

# SANDEL®

## COMPONENT MAINTENANCE MANUAL FOR SANDEL ST3400 TAWS/RMI

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REVISION SHEET

<u>REV</u>	<u>DATE</u>	<u>PAGES / PARAS.</u>	<u>DESCRIPTION OF CHANGE</u>
C	02/10/10	All / All	A/R 1108 added Window field replacement procedure.
B	5/17/04	All / All	A/R 708 added lamp disposal warning
A	2/24/03	All / All	Initial Release

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## 1. APPLICABILITY

This document is applicable to maintenance for continued airworthiness of Sandel ST3400 TAWS/RMI:

Unit P/N	ST3400-xxx, Software revision 1.00 or later
Uploader Filename	ST3400 Uploader, Software revision 1.04 or later

## **2. UPLOADING SYSTEM SW, TERRAIN AND AIRPORT DATABASES**

### **2.1. INTRODUCTION**

This section includes instructions for:

1. Installing the ST3400 USB driver on a Windows PC.
2. Loading new system software into the ST3400.
3. Loading new airport and/or terrain database files into the ST3400 unit.
4. Reading and writing an ST3400 configuration file.

### **2.2. MINIMUM SYSTEM REQUIREMENTS**

#### **2.2.1. Hardware**

A Windows capable laptop PC including a CD-ROM drive and a USB port that supports USB version 2.0. You will also need a standard USB-A to mini-USB cable for connecting the ST3400 unit to your PC. A cable is supplied with the ST3400 although any equivalent off-the-shelf cable may be used. If you do not have a cable and cannot obtain one locally, please contact SANDEL customer support.

#### **2.2.2. Software**

The Uploader software was designed to run on the Windows 98, 2000 and XP operating systems. The software needs at least 5 MB of free memory to load files into the ST3400. If you received the software on CD-ROM, the Uploader will run completely from the CD-ROM and does not need to be installed on your hard disk. The software will need a C:\Temp folder to use during loading of the new software. If this folder does not exist on your drive, the Uploader will automatically create one.

#### **2.2.3. ST3400 Power**

If you are going to update the ST3400 terrain database in the aircraft, plan on sufficient power for as much as 1 hour. You may want to consider providing external aircraft power to complete all software upgrades. Updating system software or airport data takes substantially less time.

### **2.3. INSTALLING THE USB DRIVER**

1. Turn on the laptop and boot up Windows.
2. Start the ST3400 in maintenance mode by pressing and holding both the "BRG 1" & "BRG 2" front panel buttons on the ST3400 and then applying power to the unit. Continue holding both buttons until the front panel displays the first startup screen. Do not start the loading procedures until the startup screen changes to a menu selection of maintenance screens and the ST3400 booting process has completed.
3. Connect the USB Cable between the laptop and ST3400 unit.
4. A window on the laptop will display "Found New Hardware".
5. The "Found New Hardware Wizard" will launch. Depending on which operating system you are using, Windows 98, 2000 or XP, the wizard may look slightly

different. The ST3400.Inf file is the main file you are looking for and it is located on the CD-ROM in the Sandel/Drivers/USB folder.

6. Select the "Install from a list or specific location" option.
7. Select the "Search removable media (floppy, CD-ROM ...)" option.
8. If the wizard does not automatically find the ST3400.Inf file, manually change to the Sandel\Drivers\USB folder on the CD-ROM.
9. Click on "ST3400.Inf" file.
10. Click "OK". The ST3400 USB driver will now be loaded.
11. Click "FINISH". At this point, the Uploader software is now ready to be used to update your ST3400 unit.

## **2.4. UPDATING SYSTEM AND DATABASE SOFTWARE**

The ST3400 system software, terrain and airport database files can be independently updated from a laptop Windows PC via a USB cable plugged into the communications port on the front of the ST3400 unit. This is done via an Uploader program. Before transferring database information into the ST3400, it will ask for and require an 11-character key that is part of the database package. Uploading system software must be done under the direct supervision of a qualified avionics installer.

