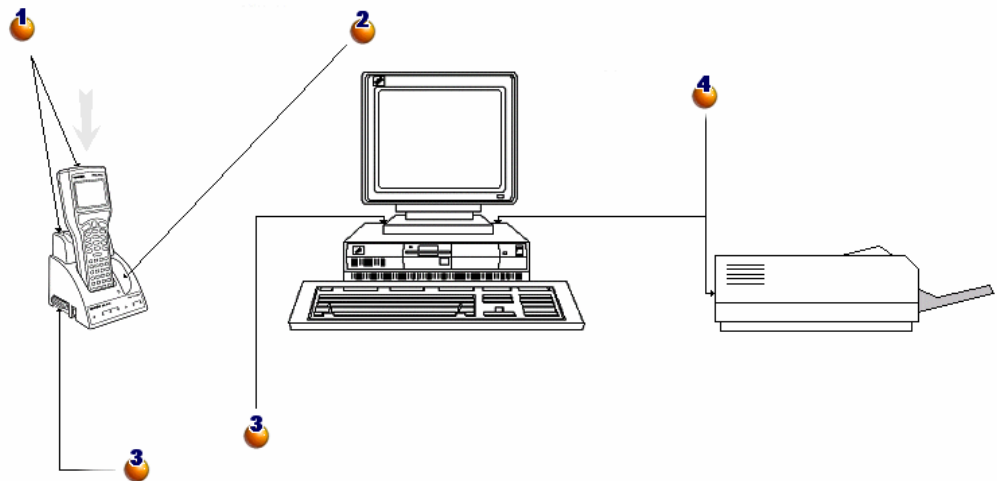
- The software, including the AssetCenter software and a program designed especially for the bar-code reader.
- The hardware, including a Telxon PTC 912 or Telxon PTC 960 LE portable bar-code reader kit with 1 MB of minimum memory and a terminal/PC communication facility (cradle + TXRX cable). This kit, available from Peregrine Systems or any authorized Telxon dealer, contains:
 - 1 A bar-code reader. This unit includes a laser-based device to read the bar-codes. It also includes a screen and a keypad. It is battery operated, giving it the necessary autonomy for a full day's inventory.
 - 2 A base (also known as a cradle). This cradle communicates with the work station using a cable connected to the computer's serial

port. The cradle provides the ability to program the reader, retrieve data collected, and recharge the batteries.

Human resources: an inventory supervisor and eventually one or several technicians to make the inventory. These people will print the bar-code labels and take the inventory according to the advise provided in this guide.

Hardware installation

Figure 2.1. Connecting the hardware



- 1:** Gently place the bar-code reader in the cradle as shown below.
- 2:** An additional socket on the right can hold an additional battery.
- 3:** Use the serial cable provided with the bar-code reader to connect the left-hand connector of the cradle to one of your computer's serial ports.
- 4:** The computer must be connected to a laser printer to print the catalogs.

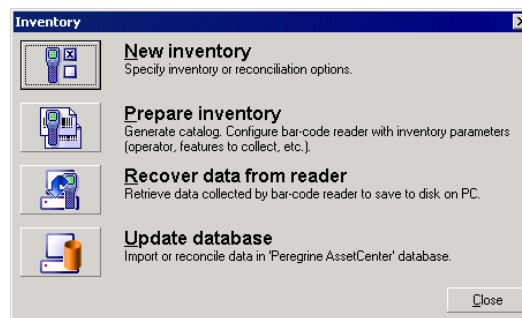
Installing the bar-code font

The data-entry books require a special True Type font to convert the alphanumeric code entered in AssetCenter into a series of "Code 39" bars. AssetCenter automatically installs this font, called C39T30Lfz, in the same place as all your other Windows fonts. You can view these fonts from the Windows "Control Panel". You should use this font when editing and printing your labels.

Refer to your Windows guide for more information on installing fonts.

The Inventory window in AssetCenter

Select the **Portfolio/ Bar-code inventory** menu item to display the following window:



Each of the four buttons above represent a step in the inventory process. These buttons are described in the next chapter.

3 Initial inventory

CHAPTER

Preparing AssetCenter for the inventory

These preparations involve the following:

- 1 Enter the reference tables: locations, employees, models, features.
- 2 Select the models and features involved in the inventory.
- 3 Prepare the data-entry book.
- 4 Configure the inventory.
- 5 Program the data entry terminals that will be used by the inventory technicians.

Populating the tables

You must populate the following tables depending on the way you want your inventory entered. We recommend doing it in the following order:

- Locations
- Employees and Departments

- Brands
 - Models
 - Features
-

 **Note:**

If you decide to record the condition of each asset on site, do not forget to create items in the **Status** itemized list through the **Administration/ Itemized lists** menu item.

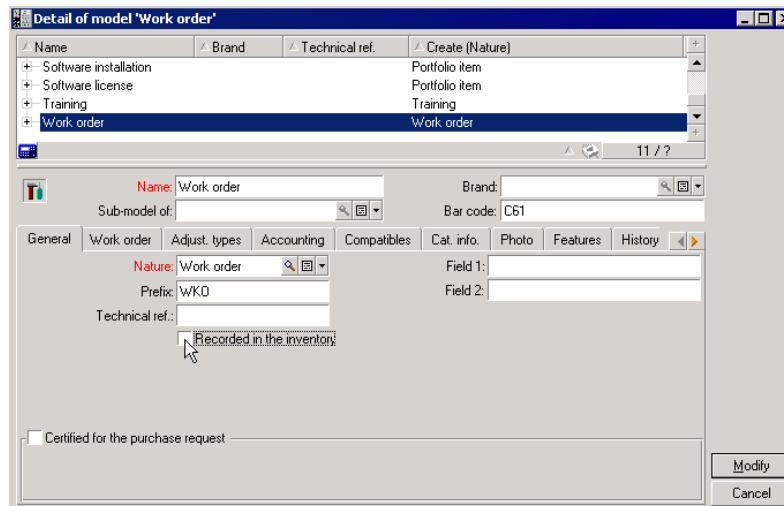
If you require more information on how to create a new employee, location or model in AssetCenter, refer to the **Core tables** and **Portfolio** guides.

Selecting the brands, models and features for the inventory

You do not have to include all the asset models managed by AssetCenter in your bar-code inventory. Furthermore, for a given model, you can choose to enter only certain features during your inventory. To include the brands of the models in your inventory, you must select the **To be inventoried** option for the records in the Brands table. (Follow the same procedure as described below.)

The To be inventoried checkbox of the models:

- 1 Open the model window and display the list and details.



