FlowPaw

Build-your-own-gizmo kit
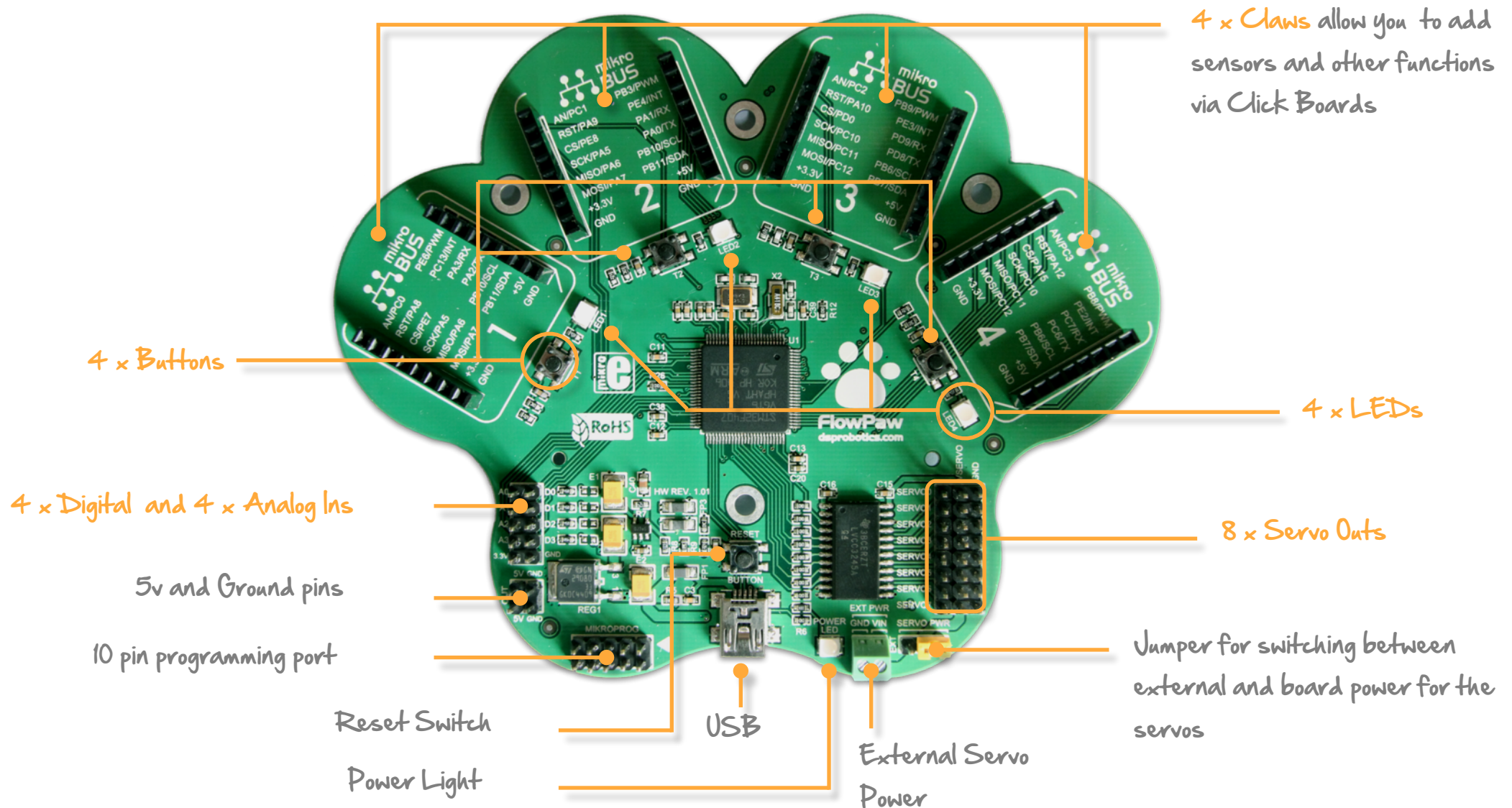
User Guide

CONTENTS

1. Welcome to FlowPaw!

Hopefully by now you'll have opened the box and had a play with your new toy.

