BarTender®

The World's Leading Software for Label, Barcode, RFID & Card Printing

Integration Overview

Importing Data into BarTender
and Controlling BarTender from
within other Programs

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S C I E N T I F I C

Contents

Introduction

Label and barcode printing is usually part of a larger process involving additional software besides just BarTender. Software applications for manufacturing, inventory, shipping, accounting, and various other supply-chain management functions typically depend on labels and barcodes to make essential tracking and identification functions possible. That's why so many systems integrators and consultants integrate Oracle, SAP and a great variety of other ERP software applications with label software and barcode software. In fact, many of BarTender's most powerful features are dedicated to integration with other software.

The available integration methods range from the simplicity of BarTender reading label and barcode data from an external database to programmatic control of BarTender from within other programs using our .NET SDKs. You can also launch print jobs using a wide variety of methods, including creating a simple data file, sending an email, or transmitting a TCP/IP message.

Selecting the Desired Label and Barcode Data

When integrating BarTender with other software, you will almost always be selecting data from an external database and somehow importing it into BarTender for printing on labels and barcodes. Having BarTender read every single record in your database system is only useful if you want to print a label or barcode for every item in your database. Instead, you will usually only want to import just one or a limited number of records from your database into BarTender. The two most fundamental issues are:

- How to choose which database records to print.
- How to get that label and barcode data into BarTender.

This chapter assumes that BarTender will be fetching the desired label data from a location that is accessible on your LAN or WAN. In some other situations, however, your database may not be directly accessible from the Windows computer running BarTender. In this case, you have to export your data to an intermediate format for subsequent use by BarTender. This scenario is discussed later in the *Using Commander™ to Control BarTender* chapter.

The following sections compare the two general approaches to selecting which data records to print:

- BarTender Query of External Data
- External Query (with and without Data Export)

BarTender Query of External Data

Your BarTender label and barcode software can connect directly to a wide variety of external databases and spreadsheets. BarTender even supports "joins" of multiple tables from multiple databases running on multiple operating system platforms.

Supports Any Database Relationship

BarTender lets you simultaneously access multiple tables and data formats located on different computers. For example:

- Oracle database tables on a LINUX server.
- SQL tables on a Windows server.
- Access, Excel or other Windows tables on a local PC.
- A simple text file on your PC in Shipping.
- And much more.

Query Methods

BarTender query methods available for selecting the desired records include:

- **Simple search** – Search on a matching field value (such as date, part number, product class, etc.).
- **Complex "Query by Example"** – Search on a single item or on multiple fields in multiple tables (with multiple search fields "ANDed" and "ORed" together as desired).
- **Custom SQL expression** – Create your own SQL from scratch, or start with SQL generated by our Query Dialog.
- **Picklist** (Select from a list) – Manually select the database records you want.
- **Record Range** – Specify a numeric range of records to print.

Our Database Setup Manager and wizard make it easy to define the links, set up the appropriate joins, query the combined database and output your labels.

With the first three methods, the values BarTender searches for can be static, entered into a prompt dialog at print time, or supplied by an external program controlling BarTender. The Picklist and Record Range methods are not typically used in integrations where other programs are controlling BarTender.
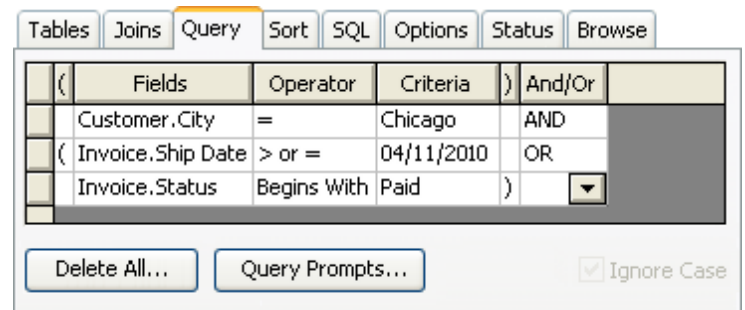
The Query screen offers a simple way to define complex searches.

External Query with Data Export

You don't have to query your label and barcode data from within BarTender. Alternatively, you can use:

- Reporting tools native to your other software.
- Third party "data mining" tools.

Whichever approach you take, you typically have to then use one of these data transport methods:

- Export or "dump" the query results to an "intermediate file" for later import by Commander or BarTender.
- Use TCP/IP to communicate the data directly to Commander.
- *Programmatically Transferring Data Using the .NET SDKs or ActiveX Automation* (click to jump to this chapter below).

Direct Connect to an External Query

It is possible to perform a query outside of BarTender without creating an intermediate file. One method is to design a "select" query within Microsoft Access to extract the desired data from your database. Because Access presents the output of a select query as if it were a table, BarTender can directly import the data as if it were reading from a data table.

Querying Inside of vs. Outside of BarTender

Obviously, if you perform your queries from within BarTender, Seagull technical support is in a much better position to help you with data mining challenges. Otherwise, there is nothing wrong with using external query tools. Because it's difficult to say in advance which method will be fastest, we recommend starting with the method with which you are most familiar.

One key situation in which your choices narrow is when your database platform is not directly accessible from the Windows computer running your BarTender label and barcode software. In this case, you would *have* to export or transmit your data in an intermediate format for subsequent use by BarTender. As discussed in the *Using Commander™ to Control BarTender* section of this document, the Commander utility included with the two Automation editions of BarTender can automatically launch BarTender label print jobs when it detects the arrival of such data.

