Thermal 2 Exposure Head

Firmware Installation Procedure

Document Number
739-001168B-EN-B

15-Mar-06

Kodak.
3700 Gilmore Way
Burnaby, BC
Canada V5G 4M1
(604) 451-2700

Copyright 2005 Kodak. All rights reserved.

Revision History

Revision	Date	Author	Comments
A	15 Nov 2005	Ken Dyck	Made changes for 1.05d. Based on document 739-00168A-EN-RevC
B	15 Mar 2006	Maureen Munroe	Minor edits to text

Thermal 2 Exposure Head
Firmware Installation Procedure

CONTENTS

Revision History i

1. Host/Exposure Head Compatibility 1

2. Laser Safety Practices 1

3. Related Resources 1

4. Preliminary Checklist 2

5. Upgrading the Firmware 3

6. Downgrading the Firmware 3
   Downgrading to 1.01i 4

Appendix A: Monitor Redirection 5
   Using Redirect Enable 5
   Using redirect pass 5
   Using Redirect Disable 6

Appendix B: Background Information on Downloading Firmware 6
   Monitor Redirection Disabled 7
   Monitor Redirection Enabled 7

Appendix C: Backing Up and Restoring NVS Parameters 7
   Baseline NVS Parameters 8
      Using prm dump 8
      Using prm diff 8
      Using prm save 9
      Using prm restore 9
      Using Service Shell Scripts 9

1. HOST/EXPOSURE HEAD COMPATIBILITY

Thermal 2 head firmware is distributed as part of a controlled release package or patch. This firmware has been qualified against certain versions of MPE and MCE firmware for each output device. Head firmware should only be loaded as part of a controlled release package. If you are installing a replacement head:

- Refer to **TechPlanet > Output > All CTP Devices Home Page > Controlled releases**, to determine whether or not your head is compatible with the device control software and firmware.
  If it is compatible, you can install the head without changing any firmware.
- If your head firmware is out-of-date, upgrade the head firmware to the version supported by the controlled release.
- If the device control software and firmware are out-of-date, determine if an upgrade path exists for a newer controlled release. If an upgrade path exists, upgrade the host to the correct controlled release. Otherwise, a head downgrade may be necessary.

2. LASER SAFETY PRACTICES

To use this document, you *must* have attended an exposure head introductory course given by the Creo service-training department, product specialist, or engineering support team. You must be familiar with the necessary safety precautions when working with a thermal head.

DANGER: *Never operate the host device with the write laser beam on and a door open. Do not use the service bypass jigs to bypass the door interlocks.*

3. RELATED RESOURCES

- Thermal 2 exposure head firmware: **TechPlanet** > **Output** > **Heads** > **Thermal 2 Head > Control/settings > Firmware releases**
  (http://techplanet.creo.com/firmware/CTP/Head/Thermal2/versions.htm)
- Service Shell: **TechPlanet** > **Output** > **Service Tools** > **Service Shell**
  (http://techplanet.creo.com/output/service_tools/service_shell/nav/v2-x/index.htm)
- Controlled Releases: **TechPlanet** > **Output** > **All CTP Devices** > **Control/settings**
  (http://techplanet.creo.com/output/computer_to_plate/all_ctp/nav/control-set.htm)

4. PRELIMINARY CHECKLIST

Before you upgrade the exposure head firmware, complete this preliminary checklist:

1. ☐ **Verify the state of the host device.** If the device is not functioning correctly before you upgrade the exposure head firmware, it is unlikely that it will function correctly after the upgrade.

2. ☐ **Verify the hardware version of the exposure head** by typing the following monitor commands:

```
>> redirect pass

>> th2 "ver"
```

   If the "`Control board`" version is less than 2, upgrade the exposure head hardware before you upgrade the exposure head firmware.

3. ☐ **Determine if an upgrade of the host firmware is required.** An upgrade of the host firmware is *not* required to upgrade the exposure head firmware. However, an upgrade of the host firmware may be required to take advantage of the new functionality of the exposure head.

