ThermoFlex WIDE II
MCE Firmware Version 1.04 Release Notes

CONTENTS

1. Scope 2

2. Formatting Conventions 2

3. Preliminary Checklist (read before you begin!) 2

4. Upgrade Procedure 3

5. Features 3
   - 5.1 NVS Parameters 3
   - 5.2 FWD Support 6
   - 5.3 Front Cover Double Acting Solenoid 6
   - 5.4 Fast Carriage Retrace 6

6. Product Configuration 7
   - 6.1 Model Type 7
   - 6.2 Product Options 7
   - 6.3 UDRC-L Parameters 8

7. Known Deficiencies And Problems 8

Appendix A: Common Acronyms 9

Appendix B: NVS Backup/Restore and Loading Firmware 10
   - RAM vs. FLASH Parameters in MCE Machines 10

1. SCOPE

This document describes the first release of firmware for the ThermoFlex Wide II device. This release of firmware supports sheet-only operation of early production devices. Sleeve support is not fully tested. Film imaging, blank skipping, and V-speed are not yet supported with this release. Common acronyms used are defined in Appendix A.

2. FORMATTING CONVENTIONS

The formatting conventions used in this document are as follows:

All NVS parameters are in *italics* and commands to be typed into the diagnostic terminal are in **bold** as well as the diagnostic command responses.

3. PRELIMINARY CHECKLIST (READ BEFORE YOU BEGIN!)

Please ensure the following checklist is performed before the upgrade is started. This upgrade will only apply to either a newly integrated device or a beta device running beta firmware for this release.

1. ☐ Using the **list version** command, record the following:

   current MCE FW version: _____

   current Xilinx version: _____

2. ☐ Record the head firmware version.

   current TFX FW version: _____

   To determine the head firmware version, you must ensure that the safety loop is closed. Close the load table and all other doors on the device and type **table lock**. After the head comes online, use the **redirect enable** to access the head, type **ver** to determine the head version, and use **redirect disable** to return back to the MCE.

   NOTE: Always perform a **table lock** command and wait for the head to come online (approx. 30 seconds) before issuing head commands.

3. ☐ Ensure you have the controlled release package available.

4. ☐ Ensure that the load table is locked and the head is online.

5. ☐ Run the Version Checker applet[1] with the new controlled release version specified.

   Identify all components that need to be updated.

[1] Available from the Default Views of Service Shell 2.5; ensure the machine is on before running the applet.

- ☐ Head compatibility (TFX V1.23 or higher).
- ☐ Print Console compatibility (Version 3.8.x.xx or higher).
- ☐ Xilinx compatibility (Version 1.79 or higher).

6. ☐ Check for any updates to the controlled release.
7. Ensure that you allocate at least 4 hours for upgrading and testing the system.

4. UPGRADE PROCEDURE

To upgrade the MCE firmware, please perform the following steps:

1. Use the Version Checker applet to identify all firmware components that need to be upgraded.
2. For the Upgrade Procedure, please see the detailed upgrade document *FirmwareUpgrade.pdf*. This document can be opened from the script view in ServiceShell by right-clicking on the Firmware Upgrade script, and clicking Help for selected script. Then click the link to the pdf file:



   The *FirmwareUpgrade.pdf* file can also be found in the d:\ServiceShell\Scripts\device folder..

3. After the upgrade is complete, run the Version Checker applet again to make sure all components are correct.
4. Perform the Product Configuration procedures in Section 6 as required.

5. FEATURES

This section describes some of the features in this release of firmware that are unique or new to the ThermoFlex Wide II device operating in sheet mode.

5.1 NVS Parameters

The following discusses relevant parameters in the firmware and explains their use. Some parameters relevant only to Sleeve operation are included for completeness but not discussed. Modifying these parameters on sheet-only devices will not affect the operation of the device.

The *mandrel* subsystem is excluded because all parameters within are for sleeve operation. The *debris* subsystem will be discussed in Section 6.3.

drumvacuum Yintercept [range -10.0-10.0, default 2.840, no units]

Used to adjust the drumvacuum open loop control. Modify only if directed to by Creo engineering.

drumvacuum MinPressure [range 1.000-7.500, default 3.500, “Hg]

Sets the minimum pressure for drumvacuum operation. Do not decrease from default without consulting Creo engineering.

mh MediaInLoader [range 0-12, default 0, no units]

Used as a state variable for firmware to determine state of media in the loader. Do not modify unless you know what you are doing. In most cases, **loaded force none** should be used to reset the device loaded status if required.

mh LEPosition [range 0-360, default 103, degrees]

Sets the load position of the leading edge in degrees. This should be done in integration and will not likely need adjustment out in the field except for possible ergonomic considerations. If this is modified, the *LEtoSensor* parameter must also be adjusted.

mh TETapeOffset [range 0-90, default 25, degrees]

