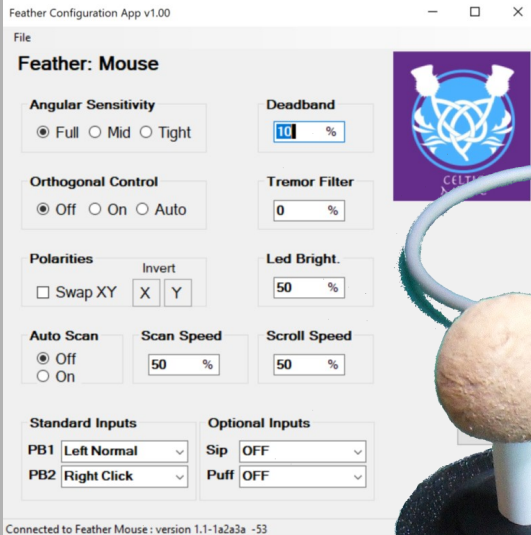


USER MANUAL



Connected to Feather Mouse : version 1.1-1a2a3a -53

FEATHER

Light Force & Customisable

Joystick / Mouse

Warnings



The Feather uses small magnets within its construction and although no stronger than what would be found in headphones those users with pacemakers should be aware and take precautions and advice before using a Feather device.



The Feather joystick has an exchangeable knob that would be a choking hazard to small children.



The Feather is a very sensitive device. Avoid leaving the in direct sunlight that may cause small distortions affecting its accuracy.

Contents

1 Introduction

- 1.1 Models
- 1.2 Hardware view
- 1.3 Configuration Application
 - 1.3.1 Basic Joystick Controls
- 1.4 Mounting
- 1.5 Adjusting the force
- 1.6 Knob selection
- 1.7 Options
 - 1.7.1 External Displays & colour blindness support
 - 1.7.2 Hand support systems
 - 1.7.3 Sip & Puff

2 Operation

- 2.1 Mouse Model CM/FM
 - 2.1.1 Configuration
 - 2.1.2 Manual / Auto Scanning
- 2.2 Joystick Model CM/FJ
 - 2.2.1 Configuration
 - 2.2.2 Microsoft Adaptive Controller (XAC) Button Mapping
- 2.3 Game Control Mixer Model CM/FGCM
 - 2.3.1 FGCM Button inputs
 - 2.3.2 Configuration
 - 2.3.3 Connecting things up
 - 2.3.4 Changing J-modes basics
 - 2.3.5 Changing J-modes detailed
 - 2.3.6 J-mode summary
 - 2.3.7 Single stick Walking & Driving

3 Specification & Support

- 3.1 Dimensions
- 3.2 Spec details
- 3.3 Support & Recalibration
- 3.4 Legal & Conformity
- 3.5 Warranty

Appendix

- A: Sip & Puff Hygiene

1 Introduction

1.1 Models

There are three models, the hardware is the same between each model but the software within the Feather models differs.

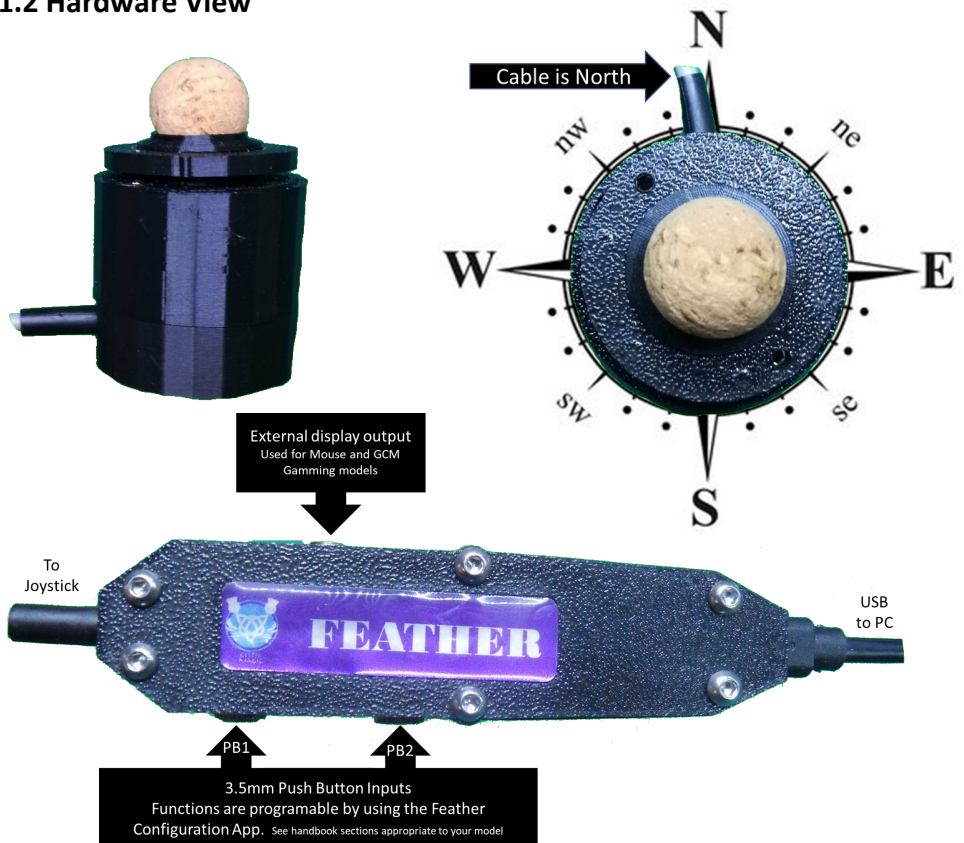
Models:

CM/FM Feather: Mouse model

CM/FJ Feather: Joystick model

CM/FGCM Feather: Game Control Mixer (an advanced gaming version)

1.2 Hardware View



1.3 Configuration Application

The PC Feather Configuration App can be downloaded from the Celtic Magic website and is used to configure any model of Feather.



