Trendsetter 400/800 and Trendsetter 400/800 AL
MCE Firmware Version 1.10 Release Notes

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1. SCOPE

This document describes the important changes to the Trendsetter 400/800 and Trendsetter 400/800 AL MCE firmware that comes with Version 1.10.

Please refer to the TechPlanet firmware documentation pages or the Creo Service CD-ROM for information on commands, error messages, and NVS parameters for the Trendsetter MCE.

Common acronyms used in this document 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.

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

current MCE version: _____
current head version: _____

☐ Ensure you have the entire controlled release package available.

☐ Run the Version Checker applet[1] with the new controlled release version specified. Identify all components that need to be updated.

- ☐ Head compatibility (Thermal 1.7x V1.83 or higher).
- ☐ Print Console compatibility (Version 3.3.1.11 or higher).
- ☐ Xilinx compatability (Version 1.50 or higher).

☐ Check for any updates to the controlled release – for example, new scripts not included in the official Service Shell release. These updates would be stored in the Patches folder of the controlled release package.

☐ Ensure that you allocate at least 4 hours for upgrading and testing the system. After the firmware upgrade, the entire system must be checked to make sure it is operating properly. This includes performing a visual check of plate handling, running a few plots to ensure proper image quality, and instructing the operators on any changes to the system operation. The customer should also be allowed to run a few plates to make sure the machine works to their satisfaction.

☐ If this device uses UDRC-B (POC) debris removal, changes may be required to the location of the UDRC pressure sensor hose. Make sure you have the required tools before starting, and allocate an additional 1/2 hour for upgrading and testing the debris removal system. See Appendix C to determine if this modification is required and for information on how to configure the device for the change.

☐ If this device is being upgraded from Pre-V1.06, record the current model configuration and any features (use the **config** and **feature** commands) due to a potential upgrade bug.

current model: _____
current features: tag _____ value_____
tag _____ value_____

[1] Available from the Default Views of Service Shell 2.4; ensure the machine is on before running the applet.

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. Note that both 1.7x head firmware and Thermal 2 firmware are included in the controlled release, but only one needs to be present. So ignore the warning for the head type not installed.
2. Run the **FirmwareUpgrade.spt** script from within Service Shell (see Appendix B for details) and select Upgrade Firmware. The script will automatically create backup files for all the NVS parameters on the device, then upgrade the firmware. The script allows several firmware components to be loaded in sequence – for example, MCE Main firmware and Xilinx.
3. Reset the machine with the **reset** command.
4. After the upgrade is complete, run the Version Checker applet again to make sure all components are correct.
5. If you were installing from Pre-V1.06 and you encounter the **[Optional feature table is full]** error, then see Section 5.4.2 for the recovery procedure.
6. Follow the procedure in Appendix C for the UDRC-B pressure sensor modification (if required).
7. Perform the Device Configuration Procedures in Section 6 as required.
   • For all devices that are being upgraded, Section 6.5 Configuring AirjetMarginHome and AirjetMarginAway is important.
   • For all S and F speed devices being upgraded, there are new drum speeds that are described in Section 6.3.
8. Perform the Device Calibration Procedures in Section 7 as required.

5. CHANGES SINCE V1.05

5.1 UDRC-B (POC) Pressure Sensor Hose Location Modifications

This change only applies to devices using UDRC-B (POC) debris removal. See Appendix C to determine if this modification is required and for information on how to configure the device for the change.

5.2 NVS Changes

The following table details new NVS parameters in this release.

NVS System	Param Name	Old Default	New Default	Description	Refer to Section
media *x*	**AirjetMarginHome**	**--**	**0**	specifies the minimum distance in um the head must be away from the home media edge before the debris airjet will be allowed to turn on	5.3.2
media *x*	**AirjetMarginAway**	**--**	**0**	specifies the minimum distance in um the head is allowed to be from the away media edge before the debris airjet will be turned off	5.3.2

5.3 New Functions

5.3.1 Support for E-Models

MCE firmware V1.10 is the first version to support E-Models:

Full Model Name	Internal Name
Trendsetter 800 S	TS8ES
Trendsetter 800 F	TS8EF
Trendsetter 800 V	TS8EV
Trendsetter 800 S Autoloader	TSAL8ES
Trendsetter 800 F Autoloader	TSAL8EF
Trendsetter 800 V Autoloader	TSAL8EV

The E-Models have a P33 head.

