

Release Notes for 4421A Firmware

This document contains release notes for firmware packages intended for the Bird 4421A model variations (4421A-xx-xx-x)

Firmware may be updated via the 4421A web page following the instructions in the manual. Specific update instructions are included in the notes below where the process is different from that contained in the manual.

Notes appear in reverse chronological order with the latest release at the top.

2024-10-10

Image file name: 4421A_Firmware_Update_20241010.1.tar.gz

- MD5 Hash: 2ED634DD31DA3C18422DBECB4BA45ED0
- SHA256 Hash: 775BA9706AA6DD63230B82C4F068203416BB32159F0828F222868D2488E43F63

Displayed Version: 2024-10-10 19:41:13+00:00 4188a256-d20a-4b9a-9763-aa82769b7821

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-0
- 4421A-12-11-1

New features in this release:

- Patched the following bugs:
 - Bug 2130: Sensor Model/SN label does not update if the sensor is swapped on the other side of a multi sensor CAL cart switch.
 - Bug 2137: Sensor model string handling is corrupted for 702x sensor model names longer than 16 characters.

Known Issues and Workarounds:

- Bug 2023: Single display graph does not reset properly on disconnect/reconnect if sensor is not assigned to the same channel.

This bug applies to dual sensor models (4421A-20-xx-x) under the following conditions:

- Use a 402x series sensor or a pulse sensor in the CW mode
- Enable the Time Power Graph
- Disconnect and reconnect the sensor while changing the channel selection for the sensor.

Under these conditions, the data from the prior channel selection will remain visible in the graph and new data will not update on the graph immediately.

If this occurs, tapping the **Clear** label on the graph with reset the graph properly.

- Bug 2143: Serial Parity setting is lost on power cycle (defaults to None).

This bug applies to all models. If the parity is set to *Even* or *Odd*, and the power is cycled, the settings will be revert to *None*. If you wish to use *Even* or *Odd* parity, you must manually restore the setting after a power cycle.

Critical Note: Upgrading from prior revisions:

Upgrading 4421A units from older versions of the firmware (Rev Date **before** 2023-11-16) **requires** a two step upgrade. It is **critical** that an intermediate update be performed to prepare the 4421A memory partitions for this new update. **If this update is not performed first, the 4421A update will fail and the unit will become inoperable. If this occurs, you must return the unit to Bird for recovery.**

To upgrade your unit to the 2024-10-10 revision, follow these steps:

1. Power on the 4421A and open the 4421A web site using Edge, Firefox, Safari, or Chrome.

You can see the IP address of the 4421A as follows:

- Tap the main menu icon in the upper right corner of the display
- Tap the Settings option near the bottom of the menu.
- Tap the LAN option on the popup dialog.
- *Note* the IP address shown on the dialog (there may be two ip options)
 - If you use the fixed ip address of 192.168.44.21, you must configure your PC or network for operation with a subnet mask of 255.255.255.224 and an ip address in the range of 192.168.44.1 to 192.168.44.31 (but not 192.168.44.21 as this is the fixed ip address of the 4421A)

2. Unzip the firmware update package to any folder on your computer.
3. Open the **Maintenance** Menu and select the **Update Module Firmware** option.
4. If the firmware revision shown on the web page is *older* than 2023-11-16, follow steps 5 to 9 to install the intermediate version. If the firmware version is *newer* than 2023-11-16, you may skip to step 11.
5. Click the **Choose File** button and select the **...\4421A_FieldUpdate_v2024-10-10\Install This First\4421A_Firmware_Update_20231116.1.tar.gz** image file from the firmware update package folder.
6. Click the **Load New Firmware** button to install the intermediate firmware update.
7. When the update is complete (approximately 50 seconds) , the page will show the prompt, "Firmware flashing completed successfully. Restart the module for changes to take effect."
8. Click the **Restart** button and wait for the 4421A to restart (approximately 35 seconds). The web page will show the **Module Status** page when the 4421A has finished restarting.
9. Verify that the firmware version shown at the top of the **Module Status** page shows, "**Current Firmware Version = 2023-11-16 15:47:48-05:00 2946b84a-358a-4acd-8f32-b68b87cbdc95**"
10. Open the **Maintenance** Menu and select the **Update Module Firmware** option.
11. Click the **Choose File** button and select the the **...\4421A_FieldUpdate_v2024-10-10\Install This Second\4421A_Firmware_Update_20240802.1.tar.gz** image file from the firmware update package folder.
12. Click the **Load New Firmware** button to install the new firmware update.

