Quadstick User Manual

User guide
2021

Table of contents

Introduction

The Quadstick is a mouth operated joystick which can emulate a Gamepad, Mouse or Keyboard. It connects via USB to a Game Console, PC, Mac, or Android device. It also contains a Bluetooth module that can be used with a PC or Android device. The Quadstick Manager Program (QMP) is a Windows desktop application that is used for setting up and modifying the preference settings that control the Quadstick and for connecting the Quadstick to other inputs devices, such as voice commands and external devices. It is available for download from the Quadstick.com website.

The Quadstick's configuration scheme is built around three concepts: Inputs, Outputs, & Connections. Google Docs Spreadsheets are used to organize the connections between Inputs and Outputs that control the mapping between a sip/puff or joystick input and an output that emulates a game controller button, joystick, PC keyboard key, or mouse.

Inputs

The mouthpiece has three sip/puff sensors and a lip position sensor attached to the joystick gimbals. On the right side of the joystick mouthpiece is a fourth sip/puff sensor tube that is usually used to control the overall operation of the Quadstick. The back of the device has connections for the lip position sensor, and external inputs.

The joystick position, sip/puff/lip sensors and optional external switches are used to generate Input signals to the Quadstick which are then used to transmit Output commands to the Host device (game console, PC, etc) over the USB or Bluetooth connection. The sip/puff pressure sensors, joystick and lip position sensors are all analog sensors.

In addition to its own hardware inputs, the Quadstick can be used with other devices, such as a PC's mouse, an UltraStik 360, or a Tobii Eyegaze device.

Outputs

The Quadstick emulates Gamepad, Mouse and Keyboard devices, and each button, key, joystick or movement these devices can send to a game console or PC become Outputs controlled by the Input sensors.

Spreadsheets

Google Docs spreadsheets are used for creating the configuration files that are downloaded into the Quadstick. Inputs, Outputs and Connections are organized as rows in a configuration spreadsheet. A collection of connections made up of all the rows in a single sheet is called a “mode”. A spreadsheet can have up to sixteen “mode sheets”. The user normally selects the active mode sheet by short sip/puffs on the side tube. The Default Configuration spreadsheet has the first mode sheet set to control the Left Analog Stick of the game controller interface. The third mode sheet is set to control the Right Analog Stick and the second controls a mix of the two sticks. Other modes control the D-Pad or Mouse pointer.

The information in the spreadsheet is converted by a menu command to a CSV file that is transferred to the Quadstick’s flash memory by the Quadstick Manager Program or manually using a PC's file manager. The Quadstick can contain many configuration files and the user can control which one is currently active by use of a long hard sip on the side tube.

A Connection binds the signal from an input sensor to an output. The connection can be “normal”, where the Output is activated directly by the current state of the Input, or it can one of several functions like “toggle”, “repeat”, “pulse”, “delay” or in some other way modify the signal between the Input and the Output.

Examples of the four “face buttons” for the PlayStation and XBox consoles:

PlayStation outputs names:		
x	normal	lip
circle	normal	mp_center_puff
square	normal	mp_center_sip
triangle	normal	mp_right_center_puff

XBox output names:		
A	normal	lip
B	normal	mp_center_puff
X	normal	mp_center_sip
Y	normal	mp_right_center_puff

FCC compliance statement (United States)

This device contains a transmitter module with FCC ID T9J-RN42.
FCC Class B Part 15
This device complies with Part 15 of the Federal Communications Commission (FCC) Rules.
Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

CAUTION:
Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instructions, may cause interference harmful to radio communications.

Industry Canada Statement

This device complies with RSS-210 of Industry Canada.
Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

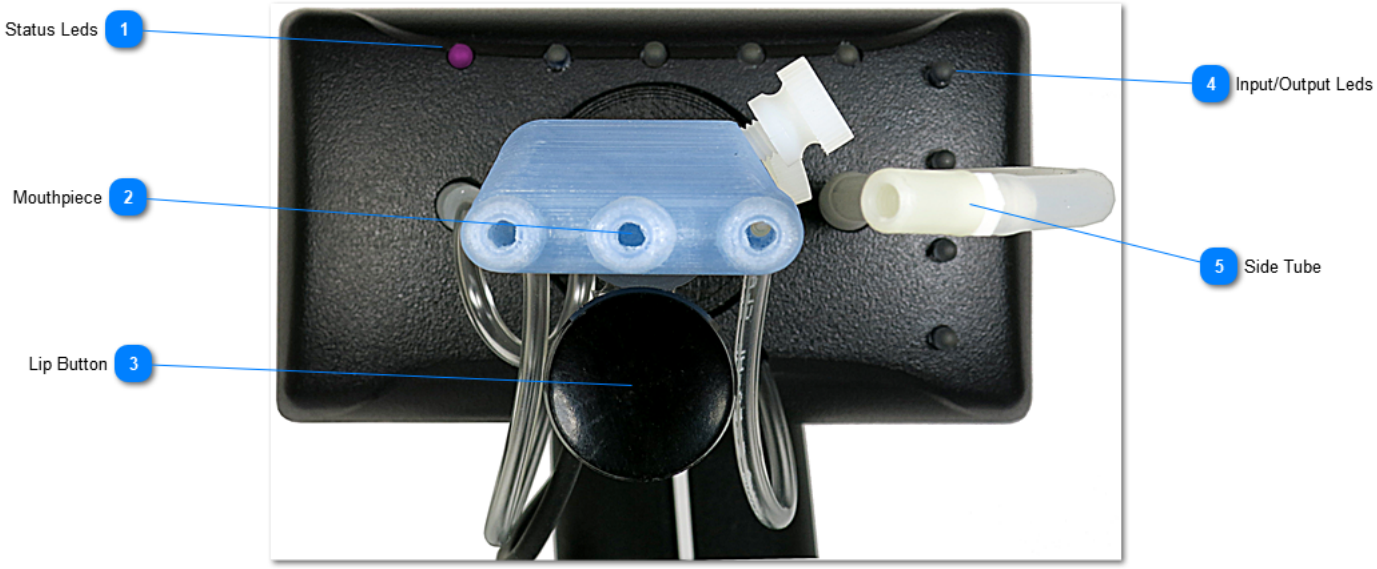
CE Statement

QuadStick controllers are CE-marked, indicating compliance with the essential health and safety requirements set out in European Directives.
The QuadStick has been tested for compliance with the following standards:

- EN 61000-4-2 ESD
- EN 61000-4-3 Radiated Field Immunity - 80-1,000 MHz
- EN 61000-4-6 Conducted Immunity 150 kHz - 80 MHz

Hardware Features

Front



1 Status Leds

Five Blue/Red Status LEDs used to indicate:

- Sensor activation
- Active configuration profile
- Boot process and self test
- USB connection status

2 Mouthpiece

Mouthpiece attached to Joystick

- Three Sip/Puff tubes. Analog pressure sensors.
- XY motion

3 Lip Button

Lip Position Sensor. Adjustable sensitivity and position.

4 Input/Output Leds

Four Green Status Leds. Can be used for two different purposes:

- Outputs Status for outputs 1 through 4, from top to bottom.
- Inputs Status 1-2, (& 7-8 if top jack is an IN jack) from bottom to top.

5 **Side Tube**

Mode selector sip/puff tube. Used to switch between different operating modes.

Back Panel


Digital Input/Output Jack 1
Lip Button Jack 2
Digital Input Jack 3
4 USB B Jack
5 USB A Jack
6 Mounting Ball
QuadStick
Model 1
In Lip Out
A USB B
Contains FCC ID: T9J-RN42
S/N: 141032B8

1 **Digital Input/Output Jack**

- 3.5 mm stereo jack with two optically isolated digital outputs or two digital inputs, depending on options chosen at time of purchase.
- See Input/Output Jack for more information

2 **Lip Button Jack**

- Lip sensor input
- Auxiliary Digital Inputs for inputs 5 & 6

3 Digital Input Jack

- 3.5 mm stereo jack for Ability Switch inputs.
- TTL-3.3Volt Serial Port. Compatible with TTL-232R-3V3-AJ
- Secondary logic level output

4 USB B Jack

- USB-B Main connector for power and/or data connection to Host device

5 USB A Jack

USB-A connector

- For hosting second daisy chained gamepads, such as the UltraStik 360, Mayflash F300 Fightstick or the Dual Shock 4.
- Auxiliary Digital Inputs for inputs 3 & 4.
- Alternative USB connection to a second host using a USB-A to USB-A cable.

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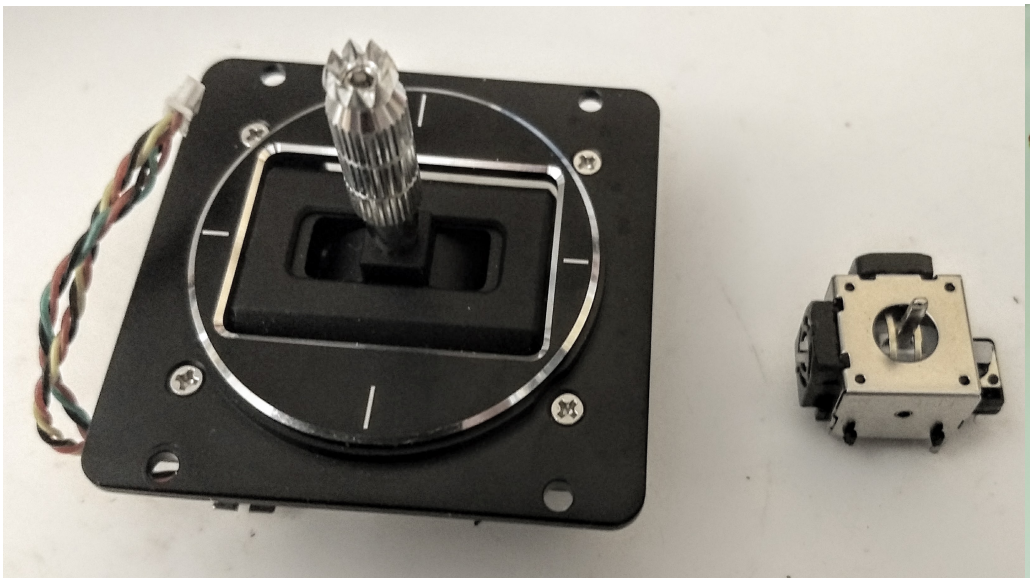
6 Mounting Ball

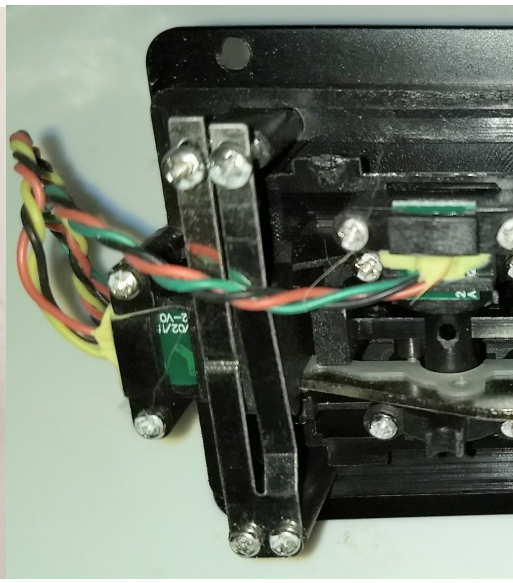
RAM Mount B-Series 1" ball mount.

FPS models:

Both the Original and FPS models use the same software and internal electronics. The difference is the joystick gimbal. The joystick gimbal in the Original model is the same part used in ordinary game controllers connected to an aluminum rod to which the mouthpiece is attached. An extra spring is used to help hold up the weight of the mouthpiece and Lip button assembly and stiffen the movement.

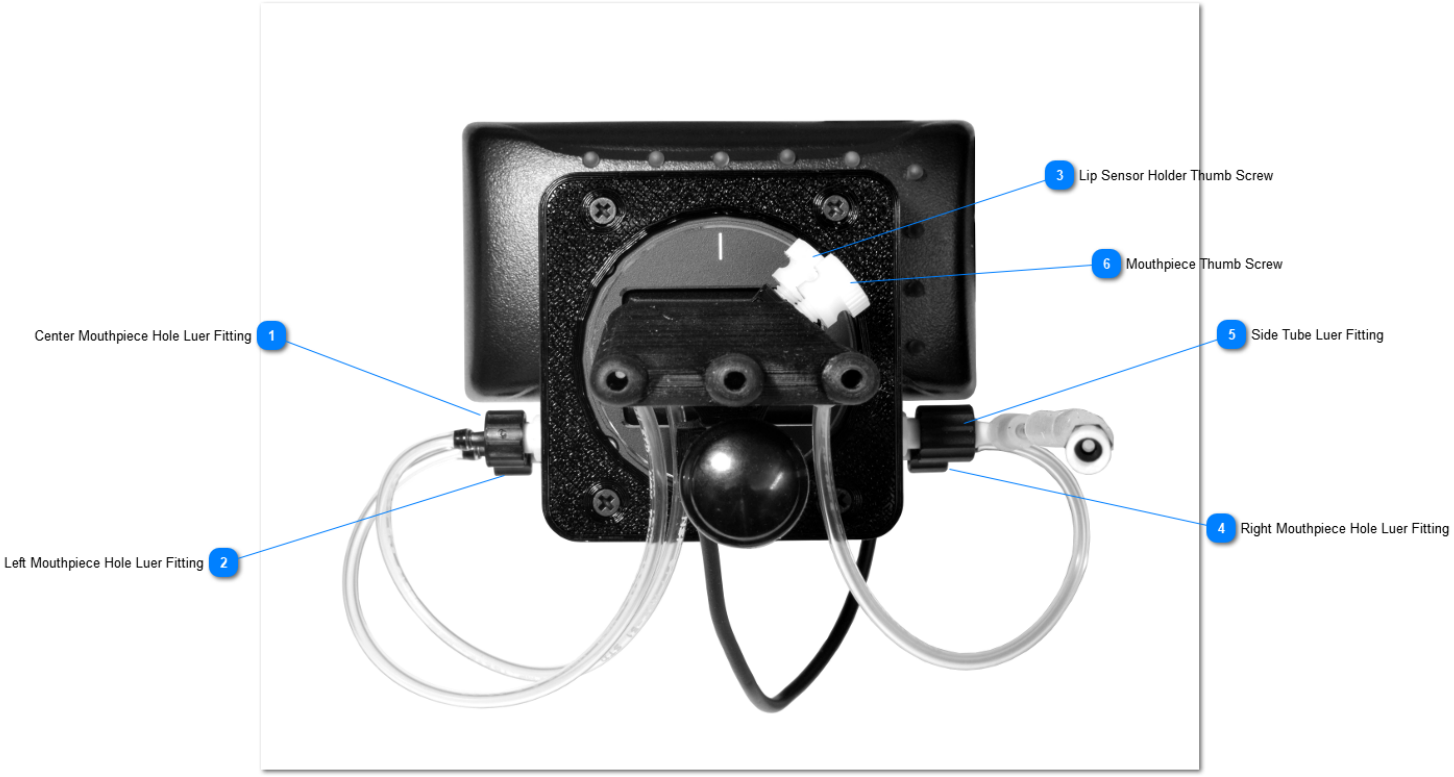
In the FPS model, a larger and and more accurate joystick module is used. The centering mechanism is different and provides a more definite feel to the center position which aids the user in precise aiming. The FPS gimbals use ball bearings for the axes and magnetic Hall Effect sensors for the position sensing. This eliminates the two main sources of wear in the Original model and gives very smooth movement.





The FPS model requires more strength in the user's lips to move. While not an issue for someone with a spinal cord injury, a user with a disability that affects the strength of the muscles in their lips may be better suited for the Original model. In the Original model, the spring and lip button assembly can be removed for users that have difficulty moving the joystick, giving it a very light feel. This is not an option with the FPS model.

The FPS mouthpiece connections use Luer fittings that can be used with Hydrophobic Syringe Filters for multi-user applications.



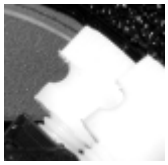
1 Center Mouthpiece Hole Luer Fitting

Connection for center hole tube. Compatible with Luer Syringe filters for multi-user applications.

2 Left Mouthpiece Hole Luer Fitting

Connection for left hole tube.

3 Lip Sensor Holder Thumb Screw



Holds the Lip Sensor in position. Loosen to slide the sensor to the desired location. DO NOT OVER-TIGHTEN. It only needs to be snug. It is possible to break the plastic bracket or crush the lip sensor if this is over-tightened.

4 Right Mouthpiece Hole Luer Fitting

Connection for right hole tube

5 Side Tube Luer Fitting

Sip/Puff tube typically used to control overall operation of the Quadstick.

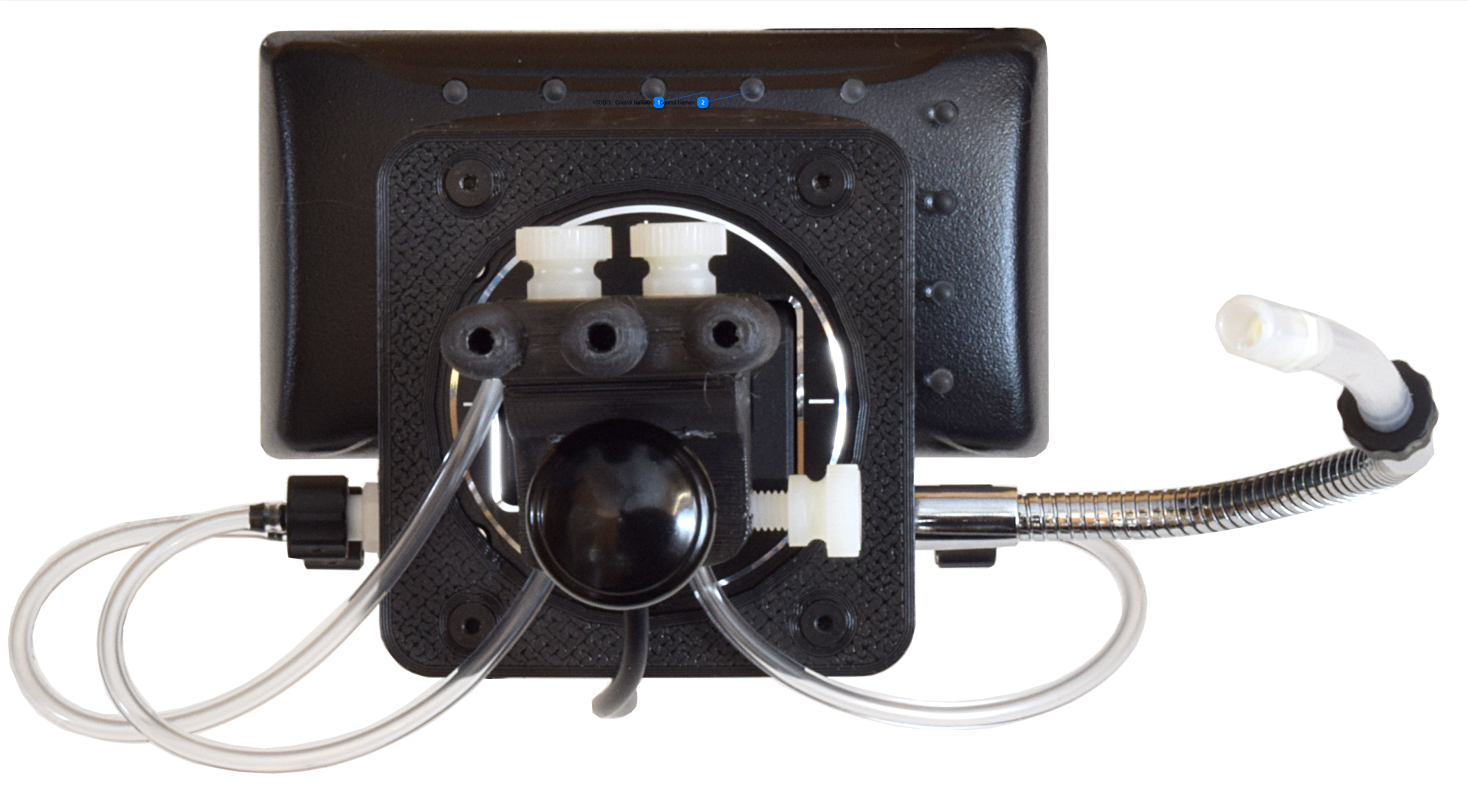
6 Mouthpiece Thumb Screw

<TODO>: Insert description text here...

Sensors and Inputs

The Mouthpiece

The mouthpiece has three sip/puff holes plus a lip button sensor.



The lip sensor activation and sensitivity is adjustable from a slight movement to up to one-half inch from the inactive position. A thumbscrew allows the lip sensor to be placed in a comfortable position. The Sip/Puff tube openings in the mouthpiece can be individually selected or used in combination, by positioning the mouth over one, two or three holes.
With a three hole, Left, Center, Right, mouthpiece, this allows for six different hole combinations (L, C, R, LC, CR, LCR). Multiply that by two pressure polarities (sip/puff), and two different pressure thresholds (soft & hard), for a total of twenty four signals to be obtained from the mouthpiece Sip/Puff sensors.

While less frequently used, the sip/puff tube to the right of the mouthpiece can also be used as a sip/puff input in configurations that do not require multiple mode sheets, giving an additional four combinations.

An additional four sip/puff combinations are possible if the user can cover the center hole with their tongue while sip/puffing on the outer two holes (LR).
In practice, a small subset of the combinations is typically used but the capability is there when needed for special situations.

The soft/hard pressure thresholds and the time delay for detecting a soft Sip/Puff are adjustable by the user.

The following table contains the names of all the Sip/Puff inputs for a three hole mouthpiece, with a brief description and if the adjustable delay timer is used to detect the input (This is a factor when determining suitable inputs choices to avoid slowing reaction time during game play):

Input Name	Description	Delay
mp_left_sip	Mouthpiece Hard Sip Left sip/puff sensor	instant
mp_left_puff	Mouthpiece Hard Puff Left sip/puff sensor	instant
mp_center_sip	Mouthpiece Hard Sip Center sip/puff sensor	instant
mp_center_puff	Mouthpiece Hard Puff Center sip/puff sensor	instant
mp_right_sip	Mouthpiece Hard Sip Right sip/puff sensor	instant
mp_right_puff	Mouthpiece Hard Puff Right sip/puff sensor	instant
mp_left_center_sip	Mouthpiece Hard Sip Left-Center sip/puff sensors	instant
mp_left_center_puff	Mouthpiece Hard Puff Left-Center sip/puff sensors	instant
mp_right_center_sip	Mouthpiece Hard Sip Right-Center sip/puff sensors	instant
mp_right_center_puff	Mouthpiece Hard Puff Right-Center sip/puff sensors	instant
mp_left_right_sip	Mouthpiece Hard Sip Left-Right sip/puff sensors	instant
mp_left_right_puff	Mouthpiece Hard Puff Left-Right sip/puff sensors	instant
mp_triple_sip	Mouthpiece Hard Sip All Three sip/puff sensors	instant
mp_triple_puff	Mouthpiece Hard Puff All Three sip/puff sensors	instant
mp_left_sip_soft	Mouthpiece Soft Sip Left sip/puff sensor	delay
mp_left_puff_soft	Mouthpiece Soft Puff Left sip/puff sensor	delay
mp_center_sip_soft	Mouthpiece Soft Sip Center sip/puff sensor	delay
mp_center_puff_soft	Mouthpiece Soft Puff Center sip/puff sensor	delay
mp_right_sip_soft	Mouthpiece Soft Sip Right sip/puff sensor	delay
mp_right_puff_soft	Mouthpiece Soft Puff Right sip/puff sensor	delay
mp_left_center_sip_soft	Mouthpiece Soft Sip Left-Center sip/puff sensors	delay
mp_left_center_puff_soft	Mouthpiece Soft Puff Left-Center sip/puff sensors	delay
mp_right_center_sip_soft	Mouthpiece Soft Sip Right-Center sip/puff sensors	delay
mp_right_center_puff_soft	Mouthpiece Soft Puff Right-Center sip/puff sensors	delay
mp_left_right_sip_soft	Mouthpiece Soft Sip Left-Right sip/puff sensors	delay
mp_left_right_puff_soft	Mouthpiece Soft Puff Left-Right sip/puff sensors	delay
mp_triple_sip_soft	Mouthpiece Soft Sip All Three sip/puff sensors	delay
mp_triple_puff_soft	Mouthpiece Soft Puff All Three sip/puff sensors	delay
right_sip	Hard Sip Right sip/puff sensor	instant
right_puff	Hard Puff Right sip/puff sensor	instant
right_sip_soft	Soft Sip Right sip/puff sensor	delay
right_puff_soft	Soft Puff Right sip/puff sensor	delay

1 **<TODO : Control Name>**

<TODO>: Insert description text here...

2 **<TODO : Control Name>**

<TODO>: Insert description text here...

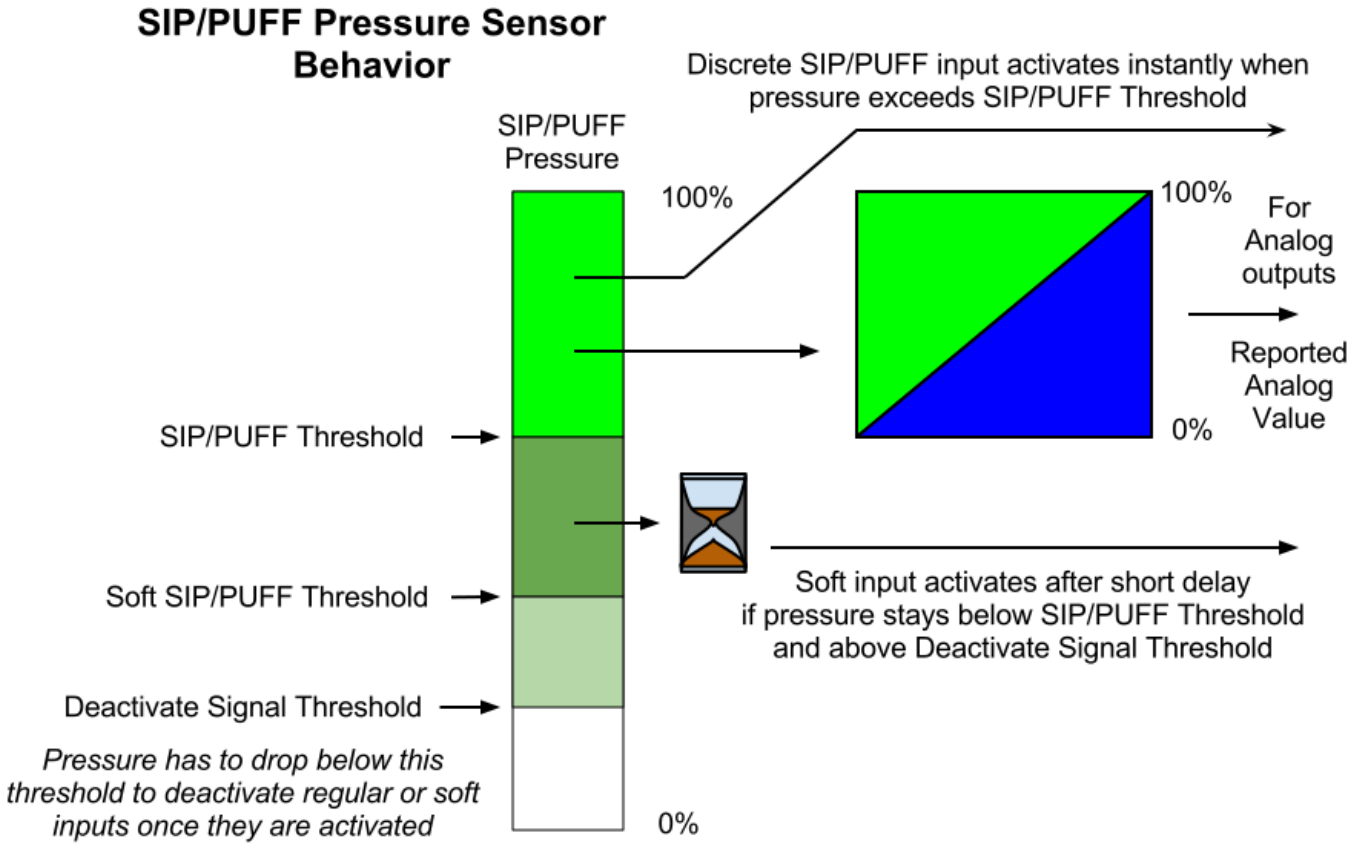
Sip/Puff Sensors

The Sip/Puff Sensors on the mouthpiece and the tube on the side of the joystick can each sense vacuum or pressure over a range of +/-2kPa (4 inches Water Column) and measure the analog value to categorize the strength as high or low, for a combination of four signals per sensor, hard and soft, sip or puff. This gives twenty-four possible sip/puff combinations when various combinations of individual and multiple holes are used. When a sensor is active, an LED lights to give feedback to the user. Red for puff and Blue for sip.

When the user sips or puffs the Quadstick will make either a click or beep to indicate it detected a hard or soft sip/puff, respectively. The hard sip/puff is detected the moment the pressure exceeds the high threshold.

To avoid triggering a soft sip/puff signal while applying a stronger pressure, an adjustable delay (default 1200ms) is used to allow time for the pressure to move out of the soft region, to the hard region, before generating the signal. While the pressure is in the soft region, the corresponding status LED flashes and an audio tone, which varies with pressure, is produced, to give the user feedback about the pressure they are applying.

Once the time delay has expired a beep sound will indicate the signal has been triggered. Once triggered, the Soft signal latches and the pressure must return below the Deactivation Threshold before the signal will release. When either Soft or Hard pressure signals are active, the pressure above the higher threshold can be used as an analog value, like with a Gamepad Joystick or Trigger. If the Soft pressure zone for a particular tube is not used, the audio tones are suppressed. The time delay is adjustable and some users shorten the delay to a few tenths of a second to activate soft sip/puffs more quickly.



Joystick

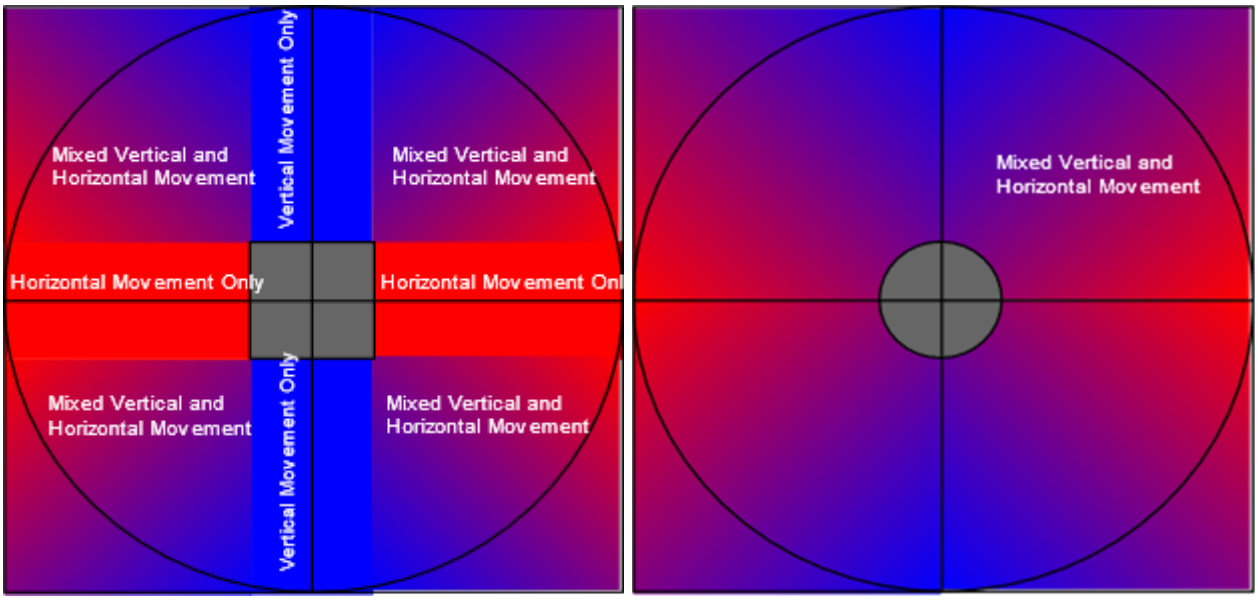
The joystick measures the deflection from the home, or center position and produces both continuous analog values and discrete position signals, depending upon the output to which it is connected. When used for the Mouse or one of the Game Pad joysticks, the position is reported as continuously variable with the movement of the joystick. The sensitivity of the joystick movement is controlled by two overall preference settings for the minimum and maximum range of motion as well as four multipliers to individually adjust the movement in the four directions: up, down, left & right. The general topic of Preference settings is covered in a later chapter.

These settings can be adjusted using the Quadstick Manager Program's Joystick tab.

joystick_deflection_minimum	9	percent	Defines center dead zone. Percent of physical movement
joystick_deflection_maximum	30	percent	Defines physical deflection scaled to 100% Signal
deflection_multiplier_up	140	percent	Adjusts joystick deflection value in the UP direction
deflection_multiplier_down	130	percent	Adjusts joystick deflection value in the DOWN direction
deflection_multiplier_left	100	percent	Adjusts joystick deflection value in the LEFT direction
deflection_multiplier_right	100	percent	Adjusts joystick deflection value in the RIGHT direction
joystick_dead_zone_shape	1		0=Square, 1=Circle
anti_dead_zone	0	percent	Counteracts the dead zone built into the Game Console's joystick softw
joystick_warning	400	percent	Joystick position beyond full scale that will flash the leds
joystick_alarm	500	percent	Joysitck position beyond full scale that will buzz the speaker

Dead-Zone

The joystick_dead_zone_shape, and the effect it has is illustrated in the next two images.



When the dead zone is a square, it tends to favor horizontal or vertical movement when the joystick position is nearly aligned with one of the two axis. This makes it more difficult to move at small angles near one of the axes. The movement tends to snap to the axis.

When the dead zone is a circle, the amount of movement in each axis is in proportion to the angle the joystick relative to the axes, the movement does not snap to one of the axis and has a more natural feel. The default value for this setting is for circle (1). If you prefer the action of the original square dead zone instead, the preference can be set to 0 in the **misc** tab in the QuadStick Manager Program by turning off the Enable Circular Dead Zone check box.

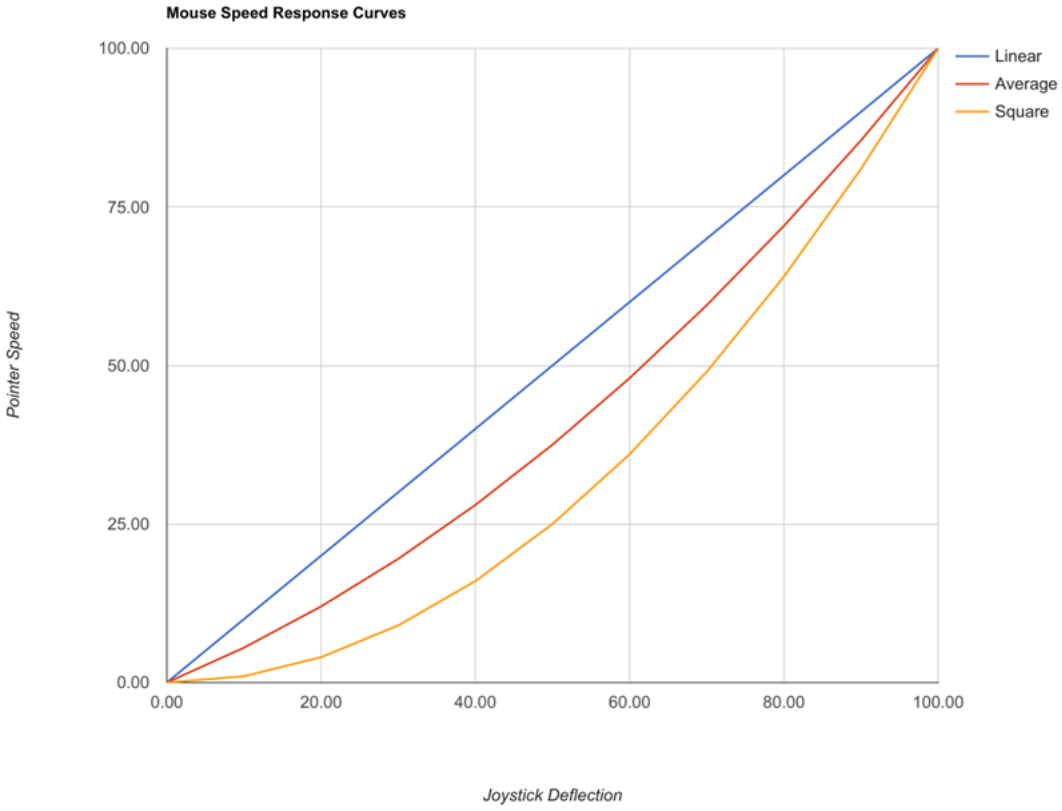
Certain applications where the outputs controlled by the two joystick axis are not related, may work better with the square dead zone. This can be controlled on individual mode sheets or on a Preference sheet in a game configuration spreadsheet.

joystick_deflection_minimum and maximum

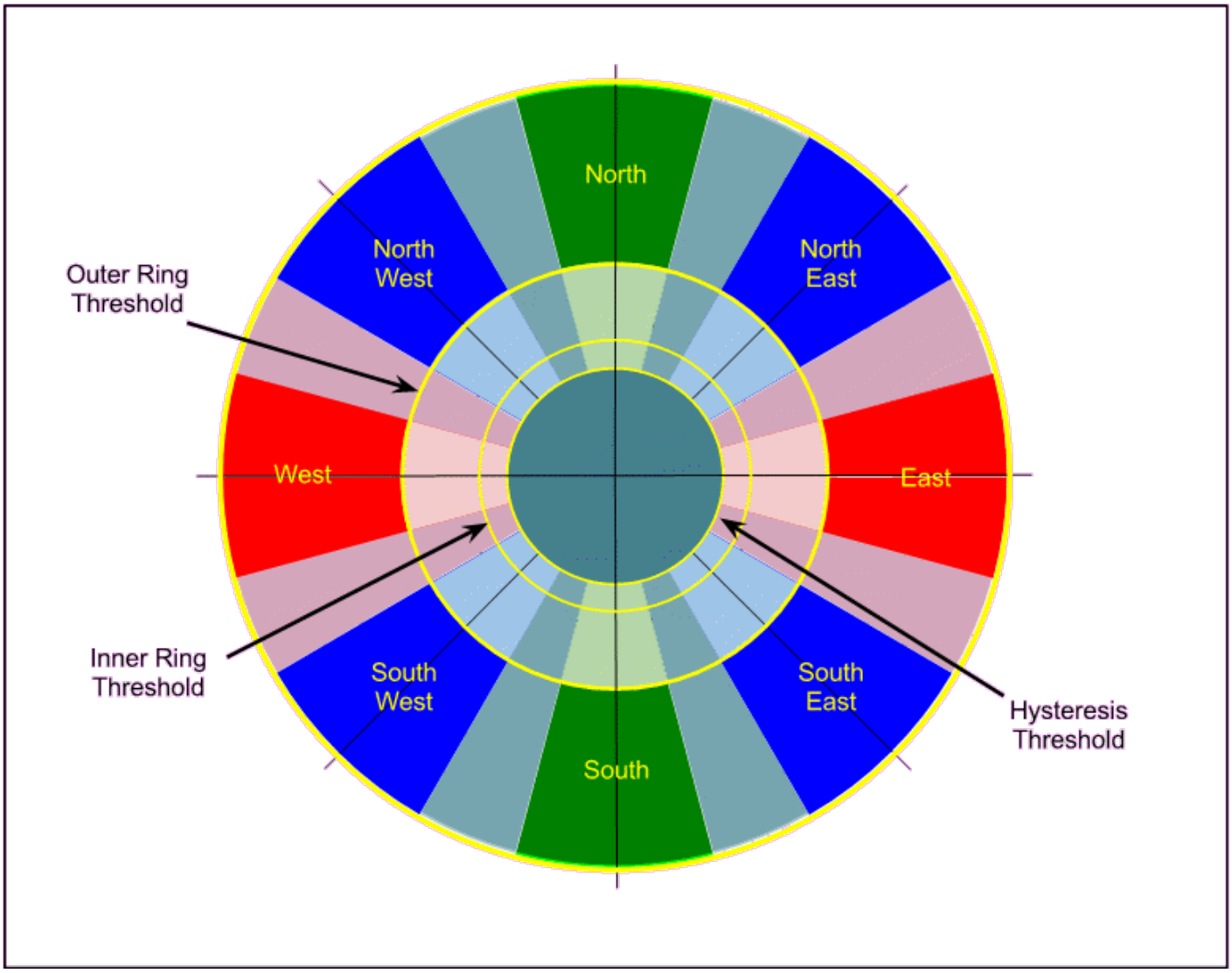
The joystick_deflection_minimum and maximum settings are relative to the full mechanical movement of the joystick. They control the overall sensitivity of the joystick movement. The deflection_multiplier_* values adjust the overall sensitivity for the four individual directions.
In the QMP Joystick tab, the joystick_deflection_* and multiplier values are displayed in the lower right corner.

The joystick_D_Pad_inner and _outer settings are relative to the scaled signal calculated as a result of the earlier deflection settings.

Mouse_speed controls how fast the mouse moves based on the scaled position from the joystick calculations. When adjusting the joystick deflections and mouse speed, first adjust the joystick in a game controller mode, then adjust the mouse speed second.
The mouse_response_curve setting can make the mouse less sensitive near the center position and move much faster when the joystick is moved farther away from the center.


Mouse Speed Response Curves
100.00
75.00
50.00
25.00
0.00
Pointer Speed
0.00
20.00
40.00
60.00
80.00
100.00
Joystick Deflection
Linear
Average
Square

D-Pad Zones



When used with a discrete output, like the D-Pad buttons, the joystick's position is divided up into a series of zones, such as North, South, East and West, which triggers a signal when the joystick is moved into a zone.

The discrete zones are further divided into the Ordinal directions, North-East, South-East, etc as well as into Inner ring and Outer ring zones, in a manner similar to the dual pressure thresholds for the Sip/Puff sensors. When moving through the inner ring, a tone is produced to indicate the joystick is within the inner ring region and a click is produced when either the time delay expires, or the joystick moves into the outer ring and an outer ring signal is triggered.

The Joystick Discrete Zones diagram shows the active areas to which the joystick can be positioned to trigger a signal. The areas of deeper color saturation, around the Cardinal and Ordinal directions, show where the joystick must be to be detected. The lighter mixed color areas between the eight directions show hysteresis areas where the previous signal will remain active until the joystick enters the next detection zone. For instance, starting at North, the joystick can be moved from the Green area, into the Blue-Green-Gray area towards either NE or NW and still maintain the North signal. It can move back into the Green area and no interruption of the North signal will have occurred. However, once the joystick crosses into the Blue area around NE or NW, that new signal becomes active and will remain active as long as the joystick remains in the Blue area or the adjacent Blue-Green or Magenta areas.

The inner and outer rings operate like the Soft and Hard Sip/Puff pressures: After entering the Inner ring, the user must hold the joystick in the area between the Hysteresis ring and the Outer ring until a timer expires and triggers the signal. A tone that varies with the position will sound until the timer expires. Once the Inner ring timer has expired and the inner ring signal is activated, the joystick has to return to the center position before moving to trigger an Outer ring signal. Once triggered, either the inner or outer ring signals will stay active as long as the joystick stays outside the Hysteresis ring. The joystick deflection between the Outer ring and the maximum deflection is scaled into the pressure applied to the corresponding PS3 button, if so mapped.

The following table contains the name of all the Joystick Zones input signals, with a brief description and if the adjustable delay timer is used to detect the input.

Input Name	Description	Delay
left	Joystick Left Analog value	instant
right	Joystick Right Analog value	instant
up	Joystick Up Analog value	instant
down	Joystick Down Analog value	instant
N	Joystick Outer ring North zone	instant
NE	Joystick Outer ring North East zone	instant
E	Joystick Outer ring East zone	instant
SE	Joystick Outer ring South East zone	instant
S	Joystick Outer ring South zone	instant
SW	Joystick Outer ring South West zone	instant
W	Joystick Outer ring West zone	instant
NW	Joystick Outer ring North West zone	instant
N_inner	Joystick Inner ring North zone	delay
NE_inner	Joystick Inner ring North East zone	delay
E_inner	Joystick Inner ring East zone	delay
SE_inner	Joystick Inner ring South East zone	delay
S_inner	Joystick Inner ring South zone	delay
SW_inner	Joystick Inner ring South West zone	delay
W_inner	Joystick Inner ring West zone	delay
NW_inner	Joystick Inner ring North West zone	delay

Table 1: Joystick Inputs

Sixteen discrete signals can be produced from the joystick using the eight compass directions and the inner/outer rings, plus using the Bite sensor like a Shift key, brings the total to thirty-two.
The deflection ring thresholds and overall sensitivity of the joystick are adjustable by the user. If the inner ring zones are not used in a specific profile, the audio tones are suppressed.

Using External Inputs and Outputs

External input switches can be connected to the Quadstick. All input signals are “logic level” signals and require switch contacts suitable for low current, or "dry circuit", applications.

Input Jack with Two Switches

The Inputs jack on the back of the Quadstick or a Singleton is a 3.5 mm stereo connector with the two input circuits (Tip & Ring) and Shield (or Ground).

Two switches may be connected using the following circuit.

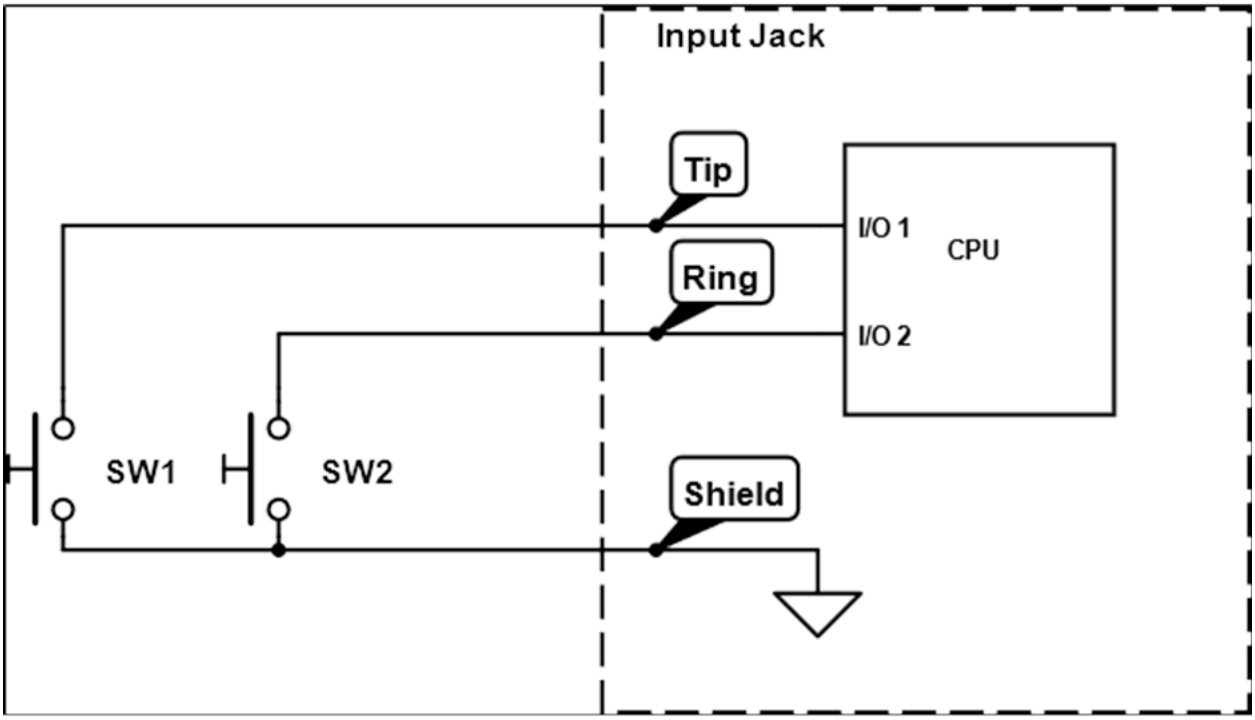


Illustration 3: Digital Input Connections for Two Switches

Input Name	Description	Delay
digital_in_1	Input Jack - Tip to Shield (SW1)	instant
digital_in_2	Input Jack - Ring to Shield (SW2)	instant

Table 2: External Digital Inputs 1 & 2

When using two Switches in this manner, the Quadstick can detect the switch closures independently and simultaneously.

Most assistive switches use 3.5mm mono connectors. An adapter that splits the two circuits on the stereo connector is required if using more than one switch. The Hosa YMM-261 3.5 mm TRS to Dual 3.5 mm TSF Stereo Breakout Cable is a suitable adapter.

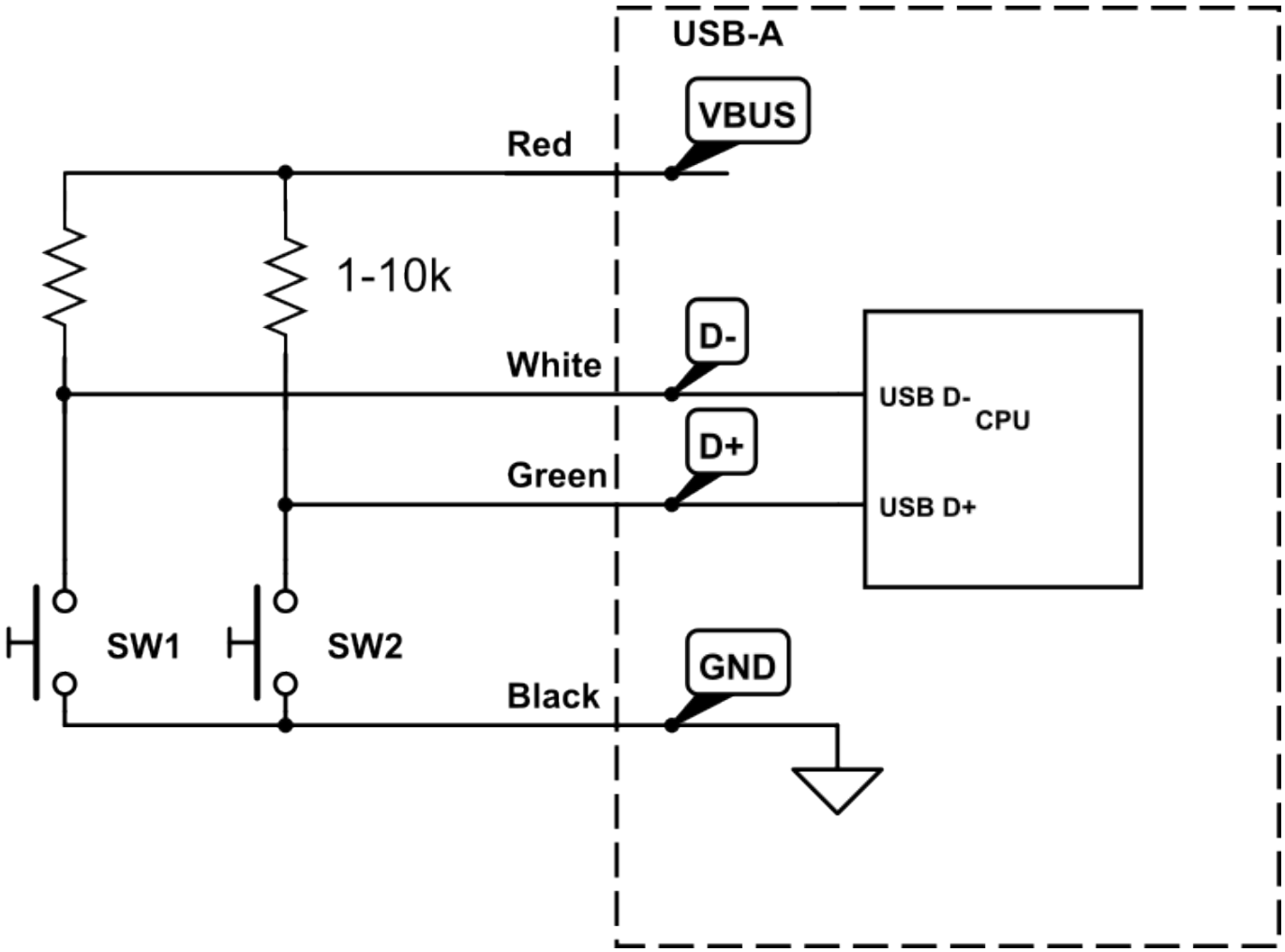
The digital inputs can be used in the configuration spreadsheet just like a sip/puff input:

left_1	normal	mp_left_sip
left_2	normal	digital_in_1
right_2	normal	digital_in_2

USB-A Jack with Two Switches

If the USB-A jack is not used for connecting to another USB device, it can be used as another Digital Input channel.

Two switches may be connected using the circuit below:



Input Name	Description	Delay
digital_in_3	USB-A Data - to Gnd (SW2)	instant
digital_in_4	USB-A Data + to Gnd (SW1)	instant

Table 3: External Digital Inputs 3 & 4

The Quadstick can detect closures of Switches 1 and 2 independently and simultaneously. "Enable USB-A Host mode" setting in the Misc tab of the QMP must be disabled

The Singleton does not have a USB-A jack.

Lip Sensor Jack with Two Switches

The Lip jack on the back of the Quadstick is a 3.5 mm stereo connector with the two input circuits (Tip & Ring) and Shield (or Ground).

Two switches may be connected using the following circuit.

