HID

FARGO® DTC®1500 Linux
User Guide

PLT-04870, A.1
September 2020

Powering
Trusted Identities

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HID Global Technical Support: **www.hidglobal.com/support**.

What's new

Date	Description	Revision
September 2020	Added printer firmware upgrade to Section 2.	A.1

A complete list of revisions is available in **Revision history**.

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Section **01**
Introduction

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Trusted Identities

This User Guide covers how to use the CUPS system on a Linux machine to install and maintain a DTC1500 Linux printer driver Rev. B (v1.3.6.4). It describes the installation of the Linux driver, how to add and maintain the printer, manage the printer, and configure the available job options.

1.1 Supported CUPS versions

Common Unix Printing System (CUPS) is a modular printing system for Unix-like computer operating systems. CUPS allows a computer to act as a print server. A computer running CUPS as a host that can accept print jobs from client computers, process these jobs, and send them to the appropriate printer.

The minimum required CUPS version for this driver is 1.7.2. If a previous version of the CUPS interface is being used, contact HID Global Technical Support at **https://www.hidglobal.com/support**.

The operating systems able to use CUPS include 64-bit Linux versions:

- Ubuntu 16.04
- Ubuntu 18.04

1.2 Firmware requirements

Printer firmware 1.0.4.10 is required to use CUPS with a DTC1500 connected by USB. To verify the firmware version, press and hold the **Pause** button on the DTC1500 for four seconds to print a printer settings card.

1.2.1 Linux with USB connection

For each Linux host machine, only one USB connection to a printer is supported.

Section **02**
Installation and maintenance

Powering
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Important: **It is important that the DTC® card printer is not connected to the computer using a USB cable before the Linux driver is installed.**

2.1 CUPS Linux driver download

1. Open a web browser and go to: **https://www.hidglobal.com/drivers**.
2. Select **FARGO®** from the **All Brands** list.
3. Select **Linux** or **Linux x64** from the **All OSs** list.
4. Select **HID® FARGO® DTC1500 Linux** driver from the list of driver files and click **DOWNLOAD**.
5. Read the End User License Agreement and click **I Accept** to download the driver.

2.2 CUPS Linux driver manual installation

1. Copy the downloaded driver archive file into the root directory of the system.
2. With root privileges, run the following command:

```
sudo tar xf /DTC1500-x64.tar.gz -C /
```

2.3 CUPS Linux driver automatic installation

1. Ensure that the "driver_install.sh" file is stored in the same directory as the downloaded driver file.
2. Add execution privileges to the script file:

```
chmod +x driver_install.sh
```

3. Execute the script file:

```
sudo ./driver_install.sh
```

The installation begins. As the installation progresses, messages are displayed on the screen. When the installation has completed, you are prompted to reboot your system.

```
root@test-Ubuntu18-04:~# ls
Desktop      Downloads        DTC1500-x64.tar.gz    Music      Public      Videos
Documents    driver_install.sh  examples.desktop     Pictures   Templates   workspace
root@test-Ubuntu18-04:~# chmod +x driver_install.sh
root@test-Ubuntu18-04:~# sudo ./driver_install.sh
*
* The DTC1500 driver installation will be running now
* Verify root privileges...
* Verify root privileges - ok
* Unzip driver files to the temporary directory - ./tmp_driver_installer
* Copy driver files to the destination directory...
* - stop CUPS process
* - copy files
* - start CUPS process
* Celanup temporary files...
* Celanup temporary files - done
* Success!
*
* Reboot required. Do you want to do it now?
* Type 'yes' if so: yess
*
root@test-Ubuntu18-04:~#
```

2.4 Upgrade the CUPS driver from an older version

Follow the installation instructions in "Installation and maintenance " on page 7 to download the driver file. Then, see "CUPS Linux driver manual installation" on the previous page or "CUPS Linux driver automatic installation" on the previous page to overwrite the existing driver with the new driver.

Note: Depending upon the desired configuration options, you may have to delete and reinstall the printer using the new PPD file. Additional modification of the default print job configuration options may be necessary.

2.5 Remove a driver

There is not an uninstall process to remove a driver. Therefore, the driver files must be deleted manually. The following table shows the locations and names of the files that are installed on the Linux system for the driver.

To remove a driver, locate these files and delete them from your Linux system.

File	Description
/usr/share/cups/model/DTC1500.ppd	PPD file for the DTC1500 card printer.
/usr/libexec/cups/filter/rastertofargo-x.y.z	Raster filter driver for the FARGO DTC Card Printers. "x.y.z" is major, minor, and minor extension.
/etc/udev/rules.d/92-FARGO.rules	Linux device management rules file.

2.6 Upgrade the printer firmware

1. Download the new firmware zip package from **https://www.hidglobal.com/drivers**.

2. Unzip the archive to extract the *.frm file.

3. From a terminal window, enter one of the following (modifying the path as needed):

   - `lpr -P DTC1500 FIRMWAREFILE NAME.frm`
   - `lp -d DTC1500 FIRMWAREFILE NAME.frm`

4. Wait for the printer to complete the upgrade procedure.

Note: The .frm file is not located in the driver package.

2.7 Determine the printer IP address

The printer IP address must be determined prior to adding a network connected printer. The printer IP address may be determined using the following procedure:

1. Power on the printer.

2. Ensure that the printer is connected to the network using the RJ45 connector on the back of the printer.

3. Wait for the printer to obtain an IP address from DHCP. This may take up to a minute.

4. Press and hold **Pause** for at least four seconds to print a settings card.

Note: The printer must be ready and idle for the settings card to print.