It's dead easy to get going but if you want to know some more detailed information about FlowPaw then this guide should have the answers you're looking for.

2. The FlowPaw Board

4 x Claws allow you to add sensors and other functions via Click Boards

4 x Buttons

4 x LEDs

4 x Digital and 4 x Analog Ins

8 x Servo Outs

5v and Ground pins

10 pin programming port

Jumper for switching between external and board power for the servos

Reset Switch

USB

Power Light

External Servo Power

3. Claws and Click Boards

FlowPaw has **4 claws** into which you can plug expansion boards called **Click Boards**.

To insert a click board, align the cut off in the lower-right corner of the board with the marking on your FlowPaw.

Once you align all the pins correctly, push the board all the way into the socket.
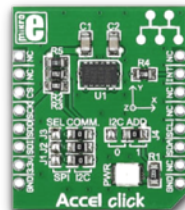
! click boards should only be added or removed when the board is unplugged

Your FlowPaw kit comes with 4 great Click Boards:
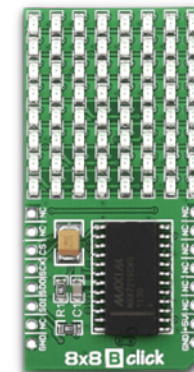

Buzzer
Plays sounds and tunes

Accel
A 3-axis accelerometer that measures tilt, just like a Wii controller

Proximity
Senses how close you are to the click board

8x8 LED
A small display that allows you to show text, patterns or shapes.

More click boards can be purchased from the flowpaw.com web site

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4. Install & Connect

Install FlowStone STEM

If you haven't done so already install your copy of our graphical programming software, FlowStone STEM.
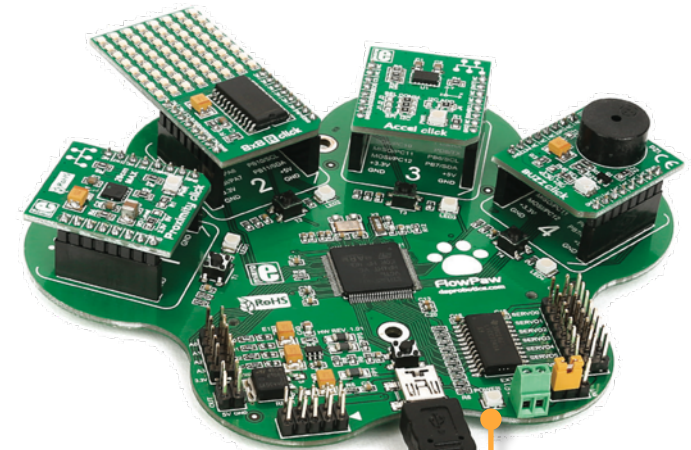
Insert the supplied FlowStone STEM DVD. A welcome screen will appear. Just click "Install FlowStone STEM" and follow the instructions.
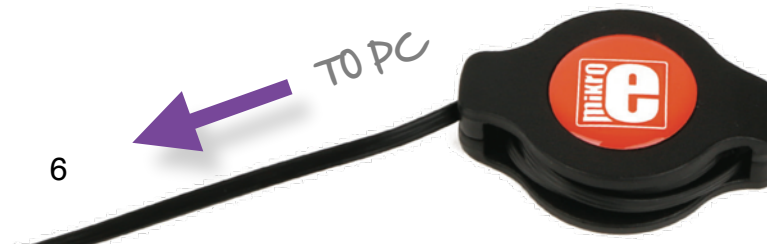
Insert into DVD drive on PC
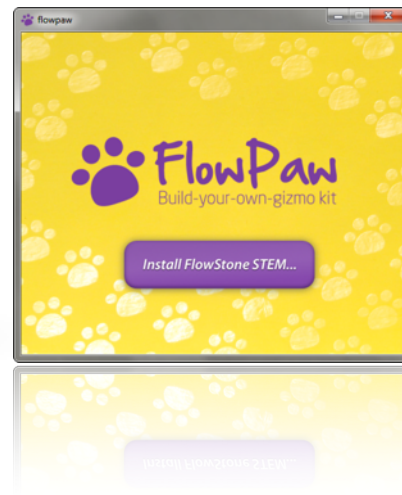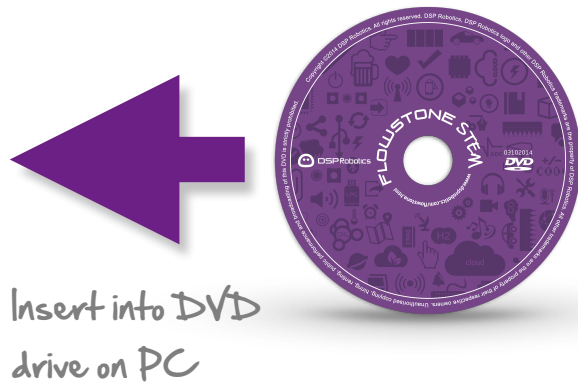
Connect to PC