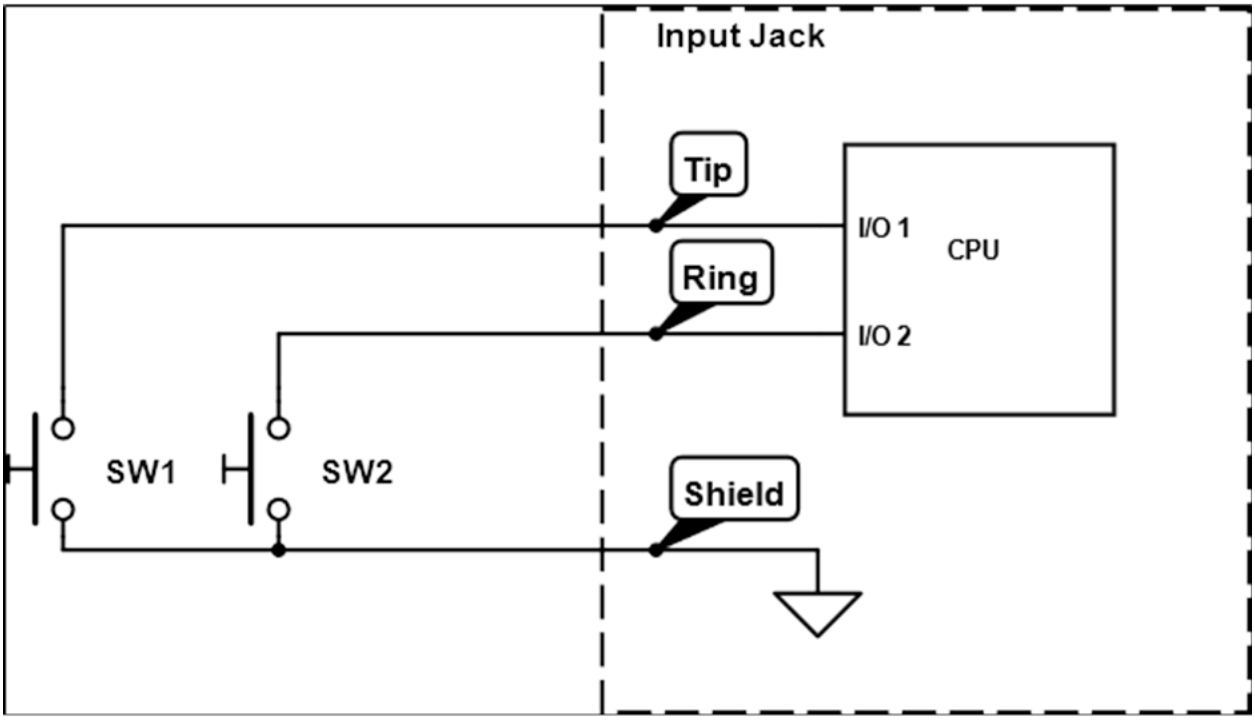


Illustration 5: Digital Input Connections for Two Switches

Input Name	Description	Delay
digital_in_5	Input Jack - Tip to Shield (SW1)	instant
digital_in_6	Input Jack - Ring to Shield (SW2)	instant

Table 4: External Digital Inputs 5 & 6

When using two Switches in this manner, the lip sensor is inoperative.

The Singleton does not have a Lip sensor jack.

Input/Output Jack

The upper input jack on the back of the Quadstick or a Singleton is a 3.5 mm stereo connector with the two input circuits (Tip & Ring) and Shield (or Ground). When ordering, two choices for this jack are available: Input or Output. If this jack is labeled Out on your Quadstick, these inputs are not available. See below for Output.

Input:

Two switches may be connected using the following circuit.

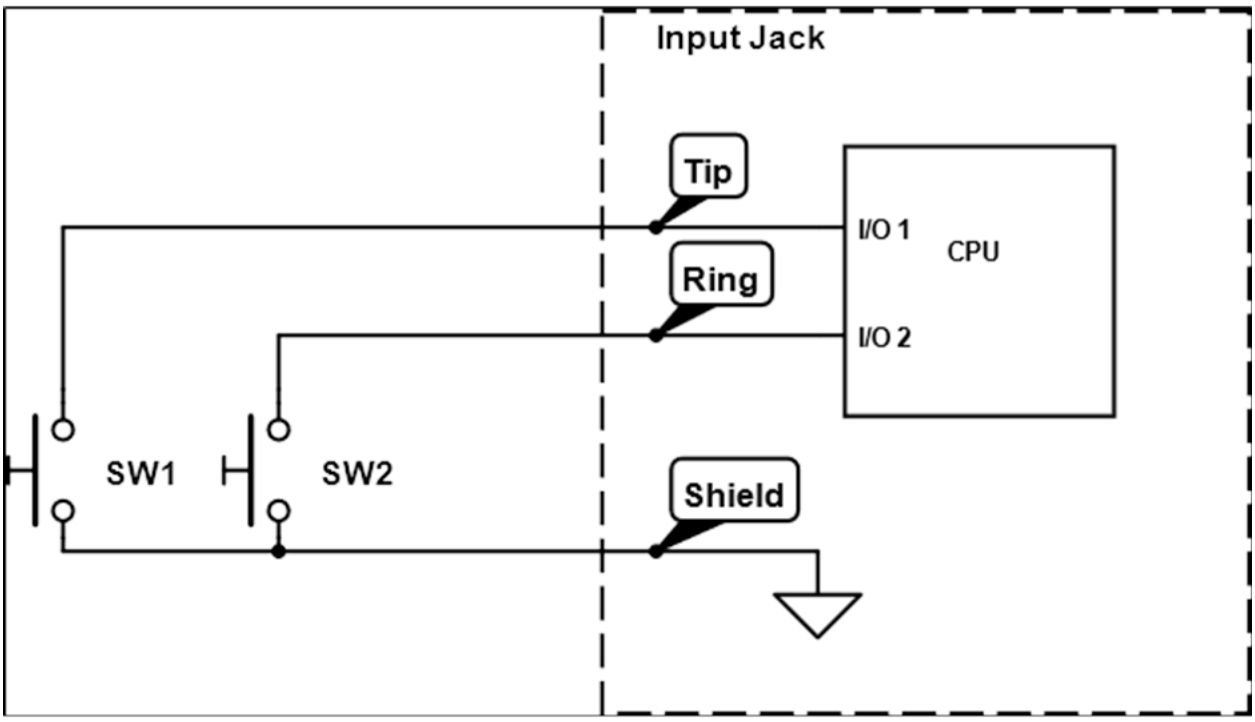


Illustration 3: Digital Input Connections for Two Switches

Input Name	Description	Delay
digital_in_7	Input Jack - Ring to Shield (SW2)	instant
digital_in_8	Input Jack - Tip to Shield (SW1)	instant

Table 2: External Digital Inputs 7 & 8

When using two Switches in this manner, the Quadstick can detect the switch closures independently and simultaneously.

Output:

This jack has two optically isolated relays that can be used to control devices that work with ability switches.

Most assistive switches use 3.5mm mono connectors. An adapter that splits the two circuits on the stereo connector is required if using more than one switch. The Hosa YMM-261 3.5 mm TRS to Dual 3.5 mm TSF Stereo Breakout Cable is a suitable adapter.

The digital outputs can be controlled directly, just like a controller button, or used with separate inputs that control the on, off, or toggle status of the output. Only digtal outputs 1 and 2, which have 24 VAC/DC solid state relays, are available on the top jack. Digital outputs 3 and 4 are 3.3 volt logic level ouputs available on the bottom IN jack.

Output Name	Description
digital_out_1	Digital Out 1
digital_out_2	Digital Out 2
digital_out_3	Digital Out 3
digital_out_4	Digital Out 4
digital_out1_on	Digital Out 1 turn on
digital_out1_off	Digital Out 1 turn off
digital_out1_toggle	Digital Out 1 toggle state
digital_out2_on	Digital Out 2 turn on
digital_out2_off	Digital Out 2 turn off
digital_out2_toggle	Digital Out 2 toggle state
digital_out3_on	Digital Out 1 turn on
digital_out3_off	Digital Out 1 turn off
digital_out3_toggle	Digital Out 1 toggle state
digital_out4_on	Digital Out 2 turn on
digital_out4_off	Digital Out 2 turn off
digital_out4_toggle	Digital Out 2 toggle state

The outputs names "digital_out_1" through "digital_out_4" can also be used in a Preferences sheet to force the output to an inital state when the configuration file is loaded. This can be used to help the user confirm they have loaded a specific configuration file.

The status of the digital outputs are displayed on the four green LEDs along the right hand side of the enclosure. The green LEDs are associated with the digital outputs from top to bottom with digital outputs 1 through 4. The green LEDs are often used to indicate some internal status.

left_joy_up	toggle	right_puff
left_joy_up	force_off	right_sip
left_joy_up	force_off	down
digital_out_1	toggle	right_puff
digital_out_1	force_off	right_sip
digital_out_1	force_off	down
digital_out_1	force_off	up

In this example, forward motion (left_joy_up) is controlled by a puff on the side tube. The digital_out_1 output is controlled in parallel with the left_joy_up so that the user has a visual indication of the left_joy_up status.

Summary

The goal of the Quadstick is to be able to extract as much information as possible using the mouth, lips, and external sensors, to take advantage of any inputs the user can actuate.

List of Inputs and Outputs.

Configuration

Configuration is where we take the Inputs and Outputs and connect or bind them together. A collection of input/output connections is called a Profile Mode. A configuration file can contain several profile modes and the user can chose which one is active at any time. The default method by which profile modes are changed is by sipping and puffing on the Right side tube, but other inputs can also be used to select the active mode.

The default configuration for the QuadStick has profile modes for the Left & Right Joysticks, D-Pad and Mouse. Each of these profile modes is presented below.

The user can maintain a library of configuration files customized for individual games or tasks and load them into the QuadStick when desired by copying the associated “CSV” file into the QuadStick's Flash drive, then using the side tube or voice command, activate a specific configuration file.

Configuration files are selected by the user by starting with a long hard sip on the side tube which invokes the file selection mode, followed by movement of the joystick. When the LED that corresponds to the desired file is illuminated, the Lip button is pressed, the file will activate and control the operation of the Quadstick. The Quadstick Manager Program can print a list of files contained in the Quadstick’s flash, along with the LED patterns that identify the selected file.

Google Drive Spreadsheets

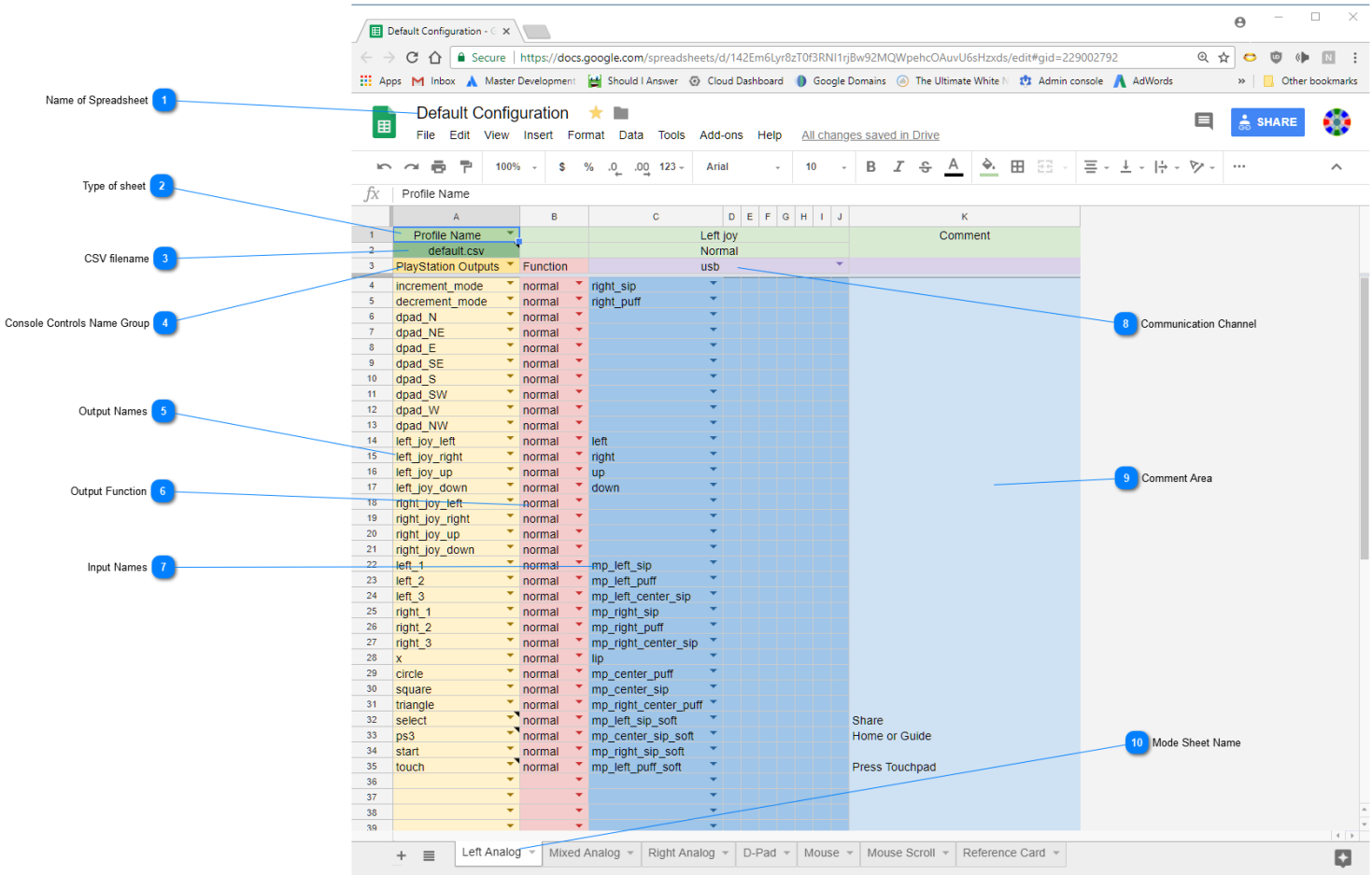
The free Google Drive Spreadsheet cloud service is used for creating and modifying configuration files. When a new configuration is ready to be loaded into the Quadstick, the user selects a menu command that converts the spreadsheet into a CSV file and downloads it into the Quadstick flash drive or uses the QuadStick Manager Program download function.

Each profile mode within a Configuration spreadsheet file is on a separate “sheet”. The sheets are associated with tabs along the bottom of the spreadsheet page. Profiles are numbered, starting with 1, in the order in which their tabs appear from left to right. The active profile mode number displays on the status LEDs when the profile is changed or when the Quadstick is idle.

As shown on the following pages, the columns and rows in a profile sheet follow a fixed layout. The Outputs are in the leftmost column, followed by an Output Function selection and then the Input(s) that control the Output. The Inputs for a row may be either a single input or a sequence of up to eight inputs. By default there can be 128 rows which have a single input, but optionally by reducing the number of rows to 64, a sequence of up to eight inputs may be used. Later, in a Keyboard configuration, we show how the optional sequential input columns are employed for pattern matching.

The Default Configuration file is available at: http:// demo. quadstick.com/ (in order to see and try the QuadStick menu commands, it is necessary to log in with a Google account, make a copy of the spreadsheet and grant permission to run the scripts).

Elements that make up a Configuration Mode sheet.

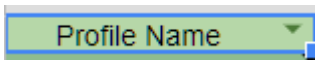


1 **Name of Spreadsheet**

Default Configuration

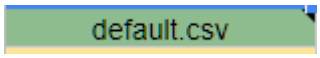
This is usually the name of the game or descriptive of the configuration's purpose.

2 **Type of sheet**



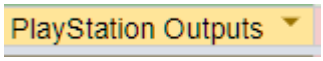
Drop down list with "Profile Name", "Preferences", and "Infrared". The contents of the cell must be from that list. Any other text will break the configuration file.

3 **CSV filename**



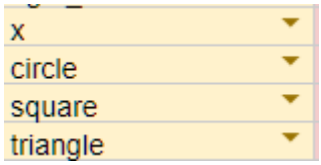
Cell A2 of the first sheet contains the name of the text file that actually goes into the Quadstick's flash. The Quadstick sorts the names of its configuration files alphanumerically, with the exceptions that "default.csv" is always first, and "prefs.csv" is not a game configuration file. The file name must be of the format "something.csv". Only cell A2 of the first sheet controls the CSV filename. The A2 cell on other sheets is ignored. If the format of the filename is wrong, the cell will turn Red.

4 **Console Controls Name Group**



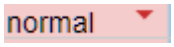
The names used for the outputs and be from either the Playstation or XBox button naming conventions. If this value is changed, all the button names will be updated to match, which can take a few minutes.

5 **Output Names**



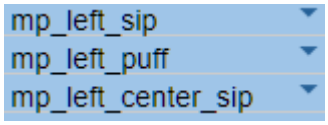
Dropdown list of the available output names. The first row with a blank Output Name will terminate the sheet. Any contents following the first blank row can break the configuration file.

6 **Output Function**



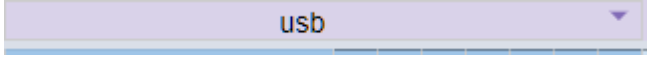
Controls how the Input's status effects the Output.
Dropdown list for Ouput Functions

7 **Input Names**



Dropdown list of available Input values. A list of unused inputs can be displayed by using the "Add-ons->Quadstick->List unused inputs" menu command. While the Unused Inputs list is open, selecting any input will highlight other uses of the same input.

8 **Communication Channel**

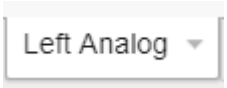


The data from the sheet can be routed out through either the USB channel or Bluetooth channel (or both). This is primarily used when the Bluetooth module is configured as a mouse for a PC.

9 **Comment Area**

Any column after J is not part of the configuration and can be used for comments.

10 **Mode Sheet Name**



Descriptive name of the sheet. Only "Reference Card" is reserved. The position of the sheet determines the number of the mode it is for.

Dropdown lists used in Profiles

Dropdown lists of all the Inputs and Outputs that were discussed in previous sections for the sensors and emulated devices are used to guide the user when creating a new profile.

• To chose an Output command or Input source, click in the desired cell and an arrow symbol will display near the upper right corner. Clicking on this symbol will display the list of available Outputs. (It can take a while for the list to appear the first time, so give it time).
• A profile is created by adding additional Output choices and matching that up with an Input.
• The first blank cell in the Outputs column indicates the end of the list, any outputs following an empty cell will be ignored. A blank cell in an Inputs column means the Output is off in that mode.
• It is permitted to have more than one Input associated with an Output, just repeat the Output choice on another row and select the additional Input to trigger it. It is also possible to have a single Input trigger more than one Output by just selecting the same Input again for the additional Outputs. This can be is used for pressing multiple buttons on a game controller or building up Control, Alt, or Shifted keycodes, where a single Input will trigger a combination of outputs to send the desired key, or where more than one Input is triggering Shifted keycodes.
• When used with the delay_on function, a sequence of button or key presses can be generated from a single input

Outputs

The output names may use either the PlayStation or XBox names for the controller buttons. Selecting the desired output names in cell A3 will automatically convert the names to the new convention.

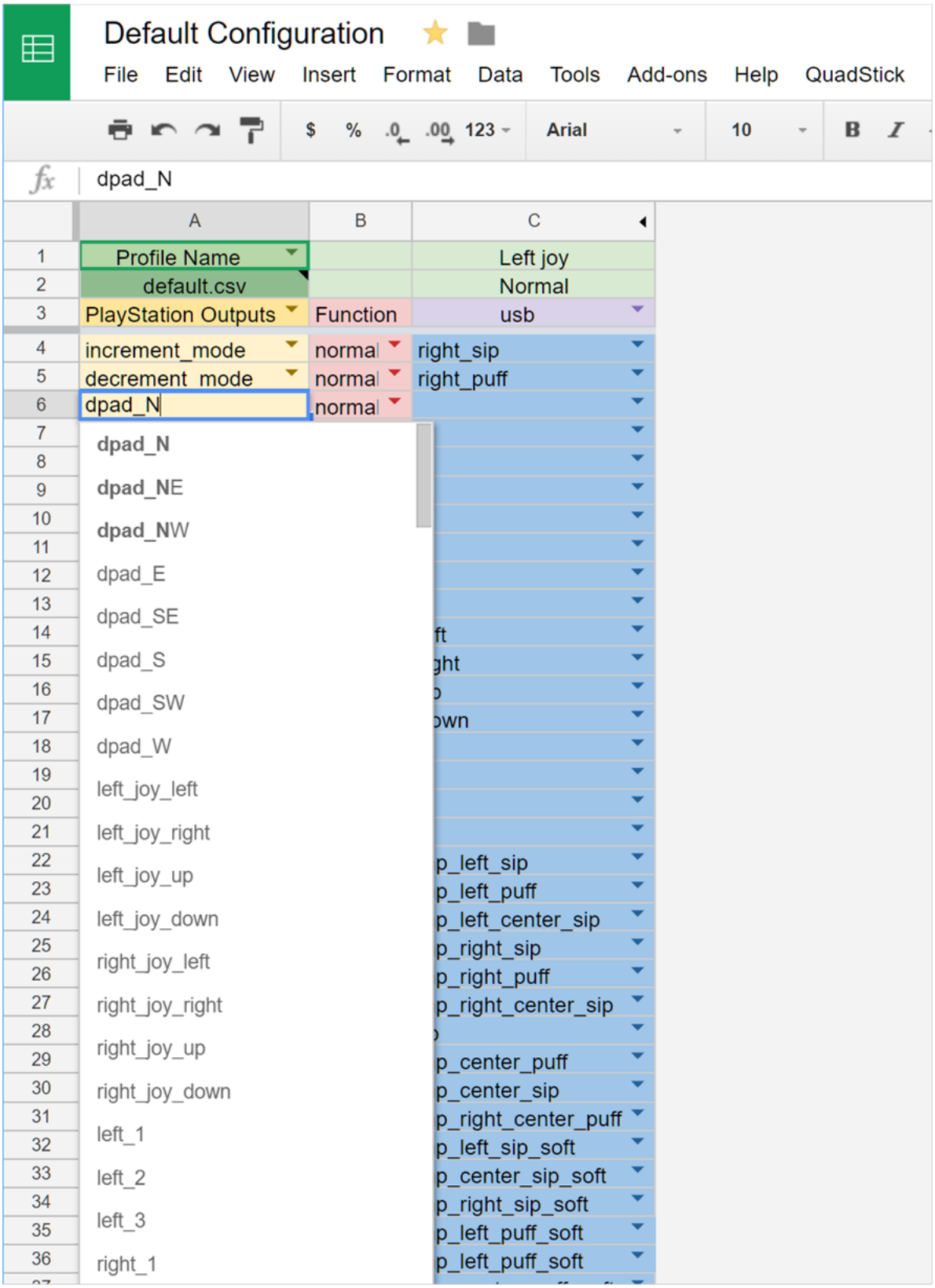


Illustration 1: Output Commands Dropdown List

PlayStation Output Names

Output names for the PlayStation 3 & 4.

XBox Output Names

Output names for XBox One and 360

Inputs

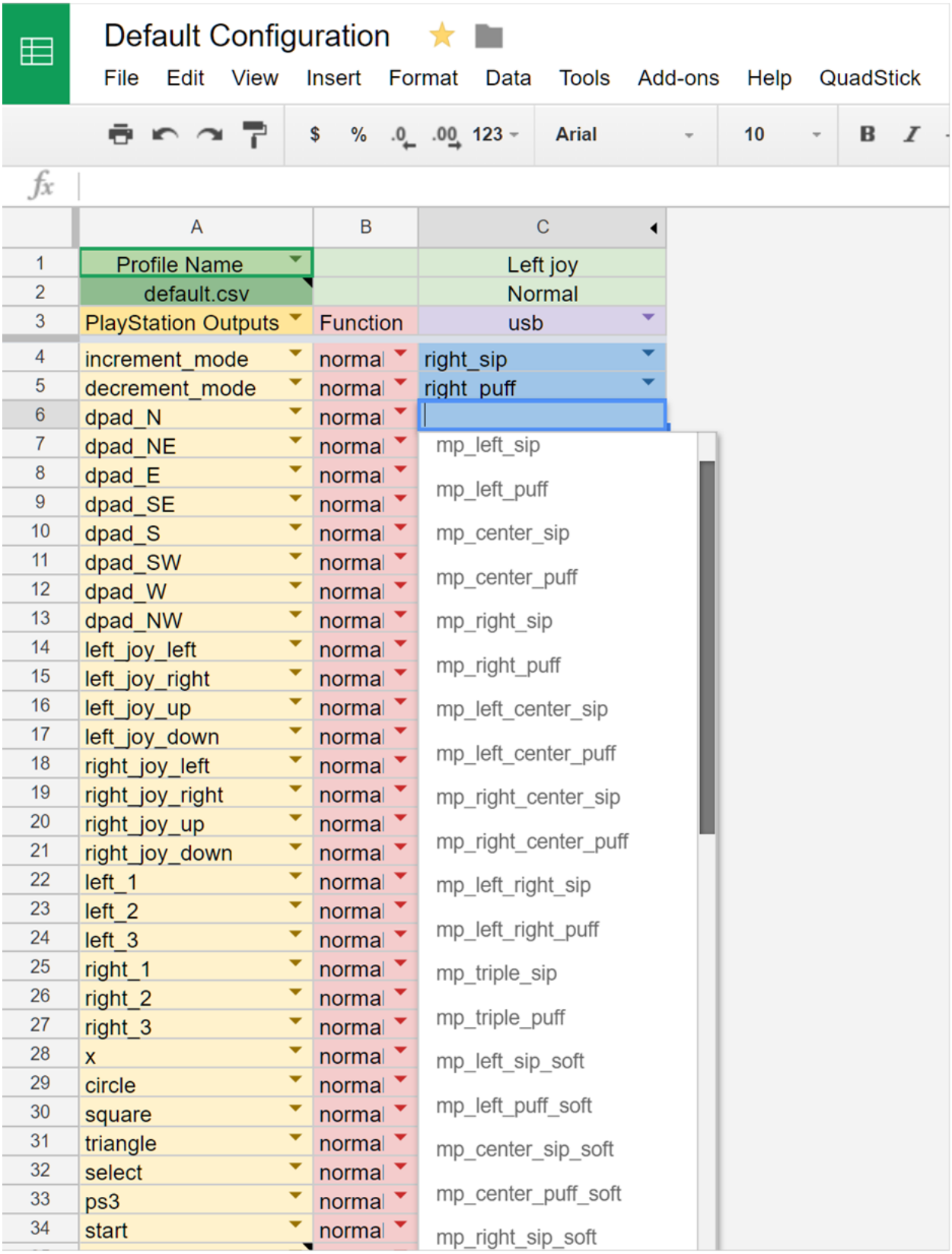


Illustration 2: Input Sensor Dropdown List

The list of inputs:

```
mp_left_sip,
mp_left_puff,
```

```
mp_center_sip,
mp_center_puff,
mp_right_sip,
mp_right_puff,
mp_left_center_sip,
mp_left_center_puff,
mp_right_center_sip,
mp_right_center_puff,
mp_left_right_sip,
mp_left_right_puff,
mp_triple_sip,
mp_triple_puff,
mp_left_sip_soft,
mp_left_puff_soft,
mp_center_sip_soft,
mp_center_puff_soft,
mp_right_sip_soft,
mp_right_puff_soft,
mp_left_center_sip_soft,
mp_left_center_puff_soft,
mp_right_center_sip_soft,
mp_right_center_puff_soft,
mp_left_right_sip_soft,
mp_left_right_puff_soft,
mp_triple_sip_soft,
mp_triple_puff_soft,

right_sip,
right_puff,
right_sip_soft,
right_puff_soft,
right_sip_long,
right_puff_long,

lip,
lip_soft,

left,
right,
up,
down,
any_direction,

N,
NE,
E,
SE,
S,
SW,
W,
NW,
N_inner,
NE_inner,
E_inner,
SE_inner,
S_inner,
SW_inner,
```

```
W_inner,
NW_inner,

usb_1_left,
usb_1_right,
usb_1_up,
usb_1_down,
usb_1_N,
usb_1_NE,
usb_1_E,
usb_1_SE,
usb_1_S,
usb_1_SW,
usb_1_W,
usb_1_NW,
usb_1_N_inner,
usb_1_NE_inner,
usb_1_E_inner,
usb_1_SE_inner,
usb_1_S_inner,
usb_1_SW_inner,
usb_1_W_inner,
usb_1_NW_inner,

usb_2_left,
usb_2_right,
usb_2_up,
usb_2_down,
usb_2_N,
usb_2_NE,
usb_2_E,
usb_2_SE,
usb_2_S,
usb_2_SW,
usb_2_W,
usb_2_NW,
usb_2_N_inner,
usb_2_NE_inner,
usb_2_E_inner,
usb_2_SE_inner,
usb_2_S_inner,
usb_2_SW_inner,
usb_2_W_inner,
usb_2_NW_inner,

usb_1_button_1,
usb_1_button_2,
usb_1_button_3,
usb_1_button_4,
usb_1_button_5,
usb_1_button_6,
usb_1_button_7,
usb_1_button_8,
usb_1_button_9,
usb_1_button_10,
usb_1_button_11,
usb_1_button_12,
```

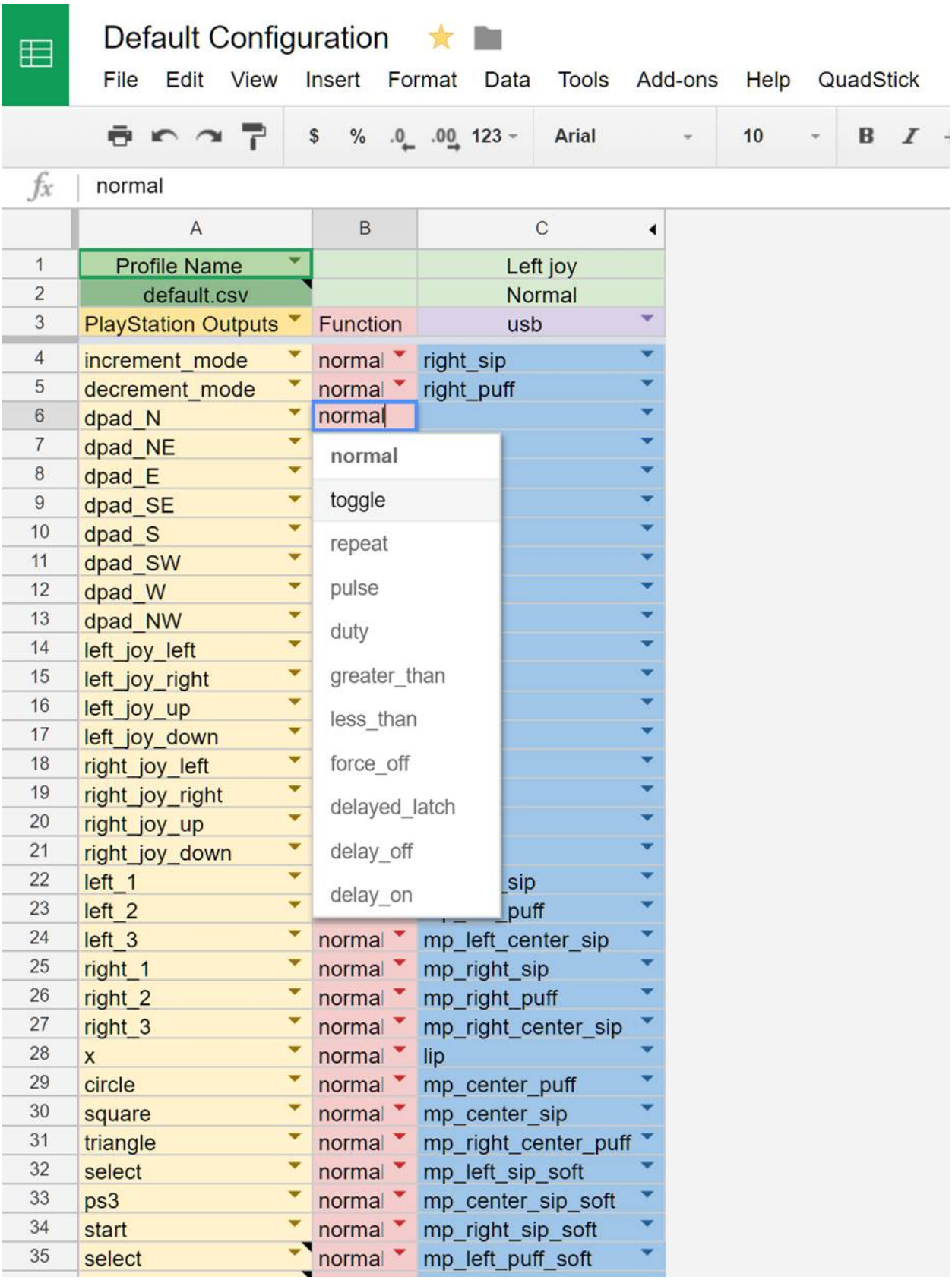
```
usb_1_button_13,
usb_1_button_14,
usb_1_button_15,

usb_2_button_1,
usb_2_button_2,
usb_2_button_3,
usb_2_button_4,
usb_2_button_5,
usb_2_button_6,
usb_2_button_7,
usb_2_button_8,
usb_2_button_9,
usb_2_button_10,
usb_2_button_11,
usb_2_button_12,
usb_2_button_13,
usb_2_button_14,
usb_2_button_15,

digital_in_1,
digital_in_2,
digital_in_3,
digital_in_4,
digital_in_5,
digital_in_6,
digital_in_7,
digital_in_8

center,
constant,
```

Ouput Functions



normal

The output is active only when the input is active.

toggle

When the input activates, the output will toggle, or latch, its on/off state. It will hold its last on/off state until the next input activation or if the user changes to a mode that does not have the output configured with a toggle.

repeat

As long as the input is active, the output will turn on and off repeatedly. The default rate is 10 times per second. An optional value for the number of repeats per second may be placed in the cell after the word, like "repeat 4". An optional 2nd parameter is a delay in milliseconds before the output starts repeating. "repeat 5 2000" would turn on the output for two seconds, then start pulsing 5 times per second until the input is released.

pulse

When the input goes from inactive to active, the output will turn on for a brief period of time. The default is 100ms. An optional parameter for the duration of the pulse, in milliseconds, may be placed in the cell after the word, like "pulse 1500". An optional second parameter controls the number of pulses delivered. The default number of pulses is 1. "pulse 50 2" could be used to "double tap" a trigger.

duty

As the input value goes from 0 to 100%, scale the duration of the on-time of the output. The default minimum on/off time is 100ms. An optional parameter, in milliseconds, can be added to adjust the minimum on/off time.

greater_than

When the analog value of the input equals or exceeds a value, the output will turn on. The default value is 100%, which will turn on the output when the input reaches 100%. (A normal function turns on at 0.1%). An optional parameter, in percent, may be added. A second optional parameter was added to greater_than in firmware build 1866 that turns the output off when it is exceeded. For example, "greater_than 25 75" would turn on the output when the input exceeded 25% and turn it back off when the input exceeded 75%.

less_than

When the analog value of the input is less than a value, the output will turn on. The default value is 100%. This function acts like an inverter or not function. An optional parameter, in percent, may be added.

force_off

When the input activates, it will force the output off. This is used to allow one input to force off an output that was turned on or latched by an earlier input. An optional parameter, in milliseconds, allows a delay in the force_off function. The default delay is 0 ms.

delayed_latch

When the input activates, the output will activate. If the input is held active for longer than a period of time, the output will latch on and stay on when the input deactivates. If the input is held active for less than the time period, the output will deactivate when the input deactivates. A previously latched output can be turned off with a brief activation of the input or forced off by another input. The default delay period is 1000ms. An optional parameter allows the user to set the delay period in milliseconds. For example, "delayed_latch 250" would latch after one quarter of a second.

delay_off

Will hold the output on for a period of time (in ms) after the input goes inactive.

delay_on

Will prevent the output from turning on for a period of time (in ms) after an input goes active. The default delay is 1000 ms. An optional parameter can control the delay. If an optional second parameter is present, the output will pulse for the duration of the second parameter and turn off. By default the output will stay on as long as the input is active. This function can be used to sequence up to six keyboard keys from one input.

If the second parameter is exactly 1, the output will toggle on/off each time the input is activated for longer than the delay period.

tap

When the input is activated for less than 500 ms and released, the output will be activated for 100 ms as the input is released. If the input is activated for longer than 500 ms, the output remains off. Can be used along with delay_on to allow a single sip/puff/lip input to control two outputs. Two optional parameters allow control of the time period that determines the tap detection and the duration of the pulse when a tap is detected. The default parameters are equivalent to "tap 500 100". This function will clear any associated toggle or latch or delay_off when the input activates.

If the second parameter is exactly 1, the output will toggle on/off each time the input is activated for less than the delay period.

increment_value & decrement_value

```
increment_value   [value]    [interval between increments in milliseconds]
decrement_value   [value]    [interval between decrements in milliseconds]
```

The first parameter, [value], is the amount the value will be incremented or decremented. The default parameter value is 10. When the second parameter, [interval...], is missing, the output value will increment/decrement each time the input transitions from off to on. When present, the second parameter is the interval between each change in the value.

The functions are a form of latch and will work with force_off, toggle & normal in the same ways as other latching functions. If switching modes, the value will be maintained only if the new mode has the same output with a latching function.

Examples: Increment Decrement Value Test

Forum post with more details: here

USB/Bluetooth channel selection

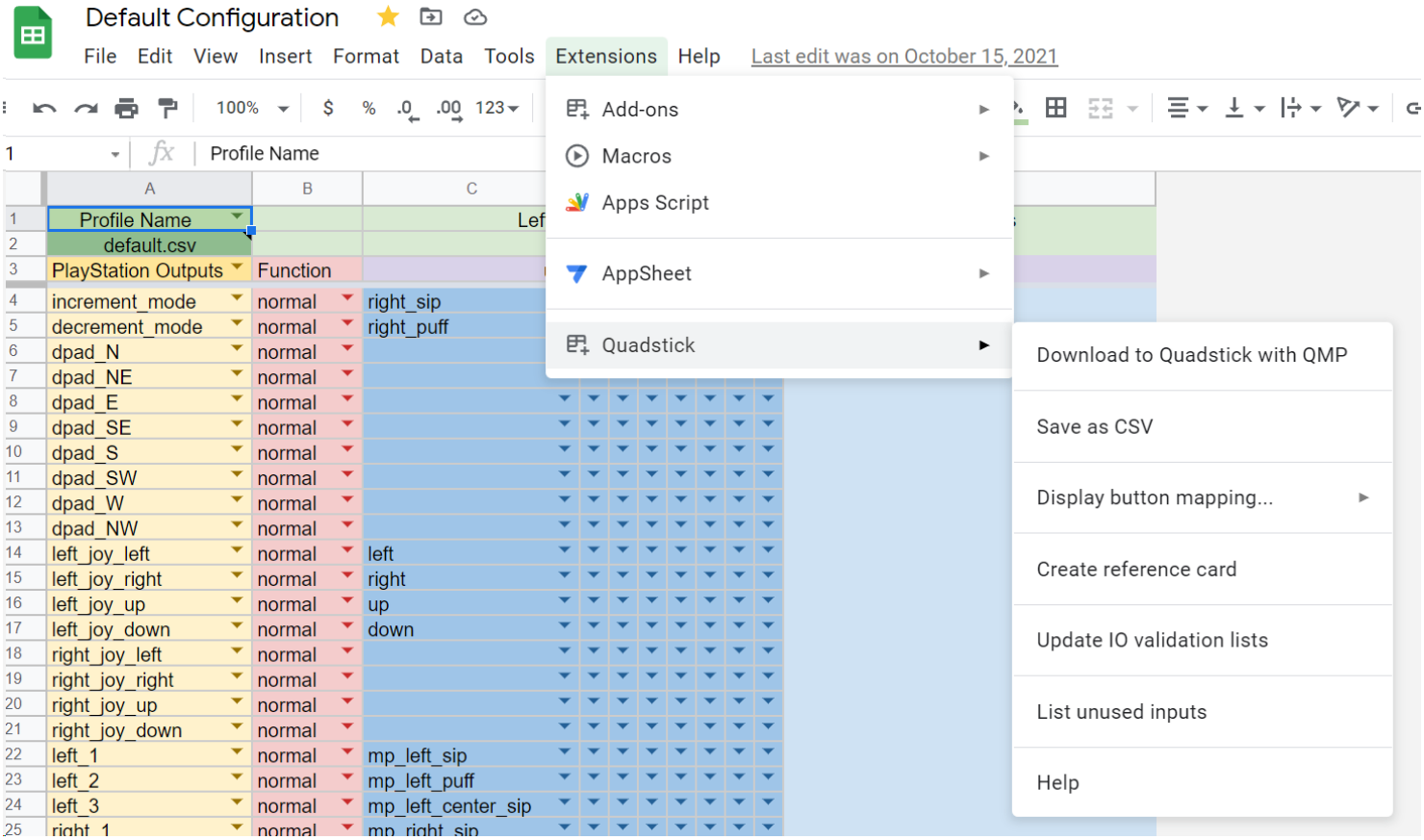
The status of the Outputs is sent to the host through either a USB connection or the Bluetooth module. We call this the communication channel. It can be selected from a dropdown list that contains USB and Bluetooth choices for the input group. The QuadStick can have a USB connection to one device while having a simultaneous Bluetooth connection to another. When the profile mode sheet becomes active, the chosen channel receives the data stream. An example would be a USB connection to a game console and a Bluetooth connection to a PC for controlling the mouse.

The Mouse mode sheets would have the Channel set to Bluetooth while the Game controller sheets would be set to USB.

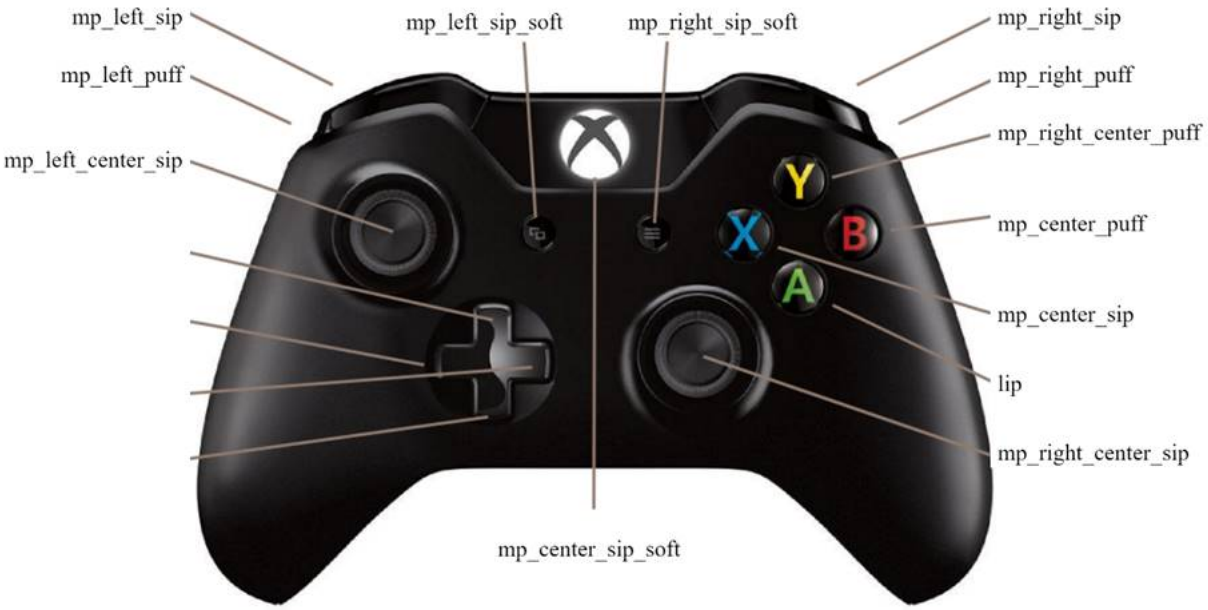
The Bluetooth module has multiple uses which will be described in detail later.

QuadStick Menu

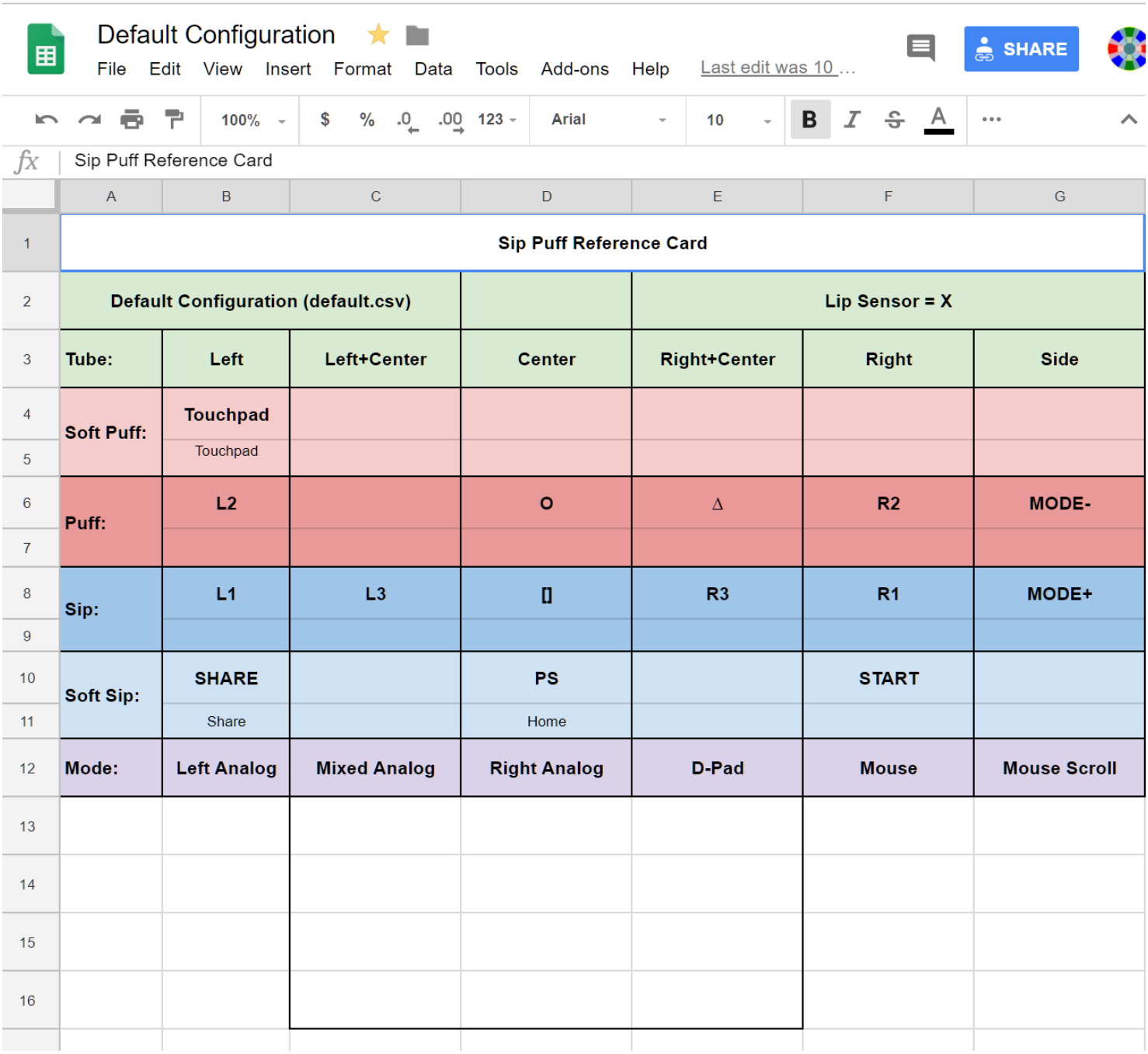
The Menu bar for the configuration spreadsheet has commands added to download and display the configuration file. If the spreadsheet or user has not already installed it, the Quadstick Add-on is available at: http://add-on.quadstick.com The user only needs to install the add-on one time and it is available for all Quadstick spreadsheets.



• The Download into Quadstick using QMP will automatically place the contents of the configuration file into the Quadstick if the Quadstick Manager Program is installed.
• The Save As CSV command will convert the spreadsheet into a CSV file and download it to the user's computer for users that are not running the QMP. Copy the new file into the Quadstick's flash drive to make it available for use.
• Display Button mapping.... will display an image of a game controller with the various controls labeled with the inputs they are mapped to in the current mode sheet.

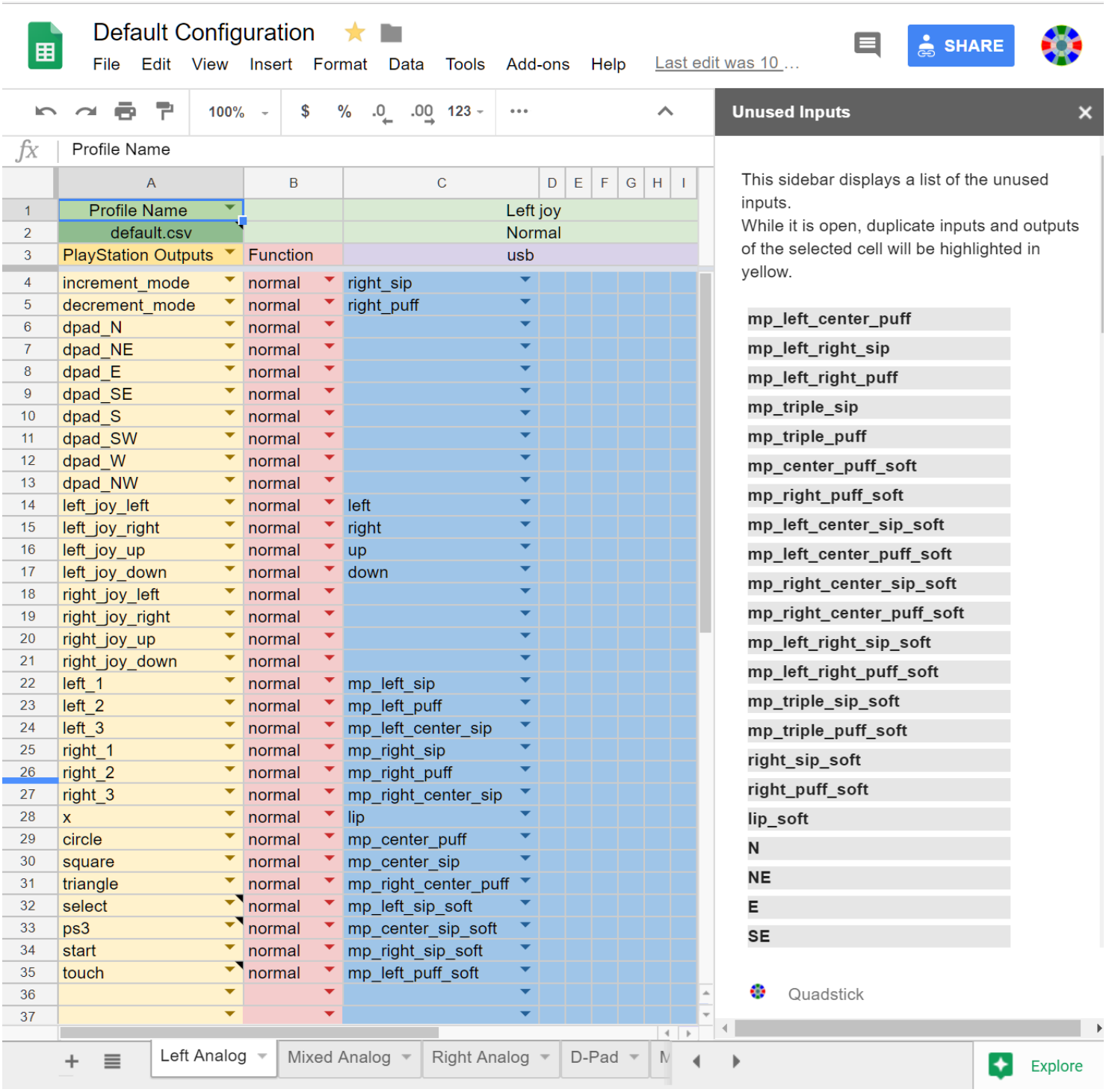


• The Reference Card command will add a new sheet that contains a summary of the IO assignments that may be printed and used the remind the user of configuration details:



	A	B	C	D	E	F	G
1	**Sip Puff Reference Card**						
2	**Default Configuration (default.csv)**				**Lip Sensor = X**		
3	**Tube:**	**Left**	**Left+Center**	**Center**	**Right+Center**	**Right**	**Side**
4	**Soft Puff:**	**Touchpad**					
5		Touchpad					
6	**Puff:**	**L2**		**O**	**Δ**	**R2**	**MODE-**
7							
8	**Sip:**	**L1**	**L3**	**[]**	**R3**	**R1**	**MODE+**
9							
10	**Soft Sip:**	**SHARE**		**PS**		**START**	
11		Share		Home			
12	**Mode:**	**Left Analog**	**Mixed Analog**	**Right Analog**	**D-Pad**	**Mouse**	**Mouse Scroll**
13							
14							
15							
16							

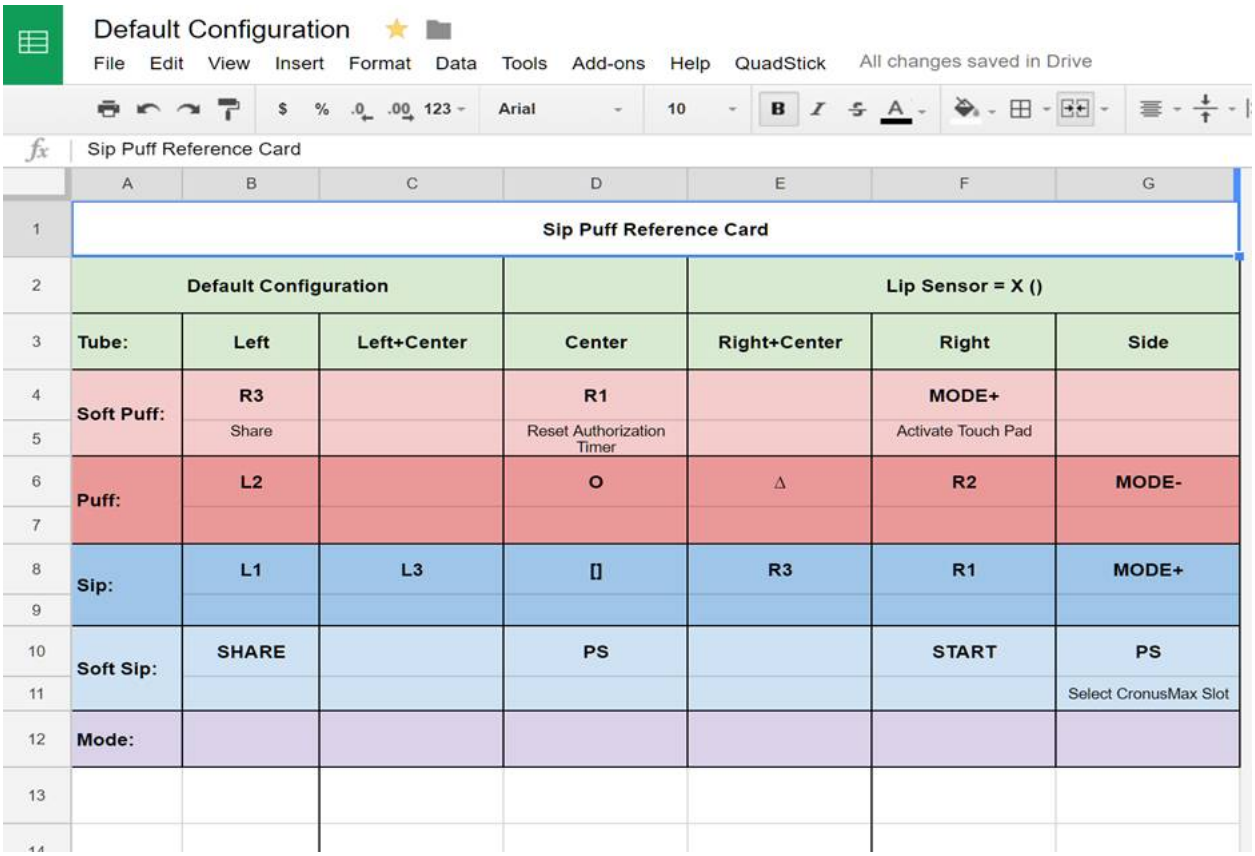
• List unused inputs will open a dynamically updated list of currently unused inputs for the active sheet.



