Thermal Exposure Head

Thermal Head Firmware Version 1.83 Release Notes

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Revision History

Revision	Date	Author	Comments
A	11/19/02	Amber Strocel	Initial release.
B	11/20/02	Amber Strocel	Update revision letter.
C	12/03/02	Amber Strocel	Update part number.

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1. SCOPE AND INTRODUCTION (PLEASE READ)

This document describes the important changes to the Thermal Head firmware that come with version 1.83.

- This version of head firmware should be loaded only as part of the controlled release package or patch, available on the TechPlanet CDs. This is the first release of head code since we began controlled software releases for all devices. As such, this head firmware was rigorously qualified against certain versions of MPE firmware for each output device.
- To access all the features of version 1.83 Thermal Head firmware, you must be using thermal module version **3.86** or higher. The essential functionality of version 1.83 will still be present, but some of the more advanced new functionality, such as blank-skipping support, will be unavailable. This is because all devices have not yet released MPE firmware containing the latest version of the thermal module.
- We have also attempted to make the upgrade as easy and as foolproof as possible by providing a script to back up the head NVS and do the code loading. The appendices provide a reference guide for backing up and restoring NVS parameters and a revised procedure for loading Thermal Head Firmware.

The formatting conventions used in this document are as follows:

- Commands contained within procedures, to be typed are in the font `Courier` and are preceded by >>. Exceptions to this rule are commands contained in an explanation of a new feature where commands are in **bold**.
- All nvs parameters are in *italics.*
- All script names are <u>underlined</u>.

Note: Unless otherwise specified, Platesetter refers to any of these Creo output devices: Platesetter 3244, Trendsetter® 800, Trendsetter 800 (Automatic), VLF Trendsetter, VLF Trendsetter Autoloader, VLF Platesetter.

2. LASER SAFETY PRACTICES

To use this document you (the FSE) **must** have attended a Thermal introductory course given either by the service-training department, the product specialist, or the engineering support team. You must therefore be familiar with the safety precautions required when working with a Thermal Platesetter.

DANGER! Never operate the Thermal Platesetter with the write laser beam on and a door open, do not use the service bypass jigs to bypass the door interlocks.

3. RELATED DOCUMENTS

- Manually Loading Thermal 1\1.7 Head Firmware, available at: **TechPlanet** > **Output** > **Heads** > **Thermal 1/17** > **Procedures**

(http://techplanet.creo.com/output/heads/thermal/content/docs/Manual_Head_Firmware_Load.pdf)

- CTP Firmware, available at **TechPlanet** > **Output** > **All CTP Devices** > **Firmware** (http://techplanet.creo.com/output/computer_to_plate/all_ctp/nav/control-set.htm)
- Thermal 1/1.7 Upgrade Script, available at: **TechPlanet** > **Output** > **Heads** > **Thermal 1/17** > **Downloads** > **Firmware Releases** (http://techplanet.creo.com/firmware/CTP/Head/Thermal/versions.htm)
- Service Shell, available at: **TechPlanet** > **Output** > **Service Tools** > **Service Shell** (http://techplanet.creo.com/output/service_tools/service_shell/nav/v2-x/index.htm)
- Splot, available at: **TechPlanet** > **Output** > **Service Tools** > **Splot** (http://techplanet.creo.com/output/service_tools/splot/nav/index.htm)
- TEH 1/1.7 Head Firmware Summary, available at: **TechPlanet** > **Output** > **Heads** > **Thermal 1/17** > **Control/Settings** > **Firmware Releases** (http://techplanet.creo.com/output/heads/thermal/content/docs/teh1-17x_firmware_summary.pdf)
- CTP Device Controlled Releases, available at: **TechPlanet** > **Output** > **All CTP Devices** > **Controlled Releases** (http://techplanet.creo.com/output/computer_to_plate/all_ctp/nav/control-set.htm)

4. COMMON ACRONYMS

MCE	Master Control Electronics
ICE	Imaging Control Electronics
MPE	Master Processor Electronics
CTP	Computer to Plate (this includes Trendsetters and Platesetters)
NVS	Non-Volatile-Storage
PHC	Parallel Head Controller
LVD	Light Valve Driver
LCA	Xilinx configuration file

5. PRELIMINARY CHECKLIST (COMPLETE BEFORE YOU BEGIN)

1. ☐ If you are upgrading from firmware version 1.32 or earlier, generate baseline plots "plot 1" and "inchgrid.ps" before performing the upgrade. A comparison of plots generated before and after the upgrade will aid in resolving any geometric correction or image quality issues.

