

Navigator 600

Silica and phosphate analyzers



Software upgrade instructions

Measurement made easy

Navigator 600
silica and phosphate
analyzers

1 Introduction

Caution. It is imperative that the instructions in this document are followed precisely. Failure to do so will damage the Navigator 600 to the extent where a factory repair will be necessary.

This publication details how to upgrade the Navigator 600 software (without losing existing data) and how to check and re-calibrate level sensors after the upgrade.

The upgrade kit comprises the following items as shown in Table 1.

Description	Part No.	Qty.
System software	SD Card 1	1
Bootloader software	SD Card 2	1
This publication – Software upgrade instructions	INF07/131	1

Table 1 Upgrade kit contents

2 For more information

Further information is available from:
www.abb.com/analytical

or by scanning these codes:



Sales



Service

3 Preparation

Caution.

- These instructions **must** be followed sequentially and precisely to ensure correct operation of the analyzer after upgrading.
- After upgrading, check the calibration of the Cleaning & Secondary Calibration Solution level sensors. Re-calibrate if necessary – see Section 7, page 5.
- If Reagent level sensors are fitted, check and, if necessary, re-calibrate them as detailed in Section 7.3, page 6.
- Refer to the instruction manual (IM/NAV6S) for details of access to the analyzer's menu system.

Before starting the upgrade process, copy the contents of SD Card 1 onto a computer in order to upgrade another analyzer.

Note. SD Card 1 can be used to upgrade only one analyzer at a time. After use for one upgrade, format the card and reload the software saved to computer.

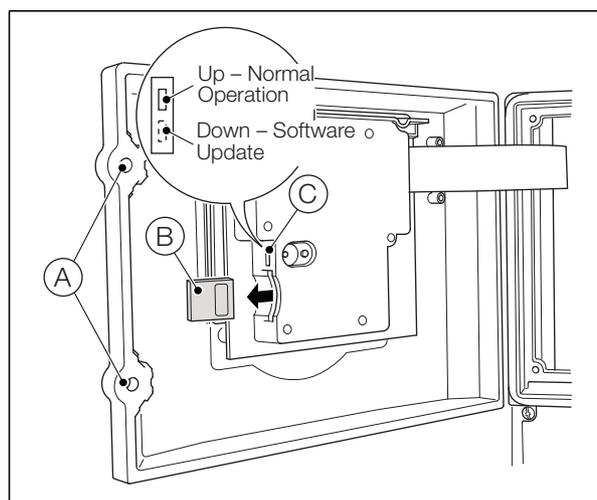
4 Upgrading the System Software (Part 1)

This part of the upgrade procedure upgrades the analyzer's motherboard software whilst ensuring that system data is not lost during the process.

Caution. Complete all steps of the upgrade procedure in sequence. **Do not** interrupt the procedure or attempt to complete an installation at a later date.

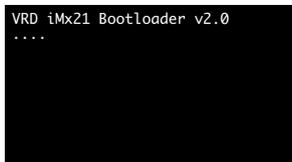
To upgrade system software:

1. Isolate the analyzer from the power supply.
2. Using a large flat-headed screwdriver, release the two door catches (A) and open the door.
3. If an SD card (B) is fitted, remove it from the card slot.
4. Using a pencil or small tipped screwdriver, move the commissioning switch (C) down to the 'Software Update' position.



Caution. At this point in the procedure, DO NOT restart the analyzer with an SD card in the SD card slot.

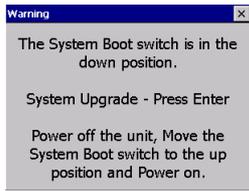
5. Restore the analyzer's power supply. A Bootloader screen is displayed:



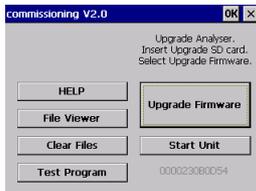
Note. The version shown may vary from this example but is likely to be either V1.2 or V2.0.

Continued...

After approximately 30 s, a 'Warning' screen is displayed:



6. Insert SD Card 1 from the upgrade kit into the SD Card slot.
7. Press . The 'commissioning V2.0' screen is displayed:



8. Use the and keys to highlight the 'Upgrade Firmware' button:
9. Press . The following message is displayed:
`\\sdmmc\aw600\nvu\aw600.mot copied'`
10. Press and wait while the file loads. A bar graph shows progress through the Initializing, Reading File, Erasing, Programming and Verifying stages.
11. Press to acknowledge the 'Programming Complete' message.
12. The following screen is displayed:



When the time displayed has counted down to zero, the following message is displayed:

`\\sdmmc\vrd\wait5sec.exe complete'`

Press to acknowledge it.

