

Two Pilots Virtual Printer

version 11.0

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Overview

The Virtual Printer Driver is a usual printer device in the system. You may print on them from any application, setup printer settings such as DPI, paper size and page orientation. Instead of the real printer device that prints on a real paper, VPD produce *copy* of the printed document in different formats such as JPEG, PNG, PDF or TEXT. In other words, VPD is a complete solution for documents conversion to other formats with abilities to control conversion process. Moreover, there is an option to notify the specified **client application** with path to an INI-file that contains:

- Print job information (User name, Job ID, Paper size, Page orientation, etc.);
- Output files information (File format, count, paths).

There is no limitations for the client application logic. It can be a desktop application which popup login dialog and upload files to the cloud via your web-service API. Or it can be a hidden console application that saves files with metadata on the server and calculates user statistics.

Getting Started

The Virtual Printer Driver delivery package contains:

- Binary files for printer driver. Detailed files information [here](#).
- Installation scripts for making your own installation package. How to build MSI and EXE package you will find [here](#) and [here](#).

There are three parts of the Virtual Printer Driver:

- [Agent service](#);
- [Converter](#);
- [Application](#).

Agent service and Converter are non-modifiable components but provides a various settings for configuration. Application is a part of your software package and should implement your business logic. There are only two limitations for the application:

1. It should be executable. It can be an EXE-file by itself or a parameter of an interpreter, for example “java.exe -jar app.jar”;
2. It should receive notifications from Agent service through command line or Windows message or named pipe.

For tests, you may build and install a sample installation from the delivery package or install DEMO build from [x86](#) or [x64](#) packages. After the installation completed, use **Properties** utility from the driver group in the Start menu or registry settings to configure application settings, output formats, general printer settings (paper size, print quality, page orientation), etc.

When your software package will be ready for deployment, you may start to create a custom installation package. It can be [EXE-file](#) or [MSI-package](#). You may use this installation files as a part of your installer or modify them for installing your part of software.

Environment variables and custom variables

Using System environment variables, output directory or output file name can be configured. Virtual Printer Driver supports all of them that can be specified with %variable_name% template. In addition to System environment variables, Virtual Printer Driver supports custom variables that can be specified with {variable_name} template. For example, output directory “%TEMP%/{yyyy}/{device}” will expand to “C:/Users/John/AppData/Local/Temp/2017/Two Pilot Demo Printer” directory.

Here is the list of supported custom variables:

Custom variables	
Name	Description
{device}	Device name
{user}	User name
{machine}	Machine name
{document}	Document title
{yyyy}	Year
{yy}	Year, last two digits
{M}	Month
{MM}	Month with leading zero
{D}	Day
{DD}	Day with leading zero
{h}	Hour
{hh}	Hour with leading zero
{m}	Minute
{mm}	Minute with leading zero
{s}	Second
{ss}	Second with leading zero
{job}	Print job ID
{job05}	Print job ID with leading zero
{page}	Page number
{page03}	Page number with leading zero
{sid}	User session ID

Agent

Agent is a Windows service which allows to communicate between Virtual Printer Driver and client applications. In services list it named as **VPDAgent**. By default Agent calls applications with a logged on user permission rights who prints documents. If Virtual Printer Driver shared via local network or domain you should use **Allow guest session** or **Allow domain session** options for allowing to call an application with a current logged on user permission rights. If Virtual Printer

Driver installed on a print-server and there are no logged on users you should use **Allow self session** which allows to call applications with Agent service permission rights without any interactives (GUI).

By default, Agent scheduler uses pool size with 8 simultaneous threads, one thread – one print job. You can change this value by passing “**-poolSize X**” command line parameter via VPD Agent service property “Start parameter:”, where “X” is a required pool size.

Agent settings are stored in the following registry key:

«HKLM\Software\REGISTRY_ENTRY\Agent»

Agent Settings

HKLM\Software\REGISTRY_ENTRY\Agent				
Option name	Type	Description	Value	Default value
Allow guest session	REG_DWORD	This option enables execute applications with current logged on user permission rights if Guest session was detected.	0 – disable 1 – enable	0
Allow domain session	REG_DWORD	This option enables execute applications with current logged on user permission rights if Domain session was detected.	0 – disable 1 – enable	0
Allow self session	REG_DWORD	This option enables execute applications with the Agent service permission rights (SYSTEM by default) w/o any GUI.	0 – disable 1 – enable	0

Authentication

Virtual Printer Driver supports user authentication through [OAuth v2.0](#) protocol. This feature allows to deny unauthorized access to the Virtual Printer Driver and the services provided. Before using Virtual Printer Driver each user should provide a valid credentials for authentication service.