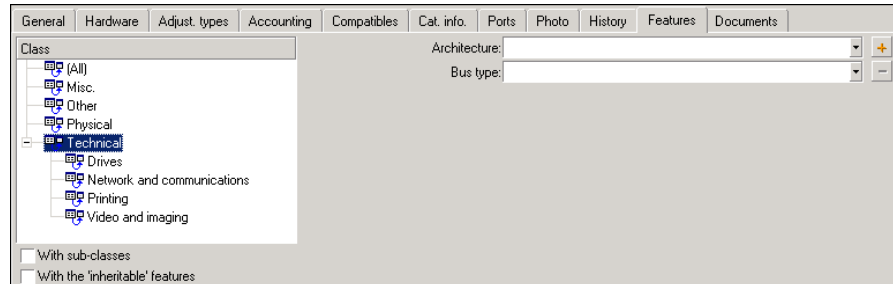
- 2 In the list section, select all the models you do not want to include in the inventory (click successively on each model in the list while holding down the Ctrl key). For example, in our illustration below, only the work orders model will not be included in the inventory.
- 3 Clear the **Recorded in the inventory** checkbox in the **General** tab.
- 4 Click **Modify**.

The To be inventoried checkbox of the feature:

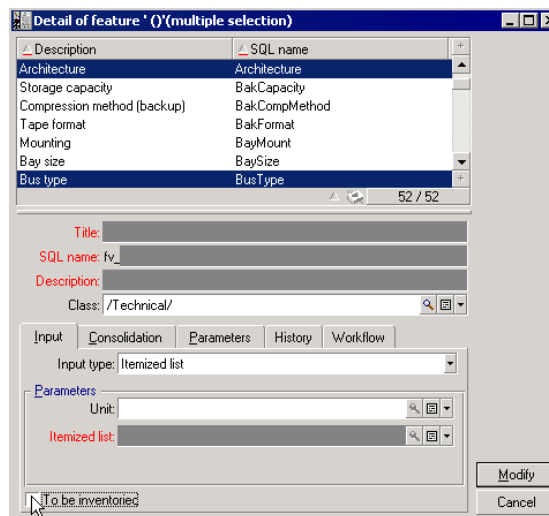
This option is selected by default for each feature. You must unselect those that you do not want to inventory.

- 1 Click the Features tab in the model detail.

2 Double-click a feature to view its details.



3 Select the **Administration/ Features** menu. You can select several features using the list and the detail of the Features screen.



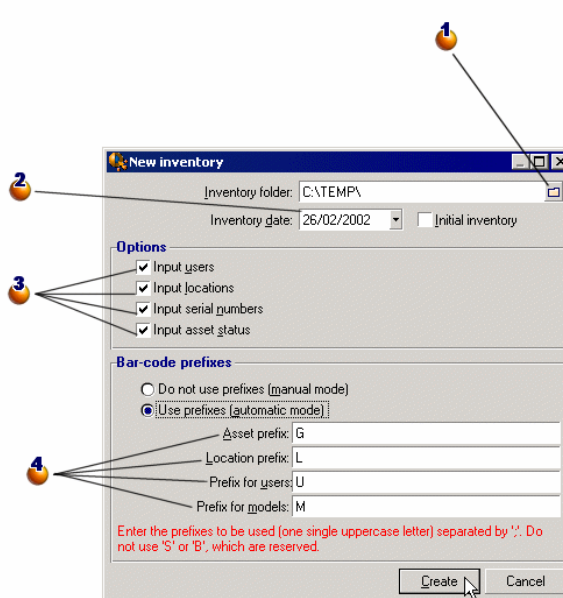
4 Clear the **To be inventoried** option.

5 Confirm the modification and close the window.

6 No inventoried model takes into account the **Architecture** and **Bus type** features.

Initializing the inventory

After you have finished populating the tables selecting the features and models to include in the inventory, click **New inventory** in the **Inventory** window.



1: Select a folder or create a new folder. This folder will contain all the files generated during the inventory.

2: The inventory date is the same for all inventoried assets. It usually corresponds to the date the inventory began. This date will be used in the **Inventory date** field (dtInvent) for each asset created from this inventory.

3: Enter the information that will be inventoried. These selections will have an impact on the bar-code reader.

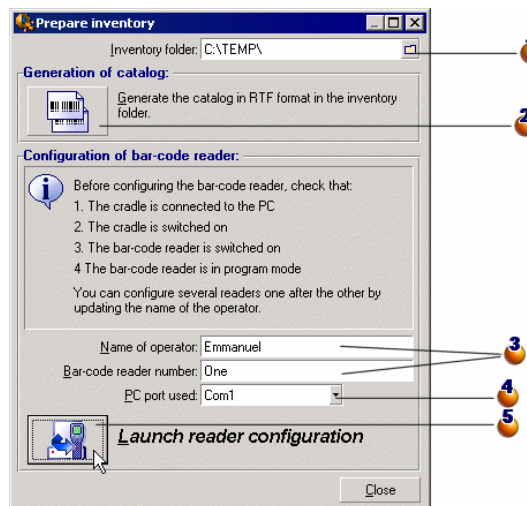
4: If you use prefixes, the code-bar reader can determine the nature of the bar codes it reads. You must only use upper-case letters in the prefixes, however.

When you click **Create**, AssetCenter generates the following files in the specified directory:

- The **INVENT.INI** file contains parameters for the bar-code reader, and the options defined above.
- The **CAT.DAT** file contains the list of models and features to include in the inventory.

Preparing the inventory

When you have initialized the inventory, click the **Prepare inventory** button.

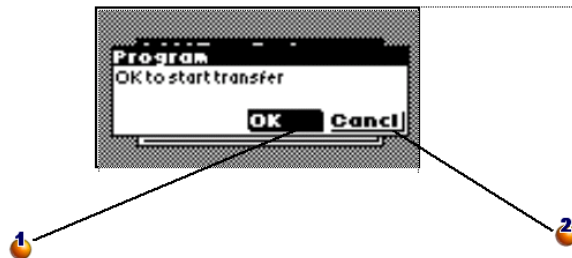


1: Specify the name of the inventory folder.

2: Click this button to generate the RTF file that enables you to create the data-entry book for the inventory technician.

3: The name of the inventory technician and number of the bar-code reader are two parameters that appear on each file generated by the bar-code reader. It is thus possible to locate the source of any problems or repeated errors.

- 4: Specify the serial port to which the bar-code reader is connected.
- 5: After having put the bar-code reader back in its cradle and activated the **Programming** option, you must activate the **OK** button on the bar-code reader ([SPACE] key) and click **Launch reader configuration** in AssetCenter. Both operations must be performed within a 10 second interval.



