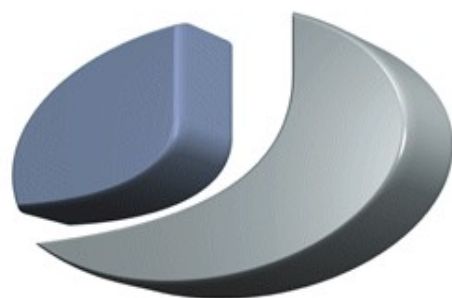JUSTCROFT INTERNATIONAL

IMAGE DATA MANAGEMENT

JustIMAGE 5.4 Reference Manual

Justcroft International

JustIMAGE 5.4 Reference Manual

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Introduction

This manual is intended for application administrators and advanced users. It explains the installation and configuration of JustIMAGE 5.4 and advanced topics such as the technical details of the CGM format.

The "JustIMAGE 5.4 User Manual" is intended for users to learn how to use the product suite.

General Information

What Is JustIMAGE 5.4?

JustIMAGE 5.4 is a product suite for viewing, converting and plotting large, complex image files. JustIMAGE 5.4 is available for Windows™ and Linux.

We are proud of our CGM interpreter support. Unlike other CGM interpreters, we strive for 100% support of the CGM standard including CGM version 4. We support the special CGM+, CGM*PIP extensions, which are required by the Oil & Gas Industry. We have also extended our CGM interpretation with ATA and WebCGM support. There are no additional license costs for CGM+, CGM*PIP, ATA or WebCGM support.

Our CGM interpreter core has some special features that reduce common CGM interpretation problems:

- Automatic package profile detection for automatic CGM interpretation correction.
- Automatic CGM cell array splitting.
- CGM Element limits based on CGM*PIP/II, ATA and WebCGM.

The Modules

The JustIMAGE 5.4 program suite consists of a number of modules. Some of these modules are also available as command line programs.

The JustIMAGE 5.4 User Interface is the main program that gives you access to the different JustIMAGE 5.4 modules. The graphical user interface allows you to control the various modules in a consistent way, so that any module is seamlessly integrated.

You need a license for the JustIMAGE 5.4 product suite. Each module of the JustIMAGE 5.4 program suite is license restricted with one or more license features. This is a technical method of enforcing the license restriction. Contact Justcroft International for an overview of what is licensed.

Viewer Module

The Viewer module allows you to preview files. You can rotate, zoom and pan on the picture you are previewing. This module also allows you to analyze CGM files and create statistical reports with our CGM Analyser. Advanced users can also run the CGM Analyser on the command line.

Input File Converter Module

This module allows you to load non-CGM graphics formats into the JustIMAGE 5.4 Viewer. JustEDIT, JustMONTAGE and The Batch Processor also use the Input File Converter module.

Conversion is either vector graphics to CGM vector graphics or bitmap graphics to CGM cell arrays. The following formats are supported.

Format	Remarks
BMP	Windows® device independent bitmap. Supported are 1, 4, 8 and 24 bits. OS/2 bitmaps are not supported. The generated CGM is always abstract.
CalComp 906/907	Limited HCBS support. Conversion is to CGM version 3 vector graphics. The generated CGM is always metric.
CalComp 925	Conversion is to CGM vector graphics. The generated CGM is always metric.
CALS	CALS type 1 and type 2. The generated CGM is always metric. By default the image will be automatically rotated to landscape during conversion if the height is larger than the width.
DGN V7	MicroStation V7 Design files. Requires an additional license. See "MicroStation Design File Converter Module" below for details.
ECW	Enhanced Compressed Wavelet files. Requires an additional license. See "Enhanced Compressed Wavelet Converter Module" below for details.
EMF	Conversion is to CGM version 3 vector graphics. The generated CGM is always metric.
GIF	Each GIF picture is converted to a CGM picture. The generated CGM is always metric.
HP-GL	Only the first HP-GL picture is converted. Conversion is to CGM vector graphics. The generated CGM is always metric.
HP-GL/2	HP-RTL is not supported. Only the first HP-GL picture is converted. Conversion is to CGM vector graphics. The generated CGM is always metric.
Insight Raster	Only Black & White raster files are supported. The generated CGM is always metric.
JPEG	The generated CGM is always metric.
PDF	PDF version 1.3 and higher with restrictions. Conversion is, by default,

	to CGM vector graphics. There is also an optional PDF to CGM bitmap converter. The generated CGM is always metric.
PDS	Schlumberger Picture Description Standard files. See "Schlumberger PDS Files" below for details.
PNG	The generated CGM is always metric.
PostScript	PostScript language level 1, 2 and 3. Conversion is usually a bitmap CGM. The generated CGM is always metric.
Raw Print	Raw Print format file with a fixed scan size and resolution. Conversion to a CGM bitmap. The generated CGM is always metric.
TIFF	Baseline TIFF is supported. JPEG compression, Deflate compression and the FAX G3/G4 extensions are supported. The generated CGM is always metric. By default the image will be automatically rotated to landscape during conversion if the width:height ratio is larger or equal to 1:2.
WebP	Web Portable format. The generated CGM is always metric.
WMF	Conversion is to CGM version 3 vector graphics. The generated CGM is always metric.
XWD	The generated CGM is always abstract.

The Input File Converter module is part of the JustIMAGE 5.4 installation but is licensed separately.

Output File Converter Module

The Output File Converter module allows you to export the picture you are currently previewing. You can export to several popular bitmap formats such as TIFF, GIF and PNG at any size or resolution. You can also save to Adobe Portable Document Format (PDF) and Scalable Vector Graphics format (SVG). Both PDF export and SVG export is vector output, including true text support.

Use the Batch Processor if you want to convert multiple files to a specific file format. Advanced users can run the Output File Converter as a command line program if needed.

The Output File Converter module is part of the JustIMAGE 5.4 installation but is licensed separately.

Print Management Module

The Print Management module allows you to print files to any supported printer. There are several printing options available. The Batch Processor also uses these printing options.

OS System Driver

The OS System Driver option is mainly intended for text printing on small paper sizes and is not intended for complex graphics printing. It relies on the native printing architecture of the OS.

Justcroft Printer Driver

Justcroft International has many years of experience with printing complex CGM graphics on UNIX® and Windows® systems. Our own printer drivers will give you the benefit of high-performance, high-quality output.

By using a virtual raster device, we can guarantee no differences in output between different printers.

Justcroft printer drivers are less resource intensive. You can get amazingly large plots with the least amount of printer memory and disk space. Our drivers can handle up to 500 meters length output.

There are two types of Justcroft printer drivers:

- Raster driver output in general suitable for printers and plotters that allow raw raster data. The device can print at maximum speed, because no special interpretation needs to be done except, possibly, raster data decompression. The raster data is generated off-line which ensures that the printer and plotter are only occupied during the physical printing process. JustIMAGE 5.4 will use the CPU power and memory of your Operating System. There is no need to buy extra memory for your printer or plotter. Supported raster types include: PCL, HP-RTL, Epson ESC/P, iSys RTL, Printrex raster, Neuralog, Versatec, OYO, Graphtec, Canon GARO and TIFF mono raster.

- PostScript vector driver output. PostScript is a graphics vector description language, which is very popular for Desktop Publishing (DTP). Because it also a programming language you can create complex graphics with relatively small file sizes.

The Print Management module requires a license.

JustPLOT Submit

JustPLOT is Justcroft's system for printing and plotting in a mixed network environment. The JustPLOT submit option is part of the JustIMAGE 5.4 installation. You do need to have one or more JustPLOT Servers installed in order to be able to submit print jobs.

JustIMAGE Driver

Until now, when our customers wanted to print or export an image from one of their Windows Geological and Geophysical applications (G&G) they first had to export the image to an output file, start up JustIMAGE 5.4 and then load the image file into JustIMAGE 5.4.

To remove these extra steps and improve the work-flow we have developed the "JustIMAGE Driver". Now a user can use the File -> Print window within the G&G Windows application to put the image directly into a JustIMAGE 5.4 Viewer, Print or Export window.

The JustIMAGE Driver module is part of the JustIMAGE 5.4 download but must be explicitly enabled during the installation. The module itself does not require a separate license but the various selectable modules (Viewer, Print, Export) do require a license.

CGM Optimiser Module

The CGM Optimiser is an application that allows you to convert CGM, CGM+ and CGM*PIP files so that these can be loaded into graphics applications.

Because CGM is an all-purpose graphics standard, there are many aspects of the file format that are not specifically defined in the standard.

Another problem is the general complexity of the CGM format. Not only are there three different ways to encode the file, but also the large number of CGM graphics elements and the complexity of these elements make it difficult to support every possible feature of the CGM format.

Most programs support only a specific subset of the CGM standard, mostly because –unlike the CGM Optimiser– it is not the native file format of the program.

The third category of problems is caused by industry specific extensions such as CGM+ and CGM*PIP. General drawing packages such as CorelDRAW™ or MicroStation™ do not support these extensions.

The CGM Optimiser solves CGM problems by analyzing the CGM file and converting the original CGM into a format that is better suited for import into a drawing packages. It takes the CGM file you want to convert and changes it into one or more other files that can be imported in the drawing package.

The converter performs several default analyzes and conversions:

- Correction of certain CGM file constructions that are known to cause problems. For example, CGM Metafile defaults are moved to the CGM Begin Picture State.

- Direct color output is generated if color index values higher than 255 were used in the original CGM file. Most drawing packages can handle only 256 index colors.

- A clear text CGM file is converted to a binary CGM. Most drawing packages only support the binary CGM encoding.

- If the input file is a CGM+ or CGM*PIP file and seismic sections are detected a seismic rendering is performed. The non-seismic CGM elements (the standard CGM elements) are kept in a CGM output file. Rectangle(s) are drawn in the output CGM file to help in placing the associated rendered seismic sections when the user wishes to re-combine the output files.

- The rendered seismic sections are placed in a separate bitmap file. This file can then be imported in the drawing package and combined with the converted CGM file.

- Large Cell arrays are split into smaller cell arrays.

- Common CGM graphics elements that are outside the active clip are removed from the CGM output, both reducing the file size and making import into drawing packages simpler.

- Line joining and Fill joining reduces the number of CGM elements making import into drawing packages simpler.

The CGM Optimiser can be run for multiple files using the Batch Processor or can be started from the command line.

The CGM Optimiser module is part of the JustIMAGE 5.4 installation but is licensed separately.

JustMONTAGE Module

The JustMONTAGE module is a program that allows you to create compositions of CGM images in combination with graphical shapes on a canvas. The composition can be created as a single CGM suitable for plotting, rendering to a bitmap format or importing into other graphics packages. JustMONTAGE will preserve the CGM seismic extensions in the resulting composition CGM. JustMONTAGE can also translate raster or vector data into CGM so that it can be used in the composition.

JustMONTAGE stores a composition in a simple XML format whose structure is based on the Scalable Vector Graphics (SVG) standard of the World Wide Web Consortium (W3C).

The JustMONTAGE module is part of the JustIMAGE 5.4 installation but is licensed separately.

JustEDIT Module

The JustEDIT module is a program that allows you to edit graphics files, primarily CGM files. Many of the features within JustEDIT have been developed following requests from our customers who were not totally happy with their current graphics Editor. As a result, as well as the normal editing functionality, the following special functionality has been included:

- *Smooth.* Smooth a line by adding more vertices.

- *Find and Replace.* Replace all objects fitting specific attributes such as edge color, line width, etc.

- *Close Gaps.* Close the gaps between disjoint lines.

- *Cut Line.* Discard a part of a (poly) line.

- *Split Line.* Cut a (poly) line into two separate lines.

- *Insert Fill*: Create transparent fills between lines or turn a single poly line into a (filled) polygon.

- *To Unconformity.* Convert a line into a sinusoidal wave.

- *Fill with Symbols* and *Fill with Images.* Fill a polygon with symbols or a small image.

The JustEDIT module is part of the JustIMAGE 5.4 installation but is licensed separately.

JustSEARCH Module

When was the last time you were looking for an image file? You know roughly when it was created, by whom and some idea of its title — but where to start looking among the workstations and servers out there?

Well, help is at hand. We have created a JustSEARCH module that can help you find that file quickly and easily. It allows users to retrieve a file by specifying any known attributes without needing to know its location. These attributes could include: file name (or part of the file name), file type, date created, date modified, creator, etc.

JustSEARCH works by initially creating an Index of all image files held in a given set of locations. These locations could be file-systems, disk arrays, cloud location, etc. For each image file it finds, it stores the precise location of the file, its attributes and a thumbnail of the image.

JustSEARCH is a client / server system. The client API is integrated in the Viewer module,

JustEDIT module and JustMONTAGE module but is licensed separately. A manager interface for JustSEARCH is part of the JustIMAGE 5.4 installation. The server is part of a separate installation.

MicroStation Design File Converter Module

You can convert MicroStation DGN V7 files to a CGM using our MicroStation Design File Converter. This converter includes support for the Zeh specific plotting extensions (Zeh Level Definition).

The MicroStation Design converter is part of the JustIMAGE 5.4 installation but is licensed separately.

Export to PowerPoint

The Export to PowerPoint module allows you to quickly and easily create PowerPoint 2007 slides from an image.

The Export to PowerPoint module is part of the standard JustIMAGE 5.4 Windows installation but is licensed separately from JustIMAGE 5.4. It is not available for platforms other than Windows.

Enhanced Compressed Wavelet Converter Module

The Enhanced Compressed Wavelet converter allows you to download ECW images and convert these to a CGM file.

The Enhanced Compressed Wavelet converter is part of the JustIMAGE 5.4 installation but is licensed separately from JustIMAGE 5.4 and falls under the US export restrictions.

Schlumberger PDS Files

Schlumberger PDS files can be imported through the Schlumberger PDS2CGM converter. The PDS2CGM converter is part of the Schlumberger GeoFrame suite. On Windows you will need PDSView.

Screen Capture

You can make screen captures with JustIMAGE 5.4 and this is available at no extra cost.

Movie

The Movie tool allows you to make time-lap screen captures and turn them into an AVI movie.

Movie is part of the JustIMAGE 5.4 installation and is available at no extra cost.

Batch Processor

The Batch Processor allows you to convert multiple files in one run. In addition there is also a hot directory mode. The Batch Processor runs independently from the JustIMAGE 5.4 User Interface so that you can continue working while the Batch Processor is running.

The following processing types are possible:

- *Convert to CGM*. Convert one or more files to a CGM.

- *Convert to non-CGM*. Convert one or more files to a bitmap, PDF or SVG.

- *Optimise files*. Perform line joining and fill joining on the specified files.

- *Process for graphics applications*. Run the CGM Optimiser to import files into a PC drawing package. Split CGM+, CGM*PIP into a normal vector CGM and a raster file for the seismic.

- *Merge PDFs*. Merge two or more PDF files into a single multi-page PDF.

- *Print files*. Print multiple files.

The Batch Processor is part of the JustIMAGE 5.4 installation.

Contact Information

Customer Support Center

Telephone: +31 70 364 4131

Email: support@justcroft.com

Support web site: support.justcroft.com

Installation

Availability

First Time Users / Trial

You can download a trial version of JustIMAGE 5.4 from the Justcroft website at www.justcroft.com. This is a fully-functioning version of the software with all modules enabled, but is time limited and require a license file. A trial license file is not part of the installation, but is provided by Justcroft via email.

Select "Trial JustIMAGE" from the ≡ menu of the website. You have to enter your contact details and Operating System in order to download the trial version. Answer the "not a robot" question and then press Send. A window might appear asking where you wish to save the JustIMAGE 5.4 download file. Press "Save File" to start the download.

Users with a Support & Maintenance Contract

You can download JustIMAGE 5.4 from our support site at support.justcroft.com in the JustIMAGE section without having to enter your contact details again. If you do not have a Justcroft Support account user name and password, or you tried it and it doesn't work, contact support@justcroft.com for help.

Important: Upgrading from JustIMAGE 5.3 requires a new license file. The JustIMAGE 5.3 license will not work with JustIMAGE 5.4. Updating minor revisions of JustIMAGE 5.4 (for example JustIMAGE 5.4.00 to JustIMAGE 5.4.01) do not require you to update the JustIMAGE 5.4 license file.

The new license file for JustIMAGE 5.4 is backwards compatible with the JustIMAGE 5.3 software.

FlexNet Users

You can download the FlexNet Enabled JustIMAGE 5.4 version from our support site at support.justcroft.com in the JustIMAGE section. **Important**: The FlexNet Enabled version cannot be downloaded directly from our commercial web site, as it falls under the USA export restrictions. If you have installed the JustIMAGE 5.4 trial version you should uninstall this first before continuing the installation.

Make sure that you have FlexNet Enabled JustIMAGE 5.4 installation. (The word *flex* is part of the installation executable.)

The FlexNet Enabled JustIMAGE 5.4 version is currently only available for Windows 64bits (x86), and Linux 64bits (x86_64). To check if you have the FlexNet Enabled version of JustIMAGE 5.4, please select Help ⇨About from the JustIMAGE menu bar after installation. You should see in the About dialog box "JustIMAGE 5.4.*xx* with FlexNet".

A FlexNet (trial) license and optional dongle is not part of the installation, but is provided by Justcroft.

Important: Upgrading from a JustIMAGE 5.3 FlexNet license requires a new FlexNet license file. The JustIMAGE 5.3 FlexNet license will not work with JustIMAGE 5.4. Updating minor revisions of JustIMAGE 5.4 (for example JustIMAGE 5.4.00 to JustIMAGE 5.4.01) do not require you to update the JustIMAGE 5.4 FlexNet license file.

The new FlexNet license file for JustIMAGE 5.4 is backwards compatible with the FlexNet Enabled version of JustIMAGE 5.3.

In addition you need to update the FlexNet daemon that was delivered with JustIMAGE 5.3 with the FlexNet daemon delivered with JustIMAGE 5.4. The FlexNet daemon is backwards compatible with the FlexNet Enabled version of JustIMAGE 5.3.

Prerequisites

We assume that you are familiar with the Operating System you are going to use and that you are familiar with installing software.

Do not install JustIMAGE 5.4 in a folder where another program or product is already installed. Also, do not install other programs in the same folder where JustIMAGE 5.4 is installed. This may cause uninstalling JustIMAGE 5.4 to fail.

Do not rename any of the sub-directories in the JustIMAGE 5.4 installation folder or move the installation folder after installation. Should you wish to move the product to a different location it is recommended that you uninstall JustIMAGE 5.4 first and then reinstall in the new location.

System Requirements

Operating System

One of the following 64bits Operating Systems:

- Windows 7 64bits. (x64 or compatible.)
- Windows 8/8.1 64bits. (x64 or compatible.)
- Windows 10 64bits. (x64 or compatible.)

- Windows Server 2008 R2 64bits. (x64 or compatible.)

- Windows Server 2012 R2 64bits. (x64 or compatible.)

- Windows Server 2016 64bits. (x64 or compatible.)

- Linux RedHat Enterprise 7 64bits. (x86_64 or compatible.)

Privileges

You will need Administrator privileges to install the software on Windows. It is recommended to install JustIMAGE 5.4 in a separate account on Linux. No special account privileges are required.

Disk Space

Between 250 MB and 350 MB are needed for a complete installation depending on the OS used and whether the FlexNet Enabled installation is used.

Electrostatic Plotters

Versatec and Oyo electrostatic plotters require a dedicated I/O device driver and hardware board. JustIMAGE 5.4 must be installed on the plotter host. Supported I/O interfaces are shown in the following chart.

I/O Interface	Linux	Windows
PCI 10117	Tahoma Tech driver	
SDI-netlink NLP	offline	offline
Tahoma Tech 10121	offline	offline

Canon Plotters

Justcroft GARO based drivers for Canon plotters are *not* part of the installation of JustIMAGE 5.4 due to their required disk space size. These are available as as separate download and installation. See the "Configuration – Canon GARO Plotters" chapter for more details.

Epson Plotters

Justcroft HTM based drivers for Epson SureColor plotters are *not* part of the installation of JustIMAGE 5.4 due to their required disk space size. These are available as as separate download and installation. See the "Configuration – Epson HTM Plotters" chapter for more details.

Qt

The Graphical User Interfaces of JustIMAGE 5.4 are written using QtCompany's Qt cross platform and UI framework. We deliver the required shared libraries of Qt with JustIMAGE 5.4.

Windows

The Qt dynamic libraries are located under the *<install folder>*\bin\ sub-folder. The Qt plug-ins are located under the *<install folder>*\qt5\plugins\ sub-folder.

It is essential that the *<install folder>*\bin\qt.conf file is kept as this is required to locate the Qt plug-ins.

Linux

The Qt dynamic libraries are located under the *<install directory>*/qt5/lib/ sub-directory. The Qt plug-ins are located under *<install directory>*/qt5/plugins/ sub-directory.

It is essential that the *<install folder>*/bin/qt.conf file is kept as this is required to locate the Qt plug-ins. *Important:* Some Linux distributions have Qt runtime libraries installed. These should not be used as we have made custom patches to the default Qt libraries.

Linux requires that the *$LD_LIBRARY_PATH* environment variable is set in order to locate the Qt dynamic libraries. Most programs are actually shell scripts that set the *$LD_LIBRARY_PATH* to *<install directory>*/qt5/lib/ before calling the actual executable.

Important: Advanced users may want to directly call a program that is not intended to be run directly. You will get a fatal error regarding the loading of the first shared library that was not found.

JustIMAGE 5.4 does *not* work on Wayland and requires X.

.NET

The "Export to PowerPoint" module requires that the Microsoft .NET 4.0 framework is installed on the user's PC. It is not necessary that the .NET 4.0 is installed for the successful installation of the JustIMAGE 5.4 application suite however, if not, the installation of the "Export to PowerPoint" module will be disabled.

The installation does not come with the Microsoft .NET 4.0 framework embedded. The self-extracting executable will check if the Microsoft .NET 4.0 is installed and will optionally use the Internet to download and install the framework if not found.

PDS Support

Windows

You will need the [PDSView](#) software in order to import Schlumberger PDS files. JustIMAGE 5.4 will automatically find the `pds2cgm` converter once the PDSView software has been installed on the same machine.

Linux

You will need the Schlumberger GeoFrame suite in order to import Schlumberger PDS files. There are two possible ways to have the JustIMAGE 5.4 software on Linux find the converter provided with GeoFrame:

- Have the *$GF_PATH* environment variable set. This environment variable is automatically set by GeoFrame when opening a GeoFrame Terminal. If not set you have to set this environment variable by hand before starting the JustIMAGE User Interface.

- You can create a sub-directory under your *$JUSTIMAGE54_HOME* with the necessary software and data files copied over from a GeoFrame installation on another computer. Important: In this case you should **not** set the *$GF_PATH* environment variable. The sub-directory structure should look as follows:

$JUSTIMAGE54_HOME/pds2cgm
    $JUSTIMAGE54_HOME/pds2cgm/bin/pds2cgm
    $JUSTIMAGE54_HOME/pds2cgm/lib/libcsutilpkg.so
    $JUSTIMAGE54_HOME/pds2cgm/lib/libpgc.so
    $JUSTIMAGE54_HOME/pds2cgm/lib/ibm.so[1]
    $JUSTIMAGE54_HOME/pds2cgm/pds/[2]

Platform Notes

Windows 7

JustIMAGE 5.4 will only work on the Windows 7 64bits (x64 or compatible) releases. The software has been digitally signed with "Justcroft International Ltd." as publisher.

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1 This library depends on your GeoFrame version and/or platform.
2 These are the various PDS data files required by the pds2cgm converter. You can find this pds directory as a sub-directory of your GeoFrame installation.

You may encounter one or more of the following:

- You may get an UAC warning when running the installation. The installation requires administrative privileges. Less privileged users will be prompted for an administrative account.

- You may get one or more UAC warnings in case the Visual Studio run-times, the .NET installation or the JustIMAGE Driver is/are installed.

Windows 8 / 8.1

JustIMAGE 5.4 will only work on Windows 8/8.1 64bits (x64 or compatible) releases. The software has been digitally signed with "Justcroft International Ltd." as publisher.

You may encounter one or more of the following:

- You may get an UAC warning when running the installation. The installation requires administrative privileges. Less privileged users will be prompted for an administrative account.

- You may get one or more UAC warnings in case the Visual Studio run-times, the .NET installation or the JustIMAGE Driver is/are installed.

Windows 10

JustIMAGE 5.4 will only work on the Windows 10 64bits (x64 or compatible) releases. The software has been digitally signed with "Justcroft International Ltd." as publisher.

You may encounter one or more of the following:

- You may get an UAC warning when running the installation. The installation requires administrative privileges. Less privileged users will be prompted for an administrative account.

- You may get one or more UAC warnings in case the Visual Studio run-times, the .NET installation or the JustIMAGE Driver is/are installed.

Windows Server 2008 R2

JustIMAGE 5.4 will only work on the Windows Server 2008 R2 64bits (x64 or compatible) releases. The software has been digitally signed with "Justcroft International Ltd." as publisher.

You may encounter one or more of the following:

- You may get an UAC warning when running the installation. The installation requires administrative privileges. Less privileged users will be prompted for an administrative account.

- You may get the error message "You must use the Role Management Tool to install or configure Microsoft .NET Framework 4.0.". The JustIMAGE 5.4 installation cannot install the .NET 4.0 framework on Windows 2008 R2. Enable the feature with the Server Manager wizard on Windows 2008 R2. Note: JustIMAGE 5.4 will be installed, but without the "Export to PowerPoint" module.

- You may get one or more UAC warnings in case the Visual Studio run-times or the JustIMAGE Driver is/are installed.

Windows Server 2012 R2

JustIMAGE 5.4 will only work on the Windows Server 2012 R2 64bits (x64 or compatible) releases. The software has been digitally signed with "Justcroft International Ltd." as publisher.

You may encounter one or more of the following:

- You may get an UAC warning when running the installation. The installation requires administrative privileges. Less privileged users will be prompted for an administrative account.

- You may get one or more UAC warnings in case the Visual Studio run-times, the .NET installation or the JustIMAGE Driver is/are installed.

Windows Server 2016

JustIMAGE 5.4 will only work on the Windows Server 2016 64bits (x64 or compatible) releases. The software has been digitally signed with "Justcroft International Ltd." as publisher.

You may encounter one or more of the following:

- You may get an UAC warning when running the installation. The installation requires administrative privileges. Less privileged users will be prompted for an administrative account.

- You may get one or more UAC warnings in case the Visual Studio run-times, the .NET installation or the JustIMAGE Driver is/are installed.

Linux

JustIMAGE 5.4 is developed and tested on Linux RedHat Enterprise 7 64bits (x86_64 or compatible), It will also work on CentOS 7(x86_64 or compatible).

Linux requires that the *$LD_LIBRARY_PATH* environment variable is set in order to locate the Qt dynamic libraries. Most programs are actually shell scripts that set the *$LD_LIBRARY_PATH* to *<install directory>*/qt5/lib/ before calling the actual executable.

Important: Advanced users may want to directly call a program that is not intended to be run directly. You will get a fatal error regarding the load of the first shared library that was not found.

A JustIMAGE 5.4 desktop icon can be added to a Linux xdg compatible Desktop. Go to the *<install directory>*/integration/desktop and run the create-desktop-icon script. See the readme.txt file for more information.

Installing on Windows

Preparation

Make sure that you have Microsoft Windows Installer 4.0 or higher. See also the various Windows platform notes.

Make sure that you have closed down any important applications before attempting to run the self-extracting executable.

Running the installation

Run the self-extracting executable. You will be prompted for a (temporary) setup extraction folder. The default is a sub-folder under *%CommonAppData%*, but you can change this to a more suitable location for your situation.
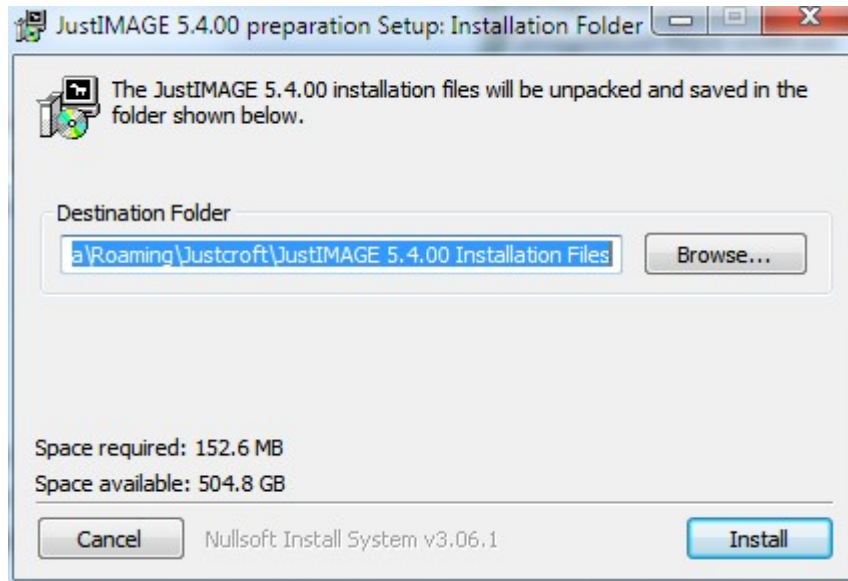
Illustration 1: Unpacking the installation files.

The self-extractor will first unpack the Windows installer files.

Next it will check if the .NET 4.0 runtime libraries are installed. You will be prompted with the message "The Microsoft .NET 4.0 is needed for Export to PowerPoint. Download & Install?". If you answer yes it will use the Internet to download and install the .NET 4.0 runtime libraries. This may take some time depending on your Internet connection speed.

The self-extractor will then start the Windows Installer. A log file will be created under *%temp%*\jimage54-*release*-win64.log, where *%temp%* is the location of your temporary files and *release* is the release number.

A welcome screen is shown. Press Next to continue.
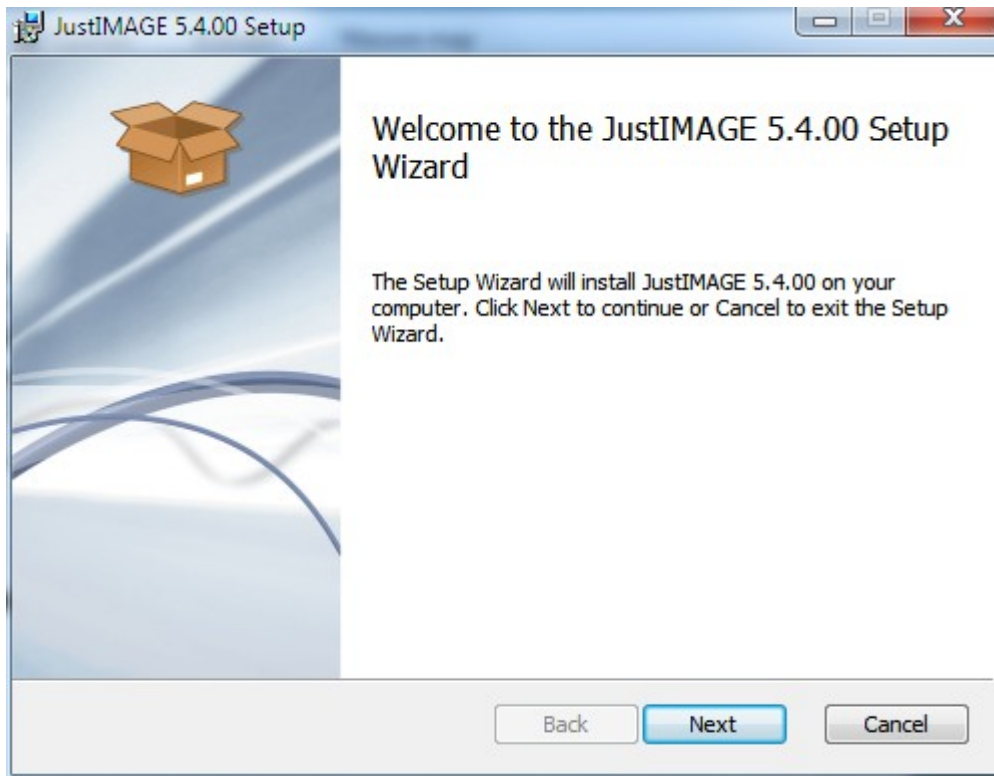
Illustration 2: Welcome screen of the Setup Wizard.

The next screen shows you the End-User License Agreement. Please read this carefully and then select "I accept the terms in the license agreement". Click `Next` to continue.
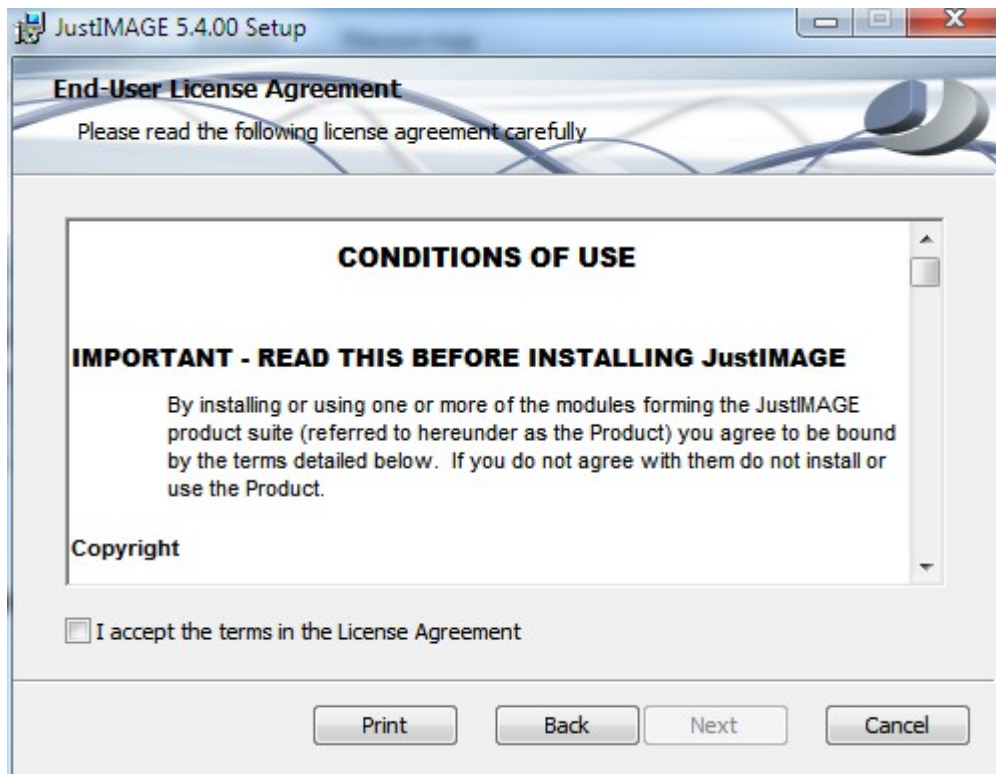
Illustration 3: End-User License Agreement screen of the Setup Wizard.
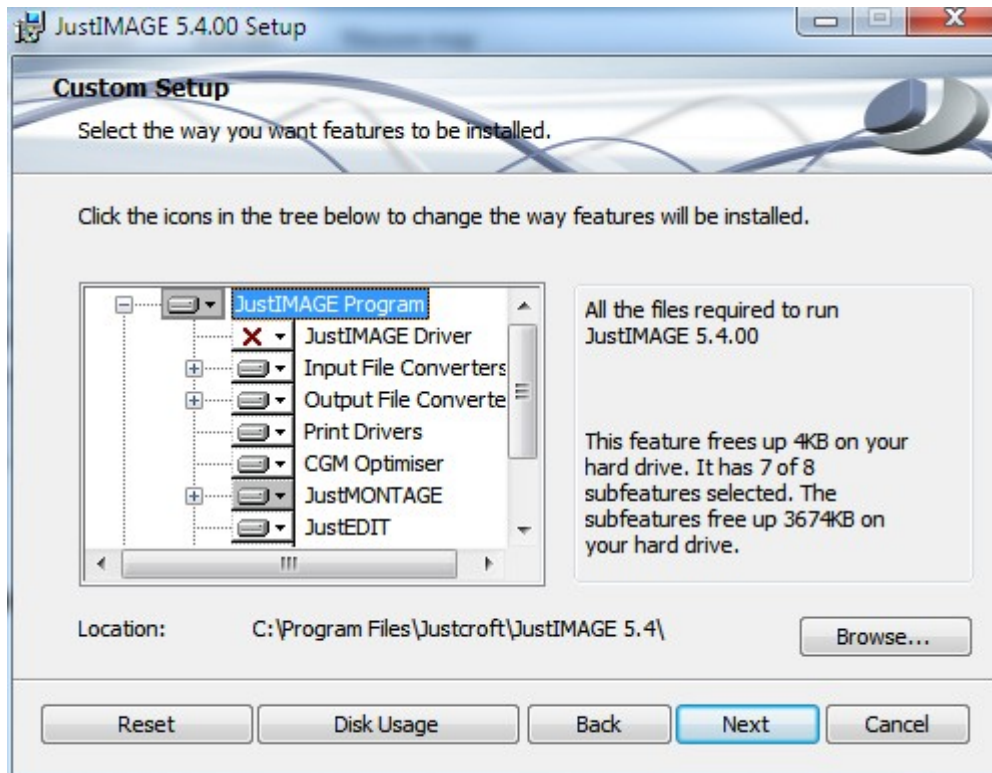
Illustration 4: Custom Setup screen of the Setup Wizard.

In the "Custom Setup" screen you can select which features should be installed. The recommended default is to have everything installed except some Montage templates. Optionally you can install the JustIMAGE Driver, see also Installation of the JustIMAGE Driver.

You can optionally set the location where JustIMAGE 5.4 will be installed. Click `Next` to continue.

The "Ready to install JustIMAGE 5.4" screen will appear. Press the `Install` button to start the installation. You may get the UAC prompt.
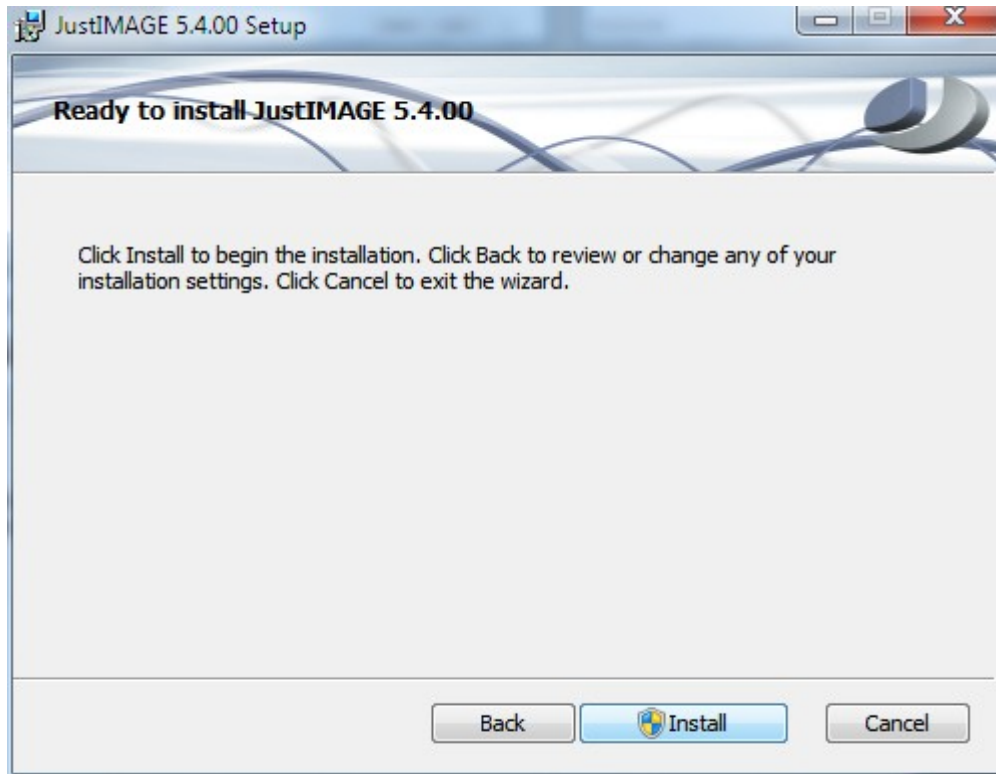
Illustration 5: Ready to install screen of the Setup Wizard.