5.3.2 Airjet Margin Home / Away

For certain media, when the airjet is on and the head is too close to a media edge, imaging quality may be compromised near that edge due to plate lifting. Before V1.10, these potential artifacts were eliminated by turning off the airjet when the head was within a margin of 12500 microns from the media edge for all media. Because this phenomenon only occurs with certain media, two media parameters have been added to V1.10 allow the airjet margin to be configured uniquely for each media.

AirjetMarginHome specifies the minimum distance in um the head must be away from the home media edge before the debris airjet will be allowed to turn on.

AirjetMarginAway specifies the minimum distance in um the head is allowed to be from the away media edge before the debris airjet will be turned off.

Note: Currently, these new media parameters do not apply to devices using UDRC-L (PACC) debris removal. These devices will effectively use *AirjetMarginHome/Away* = 0um.

5.4 Known Bugs

5.4.1 Media command

The **media** diagnostic command sometimes crashes the firmware. This is caused by setting the verbosity for HIF and EHI at high level that causes too much data being dumped to the serial port. To work around the problem, use **verbose off ehi hif** to disable verbose print for these two subsystems.

5.4.2 Optional Feature Table Full Error when Upgrading from Pre-V1.06

In rare cases, upgrading from versions prior to V1.06 may generate the following error after reset:

*** Command Failed: 41608
[Optional feature table is full]

When upgrading from Pre-V1.06, the dongle information is erased and the feature table is rewritten. There is a bug that may cause the feature table to become corrupted during this process and cause the above error to appear. The following procedure must be followed to recover from this error:

1. Clear the following parameters using:
   access dev
   stg delete flash 2404
   stg delete flash 2405
   stg delete flash 2406
   stg delete flash 2407
   reset

2. Reconfigure the device using:
   config <password> <model>

3. Reconfigure the features, if any, to their previous states using:
   feature <password> <tag> <value>

6. DEVICE CONFIGURATION PROCEDURES

6.1 Configuring the Device Model

All available model configurations can been displayed using the **config** command by itself. The model is configured using the **config <password> <model>** command, for example (command is case-sensitive):

config <password> TS8S

After using this command, reset the machine then use the **config** command on its own to verify that the model was set correctly.

6.2 Enabling Options

Use the **option** command to list all options, and enable/disable options applicable to the model. Ideally, all required NVS parameters would be configured automatically when the model is configured. This has not yet been done, in part because a single model can have different options that change its characteristics. The following list defines what settings must be verified when a model or feature is changed (do **access dev** first to gain access to commands):

- **option autoloader enable** enabled for all autoloader models
- **option rotator enable** if rotator is installed on autoloader models
- **option debris udrcb enable** if UDRC-B is installed
- **option debris udrcl enable** if UDRC-L is installed

After using this command, reset the machine then use the **option** command on its own to verify that the options were set correctly.

6.3 Configuring New Drum Speeds for S and F Speed Devices

The carriage speed limits have been increased for S and F speed devices. For S speed devices, the drum speed will be lowered but interleaving will be disabled. For F speed devices, the drum speed can be increased. The following table describes the new drum speeds for each device type:

Model	Head width	New drum speed
S speed	192 pps	160
S speed	224 pps	137
F speed	192 pps	254
F speed	224 pps	217

S speed devices using the new drum speed must have overwriting turned off for each media. Use the command **set media *x* patternid 0** for each available media number to turn off interleaving. (All available media numbers can be displayed with the **media** command).

6.4 Configuration for UDRC-B (POC) Modification

This change only applies to devices using UDRC-B (POC) debris removal. See Appendix C to determine if this modification is required and for information on how to configure the device for the change.

6.5 Configuring AirjetMarginHome and AirjetMarginAway

All devices being upgraded should have their *AirjetMarginHome* and *AirjetMarginAway* parameters for all media set to match the previously hard coded values so that the airjet behaves as before. These parameters can then be optimized as required for each media.

1. Make note of all defined media numbers using the **media** command and looking under the "Available Media" section.

2. Set the airjet parameters to their old defaults by issuing these commands:

   set media *x* **AirjetMarginHome 12500**
   set media *x* **AirjetMarginAway 12500**

3. Repeat step 2 for each available media number.

7. DEVICE CALIBRATION PROCEDURES

If the firmware is being loaded into a new machine or the NVS parameters have been erased without making a backup, then the following NVS parameters must be calibrated:

7.1 Setting the Plate Measuring Sensor Offset

Applicable devices:
⇒ Trendsetter 400/800
⇒ Trendsetter 400/800 AL

The *mh DistSensorToLEC* parameter specifies the nominal distance between the Leading Edge Clamps (LEC) and the optical plate measuring sensor on the load ramp. This parameter is used by the firmware to measure the main-scan size of plates as they are being wound onto the drum. To calibrate this parameter, place a stack of plates of a known size into the bay, load the correct plate size information from the workstation, and verify that the media mainscan size is correct by entering the **bay 1** command from the diagnostic terminal.