2. ☐ Type the command:

   ```
   >>list version
   ```

   Then record the following:

   current "MPE Firmware version": _____

   current "Thermal software version": _____

current “Head firmware version”: _____

current “MPE hardware version”: _____

current “PHC hardware version”: _____

CAUTION: If the “PHC hardware version” is less than 1.00, do NOT upgrade Thermal Head firmware. To do so could seriously affect head functionality. A hardware upgrade is required to take full advantage of new Thermal Head functionality.

If the “MPE hardware version” is less than 3.00, a hardware upgrade is required before the MPE firmware or Thermal Head firmware can be upgraded. The part number for the required MPE board upgrade is 10-0733C and, once installed, the MPE NVS must be restored before continuing.

Note: The “Thermal software version”, more commonly referred to as the “Thermal module”, is one module of the MPE firmware. The thermal module controls communication between the MPE and the thermal head. For more information on the thermal module and thermal head, refer to the TEH 1/1.7x Head Firmware Summary.

3. ☐ Ensure that you have a copy of Splot version 2.84 or higher, or ServiceShell version 2.3SP1 or higher. You will need one of these tools to back up the NVS and upgrade the head firmware.

4. ☐ This document outlines the firmware changes when upgrading from Thermal Head firmware version 1.23 or higher only, you must read to the end of this step before continuing!

WARNING: Failure to follow this step will likely result in corruption of the NVS parameters.

If you are performing a field upgrade to the Thermal head firmware, it is mandatory that the both the Thermal head firmware and the Thermal module within the MPE firmware are kept synchronized. Depending on how old your code is this may require an incremental upgrade. In all cases the MPE code should be upgraded first and then the Thermal head firmware upgraded to a version compatible with the Thermal module within the MPE firmware. Please refer to the controlled releases site for tables, which cross reference the versions of MPE code, and the compatible Thermal head code for each Platesetter model.

Note: As a general rule, if the current MPE firmware contains a Thermal module that will not support Thermal head firmware version > 1.34, you should first upgrade to a version of MPE code that does support Thermal head firmware version >1.34. After you have done this, reboot, ensuring that the Platesetter is functioning correctly. Then you can upgrade to the latest version of MPE firmware for your particular Platesetter model, and then upgrade the Thermal head firmware to version 1.83.

An example would be a Trendsetter 3244 whose MPE code is version 2.13 and Thermal head code is version 1.23.

Step 1. Upgrade MPE firmware to version 2.20. (After reading all the release notes between 2.13 and 2.20 to ensure all necessary steps are performed).

Step 2. Reboot and ensure the system is functioning correctly.

Step 3. Upgrade MPE firmware from version 2.20 to 2.xx.

Step 4. Upgrade Thermal head firmware to version 1.83 (using this document).

1. ☐ If you are installing a new or replacement head, it is also mandatory that both the Thermal head firmware and the Thermal module within the MPE firmware are kept synchronized. The MPE firmware should be upgraded to a version so that the "Thermal module" within the MPE firmware is compatible with the replacement head prior to installing the head. Depending on how old the MPE version is, this may have to be an incremental upgrade. You can find this out by reading the release notes for all versions of MPE firmware between the current version, and the one you are planning to upgrade to.

Note: If it is still not clear after reading the MPE firmware release notes which versions it is OK to skip, you should call the Product Specialist for your particular platesetter model.

As a general rule, if the current MPE firmware contains a Thermal module that will not support Thermal head firmware version >1.34, you should first upgrade to a version of MPE code that does support Thermal head firmware version >1.34. After you have done this, you can then upgrade to the latest version of MPE firmware for your particular platesetter model and install the new or replacement head that was integrated with head firmware version 1.83.

For example, in the case of a Trendsetter® 800 with 2.13 MPE firmware:

Step 1. Upgrade MPE firmware to version from 2.13 to 2.20

Step 2. Upgrade MPE firmware to version from 2.20 to 2.xx.

Step 3. Install replacement head with Thermal firmware 1.83, (follow the head installation procedure to save the new head NVS parameters to the MPE).

5. ☐ Ensure you have the following files available:
    - Thermal Head firmware version 1.83 (THCV183.EXO)
    - LCA bundle version 1.03 (LCAV103.HEX)
6. ☐ Ensure Allegro™, PrintConsole, or Prinergy® software is not running.