A progress screen is shown. The files will be installed and, if found, a migration of the JustIMAGE 5.3 configuration to JustIMAGE 5.4. Wait for the "Completed the JustIMAGE 5.4 Setup Wizard" screen to appear.
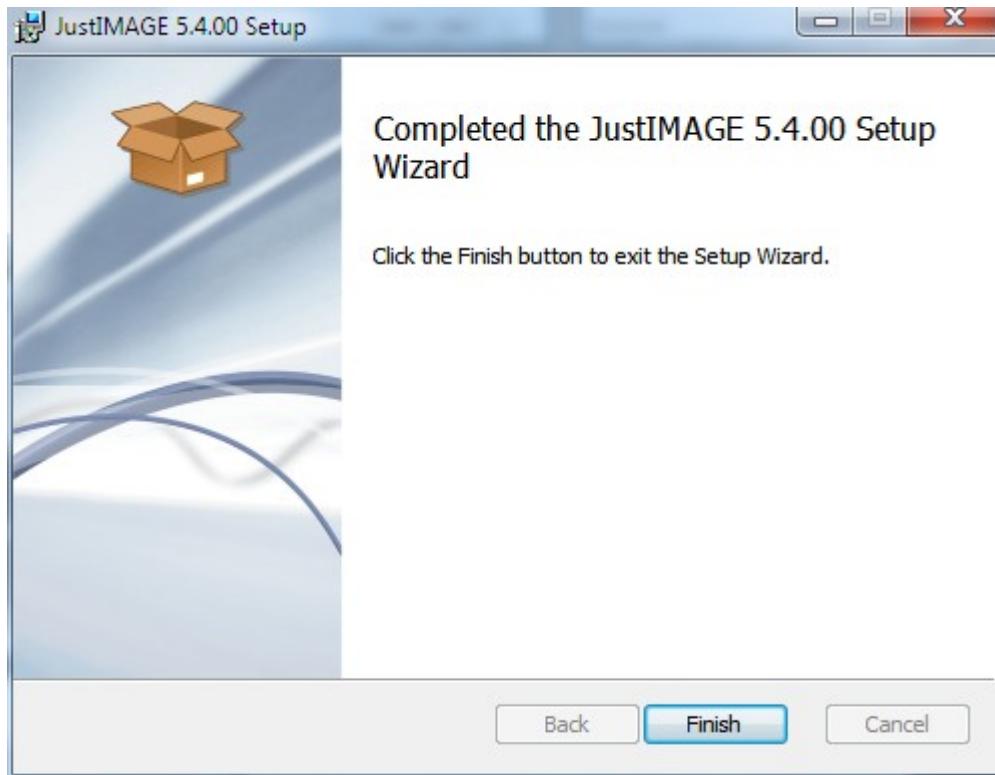
Illustration 6: Completed the Setup Wizard.

It could be that a Windows reboot is required. You will get option if you want to do this directly or do this manually at a later moment.

You may want to remove the setup extraction location. However, setup repair or network setup will no longer be possible if you do this.

Installation of the JustIMAGE Driver

During the installation you need to select the JustIMAGE Driver in the Custom setup and change the selection into "Will be installed on local hard drive".
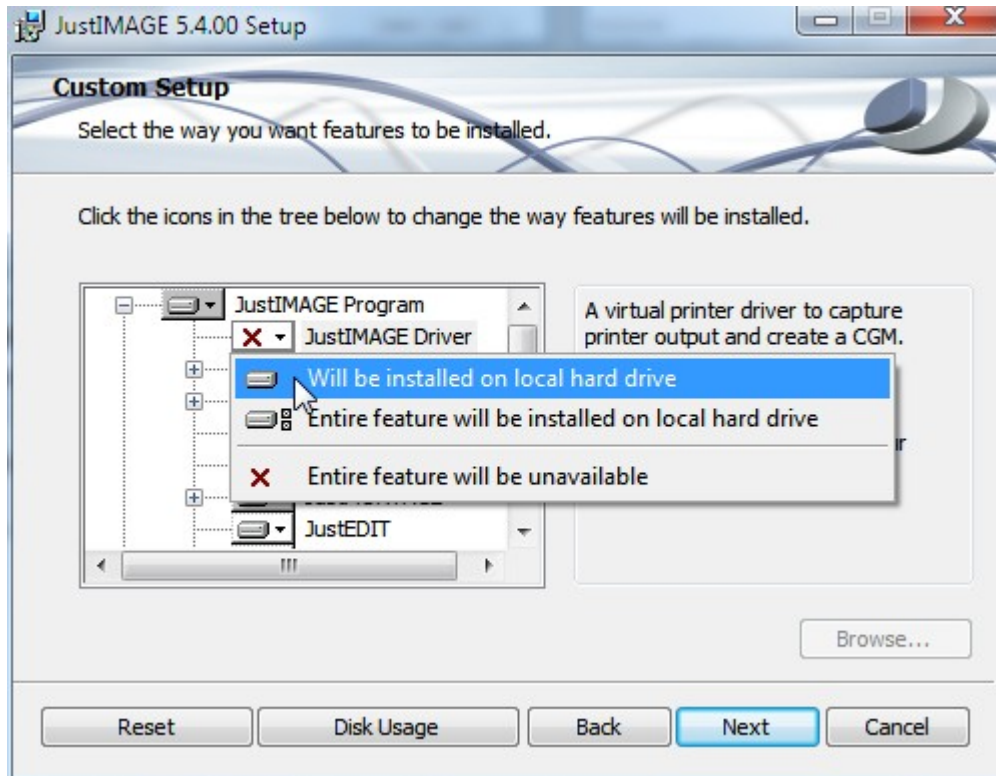
Illustration 7: Selecting the JustIMAGE Driver

After the installation you will see the new print driver in the Devices and Printers overview.

It is now possible to print from a Windows application to the JustIMAGE Driver.

Installation Information for Scripters

The following information is important for scripters of the JustIMAGE 5.4 installation on Windows.

Since the variety of network installations and system configurations is simply too great, we cannot give full support on all possible deployment requirements. There are several sites on the Internet that give you hints and tips over how to deploy software.

The JustIMAGE download is a self-extracting executable which contains a Windows Installer file, two cabinet files and the .NET 4.0 bootstrap executable. The software has been created using the Microsoft Visual Studio 2019 libraries and these are also part of the self-extracting process and installation.

This might not be suitable to you should you wish to re-script the installation. You can run the self-extracting executable with the parameter `/NORUNMSI` to prevent the automatic start of the Windows Installer. **Important:** Unlike most Windows executables, parameters for the self-extracting executable are *case sensitive*.

Use the `/D=`*folder* parameter to set the path where the MSI file and the two CAB files are extracted. This must be the last parameter used on the command line and must not contain any quotes, even if the path contains spaces. Note that the default is to create a folder under *%CommonAppData%*`\Justcroft`.

You should **not** run a capture tool and then make alterations to the captured result. Instead use the MSI file and load this into your Windows Installer authoring application.

Shortcuts are created for the main executable (justimage.exe), JustEDIT and JustMONTAGE on the user's desktop. You can force the creation of advertised shortcuts by setting the DISABLEADVTSHORTCUTS property to 0 or remove it from the MSI file.

Error Level Codes

The self-extracting executable return error level codes as a result of the execution. The following error level codes are returned. These can be used when calling the self-extracting executable in a script.

0 – Normal execution (no error)

1 – Installation aborted by the user (cancel)

2 – Installation aborted due to an error.

3010 – Successful installation, but a reboot is required. This is returned if the user did not select reboot now or if during a silent installation and a reboot is required.

.NET

The "Export to PowerPoint" module requires that the Microsoft .NET 4.0 framework is installed on the user's PC. The installation does not come with the Microsoft .NET 4.0 framework embedded. It is not necessary that the .NET 4.0 is installed for the successful installation of the JustIMAGE 5.4 application suite however, if not, the installation of the "Export to PowerPoint" module will be disabled.

You must use the Server Manager to enable the .NET 4.0 feature on Windows Server 2008 R2.

The Microsoft .NET installer does not function under Windows 2008 R2.

Silent Installation

You can perform a silent installation by specifying the parameter `/S`. This will prevent the user from seeing the installation steps. As an example:

```
jimage54-00-win64 /S
```

The self-extracting executable will *not* automatically download and install the Microsoft .NET 4.0 during a silent installation.

The self-extracting executable will *not* automatically reboot during a silent installation should this be necessary. The self-extracting executable will return error level code 3010.

Network Installation

We assume for the following that you have extracted the files from the self-extracting executable.

```
jimage54-00-win64.exe /D=F:\EXTRACTDIR /NORUNMSI
```

You can use an administrative installation to extract the software to a network share. You **must** specify the `TARGETDIR` property when doing so.

```
msiexec /a jimage54-00-win64.msi TARGETDIR=D:\SHARE\APPS
```

This will extract the software to the `D:\SHARE\APPS` folder. You may get the UAC prompt. Wait for the "Completed the JustIMAGE 5.4 Setup Wizard" screen to appear.

Client Installation

Individual users can either install the software on their local PC using the administrative image from the network share (`D:\SHARE\APPS`) or they can run the software directly from the network share. (Run from source) You may get the UAC prompt.

Installing the software on the local PC has the advantage that it is always available to the user(s) of the PC even if the network is temporarily unavailable. It is recommended to use special deployment software to perform the roll out especially in a large environment.

Installing the software on a network drive has the advantage of taking up less disk space on the local PC and software updates are relatively easy to roll out. Note that you still need to do a local "run from source" roll out once on each individual PC.

Shared Configuration

A common question we encounter is:

"We have set up JustIMAGE as a network install so we have got all the files on a

network share and then we copy the shortcuts and place them in another location where users can access it so they run JustIMAGE off the shared drive. It seems that each user still has to set up all the printers though(even with the program always being run from the same network location). Is there any way to set up the software so that regardless of user it remembers the printers that have already been setup?"

If you followed the "Client Installation" procedure above, there should be a sub directory "setup" underneath the directory where you placed the JustIMAGE 5.4 software. If you did a regular installation instead of an administrative installation this sub directory is actually located under the *%CommonAppData%*\Justcroft\JustIMAGE 5.4 data folder. (On Windows 7 *%CommonAppData%* is usually C:\ProgramData\.)

You can correct the situation by doing either:

1. A "Network Installation".

2. Alternatively. Move the "setup" sub directory and its content to the network drive under which JustIMAGE 5.4 is installed (as an example Z:\shared\apps\JustIMAGE 5.4\setup). Make sure to set either an environment variable %JUSTIMAGE54_RESOURCES% which must point to the setup sub-directory e.g. Z:\shared\apps\JustIMAGE 5.4\setup or set a registry entry under HKLM\ Software\Justcroft\JustIMAGE\5.4 with the name JUSTIMAGE54_RESOURCES and as REG_SZ the setup sub-directory path. Note that this has to be done on every client PC.

You can check if the right paths are used by starting JustIMAGE 5.4 and then select from the menu Edit ⇨ Preferences and go to the Paths section. The "Print Drivers" entry should now be set to the network share directory and is used by each and everyone running JustIMAGE 5.4 from the network share.

Note that everything from setup and below can be read-only for ordinary JustIMAGE 5.4 users and let only specific users have write access to this sub-directory who are allowed to make printer setup changes. (Adding, editing, removing).

Although more work to get the JustIMAGE 5.4 software up and running, using the *%JUSTIMAGE54_RESOURCES%* is more flexible as you can put the "setup" directory anywhere you want. This may make backups perhaps easier.

As a reference, the "setup" directory is looked up under Windows as follows:

1. If the *%JUSTIMAGE54_RESOURCES%* environment is set use this. (No checking if the folder actually exists)

2. Else check if a registry entry JUSTIMAGE54_RESOURCES is set and use this. (No

checking if the folder actually exists)

3. Else check if the *%JUSTIMAGE54_HOME%* environment is set. If the folder *%JUSTIMAGE54_HOME%*\setup exists use this.

4. Else check if the HKLM\Software\Justcroft\JustIMAGE\5.4\JUSTIMAGE54_HOME registry entry is set. If the folder *%JUSTIMAGE54_HOME%*\setup exists use this.

5. Else check if the *%CommonAppData%*\Justcroft\JustIMAGE 5.4\setup folder exists. If it does use this.

6. Else return a failure.

Migration

Configuration files of JustIMAGE 5.3 are migrated to JustIMAGE 5.4 when found during the standard Windows installation. This is not automatically done when the software is installed on a shared network drive. You can run the migration manually after an administrative installation as follows.

1. Open a command line prompt. (We assume you have write access to the "setup" directory of JustIMAGE 5.4.

2. Set the *%JUSTIMAGE54_RESOURCES%* or the *%JUSTIMAGE54_HOME%* environment variable. Important: *%JUSTIMAGE54_RESOURCES%* takes precedence over *%JUSTIMAGE54_HOME%* and must be set to where you have installed JustIMAGE 5.4. (For example: JUSTIMAGE54_RESOURCES=d:\share\apps\ justcroft\justimage54\setup or JUSTIMAGE54_HOME=d:\share\apps\justcroft\ justimage54.)

3. Go to the bin sub-directory of JustIMAGE 5.4 and run the conv5xto54 command line tool. Specify on the command line the setup directory of JustIMAGE 5.3. As an example:

```
conv5xto54 d:\share\apps\justcroft\justcgm53\setup
```

Note: The migration tool will not overwrite any files that are already in the JustIMAGE 5.4 configuration.

Troubleshooting

The installation aborts with the message: "The Installation Wizard cannot be run properly because JustIMAGE 5.4 requires Windows 7 or higher.".

The JustIMAGE 5.4 installation checks and prevents you from installing on Windows versions older than Windows 7. We do not support Windows XP and Windows Vista.

The installation aborts with the message: "The Installation Wizard cannot be run properly because you are logged in as a user without sufficient administrator rights for this system."

The JustIMAGE 5.4 installation requires that you have the Administrative privileges.

The installation aborts with the message: "A later version of JustIMAGE 5.4 is already installed.".

The JustIMAGE 5.4 installation checks and prevents you from trying to downgrade. To downgrade, you must first uninstall the newer JustIMAGE 5.4 for Windows version and then install the older version.

The installation aborts with the message: "JustIMAGE 5.4 has already been updated to 5.4.*xx*.", where *xx* is a release number such as `03`.

The JustIMAGE 5.4 installation checks and prevents the installation of a version with the same release number. It could be that you had received a pre-release of JustIMAGE 5.4. You can either uninstall JustIMAGE 5.4 or use the following Windows Installer command:

```
msiexec /i jimage54-xx-win64.msi REINSTALL=ALL REINSTALLMODE=voms
```

where *xx* is the release number.

Running the self-extracting executable will create a log file *%TEMP%*`\jimage54-xx-win64.log`, where *xx* is the release number.

The installation gives the error message "You must use the Role Management Tool to install or configure Microsoft .NET Framework .NET 4.0.".

The JustIMAGE 5.4 installation cannot install the .NET 4.0 framework on Windows Server 2008 R2. Enable the feature with the Server Manager wizard on Windows 2008 R2. Note: JustIMAGE 5.4 will be installed, but without the "Export to PowerPoint" module.

Installing on Linux

Preparation

Log into the account in which you want to install the software `/home/justcroft`.

Important: **Never** do the installation as *root*! This should not be necessary as none of the programs require root access.

Create a sub-directory from which you want to run the installer. For example `justimage54`.

```
mkdir justimage54
```

Go to this sub-directory.

```
cd justimage54
```

Extract the installation from the downloaded tarball

```
tar xvf jimage54-00-linux64.tar
```

We recommend to set either the *$JUSTIMAGE53_RESOURCES* or the *$JUSTIMAGE53_HOME* environment variable if you have JustIMAGE 5.3 and you wish to migrate the JustIMAGE 5.3 configuration to JustIMAGE 5.4.

You are now ready to do the installation.

Running the installation

Run the `installjimage` installation script. You will first see the license agreement. Use the space key to page down. To continue the installation you have to enter `y` and press `Enter`.

```
Do you accept these terms and conditions? y/n y
You agreed; Installation continues
The agreement is located under doc/Agreement.txt
JustIMAGE 5.4.00 will be installed
```

You will now be prompted for the directory under which JustIMAGE 5.4 must be installed. The default is to use the currently selected directory. Enter `n` should you wish to use a different directory.

```
Installation directory: /home/justcroft/justimage54
Is this directory correct? y/n y
```

You will get a confirmation of the directory and the installation script will proceed with extracting the software.

```
Directory /home/justcroft/justimage54 will be used for the installation
Extracting /home/justcroft/justimage54/justimage54.tar.gz …
```

The installation script will now check if a JustIMAGE 5.3 setup is available.

```
Checking for JustIMAGE 5.3 configuration files
Found JustIMAGE 5.3 in xxxx
```

If neither the *$JUSTIMAGE53_RESOURCES* nor the *$JUSTIMAGE53_HOME* environment was set you will see the message "No JustIMAGE 5.3 installation found. Do you want to specify it manually? y/n". Enter 'y' if you have a previous JustIMAGE 5.3 installation. Note: The migration tool will not overwrite any files that are already in the JustIMAGE 5.4 configuration.

After the optional migration you will see:

```
Installation of JustIMAGE 5.4.00 completed.
```

Troubleshooting

The installation aborts with the message: "Newer version than 5.4.*xx* already installed. Installation is aborted.", where *xx* is a revision number.

The JustIMAGE 5.4 installation checks and prevents from you trying to downgrade. To downgrade, you must first uninstall the newer JustIMAGE 5.4 version and then install the

older version.

The installation gives the message: "5.4.*xx* already installed. Continue with the installation y/n?", where *xx* is a revision number.

You may have a pre-release of the software or you want to repair an installation. Enter `y` to continue.

The installation aborts with the message: "FATAL: Install directory is not writable!".

You are trying to install to a directory where you have no write access. We recommend not to try to work around this problem by installing as root.

The installation aborts with the message: "FATAL: GNU zip (gzip) not found".

Make sure that GNU zip is installed on your system. Note: This message should not occur on up-to-date systems.

The installation aborts with the message: "FATAL: Extraction failed. Please try ./installjimage -uncompress".

By default, extraction of the software tar file happens through a pipe. This might cause problems in some cases. Using the `-uncompress` flag causes the software tar file to be uncompressed first. This requires more disk space for the installation and is slightly slower.

Users cannot start the JustIMAGE 5.4 software, but root can.

Make sure that you did not install as root, as the directory access mask of root is restricted. If necessary recover directory access by using the `chmod 755` command. In addition we recommend to change the ownership to a normal user account using the `chown` command.

Post Installation

You may have created additional scripts or wrapper scripts for JustIMAGE 5.3. You need to alter these for use with JustIMAGE 5.4. Specifically, check for the use of the environment variables *$JUSTIMAGE53_HOME*, *$JUSTIMAGE53_RESOURCES* and *$JUSTIMAGE53_TEMP*. These should be changed into *$JUSTIMAGE54_HOME*, *$JUSTIMAGE54_RESOURCES* and *$JUSTIMAGE54_TEMP* respectively.

Configuration

Configuration Data

Configuration data for JustIMAGE 5.4 is created during the installation of the software. You can find it in the following locations:

Windows

%CommonAppData%`\Justcroft\JustIMAGE 5.4\setup\drivers\`

   Justcroft printer drivers.

%CommonAppData%`\Justcroft\JustIMAGE 5.4\setup\dta\`

   Various configuration data.

%CommonAppData%`\Justcroft\JustIMAGE 5.4\setup\fonts\`

   Justcroft font files.

%CommonAppData%`\Justcroft\JustIMAGE 5.4\setup\packages\`

   CGM profile packages.

%CommonAppData%`\Justcroft\JustIMAGE 5.4\setup\patterns\`

   Pattern files used by JustEDIT and JustMONTAGE.

%CommonAppData%`\Justcroft\JustIMAGE 5.4\setup\templates\`

   JustMONTAGE templates available for all users.

%ProgramFiles%`\Justcroft\JustIMAGE 5.4\qt5\translations\`

   Translations files of the various JustIMAGE 5.4 programs.

%CommonAppData%`\Justcroft\JustIMAGE 5.4\setup\config.ini`

   Various configuration information including the license configuration and license file.

%CommonAppData%`\Justcroft\JustIMAGE 5.4\setup\license.dat`

   Justcroft license file if a host locked license type is used.

`HKEY_LOCAL_MACHINE\Software\Justcroft\JustIMAGE\5.4\JUSTIMAGE54_HOME`

   The JustIMAGE 5.4 installation home path. This is by default set during the Windows Installation. You should alter this if you move the installation location manually. See also "Configuration Override" below.

Linux

<install directory>`/setup/drivers/`

   Justcroft printer drivers.

<install directory>`/setup/dta/`

Various configuration data.

<install directory>`/setup/fonts/`

Justcroft font files.

<install directory>`/setup/packages/`

CGM profile packages.

<install directory>`/setup/patterns/`

Pattern files used by JustEDIT and JustMONTAGE.

<install directory>`/setup/templates/`

JustMONTAGE templates available for all users.

<install directory>`/qt5/translations/`

Translations files of the various JustIMAGE 5.4 programs.

<install directory>`/setup/config.ini`

Various configuration information including the license configuration and license file.

<install directory>`/setup/license.dat`

Justcroft license file if a host locked license type is used.

Configuration Override

It is possible to override the configuration for JustIMAGE 5.4 using environment variables. We recommend that this should only be done in special cases such as running from a network location or for testing purposes.

JUSTIMAGE54_HOME

The JustIMAGE 5.4 installation home path. Note that this is, by default, set in the registry on Windows. Setting the environment variable overrides the registry entry in this case.

JUSTIMAGE54_RESOURCES

The JustIMAGE 5.4 resource path. This is by default set to *%CommonAppData%* `Justcroft\JustIMAGE 5.4\setup\` on Windows. You can optionally set it as a key in the registry under `HKEY_LOCAL_MACHINE\Software\Justcroft\JustIMAGE\5.4\`. The default for Linux is *$JUSTIMAGE54_HOME*`/setup/`.

JUSTIMAGE54_TEMP

The scratch directory path. The scratch directory is by default set to the result of the `GetTempPath()` function on Windows. The `GetTempPath()` function checks for the existence of environment variables in the following order and uses the first path found:

1. The path specified by the *%TMP%* environment variable.

2. The path specified by the *%TEMP%* environment variable.

3. The path specified by the *%USERPROFILE%* environment variable.

4. The Windows directory.

The default for Linux is to check for the existence of the environment variable *$TMPDIR* and if not set, `/tmp/`.

User Data

The user data settings are kept in various ini files of the JustIMAGE 5.4 application. Each program of the application has its own ini file. Settings that are shared between programs are kept in a common ini file JustIMAGE-Common.ini. See below for an example of how this can be used.

Search Order

The following search order is used by the various JustIMAGE 5.4 programs to find a settings entry.

Windows

1. *%APPDATA%*\Justcroft\JustIMAGE-Common.ini

2. *%APPDATA%*\Justcroft.ini

3. *%COMMON_APPDATA%*\Justcroft\JustIMAGE-Common.ini

4. *%COMMON_APPDATA%*\Justcroft.ini

Linux

1. *$HOME*/.config/Justcroft/JustIMAGE-Common.ini

2. *$HOME*/.config/Justcroft.ini

3. /etc/xdg/Justcroft/JustIMAGE-Common.ini

4. /etc/xdg/Justcroft.ini

Individual user data will be created in the following locations:

Windows

```
%APPDATA%\Justcroft\
HKEY_CURRENT_USER\Software\QtProject\OrganizationDefaults\
```

Linux

> *$HOME*/.config/Justcroft/
> *$HOME*/.config/QtProject.conf

Format

The ini format is based on the Microsoft ini profile format with extensions. You can edit the file manually, but this is only recommended if you are familiar with this format.

Note that spaces in both group names and key names are URL encoded as %20. For example:

> [Print_Samsung%20CLP-620%20Native]

Means "Print_Samsung CLP-620 Native".

Customizing

The following section describes customizations you might want to apply. It is highly recommended that these customizations are automatically applied during roll out in a large corporate environment. For example, by applying a Windows Installer transform.

Symbols

You can add symbols to JustEDIT and JustMONTAGE if they are available as TrueType fonts. Add the symbol font to the `fonts` sub-directory if you want to keep symbols private to JustIMAGE 5.4.

Custom Colors

You can add sets of custom colors to the color pickers in JustEDIT and JustMONTAGE. You can do this by creating one or more custom colors XML files in the `dta` sub-directory. Users can select the set of custom colors they want to use from the preference settings dialog box. A color set based on the Geological Map of the World (CGMW Colors, `cgmw-colors.xml`) is delivered with the software.

Use the title attribute to set the color bar name that will be visible on the colors tab in the preferences dialog box.

Each color you specify must have a name and a value. The value can be specified as a single red, green, blue (rgb) value, as a single blue, green, red (bgr) value or as individual red, green, blue values. The value is treated as a hexadecimal number if the prefix 0x is used. For example, `rgb="0xFF0000"` means red.

A full explanation can be found in the supplied `custom-colors.example`. See the `cgmw-colors.xml` for a complete custom colors file.

Print Banner Logo

The JustIMAGE 5.4 print banner logo is a standard binary Portable Pixelmap (PPM) file located in the `dta` sub-directory. You can replace the print banner logo with your own company logo. You can create a Portable Pixelmap file with, for example, Paint Shop Pro or IrfanView. It is also possible to use the JustIMAGE 5.4 Export facility. You must observe the following guidelines:

- The Portable Pixelmap file must be binary.

- The logo should not be bigger than 512x512 pixels. Bigger logos are clipped.

- It is recommended reducing the number of unique colors in the logo to 256 to reduce print file sizes.

- The Portable Pixelmap file must have the name `usrpxlogo.ppm`. This file should be placed in the `dta` sub-directory.

Default Banner Layout

As standard there is no banner layout set for each individual user and printer queues. You can make a default banner layout for all your printer queues. Note that each user can still change the banner layout individually.

Make a JustIMAGE-Common.ini file with the following contents:

```
[Printing]
banner-text=File: $FILENAME, Date: $DATETIME, Printer: $PRINTER,
cut-marks=0
apply-banner-to-all=true
```

The key "banner-text" contains the individual banner lines separated by commas (,). In the example above we have three banner lines with the macros that expand at print time. See the "How to Print" chapter in the User Manual for details about the macros.

The key "apply-banner-to-all" must be set to "true" to ensure that these banner settings are applied to all printer queues.

It is recommended to set the key "cut-marks" to 0 to prevent cut marks during printing.

The JustIMAGE-Common.ini should be placed in a machine wide location.

Windows

%COMMON_APPDATA%\Justcroft\JustIMAGE-Common.ini

Linux

/etc/xdg/Justcroft/JustIMAGE-Common.ini

Printer Setup

JustIMAGE 5.4 does not directly use printer queues on the local PC. Application administrators can setup printer queues and the printing processing through a printer setup file `jprintsetup.xml` located in the `dta` sub-directory.

The benefits of using a printer setup file are:

- Separates printer configuration from printing reducing the complexity for the JustIMAGE user.

- Keeps the differences between printing systems on the various platforms to a minimum.

- Large corporate environments tend to have many different printer queues configured on the local PCs. Only a small sub-set of these printer queues are actually used for printing and plotting of technical drawings. The printer configuration acts as a filter.

- Integration with the JustPLOT plotting system.

The printer setup file is an XML file and contains all the selected configuration options. The Print Setup wizard tool is used to update the print setup file. It is recommended that you make a list in advance of which printers and plotters you want to setup.

You can start the Print Setup wizard tool `jprintsetup` either from the JustIMAGE 5.4 menu "File ⇨ Print Setup..." or directly from the `bin` sub-directory. You will see the Introduction screen of Print Setup wizard.
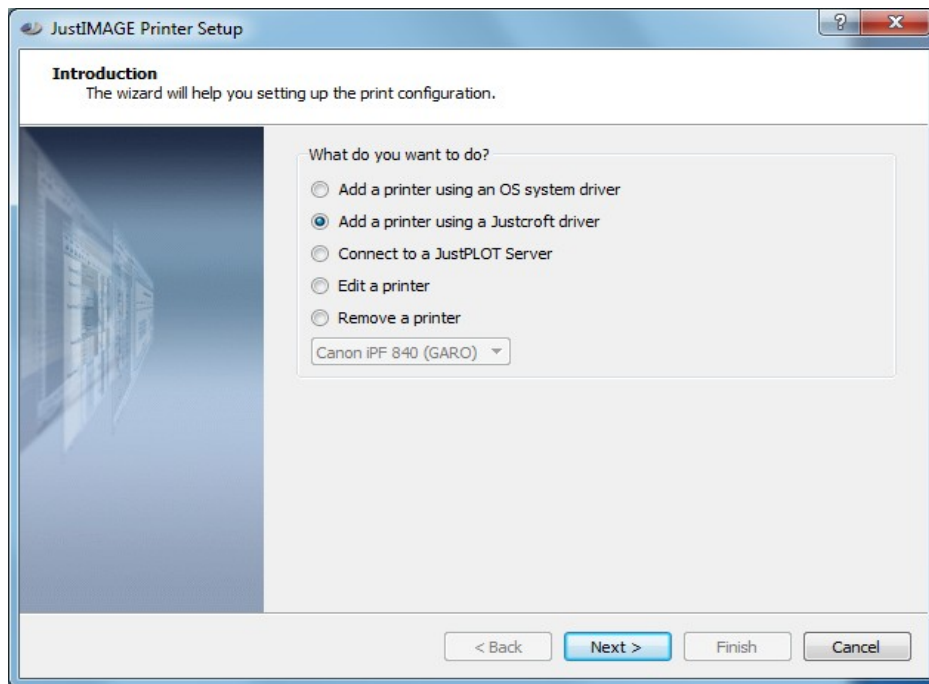
Illustration 8: The Introduction screen of the Print Setup wizard.

You need to decide how you want to setup a new printer. The following considerations may help you decide what to do:

- The printer you want to setup is already defined on Windows and is not a roll plotter. Select "Add a printer using an OS system driver".

- The printer you want to setup is a small ink-jet printer and is already defined on Windows or there is already a lp queue on Linux. Select "Add a printer using an OS system driver".

- The printer you want to setup is an iSys iTerra Mi875 on Windows. Select "Add a printer using an OS system driver".

- The printer you want to setup is a Canon GARO plotter. First install the separate Canon GARO Plotters software and then select "Add a printer using a Justcroft driver".

- The printer you want to setup is an Epson SureColor plotter. First install the separate Epson HTM Plotters software and then select "Add a printer using a Justcroft driver".

- The printer you want to setup is an HP Designjet, Canon, Printrex, iSys, Neuralog or Epson Stylus roll-plotter. Select "Add a printer using a Justcroft driver".

- The printer you want to setup is a PostScript printer or plotter. It is recommended to select "Add a printer using a Justcroft driver".

- The printer you want to setup is an electrostatic roll-plotter. Select "Add a printer

using a Justcroft driver".

- The printer or plotter you want to setup is already configured in your JustPLOT environment. Select "Connect to a JustPLOT Server".

Add a printer using an OS system driver

Select in the Introduction screen of the Print Setup wizard the option "Add a printer using an OS system driver". Click Next to continue.
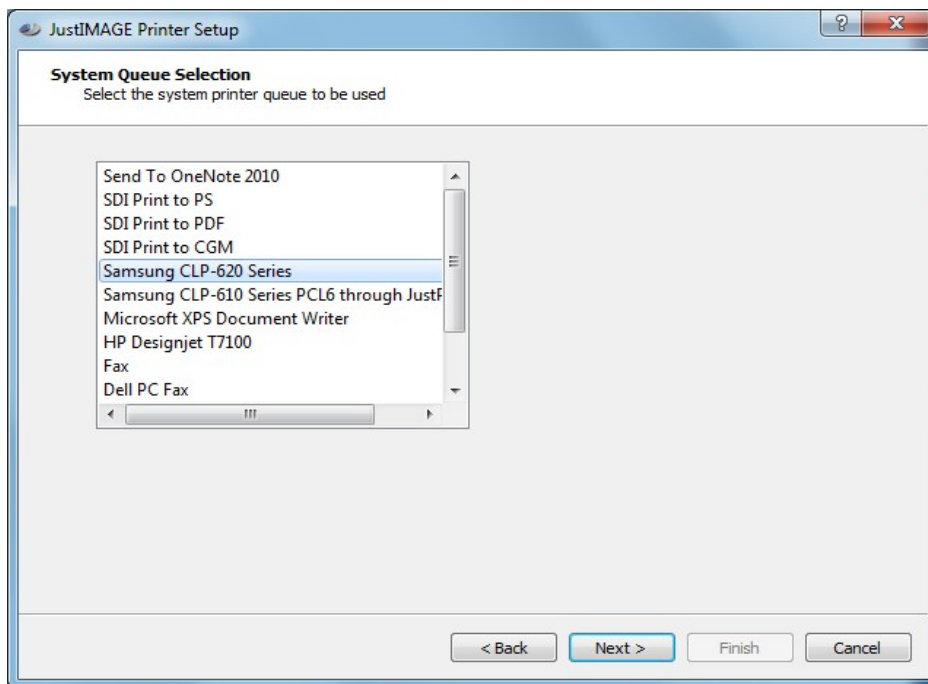
Illustration 9: System Queue Selection screen.

You will see a list of the available system printer queues on the PC. Select the system printer queue you want to use. Click Next to continue.
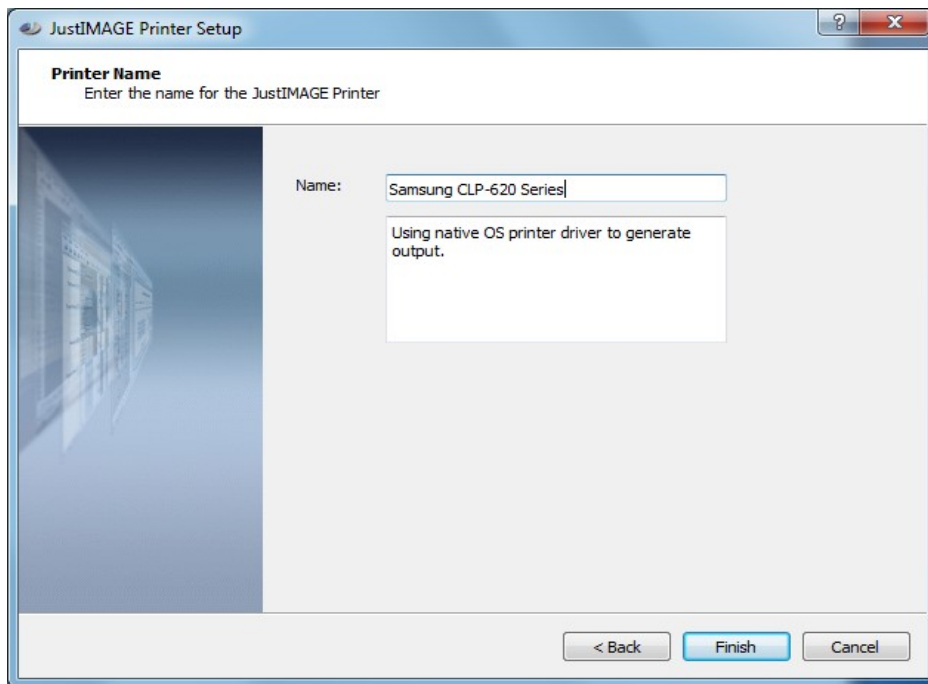
Illustration 10: Entering OS system driver printer name and description.

The Print Setup wizard has already entered a default printer name and a default description. The description is for reference purposes only. It is recommended to leave the suggested printer name to the default. You may want to change the description.

Click on Finish to save the newly added printer.

Add a printer using a Justcroft driver

Select in the Introduction screen of the Print Setup wizard the option "Add a printer using a Justcroft driver". Click Next to continue.
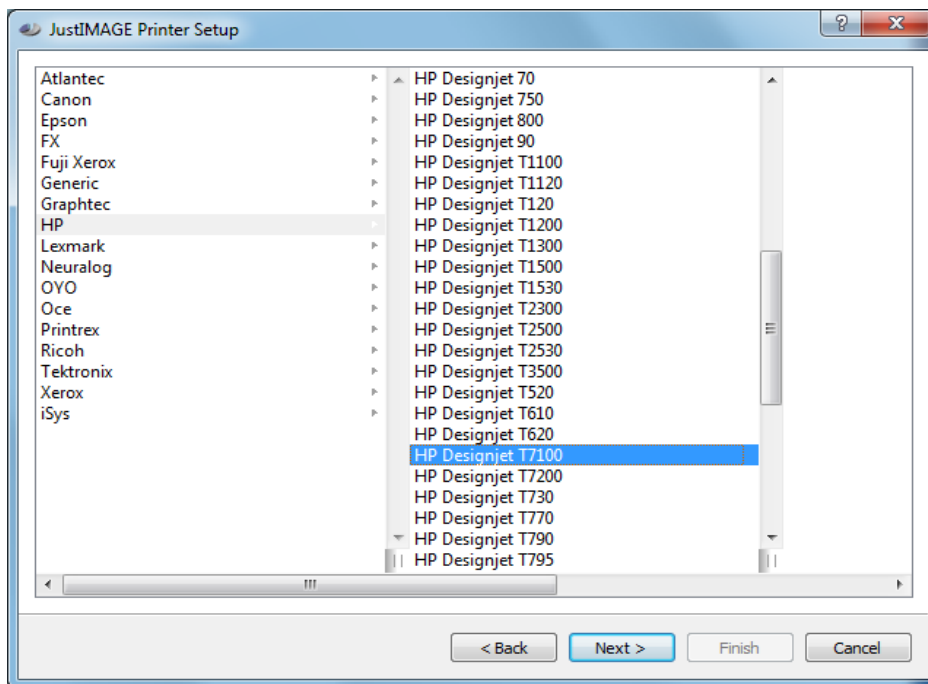
Illustration 11: Manufacturer and printer model screen of the Print Setup wizard.

You will see several columns. Select the manufacturer of your printer from the first column. The second column will be updated with the printer models available from the manufacturer. In the example we have selected "HP" (Hewlett Packard) as manufacturer and selected "HP Designjet T7100" as the printer model. Click Next to continue.

Printing Properties

The Properties screen of the Print Setup wizard shows the internal driver Id and Model name.
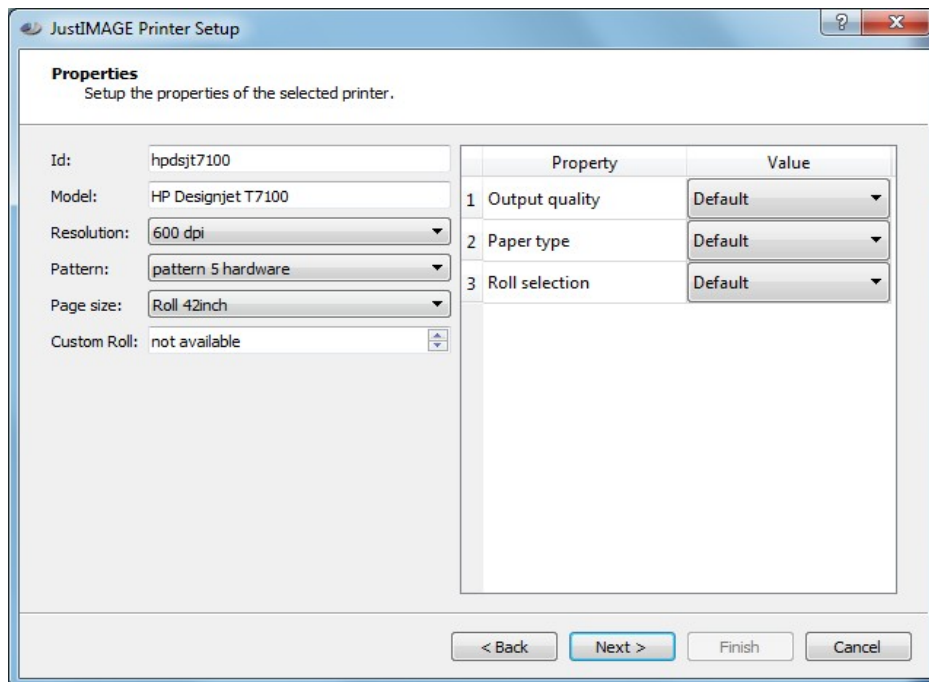
Illustration 12: Properties screen of the Print Setup wizard.

You can set the printer driver resolution if the printer supports multiple raster resolutions. Higher resolutions generate better quality output, but this will cost additional time compared to lower resolutions. A virtual resolution is used for PostScript and you can therefore not alter it.

Some printers have only one fixed page size. Roll-plotters usually allow multiple roll sizes. You can select a common roll size or select a Custom Roll size if this is allowed for the printer model. PostScript sheet printers usually have only a fixed set of page sizes.

Depending on the selected printer driver, you might have zero or more properties and a value you can set for the property. The special value "Default" will set a standard value for the selected property. The example printer driver "HP Designjet T1200" that is shown has three properties: "Output quality" which refines the output quality of the output; "Paper type" which can be set to the type of paper that is fed into the printer or plotter; and "Roll selection" controls from which roll the paper is fed should the plotter have multiple rolls.

Click Next to continue. If you had selected a raster driver you will continue with the "Color Correction" screen. PostScript drivers will skip this screen and you will go to the "Spooler Control" screen.

