Jaguar Firmware Update Instructions

Summary

All Jaguars using CAN must have the latest FRC firmware installed for the 2012 season.

Jaguars that are using Servo PWM do not have to be updated from their default factory firmware. However, teams using PWM may wish to update their older Jaguars to the latest firmware in order to gain access to the new Automatic Ramp feature.

This table describes the allowed firmware versions depending on the control mode being used.

Application	Firmware Version	Control Mode		Automatic Ramp Mode
		CAN	PWM	
FRC	100 or greater	Required	Permitted	Yes
	less than 100	Not permitted	Permitted	No
Non-FRC	8161 or greater	Not permitted	Permitted	Yes
	less than 8161	Not permitted	Permitted	No

Does this affect you?

Teams using PWM

If you are using only Jaguars distributed in the 2012 Kickoff Kit, the 8161 firmware has already been installed and you can ignore this memo.

If you are using a mix of old and new Jaguars, it is not necessary, but you may wish to update the old Jaguars so that all of your Jaguars have the new Automatic Ramp mode. Follow the steps below to update your Jaguars.

Teams using CAN

You must update **all** Jaguars to the latest FRC trusted firmware.

If aren't sure what version of firmware you have on your Jaguar motor controller, please follow the steps below.

Pre-requisites

To update your Jaguar firmware, you'll need the following tools:

- a computer with
  - Windows XP or newer
  - a Serial (RS232) port
  - the bdc-comm.exe and Jaguar firmware unzipped on your computer (download from www.ti.com/jaguar - the desktop works well)

- the Jaguars that you plan program
- a DB9 to RJ12 adaptor (provided in the 2012 Kickoff Kit)
- a CAN cable (provided in the 2012 Kickoff Kit)
- a 12V DC power supply (this can be your robot's power system)
- if you're programming a gray Jaguar, you will also need a Black Jaguar acting as a Serial-to-CAN bridge

Other helpful items include:

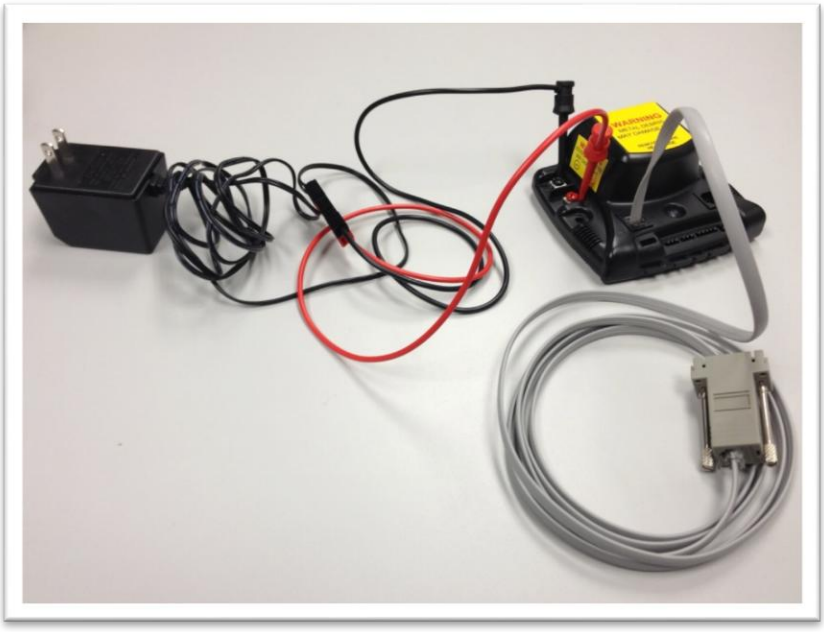
- the BDC-COMM User's Manual
- if the computer does not have its own serial port, a USB/RS232 serial (DB9) adaptor

The Steps

For simplicity, the following steps assume you are updating your Jaguars to FRC trusted firmware. There is no need to update to non-FRC firmware (even when using PWM) unless the Jaguars are being used on some other project.

Updating a single Black Jaguar

1) Connect the 12V DC power to the Jaguar power terminals.
2) Connect the powered Jaguar to your computer using the serial-to-CAN adapter and cable. If your computer doesn't have a physical serial port, use a USB-to-serial adapter. Be sure to use the left "NET" port on the Jaguar marked with "10101".



3) Launch the bdc-comm.exe application. The application should automatically connect to the Jaguar, but if it doesn't, be sure to select the correct COM port number and choose *Status* > *Connect…* from the menu bar.
4) If you are unsure of the firmware version on your Jaguar, click the *System* tab and check the

Firmware Version field.