	A	B	C
1	Profile Name		Left joy
2	default.csv		Normal
3	PlayStation Outputs	Function	usb
4	increment_mode	normal	right_sip
5	decrement_mode	normal	right_puff
6	dpad_N	normal	
7	dpad_NE	normal	
8	dpad_E	normal	
9	dpad_SE	normal	
10	dpad_S	normal	
11	dpad_SW	normal	
12	dpad_W	normal	
13	dpad_NW	normal	
14	left_joy_left	normal	left
15	left_joy_right	normal	right
16	left_joy_up	normal	up
17	left_joy_down	normal	down
18	right_joy_left	normal	
19	right_joy_right	normal	
20	right_joy_up	normal	
21	right_joy_down	normal	
22	left_1	normal	mp_left_sip
23	left_2	normal	mp_left_puff
24	left_3	normal	mp_left_center_sip
25	right_1	normal	mp_right_sip
26	right_2	normal	mp_right_puff
27	right_3	normal	mp_right_center_sip
28	x	normal	lip
29	circle	normal	mp_center_puff
30	square	normal	mp_center_sip
31	triangle	normal	mp_right_center_puff
32	select	normal	mp_left_sip_soft
33	ps3	normal	mp_center_sip_soft
34	start	normal	mp_right_sip_soft
35	touch	normal	mp_left_puff_soft
36			
37			

Reference Cards

Playstation output names:



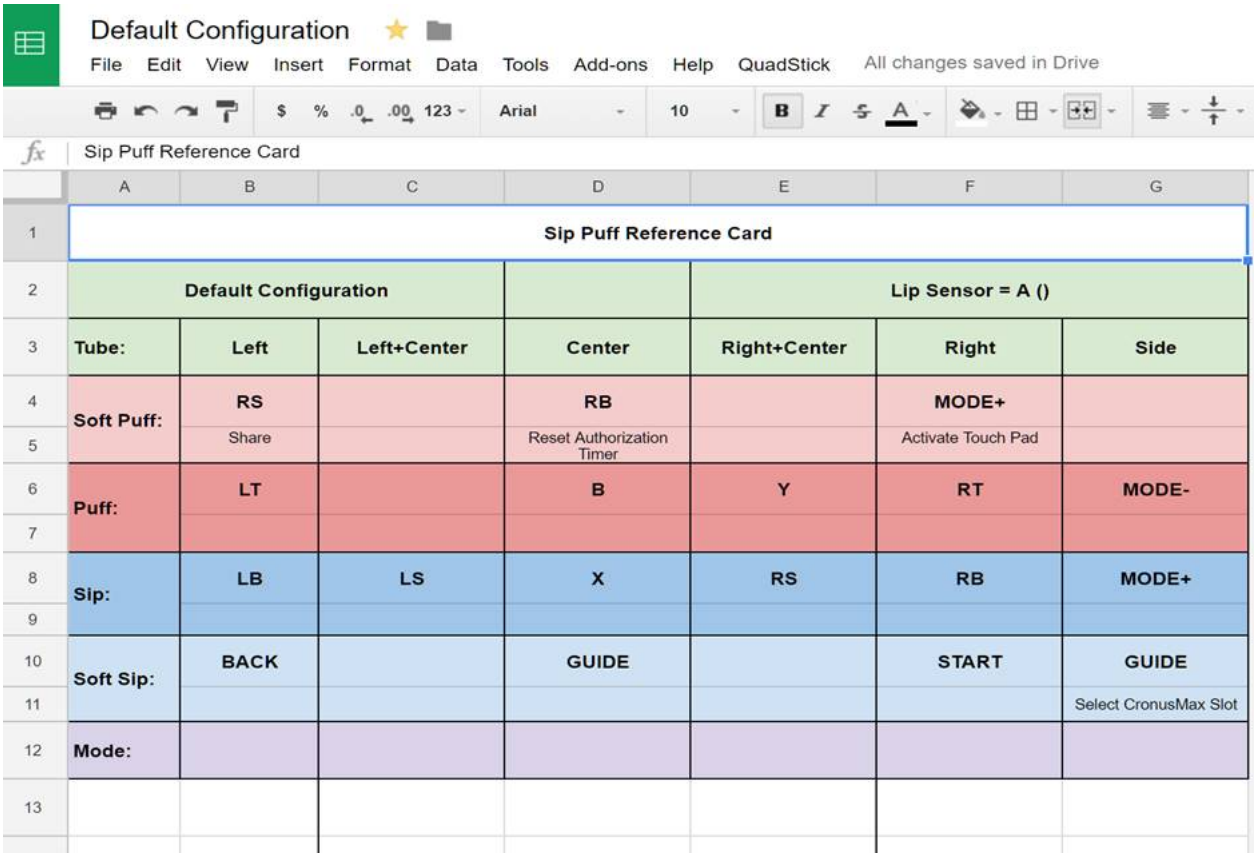
Default Configuration

File Edit View Insert Format Data Tools Add-ons Help QuadStick All changes saved in Drive

Sip Puff Reference Card

	A	B	C	D	E	F	G
1	Sip Puff Reference Card						
2	Default Configuration				Lip Sensor = X ()		
3	Tube:	Left	Left+Center	Center	Right+Center	Right	Side
4	Soft Puff:	R3		R1		MODE+	
5		Share		Reset Authorization Timer		Activate Touch Pad	
6	Puff:	L2		O	Δ	R2	MODE-
7							
8	Sip:	L1	L3	[]	R3	R1	MODE+
9							
10	Soft Sip:	SHARE		PS		START	PS
11							Select CronusMax Slot
12	Mode:						
13							

XBox output names:



Default Configuration

File Edit View Insert Format Data Tools Add-ons Help QuadStick All changes saved in Drive

Sip Puff Reference Card

	A	B	C	D	E	F	G
1	Sip Puff Reference Card						
2	Default Configuration				Lip Sensor = A ()		
3	Tube:	Left	Left+Center	Center	Right+Center	Right	Side
4	Soft Puff:	RS		RB		MODE+	
5		Share		Reset Authorization Timer		Activate Touch Pad	
6	Puff:	LT		B	Y	RT	MODE-
7							
8	Sip:	LB	LS	X	RS	RB	MODE+
9							
10	Soft Sip:	BACK		GUIDE		START	GUIDE
11							Select CronusMax Slot
12	Mode:						
13							

Changing Profiles

The configuration profile mode sheets are numbered starting with 1, in the order their sheets appear in the spreadsheet window. The default method to increment to the next profile is to activate the Right Sip tube. Puffing on the Right tube decrements the mode to the previous profile. The active profile's number is displayed on the status LEDs when the profile changes and after a short delay whenever no inputs are active. The LEDs are numbered one through five, left to right. After mode five, the fifth LED stays on and the pattern starts over from the left until the nineth mode, then both four and five stay on and the pattern repeats. The sum of the LED numbers indicates the mode number up to 15.

increment_mode	normal	right_sip
decrement_mode	normal	right_puff

Since the command to change between modes is controlled within the mode's profile, another input signal can be used instead of the Right Sip/Puff, if desired. A example would be using the button that activates a scope or zoom in an FPS to also change to the Right Analog mode for aiming, regardless of which mode was active before. This example from Far Cry 4 changes the mode from 1 to 3 and brings up the scope when mp_left_puff is activated.

left_2	toggle	mp_left_puff
increment_mode	normal	mp_left_puff
increment_mode	normal	mp_left_puff

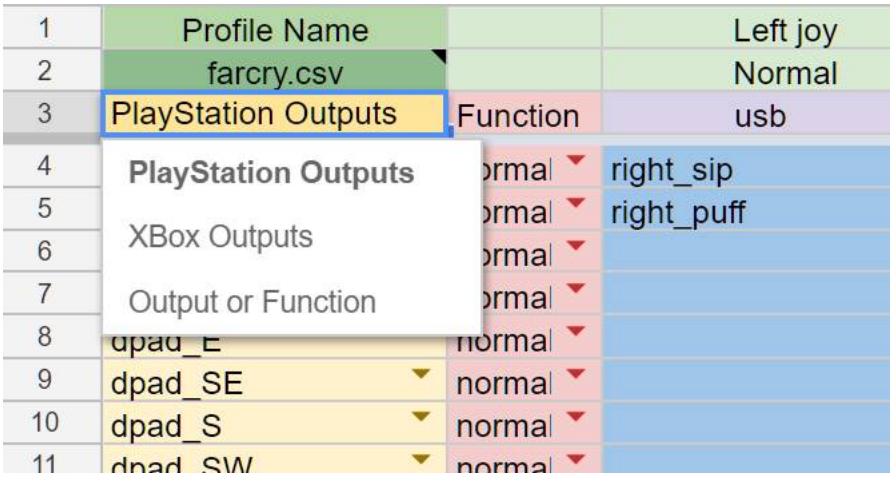
Voice mode commands can also switch the Quadstick directly to any desired mode.

Selecting Output Names for PlayStation and XBox

The game consoles use different names for buttons that have the same function. Using the Default Configuration as an example:

QuadStick	PS3	PS4	XBox	Windows	Steam BPM	Nintendo Switch
Center Sip	□	□	X	Button 1	Button 0	X
Lip	X	X	A	Button 2	Button 1	A
Center Puff	O	O	B	Button 3	Button 2	B
Right Center Puff	Δ	Δ	Y	Button 4	Button 3	Y
Left Sip	L1	L1	LB	Button 5	Button 4	L
Right Sip	R1	R1	RB	Button 6	Button 5	R
Left Puff	L2	L2	LT	Button 7	Button 6	LZ
Right Puff	R2	R2	RT	Button 8	Button 7	RZ
Left Sip Soft	select	share	back <	Button 9	Button 8	Minus
Right Sip Soft	start	options	start >	Button 10	Button 9	Plus
Left Center Sip	L3	L3	LS	Button 11	Button 10	LS
Right Center Sip	R3	R3	RS	Button 12	Button 11	RS
Center Sip Soft	PS	PS	Guide	Button 13	Button 12	Home
Left Center Puff		Touch		Button 14		Capture

To make it easier to remember button assignments, the Quadstick can use either PlayStation or XBox button names and the spreadsheets can convert them from one to the other.



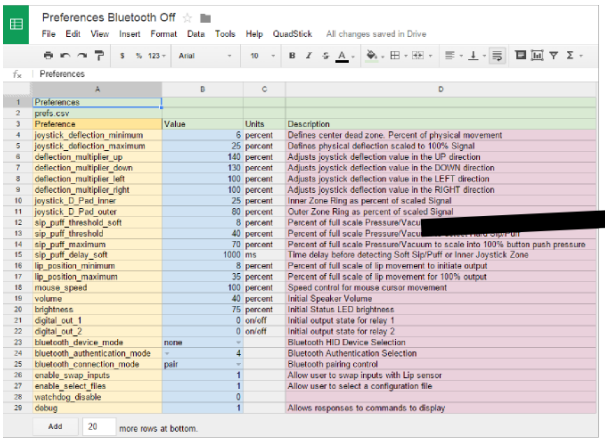
Select the appropriate output names from the drop-down list and the spreadsheet will convert all button names.

Preferences

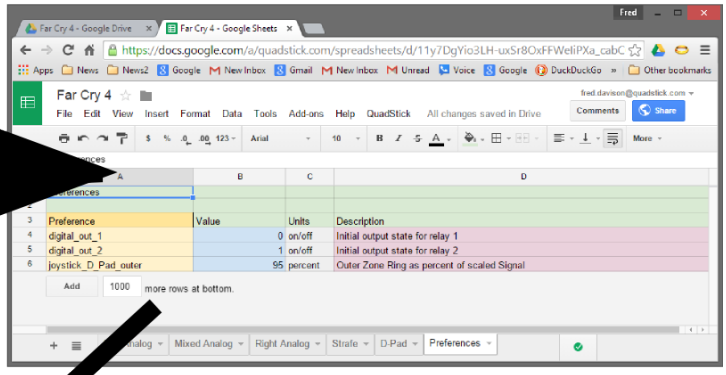
Preferences settings are values that control the overall operation of the Quadstick. The Quadstick preference settings can be tailored to an individual's needs. Globally (in prefs.csv), in a Game Configuration file for a specific game, by Voice Command, or even in an individual game Mode sheet within a game configuration file. Most preference values that are held in the prefs.csv file can be adjusted using the Quadstick Manager Program.

QuadStick Preferences Order of Precedence

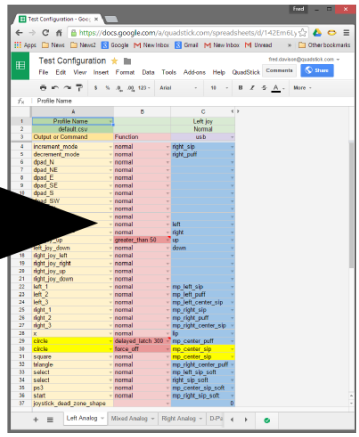
PREFS.CSV



Preferences Sheet
in game configuration



Voice Commands



Individual Mode
Sheet in game
configuration

The current value of a preference setting that is active at any given moment is determined by the order in which the value from each source is processed. Preferences are first read from the Prefs.csv file. If a game configuration file is loaded and it has a Preferences Sheet, any values contained in it will override the values in Prefs.csv. Next, any voice commands that change a Preference value can replace many of the values in Prefs.csv or a Preferences page. Finally, any preference value found on a Mode sheet in a game configuration file has the final say for the value.

The Preferences found on Mode sheets are only in effect when that Mode is active. This allows an individual mode to have a specific joystick sensitivity setting or control the center dead zone shape, to fine tune the control of the QuadStick.

The Default Preferences spreadsheet contains the values in the prefs.csv file when the Quadstick is new. The user can create their own copy of the Preferences spreadsheet and modify the values then download the CSV file into the Quadstick, or use the Quadstick Manager Program to adjust them. The values in the prefs.csv file can be

overridden by a Preferences sheet in the active game profile. Likewise, each mode sheet can modify preferences that are active only on that sheet. Every time the configuration changes in the Quadstick, the prefs.csv file is read, then any values in a Preference sheet in the active game configuration file are read, then the any individual preferences in the active mode sheet are applied. A typical use-case could be special modes sheets, like a driving mode, or a sniper mode, where the joystick sensitivity may be reduced to make steering or aiming easier.

Preferences			Can be set in prefs.csv or Preferences page in game csv file
prefs.csv			Can be changed with voice command, or file
Preference	Value	Units	Can be changed on Mode sheet, Command or file
joystick_deflection_minimum	9	percent	Defines center dead zone. Percent of physical movement
joystick_deflection_maximum	30	percent	Defines physical deflection scaled to 100% Signal
deflection_multiplier_up	140	percent	Adjusts joystick deflection value in the UP direction
deflection_multiplier_down	130	percent	Adjusts joystick deflection value in the DOWN direction
deflection_multiplier_left	100	percent	Adjusts joystick deflection value in the LEFT direction
deflection_multiplier_right	100	percent	Adjusts joystick deflection value in the RIGHT direction
joystick_dead_zone_shape	1		0=Square, 1=Circle
anti_dead_zone	0	percent	Counteracts the dead zone built into the Game Console's joystick s
joystick_warning	400	percent	Joystick position beyond full scale that will flash the leds
joystick_alarm	500	percent	Joysitck position beyond full scale that will buzz the speaker
usb_1_multiplier_up	100	percent	Adjusts a USB input sensitivity in one direction
usb_1_multiplier_down	100	percent	Adjusts a USB input sensitivity in one direction
usb_1_multiplier_left	100	percent	Adjusts a USB input sensitivity in one direction
usb_1_multiplier_right	100	percent	Adjusts a USB input sensitivity in one direction
usb_2_multiplier_up	100	percent	Adjusts a USB input sensitivity in one direction
usb_2_multiplier_down	100	percent	Adjusts a USB input sensitivity in one direction
usb_2_multiplier_left	100	percent	Adjusts a USB input sensitivity in one direction
usb_2_multiplier_right	100	percent	Adjusts a USB input sensitivity in one direction

joystick_D_Pad_inner	25	percent	Inner Zone Ring as percent of scaled Signal
joystick_D_Pad_outer	60	percent	Outer Zone Ring as percent of scaled Signal
sip_puff_threshold_soft	8	percent	Percent of full scale Pressure to detect Soft Sip/Puff
sip_puff_threshold	40	percent	Percent of full scale Pressure to detect Hard Sip/Puff
sip_puff_maximum	70	percent	Percent of full scale Pressure to scale into 100% button push press
sip_puff_delay_soft	1000	ms	Time delay before detecting Soft Sip/Puff or Inner Joystick Zone
lip_position_minimum	8	percent	Percent of full scale of lip movement to initiate output
lip_position_maximum	35	percent	Percent of full scale of lip movement for 100% output
mouse_speed	100	percent	Speed control for mouse cursor movement
mouse_response_curve	1		0=linear, 1=mixed curve, 2=parabolic
volume	40	percent	Initial Speaker Volume
brightness	75	percent	Initial Status LED brightness
digital_out_1	0	on/off	Initial output state for relay 1
digital_out_2	0	on/off	Initial output state for relay 2
bluetooth_device_mode	none		Bluetooth HID Device Selection
bluetooth_authentication_mode	2		Bluetooth Authentication Selection
bluetooth_connection_mode	pair		Bluetooth pairing control
bluetooth_throttle	15	ms	Bluetooth mouse report interval in ms.
enable_swap_inputs	0		Allow user to swap inputs with Lip sensor
enable_select_files	1		Allow user to select a configuration file
enable_usb_a_device	0	DO NOT CHANGE	1=USB-A port active, 0=USB-B port active
enable_DS3_emulation	0	DO NOT CHANGE	0=Normal PS3 mode, 1=DS3 emulation, 2=X360CE mode, 3=XB36
enable_rumble	0		1=Buzz when Rumble activated, 0=silent. Requires DS3=1

Preferences on individual mode sheets.

Any of the preferences in the above list that have the light purple background can be set on individual mode sheets and only take effect when that mode sheet is active. The preference name is selected from the pull down list in the A (Outputs) column and the numeric value is placed in column C, where an input normally goes. An error

marker will display in the upper right corner of the C column cell, but it can be ignored. The B column is ignored in this type of row.

Example: RockyNoHandsPUBG PC

joystick_dead_zone_shape	normal	0

Example Configuration Spreadsheets

<TODO>: Insert description text here... And don't forget to add keyword for this topic

Default Configuration

<TODO>: Insert description text here... And don't forget to add keyword for this topic

Elite Dangerous

Elite Dangerous is a space flight simulation game. The player pilots a space ship in an Open World representation of the Milky Way galaxy. The player is able to explore the game's galaxy of some 400 billion star systems. MMO and single player options are available.

Due to the complexity of the game, it is worthwhile to watch several of the tutorial videos showing different aspects of the game.

Other sources for information:

- Steam
- Reddit
- Polygon

The PC version of the game simultaneously uses the mouse, keyboard and game controller features of the Quadstick. The Quadstick must be plugged in before starting the game to be detected. Once the game has started, go into the Options->Controls settings and select "GENERIC JOYSTICK". All other settings are assumed to left at their default values.

Elite Dangerous PC configuration spreadsheet.

The configuration has seven mode sheets. They are:

1. Mouse
2. Flight Roll
3. Flight Yaw
4. Flight Translate
5. Panel Selection
6. Panel Operation
7. Head Look

The Mouse mode is used to manage the game and change settings. The three Flight modes all use the same keyboard bindings and differ only in which axes are controlled by the joystick. The spaceship cockpit view allows the user to focus on different control panels, which are selected using the Panel Selection mode which then automatically switches to the Panel Operation mode. Head Look temporarily lets the user look around without changing the heading of the spacecraft.

The heart of the configuration are the three Flight modes. Here is the reference card:

Since there are a large number of commands, some of the sip/puff hole inputs use short vs long sip/puffs to multiply the number of possible combinations.

Portal 2

<TODO>: Insert description text here... And don't forget to add keyword for this topic

World of Tanks

<TODO>: Insert description text here... And don't forget to add keyword for this topic

USB: Emulated Devices

The primary way the Quadstick works with game consoles and PCs (hosts) is via its USB interface. The Quadstick emulates, or pretends to be, devices like keyboards, mice & game controllers. In addition to its default PS3 & PC compatible USB configuration, it can emulate specific devices, like:

0. PS3 compatible controller with mouse, keyboard, and flash support.
1. Dual Shock 3 for the PS3
2. A special emulation to support analog triggers with the X360CE program on Windows.
3. XBox 360 controller (for PCs)
4. Dual Shock 4 for the PS4 with mouse, keyboard, and flash support on PC.
5. Nintendo Switch
6. PS3 compatile controller with mouse and keyboard support, but no flash support.
7. Dual Shock 4

The Quadstick is often used with the CronusMax Plus or Brook Accessory Super Converter USB protocol converters for use with the XBox One/360 or PS4. The Quadstick is directly compatible with the PS3, PS4, PC or Mac, and the Nintendo Switch.

Human Interface Devices

The Quadstick normally appears on the USB bus to the host PC or console as a Composite USB Device that consists of Gamepad, Mouse and Keyboard Devices. These devices are generically called Human Interface Devices (HID). They each have a specific data report they send to the host over the USB connection. From the perspective of the Quadstick, the data in these reports are the Outputs to which we connect the Inputs from the joystick or sip/puff sensors in the configuration spreadsheets.

Flash Drive

When in USB emulation modes 0, 2 & 4, the Quadstick also appears on the USB bus as a small removable storage device, a Flash drive. This drive is used to hold the customized configuration files the user may wish to use for a particular game or for updating the internal software (firmware) that runs the Quadstick. The flash drive is not available to a PC when the Quadstick is emulating the DS3, XBox 360, or Nintendo Switch controllers.

Emulation Preference settings

There are currently six USB emulation modes:

0. Composite device with a PS3 compatible game controller, mouse, keyboard and flash drive.
1. Dual Shock 3 emulation, with access to Gyroscope and Accelerometer outputs.
2. X306CE compatibility mode. Similar to mode 0, except x360ce lets PC games access the Left and Right Triggers as axes instead of just buttons. Important for racing games.
3. XBox 360 emulation. Works for games that need an XBox 360 controller where x360ce is not an option or convenient
4. PS4 compatible mode. Gives access to Touchpad, Gyro and Accelerometers outputs.
5. Nintendo Switch. Works for games that do not require motion controls.

The preference variable that controls the emulation mode for a specific game configuration spreadsheet is on a Preferences sheet formatted like this:

Preferences	
Preference	Value
enable_DS3_emulation	0

The number to the right of “enable_DS3_emulation” controls which emulation mode the Quadstick uses while that game configuration is active.

USB Emulation mode 0 (default composite device):

In USB Emulation mode 0, the Quadstick functions as a Mouse, Keyboard, Game controller and Flash drive. This mode is compatible with PC's, Macs, PlayStation 3, Brook Super Converters and the CronusMax.

Gamepad

The PS3 Game Controller is designed to be held with both hands, with the thumbs operating two analog joysticks and a set of four buttons on each side. In addition, there are a pair of buttons for the index fingers and another pair of pull triggers for the middle fingers. Three buttons in the middle section are less frequently used during actual game play and serve to control overall operation of the game console. While several of the buttons appear to be simple on/off switches, in comparison to joysticks or triggers which are obviously analog, almost all the buttons measure the pressure too. The X, Circle, Square, Triangle, R1, L1 and the D-Pad buttons all include how hard they are being pressed in the data reported to the console.

The following illustration and table contain the names of the PS3 outputs used in configuring the Quadstick. We break down compound controls, like the D-Pad or thumbsticks into each their individual elements to allow the greatest flexibility in choosing appropriate inputs to control them.

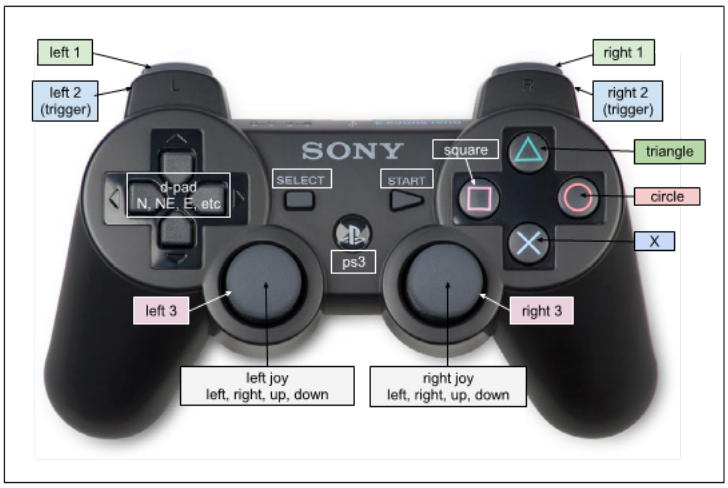


Illustration 1: PS3 Buttons & Controls

Output Name	Description
dpad_N	PS3 D-Pad Button North
dpad_NE	PS3 D-Pad Buttons North and East
dpad_E	PS3 D-Pad Button East
dpad_SE	PS3 D-Pad Buttons South and East
dpad_S	PS3 D-Pad Button South
dpad_SW	PS3 D-Pad Buttons South and West
dpad_W	PS3 D-Pad Button West
dpad_NW	PS3 D-Pad Buttons North and West
left_joy_left	PS3 Left Joystick Left side
left_joy_right	PS3 Left Joystick Right side
left_joy_up	PS3 Left Joystick Up

left_joy_down	PS3 Left Joystick Down
right_joy_left	PS3 Right Joystick Left side
right_joy_right	PS3 Right Joystick Right side
right_joy_up	PS3 Right Joystick Up
right_joy_down	PS3 Right Joystick Down
left_1	PS3 Left Button 1
left_2	PS3 Left Button 2 (trigger)
left_3	PS3 Left Button 3 (Press joystick)
right_1	PS3 Right Button 1
right_2	PS3 Right Button 2 (trigger)
right_3	PS3 Right Button 3 (Press joystick)
x	PS3 Button X
square	PS3 Button Square
triangle	PS3 Button Triangle
circle	PS3 Button Circle
ps3	PS3 Home
select	PS3 Select
start	PS3 Start

Table 1: PS3 Output Commands

Mouse

The Mouse is a simple device compared to the Gamepad but has different movement characteristics that need some explanation: Instead of linearly controlling the position of the screen cursor in direct proportion to the joystick position, for the mouse emulation, the screen cursor is “pushed” around the screen by moving the joystick away from the center position. The farther the joystick is deflected, the faster the cursor moves. Releasing the joystick stops the movement of the cursor and leaves it at its current location. If the mouse operated more like a gamepad joystick, releasing the joystick would return the cursor to the middle of the screen.

The speed at which the cursor moves versus the joystick deflection angle follows a parabolic, linear or mixed curve. For the parabolic curve, the speed is calculated from the Square of the deflection from the center position, not in linear proportion to the deflection. This gives the ability for slow and fine control near the center position but also a smooth transition to fast movement with more deflection.

The parameters controlling the mouse speed, maximum joystick deflection and center dead-zone are adjustable by the user.

Preferences			Can be set in prefs.csv or Preferences page in game csv file
prefs.csv			Can be changed with voice command, or file
Preference	Value	Units	Can be changed on Mode sheet, Command or file
joystick_deflection_minimum	9	percent	Defines center dead zone. Percent of physical movement
joystick_deflection_maximum	30	percent	Defines physical deflection scaled to 100% Signal
deflection_multiplier_up	140	percent	Adjusts joystick deflection value in the UP direction
deflection_multiplier_down	130	percent	Adjusts joystick deflection value in the DOWN direction
deflection_multiplier_left	100	percent	Adjusts joystick deflection value in the LEFT direction
deflection_multiplier_right	100	percent	Adjusts joystick deflection value in the RIGHT direction
joystick_dead_zone_shape	1		0=Square, 1=Circle
anti_dead_zone	0	percent	Counteracts the dead zone built into the Game Console's joystick software
mouse_speed	100	percent	Speed control for mouse cursor movement
mouse_response_curve	1		0=linear, 1=mixed curve, 2=parabolic

When adjusting the speed of the mouse, first adjust the game controller joystick response to your liking, then adjust the mouse speed.

A circular joystick_dead_zone_shape is import for the mouse. This is usually the default setting but if the mouse is used with a square dead-zone shape, it is difficult to slowly move the cursor on a diagonal.

The default response curve is “mixed”: the average between parabolic and linear curves.

In the Quadstick Manager Program, the mouse preferences are on the Miscellaneous tab. There is a slider to control the mouse_speed and settings for the shape of the center dead-zone and the response curve:

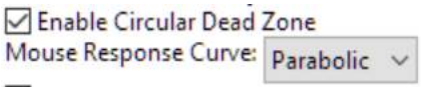


Illustration 2: Mouse Buttons & Controls

Output Name	Description
mouse_left	Mouse Left movement
mouse_right	Mouse Right movement
mouse_up	Mouse Up movement
mouse_down	Mouse Down movement
mouse_wheel_up	Mouse Wheel Up rotation
mouse_wheel_down	Mouse Wheel Down rotation
mouse_pan_left	Mouse Pan Left tilt
mouse_pan_right	Mouse Pan Right tilt
mouse_back	Mouse Button Back
mouse_forward	Mouse Button Forward
mouse_left_button	Mouse Button Left
mouse_right_button	Mouse Button Right
mouse_middle_button	Mouse Button Middle

Table 2: Mouse Outputs

Keyboard

PC based games often use the keyboard instead of a gamepad. The Quadstick can send any of the key codes for a 104-key keyboard. This opens up the ability to play PC based games by directly sending the desired key-code instead of using gamepad to keyboard adapter software.
Key-codes are associated with the key itself, not necessarily with the character printed on the face of the key. This is more apparent for keys like 2-@, 3-#, etc, than it is for letter keys. (The numeric keypad keys represent 2-down-arrow, 3-page-down, etc.) The Shift, Control or Alt keys, when combined with the key-code, are used to determine how the key is read.

The key-codes are treated like the outputs of the other HID devices. An individual key-code output can be triggered by one of the sensor inputs or by a sequence of inputs in a specific order. The Quadstick can press up to six keys simultaneously, plus the Windows, Shift, Control and Alt keys.

These example rows are from the Default Configuration's Mouse sheet for the Cut, Copy & Paste commands:

kb_left_control	normal	mp_center_sip_soft
kb_x	normal	mp_center_sip_soft
kb_left_control	normal	mp_center_sip
kb_c	normal	mp_center_sip
kb_left_control	normal	mp_center_puff_soft
kb_v	normal	mp_center_puff_soft

When the mouthpiece center hole is sipped, both the Control and C keys are pressed.

Keys can also be triggered in a sequence:

kb_a	normal	mp_center_sip
kb_b	delay_on 10	mp_center_sip
kb_c	delay_on 20	mp_center_sip
kb_d	delay_on 30	mp_center_sip
kb_e	delay_on 40	mp_center_sip
kb_f	delay_on 50	mp_center_sip

The keys "abcdef" will be entered with ten milliseconds between keys when mp_center_sip activates. This could be used to store frequently entered strings.

kb_a
kb_b
kb_c
kb_d
kb_e
kb_f
kb_g
kb_h
kb_i
kb_j
kb_k
kb_l
kb_m
kb_n
kb_o
kb_p
kb_q
kb_r
kb_s
kb_t
kb_u
kb_v
kb_w
kb_x
kb_y
kb_z
kb_1_and_exclamation
kb_2_and_at
kb_3_and_hashmark
kb_4_and_dollar
kb_5_and_percentage
kb_6_and_caret
kb_7_and_and_ampersand
kb_8_and_asterisk
kb_9_and_opening_parenthesis
kb_0_and_closing_parenthesis
kb_enter
kb_escape
kb_backspace
kb_tab
kb_space
kb_minus_and_underscore
kb_equal_and_plus
kb_opening_bracket_and_opening_brace
kb_closing_bracket_and_closing_brace
kb_backslash_and_pipe
kb_non_us_hashmark_and_tilde
kb_semicolon_and_colon
kb_apostrophe_and_quote
kb_grave_accent_and_tilde
kb_comma_and_less_than_sign
kb_dot_and_greater_than_sign
kb_slash_and_question_mark
kb_caps_lock
kb_f1
kb_f2
kb_f3
kb_f4
kb_f5
kb_f6
kb_f7
kb_f8
kb_f9
kb_f10
kb_f11
kb_f12
kb_printscreen
kb_roll_lock
kb_pause
kb_insert
kb_home
kb_page_up
kb_delete
kb_end
kb_page_down
kb_right_arrow
kb_left_arrow
kb_down_arrow
kb_up_arrow
kb_num_lock
kb_keypad_slash
kb_keypad_asterisk
kb_keypad_minus
kb_keypad_plus
kb_keypad_enter
kb_keypad_1_and_end
kb_keypad_2_and_down_arrow
kb_keypad_3_and_page_down
kb_keypad_4_and_left_arrow
kb_keypad_5
kb_keypad_6_and_right_arrow
kb_keypad_7_and_home
kb_keypad_8_and_up_arrow
kb_keypad_9_and_page_up
kb_keypad_0_and_insert
kb_keypad_dot_and_delete
kb_non_us_backslash_and_pipe
kb_power
kb_equal_sign
kb_f13
kb_f14
kb_f15
kb_f16
kb_f17
kb_f18
kb_f19
kb_f20
kb_f21
kb_f22
kb_f23
kb_f24
kb_execute
kb_help
kb_manu
kb_select
kb_stop
kb_again
kb_undo
kb_cut
kb_copy
kb_paste
kb_find
kb_mute
kb_volume_up
kb_volume_down
kb_locking_caps_lock
kb_locking_num_lock
kb_lockingroll_lock
kb_keypad_comma
kb_keypad_equal_sign
kb_international1
kb_international2
kb_international3
kb_international4
kb_international5
kb_international6
kb_international7
kb_international8
kb_international9
kb_lang1
kb_lang2
kb_lang3
kb_lang4
kb_lang5
kb_lang6
kb_lang7
kb_lang8
kb_lang9
kb_alternate_erase
kb_sisreq
kb_cancel
kb_clear
kb_prior
kb_return
kb_separator
kb_out
kb_oper
kb_clear_and_again
kb_crsel_andprops
kb_exsel
kb_keypad_00
kb_keypad_000
kb_thousands_separator
kb_decimal_separator
kb_currency_unit
kb_currency_sub_unit
kb_keypad_opening_parenthesis
kb_keypad_closing_parenthesis
kb_keypad_opening_brace
kb_keypad_closing_brace
kb_keypad_tab
kb_keypad_backspace
kb_keypad_a
kb_keypad_b
kb_keypad_c
kb_keypad_d
kb_keypad_e
kb_keypad_f
kb_keypad_xor
kb_keypad_caret
kb_keypad_percentage
kb_keypad_less_than_sign
kb_keypad_greater_than_sign
kb_keypad_amp
kb_keypad_amp_amp
kb_keypad_pipe
kb_keypad_pipe_pipe
kb_keypad_colon
kb_keypad_hashmark
kb_keypad_space
kb_keypad_at
kb_keypad_exclamation_sign
kb_keypad_memory_store
kb_keypad_memory_recall
kb_keypad_memory_clear
kb_keypad_memory_add
kb_keypad_memory_subtract
kb_keypad_memory_multiply
kb_keypad_memory_divide
kb_keypad_plus_and_minus
kb_keypad_clear
kb_keypad_clear_entry
kb_keypad_binary
kb_keypad_octal
kb_keypad_decimal
kb_keypad_hexadecimal
kb_left_control
kb_left_shift
kb_left_alt
kb_left_gui
kb_right_control
kb_right_shift
kb_right_alt
kb_right_gui

Illustration 3: Key-code names

USB Emulation Mode 1 (DS3)

The Dual Shock 3 emulation mode can be useful for PS3 games that require the Gyrometer and Accelerometer features of the Sony DS3 controller. Examples are the games Journey and Flower, which are played using these inputs.

A Preferences sheet is required to enable the DS3 emulation:

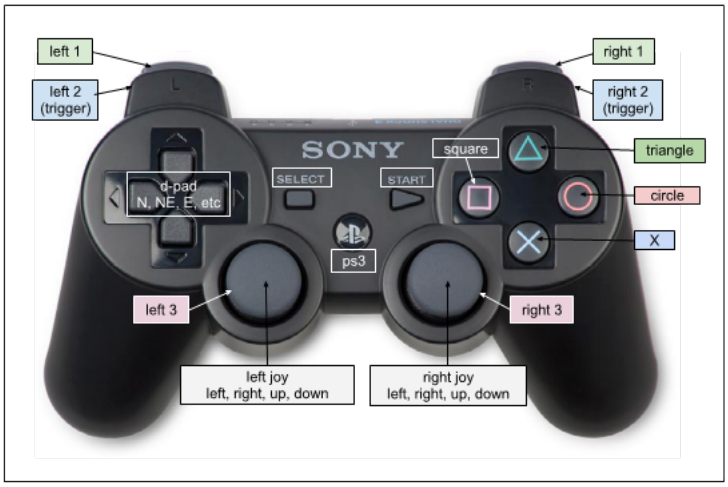
Preferences			
Preference	Value	Units	Description
digital_out_1	0	on/off	Initial output state for relay 1
digital_out_2	1	on/off	Initial output state for relay 2
enable_DS3_emulation	1		Switch to pure Dual Shock 3 emulation

The DS3 specific outputs are:

acceleration_x_left	normal	left
acceleration_x_right	normal	right
acceleration_y_fore	normal	up
acceleration_y_aft	normal	down

and:

acceleration_z_up	normal	up
acceleration_z_down	normal	down
gyroscope_x_cw	normal	left
gyroscope_x_ccw	normal	right



In the Dual Shock 3 mode (0), the Quadstick has the ability to control the Gyroscope and Acceleromter outputs of the Dual Shock 3 / Six Axis controller. This can be useful in games that require those outputs to play the game, such as shaking the flash light in the Last of Us.

USB Emulation Mode 2 (X360CE)

X360ce is an open source software project that allows the QuadStick to emulate an XBox 360 controller on a PC for many games. The Quadstick's normal controller emulation mode is not the best match for some games when using x360ce. The L2/R2, Left-Trigger/Right-Trigger, show up as on/off buttons instead of analog values when the Quadstick is in the default USB mode 0. For driving games, like Rocket League, which would like to use Right Trigger for throttle and Left Trigger for braking or moving backwards, this is a problem which is addressed by running in the x360ce mode.

From the X360CE Configuration spreadsheet, the Preferences sheet has:

Preferences			Can be set in prefs.csv or Preferences page in game csv file
			Can be changed with voice command, or file
Preference	Value	Units	Can be changed on Mode sheet, Command or file
enable_DS3_emulation	2		0=Normal composite device mode, 1=Dual Shock 3 emulation, 2=X360CE mode

The x360ce mode still allows the mouse, keyboard and flash drive functions of the Quadstick to operate. For games that do not use LT & RT as analog values, the normal default mode 0 will work fine.

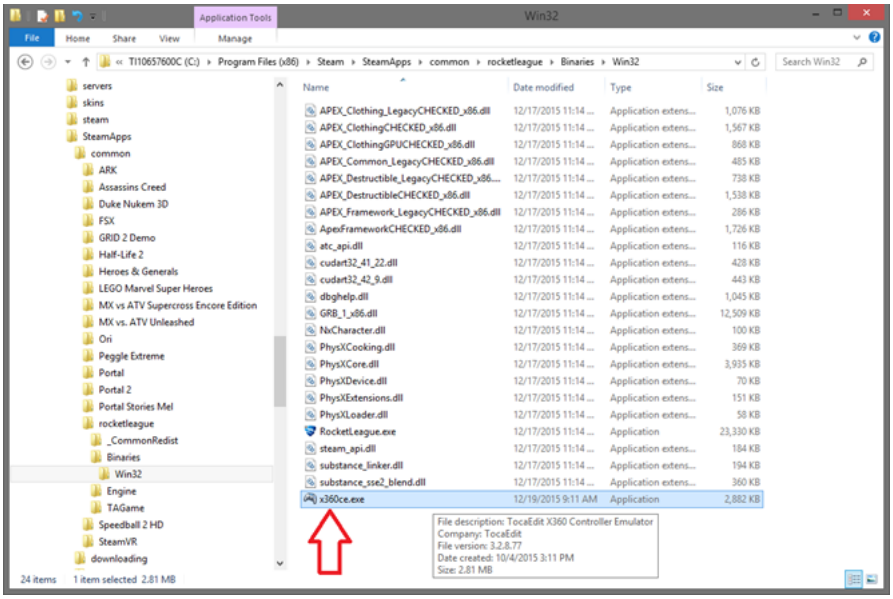
This mode and the default mode 0 will both work with x360ce. The primary difference is the Left and Right Triggers get converted as buttons with mode 0 and as Analog axes in mode 2.

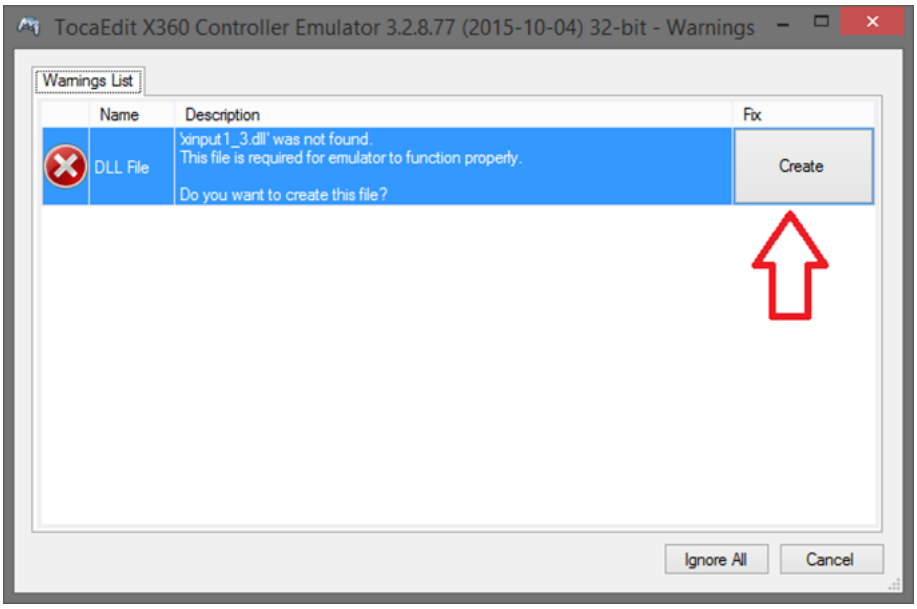
Full instructions for x360ce itself can be found on the X360CE website , but the short version is the x360ce.exe file obtained from them is copied into the folder containing the binary files for the game. X360ce.exe is run from within the game's binary folder to prepare the game's software to work with the Quadstick. The x360ce.exe configuration program itself is not running when the game is running.

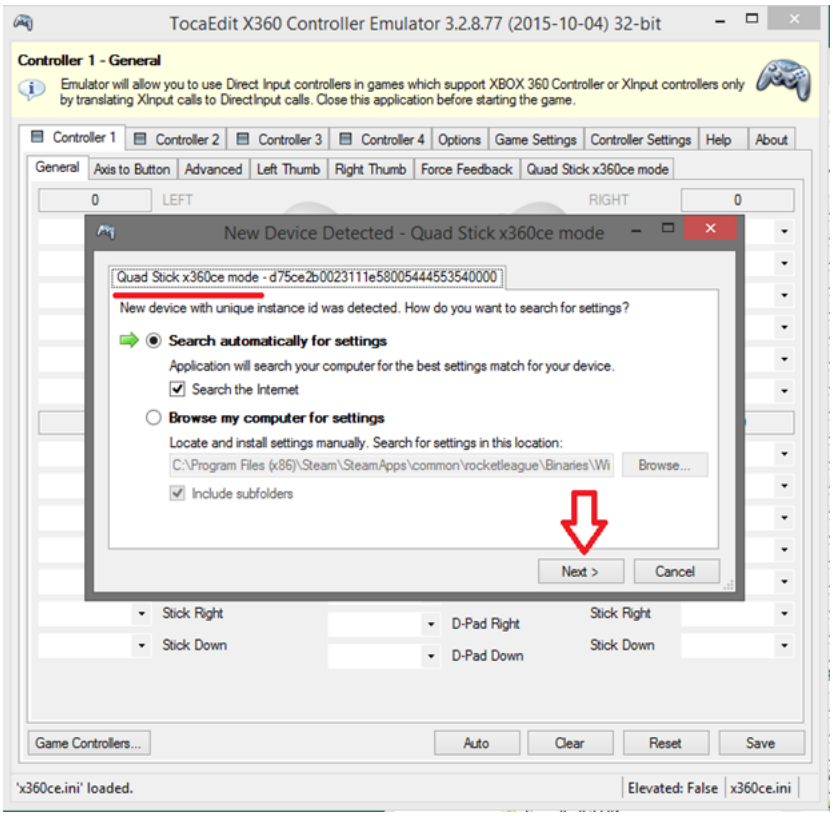
The QuadStick needs to be in x360ce mode **PRIOR** to running x360ce.exe, otherwise it will see the normal controller interface and not give access to analog values on LT/RT. You can always re-run x360ce to renew the settings. Load a game configuration that has the x360ce emulation mode (enable_DS3_emulation = 2), then run x360ce.exe to set up the game.

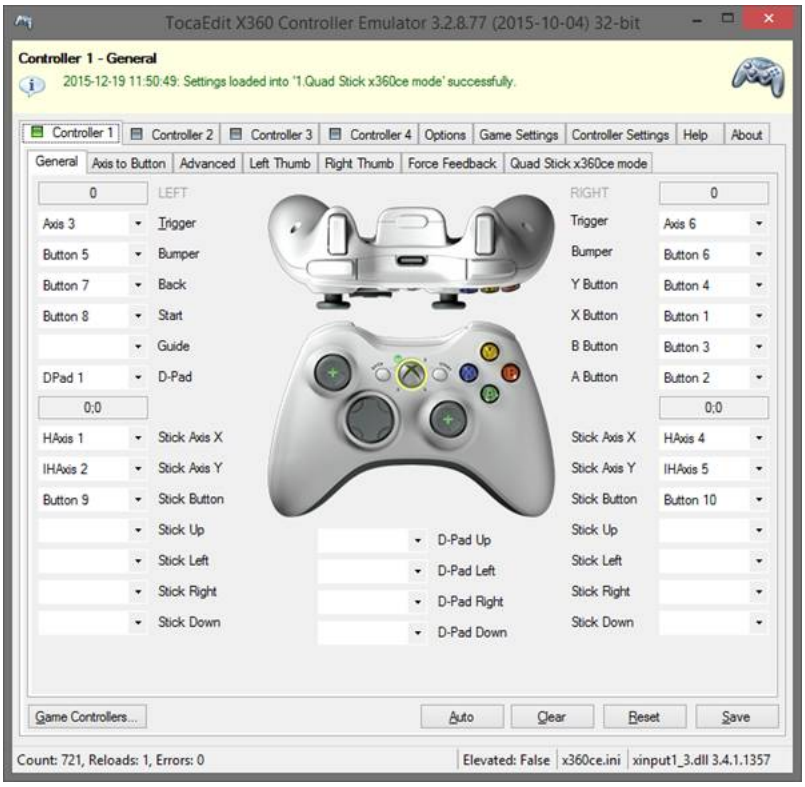
Look on the web and the x360ce website for specific instructions for different games . Their supported games list is seldom up to date, so a google search of x360ce and the game name is often your best bet.

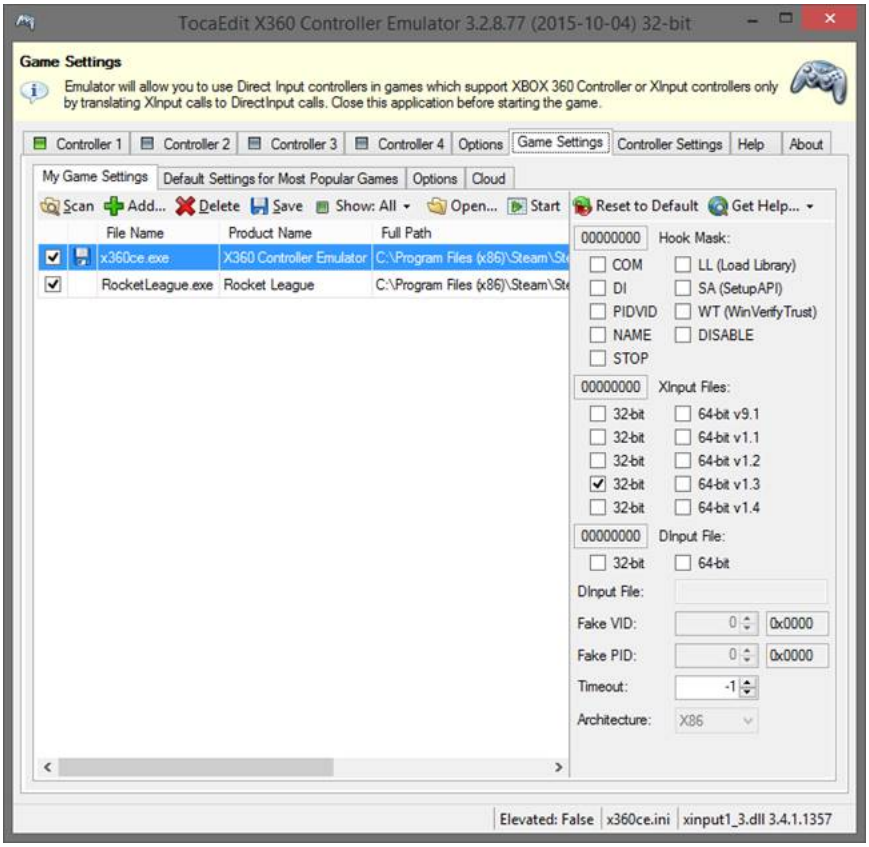
The following screen captures show setting up x360ce for Rocket League in Steam:

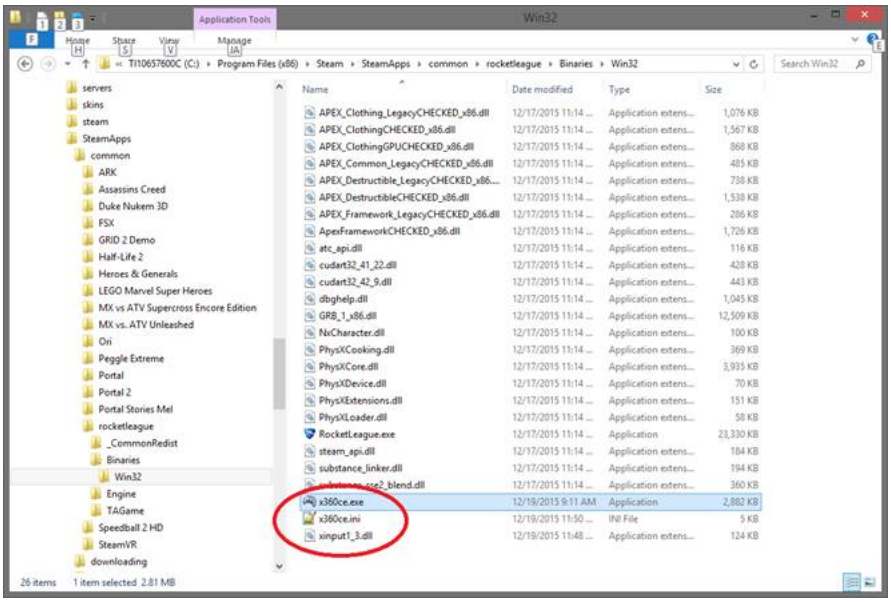



TocaEdit X360 Controller Emulator 3.2.8.77 (2015-10-04) 32-bit - Warnings
Warnings List
Name
Description
Fix
DLL File
'xinput1_3.dll' was not found.
This file is required for emulator to function properly.
Do you want to create this file?
Create
Ignore All
Cancel


TocaEdit X360 Controller Emulator 3.2.8.77 (2015-10-04) 32-bit
Controller 1 - General
Emulator will allow you to use Direct Input controllers in games which support XBOX 360 Controller or XInput controllers only by translating XInput calls to DirectInput calls. Close this application before starting the game.
Controller 1
Controller 2
Controller 3
Controller 4
Options
Game Settings
Controller Settings
Help
About
General
Axis to Button
Advanced
Left Thumb
Right Thumb
Force Feedback
Quad Stick x360ce mode
LEFT
RIGHT
New Device Detected - Quad Stick x360ce mode
Quad Stick x360ce mode - d75ce2b0023111e58005444553540000
New device with unique instance id was detected. How do you want to search for settings?
Search automatically for settings
Application will search your computer for the best settings match for your device.
Search the Internet
Browse my computer for settings
Locate and install settings manually. Search for settings in this location:
C:\Program Files (x86)\Steam\SteamApps\common\rocketleague\Binaries\Wi
Browse...
Include subfolders
Next >
Cancel
Stick Right
Stick Down
D-Pad Right
D-Pad Down
Stick Right
Stick Down
Game Controllers...
Auto
Clear
Reset
Save
'x360ce.ini' loaded.
Elevated: False
x360ce.ini


TocaEdit X360 Controller Emulator 3.2.8.77 (2015-10-04) 32-bit
Controller 1 - General
2015-12-19 11:50:49: Settings loaded into '1.Quad Stick x360ce mode' successfully.
Controller 1
Controller 2
Controller 3
Controller 4
Options
Game Settings
Controller Settings
Help
About
General
Axis to Button
Advanced
Left Thumb
Right Thumb
Force Feedback
Quad Stick x360ce mode
LEFT
Trigger
Bumper
Back
Start
Guide
D-Pad
Stick Axis X
Stick Axis Y
Stick Button
Stick Up
Stick Left
Stick Right
Stick Down
RIGHT
Trigger
Bumper
Y Button
X Button
B Button
A Button
Stick Axis X
Stick Axis Y
Stick Button
Stick Up
Stick Left
Stick Right
Stick Down
D-Pad Up
D-Pad Left
D-Pad Right
D-Pad Down
Game Controllers...
Auto
Clear
Reset
Save
Count: 721, Reloads: 1, Errors: 0
Elevated: False
x360ce.ini
xinput1_3.dll 3.4.1.1357


TocaEdit X360 Controller Emulator 3.2.8.77 (2015-10-04) 32-bit
Game Settings
Emulator will allow you to use Direct Input controllers in games which support XBOX 360 Controller or XInput controllers only by translating XInput calls to DirectInput calls. Close this application before starting the game.
Controller 1
Controller 2
Controller 3
Controller 4
Options
Game Settings
Controller Settings
Help
About
My Game Settings
Default Settings for Most Popular Games
Options
Cloud
Scan
Add...
Delete
Save
Show: All
Open...
Start
Reset to Default
Get Help...
File Name
Product Name
Full Path
x360ce.exe
X360 Controller Emulator
RocketLeague.exe
Rocket League
Hook Mask:
COM
DI
PIDVID
NAME
STOP
LL (Load Library)
SA (SetupAPI)
WT (WinVerifyTrust)
DISABLE
XInput Files:
32-bit
64-bit v9.1
64-bit v1.1
64-bit v1.2
64-bit v1.3
64-bit v1.4
DInput File:
64-bit
Fake VID:
Fake PID:
Timeout:
Architecture:
X86
Elevated: False
x360ce.ini
xinput1_3.dll 3.4.1.1357



Next, start the game and it should respond to the QuadStick as an XBox 360 controller.