4. ☐ **Ensure the thermal 2 firmware files are available.**

5. ☐ **Ensure the following applications are *not* running**:

   - Allegro Workstation
   - Print Console
   - Prinergy

5. UPGRADING THE FIRMWARE

For more information on the commands and parameters used below, see Appendix C: Backing Up and Restoring NVS Parameters. If you are unfamiliar with the redirection commands, see Appendix A: Monitor Redirection.

1. Generate baseline plots `plot 1` and **inchgrid.ps**. Comparing plots generated before and after the upgrade helps you troubleshoot any problems with image quality, geometric correction, or the geometric positioning of the exposure head.

2. Verify the baseline NVS parameters on the exposure head by typing:

   ```
   >> redirect enable
   ```

   Wait for the message `Redirect Mode=Enable` to appear.

   ```
   TH2 > prm diff
   ```

3. Save the baseline NVS parameters on the exposure head by typing:

   ```
   TH2 > prm save
   ```

4. Save a readable version of the NVS parameters on the exposure head by typing:

   ```
   TH2 > prm dump
   ```

5. If you are using Service Shell, download the firmware from a local drive:

   Note: Downloads from network drives, or remote locations, will fail.

   To initiate the firmware download, type: `download <path>\<firmware filename>` at the command line.

   For more information, see Appendix B: Background Information on Downloading Firmware, and the host documentation.

   Note: The exposure head automatically upgrades the NVS parameters when the firmware initializes for the first time.

6. Generate plots `plot 1` and **inchgrid.ps**. The quality of the `plot 1` and the geometric correction and geometric positioning of the **inchgrid.ps** should be unaffected.

7. After verifying the state of the host device, save the baseline NVS parameters on the exposure head by typing:

   ```
   TH2 > prm save
   ```

6. DOWNGRADING THE FIRMWARE

CAUTION: *Do not downgrade the exposure head firmware unless your thermal head specialist instructs you to do so. Newer versions of head firmware include new functionality, improved algorithms, problem fixes, and support for newer versions of hardware*.

When downgrading, the original firmware version of the exposure head is the minimum firmware version for that head. Exposure heads shipped from the factory have been integrated with specific versions of exposure head firmware. The firmware will ensure that

all algorithms and NVS parameters are upgraded appropriately, but the firmware cannot ensure that all algorithms and NVS parameters are downgraded appropriately.

If you still wish to downgrade the exposure head firmware, it is acceptable to downgrade to a *previously installed version,* or an intermediate version between the current and previous versions. Downgrade the firmware using the following procedure:

1. If you are using Service Shell, download the firmware from a local drive.

   Note: Downloads from network drives, or remote locations, will fail.

   To initiate the firmware download, type:

   ```
   download <path>\<previous file>
   ```

   at the command line.

   For more information, see Appendix B: Background Information on Downloading Firmware, and the host documentation.

2. Set the firmware version NVS parameter to the current code. For example if you were downgrading to 1.04d you would enter:

   ```
   TH2 > eng
   TH2 > set sys firmwareversion 1.04
   ```

Note: If you are unfamiliar with the redirection commands, see Appendix A: Monitor Redirection.

3. Save a readable version of the NVS parameters on the exposure head by typing:

   ```
   TH2 > prm dump
   ```

4. Verify that there are no differences between the readable versions of the NVS parameters generated in step 4 of section 5, and step 2 of section 6.

Downgrading to 1.01i

If you are downgrading to 1.01i follow the steps below:

1. Download the firmware as described above.
2. Run the **PostDowngradeTo101i.spt** provided with the release bundle. This script is needed because the stroke offset and stroke width parameters changed locations after 1.01i. The script sets these parameters to the blocker offset and blocker width values.

APPENDIX A: MONITOR REDIRECTION

The exposure head includes a diagnostic port for use during development and production of the exposure head.

Advantages of a diagnostic port:

- Because all diagnostic routines are implemented within the exposure head, no support for the diagnostic routines is necessary in the host.
- Because no support for the diagnostic routines is necessary in the host, modification and/or enhancement of the diagnostic routines does not require synchronized upgrades of the host and the exposure head.
- The exposure head does not require a host for the majority of development and production.