Type **load cal** through diagnostics. This will cause a plate to be picked and loaded. The plate size will be measured and the *mh DistSensorToLEC* parameter will be calibrated as the plate is wound onto the drum. The new value is automatically updated and saved.

7.2 Calibrating the Unload Table Cup Rotate Position

Applicable devices:
⇒ Trendsetter 400/800 AL

The *mhauto UtRotatorPos* parameter specifies the nominal position for the unload table traveler to move to before rotating the unload vacuum cups. The firmware moves the traveler to this position and checks the rotate position sensor before attempting to rotate the cups. If the sensor is not tripped, then the traveler is moved slowly towards the away end of the table until the sensor is tripped or the firmware gives up and suspends.

Calibrate this parameter with the unload table in the down position (use the **table down** command). Move the traveler home by typing **table home**. Then type **table move rotate**. This command will move the traveler to the position specified by *mhauto UtRotatorPos*. The center of the optical interrupter tab on the traveler should be 1-2 millimeters towards the home side of the rotate position sensor, and the sensor should be tripped (check the sensor using the **table** command). Adjust the position by changing the *mhauto UtRotatorPos* parameter and re-typing **table move rotate**. The new value is automatically saved when it is changed.

On machines with short unload tables (most Trendsetter 400 and NEWS machines), the *mhauto UtRotatorPos* parameter should be set to 500 to make sure the traveler stops in the correct place when it is dragging a plate along the unload table.

7.3 Enabling Plate Rotation

Applicable devices:
⇒ Trendsetter 400/800 AL

The rotator is enabled in firmware by typing **access expert** then **option rotator enable**. Plate rotation is controlled from Print Console. If the rotator option is enabled, then a "Rotate Plate" checkbox will show up in the Media Size settings in Print Console. If this box is checked, Print Console will tell the Trendsetter to rotate the plate during unload.

Without Print Console, rotation can be tested by typing:

- **load bay 1 r 1** to load a plate from the bay and tell it to rotate on unload, or
- **unload r 1** to unload the plate on the drum and tell it to rotate.

7.4 Adjusting Eject Speed and Distance

Applicable devices:
⇒ Trendsetter 400/800 AL

7.4.1 Eject distance

The plate will be pushed towards the processor at fast speed, then slowed down to match the processor intake speed.

The *exit FastDistance* parameter determines when the traveler slows down. This parameter should be set to the distance (in mm) from the traveler home position to the position of the far end of plate when the speed changes. To adjust this distance, enter **set exit fastdistance <nn>** where <nn> is the new value in millimeters.

To adjust the distance that the plate moves at slow speed, enter **set exit slowpush <nn>** where <nn> is the new distance value in millimeters.

The new values will be saved automatically when they are changed.

7.4.2 Eject speed

Enter **set exit velocity** to see the current slow speed setting.

Use the **table move <position> <velocity>** command to test different speeds and determine the best speed. Enter **set exit velocity <nn>** where <nn> is the new speed setting. The new value will automatically be saved.

7.5 Enabling Manual Unloading

Applicable devices:
⇒ Trendsetter 400/800 AL

Plates loaded through manual-bypass will be unloaded through manual-bypass. Plates loaded automatically from the bay will be unloaded automatically out the back of the machine. There is not currently any way to over-ride this rule when running workstation jobs.

APPENDIX A: COMMON ACRONYMS

MCE	Master Control Electronics
CTP	Computer to Plate (this includes Trendsetters and Platesetters)
NVS	Non-Volatile-Storage
PDB	Power Distribution Board
GENINE	Generic I/O Node Electronics Board
LIONEL	Little I/O Node Electronics Board
POST	Power-On Self Test
BBR	Boot-block Recovery
PC	Print Console
TH2	Thermal 2 Head
TH1.7x	Thermal 1.7x Head
WS	Workstation
TSAL	Trendsetter Autoloader
TS	Trendsetter – base model
TSSP	Trendsetter Spectrum
NEWS	Trendsetter NEWS

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. An updated copy with more MCE-specific information is available in the Trendsetter MCE Controlled Release V1.0.