2.8 Add a printer connection using a USB cable

1. Connect the USB cable to the printer.

2. Power on the printer.

3. Open a web browser and go to **http://localhost:631/**.

4. Open the CUPS home page and click the **Administration** tab.
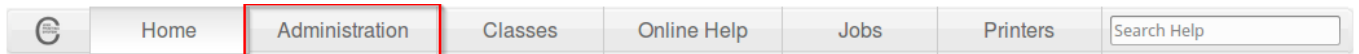
CUPS 1.7.2

CUPS is the standards-based, open source printing system developed by Apple Inc. for OS® X and other UNIX®-like operating systems.

CUPS for Users

Overview of CUPS

Command-Line Printing and Options

What's New in CUPS 1.7

User Forum

CUPS for Administrators

Adding Printers and Classes

Managing Operation Policies

Printer Accounting Basics

Server Security

Using Kerberos Authentication

Using Network Printers

cupsd.conf Reference

Find Printer Drivers

CUPS for Developers

Introduction to CUPS Programming

CUPS API

Filter and Backend Programming

HTTP and IPP APIs

PPD API

Raster API

PPD Compiler Driver Information File Reference

Developer Forum

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5. Click **Add Printer**.

6. If the CUPS **Authentication Required** message is displayed when adding a printer, enter your login **username** and **password** to continue. See your CUPS documentation for more information about permissions and authentication procedures.

7. Select the USB-connected printer or the http printer.

8. If you selected

- A USB printer, make sure the USB connections between the printer and the Linux workstation are firm and that the printer is powered on.

- An http printer, enter the IP address for the printer followed by the port number 9100 using the format

  `socket://aaa.bbb.ccc.ddd:9100`

  where `aaa.bbb.ccc.ddd` is the IP address of the printer.

9. Depending upon the requirements, the printer data can be modified in the **Add Printer** window:
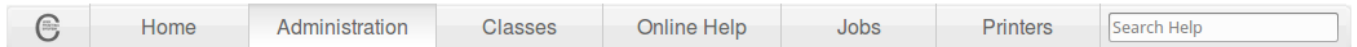
- Enter a new name for the printer, if needed.
- Enter a brief description of the printer.
- Enter a brief description of the location of the printer.

10. In the **Make** list, select **HID** and click **Continue**.
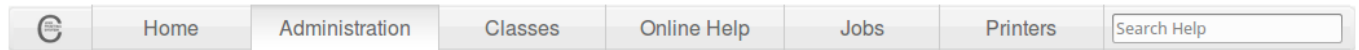
11. In the **Model** list, select the DTC1500 model and click **Add Printer**.
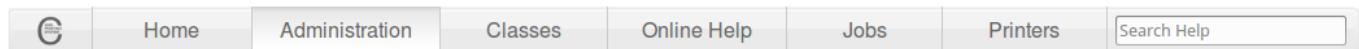
2.9 Maintenance procedures

2.9.1 Performing a ribbon sensor calibration

1. Remove all cards from the card hopper and close the hopper door.
2. Open the front cover, remove the ribbon cartridge, and close the printer front cover.
3. From a terminal window enter one of the following (modifying the path, as needed):
   - `lpr -P DTC1500 CalibrateRibbon.prn`
   - `lp -d DTC1500 CalibrateRibbon.prn`
4. When completed, the printer beeps twice.

Note: The .prn file is located in the driver package.

2.9.2 Cleaning the printer

1. Remove all cards from the card hopper and close the hopper door.
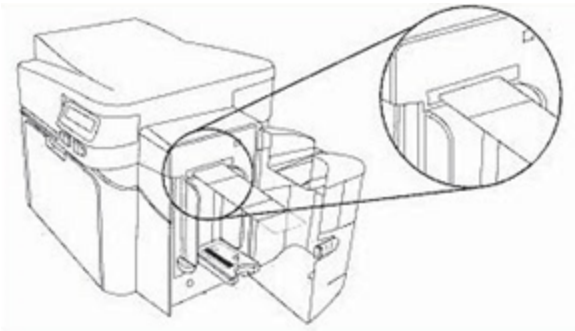
2. Open the front cover and remove the ribbon cartridge.
3. Remove the paper backing from both sides of the cleaning card.
4. Place the cleaning card into the single feed slot.
5. From a terminal window, enter one of the following (modifying the path, as needed):
   - `lpr -P DTC1500 CleanPrinter.prn`
   - `lp -d DTC1500 CleanPrinter.prn`

Note: The .prn file is located in the driver package.

Section **03**
Managing the printer

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3.1 CUPS web interface

The CUPS web-based interface is disabled by default on some operating systems. If you receive a message that it is disabled, enter the following at the command line:

```
cupsctl WebInterface=yes
```

To access the CUPS web-based interface for printer management enter the following URL:

http://localhost:631/printers

Note: For a remote server, substitute the appropriate host name string in place of localhost.

3.2 Printers tab

Configuration of the DTC1500 printer is completed through the printer queue. The printer queue is accessed from the CUPS home page.

Note: Information about the CUPS web interface can be found by selecting the **Home** tab and clicking the associated link.

1. Click the **Printers** tab to access the printer queue.

2. Select **DTC1500** from the **Queue Name** list.

   The printer queue opens to display all printer default information.

Printer Options	Options
Maintenance	■ Print Test Page ■ Pause Printer ■ Reject Jobs ■ Move All Jobs ■ Cancel All Jobs

Printer Options	Options
Administration	■ Modify Printer ■ Delete Printer ■ Set Default Options ■ Set As Server Default ■ Set Allowed Users

3.3 Option configuration

Print job option configuration is completed by using the Set Default Options window of the CUPS web interface. This window is accessed from the Print Queue Administration window.