Model of Feather detected → Feather: Mouse

Basic Joystick controls → Angular Sensitivity, Deadband, Orthogonal Control, Tremor Filter

Model specific controls → Polarities, Lid Bright, Auto Scan, Scan Speed, Scroll Speed
See section on Feather type

Status of Feather → Connected to Feather Mouse : version 1.1-1a2a3a -53

Factory default All → Reset All

Save changes to Feather → Save

1.3.1 Basic Joystick Controls

Angular Sensitivity: This sets the angle of movement to achieve 100% output.
Full = +/- 6 degrees | Mid = +/- 4.5 degrees | Tight = +/- 3 degrees

Deadband: The amount of movement that is ignored before the output starts.

Orthogonal control: Restricts movement to only 90 & 45 degree angles ie all angles in between are ignored. **Auto** allows any angle at high values of movement and restricts to orthogonal for fine movements.

Tremor Filter: Slows down inputs to reduce the effects of hand tremor at the cost of speed.

Polarities: Swaps the axis and axis polarities to allow for novel installations

Led Bright: Sets the brightness of any external Led displays if used.

*If the **Led Bright**. Value is set negative then a colour safe pallet is used appropriate for colour blind users. (firmware 1.7 on)*

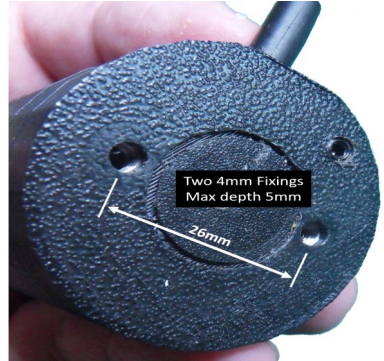
1.4 Mounting

Feathers can be mounted either by simple Velcro tape or using the 4mm mounting holes.

Any screws must not enter the Feather further than 5mm or damage may occur.

Adaptors supplied with the Feather

- 1) Camera Mount 1/4" UNC threaded
- 2) Triform Mount on three cushioned feet



Camera Mount

Part CM/F-CAM_MNT



Tri Mount

Part CM/F-TRI_MNT



Optional Feather Hand Support System

Part CM/F-HSS



1.5 Adjusting the Force

The force necessary to move the Feather is adjustable in four steps ranging from approx. 5 grams to 20 grams. The force is set by fitting one, two, three or four magnets. These being fitted under the 3mm grub screw at the centre of the of the base.

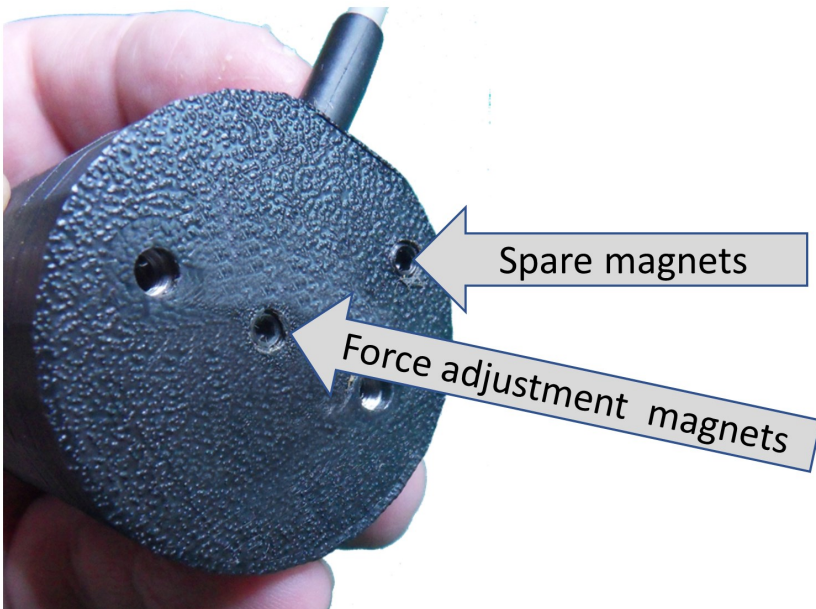


Spare magnets are stored under the second grub screw. Normally 2 magnets are fitted as standard giving approx. 10 grams of force.