## **2.5. BEFORE GOING TO THE AIRCRAFT**

1. Obtain the serial number for your ST3400. This is a 8-digit number printed on the side of your unit, listed on your shop's work order or in your aircraft logs.
2. Obtain the 11-digit database key(s) for the database file(s) you are going to update. The key may be obtained under "Downloads" at [www.sandel.com](http://www.sandel.com). Please note that each key is unique to a particular serial number AND to a particular database. You cannot interchange keys between databases or between units

## **2.6. AT THE AIRCRAFT**

**NOTE: This procedure may require avionics power for as much as 1 hour depending on the number of files you are updating in the unit.**

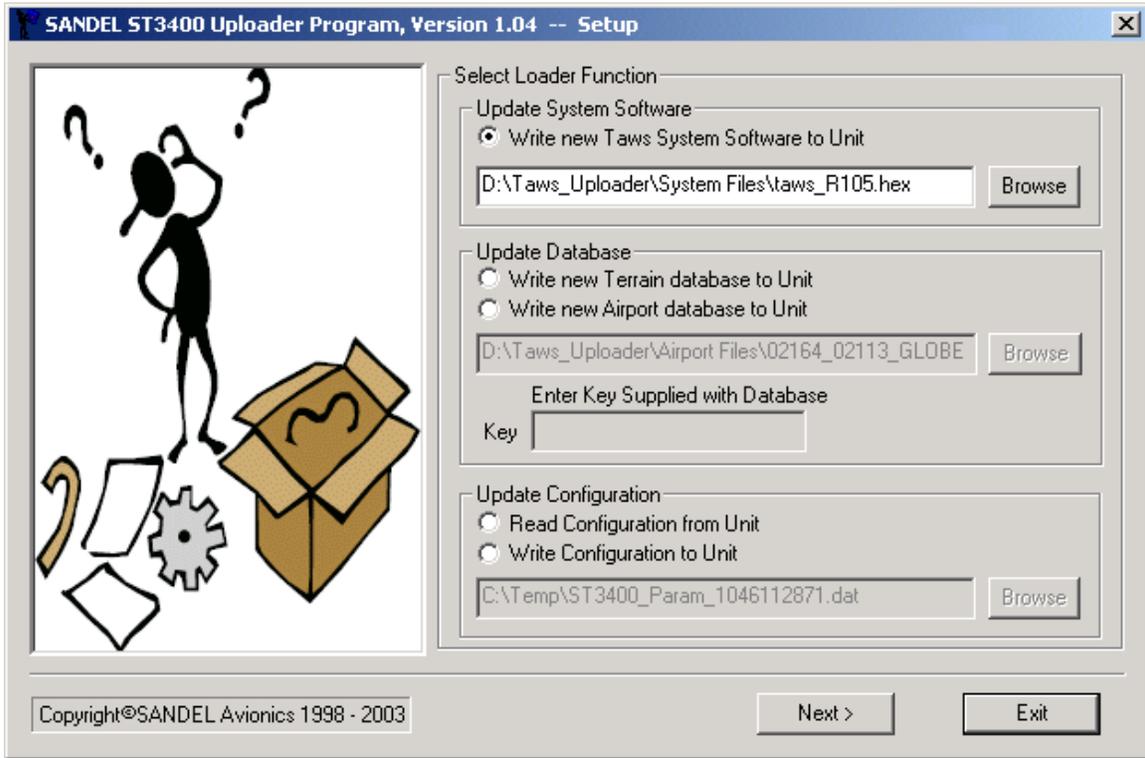
1. Bring the laptop to the aircraft. Connect the USB cable between the ST3400 front panel mini communications port and an unused USB port on the laptop. Apply avionics power and power up the ST3400 in maintenance mode as previously described in the INSTALLING THE USB DRIVER section above.
2. Insert the Uploader CD-ROM into the laptop CD-ROM drive and double-click on the Uploader.exe application located on the CD-ROM disk in the Sandel folder.
3. The CD-ROM is formatted in the following folder layout:
  - Folder: Sandel
    - Files: upload.exe, Uploader Instructions.doc, Uploader Instructions.htm
  - Folder: Airport Files
    - File: new airport filename.bin
  - Folder: Drivers

