USER MANUAL

DANGLE

USB JOYSTICK / MOUSE

- Very light force
- Wide low profile & top chin user grips
- Configurable by PC App
- Microsoft XAC compatible
- Advanced features:

  - ◊ Sensitivity adjustable for different directions
  - ◊ Auto braking: acts like a track ball
  - ◊ Auto toggle directions for extreme immobility
  - ◊ Single button control of all mouse features

Warnings

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

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

Contents

1 Introduction

At an operational force of only ten grams, the Dangle is a very light-force joystick indeed. It is an inverted design with magnetic centring and is configured via a PC application.

With the user's fingers below the mechanism, it offers a low profile of 16mm along with a low force tactile button built in when pressed downward.

The lower grip is double width and can be used by up to three fingers whilst the upper grip can be used for chin operation.

The mouse models have an automatic stop feature built in called Auto Brake such as the cursor will freeze when the joystick moves towards the centre. This offers a feel a little like using a trackball and is more natural to use when controlling a mouse cursor from a joystick.

1.1 Models

There are four models of Dangle optimised to their application

1) CM/DMAX The Max is an advanced mouse controller with additional inputs and outputs from its larger control box

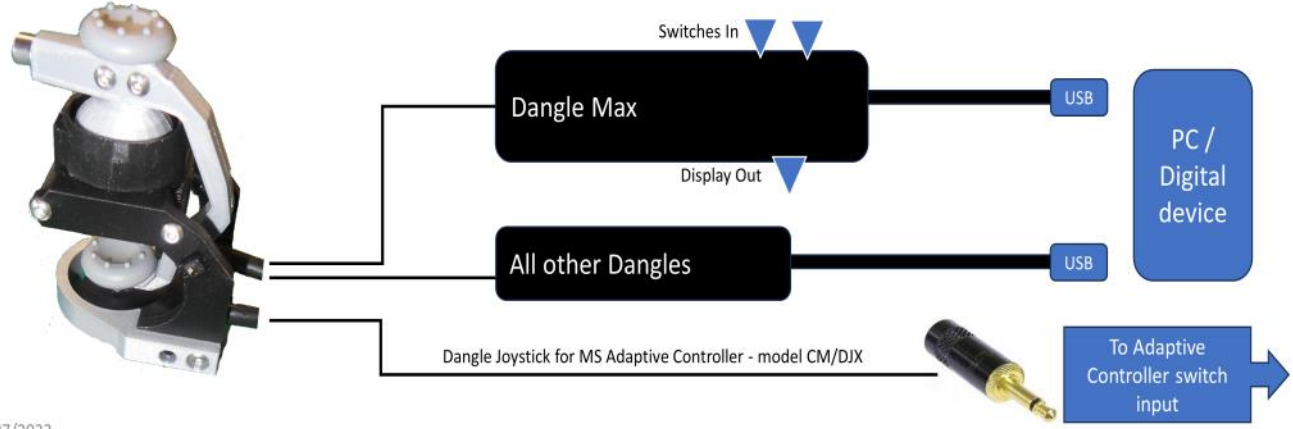
2) CM/DM Mouse model: Single configurable button incorporated

3) CM/DJ Joystick model: Single configurable button incorporated

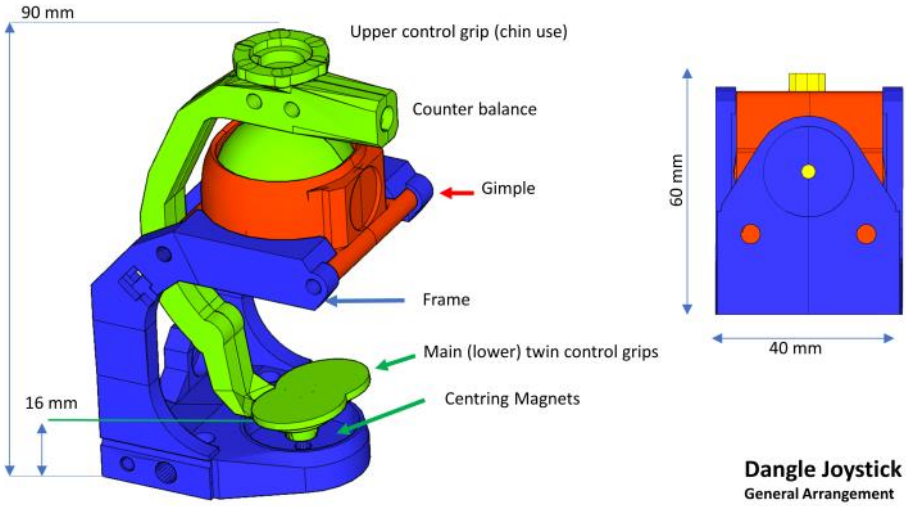
4) CM/DJX Joystick model for the Microsoft Adaptive Controller, it is identical to the CM/DJ model except that integrated button is brought out on a flying lead with a 3.5mm plug. This can be plugged into the Adaptive Controller to operate any button as required.