Color Correction

The "Color Correction" screen allows you to set the Color Correction and other corrections related to the raster printing process. In general, you should leave these settings to the default values that are setup by the wizard.
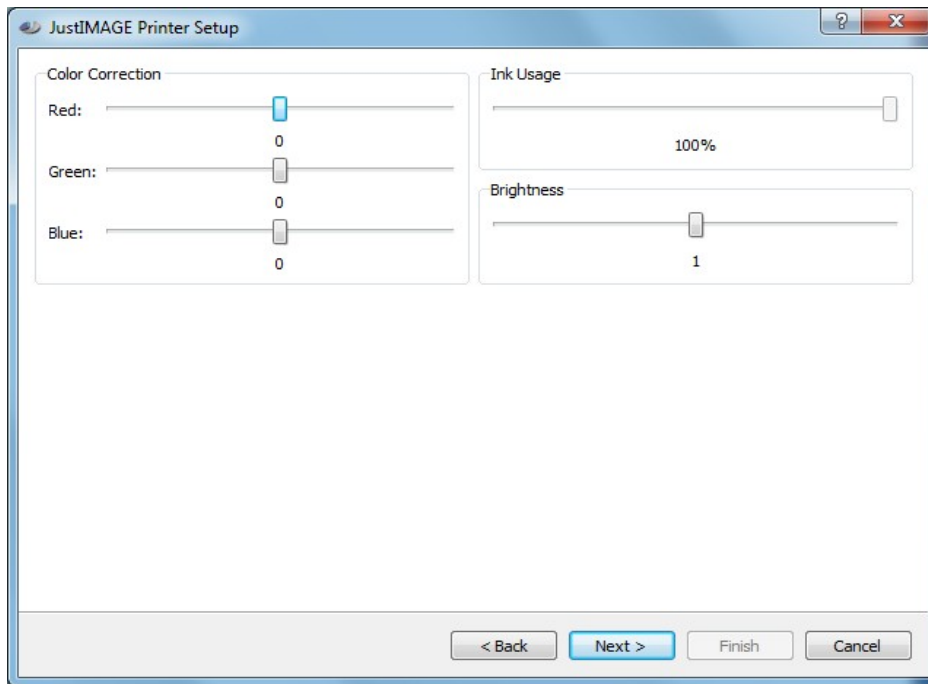
Illustration 13: Color Correction screen of the Print Setup wizard.

"Color Correction" influences the RGB to CMYK conversion. Red has the tendency to look like brown when printed. Blue has the tendency to look more like purple when printed. Green correction is usually not necessary.

The "Ink Usage" setting is to compensate for the over-inking problem. Depending on the type of paper and the ink used, printer dots may flow out too much (dot gain). You can compensate for this effect by reducing the ink usage.

The "Brightness" setting controls the darkness of the print output. A value of 1.0 means no correction. A value < 1.0 makes the plot darker and a value > 1.0 makes the plot lighter.

Spooler Control

This screen let you set how the generated printer output is spooled to the printer or plotter.
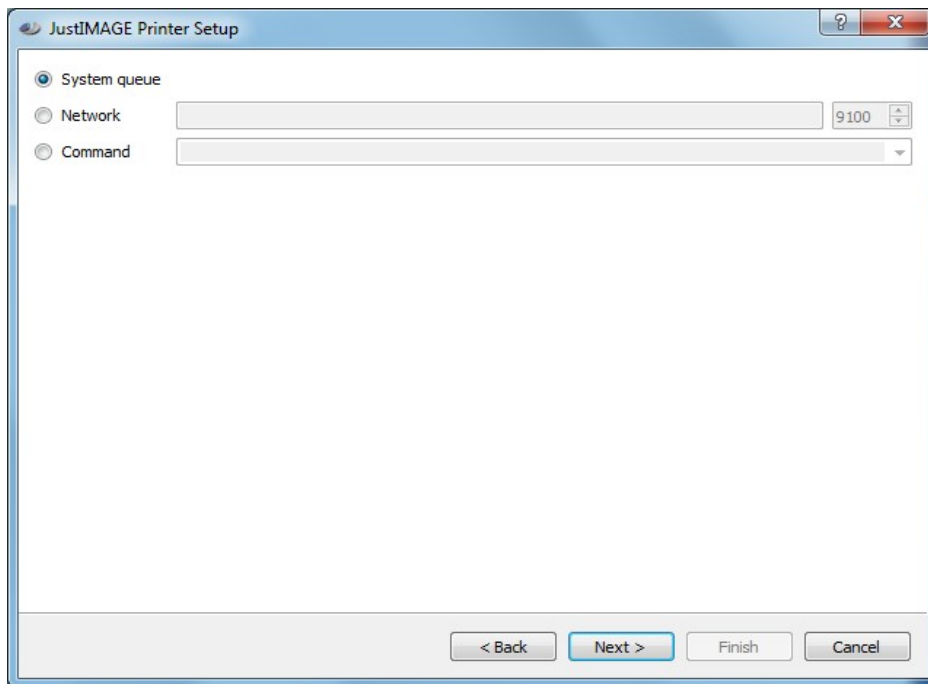
Illustration 14: Spooler Control screen in the Print Setup wizard.

Select "System queue" if you have a ready defined Windows printer queue or local lp queue to the printer or plotter. Selecting "System queue" and then selecting Next will bring up a screen where you can select the printer queue.
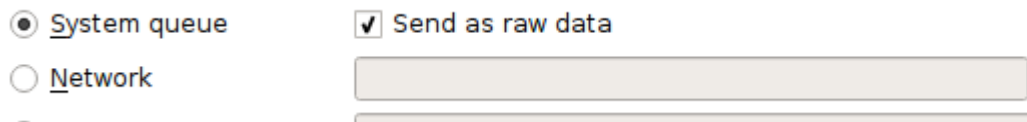
Illustration 15: Send as raw data on Linux

On Linux the file generated by the Justcroft driver is by default placed in the system queue as raw data and sent unmodified to the printer. When the file must be processed by the CUPS system queue the option "Send as raw data" should be disabled.

It could be that there is no readily available system queue but the printer or plotter is connected through a network box that accepts raw data. In this case the best solution is to select "Network" and enter either the (full qualified) host name or IP address. Most network boxes accept raw data through socket port 9100. You may need to override this.

The third method is by specifying a command line executable or script. Special plotters, such as electrostatic plotters, usually require special I/O interfaces and command line tools. Note that this is platform dependent although we do provide some scripts that hide these dependencies.

Specify an appropriate command that either takes data from standard input or use the

special keyword $OUTPUT at the place where you want to have the output file name. The command you specify should be a normal executable or a shell script. It cannot be a shell expression such as 'cat $OUTPUT|wc -l'. You can also specify the number of copies with the keyword $COPIES. The keywords $PATHNAME and $FILENAME expand to the original full file path and file name respectively.

The predefined command templates, when available, can be selected from the combo box drop down list. These commands usually require manual adjustment to your specific situation.

For example, in the command template to spool data to an online connected OYO requires that you enter the I/O device name entry.
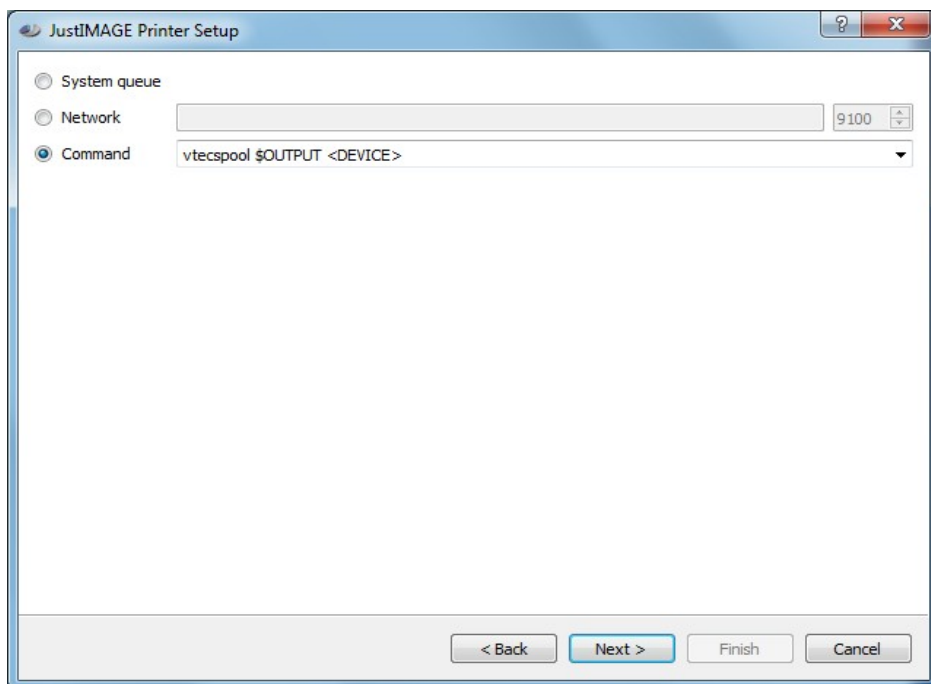
Illustration 16: OYO spool command.

The Print Setup wizard will try to help you with missing entries.
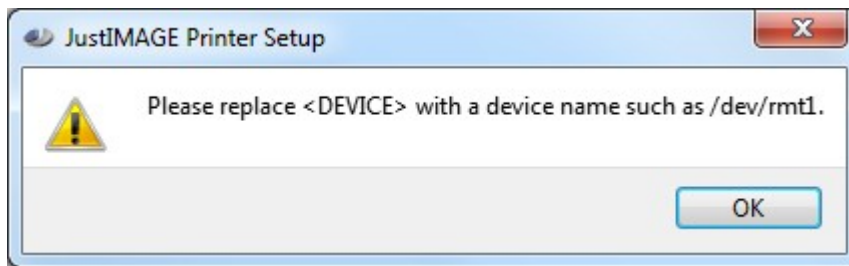
Illustration 17: <DEVICE> needs to be replaced with the appropriate device name.

Click Next to continue.

Printer Name
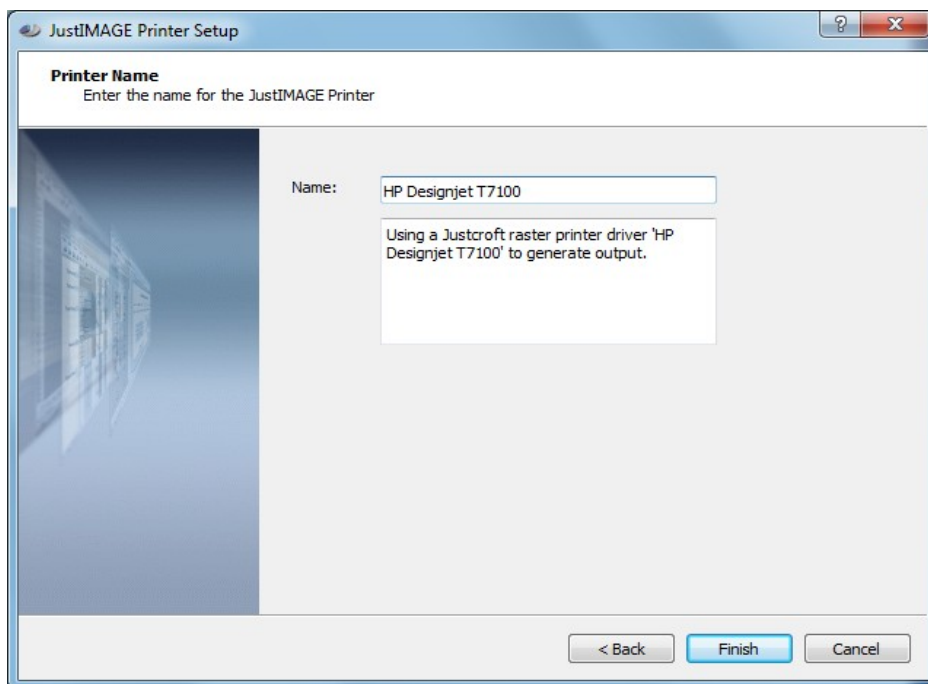
Illustration 18: Entering the name and description of a Justcroft printer driver.

The Print Setup wizard has already entered a default printer name and a default description. The description is for reference purposes only. You may want to alter the printer name to be more suitable for your users.

Click on Finish to save the newly added printer.

Connect to a JustPLOT Server

Select in the Introduction screen of the Print Setup wizard the option "Connect to a JustPLOT Server". Click Next to continue.
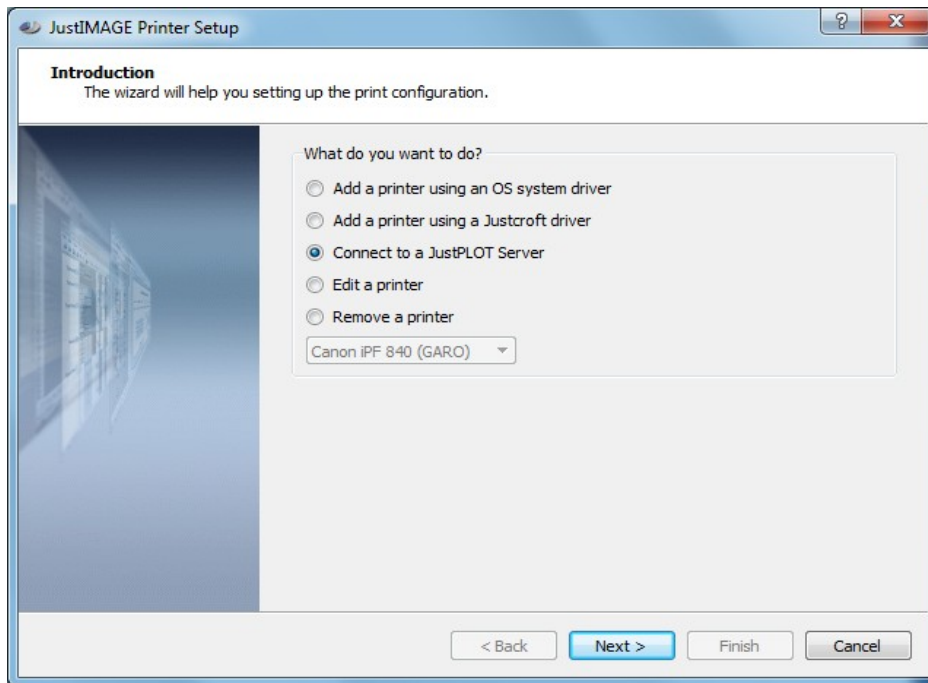
Illustration 19: Connect to a JustPLOT Server.

You first need to setup the JustPLOT configuration in the "JustPLOT Configuration" screen. Enter the (full qualified) host name of the JustPLOT Base. Make sure that you hit Enter to add the host name. Also adjust if necessary the Socket Offset and Time-out.

Click Next to continue.
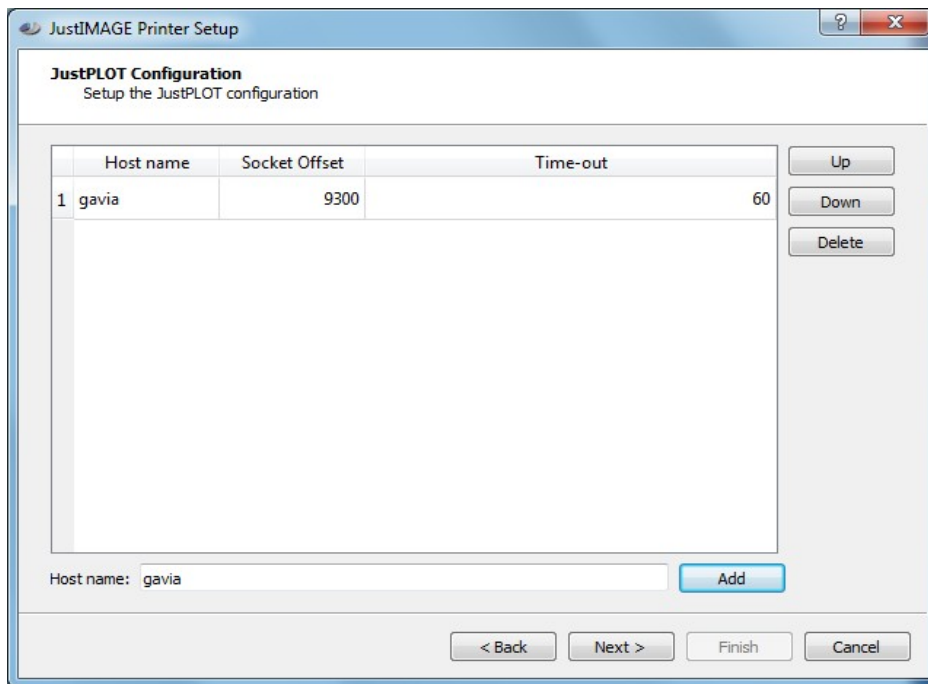
Illustration 20: Configure the JustPLOT Base in the Print Setup wizard.
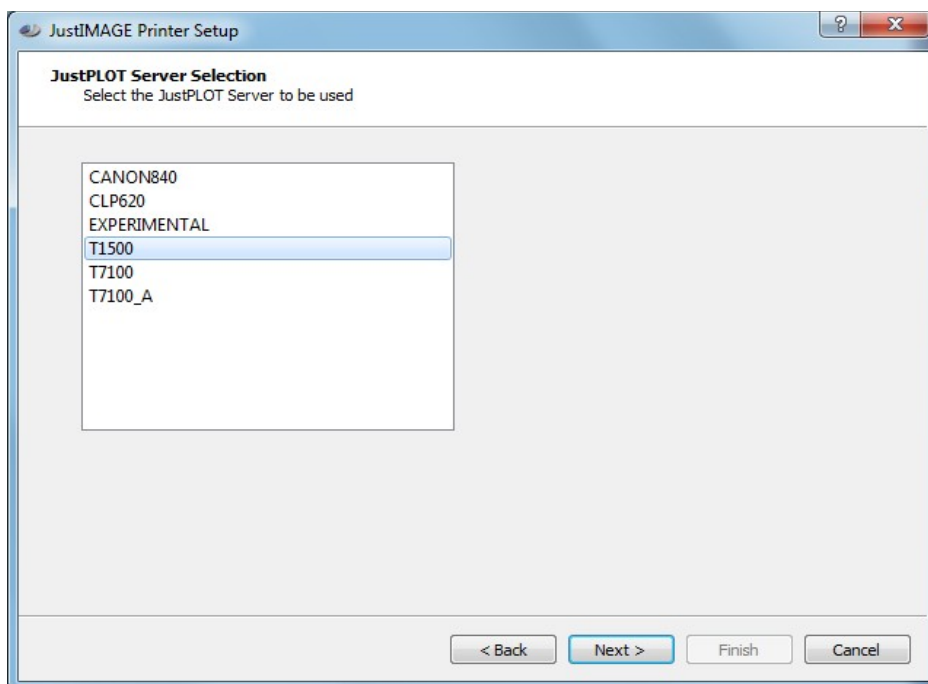
Illustration 21: Select a JustPLOT Server in the Print Setup wizard.

Select the JustPLOT Server you want to use. Click Next to continue.

The "Printer Name" screen is shown. The Print Setup wizard has already entered a default printer name and a default description. The description is for reference purposes only. It is recommended to leave the suggested printer name to the default. You may want to change the description.

Click on Finish to save the newly added printer.

Edit a Printer

Select "Edit a Printer" from the introduction screen of the Print Setup wizard to change a printer configuration. Then select the printer from the combo box drop down list and click Next. Note that you cannot alter the name of the printer.

Remove a Printer

Select "Remove a Printer" from the introduction screen of the Print Setup wizard to remove a printer from the configuration. Then select the printer from the combo box drop down list and click Finish.

iSys iTerra Mi875 Setup

The iSys iTerra Mi875 can be setup to work as a continuous roll plotter on Windows with JustIMAGE 5.4.

First make sure that you have downloaded and installed the latest engine firmware and board firmware in the printer.

Install the Windows printer driver for the iTerra Mi875 on your Windows Print Server or as a local Windows printer queue.

Next select the Windows printer queue and check Properties ⇨ Advanced ⇨ Spool print documents so program finishes printing faster.

◉ Spool print documents so program finishes printing faster
　　◉ Start printing after last page is spooled
　　◯ Start printing immediately
◯ Print directly to the printer

Illustration 22: Spool print documents setup for the iSys iTerra Mi875

Make sure this is set to "Start printing after last page is spooled".
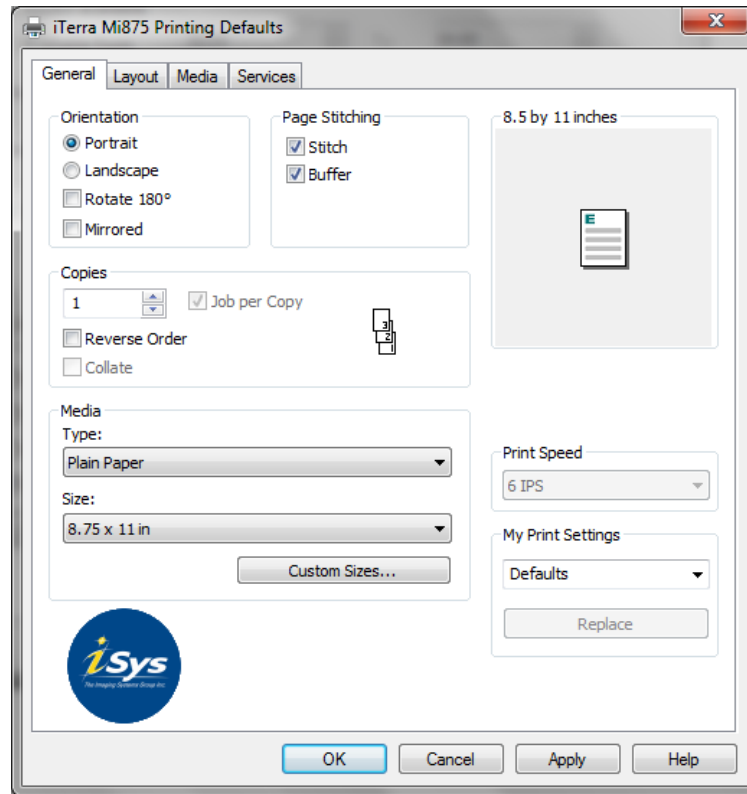
*Illustration 23: iSys iTerra Mi875 Printing Defaults
dialog box.*

The Printing Defaults should be set as follows:

- Orientation set to "Portrait".

- Page Stitching set to "Stitch" and "Buffer".

- Media Size set to "8.75 x 11in".

Next use the JustIMAGE 5.4 Print Setup tool to add the iSys iTerra Mi875 as a printer to JustIMAGE 5.4.

1. Select "Add a printer using an OS system driver". Select Next >.

2. From the list of Windows printer queues select iSys iTerra Mi875. Select Next >.

3. The name as seen for a JustIMAGE 5.4 user can be altered on this last screen, but it's recommend to leave this to the default. You may want to alter the descriptive text. Select Finish to finish the setup.

Users can now print using the iSys iTerra Mi875 from within the JustIMAGE 5.4 Viewer, editor and montage program. They should keep the following in mind when printing a well log.
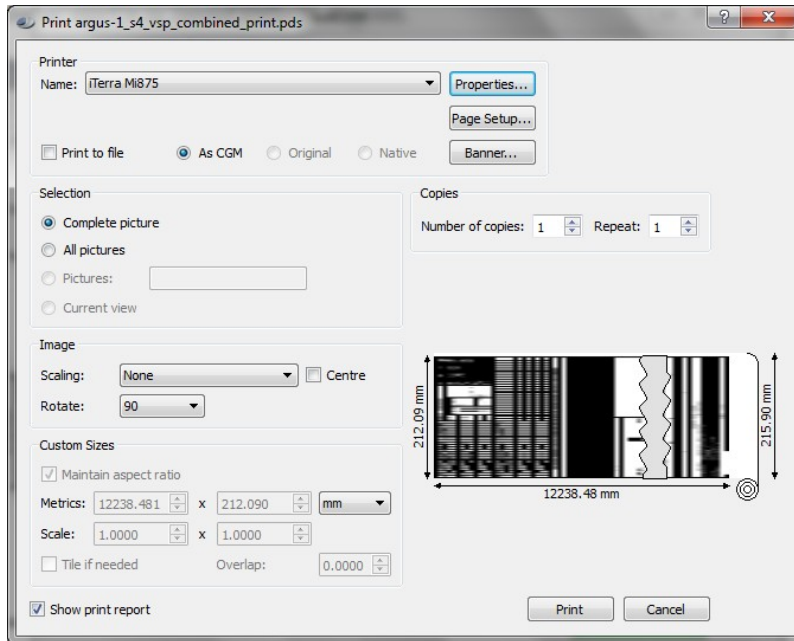
Illustration 24: Printing a large well log with a iSys iTerra Mi875.

The Print dialog box might initially say that the picture is clipped. This can be rectified by selecting "Page Setup" and set all margins to zero. If the image is vertically oriented it needs to be rotated 90 degrees. The Print dialog box will now indicate a roll-plotter output.

Canon GARO Plotters

Justcroft GARO based drivers for Canon plotters are *not* part of the installation of JustIMAGE 5.4 due to their required disk space size. These are available as a separate download and installation.

Installing Canon GARO drivers on Linux

Download a compressed tar file `canongaro01-06.tgz` from the Justcroft support website and place this on the machine on which JustIMAGE 5.4 is installed. Note that the `01-06` part is a version number and might be different for you.

Make sure that you are logged with the user account under which JustIMAGE 5.4 is installed. Within a command shell enter:

```
cd /<product-home>/setup/drivers/
```

```
tar xzvf /<path>/canongaro01-06.tgz
```

You can now run the Printer Setup tool to configure a Canon plotter.

Installing Canon GARO drivers on Windows

Download a self-extracting executable `jimage54-canongaro01-06.exe` from the Justcroft support website and place this on the machine on which JustIMAGE 5.4 is installed. Note that the `01-06` part is a version number and might be different for you.

Make sure that you are logged with the user account under which JustIMAGE 5.4 is installed and run the self-extracting executable. The program will automatically detect the folder under which the Canon drivers should be installed.

Once finished you can run the Printer Setup tool to configure a Canon plotter.

You can uninstall the Canon drivers under the Remove Programs configuration section of Windows if you so desire. Note that you do not need to uninstall the Canon drivers if you wish to update JustIMAGE 5.4. Also, you do not need to uninstall the Canon drivers first if we update the self-extracting executable. However, it is recommend to uninstall the Canon drivers first if you no longer wish to use JustIMAGE 5.4 and uninstall the product.

Epson HTM Plotters

Justcroft Epson HTM based drivers for Epson SureColor plotters are *not* part of the installation of JustIMAGE 5.4 due to their required disk space size. These are available as a separate download and installation.

Installing Epson HTM drivers on Linux

You will need to install the Epson HTM drivers on every Linux PC from which you want to print to one of the Epson SureColor plotters. The drivers will only work on Linux RedHat Enterprise 7 64bits or higher.

Download the compressed tar file `epsonhtm01-01.tgz` from the Justcroft support website and place this on the machine on which JustIMAGE 5.4 is installed. Note that the `01-01` part is a version number and might be different for you.

Make sure that you are logged with the user account under which JustIMAGE 5.4 is installed. Within a command shell enter:

```
cd /<product-home>/setup/drivers/
tar xzvf /<path>/epsonhtm01-01.tgz
```

Once finished you can run the Printer Setup tool to configure an Epson plotter.

Installing Epson HTM drivers on Windows

You will need to install the Epson HTM drivers on every Windows PC from which you want to print to one of the Epson SureColor plotters.

Download a self-extracting executable `justimage54-epsonhtm01-01.exe` from the Justcroft support website and place this on the machine on which JustIMAGE 5.4 is installed. Note that the `01-01` part is a version number and might be different for you.

Make sure that you are logged with the user account under which JustIMAGE 5.4 is installed and run the self-extracting executable. The program will automatically detect the folder under which the Epson HTM drivers should be installed.

Once finished you can run the Printer Setup tool to configure an Epson plotter.

You can uninstall the Epson drivers under the Remove Programs configuration section of Windows if you so desire. Note that you do not need to uninstall the Epson drivers if you wish to update JustIMAGE 5.4. Also, you do not need to uninstall the Epson HTM drivers first if we update the self-extracting executable. However, it is recommend to uninstall the Epson drivers first if you no longer wish to use JustIMAGE 5.4 and uninstall the product.

Integration With Other Applications

Petrel

Information about the integration of JustIMAGE 5.4 with Petrel can be found in the "JustIMAGE for Petrel Guide". You can download this guide from our support site at support.justcroft.com.

Petrosys

Information about the integration of JustIMAGE 5.4 with Petrosys can be found in the `integration/petrosys` sub-directory of the JustIMAGE 5.4 installation on Linux.

FlexNet Licensing

Introduction

JustIMAGE 5.4 can be FlexNet Enabled which means that it can work in conjunction with other FlexNet applications. FlexNet is a licensing system by Flexera Software[3].

The FlexNet Enabled JustIMAGE 5.4 version has the same modules and functionality as the standard JustIMAGE 5.4 version.

Availability

You can download the FlexNet Enabled JustIMAGE 5.4 version from our support site at support.justcroft.com from the JustIMAGE download section. **Important**: The FlexNet Enabled version cannot be downloaded directly from our commercial web site as it falls under the USA export restrictions. If you have installed a trial version of JustIMAGE 5.4 you should uninstall this first before continuing the installation.

To check if you have the FlexNet Enabled version of JustIMAGE 5.4, please select Help ⇨ About from the JustIMAGE menu bar. You should see in the About dialog box "JustIMAGE 5.4 with FlexNet".

FlexNet Requirements

FlexNet Publisher 2019 R2 (v11.17.0.0) or higher. (Delivered together with the FlexNet Enabled JustIMAGE 5.4 version.)

Windows: Windows 7 or higher, Intel/AMD 64bits.

Linux: Linux Red Hat Enterprise 7.0+ or similar, Intel/AMD 64bits. RedHat Enterprise Linux requires that the redhat-lsb library is installed as well. Use if necessary the command:

```
yum -y install redhat-lsb
```

TCP/IP v4/v6 network set-up. (Concurrent license requirement.)

License server manager lmgrd version v11.17.0.0 or higher. (Concurrent license requirement. Delivered together with the FlexNet Enabled JustIMAGE 5.4 version.).

Justcroft vendor daemon (justint). (Concurrent license requirement. Delivered together with the FlexNet Enabled JustIMAGE 5.4 version.)

A FlexNet license file.

3   FlexNet was previously known as FLEXlm and was owned by Macrovision.

Vendor Daemon

The FlexNet Enabled JustIMAGE 5.4 version uses the Justcroft International vendor daemon: `justint` which is supplied by Justcroft International. The vendor daemon is currently available on Windows 7 or higher and on Linux Red Hat Enterprise 7.0 or higher.

Windows Installation

The FlexNet Publisher 2019 R2 (v11.17.0.0) utilities, the Justcroft vendor daemon (justint.exe) and `lmgrd.exe` can be installed using the FlexNet Enabled JustIMAGE 5.4 installation file. During the installation select FlexNet Daemon in the Custom Setup. Deselect all other features if you only want the FlexNet server and not the rest of the JustIMAGE 5.4 software.
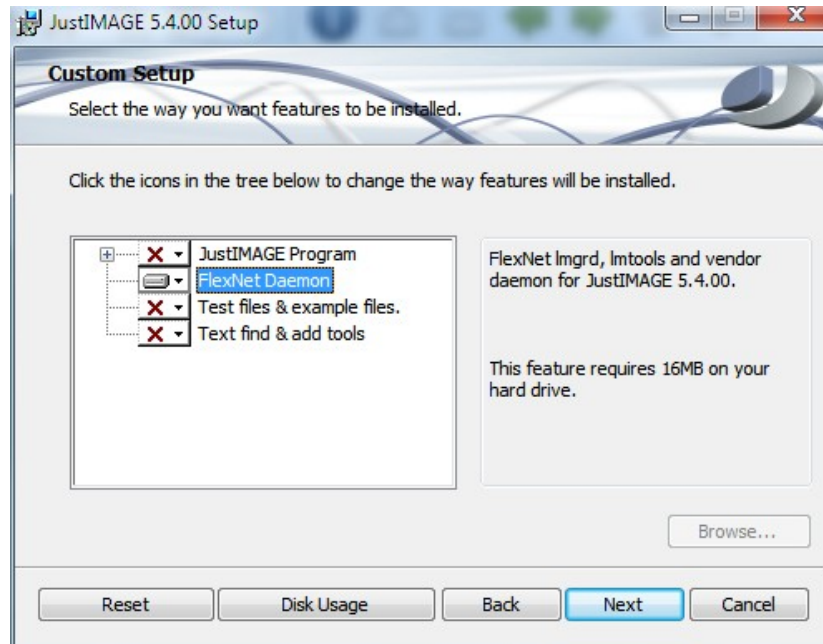
Illustration 25: FlexNet Daemon installation on Windows.

The FlexNet utilities and justint.exe will be installed in the flexnet sub directory of the JustIMAGE 5.4 installation directory.

The FlexNet utilities and justint vendor daemon are also available as a separate [RAR](#) download file on the Justcroft support site in the JustIMAGE 5.4 Downloads section.

Linux

The vendor daemon justint and `lmgrd` can be found under the `flexnet` sub-directory of the installation.

FlexNet license file

The JustIMAGE 5.4 FlexNet license file will be provided by Justcroft via email and is usually called `license.lic`.

Known issues

The following are know issues with the FlexNet enabled versions of JustIMAGE 5.4.

License server as a Windows service failed to start

A change was made in FlexNet Publisher 2015 (v11.13.1) to run the Windows license server

services with LocalService privilege instead of LocalSystem privilege, following the least-privilege security best practice. One inappropriate consequence is that a lmgrd Windows service, as installed by installs.exe or lmtools.exe, may not start. This is because a LocalService service does not, by default, have sufficient privilege to write the server debug log to (a sub-directory of) Windows Program Files or Users directories.

Flexera therefore recommends following Windows best-practice for writing application data by specifying debug log and report log locations within a sub-folder of %SystemDrive%\ ProgramData\. LocalService services do by default have sufficient privilege to write to ProgramData (sub)directories.

Version of vendor daemon is too old

JustIMAGE 5.4 might fail with a license error "Version of vendor daemon is too old" (Error -83,147).

JustIMAGE 5.4 with FlexNet has been updated to FlexNet Publisher 2019 R2 (v11.17.0.0). JustIMAGE customers with the FlexNet Enabled version of JustIMAGE 5.4 must update both their Justcroft vendor daemon (justint) and FlexNet daemon (lmgrd) with the version delivered with the installation. Or download the JustIMAGE 5.4 FlexNet tools RAR file.

For your reference: JustIMAGE 5.2.00 – 5.2.01 use FlexNet Publisher version v11.14.0.1. JustIMAGE 5.2.02 – 5.2.04 as well as JustIMAGE 5.3.00 – 5.3.01 use FlexNet Publisher version v11.14.1.1. JustIMAGE 5.3.02 – 5.3.05 use FlexNet Publisher version v11.16.2.1.

FlexNet Environment Variables

How to Set Environment Variables

FlexNet environment variables are set in two different ways:

- In the process' environment
- In *$HOME/*.flexlmrc (UNIX version 7.0 or earlier), which functions like the registry on UNIX.

Registry

On Windows systems the registry location is HKEY_LOCAL_MACHINE\Software\FLEXlm License Manager.

On UNIX, the equivalent information is stored in *$HOME/*.flexlmrc. In this file, the syntax is variable=value.

Environment Variables

The following environment variables control the working of the FlexNet Enabled JustIMAGE 5.4 version. They are not all required in order to run JustIMAGE 5.4. See also the "FlexNet Licensing End User Guide" for additional environment variables and their meanings.

JUSTINT_LICENSE_FILE

> This environment variable sets the search path of the license file list of JustIMAGE 5.4. Can be a file name, or *port@host*.

FLEXLM_BATCH

> Windows only. Prevents interactive pop-ups from appearing by setting this environment variable to 1. This is recommended to be set if you want to run one of the JustIMAGE programs unattended.

FLEXLM_DIAGNOSTICS

> Used for debugging any of the JustIMAGE 5.4 executables. Set to 1, 2 or 3 depending on the desired amount of diagnostics information.

FLEXLM_NO_CKOUT_INSTALL_LIC

> Prevent a successful checkout location to be cached in the Windows registry or, on Linux, the *$HOME/*`.flexlmrc`.

LM_APP_DISABLE_CACHE_READ

> Disable reading the cached checkout location from the Windows registry or, on Linux, the *$HOME/*`.flexlmrc`.

LM_LICENSE_FILE

> This environment variable also sets the search path of the license file list. Unlike JUSTINT_LICENSE_FILE this applies to all FlexNet Enabled applications. Can be a file name, or *port@host*.

Environment Examples

JUSTINT_LICENSE_FILE or LM_LICENSE_FILE settings	Description
40000@myserver	Used where the SERVER line in the license file is the following: SERVER myserver 17007ea8 40000 • host = myserver • port = 40000
@myserver	Used where the SERVER line in the license file is the following: SERVER myserver 17007ea8

JUSTINT_LICENSE_FILE or LM_LICENSE_FILE settings	Description
	• host = myserver • port = None specified. A default TCP/IP port number in the range of 27000-27009 is used.
C:\licenses; 40000@host1,40000@host2,40000@host3	License search path on a Windows system. Unserved licenses are stored in C:\licenses; served licenses are obtained from the three-server redundant triad 40000@host1,40000@host2,40000@host3.
licenses:40000@myserver:40000@mybackupserver	License search path on a UNIX system. Unserved licenses are stored in the local directory licenses; served licenses are obtained from either myserver or mybackupserver. In the first instance, a license is requested from myserver; if this fails, mybackupserver is tried.

FlexNet Configuration

The following describe the configuration of FlexNet within JustIMAGE 5.4.

License Types

The FlexNet Enabled version of JustIMAGE 5.4 supports in addition to FlexNet demo, FlexNet node locked and FlexNet concurrent licenses, all of the Justcroft license types.

You do not need to create/configure a `config.ini` file if, by default, you use FlexNet.

With the license setup tool it is possible to select a local FlexNet license file which only has the FlexNet server name. Setting an environment variable isn't necessary anymore.

The file should be created with a plain text editor such as vi on Linux and notepad on Windows and needs to contain the following two lines:

```
SERVER <HOSTNAME> ANY <PORT NUMBER>
USE_SERVER
```

Select the local FlexNet license file with JustIMAGE ⇨ Help ⇨ Install License ⇨ FLEXnet/FLEXLM (+ optional license file).

Host-id Types

On both Windows and Linux the Ethernet MAC address is used as the host-id. Use the `lmhostid` utility that is delivered together with the FlexNet Enabled JustIMAGE 5.4 to get the host-id.

Redundant License Server System

JustIMAGE 5.4 supports redundancy via license file list. However, all subsequent license requests will have to be fulfilled by the same license server. (Multiple FlexNet license jobs are not supported.)

We do not support the Three-Server Redundancy as this has proven in the past to be unreliable.

Default License File Location

On Windows the default license file location is the JustIMAGE 5.4 data folder. On Linux the default license file location is the `setup/license` sub-directory of the JustIMAGE 5.4 installation.

The license file name must have the extension `.lic` when installed in the default license file location.

License File Caching

By default, the Windows registry is automatically updated with the location of the license file or license server which contains the desired license. On Linux this is a file $HOME/`.flexlmrc`. You can disable the update by setting the FLEXLM_NO_CKOUT_INSTALL_LIC environment variable. To prevent reading the location from the registry set the LM_APP_DISABLE_CACHE_READ environment variable.

Note: We recommend using the `lmpath` utility to check which license locations are considered by JustIMAGE 5.4.

License Finder

The License Finder on Windows is disabled in JustIMAGE 5.4.

License Denial/Check-out Failure

You will not be able to run JustIMAGE 5.4 if you don't have a valid license. You will be able to see who has license features checked-out from the JustIMAGE 5.4 Graphical User Interface. You can also use the `lmstat` command line tool to see who has license features

checked-out.

Support for reclaiming idle license check-outs is enabled. Reclaim is, by default, after two hours of idle time. The TIMEOUT options file keyword can be set with a minimum time-out of 900 seconds (15 minutes).

All check-outs succeed when done by the same user on the same host (duplicate grouping). By default, only license features needed are checked-out on the start-up of JustIMAGE 5.4. Please contact Justcroft should you wish all license features to be reserved for the user.

Heart-beats

Automatic heart-beats are disabled for the command line programs. This is the same behavior as with the Justcroft License Server.

The graphical user interfaces of JustIMAGE 5.4 uses automatic heart-beats. The heart-beat interval is 10 minutes. Re-connection is set to 5 attempts with a 1 minute retry interval. The program will exit with the message "Lost license, cannot re-connect" should re-connection still fail after 5 minutes.

Host Naming Convention

JustIMAGE 5.4 will refer to local host names by their fully qualified domain name (FQDN). You may want to override this behavior using an options file.

FlexNet Borrow Support

FlexNet borrow allows users to borrow a license. With a borrowed license the user can use the JustIMAGE product without access to the license server. The user tool for borrowing a license can be started from the menu bar in the JustIMAGE GUI by selecting "FlexNet borrow..." from the Help menu. The user tool is described in the User Manual.

License file

The borrow option must be enabled in the FlexNet license file. The keyword BORROW specifies the borrow time in hours.

```
FEATURE JCGM/VIEWER justint 5.3 permanent 1 DUP_GROUP=UH \
     ISSUED=30-Mar-2018 BORROW=336 NOTICE="Justcroft Borrow lic#00" \
     SIGN="0083 417D 3A9F BB46 529D 583E 73EC 5300 19D5 6631 8568 \
     4BF7 DC47 A0D3 95FF"
```

When you have a FlexNet JustIMAGE 5.4 license, and would like to have support for FlexNet borrow, please contact Justcroft support. The maximum borrow time can be customer specific.

Borrow policy

By default, all users are allowed to borrow a license. The borrow policy can be defined in the vendor daemon option file.

The following keywords can be used:

- BORROW_LOWWATER Sets the number of licenses for a BORROW feature that cannot be borrowed.

- EXCLUDE_BORROW Excludes a user or predefined group of users from the list of who is allowed to borrow licenses.