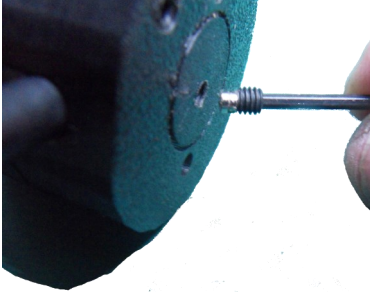
Magnets Fitted	Approx. Force	note
1	5g	Min
2	10g	Normal
3	15g	
4	20g	Max

Important that:

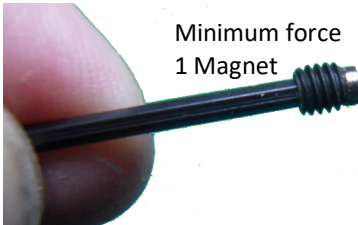
- No more than 4 magnets are fitted.
- The magnets polarity is preserved else the joystick will not centre.
- The grub screw is **NOT SCREWED IN FURTHER THAN FLUSH** else damage can occur



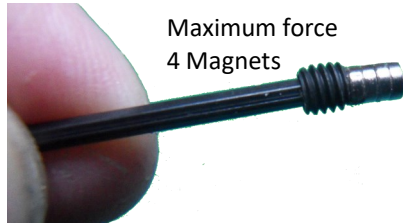
1.5 Adjusting the Force continued



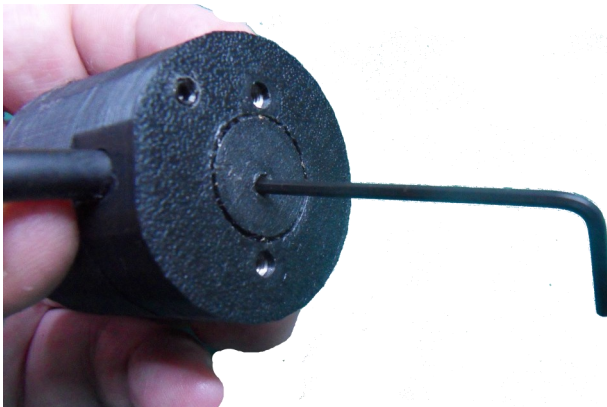
Carefully remove the 3mm grub screw taking care not to reverse the polarity & to insert the new arrangement of magnets flat.



Minimum force
1 Magnet



Maximum force
4 Magnets



Warnings

DO NOT mix up the storage grubscrew with the centre grub-screw as they are slightly different.

To avoid damage only screw the grub screw until level (flush) with the body of the Feather.

1.6 Knob selection

The knob can be replaced . The standard knob is a low profile 20mm cork sphere and is suitable for all configurations of force from 5g to 20g.

See section 1.5

Other knob options are not recommended for the lightest (5g) force option as the heavier knobs can tend to hold the Feather off centre.



Large Cork
35mm diameter

Suitable for ultra light operation
5g-20g.

Part
CM/Knob-LC



Small Cork (20mm)
Standard

Suitable for ultra light operation
5g-20g.

Part
CM/Knob-SC



Extended Cork

Suitable light operation
10g-20g

Part
CM/Knob-EC

1.7 Options

Dependant on the model of Feather several additional options are available

1.7.1 External Displays & colour blindness

Feather Mouse : display type CM/ED1

If the user requires scanning to select controls then the Celtic Magic external Display bar type CM/ED1 is required.

This fits to the top or to the side of a monitor screen indicating the mode that the mouse can be put into.

I.e clicks/ Drag / scroll etc.



Feather FGCM: display type CM/ED2



The advanced game play possible with the FGCM model is greatly enhanced by using the a compass style CM/ED2 external display that shows the current games mode selected in a colour coded compass pattern.

Colour Blindness: To use a colour safe palette appropriate for use with colour blind users then set the Led Bright. value in the Feather Configuration App to have a negative value. I.e change 50% to be -50%

(Firmware 1.7 on)

1.7.2 Feather Hand Support System

Part CM/FHSS

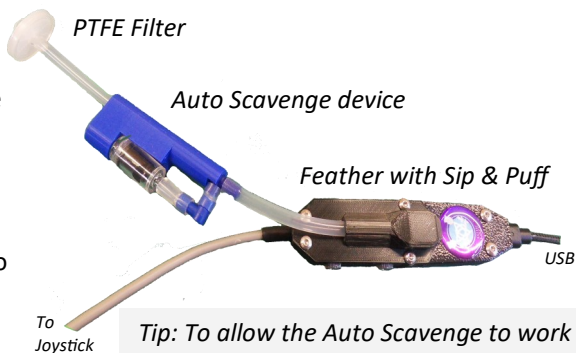
Allows the Feather to be accurately positioned at any angle-close to your hand .



1.7.3 Sip & Puff Option (model P)

The Feather with the Sip & Puff (breath) option has a silicon pipe and usually a blue device called an 'Auto Scavenge' .

The Auto Scavenge allows a tiny amount of air to return to the user on Sip such as moisture droplets close to the users lips are not allowed to travel towards the Feather.



Tip: To allow the Auto Scavenge to work best then Sip should be selected in preference to Puff for the most frequently used functions.

Next is a white circular disc that is a ptfе filter. This is the biological barrier and all components between this filter and the user must be cleaned daily.

See appendix A for hygiene & cleaning details

Either a gooseneck table or headset mounted Sip & Puff mouth connections will have been supplied with your Feather P



Headset
Model CN/SPHS-S/M/L



Table Mounted Gooseneck
Model CN/GN500SPT

2.1 Operation Mouse: model CM/FM

Mouse Control

The Feather mouse model CM/FM appears to the computer as a USB mouse and can be customised using the Celtic Magic Feather PC configuration application to suit the user.