13. When the update is complete (approximately 50 seconds) , the page will show the prompt, "Firmware flashing completed successfully. Restart the module for changes to take effect."
14. Click the **Restart** button and wait for the 4421A to restart (approximately 35 seconds). The web page will show the **Module Status** page when the 4421A has finished restarting.
15. Verify that the firmware version shown at the top of the **Module Status** page shows, "**Current Firmware Version = 2024-10-10 19:41:13+00:00 4188a256-d20a-4b9a-9763-aa82769b7821**"

2024-08-21

Image file name: 4421A_Firmware_Update_20240821.1.tar.gz

- MD5 Hash: e76e05aaea35e984bb678fc9f1f88090
- SHA256 Hash: 5681533a0417533f844fa423bb5a88cb50fec6126fadb58f7b488311ae7c813d

Displayed Version: 2024-08-21 22:50:33+00:00 cd33a133-9569-443b-908d-12f8412be138

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-0
- 4421A-12-11-1

New features in this release:

- Patched the following bugs:
 - Bug 1951: Pulse Config Dialog generates errors for 7024 parameters when connected to a 7023.
 - Bug 1998: Time Power Graph stops updating at 8 min 20 seconds (500 samples).
 - Bug 2014: Time Power Graph does not render the "Waiting" icon when averaging is enabled and there is not enough data to draw the first two points.
 - Bug 2016: The manual Frequency field and units on the Pulse configuration dialog do not match when the dialog is first displayed.

Known Issues and Workarounds:

- Bug 2023: Single display graph does not reset properly on disconnect/reconnect if sensor is not assigned to the same channel.

This bug applies to dual sensor models (4421A-20-xx-x) under the following conditions:

- Use a 402x series sensor or a pulse sensor in the CW mode
- Enable the Time Power Graph
- Disconnect and reconnect the sensor while changing the channel selection for the sensor.

Under these conditions, the data from the prior channel selection will remain visible in the graph and new data will not update on the graph immediately.

If this occurs, tapping the **Clear** label on the graph will reset the graph properly.

Critical Note: Upgrading from prior revisions:

Upgrading 4421A units from older versions of the firmware (Rev Date **before** 2023-11-16) **requires** a two step upgrade. It is **critical** that an intermediate update be performed to prepare the 4421A memory partitions for this new update. **If this update is not performed first, the 4421A update will fail and the unit will become inoperable. If this occurs, you must return the unit to Bird for recovery.**

To upgrade your unit to the 2024-08-21 revision, follow these steps:

1. Power on the 4421A and open the 4421A web site using Edge, Firefox, Safari, or Chrome.

You can see the IP address of the 4421A as follows:

- Tap the main menu icon in the upper right corner of the display
- Tap the Settings option near the bottom of the menu.
- Tap the LAN option on the popup dialog.
- Note the IP address shown on the dialog (there may be two ip options)
 - If you use the fixed ip address of 192.168.44.21, you must configure your PC or network for operation with a subnet mask of 255.255.255.224 and an ip address in the range of 192.168.44.1 to 192.168.44.31 (but not 192.168.44.21 as this is the fixed ip address of the 4421A)

2. Unzip the firmware update package to any folder on your computer.
3. Open the **Maintenance** Menu and select the **Update Module Firmware** option.
4. Click the **Choose File** button and select the ...\\FieldUpdate\\Install This **First\\4421A_Firmware_Update_20231116.1.tar.gz** image file from the firmware update package folder.
5. Click the **Load New Firmware** button to install the intermediate firmware update.
6. When the update is complete (approximately 50 seconds) , the page will show the prompt, "Firmware flashing completed successfully. Restart the module for changes to take effect."
7. Click the **Restart** button and wait for the 4421A to restart (approximately 35 seconds). The web page will show the **Module Status** page when the 4421A has finished restarting.
8. Verify that the firmware version shown at the top of the **Module Status** page shows, "**Current Firmware Version = 2023-11-16 15:47:48-05:00 2946b84a-358a-4acd-8f32-b68b87cbdc95**"
9. Open the **Maintenance** Menu and select the **Update Module Firmware** option.
10. Click the **Choose File** button and select the the ...\\FieldUpdate\\Install This **Second\\4421A_Firmware_Update_20240821.1.tar.gz** image file from the firmware update package folder.
11. Click the **Load New Firmware** button to install the new firmware update.
12. When the update is complete (approximately 50 seconds) , the page will show the prompt, "Firmware flashing completed successfully. Restart the module for changes to take effect."
13. Click the **Restart** button and wait for the 4421A to restart (approximately 35 seconds). The web page will show the **Module Status** page when the 4421A has finished restarting.
14. Verify that the firmware version shown at the top of the **Module Status** page shows, "**Current Firmware Version = 2024-08-21 22:50:33+00:00 cd33a133-9569-443b-908d-12f8412be138**"