- INCLUDE_BORROW Includes a user or predefined group of users in the list of who is allowed to use the BORROW feature. Anyone not in an INCLUDE_BORROW statement is not allowed to borrow licenses. EXCLUDE_BORROW supersedes INCLUDE_BORROW.

Details of the FlexNet option file can be found in the FlexNet Publisher license administration guide.

An example of the option file is shown below with a low water of 2 and only users jbrown and pblack allowed to use the borrow option.

```
BORROW_LOWWATER JCGM/VIEWER 2
BORROW_LOWWATER JCGM/INPUTCONVERTER 2
BORROW_LOWWATER JCGM/OUTPUTCONVERTER 2
GROUP  borrowusers jbrown pblack
INCLUDE_BORROW JCGM/VIEWER  borrowusers
INCLUDE_BORROW JCGM/INPUTCONVERTER borrowusers
INCLUDE_BORROW JCGM/OUTPUTCONVERTER borrowusers
```

Borrow Problems

When a license borrow fails the JustIMAGE FlexNet borrow tool gives an error message.

The following error messages are possible:

- *The borrow of a JustIMAGE license failed. The borrow option is not enabled in the license.* FlexNet borrow must be enabled in the Flex license file. If the BORROW option is not enabled in the license file please contact Justcroft.

- *All available licenses are in use. A borrow of a JustIMAGE license is at the moment not possible.* There must be free licenses available when the user tries to borrow.

- *The borrow of a JustIMAGE license failed.* You are excluded or not included to use the borrow option. A user can get this error when the borrow policy is restricted by the

> INCLUDE_BORROW or EXCLUDE_BORROW options in the option file.

- *No connection with license server. License cannot be returned.* When trying to return a borrowed license there must be a working network connection between the user's system and the license server.

The FlexNet command line program `lmborrow` can be used to check the borrow status on the user's system. In case of problems always check the FlexNet server status first. This can be done with "`lmstat -a`" or inspecting the server log file.

FlexNet Server Configuration

This section explains how to configure the JustIMAGE 5.4 FlexNet concurrent license server on a Windows server using LMTOOLS.

Before you begin the configuration, make sure that you are using the correct FlexNet version. Start LMTOOLS and check the Publisher version (v11.17.0.0) with LMTOOLS → Help → About.
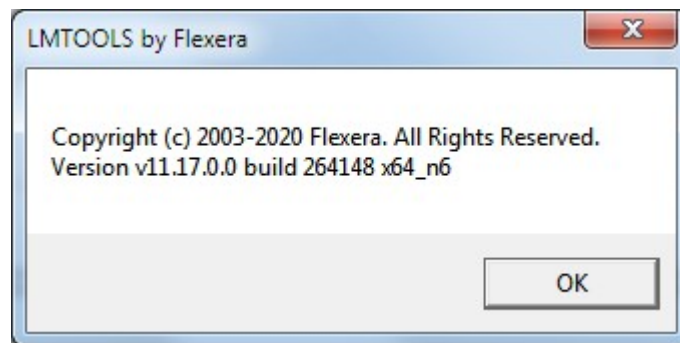
Illustration 26: LMTOOLS about dialog.

Make sure only one LMTOOLS program is used to configure all the FlexNet vendor daemons. Multiple LMTOOLS configurations could result in the justint daemon being started twice resulting in the following failure:

```
10:42:08 (lmgrd) Detecting other license server manager (lmgrd)
processes...
10:42:12 (lmgrd) justint already running 27004@FLEXNET_SERVER
10:42:12 (lmgrd) The license server manager (lmgrd) is already serving
all vendors, exiting.
```

The JustIMAGE 5.4 FlexNet license file which you will receive from Justcroft via email will be called `license.lic`.

Configure Service

Within LMTOOLS select the "Config Services" tab and enter a new service name within the "Service Name" field.

Click on the "Path to the lmgrd.exe file" Browse button and select the lmgrd.exe file.
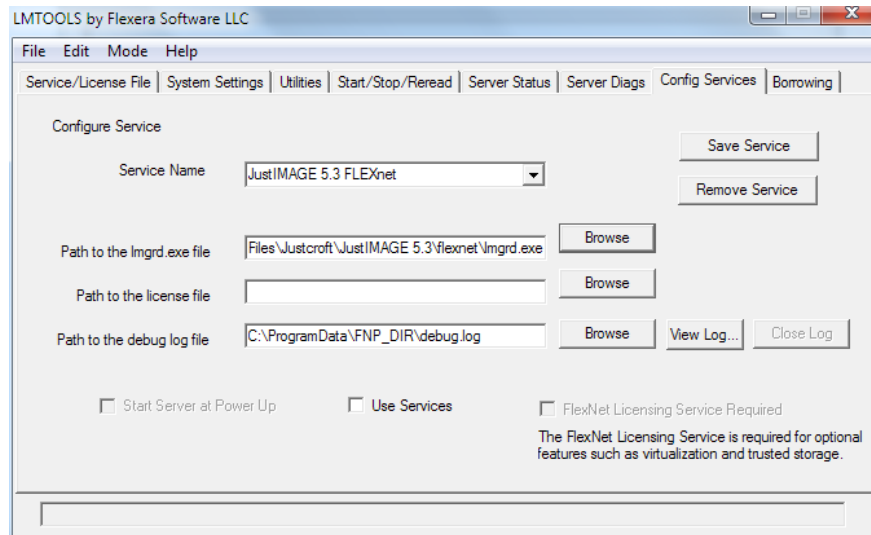
Illustration 27: LMTOOLS Configure Service.

Click on the "Path to the license file" Browse button and select the license file.

Enable "Use Services" and "Start Server at Power Up" options. Click on "Save Services' to save the configuration.
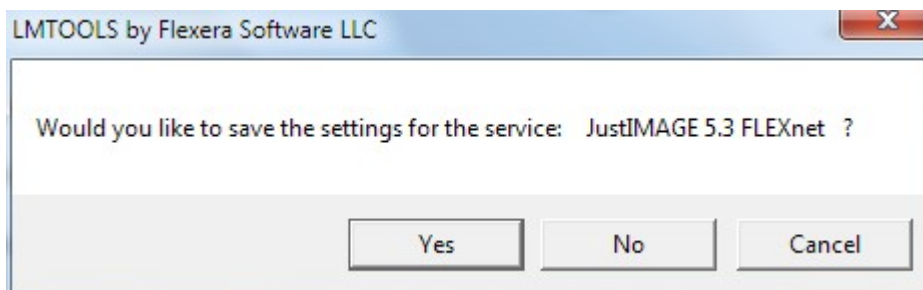
Illustration 28: LMTOOLS save server settings.

You will be asked if you want to save the service settings. Click on Yes.

Select the "Start/Stop/Reread" tab. Click on "Start Server". Make sure you see the "Server Start Successful" message in the log field.

Should you see the "VD is starting, please check vendor daemon's status in debug log" message then something went wrong. Select the "Config Services" tab and click on "View Log...".

Check the text in the log carefully for the error message. See an example below.

C:\ProgramData\Justcroft\JustIMAGE 5.3\flexnet\justint.log

```
14:00:57 (lmgrd)   and UNIX.
14:00:57 (lmgrd)
14:00:57 (lmgrd) ------------------------------------------
14:00:57 (lmgrd)
14:00:57 (lmgrd)
14:00:57 (lmgrd) Server's System Date and Time: Mon Jul 02 2018 14:00:57 W. Europe Daylight Time
14:00:57 (lmgrd) pid 9372
14:00:57 (lmgrd) SLOG: Summary LOG statistics is enabled.
14:00:57 (lmgrd) license manager: can't initialize:Cannot find license file.
14:00:57 (lmgrd) The license files (or license server system network addresses) attempted are
14:00:57 (lmgrd) listed below.  Use LM_LICENSE_FILE to use a different license file,
14:00:57 (lmgrd) or contact your software provider for a license file.
14:00:57 (lmgrd) Filename: "C:\flexlm\license.dat"
14:00:57 (lmgrd) License Path: "C:\flexlm\license.dat"
14:00:57 (lmgrd) FlexNet Licensing error:-1,359
14:00:57 (lmgrd) System Error:2 No such file or directory
14:00:57 (lmgrd) Using license file "C:\flexlm\license.dat"
```

Illustration 29: FlexNet log.

FlexNet Port Number

When using a FlexNet port number in the license file make sure the same port number is used with the environment variable on the user computers.

For example if port number 4000 is configured within the license file.

```
SERVER sales01 d8fc93dd9802 4000
VENDOR justint
```

The JUSTINT_LICENSE_FILE environment variable should also contain 4000 as port number.
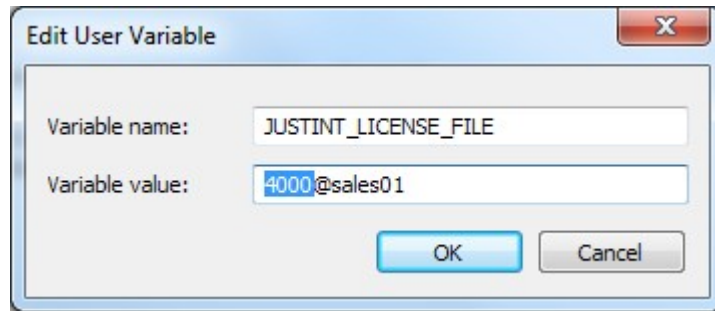
Illustration 30: Setting the JUSTINT_LICENSE_FILE environment variable on Windows.

Otherwise the following error could appear.
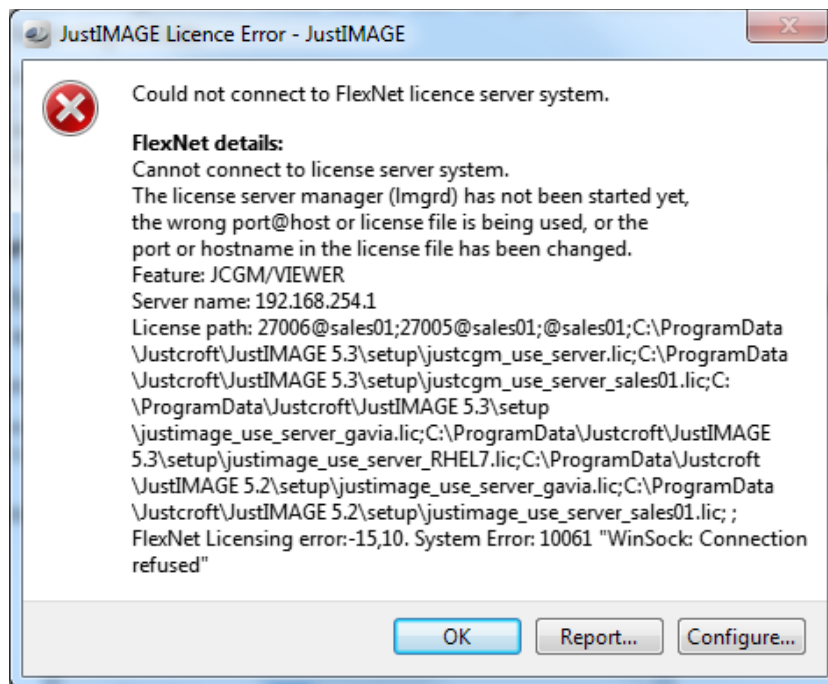
Illustration 31: JustIMAGE FlexNet license server connection error.

License Installation

JustIMAGE 5.4 will not start if a valid license has not been installed or a trial license has expired. When you buy one or more modules of the JustIMAGE program suite, you will receive a permanent (not date limited) license file from us. The license file will contain all the licenses for the modules you have bought access to.

The license file will be called `license.dat` for the Justcroft Trial, Single Seat/User License or Concurrent license system. Note: The Justcroft license system is not the same as the FlexNet license system. When using the FlexNet license system the license file will be called `license.lic`.

You will receive the license file usually as an e-mail attachment. Save the attachment to your computer. Follow one of the license installation procedures described below depending on the license type.

Important: You must have installed the FlexNet enabled version of JustIMAGE 5.4 in order to use the FlexNet license system. If you have installed a trial version of JustIMAGE 5.4 you should uninstall this first and install the FlexNet enabled version.

Trial License

No specific host information is required from you. You will receive a trial license if you have downloaded JustIMAGE 5.4 from our download page on the web. After you have downloaded and installed JustIMAGE 5.4, start the program. A JustIMAGE License Error will appear but you should click on `Configure` to install the trial license.
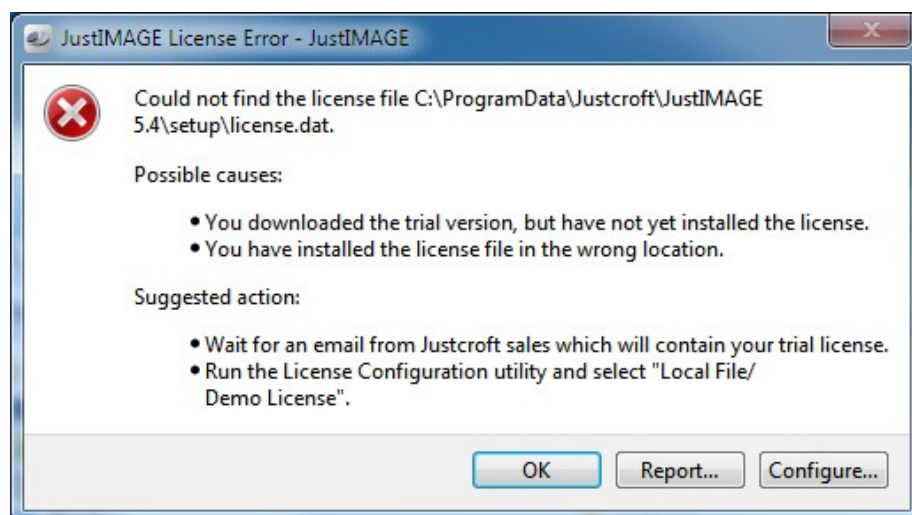
Illustration 32: License error.
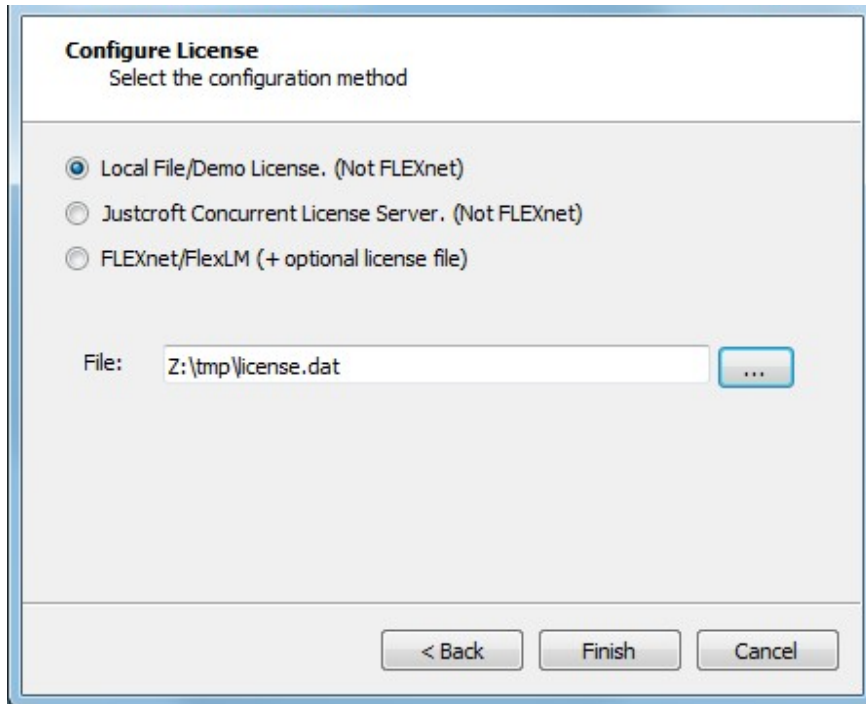
Illustration 33: Configure a license using a local file

In this screen you select the type of license you have received. You should select `Local File` and then browse to where the evaluation license has been placed. Click `Finish` to continue.

JustIMAGE 5.4 will start and you will be able to check the trial period using JustIMAGE 5.4 ⇨ Help ⇨ About ⇨ Show Details.
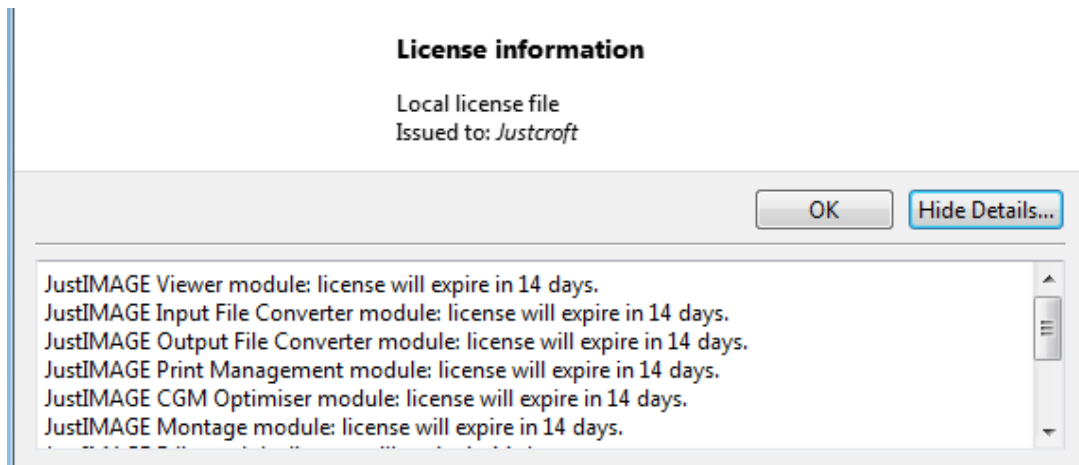
Illustration 34: License information details in the JustIMAGE 5.4 About dialog box.

Single Seat/User License

We need the host-id of the computer or computers on which you want to run JustIMAGE 5.4. If you do not yet have a license, then start JustIMAGE 5.4 and select "Host Information" from the JustIMAGE License Setup window.
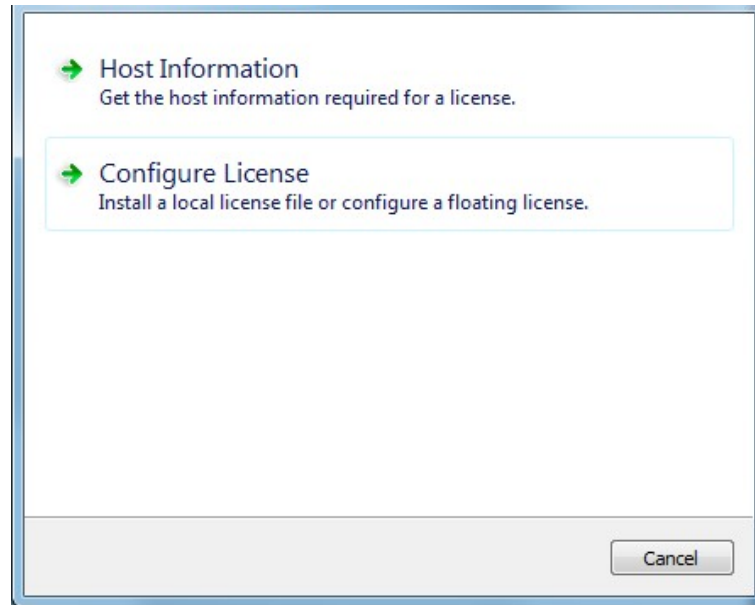
Illustration 35: Selecting the Host Information screen.

The Host Information screen will appear.
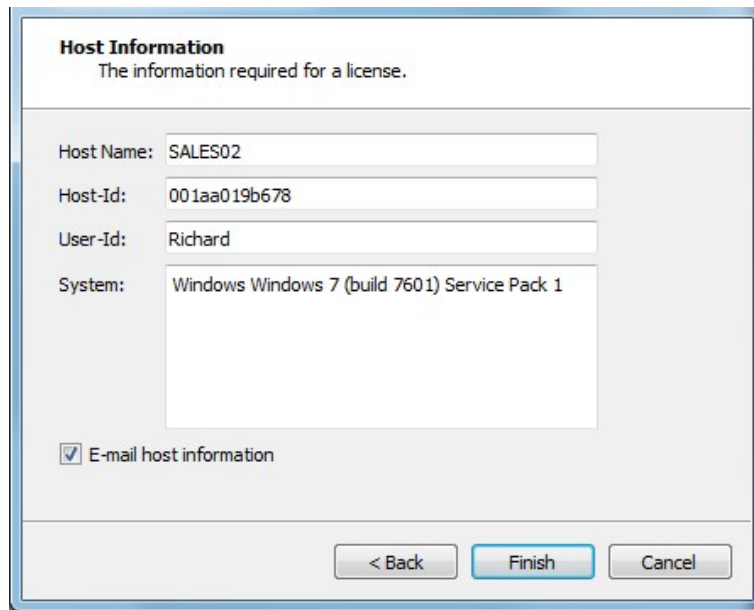
Illustration 36: The Host Information screen.

Click on the `Finish` button and a license information file (`host-info.txt`) will be placed on the computer. Note that the "E-mail host information" toggle will start your e-mail application with the license information file as attachment.
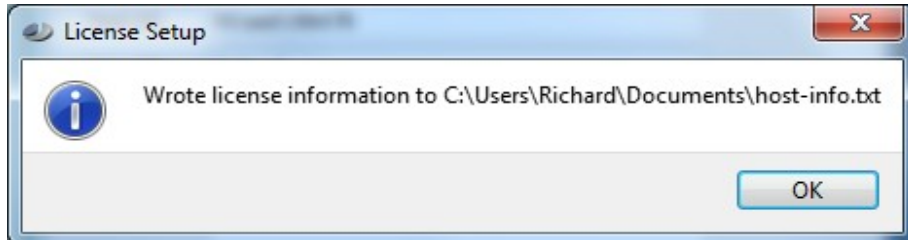
Illustration 37: Host information written confirmation message.

Send this license information file to Justcroft and, *after* we have received payment, you will receive the Single Seat/User License.
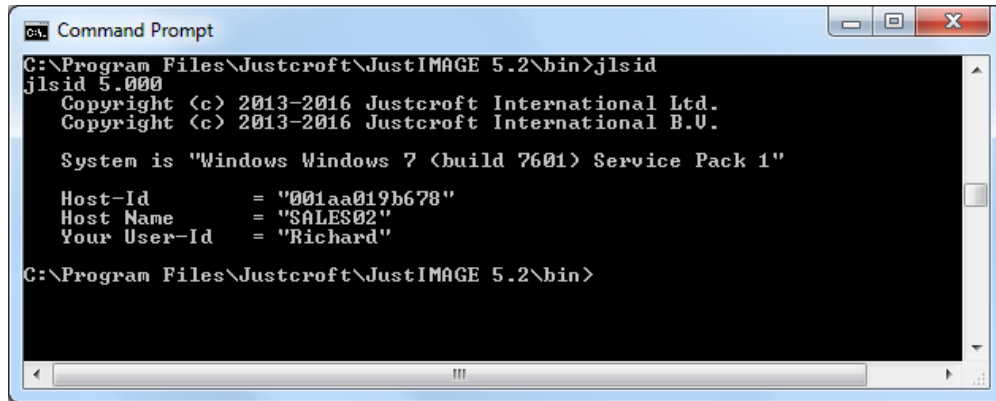
If you already have a license then go to the JustIMAGE 5.4 ⇨ Help ⇨ Host Information menu. The Host Information dialog box will appear.

Installing a Single Seat/User License is performed by following the same procedure as installing an evaluation license.

If the software is running from a local drive, then repeat this procedure for every computer that has a Single Seat/User License. You do not need to repeat this procedure if you are running the software from a server network share.

Justcroft Concurrent License

You need to run the `jlsid` utility on the concurrent license server to get the host-id and the host name of the Justcroft Concurrent License Server.

Illustration 38: Result of the jlsid command line tool.

For more details see the Justcroft License Server documentation.

The license file you receive from us should be copied to the installation folder of the Justcroft License Server. Read the Justcroft License Server documentation for details on how to do this.

You need to configure the concurrent license setup so that JustIMAGE 5.4 can locate the Justcroft License Server on the network.

Use JustIMAGE 5.4 ⇨ Help ⇨ Install License or, if JustIMAGE 5.4 isn't running, browse to the JustIMAGE 5.4 installation directory. On Windows double click *path*\bin\jcgmlicsetup.exe and on Linux run *$JUSTIMAGE54_HOME*/bin/jcgmlicsetup. Select Configure License and add the name of the Justcroft Concurrent License Server in the Host name field.
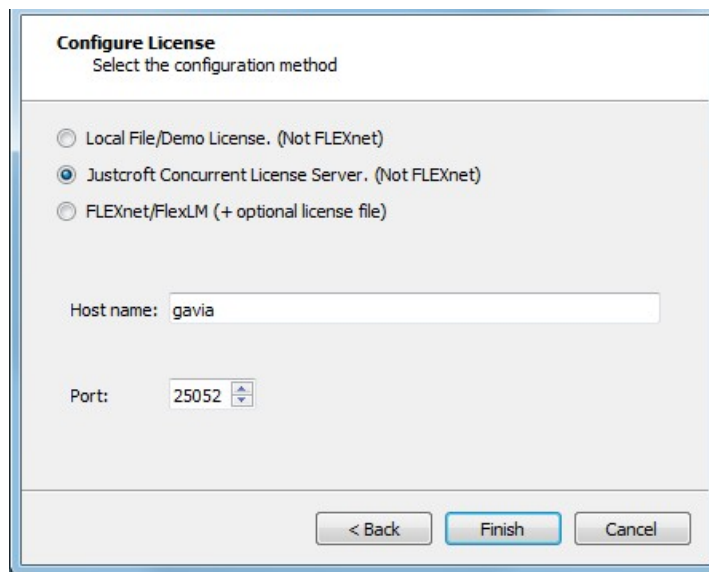
Illustration 39: Setting the host name to the concurrent license server.

FlexNet License Information

On both Windows and Linux/UNIX the Ethernet MAC address is used as the host-id. Use the `lmhostid` utility that is delivered with the FlexNet enabled version of JustIMAGE 5.4 to get the host-id.

Illustration 40: Result of the lmhostid command line tool.

Installation Single Seat/User License

For the Single Seat/User License, the license file needs to be installed on the computer on which the FlexNet enabled version of JustIMAGE 5.4 is installed. Use either the Install License tool or copy the file directly in the default license file location. See the FlexNet chapter for more details.

Installation Concurrent License

JustIMAGE 5.4 uses the Justcroft International vendor daemon: `justint` which is supplied

by Justcroft International. The vendor daemon is currently available on Windows 7 or higher and on Linux Red Hat Enterprise 6.0 or higher.

Windows: The vendor daemon `justint.exe` and `lmgrd.exe` are, by default, not installed. In the "Custom Setup" dialog enable the FlexNet Daemon feature. You can disable all the other JustIMAGE 5.4 features if you so desire. The vendor daemon will be installed in the `justint` sub-folder of the installation.
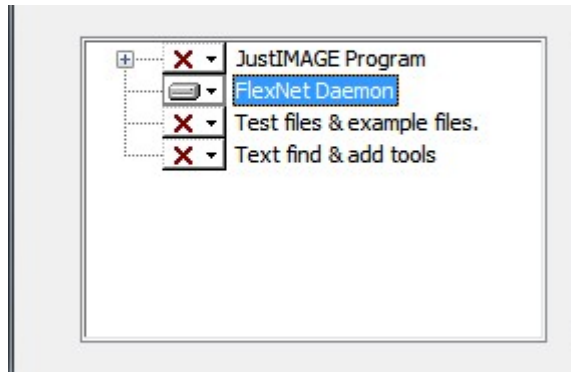
Illustration 41: Enabling the installation of the FlexNet daemon.

Linux: The vendor daemon `justint` and `lmgrd` can be found under the `setup/justint` sub-directory of the installation.

For more details see the FlexNet chapter.

JustIMAGE Graphical User Interface

Starting JustIMAGE 5.4

There are several ways to start the main Graphical User Interface of JustIMAGE 5.4:

- On Windows: Select Start ⇨ All Programs ⇨ Justcroft JustIMAGE 5.4 ⇨ JustIMAGE 5.4.

- On Windows: Double-click the desktop icon "JustIMAGE 5.4".

- On Linux: Start from a console the `justimage` script in the bin sub-directory of the JustIMAGE 5.4 installation. Alternatively you can run the `justcgm` script if you prefer.

You can specify the following optional parameter(s) when running `justimage` from a command line:

-help	Show the command line usage.
-version	Show the JustIMAGE 5.4 main interface version number.
-file *<file>*	Start the JustIMAGE 5.4 main interface with the given file.
-url *<URL>*	Start the JustIMAGE 5.4 main interface with the given URL. If the URL points to a remote file it will be downloaded first. The supported URL schemes are file, http and ftp.
-export	Open the given file or URL in the JustIMAGE 5.4 Export dialog box. The main interface program will stop after the Export dialog has been closed. You can also right-click on a CGM file from the Windows Explorer and select "JustIMAGE 5.4 Export".
-export-pptx	Windows only: Open the given file or URL in the JustIMAGE 5.4 Export to PowerPoint dialog box. The main interface program will stop after the Export to PowerPoint dialog has been closed.
-print	Open the given file or URL in the JustIMAGE 5.4 Print dialog box. The main interface program will stop after the Print dialog has been closed. You can also right-click on a CGM file from the Windows Explorer and select "JustIMAGE 5.4 Print".

The Main Window
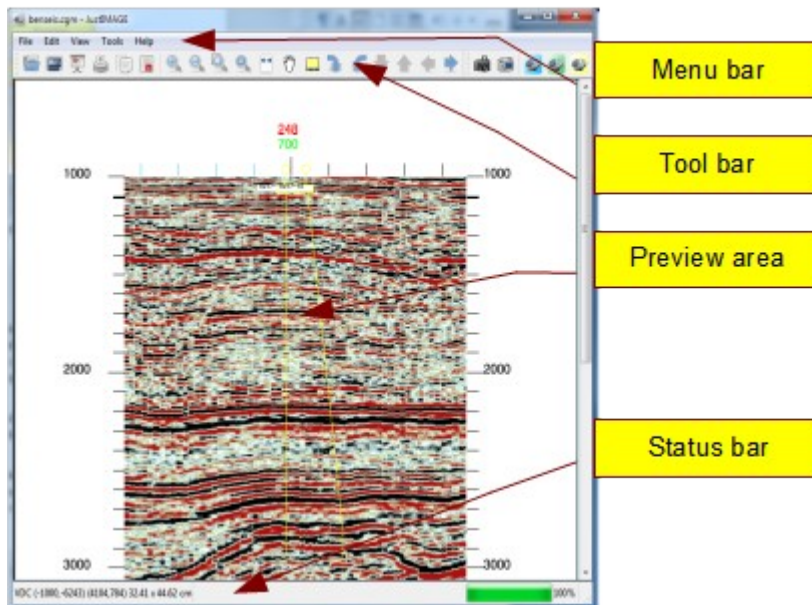
Illustration 42: The JustIMAGE 5.4 main window layout.

The main window has four areas:

1. A menu bar area.

2. A toolbar with icons to the most common commands. You can hide the toolbar by right-clicking the toolbar and select "Tool Bar" from the context menu. You can tear off the toolbar from the main window and position it as a floating toolbar anywhere on your desktop. You can also attach the toolbar to any side other than above the preview window.

3. The preview area. This will show the currently loaded CGM picture. Right clicking on the preview area while a picture is loaded brings up a pop up menu with shortcuts to the most common menu commands.

4. A status bar area. The left area of the status bar describes actions of menu items as you use the arrow keys to navigate through menus. It also shows VDC extent and VDC size if an image is loaded. The right area shows the render progress.

Version and License Information

You may be asked by our support center for the product suite version number and possible application. You can find this information under the `Help > About...` menu.

Illustration 43: The JustIMAGE 5.4 About dialog box.

In the example above you see that the product suite version number is "5.4.00". This means that it is JustIMAGE 5.4 first release indicated by the trailing 00. You also see if you have the FlexNet enabled version. The version number of the program is "2.205". You also see the date and time when the executable was created and on what kind of computer system.

You can see under "License Information" what type of license you have and to whom it has been issued. Click on the "Show Details..." button to see information about the individual modules of JustIMAGE 5.4. You will also see when the module license might expire if you are evaluating.
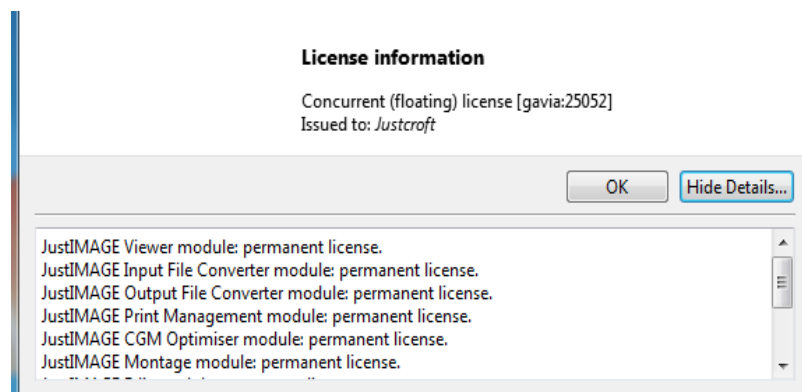
Illustration 44: License Information details.

User Preferences

Global user settings of JustIMAGE 5.4 can be found in the preferences dialog box. Open the preferences dialog box by selecting "Preferences…" from the `Edit` menu. The preferences dialog box is divided into several sections. Use "Restore Defaults" to reset the preference settings to their default values. Press `OK` to save your preferences. Note that the changes you make are not always applied immediately.

Display Preferences

The "Display" preference settings control the JustIMAGE 5.4 preview area.
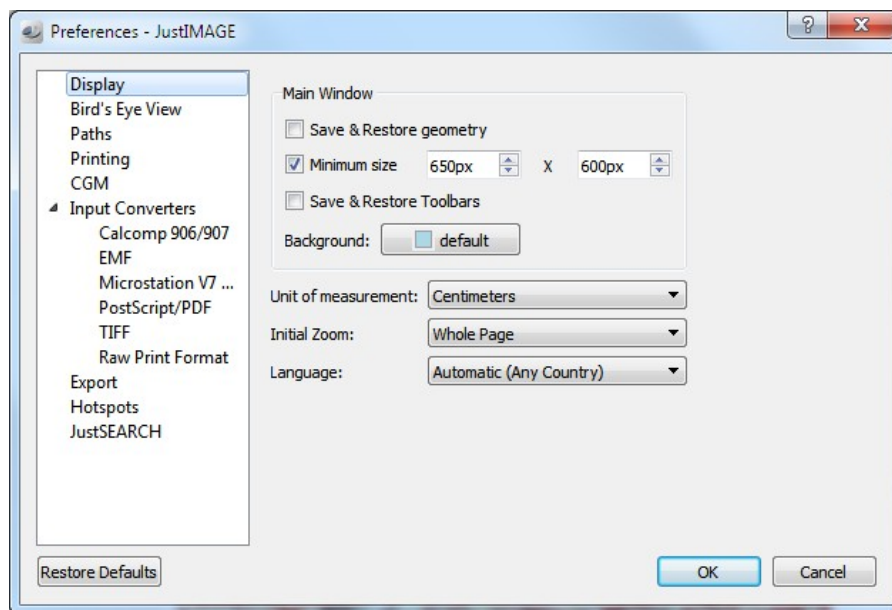
Illustration 45: The Display preferences.

The size and position of the main window is by default related to the display size. You can save and restore the size and position of the main window by enabling the "Save & Restore geometry" setting.

The main window has by default a minimum size of 650 x 600 pixels. You can change this minimum size or disable it altogether.

The position of the toolbar(s) is by default restored to their standard location. You can save and restore their position and state by enabling the "Save & Restore Toolbars" option.

The background color of the preview area can be set with the "Background" option. You can choose from a predefined set of colors or select a custom color.

JustIMAGE 5.4 uses millimeters internally for all measurements and calculations.

JustIMAGE 5.4 can also show measurements in centimeters or inches. The default metrics are based on the desktop settings of your OS. The "Unit of measurement" allows you to set this to specific metrics. For those interested: 25.4 mm ≈ 1 inch.

The "Initial Zoom" option allows you to set the default zoom level when you open a file.

The "Language" option allows you to set the User Interface language if supported. The default selects the language based on the user's desktop language setting or American English if the language is not supported. Note: You must restart the JustIMAGE 5.4 User Interface to see the effect of this option.

Bird's Eye View Preferences

The Bird's eye view window is by default always on top of the main view window. You can disable this behavior by disabling the "Always stay on top" setting.

Paths

You see here the various directories used by the JustIMAGE 5.4 program suite.
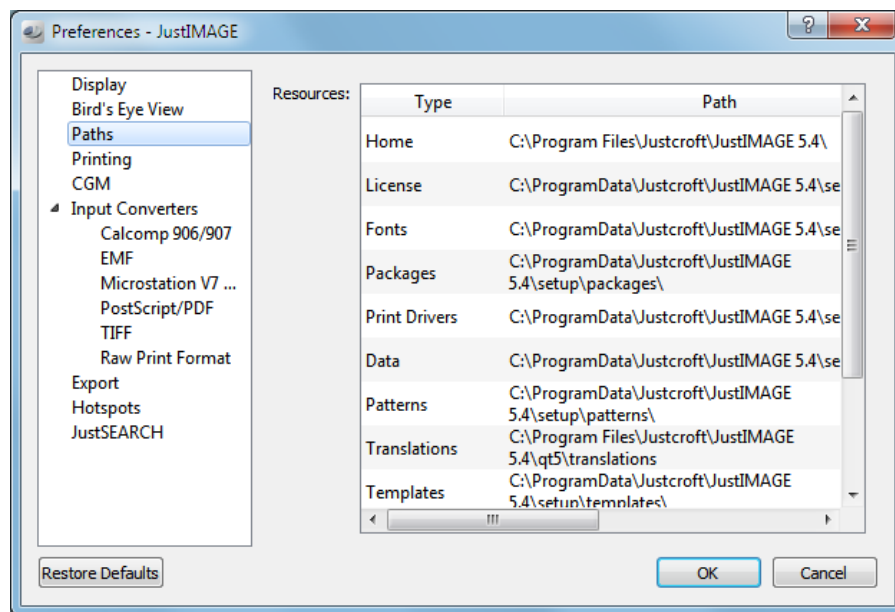
Illustration 46: The Paths preferences.

Printing Preferences

You can set here the various settings related to printing.
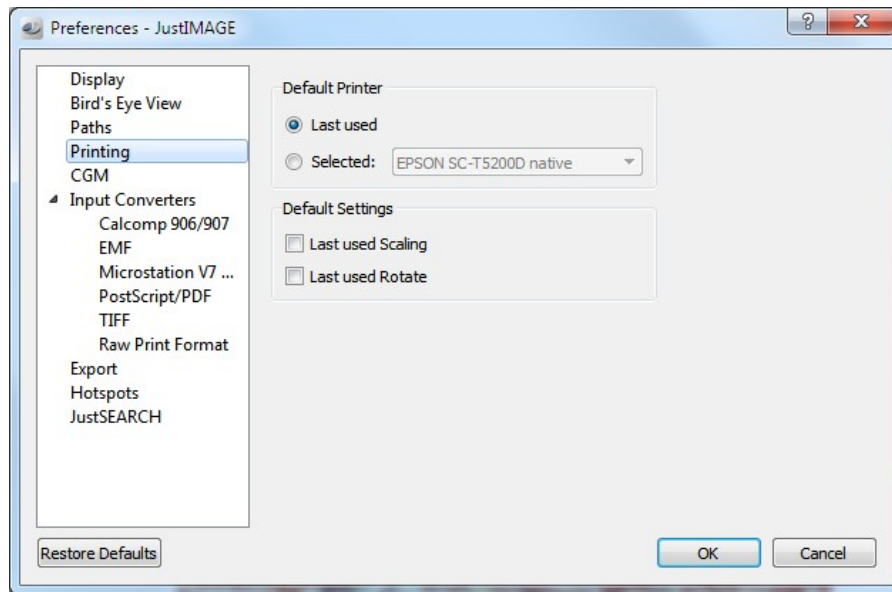
Illustration 47: The Printing preferences.

The default printer queue when opening the Print dialog box can be either:

- "Last used". Set the last used printing queue as the default.

- "Selected". Select the default printing queue from the combo box drop down list.

The default settings of the Print dialog can be influenced with the "Default Settings" options. Use the "Last used Scaling" option to force the Print dialog to come up with the last used image scaling setting. This option is by default disabled and the Print dialog will come up with no scaling applied.

Use the "Last used Rotate" option to force the Print dialog to come up with the last used image rotation setting. This option is by default disabled and the Print dialog will come up with the image rotated as previewed.