There are three basic types of mouse operation to choose from.

1 Normal

Left and right buttons via the external inputs give access to left & right clicks

2 Manual scan

Used with a Celtic Magic external display (model CM/ED1) that will show which command is being selected. *See section 2.1.2*



External Display ED1

3 Auto (Button free)

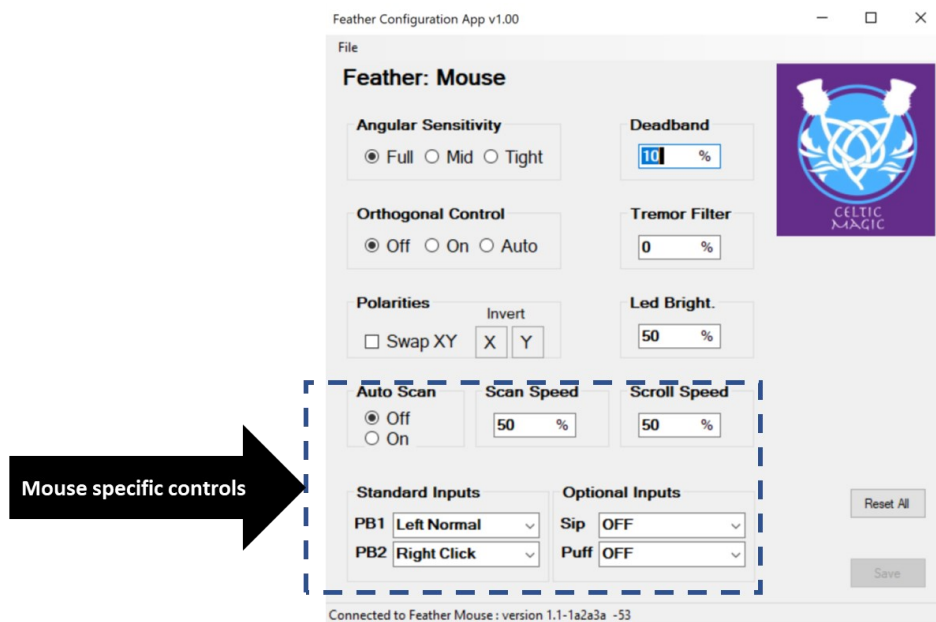
With the joystick centred the rightmost three leds on the ED1 display toggles between Red & Green. When on Green if the joystick is moved then the mouse cursor will move normally.

However if moved to the right (East) whilst Red leds are showing then the command can be selected as in Manual Scan above.

If moved Up, Left or Down when the Red leds are on, selects options associated with the left button ie single/double click or drag..

See section 2.1.2

2.1.1 Configuring Mouse Features



Auto Scan: Selects button free selection using only joystick movements to also operate buttons and features. See section 2.1.3 for full details.

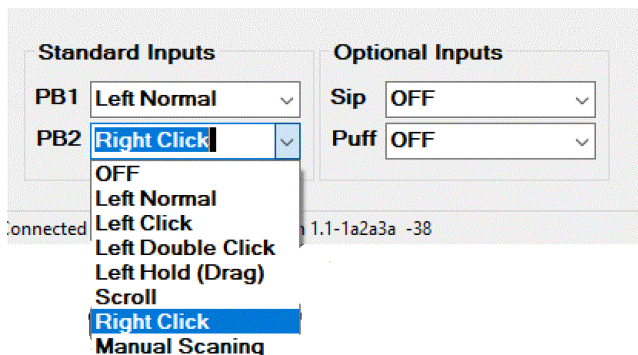
Scan Speed: Sets the speed for Auto or Manual scan selection of buttons and features. See sections 2.1.2 & 3

Scroll Speed: The rate that the screen scrolls up and down when scroll is activated.

Standard Inputs: Each button can be selected to be any of the shown functions.