Data Import Methods

Whether you query your label and barcode data externally or from within BarTender, data compatibility with BarTender is a consideration.

Native BarTender Import Methods

If your software system stores its data or can generate it in one of the many data formats supported by BarTender, then BarTender can read your label and barcode data without any special programming or custom processing.

BarTender supports a variety of data sources, from simple text files to multiple databases running on multiple operating platforms. This includes:

- Direct reading of Delimited Text. (For additional information, please see the "Text Files" topic in BarTender's online help system.)
- Use of OLE DB and ODBC to read an external database.
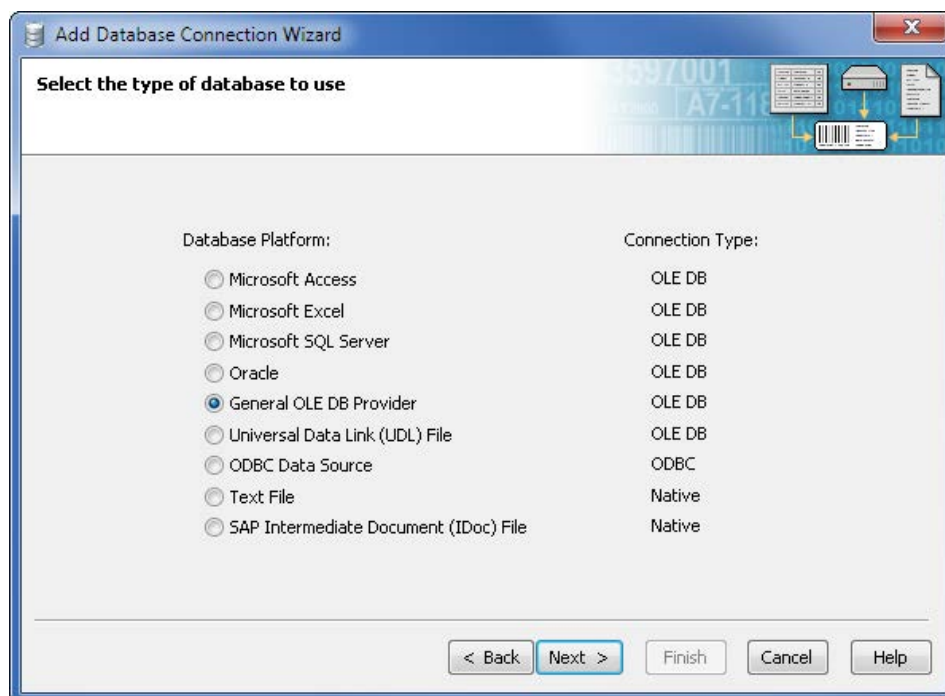
Choose from a variety of preconfigured data connections or configure any OLE DB or ODBC driver.

OLE DB and ODBC

BarTender's support for Microsoft's ODBC and OLE DB database driver standards allows the direct reading of label and barcode data from just about every major database platform, including Access, Excel, MS SQL Server, Oracle db, MySQL, and many others. If the required driver does not already come with either BarTender or Windows, one is often available from the provider of your database platform.

For Additional Information

Please see the "Understanding OLE DB" and "Understanding ODBC" topics in BarTender's online help system.

Importing Linked and Embedded Graphics

For graphics that change on each label, you can read graphics embedded right into your database, or just reference links to external graphics.

Externally-Controlled Import Methods

Sometimes your external database is stored in a proprietary format (not supported by OLE DB or ODBC) or located somewhere on your network that your BarTender label and barcode software cannot "see." Or you may have other reasons to query your label and barcode data outside of BarTender (see *External Query with Data Export*) and export it for use by BarTender. Supported methods include:

- Use of Seagull's .NET SDKs or ActiveX Automation to programmatically transfer data into BarTender. (Includes the transmission of XML.)
- Use of Seagull's Commander middleware utility to transfer transactional data from various ERP Systems into BarTender. (Includes support for SAP and Oracle's WMS and MSCA applications.)

Programmatically Transferring Data Using the .NET SDKs or ActiveX Automation

As will be discussed in the *Controlling BarTender* section, Seagull's .NET SDKs ("software development kits") and support for ActiveX Automation give you the ability to write code in your own applications to launch and control BarTender label and barcode print jobs. In addition, these tools support commands that let you assign values to named sub-strings within BarTender, thereby allowing you to programmatically populate a label with data for a print job. You can also specify multiple records of label and barcode data using BarTender XML Script (BTXML).

For Additional Information
Please see:

- The *BarTender's .NET SDKs* white paper
- The *BarTender's ActiveX Automation Interface* white paper
- The "Automating BarTender" topic in BarTender's online help

Using Commander to Transfer Data from ERP Systems such as Oracle, SAP, and IBM WebSphere

The major ERP systems can export transactional data in a variety of intermediate data formats especially designed for integration with other software applications. Your BarTender label and barcode software can read many of the formats offered by the Oracle, SAP, and IBM WebSphere applications, including:

- Oracle XML print requests
- IBM WebSphere Sensor Events print requests
- SAP AII XML

SAP® Certified
Integration with SAP Applications

- SAPscript-generated fixed-width text files
- SAP IDocs

For Additional Information
Please see the following white papers:

- *Integration with Oracle's WMS and MSCA*
- *Integration with IBM WebSphere Sensor Events*
- *Integration with SAP*

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Controlling BarTender

The previous chapters discuss how to get data into your BarTender label and barcode software. Now we need to understand how to complete an integration by controlling BarTender from within other software, including from non-Windows systems. Depending on your needs and your database platform, you can use one of three methods:

- .NET SDKs or ActiveX Automation
- Command-Line Interface
- Commander™ Integration Utility

When your integration is complete, your users don't even have to know that it's really BarTender printing your labels and barcodes (or encoding your RIFD tags).