1.2 Model Comparisons

DANGLE JOYSTICK SELECTION	Dangle Max Advanced Mouse Controller	Dangle Mouse	Dangle Joystick	Dangle Joystick For MS Adaptive Controller
Part no.	CM/Dmax	CM/DM	CM/DJ	CM/DJX
Mouse cursor control	Yes	Yes	No	No
Joystick output	No	No	Yes	Yes
Integrated button (programmable)	Yes	Yes	Yes	No
3.5mm lead from integrated button	No	No	No	Yes
Two external button inputs	Yes	No	No	No
External display output to led bar (model CM/ED1)	Yes	No	No	No
Optional Sip & Puff support	Yes	No	No	No



1.3 Hardware



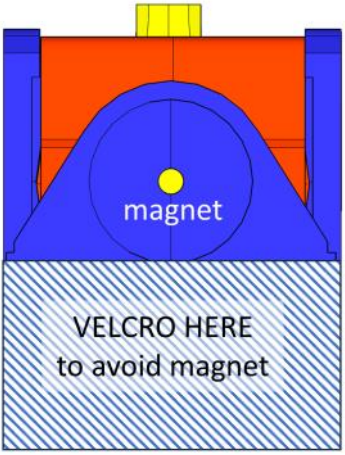
Dangle Joystick
General Arrangement

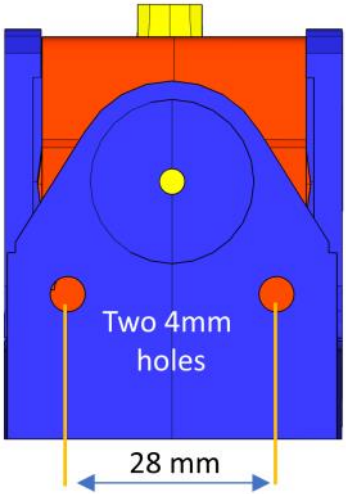
The compass directions shown below are used when configuring the Angular Sensitivity. See 2.1.1

1.4 Mounting

Dangle joysticks can be mounted either by simple Velcro tape or using the 4mm mounting holes. Please avoid the magnet area when using Velcro.

Celtic Magic can supply a 1/4" UNC camera mount adapter part CM/D-CAM on request that utilises the 4mm mounting holes.





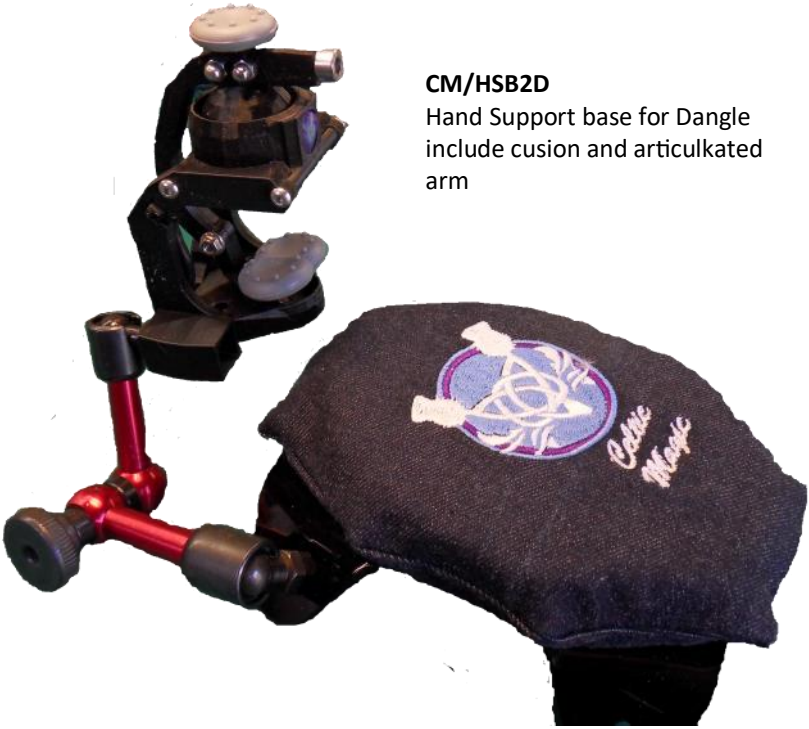
The Dangle can optionally be mounted from a Celtic Magic hand support base CM/ HSB1 , 2 or 3.

See next page & website for fuller details: www.celticmagic.org/dangle

1.4.1 Optional Mounting Systems

There are several optional hand supports available one (CM/HSB2D) of which is shown below, allowing the users hand to be supported and the Dangle to be mounted at any position best for the users comfort.