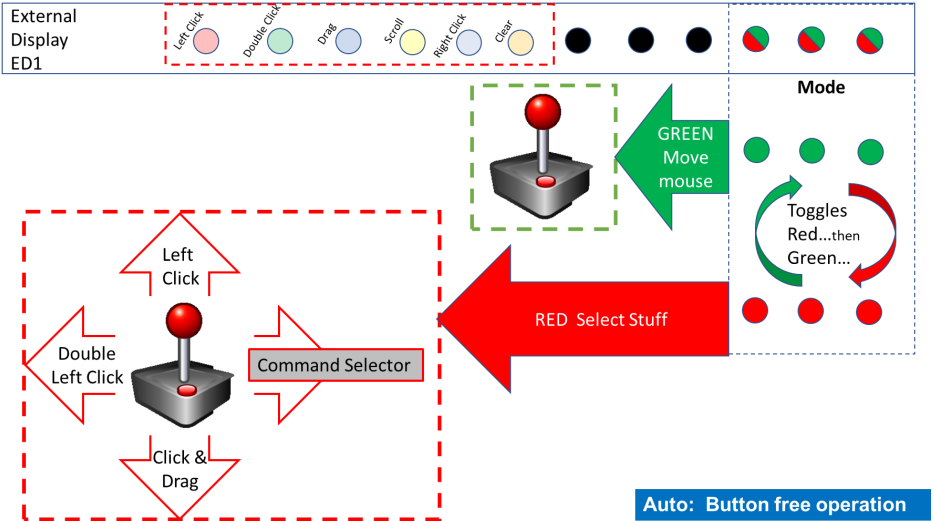
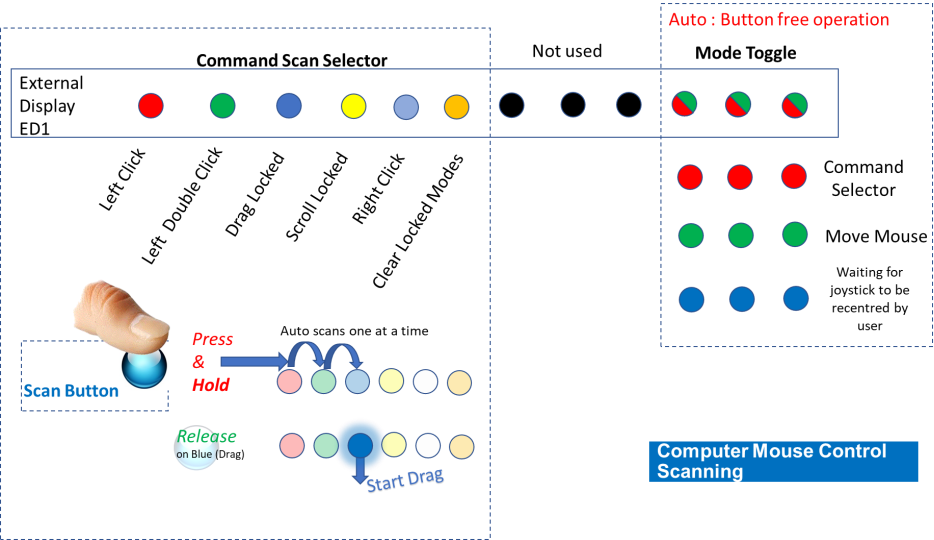
Optional Inputs:

As standard Inputs using Sip & Puff if Feather has the Sip & Puff option fitted.



2.1.2 Manual & Auto Scanning

Using the external display (CM/ED1) any mouse features can be selected either by using a single button configured as Manual Scan or by using no buttons if the button free Auto Scan is turned on.



2.2 Operation Joystick: model CM/FJ

Simple Joystick Control

The Feather joystick model CM/FM appears to a computer as a simple PC joystick with two buttons & is customised using the Celtic Magic Feather PC configuration application.

When used with a PC the two buttons can be configured to be any of 1–8 buttons available on a PC joystick.

It is also compatible with the Microsoft Adaptive Controller often referred to as a XAC.

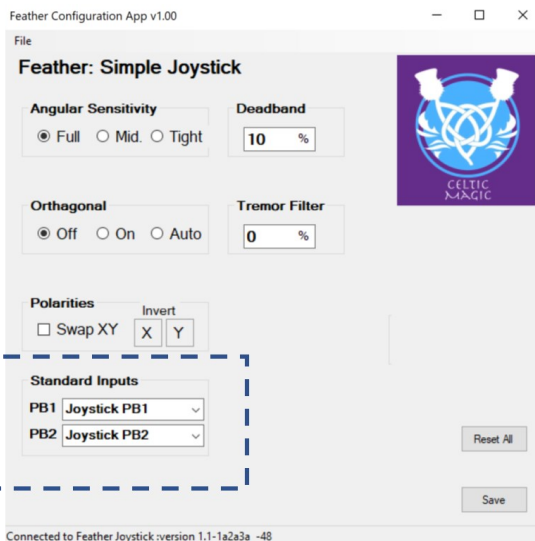
The XAC unfortunately does not support joystick buttons in a useful way.



2.2.1 Configuration

Unlike the Mouse or FGCM variants of the Feather there are fewer customisable features apart from the standard elements covered in section 1.2 above.

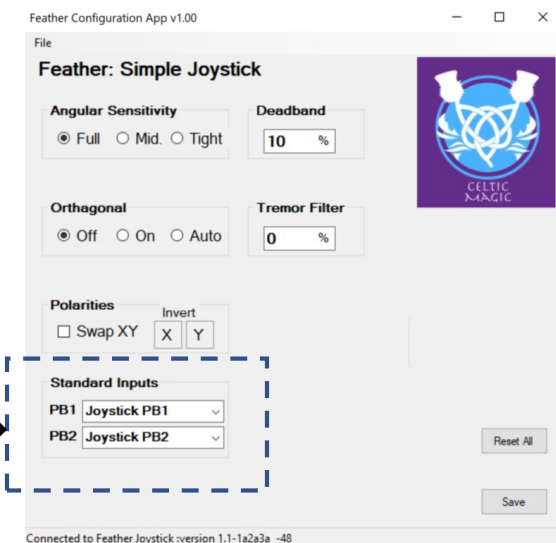
Joystick specific controls



2.2.2 Microsoft Adaptive Controller (XAC) Button Mapping

The action of the PB button inputs into the Feather operate different features of the XAC dependant on which USB, right or left is used on the XAC. Below is a table that shows the options. Your XAC will require updating to firmware from September 2024 onward using the Xbox Accessory App .