USB Emulation mode 3 (XBox 360)

The Quadstick can emulate the XBox 360 controller on PC's (not on the XBox 360 console – you still need a CronusMax for that). While in the XBox360 emulation mode, the mouse, keyboard & flash drive functions are not available. It is a pure game controller mode, like the DS3 mode 1. While easier to set up for a game than x360ce, some PC games still need a mouse or keyboard for some functions while playing or the game does not tolerate switching in and out of the XBox 360 mode. When the Quadstick switches the USB emulation mode, it disconnects as one type of device and reconnects as another.

The game configuration file needs a Preferences sheet with this setting:

Preferences			Can be set in prefs.csv or Preferences page in game csv file
			Can be changed with voice command, or file
Preference	Value	Units	Can be changed on Mode sheet, Command or file
enable_DS3_emulation	3		0=Normal composite device mode, 1=Dual Shock 3 emulation, 2=X360CE mode, 3=XBox 360 emulation

An example can be found in the XBox 360 for PC configuration spreadsheet.
Games that allow switching to XBox 360 mode after launching are:

- Fallout 4
- The Elder Scrolls V: Skyrim
- NBA2k15 & 17
- Grand Theft Auto V
- Ori and the Blind Forest

USB Emulation mode 4 (PS4)

The PS4 emulation mode is used when directly connecting to a PS4 or when the Quadstick is used with the CronusMax Plus. Since the PS4 mode allows the Quadstick to control the Touchpad, Gyros and Accelerometers of the Dual Shock 4 controller, when used with the CronusMax the PS4 mode allows direct control over those outputs, instead of needing to run the PS4 Crossover Essentials gamepack and controlling the touchpad with the Right Analog stick,.

The PS4 emulation mode allows the Quadstick to work directly with the PS4, however, unless the Dual Shock 4 (DS4) controller that came with the console is plugged into the USB A socket on the back of the Quadstick, every seven minutes the USB connection will be briefly interrupted. This is barely noticeable in some games but disrupts others (particularly two player games). It is similar to using the CronusMax in "Partial Crossover Support" , so it is recommended that either the DS4 be connect to the USB A socket on the back of the Quadstick, or a CronusMax be used in "Full Crossover Support" mode.

When used with the CronusMax in Full Crossover mode, the Quadstick needs to start up in Emulation mode 4. This requires setting the USB emulation in the prefs.csv file instead of a game configuration file. The Quadstick Manager Program has a setting on the Misc tab to accomplish this.

When the Quadstick starts and the PS4 mode is enabled, it detects if it is connected to a CronusMax, PS4 or PC (or Mac) and switches automatically to the appropriate USB emulation mode. This feature is only available in firmware builds 1242 and up.

If the user does not have a PC, a copy of the Default Preferences spreadsheet can be altered to start the Quadstick in PS4 mode. Change the "enable_DS3_emulation" value to 4.

enable_DS3_emulation	4	DO NOT CHANGE	0=Normal PS3 mode, 1=DS3 emulation, 2=X360CE mode, 3=XB360 emulation

The DO NOT CHANGE warning is because if the emulation is set to 1 or 3 the Quadstick's flash drive cannot be accessed to change it back, and previous to the addition of the PS4 mode it was never necessary to start up in anything other than the default mode 0. Modes 0, 2 and 4 will allow access to the flash. Just be careful.

Newer firmware, build 1799 and later, allows the DS4 to be connected to the USB A port on the back of the Quadstick to provide "authentication". A CronusMax is no longer required for use cases where the Quadstick connects directly to the PS4.

PS4 specific outputs:

touch_left	normal	left
touch_right	normal	right
touch_up	normal	up
touch_down	normal	down
touch	normal	lip

acceleration_x_left	normal	left
acceleration_x_right	normal	right
acceleration_y_fore	normal	up
acceleration_y_aft	normal	down

acceleration_z_up	normal	up
acceleration_z_down	normal	down
gyroscope_y_cw	normal	left
gyroscope_y_ccw	normal	right

gyroscope_x_cw	normal	left
gyroscope_x_ccw	normal	right
gyroscope_z_cw	normal	up
gyroscope_z_ccw	normal	down

USB Emulation mode 5 (Nintendo Switch)

The Nintendo Switch (NS) emulation mode lets the Quadstick control the Analog joysticks and buttons of an NS controller. It also supports motion sensing.

A configuration file for an NS game will need to have a Preferences sheet with the “enable_DS3_emulation” variable set to 5.

Preferences			Must be set in prefs.csv
			Can be changed with voice command, or game configuration file
Preference	Value	Units	Can be changed on Mode sheet, Command or file
enable_DS3_emulation	5	Nintendo Switch	0=Normal PS3 mode, 1=DS3 emulation, 2=X360CE mode, 3=XB360 emulation, 4=PS4, 5=NS

The button names are the same as the XBox names (A, B, X, Y, etc), with the exception of a new button: “capture”.

See section on Connecting to the Nintendo Switch for important information

USB Emulation mode 6 (Disable Flash)

This USB emulation is the same as mode 0, with a game controller, mouse, and keyboard interface, with the exception of removing the SCSI Flash drive interface.

It can be useful for situations where the presence of a flash drive can be a problem. An example would be when connecting to an Android device. The Quadsitck flash drive is not compatible with Android. Sometimes Android devices will keep prompting the user to "repair" the flash drive and this can lead to problems with the quadstick, forcing the user to format the flash and reload all of their configuration files.

Another example would be with Mac computers which will complain when a quadstick is unplugged without "ejecting" the flash drive first.

USB Emulation mode 7 (DS4)

Same as USB Emulation mode 4, except pure Dual Shock 4 emulation without any keyboard, mouse, or flash drive access.

Connecting to Consoles and PCs

The Quadstick can be used with the PS3, PS4, XBox One, XBox 360, Wii, Wii U, Switch, PC & Mac. A USB protocol converter is required or recommended for some game consoles. The Quadstick can connect directly to the PS3, PS4, PC/Mac and Nintendo Switch. A USB converter will be needed for the Xbox One/360, Wii or Wii U consoles. The Quadstick is supplied with a high quality USB 2.0 cable about 10 feet long. If a longer cable is required, see below.

The Quadstick can be connected to consoles and computers in multiple ways.
The two USB ports, Bluetooth module and serial communication ports are usable in a variety of ways.
See the User Manual for full details.

Name	USB B Connection	USB A	USB Emulation Modes Supported	Notes
PS5 (Experimental)				
Titan Two	T2	US360/F300	4 Titan Two flag in QMP	Requies "Specialized controller", like HORI pad Mini for authentication. May require external power supply
PS4				
PS4 Direct with DS4	PS4	DS4	4	Prefered PS4 connection for basic applications.
PS4 Direct without DS4	PS4	US360/F300	4	Every seven minutes the connection is briefly interrupted
CronusMax PS4 Full Crossover	USB Hub, then CM	US360/F300	0 or 4	Once connected, the USB connection cannot be disturbed by changing emulation mode or port. Second port on USB hub connects to the DS4 controller
CronusMax PS4 Partial Crossover	CM	US360/F300	0 or 4	Every seven minutes the connection is briefly interrupted
CronusMax PCPROG with PS4	PC	US360/F300	0, 2 or 4	PC running QMP or X-Aim plus 3rd party input devices. Limited touchpad support.
Titan One PCPROG with PS4	PC	US360/F300	0, 2 or 4	PC running QMP or MaxAim DI plus 3rd party input devices. Limited touchpad support.
Titan Two	T2	US360/F300	0, 2 or 4	May require external power supply for T2
Brook PS3 to PS4 Super Converter	BSC	US360/F300	0 or 1	
XBox One				
Brook PS3/PS4 to XBox One Super Converter	BSC	US360/F300	0 or 1	Preferred XBox One connection for basic applications
CronusMax XBox One with Hub	USB Hub then CM	US360/F300	0	Automatic authentication. Second port on USB hub connects to XBox One controller
CronusMax XBox One without Hub	CM	US360/F300	0	Manual authentication. Requires connecting the original XBox One controller to start the connection.
Titan One XBox One	T1	US360/F300	0	Manual authentication. Requires connecting the original XBox One controller to start the connection.
CronusMax PCPROG with XBox One	PC	US360/F300	0, 2 or 4	PC running QMP or X-Aim plus 3rd party input devices
Titan One PCPROG with XBox One	PC	US360/F300	0, 2 or 4	PC running QMP or MaxAim DI plus 3rd party input devices
Titan Two	T2	US360/F300	0	May require external power supply for T2
XBox 360				
CronusMax XBox 360 without Hub	CM	US360/F300	0	Manual authentication. Wired XBox 360 controller connects to CM first to authenticate the connection. Then the QS.
CronusMax XBox 360 with Hub	USB Hub, then CM	US360/F300	0	Automatic authentication. Second port on USB hub connects to a Wired XBox 360 controller.
CronusMax PCPROG with XBox 360	PC	US360/F300	0	Wired XBox 360 controller remains connected to CM input. PC connects to PCPROG port. Can use QMP or X-Aim software
Nintendo Switch				
NS Direct	NS	US360/F300	5	
Coov N100 USB Converter	N100	US360/F300	3	QS must be in XBox 360 for PC emulation mode
Brook PS3/PS4 to Switch Super Converter	BSC	US360/F300	0 or 1	BSC communicates wirelessly with NS, so it only needs power for itself and the QS from some source and be within radio range.
PC				
PC	PC	US360/F300	0, 2 or 4	

Legend	
PS4	PlayStation 4 console
DS4	Dual Shock 4 controller
PS3	PlayStation 3 console
DS3	Dual Shock 3 controller
CM	CronusMax Plus USB protocol converter
BSC	Brook Accessory Super Converter
T1	Titan One USB protocol converter
T2	Titan Two USB protocol converter
NS	Nintendo Switch
US360	UltraStik 360
F300	Mayflash F300 Fightstick

USB emulation modes	preference setting "enable_DS3_emulation"
0	PS3 compatible game controller, Mouse, Keyboard and Flash dri
1	Dual Shock 3 emulation. Game controller only.
2	X360CE compatible game controller, Mouse, Keyboard and Flash
3	XBox 360 game controller only.
4	PS4 compatible game controller, Mouse, Keyboard and Flash dri
5	Nintendo Switch compatible game controller only.

Note for using Active Extension cables when a longer cable is required:

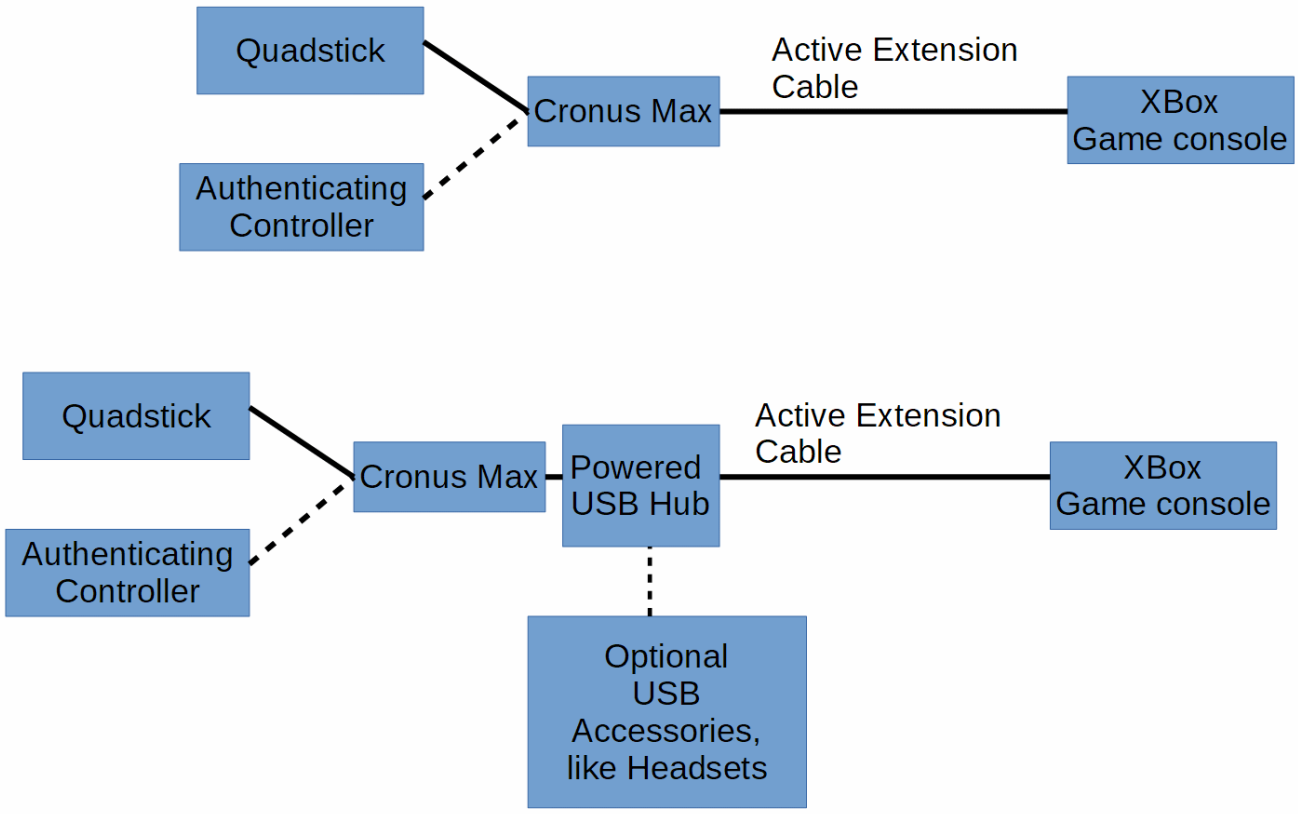
If the distance between the game console and the Quadstick requires a longer cable, the following active extension cables have been successfully used:

16 ft: http://amzn.to/2p9QO1G
32 ft: http://amzn.to/2pTHcH8 or http://amzn.to/2qPXWwt
49 ft: http://amzn.to/2qQ2yTg
up to 150 ft: http://amzn.to/2pTEz8k

That last one uses a dedicated CAT5E or CAT6 Ethernet wire but does not actually connect to your network.

You may need a powered hub at the Quadstick end if the power supplied to the Quadstick is not well regulated. The CronusMax must be at the Quadstick end of the cable.

Active extension cables will not work if positioned between a USB converter, like a CronusMax or Brook Super Converter, and the Quadstick. The Active Cable must be connected between the game console and the USB converter. Active cables have a one-port USB hub at the female end of the cable, they are not just long wires.



PS Remote Play via X360CE

It is possible to use the Quadstick with Sony's PS Remote Play application with the PS4 & PS5 without requiring any adapters, such as the CronusMax Zen or Console Tuner Titan 2. This article describes how to set this up.

This solution uses four programs:

- X360CE Version 4.x
- ViGEmBus
- VDX
- PS Remote Play

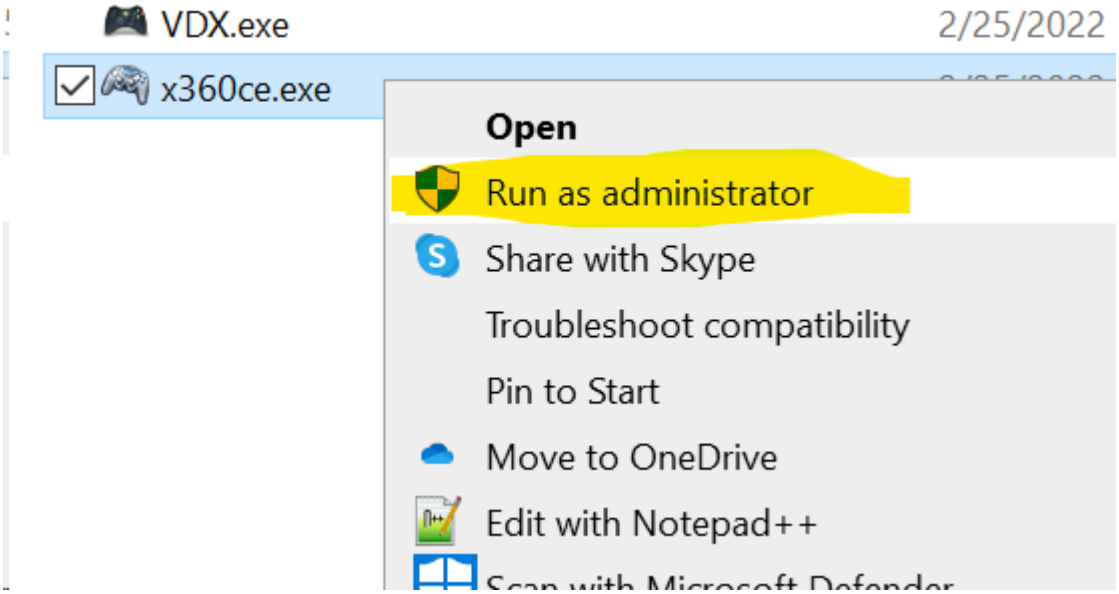
X360CE converts the Quadstick's game controller output into a virtual XBox 360 controller. It uses the ViGEm kernel level driver library, which is capable of emulating an XBox 360 controller or a Dual Shock 4 controller. VDX enables the DS4 output of the library.

The Quadstick can be running either the default USB emulation mode (0), the X360CE mode (2), or even as a XBox 360 controller (3). (Mode 3 bypasses X360CE, but the user does not have access to the mouse, which is needed for running PS Remote Play).

If analog triggers are desired, the Quadstick should be set to boot in emulation mode 2. In emulation mode 0, the triggers are only on/off buttons. **Boot in PS4 USB mode must be turned off while using X360CE**.

Follow these instructions for downloading and installing X360CE. Skip the section on "Adding Direct Device (Controller)" and "Configuring and Mapping Buttons and Axes". Quadstick specific instructions are here.

Note that X360CE can install ViGEmBus for you. To install ViGEmBus, run X360CE as Administrator by right clicking and selecting Run as administrator.



Then follow the instructions labeled "How to Install or Uninstall ViGEmBus Virtual Gamepad Emulation Driver".

HIDGuardian is not needed for PS Remote Play. It may be useful for other games that may see both the Quadstick and the X360CE controller to hide the Quadstick's controller.

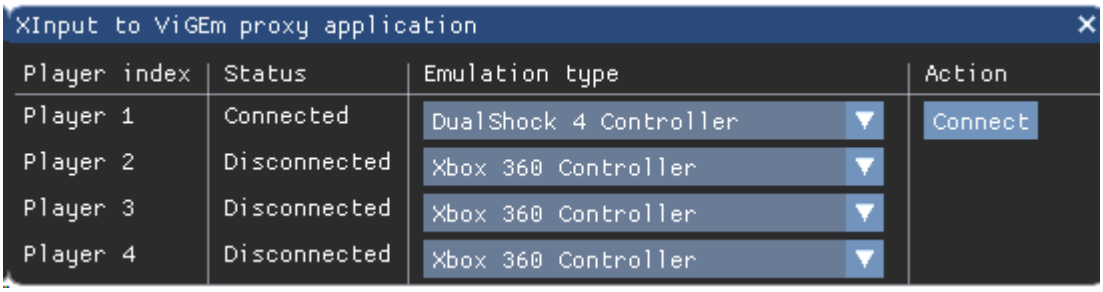
Instructions for installing ViGEmBus directly instead of via X360CE can be found here.

X360CE V4.x is simply run

VDX installation

Download the highest version from here. At this time the highest version is 1.16.65.0. Most users will want this version.

VDX is simply run after X360CE is started, there is no installer.



Adding Quadstick device to X360CE

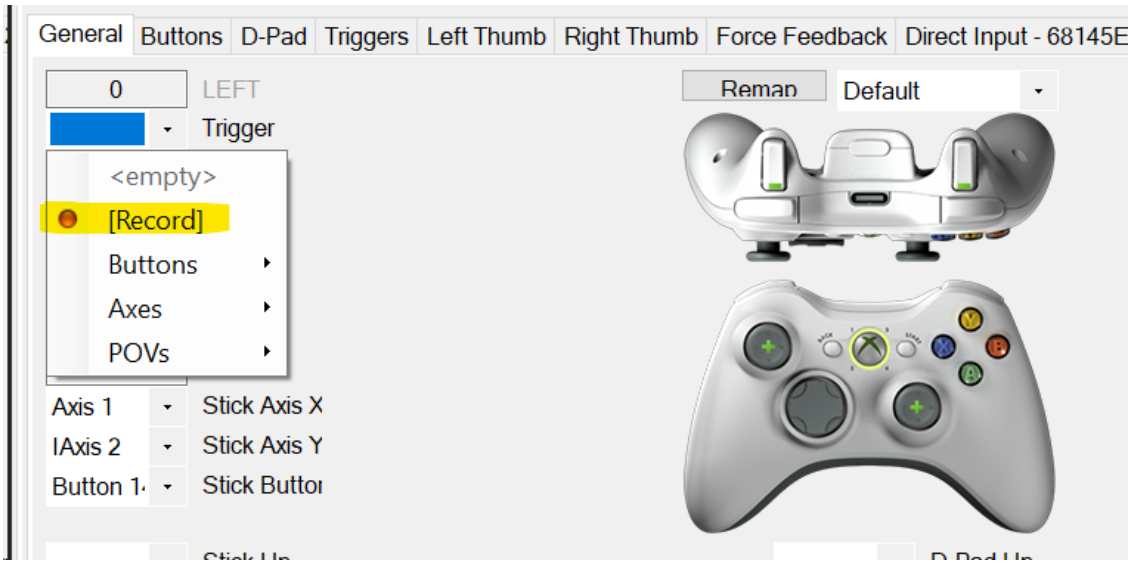
Quadstick emulation modes

There are three Quadstick USB emulation modes typically used with X360CE:

1. Default emulation mode 0. Left and Right triggers are treated as Buttons.
2. X360CE mode 2. Left and Right triggers are treated as analog triggers.
3. Boot in PS4 USB mode 4. Left and Right triggers are treated as analog triggers.

All three modes allow access to the mouse, keyboard and flash drive while using the game controller output.

Depending on the USB emulation mode chosen, the X360CE mappings differ. One way of mapping the Quadstick outputs to the XBox 360 controller buttons is to set each one using the "record" function for each button or axis one at a time:



Fortunately they offer an easy way to import or export a set of mappings for a controller.

USB Emulation mode 0 button mappings

Select and copy the text below into the X360CE General settings tab.

```
<PadSetting>
  <PadSettingChecksum>afc84b6b-6a3a-78a9-8ac0-483838849a52</PadSettingChecksum>
  <ButtonA>2</ButtonA>
  <ButtonB>3</ButtonB>
  <ButtonBack>9</ButtonBack>
  <ButtonGuide>13</ButtonGuide>
  <ButtonStart>10</ButtonStart>
  <ButtonX>1</ButtonX>
  <ButtonY>4</ButtonY>
  <DPad>1</DPad>
  <GamePadType>1</GamePadType>
  <LeftMotorPeriod>120</LeftMotorPeriod>
  <LeftShoulder>5</LeftShoulder>
  <LeftThumbAxisX>x1</LeftThumbAxisX>
  <LeftThumbAxisY>x-2</LeftThumbAxisY>
  <LeftThumbButton>11</LeftThumbButton>
  <LeftTrigger>7</LeftTrigger>
  <RightMotorPeriod>60</RightMotorPeriod>
  <RightShoulder>6</RightShoulder>
  <RightThumbAxisX>x3</RightThumbAxisX>
  <RightThumbAxisY>x-6</RightThumbAxisY>
  <RightThumbButton>12</RightThumbButton>
  <RightTrigger>8</RightTrigger>
  <ButtonADeadZone>8192</ButtonADeadZone>
  <ButtonBDeadZone>8192</ButtonBDeadZone>
  <ButtonBackDeadZone>8192</ButtonBackDeadZone>
  <ButtonStartDeadZone>8192</ButtonStartDeadZone>
  <ButtonXDeadZone>8192</ButtonXDeadZone>
  <ButtonYDeadZone>8192</ButtonYDeadZone>
  <LeftThumbButtonDeadZone>8192</LeftThumbButtonDeadZone>
  <RightThumbButtonDeadZone>8192</RightThumbButtonDeadZone>
  <LeftShoulderDeadZone>8192</LeftShoulderDeadZone>
  <RightShoulderDeadZone>8192</RightShoulderDeadZone>
  <DPadDownDeadZone>8192</DPadDownDeadZone>
  <DPadLeftDeadZone>8192</DPadLeftDeadZone>
  <DPadRightDeadZone>8192</DPadRightDeadZone>
  <DPadUpDeadZone>8192</DPadUpDeadZone>
</PadSetting>
```

USB Emulation mode 2 button mappings

Select and copy the text below into the X360CE General settings tab.

```
<PadSetting>
  <PadSettingChecksum>2219bb39-732d-b273-1fd9-d4fb4256b232</PadSettingChecksum>
  <ButtonA>2</ButtonA>
  <ButtonB>1</ButtonB>
  <ButtonBack>7</ButtonBack>
  <ButtonGuide>11</ButtonGuide>
  <ButtonStart>8</ButtonStart>
  <ButtonX>3</ButtonX>
  <ButtonY>4</ButtonY>
  <DPad>p1</DPad>
  <GamePadType>1</GamePadType>
  <LeftMotorPeriod>60</LeftMotorPeriod>
  <LeftShoulder>5</LeftShoulder>
  <LeftThumbAxisX>a1</LeftThumbAxisX>
  <LeftThumbAxisY>a-2</LeftThumbAxisY>
  <LeftThumbButton>9</LeftThumbButton>
  <LeftTrigger>a3</LeftTrigger>
  <RightMotorPeriod>120</RightMotorPeriod>
  <RightShoulder>6</RightShoulder>
  <RightThumbAxisX>a4</RightThumbAxisX>
  <RightThumbAxisY>a-5</RightThumbAxisY>
  <RightThumbButton>10</RightThumbButton>
  <RightTrigger>a6</RightTrigger>
  <ButtonBackDeadZone>8192</ButtonBackDeadZone>
  <ButtonStartDeadZone>8192</ButtonStartDeadZone>
  <ButtonXDeadZone>8192</ButtonXDeadZone>
  <ButtonYDeadZone>8192</ButtonYDeadZone>
  <LeftThumbButtonDeadZone>8192</LeftThumbButtonDeadZone>
  <RightThumbButtonDeadZone>8192</RightThumbButtonDeadZone>
  <LeftShoulderDeadZone>8192</LeftShoulderDeadZone>
  <RightShoulderDeadZone>8192</RightShoulderDeadZone>
  <DPadDownDeadZone>8192</DPadDownDeadZone>
  <DPadLeftDeadZone>8192</DPadLeftDeadZone>
  <DPadRightDeadZone>8192</DPadRightDeadZone>
  <DPadUpDeadZone>8192</DPadUpDeadZone>
</PadSetting>
```

USB Emulation mode 4 button mappings

Select and copy the text below into the X360CE General settings tab.

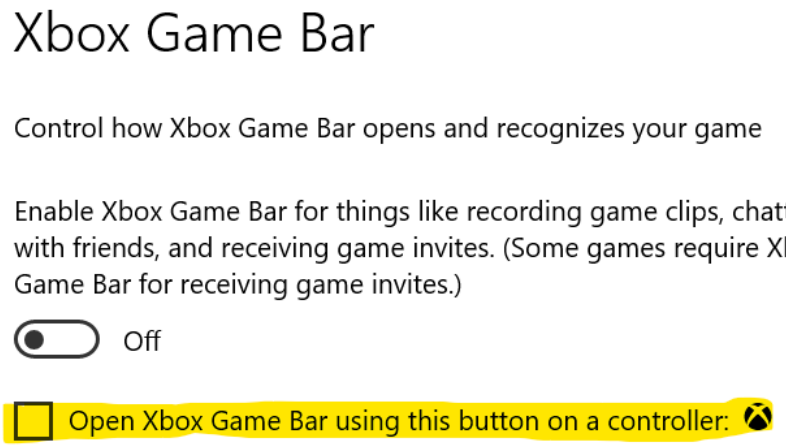
```
<PadSetting>
  <PadSettingChecksum>d6db5dd2-32e3-55ed-60d5-6df979988b95</PadSettingChecksum>
  <ButtonA>2</ButtonA>
  <ButtonB>1</ButtonB>
  <ButtonBack>9</ButtonBack>
  <ButtonGuide>13</ButtonGuide>
  <ButtonStart>10</ButtonStart>
  <ButtonX>3</ButtonX>
  <ButtonY>4</ButtonY>
  <DPad>p1</DPad>
  <GamePadType>1</GamePadType>
  <LeftMotorPeriod>60</LeftMotorPeriod>
  <LeftShoulder>5</LeftShoulder>
  <LeftThumbAxisX>a1</LeftThumbAxisX>
  <LeftThumbAxisY>a-2</LeftThumbAxisY>
  <LeftThumbButton>14</LeftThumbButton>
  <LeftTrigger>a4</LeftTrigger>
  <RightMotorPeriod>120</RightMotorPeriod>
  <RightShoulder>6</RightShoulder>
  <RightThumbAxisX>a3</RightThumbAxisX>
  <RightThumbAxisY>a-6</RightThumbAxisY>
  <RightThumbButton>8</RightThumbButton>
  <RightTrigger>a5</RightTrigger>
  <ButtonADeadZone>8192</ButtonADeadZone>
  <ButtonBDeadZone>8192</ButtonBDeadZone>
  <ButtonBackDeadZone>8192</ButtonBackDeadZone>
  <ButtonStartDeadZone>8192</ButtonStartDeadZone>
  <ButtonXDeadZone>8192</ButtonXDeadZone>
  <ButtonYDeadZone>8192</ButtonYDeadZone>
  <LeftThumbButtonDeadZone>8192</LeftThumbButtonDeadZone>
  <RightThumbButtonDeadZone>8192</RightThumbButtonDeadZone>
  <LeftShoulderDeadZone>8192</LeftShoulderDeadZone>
  <RightShoulderDeadZone>8192</RightShoulderDeadZone>
  <DPadDownDeadZone>8192</DPadDownDeadZone>
  <DPadLeftDeadZone>8192</DPadLeftDeadZone>
  <DPadRightDeadZone>8192</DPadRightDeadZone>
  <DPadUpDeadZone>8192</DPadUpDeadZone>
</PadSetting>
```

PC Preparation of Guide button response

The Guide button on the XBox 360 controller (PS on Playstation controllers) is a special button and is often used for launching XBox or Steam applications.

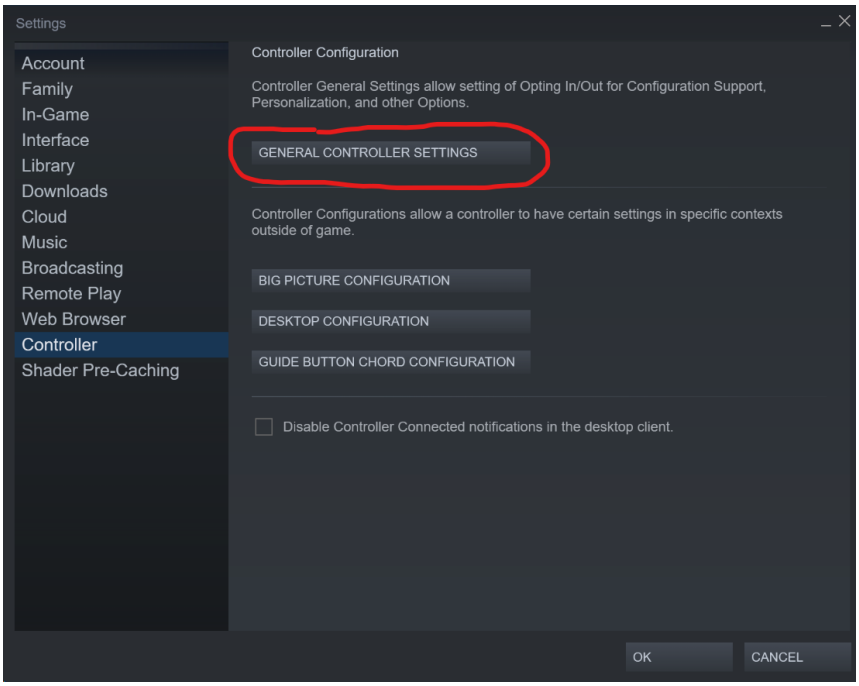
XBox App settings

To disable XBox Game Bar, open Settings, choose Gaming, then:

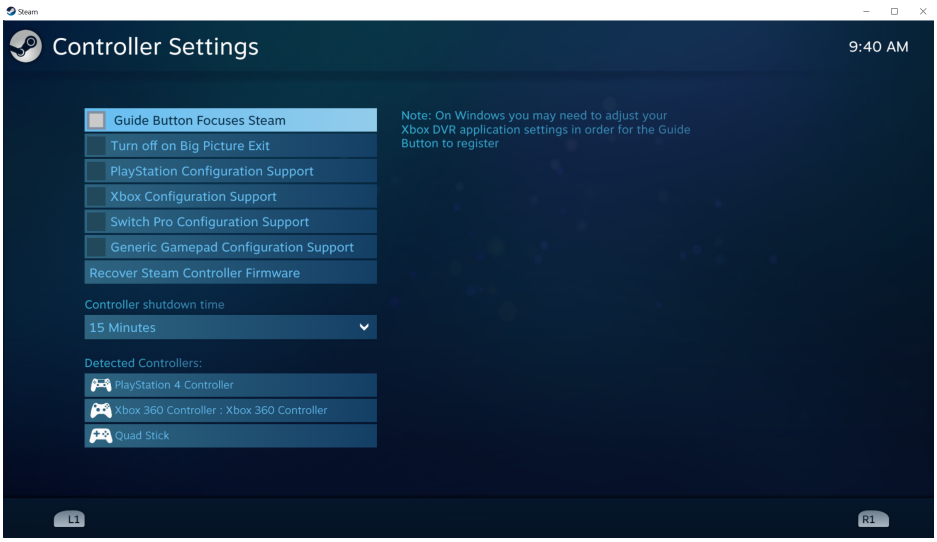


Steam settings

To disable Steam from using the Guide button, open Steam settings, then Controller settings, then General Controller Settings.



Then disable all the controller settings:


Steam
Controller Settings
9:40 AM
Guide Button Focuses Steam
Turn off on Big Picture Exit
PlayStation Configuration Support
Xbox Configuration Support
Switch Pro Configuration Support
Generic Gamepad Configuration Support
Recover Steam Controller Firmware
Controller shutdown time
15 Minutes
Detected Controllers:
PlayStation 4 Controller
Xbox 360 Controller : Xbox 360 Controller
Quad Stick
Note: On Windows you may need to adjust your Xbox DVR application settings in order for the Guide Button to register
L1
R1

PS5

Sony has implemented onerous licensing and security features with the PS5 that prevents easily adapting the Quadstick to it, however several methods have been discovered that work to varying degrees.

The traditional method of using a USB adapter, like a CronusMax or Console Tuner device, only allows playing PS4 games on the PS5 and operating the main console menu. If a modern game uses the PS5 Dual Sense controller, it will refuse to work with what it perceives to be a PS4 controller.

To play PS5 games, currently the only methods that work rely on the Playstation Remote Play feature, either through a Windows PC running some software, or some new devices made by the Beloader company. The advantage of using the PS Remote Play on Windows is that no other hardware is required. The Quadstick, plus the newest version of the Quadstick Manager Program, QMP 4, will work with PS Remote Play (versions < 6.0), allowing PS5 games to be played. Since we are only interested in the controller-to-console function of PS Remote Play, once the system has started for the best video quality, the video output of the console can be directly displayed.

Method	PS5 game support	Touchpad support	PS5 USB connection	PC required	Authentication Controller required	PS Remote Play	USB emulation modes	Access to PC KB&M
QMP 4+	yes	yes	no	yes	no	< V6.0 PSRP	0,2,4,6	yes
QMP 4+	yes	yes	no	yes	no	Chiaki	0,4,6	yes
X360CE+VDX	yes	no	no	yes	no	< V6.0 PSRP	0,2,4,6	yes
Beloader	yes	yes	power ony	no	no	on PS5	3,7	no
Beloader Pro	yes	yes	no	no	no	on PS5	3,7	no
Besavior	yes	press only	yes	no	no	no	3,7	no
Titan Two	no	yes	yes	no	Specialty	no	4	no
Titan Two	yes	yes	no	yes	no	PSRP/Chiaki	4	no
CronusMax Zen	no	yes	yes	no	Specialty	no	4	no
ConnusMax Zen	yes	yes	no	yes	no	PSRP/Chiaki	4	no
Brook Wingman XE	no	partial	yes	no	no	no	4,7	no
Brook Wingman XE	yes	partial	no	yes	no	Chiaki	4,7	no
Quadstick USB mode 7	yes	yes	no	yes	no	Chiaki	7	no

Playstation Remote Play (PSRP)

The Quadstick Manager Program versions 4+ can make use of a virtual DualShock 4 emulator named ViGEmBus. Prior to the release of version 6 of the PSRP, this allowed the Quadstick to be used by PS4/PS5 consoles with full motion and touchpad functions. With the release of PSRP Version 6, ViGEmBus stopped working (the author is aware of the problem). There are two basic work-arounds without resorting to using a hardware adapter: Install an earlier version of PSRP and patch it to prevent it from updating or use an open source alternative called Chiaki.

Installing an earlier version of PSRP:

1. Uninstall version 6 of PS Remote Play.
2. Download and install the previous release that worked with QMP 4+: PS Remote Play version 5.5.0.08250. When first running it, do not follow the prompts to update to a newer version.
3. If you do not want the continually reenter the PS remote play PIN codes, with PSRP closed, download the latest release, un-zip, and run the Remote Play version patcher: Xeropresence patcher
    - If in the future, PSRP requests you to download a new version of PSRP, re-run the patcher and it will update the version number of the installed PSRP.
4. Download and install QMP 4+ from the Quadstick Downloads page.
    - Select both QMP and ViGEmBus installation when running the installer. HIDHide is not required for PSRP.
    - On the Misc tab of QMP, Select "Enable virtual Dualshock 4 emulation" and "Enable boot is PS4 USB mode". Save preferences to Quadstick.

Chiaki

Chiaki is an open source alternative to Playstation Remote Play. It will also work with QMP 4+ and ViGEmBus. There are numerous versions of Chiaki produced by different developers. A version that supports full touchpad and motion controls can be found here.
Un-zip the file and simply run Chiaki.exe and follow the on-screen instructions. It works with QMP 4+, as described above for PSRP or with the Quadstick running in USB emulation mode 7. Since it is not formally installed, once it is running, pin to the task bar to make it easy to re-launch.

More information about Chiaki can be here, here and here.

Besavior by Beloader

The Besavior is a modified Playstation Dual Sense controller that will work with the Quadstick running USB emulation modes 3 & 7 (XBox 360 & Dualshock 4). The power requirements of the Quadstick will quickly drain the battery of a Besavior, so an external power supply will be required, which connects into the side of the QTG cable that is supplied with the Besavior. The chief drawback of the Besavior is the touchpad position cannot be controlled by the Quadstick, only pressed. The touchpad on the Besavior itself is fully functional.

Original Beloader and Beloader Pro

The Beloader setup has the advantage of not requiring a PC while playing but it is difficult to set up.

The Quadstick needs to be in emulation mode 3 or 7. Boot in PS4 USB mode doesn't work with it. 3 is XBox 360 and 7 is Dualshock 4. 7 is what the Quadstick switches to when it detects a PS4 console but it cannot detect the Beloader and must be explicitly told.

Here's the Beloader tutorial video: https://youtu.be/88rNyBVnsCs

You will need to modify your config files with a Preferences sheet to run in mode 7 if you want touchpad. Also, turn on "Titan two PS4 flag", or set the preference "titan_two" to 1 in a game file, to prevent the Quadstick from resetting the connection every 7 minutes.

DO NOT MAKE THAT YOUR DEFAULT.CSV OR PUT IT IN PREFS.CSV. Emulation mode 7 has no flash drive access for making changes to the Quadstick.

Titan Two and CronusMax Zen direct connection method:

The most up to date list with the status for which games can be played and which ones cannot be played is maintained by CronusMax Zen and Titan Two direct connections are here.

The Console Tuner Titan Two and the CronusMax Zen direct connection methods require the use of a PS4 Specialty controller for "Authentication", or a special dongal for the CM Zen. The DualSense controller that comes with the PS5 will ***NOT* work** for authenticating 3rd party crossover controllers like the Quadstick.

The CronusMax Zen direct connection instructions can be found here: https://beta.cronusmax.com/ps5

The Titan Two instructions are currently incomplete on their website. The Output Protocol must be set to **Automatic** (not PS5).

The firmware for both devices is frequently updated, so any newly purchased device will need to be updated prior to use.

See the Console Tuner Forum for the latest information on support for the PS5.

The Quadstick is set up just like for the PS4, with both the "**Boot in PS4 USB mode**" and "**Titan Two PS4 flag**" enabled in the Misc tab of QMP. The Quadstick should be running a recent firmware build, like 2328 or later.

Specialty controllers that can be used for Authentication:

Astro C40 TR
Horipad FPS Plus
Hori Fighting Stick Mini 4
Hori PS4 Mini-Pad
Hori Real Arcade Pro 4 Kai for PlayStation 4
Mad Catz Street Fighter V Arcade FightStick TE2+
Nacon Compact Wired Controller
Nacon Revolution Pro v1
Nacon Revolution Pro v2
Nacon Revolution Pro v3
Nacon Revolution Unlimited Pro
Razer Raiju Tournament Edition
Razer Raiju Ultimate
Scuf Vantage
Scuf Vantage 2

PS4

There are several ways to connect the Quadstick to the PS4. Each has advantages and limitations that need to be understood in order to chose the best method for your situation. For most users that use the Quadstick without any secondary input devices, the Quadstick can be connected directly connect to the PS4 and configured to “boot in PS4 mode”. To eliminate a brief interruption in the connection every seven minutes, connect the Dual Shock 4 (DS4) controller that came with the console to the USB A connector on the back of the Quadstick. Leave the DS4 turned off. Turn on the PS4 from the front panel, not from the DS4. The Dual Shock 4 controller must be properly configured and prepared before use.

Without the DS4 connected to the USB A port, the USB emulation mode 4 (PS4) will work in manner similar to the CronusMax – Partial Crossover Support. Approximately every seven minutes the USB connection between the Quadstick and the console is interrupted for less than half a second to reset the timer in the console that enforces the authentication timeout. This works with many games, but some games will be stopped when the interruption occurs.

The emulation mode can be set in either an individual game profile or in the prefs.csv file (by turning on Enable boot in PS4 USB mode in the QMP).

Quadstick to PS4, Direct:

Requires firmware 1799 or newer. In the Quadstick Manager Program Misc tab, turn on "Enable boot in PS4 USB mode" and save the preferences to the Quadstick.

If the DS4 is not connected to the USB A port, the connection between the Quadstick and the PS4 will be briefly interrupted every seven minutes. Some games will react to the interruption, however many others are not affected by it.

If switching from one arrangement to the other, the Quadstick will need to be unplugged and plugged back in again.

If you are converting older PS4 configuration spreadsheets that employed the PS4 Crossover Essentials Gamepack on the CronusMax to access the touchpad, you can now use the following output names to directly address the touchpad outputs:

touch_left	normal	left
touch_right	normal	right
touch_up	normal	up
touch_down	normal	down

touch	normal	lip

The "touch" output presses the touchpad and is probably all that is normally needed. The directional outputs allow the position of the touch to be controlled. See the configuration spreadsheet PS4 Full Crossover Default for an example.

The user has the option of not connecting the DS4 to USB A and operating in partial-crossover if a second player needs to use the DS4. The Quadstick will need to be unplugged and plugged back in to the PS4 again if the DS4 is removed after power is applied. If the DS4 is plugged into the USB A port after power up, and the system is in partial-crossover mode, it will switch to full-crossover when the next interruption timeout occurs.

When the DS4 is being used with the USB A port, do not turn it on. Use the front panel button to start the PS4. The DS4 will appear to be off, but will be providing a stream of data to the Quadstick.

The Dual Shock 4 controller must be properly configured and prepared before use.

CronusMax

Since the release of fimware build 1799 and later, the CronusMax no longer needed to achieve the best connection to the PS4. It still may useful for special situations, like when combining the Quadstick with other 3rd party devices, like the UltraStik or a mouse.

When using the CronusMax Plus, the CronusMax “Full Crossover” method is recommended. The PS4 continuously tests for a licensed controller with a seven minute timeout if it does not get the correct response. "Partial Crossover" takes advantage of the reset of the timeout period when the USB connection is briefly interrupted. Full Crossover routes the authentication messages to the licensed controller on one port of a USB hub and the control messages to the Quadstick on the other, preventing any interruptions.

Full instructions are available on the CronusMax.com website .

CronusMax – Full Crossover

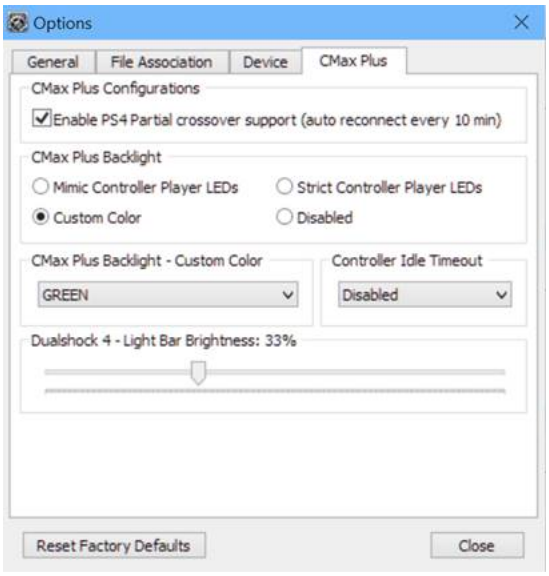
• Requires a USB 2.0 Hub that is connected to the INPUT port on the CronusMax
- A Dual Shock 4 (DS4) controller connects to one port on the hub and the Quadstick connects to another. If U/A continues to flash on the CronusMax display, reverse the order of the ports.
- Enable PS4 Partial Crossover must be **OFF** In CronusPro.
- Allows running Gamepacks in the CronusMax
- Turn on PS4 from the front panel, not the DS4.

The Quadstick must not change the USB emulation mode after power up when used in Full Crossover. USB modes 0 or 4 can be used with the CronusMax. If using the default USB mode 0, the PS4 Crossover Essentials Gamepack is required to access the touchpad.

The Dual Shock 4 controller must be properly configured and prepared before use.

CronusMax – Partial Crossover

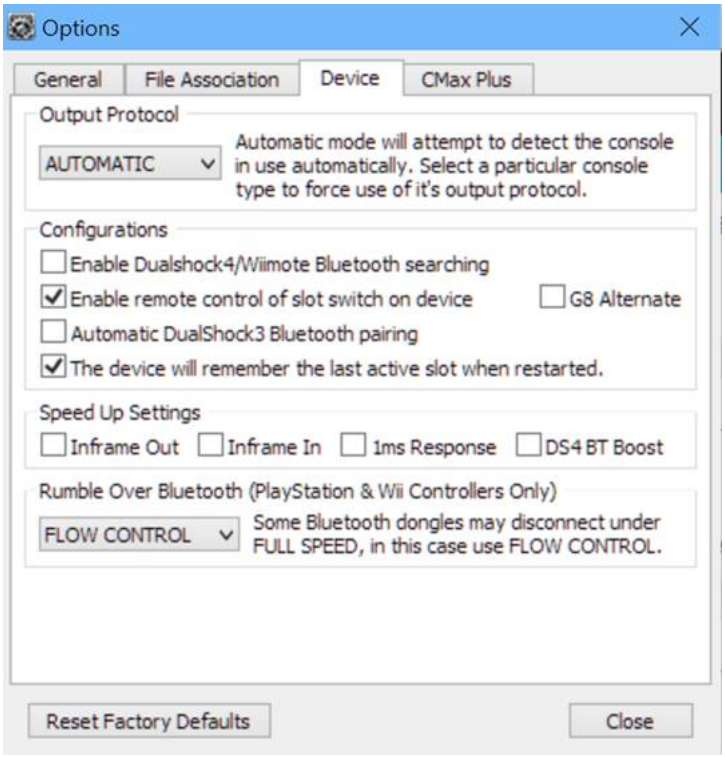
• Brief interruption every 7 minutes
- Not suitable for two player games
- Allows running Gamepacks in the CronusMax
- Partial Crossover support must be enabled using CronusPro .
- Compatible with all Quadstick USB emulation modes except mode 2 (x360ce).



The Quadstick may change its USB emulation mode at any time when used with Partial Crossover Support . This allows an individual game configuration spreadsheet to contain a Preference sheet with the "enable PS3 emulation" set to 4, if the PS4 specific outputs are used in that spreadsheet, but in general the user does not want the Quadstick to boot up in PS4 mode. If not using the PS4 emulation mode, the PS4 Crossover Essentials Gamepack will be needed to access the touchpad.

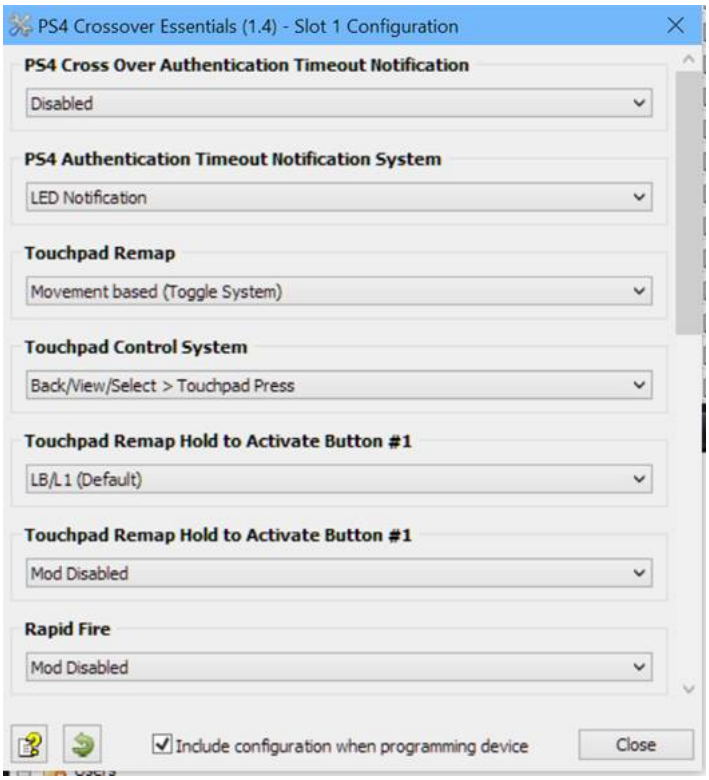
CronusMax Gamepacks

Gamepacks occupy a “slot” in the CronusMax memory. The slot system is similar to a Quadstick configuration file. The CronusMax can be programmed with several gamepacks and the active one can be chosen while playing.



One method of selecting the active slot is using the button on the CronusMax, but they can also be selected by using a combination of controller buttons on the Quadstick if that feature is enabled in the Options dialog box in CronusPro.
In the Default Configuration , a soft sip on the right side tube (the mode selector) will select the slot by pressing the PS button and Select at the same time.

select	normal	right_sip_soft
ps3	normal	right_sip_soft



Typical configuration settings for the PS4 Crossover Essentials gamepack. The Select (or Share) button is remapped as Press Touchpad.
To remap the Right Analog Stick to control the location the touchpad is touched, hold Select & press Circle.

select	normal	mp_right_puff_soft
circle	delay_on 100	mp_right_puff_soft

CronusMax – PCPROG

If you would like to combine the Quadstick with other devices, like the UltraStik 360, mouse, trackball, eye tracker, etc, you will want to consider using the PCPROG port and/or serial port method to add the additional inputs into the mix.

- Requires a Windows PC running either QMP or CronusPro+X-Aim.
- Allows combining the Quadstick with other input devices, such as:
◦ Joysticks
◦ Game controllers
◦ Mouse
◦ Trackball
◦ Eye-gaze
◦ Head Tracker
◦ Keyboards
- Cannot run gamepacks but many similar functions can be run in Max-Aim.
◦ If gamepacks are a requirement, a second CronusMax running the gamepack can inserted in between the first and the console.
- Touchpad support is limited to Pressing the touchpad in the center.