There are two options the HSB2/D shown below and is aprox sized A5 and its bigger sister HSB3/D which is aprox A4 and is morsuitable for gaming where addition



CM/HSB2D
Hand Support base for Dangle include cusion and articulkated arm

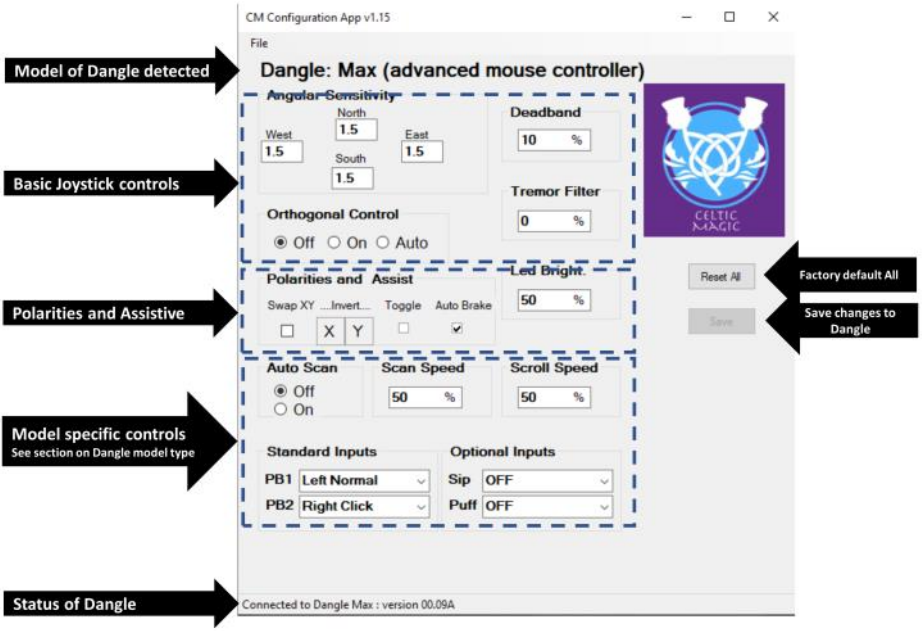
CM/D_CamMount
Camera mount accessory bolts onto base of a Dangle. Usually standard the silver legs would be removed.

2 Configuration Application

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

www.celticmagic.org/dangle

The options shown will be appropriate to the model of Dangle connected and in this example the fully featured Dangle Max is illustrated.



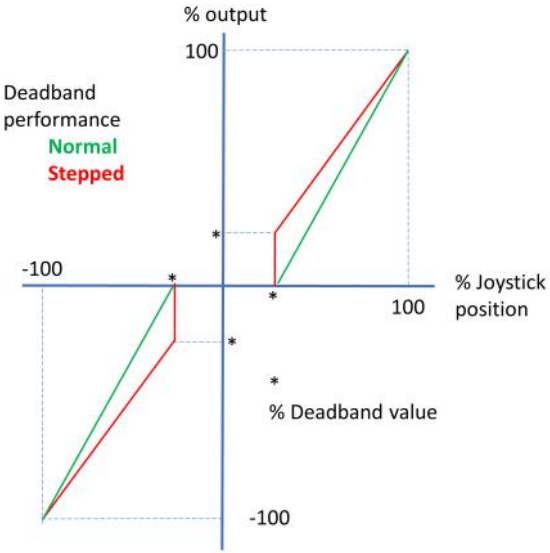
2.1 Basic Joystick Controls

2.1.1 Angular Sensitivity:
The Dangle allows for the sensitivity to be adjusted in all four polar directions. This is always the same directions as per the Dangle device as shown and is **unaffected by any Polarity changes made (see 2.2.1).**

The higher the number the greater the sensitivity.

If the sensitivity was to be set to 1 then full output would be at maximum possible swing, this is greater than normally needed and the Angular Sensitivity is typically set between 1.5—3 but can be higher or lower if so required.

2.1.2 Deadband:
The amount of movement that is ignored before the output starts. There are two types of dead-band available.



Normal: As the movement exceeds the deadband (say 10%) then from 10% angle the output starts to rise from 0% to 100% as the joystick angle increases.

Stepped: From the above example— The output starts to rise from 10% angle (the deadband value) to 100% output as the joystick angle increases.

To invoke the Stepped style of deadband enter the Deadband value as a negative number.

2.1.3 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.

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

2.2 Polarities & Assistive

2.2.1 Polarities:
Swaps the axis and axis polarities to allow for novel installations. Note that polarity changes do not affect the Angular Sensitivity setting (see 2.1.1) which remains locked to the North, South East & West orientation of the Dangle.

Tip: When changing Polarities it can become confusing. First change the 'Swap XY' before flipping the X and/or Y axis.