Once you have connected the click boards you want to use you are ready to connect to your PC.

Connect the small end of the supplied retractable USB cable to the FlowPaw and the other to the PC.

The power light should illuminate

TO PC

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Run FlowStone

Launch FlowStone STEM.

If you want to explore some of the example files, choose Open from the File menu.

You should already be in the correct folder but if not navigate to:

My Documents\FlowStone\FlowPaw Examples

Connect with FlowStone

FlowStone has a special component for connecting to FlowPaw. You need to start this component before you can use any of the example files. Click the red 'Start FlowPaw' trigger button to do this.


Click Here to Connect

This will illuminate when connected to the board
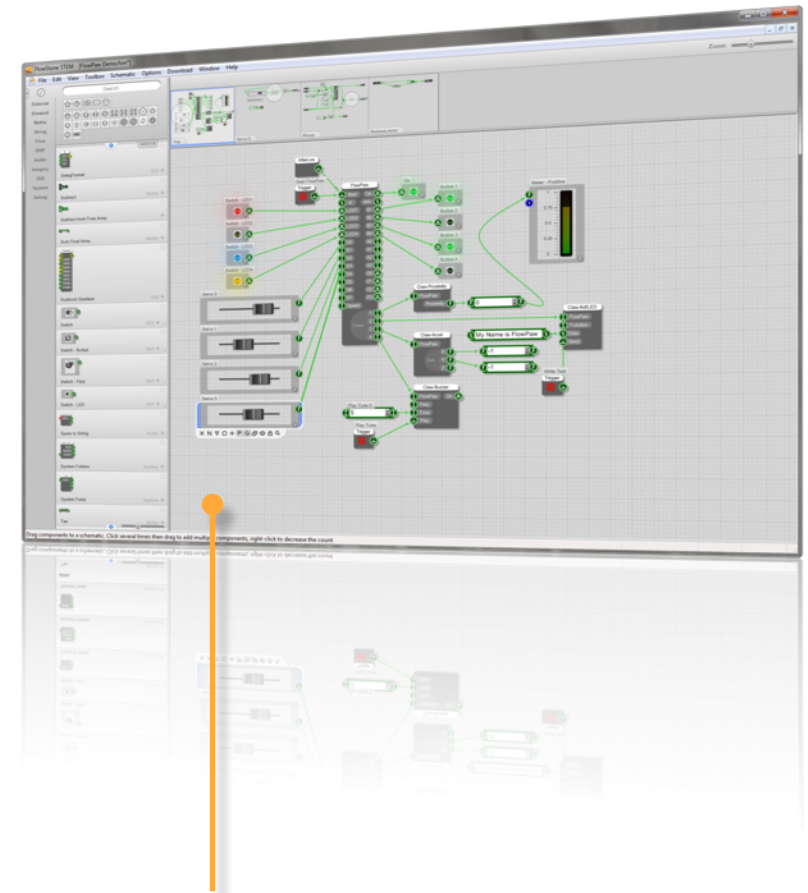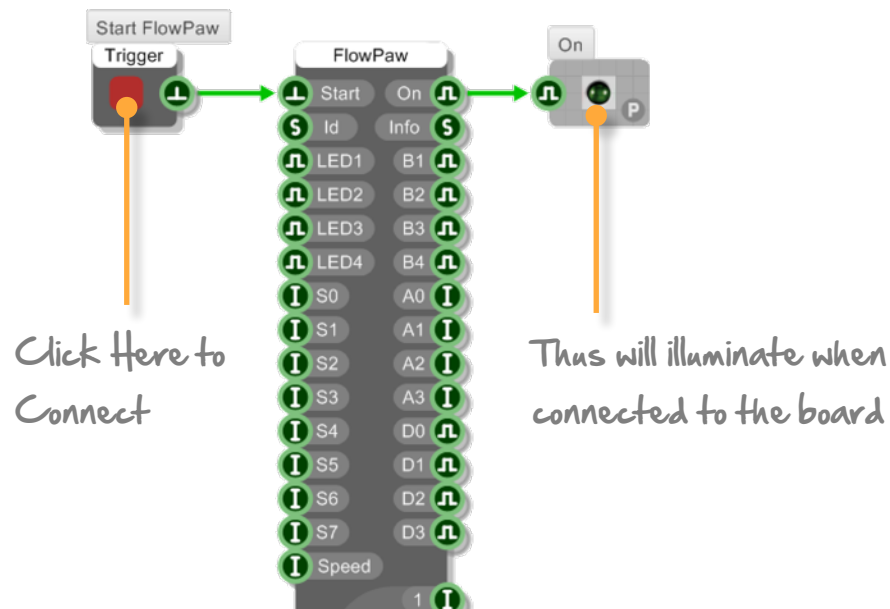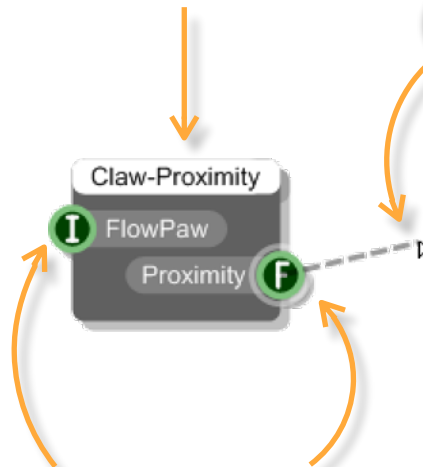