1. On the **Administration** tab, select **Set Default Options**.

Set Default Options for DTC1500

Card **Print Options** **Image Color Options** **Image Position Options** **Overlay Print Area Options** **K-Panel Options** **Global Magnetic Encoding Options** **Magnetic Track Encoding Options** **Banners** **Policies**

Print Options

Ribbon Type:	YMCKO
Print Both Sides:	◉ Yes ○ No
Split 1 Set of Ribbon Panels:	○ Yes ◉ No
Print Back Image on Front of Card:	○ Yes ◉ No
Print Back Side Only:	○ Yes ◉ No
Disable Printing (Feed Card Only):	○ Yes ◉ No
Write Only (No erase pass):	○ Yes ◉ No
Encrypt Job Data:	○ Yes ◉ No

Set Default Options

The options on this window vary depending upon the selected printer.

Set Default Options for DTC1500

Card **Print Options** **Image Color Options** **Image Position Options** **Overlay Print Area Options** **K-Panel Options** **Global Magnetic Encoding Options** **Magnetic Track Encoding Options** **Banners** **Policies**

Card

Card Size:	CR80
Card Thickness:	30
Rotate Front 180 Degrees:	◉ Yes ○ No
Rotate Back 180 Degrees:	○ Yes ◉ No

Set Default Options

3.4 Setting default options

The following is an example of the Set Default Options window. The selections you make to this list become the default options for your printer. To set the default options:

1. Set each option to your desired default.

2. Click **Set Default Options**. A message stating that the default settings have been successfully changed is displayed.

Set Default Options for DTC1500

Card   **Print Options**   **Image Color Options**   **Image Position Options**   **Overlay Print Area Options**
K-Panel Options   **Global Magnetic Encoding Options**   **Magnetic Track Encoding Options**
Banners   **Policies**

Print Options

Ribbon Type:	YMCKO
Print Both Sides:	⦿ Yes ◯ No
Split 1 Set of Ribbon Panels:	◯ Yes ⦿ No
Print Back Image on Front of Card:	◯ Yes ⦿ No
Print Back Side Only:	◯ Yes ⦿ No
Disable Printing (Feed Card Only):	◯ Yes ⦿ No
Write Only (No erase pass):	◯ Yes ⦿ No
Encrypt Job Data:	◯ Yes ⦿ No

[Set Default Options]

Note: After a brief period, this window automatically transfers back to the **Print Queue Administration** window and the printer configuration process is complete.

| ⟳ | Home | Administration | Classes | Online Help | Jobs | Printers | Search Help |
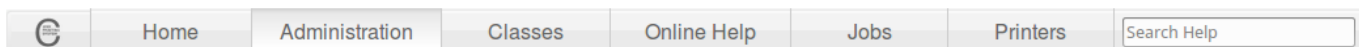
Set Default Options for DTC1500

Printer DTC1500 default options have been set successfully.

3.5 View printer specific options from the command line

Each printer has its own set of supported options that are detailed in the driver PPD file. However, you cannot access this file directly. The `lpoptions` command provides a list of the available options supported by the printer. At a command line, enter:

```
lpoptions -p [printer] -l
```

where [printer] is the current printer name.

Each of the available options is displayed on a new line. Each option listing

- Starts with the option name followed by a slash
- Continues with the text description for that option
- Finishes with a colon

Following the colon is a list of all selection values that are supported for that option. An asterisk (*) in front of a selection value indicates that this is the default selection for that option.

For a listing of available printer names, enter the following command:

```
lpstat -p
```

3.6 Set printer-specific options from the command line

For many print jobs, the default printer options are sufficient. However, at times you may need to change the options for a particular file you are printing.

The `lp` and `lpr` commands allow you to pass printer options using the –o option prefix:

```
lp -d [printer] -o landscape -o scaling=75 -o media=A4 [filename]
```

or

```
lpr -P [printer] -o landscape -o scaling=75 -o media=A4 [filename]
```

3.7 Printing from the command line

CUPS provides both System V (lp) and Berkeley (lpr) printing commands. To print a file to the current default printer, use this basic print command:

```
lpr -P [printer] [filename]
```

or

```
lp -d [printer] [filename]
```

3.8 Printing with magnetic stripe encoding

To print with magnetic stripe encoding use the following command format:

```
lp -d [printer] -o "MagTrack1=%25MAGTEST1%3F MagTrack2=%3B1234567890%3F MagTrack3=%3B1234567890%3F"
[filename}
```

Section **04**

Print job configuration options

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Each of the print job configuration options that are supported by the DTC1500 card printer are described here. However, not all options are available on all printers. Therefore, with each printer selected, only the options available for that device are displayed.

The Print Job configuration options are located at: **Printers** > **[your printer name]** > **Administration** > **Set Default Options**.

The **Set Default Options** window is displayed. Select the option you want to view or configure.

4.1 Card option

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

Card

Card Size: CR80

Card Thickness: 30

Rotate Front 180 Degrees: ⦿ Yes ◯ No

Rotate Back 180 Degrees: ◯ Yes ⦿ No

Set Default Options

Field	Description
Card Size	Sets the size of card for the print job. Options are: ■ **CR80**: This is the default. Dimensions are: 3.375″ x 2.125″ (85.6 mm x 54 mm). ■ **CR79**: Dimensions are: 3.303″ x 2.051″ (83.9 mm x 52.1 mm). To configure this field from the command line, enter: `PageSize=Selection` where `Selection` is **CR80** or **CR79**.
Card Thickness	Sets the card thickness for the print job. Options are: ■ **10 mm** ■ **20 mm** ■ **30 mm** ■ **40 mm** To configure this field from the command line, enter: `CardThickness=Selection` where `Selection` is **10**, **20**, **30**, or **40**.
Rotate Front 180 Degrees	Rotates the image on the front of the card by 180 degrees. Options are: ■ **Yes** ■ **No**: This is the default. To configure this field from the command line, enter: `RotateImageFront=Selection` where `Selection` is **True** or **False**.
Rotate Back 180 Degrees	Rotates the image on the back of the card by 180 degrees. Options are: ■ **Yes** ■ **No**: This is the default. To configure this field from the command line, enter: `RotateImageBack=Selection` where `Selection` is **True** or **False**.