.NET SDKs and ActiveX Automation (COM)
ActiveX Automation (also known as COM) is a long-established Microsoft standard that allows one Windows programs to control another one. BarTender has been controllable using ActiveX Automation since the mid 1990's and continues to be. However, developers that are familiar with the .NET languages (C# and VB.NET) can more easily develop applications to control BarTender by using Seagull's .NET Software Development Kits. These SDKs are libraries of prewritten and debugged code especially designed to control BarTender, including the loading of label formats and launching of print jobs.

Integration using the SDKs or ActiveX Automation is an ideal way to fully control BarTender from within other programs and offers far more power and flexibility than the "command-line interface" method described in a following section. (Support for ActiveX Automation and the SDKs and is only provided with the Automaton editions of BarTender.)

Supported Integration Functions

Programs that use the SDKs and ActiveX Automation do so by calling methods (functions) and reading and writing various properties (data values) in BarTender. For example, you can:

- Load and Close BarTender
- Open BarTender documents
- Modify the objects in the document
- Supply data to be printed
- Launch print jobs
- Request a print job's status
- Request jobs be reprinted
- Manage file stored in Librarian
- Query data from the System Database

Controlling BarTender using XML

Instead of sending one command at a time to BarTender using ActiveX or the BarTender SDK, these tools can also submit multiple commands at a time to BarTender by placing them within a single XML-formatted message.

To learn more about the XML format supported by BarTender (called BTXML), please see:

- The *BarTender's .NET SDKs* white paper
- The "Automation with BarTender XML Script" topic in BarTender's online help

(The use of BTXML is only available with the Enterprise Automation edition of BarTender.)

Getting Print Job Status

When controlling BarTender using BTXML, applications have the option of receiving back print job status information from BarTender within an XML Response. Alternatively, you can use the BarTender System Database SDK (one of a number of BarTender .NET SDKs) to retrieve the final status of a print job.

Required Programming Environments

To use the .NET SDKs, you must use one of the .NET languages:

- C#
- VB.NET

To access BarTender's ActiveX Automation interface, you must use a programming or scripting environment that supports ActiveX Automation. Most standard Windows development tools provide this capability, including:

- Visual Basic, VBA (Visual Basic for Applications)
- VBScript
- Java Script (JScript)
- Visual C++ (and other versions of C for Windows)
- Power Builder
- Access, Word, Excel, or any application that supports VBA
- Delphi
- Windows Scripting Host (WSH)

For Additional Information

Please see:

- "Automating BarTender" topic in BarTender's online help
- *BarTender's .NET SDKs* white paper
- *BarTender's ActiveX Automation Interface* white paper

Command-Line Interface Control

BarTender's command-line interface provides a minimum set of capabilities for controlling your BarTender label and barcode software. It is primarily suited for specifying which BarTender document and external text file to use for a print job. However, it provides little additional control. (The Automation edition or higher is required for Command line support.)

Using command lines, you can:

- Load and close down your BarTender label and barcode software
- Select and change the BarTender document
- Specify the number of copies to print of each label (or other item)
- Launch print jobs
- Select and change the external data source
- Specify a print file to which to send the print output (if printing to a file instead of the printer)
- Select and change the printer.
- Submit BarTender XML Script (Requires the Enterprise Automation edition)

To run BarTender using command lines, your controlling application must provide a "run program" command function or similar option. Common terms for this capability include:

- Run
- Runprogram
- Execute

- Shell
- Command
- Open

A common variation to this approach is to create a "Batch" file containing the desired BarTender command line and then have your program run that batch file. An example of a BarTender command line you might execute from within a batch file is:

```
bartend.exe  /AF=Address.btw  /D=Customers.dat  /P
```

For Additional Information

For complete documentation of BarTender's command-line interface, see the "Automating BarTender, Automation with the Command Line Interface" topic in BarTender's help.