Using PCPROG with QMP

In the QMP Misc tab, check Enable CronusMax. See QMP – External Pointers for using the UltraStik 360 or other mouse pointing device.

Using PCPROG with CronusPro X-Aim

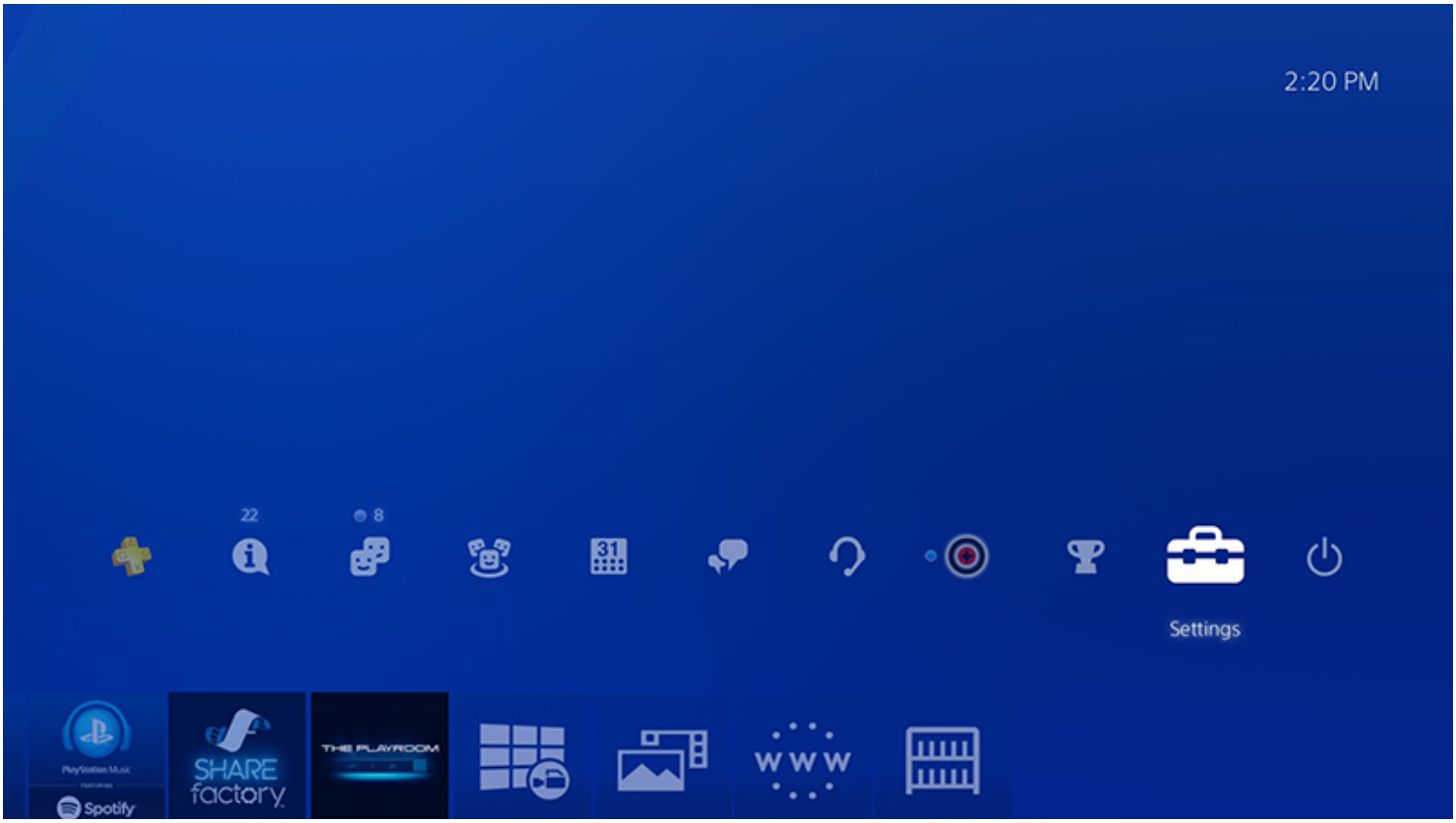
X-Aim is primarily intended for playing console games with a mouse and keyboard. It also can accept inputs from a game controller. All the inputs, buttons, axes, trigger, keys and mouse inputs, can be mapped within X-Aim to any of the game controller outputs destined for the console.
Since the Quadstick can emulate a game controller, mouse or keyboard at the same time, it can compliment the other input devices. If being used with another game controller, the Quadstick can be configured as a mouse & keyboard. If being used with a mouse pointing device, the Quadstick can be configured as a game controller.

Preparing the Dual Shock 4 Controller

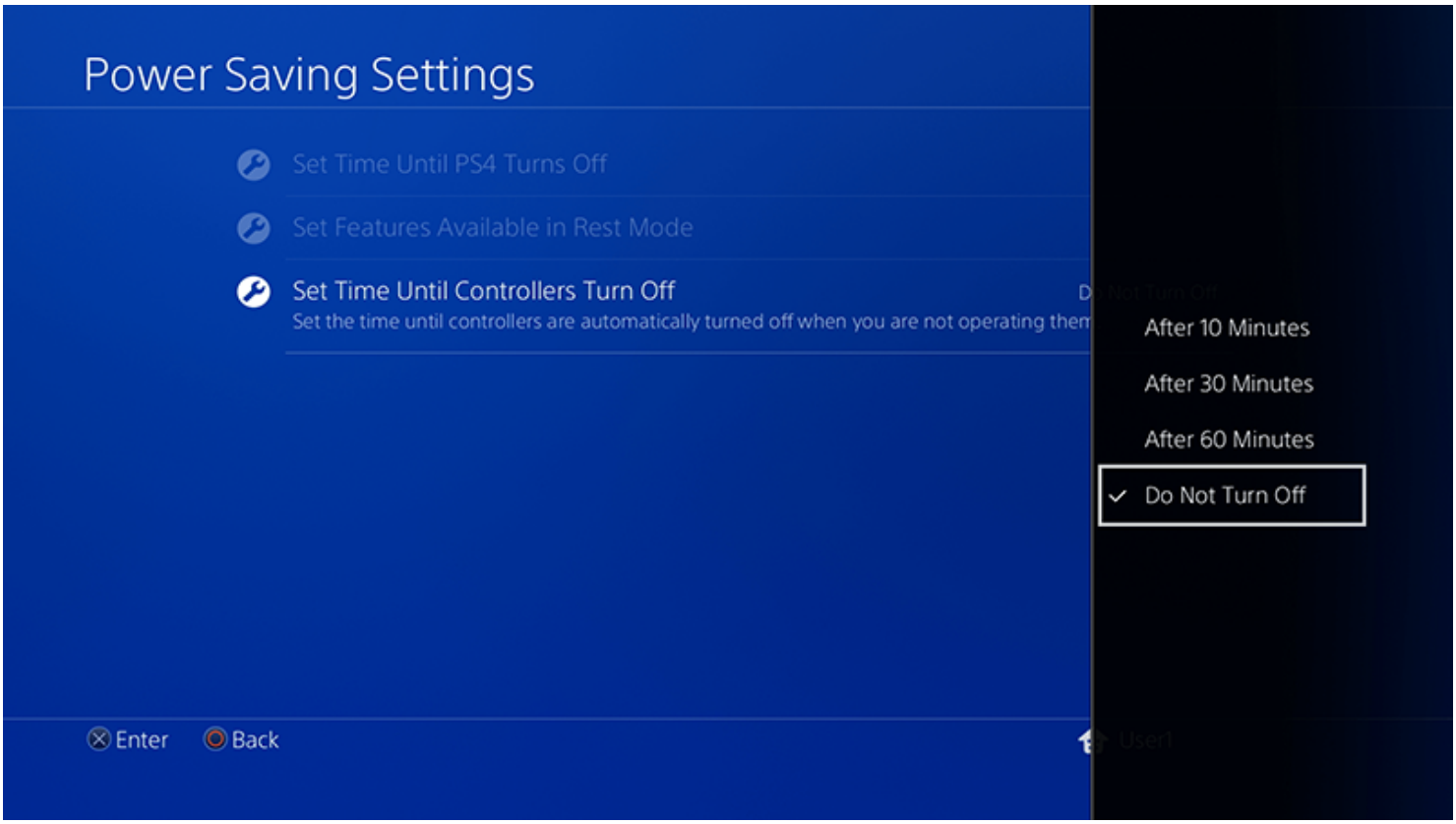
These instructions must be followed for either the PS4 Direct, the CronusMax Plus Full Crossover or PCPROG connections.

99% of users having trouble with the PS4 not responding to the Quadstick after 7 minutes have not carried out the following instructions:

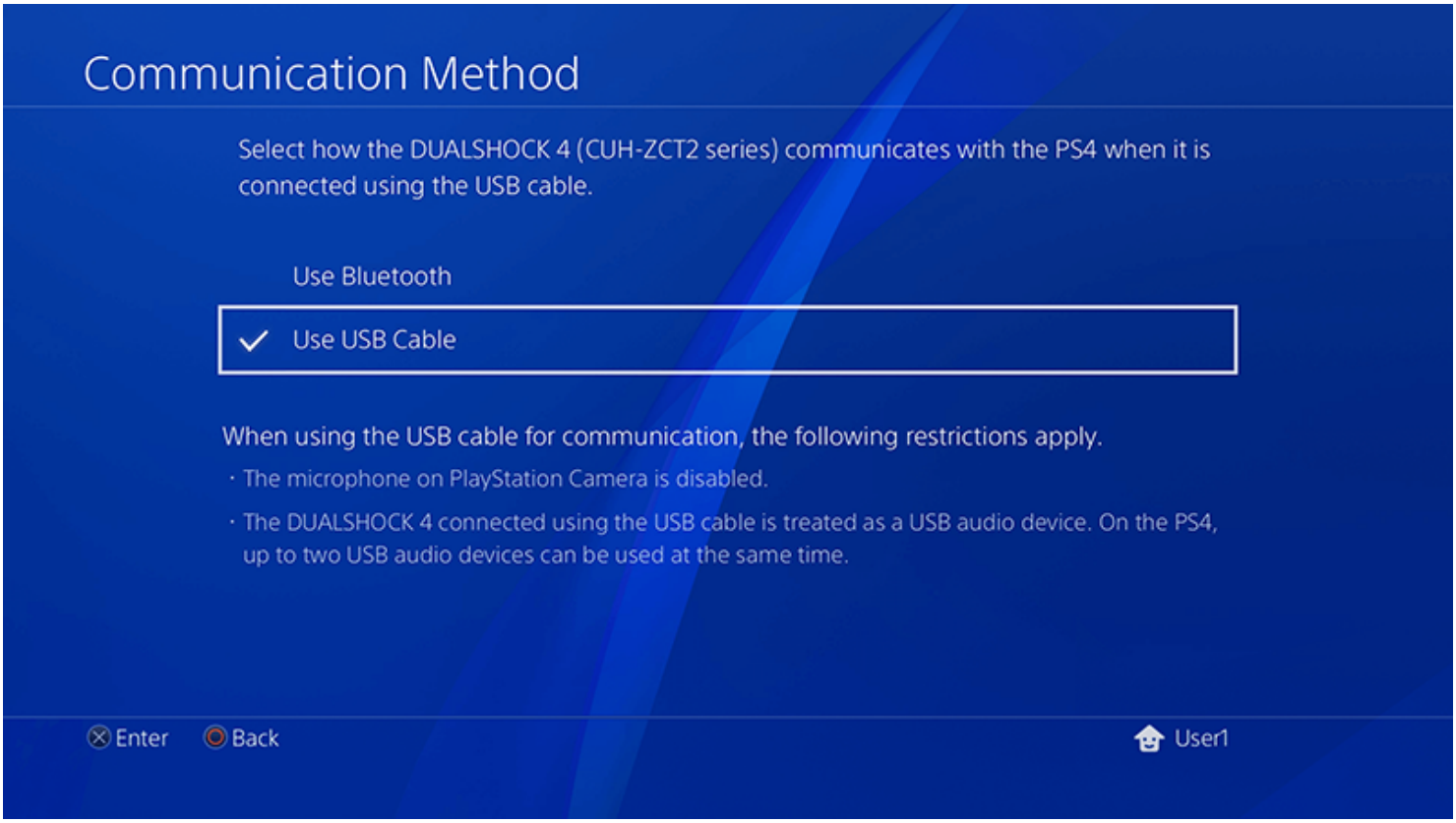
From the main menu in the PS4, go into the Settings:



With the DS4 connected to the PS4 and turned on, go into the Power Saving Settings and disable the Power Saving feature that turns off the controller if it is idle.

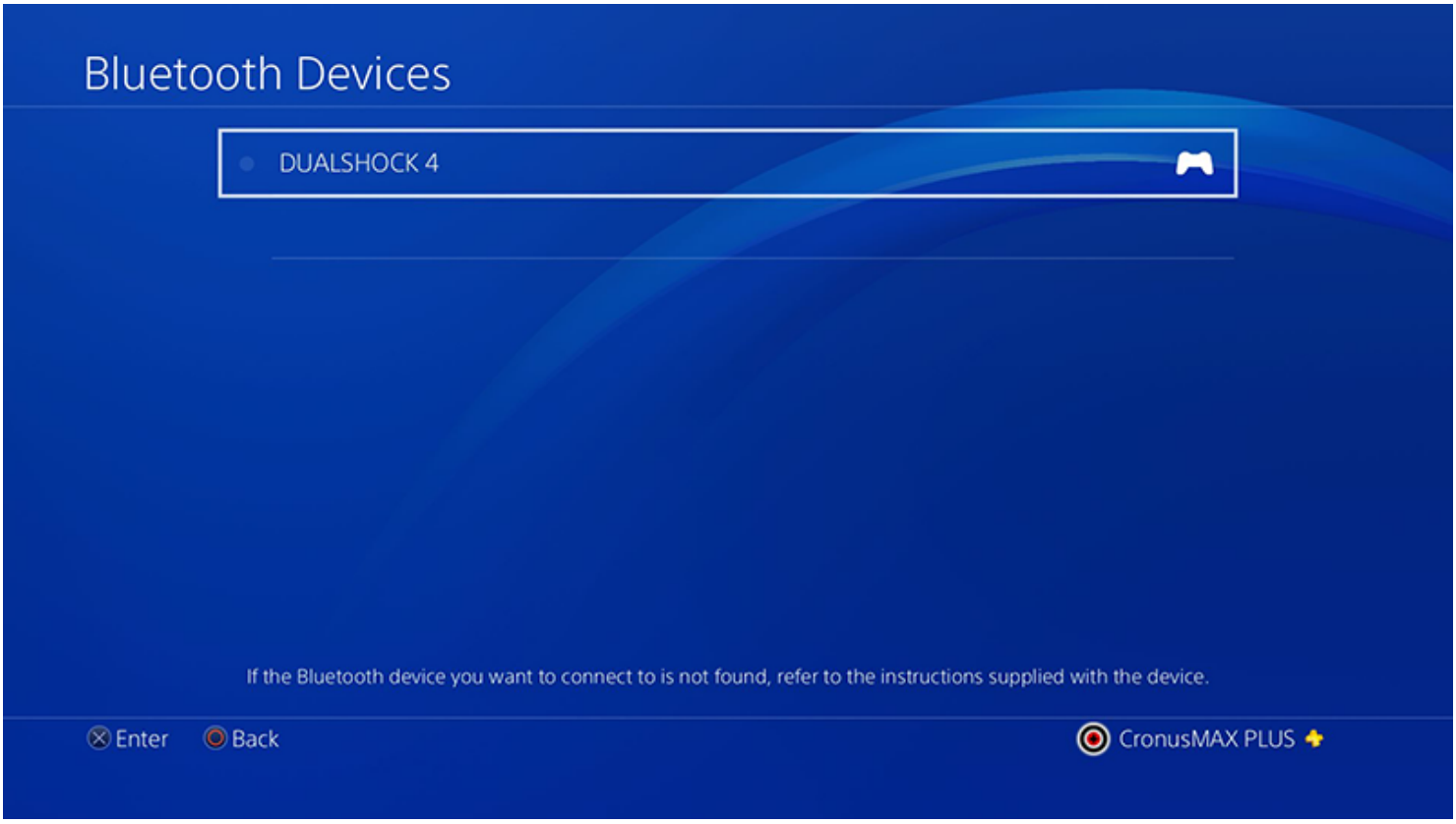


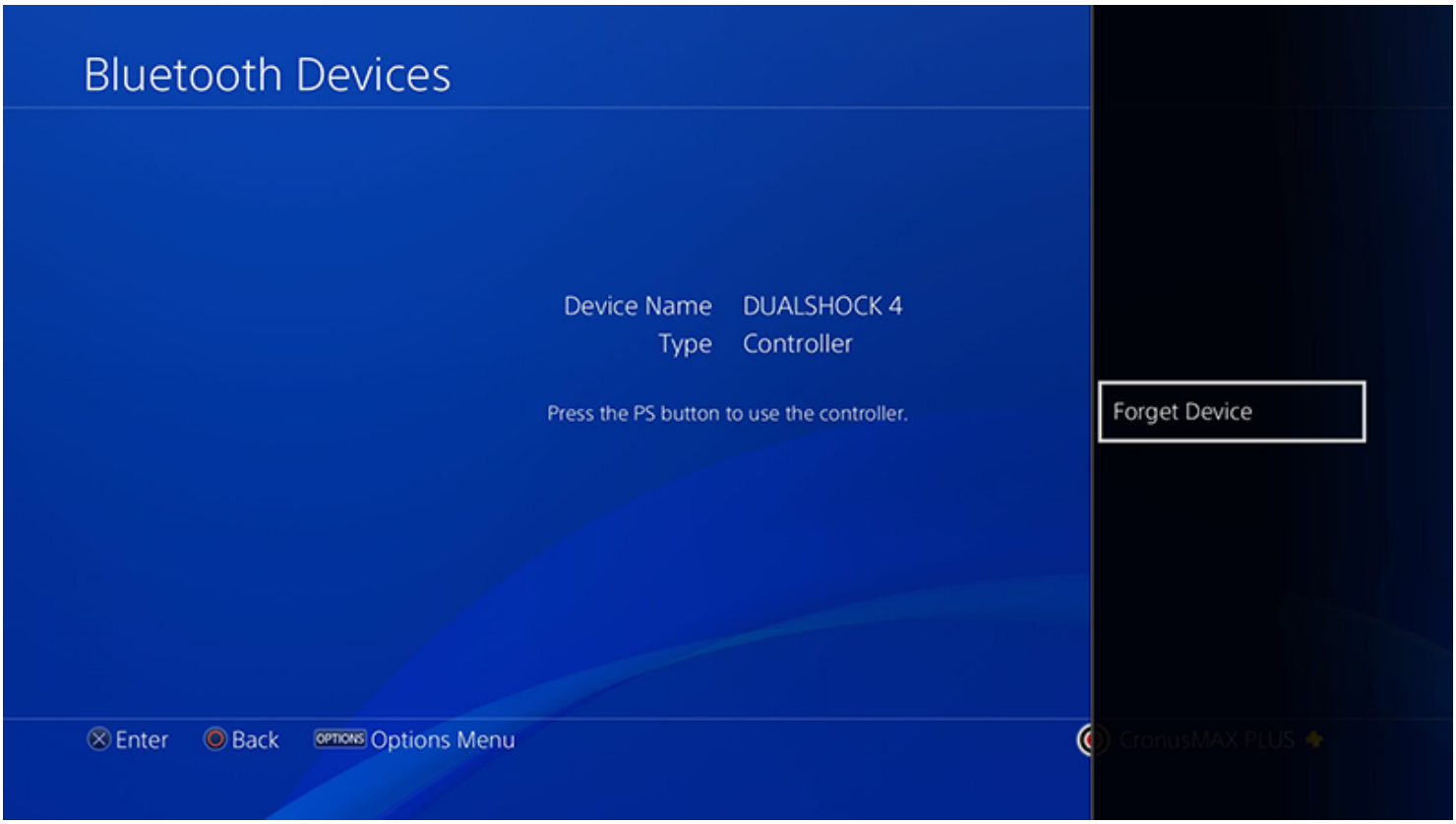
With the DS4 connected to the PS4 and turned on, change the Communication Method to "Use USB Cable" if the controller is a Version 2 controller. Older systems may not have this feature.



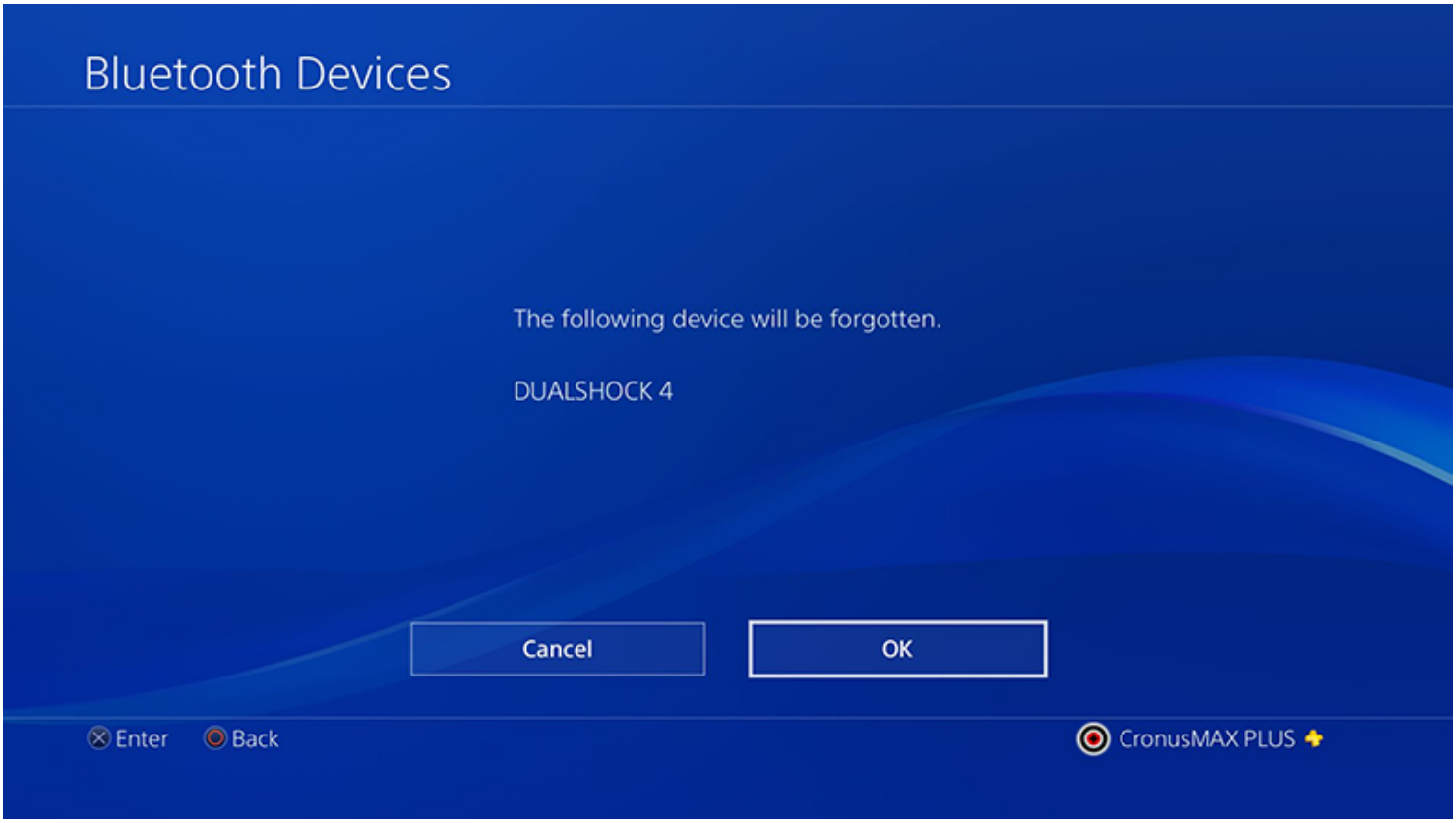
For this next step, the DS4 cannot be used to disconnect and "forget" itself from the PS4.
Disconnect the DS4 USB cable from the PS4. Do not connect it to the Quadstick yet. Connect the Quadstick to the PS4 and use it to perform the following steps: Remove the DS4 controller from the Bluetooth Devices:

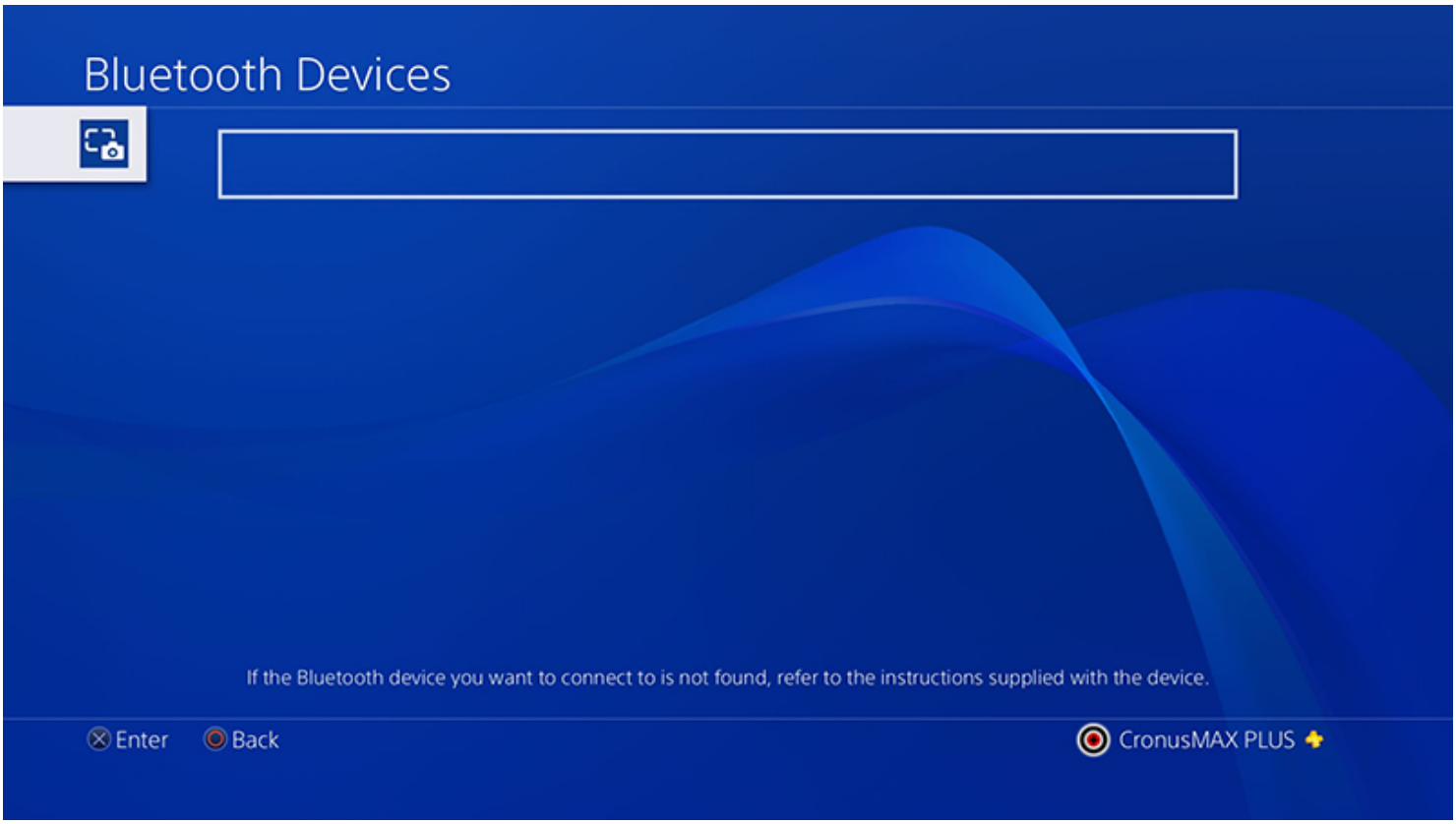

Settings
Themes
Sharing and Broadcasts
PlayStation App Connection Settings
Remote Play Connection Settings
Video Playback Settings
Devices
Date and Time
Language
Power Save Settings
Enter
Back
CronusMAX PLUS


Bluetooth Devices
DUALSHOCK 4
If the Bluetooth device you want to connect to is not found, refer to the instructions supplied with the device.
Enter
Back
CronusMAX PLUS



(If you see Disconnect, select it then come back to this point in the process again) Press the Options button, then X to Forget Device:





Turn off the PS4, then turn it back on from the FRONT PANEL, not the DS4. Then plug the DS4 into the back of the Quadstick and then plug the Quadstick into the PS4. Do not turn on the DS4 by pressing PS button. When the Quadstick first powers up, there may be a slowly varying dim yellow light from the DS4 as it is charging. Once charged, the DS4 should not have any lights on.

If the DS4 is connected to the PS4 for any reason, the Bluetooth connection may need to be deleted again.

XBox One

The XBox One consoles can be used with either a CronusMax Plus or a Brook Super Converter.

Brook Accessory Wingman XB

The Brook Wingman XB simply connects between the Quadstick and the console. Unlike the CronusMax, there is no need to “authenticate” the converter each time power is applied. A Windows PC may be needed occasionally for firmware updates. The Quadstick operates in USB emulation modes 0 or 1 when used with the Brook Wingman XB.

1 **Brooks Wingman XB**

If a firmware update is needed, monitor these websites for instructions:

[BrookAccessory website]
[BrookAccessory Facebook page]

2 Quadstick

The Quadstick USB emulation mode should be set to Default (0) or Dual Shock 3 (1).
In QMP make sure "Enable boot in PS4 USB mode" is NOT checked on the Misc tab.

CronusMax Plus

XBox One

CronusMax

CronusMax Plus 1

First this:

Wireless Controller 2

(remove batteries)

then this:

Remove Batteries 3

Quadstick 4

UltraStik 360 and Mayflash F300 Fight stick
are supported on USB A port

The CronusMax can be used with or without a USB hub with the XBox One.

The authentication challenge and response happens once at startup so when the connection is authenticated there is no need for a continuous connection with the XBox One controller like there is with the PS4.

Remove the battery pack from the game controller to ensure it turns off after authenticating the CronusMax.

Full instructions are available on the CronusMax.com website .

1 CronusMax Plus

Manufacturer's instructions for the XBox One.
Needs to be running most recent firmware (V1.24). Use CronusPro to perform firmware updates.

2 Wireless Controller

Must be a Microsoft brand Wired or Wireless Controller. Other 3rd party XBox One controllers will not work to authenticate the CronusMax.

3 Remove Batteries

If the battery pack is not removed, the Wireless controller will prevent the CronusMax from working.

4 Quadstick

Must be in USB emulation modes 0 (Default), 1 (Dual Shock 3, 3 (XBox 360), or 4 (PS4). USB emulation modes 2 (X360CE) and 5 (Nintendo Switch), will not work.

Without a USB Hub

- Start with the XBox controller OFF.
- Turn on the console using the front panel. Leave the controller off.
- Plug the CronusMax into the console.
- Observe an alternating U/A on the CronusMax display.
- Connect the XBox controller to the CronusMax Input port.
- Wait for the U/A to stop flashing on the CronusMax display. Replaced by a number (the active slot. Default is 0)
- Unplug the XBox controller.
- Plug in the Quadstick.

With a USB Hub

- Start with the XBox controller OFF.
- Turn on the console using the front panel. Leave the controller off.
- Plug the CronusMax into the console.
- Plug the hub into the CronusMax input port with the XBox controller connected to one port and the Quadstick connected to the other.
- The CronusMax display should display a number after a few seconds.
- If U/A continues to flash, reverse the order of the ports used by the Quadstick and the XBox controller.

PCPROG port

- See PS4 CronusMax – PCPROG

Xbox Adaptive Controller

The Xbox Adaptive Controller (XAC) is an XBox One controller that can form the hub of a custom game controller system for gamers with limited mobility. It can be used with the Quadstick in two completely different ways:

1. When connected to one of the USB connectors on the sides of the XAC, the Quadstick can be used as a single joystick and control up to eight buttons on the XAC.
2. When connected to the XBox One through an adapter, like a CronusMax or Brook Super Converter, the XAC and the Quadstick can be used simultaneously with the XAC through the Copilot feature of the XBox One allowing both controllers to be used as needed.

Since in the first method the Quadstick's outputs are limited to eight buttons and only one joystick when plugged into the side of the XAC, the second method using Copilot is probably the most flexible since it gives the user a greater number of buttons and joysticks that can be controlled by the Quadstick.

Each user's situation is unique and there will be occasions where the decision is made to use the first method instead of the second and this article will describe that use case:

The XAC requires an external power supply when the Quadstick is connected to either of the USB ports on the side.

When using the Default Configuration in USB mode 0 (PS3 compatible) the following button mappings are the result:

QuadStick	PS3	XBox	Windows	XAC Left USB		XAC Right USB	
			Joy.cpl	Joy.cpl	XBox	Joy.cpl	XBox
Center Sip	□	X	Button 1	Left Analog Up		Button 7	view (back)
Lip	X	A	Button 2	Left Analog Down		Button 8	menu (start)
Center Puff	O	B	Button 3	Button 9	LS	Button 10	RS
Right Center Puff	Δ	Y	Button 4	Button 5	LB	Button 6	RB
Left Sip	L1	LB	Button 5	Button 1	A	Button 3	X
Right Sip	R1	RB	Button 6	Button 2	B	Button 4	Y
Left Puff	L2	LT	Button 7	Button 7	view (back)	Left Analog Up	
Right Puff	R2	RT	Button 8	Button 8	menu (start)	Left Analog Down	
Left Sip Soft	select	back <	Button 9				
Right Sip Soft	start	start >	Button 10				
Left Center Sip	L3	LS	Button 11				
Right Center Sip	R3	RS	Button 12				
Center Sip Soft	PS	Guide	Button 13				
Left Center Puff			Button 14				

In both the left and right USB ports, six buttons and Left Analog Up & Down are available. The left analog stick output from the QS was mapped to either the left or right stick of the XBox, depending on which side the QS was plugged into. The output value is 0-100% analog. The buttons that mapped to Left Analog Up & Down controls were 0 or 100%, so mostly useful for games that don't need a full analog range.

Since it can be very confusing to map buttons through a series of name changes, a recent update to the Quadstick firmware (build 2087) and spreadsheet editor functions has added new output names specifically for the XAC:

When connected to the USB connector on the right side, the following outputs names can be used:

xac_right_X
xac_right_Y
xac_right_RB
xac_right_RS
xac_right_menu
xac_right_view
xac_right_up
xac_right_down

When connected to the USB connector on the left side of the XAC, the following output names can be used:

xac_left_A
xac_left_B
xac_left_LB
xac_left_LS
xac_left_menu
xac_left_view
xac_left_up
xac_left_down

A couple of things to note:
• The two groups of names should only be used their associated USB connector on the left or right side of the XAC. For example, when connected to the right USB connector, only xac_right_... outputs are available.
• Th xac_right_up and xac_left_up outputs the Left Analog stick of the XAC either 0% OR 100% up. The xac_..._down outputs control the Left Analog stick 0% OR 100% down.

Example configuration files for a Quadstick and a Singleton:

• XAC Right USB Port
• XAC Left USB Port
• XAC Right USB Port Singleton

Nintendo Switch

The Quadstick can directly connnect to the Switch and emulate a Nintendo Pro Controller over USB.

1. **In System Settings, Controllers and Sensors, Pro Controller Wired Communication must be turned on.**
2. The Switch only allows 45 seconds after it is turned on for the A button to be pressed, or it will go back to sleep. Pressing the A button on the JoyCon will prevent the Switch from going back to sleep. If using only the Quadstick and the Switch is powered up using its power button, the Quadstick needs to be changed from the default configuration to a Switch game configuration file (that has USB emulation mode 5) and the A button pressed within 45 seconds. This can be difficult for new users.
3. If the Switch goes into sleep mode, the Quadstick will reset continuously and may need to be unplugged and plugged in again to work. Sleep mode can be disabled in the Switch's System Settings, Sleep Mode.

Sample Direct connection configuration spreadsheets:
• Nintendo Switch
• Super Mario Odyssey Nintendo Switch
• Nintendo Switch Motion Controls

The Nintendo Switch can also be used with USB/Wireless converters:

1. Coov N100 USB converter, and the Quadstick in USB emulation mode 3 (XBox 360 for PC)
2. Brook Accessory PS3/PS4 to Nintendo Switch Super Converter. The Quadstick is used in USB emulation mode 0 or 1. (Default or DS3).

The Coov N100 converter is very simple to use, just connect it between the Quadstick and the Switch's USB port. Select a configuration file with the XBox 360 emulation mode. Coov firmware updates are very simple to apply when needed.

The Brook Super Converter is more difficult to update and use, but since it actually connects wirelessly to the Switch, it only needs power and the Quadstick plugged in the back, allowing more flexibility in your cables.

Connecting Devices and Hosts to the USB A port

The USB A port on the back of the Quadstick can be used in two different ways:

- As a Host to 3rd party devices, like game controllers or joysticks (firmware 1799+).
- As an alternative Device port, using a USB A-to-A cable, for consoles and PCs.

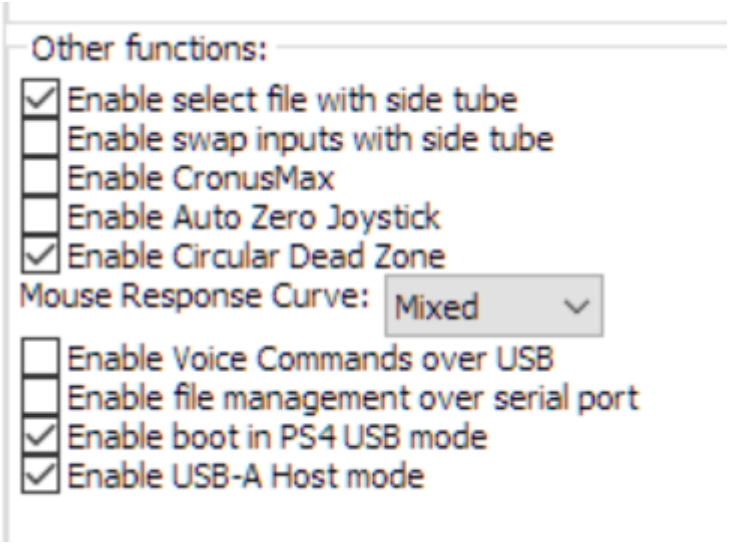
The Singleton does not have a USB-A port.

Host mode

The Host mode is active by default and currently supports the following devices:

• Dual Shock 4, for authentication messages for the PlayStation Four console.
• HORI Flex controller, was developed for gamers affected by Muscular Dystrophy, Spinal Muscular Atrophy, Cerebral Palsy, and other physical challenges.
• HORI Mini for PS4, is small dual stick controller.
• HORI RAP4 Fight Stick, an arcade style controller used for fighting games.
• 8BitDo Arcade Stick, an arcade style controller used for fighting games.
• 8BitDo Lite SE, is a compact controller designed to meet the needs of gamers with limited mobility.
• Brook Wingman XE, can adapt over 125 devices to the Quadstick and/or provide an authentication source for the PS4.
• UltraStik 360, an arcade style joystick which can be incorporated into the array of inputs available to configure the Quadstick.
• Mayflash F300 Fightstick. Another arcade style joystick with eight large buttons.
• Microsoft PDP One Handed Joystick
• Thrustmaster USB Joystick
• Generic USB HID (Human Interface Device) device, like an Arduino running GimbalStick
• ATEC Computer Interface
• Perixx PERIPAD-504 Wired USB Touchpad
• Adesso GP-160UB - Easy Cat 2 Button Glidepoint Touchpad
• Portable Finger Hand Held 4D Usb Mini Trackball Mouse

The Enable USB-A Host mode preference setting must be enabled in the QMP->Misc tab prior to use:



Dual Shock 4

When used for authentication with a PS4, the DS4 is simply plugged into the USB A port and left off. Turn on the PS4 console from the front panel. The DS4 will appear to be off but it is supplying the Quadstick with a stream of data for authentication.

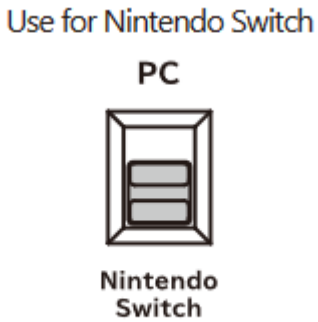
The DS4 *MUST* be prepared with the proper settings prior to use. A common complaint is the PS4 stops responding after ten minutes. This is usually because the default time period for the DS4 to turn off is ten minutes and this needs to be disabled. See Preparing the Dual Shock 4 Controller for more information.

As of firmware build 2276 (March 16, 2020), the DS4 control data can also be used within the Quadstick's configuration spreadsheets. Both joysticks and all the buttons can be used as if they were two UltraStik 360s. The touchpad and motion sensors are not read. USB Host DS4 tester is an example configuration spreadsheet showing which "usb_..." inputs map to the controls on the DS4.

HORI Flex controller

The HORI Flex Controller is similar to the XBox Adaptive Controller in many ways. It allows the use of 3.5mm assistive switches to create a custom controller setup.

To use it with the USB-A port on the Quadstick, set the mode switch in the upper right corner of the HORI Flex Controller to "Nintendo Switch" and update the firmware on the Quadstick to 2357 or later.



HORI Flex Controller is an example configuration spreadsheet showing the mapping between the buttons and joysticks and the "usb_..." inputs in the Quadstick.

The HORI Flex Controller cannot be used for PS4 authentication.

See the HORI Flex Controller factory webpage for more information.

The HORI Flex Controller can be purchased through AbleGamers.

HORI Mini for PS4

The HORI Mini for PS4 is a small handheld USB controller that can be read by the USB-A port on the Quadstick. Unfortunately it cannot be used for authentication for the PS4 console.

Its joysticks and buttons follow the same mapping to Quadstick "usb_*" inputs as the DS4.

USB Host DS4 tester is an example configuration spreadsheet that can be used to base a custom configuration on.

HORI RAP4 Fight Stick

The HORI RAP4 is a fight stick controller is a heavy solidly built USB controller that can be read by the USB-A port on the Quadstick. Unfortunately it cannot be used for authentication for the PS4 console.

Its joystick and buttons follow the same mapping to Quadstick "usb_*" inputs as the DS4. There is only one joystick and it is not analog. The value it produces is either 0% or 100%.

USB Host DS4 tester is an example configuration spreadsheet that can be used to base a custom configuration on.

More information can be found on the HORI website.

They can be purchased through Amazon.

8BitDo Arcade Stick

The 8BitDo Arcade Stick is a fight stick controller is a heavy solidly built USB controller that can be read by the USB-A port on the Quadstick.

Its joystick and buttons follow the same mapping to Quadstick "usb_*" inputs as the DS4. There is only one joystick and it is not analog. The value it produces is either 0% or 100%.

8BitDo Arcade Stick is an example configuration spreadsheet that can be used to base a custom configuration on.

More information can be found on the 8BitDo website.

They can be purchased through Amazon.

8BitDo Lite SE game controller

The 8BitDo Lite SE was designed to be a compact, mobile, and reasonably priced controller to meet the needs of gamers with limited mobility.

The buttons and joystick require very little force to operate. I had difficulty measuring the force to press a button, but it was around 20 grams. The Quadstick must be running firmware build 2364 or later. The S/D switch at the top of the controller must be in the "D" position.

8BitDo Lite SE is an example configuration spreadsheet showing the mapping between the buttons and joysticks and the "usb_..." inputs in the Quadstick.

More information can be found on the manufacture's website.

They can be purchased on Amazon.

Brook Wingman XE

The Brook Wingman XE can work with the Quadstick in three ways:

1. As an adapter for the PS4 console. Plug the Quadstick into the input of the XE and the XE into the PS4 console. A quick and easy to way to use the Quadstick with the PS4 without dealing with the headaches of using the Dual Shock 4 controller for authentication. Has limited touch pad and motion control support.
2. As an authentication source for the USB-A port on the Quadstick. Plug an XE into the USB-A port and it will provide authentication data for the PS4 connection. The Quadstick has full touchpad and motion control support when used in this manner.
3. As an adapter to the USB-A port on the Quadstick for any of the 125+ devices that the Wingman XE accepts.

Manufacturer's website.

Available on Amazon.

UltraStik 360

The UltraStik 360 is an Analog stick with optional button input jacks. It is automatically recognized when connected to the USB A port. An alternative connection method is to use an UltraStik 360 with the Quadstick is via the Quadstick Manager Program External Pointers tab, typically along with a CronusMax connected to the PC via its PCPROG port. The UltraStik's joystick data show up in the same inputs regardless of the connection method used. For example:

left_joy_left	normal	usb_1_left
left_joy_right	normal	usb_1_right
left_joy_up	normal	usb_1_up
left_joy_down	normal	usb_1_down

For PC games, the WASD keys can be controlled like this:

kb_w	greater_than 50	usb_1_up
kb_a	greater_than 50	usb_1_left
kb_s	greater_than 50	usb_1_down
kb_d	greater_than 50	usb_1_right

The button inputs names are usb_1_button_1 through usb_1_button_15. Example:

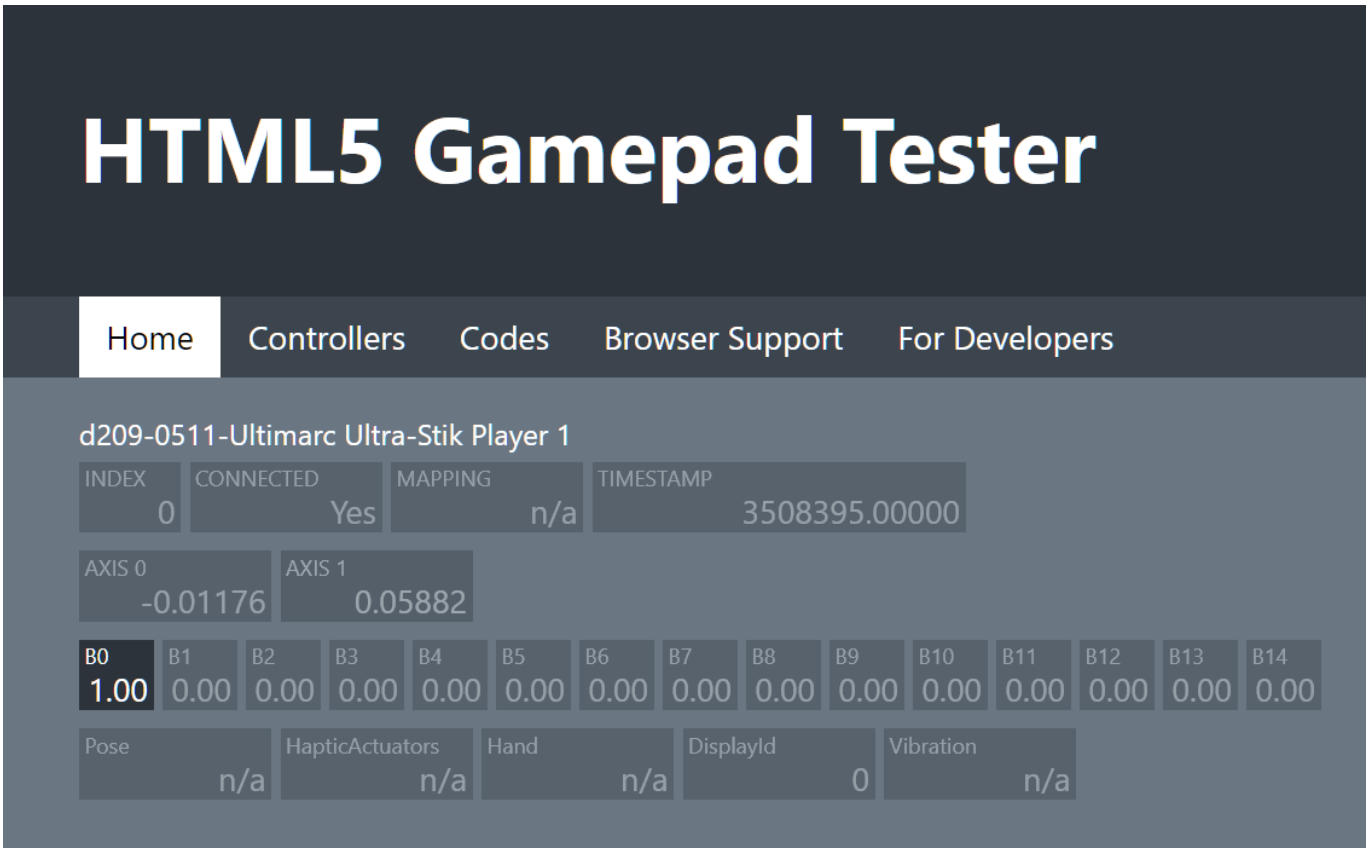
square	normal	usb_1_button_1
x	normal	usb_1_button_2
circle	normal	usb_1_button_3
triangle	normal	usb_1_button_4
left_1	normal	usb_1_button_5
right_1	normal	usb_1_button_6
left_2	normal	usb_1_button_7
right_2	normal	usb_1_button_8

Button 8 acts like a Shift key and translates buttons 1-7 into 9-15. If the use case requires button 8 to be pressed at the same time as other buttons, it may be necessary to add additional rows to the configuration spreadsheet to map the outputs to the secondary input buttons. In this example, the additional rows would be:

square	normal	usb_1_button_9
x	normal	usb_1_button_10
circle	normal	usb_1_button_11
triangle	normal	usb_1_button_12
left_1	normal	usb_1_button_13
right_1	normal	usb_1_button_14
left_2	normal	usb_1_button_15

The four optional input jacks each have two input circuits (stereo). Buttons 1 & 2 will be on the first jack, buttons 3 & 4 on the second jack, and so on. Since most switches use mono plugs, it may be necessary to use a stereo to mono breakout cable to separate the two circuits.
The Hosa YMM-261 3.5 mm TRS to Dual 3.5 mm TSF Stereo Breakout Cable is a suitable adapter.

To determine the input to which a switch is mapped, the Windows Control Panel program "joy.cpl" or a the HTML5 Gamepad Tester website can be used. In this example switch 1 shows up as B0, switch 2 would be B1, etc. B0 through B14 correspond to inputs usb_1_button_1 through usb_1_button_15.



The Quadstick software assumes the UltraStik is configured in its default Analog Joystick mode, as delivered from the factory. If any alterations have been made using the UltraMap software, the results are unpredictable.

Mayflash F300 Fightstick

The Mayflash F300 is a heavy arcade style fightstick with an eight-way digital joystick and eight large buttons.

The joystick can control either the D-Pad buttons or the Left Analog stick (outputs 0 or 100% only). Since it is not analog, it is not really suitable for applications requiring fine control, but works well for WASD or character movement in first person shooters.
The left stick and buttons show up under the same inputs names as the UltraStik.

The Mayflash F300 is only supported on the USB A port. It is not supported by the QMP, the way an UltraStik 360 is. The first two switches in the upper left corner of the F300 must be set for PS3/DInput (down) and X/Y (up).

Sample configuration spreadsheet Mayflash FightStick F300

left_joy_left	normal	usb_1_left
left_joy_right	normal	usb_1_right
left_joy_up	normal	usb_1_up
left_joy_down	normal	usb_1_down

square	normal	usb_1_button_1
x	normal	usb_1_button_2
circle	normal	usb_1_button_3
triangle	normal	usb_1_button_4
left_1	normal	usb_1_button_5
right_1	normal	usb_1_button_6
left_2	normal	usb_1_button_7
right_2	normal	usb_1_button_8

Microsoft PDP One Handed Joystick

The PDP provides an analog joystick and two (+ two) buttons. The thumb stick has a switch that acts like a Shift key and when depressed changes the two physical buttons 1 & 2 into 3 & 4.

left_joy_left	normal	usb_1_left
left_joy_right	normal	usb_1_right
left_joy_up	normal	usb_1_up
left_joy_down	normal	usb_1_down

kb_5	normal	usb_1_button_5
kb_6	normal	usb_1_button_6
kb_7	normal	usb_1_button_7
kb_8	normal	usb_1_button_8

Thrustmaster

The Thrustmaster shows up as an Analog Joystick, plus a Throttle axis, and four buttons.

left_joy_left	normal	usb_1_left
left_joy_right	normal	usb_1_right
left_joy_up	normal	usb_1_up
left_joy_down	normal	usb_1_down

The throttle axis shows up as usb_2_left (forward) and usb_2_right (backward).

square	normal	usb_1_button_1
x	normal	usb_1_button_2
circle	normal	usb_1_button_3
triangle	normal	usb_1_button_4

The buttons are the Trigger, the Yellow and Black striped center button, the button to the right of center, and an index finger button on the back. The point of view "top-hat" switch (left of center) is not currently supported.

ATEC Computer Interface

The ATEC Computer Interface shows up as the four directions of an Analog Joystick and one button. It is used in its default configuration.

The four Analog Joystick directions can be used as a joystick or as four individual buttons.