- 1: Using the [SPACE] key on the bar-code reader, activate the **OK** button to begin the transfer.
- 2: Activate the **Cancel** button to close the window and return to the main menu without having performed the transfer.

On site, the inventory technician will have a code-bar reader and a data-entry book. This window lets the technician prepare these two tools.

- Click the **Generate catalog** button to create the **CAT.RTF** file in the inventory folder. This file, in the standard RTF (Rich Text Format) format recognized by most word processors, will be used as the basis for the data-entry books for the inventory technicians.

The **CAT.RTF** file already contains certain layout options: font, size, styles, tabs, page and section breaks. This file, in the standard (Rich Text Format) format recognized by most word processors, will be used as the basis for the data-entry books for the inventory technicians.

Here are a few tips to guarantee optimal reading:

Do not modify the size of the bar-codes. They use a special font called C39T30Lfz delivered with the bar-code module, and which should

ideally be used with a size of 30 points. If you vary this recommended size by more than 10% you may have problems reading bar-codes.

Print your catalogs on a good quality laser printer. Make sure the toner cartridge is full and that the paper feed mechanism is clean and does not leave any traces.

To facilitate reading and avoid errors, bar codes must be spaced approximately 2 cm (3/4 of an inch) apart.

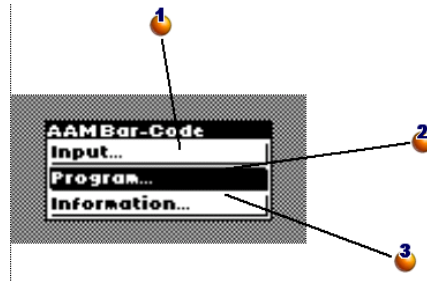
- The **Launch reader configuration** button should be used when the bar-code reader is connected to the computer (make sure you use the cradle) and ready to be programmed (the **Programming** option in the reader's menu). This enables you to load the following information into the reader:
 - The reader number.
 - The name of the inventory technician assigned to the terminal.
 - Optional information that must be entered on-site (the **Options** section in the **New inventory** window).
 - The prefixes used.
 - The list of models and features to be inventoried.

Using the bar-code reader

The Telxon PTC-912 (or PTC 960 LE) bar-code reader and its cradle each have their own user guide. They explain how to maintain your reader, as well as provide instructions on functions such as how to use the keys and control the display brightness. In this chapter we describe the use of the inventory program itself. We assume that you already know how to:

- Turn on the bar-code reader.
- Use the keypad.
- Read a bar code.

The main menu



1: displays the data entry window for assets.

2: Put the bar-code reader in programming mode to load the parameters at the start of an inventory. This option becomes **Upload** as soon as an asset has been entered.

3: Displays an information window: available memory, reader number, number of entered assets, etc.

This is the first menu that appears when you turn on the bar-code reader.

- Use the [ENTER] key to move the selection zone.
- Use the [SPACE] key to activate one of these lines and start the corresponding function.

Note:

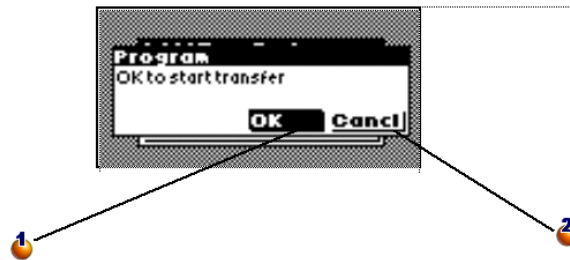
As soon as information has been entered into the bar-code reader, the **Programming** option is replaced by the **Upload** option. To return to the **Programming** state, you must perform an operation: Uploading a bar-code reader's data.

Warning:

If you do not want to keep this information, press [CTRL] [FUNC] and [0] successively. This operation definitively deletes the information stored in the terminal.

Programming the bar-code reader

This window is displayed as soon as the **Programming** line has been confirmed.



1: Using the [SPACE] key on the bar-code reader, activate the **OK** button to begin the transfer.

2: Activate the **Cancel** button to close the window and return to the main menu without having performed the transfer.

Use the [ENTER] key to go from the **OK** button to the **Cancel** button on the screen of the code-bar reader. Press the [SPACE] key to activate the selected button.

To transfer data:

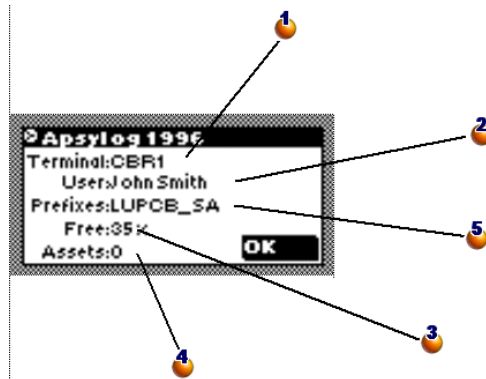
- The reader must be in the cradle.
- The cradle must be powered on and connected to the computer's serial port.
- You must have executed the **Configure a bar-code reader** button in the **Portfolio/ Bar-code inventory** menu item of AssetCenter, and entered the appropriate parameters in the **Serial port** field.
- You must have clicked the **Launch reader configuration** button (see above).

There is no required order and no hurry for pressing the **Launch reader configuration** button in AssetCenter and activating the **OK** button on the bar-code reader. Both operations must be performed within a 10 second interval.

The **Invent.ini** and **Cat.dat** files will be copied to the bar-code reader.

Displaying information

This window displays important information concerning the bar-code reader status and the main program parameters:



1: name or number assigned to the bar-code reader during it programming.

2: name of the inventory technician.

3: percentage of available memory.

4: number of assets entered.

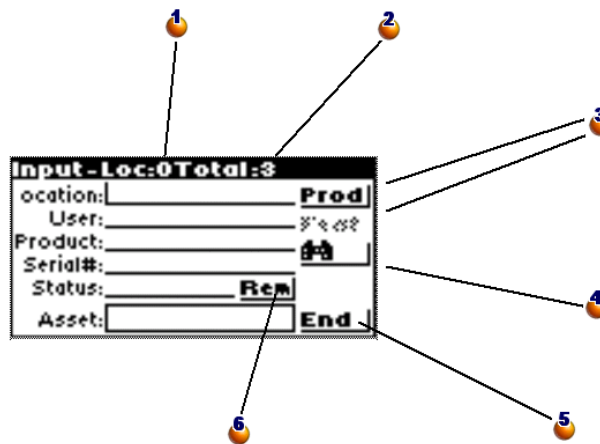
5: prefixes used.

Press the [SPACE] key to close this window and return to the main menu.