Using Commander™ to Control BarTender

The Commander utility that comes with the two Automation editions of BarTender is a "background" application that can run as an application or a service. Commander uses ActiveX Automation to control BarTender *for you,* but you (and your controlling applications) don't have to worry about ActiveX at all. Instead, your programs generate a "trigger" event, such as writing data to a file or sending a message to a TCP/IP port. Commander and BarTender don't care where the triggers originate. This allows your BarTender label and barcode software to more easily integrate with non-Windows systems on your network that your Windows applications cannot otherwise directly access.
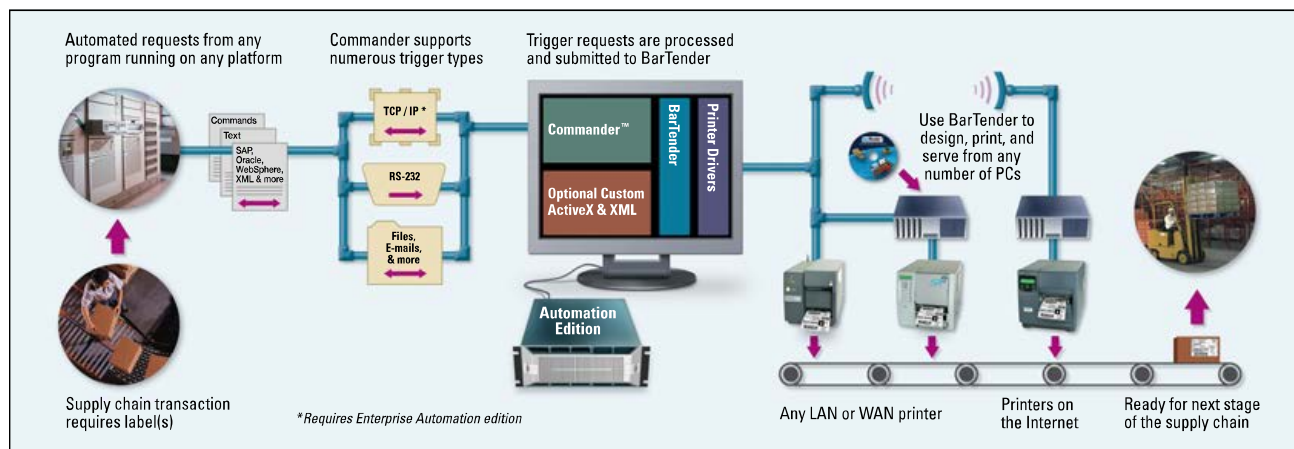
Commander lets you integrate Windows and non-Windows applications with BarTender without writing code.

How Commander Works

Commander works by waiting for and detecting certain "triggers" from your other software applications. Once a trigger is detected, Commander responds by performing one or more user-defined actions, one of which is usually to launch a BarTender print job.
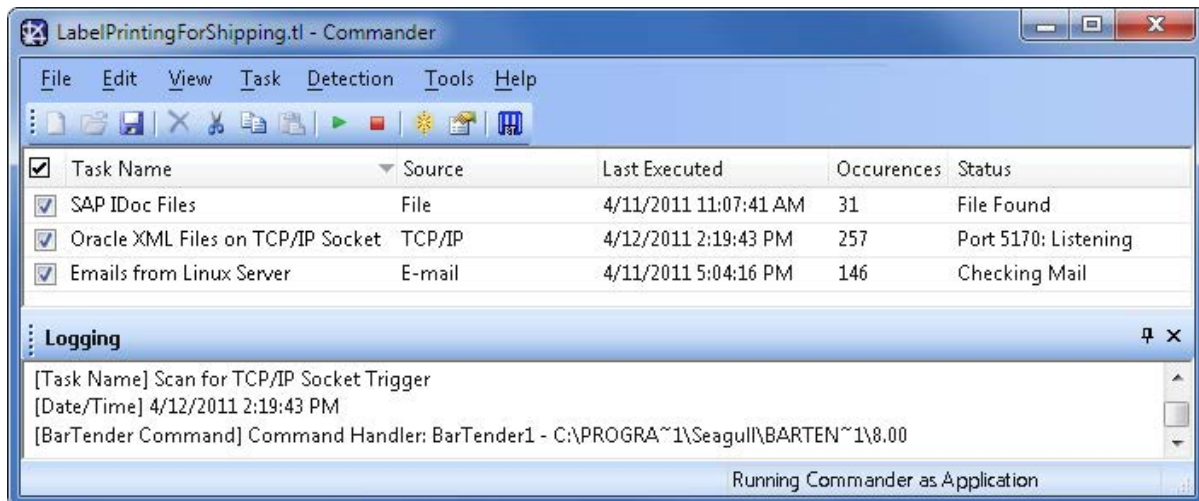
Commander lets you integrate BarTender with data generated from almost any system (Linux/Unix, AS/400, AIX, etc.) without any extra programming.

When to Use Commander

Commander can be especially useful in any of these situations:

- You don't know how to issue Command Lines or ActiveX Automation commands from your controlling program or environment (or it's not even possible).
- You don't have access to your other program's source code.
- You're working with a non-Windows platform such as Linux, UNIX, AIX or AS/400 that cannot directly access the Windows system running BarTender.
- Your controlling program is not on the same network as your BarTender label and barcode software.

Real world examples include:

- Your controlling application is located in another country and transmits label data and print job requests over the internet by e-mail.
- You are using a mainframe or Linux application that simply does not have ActiveX command capabilities.

Prebuilt, Ready-to-Use Integrations Included

As summarized later in this chapter, you can easily author totally-custom Commander integrations that:

- Receive and respond to any of a variety of trigger types
- Parse and extract commands that control Commander and BarTender
- Extract and modify the label and barcode data to print

However, you don't necessarily have to author these integrations from scratch because Commander already comes with built-in integrations for:

- Oracle WMS
- Oracle MSCA
- SAP AII
- IBM WebSphere Sensor Events

Overview of Commander Trigger Events

The available trigger types supported by Commander include:

- Creation of data files
- Reception of emails
- Reception of data over a TCP/IP Socket

Depending on the requirements of your integration, the triggers you use may or may not contain useful data.

