Customer Service Letter

To: **Data I/O Customers with UFS** Document #: 983-6010-001 Rev A

Subject: **Universal Flash Storage (UFS) Interface Board Upgrade to 8 socket**

Product: **Existing 4-socket UFS Interface Boards**

Dear UFS Customer,

With our recent release of 8-socket Universal Flash Storage (UFS) programming on LumenX, the previous generation of 4-socket UFS Interface Boards are now obsolete and incompatible with the new 8-socket UFS Interface Boards (due to updated UFS algorithms and FPGA firmware on LumenX programmers). Data I/O hereforth discontinues further development for 4-socket UFS hardware and software and algorithm development for new UFS devices will only be implemented for 8-socket UFS.

Warning: To prevent damage/reduce premature fatigue on UFS hardware in PSV Systems, decrease the socket opener/actuator air pressure setting for UFS and insert the desired number of UFS boards with equal load distribution in the programmer as described in the *UFS Getting Started Guide*.

Requirements for Eight-Socket UFS Upgrade

Hardware	• 8-socket UFS Interface Board(s) • Socket adapters for your UFS device/blank parts
Software	• LumenX Data Management Software (DMS) version 1.7.2 (or higher) • Version 2.0 LumenX Algorithm for your UFS device (Version 2.0 supports 8-socket UFS programming but 1.0 algorithms only work on 4-socket UFS Interface Boards)

Overview of Eight-Socket UFS Upgrade

First read the UFS Getting Started Guide (included with each UFS kit from Data I/O) for proper hardware handling and loading instructions (ex. PIN1 orientation). Then upgrade to 8-socket UFS:

1. After carefully inserting the desired number of 8-socket UFS Interface Boards (and UFS socket adapters) into the LumenX programmer, **update LumenX DMS** on the Handler PC.
2. **Update the programmer firmware** to version 1.7.2 (or higher).
3. **Download the latest UFS algorithm version 2.0** (or higher).
4. **Create a new job in LumenX DMS 1.7.2**: select the UFS device and 2.0 algorithm, then configure job, data/image, and device settings.

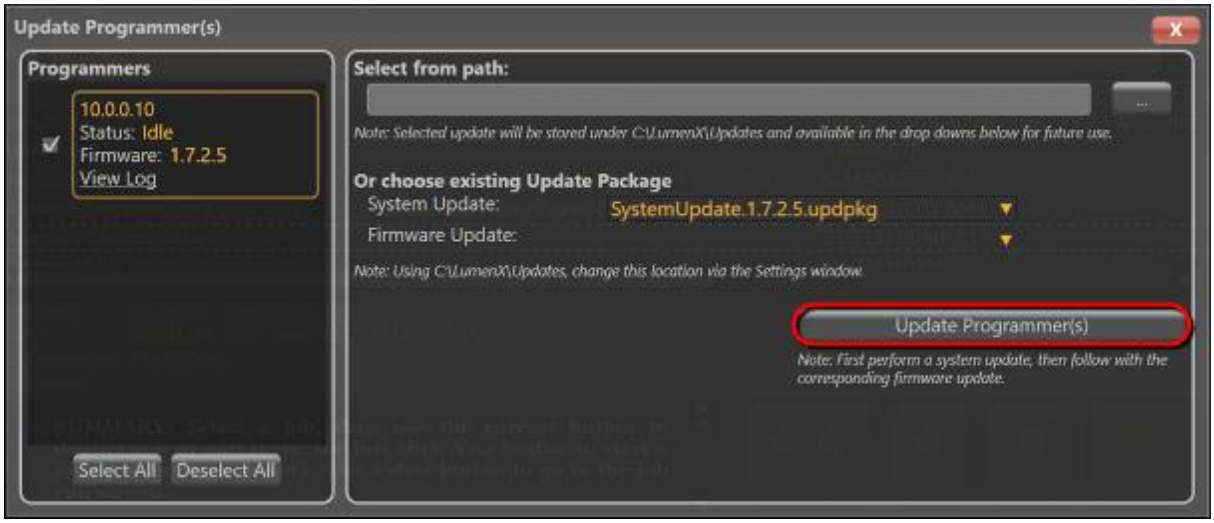
1 - Update to LumenX DMS 1.7.2+

Complete the following steps to update LumenX Data Management Software (DMS) to version 1.7.2 (or higher). Previous versions do not support 8-socket UFS implementation.