CGM Preferences

The CGM preferences allow you to control the interpretation of a CGM.
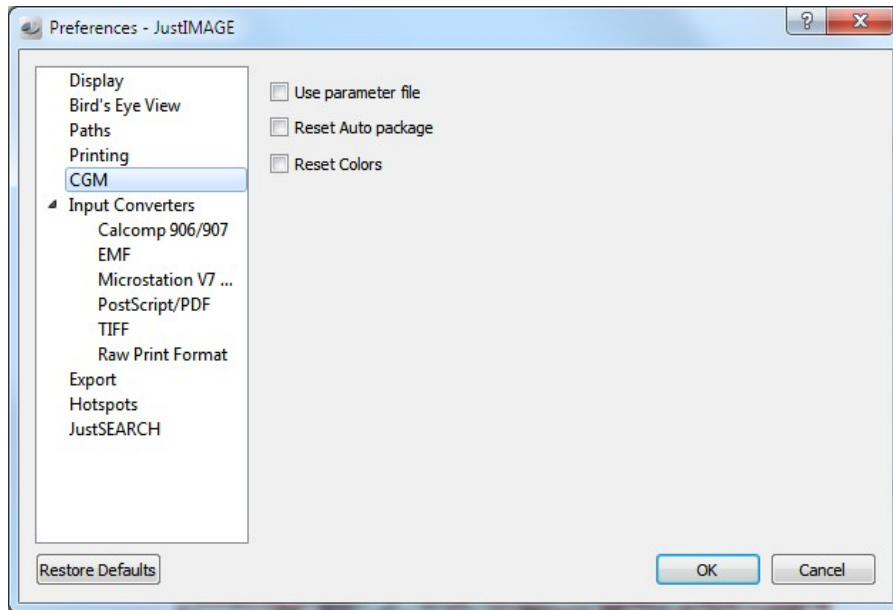
Illustration 48: The CGM interpretation preferences.

"Use parameter file" enables support for old ProMAX and Finder parameter files. These applications specify some crucial CGM information in a separate parameter file. Our CGM interpreter can use the parameter file to show a correct CGM file. JustIMAGE 5.4 assumes that this parameter file has the same name as the CGM but has one of the following extensions: `.cgmp`, `.cgm_cntl` or `.par`.

"Reset Auto package" causes the currently used CGM package to be reset to the default detection each time you open a file.

"Reset Colors" causes the CGM Color Redefinition to be reset to the defaults each time you open a file.

Input Converter Preferences

The following settings control the import conversion options of graphics formats other than CGM. There are settings that apply to all types of import while others are format specific.
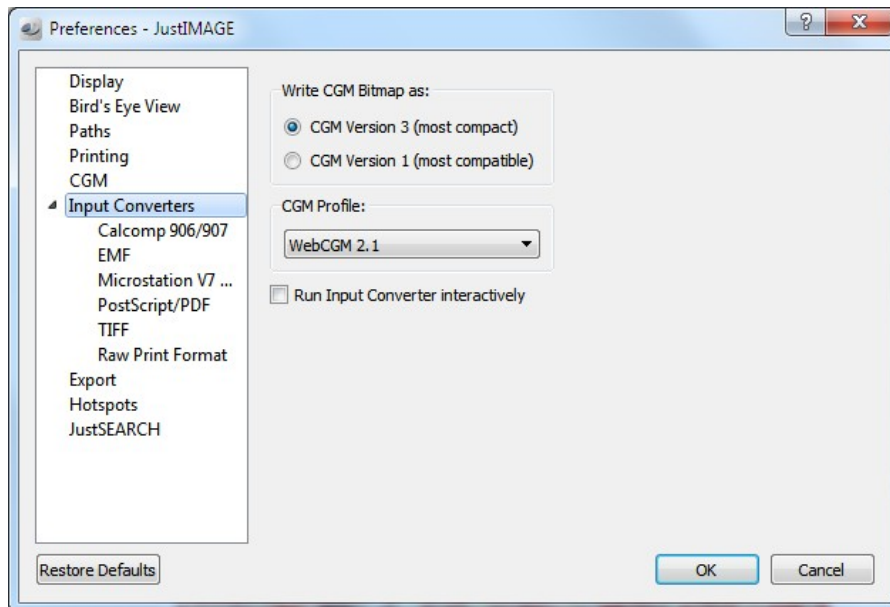
Illustration 49: The general Input Converter preferences.

"Write CGM Bitmap as" controls the way bitmap only CGMs are generated. This applies to most bitmap conversions and screen captures. Select "CGM Version 3" for the most compact file format. However, you may encounter problems using such CGMs in other applications. Select "CGM Version 1" if the CGM Version 3 format is not supported by your application. This does result in much larger files.

The "CGM Profile" setting allows you to control the profile to be used when generating a CGM Version 3 file. You may want to set this when exchanging files with other organizations. Selecting "ATA Graphics Exchange 2.6", "WebCGM 1.0" or "WebCGM 2.1" will also disable automatic rotation for CALS 1/2 and TIFF files.

Selecting "WebCGM 2.1" will also result in slightly compacter CGM files that are also better for use with JustEDIT.

Enabling the "Run Input Converter interactively" allows you to manually set conversion options during the import of the non-CGM.

CalComp 906/907

The following settings are specific to the CalComp 906 and CalComp 907 plotter formats.
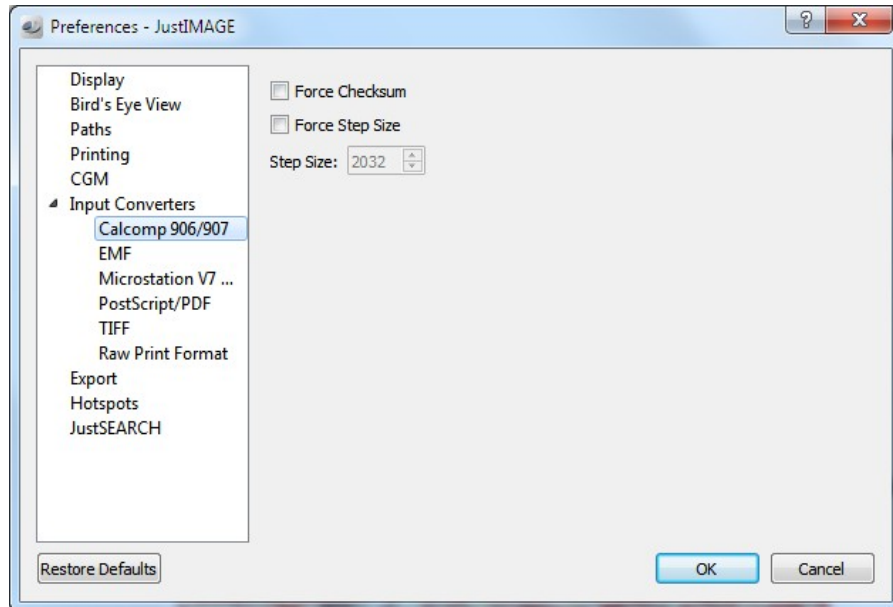
Illustration 50: The Calcomp 906/907 conversion preferences.

You can force the use of a checksum. Warning: It is recommended to let JustIMAGE 5.4 auto-detect the check sum. Forcing a checksum on files that do not contain the checksum causes the conversion to fail.

You can force the step size to a specific value. The value must be between 32 and 9600. The default is 2032, or the value specified in the CalComp controller header if found. Step sizes influence the metric size of the conversion.

EMF

The following settings are specific to the EMF image format.
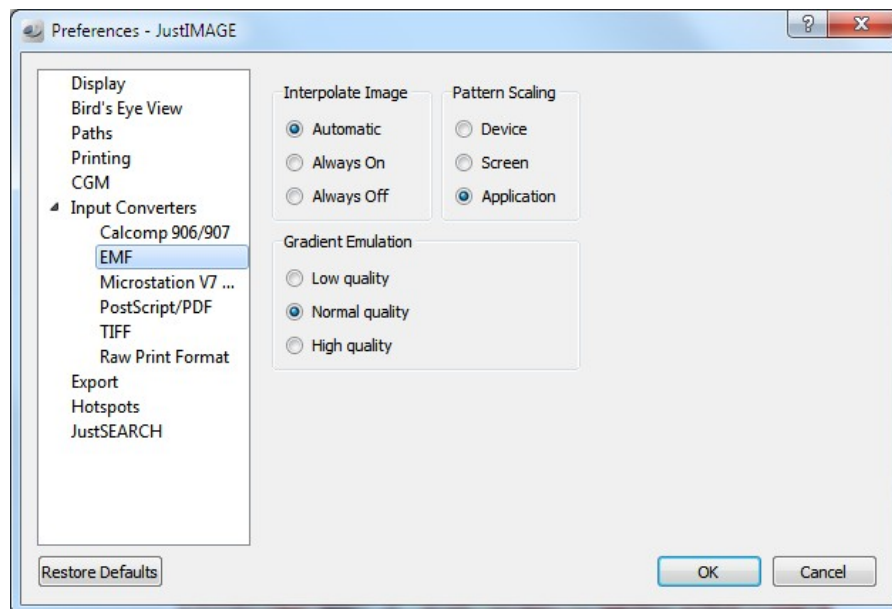
Illustration 51: The EMF conversion preferences.

You can interpolate an image in three different ways. "Automatic" means that the converter determines interpolation mode. "Always On" forces the use of image interpolation, while "Always Off" disables image interpolation. Note: Image interpolation is handled by a Justcroft private CGM Escape –12000.

Patterns can be scaled in three different ways. "Device" means that patterns are scaled for the reference device used to generate the EMF. "Screen" means that patterns are scaled based on the screen device (monitor). Patterns under Windows don't scale, so any scaling has to be handled by the application. Some applications such as Petrel 2007.1 don't scale and the patterns may appear too small. Use this option if this is the case. "Application" means that pattern scale is either based on the (reference) device used or based on the screen device depending on the application that generated the EMF. If the application could not be determined, the reference device is assumed

Gradient fills are emulated by the converter. The quality of the emulation can be specified. "Low quality" gives a quick but poor conversion. This will result in relative small files. "Normal quality" gives the best trade-off between quality and file size. "High quality" gives the best quality but results in very large files. Don't use this option if you want to post edit the CGM with for example PowerPoint.

MicroStation V7 Design File

The following settings are specific to the MicroStation V7 file format.
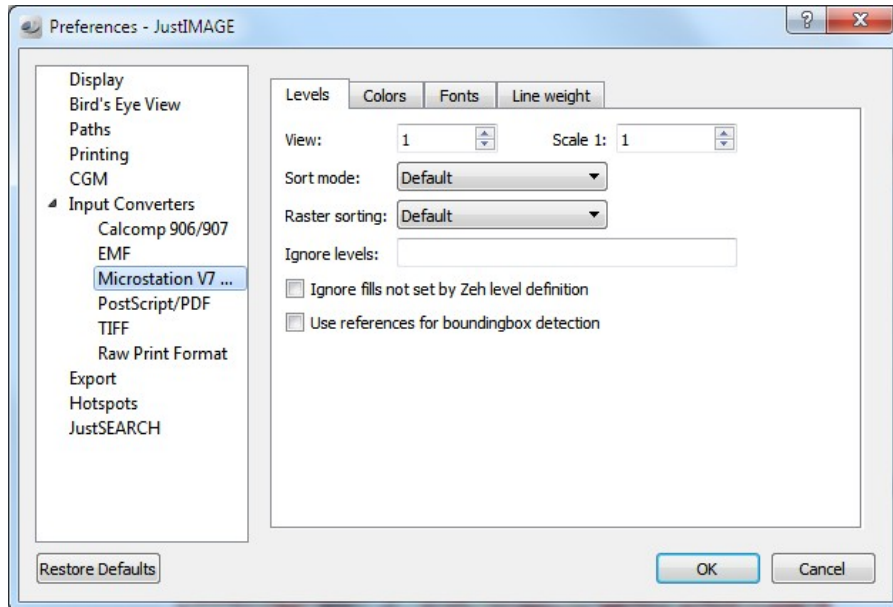
Illustration 52: The MicroStation Design File Level options.

You can override the Design file view that is converted with the "View" setting. You specify a scale factor to map metric Design file units to a metric CGM. Note: The scale option will only work if the Design file contains units that can be recognized by the converter.

You can sort levels in the following ways:

- Default. The default method to sort levels is to use the Zeh level definition element if found in the Design file.

- Zeh Level Definition. Use the Zeh level definition element for fills and priority.

- Zeh Priority Only. Use the Zeh level definition element only for priority. Elements are filled according to the MicroStation attributes.

- None. Ignore the Zeh level definition element. No element sorting will be done.

You can sort raster images in the following ways:

- Default. Sort images according to the image layer-id before vector elements are drawn.

- Zeh Level Priority. Sort images according to the Zeh level priority.

By default, all levels that contain elements are used by the converter. Use the "Ignore levels" field to leave out levels in the output CGM file. You can specify individual levels or ranges of levels. For example:

1   Ignore level 1.

1–4   Ignore levels 1, 2, 3 and 4.

1.7   Ignore levels 1 and 7.

Use the option "Ignore fills" not set by Zeh level definition to ignore unnecessary fills.

The boundingbox is by default defined by the extent of the master DGN file. Use the option "Use references for boundingbox detection" if reference drawings are partially outside this extent and must be included in the drawing.
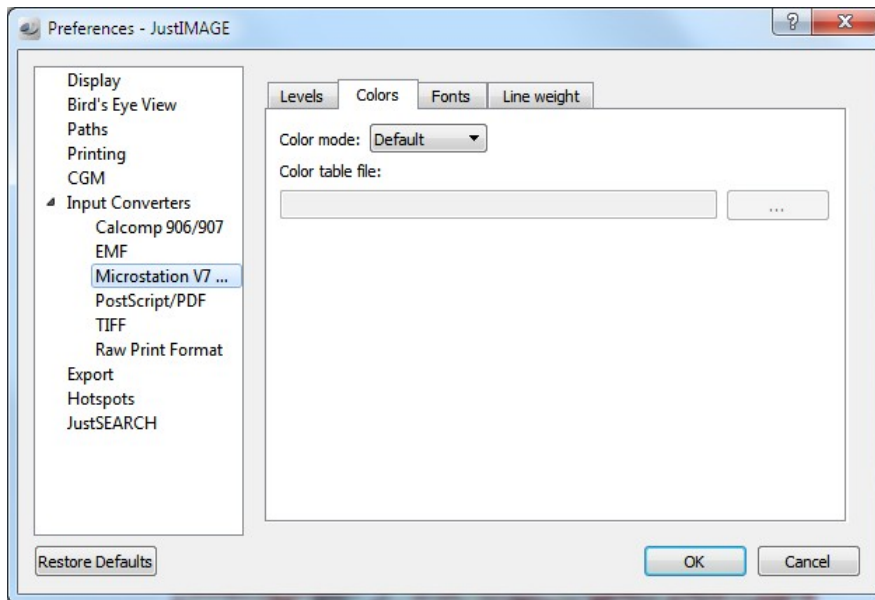
Illustration 53: The MicroStation Color Options.

Colors can be defined in the following ways:

- Default. Use the color table as found in the (reference) Design file. Use the standard MicroStation color table if no color table was found.

- MicroStation. Use an external MicroStation color table file as color table. You must specify the color table file in the Color Table file field.

- Zeh. Use an external Zeh color table file as color table. You must specify the color table file in the Color Table file field.

MicroStation font files are currently not supported by the MicroStation converter. You can however specify a font name mapping. MicroStation fonts are internally identified by a number. The font name mapping is used to map such a number to a font name.
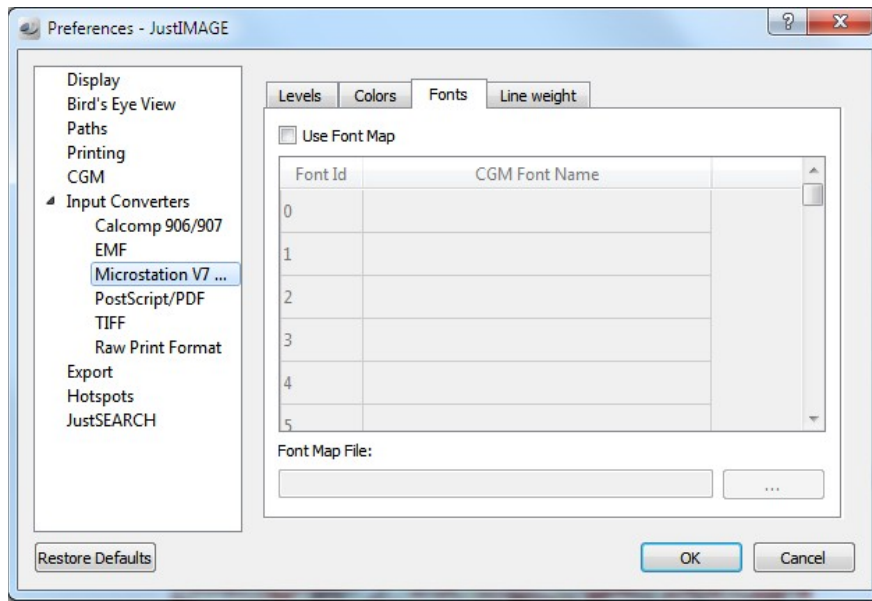
Illustration 54: The MicroStation Fonts options.

Highlight/select the second column ("CGM Font Name") of the slot for which you want to specify a font name. You can then enter a font name. Font names can be up to 60 characters.

You must create a font name mapping file. You will be prompted for a font file name if needed. You can also create multiple font name mapping files and switch between files. Unset the "Use Font Map" option to disable font name mapping.
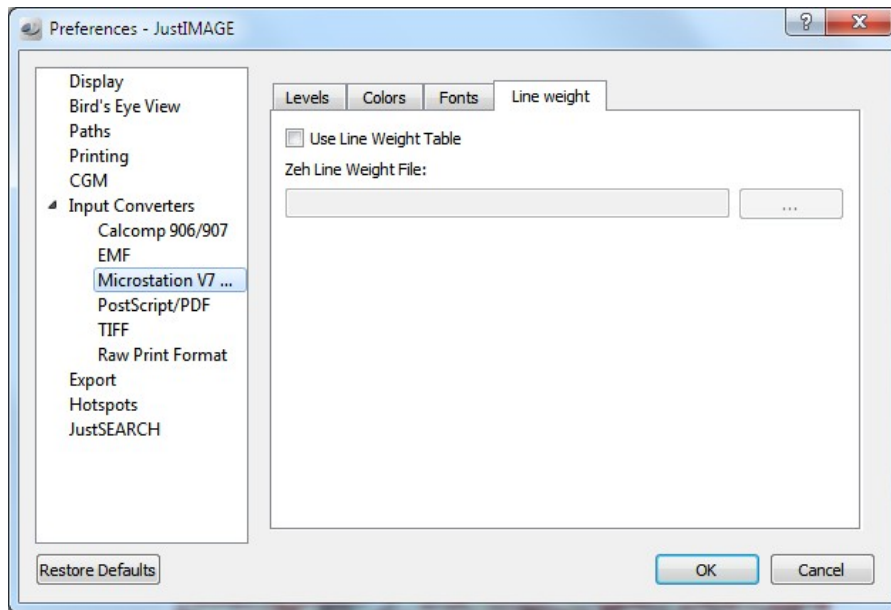
Illustration 55: The MicroStation Line Weight options.

You can specify a Zeh Line Weight table file to define the width of the different line weights. See your Zeh DGN Converter documentation for more information.

Note: Any (raster) attachment files are automatically processed as well. Look up of attachment files is performed by trying the absolute path of the attachment file or, should this fail, by trying the same directory as the master design file.

PostScript/PDF

The following settings are specific to the PostScript and PDF formats.
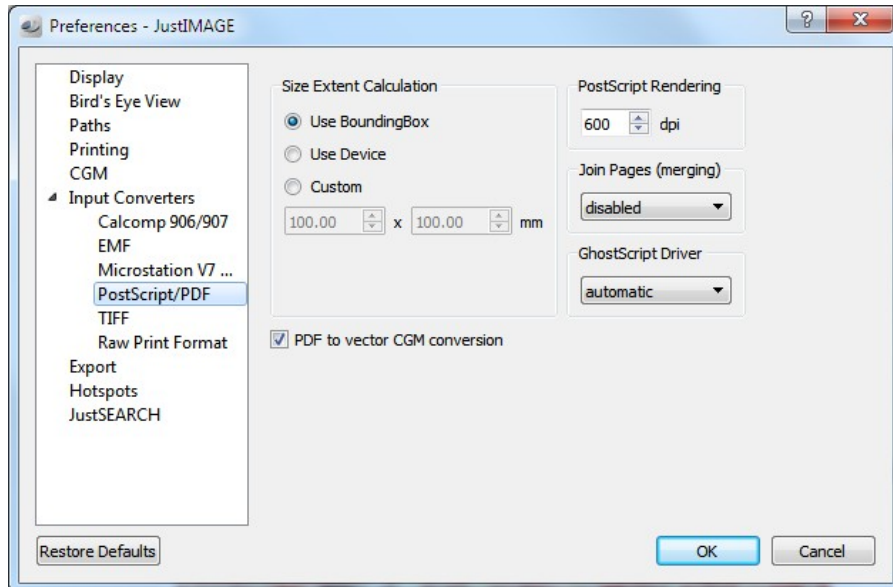
Illustration 56: The PostScript and PDF conversion preferences.

You can specify three different ways to calculate the PostScript image size extent:

- The default is to use the BoundingBox DSC comment of the PostScript file. This results, in most cases, in a correct size calculation.

- The second method is to use the device size commands of the PostScript file. This ensures a correct size calculation even when the BoundingBox is not specified correctly as might happen with some composite PostScript files. The disadvantage of this method is that it does not work for Encapsulated PostScript files (EPS).

- The third method allows you to specify the extent manually in millimeters. You can specify values between 5 cm (1.97") and 1000 cm (32.8 ft).

You can also override the PostScript raster density used to convert the PostScript file. Use low values to convert files quickly at the expense of the render quality. You can specify values between 50 dpi and 1200 dpi.

Well log images might have been broken up into two or more PostScript or PDF pages. Select either horizontal or vertical joining to stitch pages into a single image. Note: The same effect can be reached with the menu command `Tools ⇨ Stitch...`. It's better to leave this

option disabled, unless you always have a lot of PostScript or PDF pages that need stitching.

You can specify the type of GhostScript driver that will be used to convert the file into a CGM. The default is to automatically determine the best driver based on the type of file.

The option "PDF to vector CGM conversion" enables the vector PDF to CGM converter for converting PDF to CGM. This converter does not use GhostScript. This can result in better looking CGM output that scales better, has faster conversion and smaller output file sizes.

TIFF

The following settings are specific to the TIFF image format.
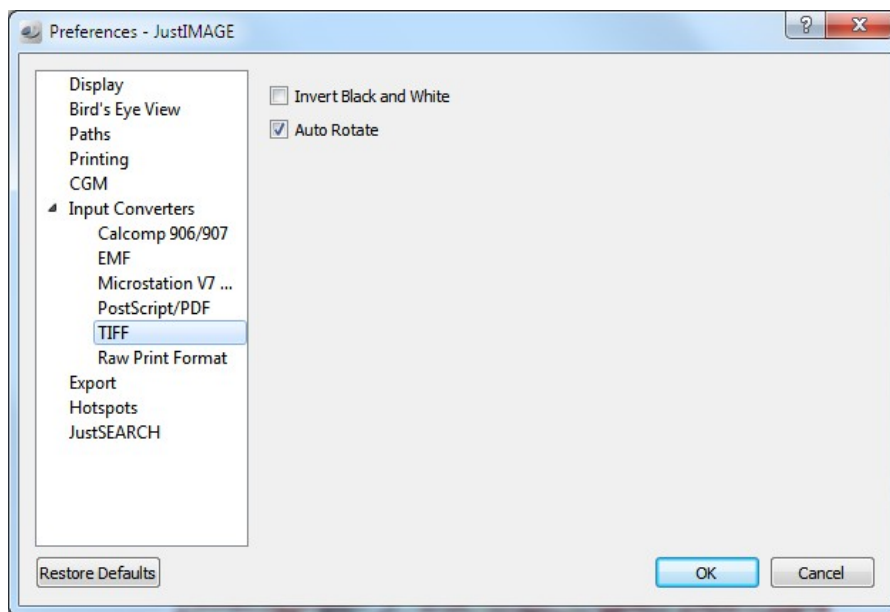
Illustration 57: The TIFF conversion preferences.

Some black and white TIFF files have a black background and a white foreground. The "Invert Black & White" option allows you to invert black and white in black & white TIFF images and in index color TIFF images.

The "Auto rotate" option rotates long TIFF files to landscape. This is an optimization for printing and plotting of scans of Well Logs. You may want to disable auto rotate to ensure that the created CGM matches the original TIFF image. Note that if you created CGMs according to the ATA profile or the WebCGM profiles then the "Auto Rotate" option has no effect.

Raw print format
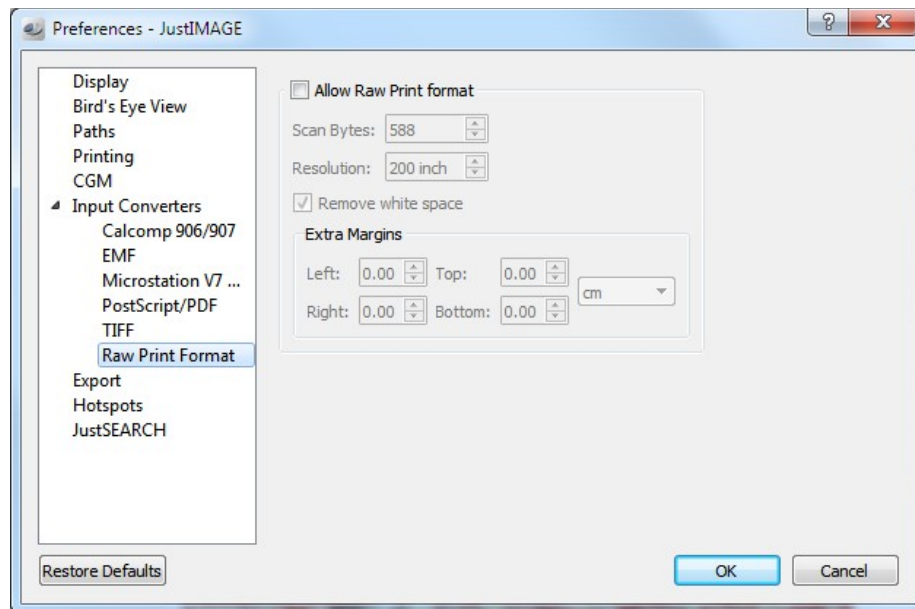
Illustration 58: Raw print conversion preferences.

Support for the raw print format can be turned on by enabling the option "Allow raw print format". When using this format it is important that the right scan bytes and the correct resolution are specified. This data is not included in the print file itself so it is important these the values are correctly specified. The default is 588 scan bytes at 200 dpi, which corresponds with 23 inches. Another common value would be 880 scan bytes at 200 dpi, which corresponds with 35 inches.[4]

With the option "Remove white space", white background around the image is removed.

You can add extra margins to any of the four sides up to 1 centimeter. This can be combined with the "Remove white space" option. The extra margins are added after the white background has been removed.

Export Preferences

The "Browse Behavior" setting controls how the (directory) browse button in the Export dialog and Export to PowerPoint dialog behave. Use "Select directory" to make clicking the browse button to bring up a directory selection dialog box. Use "Select file" to make clicking

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4 Keep in mind that printers have hardware borders. These values means that the output can be printed on 24 inch and 36 inch paper respectively.

the browse button bring up a file selection dialog box. You may find this behavior more intuitive.

Hotspots Preferences
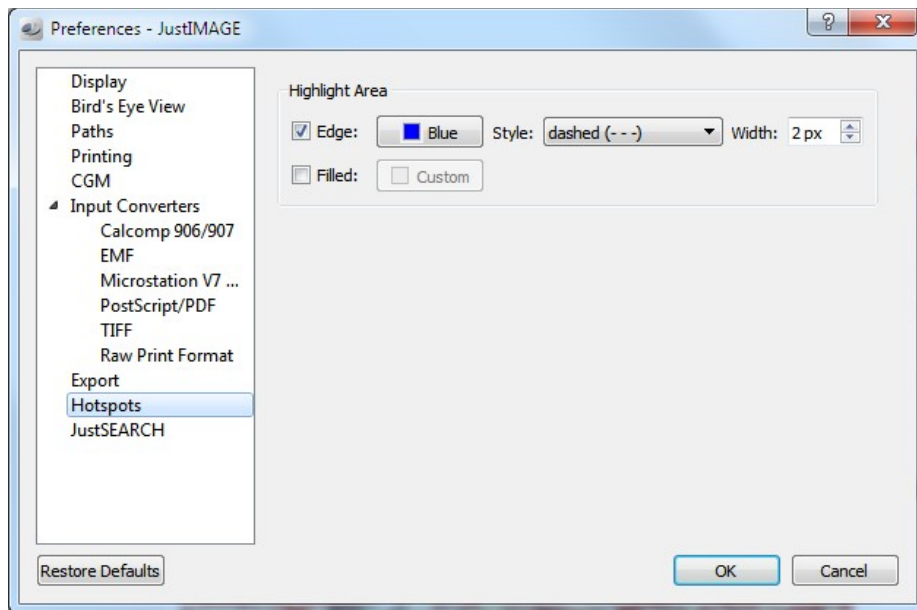
Illustration 59: Hotspots preferences.

You can specify how the WebCGM hotspots are highlighted by specifying the edge color, edge style, edge width and optionally a (transparent) fill color.

JustSEARCH Preferences
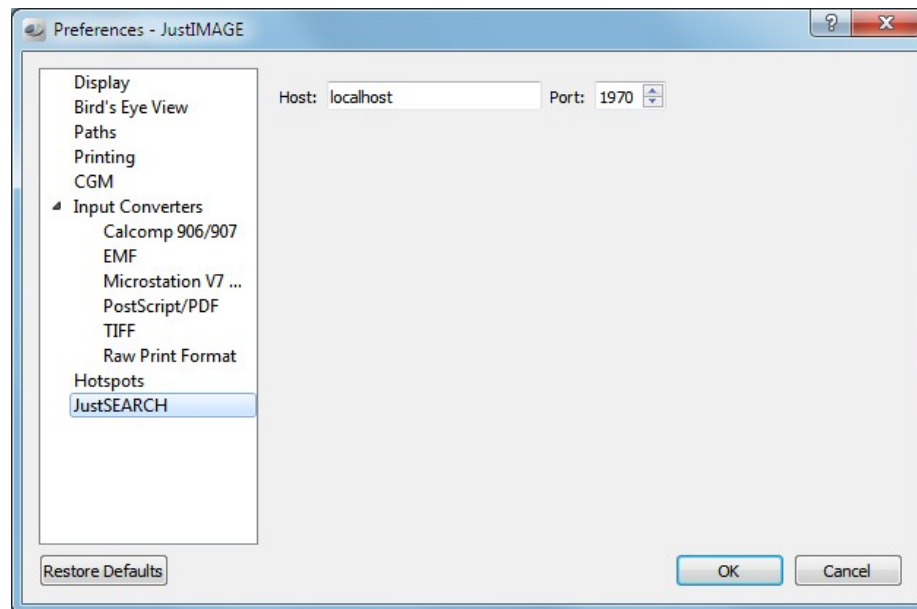
Illustration 60: JustSEARCH preferences.

Specify here the default address and port of the host on which the JustSEARCH server is running.

Color Redefinition

The colors of the picture can be influenced using the Color Redefinition option. JustIMAGE 5.4 uses the color redefinition also for printing and exporting as well. See also the "Color Reset" preference option.

You can open the Color Redefinition dialog box by selecting the "Color Redefinition..." command from the Edit menu.
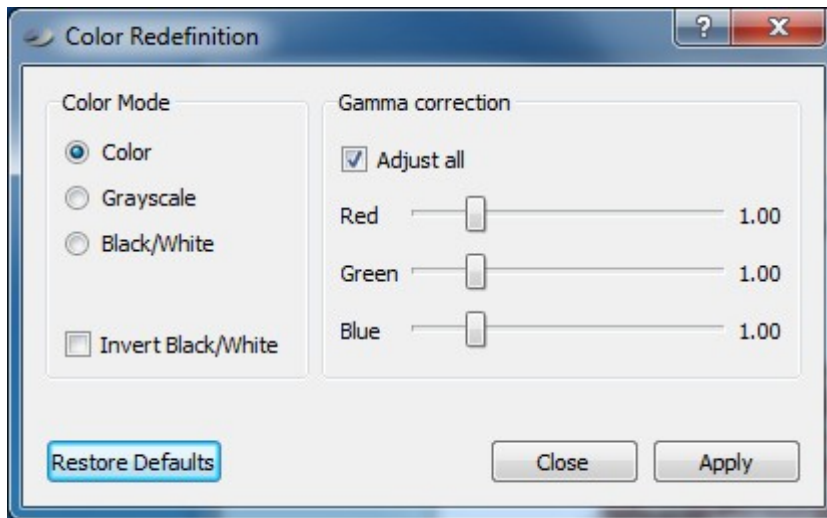
Illustration 61: The Color Redefinition dialog box.

You can select the following options:

- Color mode. Select the color mode of the picture. The default mode is color and in this mode all colors stay unmodified. If gray scale is selected all colors are converted to a gray value. The Black/White option converts all colors not equal to white to black.

- Invert Black/White. Invert Black and White in the original image. This is useful if an image is created with a Black background and White as the foreground color.

- Gamma correction. Adjust the Red, Green and Blue gamma values to compensate for the non-linear reaction of your eyes to colors. The default is 1.00, which means no adjustment. Specify higher values to increase the intensity of the color component. Specify lower values to decrease the intensity. Disabling the "Adjust all" option allows you to adjust the individual gamma values.

Set the Color Redefinition options you want to use and press the `Apply` button to confirm the new settings. The picture currently loaded into the drawing area is redrawn with the new settings. You can revert to the default color redefinition settings by pressing the `Restore Defaults` button. Use the `Close` button to dismiss the dialog box.

Packages

JustIMAGE 5.4 will, by default, determine which application created a CGM file and automatically perform corrections to ensure that the CGM is interpreted as intended by the CGM generator application. We have created profiles for most of the common Oil & Gas

applications and some of the popular PC applications.

You can overrule the automatic profile system with the "Package..." command from the Edit menu. The CGM Package dialog will appear.
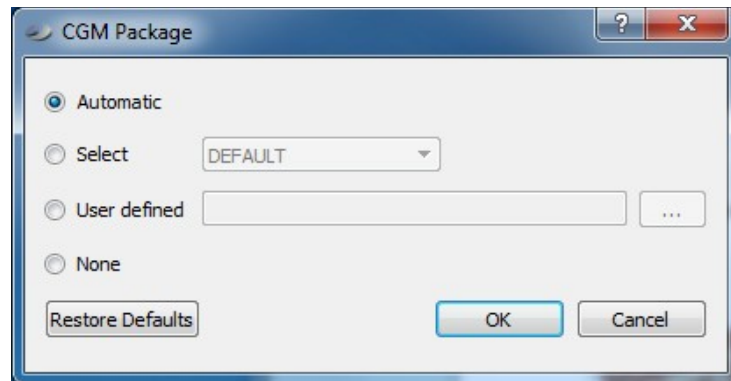
Illustration 62: The CGM Package dialog box.

You have four methods with the package system. Press the OK button to process the CGM with the given method. Note: The selected method will stay active while running JustIMAGE 5.4. Use Restore Defaults to revert to the standard behavior. See also the 'Reset Auto package' option from the CGM preferences.

- Automatic. This means that JustIMAGE 5.4 tries to determine the application that generated the CGM and applies the CGM package belonging to that particular application. The DEFAULT package is used when the application could not be determined.

- Select. You can select the package from the pop up menu when the application that created the CGM is not automatically recognized.

- User Defined. The User defined method allows you to select a package file from your local file system. In general, this method is used when you receive a package file from Justcroft support. This method requires that you select a package file before you can select OK.

- None. This will disable any package profile option and use the defaults of the CGM interpreter. This is not the same as selecting the DEFAULT package. For example, the DEFAULT package always clears the background with white, while the default of the CGM interpreter is to clear with the background color of the CGM.

Online Help
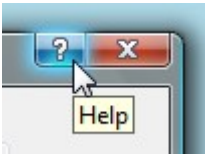
You can get a quick help hint for most of the dialog box items by selecting the small question mark button and then clicking on the item for which you want to get help[5]. A second method is to set the focus on the dialog box item for which you want to get help and press Shift+F1. Another alternative method is to right click on the dialog box item select the "What's This?" from the pop-up menu.

Last minute information about JustIMAGE 5.4 can be found by selecting the "Release Notes..." command from the Help menu. This will open your default web browser with the last minute information.

JustIMAGE 5.4 has two manuals in Adobe Portable Document Format (PDF). You can open the manuals from the Help menu by selecting the "User Manual..." and "Reference Manual" respectively. Note that these manuals are online and you must have Internet access.

Troubleshooting the User Interface

The JustIMAGE 5.4 User Interface shows a fatal message: "JustIMAGE Home environment is not set.".

Windows: Make sure that the JustIMAGE 5.4 software was installed on the local PC.
Windows: Check that in the registry JUSTIMAGE54_HOME is set. You can find this under HKEY_LOCAL_MACHINE\Software\Justcroft\JustIMAGE\5.4. Note: this registry entry is created by the Windows software installation.
Linux: Check that you used the justimage script from the bin sub-directory.

The JustIMAGE 5.4 User Interface shows a fatal message: "JustIMAGE Home directory <path> does not exist.

Windows: Check that you have not inadvertently set the %JUSTIMAGE54_HOME% environment.
Windows: Check that in the registry JUSTIMAGE54_HOME is set correctly to the installation directory of JustIMAGE 5.4. You can find this registry entry under HKEY_LOCAL_MACHINE\Software\Justcroft\JustIMAGE\5.4.
Check that the JUSTIMAGE54_HOME environment variable is correctly set to the installation directory of JustIMAGE 5.4.

The JustIMAGE 5.4 User Interface shows a fatal message: "Resource environment is not set."

Linux: Check that you used the justimage script from the bin sub-directory.

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5 The position of the question mark is usually the upper right corner of the dialog box. Some Window managers might not show the question mark.

The JustIMAGE 5.4 User Interface shows one of the following fatal messages: "Resource directory *<path>* does not exist.", "Fonts directory *<path>* does not exist.", "The fonts.map file was not found in directory *<path>*.".

Check that you have not inadvertently set the JUSTIMAGE54_RESOURCES environment. Note: In general it is not recommended to set this environment variable, unless you have moved the `setup` sub-directory to a non standard location.

Windows: Switching from a local installation to a "run from source" installation might have inadvertently left a setup sub-directory under the *%ProgramFiles%\Justcroft* JustIMAGE 5.4 directory. Please remove this sub-directory.

Windows: Check if the registry JUSTIMAGE54_RESOURCES is set, and if so that it is set correctly to the setup directory of JustIMAGE 5.4. You may find this registry entry under HKEY_LOCAL_MACHINE\Software\Justcroft\JustIMAGE\5.4. Note: In general it is not recommended to have this registry entry set.

Check that the JUSTIMAGE54_RESOURCES environment variable is correctly set to the `setup` sub-directory of JustIMAGE 5.4. Note: In general it is not recommended to set this environment variable, unless you have moved the `setup` sub-directory to a non standard location.

The JustIMAGE 5.4 User Interface shows a fatal message: "*<path>* used for temporary files does not exist.".

Windows: Check that the TEMP environment variable is correctly set to a directory for temporary files.

Linux: Check that the JUSTIMAGE54_TEMP environment variable is correctly set to a directory for temporary files. Note: In general it is not recommended to set this environment variable, unless users have limited disk storage under the `/usr/tmp` directory.

Reporting a Problem
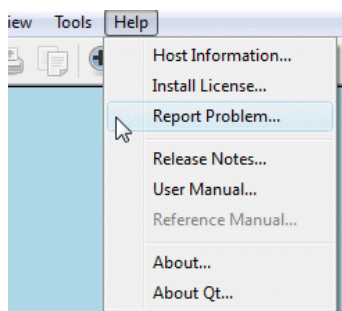
JustIMAGE 5.4 comes with a tool that allows you to email information to us should you encounter technical difficulties with the JustIMAGE 5.4 program suite. Most of the Graphical User Interfaces give you access to this tool through their menu bar: Help ⇨ Report Problem.

The report tool will gather information about your JustIMAGE 5.4 settings, JustIMAGE 5.4 data files, fonts, OS type and version, Environment variables and the JustIMAGE 5.4 license. In addition both JustEDIT and JustMONTAGE generate log files (`justedit.log`, `justmontage.log`) under the JUSTIMAGE54_TEMP directory.

The sole purpose of this information is to help us with a specific problem you might have. The information is not sent automatically to us but always as part of the problem report via email.

CGM Details

The following chapter explains details, and some of the problems, associated with CGM interpretation and CGM data exchange between applications. In addition, we provide details about our CGM Interpreter behavior.

What Is CGM?

Computer Graphics Metafile is an ISO standard to define virtual two-dimensional static pictures. It has been carefully designed to be not intrinsically application specific or device dependent. Because of this, CGMs can be displayed on a wide range of output devices.

Several versions of the CGM standard have been created over the years. The latest official standard is CGM version 4 (ISO/IEC 8632-1:1999). Each higher version is an extension of lower versions. However, while the CGM V1 to V3 are for device independent pictures, CGM V4 is intended for interactive image display.