FlowStone STEM Software

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5. FlowStone STEM

FlowStone STEM is an education version of our graphical programming software FlowStone.

There are full user guides for FlowStone available from the Download menu inside the software but here's a quick overview to get you started.

ons | Download | Window | Help

User Guide...
Component Reference...
Modules...
Example Schematics...
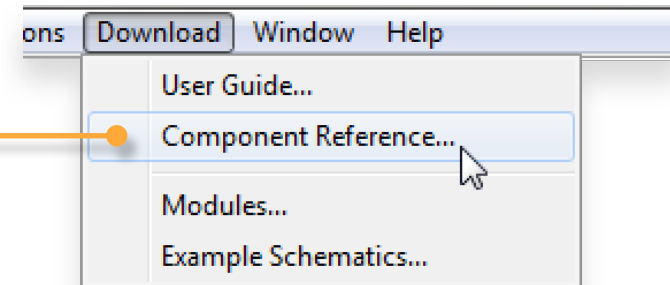
1 Programs are made by linking building blocks called COMPONENTS

3 Click on an output and drag to an input to make a LINK

Claw-Proximity
FlowPaw
Proximity

F 0

2 Components have INPUTS and OUTPUTS called connectors

4 Data is processed by one component and then passed on to the next

The FlowPaw Component

FlowStone has a special FlowPaw component which allows you to connect to a board and control it.

