

Revision	Change	Approved	Date
1	Initial release	mje	15/03/16



# SUPPLEMENTARY INSTRUCTION

## SI-005 AC200 4.42 FIRMWARE

### UPDATE INSTRUCTIONS

Part / Assy #		AH-xxx
Drawing #		
Applicability		All hubs updated with Maxon pitch change motors
Compliance		

**SUBJECT:        UPDATING AC200 FIRMWARE FOR USE WITH  
 MAXON PC MOTOR IN AP-X HUB ASSEMBLY**

#### 1.                Introduction

This document is intended to assist the service engineer in updating the AC200 control box firmware. This is done through the use of software running on a MS Windows PC. A lap-top computer is recommended, to allow it to be taken to the controller in the aircraft.

Revision 4.42 software is required for all Maxon type pitch change motors. It introduces the following changes.

- Changes control algorithm to ‘look ahead’.
- NCV parameter for PC motor response tuning
- PWM rate parameter

Note:            Instructions for the physical replacement of the pitch change motor are covered in SI-001.

#### 2.                Material Information

##### 2.1              Parts Required

Item	Assy No.	Description
1		
2		

## 2.2 Tooling

Item	Qty	Part Number	Description
1	1	A0117	AC200 USB serial cable assy
2	1		Firmware Update Software V3.03
3	1		Parameter file .par
4	1		User Software AC200UserV4.42
5			
6			

## 2.3 Material

Item	Qty	Part Number	Description
1			
2			
3			
4			
5			
6			
7			

### 3. Procedure

#### 3.1 Software installation

##### a. USB Driver

- i. Install the USB driver supplied on the minidisk as per its instructions (on disk).

##### b. AC200FirmwareUpdate

- i. Unzip the AC200FirmwareUpdate to a convenient folder on your computer hard drive. Keep all the files together in the same directory.

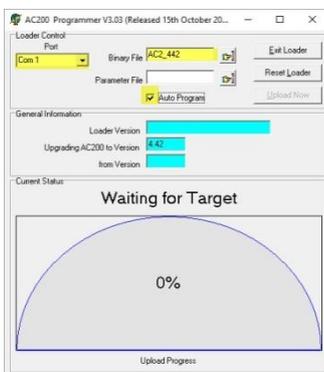
##### c. AC200User

- i. Unzip the AC200User to a convenient folder on your computer hard drive.
- ii. Ensure your computer is updated to include .NET3.5  
<http://www.microsoft.com/downloads/en/details.aspx?FamilyId=333325FD-AE52-4E35-B531-508D977D32A6&displaylang=en>

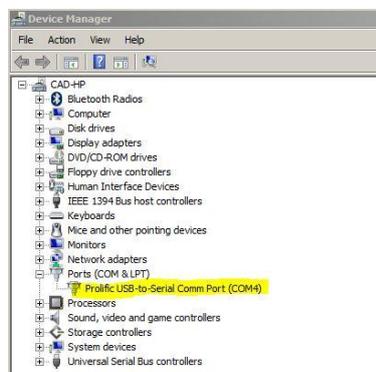
#### 3.2 Updating Firmware

**Note:** This update only applies to version 4 hardware. This is denoted by software version numbers 4.xx. If you have software 3.xx you must contact Airmaster Propellers Ltd for a hardware upgrade. The software version is recorded in the propeller log book and on the rear of the AC200 control box.

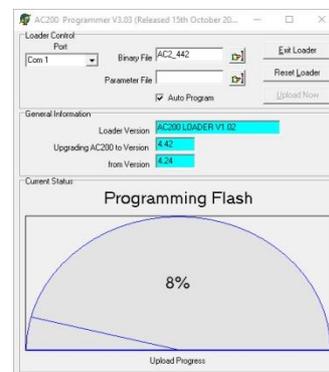
##### a. Run the application 'AC200FlashLoader'



Run AC200FlashLoad



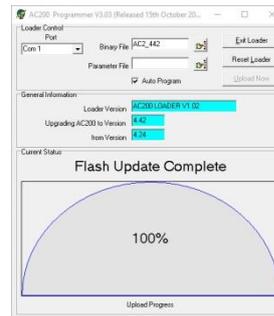
Check Serial Port number



Update in progress.

- b. Select the com port you connected the USB converter into. If you are not sure check in start:controlpanel/system/devicemanager
- c. Select the binary file to update (AC2\_442.bin)
- d. Note: don't select a parameter file at this stage.**
- e. Check 'AutoProgram'
- f. Reset Loader
- g. Apply power to the AC200 controller. Programming will commence.