Joystick specific controls



Feather PB Button	Using the XAC Left USB	Using the XAC Right USB
1	Left stick 100% North	View Button
2	Left stick 100% South	Menu Button
3	Left stick button	Left stick button
4	Left shoulder button	Right shoulder button
5	Button A	Button Y
6	Button B	Button X
7	View button	Left stick 100% North
8	Menu button	Left stick 100% South

2.3 Operation Games Control Mixer: model CM/FGCM

Games Control Mixer

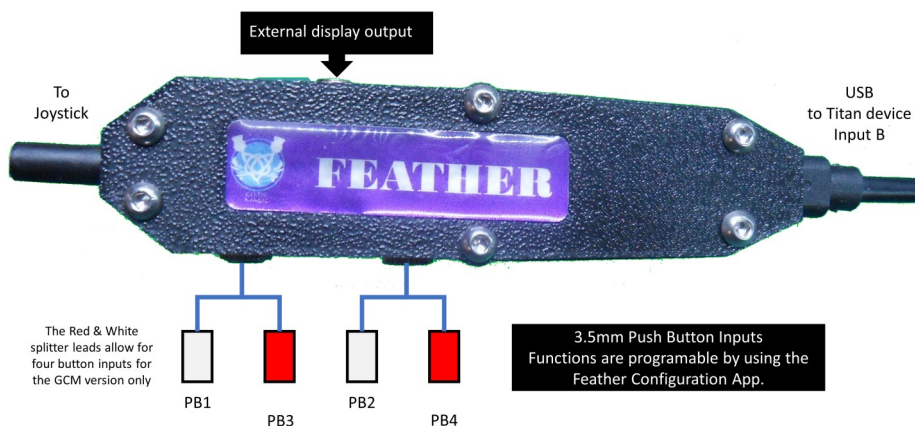
The Feather Games Control Mixer model CM/FGCM is designed to operate as a input device into the Console Tuner Titan Two device running Celtic Magic J method software. The combination of the Feather offering unparalleled sensitivity and the Titan offering access to all popular consoles is a powerful combination.

The details of all the options available are beyond this hand book and further information is available on the Celtic Magic website.

The concept is that a single button or sip or puff changes the Joystick into a four ways switch North/ East/ South & West. 8 different modes (called J modes) are then available in each of these directions, eg changing the single Feather joystick from say left stick to right stick and a host of other possibilities.

2.3.1 FGCM Button inputs

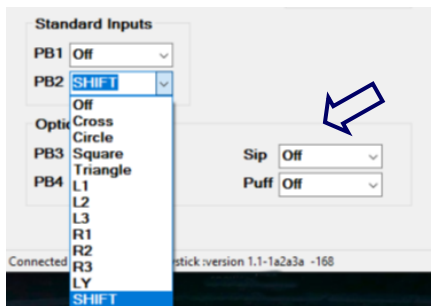
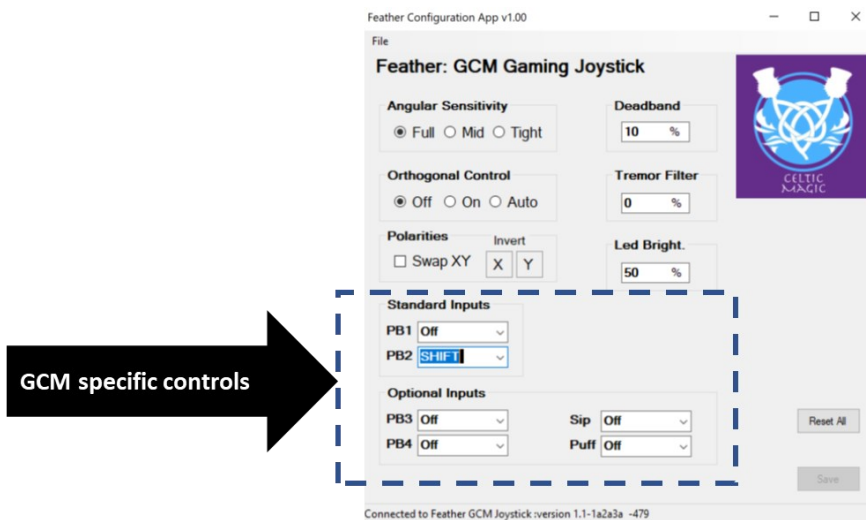
Unlike the Mouse & standard Joystick models the Feather FGCM supports up to 4 inputs in is normally used with two spitter cables that allows for byttions PB1—PB4 as shown. One of these inputs should be configured as SHIFT and by default this is PB2.



2.3.2 FGCM Configuration

One of the two Standard Inputs PB inputs should be configured as SHIFT and by default this is PB2.