2024-08-02

Image file name: 4421A_Firmware_Update_20240802.1.tar.gz

- MD5 Hash: de0da4e0676dd6f9eb97218b6d407de7
- SHA256 Hash: c87ebfbbeaabbac9e69003d498f8c9a813e6cf6d798394a8d4ac48eb2dd85a

Displayed Version: 2024-08-02 16:36:23+00:00 eed74aa9-7456-4202-9626-e39d0ed4546c

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-0
- 4421A-12-11-1

New features in this release:

- Supports new user Pulse measurement capabilities using one or two model 702x series precision pulse sensors with model 4421A-12-11-1 of the 4421A
 - The 4421A may be configured to perform simple CW measurements or Pulse measurements when a 702x series precision pulse sensors is connected.
 - Two pulse analysis models to simplify effective configuration and use of the pulse sensors:
 - Pulse gate model supporting automated measurements of forward and reflected average power, frequency, duty cycle, period, rep rate, width, and gated pulse power in the on state of a simple two state pulsed signals. The user may manually configure the target period and trigger parameters or allow the pulse sensor to determine these parameters automatically.
 - Triggered Gate model supports measurements of forward and reflected average power, frequency, and up to four user defined gated regions on more complex pulsed signals with up to four pulse states. Configuration options include period, trigger parameters, and up to four triggered gate regions. Configuration is manual and requires knowledge of the expected time/power shape of your intended signal in order to effectively configure the 4421A and pulse sensor to make effective measurements.
 - SCPI protocol extensions to allow remote automation of sensor configuration and measurement of pulsed signals.
 - Includes improved reporting of SCPI errors via the standard SCPI error queue.
 - Independent configuration and measurement options for each of two connected pulse sensors.
- New user selection of the display and SCPI channels assigned to connected sensors.
 - Sensors are assigned to the upper display and SCPI channel 1 or to the lower display and SCPI channel 2.
- Improved information displays when no sensor is connected or while a sensor is initializing and is not yet ready to make measurements.
- Retains all prior 402x features: CW Measurements using 402x or 702x family sensors and legacy 4421 protocol via RS232 for drop in compatibility with older 4421 applications.
- See the user manual for full information about the features of the 4421A and details on the displays and usage of the pulse measurement capabilities.

Critical Note: Upgrading from prior revisions:

Upgrading 4421A units from older versions of the firmware (Rev Date **before** 2023-11-16) **requires** a two step upgrade. It is **critical** that an intermediate update be performed to prepare the 4421A memory partitions for this new update. **If this update is not performed first, the 4421A update will fail and the unit will become inoperable. If this occurs, you must return the unit to Bird for recovery.**

To upgrade your unit to the 2024-08-02 revision, follow these steps:

1. Power on the 4421A and open the 4421A web site using Edge, Firefox, Safari, or Chrome.

You can see the IP address of the 4421A as follows:

- Tap the main menu icon in the upper right corner of the display
 - Tap the Settings option near the bottom of the menu.
 - Tap the LAN option on the popup dialog.
 - Note the IP address shown on the dialog (there may be two ip options)
 - If you use the fixed ip address of 192.168.44.21, you must configure your PC or network for operation with a subnet mask of 255.255.255.224 and an ip address in the range of 192.168.44.1 to 192.168.44.31 (but not 192.168.44.21 as this is the fixed ip address of the 4421A)
2. Unzip the firmware update package to any folder on your computer.
 3. Open the **Maintenance** Menu and select the **Update Module Firmware** option.
 4. Click the **Choose File** button and select the ...\\4421A_FieldUpdate_v2024-08-02\\Install This **First\\4421A_Firmware_Update_20231116.1.tar.gz** image file from the firmware update package folder.
 5. Click the **Load New Firmware** button to install the intermediate firmware update.
 6. When the update is complete (approximately 50 seconds) , the page will show the prompt, "Firmware flashing completed successfully. Restart the module for changes to take effect."
 7. Click the **Restart** button and wait for the 4421A to restart (approximately 35 seconds). The web page will show the **Module Status** page when the 4421A has finished restarting.
 8. Verify that the firmware version shown at the top of the **Module Status** page shows, "**Current Firmware Version = 2023-11-16 15:47:48-05:00 2946b84a-358a-4acd-8f32-b68b87cbdc95**"
 9. Open the **Maintenance** Menu and select the **Update Module Firmware** option.
 10. Click the **Choose File** button and select the the ...\\4421A_FieldUpdate_v2024-08-02\\Install This **Second\\4421A_Firmware_Update_20240802.1.tar.gz** image file from the firmware update package folder.
 11. Click the **Load New Firmware** button to install the new firmware update.
 12. When the update is complete (approximately 50 seconds) , the page will show the prompt, "Firmware flashing completed successfully. Restart the module for changes to take effect."
 13. Click the **Restart** button and wait for the 4421A to restart (approximately 35 seconds). The web page will show the **Module Status** page when the 4421A has finished restarting.
 14. Verify that the firmware version shown at the top of the **Module Status** page shows, "**Current Firmware Version = 2024-08-02 16:36:23+00:00 eed74aa9-7456-4202-9626-e39d0ed4546c**"