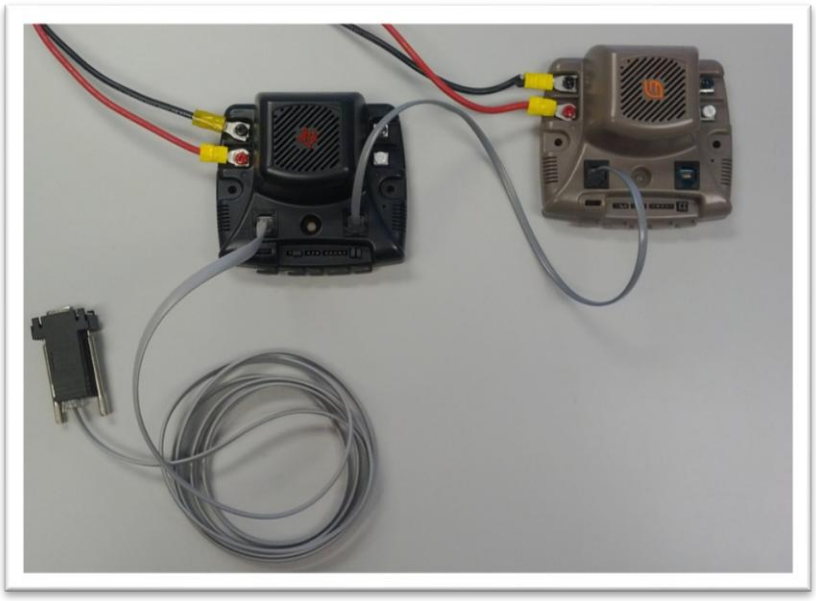
5) Select *File* > *Update Firmware…* from the menu bar to bring up the *Update Firmware* window.
6) Browse to "BlackJaguar-100.bin" and select it.
7) Click *Update*.

   CAUTION! Do not unplug the power or the Serial cable during the update!
8) Verify that the firmware version is now "100" by going to the *System* tab and looking at the *Firmware Version* field.
9) This process is complete. Unplug the Jaguar from the computer and disconnect the power.

Updating a single Gray Jaguar

Because the Gray Jaguars don't have serial capabilities, you must use a Black Jaguar to act as a Serial-to-CAN bridge.

1) Connect 12V DC power to both Jaguars' power terminals.
2) Connect the Black Jaguar to your computer using the serial-to-CAN adapter and cable. If your computer doesn't have a physical serial port, use a USB-to-serial adapter. Be sure to use the left "NET" port on the Jaguar marked with "10101".
3) Launch the bdc-comm.exe application. The application should automatically connect to the Jaguar, but if it doesn't, be sure to select the correct COM port number and choose *Status* > *Connect…* from the menu bar.
4) Before connecting the Gray Jaguar to the free port on the Bridging Black Jaguar, make sure the Black Jaguar doesn't have the same ID number as the Gray Jaguar. Click the *System* tab and assign a known unique ID number to the Black Jaguar. After clicking *Assign,* you have a few seconds to press the user button on the Jaguar with a straightened paperclip. The default ID is '1', so choose something other than '1' and different from the Gray Jaguar. Use your best guess if you don't know what the Gray Jaguar's ID is.
5) Now connect the Gray Jaguar to the Bridging Black Jaguar using another CAN cable (additional CAN cables are included in *FIRST* Choice).



6) Cycle the BDC-COMM connection so that the Gray Jaguar appears in the Board ID drop-down list. If only one ID appears, verify the Gray Jaguar is connected properly and receiving a signal. If it is connected properly, this may be a sign that both Jaguars have the same ID. Disconnect the Gray Jaguar and repeat step 4 to assign a new ID to the Bridging Black Jaguar.
7) Select the Gray Jaguar's ID from the Board ID drop down list.
8) If you are unsure of the firmware version on your Jaguar, click the *System* tab and check the *Firmware Version* field.
9) Select *File* > *Update Firmware…* from the menu bar to bring up the *Update Firmware* window.
10) Browse to "Jaguar-100.bin" and select it.
11) Click *Update*.

CAUTION! Do not unplug the power or the Serial cable during the update!

12) Verify that the firmware version is now "100" by going to the *System* tab and looking at the *Firmware Version* field. Be sure you are looking at the correct Board ID for the Gray Jaguar.
13) This process is complete. Unplug the Jaguar from and disconnect the power.

Troubleshooting

If the update doesn't complete successfully, try using the *File* > *Recover Device* feature in BDC-COMM. Be sure to read the screen instructions before using the Recover Device feature. Some causes of an unsuccessful update could be:

- Loading Gray Jaguar firmware on a Black Jaguar or vice versa
- Unplugging the Jaguar in the middle of an update
- Loose CAN cabling