"Empty" Triggers

When your triggers do not contain data for labels, barcodes, or RFID tags, then your triggers function as nothing more than a "wake up" call to Commander to begin processing one or more user-defined commands. In this case, the data needs to be read separately by BarTender using one of its available data import methods.

Triggers Containing Label Data

Alternatively, trigger files and messages can contain the actual label and barcode data to print.

Including Commands within Trigger Data

Triggers from your controlling applications can include more than just label and barcode data. They can also include embedded commands intended to control Commander, BarTender, or both.

Commander Script

Commander Script is a text-based command language for submitting instructions to Commander for execution. Controlling applications can include different Commander Script commands inside of different triggers, thereby issuing different instructions to Commander depending on the action(s) desired. Commander Script includes commands to control BarTender behavior, as well as run other applications using command line parameters.

BarTender XML Script (BTXML)

There are a number of ways of controlling BarTender using XML. One method is for a controlling application to include XML in triggers being detected by

Commander. Commander then converts this into BTXML (if necessary) and then forwards it to BarTender for processing.

Converting from XML to BTXML Using XSL Transforms

Most ERP software packages already have standard functions built into them for generating XML. This is one reason why XML is such a convenient way for controlling applications to send commands to your BarTender label and barcode software. One potential challenge, however, is that the default XML generated by your software may not be compatible with the BTXML format understood by BarTender. As an alternative to generating custom XML from your ERP application, you can generate your XML in its default format and author an XSL transform document for use by Commander. Commander can use XSL (for Extensible Style Sheet Language) to automatically convert from the XML you provide into BTXML.

To learn more about XSL style sheets, please see:

- "Integrating with Oracle" topic in BarTender's online help
- *Integration with Oracle's WMS and MSCA*
- *What's New in BarTender 9.2*

(Support for BTXML and XSL is only available with the Enterprise Automation edition of BarTender.)

Getting Print Job Status

When controlling BarTender using BTXML, applications have the option of receiving back print job status information from BarTender within an XML Response.

High Volume Printing Environments

When Commander receives multiple triggers in a short period of time, triggers are queued and serviced in the order received. Therefore, users striving for maximum possible printing throughput should consider using the Enterprise Automation edition. It supports the launching of multiple simultaneous instances of BarTender so that more than one trigger can be serviced at the same time. This can significantly increase a system's over overall label throughput. In contrast, the Automation edition can only control one instance of BarTender at a time. Therefore, regardless of how many triggers may be waiting for processing, only one trigger can be processed at a time. In environments that send a high volume of triggers to Commander, this limitation can reduce overall throughput and response time.

For Additional Information

Please see:

- Commander's online help system
- The *Commander* white paper
- The *Commander Examples* white paper

Alerting and Logging

As described previously, programs that control BarTender can optionally request print job status information from BarTender using code, receive the status indirectly from Commander, or use the .NET SDKs to query status information previously logged to the BarTender system database. However, it is not necessary to use any code at all to retrieve BarTender status information. BarTender, Commander, and Printer Maestro can also actively *broadcast* e-mail alerts to you in response to selected events. A large variety of print job, status, and event information can also be logged to a SQL database for later review.

Alerts Reduce Down-Time

When managing label generation and barcode printing in an Enterprise environment, you want to be alerted as quickly as possible when a critical component is down, your media is low, or your software has encountered an error condition. To satisfy this requirement, BarTender, Commander, and Printer Maestro are all capable of sending custom alert messages.

BarTender Alerts

You can configure both the Automation editions of BarTender to send you informational emails in response to a variety of events, warnings, and errors. For example:

- Print job requested
- Unable to access database
- Printer unavailable
- Print job failed

Commander Alerts

The Commander companion application, provided with both Automation editions of BarTender, can also email alerts. For example:

- Trigger detection started/stopped
- Error accessing trigger file
- XML parsing error

Printer Maestro Alerts

The *Printer Maestro* companion application, provided with both Automation editions of BarTender, can send alerts by instant message (IM), text message (SMS), and e-mail. For example:

- Printer off-line
- Computer off-line

- Paper low or out
- Ribbon low or out
- Error messages specific to specific printer models, such as a print head problem.

For more information about Printer Maestro and Alerting, please see the "*Printer Maestro*" White Paper:

- *http://www.seagullscientific.com/docs/whitepapers/Enterprise-Print-Management(English).pdf*
- Printer Maestro's Online help system

Print Job and Event Logging help Verify Print Jobs

To support security audits and ensure that automated print jobs succeeded, the Automation editions of BarTender and Printer Maestro offer extremely detailed logging into the "BarTender System Database" of important print job information and application events. (With the Enterprise Automation edition of BarTender installed, *Printer Maestro* can log printer and print job events from *any* Windows application, not just BarTender.)

The Importance of Logging when Automating BarTender

When sitting in front of your computer, *manually* using your BarTender label and barcode software to execute a label print job, you may see important warning or error messages under certain circumstances. However, when BarTender is controlled from within other software, it runs "invisibly" and any such messages are therefore not seen. Your options for learning about potential problems are therefore real-time "alerts" (discussed above) and logging (which allows you to review and confirm print jobs after the fact).

The BarTender System Database

When logging is enabled, BarTender and Printer Maestro can store a variety of information into the BarTender System Database. This database can be created either within a free copy of SQL Server Express Edition (included with BarTender), or within a full install of SQL Server, if you have one available.