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.

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.

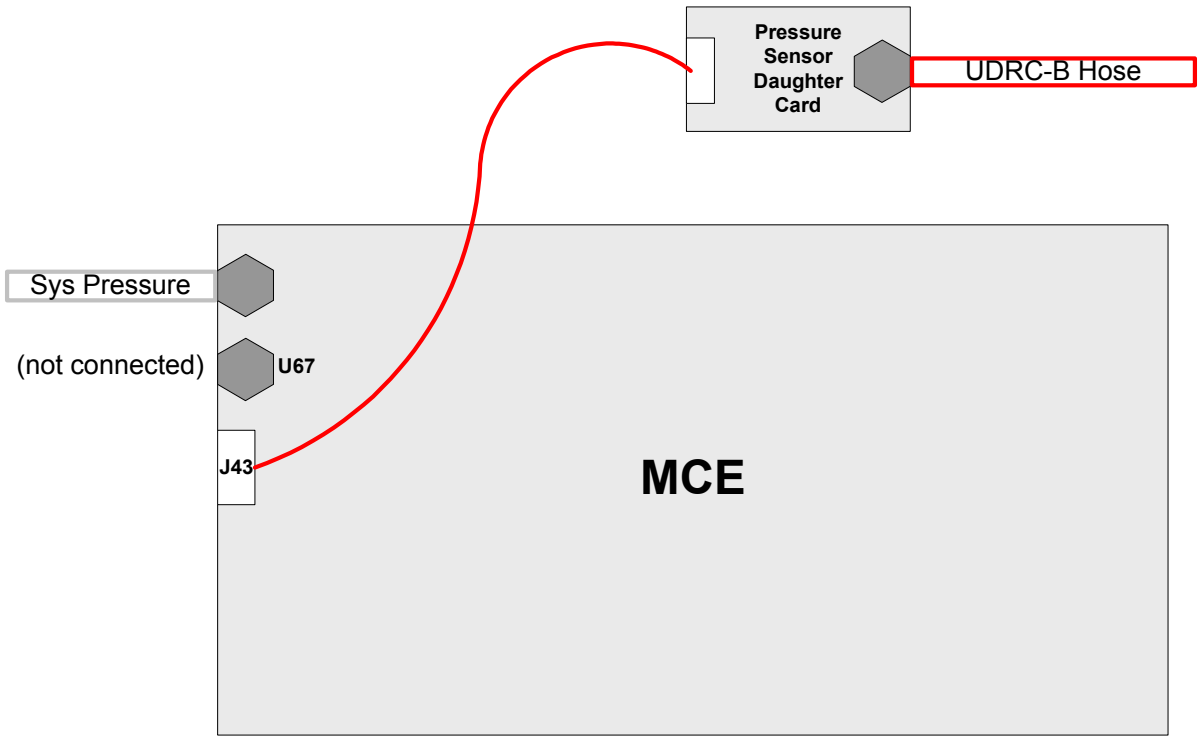
IMPORTANT: BEFORE UPGRADING THE FIRMWARE OF ANY RECORDER MACHINE YOU MUST BACKUP THE CONTENTS OF THE CURRENT NVS MEMORY IN CASE IT BECOMES NECESSARY TO REVERT TO THE PREVIOUSLY INSTALLED VERSION OF FIRMWARE!

APPENDIX C: UDRC-B (POC) PRESSURE SENSOR HOSE LOCATION MODIFICATION FOR TRENDSETTER 400/800 AND TRENDSETTER AL

If this device is being upgraded from V1.09.27 or earlier, you must change the location of the debris pressure sensor hose for units equipped with UDRC-B (POC) debris removal. Debris removal will not function properly without this change. Devices with UDRC-L (PACC) do not require this modification.