Example configuration file: APEC Example

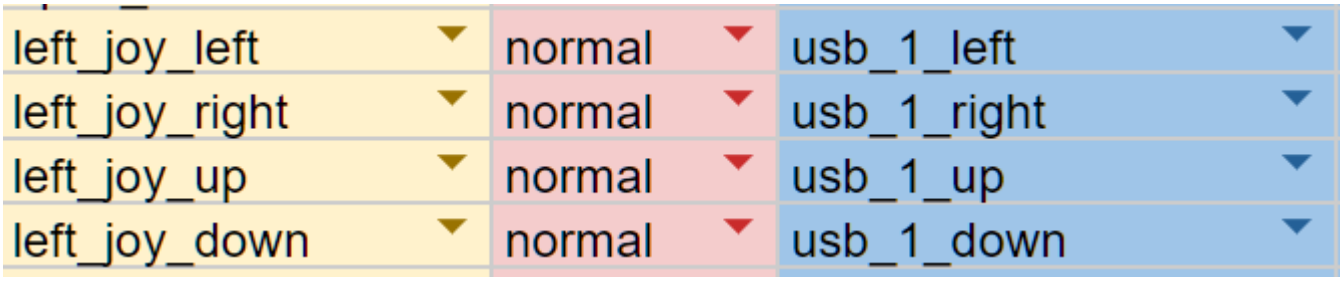
left_joy_left	normal	usb_1_left
left_joy_right	normal	usb_1_right
left_joy_up	normal	usb_1_up
left_joy_down	normal	usb_1_down
square	normal	usb_1_button_1

mouse_left	normal	usb_1_left
mouse_right	normal	usb_1_right
mouse_up	normal	usb_1_up
mouse_down	normal	usb_1_down
mouse_left_button	normal	usb_1_button_1

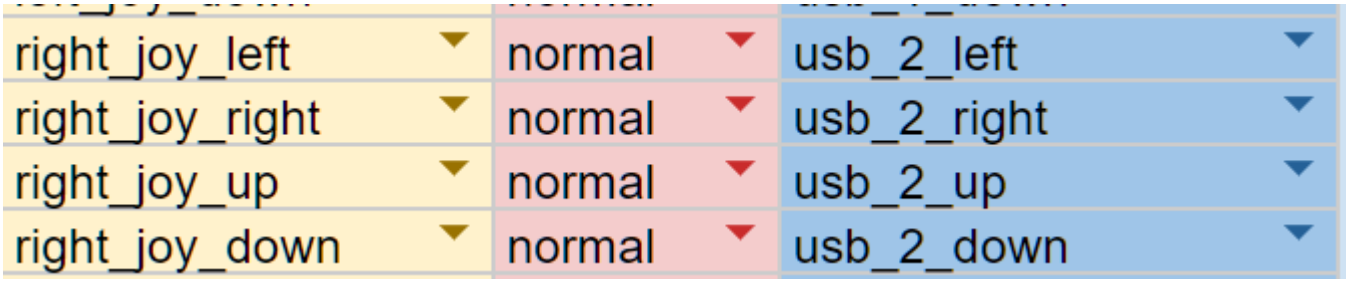
Generic HID device

The USB-A driver can decode some simple USB devices. It will import the first four axes in the device and the first eight buttons.

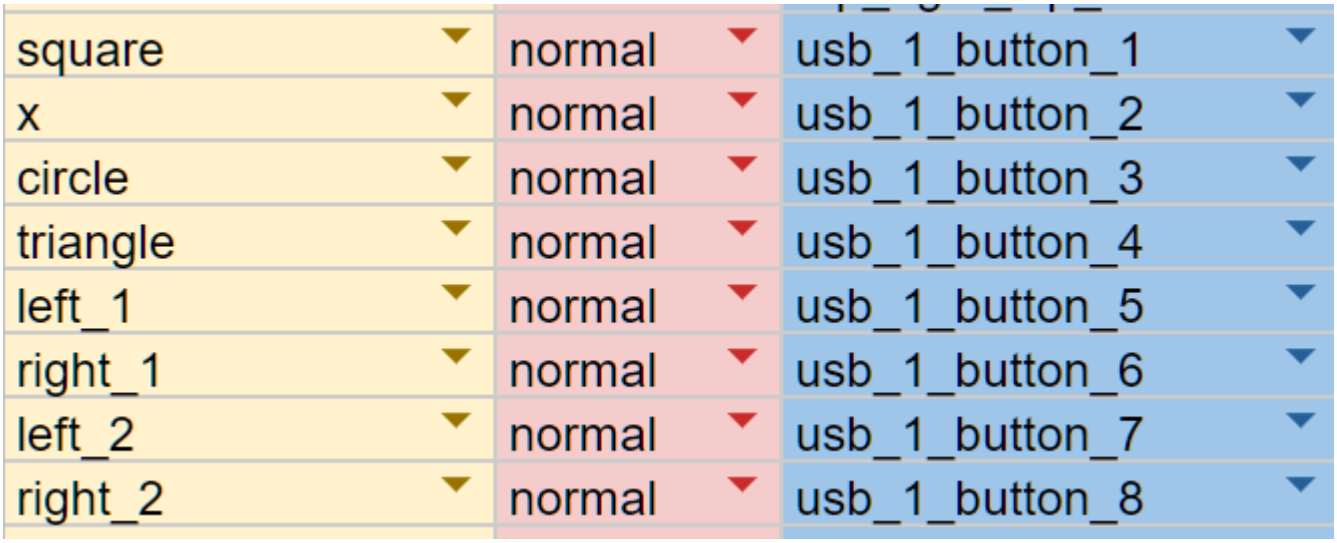
The first two axes show up like:



The third and forth axes are:



Buttons show up as:



Perixx PERIPAD-504 Wired USB Touchpad

The Perixx PERIPAD-504 Wired USB Touchpad shows up as the four directions of an Analog Joystick and two buttons. It is used in its default configuration.

The four Analog Joystick directions can be used as a joystick or as four individual buttons.

Example configuration file: APEC Example

left_joy_left	normal	usb_1_left
left_joy_right	normal	usb_1_right
left_joy_up	normal	usb_1_up
left_joy_down	normal	usb_1_down
square	normal	usb_1_button_1

mouse_left	normal	usb_1_left
mouse_right	normal	usb_1_right
mouse_up	normal	usb_1_up
mouse_down	normal	usb_1_down
mouse_left_button	normal	usb_1_button_1

Device Mode

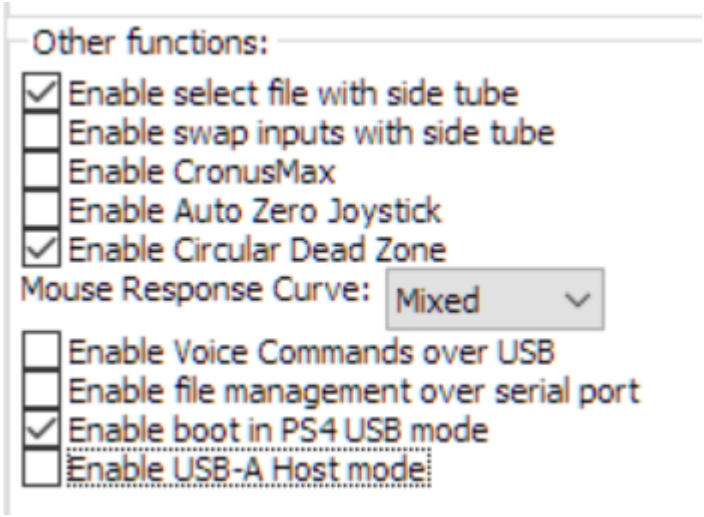
Through the use of a USB A-to-A cable, the Quadstick can switch to a second Host, like a PC or game console. The **enable_usb_a_device** preference on a Preferences sheet controls which port is active:

Preferences	
Preference	Value
enable_usb_a_device	1

Sample configuration spreadsheet: USB A

- **Do not set the value of the enable_usb_a_device to 1 in the prefs.csv or default.csv files**. You may lose the ability to connect to your Quadstick. Only use the feature in other configuration files that are selected after power up.
- Power for the Quadstick only comes through the USB-B port, so it must remain connected to a power source while using the USB-A port in device mode.
- CronusMax Full Crossover, with a USB hub, will not operate with USB connections that ever change after they first connect. This means you cannot disconnect from a Full Crossover connection on USB B to a separate host on the USB A then back again. The CronusMax in Partial Crossover mode does not have this limitation and you can switch back and forth at will.

The Enable USB-A Host mode preference setting must be disabled in the QMP->Misc tab prior to using USB-A Device mode:



Connection Examples

With all the connection possibilities it can be more than a little confusing to devise a way that will work best for your setup. The following table shows some of the ways the Quadstick can be used.

Name	USB B Connection	USB A	USB Emulation Modes Supported	Firmware	
			(enable_DS3_e		
PS4					
PS4 Direct with DS4	PS4	DS4	4	1799+	
PS4 Direct without DS4	PS4	US360/F300	4	1799+	
CronusMax PS4 Full Crossover	USB Hub, then CM	US360/F300	0 or 4	Any	O co ch S to
CronusMax PS4 Partial Crossover	CM	US360/F300	0 or 4	Any	
CronusMax PCPROG with PS4	PC	US360/F300	0, 2 or 4	Any	
Brook PS3 to PS4 Super Converter	BSC	US360/F300	0 or 1	Any	
XBox One					
Brook PS3/PS4 to XBox One Super Converter	BSC	US360/F300	0 or 1		
CronusMax XBox One with Hub	USB Hub then CM	US360/F300	0		S to
CronusMax XBox One without Hub	CM	US360/F300	0		
CronusMax PCPROG with XBox One	PC	US360/F300	0		

XBox 360					
CronusMax XBox 360 without Hub	CM	US360/F300	0		W to co
CronusMax XBox 360 with Hub	USB Hub, then CM	US360/F300	0		Sc to
CronusMax PCPROG with XBox 360	PC	US360/F300	0		W co co Q
Nintendo Switch					
NS Direct	NS	US360/F300	5	1820+	
Coov N100 USB Converter	N100	US360/F300	3		Q en
Brook PS3/PS4 to Switch Super Converter	BSC	US360/F300	0 or 1		Bs N ar be
PC					
PC	PC	US360/F300	0, 2 or 4		

Legend	
PS4	PlayStation 4 console
DS4	Dual Shock 4 controller
PS3	PlayStation 3 console
DS3	Dual Shock 3 controller
CM	CronusMax Plus USB protocol converter
BSC	Brook Accessory Super Converter
NS	Nintendo Switch
US360	UltraStik 360
F300	Mayflash F300 Fightstick

USB emulation modes	
0	PS3 compati Keyboard and
1	Dual Shock 3 e
2	X360CE comp Keyboard and
3	XBox 360 gam
4	PS4 compati Keyboard and
5	Nintend Switch

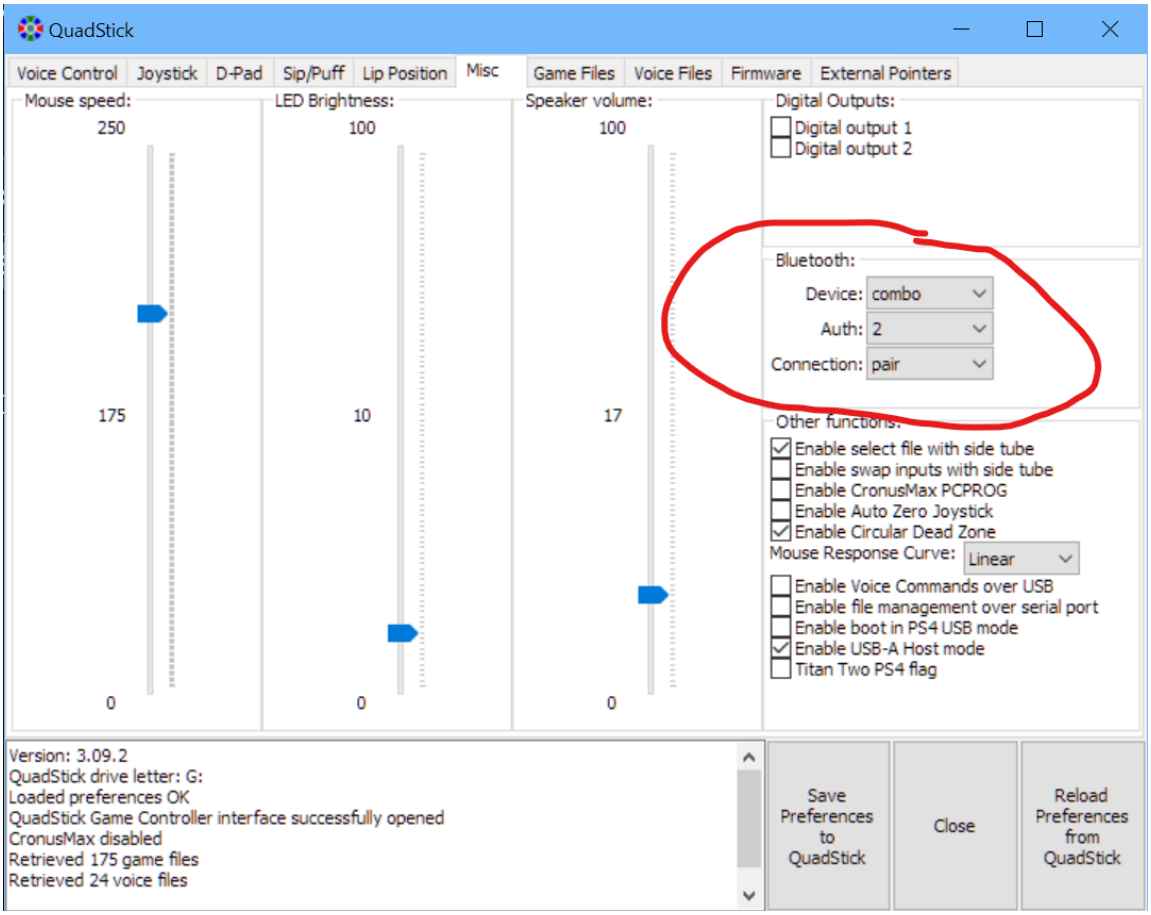
Bluetooth

The Bluetooth communication channel can be used instead of the USB connection for PCs and Android devices for the Mouse and/or Keyboard, plus it can emulate a generic Gamepad, or a Joystick, or it can be used as a serial connection for relaying voice commands. The Quadstick Manager Program can also use the serial connection over Bluetooth to copy and manage configuration files in the flash drive and relay UltraStik 360 data.

The Bluetooth module is a Roving Networks RN-42 with the HID firmware.

To use the Quadstick over Bluetooth with most phones and tablets, there are three elements to setting it up:

- Enable bluetooth on the quadstick
- Download a configuration file
- Setup the phone to work with a bluetooth mouse.



Sample configuration: Bluetooth Mouse

PC Magazine artcle explaining how to set up an iPad for a Bluetooth mouse: How to Use a Mouse With iPadOS 13.4

Settings

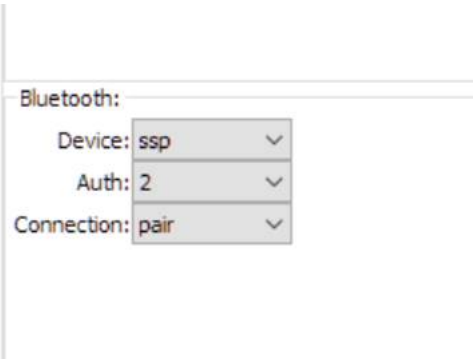
Three parameters that control the module are adjustable in the Preferences section of the configuration:

- Bluetooth_device_mode (mutually exclusive)
◦ keyboard
◦ game_pad
◦ mouse
◦ combo (keyboard & mouse together)
◦ joystick
◦ ssp (a serial connection used in Voice control & QMP applications)

- Bluetooth_authentication_mode
◦ 0 Bluetooth version 2.0 NO encryption (open mode)
◦ 1 Bluetooth version 2.1 mode
◦ 2 Bluetooth version 2.1 Secure Simple Pairing (SSP),
◦ 4 Bluetooth version 2.0 PIN code authentication (“1234” is the code)

- Bluetooth_connection_mode
◦ slave (needs to be reconnected to host after each restart)
◦ master
◦ trigger
◦ auto master
◦ dtr
◦ any
◦ pair (will automatically reconnect to host)

By default, the Bluetooth module is disabled and powered down when the Device mode is set to “none”. In QMP, the Misc tab contains fields for the three settings:



The connection mode for PCs and Android devices is almost always “pair” and the Auth mode is usually 2 or 4. Try 2 first. If 4 is used, if prompted for a pairing code, use “1234”.

In a Preferences configuration file for non-QMP users, these parameters would be:

bluetooth_device_mode	ssp		Bluetooth HID Device Selection
bluetooth_authentication_mode	2		Bluetooth Authentication Selection
bluetooth_connection_mode	pair		Bluetooth pairing control
bluetooth_throttle	15	ms	Bluetooth mouse report interval in ms.

The "bluetooth_throttle" parameter controls how often the Quadstick sends mouse or game controller data over the Bluetooth channel. If updates are sent more quickly than the channel can deliver them to the host, the user may experience lag and run-on of the mouse pointer. Increase the interval if this occurs. Also reducing the number

of competing Bluetooth devices or separating the Bluetooth radios from any nearby WiFi devices may improve throughput.

When changing the Device mode from one type of device to another, like from mouse to combo, it may be necessary to first un-pair the Quadstick from its host, then re-pair it, before the new device type will be functional.

The Bluetooth mode settings need to take effect upon power up, so they must reside in the prefs.csv file.

The Bluetooth module should be "paired" within 60 seconds after power up. If you are having trouble pairing the Quadstick with a Host, unplug it and plug it in again.

Serial communication:

Voice commands and remote file management by the QMP can utilize the Bluetooth serial connection. Alternatively, the IN port on the back of the Quadstick, normally used as a switch input, can be used as a physical serial connection with a FTDI, Future Technology Devices International Ltd TTL-232R-3V3-AJ cable, if the Bluetooth serial connection is not available.

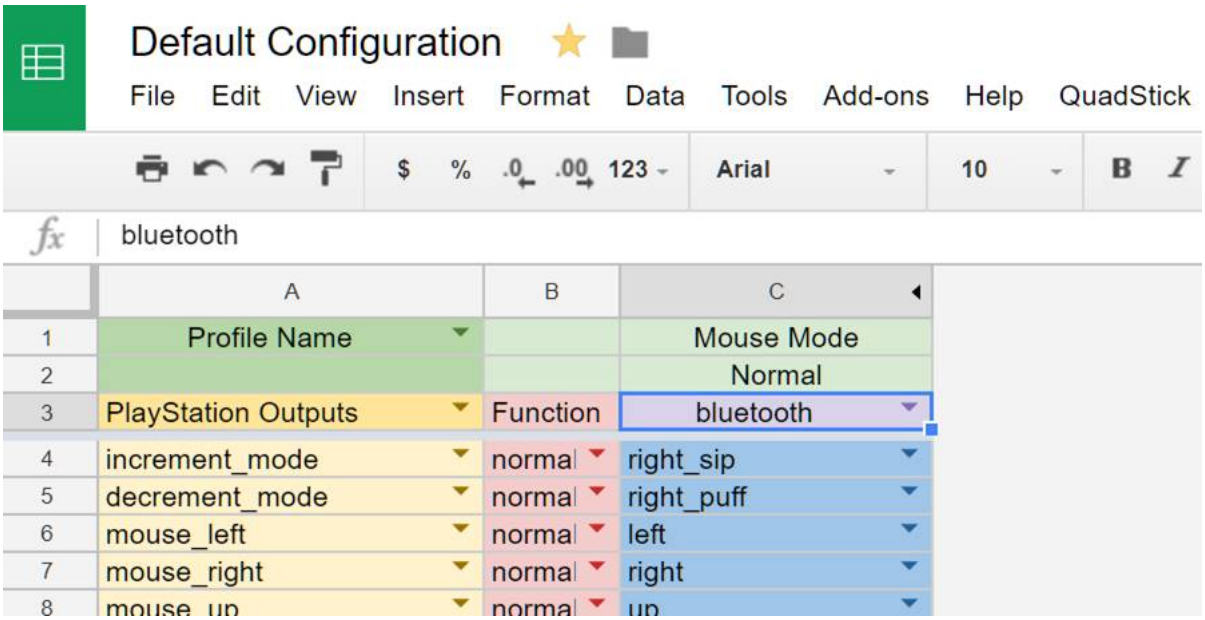
The Quadstick Manager program will automatically search for any available serial connection to the Quadstick at startup.

Wireless only operation:

When used as a Bluetooth mouse, keyboard, or combo, the Quadstick can be powered by a battery pack, like the Anker Astro E1 5200mAh or similar instead of receiving power from a host.

Data Channel assignment:

The data destined for the mouse, keyboard or game controller outputs is only sent to the USB port by default. When using the Bluetooth for one of these devices, the Data Channel must be changed to “bluetooth” in cell C3 of the appropriate mode sheets.



Infrared Remote Control

The Infrared transmitter LED on the back panel can be programmed to send IR Remote Control codes. The IR command names are listed below are treated the same as outputs for other kinds of devices in a configuration profile sheet. The specific codes sent for each command are defined on a second sheet, named “IR Codes”, that contains the Philips Pronto Hex Code for the particular TV or A/V devices.

Output Name	Description
ir_tv_channel_up	Xmit IR code from command table
ir_tv_channel_down	Xmit IR code from command table
ir_tv_volume_up	Xmit IR code from command table
ir_tv_volume_down	Xmit IR code from command table
ir_tv_on_off	Xmit IR code from command table
ir_tv_select_input	Xmit IR code from command table
ir_play	Xmit IR code from command table
ir_stop	Xmit IR code from command table
ir_fast_forward	Xmit IR code from command table
ir_rewind	Xmit IR code from command table
ir_skip_forward	Xmit IR code from command table
ir_skip_back	Xmit IR code from command table
ir_record	Xmit IR code from command table
ir_pause	Xmit IR code from command table
ir_mute	Xmit IR code from command table
ir_guide	Xmit IR code from command table
ir_menu	Xmit IR code from command table
ir_cancel	Xmit IR code from command table
ir_select	Xmit IR code from command table
ir_up	Xmit IR code from command table
ir_down	Xmit IR code from command table
ir_left	Xmit IR code from command table
ir_right	Xmit IR code from command table
ir_aux1	Xmit IR code from command table
ir_aux2	Xmit IR code from command table
ir_aux3	Xmit IR code from command table
ir_aux4	Xmit IR code from command table

Table 1: Infrared Remote Control command list

An example of controlling a TV:

Profile Name		Left joy
samsung.csv		Normal
Output or Function	Function	usb
increment_mode	normal	right_sip
decrement_mode	normal	right_puff
ir_tv_on_off	normal	mp_center_puf
ir_aux1	normal	mp_left_puff
ir_aux2	normal	mp_right_puff
ir_tv_volume_up	normal	N
ir_tv_volume_down	normal	S

The output names refer to the codes on the Infrared sheet:

Infrared	Samsung Most Models - Set #: 595 http://irdb.globalcache.com/
Command Name	Hex Code
ir_tv_on_off	0000 006D 0000 0022 00AA 00AA 0014 003F 0014 003F 0014 003F 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 003F 0014 003F 0014 003F 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 003F 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 0014 003F 0014 0014 0014 003F 0014 003F 0014 003F 0014 003F 0014 003F 0014 003F 0014 0706
ir_aux1	0000 006D 0000 0022 00AC 00AC 0015 0040 0015 0040 0015 0040 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0040 0015 0040 0015 0040 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0040 0015 0040 0015 0040 0015 0040 0015 0040 0015 0040 0015 0040 0015 0040 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0689
ir_aux2	0000 006D 0022 0000 00ad 00ad 0015 0041 0015 0041 0015 0041 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0041 0015 0041 0015 0041 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0041 0015 0015 0015 0015 0015 0041 0015 0041 0015 0015 0015 0041 0015 0041 0015 0015 0015 0015 0015 0041 0015 0041 0015 0015 0015 0041 0015 0015 0015 0015 0015 0041 0015 0728
ir_tv_volume_up	0000 006D 0000 0022 00AC 00AC 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015 0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015 0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 071C
ir_tv_volume_down	0000 006D 0000 0022 00AC 00AC 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015 0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015 0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0040 0016 0040 0016 071C

The hex codes are obtained from the Global Cache database, or other sources for Pronto Hex codes. Global Cache will email you the hex codes in a format like this:

```
"VOLUME
DOWN","sendir,1:1,1,38028,1,1,172,172,22,64,22,64,22,64,22,21,22,21,22,21,22,21,22,21,2
006D 0000 0022 00ac 00ac 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015
0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015 0016
0015 0016 0015 0016 0040 0016 0040 0016 0015 0016 0040 0016 0015 0016 0015 0016
0015 0016 0015 0016 0015 0016 0015 0016 0040 0016 0015 0016 0040 0016 0040 0016
0040 0016 0040 0016 071c",,
"VOLUME
UP","sendir,1:1,1,38028,1,1,172,172,22,64,22,64,22,64,22,21,22,21,22,21,22,21,22,21,22,
006D 0000 0022 00ac 00ac 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015
0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015 0016
0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015 0016
0015 0016 0015 0016 0015 0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016
0040 0016 0040 0016 071c",,
```

Copy the last long string of hex characters into the Hex Code cell for the related IR command. In this case:

```
0000 006D 0000 0022 00ac 00ac 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016
0015 0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015
0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016 0015 0016 0015 0016 0015 0016
0015 0016 0015 0016 0015 0016 0015 0016 0015 0016 0040 0016 0040 0016 0040 0016
0040 0016 0040 0016 071c
```

would be copied into the cell next to ir_tv_volume_up.

The IR transmitter on the back of the Quadstick may not be bright enough or aimed in the right direction to be seen by the TV's sensor. If so, an IR repeater may be useful.

Example configuration files:

Samsung TV
Sony STRDN1040

The Quadstick Manager Program

The Quadstick Manager Program (QMP) is a Windows desktop application that is used for setting up and modifying the preference settings that control the Quadstick and for connecting the Quadstick to other inputs devices, such as voice commands and external devices. It is available for download from the Quadstick.com website.

The QMP is organized with a series of tabs that contain the user interfaces for different functions:

- Personal settings for:
  - Joystick calibration and sensitivity
  - Sip & Puff sensor sensitivity
  - Lip position sensor
- Game configuration file management
- Voice commands interface
- Voice command file management
- Firmware updates
- External pointers interface for:
  - UltraStik 360 Joystick
  - PC Mouse
  - Tobii Eye-gaze
  - TrackIR head tracker.
- Miscellaneous settings for:
  - Bluetooth module configuration
  - LED brightness
  - Speaker volume
  - CronusMax PCPROG port relay
  - Boot mode for PS4 support
  - Mouse speed and response curve

Except for the interfaces for Voice command, external pointer and CronusMax PCPROG port, non-Windows users are able to accomplish many of the same tasks through direct editing of the Quadstick's preferences file spreadsheet (prefs.csv) and managing game configuration files using their computer's file manager program. The QMP just makes it easier.

Voice Control Tab

Voice commands are an optional feature of the Quadstick. There is more than one way to implement voice commands:

1. Dragon Naturally Speaking in combination with Natlink and Vocola 2.
2. Voice Attack
3. Auto Hot Key

A common element of the three methods is they all communicate with a part of the Quadstick Manager Program that listens for commands and relays them to the Quadstick via a Serial, Bluetooth or USB connection. The Voice Command Transcript contains the record of the commands and the responses from the Quadstick. When the user says one or more words, the voice program recognizes and converts the phrase into the specific text used by the Quadstick. It sends text to the QMP which relays the command to the Quadstick. The phrases and the resulting command text is configurable by the user.

Vocola:

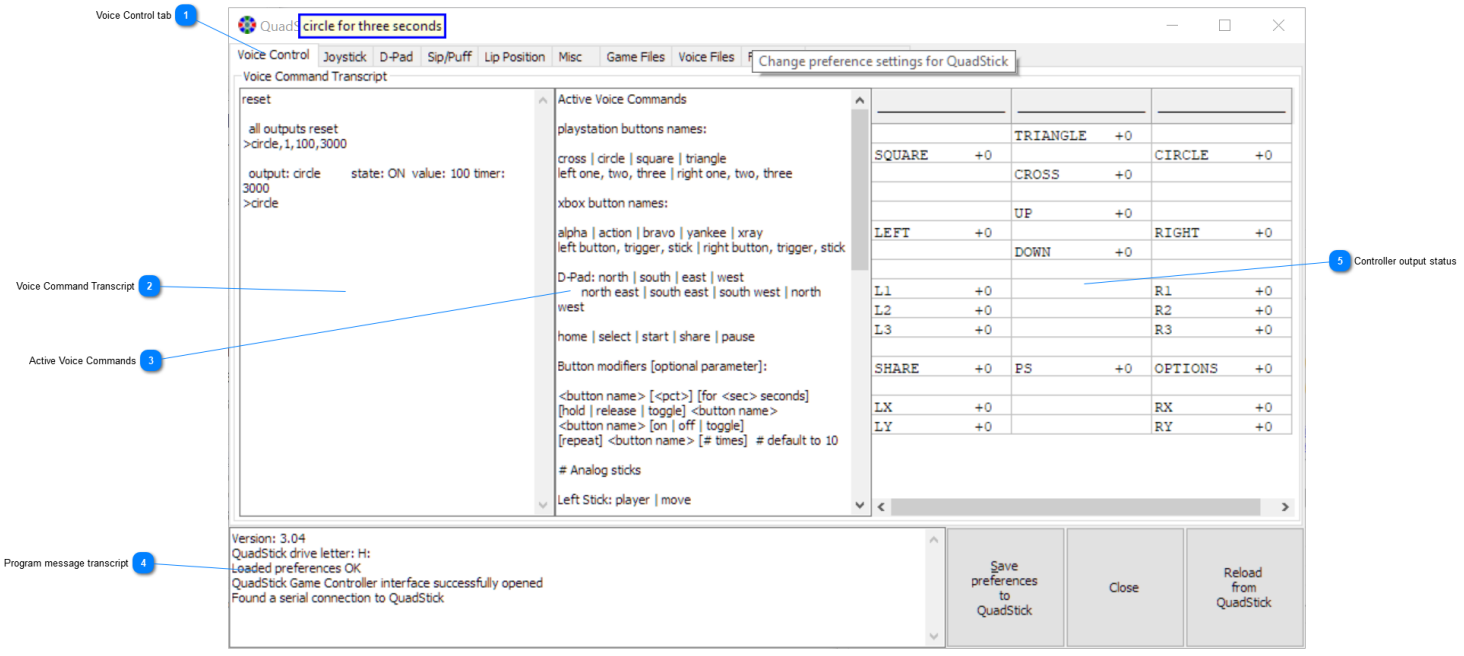
The Quadstick Manager Program works with Dragon Naturally Speaking through a pair of programs called Vocola and Natlink. Both are free programs. There is a signed installer for the Vocola/Natlink package on the Quadstick.com website.

The lowest cost Home version of Dragon Naturally Speaking 12 through 15 may be used.

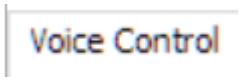
The QMP receives voice commands that have been converted from short phrases to a Quadstick specific commands that are defined in text files with the extension VCL and VCH. VCL stands for Voice Control Language. A VCL file is associated with a specific program by matching the name of the file with the name of the program that receives the text. The QuadStick.vcl file, which was installed as part of the Vocola package, contains the voice commands for the QMP. Individual game voice files are contained in VCH files which are imported by the VCL file.

The commands are sent through a serial connection, either via Bluetooth, a serial cable connected to the Input jack or when “Commands over USB” is enabled, to the Quadstick from a Windows PC.

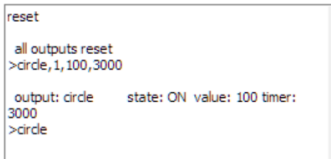
When using Vocola, the commands that are available are always shown in the center column of the Voice tab in the QMP.



1 Voice Control tab

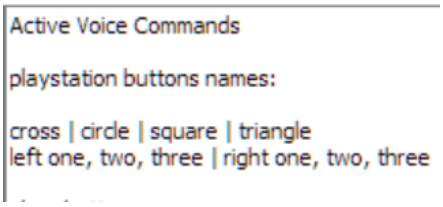


2 Voice Command Transcript



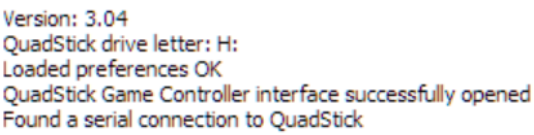
Displays a list of the commands that have been issued.

3 Active Voice Commands



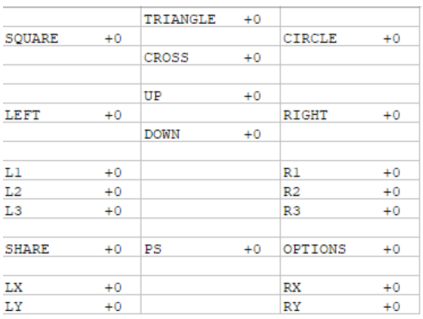
Currently available voice commands. The contents of this pane will change when different vocola files are active.

4 Program message transcript



A serial connection (Bluetooth SSP or cable), is normally required for voice commands and, if one is found, the message "Found a serial connection to QuadStick" will display here. If the Quadstick is connected to the PC via USB and "Enable Voice Commands over USB" is on in the Misc tab, voice commands may be used without a serial connection. If the voice commands are to be used with a game console, then a serial connection is required.

5 Controller output status

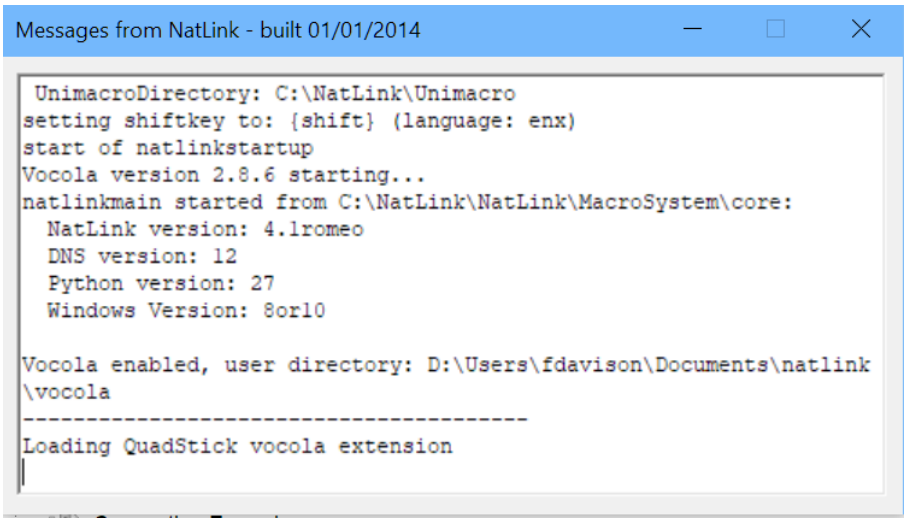


		TRIANGLE	+0		
SQUARE	+0			CIRCLE	+0
		CROSS	+0		
		UP	+0		
LEFT	+0			RIGHT	+0
		DOWN	+0		
L1	+0			R1	+0
L2	+0			R2	+0
L3	+0			R3	+0
SHARE	+0	PS	+0	OPTIONS	+0
LX	+0			RX	+0
LY	+0			RY	+0

When the Quadstick is connected to the PC, this table will display the current values of the outputs. This can be used for troubleshooting configuration files. "Enable CronusMax" must be enabled on the Misc tab for values to show up here.

Natlink Window:

The "Messages from Natlink" window will display when Dragon Naturally Speaking starts. It should be inspected for any error messages:



It can be closed after DNS has finished starting up.

Voice Commands

The commands that are available are always shown in the center column of the Voice tab in the QMP:

```
playstation buttons names:
cross | circle | square | triangle
left one, two, three | right one, two, three

xbox button names:
alpha | action | bravo | yankee | xray
left button, trigger, stick | right button, trigger, stick

D-Pad: north | south | east | west
       north east | south east | south west | north west

home | select | start | share | pause

Button modifiers [optional parameter]:
<button name> [<pct>] [for <sec> seconds]
[hold | release | toggle] <button name>
<button name> [on | off | toggle]
[repeat] <button name> [# times]  # default to 10



Analog sticks
Left Stick: player | move
Right Stick:  look | camera | view
Direction: up | down | left | right

<stick> <direction>
<stick> <direction> [<pct>] [for <sec> seconds]

Quadstick operational  control
Reset | stop  # releases all buttons
Mode <mode #>
reboot quad stick

Preference changing commands
display preferences
calibrate quad stick
use USB [(A=1 | B=0)]
set mouse speed <pct>
set mouse curve 0..2
set volume <pct>
set brightness <pct>
set digital out (1 | 2) (on | off)    # control digital outputs

control sip/puff thresholds
set sip puff soft (2..20)
set sip puff (30..90)
set sip puff maximum (50..100)
set sip puff delay (1..20) hundred

control joystick calibration
joy stick deflection minimum (1..20)
joy stick deflection maximum (10..100)
```

```
D pad inner (1..100)
D pad outer (20..100)
joy stick dead zone (circle | square)
anti dead zone (0..50)
```

Vocola files:

Vocola VCL and VCH files are usually located in the `Documents\Natlink\Vocola` folder. The main file for the Quadstick Manager Program is `QuadStick.vcl`. Whenever the QMP is the front-most window, this file controls how Vocola maps spoken phrases to Quadstick commands. It "includes" two VCH files: `_qs_common.vch` and `_includes.vch`. `_qs_common.vch` contains the voice commands that are considered common to all games. `_includes.vch` is automatically generated by the QMP to include any game specific vch files in the user's vocola folder.

When creating a

The format for a voice command file is fully documented on the Vocola website . The general form is:

```
some short phase = some text to substitute or command to run;
```

The text phrases can be condensed by creating lists of related words that are searched when matching a phase containing a reference to the list:

```
<buttons> := (square | circle | triangle | cross=x | home=ps3 |….
<buttons> = Command( $1 ",1,100,200" );
```

The items within the Command parentheses follow this format for activating output buttons:

`output_name,state,value,duration`

where:

`output_name` is from the outputs list.
`state` is 0=off, 1=on, -1=toggle state.
`value` is an integer percent 0-100.
`duration` is in milliseconds or -1 for permanent.

Example, press D-Pad North button with half force for 200 milliseconds:

Vocola file: `<buttons> <pct>  = Command( $1 ",1," $2 ",200" );`
Command seen by Quadstick: `dpad_n,1,50,200`

Example, press and hold Circle button continuously (until new command or reset):

Vocola file: `<buttons> on  = Command( $1 ",1,100,-1" );`
Command seen by Quadstick: `circle,1,100,-1`

Action Buttons			
Square	<nothing>		Pushes button with 100% force for 200 ms
Circle	%		Pushes button with % force for 200 ms
Triangle	% for ## seconds		Pushes button with % force for ## seconds
Xray	For ## seconds		Pushes button with 100% force for ## seconds
Home	On		Holds button down with 100% force
Select	Off		Releases button

Start	Toggle		Releases or Holds button
Left One			
Left Two			
Left Three			
Right One			
Right Two			
Right Three			
D-Pad			
North			D-Pad Up
North East			D-Pad Up and Right
East			D-Pad Right
South East			D-Pad Down and Right
South			D-Pad Down
South West			D-Pad Down and Left
West			D-Pad Left
North West			D-Pad Up and Left
Analog Sticks			
Player	Up	<%>	Holds stick in specified direction by <%>
Look	Down	<%>	(default = 100%)
	Left	<%>	
	Right	<%>	
Lip Sensor Control			
Swap	Square		Switches Lip input with named output
And	Circle		Adds named output to Lip input
	Triangle		
	Xray		

	Home		
	Select		
	Start		
	Clear		Clears out Swap funtion
Quadstick Control			
Reset			All outputs cleared
Quit			
Stop			
Mode ##			Switch directly to mode ##
Full Screen			Toggles Full Screen display
Help			Display help text message
Reboot Quad Stick			Restarts the Quadstick
Load	Call of Duty		Loads cod.csv file
	Default		Loads config.csv file

Plus direct commands for controlling the operation of the Quadstick:

Command	Description
mode,#	Change selected profile mode to new value
reset	Clear all output states and values to zero
boot	Reboot Quadstick
help	Print a Help messong
load,filename.csv	Load new configuration profile
echo	Turn on local echo (for debugging)
swap,output_name	Exchange inputs for Lip Sensor with another output
and,output_name	Add a second output to the Lip Sensor
print	Print out the active profile
debug	Print out internal values

Preference settings can be changed via command. The general command format is:

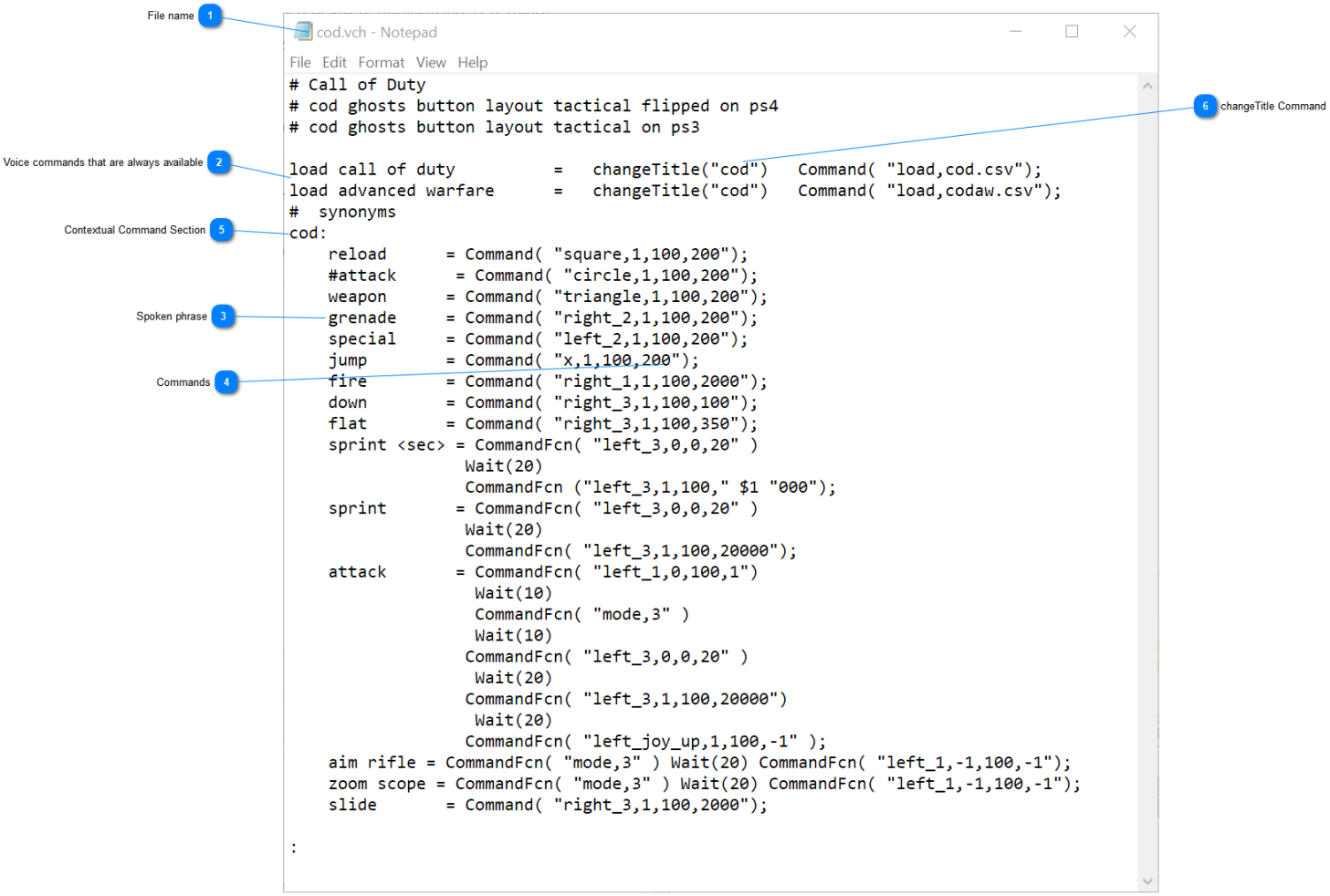
```
preference_name, new value
```

Examples:

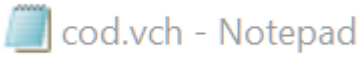
Vocola file: `set volume <pct>  = Command( "volume," $1);`
When “set volume 25” is spoken, the command seen by the Quadstick is:
`volume,25`

Vocola file: `set brightness <pct> = Command( "brightness," $1);`
When “set brightness 50” is spoken, the command seen by the Quadstick is:
`brightness,50`

Sample VCH file



1 File name



The file name, the contextual command section name and the changeTitle parameter must all match.

2 Voice commands that are always available

```
load call of duty          =   changeTitle("cod")   Command( "load,cod.csv");
load advanced warfare      =   changeTitle("cod")   Command( "load,codaw.csv");
```

Contains commands that are always available. Usually commands that activate the contextual section and the Quadstick.

3 Spoken phrase

```
reload
#attack
weapon
grenade
special
jump
fire
down
flat
sprint <sec>
```

Word or phrase the program is listening for.

4 Commands

```
Command( "triangle,1,100,200");
Command( "right_2,1,100,200");
Command( "left_2,1,100,200");
Command( "x,1,100,200");
```

The text parameter is passed to the Quadstick via the serial or USB connection.

5 Contextual Command Section

```
cod:
```

Commands following the label will only be active when the title of the QMP contains the word before the colon. The label must match the name of the VCH file. In this example, the VCH file is named "cod.vch" and the contextual section begins with "cod:". Commands above the contextual section are always available. In this example, changeTitle("cod") will change the title of the QMP to include the word "cod" which will activate this section.

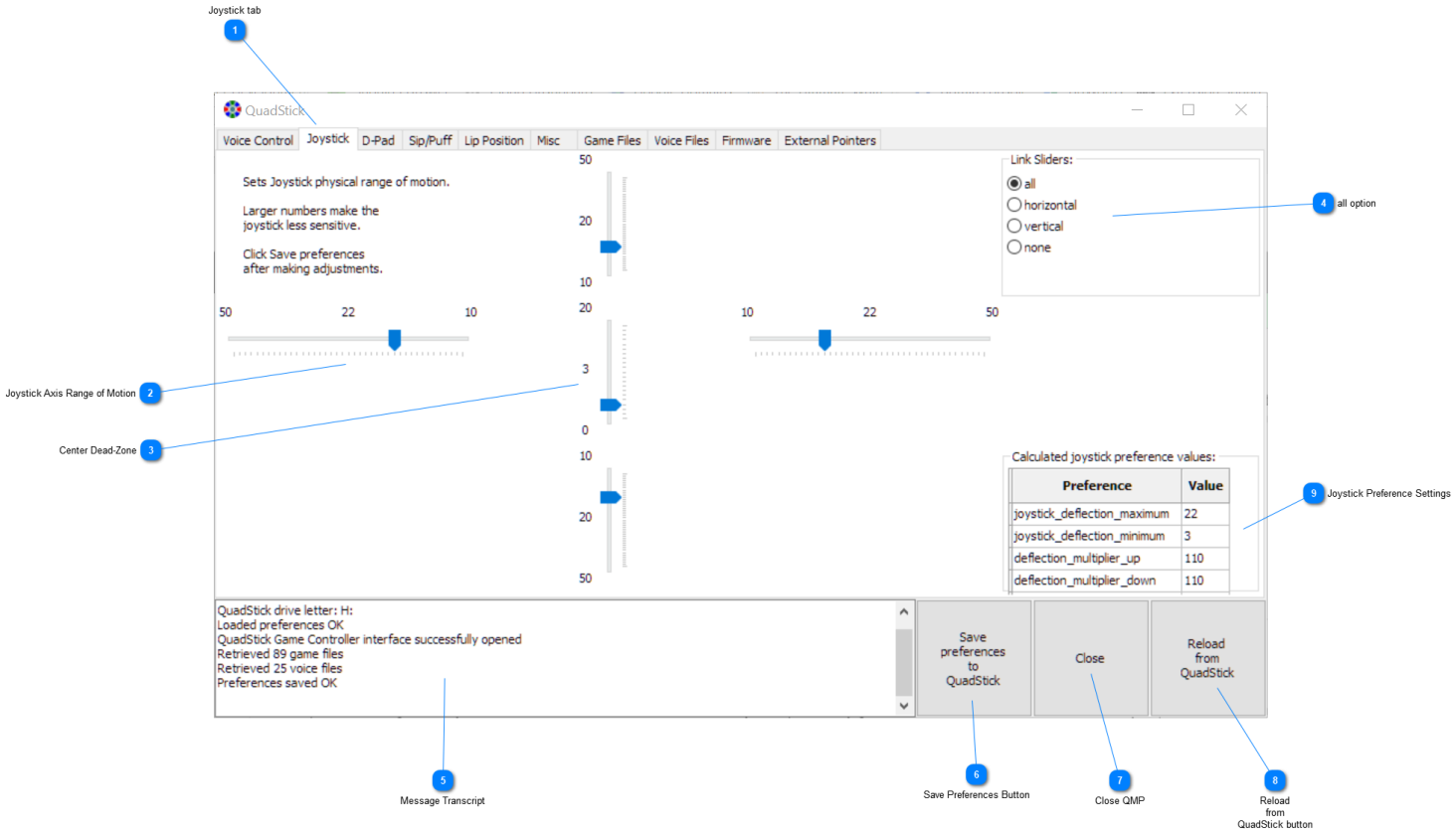
6 changeTitle Command

```
changeTitle("cod")
```

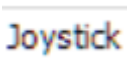
Sets the title of the QMP to include the word parameter which activates the contextual command section. Without this command, the commands below the contextual section will not be active. Usually paired with a "load,something.csv" command to select the associated configuration file in the Quadstick's flash.

Joystick Tab

The sensitivity the joystick is adjustable. This tab allows the user to change the sensitivity of the joystick's movement in each of the four directions by sliding the indicator to control how far the joystick needs to move to generate a 100% output signal to the corresponding output. The closer to the center the four sliders are, the most sensitive the joystick will be. In the center, the size of the "dead-zone" can be controlled.



1 Joystick tab

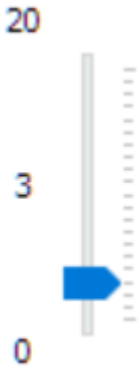


Select the Joystick Tab to display this page.

2 Joystick Axis Range of Motion

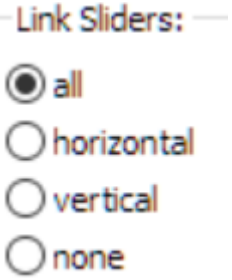
Controls the range of motion required to generate the full output signal for that axis. The smaller the number, the more sensitive the joystick will be in that direction.

3 Center Dead-Zone



The dead-zone is the distance the joystick needs to move before it generates an output signal greater than 0%. If the dead-zone is too small, the natural small variations in the position the joystick when it is released, or when the user slightly touches it can cause unwanted outputs.

4 all option

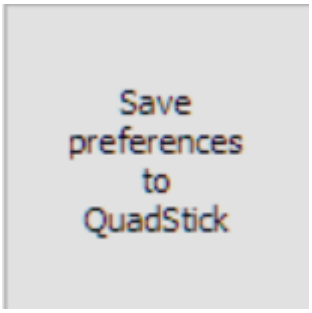


The four directional sliders can be adjust simultaneously by linking their movement. To adjust them individually, select "none".

5 Message Transcript

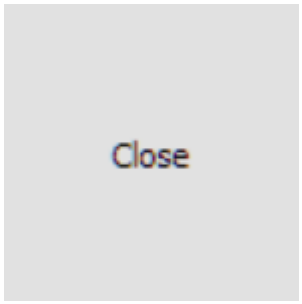
Messages from the program will show up here.

6 Save Preferences Button



Click this button to save your changes. Changes to preferences are not saved automatically.

7 Close QMP



Close the Quadstick Manager Program

8 Reload from QuadStick button

Click this button the reload the preferences that are currently in the Quadstick if you wish to start over.

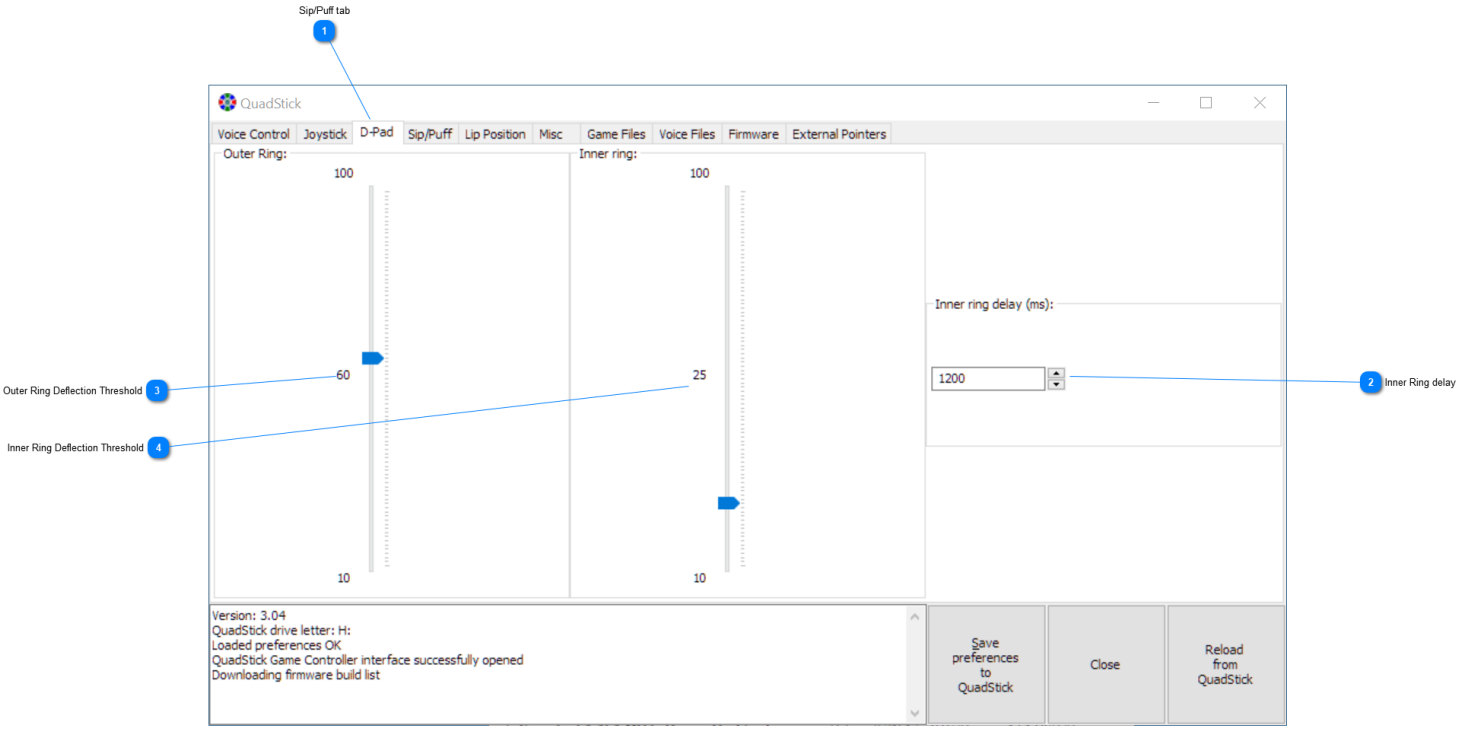
9 Joystick Preference Settings

Preference	Value
joystick_deflection_maximum	22
joystick_deflection_minimum	3
deflection_multiplier_up	110
deflection_multiplier_down	110

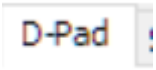
These are the actual preference settings that are calculated from the Sliders that go into the prefs.csv file. If a configuration requires a mode with unique joystick preferences, these values can serve as a starting point. For instance, to make a mode sheet have a less sensitive joystick, add a preference row with "joystick_deflection_maximum" with a value greater than the global value:

D-Pad Tab

For the details about the behavior of the D-Pad inputs, see the Joystick topic.