Sets the media position for unload. The unload position is calculated by adding the plate size in degrees to the *LEPosition* and subtracting the *TETapeOffset*. The position should be set so that the trailing edge of the media is beneath the load table ledge and removing the tape will allow the user to place the media onto the load table ledge. Larger values of *TETapeOffset* will put the media trailing edge further underneath the table while smaller values will place the media trailing edge closer to the front of the device (further away from the load table). This value should be set in integration and will not likely need adjustment out in the field.

mh LEtoSensor [range 0-1000, default 140, millimeters]

Used to determine the length of the plate. This parameter represents the distance from the load table plate sensor to the leading edge registration bar with the drum positioned at *LEPosition* degrees and the load table in the fully open position. After the plate is loaded, the length is determined by the distance traveled from leading to trailing edge and the *LEtoSensor* value is added to calculate the total plate length. This value should be set in integration.

mh ParkPosition [range 0-10000, default 2212.5, millimeters]

This parameter is for sleeve mode operation where the head is sent to the “park position” in order to prevent damage during sleeve exchange operations. This position should be set so that the head contacts the park position switch at the away side of the device. This

should occur before the carriage encounters the away limit sensor. This value should be set in integration.

mh DVSetpointFlexo [range 6.0-8.0, default 7.5, "Hg]

This is the drum vacuum setpoint for imaging flexo plates.

mh DVSetpointFilm [range 3.5-8.0, default 7.5, "Hg]

For future use, currently not used.

mh DBLowerLimit [range 0-1024, default 0, no units]

Used to set lever positions for one-touch sleeve loading. Not used in sheet mode.

mh DBUppoerLimit [range 0-1024, default 0, no units]

Used to set lever positions for one-touch sleeve loading. Not used in sheet mode.

prd ShImageStartPos [range 0-1000000, default 63500, microns]

Sets our imaging start position for sheet imaging. Since the Thermoflex Wide II device does not perform an edge detect, this should be used to set where we expect to start imaging when sheet media is loaded against the registration bars. It should be set to be a ½" in (on media) from the edge of the media. This value should be used to shift the image in integration, not *gc sshift*.

prd MandrelEdgePos [range 0-1000000, default 78500, microns]

Sets the imaging start position for sleeve imaging. As the position where sheet imaging starts is too far towards the home side for sleeve imaging, this parameter is required to set the edge of the mandrel. It should be set to a position at the edge of the mandrel and is typically about 15000 microns past the *ShImageStartPos*. Offsets for sleeve imaging are referenced to this position. This value is only used for sleeve mode.

prd SeamSearchSpeed [range 5-200, default 25, millimeters per second]

Sets the surface velocity for seam detection when imaging Plate-On-Sleeve jobs. This should not need to be adjusted.

zac BaseFocusDist [range 1.000-1000.000, default 257.500, microns]

Defines the distance from the head at the head stage home position to the center of the drum. This value is used to calculate the thickness of the plate after the head is focused on the media. The calculation used is:

PlateThickness = *BaseFocusDist* – ZaxisPosition - DrumDiameter / 2

To set the *BaseFocusDist* parameter, refer to the startup and integration procedures.

zac SamplesToAvg [range 1-200, default 1, no units]

Sets the number of samples to read when focusing the head on media. Do not change without consulting Creo engineering.

zac MaxFinalError [range 1-100, default 10, microns]

Sets the threshold between "good range" and "within range". The head is considered focused when in "good range". Do not change without consulting Creo engineering.

zac CarriageFocPos [range 1.000-10000.000, default 140.00, millimeters]

Used in sheet mode only to set where focus upon the media is performed in the subscan direction. If modified, ensure that it is at a position where the smallest permissible plate can still be focused upon.

5.2 FWD Support

This release of firmware contains support for the FWD (**F**irm**W**are **D**irectory) subsystem which was added to better organize memory utilization on the MCE board. When upgrading existing sites (i.e. Beta sites running 1.02 or earlier), ensure that you utilize the FirmwareUpgrade.spt script as described in section 4. The new firmware is not compatible with the previous versions of boot code and POST code (requires 1.12 boot code and 1.06 POST code).

5.3 Front Cover Double Acting Solenoid

For safety reasons, the release solenoid for the front cover was changed from a single acting to a double acting solenoid. This change is being retrofitted to devices currently in the field and requires this firmware release to support the cover operation.

5.4 Fast Carriage Retrace

Carriage retrace during the unload sequence was added in this version to increase throughput. This requires wiring changes so that carriage power is available when the load table is open. The carriage is retraced at the end of image immediately before the load table is unlocked and continues back to the home position as the media is unloaded. Accompanying wiring changes must be done in order to support this feature. There is no firmware configuration required for this feature and devices that currently do not have the wiring changes will continue to perform as previously (load table opens *after* the carriage retraces).