Connects to the board

Indicates whether connection has been established

With more than one boards attached you can specify the unique 25 char id or an integer index to identify the one you want

Information about the board including unique id, firmware version and number of click boards supported

Connect boolean values here to illuminate the LEDs on the board

The states of the 4 push buttons on the board

Set the value for each of the 8 servo outputs here (0-999)

The readings from the 4 analog inputs

The readings from the 4 digital inputs

Servo speed (0-99) or you can use 100 to engage Rover Mode which changes outputs 3,4,5 & 6 to PWM

For attaching claw components (see next section on Click Boards)

FlowPaw

Start — On
Id — Info
LED1 — B1
LED2 — B2
LED3 — B3
LED4 — B4
S0 — A0
S1 — A1
S2 — A2
S3 — A3
S4 — D0
S5 — D1
S6 — D2
S7 — D3
Speed
Claws 1 2 3 4

Click Boards

To send or receive information to or from the physical click boards there are equivalent claw components.

All you need to do is connect the claw components to the Claw outputs on the FlowPaw component.

Just make sure that the component you connect to a claw output matches the click board plugged into the corresponding claw on the physical board.
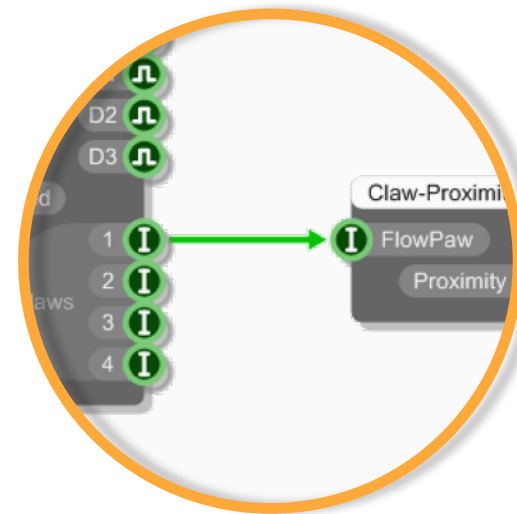
Proximity click board on Claw 1 is accessed by the equivalent component attached to the Claw1 output on the FlowPaw component.

Claw components model each supported click board
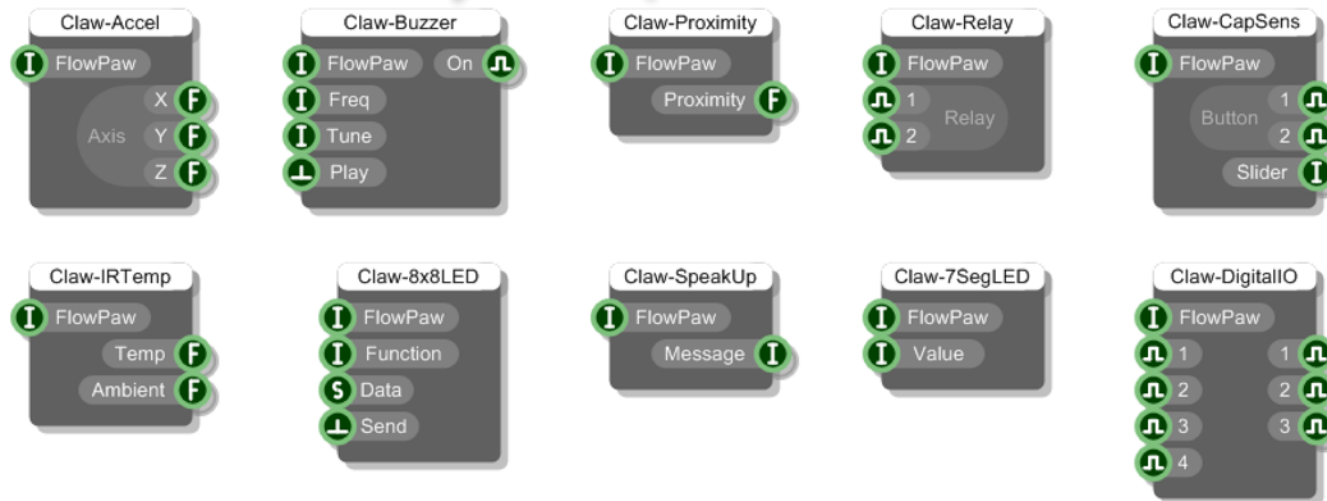
Reporting Errors

There are certain situations under which the board may stop communicating with FlowStone.

