

USB ProgKey

USB to RS232 interface for YAPSC series servo boards

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1 Introduction

The USB ProgKey is a FTDI chip-based cable to upgrade (via a bootloader) or configure (via a serial terminal emulator) YAPSC series Servo Boards. It can be unplugged from the Servo Board so a single USB ProgKey is enough to configure multiple Servo Boards, one at a time.

It features:

- Total optoisolation (>600VDC) between the computer and the Servo Board provides complete safety for the computer
- Board-reset capability
- 5V and 3.3V compatibility

Note:

The .zip file this manual is referring to is the .zip file you find this manual in. It can be downloaded from http://max-mod-shop.com/index.php?option=com_content&view=article&id=47

2 Physical description

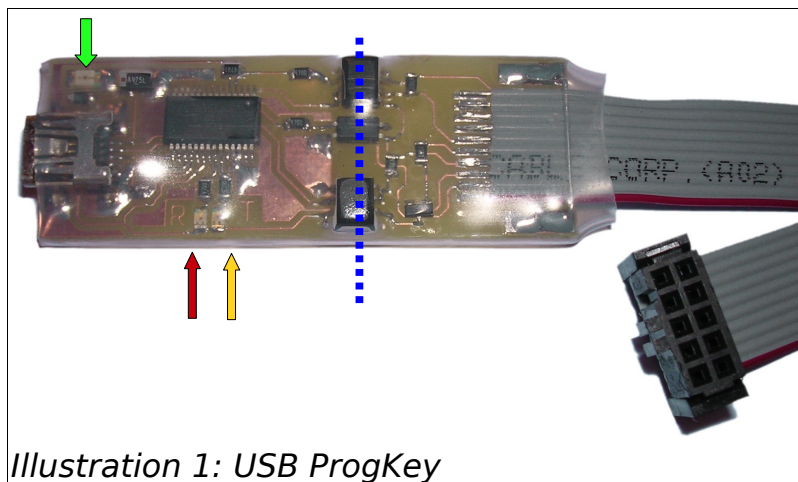


Illustration 1: USB ProgKey

On the left :

- mini-B USB connector
- Green led for Power

On the bottom side :

- Red led : blinks when data is received from the Servo Board
- Yellow led : blinks when data is sent to the Servo Board

On the right :

- Ribbon cable terminated with a 10p IDC (also called HE10) connector to the Servo Board

The dotted blue line represents the isolation barrier between PC side (left) and Servo Board side (right). The isolation between both sides is over 600VDC (in dry environment).

Note :

The USB ProgKey does not provides power to the Servo Board! You must power it from an external supply in order to configure/upgrade the Servo Board!

3 Installation

Do not plug the ProgKey to the Servo Board before you have it installed on the computer and the connection opened!

Connecting/disconnecting the connection can reset the board! Read section 4.4.

3.1 Linux

On most (recent) Linux distributions, you don't need to install the driver to use the USB ProgKey. Simply open ttysUSBx (where x =0, 1... etc is the number of the port associated to the USB ProgKey) with your serial terminal emulator.

If the driver is not present natively on your distribution, check the drivers and installation tips on www.ftdi.com.

3.2 Windows

Note:

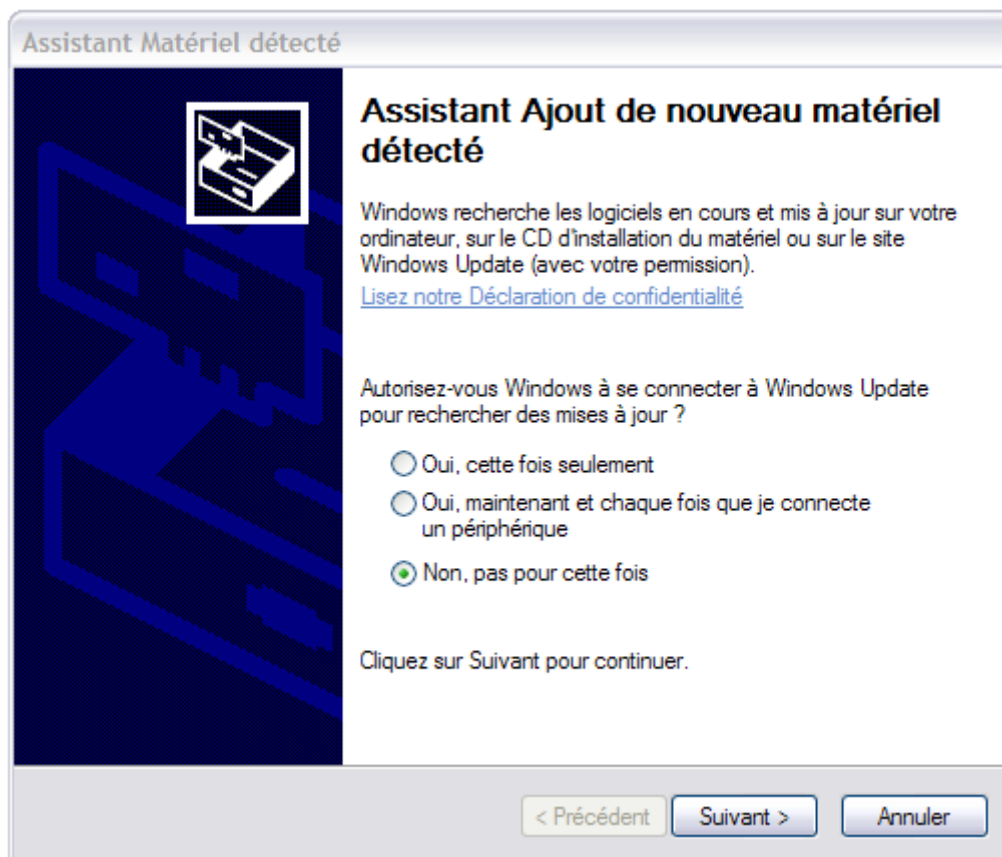
the driver is installed by YAPSC Tuning Tool if you choose so at the end of the installation. If installed YTT and chose to install the CDM driver, you can skip this section and go to the section 4.

3.2.1 Step 1

The driver files are contained in the .zip file, in “/USB Driver” directory. It is the 2.04.14 version of FTDI's driver, so a more recent could have been released on FTDI's website (search “FT232R” on www.ftdi.com) where you will find “serial port emulation driver”. A more recent driver is not necessary unless you are experiencing problems with the ProgKey.