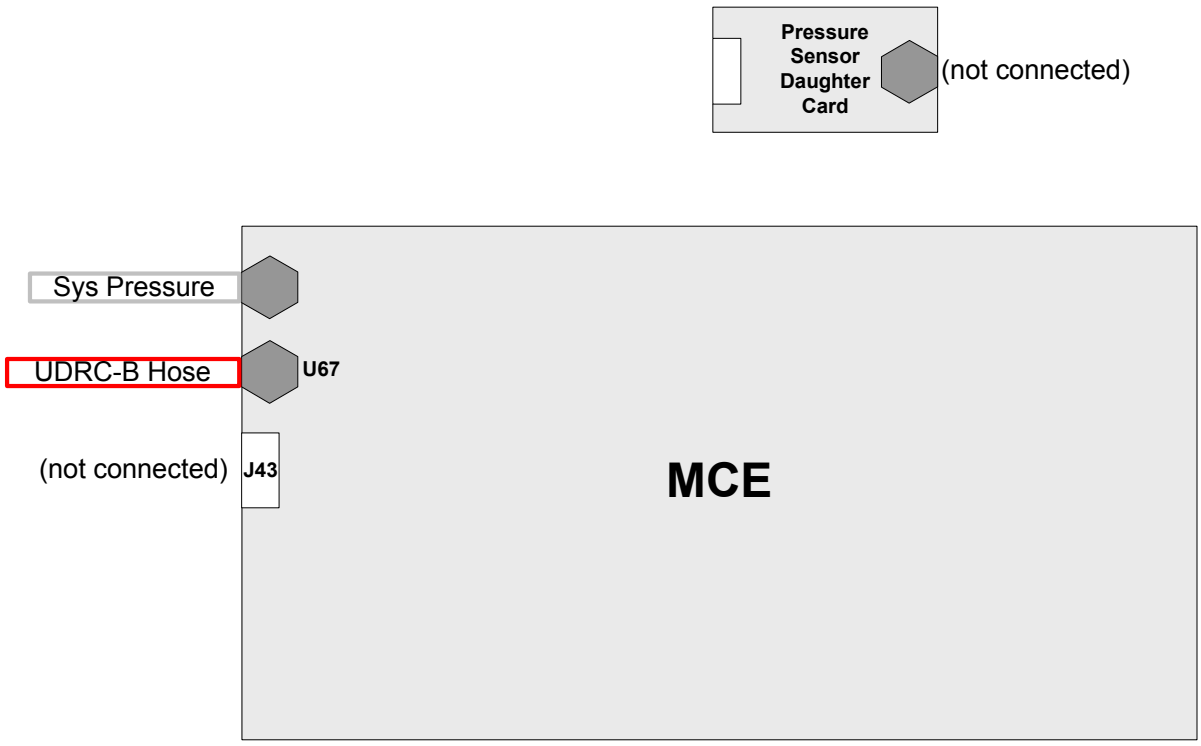
1. **Determine if the device requires UDRC-B pressure sensor hose location change**
   If this device uses UDRC-B (POC) debris removal, the surest way to determine if this modification is required is to look inside the power box. If the UDRC-B pressure is sensed through a daughter board to J43 on the MCE, then this modification is required. The old configuration looks like this:

Old UDRC-B Pressure Sensor Configuration:



2. **Change the UDRC-B pressure sensor hose location**
   Move the UDRC-B pressure sensor hose from the daughter card over to U67 on the MCE. The daughter card is no longer used and the cable can be removed from J43. The new configuration for V1.10 looks like this:

New UDRC-B Pressure Sensor Configuration:



3. **Upgrade the firmware**
   If the firmware has not yet been upgraded, then complete the firmware upgrade procedure before continuing with the UDRC-B configuration.

4. **Configure the firmware to use the new UDRC-B pressure sensor location**
   The old sensor type (type 5 = on Pressure Sensor Daughterboard) is different than the onboard sensor type (type 0 = onboard), so the MCE firmware must be informed of this change using:

   set debris nozzlesensortype 0
   reset

   The device must be reset before this change will take effect.

5. **Confirm the changes**
   To quickly check if the modifications and configuration were done properly, you can enter the following commands and look for a change in the AI_UDRC_POCNozzPress readings:

```
TS>>scan ai_udrc
Group Name            Status Value
AI_UDRC_POCNozzPress       b 0000099Ah
AI_UDRC_POCNozzPressNF     b 00000000h
AI_UDRC_PACCNozzPress     ** 00000000h
AI_UDRC_DiffPress         ** 00000000h
AI_UDRC_BellPress         ** 00000000h
*** Command Complete
debris blower on
TS>> debris blower on
*** Command Complete
TS>> scan ai_udrc
Group Name            Status Value
AI_UDRC_POCNozzPress       b 00000E4Dh
AI_UDRC_POCNozzPressNF     b 00000000h
AI_UDRC_PACCNozzPress     ** 00000000h
AI_UDRC_DiffPress         ** 00000000h
AI_UDRC_BellPress         ** 00000000h
*** Command Complete
TS>> debris blower off
```

You should see the AI_UDRC_POCNozzPress value change when the debris blower is turned on