The Three Types of Logged Information

BarTender and Printer Maestro can log three types of information to the BarTender System Database:

- **Print Job Information:**
    - Name and even a copy of the BarTender document (that is, the BTW file)
    - Computer and user name
    - Details about printer status and BarTender print settings

- **Label Data and Label Images:** Allows for easy reprinting of any damaged labels and quick response to security audits.
- **Application Event Messages:** Reviewing possible errors and warnings encountered during print jobs is especially helpful when debugging integrations between other software and your BarTender label and barcode software.

Easy Viewing of Logs

Logged information is very easily searched on, formatted, retrieved and viewed using either:

- History Explorer
- Reprint Console
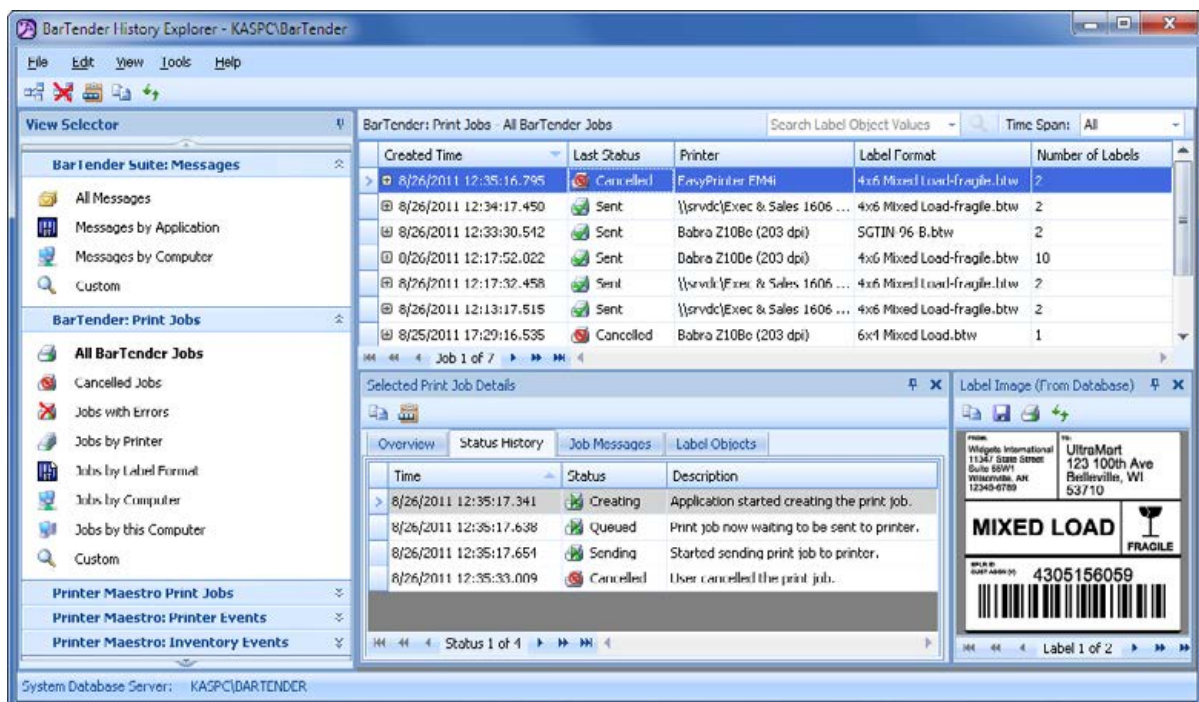
History Explorer lets you easily navigate through past print jobs and customize the view of your data.

For details on History Explorer and Reprint Console, please see:

- The *History Explorer* white paper
- The *Reprint Console* white paper
- The online help systems of History Explorer and Reprint Console

Programmatically Retrieving Data from the System Database

Using the .NET SDK, you can retrieve any data you can view using History Explorer. You can use this information in a number of ways, including creating a tighter integration with your own data store, or retrieving information regarding a print job for use by your own application.

Logging to a Text File

Your BarTender label and barcode software also supports logging to text files. However:

- The information available is not as detailed.
- The format is not as easily customized.
- No dedicated log viewers are provided.
- Finding the exact information you are looking for is not as easy.
- Tracking information for multiple jobs is more complicated.
- There is no automatic log maintenance.
- Text file logs are not as secure as a SQL database.

For Additional Information

For more details on logging, including details on the BarTender System Database and logging security, see:

> *http://www.seagullscientific.com/docs/whitepapers/WhitePaper_WhatsNew InBT900.pdf*

For details on the various other applications mentioned above, including Printer Maestro, History Explorer, Reprint Console, etc. please see the dedicated white papers at:

> *http://www.seagullscientific.com/aspx/whitepapers.aspx.*

Also see the online help systems for Printer Maestro, History Explorer and Reprint Console.

Using Printer Code Templates

So far in this Integration Overview, we have discussed multiple ways to perform the two most basic aspects of integrating BarTender's label and barcode printing process with other software:

- Getting externally-located label and barcode data into BarTender.
- Controlling BarTender from within other software.

These two methods can be implemented so seamlessly with other software that users don't even have to know that it is really BarTender printing the labels and barcode, or encoding your RFID tags. There are, however, some environments in which direct integration with BarTender may not be possible. Some of these challenges can be solved using BarTender's ability to export Printer Code Templates. (Available with the two Automation editions only.)