Entering assets

Overview

The following screen is displayed when you select **Input** from the main menu.



1: Counter: number of assets entered in the current location.

2: Counter: total number of assets entered.

3: The **Prod** button enables you to specify the model of the asset. The **Feature** button is then available to specify the features.

4: opens the window that lets you search for an asset in the bar-code reader's memory.

5: Closes the input screen and returns to the main menu. Warning: Closing this screen is not the same as saving the information being entered. The record is only saved when the **Asset** field is populated and validated.

6: opens the window that lets you enter a comment.

Use the [ENTER] key to go from one zone to the next and the [SPACE] key to activate the selected button.

Press [SHIFT] then [ENTER] to go up to the preceding zone or button. (You must release the [SHIFT] key before pressing [ENTER].)

A vertical bar indicates the position of the cursor and the place where data will be entered. All information can be entered from the keypad or by reading a bar code, and thus, you needn't worry about an illegible or damaged bar code.

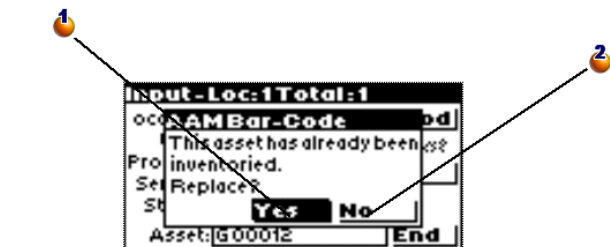
If all the necessary information has been entered, the asset is saved as soon as a bar code has been entered and validated. The last information entered is kept so you can enter several identical assets in succession without having to describe them again.

Optionally you can enter a serial number, a condition or a comment. All the other information is mandatory, and required for the asset to be saved. An error message is displayed if you try to save an asset without having entered all the necessary information.

 **Note:**

The **End** button closes the window and returns to the main menu. The information entered since reading the last asset label will be lost.

When you read the label attached to an asset, the program systematically searches the information already entered to see if this number has already been used. If so, you will hear a beep and the following window is displayed:



1: Replaces the old values with the new ones.

2: Cancels the entered bar code and closes the window.

Entering data with the keypad

To enter information with the keypad, move the cursor to the zone you want using the [ENTER] or [SHIFT]+[ENTER] keys.

If erroneous information appears in the field, use the [ESC] key to clear the field.

Your data entry is validated when you press the [ENTER] key. The cursor automatically moves to the next field.

You always have the possibility of entering data on the keypad. To do this, make sure the RTF catalog, which acts as the data-entry book, does not have any corresponding bar codes.

Reading a bar code

Depending on the prefix options chosen by the inventory manager, the program's operating mode changes slightly.

Reading with prefixes:

Wherever the cursor is positioned, find the bar code corresponding to the desired information in the data-entry book and read it. The program immediately recognizes the type of information read and automatically places it in the corresponding field.

If you have chosen to use prefixes, the cursor position and the order for reading information has no importance. You must make sure that you do not forget any information.

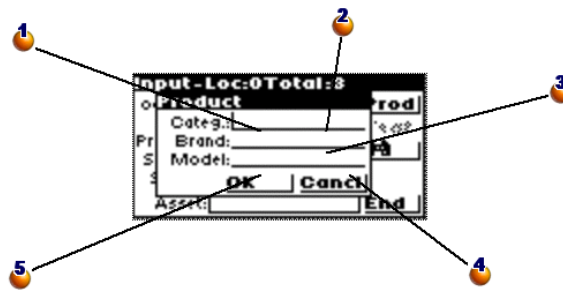
Reading without prefixes:

In this case, the program is incapable of knowing the type of code read. You must therefore make sure the cursor is positioned on the correct field before each entry.

Once you have read the code, the cursor automatically moves to the next field.

Describing an asset by model and features

Step 1 : Specify the Model and Brand

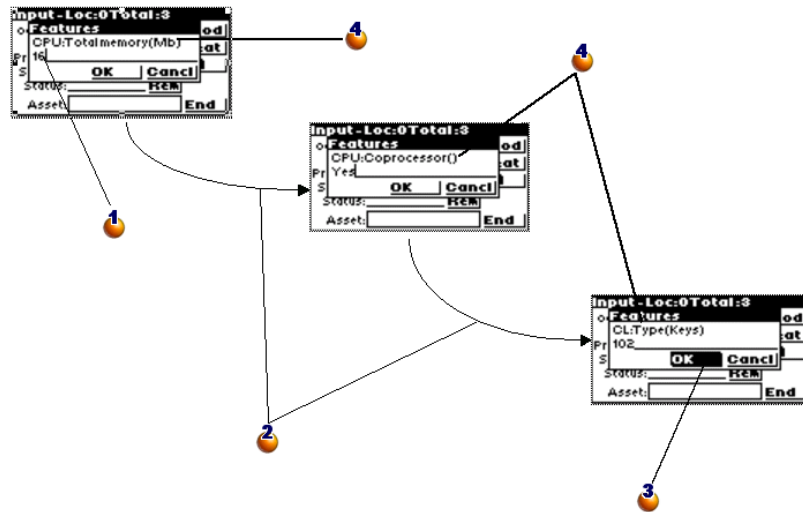


- 1: The Cate9. field takes the value of a model code.
- 2: Reads the code and the brand of the model from the data-entry book.
- 3: Previous code of the model. To ignore.
- 4: Cancel the data entry, close the window and return to the previous window.
- 5: Display the window in which to enter an asset's features.

This window is displayed when you activate the **Prod.** button on the reader's screen or, if prefixes are used, when you read the bar code of a model or brand.

Using this window you can define a model that is not in the data-entry book.

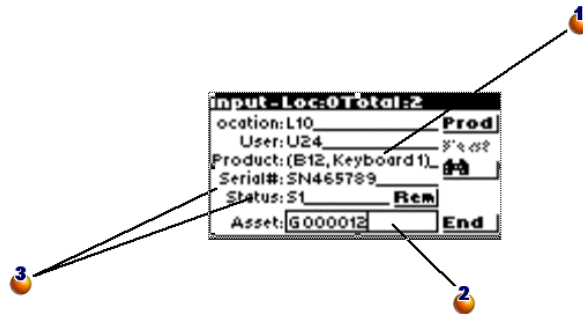
Step 2 : Entering features



- 1: Consult the data-entry book to find out if the features entry must be entered using the bar-code reader or the keyboard.
- 2: Features are displayed one after another, in order.
- 3: After having entered the last feature, use the [SPACE] key to activate the **OK** button: This closes the window so you can continue the inventory.
- 4: The bar-code reader requires you to enter a precise list of features according to the model.