4.2 Print options

Field	Description
Ribbon Type	Allows you to manually select the installed ribbon. Options are: ■ **YMCKO** This is the default. This option sets the print job to YMCKO - Full Color with Resin Black and Overlay Panel. ■ **YMCKO Half Panel** ■ **YMCKK** ■ **YMCKOK** ■ **YMCKOK Half Panel** ■ **YMCKOKO Half Panel** ■ **Standard Resin** ■ **None - Re-Writable** To configure this field from the command line, enter: `Ribbon=Selection` where `Selection` is **YMCKO**, **YMCKO_Half**, **YMCKK**, **YMCKOK**, **YMCKOK_Half**, **YMCKOKO_Half**, **KStandard**, or **None**.
Print Both Sides	Determines whether duplex printing is enabled or disabled. If the printer is equipped with a flipper module then odd numbered sides of the print job are printed on the front side of the card and even numbered sides are printed on the back side of the card. Options are: ■ **Yes**: This option enables duplex printing. If the printer is equipped with a flipper module, then odd numbered sides of the print job are printed on the front side of the card and even numbered sides are printed on the back side of the card. ■ **No**: This is the default. This option disables duplex printing. If the print job has multiple sides, then each side is printed on a separate card. To configure this field from the command line, enter: `PrintBothSides=Selection` where `Selection` is **True** or **False**.

Field	Description
Split 1 Set of Ribbon Panels	Determines if the ribbon panel is full or split. By default, each side of the card uses a full set of ribbon panels, regardless of the ribbon type selection. Options are: ■ **Yes** ■ **No**: This is the default. Enable this option to automatically print (when printing using a full color with resin type ribbon): ■ Full-color on the front side of the card. ■ Resin black on the back side of the card. If using the YMCKO ribbon type, this option automatically prints ■ Full-color on the front side of the card. ■ Resin black on the back side of the card. The overlay panel is printed on the front side of the card. To configure this field from the command line, enter: `SplitRibbon=Selection` where `Selection` is **True** or **False**.
Print Back Image on Front of Card	Determines where the back image is printed. When this option is enabled, the first card side is printed on the back side of the card and the second card side is printed on the front card side. Options are: **Yes** or **No** (default). To configure the field from the command line, enter: `PrintBackOnFront=Selection` where `Selection` is **True** or **False**.
Print Back Side Only	Enables the card image to be printed on the back side of the card. Options are: ■ **Yes** ■ **No**: This is the default. To configure this field from the command line, enter: `PrintBackOnly=Selection` where `Selection` is **True** or **False**.
Disable Printing (Feed Card Only)	Enables image data to not be printed on the card. This option is useful when only card encoding is desired. Options are: ■ **Yes** ■ **No**: This is the default. To configure this field from the command line, enter: `DisablePrinting=Selection` where `Selection` is **True** or **False**.
Write Only (No Erase Pass)	When using re-writable media, this option determines the write only options. When enabled, the erase pass is skipped and only the write pass is affected. Options are: ■ **Yes** ■ **No**: This is the default. To configure this field from the command line, enter: `WriteOnly=Selection` where `Selection` is **True** or **False**.

Field	Description
Encrypt Job Data	Provides AES encryption of data sent to printer when enabled. This feature is useful when a printer is shared or connected via Ethernet. Options are: ■ **Yes** ■ **No**: This is the default. To configure this field from the command line, enter: `EncryptJobEnable=Selection` where `Selection` is **True** or **False**.

4.3 Image color options

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

Image Color Options

Color Mode: Color RGBK
Color Matching: No Color Management
Resin Dither: Optimize for Graphics
Dye-Sub Intensity (YMC): 0
Resin Heat Front (K): 0
Resin Heat Back (K): 0
Overlay Heat: 0
Erase Intensity: 0

Set Default Options

Field	Description
Color Mode	The input color mode of the raster image processor. Options are: ■ **Color RGB** ■ **Color RGBK (RGB + black)** To configure this field from the command line, enter: `ColorMode=Selection` where `Selection` is **RGB** or **RGBK**.
Color Matching	Shifts colors to a different color model so the colors in the printed image are more closely matched to how they appear on the monitor. The default selection provides a closer match to the RGB color specifications. Options are: ■ **System Color Management**: This is the default. ■ **None** (third party color matching software) To configure this field from the command line, enter: `ColorMatching=Selection` where `Selection` is **System** or **None**.
Resin Dither	Selects which dithering method is used. Options are: ■ **Optimize for Graphics**: This is the default. Use this option when printing barcodes and graphics with resin. ■ **Optimize for Photos**: Use this option when printing photo quality images with resin. To configure this field from the command line, enter: `ResinDither=Selection` where `Selection` is **Graphics** or **Photos**.
Dye-Sub Intensity (YMC)	Selects the intensity of the dye-sub. The default is 0. Options are: ■ Adjust the value higher (+) to use more heat when transferring dye-sub colors to the card. This produces a darker, more saturated image. ■ Adjust the value lower (-) to use less heat when transferring dye-sub colors to the card. This produces a lighter, less saturated print. To configure this field from the command line, enter: `DyeSubIntensity=Selection` where `Selection` is a numeric value from **-50** to **50**.

