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Title: DS20031, Procedure, OS3, USB Memory Stick Firmware Updates

1   Purpose:

The purpose of this document is to provide a method to update OS3 Firmware in the field using a USB Memory Stick. Procedure also includes instructions for downloading files and documents from Tennantco.com web page.

2   Scope:

This standard applies to the Orbio OS3 System, and as a reference for the 5000-Sc system in regards to downloading firmware in **Section 6**.

3   Applicable Documents

None

4   Items Needed

- USB Memory Stick

  EC20086, OS3 USB MEMORY KEY, 2GB FAT16 FORMAT, KEY SHAPE PROFILE .

  Or an equivalent USB Memory Drive that must be formatted to 2 Gigabytes or less in FAT16 format [for *older style displays* only].

- Also needed for *older style displays (Fig. 4)* only:

  6mm Allen Wrench, or *CA20002 Hex Key, Orbio, Os3*

  T30 Torx Driver

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5 Place OS3 Firmware on a 2GB or less FAT16 File System Format USB Memory stick.

- Updates to Interface Board require Interface Firmware either ".hex" [or ".tar.gz"] files. Updates to Water Softener Control Board require two ".hex" files.

- Reference Only. It isn't required to use an Orbio supplied USB memory stick as long as the File System format is FAT16.

  Note: if you are updating a newer style display (Fig. 5), then you should only use the **Green** *Orbio EC20086 or any other standard USB flash drive. Do not use the thin* **Blue** *Orbio Supplied USB drive EC20086 with a newer style display.*

- Firmware required for updating interface board will start with the numbers 20009R *for the older style displays (Fig. 4)*, and then the revision level. Example: **20009RL1.hex**. The "**L1**" is the revision and version level.

  Note: Firmware required for updating interface board on newer style displays (Fig. 5) will start with the numbers 20020R… as shown on the display service screen. The firmware filename on the USB will always be **"*firmware_update.tar.gz*"** *without any revision number.*

- To update Water Softener Control Board, two files are required. One will begin with the numbers 20008R, and one will begin with 20010R. Examples: **20008RB0.hex** and **20010RA0.hex**. The "**B0**" and "**A0**" are the revision and version levels.

  Note: If you have a newer style display you **canno***t update the Water Softener Control Board firmware at this time.*

- Using a personal computer with USB ports, place these files on a blank USB Memory Stick ahead of time, before leaving for the OS3 installation site.

- To acquire files and documentation from *www.tennantco.com*, follow steps in **Section 6**below.

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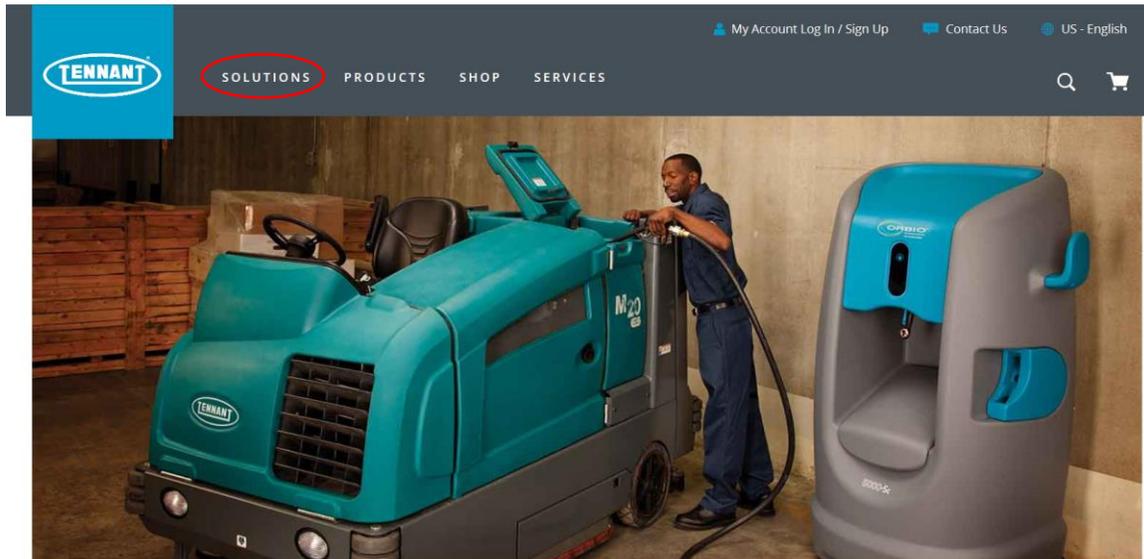**Engineering Standard**

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6   Firmware Revision Confirmation and *www.Tennantco.com* Downloads.