Authentication settings are stored in the following registry key:

«HKLM\Software\REGISTRY_ENTRY\Agent\OAuth v2.0»

Authentication Settings

HKLM\Software\REGISTRY_ENTRY\Agent\OAuth v2.0				
Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables authentication.	0 – disable 1 – enable	0
URL	REG_SZ	Authorization service URL		
Client ID	REG_SZ	This is a publicly exposed string that is used by the service API to identify the application, and is also used to build authorization URLs that are presented to users.		
Client Secret	REG_SZ	This is used to authenticate the identity of the application to the service API when the application requests to access a user's account, and must be kept private between the application and the API.		
Ignore certificate error	REG_DWORD	This option allows to ignore SSL certificate errors.	0 – do not ignore 1 – ignore	1
Remove unauthorized job	REG_DWORD	This option allows to remove unauthorized print jobs from the printer queue.	0 – do not remove 1 – remove	1

Applications

Application is an executable file (exe-file) which called by Agent service during a processing of a print job. There are two types of applications: **preconverter** and **postconverter**. **Preconverter** allows to handle EMF files before processing to other formats. **Postconverter** allows to handle a result of EMF files processing to BMP, JPEG, TIFF, PNG, TEXT or PDF formats.

Preconverter

Using the **preconverter** you can modify or remove the EMF files in print job and alter conversion settings. When the driver runs the **preconverter**, this information is available:

- document name
- job id
- machine name
- user name
- print resolution
- paper orientation
- paper size
- bin name
- pages
- EMF files

Using this data the preconverter can stop or resume the print job. To resume the print job the preconverter should put this section in the ini-file:

[Preconverting]
Status = resumed

To cancel the print job, this section:

[Preconverting]
Status = canceled

Preconverter settings are stored in the following registry keys:

«HKCU\Software\REGISTRY_ENTRY\Application\Preconverter»
«HKLM\Software\REGISTRY_ENTRY\Application\Preconverter»

Postconverter

Postconverter (or **the client application**) is started at the end of the print job processing. When the driver runs the **postconverter**, this information is available:

- document name
- job id
- machine name
- user name
- print resolution
- paper orientation
- paper size
- bin name
- pages
- full paths to EMF, BMP, TIFF, JPEG, PNG, TEXT, PDF files.

Postconverter settings are stored in the following registry keys:
 «HKCU\Software\REGISTRY_ENTRY\Application\Postconverter»
 «HKLM\Software\REGISTRY_ENTRY\Application\Postconverter»

Application Settings

HKLM\Software\REGISTRY_ENTRY\Application\Preprocessor {HKLM, HKCU}\Software\REGISTRY_ENTRY\Application\Preconverter {HKLM, HKCU}\Software\REGISTRY_ENTRY\Application\Postconverter				
Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables component.	0 – disable 1 – enable	0
Early Access	REG_DWORD	Execute application at spooling time and notify about changes in run-time. Works only with WM_COPYDATA and named pipe Transfer Mode .	0 – disable 1 – enable	0
Executable File	REG_SZ	Full path to the application EXE-file, may include system environment variables.		
Transfer Mode	REG_DWORD	Type of the communication between Agent and component application.	0- through the command line 1- through the WM_COPYDATA 2- none 3- through the named pipe	
Skip Mode	REG_DWORD	This option enables to skip component application call for EMF/RAW data.	0 - allows application call for EMF/RAW 1- disable application call for EMF 2- disable application call for RAW	0
Window Title	REG_SZ	Title of the component application window.		
Timeout	REG_DWORD	Timeout value in ms after the component application launch.		
Window Class	REG_SZ	Class of the component application window.		
Message Id	REG_DWORD	Unique numeric value to identify that the notification message has been received from the printer driver. For the WM_COPYDATA transfer mode this value represents dwData member of COPYDATASTRUCT structure.		
Notify All	REG_DWORD	Notify all top-level windows with WM_COPYDATA message.	0 – don't notify 1 – notify	0
Pipe Name	REG_SZ	Unique pipe name for ini-file transfer to the component application.		
Pipe Message Size	REG_DWORD	Pipe message size.		
Pipe Launch Application	REG_DWORD	This option allows to launch the component application or skip it.	0 – don't launch an application 1 – launch an application	

Early Access

Early Access allows to receive information from Virtual Printer Driver in run-time. In this mode, Virtual Printer Driver sends to the Application packages with required information. Packages sends according to the next scheme:

- The first package contain a path to the INI-file and a “Document” section of the INI-file contain “Status” equal to “Spooling”:

[Document]

Status = Spooling

- The second and all the next packages contains paths to converted files with zero ('\0') as delimiter and double zero at the end of the package. For example, “printer name\0job id\0c:\Output\result.emf\0c:\Output\result.bmp\0c:\Output\result.png\0\0”. Paths to multipage formats (TIFF, PDF and Text) sends before the last package;

- The last package contain path to INI-file and the “Document” section of the INI-file contain “Status” equal to “Printed”:

[Document]

Status = Printed

To enable “**Early Access**” you should add “Application/Postconverter/Early Access”, REG_DWORD value and set to “1”.