Field	Description
Resin Heat Front (K)	Selects the heat intensity used on the front side of the card. The default is 0. Options are: ■ Adjust the value higher (+) to use more heat to transfer resin to a card when printing resin black on the front side of the card. ■ Adjust the value lower (-) to use less heat to transfer resin to a card when printing resin black on the front side of the card. To configure this field from the command line, enter: `ResinHeatFront=Selection` where `Selection` is a numeric value from **-50** to **50**.
Resin Heat Back (K)	Selects the heat intensity used on the back side of the card. The default is 0. Options are: ■ Adjust the value higher (+) to use more heat to transfer resin to a card when printing resin black on the back side of the card. ■ Adjust the value lower (-) to use less heat to transfer resin to a card when printing resin black on the back side of the card. To configure this field from the command line, enter: `ResinHeatBack=Selection` where `Selection` is a numeric value from **-50** to **50**.
Overlay Heat	Selects the heat intensity to transfer the overlay panel to the card. The default is 0. Options are: ■ Adjust the value higher (+) to use more heat. ■ Adjust the value lower (-) to use less heat. To configure this field from the command line, enter: `OverlayHeat=Selection` where `Selection` is a numeric value from **-50** to **50**.
Erase Intensity	This option selects the intensity of the erase signal when using re-writable media. The default is 0. Options are: ■ Adjust the value higher (+) to increase the intensity. ■ Adjust the value lower (-) to decrease the intensity. To configure this field from the command line, enter: `EraseIntensity=Selection` where `Selection` is a numeric value from **-50** to **50**.

4.4 Image position options

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

Image Position Options

Vertical Offset: 0

Horizontal Offset: 0

Set Default Options

Field	Description
Vertical Offset	Selects the vertical offset of the image on the card. The default is 0. Options are: ■ Adjust the value higher (+) to move the image towards the back side of the printer. ■ Adjust the value lower (-) to move the image towards front side of the printer. To configure this field from the command line, enter: `ImageVOffset=Selection` where `Selection` is a numeric value from **-100** to **100**.
Horizontal Offset	Selects the horizontal offset of the image on the card. The default is 0. Options are: ■ Adjust the value higher (+) to move the image towards the card output side of the printer. ■ Adjust the value higher (-) to move the image towards the card input side of the printer. **Note:** Adjusting the Horizontal Offset may result in ribbon breakage. To configure this field from the command line, enter: `ImageHOffset=Selection` where `Selection` is a numeric value from **-100** to **100**.

4.5 Overlay print area options

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

Overlay Print Area Options

Front Overlay/Print Area: Full Card
Back Overlay/Print Area: Full Card
Front Apply Area(s): Print and Overlay
Back Apply Area(s): Print and Overlay
Visual Security Solution: No Visual Security
Visual Security Type: VeriMark

Set Default Options

Field	Description
Front Overlay/Print Area	Selects where the overlay is applied to or omitted from the front of the card. Options are: ■ **Full Card**: This is the default. This option instructs the printer to print image data and overlay data on the full front card surface. No omit sections are enabled. ■ **Omit Mag Stripe Area**: This option instructs the printer to omit print image and overlay data from an area of the front card surface corresponding to the ISO location for a magnetic stripe. ■ **Omit Smart Chip Area**: This option instructs the printer to omit print image and overlay data from an area of the front card surface corresponding to the ISO location for a smart chip. ■ **Omit Signature Area**: This option instructs the printer to omit print image and overlay data from an area of the front card surface corresponding to the ISO location for a signature stripe. For visual examples of these pre-defined omit regions see Section 4.5.1: Pre-Defined Print Area Omit Regions. To configure this field from the command line, enter: `PrintAreaFrontOption=Selection` where `Selection` is **Fullcard**, **OmitMagStripe**, **OmitSmartChip**, **OmitSignature**, **Defined**, or **Undefined**.

Field	Description
Back Overlay/Print Area	Selects where the overlay is applied to or omitted from the back of the card. Options are: ■ **Full Card**: This is the default. This option instructs the printer to print image data and overlay data on the full back card surface. No omit sections are enabled. ■ **Omit Mag Stripe Area**: This option instructs the printer to omit print image and overlay data from an area of the back card surface corresponding to the ISO location for a magnetic stripe. ■ **Omit Smart Chip Area**: This option instructs the printer to omit print image and overlay data from an area of the back card surface corresponding to the ISO location for a smart chip. ■ **Omit Signature Area**: This option instructs the printer to omit print image and overlay data from an area of the back card surface corresponding to the ISO location for a signature stripe. For visual examples of these pre-defined omit regions "Pre-defined print area omit regions" on page 34. To configure this field from the command line, enter: `PrintAreaBackOption=Selection` where `Selection` is **Fullcard**, **OmitSignature**, **OmitMagStripe**, **OmitSmartChip**, **Defined**, or **Undefined**.
Front Apply Area(s)	Selects what is applied to the front of the card. Options are: ■ **Print and Overlay**: This is the default. Both the image and overlay are applied to the front of the card. ■ **Overlay Only**: The overlay is applied only to the selected area. The print image is not affected. ■ **Print Only**: The print image is applied only to the selected area. The overlay is completed disabled. To configure this field from the command line, enter: `PrintAreaFrontApply=Selection` where `Selection` is **PrintAndOverlay**, **OverlayOnly**, or **PrintOnly**.
Back Apply Area(s)	Selects what is applied to the back of the card. Options are: ■ **Print and Overlay**: This is the default. Both the image and overlay are applied to the back of the card. ■ **Overlay Only**: The overlay is applied only to the selected area. The print image is not affected. ■ **Print Only**: The print image is applied only to the selected area. The overlay is completed disabled. To configure this field from the command line, enter: `PrintAreaBackApply=Selection` where `Selection` is **PrintAndOverlay**, **OverlayOnly**, or **PrintOnly**.