1. Download the LumenX DMS version 1.7.2 (or higher) installer from: https://www.dataio.com/Technology/LumenX/LumenX-Release.
2. On the Handler/Host PC, run the installer file (ex. ***LumenXDataManagement_1.7.2.exe***).
3. Complete the LumenX DMS Setup Wizard and reboot the computer.
4. Ensure the new version of LumenX DMS has programmer connectivity:
   - Login to LumenX DMS > Settings > Settings.
   - In left pane, check that DMS has Contact with each programmer (else discover/add).

2 - Update Programmer Firmware to Version 1.7.2+

1. Login to LumenX DMS > **Tools** > **Update Programmer(s)**.
2. In the left pane, check the boxes for the programmers to update.
3. In the right pane, select **SystemUpdate.1.7.2.updpkg** > **Update Programmer(s)**.



4. Now select **FirmwareUpdate.1.7.2.updpkg** > **Update Programmer(s)**.
5. In the left pane, confirm that firmware version is updated on each programmer.

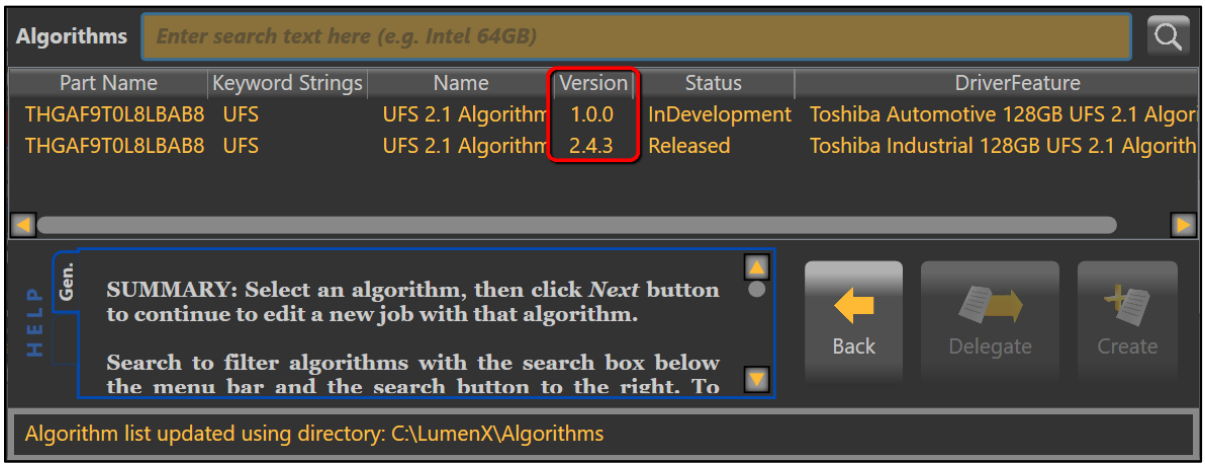
3 – Download latest UFS algorithm version 2.0+

In LumenX, all 8-socket UFS Interface Boards require UFS algorithm version 2.0 (or higher) because earlier versions (ex. LumenX algorithm 1.*X* for UFS) only support the 4-socket UFS boards. Use one of two ways to download the latest UFS algorithm version 2.0 (or higher):

- Visit www.dataio.com/Support/Device-Search to search for and download the Version 2.0 algorithm for your UFS device.
- In LumenX DMS: click Tools > Algorithm Updater > Update List > Download Selected.