13. Press to acknowledge the message:
`\\sdmmc\aw600\release\aw600.mot copied'`
14. Wait while the file loads. A bar graph shows progress through the Initializing, Reading File, Erasing, Programming and Verifying stages.
15. Press to acknowledge the 'Programming Complete' message.
16. Press to acknowledge the message:
`\\sdmmc\aw600\aw600.mot deleted'`
17. Press to acknowledge the message:
`\\sdmmc\vrd\exchangecommandlist.exe copied'`

18. Press to acknowledge the message:

`\\sdmmc\vrd\tasklist.txt copied'`

There will be a delay of several seconds while the next file is copied.

19. Press to acknowledge the message:

`\\sdmmc\vrd\ver7\mkaw3003.bin copied'`

20. Press to acknowledge the 'Installation Complete' message.

21. Use the and keys to highlight the 'Start Unit' button:



22. Press . The 'System Upgrade' dialog is displayed:

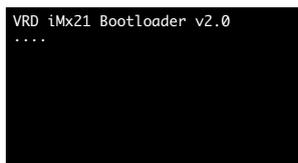


23. Remove SD Card 1.
24. Proceed to Section 5.

5 Upgrading the Bootloader

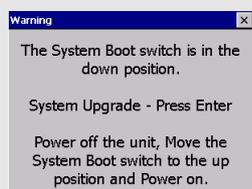
This part of the procedure checks the existing Bootloader software and, if necessary, upgrades it automatically.

1. Insert SD Card 2 from the upgrade kit into the SD Card slot.
2. Press . The analyzer resets and a screen similar to the one below is displayed:

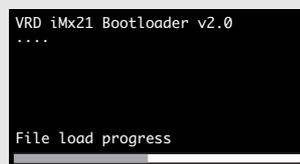


The Bootloader version is now analyzed to assess if an upgrade is required.

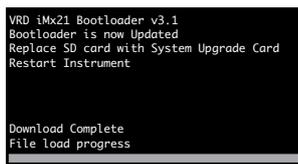
Note. If the Warning screen below is displayed after approximately 30 seconds the Bootloader **DOES NOT** require upgrading – **proceed to Section 6.**



If the following screen is displayed, the Bootloader software requires upgrading. A progress bar at the bottom of the screen indicates that the new file is loading:



3. Once the Bootloader upgrade is complete the following screen is displayed:

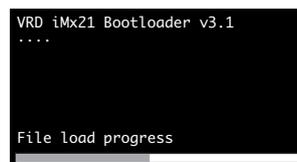


4. Proceed to Section 6.

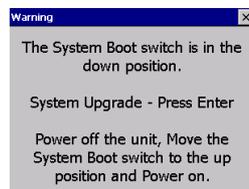
6 Upgrading the System Software (Part 2)

This final part of the upgrade procedure restores the system data saved in Part 1 and updates the operating system and application software in the display unit.

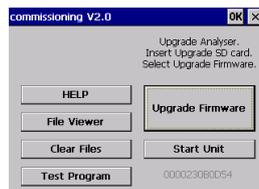
1. Replace SD Card 2 with SD Card 1.
2. Isolate the analyzer from the power supply.
3. Restore the analyzer's power supply.
4. A screen similar to the one below is displayed as the operating system is upgraded:



5. When the operating system upgrade is complete the following Warning is displayed:



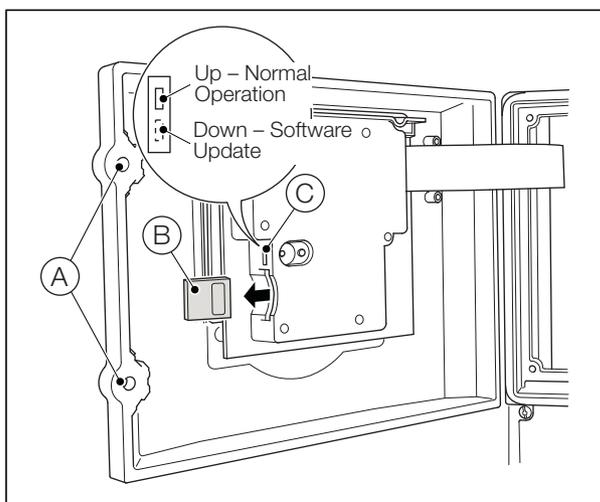
6. Press . The 'commissioning V2.0' screen is displayed:



7. Use the  and  keys to highlight the 'Upgrade Firmware' button:
8. Press . A dialog box is displayed showing the details of the application code files being loaded and a bar graph shows the file load progress.
9. Press  to acknowledge the 'Upgrade Complete' message.
10. Press . A dialog box is displayed showing details of the help files being loaded and a bar graph shows the file load progress.