If this happens the FlowPaw component will show a red warning message in the bottom-left corner.

If you click the message a dialog box appears with more information about the problem.

To rectify the situation, usually all you need to do is press the reset button on the board and then reconnect within FlowStone.
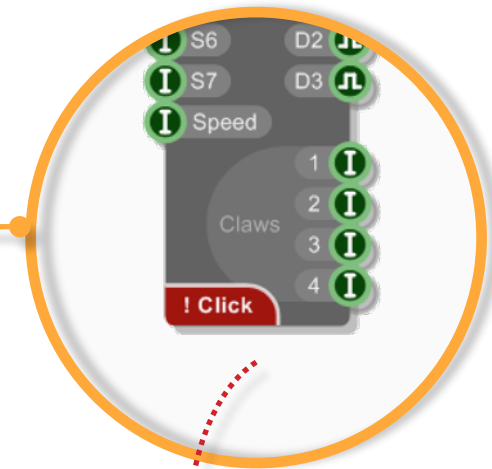
The error message appears here because you can only have one Buzzer per board
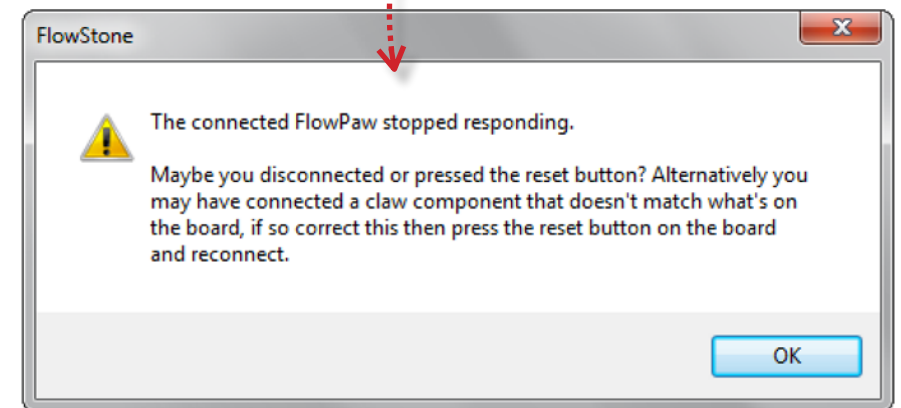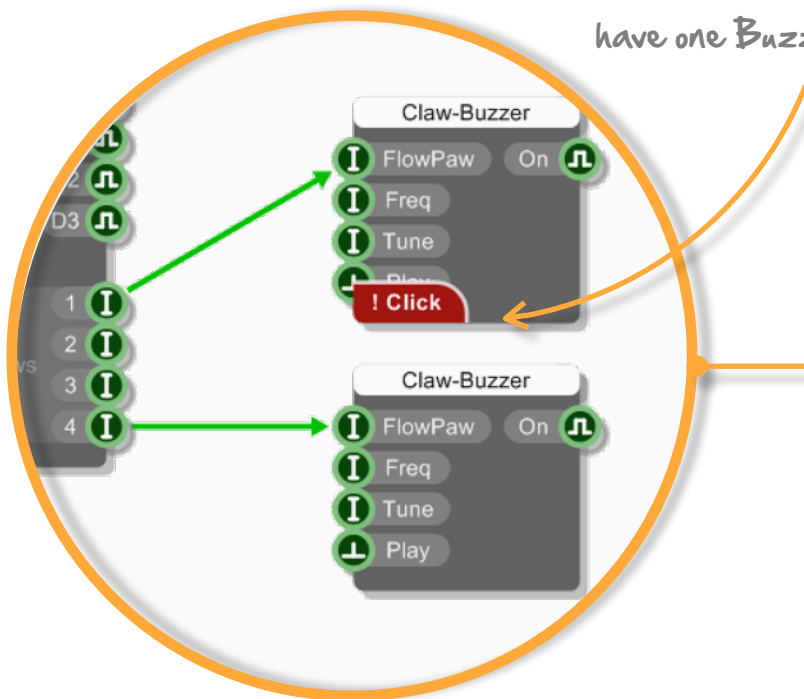
The warning message can also appear on claw components if you connect them in a way that won't work correctly or is incompatible with the way your board is set up.