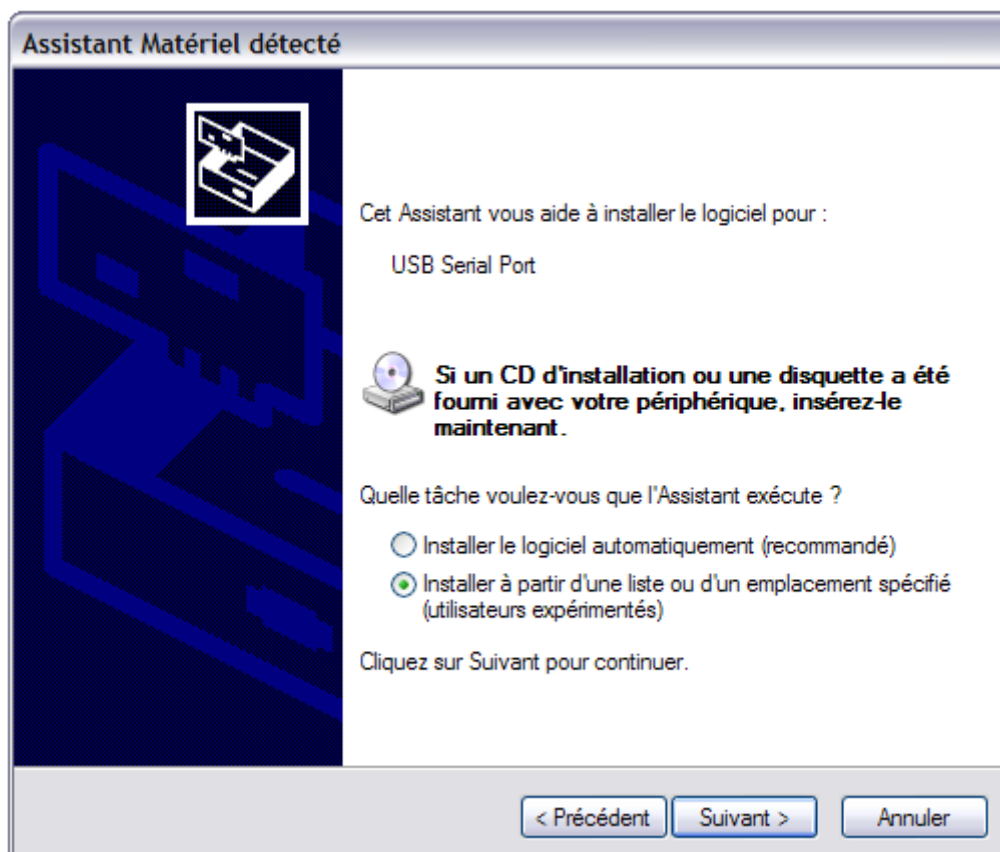
3.2.2 Step 2

Plug a A-to-miniB USB cable between the ProgKey and the computer. The green led lights and both red and yellow leds blink briefly. Now a similar window should appear:



Choose “no, no this time” and click “next”.

3.2.3 Step 3



Now choose the second option, I.e to locate driver file, and click next.