Continued...

11. Press  to acknowledge the 'Help Installed' message.
12. Press  to acknowledge the message:
"sdmmc\vr\d\navigator.cfg copied"
13. Press  to acknowledge the message:
"sdmmc\vr\d\aw600sn.snf copied"
14. Press  to acknowledge the message:
"sdmmc\vr\d\saveddata copied"
15. Press  to acknowledge the 'Installation Complete' message.
16. Isolate the analyzer from the power supply.
17. Remove SD Card 1 from the SD card slot (B).
18. Using a pencil or small tipped screwdriver, move the commissioning dip switch (C) up to the 'Normal Operation' position.



19. Close the analyzer door and using a large flat-headed screwdriver, secure the two door catches (A).
20. Restore the analyzer's power supply.
21. Check that the correct software versions are shown in the Diagnostics/System Information menu as follows:
HMI App:v1.027
OS:v6001.024 or v6003.003
(depending on processor hardware fitted to unit)
LL:AW600 v1.033

Note. The software upgrade procedure is now complete. Proceed to Section 7, page 5 to check level sensor calibrations and, if necessary, to re-calibrate the level sensors.

7 Level Sensor Check and Calibration

This section details the checking and, if necessary, the recalibration of the Secondary Calibration, Cleaning Solution and Reagent level sensors (if fitted).

Warning. Wear protective gloves and eye protection when handling chemical solutions.

Note. If any of the readings are out-of-range, it is possible that the level sensor took a reading while in the air or partially submerged. To correct this, hold the sensor in the air until the reading indicated is low and immediately place it in the appropriate solution.

7.1 Secondary Calibration and Cleaning Solution Level Sensor Calibration Check

7.1.1 Secondary Calibration Solution Level Sensor

To check the calibration:

1. Remove the top and level sensor from the Secondary Calibration bottle and fill the bottle with 260 ml of demineralized water. Refit the top and level sensor.

In the analyzer's menu system, navigate to 'Diagnostic Information', 'Reagent and Solution Levels'. Check the level sensor indicates 18 to 31 calibrations remaining.

2. Remove the top and level sensor from the Secondary Calibration bottle and fill the bottle with 500 ml of demineralized water. Refit the top and level sensor.

Check the level sensor indicates 43 to 55 calibrations remaining.

7.1.2 Cleaning Solution Level Sensor

Note. The number of cleans remaining depends on the preset automated cleaning time. The figures below are based on a preset automated cleaning time of 30 min.

To check the Cleaning Solution level sensor calibration:

1. Remove the top and level sensor from the Cleaning Solution bottle and fill the bottle with 260 ml of cleaning solution. Refit the top and level sensor.

In the analyzer's menu system, navigate to 'Diagnostic Information', 'Reagent and Solution Levels'. Check the level sensor indicates 10 to 23 cleans remaining.

2. Remove the top and level sensor from the Cleaning Solution bottle and fill the bottle with 500 ml of cleaning solution. Refit the top and level sensor.

Check the level sensor indicates 27 to 39 cleans remaining.

Note. If the Cleaning Solution and Calibration Solution values are outside these ranges, it may be necessary to re-calibrate them – see Section 7.2.

7.2 Recalibrating the Secondary Calibration and Cleaning Solution Level Sensors

Note. The level sensors must be enabled in the Measurement/Diagnostics menu before they can be calibrated.

Table 7.1 identifies Secondary Calibration and Cleaning solutions by their color codes:

Solution	Color
Standard	Yellow
Cleaning	Light Grey

Table 7.1 Secondary Calibration and Cleaning Solution Color Codes

To calibrate the Secondary Calibration and Cleaning Solution level sensors:

1. Prepare the following bottles of solution:
 - a. Secondary calibration bottle containing 500 ml demineralized water (bottle A).
 - b. Secondary calibration bottle containing 100 ml demineralized water (bottle B).
 - c. Cleaning solution bottle containing 500 ml cleaning solution – refer to the User Guide, IM/NAV6S (bottle C).
 - d. Cleaning solution bottle containing 100 ml cleaning solution (bottle D).
2. From the main menu select 'Configuration' and 'Commissioning'. Scroll to 'Level Cal', select 'Secondary Calibration' to display the 'Fill to 500 ml' message.