Disadvantages of a diagnostic port:

- The exposure head diagnostic routines are not accessible from the host.
- The diagnostic port of the exposure is not accessible once the exposure head is closed.

To compensate for the disadvantages, monitor redirection will redirect the diagnostic port of the exposure head through the host to the diagnostic terminal of the host.

Using Redirect Enable

To enable monitor redirection, type:

```
>> redirect enable
```

When monitor redirection is enabled, the host's diagnostic terminal displays only diagnostic information from the exposure head. All monitor commands are handled by the exposure head.

Using redirect pass

To enable monitor redirection in passthrough mode, type:

```
>> redirect pass
```

When monitor redirection is enabled in passthrough mode, the diagnostic terminal of the host displays diagnostic information from both the host and the exposure head. All monitor commands are handled by the host (although the host passes through monitor commands intended for the exposure head).

Note: When in passthrough mode, enabling verbose information on the host and/or the exposure head platforms will degrade system performance.

When monitor redirection is enabled in passthrough mode, the host handles all monitor commands entered on the diagnostic terminal. However, the host will recognize monitor commands intended for the exposure head if you type:

```
>> th2 "xxx"
```

In this example, the host passes the monitor command `xxx`, to be handled by the exposure head.

Using Redirect Disable

To disable monitor redirection, type:

```
>> redirect disable
```

When monitor redirection is disabled, the diagnostic terminal of the host will only display diagnostic information from the host and all monitor commands will be handled by the host.

APPENDIX B: BACKGROUND INFORMATION ON DOWNLOADING FIRMWARE

You can download firmware to the exposure head using various algorithms and configurations. To understand the algorithms and configurations, you need to understand the following aspects of the exposure head:

- The datalink port on the exposure head is used for communicating with the host.
- The diagnostic port on the exposure head is used during development and production of the exposure head. It is the most efficient method of accessing the exposure head, but is not accessible when the exposure head is closed.
- The flash in the exposure head is used for permanent storage of the firmware bundle (and NVS parameters, test jig waveforms, and so on). The flash is not used during normal operation of the exposure head.
- The RAM in the exposure head is used to execute firmware. During initialization, the firmware bundle is loaded from flash into RAM.
- The bootloader ROM in the exposure head is used to download the serial bootloader stored in the host. The bootloader ROM and serial bootloader allow you to download firmware to the exposure head, even if the exposure head flash is corrupt (or erased).
- The reset line from the host to the exposure head allows the host to reset the exposure head when required.
- The boot line from the host to the exposure head allows the host to select between the two bootstrap methods of the exposure head. The bootloader ROM in the exposure head will either boot from flash or prepare for a serial download from the host.

IMPORTANT: *When downloading firmware to the exposure head*:

- If the flash is corrupt (or erased), the host is required to download the serial bootloader stored in the host to the exposure head. As a result, only the default (and original) method used to download firmware to the exposure head will succeed.
- Once the flash is erased, you must successfully complete a firmware download. Because the firmware executes from the RAM in the exposure head, the firmware will continue to

execute as normal. However, if the exposure head is reset or power to the exposure head is cycled, the bootloader ROM in the exposure head will not be able to boot from flash.

Monitor Redirection Disabled

In a closed head, the datalink port is accessible through the host. This is the default (and original) method used to download firmware to the exposure head. Because the algorithm downloads the serial bootloader stored in the host to the exposure head, this algorithm succeeds even if the exposure head is not functional.

If you are downloading head firmware using Service Shell on a GMCE then download the HEX SRecord file. In all other cases use the binary file. Download using the following steps:

1. Connect a workstation with a terminal program to the diagnostic port of the host.
2. Configure the terminal program to use the correct serial port and the correct baud rate for the host device.

WARNING: *Do not edit the binary or HEX file in any way.*

3. Download the firmware from a local drive. To initiate the firmware download, type:

   ```
   download <path>\<filename>
   ```

   at the command line.