**Note:** If programming does not commence, check previous settings, reset loader, and repower controller.



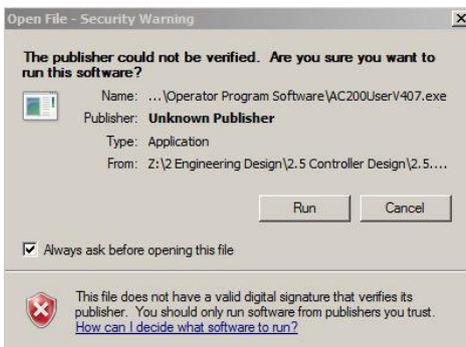
Download complete

- h. Once the firmware is updated the display will show update complete.
- i. Exit Loader.

#### 4. Load Parameters

**Caution:** Ensure you have quit the FlashLoader before you run the AC200 User software. Only one of these can be open at the same time or you will get an error accessing the serial port.

- a. Run application AC200User



Security Warning



Application connection

**Note:** If you see a security warning from Microsoft referring to ‘unknown publisher’, you may ignore this and select Run.

- b. Select the com port you are using to connect the serial programming cable to.
- c. Apply power to the AC200 controller. You should now get a ‘connected’ indication in the top right corner. The right hand windows will display the current state of the controller.



### Load parameter file

### Update HOLD RPM

- d. Select 'Load Par File' to view the available files. Choose the appropriate file and press Open.
- e. Select 'Update AC200 with New Settings'. Parameters are loaded into the controller memory.
- f. Check each of the parameter values against the parameter sheet.

**Note:** Some parameters are contained in tabs that are not obvious. Use the right and left arrows (next to the Misc TAB) to view all available tabs.

## 5. Changing Parameters

- a. To make a change, highlight the parameter window and type in the new value. To change the starting Hold rpm, highlight the value in the window of 'HOLD RPM (113) and enter 4800 (for example).
- b. If a parameter value is changed, the 'Update AC200 with New Settings' button will highlight red. Confirm the parameter change by clicking this button. The parameters will be written to the controller.
- c. To access the parameters other than the flight variables, enter the password into the password box. The remaining parameters can then be accessed.

**Caution:** It is not recommended to make any changes to parameters other than the 'Flight Parameters' without direct instruction from Airmaster Propellers Ltd. Incorrect parameters may cause the controller to function incorrectly.

- d. Close the AC200 User Program.

## 6. Recording parameter changes

- a. Record any changes that are made to parameters on the Software and Parameters Sheet, and the propeller log book.
- b. Record any changes of firmware revision number on the rear of the AC200 controller, the Software and Parameters Sheet, and the propeller log book.

## Completion

### 7. Recording parameter changes

- a. Record any changes that are made to parameters on the Software and Parameters Sheet, and the propeller log book.

- b. Record any changes of firmware revision number on the rear of the AC200 controller, the Software and Parameters Sheet, and the propeller log book.
- c. Send an email to [support@airmasterpropellers.com](mailto:support@airmasterpropellers.com) stating
  - i. Serial number of propeller hub
  - ii. Serial number of controller
  - iii. Old firmware that was installed
  - iv. New firmware installed

Note: It is very important to send Airmaster this information so records can be kept up to date.

<i>Description</i>	<i>Check</i>
Firmware uploaded successfully	
Parameters checked against Parameter sheet	
Software and Parameters Sheet updated	
Controller software label updated	
Propeller log book updated.	
Confirmation email sent to Airmaster	

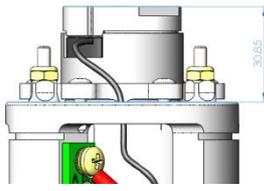
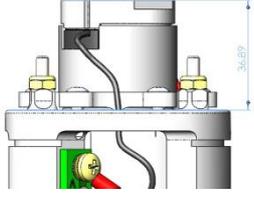
## 8. Notes on pitch rate tuning

The update 4.42 is designed primarily for use with Maxon servo motors. It modifies both the control algorithm and the pwm rate to better match these motors requirements. It can however still be used with Globe brand PC motors. The chart below prescribes the parameter values that should be used in the stated engine and PC motor combinations.

Engine	PC motor	Parameter (301) NCV	Parameter (302) PWM Rate
Rotax 912-914	Maxon 150	100	0
Rotax 912-914	Maxon 231	50	0
Rotax 912-914	Globe 180	50	2
Rotax 912-914	Globe 320	30	2
Direct Drive	Maxon 150	50	0
Direct Drive	Maxon 231	30	0
Direct Drive	Globe 180	30	2
Direct Drive	Globe 320	20	2

## 9. Identifying PC motor type

Use the visual guide below to identify which pitch change motor is installed

 <p><b>Maxon 150</b> 'H' inscribed on top of motor</p>	 <p><b>Maxon 231</b> No 'H' on top of motor</p>	 <p><b>Globe 180</b> Motor extends 30mm from microswitch mount body</p>	 <p><b>Globe 320</b> Motor extends 37mm from microswitch mount body</p>
---	--	---	--