The procedure for entering features is started automatically when you have opened and then closed the model definition window (see Step 1) or when you activate the **Feature** button on the asset entry window. The **Feature** button as well as the procedure for entering features cannot be activated until a model has been entered in the **Product definition** window.

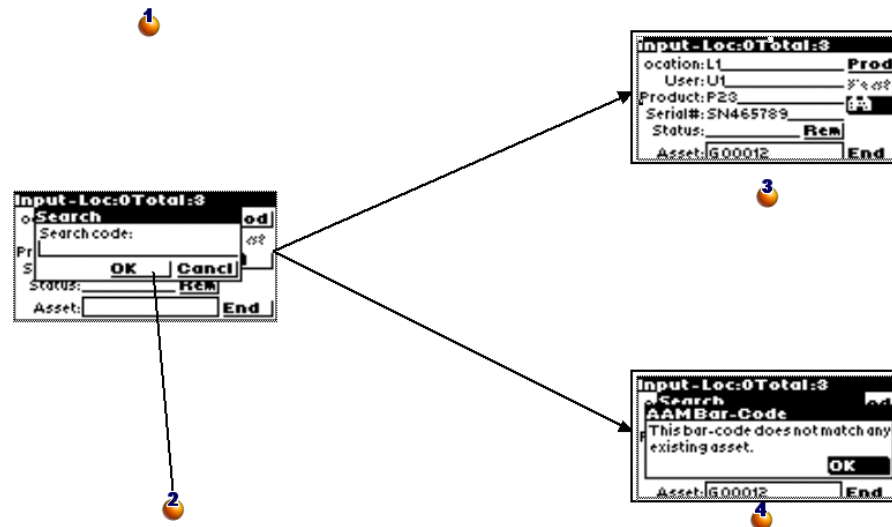
Step 3 : Returning to the asset data entry window and creating the asset



- 1: Once the location and user have been populated, select **Prod** and populate these fields. (When performing an inventory for checking purposes later on, you can simply populate the **Product** field using a code corresponding to a model.)
- 2: The asset is saved as soon as the label has been read.
- 3: Specify the serial number and its status.

Finding an asset

This window is displayed when you activate the **Binoculars** button in the asset data entry window



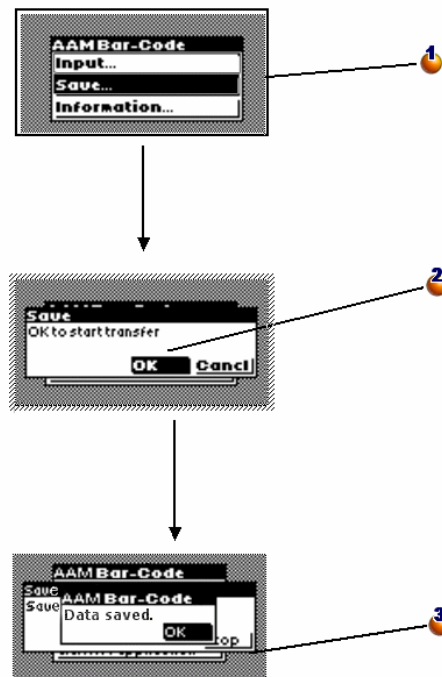
- 1: You can conduct the search using the asset's bar code. You can enter this information using the bar-code reader or manually with the keyboard.
- 2: Using the [SPACE] key, activate the **OK** button to launch the search.
- 3: The asset has been found.
- 4: The asset has not been found.

Modifying an asset already entered

To modify an asset that has already been entered, you just need to re-enter it. When AssetCenter creates assets, only the most recent values will be used. To avoid re-entering all the information, proceed as follows:

- Search for the asset to display all the information concerning the asset.
- Modify the incorrect values.
- Re-enter the asset's bar code.

Uploading a bar-code reader's data



1: After having entered an asset, the **Programming** option of the main menu is replaced by the **Upload** option. Validate this option to open the Upload window.

2: Select **OK** to start the transfer (See the procedure to follow in AssetCenter explained further on in this document).

3: The upload was successful. Activate the **OK** button to return to the main menu.

After the transfer, the **Upload** option is again replaced by the **Programming** option. You can now modify the bar-code reader's parameters.

Integrating data in AssetCenter

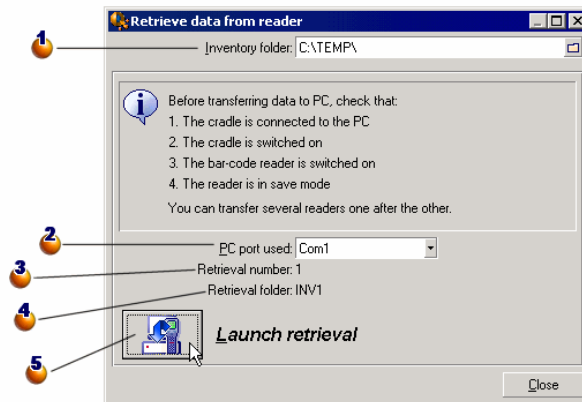
Uploading collected data

The data entry terminals have limited autonomy and storage capacity. They must periodically be re-charged and their contents must be transferred to the computer.

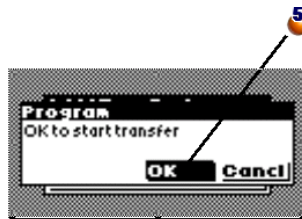
For this, use the **Recover data from reader** button in the **Inventory** window:

This operation enables you to transfer the data contained in your bar-code reader to your computer's disk drive. It also reinitializes the terminal, freeing up memory for a new round of data entry.

When the upload is finished, the window remains open in case you want to repeat the operation for another bar-code reader.



- 1: Specify the name of the inventory folder. By default, the last folder used is listed here.
- 2: Specify the serial port to which the bar-code reader is connected.
- 3: For informational purposes, the retrieval number is given here. In this case it is the first file transfer.
- 4: The name of the inventory sub-folder into which the files were transferred is listed here for your information. The full name of this folder is C:\TEMP\INV1.
- 5: After having put the bar-code reader back in its cradle, activate the **OK** button on the bar-code reader ([SPACE] key) and click **Launch retrieval** in AssetCenter. Both operations must be performed within a 10 second interval.



Files generated by the reader program are saved in a sub-directory in the inventory directory. These are tab-separated ASCII files with the .DAT extension. You can use any word processor or spreadsheet to verify the data before importing it into AssetCenter.

These files are difficult to interpret, however, since they mostly include bar codes. As a result, during the transfer AssetCenter generates "interpreted" files by adding a description column to the right of the bar codes. These "interpreted" files have the .IMP extension.