Folder: USB  
Files: ST3400.Inf, ST3400.sys  
Folder: System Files  
File: new system software filename.hex  
Folder: Terrain Files  
File: new terrain filename.bin  
Folder: Uploader Instructions\_files (support for Uploader Instructions.htm file)

The Uploader has three main functions and one utility:

1. Update the ST3400 Taws System Software
2. Update the Terrain database
3. Update the Airport database
4. Update the configuration. The update configuration selection allows the reading and writing of the internal ST3400 configuration file values. This utility function is not typically used for normal updates. This function can be used to backup the internal configuration file for disaster protect or used to write the same configuration setup into multiple units during a pre-installation procedures on multiple aircraft.

The Uploader application presents a main setup screen as shown below. This screen allows the user to complete any or all of the functions listed above.

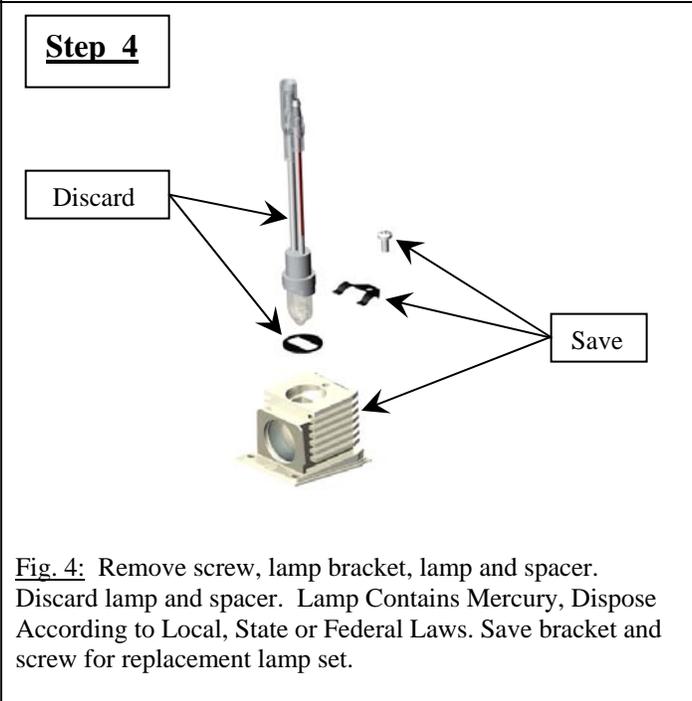
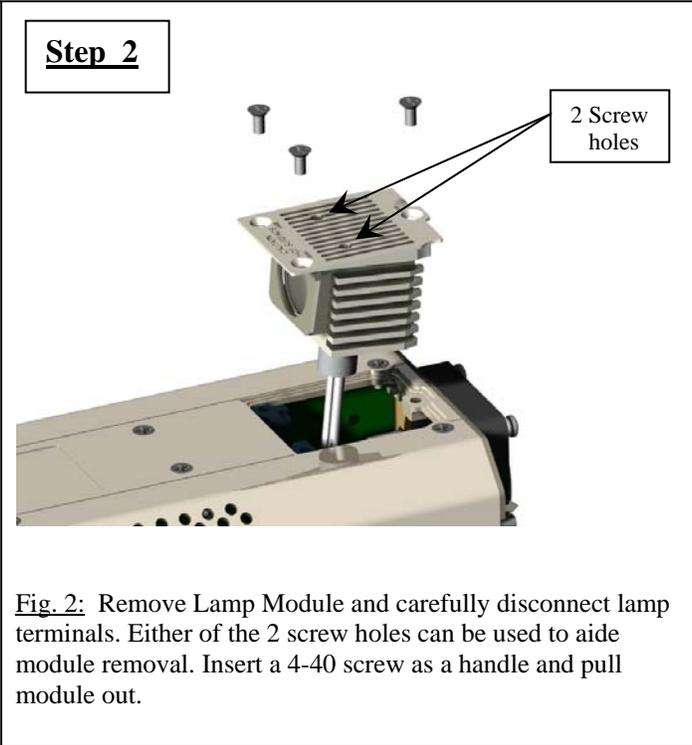
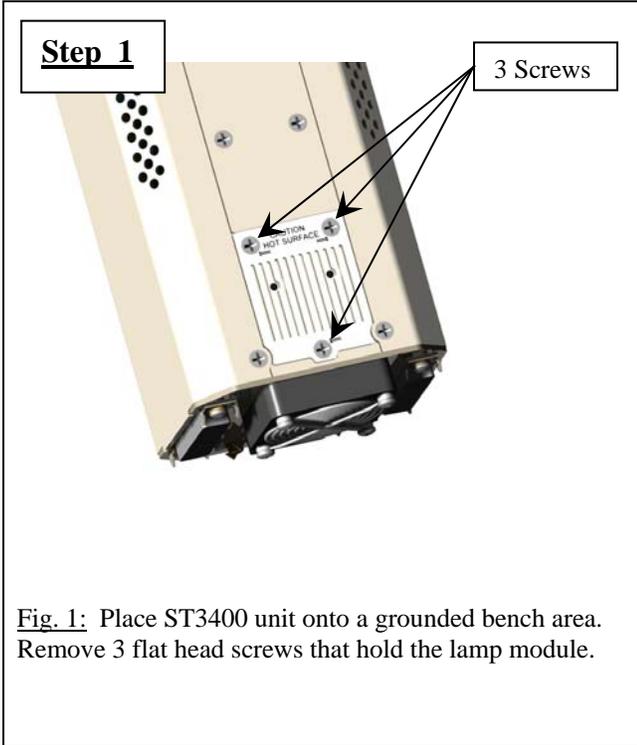