6. UPGRADE PROCEDURE

In order to simplify the upgrade process, we have developed the upgrade script thcv183x.spt. You are strongly encouraged to use the upgrade script, as it prevents NVS corruption. However, if you encounter serious problems using the upgrade script, you can manually upgrade head firmware as a last resort. Refer to the Related Documents section for the Manually Loading Thermal 1\1.7 Head Firmware. The procedure described here assumes you are using thcv183x.spt.

To upgrade the Thermal Head firmware using the upgrade script, Splot version 2.84 or later is required. Alternatively, you can use Service Shell 2.3SP1 or higher as well. Splot,

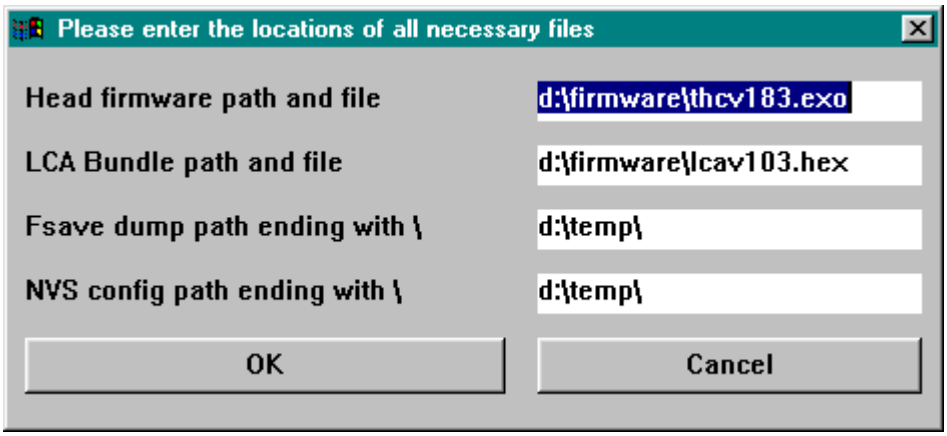
Service Shell, head firmware, and the upgrade script are available on the Technical Library. Refer to the Related Documents section for more information.

To upgrade the Thermal Head firmware from version 1.32 or earlier, please perform all the following steps. To upgrade the Thermal Head firmware from version 1.34 or later please perform steps 1 and 2 only.

1. *If any field upgrade is required*, the MPE firmware must *first* be upgraded, prior to performing the head upgrade. Upgrade the MPE firmware version to Thermal module 2.36, referring to the controlled release version tables and the customer support technical library, as these versions are updated frequently.

2. Open Splot, and load the upgrade script, thcv183x.spt. Execute this script: from the **Exec** menu select **Execute**. This script will upgrade the head code to the latest version, provided the current version is 1.23 or greater.

   The upgrade script prompts you to enter filenames and paths, as shown below.



   - The **Head firmware path and file** should provide the full name and location of the thcv183.exo file, as shown above.

   - The L**CA Bundle path and file** should provide the full name and location of the lcav103.hex file, as shown above.

   - The **Fsave dump path** provides the location that the fsave dump file will be saved to. As shown above, the Fsave dump path must end with the '\' character.

   - The **NVS config path** provides the location that the config script will be saved to. As shown above, the NVS config path must end with the '\' character.

   The NVS config script is an independent Splot script that can be run in the event of loss or corruption of NVS data. Running the script will take approximately half an hour, and will completely restore the NVS to its state before the upgrade took place.

The upgrade takes approximately half an hour to execute. The time has been reduced significantly from previous versions of head firmware, as we now reload the fsave dump data rather than run the NVS config script.

For more information on using the upgrade script, please refer to Appendix C.

3. Generate plots "plot 1" and "inchgrid.ps" and compare with the plots run in section 5, step 1. The quality of the "plot 1" should be unaltered, and check that the geometric correction and positioning of the "inchgrid.ps" are the same as the plot imaged prior to the upgrade.

7. NVS CHANGES

The following table outlines which NVS parameters changed in this release. The upgrade script automatically implements all of these changes, and no special action is required by the user.

You must have thermal module 3.86 or later for all of these change to be visible.