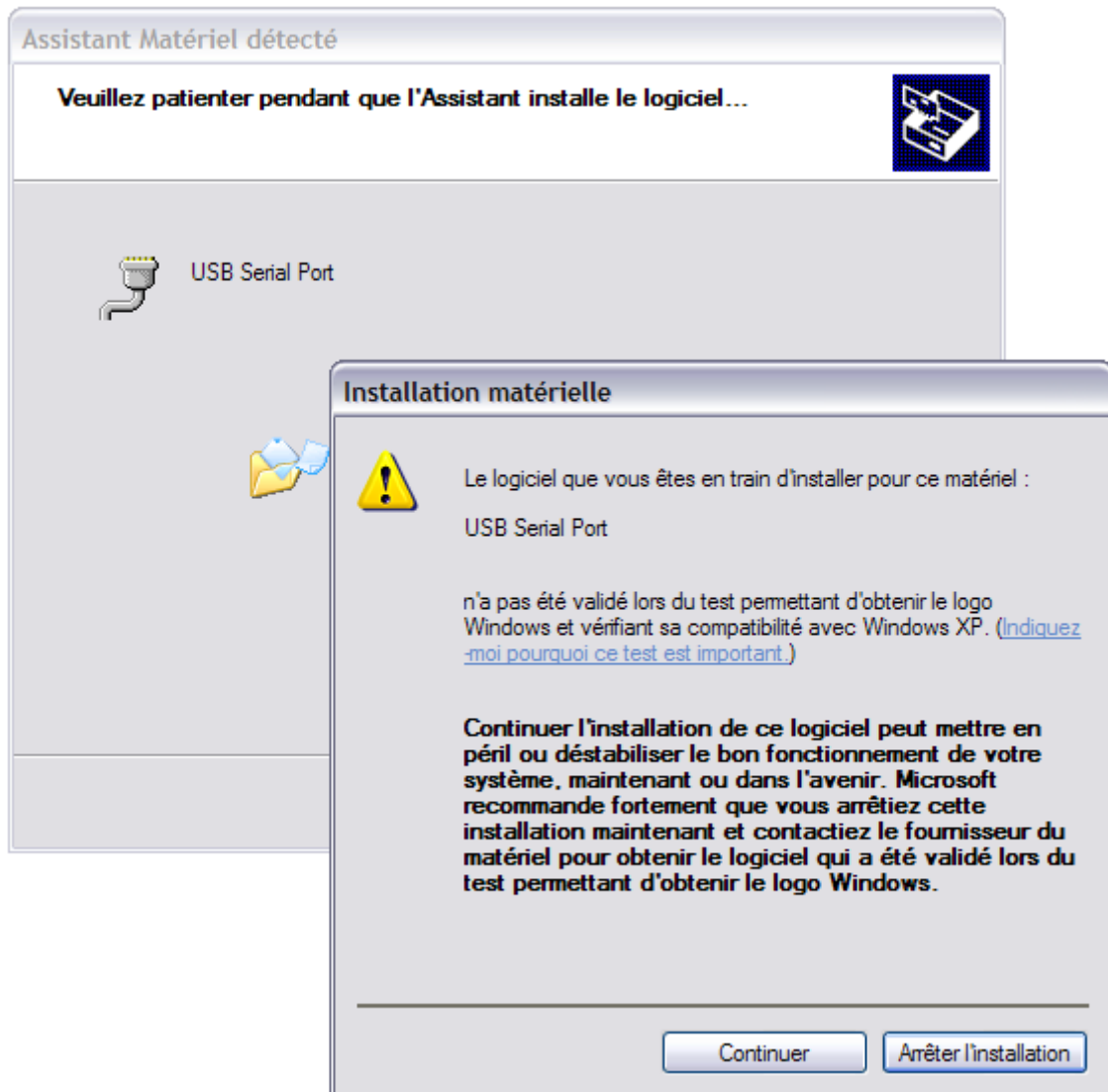
3.2.4 Step 4



Uncheck the “search on removable medias (CD-ROM...)” and check “include specified folder”. Now click on the overlined button, and choose the directory in which you have unzipped the driver files.

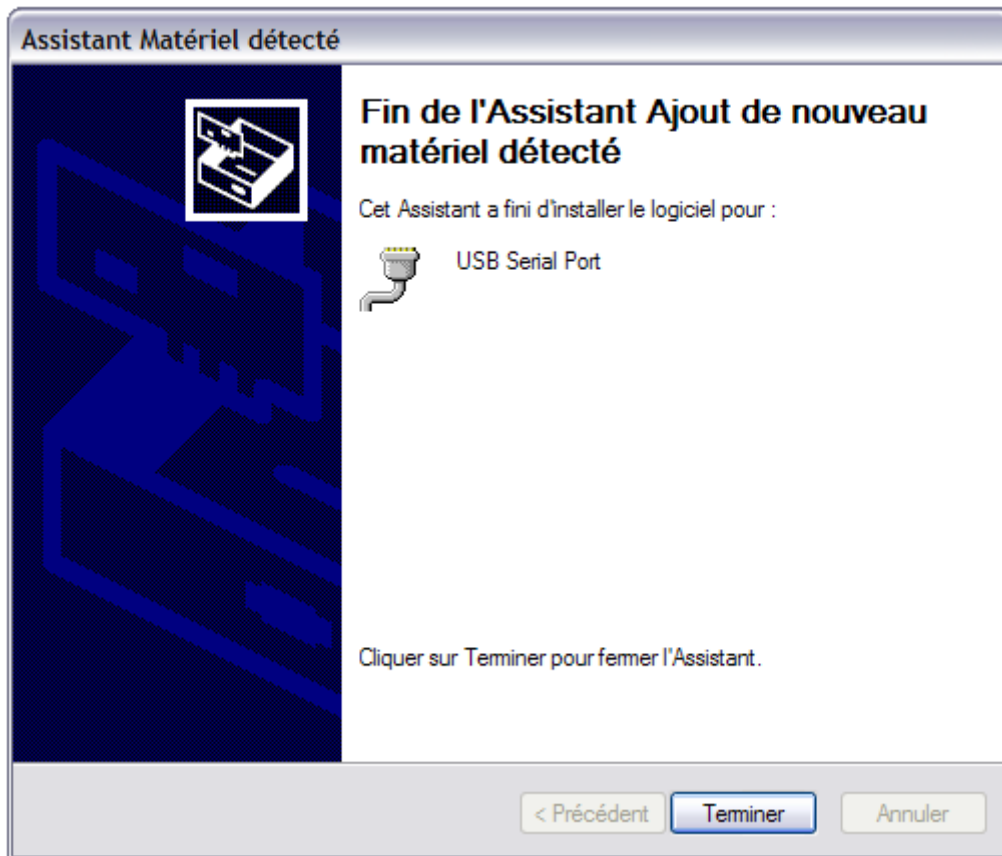
Click next.

