



# Mobile Zebra Print Manual

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## Introduction

**Green Screens** Mobile has support for printing to various mobile printers including Zebra Printers. Zebra printers use text command mode to print spool files which are not supported by default by IBM I so we created a driver.

Our ZPL driver can print in two modes:

- Raster – will convert SCS spool file to an image and print as a ZPL encoded image.
- Text – will wrap SCS spool text lines into ZPL commands

**NOTE:** Spools marked as \*USERASCII will always be printed in raster mode if spool data is PDF stream format. Other types are ignored.

Those modes have advantages and disadvantages against each other. Client has to choose option which suites him the best.

## Raster Mode

In raster mode, SCS is converted into image resized to fit to a physical printer width. That might reduce print quality depending on a printer. However, if printer does not support character codes for specific language, raster mode will not have a such problem as image is rendered on the server with Unicode fonts. Also, raster printing will not have issues with fixed-width fonts and space sizing.

Raster mode disadvantage: Text within spool file containing ZPL commands will be printed as is (as text) not as processing command.

To reduce file size, Z64 compression is enabled by default. If device does not support Z64, turn off compression feature in mobile application Printing Preferences.

## Text Mode

Printing from IBM I require monospaced (fixed-sized) fonts. By default, only such fonts available are bitmap fonts covering only small range of codepages (Arabic, Chinese, Hebrew, Korean etc. are not supported). Available Unicode font on ZPL printer is not monospaced so it is not good for SCS printing as it will lose proper font spacing. Zebra printers are optimized for positional text and graphic printing where such limitations are not relevant.

Solution to overcome positional and character problems are in loading custom fonts supporting required codepage and monospace setup. (process described later in document)

## Quick Start

To use **Green Screens Terminal** Android device with Zebra printer, additional software to link Zebra Printer with device is required. It is Zebra PrintConnect available on Google Play Store.

### Link Zebra to Android

To install it, open **Green Screens Terminal** application, go to **Settings** -> **Printing Preferences** -> **Printing Services** and tap Zebra **Print Service Plugin**. This will open Google Play Service to install required **PrintConnect** application.

After installing **PrintConnect**, use that application to detect Zebra printer through Wi-Fi or Bluetooth link. Once linked, **Green Screens Terminal** application will be able to print to Zebra printer.

### Configure Zebra dimensions

For ZPL driver to properly prepare spool for printing, exact page width and printer density must be set in **Green Screens Terminal** application.

Go to **Settings** -> **Printing Preferences** and enter **Printer DPI** and **Printer Width** with values from printer technical specification document.

- Printer DPI – is print density in dots/mm or dots/inch.
- Printer LPI – space between lines in dots.
- Printer Width – is physical width of paper in inches minus minimum margins.
- Printer Font – used to set default font and font size for printing (not needed if spool override is used).

**NOTE:** When printing in raster mode and image is out of paper, not fitted properly, try to reduce width in steps on 0,1 inch.

**NOTE:** When printing in text mode, use Printer Font option to adjust font type and size.

### Print Spool to Zebra Printer

In **Green Screens Terminal** start printer with **ZPL Driver** and **Share as File** option to print spool files to Zebra printer.

## Advanced configurations

This set of chapters contains advanced instructions how to setup custom fonts and how to create new font upload files.

### Font sizes

In **Settings** -> **Printing Preferences** one can find **Printer Font** option. It is in format F,X,Y where X,Y are optional values. F – font code from 0..9 and A..Z, X and Y values are character size in points.

If font is not set, default font is used and size is calculated from 9 as default to best fit size calculated by longest line to be printed.

**NOTE:** Default font can be set in initialization file on server side. (described in later chapter)

### Loading custom fonts

To support monospaced Unicode fonts for printing SCS spool files we need to upload custom fonts to Zebra printer.

Available open-source monospaced Unicode fonts are FreeMono and DejaVu. We provide already prepared printer setup files which can be uploaded to the printer.

[http://www.greenscreens.io/updates/zebra\\_mono\\_uni\\_fonts.zip](http://www.greenscreens.io/updates/zebra_mono_uni_fonts.zip)

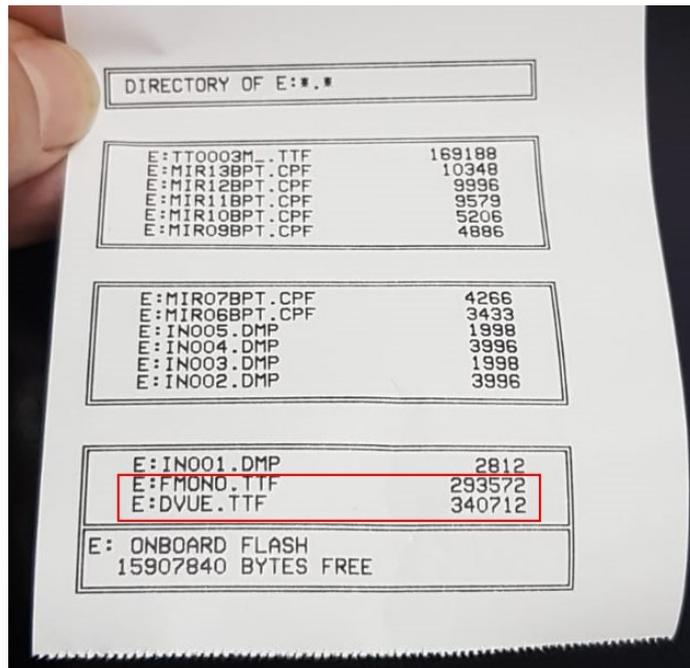
To transfer downloaded fonts to mobile device use **PrintConnect** mobile application to print received files. Files contains font data which will be stored on Zebra printer eeprom.