2.2.2 Toggle:
Used for very limited user movements when a user can only just push OR pull the stick.

Both the X&Y polarities automatically reverse each time the joystick centres. More useful for mouse control than gaming. The CM/Dmax model can support and external dieplay bar (CM/ED1) and if used indication of direction will be shown before the cursor moves otherwise the movement must be observed and if the opposite movement to that required, then recentre and move again.

2.2.3 Auto Brake: *Dangle Mouse/Max models only ((CM/DM CM/Dmax)*

Auto Brake offers the feel similar to using a trackball.

This is normally ON by default. It assists the user by automatically stopping the mouse cursor dead when the joystick 'begins' to return to centre and before the joystick is actually on centre.

With the feature OFF the mouse slows down and only comes to rest once the joystick is at centre and an overshoot of the desired position can then occur.

Auto Brake Tip: When the cursor abruptly stops but you wish to continue in the same direction, reduce the joystick angle just a little but not all the way back to the centre.

Then move in the same direction and the mouse will move again.
This feel similar to using a Trackball

2.2.4 Led Bright: *Dangle max only (CM/Dmax)*
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**.**

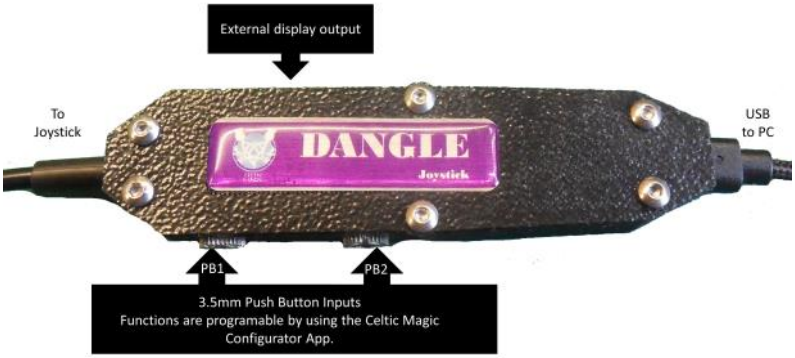
For other advanced parameters See Dangle Max section 3

3 Dangle Max: Advanced Mouse Controller

Model CM/DMax

The Dangle model CM/Dmax appears to the computer as a USB mouse and can be customised using the Celtic Magic Configurator application (see 2) to suit the user. The mouse control has an Auto Brake feature built in such as the cursor will freeze when the joystick moves towards the centre. This give a feel a little like using a trackball and can be turned off in the app.

The integrated button on the Dangle joystick acts the same as the PB1 input



3.1 Mouse Buttons There are three basic types of mouse button operation to choose from…

3.1.1 Normal button operation
Left and right buttons via the external inputs give access to left & right clicks. These defaults can be changed in the app.

External Display ED1

3.1.2 Manual scanning (models Dmax & DM)

The Manual scanning allows for single button operation of all mouse features such scrolling and dragging. Manual scanning is activated in the Configuration app and selecting Manual Scanning as an option for a PB button input.

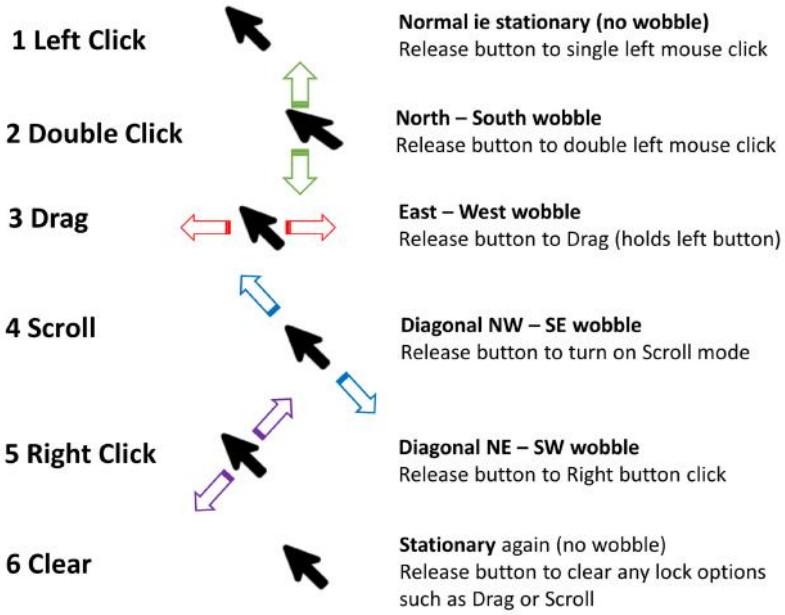
Holding the button on will step through the various options and either by using an external display (ED1) from a Dmax Dangle or by using the Wobble codes (all mouse models) where the cursor will vibrate slightly indicating the function.