3.2.5 Step 5



Now you will be told the driver is not signed, which is normal. Click "continue".

3.2.6 Step 6



If you have a similar window telling you the installation is complete, congratulations! Your ProgKey is ready to run!

Note:

You may be asked to install the ProgKey twice, if so you will have to do steps 2 to 6 once again.

4 Configuring the Servo Board

A dedicated software has been made to ease YAPSC:10V configuration: YTT (YASPC Tuning Tool). It is advised to use YTT unless software or hardware problems would prevent you from running YTT!

You will find YAPSC Tuning Tool homepage here: <http://max-mod-shop.com/ytt>

If you have installed YTT, you can skip this section and go to the section 5.

Alternatively, you can use a Serial port Terminal Emulator such as HyperTerminal.

Serial port terminal's settings are:

```
speed : 9600bps
data length : 8bits
stop bit : 1
flux control : none
known as "9600/8/N/1"
```

Note:

From firmware 0.9.3, the speed has changed. Thus, the correct parameters are

```
speed : 57600bps
```





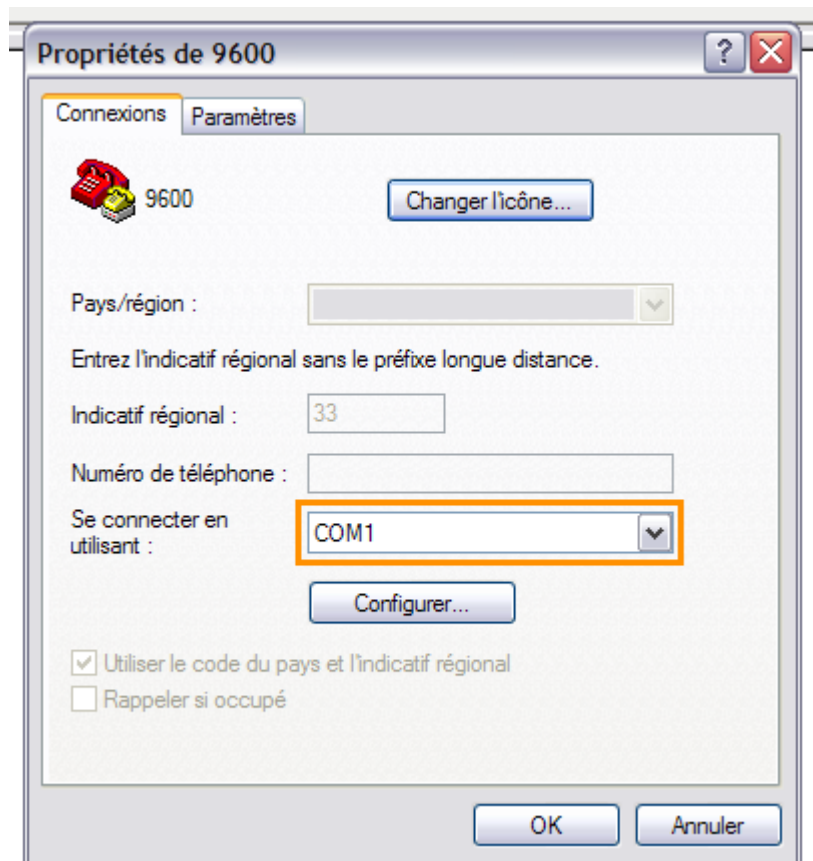
```
data length : 8bits  
stop bit : 1  
flux control : none  
known as "57600/8/N/1"
```

4.1 Linux

Using a serial terminal emulator is the easiest way to use the ProgKey on Linux. Any will do, but you may like it to be able to control manually the DTR signal, which is used to reset the Servo Board. Check your distro repositories for Terminal Emulators.