**NOTE:** Some ZEBRA printers support FNT, some TTF and some both font formats. Before loading fonts to the printer, please review printer specification. Files in zip file that contains \_DU are in FNT format while files that contains \_DY are in TTF format.

After loading font, instruct printer to print eeprom font list. If list contains font name as noted in uploaded file, upload was successful. To print available custom fonts on printer eeprom create list.zpl file with ^XA^WDE:\*^XZ text and send that file with **PrintConnect** mobile application to Zebra printer. It will print directory list with available files.

There are also test\_fnt.zpl and test\_ttf.zpl files provided for test print. Script will switch to loaded font and print invoice in Hebrew. Reason we choose Hebrew a it is good test to show UTF-8 support and right-to-left printing support.

Picture shows printout of available files. Uploaded fonts are marked with red box.



Picture shows IBM I spool file printed with uploaded monospaced Unicode font (DejaVu).



## Using custom fonts

As Zebra printer use device implemented fonts named form 0..9 and A..Z, we need to use substitute command which will tell printer to use a custom font loaded to eprom instead of a default one.

For example below, we substituted font Q with uploaded DejaVU DVUE.FNT and font Q with FreeMono FMONO.FNT.

```
^XA
^CWQ,E:DVUE.FNT
^CWR,E:FMONO.FNT
^XZ
```

Now we can refer those fonts in our text printouts.

```
^XA^CI28^CFQ,10,10
^FO0,12^FDThis is test^FS
^XZ
```

**NOTE:** If TTF fonts are used, remove .FNT from examples.

**NOTE:** If substituted font code is Q for example, in mobile application under Printer Font we have to set Q also so that every printed spool line will use substituted font.

## Label length

By default, label length is calculated based on font size and SCS Spool page length. Default SCS page length is 66 lines and default font size are 9. Final page length (^LL command) in points is 594.

If user provides different font size through mobile app or initialization file, page length will auto adjust to new values. Also, page length can be set to fixed size by defining ^LL command in initialization file.

In initialization file example shown below, page length is set to fixed 600 points and font size is 20 points. This will print 30 lines of text.  $600/20 = 30$ .

```
^XA
^CWQ,E:DVUE.FNT
^CWR,E:FMONO.FNT
^LL600
^CFR,20,20
^XZ
```

## Darkness print adjustment

Zebra printers have a special command to set darkness ^MDx where x = -30..30. Add command to initialization file.

```
^XA
^CWQ,E:DVUE.FNT
^CWR,E:FMONO.FNT
^LL600^CFR,20,20
^MD10
^XZ
```

## Initialization file

Initialization file is ZPL driver init string that will be injected into every printed spool file to prepare printer with some defaults. For example, if we are using custom fonts, font substitution can be added to initialization file.

**NOTE:** Leaving inside mobile app Printer Font empty, defaults from initialization file will be used.

Location is in [user]/io.greenscreens/overrides

Multiple options are available. We can create custom initialization files for every spool, outq or host configuration. Here is a list of available options.

```
[USER]/io.greenscreens/system/[SERIAL]/[PARTITION]/print/overrides/[OUTQ_NAME]/[SPOOL_NAME].zpl
[USER]/io.greenscreens/system/[SERIAL]/[PARTITION]/print/overrides/[OUTQ_NAME].zpl
[USER]/io.greenscreens/system/[SERIAL]/[PARTITION]/print/overrides/default.zpl
[USER]/io.greenscreens/system/[SERIAL]/[PARTITION]/print/overrides/defaults/[SPOOL_NAME].zpl
```

## Creating font upload files

To convert TTF font to ZPL format, 2 options are available. With ~DU and ~DY commands. Only difference is that ~DY sends font in binary form (smaller size), while ~DU sends font data in ASCII HEX encoded form (2x ~DY format size).

We provide already prepared free monospaced fonts for upload to the printer. One can open fonts ending with \_DU.ZPL in text editor to see how encoded font looks like. For fonts ending \_DY.ZPL we prepended ~DY command header to original TTF font file.

**NOTE:** For details, please refer to Zebra Printer Programming Guide what are the parameters of ~DU and ~DY instructions.