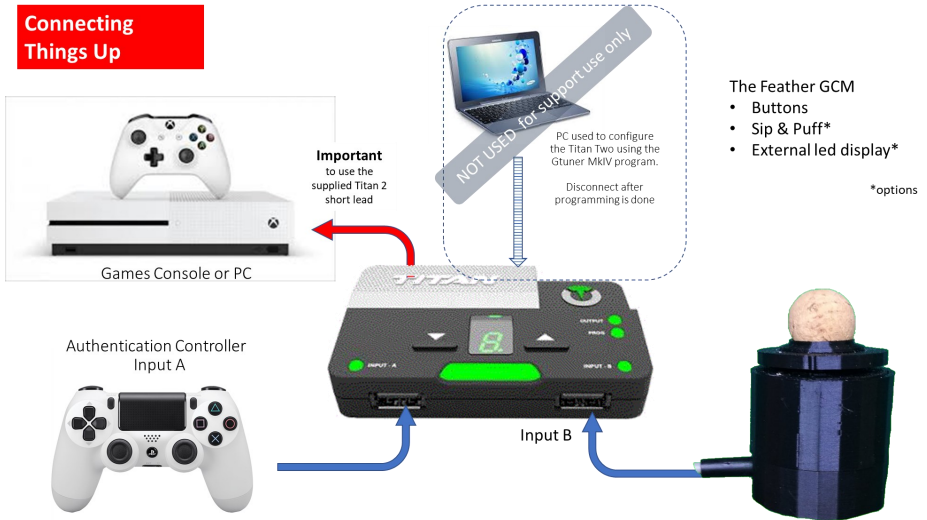
Additional Optional Inputs are available ,up to four PBs on request.



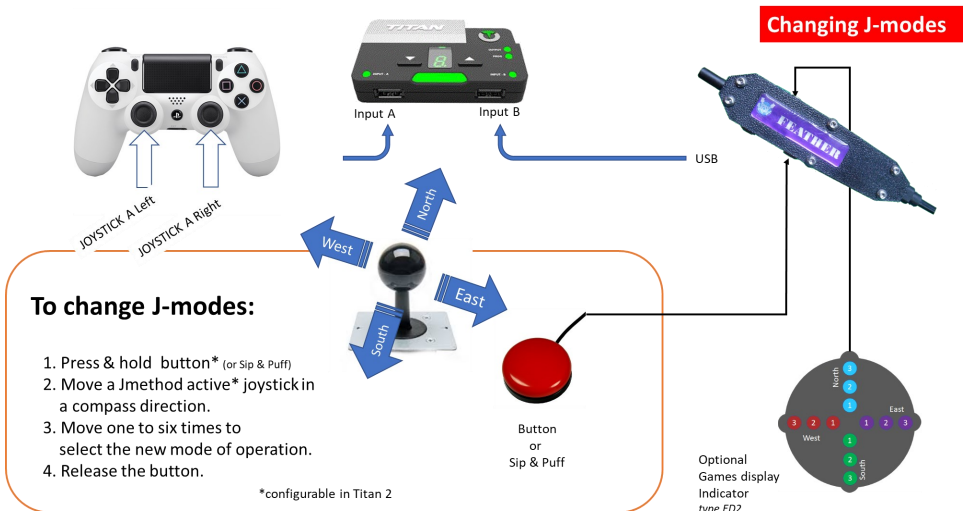
Sip & Puff is also supported* and offers the same options along with TITAN ONLY where analogue levels of Sip & Puff can be utilised for example to accelerate or brake.