1 Sip/Puff tab



Select the D-Pad tab to adjust the D-Pad zone settings.

2 Inner Ring delay

How long the joystick must stay between the Inner and Outer rings to be detected as an "inner" ring input.

3 Outer Ring Deflection Threshold

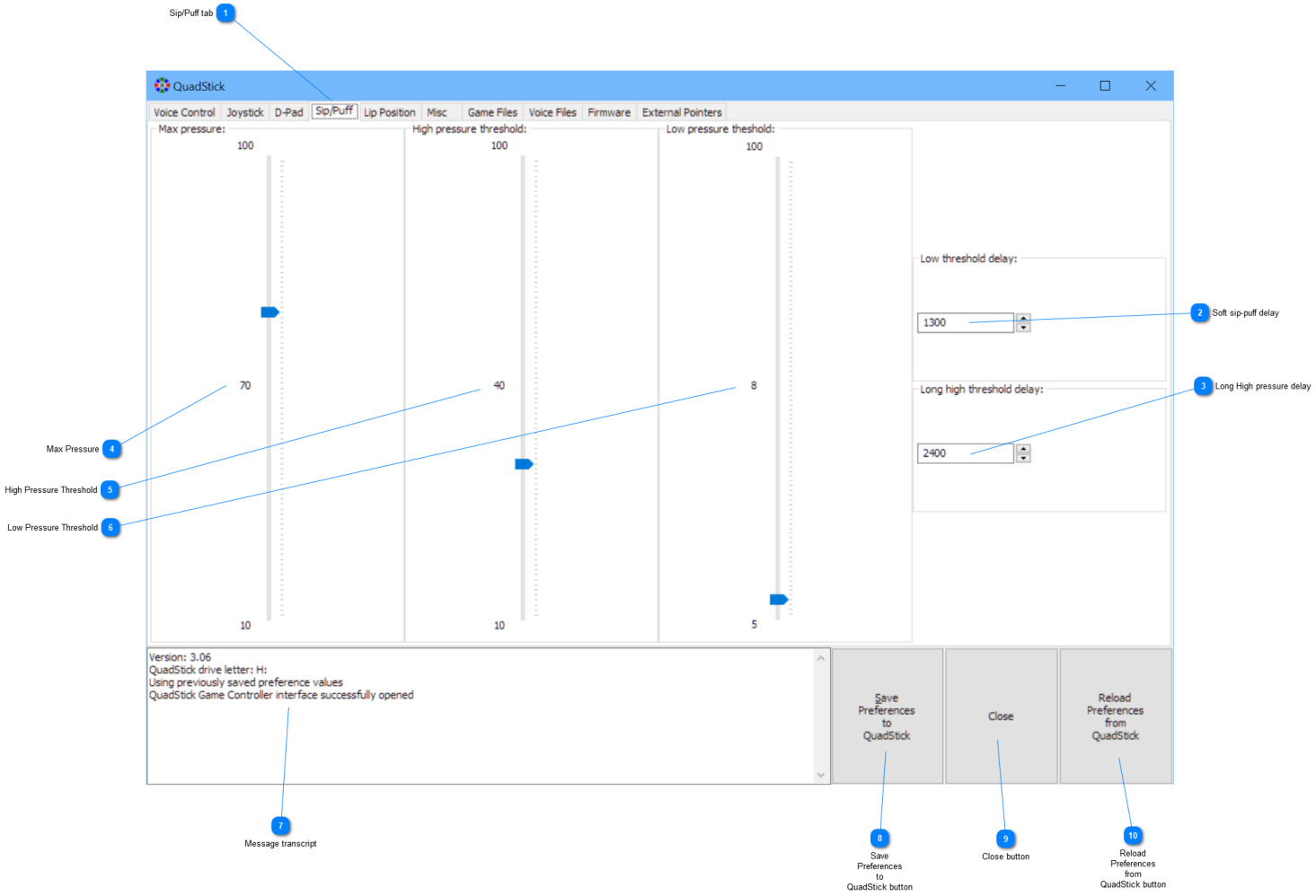
Controls how far the joystick needs to move before the position is detected as N, S, E, W, NW, NE, SW, or SE. See the section on D-Pad in the Joystick topic for details

4 Inner Ring Deflection Threshold

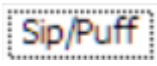
Controls how far the joystick needs to move before the position is detected as N_inner, S_inner, E_inner, W_inner, NW_inner, NE_inner, SW_inner, or SE_inner.

Sip Puff Tab

More information about the behavior of the Sip/Puff sensors can be found in the Sensors and Inputs section.



1 Sip/Puff tab



Select the Sip/Puff tab to display this page

2 Soft sip-puff delay

The length of time in milliseconds the pressure must remain between the Low Pressure Threshold and the High Pressure Threshold before a "Soft" sip/puff is detected. This delay allows time for the pressure to reach the High Pressure Threshold to trigger a "Hard" sip/puff without triggering the soft sip/puff.

3 Long High pressure delay

The length of time in milliseconds the pressure must remain above the High Pressure Threshold before the Long High Pressure is detected. The applies only to the fourth tube on the side which has an additional function to trigger the loading of new configuration files. A long hard sip triggers the load configuration file function. A long hard puff triggers the "Swap" function, which allows swapping the Lip button temporarily with another input. Both functions can be enabled and disabled on the Misc tab.

4 Max Pressure

The pressure at which the Analog output value will reach 100%. The sip/puff inputs can be used for Analog outputs, like a Joystick or Trigger axis. To allow a greater range of pressure for more accurate control, this value may be increased.

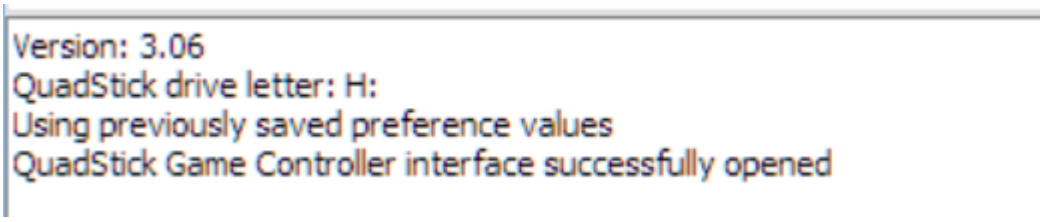
5 High Pressure Threshold

The pressure at which a "Hard" sip/puff is detected. There is no delay. If being used to control an Analog output, the value will become greater than 0% and increase towards 100% with increasing pressure, up to the Max Pressure.

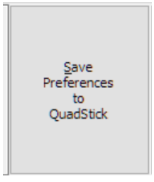
6 Low Pressure Threshold

The pressure at which a "Soft" sip/puff can be detected if the pressure does not exceed the High Pressure Threshold by the time the Soft sip/puff delay timer has expired.

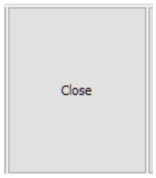
7 Message transcript



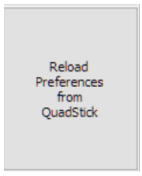
8 Save Preferences to QuadStick button

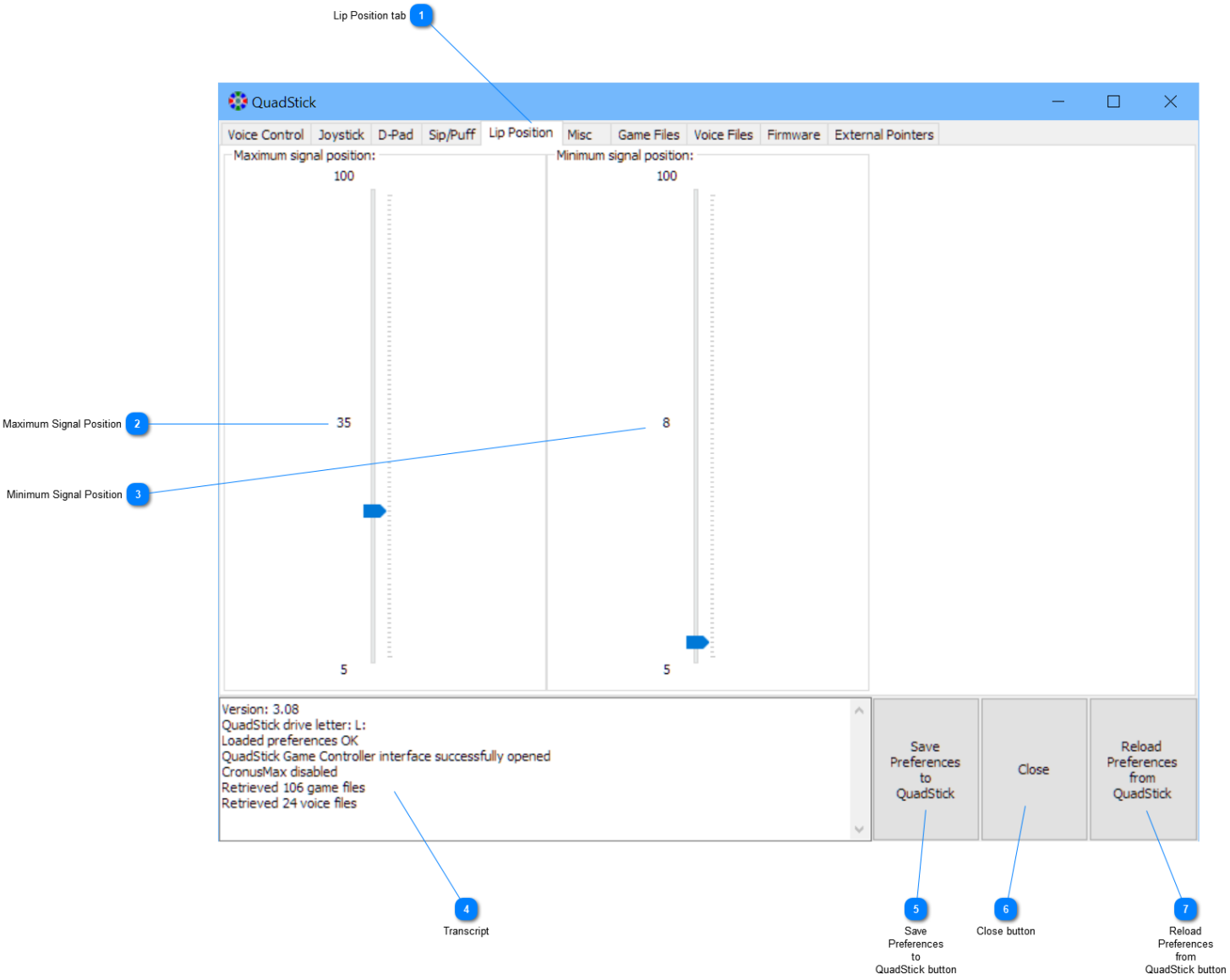


9 Close button



10 Reload Preferences from QuadStick button





1 Lip Position tab

Lip Position

Select the Lip Position tab to display this page

2 Maximum Signal Position

35

Controls how far the Lip button must be pushed forward to produce an output of 100%. A larger number means the button must be push farther to archive the same output result. Mostly important for Analog outputs, like Joystick axis outputs.

3 Minimum Signal Position

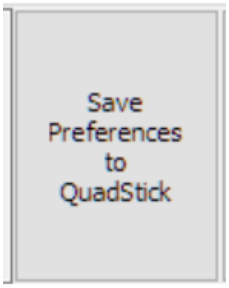
8

Controls how far the Lip button must be pushed to be detected. For most Button outputs, this value controls the point they will turn on.

4 Transcript

```
Version: 3.08
QuadStick drive letter: L:
Loaded preferences OK
QuadStick Game Controller interface successfully opened
CronusMax disabled
Retrieved 106 game files
Retrieved 24 voice files
```

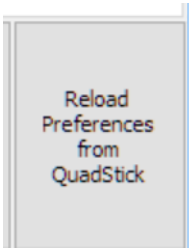
5 Save Preferences to QuadStick button



When changes are made to any Preference settings, this button must be clicked to write the new values to the Quadstick.

6 Close button

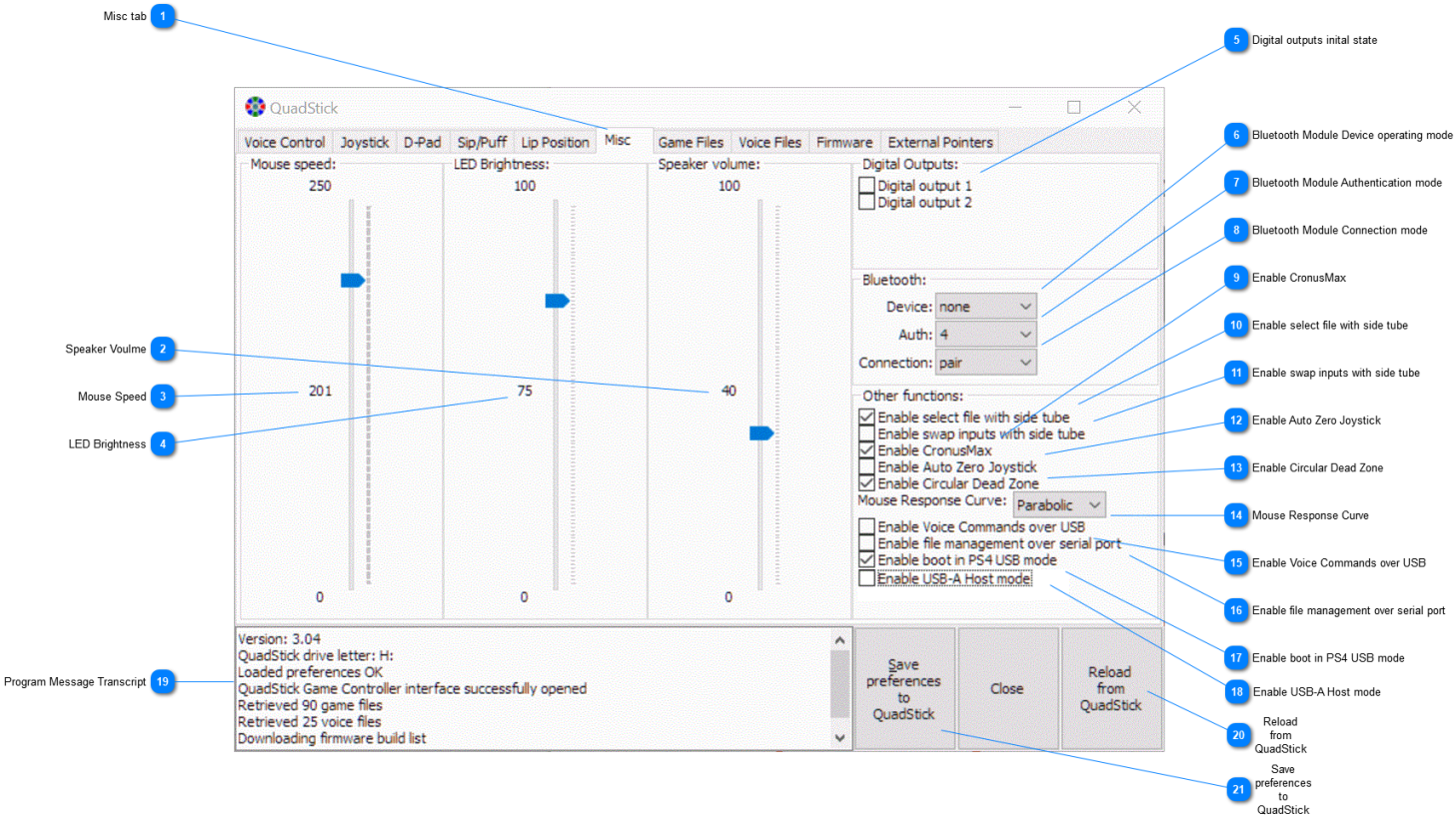
7 Reload Preferences from QuadStick button



Lip Position

<TODO>: Insert description text here... And don't forget to add keyword for this topic

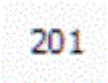
Miscellaneous Tab



1 Misc tab

2 Speaker Voulme

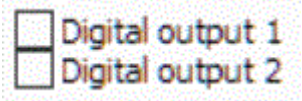
3 Mouse Speed



This setting controls the speed of the mouse relative to the game controller joystick. Adjust the joystick sensitivity for use as a game controller first, then adjust this mouse speed second.

4 LED Brightness

5 Digital outputs inital state

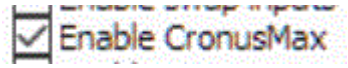


6 **Bluetooth Module Device operating mode**

7 **Bluetooth Module Authentication mode**

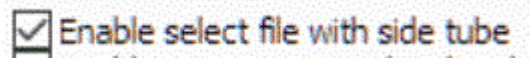
8 **Bluetooth Module Connection mode**

9 **Enable CronusMax**



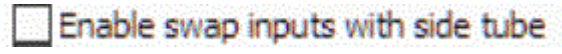
The QMP and CronusPro cannot both access the CronusMax Plus PCPROG port at the same time. Turn this setting off if using the CronusPro while the QMP is open. If using the QMP to relay Quadstick data to the CronusPro PCPROG port, this setting must turned on.

10 **Enable select file with side tube**



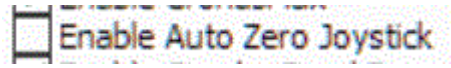
Enables the long hard sip on the side tube to allow the user to activate different configuration files. When activated, a "boing" sound will be heard and the leds will flash rapidly indicating the number for the active file. Move the joystick left-right or up-down to light up the leds for the desired file, then press the lip button.

11 **Enable swap inputs with side tube**

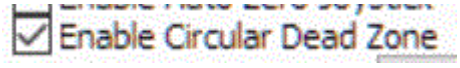


A long hard puff on the side tube allows the user to temporarily remap the lip button to the next input the user activates. While waiting for the user to select an input, a tone will sound from the speaker. To clear the swap, a long hard puff, followed by pushing on the lip button will restore the original mapping.

12 **Enable Auto Zero Joystick**



13 **Enable Circular Dead Zone**



See the Joystick topic for a description of this setting.

14 **Mouse Response Curve**

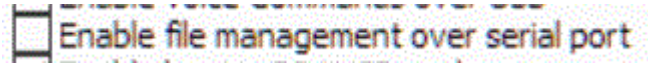
The three choices are:
1. Linear - the mouse movement speed is directly proportional to the joystick position
2. Mixed - the mouse movement speed is an average of the Linear and Parabolic values.
3. Parabolic - the mouse movement speed is proportional to the square of the joystick position.

Parabolic gives the user greater control over small movements of the mouse pointer while still moving quickly for larger deflections of the joystick.

15 **Enable Voice Commands over USB**

If there is no serial connection to the Quadstick, this setting can be used for voice commands when the Quadstick is connected to the PC. This setting overrides any serial connection.

16 **Enable file management over serial port**



If a serial connection is found to the Quadstick, via a cable or Bluetooth SPP, and the Quadstick is not connected to the PC, turning this setting on will allow configuration file management over that serial connection.

17 **Enable boot in PS4 USB mode**

When connecting directly to the PS4 or when using the CronusMax in "Full Crossover mode", turn this setting on.
See USB Emulation mode 4 (PS4) and connecting to the PS4 for more information.

18 **Enable USB-A Host mode**

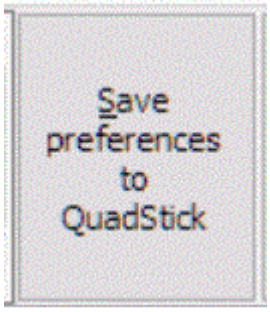
To use the USB-A port with a Dual Shock 4, UltraStik 360, or other supported device, this preference must be enabled.

19 **Program Message Transcript**

20 Reload from QuadStick

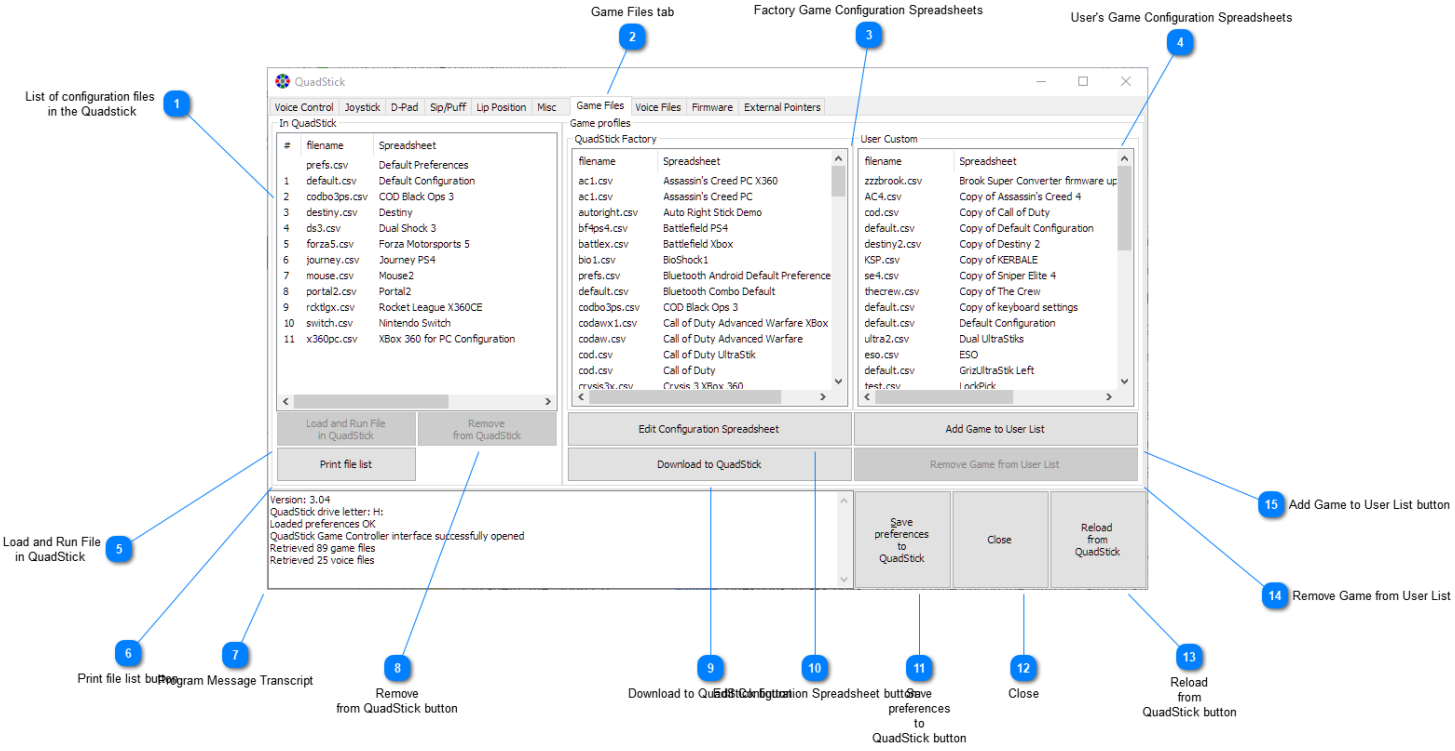
Read the prefs.csv file from the Quadstick and update the controls in the program

21 Save preferences to QuadStick



Nothing is saved to the Quadstick until this button is clicked. A new prefs.csv file will be created and copied into the Quadstick's flash.

Game Files Tab

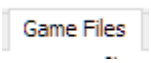


1 List of configuration files in the Quadstick

#	filename	Spreadsheet
	prefs.csv	Default Preferences
1	default.csv	Default Configuration
2	codbo3ps.csv	COD Black Ops 3
3	destiny.csv	Destiny
4	ds3.csv	Dual Shock 3
5	forza5.csv	Forza Motorsports 5
6	journey.csv	Journey PS4
7	mouse.csv	Mouse2
8	portal2.csv	Portal2
9	rcktlgx.csv	Rocket League X360CE
10	switch.csv	Nintendo Switch
11	x360pc.csv	XBox 360 for PC Configuration

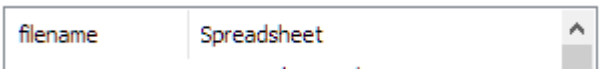
CSV files are sorted alphabetically, except default.csv is always number one and prefs.csv is not a game configuration file. The number next to the filename corresponds with the LED lit when selecting the active configuration file.

2 Game Files tab



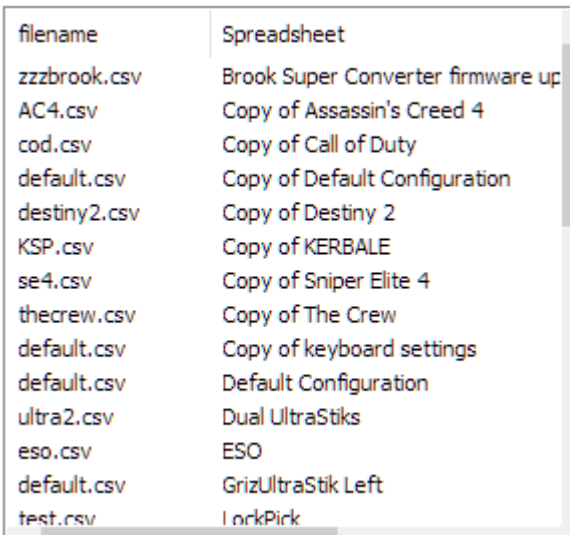
Click on the tabs to change a new tab.

3 Factory Game Configuration Spreadsheets



Spreadsheets that the user can download into the Quadstick's flash, or use as a starting point for their own configuration spreadsheets.

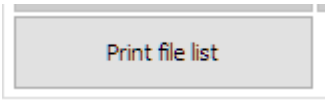
4 User's Game Configuration Spreadsheets



5 Load and Run File in QuadStick

If the Quadstick is connected via a serial connection, either a cable or via Bluetooth, this button commands the Quadstick to activate the selected file.
An alternative serial connection is available if the Quadstick is connected to the PC over USB _AND_ the "Enable Voice Commands over USB" is checked on the Misc tab, if a Bluetooth or Serial cable connection is not used.

6 Print file list button



Open the default browser with a list of the configuration files loaded into the Quadstick's flash along with the LED patterns that indicate the file number for each file.

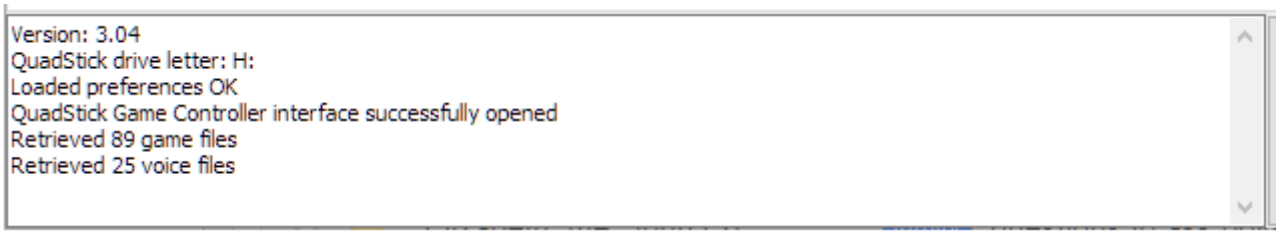
QuadStick File Selector.

To activate a configuration file, start with a long sip on the side tube. When the purple leds start flashing, move the joystick right or left to select the desired file. Press the Lip button to select file.

LED Pattern	File Number	CSV Filename	Configuration Filename
●○○○○	1	default.csv	Default Configuration
○●○○○	2	codbo3ps.csv	COD Black Ops 3
○○●○○	3	destiny.csv	Destiny
○○○●○	4	ds3.csv	Dual Shock 3
○○○○●	5	forza5.csv	Forza Motorsports 5
●○○○●	6	journey.csv	Journey PS4
○●○○●	7	mouse.csv	Mouse2
○○●○●	8	portal2.csv	Portal2
○○○●●	9	rcktlgx.csv	Rocket League X360CE
○○○○●	10	switch.csv	Nintendo Switch
●○○○●	11	x360pc.csv	XBox 360 for PC Configuration

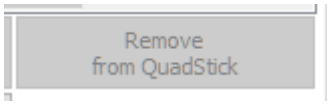
---

7 Program Message Transcript



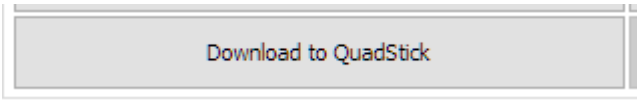
Various status messages from the program. When requesting technical support, copying the contents of this window and pasting it into the request can be helpful.

8 Remove from QuadStick button



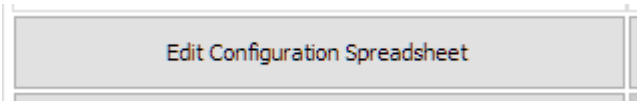
Will delete the selected file from the Quadstick's flash.

9 Download to QuadStick button



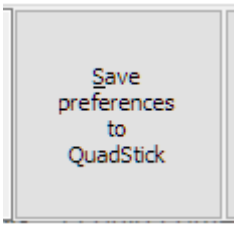
Will convert the spreadsheet selected in either the Factory or User configuration Spreadsheet lists into the CSV format and copy them into the Quadstick. The spreadsheet must be shared for public access with a link for this command to work. Using the "Download to Quadstick with QMP" command in the spreadsheet's Add-ons->Quadstick menu will automatically enable this setting.

10 Edit Configuration Spreadsheet button



Will open the spreadsheet selected in any of the three columns in your default browser. If you have editing rights to the spreadsheet, you can make changes and then click on the "Download to Quadstick" button to copy the new changes into the Quadstick's flash. If you do not have editing rights and wish to make changes to the spreadsheet, make a copy of the spreadsheet, make your changes, then click on the Add-ons->Quadstick->Download to Quadstick with QMP" in the spreadsheet's menu to register the spreadsheet in the User Custom list.

11 Save preferences to QuadStick button



Whenever changes are made to preference settings, click on this button to copy them into the Quadstick.

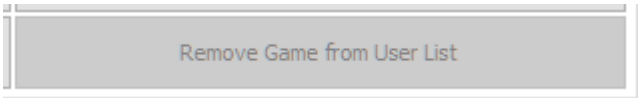
12 Close

Closes the QMP

13 Reload from QuadStick button

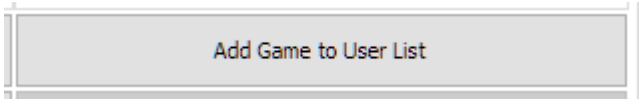
Will fetch the contents of the prefs.csv file in the Quadstick and update the elements of the user interface.

14 Remove Game from User List



Select a spreadsheet in the User Custom list and click on this button to remove the spreadsheet from the list. The spreadsheet still will be in your Google Drive unless you delete it there as well.

15 **Add Game to User List button**

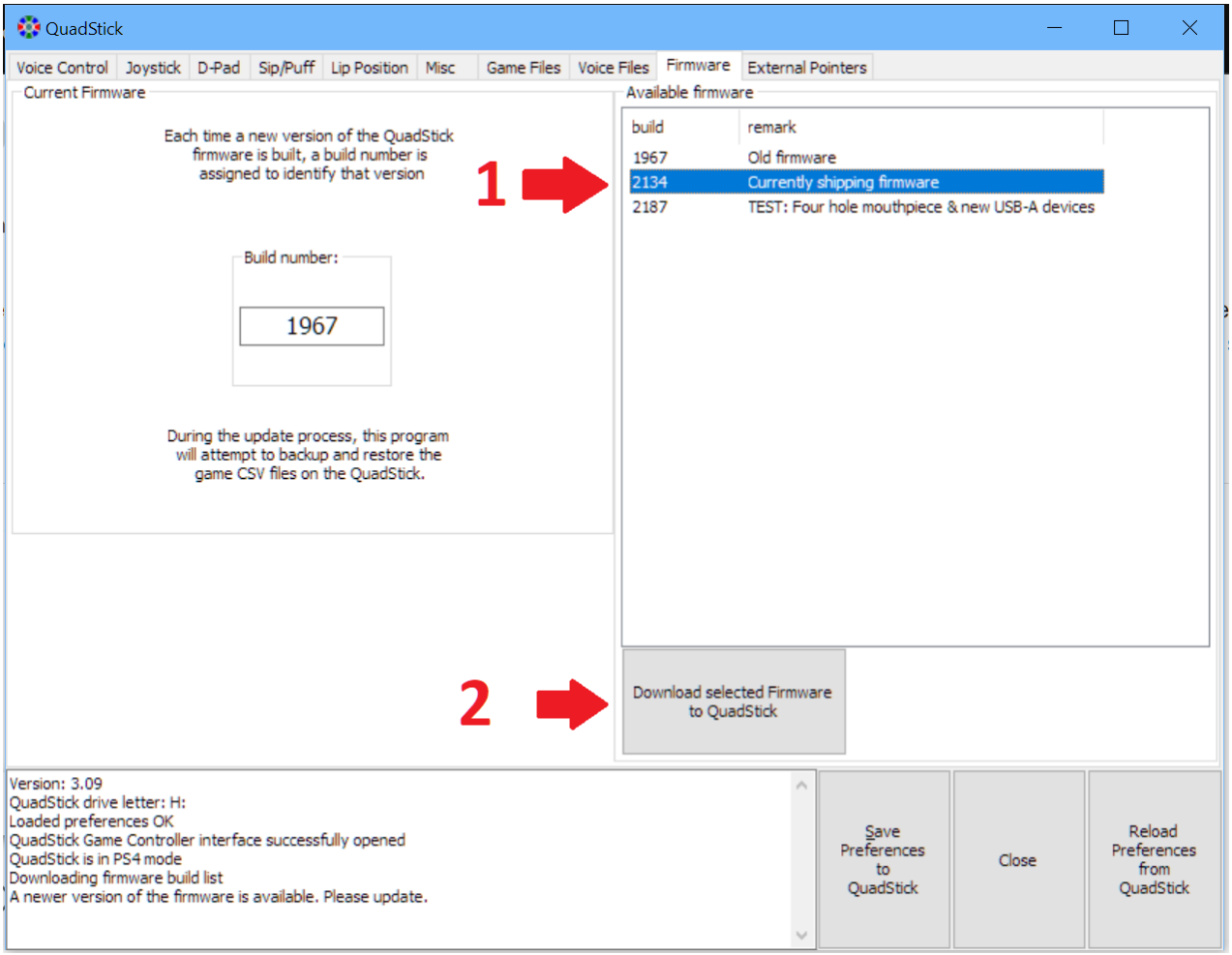


An alternative method of adding a spreadsheet to the User Custom list is to copy the URL of the new spreadsheet into the dialog box that will open when this button is pressed.

Firmware Tab

Firmware updates are copied into the flash drive to reprogram the Quadstick. When new firmware is loaded into the flash drive, the Quadstick will reboot after a few seconds then copy the new firmware into the CPU's internal memory. This process re-formats the flash drive so any configuration files will be erased and must be rewritten to the flash drive from a backup copy or a fresh download from a configuration spreadsheet.

The QMP has a tab for firmware updates that automates the process.



The transcript in the lower left corner will display a message similar to this:

Download new firmware file. Please wait...
Backup game configuration files
prefs.csv
default.csv
Write new firmware file to QuadStick
Wait for QuadStick to reboot...
.....
QuadStick rebooting
Waiting for QuadStick to install new firmware...
.....
Copy files back
prefs.csv
default.csv
Done!
QuadStick Game Controller interface successfully opened

Updating Firmware without the Quadstick Manager Program:

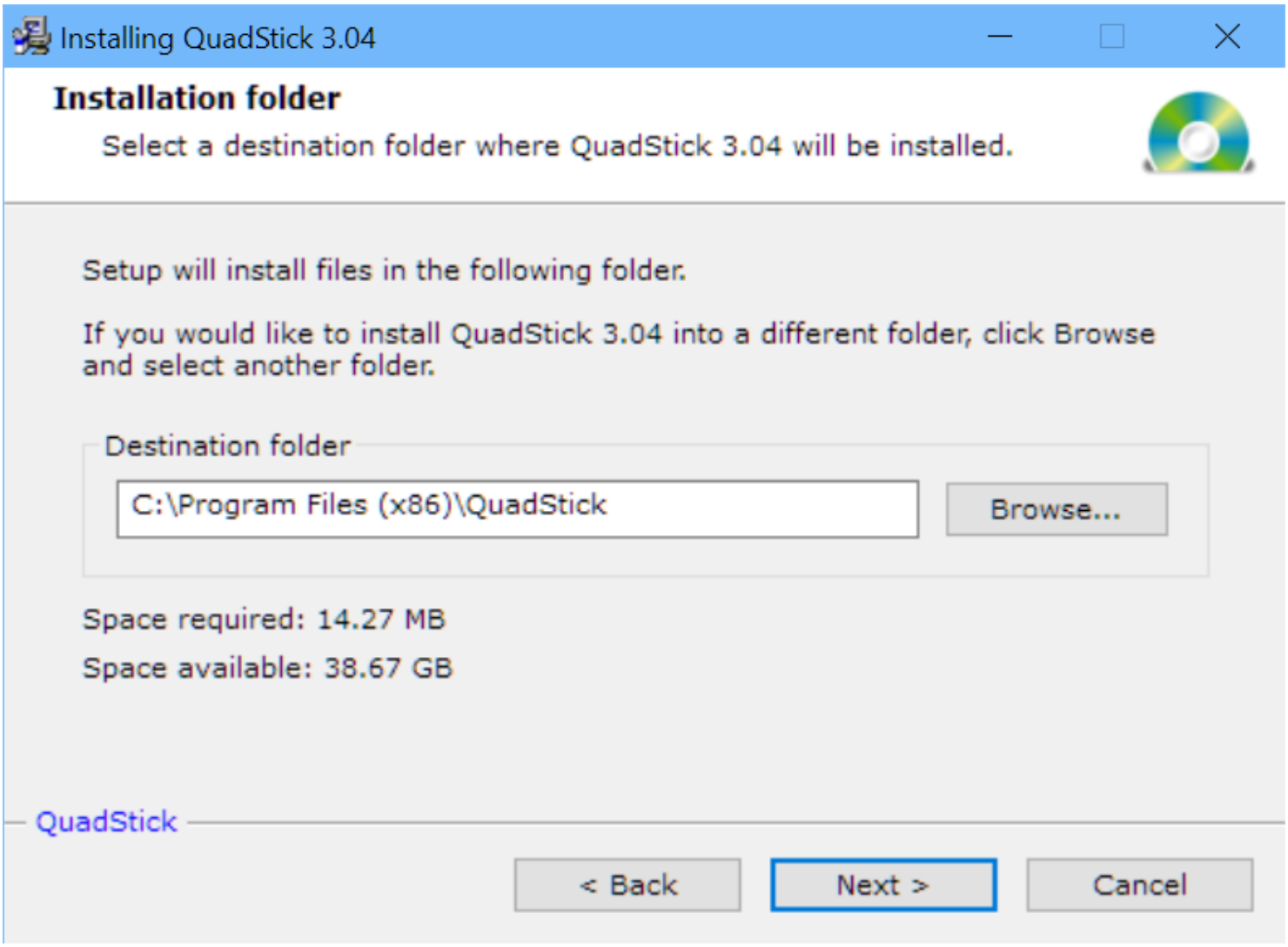
To manually update the firmware follow this procedure:
1. Backup your existing CSV files from your Quadstick's flash to a folder on your hard drive.
2. Download the desired "Joystick.bin" firmware from http://fw.quadstick.com .
3. Copy the Joystick.bin file into the Quadstick's flash and wait for the Quadstick to reboot. It can take a minute or two.
4. Once the Quadstick has rebooted, it will be empty and running a simple default profile with a mouse in mode 5, USB emulation mode 0.
5. Copy all of your backed up CSV files into the Quadstick's flash and it will reload the prefs.csv and default.csv.

Monitor the forum for news about firmware updates.

Installation

The Quadstick Manager Program installer can be downloaded from the Downloads page of the Quadstick.com website.

Click Next then select the installation folder:

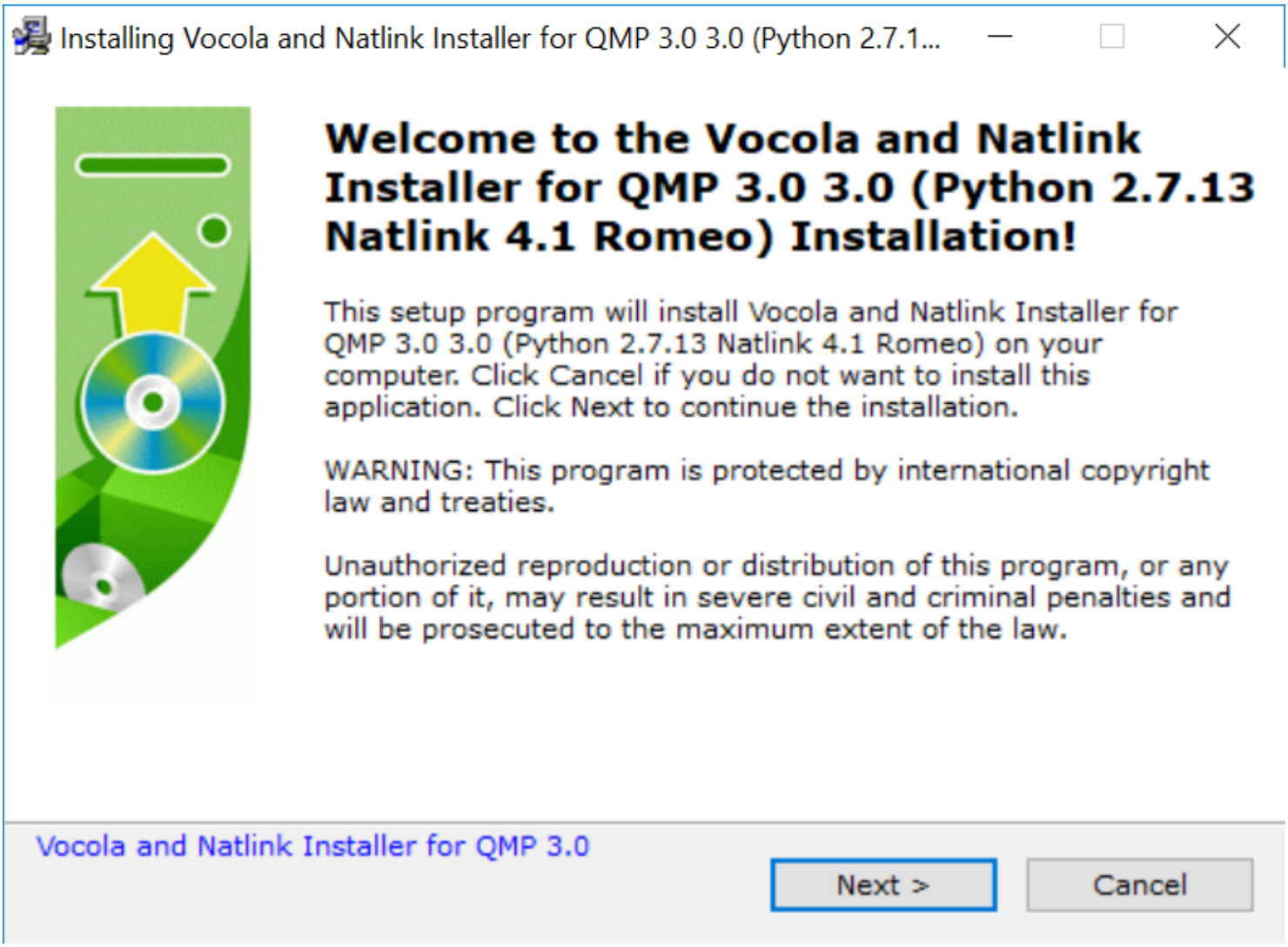


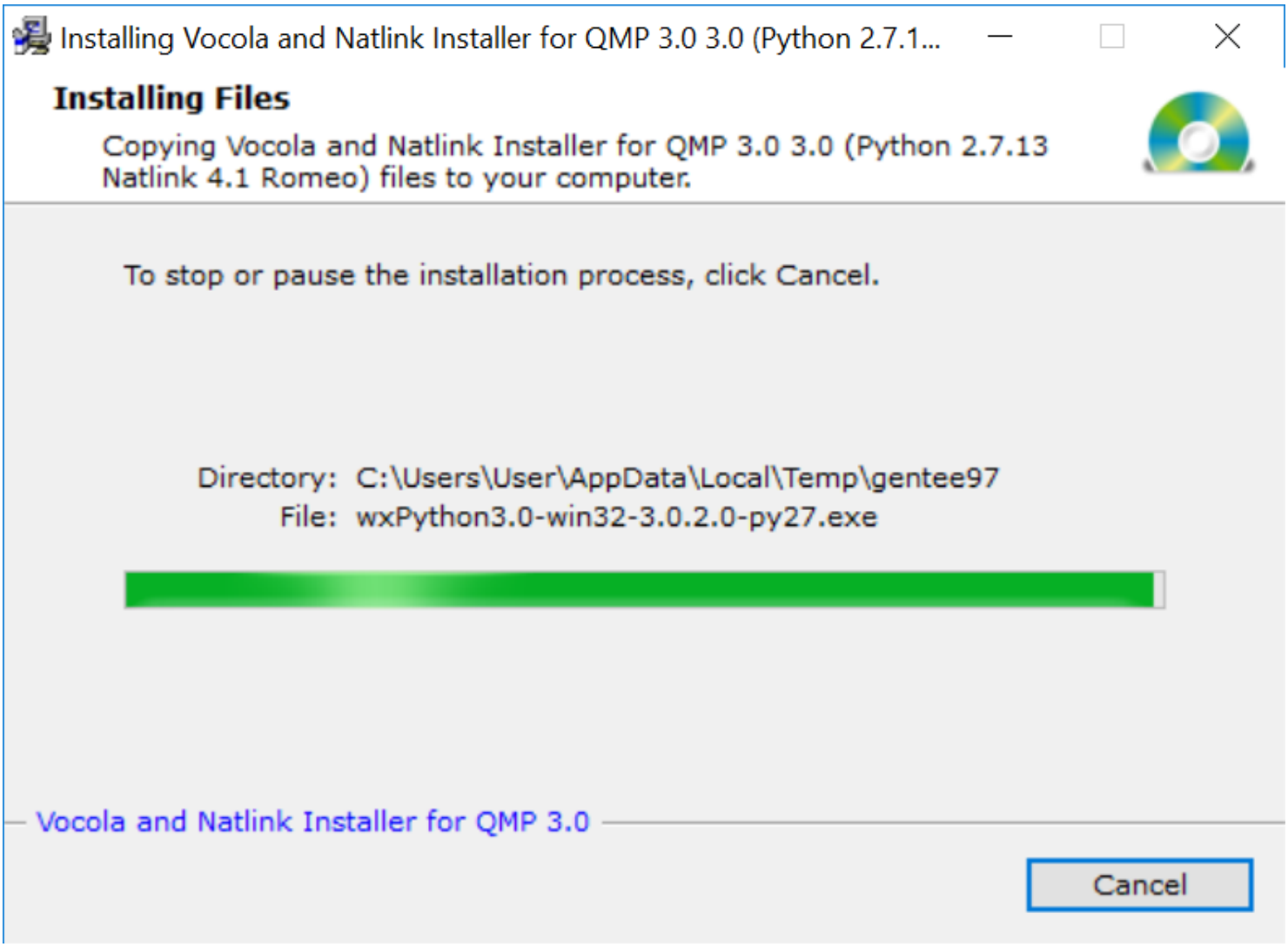
In a few seconds the final screen will display:

After the Quadstick Manager Program is installed, the optional Vocola/Natlink package can be installed if the user wants to use voice commands with the Quadstick. Vocola requires Dragon Naturally Speaking to operate.

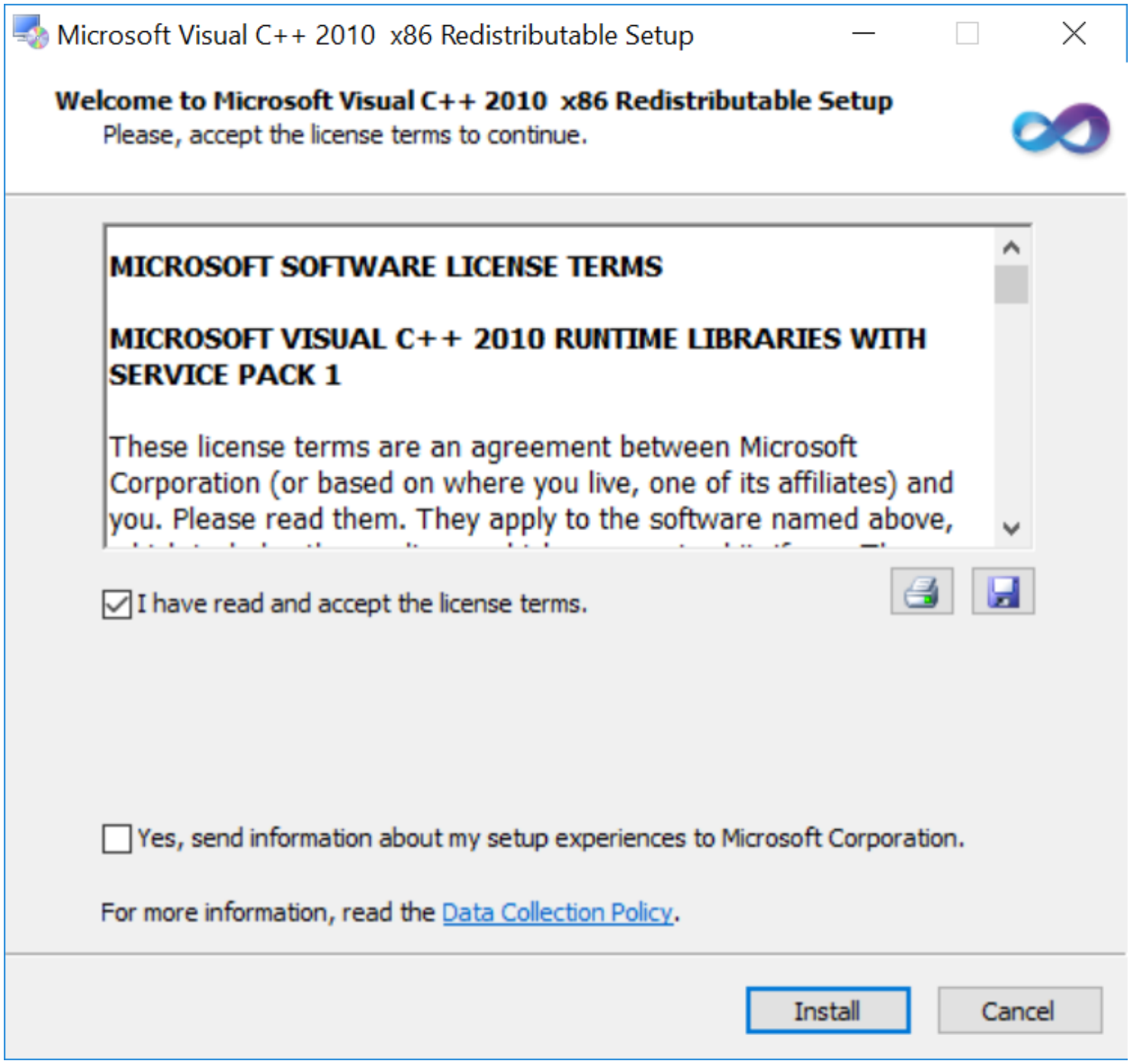
Installing the optional Vocola program for using the Quadstick with Dragon Naturally Speaking:

The Vocola installer installs a series of programs that work together to connect Dragon Naturally Speaking to the Quadstick. The user can accept the default settings for all the prompts.