Converter

Converter performs conversion of EMF files to BMP, JPEG, TIFF, PNG, TEXT or PDF formats. If a source format is ESC/POS, it is converted to the EMF first, then to other formats. Also converter allow to add graphical and textual watermarks to produced files, redirect a print job to other printer or upload produced files to FTP/SFTP/FTPS server. All produced files are stored in the **output directory**.

Converter settings are stored in the following registry keys:

«HKCU\Software\REGISTRY_ENTRY\Converter»

«HKLM\Software\REGISTRY_ENTRY\Converter»

Target format settings for BMP, JPEG, TIFF, PNG, TEXT, PDF, POS, FTP, WATERMARKS and REDIRECTION are stored in corresponding subkeys.

Converter Settings

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter				
Option name	Type	Description	Value	Default value
Threads	REG_DWORD	This option sets thread pool size for emf2bmp/jpeg/png/tiff/pdf converters.		2
Cleanup Output	REG_DWORD	Cleanup output directory after processing.	0 – do not cleanup 1 – cleanup	0
Show Progress	REG_DWORD	This options enables show or hide progress bar.	0 – disable 1 – enable	1
Output Directory	REG_SZ	Path to the output directory, may include system environment variables and custom variables. Use a canonical path for a network mounted device, i.e. “\\server\shared\output” instead of “x:\output”.		
File name mask	REG_SZ	Mask for the output file name, may include custom variables.		{yyyy} {MM} {DD} {hh} {mm} {ss} {job05} {page03}
Pages Per Sheet	REG_DWORD	Number of pages per sheet.	1 – one page per sheet 2 – two pages per sheet 4 – four pages per sheet 6 – six pages per sheet 9 – nine pages per sheet 16 – sixteen pages per sheet	1
Draw Borders	REG_DWORD	Draw borders for each page per sheet.	0 – do not draw 1 – draw	0

EMF

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\EMF				
Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables producing of EMF files.	0 – disable 1 – enable	1
Normalize lines	REG_DWORD	This option enables lines width normalization. If a line logical width is out of range [Thin line width .. Thick line width] then it assigns to margin value.	0 – disable 1 – enable	0
Thin line width	REG_DWORD	Minimal line logical width. All thinner lines draws with this value.		1
Thick line width	REG_DWORD	Maximal line logical width. All thicker lines draws with this value.		20
Cut document	REG_DWORD	This option enables cut space area from the bottom of the document.	0 – disable 1 – enable	0
Extra bottom space	REG_DWORD	Extra space at the bottom after cut, in tenths of a millimeter.		50
Store embedded fonts	REG_DWORD	This option enables embedded font storing on a disk. The output INI-file will contain Font section: [Font] Count=3 Font0=C:\...\Output\Fonts\Z@R6467.tmp.ttf Font1=C:\...\Output\Fonts\Z@R6621.tmp.ttf Font2=C:\...\Output\Fonts\Z@R68C7.tmp.ttf	0 – disable 1 – enable	0
Embedded fonts directory	REG_SZ	Embedded fonts output directory, may include custom variables. This is path relative to the Output directory. For example, value “fonts” expands to “[Output directory]\fonts\” path.		{yyyy} {MM} {DD} {hh} {mm} {ss} {job05} {page03}

BMP

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\BMP				
Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables producing of BMP files.	0 – disable 1 – enable	0
Bits per pixel	REG_DWORD	This option sets color quality (bits per pixel) of BMP images.	1 – 1bpp (black and white) 4 – 4bpp color (16 colors) 8 – 8bpp color (256 colors) 24 – 24bpp	24
Grayscale	REG_DWORD	This option sets BMP to 8bpp grayscale mode. If enabled Bits per pixel parameter is ignored.	0 – grayscale mode off 1 – grayscale mode on	0
Dithering	REG_DWORD	Dithering algorithm to use for conversion of color images to 1-bit black&white images. The algorithms differ by speed and quality.	0 – Floyd-Steinberg 1 – Ordered-Dithering (4x4) 2 – Burkes 3 – Stucki 4 – Jarvis-Judice-Ninke 5 – Sierra 6 – Stevenson-Arce 7 – Bayer (4x4 ordered dithering)	0

PNG

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\PNG				
Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables producing of PNG files.	0 – disable 1 – enable	0
Bits per pixel	REG_DWORD	This option sets the color quality (bits per pixel) of PNG images.	1 – 1bpp (black and white) 4 – 4bpp color (16 colors) 8 – 8bpp color (256 colors) 24 – 24bpp	24