NVS Parameter	Comment	Description	See Section
set head *fmod*	default changed	Default value changed from –0.020 to 0.000.	
set head *fpower*	default changed	Default value changed from 1.000 to 0.000.	
set servo_stat *nosedev*	range changed	Upper limit changed from 4.096 to 50.000.	
set servo_stat *bp0mean*	range changed	Upper limit changed from 50000 to 4096.	
set servo_stat *bp0max*	range changed	Upper limit changed from 50000 to 4096.	
set servo_stat *bp0min*	range changed	Upper limit changed from 50000 to 4096.	
set servo_stat *bp1mean*	range changed	Upper limit changed from 50000 to 4096.	
set servo_stat *bp1max*	range changed	Upper limit changed from 50000 to 4096.	
set servo_stat *bp1min*	range changed	Upper limit changed from 50000 to 4096.	
set servo_stat *ld_dev*	range changed	Upper limit changed from 4.096 to 50.000.	

8. BUG FIXES

- This release fixes the way stroke width and stroke offset values are applied to the light valve. Previously, two media index commands had to be issued before new stroke parameters took effect. Now, they take effect with the first media index command.
- This release fixes a bug in the NVS that resulted in corruption in very rare cases. The bug was intermittent, and occurred on only a very few heads. The bug is characterized by loss or corruption of head NVS parameters.

9. NEW FUNCTIONALITY: SUPPORT FOR P33 IMAGING HEAD

P33 imaging heads are differentiated from SQUARESpot® imaging heads during the manufacturing process. P33 heads must not be installed on Quantum devices. If a P33 head is installed on a Quantum device, the laser will not power on.

P33 imaging heads are distinguished from SQUARESpot imaging heads by a sticker affixed to the head, and by a distinct part number. The P33 sticker says "Creo Thermal Imaging Head." The part number for P33 imaging heads is 32-4180A.

P33 imaging heads can also be identified through the MPE monitor. In order to determine the type of head you are using, type:

```
>>list version
```

If your head is Creo Thermal Imaging, a message will be displayed next to the PHC hardware version, like this:

```
PHC hardware version: 3 (P33 Imaging)
```

NOTE: Older versions of MPE firmware may use the identifier (Entry Imaging) instead of (P33 Imaging).

10. KNOWN DEFICIENCIES

Without thermal module version 3.38, the new hms block and all of its parameters will not be visible. If, after upgrading the head firmware, you receive error 17672 or 17673, enter the following commands:

```
>>nvs save servo_stat cal
>>nvs save servo_stat cfg
```

If, after entering the above commands, the error persists, you can safely disregard it. This error will not affect machine functionality or plot quality in any way.

11. APPENDIX A: TERMINAL PROGRAM SET-UP

The Splot terminal utility is needed to run the upgrade script. It is assumed that the terminal program will be run on the system workstation.

Note: If it is run on another PC it may be necessary to change all the hard drive reference letters in the filenames. Any files created on the C: drive of a separate PC (that is, terminal) should be copied over to the workstation's System Drive (S:, D:, or E:).

CAUTION: You must use Splot version 2.84 or later in order for the script to run.

If Splot is functioning properly, a terminal prompt should appear when you press the **Enter** key. If the terminal prompt does not appear, execute the following steps to ensure that the terminal link is set-up correctly:

1. Under **Term** ensure that **Input Mode** is checked. If no check-mark appears, select **Input Mode**.

2. Under **Term**, select **Port…** and ensure that the correct input port is selected.

3. Under **Term**, select **Port Settings…** and ensure that the following are selected:

    - baud rate selected is **9600**
    - parity is **none**
    - data bits is **8**
    - stop bits is **1**

12. APPENDIX B: BACKING UP AND RESTORING THE MPE NVS

Before upgrading the firmware of any recorder machine, it is important to backup the current NVS memory in case it becomes necessary to revert to the previously installed version of firmware.

What is NVS RAM?

The NVS RAM in recorder machines provides the following:

- Storage for machine-dependent configuration and calibration parameters that must remain intact between power cycles.
- Storage for state variables that allow a machine to resume where it left off if power is cycled during loading or imaging.

Saving individual NVS configuration parameters is a two-step process. A parameter is first *changed* in a volatile RAM copy of the NVS map and then *saved* (that is, copied) to the NVS map itself. State variables are always accessed directly from NVS. Generally, there is no need to change state variables manually since they simply contain a record of where the machine is (or was) during various tasks.

- Whenever firmware is upgraded in a recorder machine, some of the NVS calibration and configuration parameters will typically need to be upgraded as well. Simply loading new firmware into a machine will *not* upgrade the NVS. Steps must be taken to ensure that the NVS is properly configured for the new firmware. This process may be partly or wholly accomplished with the **nvs upgrade** command available from the recorder monitor. In some cases, however, it will be necessary for the installer to make certain upgrade configurations depending on the hardware that is present in the particular machine (plus state variables). The upgrade script will upgrade any necessary NVS parameters.
- The upgrade script will save all the NVS settings and produce a new script that can be used to revert to the current firmware version and settings if necessary. For manual procedures on how to save and restore NVS refer to release notes for earlier versions of head code.