When the button is *released* the selected function occurs.

Dmax model CM/Dmax: Used either with the optional Celtic Magic external display (model CM/ED1) that will show which command is being selected. *See section 3.3.* Or by using the cursor wobble codes below.

Simple Mouse model CM/DM: As the DM model does not have the options to support an external display as the Dmax does, the DM model only uses the Wobble codes below.

3.1.3 Wobble Patterns



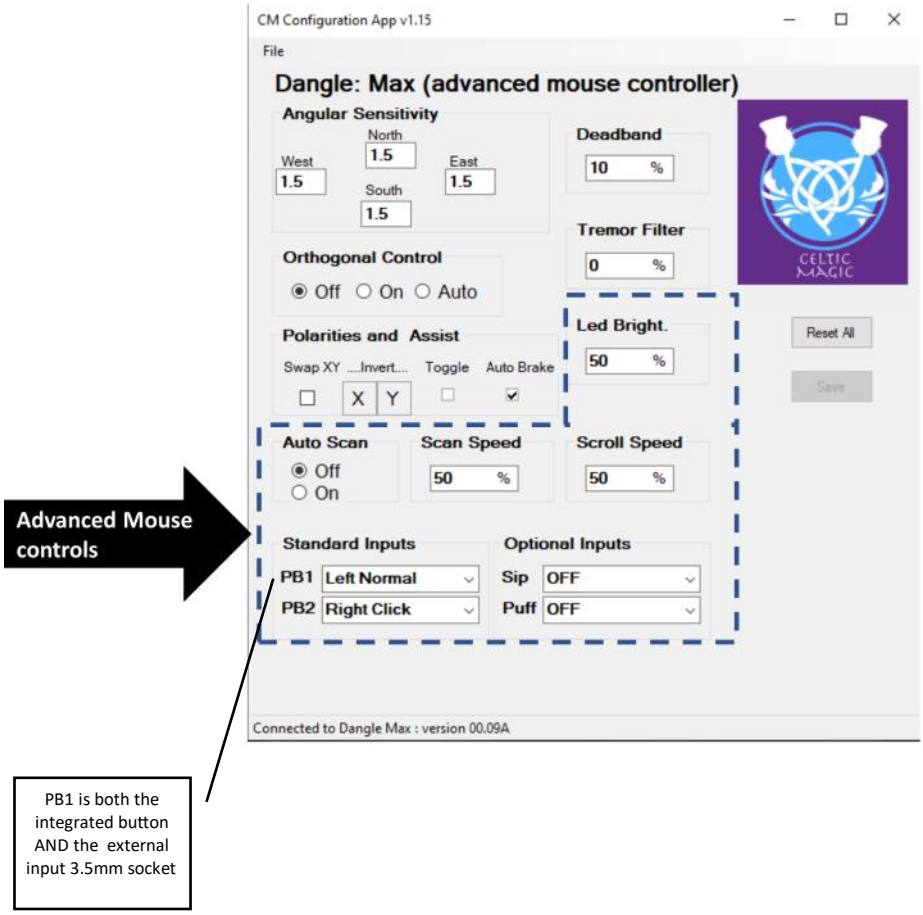
3.1.4 Auto scanning—Button free operation

(Requires external display CM/ED1)

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. See 3.3 for illustrations

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 graphic in section 3.3



Configuring Advanced Mouse Features—continued

Auto Scanning: Selects button free selection using only joystick movements to also operate buttons and features. See section 3.1.3 & 3.3

Scan Speed: Sets the speed for Auto or Manual scan selection of buttons and features. See sections 3.1.2, 3.1.3 & 3.3

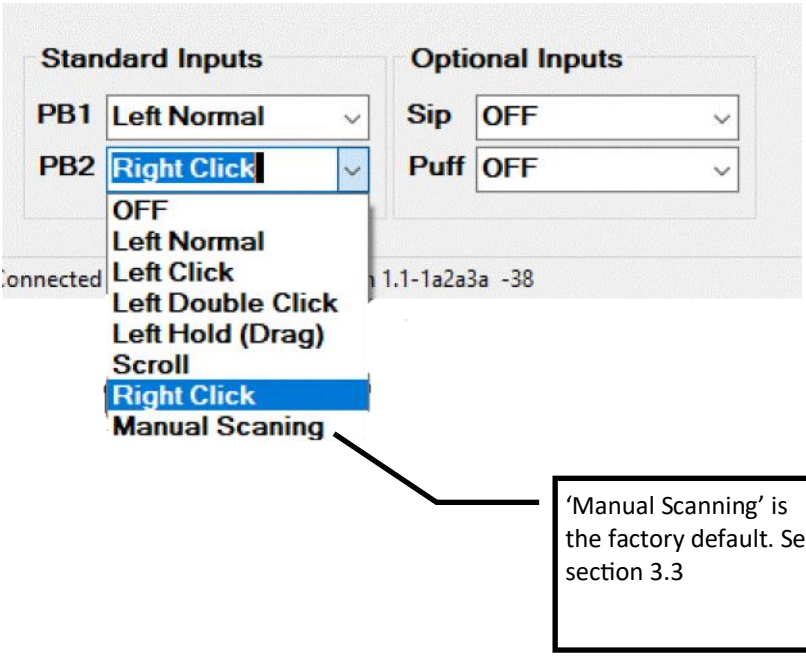
Continued...

