



Plug-in Manual

Celix

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Overview

Xitron's Navigator PostScript RIP and Raster Blaster TIFF Catcher rely on software modules called plug-ins to communicate with imagesetters, platesetters, and proofers. These plug-ins are written and compiled to a format known as Dynamic Link Libraries, or DLLs. They act as device drivers for the software and control most actions of the output devices. Some of these actions include checking device status, device setup, and advancing and cutting material. In addition, the plug-in relays all the physical characteristics of an engine such as supported resolutions and imageable area.

During the launch sequence, both Navigator and Raster Blaster scan a directory called "devices" for plug-in files. The software loads each plug-in it finds, and then queries them for a description of the capabilities of the supported devices. In this manner the plug-in configures the RIP to output a bitmap to these devices.

Each plug-in controls a particular family of recorders and is able to understand most messages and errors communicated by the output device. Plug-ins for use with Windows-based platforms consist of three software modules. The first module is the core plug-in written specifically for a particular device. This DLL is 32-bit code and runs under Windows NT, Windows 2000 Server, Windows 2000 Professional, Windows 2003 Server and Windows XP. The second module is a kernel mode device driver. This module communicates with the Xitron interface boards and moves the bitmap data from the PC to the output device's interface. The third module is a 'helper' DLL that translates calls from the plug-in to the Windows device driver.

When a page is sent to an output device for imaging, the Xitron software loads the correct plug-in and begins a series of steps prior to output. The plug-in first initializes the engine and checks that it is ready. After receiving the proper signal, the plug-in will begin reading bitmap data from the platform's hard drive into a "printer buffer." When the printer buffer is full, the plug-in starts communicating the data to the output device. As the output device consumes the data, the plug-in relays this information to the software, which then refills the buffer. This continues until all of the data has been communicated to the output device. The plug-in tells the software the job is complete and waits for an indicator that the recorder has finished. This process is repeated for each page being output.

The Celix Interface

The plug-in for Fuji's Celix family of recorders communicates over a differential SCSI bus. Since differential SCSI is electronically different from typical "single-ended" SCSI busses found in many personal computers, this configuration requires a dedicated differential SCSI interface card. Additionally a special type of device driver, known as a Windows SCSI class driver, is required for the plug-in to communicate with the Celix recorder through the differential SCSI adapter. This driver, along with the plug-in are installed automatically.

Drum Recorders

The Fuji Celix recorder is a drum imagesetter. This simply means that a sheet of film is fed from a roll into a circular “drum” where it is then imaged by a laser moving across the image area. This could be an internal drum where the laser spins through the center of the drum while the film conforms to the inside dimension, or it could be an external drum where the film conforms to the outside of the drum and the laser transverses the width of the image while the drum spins.

This is in contrast to a capstan device where the media moves across an imaging plane and the laser is stationary. More important however, is the orientation of the output image, which is different for each device type.

On a capstan recorder, the left and right sides of the image are parallel with the left and right margins of the media. This implies that the top and bottom of a job are oriented with the cut edges, which means a capstan recorder can theoretically image a job as wide as the media and as long as a roll of film.

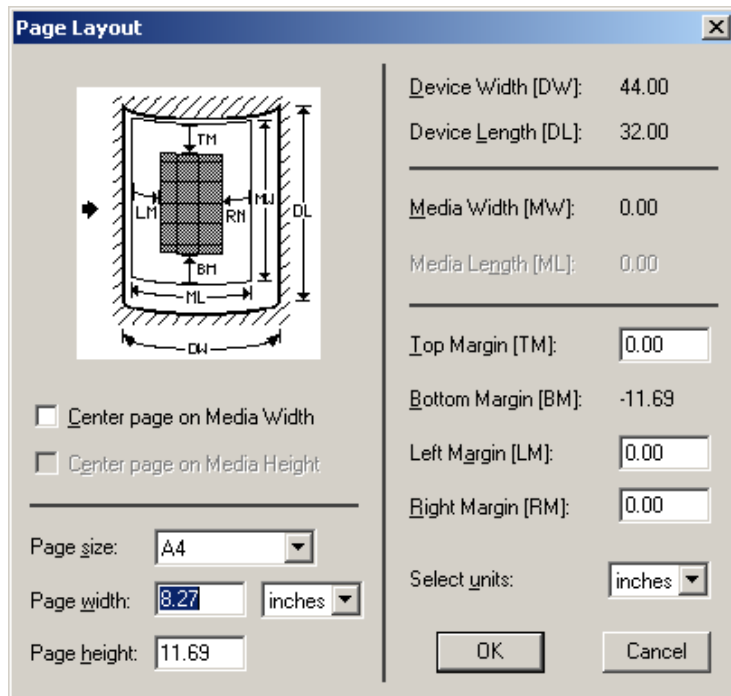
Drum recorders usually rotate the image 90 degrees so that the sides of the image are parallel with the cut edges. Therefore, the top and bottom are aligned along the media’s margins. Of course, all drum recorders have a fixed maximum width, which means that no job can exceed the dimensions of the imaging drum, regardless of the length of the material supply.