   Note: Downloads from network drives or remote locations will fail.

   Once the serial bootloader is downloaded to the exposure head, the green LED on top of the exposure head that is closer to the drum will flash once per second.

   While downloading the firmware to the exposure head, the green LED on top of the head that is farther from the drum will flash. The firmware download takes approximately 5 to 10 minutes, depending on the efficiency of the terminal program, workstation, and host.

Note: Service Shell automatically performs all the manual steps you perform when using Splot.

Monitor Redirection Enabled

In a closed head, the diagnostic port is not accessible. However, monitor redirection allows you to access the diagnostic port of the exposure head through the host. You cannot download firmware to the exposure head using this configuration.

APPENDIX C: BACKING UP AND RESTORING NVS PARAMETERS

NVS parameters allow the exposure head to save calibration and configuration parameters permanently. Before upgrading the firmware of exposure head, it is important to backup the NVS parameters in case it becomes necessary to revert to the previously installed version.

IMPORTANT: *Points about exposure head NVS parameters:*

- The exposure head automatically saves changes to the NVS parameters.
- If you upgrade exposure head firmware, upgrades of the NVS parameters will occur automatically when the firmware is executed for the first time.
- If you downgrade exposure head firmware to the previously installed version, it is not necessary to restore the NVS parameters.

Baseline NVS Parameters

The exposure head implements baseline NVS parameters to allow you to save a snapshot or baseline of the NVS parameters that are saved in the head.

- The advantage of baseline NVS parameters is that you can easily manipulate and compare NVS parameters without any additional tools.
- The disadvantage of baseline NVS parameters is that you are dependent on the exposure head firmware and hardware functioning normally.

Remember, baseline NVS parameters are a useful tool but do not replace the readable versions or backups of NVS parameters.

For example, if you encounter problems after upgrading the exposure head firmware, you can use the baseline NVS parameters as follows to determine what, if any, differences there are in the NVS parameters:

1. Before you upgrade the exposure head firmware, save the baseline NVS parameters (step 3 of section 5).
2. If you encounter problems with the host after you complete the head firmware upgrade, type the command:

   ```
   TH2 > prm diff
   ```

   This will compare the current, unsaved NVS parameters with the baseline NVS parameters, allowing you to determine what, if any, changes have been made.

Using prm dump

To display the NVS parameters, type:

```
TH2 > prm dump
```

Note: This displays all NVS parameters. The only exceptions are NVS parameters that are not accessible using monitor commands and intended for engineering use only.

Using prm diff

To compare the NVS parameters to the baseline NVS parameters, type:

```
TH2 > prm diff
```

This command verifies the baseline NVS parameters and then compares them to the current, unsaved NVS parameters. The following differences are displayed:

- Any NVS parameters that differ from the baseline NVS parameters.

- Any NVS parameters that do not exist in the baseline NVS parameters.

Note: When the exposure head firmware is upgraded there are often a *small* number of NVS parameters that do not exist in the baseline NVS parameters. When the baseline NVS parameters have never been saved, there are a *significant* number of NVS parameters that do not exist in the baseline NVS parameters.

Using prm save

To save the current, unsaved NVS parameters to the baseline NVS parameters, type:

```
TH2 > prm save
```

This command verifies the NVS parameters, erases the baseline NVS parameters, and saves the current values to the baseline NVS parameters.

Using prm restore

Note: `prm restore` will delete any unsaved changes that have been made to the NVS parameters.

To restore the NVS parameters from the baseline NVS parameters, type:

```
TH2 > prm restore
```

This command verifies the baseline NVS parameters and restores the NVS parameters from the existing baseline. Any NVS parameters that do not exist in the baseline NVS parameters are ignored.

Using Service Shell Scripts

The Service Shell script **nvsdump.spt** will dump a readable version of the NVS parameters and the Service Shell script **nvsrestore.spt** will restore the readable version of the NVS parameters. For more information about Service Shell scripts, see the TechPlanet Service Shell page (http://techplanet.creo.com/output/service_tools/service_shell/nav/v2-x/index.htm).