There are three of these files:

- **ASSETP.IMP** contains all the assets that were entered associated with a model code.
- **ASSETC.IMP** contains all the fully described assets without referring to a product code, without their features.

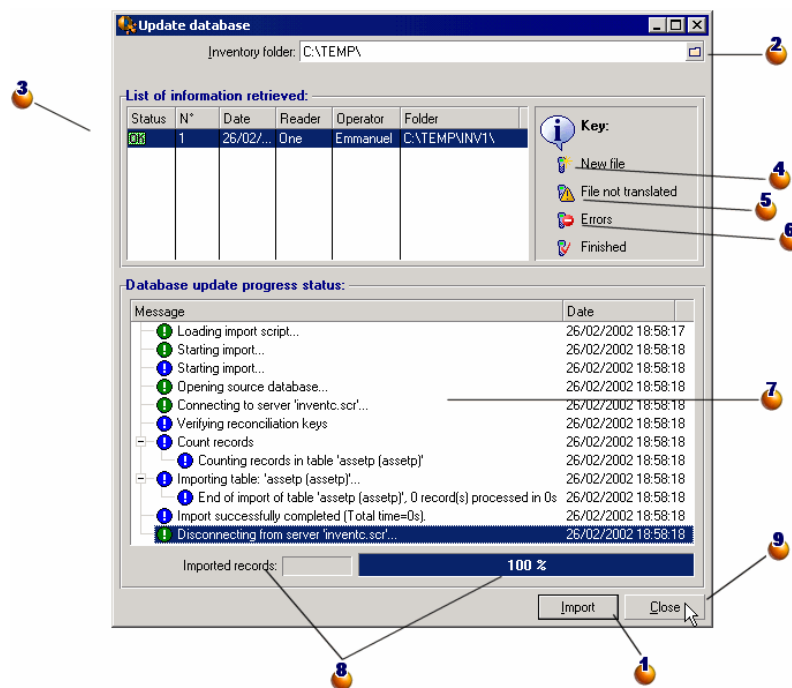
- **VAL.IMP** contains all the features and feature values for the assets listed in **ASSETC.IMP**.

Importing assets into the database


This is the last phase of the initial inventory. It creates assets in AssetCenter by importing inventory data. This operation can be carried out once at the end of the inventory, or spread out over the entire inventory period as data is uploaded from the bar-code readers.


In any case, we recommend that you make a backup of your database before importing this data.


Once the backup is completed, click on the **Update database** button, accessible via the **Tools/ Bar-code inventory** menu.





1: Click this button to import the selected lines.


: Specify the name of the inventory folder. By default, the last folder used is listed here.


: OK indicates that the files have been correctly imported.


: This icons indicates that the files have not yet been integrated into AssetCenter.

: This "Danger" symbol indicates the inventory files contain codes unknown to AssetCenter. These files cannot be imported with such codes. See the note below.

: STOP indicates that there was a problem during the import. Click the line and consult the **Database update progress status** table to figure out the cause.

: In this table, you can find the history of the import corresponding to the line selected in the list of retrieved information. The slightest problem is signaled.

: For informational purposes, the number of lines imported and the progress is shown here.

: Click this button to close the window.

When you click the **Import** button, the assets are created in AssetCenter with other data as per the inventory parameters, such as user, location, etc.

An asset is described using an association with a model. This association is kept in AssetCenter and the asset inherits all the model's properties.

Now you can display the results of the import process in the AssetCenter asset window.

 **Note:**

The "Danger" symbol indicates that the inventory files contain unknown codes. To guarantee a coherent database, the program cannot import these files as long as the error remains. You must therefore edit the corresponding .IMP files and correct the error, or delete the line. These files are in tab-separated text format, and may be edited by most word processors. Once you have corrected the error, return to AssetCenter and click the **Import** button again after clicking the **Update database** button.



4 | Practice case: Entering an asset step by step

CHAPTER

To help you practice entering assets using your bar-code reader, we have prepared some examples of asset descriptions in the following pages.

Initialize the inventory

Enter the bar-code reader's parameters as described below:

Program the reader

Now you should program the bar-code reader following the procedure described previously. Then use the tables below to practice entering data.

To complete the cycle, you should transfer this information to the computer, then import it into the AssetCenter database.

The case of an asset whose features are not entered:

Location	/Andrews building/30th floor/024 - Office L17
User	/TALTEK/Adm. & Financial Mgmt. U56
Model code (in the Product field)	Multisync A500 M21

Serial number	LR456456
Status	Good
Comments	Enter text on keypad then press [ENTER]
Asset bar-code label	A00001

Case of an asset whose brand and features are entered:

Location	/Greenwood Site/Building 01/1st Floor/001 - Office L52
User	/TALTEK/Information Services Mgmt/Chavez U5
Comments	Enter text on keypad then press [ENTER]
Asset bar-code label	A00003
Model (in the Category field via the Prod. button)	/Furniture/Filing Cabinet C53
Brand	STARITE Type on keypad: STRAFOR then press [ENTER]
Color	Beige
Number of shelves	Enter a value on the keypad then press [ENTER]

5 | Glossary (Bar-code inventory)

CHAPTER

Data-entry book

A rather hefty document that resembles a catalog of the bar codes associated with the values that describe your company's assets. Reading these values directly facilitates the identification of these assets during an inventory.

Synonyms

Catalogs, bar-code catalog, data-entry book

Bar-code reader

An optical device used to read bar codes.

Synonyms

Reader, scanner, handset

Code 39

Self-checking alpha-numeric barcode. It is the most widely used barcode because of its ease of use in printing and reading.

6 | References (Bar-code inventory)

CHAPTER

Menu (Bar-code inventory)

The data from the Bar-code inventory module can be accessed via the following menus, tabs, links and fields:

Table 6.1. Menus and tabs (Bar-code inventory)

Sub-menus	Table accessible via the menu (label and SQL name)	Dedicated tabs, fields or links	Section of the guide to consult
Portfolio menu			
Bar-code inventory	Enables you to access the functions of the Bar-code inventory module, if your license file permits it.	None	Chapter Installation, section The Inventory window in AssetCenter
Portfolio menu			

Sub-menus	Table accessible via the menu (label and SQL name)	Dedicated tabs, fields or links	Section of the guide to consult
Locations	Locations (amLocation)	General tab and Bar code field (BarCode)	Chapter Overview: Inventory methodology, section Studying locations.
Portfolio menu			
Departments and employees	Employees (amEmplDept)	General tab and Bar code field (BarCode)	Chapter Initial inventory, section Populating the tables.
Portfolio menu			
Models	Models (amModel)	Bar code field (BarCode)	Chapter Initial inventory, section Populating the tables.
Portfolio menu			
Brands	Brands (amBrand)	Bar code field (BarCode)	Chapter Initial inventory, section Selecting the brands, models and features for the inventory.
Portfolio menu			
Assets and batches	Assets (amAsset)	General tab and Bar code field (BarCode)	Chapter Initial inventory, section Importing assets into the database.
Administration menu			
Itemized lists	Itemized lists (amItemizedList)	None	Chapter References (Bar-code inventory), section Itemized lists (Bar-code inventory).
Counters	Counters (amCounter)	None	Chapter References (Bar-code inventory), section Counters (Bar-code inventory).
Features	Features (amFeature)	None	Chapter Initial inventory, section Selecting the brands, models and features for the inventory.

