Technology Brief

Scan-to-Connect For Intermec Printers

Version 2

Executive Summary

This technology brief shows how easy it is to configure an Intermec printer using bar codes and a USB scanner. There are a few simple steps to follow, as described below:

Either:

- create a bar code containing all of the commands you want to execute

OR

1. Create and debug a Fingerprint script for your Intermec printer.
2. Download the script file to the printer.
3. Run the Fingerprint conversion application to print the bar code.

Once you have a set of tested bar codes:

1. Connect a scanner to the printer to configure.
2. Scan the configuration bar code.
3. Repeat for each printer you wish to configure.

Introduction

This technology brief describes how easy it is to configure a printer out of the box or to reconfigure a printer after deployment by connecting an Intermec USB scanner to the printer and scanning some pre-printed bar codes. This is particularly useful for icon printers where there is no screen to modify printer settings.

Scan to Connect can help in many areas of printer configuration. . Here are just a few examples:

- Retrieve settings such as printer IP address by printing a test label
- Configure printer settings
- Change command language or wireless settings
- Re-configure a deployed printer while it is running[1]
- Download resources and applications from a web server and install in the printer
- Create simple labels and print out on demand

How Does Scan to Connect Work?

By default, the Fingerprint language in your Intermec printer will listen for data on all communication ports including the USB host. By connecting a USB keyboard or USB scanner, a user can send commands directly to the Fingerprint parser.

After encoding Fingerprint (or shell) commands into a bar code, scanning this bar code sends the commands to the printer.

Any commands that can be used with Fingerprint from a normal terminal or computer can also be used in a bar code. This includes not only configuring the printer, but also sending commands to calibrate media, reboot the printer, print test labels, etc.

The procedure to configure the printer or perform any other actions by scanning a bar codes is simple:

1. Generate one or multiple bar codes encoded with Fingerprint commands.
2. Connect a scanner to the printer.
3. Scan the bar code to perform the action(s).

To validate that the scanning was accepted just send commands to enable the speaker/buzzer volume at the beginning of the data stream, and include a sound command in the bar code.

[1] The printer should have Ready displayed on its screen (LCD versions) or no red or yellow icons lit (icon version).

Supported Printers and Language

Any Intermec printer that uses our new firmware application platform supports all the features described within this document. This includes:

- PC23, PC43 and PC43t (LCD and icon models)
- PM43 and PM43c (LCD and icon models)

Note that the printer must be running the Fingerprint command language (other command languages do not support the USB host port).

Supported Scanners

Any USB scanner that is properly configured and is recognized by the printer will support this feature.

We have validated the scanners below:

- SR30
- SR61
- SG20
- SG20BT if paired with its base station, with the station connected to the printer via USB.

Note that it is very important that the scanner is configured properly and that it uses its default settings. If other settings than default as used, , the bar code may need to be programmed differently. An important consideration is the language configured in the scanner. All our validation was performed with defaulted U.S.-configured scanner and U.S. keyboard mapping to create bar codes.

Supported Bar Codes

Any bar code can be used to scan and configure, but we recommend Datamatrix due to its high data capacity and because it is enabled in Intermec scanners by default.

Creating Configuration Bar Codes

There are two procedures available to create a configuration bar code:

1. The bar code data is manually created and it is generated either in the printer or by another application/device.
2. The bar code data is created in a Fingerprint application, supplied with this white paper, which converts a set of Fingerprint commands in a text file located in the printer.

We recommend using the Fingerprint application to generate the labels. Usage instructions follow later in this document.

Printing Simple Layouts

For simple label layouts, the USB scanning feature can be used to encapsulate Fingerprint commands to generate and print a label.

For complex labels requiring many commands, one bar code may not be able to hold all of the commands. In this case, use multiple bar codes. Abbreviating commands saves space as well.

The example below shows a simple “Hello World” application that is printed out on a label.

```
PRPOS 100,100
PRTXT “Hello World!”
PRINTFEED
```

Download/Install Resources from a Server

By using the new shell command *wget* it is possible to download resources such as fonts, images and applications from a web server by a simple scan.

This example downloads a font, installs it, then downloads and installs an application which will be started at each boot-up. Of course, the printer must be connected to a network.

An (→) arrow indicates a continued line. Type both lines as one long line: “ .TTF http://www”

```
SYSVAR(43)=1
run”wget -O /home/user/fonts/FONT.TTF
→       http://www.myserver.com/apps/FONT.TTF”
run”installfile /home/user/fonts/FONT.TTF”
run”wget -O /home/user/scripts/APP.PRG
→       http://www.myserver.com/apps/APP.PRG”
run”echo /home/user/scripts/APP.PRG
→       /home/user/APPLICATION”
REBOOT
```

Printing Test Labels

A simple way to validate the settings in the printer is to print test labels. Test labels show most of the important settings, such as media, serial port settings, IP settings, and Wireless 802.11 settings.

The example below prints the Ethernet Settings and Media Settings test labels.

RUN ”testlabel hw_ethernet”
RUN ”testlabel print_config”

Configuring the Printer

One of the most powerful scan-to-connect features is modifying a printer’s configuration while it is in use. This is beneficial for example when swapping between different types of media requiring different media settings. Customers who need to change media settings frequently may find it easiest to have a scanner connected permanently to their printers..