Understanding Printer Code Templates

Although implementing and using Printer Code Templates requires specialized technical knowledge, explaining the basic concept is fairly straight-forward. First, let's review how a conventional print job works.

Conventional Print Jobs

With conventional print jobs, BarTender reads (or is supplied with) label and barcode data from an external data source. BarTender then merges that label data with the BarTender template you have designed and generates commands instructing your printer to print the various fields of label and barcode data in the appropriate locations. With this method, the data is supplied prior to the generation of the printer commands.

Generating Printer Code Templates

When printing with Printer Code Templates, the label and barcode data is supplied to software other than BarTender and it is supplied *after* the generation of the printer commands. To make this possible, instead of sending the printer commands directly to a printer, BarTender sends it to a data file. In addition, each position in the printer code where label and barcode data would normally be located is replaced by an easily-recognizable placeholder. For example, the portion of the printer code where a text field would have been located might instead contain this text:

```
<*FIELD1*>
```

The next object on the label, perhaps a barcode, might instead contain:

```
<*FIELD2*>
```

The text file that BarTender creates that contains this especially modified printer code is called a Printer Code Template. (Please remember that the above is just an illustrative example using a totally arbitrary syntax. Any resemblance to an actual syntax is coincidental.)

Printing with Printer Code Templates

It is not useful to directly print the above-described Printer Code Template because the label data `<*FIELD1*>` and `<*FIELD2*>` would appear on all of your labels. Instead, you store Printer Code Templates inside a computer program or a hardware device that knows how replace the placeholders with real data. You do not have usable printer code that can be used by a printer until the label and barcode data has been "merged" with the Printer Code Template.

Uses of Printer Code Templates (PCTs) include:

Embedding Printer Code directly into Programs

Many people know that, before there were personal computers and Windows, software ran on very large mainframe computers. In some of the very first software programs ever designed for supply chain management, programmers hand-coded all of the printer code that was required for their labels and simply compiled it as part of the program. Changes to the label format, no matter how small, meant manually changing these sections of embedded printer code.

Some of these legacy applications are still in use today and some old-timers still prefer to hand code their labels and barcodes. A more efficient way to manage embedded label formats is to use BarTender to generate a Printer Code Template (PCT) to a file and then compile that printer code into the program. Changing the design template still takes time, because you have to run BarTender, make your change, export a new PCT, and recompile it into the external program. Still, working with a good WYSIWYG program such as BarTender is going to be a much easier and faster way to design labels and barcodes than hand coding them.

SAPscript-ITF Integrations

SAPscript is a reporting engine available in SAP that supports the automated combining of SAP-provided label and barcode data with an externally-supplied Printer Code Template format called ITF (Interchange Text Format). Just as you do when creating embedded formats, you have to export a PCT from BarTender, in this case using the SAPscript-ITF PCT format available with either of the Automation editions. The exported ITF file must then be "uploaded" to the SAP system. The SAP system can then be configured to run the appropriate SAPscript report and merge in the required label and barcode data whenever an SAP transaction requires one or more labels.

Although the SAPscript-ITF system makes design template changes easier than physically embedding and compiling new printer code into the SAP application, it still must face the *Technical Challenges of Printer Code Templates* described in the next section.

Portable Keypad Devices

A number of portable keypad devices are available that are little more than a portable keyboard, a small screen display, and a printer port. These devices generally lack the intelligence of portable "data terminals" and typically don't have any kind of connectivity to the main company network. The most common use is connected to a printer that is being wheeled around through a warehouse on a wheeled cart or forklift.

A keypad device that is not running Windows and is not connected to the main network obviously cannot run label software or barcode software such as BarTender. However, many keypad devices allow you to download and store

Printer Code Templates. They can then prompt you for the label data, merge it with the PCT, and output the printer code to the attached printer.

Using XML-enabled Printers

Although most label printers provide a full and robust printer language, some of them have an option to accept Printer Code Templates. As with the embedded formats and keypad devices (discussed above), you first have to design a label and export a PCT for subsequent download to the printer. Thereafter, you have the option of sending label data only (without printer code) to the XML-enabled printer.

Printing in non-Windows Environments

Even if a controlling software program is not running on Windows, the Commander middleware application that comes with the two Automation editions of BarTender offers a number options for integration with BarTender. (Please see the dedicated section earlier in this white paper and the separate _Commander_ white paper.) However, if your controlling application is set up in a manner in which it simply does not have access to Windows computers on the network, the embedding of Printer Code Templates offers a method by which you can still take advantage of the convenience of Windows-based label and barcode design (although not Windows-based printing).

Technical Challenges of Printer Code Templates

Generating Printer Code Templates requires use of either of the Automation editions of BarTender. However, unlike in a conventional label print job, BarTender does not serve as the print engine for the label jobs. BarTender therefore cannot provide a variety of advanced label and barcode printing features that we have developed over many years. Among the technical and security challenges of Printer Code Templates are:

Often Requires Coding Knowledge

When you use BarTender as your print engine, you don't have to worry about the technical details of communicating with your printer. In contrast, to embed label formats into your other software, you need to know how to code in the language that software was written in, as well as be able to read, manipulate and embed large sections of printer code.