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\PNG

Option name	Type	Description	Value	Default value
Grayscale	REG_DWORD	This option sets PNG to 8bpp grayscale mode. If enabled Bits per pixel parameter is ignored.	0 – grayscale mode off 1 – grayscale mode on	0
Dithering	REG_DWORD	Dithering algorithm to use for conversion of color images to 1-bit black&white images. The algorithms differ by speed and quality.	0 – Floyd-Steinberg 1 – Ordered-Dithering (4x4) 2 – Burkes 3 – Stucki 4 – Jarvis-Judice-Ninke 5 – Sierra 6 – Stevenson-Arce 7 – Bayer (4x4 ordered dithering)	0

JPEG

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\JPEG

Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables producing of JPEG files.	0 – disable 1 – enable	0
Grayscale	REG_DWORD	This option sets JPEG to the grayscale mode.	0 – grayscale mode off 1 – grayscale mode on	0
Quality	REG_DWORD	This option sets the JPEG quality.	Must be in range from 0 (min size) to 100 (max quality)	80

TIFF

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\TIFF

Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables producing of TIFF files.	0 – disable 1 – enable	0
Bits per pixel	REG_DWORD	This option sets the color quality (bits per pixel) of TIFF images.	1 – 1bpp (black and white) 4 – 4bpp color (16 colors) 8 – 8bpp color (256 colors) 24 – 24bpp	24
Grayscale	REG_DWORD	This option sets TIFF to 8bpp grayscale mode. If enabled Bits per pixel parameter is ignored.	0 – grayscale mode off 1 – grayscale mode on	0
Dithering	REG_DWORD	Dithering algorithm to use for conversion of color images to 1-bit black&white images. The algorithms differ by speed and quality.	0 – Floyd-Steinberg 1 – Ordered-Dithering (4x4) 2 – Burkes 3 – Stucki 4 – Jarvis-Judice-Ninke 5 – Sierra 6 – Stevenson-Arce 7 – Bayer (4x4 ordered dithering)	0
Multipage	REG_DWORD	This option enables generation of multipage TIFF file.	0 – separate TIFF file for every printed page 1 – multipage TIFF file	1
Compression	REG_DWORD	This option sets TIFF compression.	0 – Automatic 1 – None 2 – CCITT modified Huffman RLE 3 – CCITT Group 3 fax encoding 4 – CCITT Group 4 fax encoding 5 – Lempel-Ziv & Welch 7 – JPEG DCT compression 8 – Adobe deflate compression 32773 – Macintosh RLE	0

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\TIFF

Option name	Type	Description	Value	Default value
			32946 – Deflate compression	

RAW**{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\RAW**

Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables RAW-data storing after printing.	0 – disable 1 – enable	0

INI**{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\INI**

Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables INI-file storing after printing.	0 – disable 1 – enable	0
Duplicate	REG_DWORD	Duplicate INI-file to the output directory for further processing.	0 – do not duplicate 1 – duplicate	0

FTP**{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\FTP**

Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables files upload via FTP.	0 – disable 1 – enable	0
Url	REG_SZ	URL string like «ftp://colorpilot.com».		
User Name	REG_SZ	User name.		
Password	REG_SZ	Plain-text password.		
Upload	REG_SZ	Information string for uploaded files. String value should be in format (TYPE:DIR;)*, where TYPE: uploaded files type like EMF/BMP/JPEG/PDF/PNG/TXT/TIFF DIR: target directory for upload. Upload directory should exist. Sample: in «HKEY_CURRENT_USER\Software\Company\ Printer\Converter\FTP» Url=«ftp://colorpilot.com» Upload=«BMP:» will upload all BMP files to the «ftp://colorpilot.com/.» directory i.e. root directory. Upload=«BMP:.;JPEG;jpeg;PNG:other/png» will upload all BMP files to the «ftp://colorpilot.com/.» directory, all JPEG files to the «ftp://colorpilot.com/jpeg/» directory and all PNG files to the «ftp://colorpilot.com/other/png/» directory.		
Encrypted	REG_DWORD	Does user credentials encrypted with AES algorithm or not.	0 – not encrypted 1 – encrypted	0
Attempts	REG_DWORD	Count of attempts for files uploading to the FTP server.		1
Ignore certificate error	REG_DWORD	This option allows to ignore SSL certificate errors for FTPS/SFTP servers with self-signed certificates.	0 – do not ignore 1 – ignore	0