To operate, first select the desired function, then select the file to load; then click the "Next" button to start the file transfer. The screens following the Next button will give you status of the file transfer and signal when the function is complete. After all the new program and/or database updates have been transferred, close the Uploader program and disconnect the computer from the ST3400 front panel. The upgrade is now complete.

## 2.7. PROBLEMS

If you experience any problems with the upgrade procedure, please call SANDEL Avionics at 760-727-4900 and ask for customer support. To report problems after normal business hours, please send us email at [support@sandel.com](mailto:support@sandel.com).

### 3. LAMP REPLACEMENT PROCEDURE



**Step 5**

Lamp Assy  
84015



Fig. 5: Remove lamp and shim from protective packaging. **Do not touch lamp glass with bare skin!** This can significantly reduce lamp life. Ensure lamp is clean and free from dirt or dust. If cleaning is required, use isopropyl alcohol and a clean cotton swab.

**Step 6**

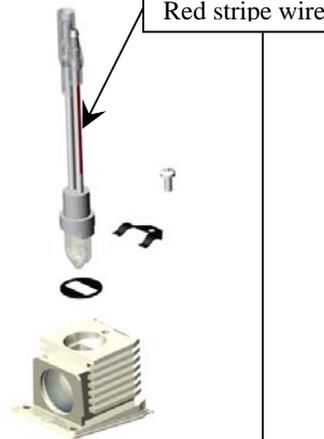


Fig. 6: Orient the lamp wire with red stripe as shown. Assemble new lamp, spacer, existing bracket and screw into lamp module as shown.

**Step 7**



Fig. 7: Ensure lamp is fully seated into lamp housing. Torque pan head screw until snug.