Complexity of Changing the Label Format

When using BarTender as your print engine, you just simply modify your label design and you are ready to print again. In contrast, no matter how small a change you make when using Printer Code Templates, you need to:

- Run BarTender and modify your label.
- Export the label design to a Printer Code Template (PCT).

- Re-embed the PCT into your application and recompile it. (Or redownload the PCT to your hardware devices.)

More Complicated Printer Maintenance

If you have stored Printer Code Templates in a printer that fails, you usually have to call somebody from I.T. to get label and barcode production restarted in your replacement printer – even if you continue to use the exact same printer model. This is because you have to execute whatever custom process your company uses for deploying PCTs. In contrast, when you use BarTender as your print engine, you can print to the new printer right away. And changing printer brands just means specifying a different printer driver. In contrast, changing printer brands when using PCTs usually requires custom programming!

No Print Job Status Monitoring

Many Windows printer "Drivers by Seagull™" provide Windows and BarTender's Printer Maestro utility with information such as:

- Is your printer on-line?
- Is your print job running or stalled?
- Is your printer low on labels?
- Why did your printer stop?

In contrast, when printing using PCTs, unless you have coded your own support to handle this type of status monitoring, you will normally be printing "blind," without any knowledge of your printer's status.

Inability to Support Multiple Printer Models

When printing from BarTender, you can select a different printer in seconds. What's more, when using the Printer Maestro utility, if a print job ever fails due to a "stuck" or unavailable printer, you can move the print job to a different printer brand or model with a quick drag of your mouse. In contrast, because PCTs are by their very definition code for a specific printer, you cannot "move" a failed print job to a different brand of printer. In fact, the different printer models from most manufacturers have enough differences between them that you typically need different PCTs for each model. (We have even seen instances where "identical" printer models with different firmware versions required slightly different PCTs.)

No Access to Unsupported Fonts and Barcodes

When BarTender uses Windows printer "Drivers by Seagull™," you have full access to all of the fonts and barcodes built into your printer. Therefore, any PCTs that you generate will also have this support. However, BarTender can also print TrueType (and various third party) fonts as well as an extraordinary variety of one and two dimensional barcodes *even if those fonts and barcodes are not built into the printer*. This is because BarTender can, as necessary, send these items to printers as raster graphics. In contrast, Printer Code Templates

can only support static (that is, *unchanging*) graphics. This prevents the printing of "rasterized" barcodes and text that change from label to label.

No Support for Changing Graphics
For the same reasons just described, PCTs cannot support the reading and printing of different graphics objects for different labels. For example, if you wanted to read a different picture from a database to print next to each barcode on your inventory labels, you could not print using PCTs.

No Paragraph Formatting
BarTender offers an extensive variety of paragraph formatting features, including word wrapping, indentation, justification, bullets, numbering and line spacing. Use of PCTs does not allow for this kind of paragraph formatting.

No Variable Font Sizes
The **Font** dialog in BarTender has an **Auto Size** option that allows BarTender to automatically increase or decrease the font size for a text object depending on the amount of text supplied for it on each label. In contrast, use of PCTs requires that each text object always print out with the same font size on each label.

Loss of Numerous Security and Audit Preparation Features
Among the Companion Applications available with the BarTender Application Suite are:

- **BarTender Security Center** – Manages permissions and other security functions.
- **Librarian** – Lets large groups of users, designers and administrators cooperatively and securely manage the storage and revision of label formats and other files.
- **History Explorer** – Lets users view logged information about past label jobs, including images of the labels, barcodes and any print job messages that may have been generated.

The use of PCTs completely bypasses these security features and the logging functions that that make History Explorer's auditing functions possible.

Loss of Advanced Print Management Functions
Printer Maestro is a powerful tool that can monitor every printer and print job on a Windows network and display the status information in a single screen. Printer Maestro even lets you move failed print jobs from one printer to another printer (even a different brand) with a single, quick mouse movement. In contrast, use of PCTs bypasses the standard Windows functions that make these management features possible.

For Additional Information

For more information about Printer Code Templates, see the *Exporting Printer Code Templates* white paper.

Conclusion

There are many ways to integrate your BarTender label and barcode software with other software. The best method depends not just on the capabilities of your other software, but also on the integration methods you prefer to use. Fortunately, BarTender's versatile data import capabilities and powerful features for control by other programs provide you with a wealth options for implementing a fast, successful and reliable integration.

Available Seagull White Papers

General White Papers
- The Advantage of Drivers by Seagull

Companion Applications
- Printer Maestro: True Enterprise Print Management for Windows
- Librarian
- BarTender Security Center
- BarTender Web Print Server

Recent Upgrades
- What's New in the Latest BarTender

Integration White Papers
- Integration Overview
- Commander
- Commander Examples
- BarTender's .NET SDKs
- BarTender's ActiveX Automation Interface
- Exporting Printer Code Templates
- Using BarTender with Remote Desktop Services and Citrix XenApp
- Integration with Oracle's WMS and MSCA
- Integration with IBM WebSphere Sensor Events
- Integration with SAP

Miscellaneous White Papers
- Weighing Scales
- Dynamically Changing Objects at Print Time using VB Script
- GHS Compliance Labeling
- Licensing for BarTender's Automation Editions
- Printing International Characters Using BarTender
- BarTender Software Activation
- Using BarTender's Application Identifier Wizard
- Optimizing Output Performance
- Status Monitor Overview
- Silent Install

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