PDF

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\PDF				
Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables producing of PDF files.	0 – disable 1 – enable	0
Multipage	REG_DWORD	This option enables generation of a multipage PDF file.	0 – separate PDF file for every printed page 1 – multipage PDF file	1
Produce PDF/A	REG_DWORD	This option enables producing of PDF-A/b files.	0 – disable 1 – enable	0
Timezone	REG_DWORD	This option allows to set timezone for file creation date .	0 – UTC time 1 – Local time	0
Grayscale	REG_DWORD	This option sets text and image color to 8bpp grayscale mode.	0 – grayscale mode off 1 – grayscale mode on	0
Subsetting	REG_DWORD	This option allows to reduce PDF size by creating a subset of a font.	0 – disable 1 – enable	1
Page Layout	REG_DWORD	This option allows to set document page layout.	0 – single page 1 – one column 2 – two column left 3 – two column right 4 – two page left 5 – two page right	0
Page Mode	REG_DWORD	This option allows to set document page mode	0 – none 1 – outlines 2 – thumbnail 3 – full screen 4 – optional content 5 – attachments	0
Image Quality	REG_DWORD	This option allows to set image quality for PDF files.	range value from 1 to 100	80
Black and White	REG_DWORD	Produce B&W non searchable PDF files.	0 – Searchable colored PDF 1 – Non searchable B&W PDF	0
Security Enabled	REG_DWORD	This option enables a password protection of PDF files.	0- disable 1- enable	0
Encryption Level	REG_DWORD	This option allows to set an encryption algorithm for document password.	0 – none 1 – 40-bit RC4 2 – 128-bit RC4 3 – 128-bit AES 4 – 256-bit AES	0
User Password Enabled	REG_DWORD	This option enables user password protection of PDFfiles.	0- disable 1- enable	0
User Password	REG_SZ	User password.		
Owner Password Enabled	REG_DWORD	This option enables owner password protection of PDF files.	0- disable 1- enable	0
Owner Password	REG_SZ	Owner password..		
Allow Copying	REG_DWORD	Allow copying or extraction a PDF document.	0 – do not allow 1 – allow	0
Allow Commenting	REG_DWORD	Allow form filling, signing or commenting a PDF document.	0 – do not allow 1 – allow	0
Allow Changing	REG_DWORD	Allow changing a PDF document.	0 – do not allow 1 – allow	0
Allow Printing	REG_DWORD	Allow printing a PDF document.	0 – do not allow 1 – allow	0
Title	REG_SZ	PDF document title.		
Author	REG_SZ	PDF document author.		
Producer	REG_SZ	PDF document producer.		
Creator	REG_SZ	PDF document creator.		
Subject	REG_SZ	PDF document subject.		
Keywords	REG_SZ	PDF document keywords.		

POS

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\POS				
Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables POS converter.	0 – disable 1 – enable	0
FontA	REG_SZ	Font A name.		Liberation Mono
FontA Size	REG_DWORD	Font A size.		48
FontB	REG_SZ	Font B name.		Liberation Mono
FontB Size	REG_DWORD	Font B size.		34
Encoding	REG_DWORD	Specify text character encoding in the receipt.	0 – ASCII 128 – Japanese Shift-Jis 129 – Korean 130 – Korean Johab 134 – Chinese GB2312 136 – Chinese Big5 161 – Greek Windows-1253 162 – Turkish Windows-1254 163 – Vietnamese Windows-1258 177 – Hebrew Windows-1255 178 – Arabic Windows-1256 186 – Baltic Windows-1257 204 – Russian Windows-1251 222 – Thai Windows-874 238 – East Europe Windows-1252	0
Skip Header	REG_DWORD	Skip first N bytes from the beginning of a receipt.		0
Specification	REG_DWORD	ESC/POS instructions set.	0 – common set 1 – EPSON set 2 – StarMicronics set	0
Left Margin	REG_DWORD	Specify default left margin in dots.		15

Redirect

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\Redirect				
Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables the print redirection.	0- disable 1- enable	0
Force EMF	REG_DWORD	Force redirection in EMF format.	0- Redirect in spool type format 1- Redirect EMF files	0
Printer	REG_SZ	Name of printer to redirect to.		
Redirect watermarks	REG_DWORD	This option enables watermarking on redirected documents.	0- watermarks disabled 1- watermarks enabled	0
Left Correction	REG_DWORD	Additional left margin in device units.		0
Top Correction	REG_DWORD	Additional top margin in device units.		0
Right Correction	REG_DWORD	Additional right margin in device units.		0
Bottom Correction	REG_DWORD	Additional bottom margin in device units.		0
Extra Command	REG_SZ	Extra command which will be send to the specified device at the end of the redirection. It should be a valid ESC/POS command which should contain text description of the command. Allowed symbols are: abcdefghijklmnopqrstuvwxyz ABCDEFGHIJKLMNOPQRSTUVWXYZ 0123456789 !&+;?:^}\ '";@_~#(-<['\$).= \{ % * / > All escape symbols should be specified by it ASCII-name: 0x00 = "NUL", 0x01 = "SOH", 0x02 = "STX", 0x03 = "ETX", 0x04 = "EOT", 0x05 = "ENQ", 0x06 = "ACK", 0x07 = "BEL", 0x08 = "BS ", 0x09 = "HT ", 0x0A = "LF ", 0x0B = "VT ", 0x0C = "FF ", 0x0D = "CR ", 0x0E = "SO ", 0x0F = "SI ", 0x10 = "DLE", 0x11 = "DC1", 0x12 = "DC2", 0x13 = "DC3", 0x14 = "DC4", 0x15 = "NAK", 0x16 = "SYN", 0x17 = "ETB",		