6. PRODUCT CONFIGURATION

6.1 Model Type

Currently shipping devices should be configured as one of the following types:

1. **4836F** – 48" mainscan/36" subscan maximum plate size, F-speed[2]
2. **4260F** – 42" mainscan/60" subscan maximum plate size, F-speed
3. **5280F** – 52" mainscan/80" subscan maximum plate size, F-speed

There are also corresponding model types using V-speed imaging (**4836V, 4260V, 5280V**) which has not been released at the time of this firmware release.

To change the model type, use the following commands:

```
Flexo>> access enable

Flexo>> config <password> <model type>

Flexo>> reset
```

Please contact Creo Service or your PSM if you do not know the password.

6.2 Product Options

The Thermoflex Wide II device monitor will display the following options:

```
Product Option commands
-----------------------
option edgedetect     enable|disable
option buzzer         enable|disable
option debris udrcb   enable|disable
option debris udrcl   enable|disable
option drumvacuum     enable|disable
option sprayon        enable|disable
option sheetmode      enable|disable
option sleevemode     enable|disable
option doblo          enable|disable
```

[2] This configuration's product designation is "3648". "4836" is used for firmware configuration only.

when the **option** command is entered. For sheet mode only devices, please enable only the options in **bold** above. All other options should be disabled. The commands for enabling/disabling options are displayed in the output of the **option** command. Note that you must use **access enable** to enable access to the option command.

6.3 UDRC-L Parameters

The parameters in the *debris* NVS subsystem should be set according to the *Debris Removal Firware Guide – Parameter Values, Descriptions, and Flowchart* document available on Techplanet. The default NVS values in the firmware are not applicable to the Thermoflex Wide II configuration.

7. KNOWN DEFICIENCIES AND PROBLEMS

Known deficiencies and problems in the device firmware to be worked on for the next release.

- Device does not recover properly from all emergency stop situations. This varies from situation to situation.
- When rotating drum with drum control buttons, the response lags and it may sometimes be necessary to hold the buttons longer than one might expect before the drum starts to rotate.
- When starting the loading process, the side taping step may be confused with the actual media load if care is not taken. This can result in the operator loading the plate without drum vacuum and thus dropping the plate into the device. A possible future fix is to prevent forward rotation of the drum during the side taping step. Currently, the operator must ensure that the drum vacuum button is pressed and the vacuum is on before attempting to load media.

Appendix A: Common Acronyms

BBR	Boot-block Recovery
CTP	Computer to Plate (this includes Trendsetters and Platesetters)
GENINE	Generic I/O Node Electronics Board
kPa	kilopascals
LIONEL	Little I/O Node Electronics Board
MCE	Master Control Electronics
NVS	Non-Volatile-Storage
PC	Print Console
PDB	Power Distribution Board
POST	Power-On Self Test
TFX	TFX Head
TS	Trendsetter – base model
UDRC	Universal Debris Removal Cabinet
WS	Workstation

APPENDIX B: NVS BACKUP/RESTORE AND LOADING FIRMWARE

Service Shell is required to load new firmware, and to backup or restore NVS parameters. A script has been written to simplify these tasks.

As part of the Service Shell install, a script named **FirmwareUpgrade.spt** is copied to the Device scripts folder. A document describing how to configure Service Shell and how to use the script is also included in the **d:\ServiceShell\scripts\device** folder. Service Shell is installed on every workstation before it leaves the factory, so this document will be present on every workstation.

Inside Service Shell, left-click on the Scripts icon, then left-click on the Device group. Double-click on FirmwareUpgrade.spt to start the script. It is very important to use this script for the upgrade to make sure a full NVS backup is performed. Furthermore, this release of firmware requires a new BOOT module to be installed on the MCE, and requires the POST, Xilinx and OVWR modules to be re-installed. **If the new BOOT module is not installed before the new firmware is, the new firmware will not execute!** The upgrade script will take care of this for you, so it is important that you use it.

RAM vs. FLASH Parameters in MCE Machines

There are two separate types of NVS parameters that are accessed by the MCE firmware. Most parameters are stored in RAM. A few parameters that are not expected to be changed frequently are stored in Flash. Both sets of parameters must be backed up to fully capture the state of the machine; and both sets of parameters must be loaded onto a new board to restore the machine to its previous state. The FirmwareUpgrade.spt script automatically creates two separate files, one for each type of NVS, and expects both files when restoring parameters.

NVS parameters in general provide the following:

- Storage for machine-dependent 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.

All parameters are saved immediately as soon as they are changed.

When firmware is upgraded on a device, any new parameters will automatically be set to their default value. If a more complicated upgrade procedure is required, a script will be created to perform this upgrade, and this script will be released with the firmware.

IMPORTANT: BEFORE UPGRADING THE FIRMWARE OF DEVICE YOU MUST BACKUP THE CONTENTS OF THE CURRENT NON-VOLATILE STORAGE IN CASE IT BECOMES NECESSARY TO REVERT TO THE PREVIOUSLY INSTALLED VERSION OF FIRMWARE!