Before loading firmware it is assumed that the installer is running Splor version 2.84 or later on the system workstation. It is also assumed that all of the necessary program options have

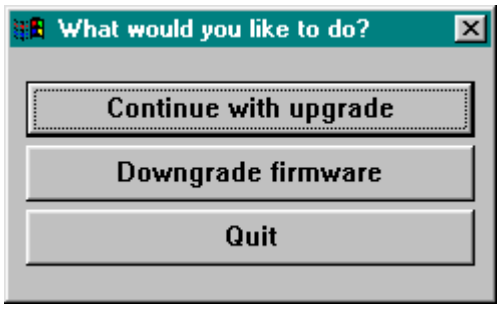
been set up as described in Appendix A, *Terminal Program Setup* and that the Allegro™ software is *not* running on the workstation.

13. APPENDIX C: USING THE UPGRADE SCRIPT *THCV183X.SPT*

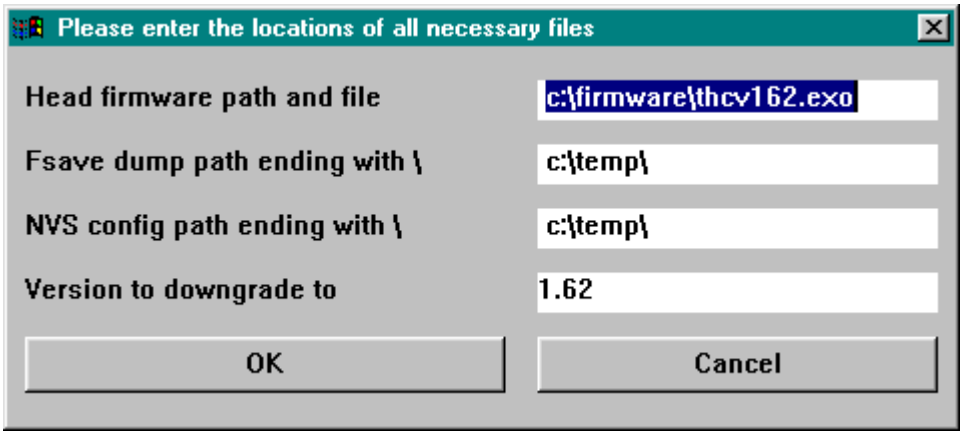
The current upgrade script has a wide range of functionality. Its primary function is still to upgrade the firmware from a previous version to version 1.83. To accomplish this, the script performs the following steps:

- Read current NVS data, along with stroke and scorr tables, and save to the NVS config script. The upgrade script will automatically generate the file and store it to the user-specified path. The config script will be called ldTHxxxxVyyy.spt, where xxxx will be the head serial number, and yyy will be the head code version before upgrade.
- Run an **fsave dump**, capturing the data to a file. The upgrade script will automatically generate the file and store it to the user-specified path. The dump file will be called fsTHxxxxVyyy.txt, where xxxx will be the head serial number, and yyy will be the head code version before upgrade.
- Upload the head firmware from the user-specified file and location.
- Load the fsave dump data in order to fully restore all NVS parameters and prevent corruption.
- Save all head NVS parameters.
- Run the **nvs upgrade head** command in order to ensure that all NVS parameters are properly initialized.
- Save the head mask.
- Reset the system.

The script also offers the secondary option of downgrading the firmware. If the current head firmware is already version 1.83 or later, and thcv183x.spt is executed, the following dialog will appear:



By selecting **Continue with upgrade**, the script will proceed to upgrade the firmware in the same way as outlined above. By selecting **Downgrade firmware**, the script will perform a firmware downgrade. The following dialog will appear:



- The **head firmware and path** should provide the location of the firmware version that you wish to downgrade to. As with the firmware upgrade, you must enter the full path and file name.
- The **Fsave dump path** should provide the location of the fsave dump file previously generated during a firmware upgrade. That is, if you previously upgraded the firmware from version 1.38 to version 1.83, the upgrade script generated a file called fsTHxxxxV138.txt, which the script will search for. As with the firmware upgrade, you must enter the full path name ending with '\'.
- The **NVS config path** should provide the location of the NVS config script previously generated during a firmware upgrade. That is, if you previously upgraded the firmware from version 1.38 to version 1.83, the upgrade script generated a script called ldTHxxxxV138.spt, which the script will search for. As with the firmware upgrade, you must enter the full path name ending with '\'.
- The **Version to downgrade to** should be the same version as the head firmware file. Note that the downgrade will only work if you have previously upgraded from this version number.