RIPs generate bitmap data from left-to-right, top-to-bottom in the form of scan lines. The first scan line is at the top of the image and the last scan line is at the bottom of the image. Another way to think of this is to preview or ROAM an image. Scan lines run from the left side of the monitor to the right side, the first scan line is at the top of the monitor, the next beneath it and so on to the bottom of the screen.

An internal drum recorder images a single scan line every time its laser beam makes a complete rotation. For an external drum, one scan line is imaged with each rotation of the drum. This is known as the fast scan direction and it is parallel with the direction the media travels. “Slow scan” refers to the direction the laser must travel in order to image the width of the drum.

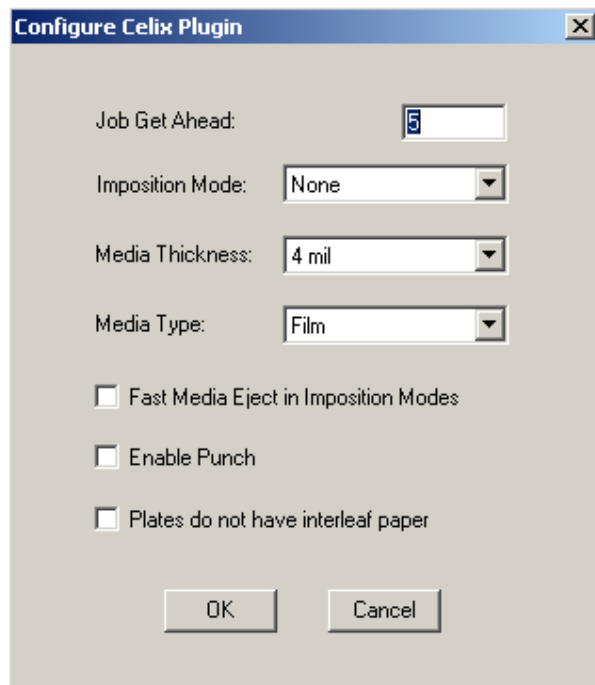
Looking at the Page Layout dialog for a drum imager from within Navigator may help; an example of which is printed on the next page. Note the arrow denoting the direction that media is fed.

The term “Drum Length” describes the slow scan dimension while “Drum Width” describes the fast scan dimension. Having explained all these terms, the easiest way to remember is that, as you stand in front of the recorder, the slow scan direction or Drum Length is from left to right.



Configuring Devices

The Fuji Celix plug-in has only a few options and there are two ways to configure them. The first is through a dialog called the “Configure Celix Plug-in” dialog box. This dialog is accessible by clicking the button labeled “Configure device...” in the Page Setup and appears below.