4.2 Windows

Hyperterminal should be present by default on your computer (Start->programs->accessories->communication->hyperterminal). You can enter the settings manually or you can use the configuration file "9600.ht" present in the zip file. Simply double-click "9600.ht" should launch HyperTerminal. Once HyperTerminal is launched, close the connection (using this button  on the top) and then change the settings (using this button  on the top) and choose the right (usually highest) port number :



4.3 Common to both systems

Now you have your terminal opened, connect the ProgKey to the Servo Board. Refer to the right manuals to configure the Servo Board.





To reset the Servo board, you will need to either cycle (remove the power a brief instant and put it back) the Servo Board's power, or to cycle the DTR line on you serial port terminal. Read section 4.4 "Tips" to learn more.

4.4 Tips

Beware! When you plugged the USB ProgKey and did NOT opened it's COM port, the Servo Board will be held in reset!

If you connect a ProgKey to a Servo Board before you opened Hyerterminal and established a connection, the Servo Board will be reseted. This could be harmful if the Servo Board is running!

Explanations : When a COM port is closed, the DTR signal (used to the board reset feature) on this port is active. It means that the Servo Board is held in reset mode when the COM port is not opened. When the COM port is active, and that the serial terminal emulator is not using hardware flow control (I.e correct configuration), DTR is not used (inactive), so the board is in normal mode (not held in reset).

- Do **NOT** close ( button on HyperTerminal) or open ( button on HyperTerminal) the port if the board is operating and that you don't want to reset it. If you have to change the port's settings, open or close it, first disconnect the ProgKey from the Servo Board (not USB port), change the parameters (if required), open the associated COM port and **then only** connect the ProgKey to the Servo Board.
- You can reset the board by closing () and then opening () the connection under hyperTerminal
- Please not that the DTR line can change during the USB Prog Key installation or computer boot-up

5 Upgrading the Servo Board

5.1 Ingenia bootloader

Ingenia's free bootloader is used to upgrade (and only for upgrade) the Servo Board's Firmware. This tool is Windows only.

You will find the installation file in *bootloader/IBLInstaller.exe*. Run it and follow the instructions.

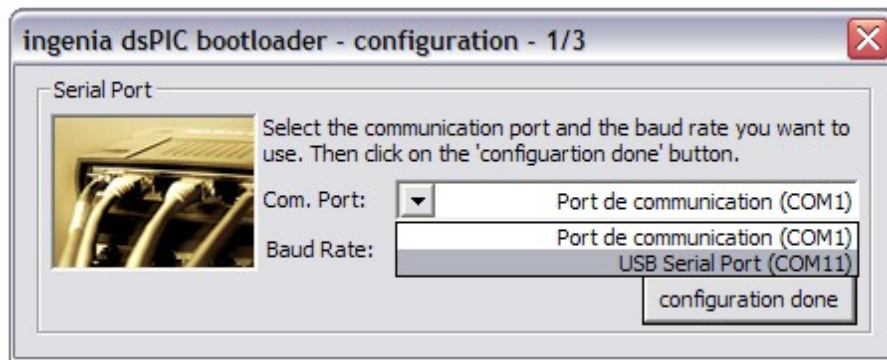
Note:

Write down/copy the directory you will install the bootloader in (default : C:\Program Files\Ingenia\dsPICbootloader\).

You must copy the file “bootloader/ibl_dspiclist.xml” into this directory, overwriting the existing one.

Otherwise the bootloader won't be able to work.