Use steps in this section only if you wish to acquire the latest firmware from the www.tennantco.com webpages.

6.1   From www.tennantco.com, select the "SOLUTIONS" drop-down menu on the left as circled in red below in **Figure 1**. Then select "On-Site Generation".
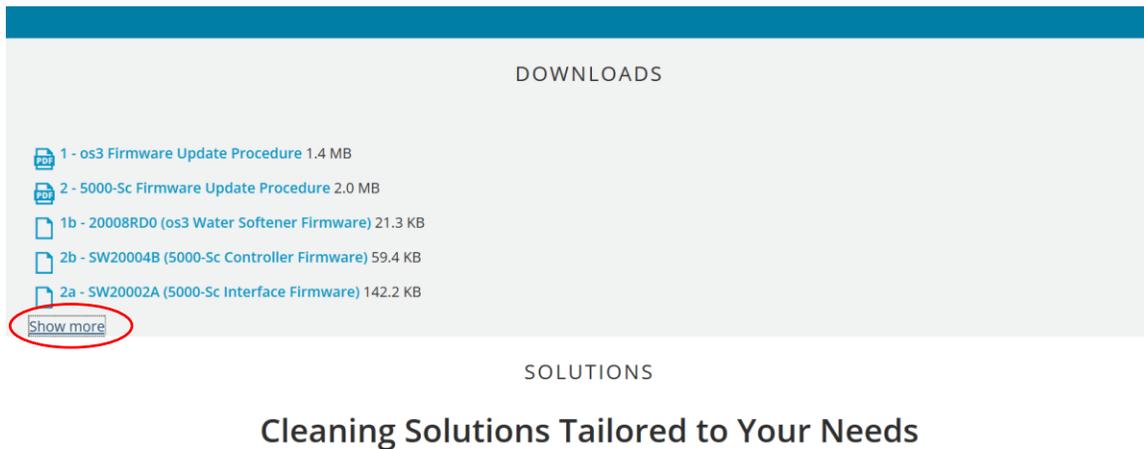

Figure 1

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6.2   Scroll down to the "DOWNLOADS" section as shown in **Figure 2**. Then select "Show more" as circled in red below.
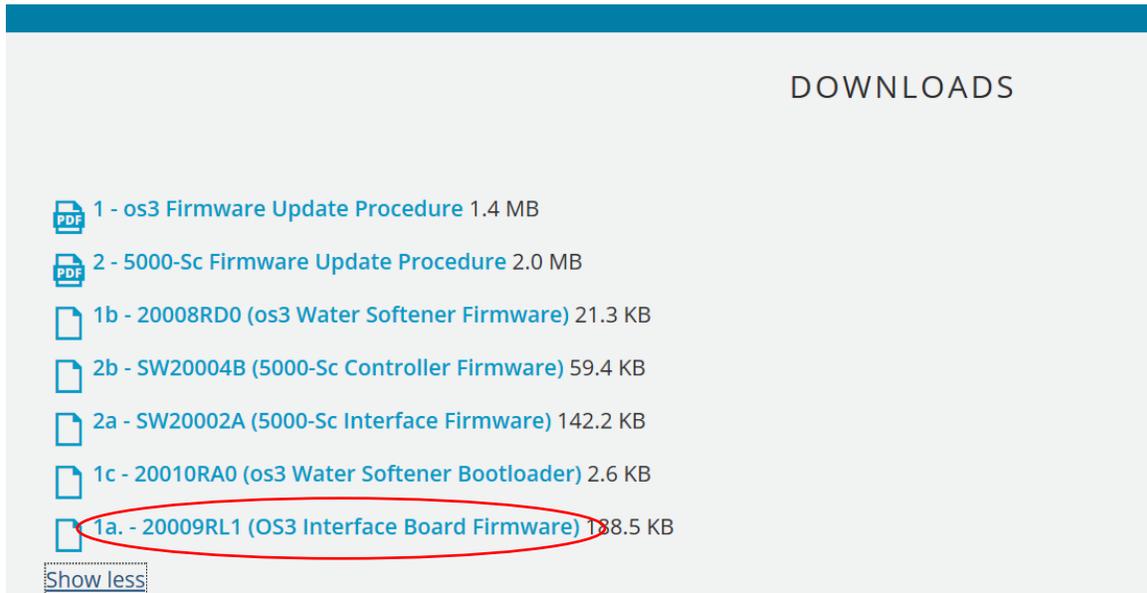

Figure 2

6.3   Double-click on the appropriate firmware file you want to download to first save them locally to your computer. For example to download the OS3 Interface Board Firmware double-click on the file circled in red in **Figure 3**.