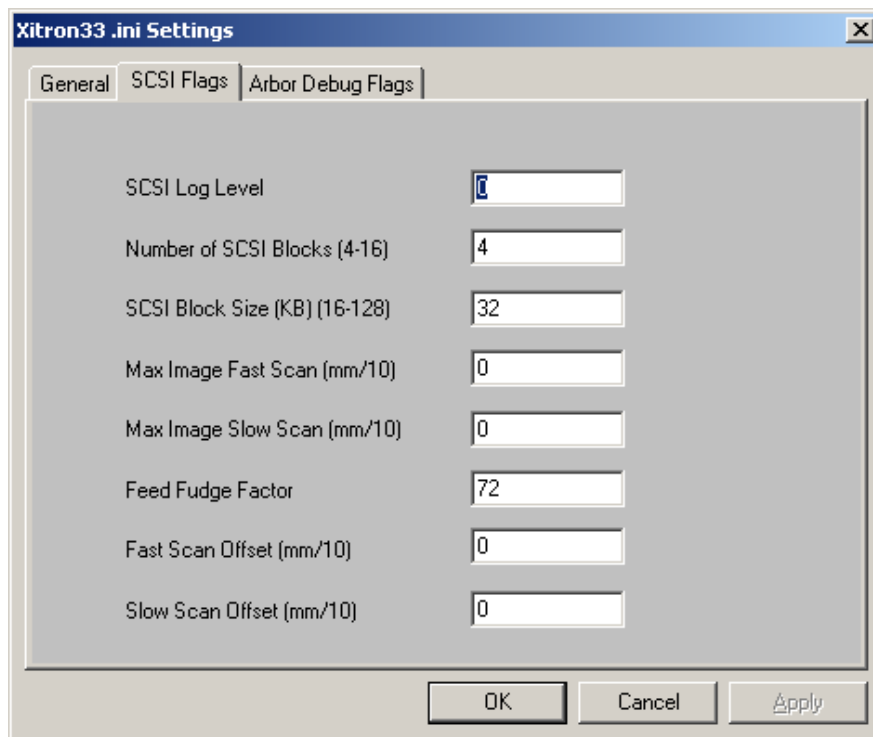


A description of each option follows:

- Job Get Ahead: This describes how many imaged pages the plug-in allows on the hard drive of the Celix. If a page is ready to be downloaded and there are “this” many pages waiting to be imaged on the Celix, the plug-in waits until a page has output before downloading another page. The default for this value is 5.
- Imposition Mode: This tells the Celix plug-in how to impose pages. There are three modes: Fast scan, slow scan and none. In fast scan imposition mode, pages are placed next to each other along a row in the fast scan direction. In slow scan imposition mode, pages are stacked up in a column in the slow scan direction. Selecting “none” tells the system to output one page per piece of film. This feature is described in more detail in a subsequent section.
- Fast Media Eject in Imposition Modes: This flag tells the plug-in to eject the media when it has completely filled a row (fast scan mode) or a column (slow scan mode), as opposed to completely filling the media by starting a second row or column.
- Enable Punch: If the recorder has punches, this check box will be enabled. Once checked, punches will be activated for this Page Setup.

PB2Diag Configuration

PB2Diag may be used to configure a second set of parameters. This application is automatically installed with the Navigator RIP and can be found in the RIP’s start group. Once launched, select “Utilities” and highlight “Edit ini settings.” The following dialog appears:



Editing SCSI Flags

- **SCSI Log Level:** This is a diagnostic tool and causes results from SCSI transfers to be written to a log file. This value should remain at 0 during normal production.
- **Number of SCSI Blocks:** This value determines how many blocks of memory the plug-in uses to transfer image data from the RIP to the SCSI interface card. Increasing this number can sometimes improve performance. The default for this value is 4 and the range is 4 to 16.
- **SCSI Block Size:** This is the size of each SCSI block in kilobytes. Increasing this value can sometimes improve performance. The default for this value is 32 and the range is 16 to 128.
- **Max Image Size (Slow Scan):** This value can override what the plug-in uses for the width of the media. If this value is 0, the default, then the plug-in uses the value that you enter in the cassette manager. This value should remain at 0.
- **Max Image Size (Fast Scan):** This value can override what the plug-in considers the width or circumference of the drum. If this value is 0, the default, the plug-in uses the value reported by the recorder itself. This value should remain at 0.
- **Feed Fudge Factor:** This is a value that is added to each sheet of film as it is ejected. The actual value of this number has no meaning; only relative values have significance. If the recorder is not feeding enough media with each page, increase this value. Likewise reduce the number to reduce the extra film fed with each sheet. The default (and recommended setting) for this value is 72.
- **Fast Scan Offset:** This is the distance in the fast scan direction to delay the start of each scan line. This should never be needed and should be kept at 0, which is the default.