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\Redirect

Option name	Type	Description	Value	Default value
		0x18 = "CAN", 0x19 = "EM ", 0x1A = "SUB", 0x1B = "ESC", 0x1C = "FS ", 0x1D = "GS ", 0x1E = "RS ", 0x1F = "US ", 0x20 = "SP ", 0x7F = "DEL" All command data should be placed as HEX value with leading "0x": "ESC p 0x00 0x3c 0xff"		

Text

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\TEXT

Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables producing of TXT files.	0- disable 1- enable	0
Multipage	REG_DWORD	This option enables generation of a multipage TXT file.	0 – separate TXT file for every printed page 1 – multipage TXT file	1
Encoding	REG_DWORD	This options sets text encoding.	0 – ANSI 1 – Unicode 2 – UTF-8	0
Write BOM	REG_DWORD	This option sets writing of byte-order mark (BOM) at the beginning of Unicode and UTF-8 encoded text file.	0 – BOM off 1 – BOM on	0
Line concatenation interval	REG_DWORD	This option allows to set a width of an interval on axis OY in which two words are in a single line.		5
Word separation interval	REG_DWORD	This option allows to set a minimal separator width between two neighboring words.		1
Debug	REG_DWORD	This option allows to print tokens information at the end of text file.	0 – disable 1 – enable	0
Keep formatting	REG_DWORD	This option allows to keep an original document formatting.	0 – do not keep formatting 1- keep formatting	1
Default Bidirectional Algorithm	REG_DWORD	This option allows to use default bidirectional algorithm.	0 – use inbuild BIDI algorithm 1 – use default BIDI algorithm	0

Watermarks

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\Watermarks

Option name	Type	Description	Value	Default value
Enabled	REG_DWORD	This option enables watermarks.	0- watermarks disabled 1- watermarks enabled	0
Quality	REG_DWORD	Image watermarks quality.	range value from 1 to 100	100

**General watermark settings are stored in the following registry key:
Converter\Watermarks\WatermarkID, where WateramarkID is a unique name of a watermark.**

Type	REG_DWORD	Watermark type.	0 – image watermark 1 – textual watermark	
Left offset	REG_DWORD	Offset from the left border in logical units.		
Right offset	REG_DWORD	Offset from the right border in logical units.		
Top offset	REG_DWORD	Offset from the top border in logical units.		
Bottom offset	REG_DWORD	Offset from the bottom border in logical units.		
Position mode	REG_DWORD	Position of an origin on a page.	0 – left-top corner of a page 1 – left-bottom corner of a page 2 – right-top corner of a page 3 – right-bottom corner of a page 4 – at the center of a page	

{HKLM, HKCU}\Software\REGISTRY_ENTRY\Converter\Watermarks

Option name	Type	Description	Value	Default value
Image watermark settings				
Image path (Image watermark only)	REG_SZ	Full qualified path to an image watermark.		
Fill mode (Image watermark only)	REG_DWORD	Image position on a page.	0 – none 1 – fill 2 – fit 3 – stretch 4 – title 5 – center	
Textual watermark settings				
Text (Textual watermark only)	REG_SZ	Text watermark message, may include custom variables.		
Horizontal Alignment (Textual watermark only)	REG_DWORD	Text horizontal alignment on a page.	0 – left 1 – center 2 – right	
Vertical Alignment (Textual watermark only)	REG_DWORD	Text vertical alignment on a page.	0 – top 1 – center 2 – bottom	
Color (Textual watermark only)	REG_DWORD	Text color in 0xBBGGRR format, where BB – blue channel GG – green channel RR – red channel		
Font Name (Textual watermark only)	REG_SZ	Text font name.		
Font Height (Textual watermark only)	REG_DWORD	Text font height.		
Font Width (Textual watermark only)	REG_DWORD	Text font width.		
Rotation (Textual watermark only)	REG_DWORD	Text counterclockwise rotation angel in degreese.		

Installation Directory Settings

HKLM\Software\REGISTRY_ENTRY				
Option name	Type	Description	Value	Default value
Installation Directory	REG_SZ	Full qualified path to the driver installation directory.		