One or more pictures are stored in a CGM. Each CGM consists of elements in a specific layout. The CGM standard also specifies how each element should be stored in the CGM. Graphics are stored in a "record and playback" fashion. As with a tape recorder, a picture is "recorded" in a CGM. The picture can then be re-created by "playing back" the CGM.
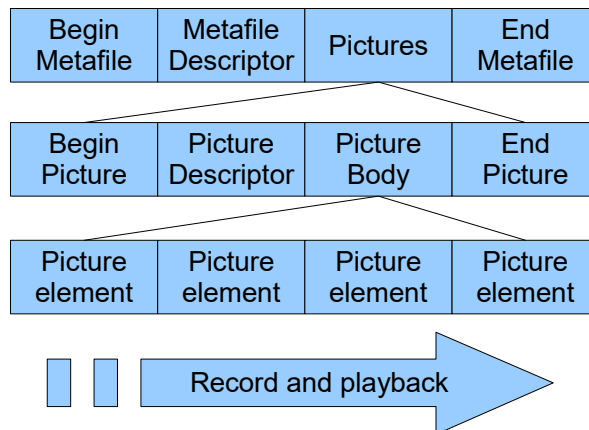
Drawing 1: CGM Metafile layout

Each CGM starts with a Begin Metafile element and ends with the End Metafile element. The Metafile Descriptor contains information that applies to the whole CGM. The Metafile Descriptor is followed by one or more CGM pictures.

Each CGM picture is delimited with the Begin Picture and the End Picture elements. The Picture Descriptor contains information that applies to the whole picture. This is followed by the picture elements grouped together in the Picture Body.

The order in which picture elements are recorded is important, since the CGM format is a static picture format. For example, changing the line color only affects lines that follow the line color change. In addition, graphical elements should be recorded in the correct order, because elements can be drawn on top of each other.

The CGM standard deliberately separates the formal specification of each CGM element and the specific encoding of the CGM element. There are three types of encoding specified by the CGM standard.

- Binary encoding. This provides a representation that has been optimized for speed of generation and interpretation. CGMs created this way are relatively small, but are illegible. Most CGMs seen in practice are binary encoded. The Justcroft CGM Interpreter can handle this type of encoding.

- Clear text encoding. This produces a legible representation, which make it a good encoding format for small-scale testing or simple images. The down side is the much larger file sizes and the relatively complex and slow interpretation process. The Justcroft CGM Interpreter can handle this type of encoding.

- Character encoding. This provides a representation that provides the most reliable data exchange between computer systems. CGMs created this way are very small, provided the generation process is smart enough. In practice, these types of CGMs are rare, because the generation and interpretation is relatively complex. Character encoding is now declared obsolete by the CGM Version 4 specification. The Justcroft CGM Interpreter does not handle this type of encoding.

The CGM standard allows the inclusion of application specific extensions. Two extensions are possible:

- A Generalized Drawing Primitive (GDP). A GDP is best suited for a visible object.

- An Escape. Escapes are best suited for control extensions.

CGM In Practice

It would be nice if each CGM created in practice was bound to be perfect and fully

conformed to the CGM ISO standard. This should allow easy interchange of CGMs between vendor applications.

One of the main problems is caused by the often poor implementation job done by the vendors regarding CGM generation. CGMs are in many cases only partly self-contained or inconveniently generated. Some examples:

- A CGM uses index colors without specifying a color table.

- A CGM generates text with negative height and/or width.

- Generation of the CGM image as one big cell array.

- Blind assumptions about font metrics and font names.

Even if the CGM conforms fully to the CGM standard and is completely self-contained, such a CGM might not be what the user expects. Also, some parts of the standard are left open and are thus subject to differences between interpreters.

The Justcroft CGM interpreter solves the most common problems caused by CGMs by:

- Making reasonable assumptions for implicit CGM values or states. CGM limits are based on the CGM*PIP/II and ATA specification. (See also the CGM Profiles section below.)

- Provide a graceful fallback in problematic cases.

- Using a package profile system to enforce implicit assumptions or to enforce user expectations.

CGM Version 1

CGM Version 1 was the original ISO/IEC specification of 1987. This version was adopted quickly by the industry. There are several problems with the CGM Version 1 specification. One is the ambiguity in the CGM Version 1 specification. Another is the limited set of graphic primitives, with no Bezier curves or spline curves. The already noted early adoption by the industry also lead to rushed and often very poor implementations by vendors.

CGM Version 2

In 1990 the CGM Version 2 ISO/IEC standard was release. It corrected some of the ambiguity of the CGM Version 1 standard and introduced the concept of segments. Segments allow a group of CGM elements to be handled as a single entity to reduce the CGM file size. Unfortunately, segments introduced yet another set of ambiguity. Because of this and the lack of support by the Oil & Gas industry we have not implemented support for segments.

CGM Version 3

CGM Version 3 was released in 1992 and was a major improvement of the standard. About 40 new graphic primitives were introduced, including Bezier curves and spline curves, advanced font and text support, better raster compression, advanced area fills and color models other than RGB.

This version also removed almost all ambiguity that had plagued the CGM Version 1 and CGM Version 2 standards.

CGM Version 4

In 1995 an amendment was made to the CGM Version 3 specification adding application structures. This was formalized in the CGM Version 4 specification of 1999. Application structures allow inclusion of non-graphic information to be associated with graphical elements in the meta-file.

Although CGM Version 4 does not seem to have a big impact in the Oil & Gas industry, expectations are high in the aviation and automotive industry.

CGM Profiles

Because the CGM standard is open ended, exchange between applications would be potentially difficult. To prevent this, group endorsements by academic and industry groups were created. A group endorsement establishes common ground for applications that are related to such a group. Such a group endorsement is called a profile. Some well known profiles are:

- The Petroleum Industry Profile (CGM*PIP) specification was established by the geophysical and earth sciences community.

- The CGM+ specification by Larson. This was, until recently, the de-facto standard in the Oil & Gas Industry.

- The Air Transport Association (ATA) created a profile specific to the commercial aviation community.

- WebCGM is a profile created by the World Wide Web community using binary CGMs as a compact vector file format for interactive graphics.

- The SAE J2008 is a profile created by the automotive industry.

- The CGM Model Profile. The minimum requirements specification of the CGM standard as introduced by CGM Version 3.

Formal CGM Profiles specifications use the terms *required*, *permitted* and *prohibited* when

describing a CGM element. These terms can lead to "weasel wording" since a vendor can claim that if an element is not required but only permitted, then a CGM interpreter does not need to "do something" with the element (i.e., showing nothing). For example the Poly Bezier element is not required, but permitted by the WebCGM profile. "Supported" by our CGM interpreter should be interpreted as "doing something meaningful with the CGM element".

Our policy is to continuously enhance our CGM Interpreter with aspects of the CGM standard as we encounter them in practice. We might enhance our CGM interpreter without explicit notice. It is recommended to contact Justcroft International should you wish to know what the latest state of our CGM support is or if you think that our CGM Interpreter is lacking a specific requirement of your industry.

CGM+/CGM*PIP

The Petroleum Industry Profile (CGM*PIP) specification was established by the geophysical and earth sciences community and was released by the Petrotechnical Open Software Corporation (POSC)[6]. This community requires rich intricate details, color, and raster and pattern control. This profile specifies special Seismic Trace drawing primitives that are not supported by most general-purpose CGM applications. There are three different CGM*PIP sub-specifications of which CGM*PIP/I (CGM Version 1) and CGM*PIP/II (CGM Version 3) are in practice used by applications.

The following seismic trace extensions are supported by our CGM Interpreter:

- Wiggle Trace (CGM+)
- Background Trace (CGM+)
- Wiggle Line
- Wiggle Line Va-fill
- Wiggle Variant Va-fill
- Background Trace Interpolated
- Background Trace NullColour

CGM*PIP/II files are also supported. However, the CGM*PIP/II specific trace extensions to the CGM standard are currently not supported.

---

6   POSC no longer exists and has been replaced by Energistics.

The CGM+ specification by Larson was, until recently, the de-facto standard in the Oil & Gas Industry. This profile also specifies special Seismic Trace drawing primitives, although less extensive as the CGM*PIP profile. Since CGM+ is an incomplete formal specification, some things were left open to our own interpretation of CGM+:

- Wiggle lines are always drawn with the smallest device unit regardless of the current line width.

- Solid VA filled lobes are drawn with the current fill color.

- CGM primitives other then CGM+ GDPs should not appear between traces. Versions of the Justcroft CGM Interpreter after February 2003 allow CGM primitives between traces through a package option.

ATA 2100

The ATA profile, ATA Specification 2100, GREXCHANGE[7] has been developed for technical documentation of the manufacture and operation of commercial airplanes. The profile supports the binary and clear text encodings at the CGM Version 3 functionality level. It is appropriate for the exchange of technical manuals, publishing applications, and visualization.

Most of the standard CGM Version 3 elements and CGM Version 3 element limits as specified in the ATA 2100 GREXCHANGE profile are supported. However, the ATA 2100 profile extensions such as ATA line styles are currently not supported.

A second profile, ATA Specification 2100, IGEXCHANGE provides for the transfer of intelligence associated with graphical data. This profile supports the application structuring defined in CGM Amendment 2. The IGEXCHANGE profile is not supported by our CGM interpreter.

WebCGM

The WebCGM profile uses the CGM Version 4 application structures extensively for interactive graphics, such as hyperlinks. The latest official release is WebCGM 2.1.

Our CGM interpreter is compliant with most of the CGM Version 4 elements and CGM Version 4 element limits of the WebCGM specification. In addition the JPEG and the PNG compression types for cell arrays and tiles are supported.

The CGM interpreter also supports the WebCGM Color Models RGB-Alpha and sRGB-Alpha.

7 Sometimes referred to as ATA 2.6 or GREXCHANGE 2.6. The number 2.6 is the revision number of the profile specification.

The CGM Version 4 application structures and the WebCGM specific extensions for dynamic content are ignored when printing. You may encounter warning E-303 which indicates that the CGM reader recognized the CGM 4 application structures, but otherwise ignores it for the given render mode. WebCGM application structures and Hotspot information are used to generate SVG files with the Itedo specific SVG extensions or when the SVG hotspots mode is enabled. WebCGM layer application structures and hotspots with hyperlinks are used for generating PDF output.

CALS Profile

The CALS profile, MIL-D-28003A, was developed by the U.S. Department of Defense for technical illustrations and publications. The profile supports the binary encoding at the CGM Version 3 functionality level. There are many implementations that support this profile at the CGM Version 1 level. This profile does not follow the rules of CGM Amendment 1, since it was produced prior to Amendment 1.

VDC Extent and Clipping

Drawing of CGM graphics is done in a two-dimensional virtual space. Co-ordinates of this virtual space are called Virtual Device Co-ordinates (VDC). While the virtual space has an infinite extent, the part used by a CGM picture is called the VDC extent.
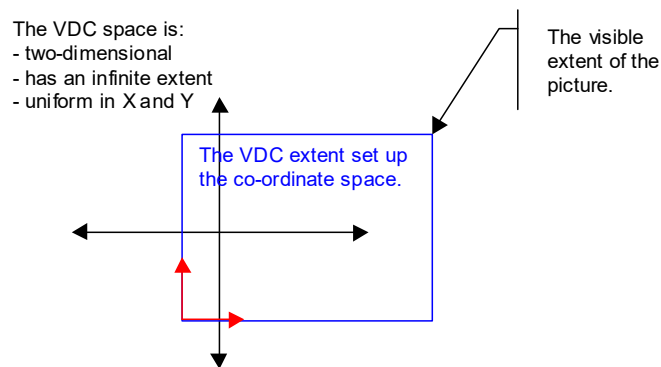
Drawing 2: VDC Extent

The VDC extent defines the visible extent of the CGM picture and it specifies the sense and orientation of the co-ordinates of the CGM picture.
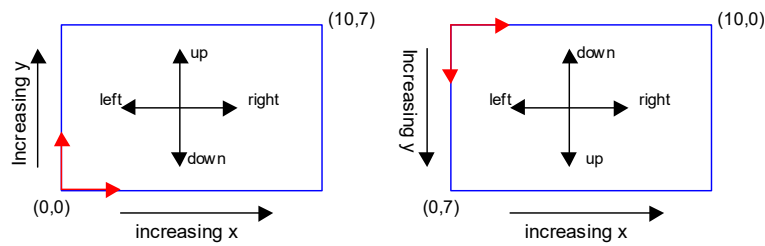
Drawing 3: Lower Left and Upper Left VDC Extents

Two pairs of co-ordinates define a VDC extent. The first pair is always the lower left corner (in VDC space) and the second pair is always the upper right corner. Note the direction in which the VDC units increase establish the sense and orientation. The left VDC extent shows a common mathematical sense and orientation, while the right VDC extent shows a common screen orientation.

A CGM image can make the drawing area temporarily smaller by the specification of a clip rectangle. Note that clip rectangles outside the VDC extent make no sense. The CGM specification also defines a control element called the clip indicator. The clip indicator controls whether the current clip rectangle should be used to clip any drawing.
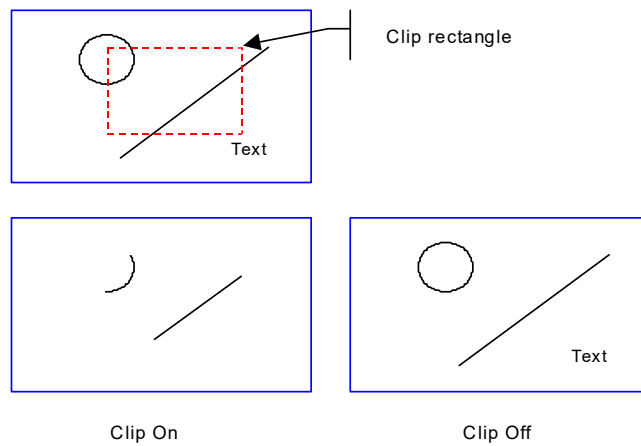
Drawing 4: CGM clipping.

Our CGM Interpreter assumes that all drawing is done within the VDC extent. Any drawing outside the VDC is clipped to the VDC extent. This can cause problems because some CGMs are generated with VDC sizes that are either too large, or too small. If no default clip

rectangle is specified, it is assumed that the clip rectangle is the same as the VDC extent.

CGM Picture Handling

Each CGM picture is treated by the Justcroft CGM Interpreter as a new drawing image that has no relation with other pictures within the same file. This may cause problems with some applications that may use pictures in the following ways:

- Picture banding. Each CGM picture is a part of a larger image. This is commonly used by CGM interpreters that cannot generate printer output in one pass and use bands to create the output.

- Picture layers. Advanced drawing applications such as Canvas™ define layers to make image composition easier. Note that this is a Canvas™ specific extension unlike the WebCGM profile extension.

The Justcroft CGM Interpreter will handle banded CGM pictures created by ProMAX, SDI or OmegaSEISPLOT as a single picture CGM.

CGM Text

Text is one of the areas where the CGM version 1 specification was notoriously vague. The CGM V3/V4 specification solved most problems related to text. However, we have not yet seen these CGM V3/V4 types of files.

Some applications create CGM text with negative heights or negative widths. This is ignored by the Justcroft CGM interpreter (report log message: "E-250 error during drawing text").

Font Support

CGM version 1 allows applications to specify font names. However, the characteristics of the font are left completely open. CGM version 3 has the Font Properties element to specify font characteristics within the CGM, but in practice these are only used by the WebCGM profile. The Justcroft CGM interpreter tries to guess what font is requested by performing a two-pass mapping of font names.

Fonts are known to the CGM interpreter through the `fonts.map` file[8].

Entries in the `fonts.map` file are of the form:

```
<font file> <CGM font name>
```
For example:

```
pspelroman.fnt    TimesRoman
```

8   Consult the installation guide for the location of this file.

maps the CGM font name "TimesRoman" to the "Pelham Roman Regular" font. CGM font names can be mapped to the same font.

In addition the CGM interpreter scans for TrueType fonts. On Linux the Fontconfig system is used. On other UNIX® platforms, TrueType fonts are searched in the `setup/fonts/` directory. On Windows® TrueType fonts are searched in the Windows system font directory, the Windows user font directory and the `setup/fonts/` directory. TrueType font files must have either `.ttf` or `.ttc` as their file extension[9]. OpenType fonts are supported as well since these are a super set of a TrueType font. In general OpenType fonts under Windows have the same file name extension as TrueType fonts. On other platforms OpenType fonts may have the extension `.otf`, so you have to rename them to a `.ttf` extension should you wish to use them with our software.

TrueType family names can be substituted if necessary. For example:

```
Substitute MS-Shell-Dlg      Tahoma
```

During the first pass the font name entries in the CGM are translated by stripping the special characters such as '/', '\', '_', '-' or white space. The resulting names, which are character case insensitive, compared to the known font names of the CGM interpreter. During the second pass the resulting names, which are character case insensitive, are then compared by CGM interpreter to the fonts it knows.

1. Check for an exact name match in the `usrfonts.map` and `fonts.map`.

2. Check for an exact name match with one of the scanned TrueType font names.

3. Check for a (partial) name match in the `usrfonts.map` and `fonts.map`.

4. Check for a TrueType font that has the best match with the Font Properties if specified in the CGM. Currently the Font Properties Font Family, Posture, Weight, Proportionate Width and Design Group are used for matching.

5. If still no match could be found, the font specified by the CGM font name "Default" is used.

The `fonts.map` file delivered with our products is based on the CGM*PIP/II specification of font names. You can override the font name mapping or add additional font names by creating a file `usrfonts.map` in the fonts sub-folder. The available font names are a merge of the `fonts.map` and the `usrfonts.map` files. Alterations in `usrfonts.map` changes the font name mappings for all CGM files, unless font names are remapped through a package profile.

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9 On UNIX® a search is also done with extensions .TTF and .TTC.

Supported polygon fonts as specified by CGM*PIP/II[10]:

- TimesRoman (Pelham DT).
- TimesItalic (Pelham DT Italic).
- TimesBold (Pelham DT Bold).
- TimesBoldItalic (Pelham DT Bold Italic).
- Helvetica (Newhouse DT Regular).
- HelveticaOblique (Newhouse DT Oblique).
- HelveticaBold (Newhouse DT Bold).
- HelveticaBoldOblique (Newhouse DT Bold Oblique).
- Courier (Courier DT Regular).
- CourierItalic (Courier DT Italic).
- CourierBold (Courier DT Bold).
- CourierBoldItalic (Courier DT Bold Italic).
- Symbol (Symbol DT).
- AvantgardeBook (Modern Gothic DT).
- Avantgarde Book Oblique (Modern Gothic DT Italic).
- AvantgardeDemi (ModernGothic DT Bold).
- AvantgardeDemiOblique (Modern Gothic DT Bold Italic).
- BookmanLight (Derby Old Style DT).
- BookmanLightItalic (Derby Old Style DT Italic).
- BookmanDemi (Derby Old Style DT Bold).
- BookmanDemiItalic (Derby Old Style DT Bold Italic).
- HelveticaNarrow (Newhouse DT Narrow).
- HelveticaNarrowOblique (Newhouse DT Narrow Oblique).
- HelveticaNarrowBold (Newhouse DT Narrow Bold).
- HelveticaNarrowBoldOblique (Newhouse DT Narrow Bold Oblique).
- NewCenturySchlbkRoman (Century Schoolbook DT Regular).
- NewCenturySchlbkItalic (Century Schoolbook DT Italic).
- NewCenturySchlbkBold (Century Schoolbook DT Bold).
- NewCenturySchlbkBoldItalic (Century Schoolbook DT Bold Italic).
- PalatinoRoman (Oron DT Roman).
- PalatinoItalic (Oron DT Italic).
- PalatinoBold (Oron DT Bold).
- PalatinoBoldItalic (Oron DT Bold Italic).
- ZapfChanceryMediumItalic (Chancery DT Medium Italic).
- ZapfDingbats (Dingbats DT).

10 Fonts courtesy DTP Types Limited. DTP Types font names between braces.

Supported CAD engineering type of fonts are:

- Hershey/SimplexRoman
- Hershey/ComplexRoman
- Hershey/DuplexRoman
- Hershey/TriplexRoman
- Hershey/ComplexItalic
- Hershey/TriplexItalic
- Hershey/SimplexScript
- Hershey/ComplexScript
- Hershey/SimplexGreek

- Hershey/ComplexGreek
- Hershey/CartographicRoman
- Hershey/CartographicGreek
- Hershey/ComplexCyrillic
- Hershey/GothicEnglish
- Hershey/GothicGerman
- Hershey/GothicItalian
- SimplexMonoSpace
- PIP/MonoSansSerif

Character Sets

Although the CGM standard allows character sets and character encoding definitions, most applications that generate CGMs do not care or use these definitions incorrectly.

The Justcroft CGM Interpreter checks if the WebCGM UTF-8 or UTF-16 character encoding is used in the CGM in which case the UNICODE character set is assumed[11]. Otherwise the DEFAULT_CHARSET() package option is used when set. If not set, the character sets and character encoding are ignored and it assumes ISO Latin 8859-1 as the standard glyph encoding.

The polygon fonts and CAD engineering fonts are based on the CGM*PIP/II standard. You can view the fonts and glyphs supported by Justcroft with the `hersheyfonts.cgm`, `polyfonts.cgm` and the `polyfonts2.cgm` test files.

Most glyphs and metrics are supported for TrueType fonts. We also support Arabic script with restrictions. In general Arabic will work if a OpenType font file is used. UNICODE bidi encoding is currently not supported.

Asian languages such as Chinese can have thousands of possible glyphs. TrueType fonts may not always contain all possible glyphs of such a language. You can optionally specify a fallback font which is used if text string contains glyphs that are not found in the original TrueType font. The fallback font is indicated in the `fonts.map` with the keyword "`Fallback`" followed by the TrueType font name. (Not the font file name.) The entry can be overridden in the `usrfonts.map` file.

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11 Unfortunately the way how this must be indicated in the CGM is different between WebCGM 1.0 and the new WebCGM 2.0 standard. Our software supports both methods.

CGM Restricted Text

CGM Version 1 defines restricted text. Restricted text is expected to fit a specified (invisible) restricted text box. However the CGM Version 1 standard did not describe how this restriction was applied and left the implementation details undefined. CGM V3/V4 allows the specification of a restricted text type.
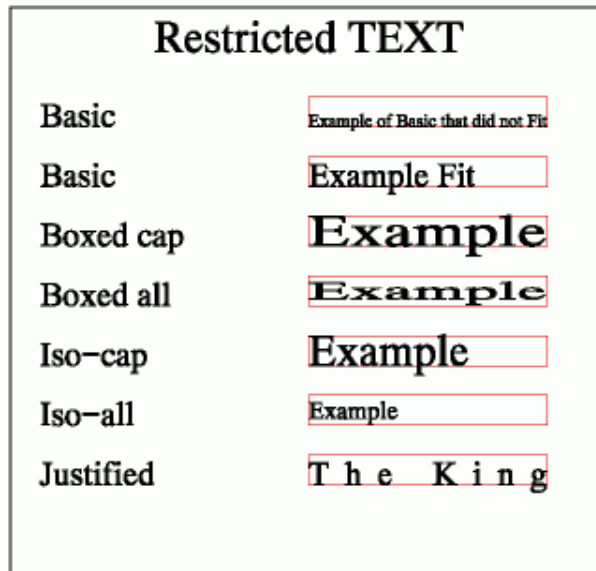
Illustration 63: Restricted Text examples

Our implementation of Basic behaves as Isotropic Cap if the text does not fit the specified restricted text box. The text attributes are not modified if the text does fit the text box.

CGM Specification Modes

CGM version 1 can specify the widths of lines and edges in two different ways. Either absolute where widths are fractions of the VDC or as scaled where widths are specified relative to a nominal width. The problem is that this nominal width is not specified by the CGM version 1 standard. The Justcroft CGM interpreter assumes, by default, 1/1000 of a VDC or up to a certain maximum limit to prevent lines being scaled too large.

Since CGMs can be either metric or abstract, abstract CGMs that specify width modes as scaled can cause problems. Our CGM interpreter limits scaling for very large printer devices or very small printer devices.

Markers also have sizes that can be either absolute or scaled. Again, this can cause problems should the Justcroft CGM interpreter not limit the marker size.

CGM Line Width

Applications such as CPS-3 generate CGM output based on old pen plotter drivers. This creates problems because these old drivers assume that pen widths are fixed. Thick lines are emulated using multiple thin lines. You may notice this when printing such CGMs on high-resolution (600/1200-dpi) printers.

Another common problem is the interpretation of a line with a width of zero. The Justcroft CGM Interpreter handles this as is recommended, and draws with the smallest possible device dot. There is however, a package option to overrule this behavior. See The Package Profile System section below for more information.

Miter Join

Lines and edges can have miter as join type specified. The miter limit value is to prevent the miter to extend too far out at sharp angled joins. Higher miter limit values allows the miter to extend further from the join.

The CGM standard defines the default miter limit as 32767.0 which means that there is no miter limit. In practice this is not the expected default limit. Most drawing applications use either 10.0 or 4.0 as default. Unfortunately the miter limit is not always explicitly set in the CGM. Our library uses 4.0 as the default limit should a miter limit not be specified in the CGM. There is a package option to set the default limit if necessary. See The Package Profile System section below for more information.

A miter limit < 1.0 is rounded up to 1.0. A miter limit < 0.0 is not allowed and ignored. The miter join that exceeds the miter limit is drawn by truncating the miter at the miter limit point. This is different from the PostScript, PDF and SVG behavior that treats the miter limit as a threshold value. A join that exceeds the miter limit is drawn as a bevel join. The WebCGM comity has been arguing in favor of the threshold behavior and requested a change of the CGM standard, but this has not happened as far as we know. The advantage of the CGM handling is that there is less of a <u>visual jump at sharp angles</u>.

CGM Color

There are two possible ways to select a color in a CGM. Direct color means that a color is directly specified where needed. Index color means that a color is specified through a look-up color table and references the index where needed. Using index colors reduces, in general, the overall file size, since the index reference usually takes less space than the direct color specification.

Index color implies that the color table should be specified in the CGM before using index colors, since CGM pictures are static.

As stated previously, some CGMs use index colors without actually specifying the color values. Our CGM interpreter can take the color values through the usage of a package profile. Some applications reuse color indexes multiple times within the same picture. Our CGM interpreter will handle this correctly.

Another common problem is black and white reversal. That is, black background and white foreground. These types of CGMs were intended for technical drawings.

By default, our CGM interpreter will clear the drawing area on Begin Picture using the current background color. There is, however, a package option to overrule this behavior. See "The Package File Syntax" below for more information. Other interpreters either do not clear the background or clear the background with white.

CGM Color Models

CGM version 1 and version 2 assumed that individual colors are defined as RGB values. CGM version 3 introduced other possible color models through a new CGM element COLRMODEL: CIELAB, CIELUV, CMYK and RGB-related. WebCGM extended this further with: RGB-Alpha (RGB + Alpha translucency), sRGB and sRGB-Alpha.

We have seen the COLRMODEL element only in practice with WebCGM files and when used being set to the default value RGB. Our interpreter supports the color models RGB, sRGB, RGB-Alpha and sRGB-Alpha. sRGB is treated as being RGB.

CGM Transparency

The term CGM Transparency is not, as you might expect, related to the opaqueness of a fill color. Instead it refers to the fill mode for dashes, hatches, markers and text background. When CGM Transparency is enabled, no filling is done with the auxiliary color. When CGM Transparency is disabled, filling is done with the auxiliary color.

The following example shows the effect of CGM Transparency. The top half is with CGM Transparency enabled while the bottom half shows CGM Transparency disabled.
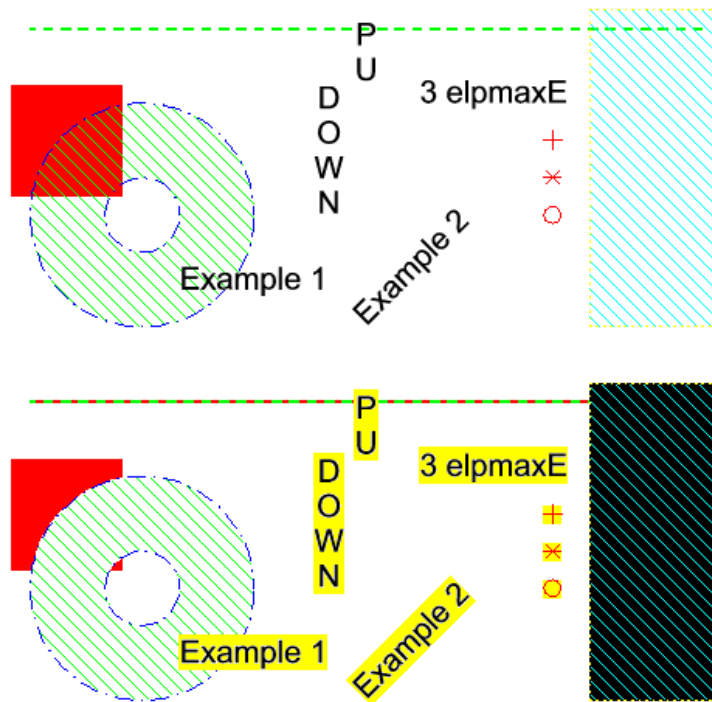
Illustration 64: CGM Transparency

The problem with CGM Transparency is that it's not always understood and therefore used incorrectly.

Alpha Transparency

Alpha transparency or translucency is what most users define as transparency. It is also known as color opaqueness or fill transparency. Alpha transparency controls how much of the already drawn background is visible while drawing the current filled element.

Alpha transparency is not directly supported by the CGM standard with the default color model RGB. The WebCGM profile has defined a CGM Escape 45 which controls the alpha transparency drawing of any filled elements following the CGM Escape. Not many applications generate this CGM Escape, although maybe in the future there may be more[12]. Alpha transparency is possible when previewing, saving to a bitmap, PDF or SVG. It also possible with the Justcroft raster drivers (jdd). It is not supported with PostScript drivers (PPD).

The follow is an example of the effect of alpha transparency disabled (left) and enabled

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12 At the time of writing, we know of only two companies who are generating the Escape 45, one of which is us.

(right).
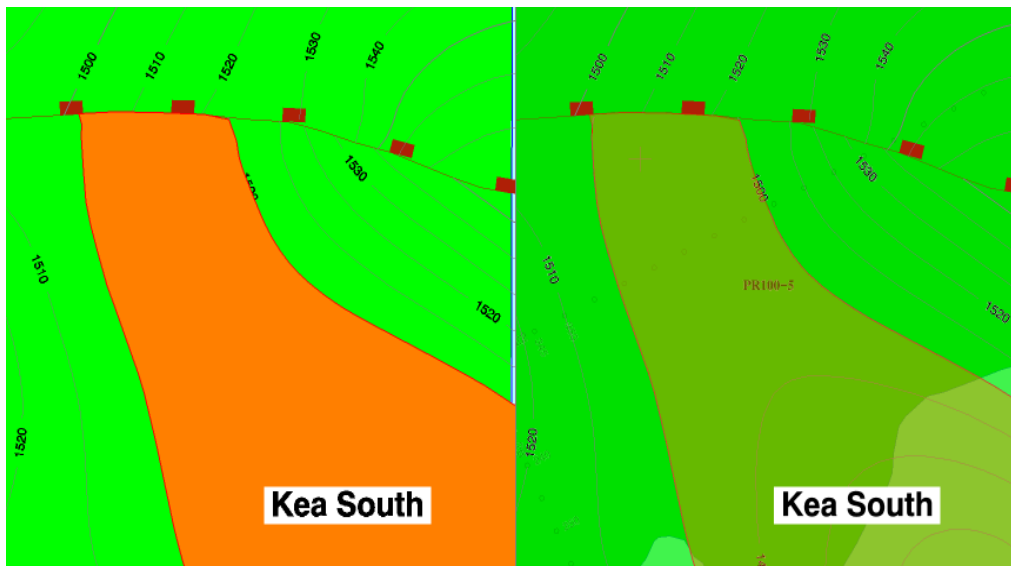
Illustration 65: Alpha Transparency

Gradient Fills

There is limited render support for interpolated fills (Interpolated Interior). This works only with the parallel style, two colors and the reference lines must be parallel to the VDC.

CGM Element limits

Element limits are based on the CGM*PIP/II profile and the ATA 2.4 profile specifications. We will try to lift restrictions should we encounter them in practice.

- Binary File Precisions:
  - Integer precision: 16, 24, 32 bits.
  - Real precision: Fixed 32/64; IEEE 32/64.
  - Index precision: 8, 16, 24, 32 bits.
  - Color precision: 8, 16 bits.
  - Color index precision: 8, 16, 24, 32 bits[13].
  - VDC integer precision: 16, 24, 32 bits.
  - VDC real precision: Fixed 32/64; IEEE 32/64.

13 24 and 32 bits index precision are mapped to 16 bits precision.

- Font list maximum: 256.

- Maximum index color value 32767.

- Maximum index pattern value: 8091.

- Maximum pattern size: 512×512.

- Maximum cell array size: limited only by memory. Direct color cell arrays are automatically split.

- Maximum number of line points: limited only by memory.

- Maximum number of polygon(set) points: limited only by memory.

- Maximum number of seismic sample points: limited only by memory.

- Maximum dash section: unknown.

- Maximum number of protection regions: limited only by memory.

- Maximum number of graphical primitives within a protection region: 1024.

- Supported bitonal tile compression types:
  - 0: null background.
  - 1: null foreground.
  - 2: T6.
  - 3: T4 1-dimensional.
  - 4: T4 2-dimensional.
  - 5: uncompressed bitmap.

- Supported tile compression types:
  - 0: null background.
  - 1: null foreground.
  - 2: T6.
  - 3: T4 1-dimensional.
  - 4: T4 2-dimensional.
  - 5: uncompressed bitmap.
  - 6: run length.
  - 7: JPEG.
  - 9: PNG.

- Supported local color precisions for tiles: 8/24 bit direct; 8 bit, 16 bit index.

- Supported local color precisions for cell arrays: 8, 16, 24, 32 bit direct; 1, 2, 4, 8, 16, 32 bit index.

- Supported color models: 1 (RGB), 6 (RGB-Alpha), 7 (sRGB), 8 (sRGB-Alpha).

- Supported Interpolated Interior style: 1 (parallel). Number of stages: 2.

- Supported hatch style definition: 1 solid hatch line at multiples of 45 degrees angles. Can be either parallel style or cross hatch style type.

- Reader/writer supported Font Properties: 1 (Font Index), 2 (Standard Version), 3 (Design Source), 4 (Font Family), 5 (Posture), 6 (Weight), 7 (Proportionate Width), 10 (Design Size), 11 (Minimum Size), 12 (Maximum Size), 13 (Design Group), 14 (Structure).

- Interpreter supported WebCGM Font Properties: 1 (Font Index), 4 (Font Family), 5 (Posture), 6 (Weight), 7 (Proportionate Width), 13 (Design Group).

- Supported WebCGM APS structures:
  - layer
  - grobject
  - grnode
  - para
  - subpara

- Supported WebCGM APS attributes:
  - id
  - name
  - layername
  - region
  - viewcontext
  - screentip
  - content
  - linkuri
  - visibility
  - interactivity

- The maximum allowed CGM file size is OS dependent. The CGM interpreter supports 64 bit file offsets.

Degenerate CGM Elements

The CGM standard does not always specify what an interpreter should do in the case of degenerate CGM elements. The behavior for degenerate CGM elements has been implemented as recommended by either the CGM*PIP profile or the ATA profile.

- Lines with a length of zero are drawn with the caps only.

- Collinear Circular Arc 3 Points are drawn as a line.

- A circle is drawn when the start ray and end ray of a "Circular Arc Center" or "Circular Arc Center Reversed" coincide.

- Degenerate ellipses are not drawn.

- Text strings with no height or negative heights are not drawn.

Special CGM Extensions

The following extensions of the CGM standard are supported by our CGM Interpreter. Justcroft private CGM Escape extensions are within the –12000 to –12010 range:

- Support for ProMAX and Finder parameter files. These applications specify some crucial CGM information in a separate parameter file. Our CGM interpreter can use the parameter file to show a correct CGM file. Most Justcroft applications assume that this parameter file has the same name as the CGM but has one of the following extensions: `.cgmp`, `.cgm_cntl` or `.par`.

- Banded CGM pictures as created by ProMAX, SDI or OmegaSEISPLOT are automatically interpreted as a single picture CGM.

- WebCGM application structures and Hotspot information can be used to generate Itedo SVG files or hotspot enabled SVG including hyperlinks.

- WebCGM layer application structures are used to generate layered SVG and PDF files. They are also used by other Justcroft applications.

- APS sublayer: Used to specify a sub layer within an APS layer. The structure has the same APS attributes as the WebCGM layer application structure.

- Escape 22: Transparent Cell Colour (CGM V1/V2 only). This escape has been superseded by the Transparent Cell Colour CGM V3 element.

- Escape 45: Alpha transparency. This CGM Escape is part of the WebCGM profile.

- Escape –2999: Color Blending. This CGM Escape is part of the CGM*PIP/I profile.

- Escape –12000: Cell Array and Tile image interpolation. This CGM Escape is a

Justcroft private extension.

- Escape −12001: Layer visibility. This CGM Escape was a Justcroft private extension and has been superseded by the WebCGM APS visibility attribute.

- Escape −12002: Begin group. This CGM Escape is a Justcroft private extension. This might be replaced in the future by a WebCGM APS element.

- Escape −12003: End group. This CGM Escape is a Justcroft private extension. This might be replaced in the future by a WebCGM APS element.

- Escape −12004: Begin edit object. This CGM Escape is a Justcroft private extension. This might be replaced in the future by a WebCGM APS element.

- Escape −12005: End edit object. This CGM Escape is a Justcroft private extension. This might be replaced in the future by a WebCGM APS element.

- Escape −20134. Turn Alpha transparency on or off. The alpha value is fixed to 50%. This is a private extension generated by applications such as Landmark PowerView. You might encounter this in other applications.

The Package Profile System

In order to handle certain CGMs correctly, or to render a CGM as expected by the user, the Justcroft CGM interpreter has a package profile system. A package profile consists of one or more package options that cause the interpretation of a CGM to be changed. A package profile is stored in a package file. Package files are located in the packages sub-directory.

The CGM interpreter will use the correct package profile based on the information found in the Metafile Descriptor or in the Metafile Name. The mapping between the CGM and the correct package file is stored in the `packagemap.dat` file. This is an ASCII file that uses the following syntax:

- Comment lines have to start with a '#'.

- It is not possible to combine keywords and comments on the same line.

- Keywords are in upper case. Keywords have a value separated from each other by a '='.

- Each mapping should begin with `PACKAGE` that has as a value a unique package name. The convention is to use upper case characters. White space should be replaced by an underscore ('_').

- The `PACKAGE` line can be followed by up to three `UNIQUEMAP` keywords. The value must map to a string that must match a (sub) string of the CGM description and/or CGM Metafile name. It is recommended to make this string as near unique as

possible.

- The UNIQUEMAP keyword line(s) should be followed by a PACKAGE_FILE keyword line. The keyword value should be a package file name.

If no mapping could be made between a CGM application and a package file then the package file that maps to the special entry DEFAULT is used. The DEFAULT entry maps to the default.pkg file.

The contents of system.pkg file will be read before any other mapped package file. The result will be a merge of the profile options specified in the system.pkg and the mapped package file. In case a profile option is specified in both files, then the mapped package file takes precedence. By default this file does not exist but is useful if you want, for example, to specify the CGM dash definitions for all CGM files.

Our products come with a set of package files and a packagemap.dat file for most of the common CGM generating applications. You can also create your own package files if needed. We recommend that you create a new package file, instead of editing one of the files we supply, otherwise your changes might be overwritten when you update your installation. You can override or extend package mappings with the usrpackagemap.dat file. By default this file does not exist.

The Package File Syntax

A package file is an ASCII file with the extension .pkg. The following syntax is used within the package file:

- Comment lines have to start with a '#'.

- It is not possible to combine keywords and comments on the same line.

- The package file should contain a line CGMPIX_BEGIN and a line CGMPIX_END. Keywords should be placed between these lines.

- Keywords are in upper case.

Profile Keywords

The following profile keywords can appear between CGMPIX_BEGIN and CGMPIX_END. Note that keywords and their arguments are case sensitive.