- **Slow Scan Offset:** This is a distance, in tenths of millimeters, to advance down the drum before imaging. For example, if you have a 20” roll of media loaded in the center of a 30” cassette, you probably want a 5” margin before imaging. One inch equals 25.4 mm, or 254 tenths of millimeters. Multiplying 5 x 254=1270. Zero is the default value for this dialog.

Loading Media Values

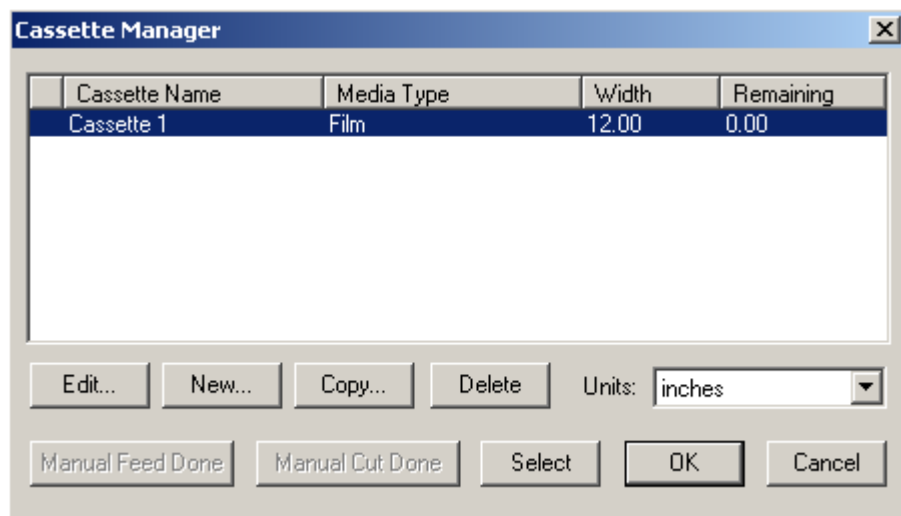
Although the Fuji Celix recorder can track the quantity of media that it uses, it does not store this value when it is reset. Additionally, there is no method of entering the length of a new roll of media when it is loaded into the recorder. Therefore the tracking capabilities of the Fuji Celix are used in combination with the Cassette Manager in the Xitron Navigator. Initial media lengths are configured in the Cassette Manager. After that, the Fuji Celix reports to the RIP how much media has been used.

When loading a new cassette on the Fuji Celix follow these steps:

1. Load the media cassette onto the Fuji Celix as described in the documentation for the recorder. You should bring the recorder to the state where it is “AWAITING MEDIA DATA”.
2. From the Xitron Navigator’s Output menu, choose “Cassette Manager...” You will see the dialog shown below.
3. Enter the width of the media you are loading as well as the length remaining.

The next page output using the cassette you configured in the steps above will cause this information to be downloaded to the Celix. From that point on, the Celix will track the media usage and report it back to the RIP.

Note: although you can edit the remaining length value in Cassette Manager, the only time that this data is sent to the Fuji Celix is when it is displaying the “AWAITING MEDIA DATA” icon. Any changes you make at any other time will be overridden by values that are returned by the recorder.



Imposition

The Celix plug-in has the ability to place multiple images on the same sheet of film. Please note that, while this is called “Imposition” in Celix terms, it is NOT imposition in pre-press terms. It is really more of a media save function.

Imposition happens automatically once enabled. The plug-in tracks the pages that have been imaged on the recorder and adjusts the placement of subsequent pages, as they are made available for output. There are two imposition modes; Fast scan and slow scan. In fast scan mode, pages are placed next to each other in a row in the fast scan direction. In slow scan mode they are stacked in a column in the slow scan direction.