Field	Description
Visual Security	Selects where the Visual Security is located on the front of the card. Options are: ■ **No Visual Security**: This is the default. The option disables Visual Security. ■ **Lower Left**: Enables the option by placing the Visual Security region in the lower left corner of the card image. ■ **Upper Left**: Enables the option by placing the Visual Security region in the upper left corner of the card image. ■ **Lower Right**: Enables the option by placing the Visual Security region in the lower right corner of the card image. ■ **Upper Right**: Enables the option by placing the Visual Security region in the upper right corner of the card image. **Note:** When this option is enabled, the **Front Overlay/Print Area** selection is ignored. To configure this field from the command line, enter: `VisualSecurityArea=Selection` where `Selection` is **None**, **LowerLeft**, **UpperLeft**, **LowerRight**, or **UpperRight**.
Visual Security Type	Selects the type of Visual Security. Options are: ■ **VeriMark®**: This is the default. ■ **HoloMark™** To configure this field from the command line, enter: `VisualSecurityType=Selection` where `Selection` is **VeriMark** or **HoloMark**.

4.5.1 Pre-defined print area omit regions

These card examples show the effect of the pre-defined print area omit regions that may be selected using the Front Overlay/Print Area and the Back Overlay/Print Area options. The red highlighted area is omitted.
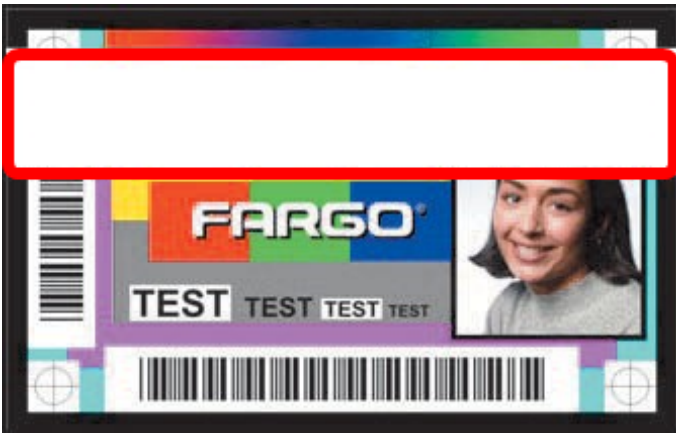
Omit Mag Stripe Area Example

Omit Smart Chip Area Example

Omit Signature Area Example

4.6 K-Panel options

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

K-Panel Options

Front YMC Under K: ○ Yes ◉ No
Back YMC Under K: ○ Yes ◉ No
Front K-Panel Area: None
Back K-Panel Area: None
Resin Threshold: 99%

Set Default Options

Field	Description
Front YMC Under K	Determines if YMC is printed under the resin black on the front of the card. Options are: ■ **Yes**: Enables YMC dye-sub black to be printed underneath the resin black for pixels that are affected by the Front K-Panel Area option. This option provides a gradual transition between background colors and the edges of text and bar codes printed with resin black. ■ **No**: This is the default. YMC dye-sub black is not printed under the resin black for pixels that are affected by the Front K-Panel Area option. This option maximizes the sharpness of text and bar codes printed with resin black. To configure this field from the command line, enter: `YMCunderKFront=Selection` where `Selection` is **True** or **False**.
Back YMC Under K	Determines if YMC is printed under the resin black on the back of the card. Options are: ■ **Yes**: Enables YMC dye-sub black to be printed underneath the resin black for pixels that are affected by the Back K-Panel Area option. This option provides a gradual transition between background colors and the edges of text and bar codes printed with resin black. ■ **No**: This is the default. YMC dye-sub black is not printed underneath the resin black for pixels that are affected by the Back K-Panel Area option. This option maximizes the sharpness of text and bar codes printed with resin black. To configure this field from the command line, enter: `YMCunderKBack=Selection` where `Selection` is **True** or **False**.
Front K-Panel Area	Selects if the K-Panel is used on the front of the card. Options are: ■ **None**: This is the default. ■ **Full Card**: Instructs the printer to use the resin black ribbon panel to print all black pixels found within the image data on the front of the card. To configure this field from the command line, enter: `KPanelFrontApply=Selection` where `Selection` is **None** or **Fullcard**.

Field	Description
Back K-Panel Area	Selects if the K-Panel is used on the back side of the card. Options are: ■ **None**: This is the default. ■ **Full Card**: Instructs the printer to use the resin black ribbon panel to print all black pixels found within the image data on the back side of the card. To configure this field from the command line, enter: `KPanelBackApply=Selection` where `Selection` is **None** or **Fullcard**.
Resin Threshold	Changes the level at which the driver moves a pixel to be printed on a resin panel instead of a YMC. To configure this field from the command line, enter: `ResinThreshold=Selection` where `Selection` is a numeric value from **1** to **99**.

4.7 Global magnetic encoding options

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

Global Magnetic Encoding Options

Coercivity: High (2750 Oe)

Shift Left Data: ○ Yes ⦿ No

[Set Default Options]

Field	Description
Coercivity	Selects the coercivity for magnetic encoding. Options are: ■ **Super (4000 Oe)** ■ **High (2750 Oe)**: This is the default. ■ **Medium (600 Oe)** ■ **Low (300 Oe)** To configure this field from the command line, enter: `Coercivity=Selection` where `Selection` is **4000**, **2750**, **600**, or **300**.
Shift Left Data	Enables the magnetic data to be shifted left as it is encoded onto the magnetic stripe. Options are: ■ **Yes** ■ **No**: This is the default. To configure this field from the command line, enter: `ShiftDataLeft=Selection` where `Selection` is **True** or **False**.