Syntax	Default	Description	Restrictions
ALLOW_PRIM_IN_CGMPLUS(*Boolean*) *Boolean*: yes, no			

Syntax	Default	Description	Restrictions
	no	Enable this option should there be problems with 2.5D seismic being drawn as 1D interpolated. This option may be needed for those applications that have CGM primitives between CGM+ traces.	None.
SEISMIC_ATTR_IN_GROUP(*Boolean*) *Boolean*: yes, no			
	no	Allow trace attributes to be changed within a CGM*PIP group. This does not conform to the standard and should only be used for specific applications such as Landmark PowerView.	None.
BACKCOLR_FILL(*Boolean*) *Boolean*: yes, no			
	yes	The normal behavior of our CGM printing system is to fill the background with the background color. By specifying no, the background color is ignored.	None.
CHARHEIGHT_FACTOR(*float*) 0.1 ≤ *float* ≤ 10.0			
	0.1	This option modifies the height of all text in the CGM with the specified factor. Use this keyword if all text is too small or too high.	None.
CHAREXPAN_FACTOR(*float*) 0.1 ≤ *float* ≤ 10.0			
	0.1	This option modifies the expansion factor of a character. A value larger than 1.0 results in wider characters.	None.
DEFAULT_CHARSET(*type*) *type*: iso8859-1, latin1, iso8859-5, cyrillic			

Syntax	Default	Description	Restrictions
	`iso8859-1`	This option overrules the default character set in the CGM. Character codes 0xA0-0xFF are mapped to UNICODE Cyrillic, when no character set is defined and `iso8859-5` is specified. Types `latin1` and `cyrillic` are aliases for `iso8859-1` and `iso8859-5` respectively. This option has no effect if the CGM uses the UNICODE character set (UTF8/UTF16).	The used fonts must be TrueType and contain the Cyrillic glyphs.
`DEF_RESTRTEXT_TYPE`(*type*) *type*: `basic`, `boxcap`, `boxall`, `isocap`, `isoall`, `justified`			
	`basic`	Alter the restricted text type to be used when drawing restricted text. Note that this option is intended for CGM version 1 files that do not specify the restricted text type. In general, you should specify either `isoall` or `boxcap` if you want to overrule the default. Note that `boxcap` is recommended by the CGM*PIP/II profile.	None.
`RESTRTEXT_AS_TEXT`(*Boolean*) *Boolean*: `yes`, `no`			
	`no`; Apply text box restriction.	Enable/disable restricted text. This option should in general not be used.	None.
`DRAW_LINEWIDTH_ZERO`(*Boolean*) *Boolean*: `yes`, `no`			
	`yes`; Draw zero width lines.	Enable/disable drawing lines with a line width of zero. This is currently used for Canvas™ generated CGMs.	None.
`COLOUR_ENTRY`(*index,* *red,* *green,* *blue*) 0 ≤ *index* ≤ 63, 0 ≤ *red* ≤ 255, 0 ≤ *green* ≤ 255, 0 ≤ *blue* ≤ 255			

Syntax	Default	Description	Restrictions
	No default.	This option overrules the color entry value of the CGM color table. Note that color values should be given in the range 0-255 regardless of the color extent within the CGM.	Only the first 64 index color entries can be overruled in index color CGMs. Only the background color (index 0) can be overruled in direct color CGMs.
`DRAWING_MODE(`*mode*`)` *mode*: `opaque`, `transparent`			
	`opaque`	The drawing mode can be set to color blending by this option. Certain CGMs assume this type of drawing. This option is currently used for Logic generated files. The term transparent is used because of historical reasons. A better term would be color blending. The CGM*PIP profile has defined escape -2999 for this type of drawing.	This option is ignored for PostScript output and PDF output. These types of output do not support color blending. Native printing for color blending depends on the printer driver used.
`FONTMAP(`"*input font name*"`,` "*mapped font name*"`)` Example to map the default font to Hershey/SimplexRoman: `FONTMAP(`"`Default`"`,` "`Hershey/SimplexRoman`"`)`			
	Automatic font name mapping.	Map the "input font name" to a different font name. The font names should be surrounded by double quotes if a name contains white space. The input name is case sensitive and must be specified exactly as it appears in the CGM font list. The output name must match one of the Justcroft fonts or a system font. Specify as input font name "Default" if you wish to override the default font used by the CGM Interpreter for a specific application.	None.
`MINIMUM_LINEWIDTH(`*float*`)` `0.01` ≤ *float* ≤ `2.0` mm			

Syntax	Default	Description	Restrictions
	Not used	This option forces lines to have the minimum width specified. Thicker lines will not be affected. This is currently used to correct CPS-3 wiggle lines.	This option affects only normal lines, not CGM+ wiggle lines.
SCALED_MARKERSIZE(*float*) $0.01 \leq float \leq 10.0$			
	1.0	This option scales markers by the specified factor. The final marker size will be the multiplication of the marker size and the given factor.	This option works only for marker size mode "scaled".
SCALED_EDGEWIDTH(*float*) $0.01 \leq float \leq 2.0$ mm			
	Plot size dependent algorithm between 0.05 and 0.2 mm	This option sets the values of the scaled edge width size. The thickness of the edge on the plot will be the result of the multiplication of this value and the actual edge width.	This option works only for edge width mode "scaled".
SCALED_LINEWIDTH(*float*) $0.01 \leq float \leq 2.0$ mm			
	Plot size dependent algorithm between 0.05 and 0.2 mm	This option sets the values of the scaled line width size. The thickness of the line on the plot will be the result of the multiplication of this value and the actual line width.	This option works only for line width mode "scaled".
WIGGLE_LINEWIDTH(*float*) $0.01 \leq float \leq 2.0$ mm			
	Plot size dependent algorithm between 0.05 and 0.2 mm	This option sets the values of the CGM+ wiggle line width size	This option works only for wiggle lines.
LINE_DASH_DEF(*index*, *{on, off}**) *index*: 2 (dash), 3 (dot), 4 (dash-dot), 5 (dash-dot-dot) Examples: LINE_DASH_DEF(2, 2500, 2500) LINE_DASH_DEF(4, 4000, 1500, 500, 1500)			

Syntax	Default	Description	Restrictions
	Interpreter specific.	This option allows the definition of a line/edge dash type. {on, off}* is a list of pairs of on/off values describing the pattern. Values are specified in thousands of millimeters.	This option works only for the standard CGM line/edge types. Up to 5 on/off pairs can be specified.
`DRAW_TEXT_WITH_LINEWIDTH`(*Boolean*) *Boolean*: `yes`, `no`			
	`no`	Control the width of stroked text such as Hershey fonts by the line width element when enabled. This is for applications such as ProMAX.	None.
`HATCHSIZE`(*float*) `0.5` ≤ *float* ≤ `5.0` mm			
	`2.5` mm (1/10 inch)	This option allows you to specify the hatch size (duty cycle) for raster drivers.	This option works only for the standard CGM hatch types. This option is ignored for PostScript output or PDF output. These types of output always use a hatch size of 2.5 millimeter.
`POLYGON_SPIKE_FIX`(*Boolean*) *Boolean*: `yes`, `no`			
	`no`	This option enables extra checks for degenerate polygons. Enable this option should spurious lines appear on your output. By default this option is not enabled since it slows down the interpretation process.	None.
`SKIP_ESCAPE22`(*Boolean*) *Boolean*: `yes`, `no`			
	`no`	This option disables the use of the CGM Escape 22, which controls the use of a transparent color for patterns or cell arrays (Transparent Cell Color). Some applications use this escape incorrectly.	None.
`DEFAULT_MITRELIMIT`(*float*|`iso`) *float* `1.0` ≤ *float* ≤ `32767.0`			

Syntax	Default	Description	Restrictions
	4.0	Set the default miter limit when not explicitly set in the CGM file. The ISO CGM default value of 32767.0 will be used when the value `iso` is used. Practical values would be 4.0 (SVG default) and 10.0 (PDF and PostScript default).	None.
`ALLOW_RDF_IDXCOLPAT`(*Boolean*) *Boolean*: `yes`, `no`			
	`yes`	If "yes" the index colors defined at the time an area is filled with the pattern are used. If the value is "no", the index colors at the time the pattern was defined are used.	None.

References

We recommend the following sources should you wish to know more about the CGM format:

- Computer Graphics Metafile functional specification: ISO/IEC 8632-1:1999. This document had to be ordered in the past from either ISO or ANSI. You can now download this from the web at www.iso.ch. Since this is the official standard, you may find the reading a bit difficult.

- The CGM Handbook, Lofton R. Henderson & Anne M. Mumford, Academic Press, 1993, ISBN 0-12-510560-0. A good introduction to the CGM format that is easier to read than the official specification. Slightly dated since it does not describe the CGM V4 specification.

- The "CGM Open Organisation" is an international organization of vendors and users dedicated to open and interoperable standards for the exchange of graphical information. You can find them on the web at www.cgmopen.org. You will find here the official WebCGM test set.

- The POSC website has been shutdown. However, the CGM*PIP standards can still be found as part of the Epicentre archive POSC_SIP_Specifications_v2.2_spec_disk.zip.

- The NIST CGM Projects site www.itl.nist.gov/div897/ctg/graphics/cgm.htm contains information about CGM. You can also download the CGM ATA test sets from this site.

- Both ATA 2100 profiles are developed and maintained by the ATA/AIA (Airline

Transport Assoc. and Airline Industry Assoc.). Information about this profile can be obtained from ATA at 1301 Pennsylvania Ave. N.W., Suite 1100, Washington, D.C. 10004-1707, +1 (202)626-4000.

- The CALS profile can be found at the Naval Surface Center, Carderoc Division.

- The latest WebCGM standard can be found at www.w3.org/TR/webcgm.

CGM Analyser

The CGM Analyser is a tool to analyze a CGM. It creates a report with information and error messages. The report also contains information that can be used for creating a custom CGM package file.

Graphical User Interface

Select the "CGM Analyser..." command from the `Tools` menu. The CGM Analyser dialog box will appear.
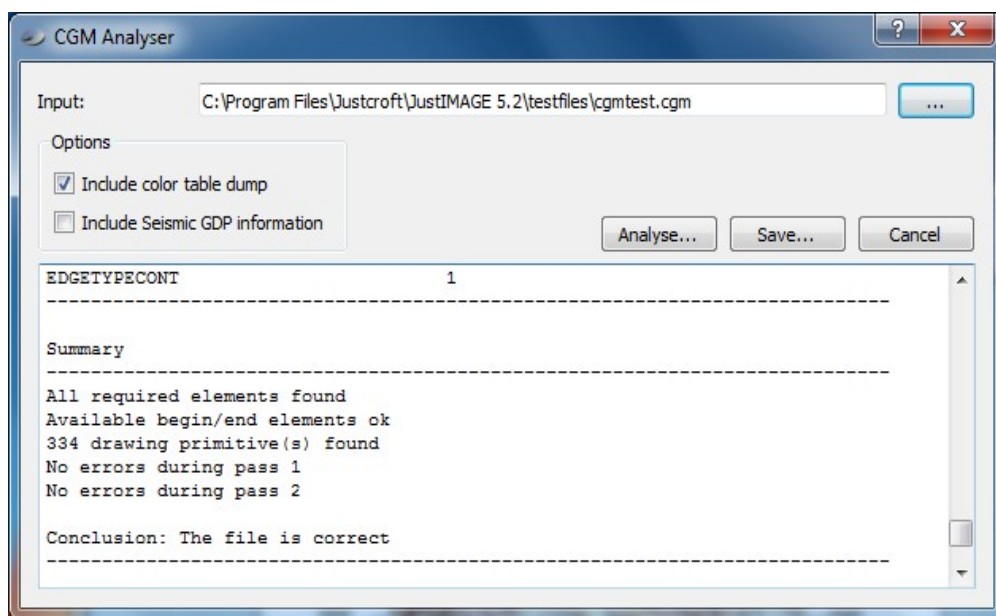
Illustration 66: The CGM Analyser dialog box.

By default, the analyzer window will come up with the name of the selected CGM. The input file can be changed by pressing the … button.

With the "Include color table dump" option, index color table entries are written to the report.

With the "Include Seismic GDP information" information about the seismic GDPs is written to the report.

Press the `Analyse...` button to start the analysis process. Depending on the size of the file, this may take from several seconds up to several minutes.

The report will appear in the log section of the dialog box. You can save the report to disk by pressing the `Save...` button. The default report file will have the same name and path as

the input file. You can save the report as either an ASCII text file or as a PDF file.

Command Line Interface

The CGM Analyser can be started from the command line. The command line syntax is:

```
cgmana <filename> [options]
```

where *<filename>* is the name of the CGM that has to be analyzed. You can specify the following options:

Option	Meaning
-log *<logfile>*	Write the analysis report to *<logfile>* instead of standard output.
-dcol	Add index color table entries to the report (Debug option).
-dseis	Add CGM+/CGM*PIP seismic information to the report. (Debug option.)

Understanding the Report

 The CGM Analyser processes the CGM in two steps. During the first step, it reads the CGM. During the second step, it also interprets the CGM. Informational messages and error messages during these steps are written to the report. The report consists of several parts.

CGM Information Part

A sample of the CGM information is shown below:

```
CGM Information
--------------------------------------------------------------------
CGM-Version   : 1
Metafile name : Paradigm Geophysical  CGM Output: Binary CGM v1.0:
98/03/25
Metafile descr:
CGM encoding  : binary
Color Model   : RGB


Package Automatic mapped to DEFAULT
```

It contains the CGM version number, the Metafile name, the Metafile description, the CGM encoding and the color model.. The Metafile name and the Metafile description are also used for the CGM package profile mapping. The result of the package mapping is also shown. In this example, there was no Automatic package map and the DEFAULT package is used.

Binary / Clear Text Information

The CGM Analyser will create a binary precision section in the log file if a binary CGM is being analyzed. Binary CGMs can have different precisions for storing numbers in the file, e.g. 16 or 32 bit for integers and 32 or 64 bit for floating points numbers.

```
Binary coding precisions
------------------------------------------------------------
Integer          : 16 bit
Real             : fixed point 32 bit
Index            : 16 bit
Colour           : 16 bit
Index Colour     : 16 bit
Vdc-Integer      : 32 bit
Vdc-Real         : fixed point 32 bit
------------------------------------------------------------
```

A binary precision section will not be created if the file is a clear text CGM.

Picture Summary

The log contains a picture summary for each picture in the CGM.

```
Summary of picture 1
------------------------------------------------------------
Name             = BegPic
VdcType          = Integer
ScaleMode        = Metric,  0.025000 mm/Vdc
VdcExtent        = (-2032,0) (19941,13190) (21.63 x 12.98 inch)
Colourmode       = Direct
Linewidth mode   = Absolute
Edgewidth mode   = Absolute
Markersize mode  = Absolute
------------------------------------------------------------
```

Field	Meaning
Name	Name of the picture in the CGM.
VdcType	Type of the co-ordinates used in the file. Integer for integer number and Real for floating point numbers.
ScaleMode	Metric for metric CGM. In this case, the scale factor defines the size of one VDC unit in mm. Abstract means that the CGM has no metric size.
VdcExtent	Co-ordinates of the picture. Normally the extent defines the interesting part of the picture.
ColorMode	Indexed: the CGM contains a color table. Indexes into the color

	table are used to specify colors. Direct: the CGM specifies colors directly.
Linewidth mode Edgewidth mode Markersize mode	Specifies the way the value of the width/size is defined. Absolute means that the values are specified in VDC units. Scaled means that the values are defined as a scale factor to an implementation specific value. Note: The package options SCALED_LINEWIDTH, SCALED_EDGEWIDTH and SCALED_MARKERSIZE can be used to set the implementation specific value if the corresponding mode is scaled.

Font List / Font Mapping

The log file will contain a font list overview if the CGM has a font list.

```
Font list overview
Entry  Used  Name                             Mapped to
-------------------------------------------------------------------
  1     Y    NBS HERSHEY:CARTOGRAPHIC_ROMAN   Hershey/CartographicRoman
  2          NBS HERSHEY:CARTOGRAPHIC_GREEK
  3     Y    NBS HERSHEY:SIMPLEX_ROMAN        Hershey/SimplexRoman
  4          NBS HERSHEY:SIMPLEX_GREEK
  5          NBS HERSHEY:SIMPLEX_SCRIPT
  6          NBS HERSHEY:COMPLEX_ROMAN
  7          NBS HERSHEY:COMPLEX_GREEK
  8          NBS HERSHEY:COMPLEX_SCRIPT
  9          NBS HERSHEY:COMPLEX_ITALIC
 10          NBS HERSHEY:COMPLEX_CYRILLIC
 11          NBS HERSHEY:DUPLEX_ROMAN
 12     Y    NBS HERSHEY:TRIPLEX_ROMAN        Hershey/TriplexRoman
 13          NBS HERSHEY:TRIPLEX_ITALIC
 14          NBS HERSHEY:GOTHIC_GERMAN
 15          NBS HERSHEY:GOTHIC_ENGLISH
 16          NBS HERSHEY:GOTHIC_ITALIAN
 17     Y    AVANTGARDE BK BT                 TimesRoman
-------------------------------------------------------------------
```

The overview contains the name of the font entries specified in the CGM. If a font entry is actually used in the file, then the Used column will contains a 'Y'. The font to which the entry is mapped is shown as well. A warning is given if a font entry could not be mapped to one of the available fonts.

```
No mapping found for 'AVANTGARDE BK BT', using Default
```

If you are not satisfied with the automatic font mapping you can use the FONTMAP CGM package option to get a better font map.

Element Summary

The element summary contains the CGM elements that were found in the file and the number of times the element was used. An example is shown below:

```
Element summary
Number of elements            : 425511
Number of unsupported elements :      0

Biggest Line has 475 points
Linewidth min = 1.000000, max = 20.000000
Biggest Polygon has 25 points
Edgewidth min = 1.000000, max = 15.000000
Biggest CellArray has 192 x 77 cells

Element                       Count
-------------------------------------------------------
BEGMF                            1
ENDMF                            1
BEGPIC                           1
BEGPICBODY                       1
ENDPIC                           1
MFVERSION                        1
INTEGERPREC                      1
REALPREC                         1
INDEXPREC                        1
COLRPREC                         1
COLRINDEXPREC                    1
MAXCOLRINDEX                     1
MFELEMLIST                       1
MFDEFAULTS                       1
FONTLIST                         1
SCALEMODE                        1
COLRMODE                         1
LINEWIDTHMODE                    1
MARKERSIZEMODE                   1
EDGEWIDTHMODE                    1
VDCEXT                           1
VDCINTEGERPREC                   1
CLIPRECT                         8
CLIP                            21
LINE                         26215
TEXT                          1204
POLYGON                      49371
CELLARRAY                        1
RECT                            70
CIRCLE                        2287
LINETYPE                         3
LINEWIDTH                    31203
LINECOLR                     83528
MARKERCOLR                       2
TEXTFONTINDEX                   84
TEXTCOLR                     36080
```

```
CHARHEIGHT                          1107
CHARORI                             1078
TEXTALIGN                           1121
INTSTYLE                           14596
FILLCOLR                           82981
HATCHINDEX                            13
EDGEWIDTH                           5661
EDGECOLR                           83372
EDGEVIS                             5481
APPLDATA                               1
-------------------------------------------------------
```

The minimum and the maximum line width and edge width (when used) are shown as well. This can be useful when there is a problem with the line width or edge width.

Sometimes a CGM appears to contain text but the elements TEXT and RESTRTEXT are not used. In this case, the text was simulated with polygons and/or lines. Font mapping will have no effect in these cases.

The CGM package option RESTRTEXT_TYPE might be useful when the element RESTRTEXT is used but with no RESTRTEXTTYPE.

Summary

The summary contains a short summary of the file.

```
Summary
-------------------------------------------------
Required elements are available
Available begin/end elements ok
79148 primitives found in the file
No errors during pass 1
No errors during pass 2

Conclusion: The file is correct
-------------------------------------------------
```

It contains information about the required elements and whether every CGM begin element is properly closed with a close element. The number of primitives and the number of errors during pass 1 (reading) and pass 2 (interpretation) are summarized. The conclusion contains information about whether or not the file is correct according to the Justcroft CGM interpretation. A valid CGM that has no drawing primitives will result in a message: "Conclusion: The file is correct, but does not contain a drawing."

Export

This chapter explains the Export dialog box in more detail as well as the command line interface.

The Export Dialog Box
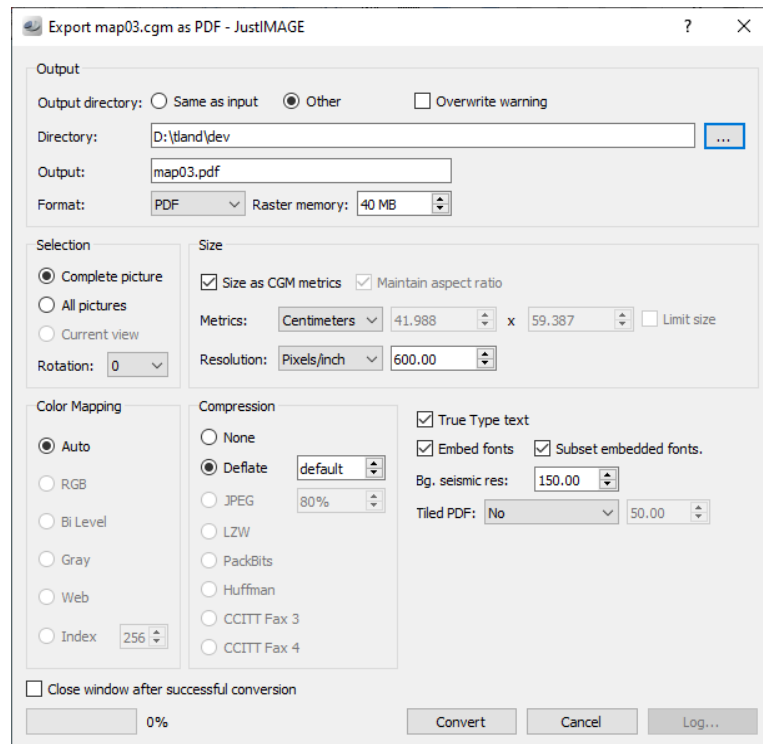
Illustration 67: The Export dialog box.

The output directory is, by default, the same directory as the input file. Select Other if you want to specify a different output directory. Press the browse (`...`) button to browse for the directory. By default, the output file name is derived from the input file and has the extension of the selected format. Type the name in the Output field to change the file name.

There is an alternative behavior you can enable through the `Edit ⇨ Preferences ⇨ Export` "Browse Behavior" setting. Pressing the browse button will allow you not only to select the output directory, but the file name and file type as well.

Enable the "Overwrite warning" option if you want to be warned should the output file already exist.

The raster memory is the amount of memory used for the bitmap conversion. For PDF / SVG this is used for the bitmap conversion of the Seismic Background sections.

Enabling the "Close window after successful conversion" option will cause the Export dialog to behave like a modal dialog box. Disable this option if you want to do multiple types of conversions of the same picture/view without having to reopen the dialog.

The dialog has different selection parts and these will be described in the following sections. Depending on the selected format, certain options are enabled or disabled. JustIMAGE 5.4 will use the current Color Redefinition and Package settings for the Export as well.

Save to the selected format by pressing the `Convert` button. The progress indicator will give you some idea how long the conversion is going to take. Press the `Cancel` button to abort the conversion.

After conversion, the log information can be viewed using the `Log` option.

Press the Cancel button (again) to close the Export dialog box.

Selection

In the selection section, you can choose between saving the "Complete picture", "All pictures" or the "Current view". The "All pictures" option is only available for PDF and TIFF; in this case each picture in the CGM will be converted to a separate PDF or TIFF page.

The "Current view" option is available if you have zoomed in on a part of the picture or if you had placed a view fence. If you choose this option, only the visible part in the viewer will be saved in the file. The default value for this option is the "Complete picture" for the raster formats and "All pictures" for PDF and TIFF.

With the rotate option the picture can be rotated; the default for rotate is the current rotation setting from the view window.

Size

In the size section, you can control the size of the output file. For a metric CGM, the default size will be the same as the size of the CGM (this is after rotation). If you disable the "Size as CGM metrics" option, the size (horizontal x vertical) can be changed. Abstract CGMs will get a size of 200mm by default, which can be changed.

Sizes can be specified in millimeters, inches or pixels depending on the value of the Metrics option menu. If you change one of the size fields the other is updated as well (after losing focus or pressing enter) so as to maintain the aspect ratio. The aspect ratio can be forced to an-isotropic by disabling the "Maintain aspect ratio" option.

The resolution of the output can be changed as well by entering a value. Changing the resolution has no effect on the metrics but only changes the number of pixels of the bitmap formats. By default, the resolution has a value of 150 dpi for the bitmap formats and 600 dpi for PDF / SVG / SVGZ.

The "Limit size" option prevents images becoming larger than the specified size. This is intended if you are creating a series of exports and you don't want images that are "blown up" too large.

Color Mapping

In the color mapping section, the color type of the output file can be specified. One of the following options can be selected:

- Auto. Automatically the 'best' option for the format is chosen. The detection of what is the best option will cost additional time, but ensures that the smallest possible output file is generated. This is the default color mapping mode.

- RGB. The output will be a true color RGB file.

- Bi Level. The output will be a bi-level (Black/White) output file.

- Gray. The output will be gray scale.

- Web. The colors in the output will be mapped to the standard color map for the Web.

- Index. The output will not have more than the specified number of colors.

The options that are not supported for the selected format can not be selected.

Compression

For some formats, different compression methods are possible, e.g. for TIFF. Normally the default value is the most common compression method and it should not be necessary to change it. One of the following can be selected: "None", "Deflate", "JPEG", "LZW", "PackBits", "Huffman", "CCITT Fax 3" or "CCITT Fax 4". The compression methods "Huffman", "CCITT Fax 3" and "CCITT Fax 4" can be used when a bi-level TIFF is created.

The quality of the JPEG files can be controlled. A higher value normally gives better quality then a lower value but the files will be bigger. The default value is 75 and should be good enough in most cases.

The level for the Deflate compression (PDF, PNG, SVGZ and TIFF) can be controlled. A higher value normally gives a smaller file but it takes more time to create the file. The value "default" gives the best trade-of between speed and compression.

Advanced Options

The "Anti Alias 2x2" can be used to create an anti alias effect on the final bitmap by an over sampling of 2×2. Anti aliasing reduces visual artifacts when rendering bitmaps at low resolutions. This requires more resources (CPU-time, memory/disk space) and should be

used for pictures with a final size up to 1000×1000 pixels.

TrueType text in PDF output can be generated as text instead of being emulated. This makes text searching and selection possible. The PDF is less portable if the font data is not embedded. Select "Embed fonts" to have the font data added to the PDF. It's recommended to leave "Subset embedded fonts" enabled as this will keep the PDF relative small in size.

The "Include Itedo SVG extensions" is an advanced option which will add WebCGM meta information in the SVG/SVGZ file. WebCGM Layer information and Hotspots information are automatically added to a PDF.

The Seismic Resolution is used for the bitmap conversion of Seismic Background sections when generating PDF or SVG/SVGZ. The default value of 150dpi is normally good enough.

You can divide a PDF image into tiles. The PDF will be tiled along the longest side of the input (taking the rotation into account). The length of each tile can be A4, Letter or a custom length specified in either millimeters (Custom mm) or inches (Custom inch)

Command Line Interface

The conversion of a CGM into a bitmap image, PDF or SVG is done by the command line program fscgmint. The general syntax of the program is:

```
fscgmint [option…][input file [output file]]
```

Input is taken from standard input when no input file is specified. The output file name extension indicates the output file format. Some formats have allowed aliases. Output is passed to standard out if no output file is specified.

Format	Supported sub types	Extension
BMP Windows device independent bitmap	1 bit bilevel, 8 bit index, 24 bit RGB	`.bmp`
JPEG Joint Photographic Expert Group	YUV	`.jpg` | `.jpeg`
PBM Portable Bitmap	1 bit bilevel (binary only)	`.pbm`
PPM Portable Pixelmap	24 bit RGB (binary only)	`.ppm`
PGM Portable Graymap	8 bit index, gray values (binary only)	`.pgm`
TIFF	1 bit bilevel, 8 bit index, 24 bit	`.tif` | `.tiff`

Tagged Image Format	RGB	
GIF Graphics Interchange Format	8 bit index	`.gif`
PNG Portable Network Graphics	1 bit bilevel, 8 bit index, 24 bit RGB	`.png`
PDF Portable Document Format	24 bit RGB	`.pdf`
SVG Scalable Vector Graphics	24 bit RGB	`.svg`
SVGZ Deflate compressed Scalable Vector Graphics[14]	24 bit RGB	`.svgz`

Options

Options are case sensitive and start with a dash (-). On Windows, options can also start with a forward slash (/). Options cannot be abbreviated. An option may be followed by one or more parameters.

Option	Meaning
`-help`	Show the available options.
`-version`	Shows program version and build date.
`-log` *<log file>*	File name of the log/error file. Log and error information goes, by default, to standard error (stderr).
`-loglevel` *<0-3>*	Log level 0: quiet, 1: error, 2: warnings. 3: informational. Default is 2.
`-otype` *<format>*	Output file format. See the chart above for allowed file formats. As standard, the output file format is based on the output file extension, so this option is only needed when fscgmint is used in a command pipe. The default is PPM if no output file extension was specified.

14 Technically SVGZ is not a separate graphics format but the same as the SVG graphics format. It's purpose is to reduce SVG file size. Any program that can handle the GNU Zip file format can convert between SVGZ and SVG.

Option	Meaning
-res *<H>*[x*<V>*][in|mm]	Horizontal and vertical resolution in either dots per inch (in) or dots per millimeter (mm). Both values can be real numbers. The vertical resolution is optional. The default is 150x150in for bitmaps. The default is 600in for PDF and SVG. Only the horizontal resolution is used for PDF / SVG.
-sres *<X>*[in|mm]	Resolution of the Background Seismic Sections in either dots per inch (in) or dots per millimeter (mm) of a PDF / SVG. The default is 150in.
-size *<X>*x*<Y>*[px|in|mm]	Image output size. The dimensions specified must be width (X) and height (Y). Sizes can be specified in real numbers. An optional size unit can be specified. The default size unit is pixels (px) for bitmaps. You can only specify inches or millimeters for PDF / SVG.
-maxsize *<X>*x*<Y>*[px|in|mm]	Maximum image output size. This limits the metric size of an image to the specified dimensions. It is also the size in the case of abstract CGMs.
-rot [0|90|180|270]	Image rotation: 0, 90, 180 or 270 degrees. Default is 0 degrees.
-aspect [iso|aniso]	Image aspect ratio. Either isotropic or an-isotropic. The default is isotropic.
-cgmp *<parameter file>*	CGM Parameter file. This might be needed for some old versions of ProMAX and Finder.
-package *<CGM package>*	Specify CGM interpreter package. This is an advanced option that in general does not need to be specified.
-pkgfile *<file>*	User defined package file. This is also an implicit -package USER-DEFINED.
-cropvdc *(bl),(tr)*	Specify the crop VDC. Must be specified in VDC units for the bottom left and top right VDC extents. Units can be real numbers. The crop VDC is clipped against the real VDC of the CGM. The default is to use the

Option	Meaning
	complete VDC extent.
-picture [<#>|all]	Specify the CGM picture number. Use the keyword all if you want all pictures in the output. The default is all pictures for PDF or TIFF output; the first picture for all other formats.
-maxmem <#>	Maximum amount in Mb of virtual memory to be used for rendering. The default is 40 Mb.
-tmpdir <dir>	Directory to be used for temporary files. The default is platform dependent.
-cmode [rgb|grey[15]|gray| bilevel]	Color render mode. The default is RGB.
-cmap [auto|rgb|bilevel| grey|gray|web|n]	Map colors. The default is auto, which means best color mapping. Auto will cost additional time to determine the best possible mapping. You can also specify a number n where n is 16-256.
-cinvert [none|bw]	Invert colors. bw: black & white. The default is none.
-gamma <#|#,#,#>	Gamma correct with value # (0.1-5.0). The #,#,# form allows correction of individual red, green and blue values.
-cplevel <1-9>	Deflate compression level. The default is to use the best time/compress ratio.
-cptype <type>	Compression type. This depends on the supported compression type of the output format.
-jpegq <1-100>	JPEG quality. Higher numbers mean better quality at the expense of file size. The default is 75.
-aa [2x2]	Anti alias method for bitmaps. The default is no anti alias method. This option has no meaning for PDF or SVG output.

15The keyword grey is an alias for the keyword gray.

Option	Meaning
`-ttf <emu|text>`	Emulate TrueType text (`emu`) or use text strings with PDF output. The default is `emu`.
`-fonts <none|embed|subset>`	Embed whole fonts or use subsets (smaller) with PDF output. The default is `none`. Embedding fonts make the PDF more portable outside the office. Use `subset` if possible instead of `embed` as the latter increases the file size considerable.
`-tile <no|a4|letter|X[in| mm]>`	Create a tiled PDF. The default is no. The PDF will be tiled in the longest direction of the input (taking the rotate option into account), the length of each tile will by `a4`, `letter` or a length specified in inches (`in`) or millimeters (`mm`).
`-pdfversion <acrobat5| acrobat7>`	Create a PDF for Acrobat 5 (PDF 1.4) or Acrobat 7 (PDF 1.6). The default is a PDF compatible with Acrobat 7. Note that it is highly recommended to leave this to the default as Acrobat has problems with files with image widths or heights larger than 200 inches.
`-hotspots <disabled| enabled>`	Create a SVG with hotspots information suitable for Web browsers. The default is disabled. The `-itedosvg` parameter will overrule this option.
`-itedosvg`	Create a SVG with Itedo SVG extensions. Used to encode Itedo WebCGM meta data in the SVG output.
`-css <none|default| external|'custom'>`	Set the SVG CSS styling of hotspots if -hotspots is enabled. The default is to place a simple 50% transparency with a red border. No styling will be placed in the file if none is used. The external option references a separate file 'aps-style.css'. The 'custom' option allows any kind of CSS styling to be placed in the file.

The output options you can specify depend on the output format.

Format	Allowed output options
BMP	-cmap auto|rgb|bilevel|grey|gray|web|n
JPEG	-cmap auto|rgb|grey|gray -jpegq
PBM	-cmap auto|bilevel
PPM	-cmap auto|rgb
PGM	-cmap auto|grey|gray
TIFF	-cmap auto|rgb|bilevel|grey|gray|web|n -cptype lzw|deflate|none|packbits|hufman|fax3|fax41 -cplevel
GIF	-cmap auto|grey|gray|bilevel|web|n
PNG	-cmap auto|rgb|grey|gray|web|n -cplevel
PDF	-cptype deflate|none -cplevel -ttf -fonts none|embed|subset -tile -pdfversion acrobat5|acrobat7
SVG	-css none|default|external|'custom' -hotspots enabled|disabled -itedosvg
SVGZ	-hotspots enabled|disabled -itedosvg -size metric|abstract|force-abstract

Format	Allowed output options
	-cplevel

Exit Codes

The following exit codes are returned by fscgmint:

0. Program could run successfully.

1. General failure; for example the specified input file was not found.

2. Usage error; for example the command line option was not recognized.

3. Resource failure; such as not enough memory, out of disk space or bitmap width or height too large.

4. License failure.

CGM Optimiser

This chapter explains the CGM Optimiser Graphical User Interface in more detail and also the command line interface.

Optimizations

Conversion Modes

The CGM Optimiser can work in three different modes:

Filter CGM

> Split the CGM into a normal vector CGM and a raster file for the seismic. Select the graphics application into which you want to import the CGM from the Profile combo box. Click on the Advanced button if you want to tune the conversion options.
> You can change the Picture that the CGM Optimiser will convert. By default the picture that is currently visible in JustIMAGE 5.4 is selected.

Convert to raster

> Convert the CGM to the specified raster file. This option is superseded by the Output File Converter module of JustIMAGE 5.4, which gives you more options and control over the generated bitmap.

Optimize CGM

> Only perform the join operations on the CGM; the seismic is kept in the CGM.

The CGM Optimiser will also perform some standard conversions:

- Correction of certain CGM file constructions that are known to cause problems. For example, CGM Metafile defaults are moved to the CGM Begin Picture State.

- Clear text CGM to binary CGM conversion.

- Direct color output is generated if color index values higher than 255 were used in the original CGM file. Most drawing packages can handle only 256 index colors.

- Large cell arrays are split into multiple smaller cell arrays (if the Convert cell arrays to Raster option is disabled)

- Banded CGM pictures are merged into a single picture.

- Common CGM graphics elements that are outside the active clip are removed from the CGM output, both reducing the file size and making import into drawing packages simpler.

Note: Standard conversions cannot be disabled.

The CGM Optimiser is currently only able to convert CGM version 1, CGM+ and CGM*PIP/I files. This does not apply when using the convert to raster mode.

Join Options

Sometimes the applications that create CGMs use many short lines instead of one line with many points. When importing such a CGM into a drawing package it is difficult to change the line.

The Join options can be used in the Filter CGM mode and the Optimise CGM mode.

Line joining

> Convert multiple single lines into a single multiple sections line. This reduces the file size and makes importing into graphics applications such as CorelDRAW easier.
> The line join filter performs the following four types of conversions:

1. Normal line-join of lines with the same attributes (color, width, style) by connecting the start point of a line to the end point of the previous line.

2. Convert thick line simulation or diagonal line simulation into true lines with the correct width.

Thick line
emulation

Line join
replacement
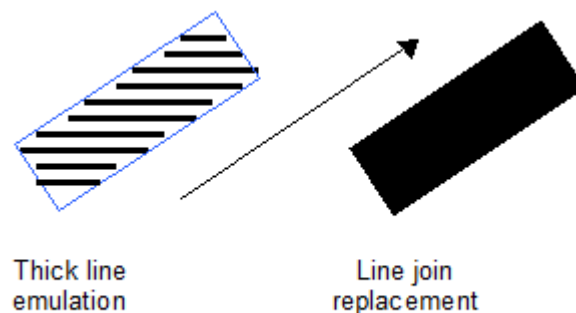
Illustration 68: Thick line emulation removal by the CGM Optimiser.

3. Removing unnecessary points on a line. For example, a horizontal line with three points is reduced to a line with two points.

4. Lines with a zero line length are converted to have a line length of one VDC unit.

Line point tolerance

> Remove points on a line that fall within a certain delta distance. This reduces the file size and makes importing into graphics applications such as CorelDRAW easier. You can specify tolerance factors between 1 and 10, where 10 is the most aggressive removal factor. Specify 0 to disable the option.
>
> This option can cause line details to be lost and can lead to poor graphics quality. In between points on straight line sections are always removed, regardless of this option.
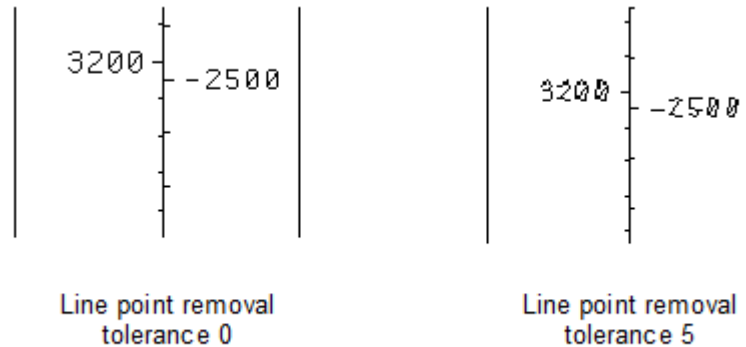
Illustration 69: The effect of setting the line point removal tolerance.

Simulated thick line detection

> Detect and replace lines that are parallel to the VDC and appear to simulate thick lines. This might make for easier editing later. However, detection is not 100% reliable and this option should be used with caution.

Fill joining

> Convert multiple simple polygons into a single larger polygon. This reduces the file size and makes importing into graphics applications such as CorelDRAW easier.
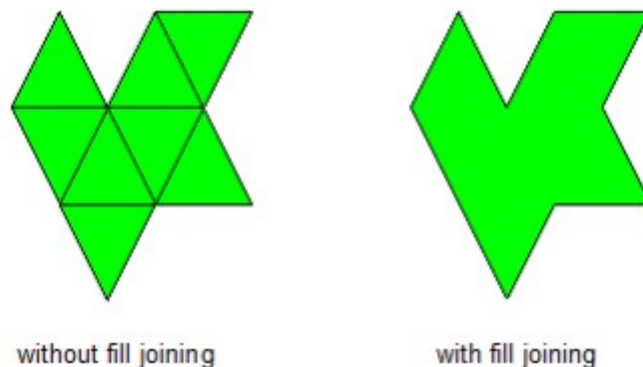
Illustration 70: Fill joining by the CGM Optimiser.

Fill joining alters the order of the CGM elements and may cause unexpected results. Disable this option should this be the case.

Fast processing

This option will speed up the joining process because fewer polygons are kept in memory. In general this option takes less time but fewer polygons will be joined.

Fill color tolerance

Normally the fill joins are based on polygons of the same color. Specifying a "Fill color tolerance" performs an even more aggressive conversion of simple polygons by joining polygons based on color matching. You can specify color matching between 1 and 20 percent. Specifying 0 turns this option off.

without color tolerance   with color tolerance
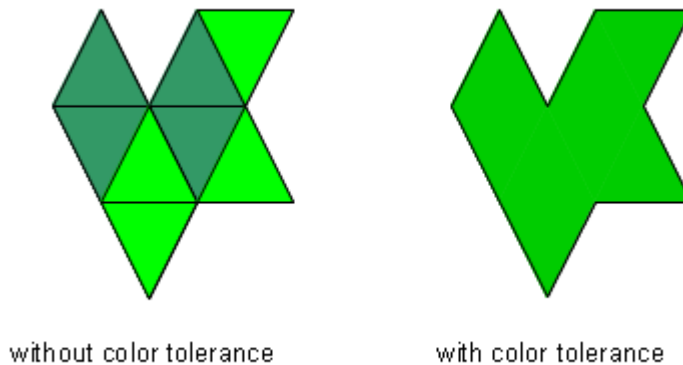
Illustration 71: The effect of setting a fill color tolerance.

Fill point tolerance

Same as line point tolerance, except that this works for polygons.

Overlay test

Enable test for overlapping polygons when joining. The normal join filter does not handle overlapping fill correctly resulting in gaps in the joined area. This option will slow down the joining process.

White rectangle removal

Remove white rectangles from the file. This option is created for inefficient IESX files and should be used carefully as the result might not be correct for CGMs from other applications.