Another useful scenario is identically configuring several printers out of the box.

There is no limit to the number of configuration settings that can be applied as long as Fingerprint SETUP commands are used for each.

Here is a bar code that configures media and ribbon settings and performs a media calibration.

SETUP ”Printing,Media,Media Type,Media With Gaps”
SETUP ”Printing,Media,Print Method,No Ribbon (DT)”
SETUP ”Printing,Media,Print Area,Media Length,1200”
SETUP ”Printing,Media,Print Area,Media Length,800”
TESTFEED

Troubleshooting

You may need to troubleshoot your Fingerprint scripts as part of creating them. The easiest way to do this is to validate the content of the bar code once scanned.

To see the content of the bar code and how it is accepted by the Fingerprint parser, follow these steps:

1. Connect to Fingerprint from a terminal program such as HyperTerminal via either serial or network port 9100.
2. Issue one of these commands, which makes the printer listen on all I/O ports (100) and output the response on a defined port:
   SETSTDIO 100,5 (if connected via network)
   or
   SETSTDIO 100,1 (for serial)
3. Connect the scanner and scan the bar code.
4. You will see each command echoed to the terminal window as it is executed, and either an “ok” response (success) or an error message will appear.
5. Modify the script until the response from Fingerprint is “ok” for all commands.

Notes

The bar codes with each example above are the actual bar codes created by the example commands, and you should be able to use them as-is with a properly configured scanner. The exception is the resource bar code since it uses a fictitious web address.

Tips & Tricks

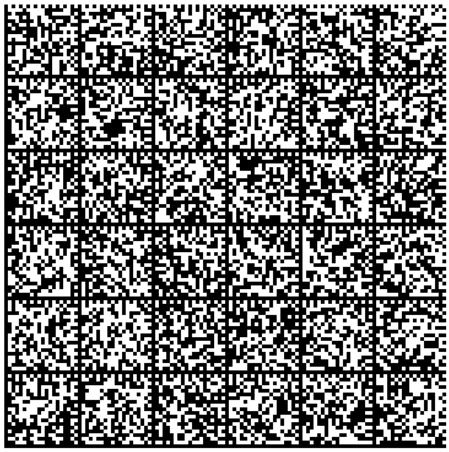
Take the following into account when using scan-to-connect:

- Bar code data capacity depends on the bar code symbology used and the capability of the scanner.
- Since all data is stored in plain text, we do not recommend using secret passwords such as secret network keys.
- Fingerprint is the only language supporting this feature. Other command languages like ESim, ZSim, DSim and IPL do not support USB input.
- The configuration of the scanner itself is critical and any system used should be properly validated. All examples in this document have been tested with US-configured scanners.
- The order of configuration settings is important. For example, you must configure a printer to use manual IP addressing *before* configuring the actual IP address.
- When using the *installfile* command to install fonts or images, these resources will not be included in test labels until after reboot. However, they are available immediately in Fingerprint.

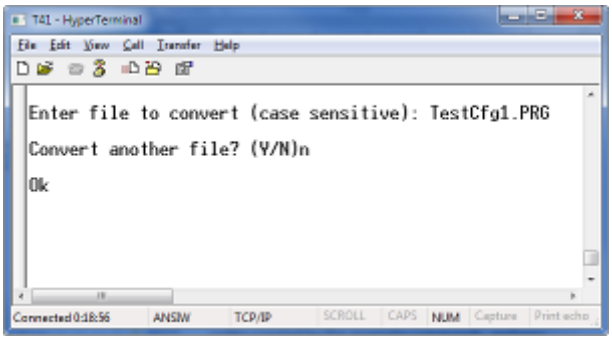
Using the CFGBARCODE.PRG App

CFGBARCODE.PRG converts one or more script files to DataMatrix bar codes which are then scanned at the target printer. We recommend that your lab computer (the one you use to create the configuration bar codes) be connected via a network connection and these steps assume it is. To use this app:

1. With your favorite FTP client, connect to your printer as user “itadmin”. The default password is “pass”. Use the default FTP port.
2. On the printer, change to the /home/user folder.
3. Copy your configuration scripts to this folder.
4. Connect to your printer via your favorite terminal application (i.e.: HyperTerminal) on port 9100.
5. Plug your USB 2D scanner into your printer.
6. Scan this bar code:



7. Type RUN from your terminal window and then press enter
8. A prompt will display in HyperTerminal. Type the name of the first script to convert then press Enter.



9. The converted script will print as a DataMatrix bar code and then a “Convert another file?” prompt will display. Type Y or N then press Enter. As an aid to sequencing multiple bar code configurations, the first line of the file prints just below the bar code. If you use a single quote mark (‘) to begin this first line, you may enter a descriptive title for the script.
10. If you intend to distribute configuration bar codes electronically, log onto the printer using a web browser at http://<IP address>/printer/label.png. This location displays the last-printed label. Simply refresh this page for each converted script and then you can save the bar code.
11. Repeat steps 7-9 for each script file.

CFGBARCODE.PRG is not saved in your printer’s permanent memory so when you restart the printer it is lost. Simply follow these instructions each time you want to create new configuration bar codes.