Note. The 'Commissioning' menu is enabled only if the commissioning switch is enabled. This switch is a large black slider switch found on the top left hand corner of the application board in the top of the unit.

Return this switch to its original position after calibration of the level sensor is complete.

Caution. Modifying settings in the 'Commissioning' menu can seriously affect the analyzer's operation, requiring it to be returned for repair.

3. Wipe the Secondary Calibration (yellow) level sensor with a tissue and fit it into a solution bottle top. Screw the top onto bottle A.

4. Wait approximately 10 seconds then press . The message 'Calibrating' appears followed (after approximately 30 seconds) by 'Fill to 100 ml'.
5. Remove the top and sensor from bottle A and screw onto bottle B.
6. Wait approximately 10 seconds, then press . Wait until the message 'Calibration Completed' is displayed (approximately 30 seconds).
7. Repeat steps 3 to 6 for the Cleaning Solution (light grey) level sensor using bottles C and D.
8. Return to the Main Menu, ensuring the changes are saved to the internal memory.
9. Check the calibration of the Secondary Calibration and Cleaning Solution level sensors – see Sections 7.1.1 and 7.1.2 on page 5.

7.3 Reagent Level Sensor Calibration Check

To check Reagent level sensor calibration:

1. Prepare the following bottles of solution:
 - a. Reagent bottle containing 2,500 ml of Reagent 1 (bottle A)
 - b. Reagent bottle containing 1,330 ml of Reagent 1 (bottle B)
2. Fit Reagent 1 level sensor to bottle A.
3. In the analyzer's menu system, navigate to 'Diagnostic Information', 'Reagent and Solution Levels'. Check that the display for the Reagent level sensor indicates 80 to 94 days remaining.
4. Record this value.
5. Remove Reagent 1 level sensor from bottle A and fit it to bottle B.

Wait for approximately 5 minutes to allow the value to update, then check that the display shows half the number of days remaining (+/-10) compared with the value recorded at Step 4.
6. Rinse Reagent 1 level sensor in a bottle of demineralized water, wipe it with a tissue and return it to its reagent bottle.
7. Repeat steps 2 to 6 for Reagent 2, 3 and 4 level sensors.

Note. If the Reagent level sensor values are outside these ranges, it may be necessary to re-calibrate them – see Section 7.4.

7.4 Recalibrating the Reagent Level Sensors

Table 7.2 identifies Reagent solutions by their color-coding:

Reagent Solution	Description	Color
1	1 st Acid	Red
2	Molybdate	Purple
3	2 nd Acid	Orange
4	Reduction	Brown

Table 7.2 Reagent Solution Color-coding

Note. Use Reagent 1 to calibrate all 4 reagent sensors.

To re-calibrate the Reagent level sensors:

1. Prepare the following bottles of solution:
 - a. Reagent bottle containing 2,500 ml of Reagent 1 (bottle A)
 - b. Reagent bottle containing 400 ml of Reagent 1 (bottle B)
2. From the analyzer's menu system, select 'Configuration' and 'Commissioning'. Scroll to 'Level Cal', and select 'Reagent 1' to display the 'Fill to 2500 ml' message.

Note. The 'Commissioning' menu is enabled only if the commissioning switch is enabled. This switch is a large black slider switch found on the top left hand corner of the application board in the top of the unit.

Return this switch to its original position after calibration of the level sensor is complete.

Caution. Modifying settings in the 'Commissioning' menu can seriously affect the analyzer's operation, requiring it to be returned for repair.

3. Wipe the Reagent 1 (red) level sensor with a tissue and fit it into a reagent bottle top. Screw the top onto bottle A.
4. Wait approximately 10 seconds then press (•↵). The message 'Calibrating' appears followed (after about 30 seconds) by 'Fill to 400 ml'.
5. Remove the top and sensor from bottle A and screw onto bottle B.
6. Wait approximately 10 seconds then press (•↵). Wait until the message 'Calibration Completed' is displayed (approximately 30 seconds).
7. Repeat steps 2 to 6 for Reagent 2, 3 and 4 level sensors.
8. Return to the Main Menu, ensuring the changes are saved to the internal memory.
9. Check the calibration of the Reagent level sensors – see Section 7.3, page 6.

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