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. The integrated button is the same as the PB1 input.

Optional Inputs:
As standard Inputs using Sip & Puff if Dangle has the Sip & Puff option fitted.

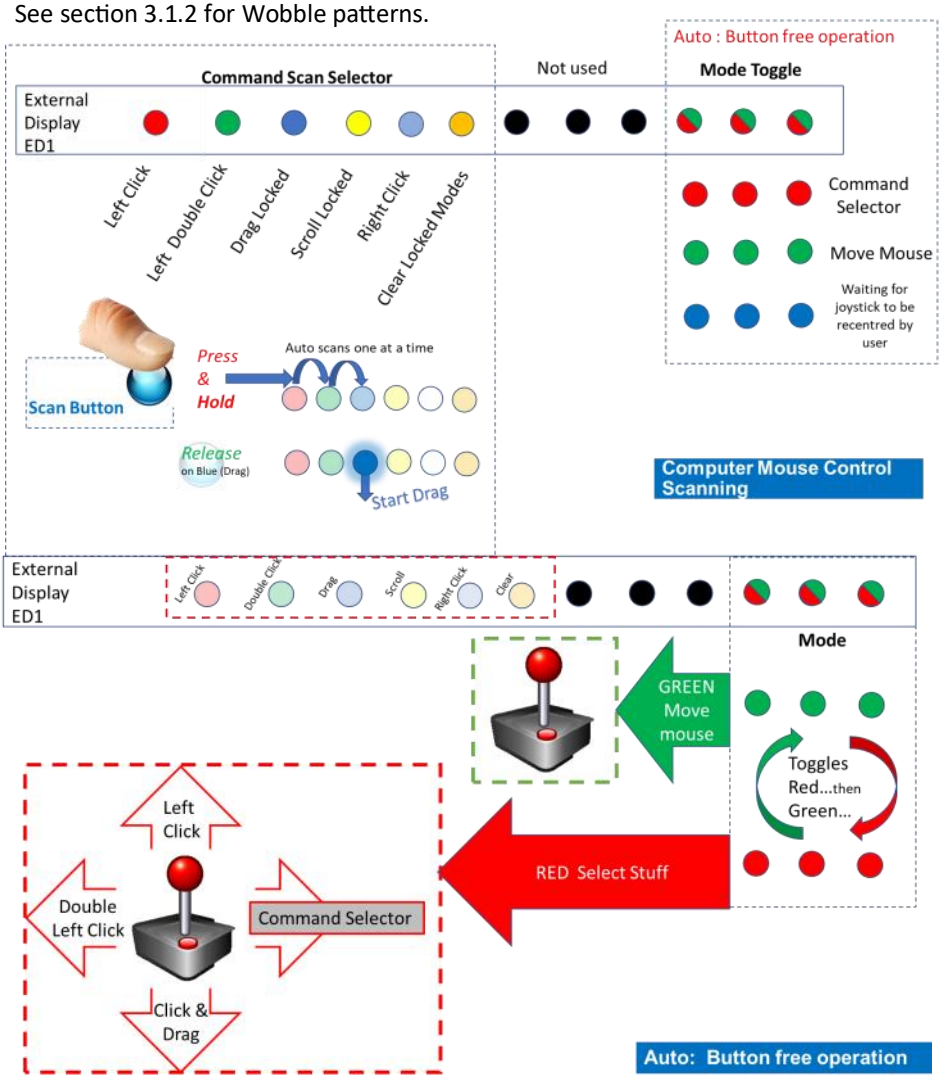
Led Bright:
Sets the brightness of any external Led displays if used. If the **Led Bright.** Value is set negative then a colour safe pallet are used appropriate for colour blind users**.**



3.3 Using Manual & Auto Scanning

Using the external display (CM/ED1) any mouse features can be selected either by using a single button configured as Manual Scanning or by using no buttons if the button free Auto Scan is turned on. See sections 3.1.2, 3.1.3 and 3.2.

The scanning options can either be from an external display (part CM/ED1) supported by the Dmax model or using Wobble pattern codes where the cursor vibrates in a pattern indicating the command to be selected.
See section 3.1.2 for Wobble patterns.