4 - Create new job in LumenX DMS 1.7.2+

1. Return to the **Jobs** list/tab in LumenX DMS and click **New** (job).
2. Select desired UFS device > **Next**.
3. On the **Algorithms** screen, select the appropriate UFS algorithm version (2.0 or higher, see the **Version** column), and then click **Create** in the lower-right corner.



Note: If a version 2.0 algorithm is not available for the selected UFS device, then run **Algorithm Updater** (or otherwise copy the relevant ***.algpkg** file to C:\LumenX\Algorithms.

4. Replicate/reconfigure the job, data/image, and device settings for an 8-socket UFS programming job (using the 4-socket UFS job as original sample), and then click **Save** in the lower-right corner.
5. Returning to the **Jobs** list, select your new job and click **Run** in the lower-right corner.
6. Validate that the 8-socket UFS programming job succeeds without errors (ex. no errors or alerts in LumenX DMS, all sockets PASSED, reading from programmed UFS device works as expected).

Frequently Asked Questions

- **Can I still run UFS programming jobs on 4-socket UFS Interface Boards?**
  Technically Yes, you can still run UFS programming jobs using your existing 4-socket UFS Interface Boards but you may need to downgrade or keep your version of LumenX DMS (and programmer firmware) to a version that supports 4-socket UFS programming (essentially LumenX DMS version 1.6.3.4 and below). Officially, Data I/O is no longer supporting 4-socket UFS implementations on LumenX and all development hereforth is focused on extending our leadership in UFS programming with the 8-socket UFS implementation.
- **Are 4-socket and 8-socket UFS Interface Boards compatible with each other?**
  No, 4-socket and 8-socket UFS implementations are completely separate and not interchangeable nor compatible with each other. All existing 4-socket UFS algorithms were version 1.*x* but new 8-socket UFS algorithms have version 2.*x*:
    - UFS Version 1.0 algorithms in LumenX do NOT work with the new 8-socket UFS boards (they only work with the 4-socket UFS boards).

- Similarly, UFS Version 2.0 algorithms in LumenX do NOT work with the existing 4-socket UFS boards (they only work with the new 8-socket UFS boards).

- **Will my existing 4-socket UFS jobs run on the new 8-socket UFS Interface Boards?**
  No, see previous question. When you upgrade to 8-socket UFS Interface Boards, you also upgrade your version of LumenX Data Management Software (DMS) to version 1.7.2 (or higher), which no longer supports 4-socket UFS Interface Boards. Then in LumenX DMS 1.7.2+, you (re)create the UFS job with the same job, data/image, and device settings as the original 4-socket UFS job.

- **Does LumenX have any maximum preload limitations for UFS?**
  Maximum preload limitations for UFS differ between memory vendors and UFS device grades. Some vendors of UFS devices do impose maximum preload limitations for specific devices while others do not. Please check with your UFS memory vendor for device-specific details.

- **How do I get a Version 2.0 LumenX algorithm for my UFS device?**
  Please consult with your local Data I/O representative for details and possible timeline for when Version 2.0 support is available for your UFS device. Due to the extensive range of UFS device support in LumenX, Data I/O is applying a phased-approach to Version 2.0 UFS algorithm development and release.

If you have other questions or any issues performing the upgrade to 8-socket UFS, then please do not hesitate to contact your local Data I/O representative or visit us at https://www.dataio.com/max (create a free account to log and track any questions or issues for Data I/O).

For customers with a Service Contract, you may phone a Service Engineer by calling or the Service Department in your local region:

- Asia: Shanghai Corporate line (021) 58827686
- Europe: Munich Corporate line +49-89-858-580
- USA: Redmond Corporate line (425) 881-6444

Thank you for your collaboration with Data I/O on your UFS programming needs. We remain committed to our loyal customers and will ensure that your upgrade process goes as smoothly as possible.

Respectfully,

Your Data I/O Team