6.4   When you double-click on a firmware name you will download a ZIP file which will contain the actual firmware ".hex" [or ".tar.gz"] files.

6.5   For older style displays the .hex file needed for the firmware update is in the downloaded .zip file. To extract the .hex file, press and hold (or right-click) the folder, select **Extract All**. Then, click and drag the extracted .hex file to your removable USB device.

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DOWNLOADS

1 - os3 Firmware Update Procedure 1.4 MB

2 - 5000-Sc Firmware Update Procedure 2.0 MB

1b - 20008RD0 (os3 Water Softener Firmware) 21.3 KB

2b - SW20004B (5000-Sc Controller Firmware) 59.4 KB

2a - SW20002A (5000-Sc Interface Firmware) 142.2 KB

1c - 20010RA0 (os3 Water Softener Bootloader) 2.6 KB

1a. - 20009RL1 (OS3 Interface Board Firmware) 188.5 KB

Show less

Figure 3

**Figure 4
Older Style Display**

**Figure 5
Newer Style Display**

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6.6 If you have an *older style display* as shown in **Figure 4** then you only want to transfer the "**20009R__.hex**" file onto your USB device. Do not transfer any ".tar.gz" files.

6.7 If you have a *newer style display* as shown in **Figure 5** with the USB ports in front, then you only want to transfer the "**firmware_update.tar.gz**" file onto your USB device.

6.8 On your USB flash drive you should only have the files saved which end in ".hex" [or ".tar.gz"] – for example in the case of an *older style display* you will want to save the file "**20009RL1.hex**" onto your USB flash drive. You don't want to save any folders or sub-folders or ZIP folders, only the ".hex" [or ".tar.gz"] firmware files by themselves and nothing else.

6.9 To update an OS3 with all new firmware you will need the following 3 firmware download files:

OS3 Interface Board Firmware [20009R-- or 20020R--]

OS3 Water Softener Firmware [20008R--]

OS3 Water Softener Bootloader [20010R--]

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7   On-Site OS3 Firmware Installation Procedure

7.1   Refer to **Figure 6** and **Figure 7**. Using the 6mm Allen wrench or Orbio Tool, remove the Front Cover Panel by turning the lock counter-clockwise 1/2 turn. Pull top of cover back, and lift cover from lower studs. *Note: you can skip this step if you have a newer style display.*

| Figure 6 | Figure 7 |

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7.1.1   Using the T30 Torx tool loosen the two bottom bolts on lower corners of Interface Panel Assembly 2 turns counter-clockwise. See **Figure 8.** *Note: this step can be skipped if using the thin Orbio USB flash drive or if you have a newer style display.*

Figure 8

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7.2   Programming of *Older Style Displays*:

      7.2.1   Insert the USB memory stick into the USB port located on the bottom left side of the OS3 Front Interface Panel as shown in **Figure 9** or **Figure 10** (using thin Orbio USB memory stick). Installed USB Memory is shown in **Figure 11** and **Figure 12**.

Figure 9

Figure 10

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Figure 11

Figure 12

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7.2.2   The *Wait Hand* will soon appear and green *Progress Bar* will scroll as shown in **Figure 13**, indicating that the software on the USB memory stick is loading into the OS3 unit.

Figure 13

7.2.3   Once the software has been read from the USB Memory Stick, the scroll bar will stop moving, and the screen might go blank. Remove the USB Memory stick when the LCD screen goes blank, or the scroll bar stops scrolling. After a period of time, up to 5 minutes, the OS3 unit will automatically reset and finish the download process.