**Step 8**

Terminal  
Covers

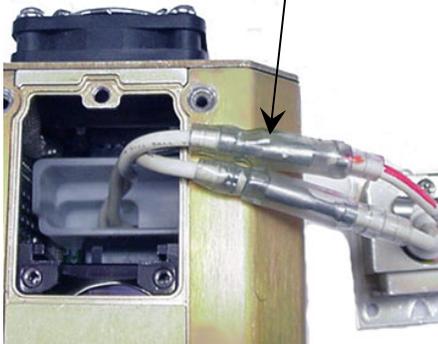


Fig. 8: Reconnect the lamp terminals to mating terminals inside unit lamp pocket. **Ensure terminal covers are completely engaged and completely cover the connected terminals.** These covers prevent high voltage shorting inside the unit.

**Step 9**

Wires  
inside  
box

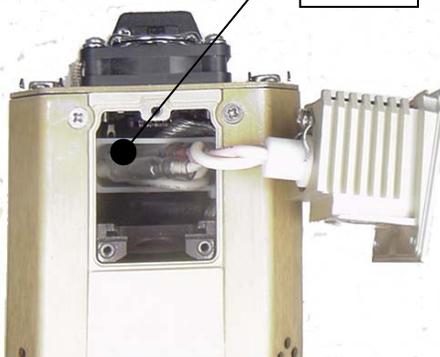


Fig. 9: **Ensure the lamp wires are securely seated inside the plastic wire box.** Ensure the lamp wires are not touching the circuit cards or rear fan surface.

**Step 10**

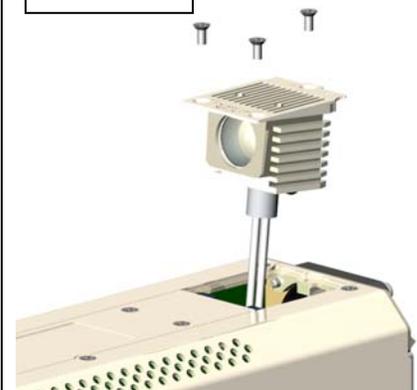
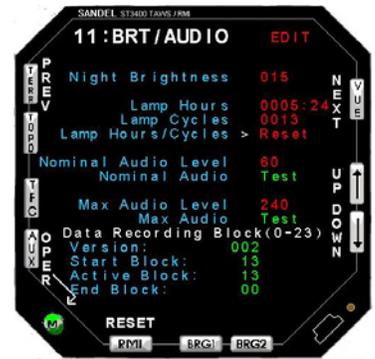


Fig. 10: Fully seat lamp module into unit lamp pocket. Fasten and torque flat head screws until snug.

**Step 11**

**SOFTWARE RESET:**

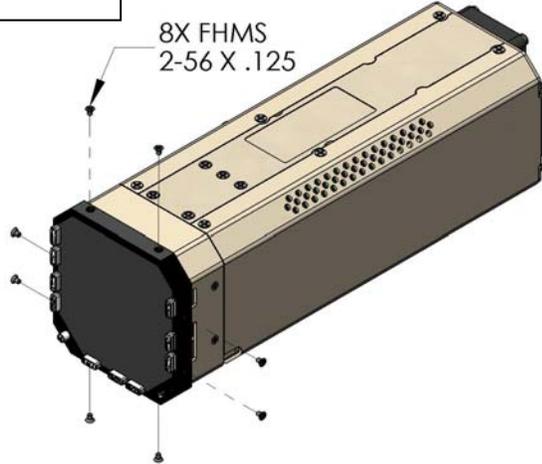
Reset the lamp-hours counter in the ST3400 by entering the BRT/AUDIO maintenance page #11, in Edit Mode. Select "Lamp Hours/Cycles" using the arrow buttons. Press the "Reset" softkey to reset.