Properties Dialog Settings

HKLM\Software\REGISTRY_ENTRY				
Option name	Type	Description	Value	Default value
About: Hide page	REG_DWORD	Hide About property page.	0 – show 1 – hide	0
General: Hide page	REG_DWORD	Hide General property page.	0 – show 1 – hide	0
Paper: Hide page	REG_DWORD	Hide Paper property page.	0 – show 1 – hide	0
Additional: Hide page	REG_DWORD	Hide Additional property page.	0 – show 1 – hide	0
Application: Hide page	REG_DWORD	Hide Application property page.	0 – show 1 – hide	0
Converter: Hide page	REG_DWORD	Hide Converter property page.	0 – show 1 – hide	0
BMP: Hide page	REG_DWORD	Hide BMP property page.	0 – show	0

HKLM\Software\REGISTRY_ENTRY				
Option name	Type	Description	Value	Default value
			1 – hide	
EMF: Hide page	REG_DWORD	Hide EMF property page.	0 – show 1 – hide	1
JPEG: Hide page	REG_DWORD	Hide JPEG property page.	0 – show 1 – hide	0
PDF: Hide page	REG_DWORD	Hide PDF property page.	0 – show 1 – hide	0
PNG: Hide page	REG_DWORD	Hide PNG property page.	0 – show 1 – hide	0
Redirect: Hide page	REG_DWORD	Hide Redirect property page.	0 – show 1 – hide	0
TIFF: Hide page	REG_DWORD	Hide TIFF property page.	0 – show 1 – hide	0
TXT: Hide page	REG_DWORD	Hide TXT property page.	0 – show 1 – hide	0
Version	REG_SZ	Product version info for About property page..		

For Developers

For developers we provide a full set of files and scripts for building their own installation package or incorporate Virtual Printer Driver to their products. We provide set of installation scripts for [Wix Toolset](#) and [NSIS](#) + [Inno Setup](#). You will receive your a delivery package after purchase the Virtual Printer Driver. For tests we provide [Devkit](#) for our demo build of Virtual Printer Driver ([x86](#) and [x64](#) builds). Inside the [Devkit](#) you will find the next directories:

- **Files** — files for VPD for x86 systems;
- **Files_x64** — files for VPD for x64 systems;
- **msi_installer** — files for building MSI package with using [Wix Toolset](#);

Binaries overview

Here is a short description of delivery package components.

files_full and files_full_x64 directories	
Component name	Description
pdfout.dll, emf2pdf.dll	Our library that provide EMF to PDF conversion. If you do not required in the PDF format you can skip this file in your installation scripts.
fwproc.exe / fwproc_x64.exe	Sends WM_COPYDATA notification to the target application.
Make.iss / Make_x64.iss	Inno Setup installation scripts.
MessageBox.exe / MessageBox_x64.exe	Shows standard Windows message box.
Microsoft_VC{120, 140}_CRT_{x86, x64}.msm	Merge modules for Microsoft Visual C++ 2013, 2015 Redistributable Package. It uses in MSI package for installation required C-runtime libraries.
vcredist_{2013, 2015}_{x86, x64}.exe	Microsoft Visual C++ 2013, 2015 Redistributable Packages. It uses in NSIS scripts for installation required C-runtime libraries.
printer.ico	Icon file.
progress.exe	Shows progress during the files convertation.
properties.exe	Shows settings dialog for VPD.
README.pdf	This file.

files_full and files_full_x64 directories

Component name	Description
SampleClient.exe / SampleClient_x64.exe	Sample client application that shows content of INI file after processing. You should use this sample as a start point of your application. Source code for this application available here: <ul style="list-style-type: none"> • C++ source code; • C# source code.
setupdrv.exe	Installs driver components of VPD.
SetupPrn.nsi / SetupPrn_x64.nsi	NSIS installation scripts.
srvinst.exe / srvinst_x64.exe	Installs VPDAgent service.
stdnames_7x{32, 64}.gpd \${PREFIX}.gpd \${PREFIX}.ini \${PREFIX}pm.dll \${PREFIX}ui.dll unidrv_7x{32, 64}.dll unidrv_7x{32, 64}.hlp unidrvui_7x{32, 64}.dll unires_7x{32, 64}.dll	VPD components that allows to install VPD as a printer driver. \${PREFIX} is a custom file prefix, for example, for our demo build it equals to «tpdps».
\${PREFIX}.lng	Localization file for properties.exe tool. You can add or remove localization language here.
vpd_sdk.dll	Our SDK that provides API for Virtual Printer Driver settings.
VPDAgent.exe / VPDAgent_x64.exe	Windows service with name VPDAgent.
vpdisp.exe	Converter tool for converting EMF files to raster or vector formats.

msi_installer directory

Component	Description
VPDInstaller.sln	Microsoft Visual Studio solution for building MSI package. Wix Toolset required.
License.rtf	Our license file. You should replace it with your own or skip it.
make_msi_x86.bat / make_msi_x64.bat	Batch files for building MSI package with using tools from Wix Toolset .
VPDInstaller.wixproj	Microsoft Visual Studio project for MSI package. Wix Toolset required.
Config.wxi	Configuration file for the MSI package. You should to modify it according to your requirements (company name, installation directory, default VPD settings, etc.).
RegistrySettings.wxs	Configuration file for default registry settings. You should to modify it according to your requirements.
Product.wxs ProductComponents.wxs ProductTempComponents.wxs Shortcuts.wxs	Other installation scripts.