The CGM Optimiser Graphical User Interface
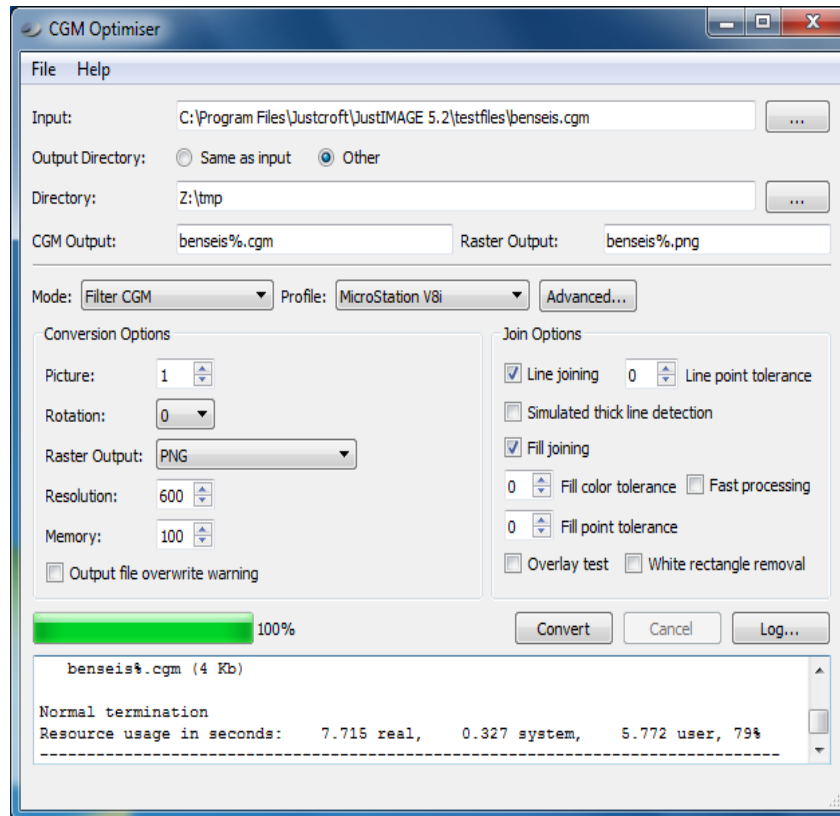
Illustration 72: The CGM Optimiser main window.

The output directory is, by default, the same directory as the input file. Select Other if you want to specify a different output directory. Press the . . . button to browse for the directory.

Depending on the selected mode, CGM Optimiser will create one or more output files in the output directory.

The output file names are by default derived from the input file name and have a percentage sign (%) appended. If there are multiple raster files generated the first raster file has only the '%' the second '%1' and so on. You can alter the names if needed. The extension of the file is based on the output format (e.g. .cgm for the CGM and .tif in case of a TIFF raster file).

With the "Rotation" option, the output file (both raster and CGM) can be rotated 0, 90, 180 or 270 degrees.

With the "Raster Output" option, the format of the raster output file can be selected. You can choose one of the following formats: BMP, GIF, JPEG, PNG, TIFF with deflate compression, TIFF with LZW compression and TIFF with PackBits compression.

Select the resolution of the raster file to be generated for the seismic sections or when using the Convert to Raster option. Higher resolution gives better seismic details, however this will cost more memory and the conversion will take longer. We recommend resolutions between 75 and 300 dots per inch (DPI) in the case of background seismic. Wiggle Seismic usually

requires 300 DPI.

The "Memory" setting controls the maximum amount of cache memory to use for rendering seismic sections or when using the Convert to Raster option. You can raise this value if you have large amounts of physical memory in your computer and you want to have better performance.

Use the "Output file overwrite warning" option if you want to get a warning message when you are going to overwrite existing files with the converter.

After having selected one or more conversion options, click on the `Convert` button to start the conversion. Please wait until the progress bar is completely filled and you see a termination message in the log window. You can look at the conversion log in a larger window by clicking on the `Log` button.

Select either the "Exit" command from the `File` menu or click on the `Close` button to close the CGM Optimiser dialog box.

Advanced Options

You can alter any CGM Optimiser option after selecting a profile under the Advanced Options dialog box. Make any alteration and click on the OK button.
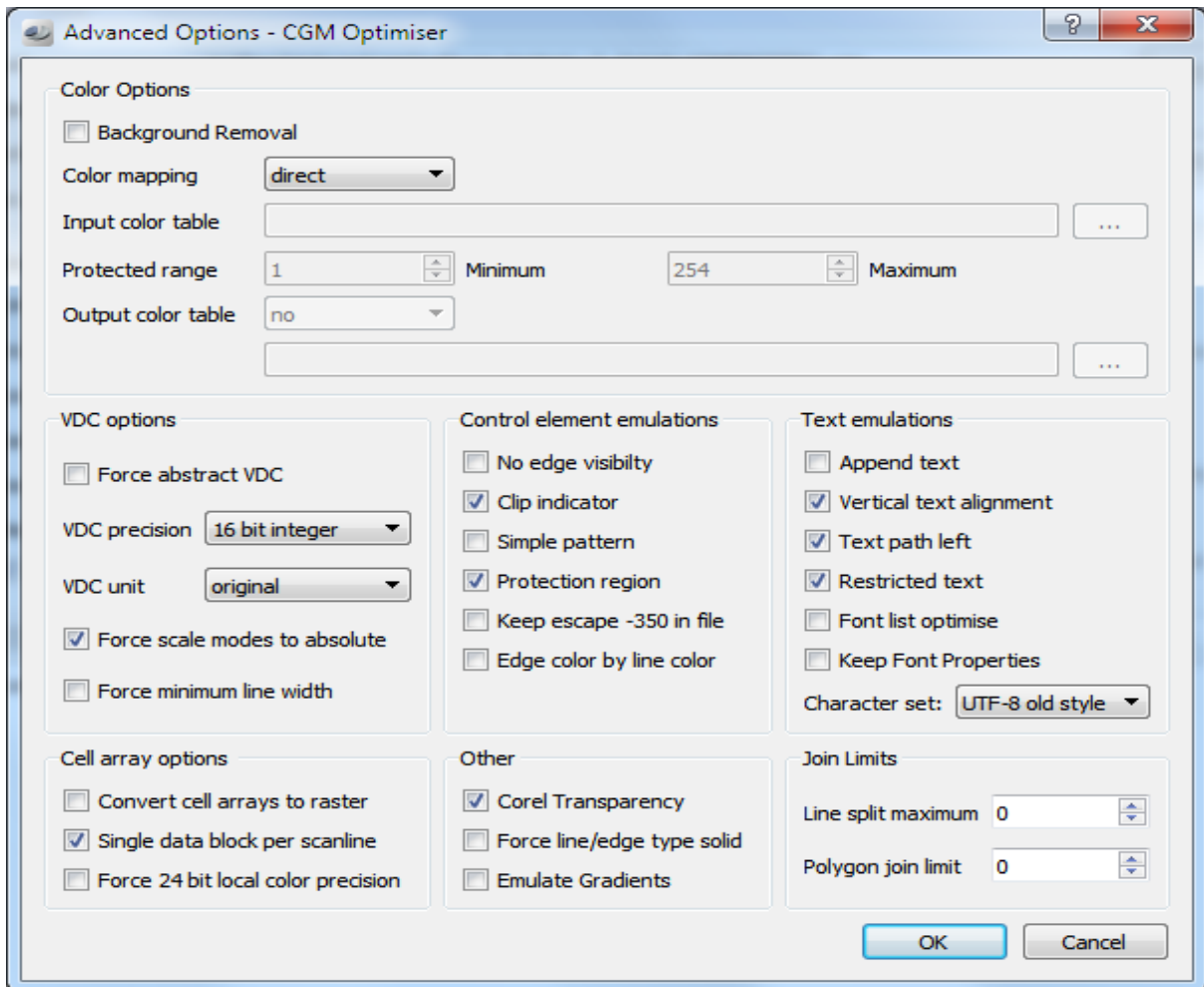
Illustration 73: Advanced Options dialog box of the CGM Optimiser.

The CGM Optimiser Interface will remember the settings used if you close the program. The last used settings will be restored next time you start the CGM Optimiser Interface. The options will be reset to the defaults if you re-select a converter profile. The following options can be specified.

Color Options

Background Removal

The CGM standard defines a background CGM element. This element can be removed from the file. This may or may be not what you want.

Direct Color

Some graphics applications only support direct color or do not support the fact that color index entries can be redefined in the CGM file (a typical trick some CGM generating programs do).

CGM Optimiser can change index color entries to direct color entries. This increases the converted CGM file size.

Optimise 256

Graphics applications such as MicroStation can better import CGM files if the file is indexed colored with a maximum of 256 different colors.

Important: The conversion will fail if more then 256 distinct colors are required.

Color Table

Use a MicroStation color table for the output CGM. By default, only the colors that are found in the color table are used. You can also specify a protected range within the color table, by setting the minimum and maximum value.

Important: Color table entries 0 and 255 (background color) are always protected and will not be altered by the CGM Optimiser.

The CGM Optimiser can also create a MicroStation color table. You can create a color table with the same name as the output CGM (but with the extension `.tbl`) or specify a name and path for the color table.

VDC Options

Force VDC abstract

You can use CGM Optimiser to convert a metric CGM to an abstract CGM. This option has no effect when the original CGM was already abstract. Seismic CGM files are usually metric and, depending on the type of seismic, can have sizes of a square meter up to twelve meters in length.

Most graphics applications have much smaller internal metrics, which can cause problems if you try to import large metric files.

VDC precision

By default, real VDC are converted to integer 16 bit co-ordinates. This is done because some graphics applications, such as MicroStation J, do not support all possible VDC extent combinations. Canvas, on the other hand only supports 32 bit fixed point real co-ordinates in all possible VDC extent combinations. CGM Optimiser can also generate normalized 32 bit fixed point real co-ordinates.

VDC unit

This option has been made for importing metric CGMs into MicroStation. It seems that MicroStation maps one VDC unit to one Master or Sub unit from the design file. With this option you can create a CGM where 1 VDC unit is a mm, cm, meter, inch, foot or yard. The default value of this option is original, which means that no conversion is done.

Force scale mode to absolute

Line widths, edge widths and markers can have sizes that are scaled or absolute sized. This can cause problems for certain graphics applications such as CorelDRAW that do not support scaled modes correctly. CGM Optimiser can enforce that only absolute modes are used within the CGM.

Force minimal line width

ATA specifies that lines with a width of zero should be interpreted as being drawn with the smallest possible device dot. Graphics applications, such as Canvas, do not follow this guideline. This will cause lines to disappear when imported. The "Force minimal line width" option will generate CGM files that always have a line width.

Cell array options

Convert cell array to raster

Some graphics applications do not support all possible types of cell arrays.
CGM Optimiser can convert cell arrays and tiles to raster files. Cell arrays can be joined if needed. Some CGM packages generate cell arrays that are one unit high or wide (a typical trick to put seismic data in a standard CGM file).

Force 24 bit local precision

CGM files with cell arrays have a local color precision. The local color precision overrules the picture color precision. Unfortunately, Canvas interprets the local color precision incorrectly with direct color cell arrays. CGM Optimiser can convert direct color cell arrays so that these can be imported into Canvas. Note that this option should only be used to import CGM files into Canvas.

Single data block per scanline

This will create CGMs with cell arrays where each scanline is stored in a separate data block. This is needed as a workaround for a problem in the CGM import filter of CorelDRAW. This option creates files that have a slightly bigger file size.

Control Element Emulations

No edge visibility

CGM filled graphical elements, such as rectangles can have an edge. Drawing of this edge is regulated by the edge visibility control element. MicroStation does not handle the edge

visibility element and always draws an edge around filled elements. CGM Optimiser can work around this MicroStation problem but at the expense of slightly larger CGM output. This option is not required if you are using MicroStation V8i.
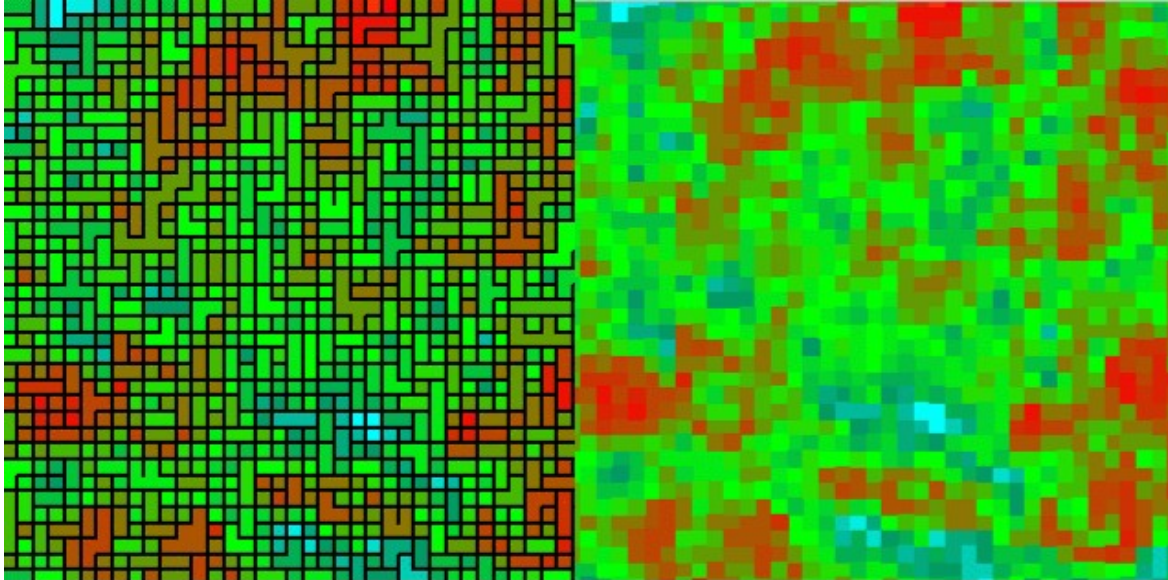
Illustration 74: Edge visibility emulation by the CGM Optimiser.

Clip indicator

Clipping of CGM graphical elements is handled by several control elements. In general, both a clip rectangle and a clip indicator control element are specified. The clip indicator specifies whether the clip rectangle should be used. Canvas ignores this element and only looks at the clip rectangle. CGM Optimiser can work around this Canvas problem, at the expense of slightly larger CGM output.

Simple pattern

With this option, polygons with a pattern fill are converted into polygons with a solid fill of the most dominant color in the pattern. Some applications do not support patterns and show no fill at all. For applications such as MicroStation "this poor man's solution" might be an alternative.

Keep escape –350 in file

With this option the CGM escape code –350 is kept in the file. This option should only be used when CGMs generated by Finder are going to be imported into MicroStation with the GeoCGM+ import module. The escape information is used for placing the primitives on different layers.

Protection region

This option emulates Protection Regions. This has been done to improved the import of

Petrel generated EMF files into applications such as PowerPoint and MicroStation.

Edge color by line color

Use the Line color as the Edge color of a filled element. This is a workaround for a problem in MicroStation V8i.

Text Emulations

Append text

With this option, the Append Text primitives will be combined into one single Text primitive. The combined Text element will use the Text attributes of the first Append text member. Some applications cannot handle Append Text at all and in this case, this is a good alternative.

Vertical text alignment

This option converts non-default Vertical Text Alignment to the default to prevent possible text shifts.

Text path left

Some applications do not support Text Path Left and will show text reversed. This option emulates Text Path Left.

Restricted text

Some applications don't handle Restricted Text correctly causing text to become either too big or too small. This option converts Restricted Text into normal unrestricted text.

Font list optimise

Microsoft Office has problems with font lists that contain font name entries that are actually never used. This option restricts the font list to fonts that are actually used in the CGM.

Keep Font Properties

By default Font Properties are removed as the Font Properties element could cause problems with applications that don't fully support CGM Version 3 elements.

Character set

By default text is mapped to ISO Latin 1 as most CGM interpreters don't handle Unicode. Some advanced interpreters handle UTF-8. Old style UTF-8 may be required to handle UTF-8 correctly.

Join Limits

Line split maximum

This option is used to split lines that contain more then the specified factor * 1000 of line points. Zero means no limit. This is currently used for MicroStation since this application has a limit for the number of points on a single line.

Polygon join limit

> This option is used to restrict the number of vertex points when joining polygons. The number of vertex points is restricted to the specified factor * 1000. Zero means no limit. This is currently used for MicroStation since this application has a limit for the number of vertex points.

Other

Corel Transparency

> Convert standard CGM Alpha Transparency into CorelDRAW X5/X6 CGM Alpha Transparency. Note that this option will generate CGMs that are not compatible with other applications.

Force line/edge type solid

> Force all dashed lines and dashed edges to become solid. This is a (partial) workaround for applications that do not handle dashed lines and dashed edges correctly.

Emulate Gradients

> Replace gradient fills (Interpolated Interior) with an average color fill. Most applications do not support gradient fills resulting in either empty fills or a random color fill.

Command Line Interface

The optimization of a CGM is done by the command line program justtiff. The general syntax of the program is:

    justtiff *<filespec>* [options]

where *<filespec>* is either the name of the CGM file to be converted or a wild card specification of files that have to be converted.

You can specify the following options:

Option	Meaning
-abstract	Force the CGM to have an abstract VDC.
-all2ras	Enables complete CGM to raster conversion.
-apte	Enable Append text emulation.
-ca2ras	Enable cell array/tile to raster conversion.
-cal24	Force local color precision of a cell array to 24 bits. This option should only be used for import into Canvas, since this option creates incorrect CGM files.

Option	Meaning
-caslb	Write every line of a CGM Cell Array into a single data block. This option should be used for import into CorelDRAW 11 or higher. Using this option will generate CGMs that will have a slightly larger file size.
-cgmp *<file>*	CGM Parameter file. This might be needed for some old versions of ProMAX and Finder.
-cioe	Clip indicator off emulation.
-cptype *<type>*	Specify the TIFF compression type which type can be `lzw` for LZW compression, `deflate` for deflate compression and `packbits` for PackBits compression. Specify `none` to disable compression.
-ctblin *<file>* [*min max*]	Input MicroStation RGB color table. This option overrules the -idx255 option. Optionally two numbers in the range 1-254 can be given as the lower bound and upper bound of the protected colors. If not specified, the whole table is protected. *min <= max*.
-ctblout [*file*]	Create an output MicroStation RGB color table. Use the output CGM name and path with the extension `.tbl` if no output color table file is specified.
-cx5t	Convert a CGM with Escape 45 into a (incorrect) CGM with CGM Transparency. This is to workaround a bug in the CorelDRAW X5 import filter. This option should **not** be used for any other kind of application.
-delbgnd	Remove background color.
-dircol	Enable direct color conversion.
-evoe	Edge visibility off emulation.
-lced	Edge color by line color substitution.
-idx255	Enable 256-color table optimiser.
-ljoin	Enable lines join option.
-ltol *<X>*	Remove line points based on the tolerance factor. *<X>* can be

Option	Meaning
	between 0 and 10. Specify 0 to disable the line point removal.
-tled	Detect and replace lines that are parallel to the VDC and appear to simulate thick lines.
-fjoin	Enable polygons fill join option.
-fjovl	Enable the fill join overlay test.
-fjfast	Enable fast fill join processing.
-ftol *\<X>*	Join polygons based on color tolerance. *\<X>* can be between 0 and 20 percent. Specify 0 to disable fill color tolerance join. (Default 0.)
-fptol *\<X>*	Remove polygon points based on the tolerance factor. *\<X>* can be between 0 and 10. Specify 0 to disable the polygon point removal. (Default 0.)
-fntopt	Enable font list optimization. Important for Microsoft Office which has problems with font lists that contain unused entries.
-fntprop	Keep Font Properties. By default Font Properties are removed as the Font Properties element could cause problems with applications that don't fully support CGM Version 3 elements.
-lsplit *\<X>*	Split lines that contain more then the specified *\<X>* * 1000 of line points. Specify 0 to disable the line split option.
-jlimit *\<X>*	Limit the number of vertex points in a polygon to *\<X>* * 1000 points. Specify 0 to disable the vertex points limit.
-maxmem *\<#>*	Maximum amount in Mb of virtual memory to be used for rendering. The default is 40 Mb.
-modeabs	Force line width mode, edge width mode and marker size mode absolute.
-nolw0	No line width zero. Always give lines a width.
-novdcr2i	Obsolete. Use the –ovdc option instead.
-ovdc *\<X>*	Set output VDC type. *\<X>* can be either int or real. (Default is

Option	Meaning
	`int.`)
-nodash	Force all dashed lines and dashed edges to become solid lines and solid edges.
-odir *<dir>*	Specify *<dir>* for output. (Default is derived from input.)
-ocgm *<file>*	Specify name of the output CGM. (Default derived from input.)
-oras *<file>*	Specify name of the output raster file. (Default derived from input.)
-ochar *<char>*	Specify character for output names (default '`%`'.)
-otype *<type>*	Specify the type of raster file to create. You can specify for *<type>* either `tif`, `tiff`, `bmp`, `jpg` , `jpeg`, `gif` or `png` (default is `tiff`) Note that *<type>* is case sensitive.
-package *<P>*	Specify the CGM interpretation package *<P>*. This option is used only when -all2ras is specified.
-pic *<#>*	Select picture in a multi-picture CGM. Default is the first picture. This works only in filter mode.
-pkgfile *<file>*	Specify the user defined CGM interpretation package file. This option is used only when –package USER-DEFINED is specified.
-prge	Enable Protection Region emulation.
-res *<X>*	Set resolution of the generated raster file to *<X>*. Resolution must be between 50 and 600 dpi. (Default is 75 dpi.)
-rot *<X>*	Rotate the output by *<X>* degrees. Valid rotation values are 0, 90, 180 and 270. (Default is 0.)
-rste	Enable Restricted text emulation.
-spte	Enable Simple Pattern emulation.
-tcgm	Enable the CGM optimize mode, keeps the seismic in the file as well.

Option	Meaning
-vtae	Vertical Text Alignment emulation.
-tple	Text Path Left emulation.
-cset *<set>*	Specify the character set encoding. By default text is mapped to ISO Latin 1 (`latin1`) as most CGM interpreters don't handle Unicode. Some advanced interpreters handle UTF-8 (`utf8`). Old style UTF-8 (`utf8old`) may be required to handle UTF-8 correctly. This option is used for import into CorelDRAW X5. A third option is to keep the original (`org`) character set encoding. This may be needed for CorelDRAW in combination with Russian text.
-cx5t	Convert standard CGM Alpha Transparency into CorelDRAW X5/X6 CGM Alpha Transparency.
-egra	Emulate Gradients. Replace gradient fills (Interpolated Interior) with an average color fill. Most applications do not support gradient fills resulting in either empty fills or a random color fill.
-tmpdir *<dir>*	Specify the directory to be used for the temporary patch file used to create the TIFF image. The default is platform dependent.
-vdcu *<U>*	Specify the VDC unit option. The value of *<U>* can be original, `mm`, `cm`, `meter`, `metre`[16], `inch`, `foot` or `yard`. (default is `original`.)
-wrr	Enable White rectangle removal.

The `-cgmp`, `-ocgm` and `-otif` options only work if one input file is specified.

The output file names are derived from the input file with an appended percentage (%) character.

name%.cgm	Converted CGM file. (Without seismic.)
name%.tif	First optional generated TIFF file.
name%1.tif	Second optional generated TIFF file.

---

16 This is an alias for `meter`.

…

The output files are created, by default, in the same directory as the input file.

CGM Error Codes

The following table contains the error codes generated by the Justcroft CGM applications. Usually these errors codes are shown in the following format:

E<*Error code*>:*Message*

The keyword *ELEMENT* in the message will be replaced by the actual CGM element. In addition some messages will have a number value indicated by *NUM*.

Error	Message / Description
E-100	Error during open file.
	This means that the file could not be opened. This may indicate a file permission problem (read access) or that the file does not exist.
E-101	Error during creating file.
	This means that the file could not be created. Normally this indicates a write permission problem. It could also mean that there are no free i-nodes left. (unlikely)
E-102	Error during reading file.
	This means there was a problem during reading the file (unexpected end of file). It could be that the file was removed.
E-103	Error during writing file.
	This means there was a problem during writing the file. Normally this indicates an out of disk space problem.
E-110	Out of memory.
	This means that the program could not allocate virtual memory. Your system might be too heavily loaded.
E-111	File is not a CGM.
	This means that the given input file is not recognized as a valid CGM. Normally this means that the file is not a CGM but another type of file.
E-112	Invalid picture number.

Error	Message / Description
	Internal error when a wrong CGM picture number is specified.
E-113	Font data not available, *ELEMENT* skipped.
	This means the font files could not be read and no text could be drawn. This can happen if the access to the Justcroft fonts sub-directory is denied. (permission problem)
E-200	Wrong interpreter state for *ELEMENT*.
	This means that the element is used at the wrong state within the CGM. Normally this means that the CGM is not a correct CGM.
E-201	Incorrect value for *ELEMENT*.
	This means that the parameters of the element have an incorrect value. For example, a negative line width.
E-202	Specified precision *NUM* of *ELEMENT* not supported.
	These means that the binary encoding precision of the data is not supported or not correct. This error might result in unexpected output because the data is not read with the correct precision. (Might indicate a corrupt or invalid CGM.)
E-203	Unsupported element *NUM* found.
	Normally this means that the CGM is not correct.
E-204	Specified mode *NUM* of *ELEMENT* not supported.
	This means that the specified mode of the element is not supported. (Limitation of the interpreter)
E-205	Data missing for Element *ELEMENT*.
	This means that data for the ELEMENT is missing.
E-206	Specified *ELEMENT* too large.
	This means that the data of element is too large for the interpreter. The element is skipped. (Limitation of the interpreter).

Error	Message / Description
E-207	Unknown GDP *NUM* skipped.
	This means that the CGM contains a GDP primitive that is not recognized by the interpreter. The element is skipped.
E-208	Unknown ESCAPE *NUM* skipped.
	This means that the CGM contains an ESCAPE element that is not recognized by the software. The element is skipped.
E-209	Error during decomp. of RLL data of *ELEMENT*.
	This means that the Run Length List encoding of the element data could not be decompressed correctly. This also might indicate a corrupt CGM.
E-210	Error *ELEMENT* is unknown element.
	This means that the element opcode is not recognized. (Clear text encoding only.)
E-211	Incorrect value *VALUE* for *ELEMENT*.
	This means that the value of the element is not correct. (Clear text encoding only; This might indicate a corrupt CGM.)
E-212	Error during decompression of *ELEMENT* data.
	This means that the compressed data of the element could not be decompressed. This is possible for the compressed Tile primitives (CGM V3/V4).
E-213	Compression type *NUM* of *ELEMENT* data not supported.
	This means that the compression type for the data of the element is not supported. (limitation of the interpreter)
E-214	Row padding value of *ELEMENT* not supported.
	This means that the specified row padding of the element is not supported. (Limitation of the interpreter.)
E-215	Parameter of *ELEMENT* has Not a Number value.

Error	Message / Description
	The error means that one of the floating-point values of the element has a Not a Number value. (Binary encoding only; This might indicate a corrupt CGM.)
E-216	Unexpected extended data of *ELEMENT* skipped.
	This means that the CGM element has more data then expected. Normally this indicates a corrupt CGM, or (less likely) a limitation of the reader. (Binary encoding only.)
E-217	Data of *ELEMENT* is degenerated.
	This means that the data of the CGM element has invalid values. An example is a polygon which consists of co-linear points.
E-218	Protection region too complex, *ELEMENT* not added.
	The definition of the protection region contains too many elements and the CGM element will not be added to protection region definition. (Limitation of the interpreter.)
E-219	Protection region does not exist (*ELEMENT*).
	This means that the protection region was not previously defined. This usually indicates an incorrectly generated CGM or a corrupt CGM.
E-220	Invalid state for *ELEMENT* assuming MDR-state.
	This means that the element is used within the wrong state of the CGM and the interpreter treats it as if it was specified in the Metafile Default Replacement (MDR) state.
E-221	Invalid state for ELEMENT assuming MDS-state.
	This means that the element is used within the wrong state of the CGM and the interpreter treats it as if it was specified in the Metafile Descriptor State.
E-222	Incorrect value *NUM* for *ELEMENT*.
	This means that an integer value (usually an index) for the given element is incorrect. For example, "Incorrect value -1 for TEXTFONTINDEX". In some cases it might indicate a not supported extension of the CGM standard.

Error	Message / Description
E-223	Incorrect value *NUM* for *ELEMENT*.
	This means that the given floating point number for the given element is incorrect.
E-224	Incorrect or not supported value *NUM* for SDR-type in *ELEMENT*
	This means that the element is encoded with a SDR record that contains an incorrect or a not supported value.
E-225	Non-orthogonal pattern size (*VECTOR PAIR*) not supported.
	This warning means that a pattern has a *VECTOR PAIR* that is not orthogonal to the VDC. This is not supported by the interpreter, instead the last available orthogonal pattern is used. You may encounter it in some CGMs that set the pattern size, but don't use any patterns. In this case it can be safely ignored.
E-226	COLRMODEL *MODEL* is not supported, please report to Justcroft.
	This means that the CGM uses a Color Model that is not supported by the interpreter. The interpreter will stop interpreting the CGM and nothing will be drawn as the correct interpretation of this element effects the overall image. Please report this to Justcroft and if possible provide us with an example file.
E-231	Warning: value for *ELEMENT* not conform CGM*PIP.
	This means that the value of element is not conforming to the CGM*PIP profile but was accepted by the interpreter. (For example, pattern index 0)
E-250	Error during drawing *ELEMENT*.
	This means that the element could not be drawn correctly by the interpreter. (This might indicate a corrupt CGM.)
E-280	Specified option not supported.
	This means that one of the options in the package file is not correct.
E-281	Wrong value used for option.

Error	Message / Description
	This means that one of the options in the package file has an unsupported value.
E-301	Support for *ELEMENT* not implemented yet.
	This means that the element is currently not supported by the interpreter. (Limitation of the interpreter.)
E-302	*ELEMENT* mode *NUM* not implemented, seismic may be missing.
	This means that the mode for the seismic (escape) element is currently not supported by the interpreter. (Limitation of the interpreter.) One or more seismic traces will not be drawn. This is most likely a not supported CGM PIP/II extension.
E-303	WebCGM Hotspot extensions not used in this render mode.
	The WebCGM APS elements are ignored in the current render mode. PDF and SVG output rendering can use APS elements.
E-400	Error in vector driver caused by *ELEMENT*.
	Fatal error in the vector driver during the processing of the element. (Disk space or memory problem.)
E-401	Illegal drawing area setup caused by *ELEMENT*.
	Fatal error in the setup of the drawing area during the processing of the element. This is an internal error.

Use of Russian characters in CGMs

Russian characters, also known as Cyrillic script, might give problems in CGM. Russian characters can be used in CGMs in different ways.

Unicode (UTF8 / UTF16)

JustIMAGE 5.4 support CGMs with Russian characters using Unicode but there are some restrictions.

- The characters string in the CGM should be encoded as Unicode. This can be in the UTF8 or in the UTF16 format. The CGM should have a Character Set List element defining the UTF8 or UTF16 format.

- The font list entry should map to a TrueType font that has the Cyrillic glyphs and have a proper Unicode character glyph mapping. (the standard fonts delivered with JustIMAGE 5.4 do not contain Cyrillic glyphs).

Known applications to create CGMs with Unicode:

- Edit / Montage

- The Justcroft EMF to CGM converter

You can use the CGM Analyser to see if there is a character set defined in the CGM. The CGM Analyser will also report the defined character sets.

ISO 8859-5

Some applications use ISO 8859-5 to define the Russian characters. The Justcroft software will treat this as IS0 8859-1. The result is that there are no Russian characters but characters from the ISO 8859-1 table.

ISO8859-1 (Latin1) table:

ISO 8859-5 (Cyrillic) table:

I	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**
128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
I	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**
144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
nbsp	Ё	Ђ	Ѓ	Є	Ѕ	І	Ї	Ј	Љ	Њ	Ћ	Ќ	shy	Ў	Џ
160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я
192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
а	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э	ю	я
224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
№	ё	ђ	ѓ	є	ѕ	і	ї	ј	љ	њ	ћ	ќ	§	ў	џ
240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

When previewing a file that assumes Iso8859-5 character set you will get the glyphs from the Iso8859-1 table instead.

There is a package option to force the default character set to ISO8859-5 so that these files can be viewed correctly. The solution is to create a package file with the default character set and some font map redefines if needed. It is important that the used fonts are mapped to a system font containing Cyrillic glyphs.

Example package file:

```
#
# Name:          force_cyrillic.pkg
#
# Description:   example to force cyrillic character set
#
CGMPIX_BEGIN
   DEFAULT_CHARSET(iso8859-5)
   FONTMAP("TT:NewTimesCyrBold", "TimesNewRomanCyrBold")
   FONTMAP("TT:NewTimesCyrBoldItalic", "TimesNewRomanCyrBoldItalic")
   FONTMAP("TT:NewTimesCyrItalic", "TimesNewRomanCyrItalic")
CGMPIX_END
```

Example `usrpackagemap.dat`:

```
#
PACKAGE = CYRILLIC
UNIQUEMAP = "%CGMO-I-VERSION, Copyright (c) 1994 ZGS, Inc. Version 1.1.8"
PACKAGE_FILE = force_cyrillic.pkg
```

For more info see the package documentation in the JustIMAGE 5.4 manual and if you have further questions please contact the help desk (support@justcroft.com).

NOTE: this option should be used with care because it can change unexpected Russian

characters as well.

Hershey/ComplexCyrillic

In older CGMs Russian text is sometimes defined using the Hershey/ComplexCyrillic font. The Hershey Cyrillic font defines Cyrillic glyphs. We have seen files generated by Zeh using a different mapping for the Hershey/ComplexCyrillic font resulting in wrong output.

A few examples of wrong mapped characters:

<p align="center">**У in zeh= Ф in JustIMAGE 5.4, С in zeh = T in JustIMAGE 5.4**</p>

If you see the wrong Cyrillic characters in JustIMAGE 5.4 you can verify with the CGM-Analyser if the file is generated by Zeh and that the 'NBS Hershey/ComplexCyrillic' font is used.

In this case you can create a `usrfonts.map` file in the JustIMAGE 5.4 fonts directory with the following lines:

```
#
# Zeh uses different mappings
#
hcomproman5.fnt      Hershey/ComplexRoman
hcompcyrilzeh.fnt    Hershey/ComplexCyrillic
```

After the `usrfonts.map` file is created you can verify if the mapping works. Open the hershey-cyrillic-test.cgm from the JustIMAGE 5.4 `testfiles` directory and verify the output. If the `usrfonts.map` is created properly the output in JustIMAGE 5.4 should look like the image below.

$$=>?$$

прстуфхцчшщъыьэ

абвгдежзийклмно

ПРСТУФХЦЧШЩЪЫЬЭЮ

@АБВГДЕЖЗИЙКЛМНО

If you have access to the Zeh software you can also load this test file into Zeh and verify if it looks like above. The usrfonts.map can be used to solve the mapping problem between Zeh and JustIMAGE 5.4.

JTOF: Justcroft Top Of Form

Introduction

JTOF is an abbreviation for Justcroft Top Of Form printing. Using JTOF it is possible to use fan-fold paper on a roll or fan-fold paper from a box. Currently the functionality is only available for the Canon GARO and Canon SGRaster drivers.

The JTOF options can found in the JTOF tab of the "Properties" menu in the Print Screen of JustIMAGE, JustEDIT and JustMONTAGE.
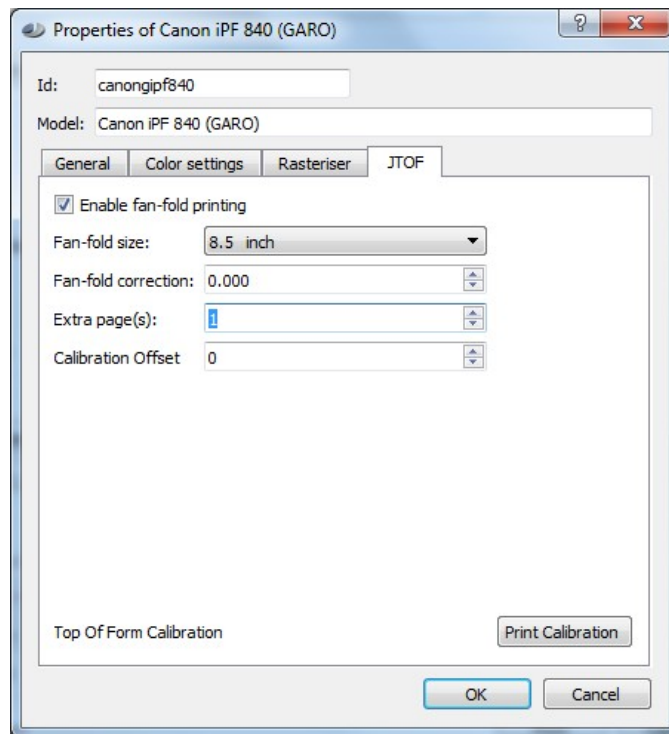
Illustration 75: JTOF options.

The following options can be specified:

 • Size of the fan-fold page; this is the distance between the two fold lines and not the roll width. Currently 6.25″ and 8.5″ are supported.

 • Fan-fold correction: fan fold page correction value. This is to compensate for the fact that the average page size is not exactly the specified fan-fold size.

 • Extra page(s): number of extra pages after each job (0-2).

- Calibration offset: offset for the next job to be printed to align the Top Of Form. After the job is printed the offset will be 0 again.

When JTOF is enabled the cutter is disabled. It is not advised to use JTOF on a multi-roll plotter. Using multi-roll and disabling the cutter does not work together.

Top Of Form Calibration

If you press the "Print Calibration" the calibration file will be sent to the printer. The calibration offset can be found on the paper where the red line crosses the fold line.
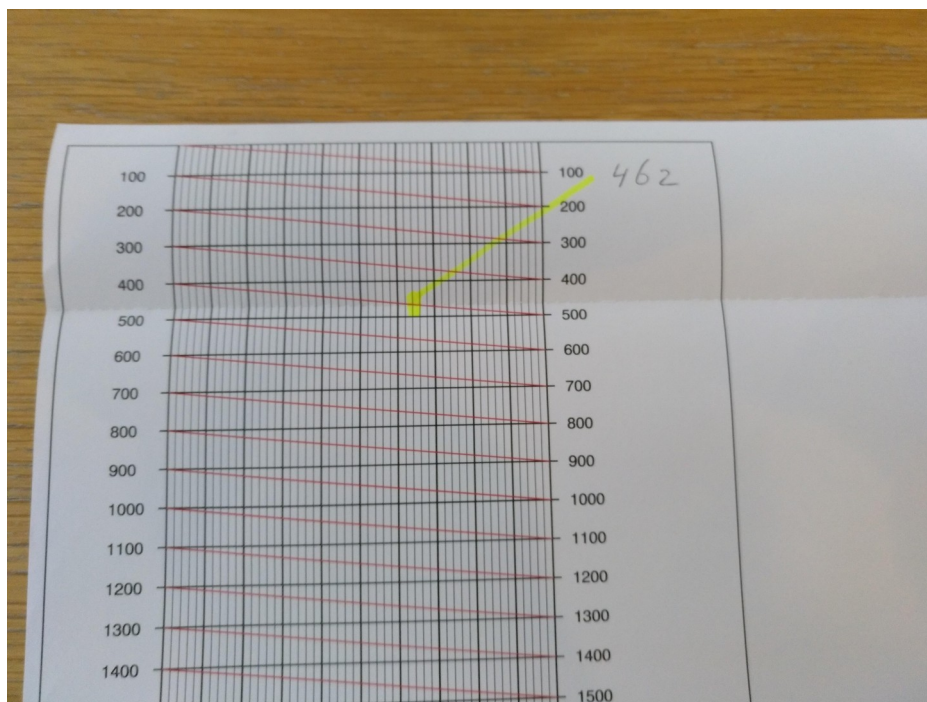
Illustration 76: JTOF calibration file.

The offset needs to be filled in the Calibration offset field and will be used when printing the next job.

Calculation of the correction

If the paper is aligned at the Top of Form the next job should stay aligned because every job, when using the JTOF mode, will be aligned to a fixed number of "fan-fold pages" and will start Top Of Form. In theory the correction is 0.0, in practice the average page size is not always exactly the specified fan-fold size and also the temperature and humidity can have an

influence.

To calculate the correction value the following steps need to be performed:

- Align the paper by sending the calibration file
- Set the correction to 0.0 and fill in the calibration offset and print a job of 10 or more pages
- Send the calibration file again.

Now there are 3 possibilities:

- The calibration is exactly on Top Of Form. No correction is needed, use the value 0.0.
- The calibrate job starts before the fold line. The correction is positive, the average page is a bit smaller then the fan-fold size.

    correction = offset / n-pages

- The calibrate job starts after the fold line. The correction is negative, the average page size is a bit bigger then the fan-fold size.

    For 6.25 inch fan-fold: correction = -(1587.5 – offset) / n-pages
    For 8.5 inch fan-fold: correction = -(2159 – offset) / n-pages

    offset: calibration offset, value where the red line crosses the fold line. N-pages: total number of pages of the job including empty trailing pages.

Movies

On the Justcroft support site there are two movies showing the calibration process. You can find these movies under "Tutorial → Tutorial Movies".

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