2022-08-23

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0

- 4421A-20-00-0
- 4421A-20-11-1

New Features:

- Provide CW measurements from 7023 & 7024 series pulse sensors via USB ports on new model 4421A-12-11-1.
 - Involves a revised sensor/display mapping scheme in dual sensor models to handle ambiguity of which USB port a 702x sensor is plugged into.
 - Displays model & SN in sensor labels on the UI to provide clear indication of which sensor is routed to which display.
- Adjusted battery capacity monitoring to accurately monitor remaining charge in larger 6000 mAh battery.
- Supports new GEI display.

2021-05-19

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-1
- Add trailing space (0x20) at end of U1 response to match legacy 4421.

2021-05-10

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-1
- Add U0, U1, U2, & J0 legacy commands to support AMAT interchangeable use of 4421 and 4421A.
- Add YT, PY, & XF legacy dummy commands to avoid invalid command errors in the new U1 response to support AMAT interchangeable use of 4421 and 4421A.
- Add RYY, RNN, and R00-R17 legacy commands to support Logysis interchangeable use of 4421 and 4421A.

2021-01-06

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-1
- Add graphing of forward power using either raw or averaged data with two limit lines, auto and manual scale operations, and automatic tracking of main display units.

- Add a SCPI compliant protocol via either LAN or RS232. See the manual for SCPI protocol reference details.
- Add support for legacy 4421 command mode in legacy RS232 protocol. See the manual for legacy protocol reference details.
- Increase overrange warning trigger to 120% of sensor maximum power to match legacy 4421 behavior.
- Revise main menu to add configuration of new features and to include options to display 4421A model, SN, and revision information, Regulatory compliance details and Open Source licensed component details.

2020-06-16

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-1
- Improve RS232 framing recovery when extraneous characters are found in the stream.
- Include model and SN in the License file to allow model specific power icon behavior for the Cal Carl model (4421A802-3).
- Implement battery charge current throttling above 45 deg C (2A below 45C, linear ramp to 0 A from 45C to 84C).

2020-05-15

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-1

Power Meter App:

- Improve the reliability of the of the battery monitoring algorithm in certain edge cases.
- Display a warning for 24 seconds before shutdown when battery drops below 1%.
- Include the fixed ip address (192.168.44.21) on the ethernet dialog.

2020-04-29

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-1

u-boot/linux/buildroot:

- Clean up display artifacts

- Improve bootloader startup time.

Power Meter App: Features:

- Revise main layout and colors to maximize font size and feature primary information (measurements) over secondary information (labels).
- Implement manual scale controls (includes improved gtk layout manager)
- Implement Serial settings dialog with larger font and buttons.
- Make Network and Serial icons yellow to indicate that they are clickable by the user.
- Clearly indicate when no sensor is detected (blank values and units, display 'No Sensor Detected').
- Implement more precise battery indicators using the fuel gauge.

Bug Patches:

- Patch handling of unit tap when in overrange.
- Make RS232 ENT command use either channel 1 or 2 with preference for channel 1.
- Make sensor max power default to max display rather than to 0.
- Fix scale bug when switching between 1 & 2 sensor displays.
- Fix the position and formatting of the VSWR display to eliminate overlap of values alrger than 99.99 with the units field.
- Do not arm ship mode in battery monitor on shutdown. Using the mode prevents booting from the battery.

2020-03-13

Supported Models:

- 4421A-10-00-0
- 4421A-10-11-0
- 4421A-20-00-0
- 4421A-20-11-1

Initial prototype version. Contains base feature set, license management, & RS232 legacy commands.