While functioning in imposition mode, media is ejected automatically in one of two ways. The first method is called “Fast Eject” and is enabled in the plug-in’s configuration dialog as described above. If this is enabled, media is ejected if the plug-in finds that a column or row is full and it is time to start a second. If the Fast Eject is not enabled, the media is ejected if a page is ready to be downloaded and the plug-in discovers that it will not fit on the sheet.

Enable Imposition Mode through the “Configure Celix Plug-in” dialog by choosing a method from the drop down menu. For image placement, the plug-in uses the value entered in the Cassette Manager for the height (slow scan direction) of the film area. The circumference of the drum as reported by the Fuji Celix is used for the width (fast scan direction).

The values for the width and height may be overridden manually by using PB2Diag. To set a custom film width, set the value of “Max Image Slow Scan” to the desired value. As stated earlier, measurements are in tenths of millimeters.

Here is a brief description of how the plug-in handles a job and subsequent film ejection with and without imposition enabled:

1. With imposition disabled:

- If there are exposed images on the drum they are ejected
- The page being downloaded is always ejected

2. With imposition enabled:

- If the page is the first page and there are exposed images on the drum they are ejected
- If a new row or column is required and “Fast Eject” is enabled, the film is ejected
- If the page does not fit on the remaining area of the film, the film is ejected
- The image to be imposed is downloaded and its position is recorded

Media Eject & Job Status Dump

The Celix plug-in can eject the exposed media on the drum through the use of a menu option. By selecting “Celix 4000>Eject Exposed Media” any jobs currently on the drum will be ejected. The same menu allows the capability to download a list of the most recent pages to the Celix hard drive. Included are the job name and the current status.

Updating Celix Firmware

Version 2 of the PB2Diag utility has the ability to update firmware on the Celix recorder. The firmware set for the Celix consists of three files; boot code, diagnostic code and application code. The names of these files typically start with “Boot”, “Diag” and “Application” respectfully. In fact, PB2Diag will refuse to download files whose names start with any other three characters. This is because PB2Diag must tell the Celix which type of file is being downloaded and the filename conveys this information.

The firmware is downloaded to the recorder one file at a time. After each file is downloaded, the recorder checks its integrity, decodes it and stores it into permanent memory. The Celix will reboot after each download. During the time before the recorder reboots, the PB2Diag application will be unresponsive as it waits for the message from the recorder that the firmware file has been successfully updated.

To download the firmware, start the PB2Diag utility and select “Update firmware...” from the Utilities menu. You will be prompted for the location of the three firmware files. You may

update the three files in any order unless the release notes from Fuji instruct you otherwise. Typically these files will have the “.hex” suffix and the file open dialog will default to checking for files of that type.

Choose the file to update on the recorder. As the file is downloaded to the Celix, you will see a progress bar displaying the status of the download. When the download is complete, the recorder processes the file and after checking its integrity, burns it into permanent storage. This process can take over five minutes, so please be patient. PB2Diag will stop responding during this time. When the recorder finishes storing the file and prepares to re-boot, it sends PB2Diag a message that the update process has been completed at which point PB2Diag will come back to life.

Plug-in Messages

As soon as a plug-in is loaded for the purpose of setting up and outputting to a device, it begins sending messages to the RIP’s System Monitor window. These messages are typically informational but can also convey warnings and report errors from the output device. The “debug level” of the software controls the quantity of messages seen in the monitor window. This can range from 0 (almost no messages) to 4 (very high message traffic).

Examples of informational messages are:

- PostScript job name
- Commands being sent to configure the engine
- Output start and stop time

Examples of warning messages are:

- A job being clipped to fit a recorder
- Data being left at the end of the job
- Certain settings in the ini file overriding defaults

When a plug-in encounters an error on an output device, it will print an appropriate error message. The short form of this message will appear in the Throughput Controller. The long form will appear in the RIP System Monitor window.

If the error encountered is easily remedied, i.e. an engine panel is open, then the plug-in will continue to periodically test the engine until the error has been cleared. During this time the user may disable output by checking the “Disable output” check box in the Throughput Controller and drag the page to either the Active or Held queues. If the error is serious, the plug-in will request that the RIP disable output and the page will be placed back in the Active Queue automatically.