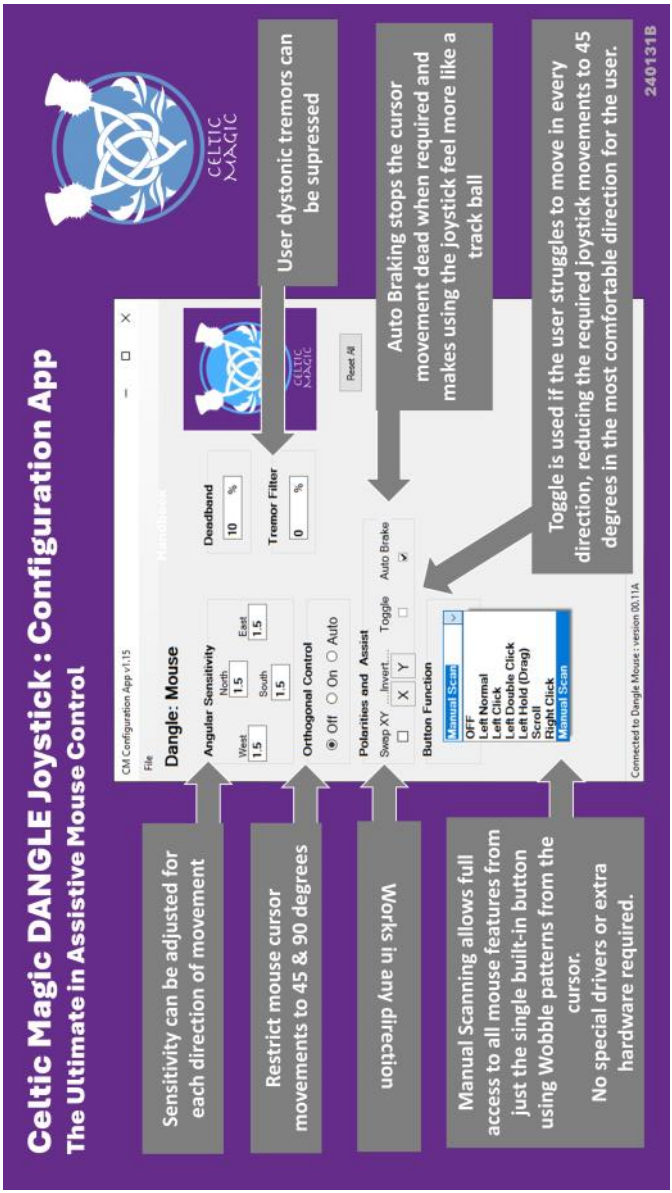
4 Dangle Mouse: Simple Mouse Controller

Model CM/DM

Mouse Control using the Dangle Mouse
The Dangle model CM/DM appears to the computer as a USB mouse and can be customised using the Celtic Magic Configurator application shown

The integrated button can be selected to be any of the shown functions including Manual Scanning (default) where multiple button functions such as Drag and Scroll can be selected. These various controls are accessed by releasing the button when the mouse cursor is wobbling slightly in a given pattern. See section 3.1.2 for details on Manual Scanning and the Wobble patterns.

For other standard features see section 2



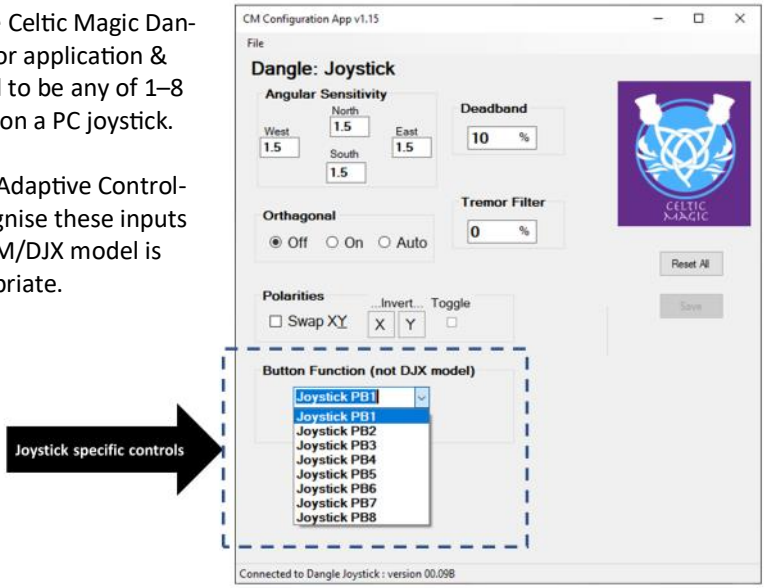
5 Dangle Joystick: Gaming

Models CM/DJ & DJX

The Dangle joystick model CM/DJ & DJX appears to a computer or MS Adaptive Controller as a simple PC joystick

Model CM/DJ The button is customised using the Celtic Magic Dangle PC Configurator application & can be configured to be any of 1–8 buttons available on a PC joystick.