Toolbar icons (Bar-code inventory)

There are no toolbar icons specific to the Bar-code inventory module.

Interface options (Bar-code inventory)

There are no general interface options specific to the Bar-code inventory module.

Tables (Bar-code inventory)

The Bar-code inventory module uses numerous tables.

The following tables are associated with the Bar-code inventory module:

Table 6.2. Tables (Bar-code inventory) - list

Label of the table	SQL name of the table	Menus enabling you to access the table	Sections of the guide to consult
Tables specifically linked to the Bar-code inventory module			
Locations	amLocation	Portfolio/ Locations	Chapter Overview: Inventory methodology, section Studying locations.
Departments and employees	amEmplDept	Portfolio/ Departments and employees	Chapter Initial inventory, section Populating the tables.
Models	amModel	Portfolio/ Models	Chapter Initial inventory, section Populating the tables.
Brands	amBrand	Portfolio/ Models	Chapter Initial inventory, section Selecting the brands, models and features for the inventory.

Label of the table	SQL name of the table	Menus enabling you to access the table	Sections of the guide to consult
Assets and batches	amAsset	Portfolio/ Assets and batches	Chapter Initial inventory, section Importing assets into the database.
Itemized lists	amItemizedList	Administration/ Itemized lists	Chapter References (Bar-code inventory), section Itemized lists (Bar-code inventory).
Counters	amCounter	Administration/ Counters	Chapter References (Bar-code inventory), section Counters (Bar-code inventory).
Features	amFeature	Administration/ Features	Chapter Initial inventory, section Selecting the brands, models and features for the inventory.

Dependent relationships between tables (Bar-code inventory)

There are no dependent relationships between tables in the Bar-code inventory module.

Itemized lists (Bar-code inventory)

The value of certain fields can be selected in an open or closed itemized list.

To access the **Itemized lists** table (**amItemizedList**), select the **Administration/ Itemized lists** menu.

The following table details the itemized lists specific to the Bar-code inventory module.

Table 6.3. Itemized lists (Bar-code inventory) - list

ID of the itemized list	Fields populated using the itemized list (label and SQL name)	Table in which the field is found (label and SQL name)
amStatus	Status (Status)	Assets (amAsset)

For more information about itemized lists, refer to the **Advanced use** guide, chapter **Itemized lists**.

Calculated fields (Bar-code inventory)

The Bar-code inventory module does not use any standard, calculated fields.

For more information about calculated fields, consult the **Advanced use** guide, chapter **Calculated fields**.

For more information about writing scripts, consult the **Advanced use** guide, chapter **Scripts**.

For more information about APIs, consult the **Programmer's reference** guide.

Counters (Bar-code inventory)

The Bar-code inventory module uses certain counters.

These counters are used in the default values of certain fields.

To access the **Counters** table (amCounter), select the **Administration/Counters** menu.

The following table details the counters specific to the Bar-code inventory module.

Table 6.4. Counters (Bar-code inventory) - list

SQL name of the counter	Label and SQL name of the table using the counter	Label and SQL name of the field using the counter
amBrand_BarCode	Brands (amBrand)	Bar code (BarCode)
amEmplDept_BarCode	Employees (amEmplDept)	Bar code (BarCode)
amLocation_BarCode	Locations (amLocation)	Bar code (BarCode)
amModel_BarCode	Models (amModel)	Bar code (BarCode)

For further information on counters, refer to the **Administering the database** guide, chapter **Customizing the database**, section **Counters in field default values**.

Actions and wizards (Bar-code inventory)

The Bar-code inventory module does not use any standard actions.

AssetCenter Server modules (Bar-code inventory)

There are no AssetCenter Server modules specifically dedicated to the Bar-code inventory module.

System data and line-of-business data (Bar-code inventory)

AssetCenter is provided with a set of standard data.

None of this standard data applies specifically to the Bar-code inventory module.

Reports and forms (Bar-code inventory)

AssetCenter is provided with reports and forms; some of them are specific to the Bar-code inventory module.

In order for these reports and forms to be available in your database, you must import them from the AssetCenter Database Administrator.

Importing and identifying reports specific to the Bar-code inventory module

To import reports, refer to the **Advanced use** guide, chapter **Crystal Reports**, section **Operation and installation of the report generator**.

To identify the reports specific to the Bar-code inventory module, refer to the **Advanced use** guide, chapter **Crystal Reports**, section **Identifying Crystal reports specific to a given module**.

Importing and identifying forms specific to the Bar-code inventory module

To find out how to import forms, refer to the **Advanced use** guide, chapter **Forms**, section **Installing preconfigured forms into your working database**.

To identify the forms specific to the Bar-code inventory module, refer to the **Advanced use** guide, chapter **Forms**, section **Identifying forms specific to a given module**.

Automatic background processes (Bar-code inventory)

There are no automatic background processes triggered by the Bar-code inventory module.

For more information about automatic processes executed in the background by AssetCenter, consult the **Database structure** guide. For each table described in this guide, you will find a section called **Background processes**.

APIs(Bar-code inventory)

There are no AssetCenter APIs for the Bar-code inventory module.

Views (Bar-code inventory)

There are no standard views specific to the Bar-code inventory module. For more information about views, refer to the **Using AssetCenter** guide, chapter **Using views**.