## 4. WINDOW REPLACEMENT PROCEDURE

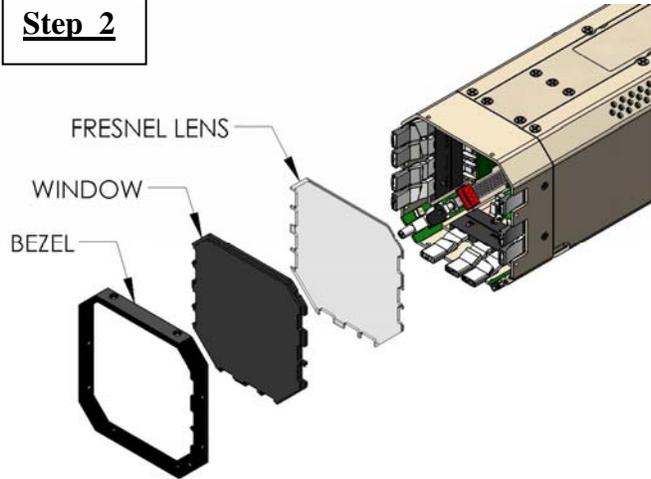
Field replacement of Diffuser Window applies to part number ST3400-xxx. Replacement display windows, Sandel part number 63034 may be ordered from Sandel.

### Step 1



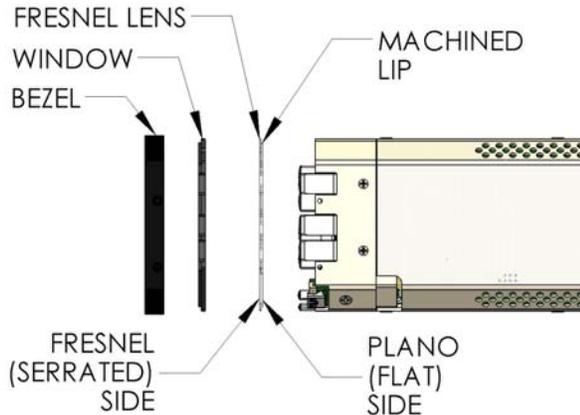
**Fig. 1:** Place ST3400 unit onto a grounded bench area. Remove 8 ea 2-56 X .125 flat head machine screws securing bezel.

### Step 2



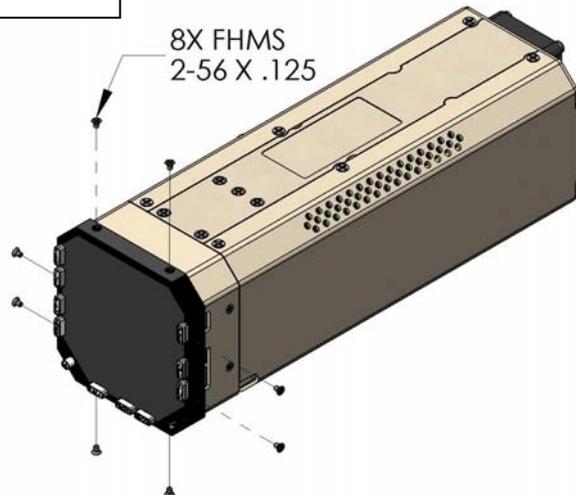
**Fig. 2:** Remove Bezel, Display Window, and Fresnel Lens from unit.

### Step 3



**Fig. 3:** Align and install Fresnel Lens and replacement Window to Actuator Housing. Ensure that the machined lip in Diffuser Window engages Bezel opening, that machined lip of Fresnel Lens engages lands on Actuator Housing and that Bezel fully seats. If necessary, loosen (but do not remove) screws at bottom corners of unit to allow Menu Actuator and USB socket to “float” to facilitate installation.

### Step 4



**Fig. 4:** Secure Bezel using 8 Ea Flat Head Machine Screws, 2-56 X .125. Torque to 2-3 in-lbs. Re-torque corner screws, if loosened, to 6-7 in-lbs. Ensure that All affected components are properly seated and that all fasteners are installed and properly torqued.