4.8 Magnetic track encoding options

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

Magnetic Track Encoding Options

Track 1 Encoding Mode:	ISO
LRC Generation:	Even Parity
Character Size:	7 Bits
Parity:	Odd Parity
ASCII Offset:	Space
Bit Density:	210
Reverse Char Bits Order:	○ Yes ⦿ No
Add Leading Zeros:	○ Yes ⦿ No
Track 2 Encoding Mode:	ISO
LRC Generation:	Even Parity
Character Size:	5 Bits
Parity:	Odd Parity
ASCII Offset:	Zero
Bit Density:	75
Reverse Char Bits Order:	○ Yes ⦿ No
Add Leading Zeros:	○ Yes ⦿ No
Track 3 Encoding Mode:	ISO
LRC Generation:	Even Parity
Character Size:	5 Bits
Parity:	Odd Parity
ASCII Offset:	Zero
Bit Density:	210
Reverse Char Bits Order:	○ Yes ⦿ No
Add Leading Zeros:	○ Yes ⦿ No

Set Default Options

Field	Description
Track 1 Encoding Mode (Magnetic Encoding)	Sets the encoding mode independently for each of the three magnetic tracks. Options are: ■ **ISO**: This is the default. ■ **Custom** ■ **JIS II** ■ **Raw** To configure this field from the command line, enter: `MagNTrackMode=Selection` where N is **1**, **2**, or **3**, and `Selection` is **ISO**, **Custom**, **JIS**, or **Raw**.
LRC Generation	Sets the LRC generation independently for each of the three magnetic tracks. Options are: ■ **None** ■ **Even Parity**: This is the default. ■ **Odd Parity** To configure this field from the command line, enter: `MagNLRCGeneration=Selection` where N is **1**, **2**, or **3**, and `Selection` is **None**, **Even**, or **Odd**.

Field	Description
Character Size	Sets the character size (in bits per character) independently for each of the three magnetic tracks. Options are: ■ **4 Bits** ■ **5 Bits**: This is the default for magnetic tracks 2 and 3. ■ **7 Bits**: This is the default for magnetic track 1. ■ **8 Bits** To configure this field from the command line, enter: `MagNCharSize=Selection` where `N` is **1**, **2**, or **3** and `Selection` is **4**, **5**, **7**, or **8**.
Character Parity	Sets the character parity independently for each of the three magnetic tracks. Available options: ■ **None** ■ **Even Parity** ■ **Odd Parity**: This is the default. To configure from the command line: `MagNParity=Selection` where `N` is **1**, **2**, or **3** and `Selection` is **None**, **Even**, or **Odd**.
Character ASCII Offset	Sets the character ASCII offset independently for each of the three magnetic tracks. Available options: ■ **Null** ■ **Space**: This is the default for magnetic track 1. ■ **Zero**: This is the default for magnetic tracks 2 and 3. To configure this field from the command line, enter: `MagNASCIIOffset=Selection` where `N` is **1**, **2**, or **3** and `Selection` is **Null**, **Space**, or **Zero**.
Track Bit Density	Sets the encoding bit density independently for each of the three magnetic tracks. Available options: ■ **75**: This is the default for magnetic track 2. ■ **128** ■ **210**: This is the default for magnetic tracks 1 and 3. To configure this field from the command line, enter: `MagNBitDensity=Selection` where `N` is **1**, **2**, or **3** and `Selection` is **75**, **128**, or **210**.

Field	Description
Track Reverse Bit Order	Reverses the order of the magnetic track data bits as it is encoded onto the magnetic stripe. Options are: ■ **Yes**: This is the default. ■ **No** To configure this field from the command line, enter: `MagNReverseCharBits=Selection` where `N` is **1**, **2**, or **3** and `Selection` is **True** or **False**.
Track Add Leading Zeros	Prepends leading zero bits to the stream of magnetic track data bits. Options are: ■ **Yes** ■ **No**: This is the default. To configure this field from the command line, enter: `MagNAddLeadingZeros=Selection` where `N` is **1**, **2**, or **3** and `Selection` is **True** or **False**.

4.8.1 Card printer driver magnetic encoder settings

This table shows the settings that should be used to correctly configure HID card printers.

Encoding Mode	Shift Left Data	LRC Generation	Character Size	Character Parity	ASCII Offset	Bit Density	Reverse Bit Order	Add Leading Zero
ISO	No	Even	Track 1 = 7 Track 2 = 5 Track 3 = 5	Odd	Track 1 = Space Track 2 = Zero Track 3 = Zero	Track 1 = 210 Track 2 = 75 Track 3 = 210	Yes	Yes
Custom	Yes, No	No, Even, Odd	5, 7	No, Even, Odd	Null, Space, Zero	75, 128, 210	Yes	Yes
Raw	No	No	4, 8	No	Null	75, 210	Yes, No	Yes, No
JIS	No	Even	8	Even	Null	210	No	No

4.9 Magnetic stripe encode data

Magnetic stripe encode data must be passed to the CUPS driver using the command line. The following command line options have been defined for this purpose:

- Magtrack1
- Magtrack2
- Magtrack3

Each option is set equal to the string of data to be encoded for that track. The string of encode data must be passed to the CUPS driver in URL character encoding mode. See "URL character encoding mode" below.

A command line option flag (-o) must precede the first track of magnetic stripe encode data passed on the command line. The second and third tracks, however, may be specified following the first track without including additional command line option flags.