To fix the problem, disconnect the claw component that is showing the error

6. Firmware Upgrades

The capabilities of your FlowBoard can be expanded and improved by upgrading the firmware. This is not as scary as it sounds. It's really easy - anyone can do it by simply following the steps below.

1 Download the latest firmware package from here:

www.flowpaw.com/files/firmware.zip

Unzip the files to a folder on your PC. There are three: the updater program **mikroBootloader USB HID.exe**, the firmware (a **.hex** file) and an instruction PDF which matches the instructions you'll find here.

2 Make sure your FlowPaw is connected to your PC.
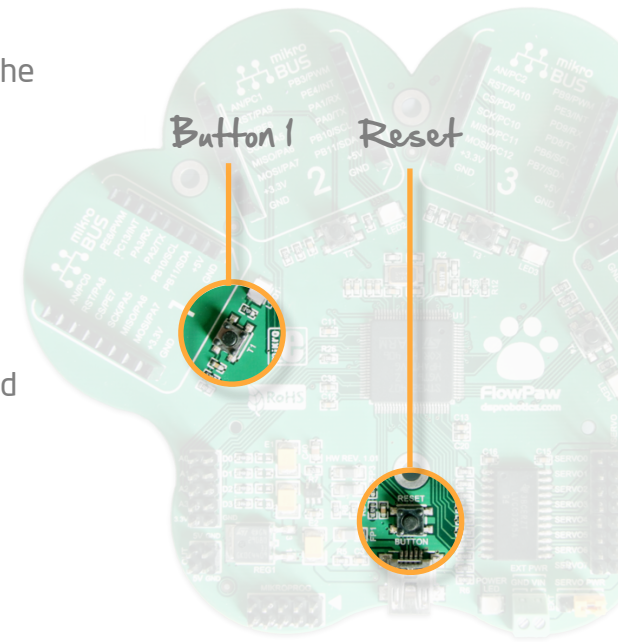
Run mikroBootloader USB HID.exe

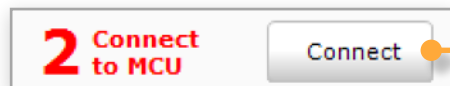**3** Press and hold both Button 1 and the Reset button on your FlowPaw.

Now release the Reset button but keep Button 1 held until the red LED1 is illuminated

The USB indicator on the mikroBootloader program will go red

Button 1   Reset

4 You now have 5-10 seconds to click the **Connect** button

    Click to Connect

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Board connected

5 If you successfully connect you'll see this confirmed in the History Window

3 Choose HEX file | Browse for HEX

Click to Choose the firmware .hex file

History Window
Attach USB HID device or reset if attached.
Waiting MCU response...
Connected.

Click the **Browse for HEX** button, navigate to the folder where you extracted the firmware files and select the firmware **.hex** file.

6 To complete the process, click the **Begin Uploading** button.

4 Start bootloader | Begin uploading

Click to upload the firmware

Bootloading progress bar

Uploading progress is shown here

Success

Restarting MCU...

Uploading program completed successfully.

⌄ Show details   OK

When the Success dialog shows the firmware has been updated. You can now use your FlowPaw again.

7. More Information

For more information on FlowStone and the FlowPaw components see the FlowStone User Guide and FlowStone Component Reference.

As mentioned earlier you can get at these from the Download menu inside FlowStone or you can follow this link:

www.dsprobotics.com/manualsarea.php

All our online information about FlowPaw can be found here:

www.flowpaw.com/getstarted

We have an active forum of FlowStone users here if you want to ask a question :

www.dsprobotics.com/support

If you need any other help or assistance that you can't find elsewhere, please contact us on the email address below:

info@flowpaw.com