However the MS Adaptive Controller does not recognise these inputs and the Dangle CM/DJX model is then more appropriate.

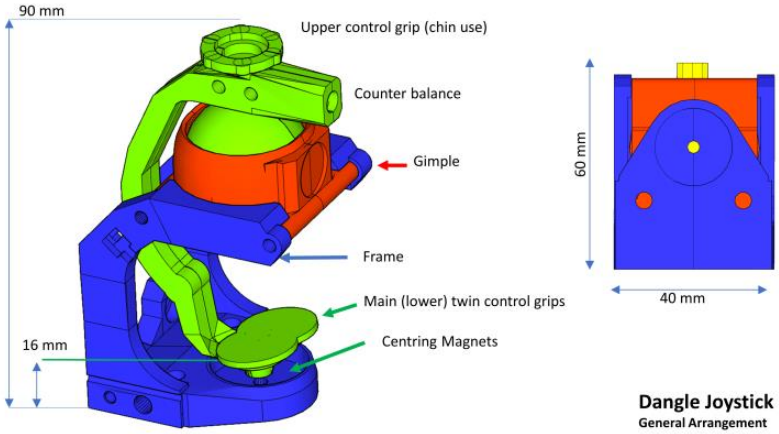


Model CD/DJX

The Microsoft Adaptive Controller version of the Dangle brings the integrated button out on a separate lead which can be plugged into the Adaptive Controller to act as your preferred button.

6 Specification & Support

6.1 Dimensions



Dangle Joystick
General Arrangement

6.2 Support & Fault finding

For the latest support information please visit the Dangle webpage. **www.celticmagic.org/Dangle**

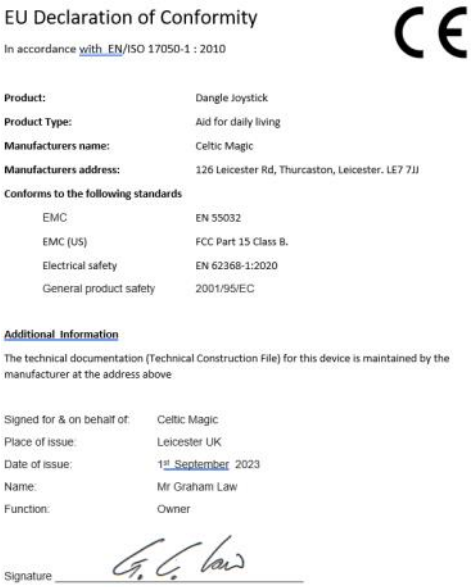
Tips

- Stick is outside of base, this may happen if the joystick has bee dropped. Gently force the swinging arm back to its correct position by bending the arm over the chassis.
- Not moving freely. Check for magnetic debris between thew bottom of the swinging arm and the base. Remove any debris using tweezers.
- If the cursor fails to move it could be due to the button inadvertently being pressed when the device turns on. This will put the joystick into sleep mode until it is unplugged and restarted/
- Cursor drifts. With the joystick at centre disconnect the usb. Wait 2 seconds and then plug back in for 2 seconds. This will recentre the device slightly. Try this up to twenty times if drifting is persistent.
- Jerky or unexpected movements of a mouse —try turning off the Auto Brake feature 2.2.3

6.3 Specifications

Electrical		notes
Connection to digital device	USB	
Max load	60mA	With ext. display
Lead length	1m + *1m	*1m extension lead included
Button inputs	2x 3.5mm	CM/Dmax only
Outputs	1x 3.5mm	CM/DJX only
Sensor technology	Analogue	
Angular resolution	0.5%	
Mechanical		
Ingress rating	IP42	
Operating temperature	0C—30C	
Storage Temperature	-15C—40C	
Operating force	10 grams	
Movement angle (mechanical)	+/-35 degrees	

6.4 Legal & Conformity



EU Declaration of Conformity

In accordance with EN/ISO 17050-1 : 2010

CE

Product:	Dangle Joystick
Product Type:	Aid for daily living
Manufacturers name:	Celtic Magic
Manufacturers address:	126 Leicester Rd, Thurcaston, Leicester. LE7 7JJ
Conforms to the following standards	
EMC	EN 55032
EMC (US)	FCC Part 15 Class B.
Electrical safety	EN 62368-1:2020
General product safety	2001/95/EC

Additional Information

The technical documentation (Technical Construction File) for this device is maintained by the manufacturer at the address above

Signed for & on behalf of:	Celtic Magic
Place of issue:	Leicester UK
Date of issue:	1st September 2023
Name:	Mr Graham Law
Function:	Owner

Signature G. G. law

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6.5 Limited Warranty

What Does This Warranty Cover?

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

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?

Cost of shipping to & from Celtic Magic or any taxes incurred either way.
Any 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.