Building MSI package

We provide sample scripts for building MSI package with using [Wix Toolset](#). You should download and install Wix Toolset package. For this tutorial we use [Wix v3.8 \(Stable\)](#) version. Online documentation for Wix Toolset v3.* available [here](#).

Before build you should to modify the RegistrySettings.wxs file to provide a valid settings for [Application](#), [Converter](#) and [Agent service](#) components.

There are two ways of building MSI package:

- with using Microsoft Visual Studio;
- with using Wix tools.

Using Microsoft Visual Studio

Here is a short brief of building our sample with using Microsoft Visual Studio. The detailed documentation «Working in Visual Studio» available [here](#).

Before starting you should install Wix Toolset and Wix Visual Studio Plugin. Open «msi_installer/VPDInstaller.sln» solution in your delivery package with using Microsoft Visual Studio. Specify target platform «x86» or «x64» in Solution Platforms and build Wix project via «Build → Build Solution». The result MSI package will placed to «msi_installer/VPDIntaller/bin» directory.

Using Wix tools

Here is short brief of building our sample with using Wix tools. The detailed documentation «Tools and concepts» available [here](#).

Before starting you should install Wix Toolset. Open directory «msi_installer/VPDInstaller» in your delivery package. Here you will find two Batch files «make_msi_x86.bat» and «make_msi_x64.bat» which builds MSI package for x86 and x64 platforms respectively and place it to the «msi_installer/VPDInstaller/bin» directory.

Building executable package

We provide sample scripts for building executable installation package with using [NSIS](#) and [Inno Setup](#) installers. For this tutorial we use [NSIS v2.46](#) and [Inno Setup 5.5.4](#) versions.

Before starting you should install NSIS and Inno Setup installers. For building installation package for x86 platform, you should use files and scripts from the «files_full» directory of your delivery package. For x64 platform you should use files and scripts from the «files_full_x64» directory. Later in the text we will refer to files from «files_full» directory. You can apply the same things to the files from the «files_full_x64» directory.

NSIS

Open «SetupPrn.nsi» in the favorite text editor and look at the two lines at the beginning of the file:

```
!define PRINTER_NAME "Your printer name"  
!define PREFIX "Your file prefix"
```

Here you should change PRINTER_NAME and PREFIX defines to your specified.

PRINTER_NAME is a printer name which you have selected after purchase, for demo build you should set it to «Two Pilots Demo Printer»:

```
!define PRINTER_NAME "Two Pilots Demo Printer"
```

The next, you should set PREFIX to your file prefix. Look at the .gpd or .ini file in the «files_full» directory and place its name as PREFIX. For example, demo build has «tpdps.gpd» and «tpdps.ini» files, so, PREFIX should be «tpdps»:

```
!define PREFIX «tpdps»
```

Save changes and close «SetupPrn.nsi» file. Now, run «makensisw.exe» from the NSIS installation directory and select «SetupPrn.nsi» script from «File → Load script», NSIS will compile script. If all is correct you will receive «SetupPrn.exe» file in the «files_full» directory. Now you are ready to build Inno Setup script.

Inno Setup

Before starting you should build «SetupPrn.nsi» script. See previous section.

Open «Make.iss» with using Inno Setup Compiler («Compil32.exe» in the Inno Setup installation Directory) and look at the two lines at the beginning of the file:

```
#define PRINTER_NAME "Your printer name"  
#define REGISTRY_KEY "Your registry key"
```

Here you should change PRINTER_NAME and REGISTRY_KEY defines to your specified. PRINTER_NAME is a printer name which you have selected after purchase, for demo build you should set it to «Two Pilots Demo Printer». This is the same name as in the «SetupPrn.nsi» script.

```
#define PRINTER_NAME "Two Pilots Demo Printer"
```

REGISTRY_KEY is a registry key for storing VPD setting in the registry which you have selected after purchase, for demo build you should set it to «Two Pilots Demo Printer»:

```
#define REGISTRY_KEY "Two Pilots Demo Printer"
```

Modify the registry settings in the “[Registry]” section to provide a valid settings for [Application](#), [Converter](#) and [Agent service](#) components.

Save changes and compile script «Build → Compile» in the «Inno Setup Compiler». If all is correct, you will receive «sample_installation.exe» in the «Output» directory. This file you can provide to your customers.

The Driver Pipeline