Command line example:

```
lp -d <Printer_Queue_Name> -o "Magtrack1=%25MAGTEST1%3F Magtrack2=%3B1234567890%3F
Magtrack3=%3B1234567890%3F" <Filename>
```

4.9.1 Magnetic stripe encoding - format details

The following sections describe the URL character encoding mode and details the currently supported magnetic stripe encoding modes:

- ISO Mode
- JIS II Mode
- Custom Mode
- Raw Mode

4.9.2 URL character encoding mode

The CUPS driver uses URL encoding mode when defining data to be encoded to each of the magnetic stripes. To be recognized, all characters passed to the driver, including any special characters (such as start and end sentinels), must be described with a URL Encoding Mode.

In URL encoding mode all ASCII characters, except for the reserved character set defined here, are represented by their normal ASCII character codes. Each character in the reserved character set must be represented by a 3-character sequence: a percent character (%) followed by a 2-character representation of the hex equivalent of the ASCII character code.

This table specifies each of these reserved characters and their associated 3-character URL encoding sequence.

ASCII Character	URL Encoding
!	%21
#	%23
$	%24
%	%25
&	%26
'	%27
(	%28
)	%29
*	%2A
+	%2B
,	%2C
/	%2F
:	%3A
;	%3B
=	%3D
?	%3F
@	%40
[	%5B
]	%5D

4.9.3 ISO magnetic encoding mode

The ISO magnetic encoding mode comprises three components:

- Start Sentinel
- Track Character Data
- End Sentinel

The first character of each track data string must be the track specific start sentinel (SS), and the last character must be the track specific end sentinel (ES).

The data characters in between the SS and ES must be limited to the track specific range of valid character codes.

The total number of characters for each track must be limited to the track specific maximum character count.

When segmenting track data, the track specific field separator (FS) must be used.

The following table details the required start sentinel, end sentinel, field separator, valid character code range, and the maximum character count for each of the three magnetic tracks.

Track	Start Sentinel (SS)	End Sentinel (ES)	Field Separator (FS)	Valid Character Code Range	Maximum Character Count
1	%	?	^	ASCII 32-95	78
2	;	?	=	ASCII 48-63	39
3	;	?	=	ASCII 48-63	109

4.9.4 JIS II magnetic encoding mode

The JIS II magnetic encoding mode allows you to specify string data to be encoded on the magnetic stripe using the JIS II encoding format. JIS normally is only for Track 2. Track 1 and 3 are not standard JIS, but is supported. JIS II does not expect a beginning and ending sentinel for the encoding character string.

4.9.5 Custom magnetic encoding mode

The custom magnetic encoding mode allows you to independently specify each of the various encoding parameters for each magnetic track. Individual characters are encoded on each magnetic track using the set of parameters. For custom encoding more flexibility than for JIS II or ISO is provided.

4.9.6 Raw magnetic encoding mode

The raw magnetic encoding mode allows you to specify raw binary string data to be encoded on the magnetic stripe. A specific format of the input data is not assumed and all encoding parameters for each magnetic track are ignored, except for the track bit density. Using RAW format requires the binary data to be specified more completely than for other formats. Such options as parity, LRC, shift left data are not supported. The bit density can be any value between 75 and 210; however, a value not selectable from the UI can only be specified by a command line option.

4.10 Banners option

The Banners option is accessible using the CUPS web interface.

These options are not printer specific, but is part of the standard set of configuration options supported by the CUPS system for all printers.

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

Banners

Starting Banner: none

Ending Banner: none

Set Default Options

Field	Description
Starting Banner	Specifies the message that is displayed on the banner (other than the default). Options are: ■ **None**: This is the default. ■ **Standard** ■ **Confidential** ■ **Unclassified** ■ **Classified** ■ **Secret** ■ **Top Secret** To configure this field from the command line, enter: `job-sheets = StartBanner,EndBanner` where `StartBanner` and `EndBanner` are each one of the following: ■ **None** ■ **Standard** ■ **Confidential** ■ **Unclassified** ■ **Classified** ■ **Secret** ■ **Topsecret**

| Field	Description
Ending Banner	Specifies the message that is displayed on the banner (other than the default). Options are: ■ **None**: This is the default. ■ **Standard** ■ **Confidential** ■ **Unclassified** ■ **Classified** ■ **Secret** ■ **Top Secret** To configure this field from the command line, enter: `job-sheets = StartBanner,EndBanner` where `StartBanner` and `EndBanner` are each one of the following: ■ **None** ■ **Standard** ■ **Confidential** ■ **Unclassified** ■ **Classified** ■ **Secret** ■ **Topsecret**

4.11 Policies options

The Policies options is accessible using the CUPS web interface. These options are not printer specific, but is part of the standard set of configuration options supported by the CUPS system for all printers.

Set Default Options for DTC1500

Card   Print Options   Image Color Options   Image Position Options   Overlay Print Area Options
K-Panel Options   Global Magnetic Encoding Options   Magnetic Track Encoding Options
Banners   Policies

Policies

Error Policy: retry-job

Operation Policy: default

Set Default Options

Field	Description
Error Policy	Defines the policy that is used when a backend is unable to send a print job to the printer. Options are: ■ **Abort-job**: Aborts the job and proceeds with the next job in the queue. ■ **Retry-current-job**: Retries the current job immediately. ■ **Retry-job**: Retries the job after waiting N seconds, where the cupsd.conf JobRetryInterval directive controls the value of N. ■ **Stop-printer**: This is the default. Stops the printer and keeps the job for future printing. The Error Policy is supported using the `lpadmin` command on the command line interface.
Operation Policy	Defines the required authentication type. Options are: ■ **Default**: This is the default. ■ **Kerberos** The Operation Policy is supported using the `lpadmin` command on the command line interface.

Section **05**
Licenses

HID®

Powering
Trusted Identities

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Revision history

Date	Description	Revision
September 2020	Added printer firmware upgrade to Section 2.	A.1
June 2020	Initial release.	A.0

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PLT-04870, A.1

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