Once the bootloader is installed and “bl_dspiclist.xml” updated, run it (by double-clicking the icon on your desk or by clicking it on the start menu), when started, a similar windows should open:

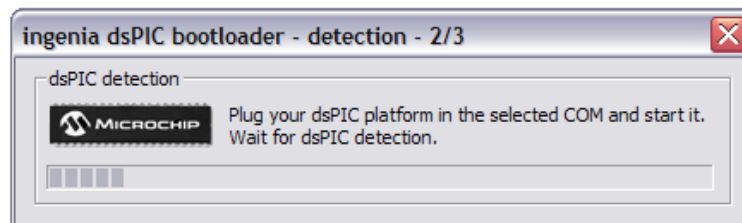


choose you ProgKey from the list (it is called “USB Serial Port”) and click “configuration done”.
Now the window should look like this :



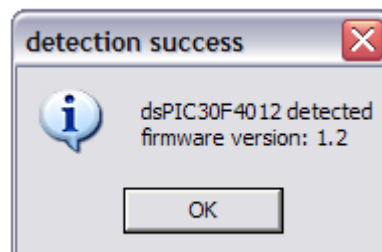
Now power the Servo Board off, plug the ProgKey into the Servo Board and click “OK, my platform is shut down”.

You will now see this window:

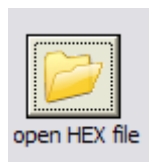
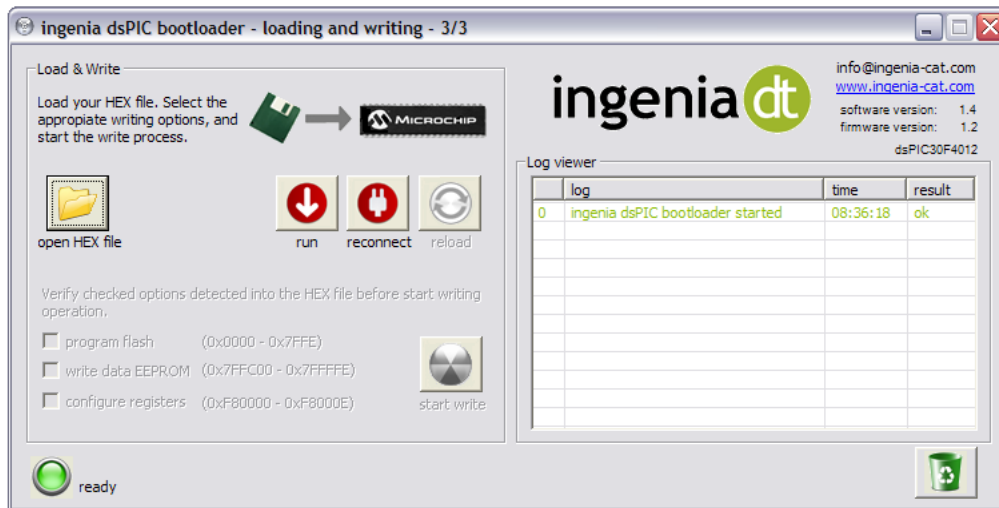


At this point, power the Servo Board back.

This window will open, meaning the bootloader is synchronized and ready!



Click “OK”, and this window should appear:



Now click “open HEX file” and choose your Servo Board's firmware file :



Click “open” to validate the firmware chosen, and click “OK” on the warning window.
Click “Start write”



The detail of the operation should appear in the log viewer:

Log viewer

	log	time	result
0	ingenia dsPIC bootloader started	08:36:18	ok
1	Load HEX file	08:39:26	ok
2	Load HEX file	08:40:59	ok
3	write process started	08:41:00	ok
4	flash write finished	08:41:13	ok
5	eeeprom write finished	08:41:14	ok
6	dsPIC write process completed	08:41:14	ok

Now quit the bootloader program, (open your serial port terminal to configure the board) and cycle power off and on. The Servo Board is now ready for using.

5.2 Tips

Remember section 4.4 “Tips”? When COM port is not opened, the board is held in reset mode.

Now, you have to know that the bootloader does not open a port until you click “configuration done” button. If you are fast enough, try clicking “OK, my platform is shut down” as fast as possible after you clicked “configuration done” button. This way you won't have to cycle power on the board to reset the board and enter bootloader mode.

OR you can check the “don't remember me again” checkbox. That way, the bootloader will connect as soon as you clicked the “configuration done” button.

One last tip: clicking the “run” button (step 3/3 window) will close the COM port, thus allowing to connect to the ProgKey with HyperTerminal. You don't have to close the bootloader to use HyperTerminal.