** feature pending*

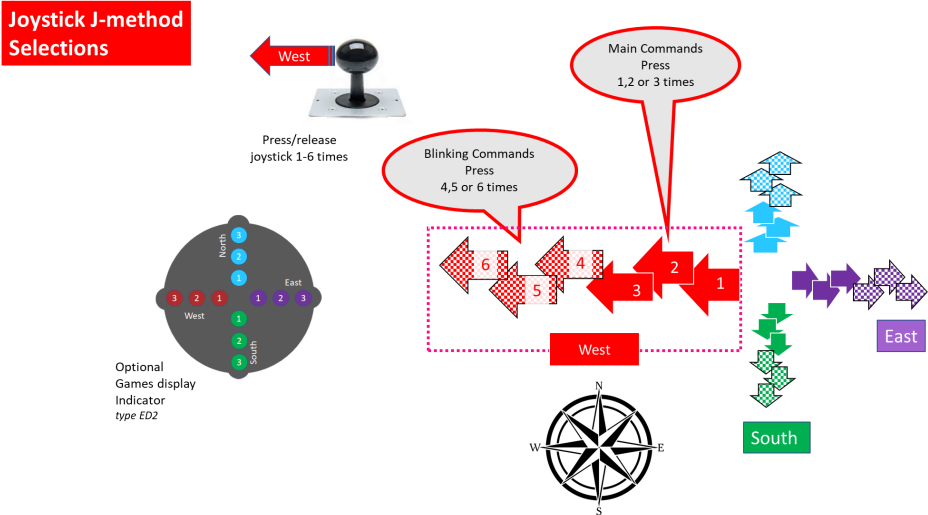
2.3.3 Connecting things up : FGCM



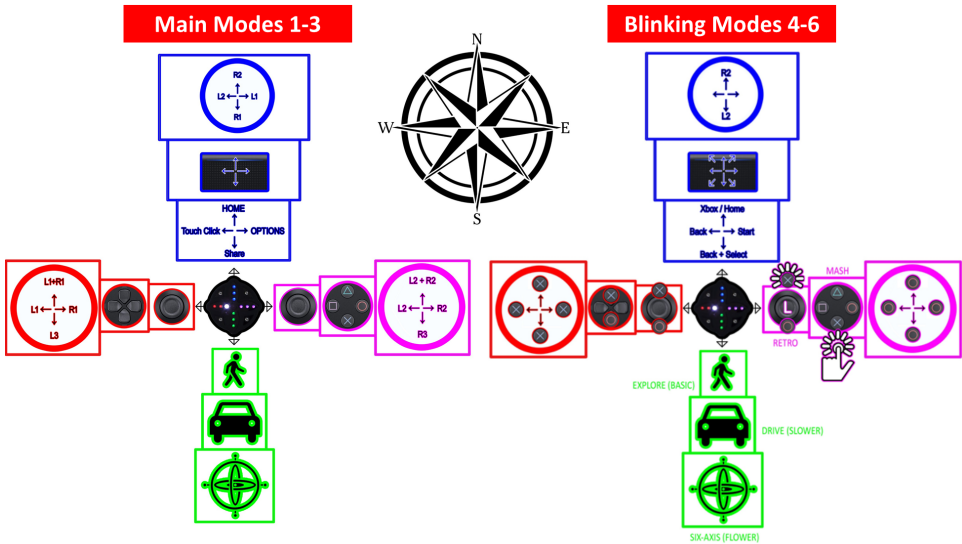
2.3.4 Changing J-modes basics : FGCM



2.3.5 Changing J-mode detailed : FGCM



2.3.6 J-mode summary : FGCM



3.2 Specifications

Electrical		notes
Connection to computer	USB	
Max load	60mA	With ext. display
Lead length	1.2m	
No of inputs	2x 3.5mm	4 optional
Outputs	1x 3.5mm	To external display
Input—push buttons	2/4 x 3.5mm	4 is an option
Sensor technology	Magnetic flux	
Angular resolution	0.5%	
Mechanical		
Ingress rating	IP42	
Suspension system	magnetic	
Operating temperature	0C—30C	
Storage Temperature	-15C—40C	
Operating force	5/10/16/20 grams	user selectable
Movement angle	+/- 6 degrees	
Sip & Puff	max +/-1psi	

3.3 Support & Recalibration

For the latest support information please visit the support webpage or scan the QR code

www.celticmagic.org/feather-support

If the feather exhibits symptoms that indicate a recalibration is necessary such as creeping on its own or not achieving full output then it is simple to recalibrate follow the short video on the same webpage.



3.4 Legal & Conformity

Disclaimer: Terms and product names may be trademarks of others. The information in this document is provided in connection with Celtic Magic products. No license, express or implied or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Celtic Magic products. Neither the whole nor any part of the information contained in or the product described in this document may be adapted or reproduced in any material form except with the prior written permission of the copyright holder, unless it is clearly stated by Celtic Magic that the product is licensed under the Open Source Hardware (OSHW) Definition 1.0. The product described in this document is subject to continuous development and improvements. All particulars of the product and its use contained in this document are given by Celtic Magic in good faith. However all warranties implied or expressed including but not limited to implied warranties of merchantability or fitness for purpose are excluded. This document is intended only to assist the reader in the use of the product. Celtic Magic shall not be liable for any loss or damage arising from the use of any information in this document or any error or omission in such information or any incorrect use of the product.

3.5 Celtic Magic Feather Limited Warranty

What Does This Warranty Cover?

This warranty covers any defects or malfunctions in your new Feather.

How Long Does The Coverage Last?

This warranty lasts from one year of purchase date. Coverage terminates if you sell or otherwise transfer the device.

What Will Celtic Magic Do?

Celtic Magic will replace any defective or malfunctioning part at no charge..

What Does This Warranty Not Cover?

The headset silicon micro pipe which is vulnerable to biting damage if mis-used. Any other problem that is caused by abuse, misuse, or an act of God (such as a flood) are not covered. Also, consequential and incidental damages are not recoverable under this warranty.

Manufacturer’s declaration of conformity

EU Declaration of Conformity to ISO/IEC 17050-1

Manufacturers name: Celtic Magic
Manufacturers address: 126 Leicester. LE7 7JJ

Declares that this product:

Product Type: Joystick /Mouse
Product Name: Feather Joystick
Product Options: Pressure - breath control

Conforms to the following standards

EMC compatibility 2004/108/EC
Low voltage directive 2006/95/EC
General product safety 2001/95/EC

Supplementary information:

This equipment complies with the requirements for the CE mark



Appendix A : Sip & Puff Hygiene

Your headset or tube assemble is supplied with a 60ml syringe with a female luer lock connection. To clean the internal pipes this can be attached just to the headset itself or the whole pipe assembly.

To clean the internal pipework use a warm strong soapy water solution. Use a full syringe to flush this cleaning solution through the pipework. Refill the syringe with clean water and flush out the soap solution twice then use the syringe again to blow air only to remove the water from the cleaned pipe work until no water splutters from the pipe. It may take several strong pumps of air to get all the water out.

Never attempt to flush clean the ptfe filter at the GCM end this is not a serviceable component.

Daily: Flush all tubes as above and hang to dry overnight in a clean area. Wipe clean the external headset using warm soapy water and dry.

Weekly or after a period of no use: Flush ALL removable pipework as above and leave to dry overnight

Every Month Inspect the head set, connecting pipework and fittings looking for signs of wear and tear.

Every 12 Months Fit a new PTFE filter. If there has been heavy use, may also need to renew headset and connecting pipework.

If a GCM device with breath is used by multiple users perhaps in a medical environment it is important that each user not only has their own headset / mouth piece but also their own connection pipe and ptfe filter as all these parts form a biologically common element. The PTFE filter is 0.2um and considered a biological barrier.