7.2.4   When OS3 restarts, LCD Display will show Wait Hand, and the water softener valve will begin turning and move to service position.
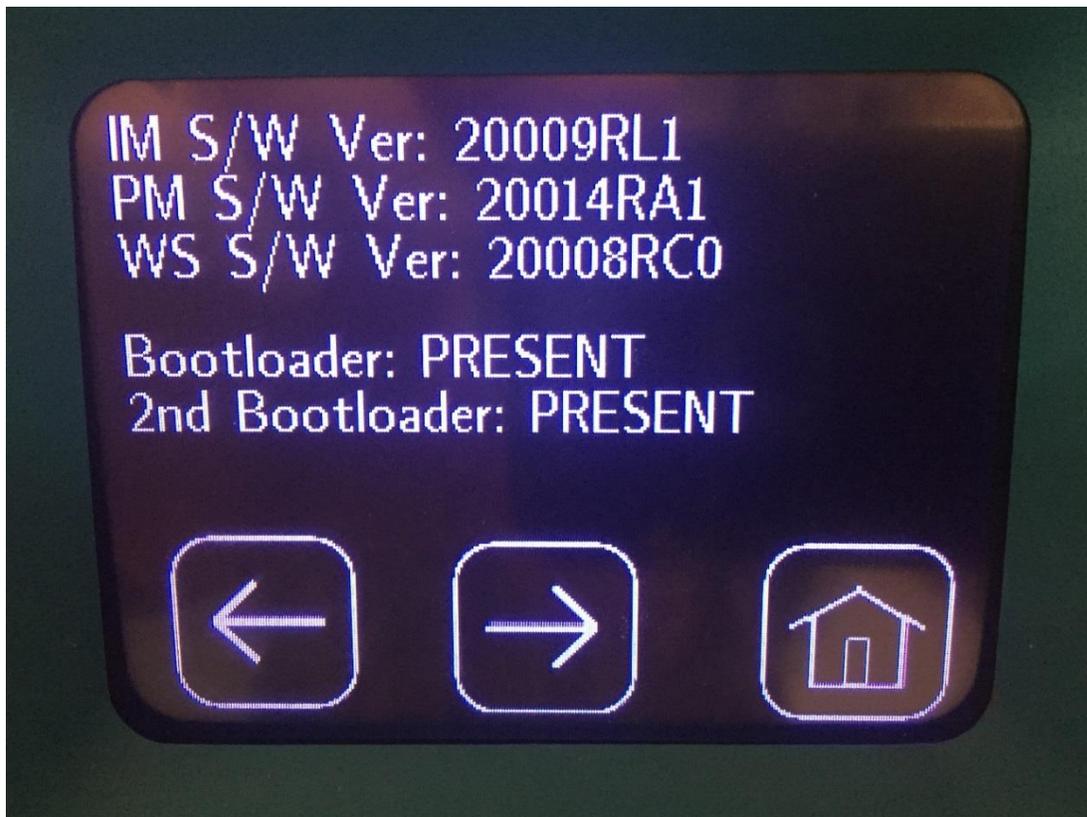
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7.3   Final Steps – Confirmation of Proper Installation

7.3.1   After the OS3 unit has finished its initialization, tap the LCD display and select the Wrench Icon to display the Service Menu.

7.3.2   Press the left arrow icon (←) multiple times until you arrive at the Software Version Screen shown below as example in **Figure 10**.

7.3.3   Confirm display shows the correct firmware p/n's and revision that you downloaded from Tennantco.com.

7.3.3.1   IM = Interface Assembly.

7.3.3.2   PM = Power Board.

7.3.3.3   WS = Water Softener.

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7.4   Re-assembly

7.4.1   If needed tighten the 2 screws on lower corners of Interface Assembly with T30 Torx tool.

7.4.2   Replace front cover on two lower shoulder bolts, and align top of front cover so that the tabs align with the slots in the Interface Assembly.

7.4.3   Turn lock ½ turn clockwise with 6mm hex wrench or Orbio tool.

7.5   Programming of *Newer Style Displays*:

7.5.1   Do not use the thin **Blue** Orbio USB flash drive **(Figure 14)** with the *newer style displays*. Instead you should use the **Green** Orbio USB flash drive or a standard USB that has been formatted to FAT16 or FAT32. *Note: that some newer USB's have been formatted using exFAT or NTFS formats and these may not work properly.*

Figure 14

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7.5.2   Insert the USB flash drive into the USB port located in front under the right side of the OS3 LCD display as shown in **Figure 15.** Access the port by gently pulling on the rubber plug that covers the USB port.

Figure 15

7.5.3   Wait for the scrolling green bar to appear on the LCD display as shown in **Figure 16**. Remove the USB device from the USB port and reinstall the rubber plug covering the port.

7.5.4   Verify the appropriate version numbers have changed for the firmware on the service screen.

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Figure 16

8   Disposition

8.1   OS3s that will not perform this procedure have invalid files loaded on the USB Memory Stick, or have an incompatible USB Memory Stick or require replacement of the Interface Assembly.