In order to accomplish the downgrade, the script performs the following steps:

1. Upload the head firmware from the user-specified file and location.
2. Load the fsave dump data in order to fully restore all NVS parameters and prevent corruption.
3. Save all head NVS parameters.
4. Save the head mask.
5. Reset the system.

14. APPENDIX D: THERMAL HEAD VERSION INFORMATION

The following table cross-references the Thermal Head Firmware Version with the MPE Thermal Module required. Note that Thermal Head Firmware Version entries that are **bold** are the supported releases. Information about which versions of head firmware are

compatible with device control (MPE or MCE) firmware can be found on the Controlled Release Website.

Thermal Head Firmware Version	MPE Thermal Module	Notes
1.00	1.56	
1.03	1.62, 2.00	
1.05	1.62, 2.00	
1.11	2.06, 2.07, 2.08, 2.09	Beta release of Thermal Head firmware version 1.12.
1.12	2.06, 2.07, 2.08, 2.09	Adds support for more than one media type.
1.13	2.06, 2.07, 2.08, 2.09	Corrects bugs in Thermal Head firmware version 1.12.
1.14	2.06, 2.07, 2.08, 2.09	Corrects bugs in Thermal head firmware version 1.13.
1.15	2.06, 2.07, 2.08, 2.09	Corrects bugs in Thermal Head firmware version 1.14.
1.16	2.06[1], 2.07, 2.08, 2.09, 2.10	Adds support for the 10-0892C version of the Thermal Head Controller.
1.17	2.06[2], 2.07, 2.08, 2.09, 2.10	Beta release of Thermal Head firmware version 1.16 that supports 40W Thermal Heads.
1.18	2.06[3], 2.07, 2.08, 2.09, 2.10	Corrects bugs in Thermal Head firmware version 1.16.
1.18b	2.06[4], 2.07, 2.08, 2.09, 2.10	Corrects bugs in Thermal Head firmware version 1.18.
1.19	2.06[5], 2.07, 2.08, 2.09, 2.10	Beta release of Thermal Head firmware version 1.18 that supports 40W Thermal Heads.
1.20	2.23	Beta release of Thermal Head firmware version 1.21.
1.21	2.23	Adds support for Staccato and Bipolar.
1.22	2.23	Corrects bugs in Thermal Head firmware version 1.21.
1.23	2.23	Corrects bugs in Thermal Head firmware version 1.22.
1.24	2.30	Beta release of Thermal Head firmware version 1.30.
1.30	2.30	Adds support for the active chiller and laser standby.

[1]Thermal Module 2.06 only supports the 10-0892B version of the Thermal Head Controller.
[2] See footnote 1.
[3] See footnote 1.
[4] See footnote 1.
[5] See footnote 1.

1.31	2.30	Beta release of Thermal Head firmware version 1.34.
1.32	2.30	Corrects bugs in Thermal Head firmware version 1.30.
1.32.6	2.30	Corrects a hardware problem that resulted in the error message “Timeout waiting for LASER OK”.
1.33	2.34	Beta release of Thermal Head firmware version 1.34.
1.34	2.34	Adds support for laser mode 3 and enhanced safety loop handling.
1.35	2.34	Beta release of Thermal Head firmware version 1.36.
1.36	2.34	Corrects bugs in Thermal Head firmware version 1.34.
1.37	2.34	Development work only.
1.38	2.34	Corrects a hardware problem that resulted in the error message “Timeout waiting for LASER OK”.
1.56	2.34, but higher versions preferred	Improved diagnostics, focus and bug fixes
1.62	2.34, but higher versions preferred	Bug fixes and added functionality to allow shutter sensor calibration in the field.
1.73	2.34 but higher versions strongly recommended	Improved diagnostics, code optimization, reorganized NVS, added plot statistic storage.
1.74	2.34 but higher versions strongly recommended	Fixed head power pulse and stroke profile bugs in version 1.73.
1.80	2.36 but higher versions strongly recommended	Support Entry Imaging heads, move media statistics collection to *hms* subsystem.
1.82	2.36 but higher versions strongly recommended	Support revised P33 Imaging plan.
1.83	2.36 but higher versions strongly recommended	Fix bug that resulted in rare, intermittent NVS corruption.