Documentations (Bar-code inventory)

The AssetCenter 4.1.0 - Bar-code Inventory guide only provides information directly linked to the Bar-code inventory module. For a larger scope of information, we recommend the following documentations:

Table 6.5. Documentations (Bar-code inventory) - list

Document	Information	Format	Location in the AssetCenter installation folder
Installation	<ul style="list-style-type: none"> • Installation of AssetCenter. 	Printed	<code>\doc\pdf\installbook*.pdf</code>
		Online	<code>\doc\chm\installbook*.chm</code>
Core tables	<ul style="list-style-type: none"> • Management of locations • Management of employees • Management of features • Employee groups • Employee training 	Printed	<code>\doc\pdf\core*.pdf</code>
		Online	<code>\doc\chm\core*.chm</code>
		Printed	<code>\doc\pdf\intro*.pdf</code>
		Online	<code>\doc\chm\intro*.chm</code>
		Printed	<code>\doc\pdf\intro*.pdf</code>
Introduction	<ul style="list-style-type: none"> • General interface layout of the application. 	Printed	<code>\doc\pdf\intro*.pdf</code>
		Online	<code>\doc\chm\intro*.chm</code>

Document	Information	Format	Location in the AssetCenter installation folder
Portfolio	<ul style="list-style-type: none"> Portfolio items Assets Models 	Printed	\doc\pdf\port*.pdf
		Online	\doc\chm\port*.chm
Contextual help on fields and links.	<ul style="list-style-type: none"> Using the fields and links of the database. 	Online	<p>To access the contextual help of a field or link:</p> <ol style="list-style-type: none"> Select a field or link. Perform one of the following actions: <ul style="list-style-type: none"> Right-click and select Help on this field from the shortcut menu. Press SHIFT and F1 simultaneously on the keyboard. Select the Help/ Help on this field menu.
Database structure	<ul style="list-style-type: none"> List of tables, fields, links and indexes of the database. Agents automatically triggered by AssetCenter. 	Text file	<ul style="list-style-type: none"> \infos\database.txt \infos\tables.txt
		Printed	\doc\pdf\dbstruct*.pdf
		Online	\doc\chm\dbstruct*.chm
General online help	<ul style="list-style-type: none"> The functioning of the entire application. 	Online	<p>To access the general online help, perform one of the following actions:</p> <ol style="list-style-type: none"> Press F1 on the keyboard. Select the Help/ Index menu.

Workflow schemas (Bar-code inventory)

There are no standard workflow schemas specific to the Bar-code inventory module.

Code 39 specifications

This section provides the full specifications for the Code 39 type bar code.

Bar code construction

Code 39 is an alphanumeric coding system that encodes decimal number, alphabetic letters (in upper-case only) and the following series of special characters:

<space> - . * \$ / % +

 **Note:**

This bar-code type can theoretically encode an unlimited number of characters.

 **Warning:**

The * character is reserved for framing encoded sequence in the bar code. It thus cannot be a part of the sequence itself.

Each encoded character is composed of nine elements: five black bars and four spaces. Out of the nine elements, three are wider than the others: two black bars and a space. The name of this type of bar code is based on this particularity. The wider elements are represented by 1s and the narrower elements are represented by 0s.

For a bar-code reader to be able to distinguish the wide and narrow elements, a ration between the size of these two types of elements is necessary. According to the resolution used for printing, the size of the wider elements must be at least two times greater than the narrow elements. A 1 to 3 ratio is usually used. All elements of the same type must have the same size when printed: For example, the size of a narrow bar must be equal to the size of a narrow space.

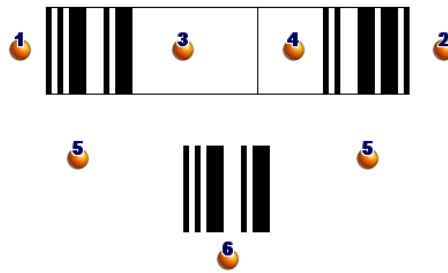
Code 39 is a discrete-type bar code. Each encoded character is separated by a space (called a space character) that does not contain any

information. The size of the space character is generally equal to the size of a narrow element.

Due to its structure, Code 39 is can check its own characters. Nevertheless, a check character option is available.

Code structure

The following diagram presents the typical structure of a Code 39 bar code.



- 1: Beginning margin.
- 2: Ending margin.
- 3: Encoded character.
- 4: Optional check character.
- 5: Encoded "*" character, reserved to mark the beginning and the end of the bar code.
- 6: Example of an encoded character.

Character set

The following table presents the list of available characters, the binary word associated with each character, and the optional check character used for each character.

ASCII character	Associated binary word	Control character value
0	000110100	0
1	100100001	1
2	001100001	2
3	101100000	3
4	000110001	4
5	100110000	5
6	001110000	6
7	000100101	7
8	100100100	8
9	001100100	9
A	100001001	10
B	001001001	11
C	101001000	12
D	000011001	13
E	100011000	14
F	001011000	15
G	000001101	16
H	100001100	17
I	001001100	18
J	000011100	19
K	100000011	20
L	001000011	21
M	101000010	22
N	000010011	23
O	100010010	24
P	001010010	25
Q	000000111	26
R	100000110	27
S	001000110	28
T	000010110	29
U	110000001	30
V	011000001	31
W	111000000	32
X	010010001	33
Y	110010000	34
Z	011010000	35
-	010000101	36
.	110000100	37
Space	011000100	38
*	010010100	None

ASCII character	Associated binary word	Control character value
\$	010101000	39
/	010100010	40
+	010001010	41
%	000101010	42

Check character

The check character for a Code 39 bar code is determined by the total of the values of the character check modulo 43 (divide the total by 43). This operation's result is a value between 0 and 42 that enables you to determine the check character using the character table. For example:

Characters	C	O	D	E		3	9
Control value	12	24	13	14	38	3	9
Total of the values	113						
Modulo 43	27						
Control character	R						
Encoded sequence	CODE 39R						

Dimensions of the code

The length of a printed, Code 39 bar code is determined by the following formula:

$$\text{Length} = N * 16x + 31x + (16x) + M1 + M2$$

In this formula:

- M1 and M2 represent the starting and ending margins of the bar code. Their size must be between 0.25 inches (6 mm) or 10 times the size of a narrow element if this dimension is superior to 0.25 inches.
- N represents the number of encoded characters.
- X represents the size of a narrow element. For an optimal reading of the bar codes by the bar-code reader, x must be greater or equal to 0.075 inches (0.19 mm).

- 16x represents the size of the encoded character, including the size of the space character (using a wide-narrow ratio of 3: a large element is three times the size of a narrow element).
- 31x represents the size of the starting and ending characters (*) in the sequence. This value includes the space character between the starting character and the first character of the sequence.
- (16x) represents the size of the optional check character.

When the narrow-wide ratio is not 3 (in this case, R represents the ratio used), the formula is written:

$$\text{Length} = N(3Rx+7x) + 6Rx + 13x + (3Rx+7x) + M1 + M2$$

The height of a Code 39 bar code when printed is 0.25 inches (6mm) or 0.15 times the length of the symbol (without counting its margins) if this dimension is superior to 0.25 inches.