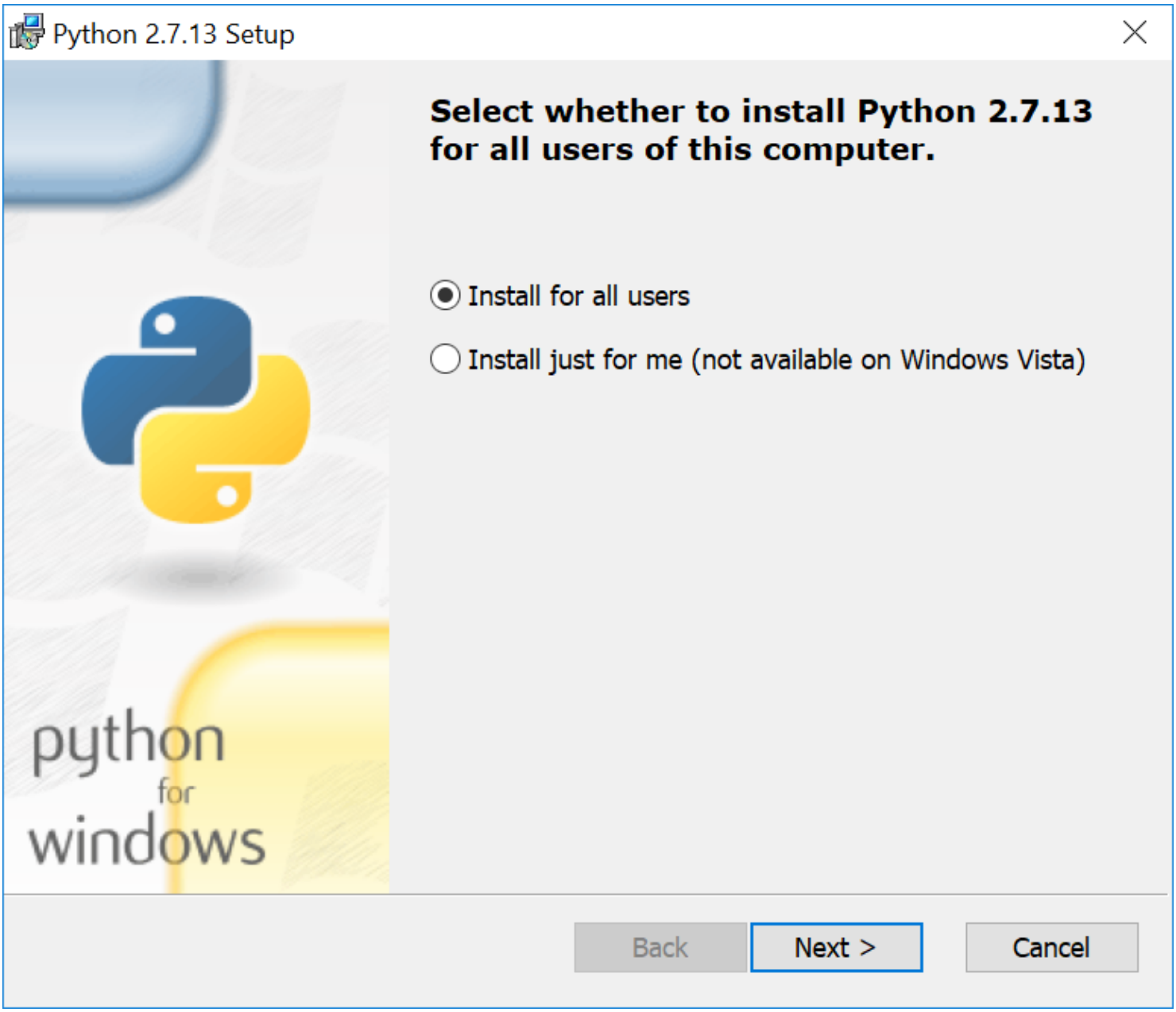

Installing Vocola and Natlink Installer for QMP 3.0 3.0 (Python 2.7.1...
Welcome to the Vocola and Natlink Installer for QMP 3.0 3.0 (Python 2.7.13 Natlink 4.1 Romeo) Installation!
This setup program will install Vocola and Natlink Installer for QMP 3.0 3.0 (Python 2.7.13 Natlink 4.1 Romeo) on your computer. Click Cancel if you do not want to install this application. Click Next to continue the installation.
WARNING: This program is protected by international copyright law and treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties and will be prosecuted to the maximum extent of the law.
Vocola and Natlink Installer for QMP 3.0
Next >
Cancel



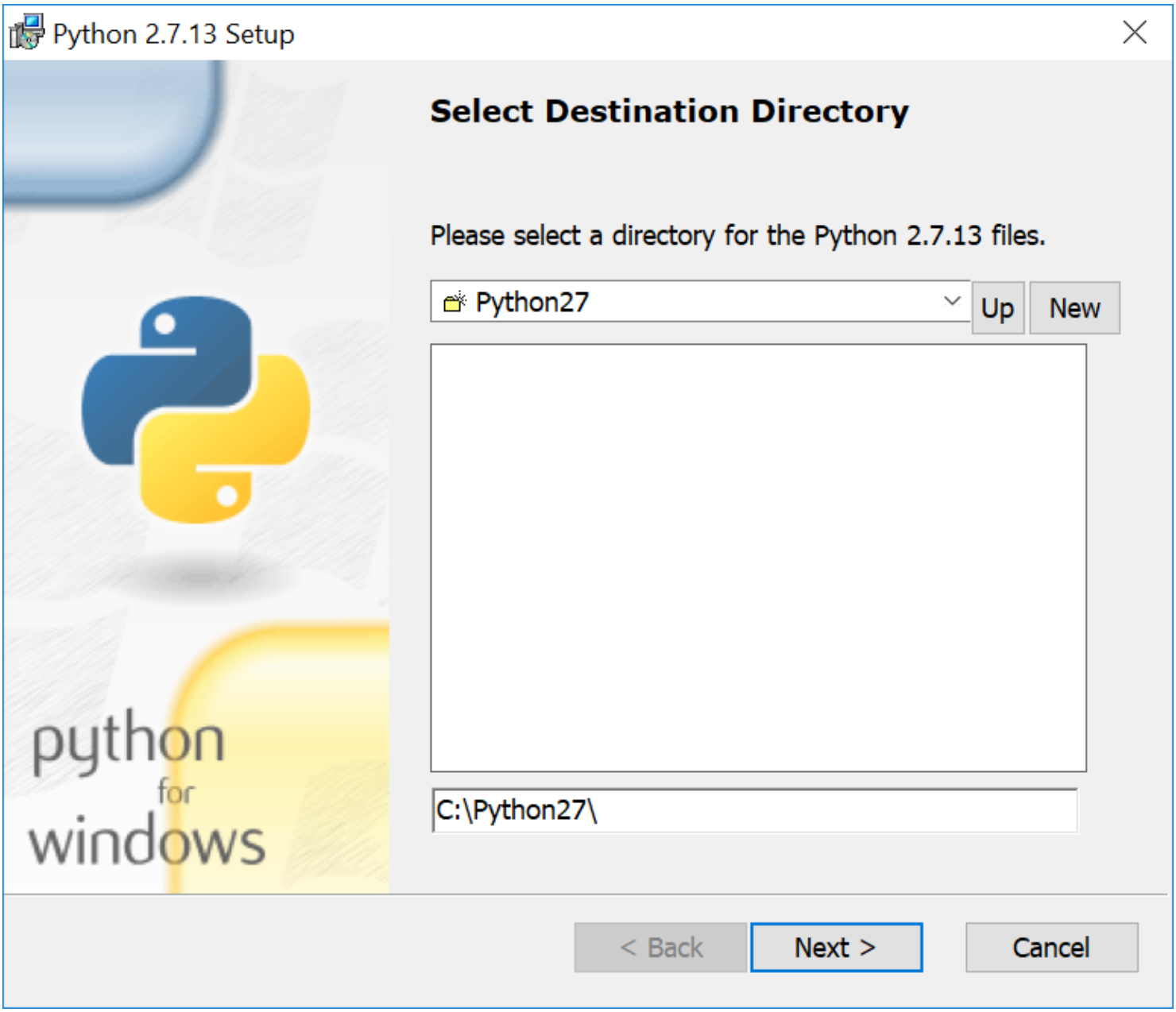
If the computer does not already have a copy of Microsoft support files needed by Vocola, the following installer may launch:



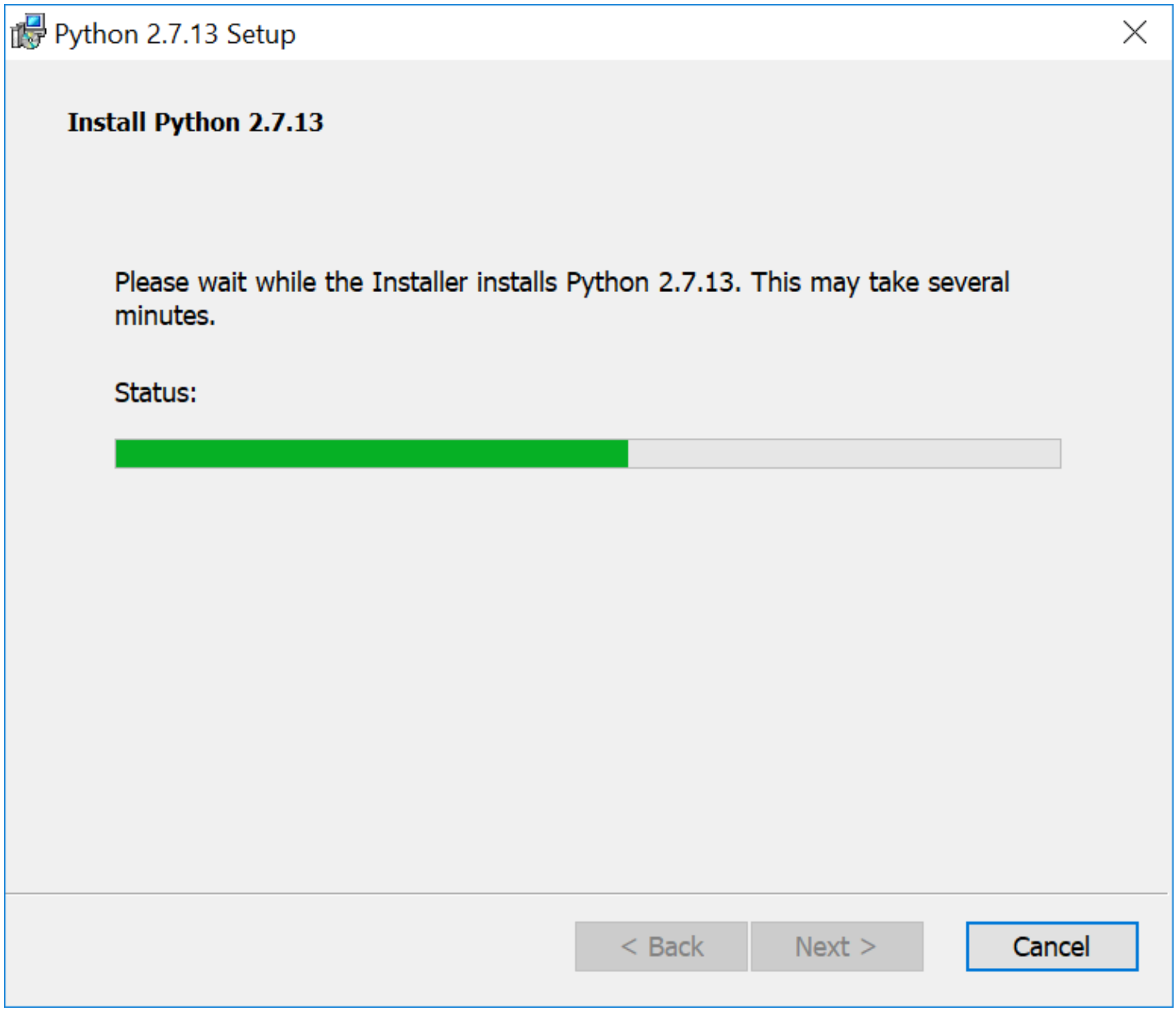
Install Python for all users:

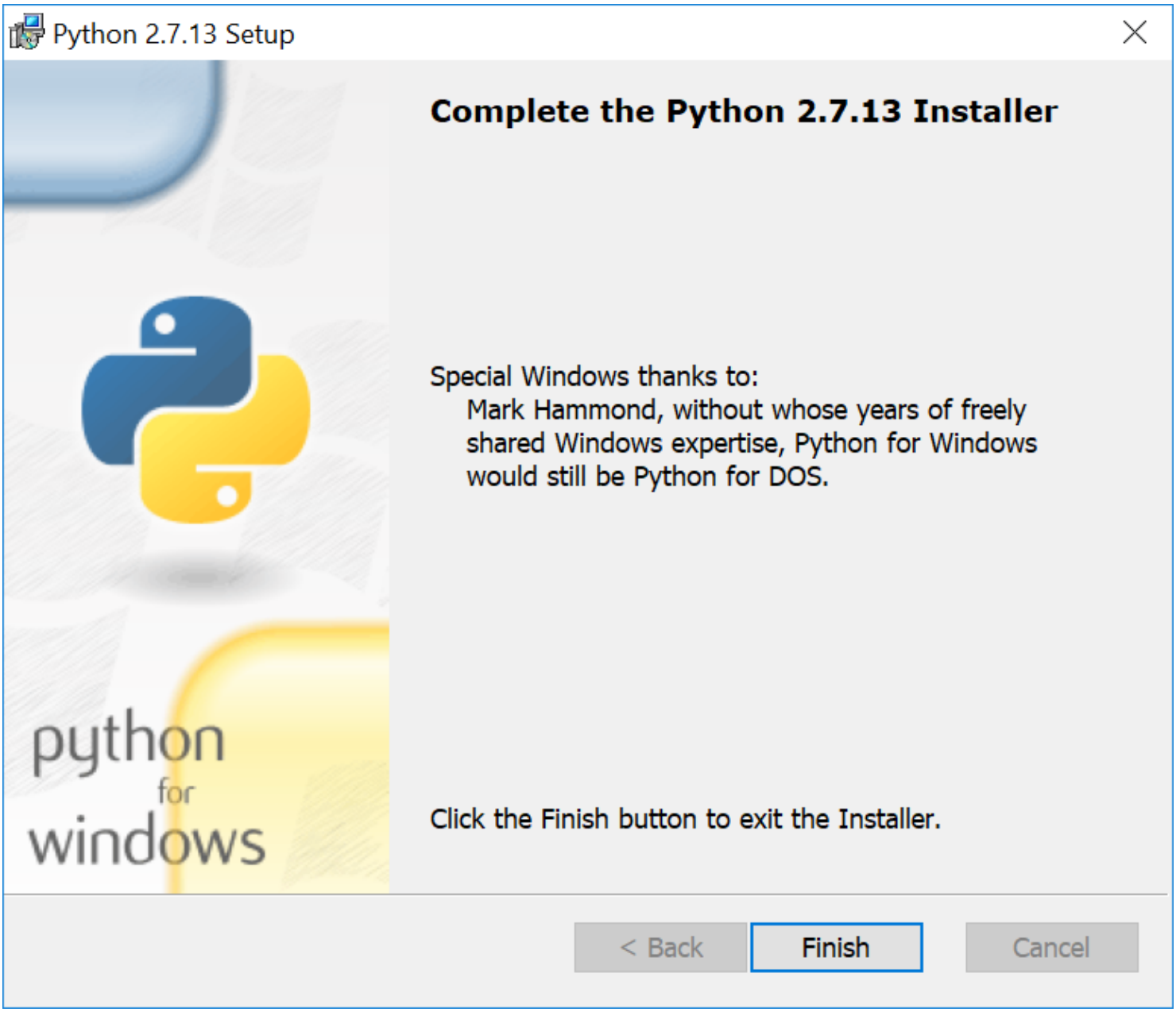


Do not change the destination directory from the default:

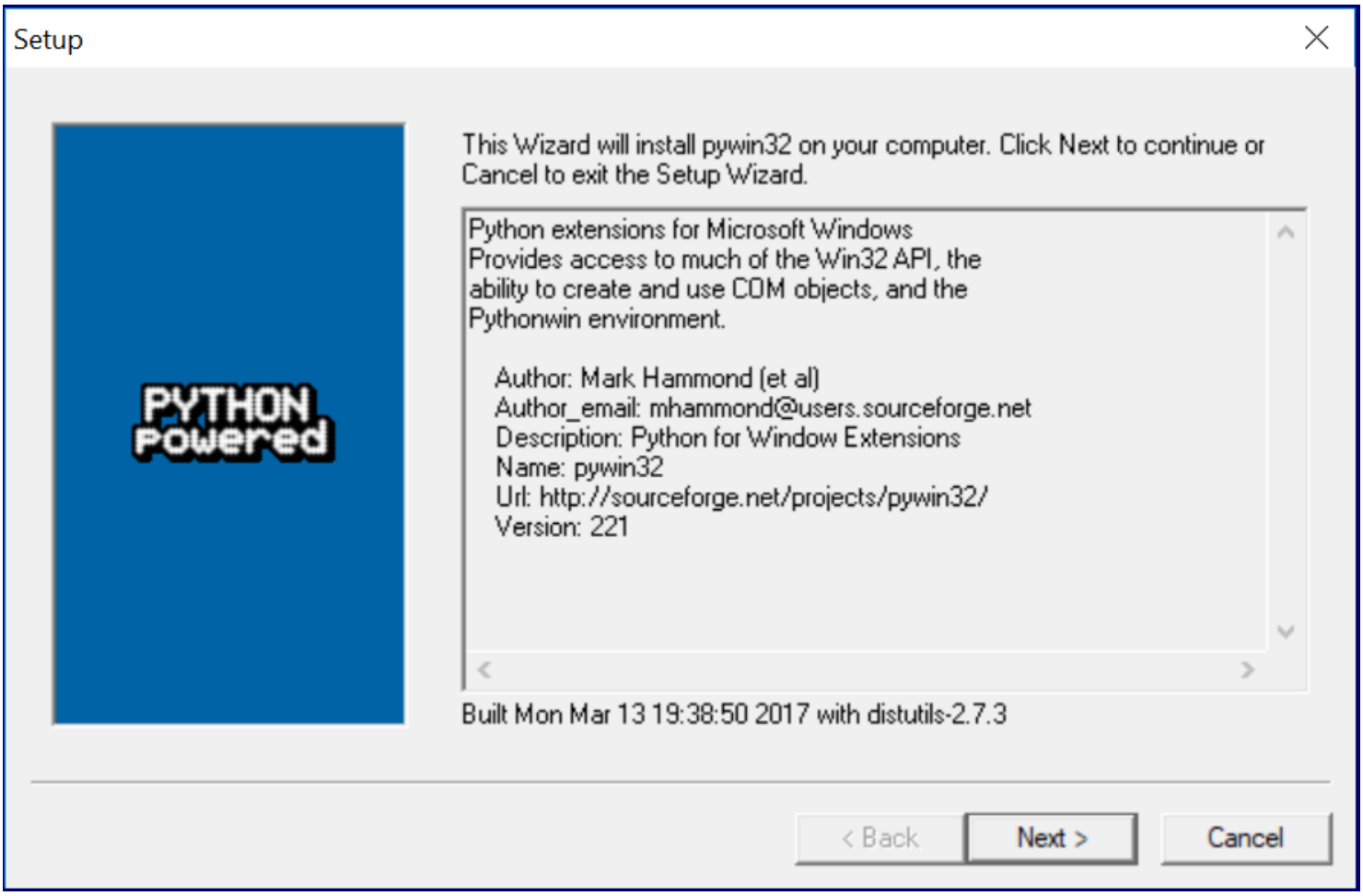

Python 2.7.13 Setup
Select Destination Directory
Please select a directory for the Python 2.7.13 files.
Python27
Up
New
C:\Python27\
python
for
windows
< Back
Next >
Cancel

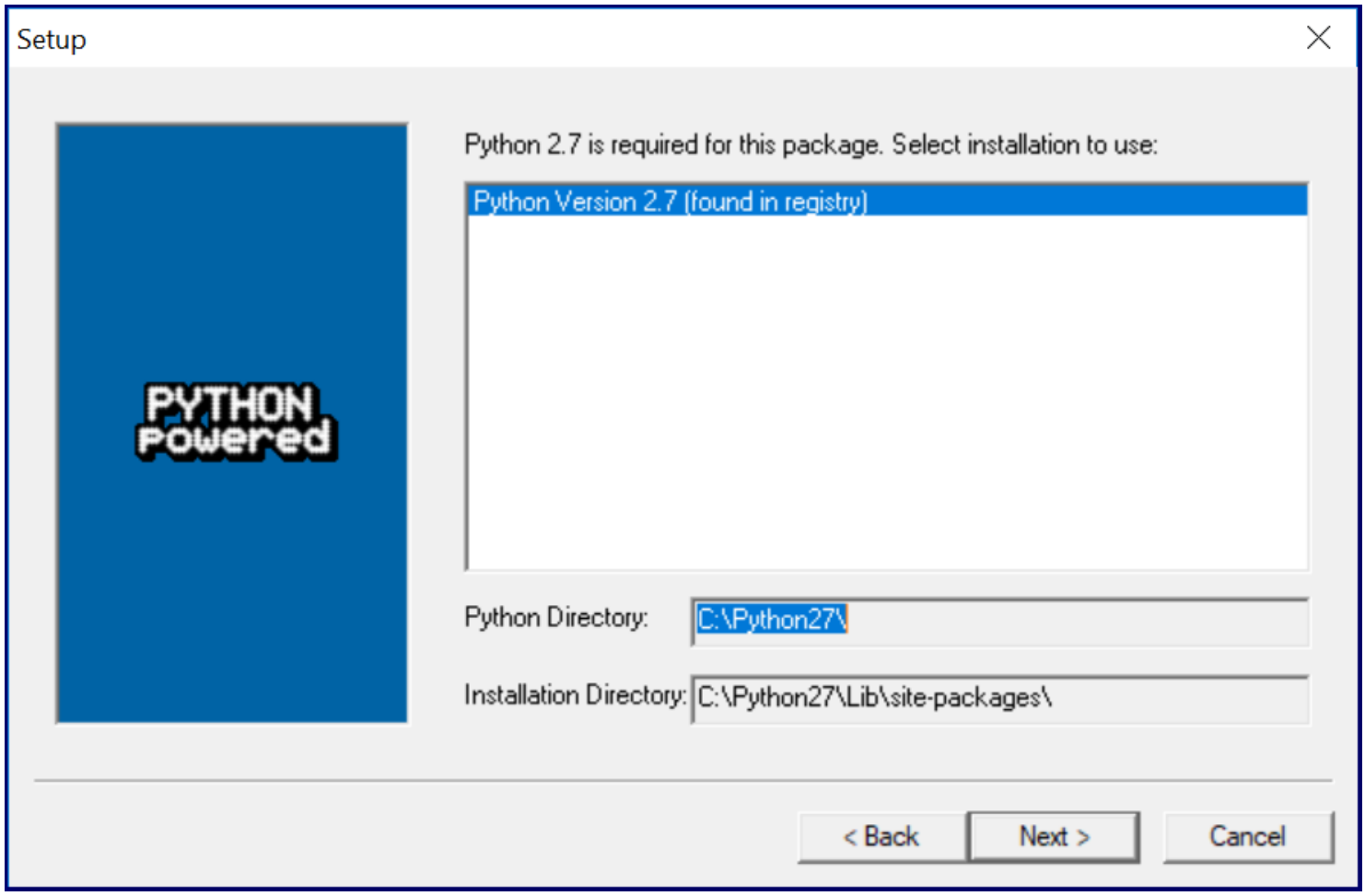

Python 2.7.13 Setup
Customize Python 2.7.13
Select the way you want features to be installed.
Click on the icons in the tree below to change the way features will be installed.
Python
Register Extensions
Tcl/Tk
Documentation
Utility Scripts
pip
Test suite
Add python.exe to Path
Python Interpreter and Libraries
This feature requires 26MB on your hard drive. It has 6 of 7 subfeatures selected. The subfeatures require 31MB on your hard drive.
python
for
windows
Disk Usage
Advanced
< Back
Next >
Cancel

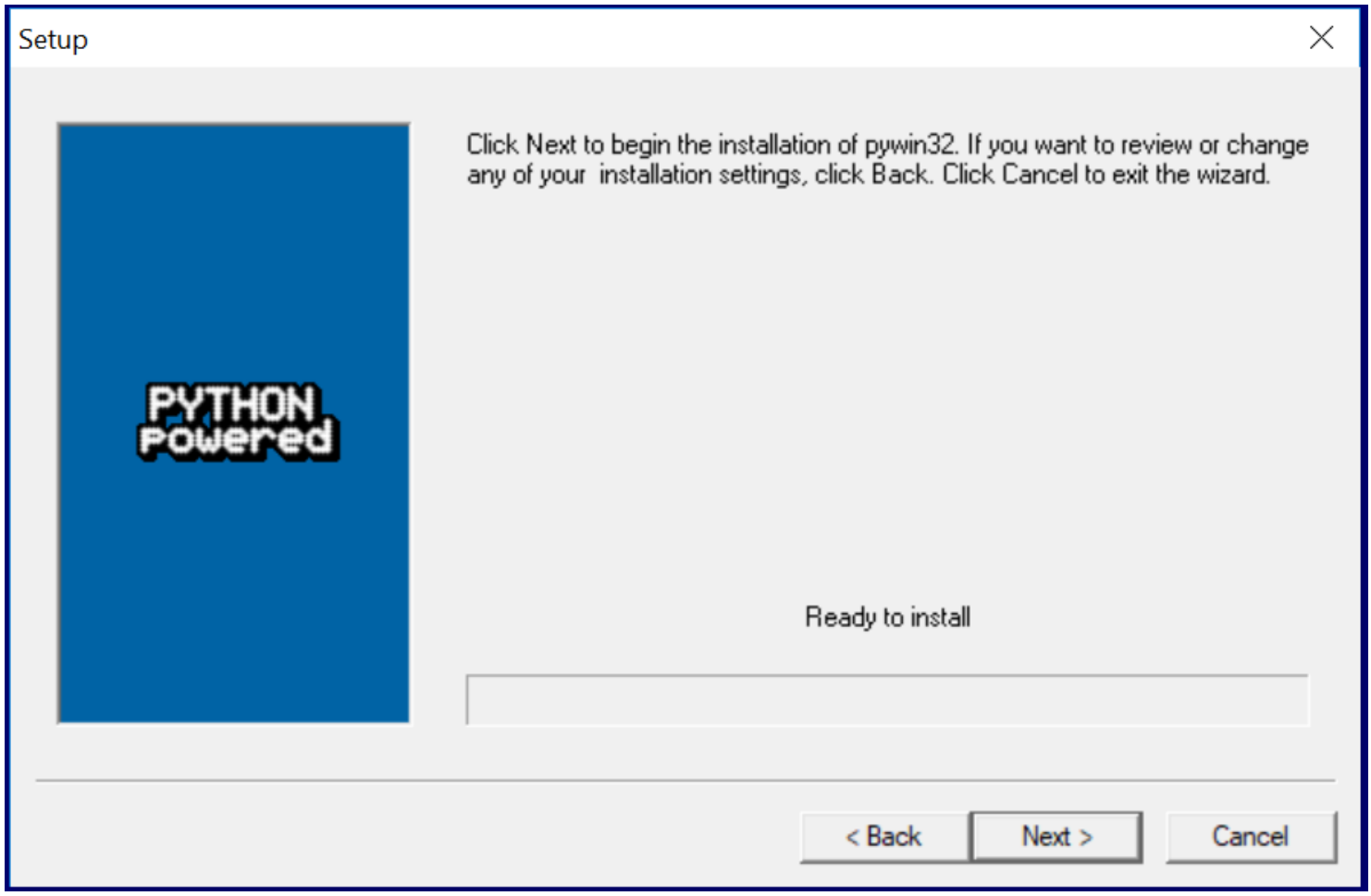

Python 2.7.13 Setup
Install Python 2.7.13
Please wait while the Installer installs Python 2.7.13. This may take several minutes.
Status:
< Back
Next >
Cancel

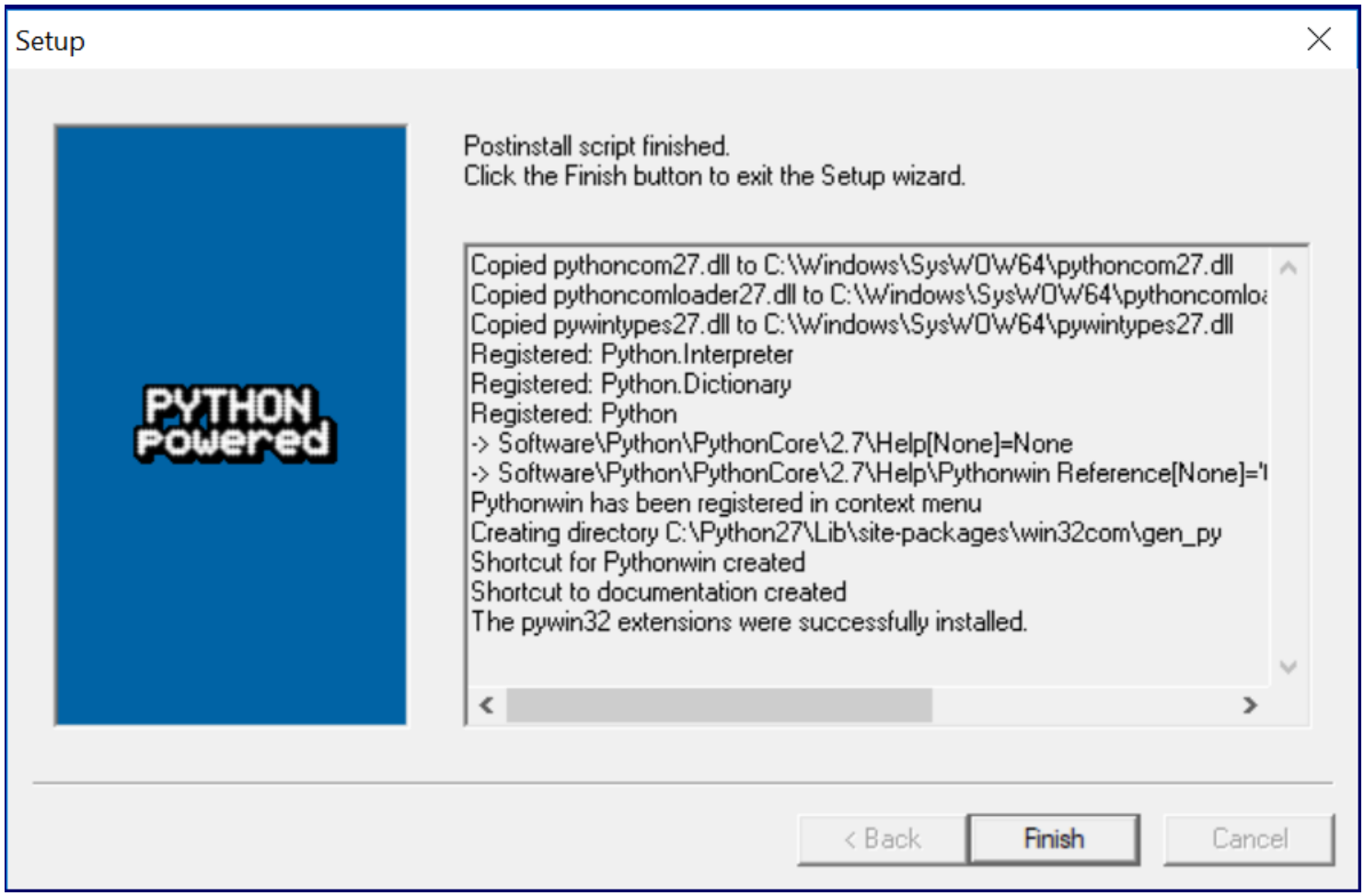


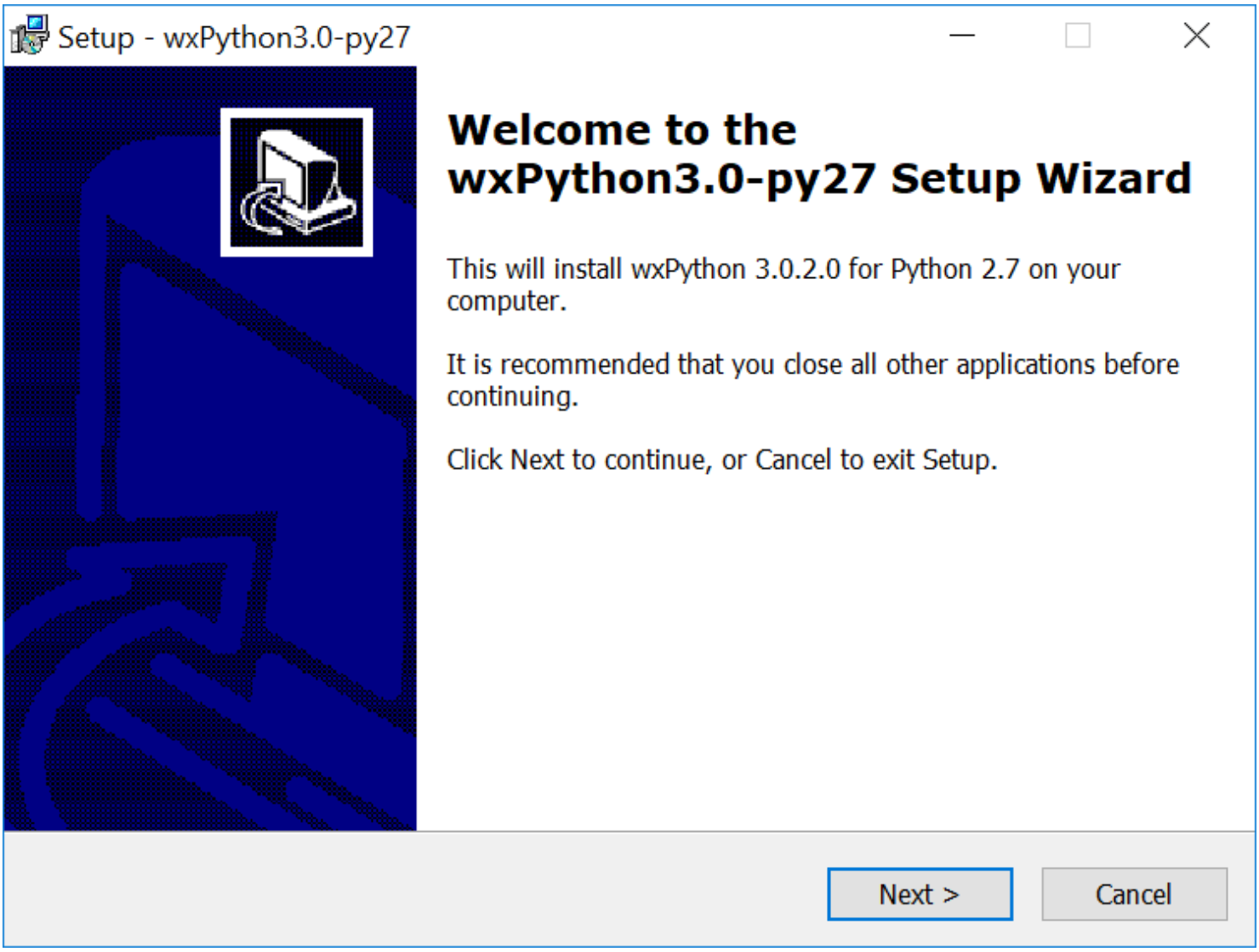
After Python is installed, two companion programs will be installed:

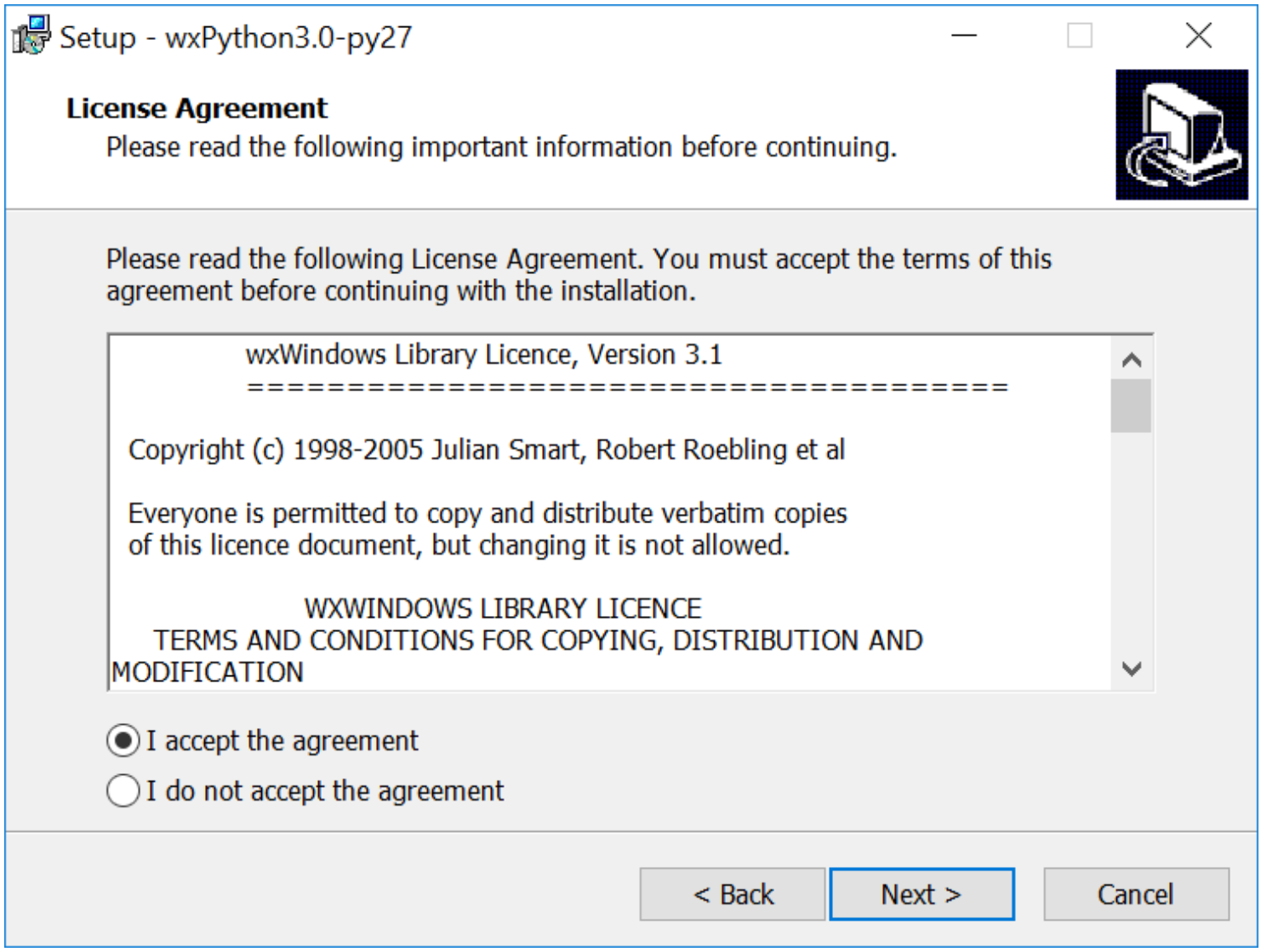

Setup
PYTHON
Powered
This Wizard will install pywin32 on your computer. Click Next to continue or Cancel to exit the Setup Wizard.
Python extensions for Microsoft Windows
Provides access to much of the Win32 API, the
ability to create and use COM objects, and the
Pythonwin environment.
Author: Mark Hammond (et al)
Author_email: mhammond@users.sourceforge.net
Description: Python for Window Extensions
Name: pywin32
Url: http://sourceforge.net/projects/pywin32/
Version: 221
Built Mon Mar 13 19:38:50 2017 with distutils-2.7.3
< Back
Next >
Cancel

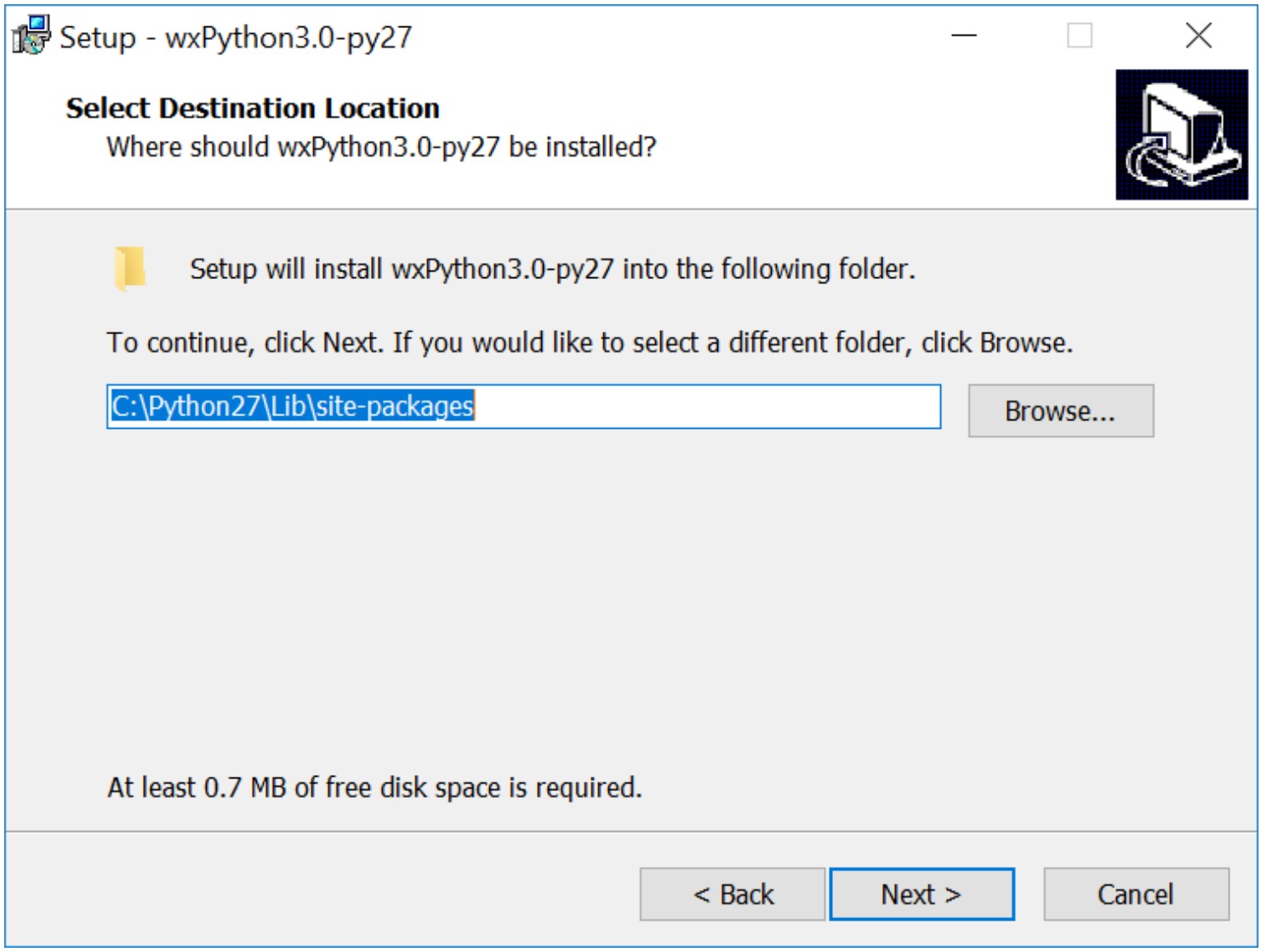

Setup
PYTHON
powered
Python 2.7 is required for this package. Select installation to use:
Python Version 2.7 (found in registry)
Python Directory:
C:\Python27\
Installation Directory:
C:\Python27\Lib\site-packages\
< Back
Next >
Cancel

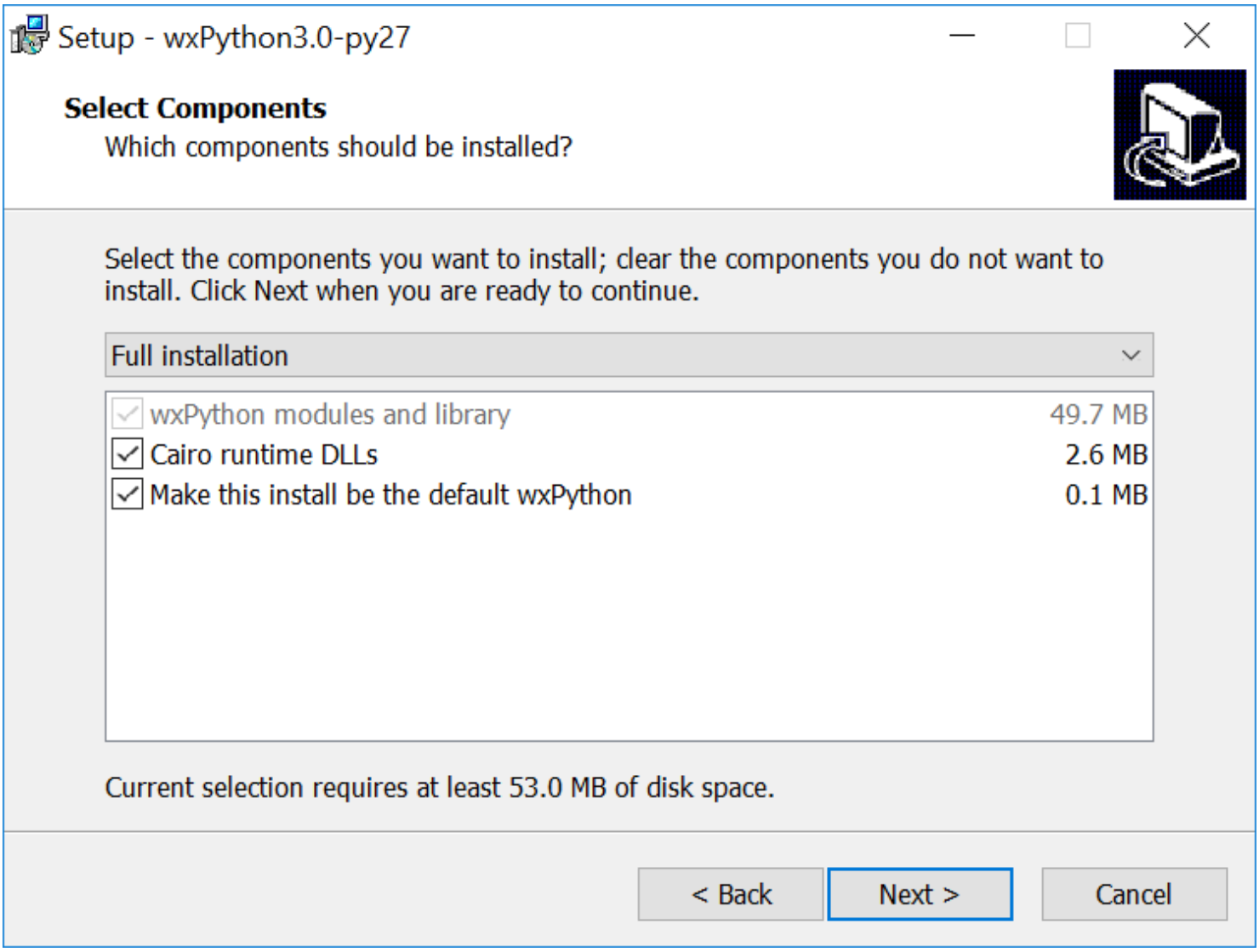

Setup
PYTHON
Powered
Click Next to begin the installation of pywin32. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
Ready to install
< Back
Next >
Cancel


Setup
PYTHON
Powered
Postinstall script finished.
Click the Finish button to exit the Setup wizard.
Copied pythoncom27.dll to C:\Windows\SysWOW64\pythoncom27.dll
Copied pythoncomloader27.dll to C:\Windows\SysWOW64\pythoncomlo
Copied pywintypes27.dll to C:\Windows\SysWOW64\pywintypes27.dll
Registered: Python.Interpreter
Registered: Python.Dictionary
Registered: Python
-> Software\Python\PythonCore\2.7\Help[None]=None
-> Software\Python\PythonCore\2.7\Help\Pythonwin Reference[None]='
Pythonwin has been registered in context menu
Creating directory C:\Python27\Lib\site-packages\win32com\gen_py
Shortcut for Pythonwin created
Shortcut to documentation created
The pywin32 extensions were successfully installed.
< Back
Finish
Cancel

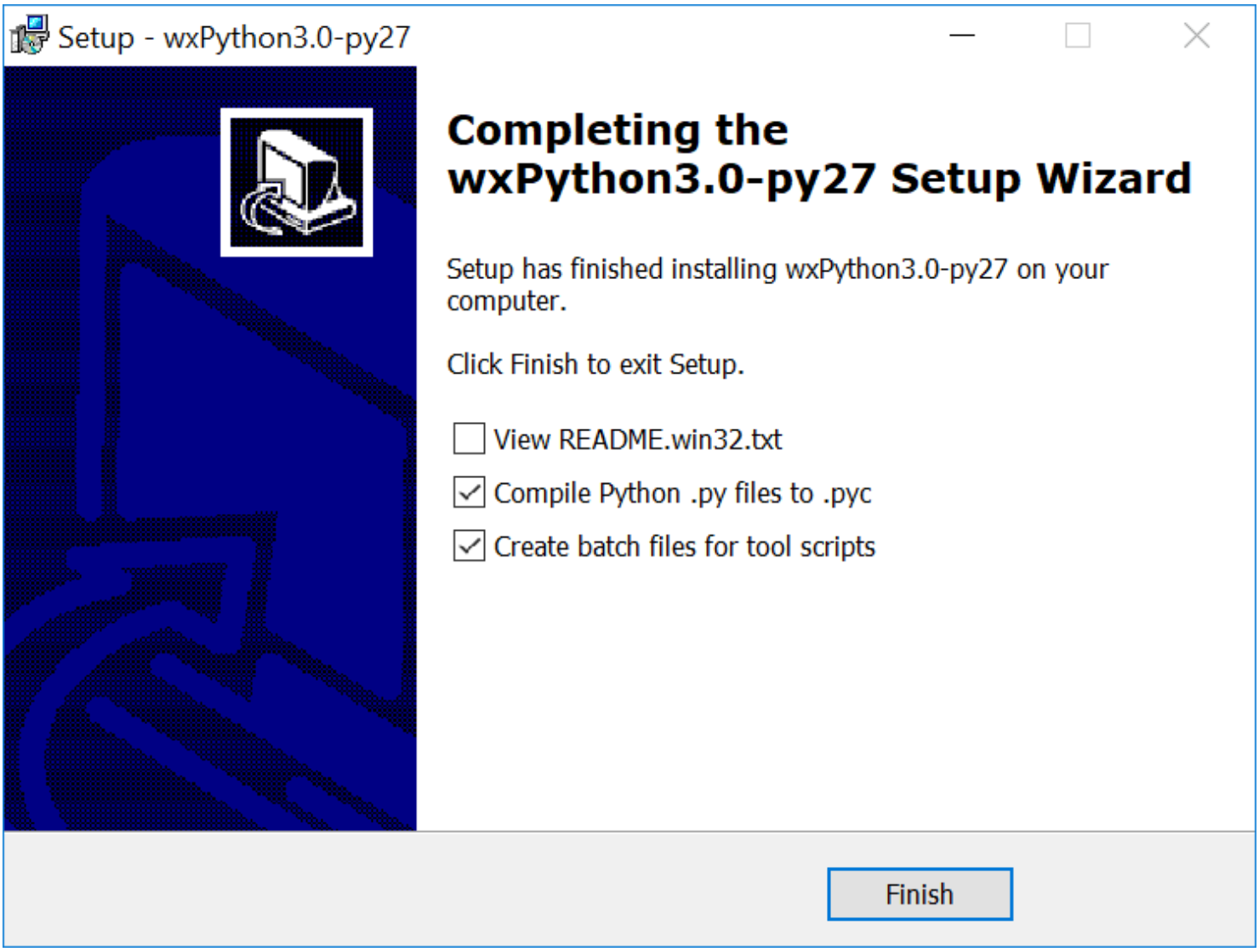

Setup - wxPython3.0-py27
Welcome to the wxPython3.0-py27 Setup Wizard
This will install wxPython 3.0.2.0 for Python 2.7 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel


Setup - wxPython3.0-py27
License Agreement
Please read the following important information before continuing.
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.
wxWindows Library Licence, Version 3.1
Copyright (c) 1998-2005 Julian Smart, Robert Roebling et al
Everyone is permitted to copy and distribute verbatim copies
of this licence document, but changing it is not allowed.
WXWINDOWS LIBRARY LICENCE
TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND
MODIFICATION
I accept the agreement
I do not accept the agreement
< Back
Next >
Cancel

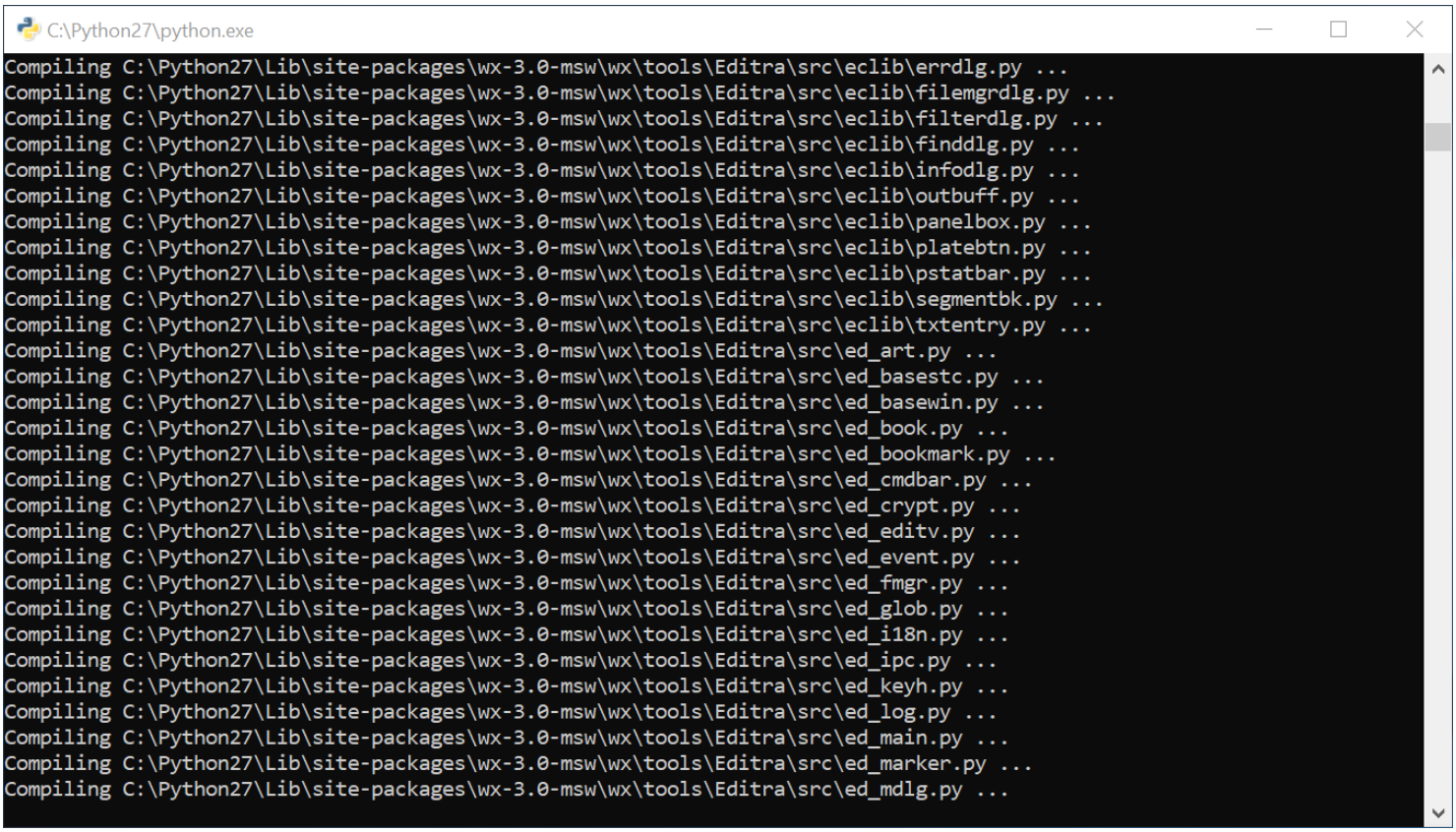

Setup - wxPython3.0-py27
Select Destination Location
Where should wxPython3.0-py27 be installed?
Setup will install wxPython3.0-py27 into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Python27\Lib\site-packages
Browse...
At least 0.7 MB of free disk space is required.
< Back
Next >
Cancel



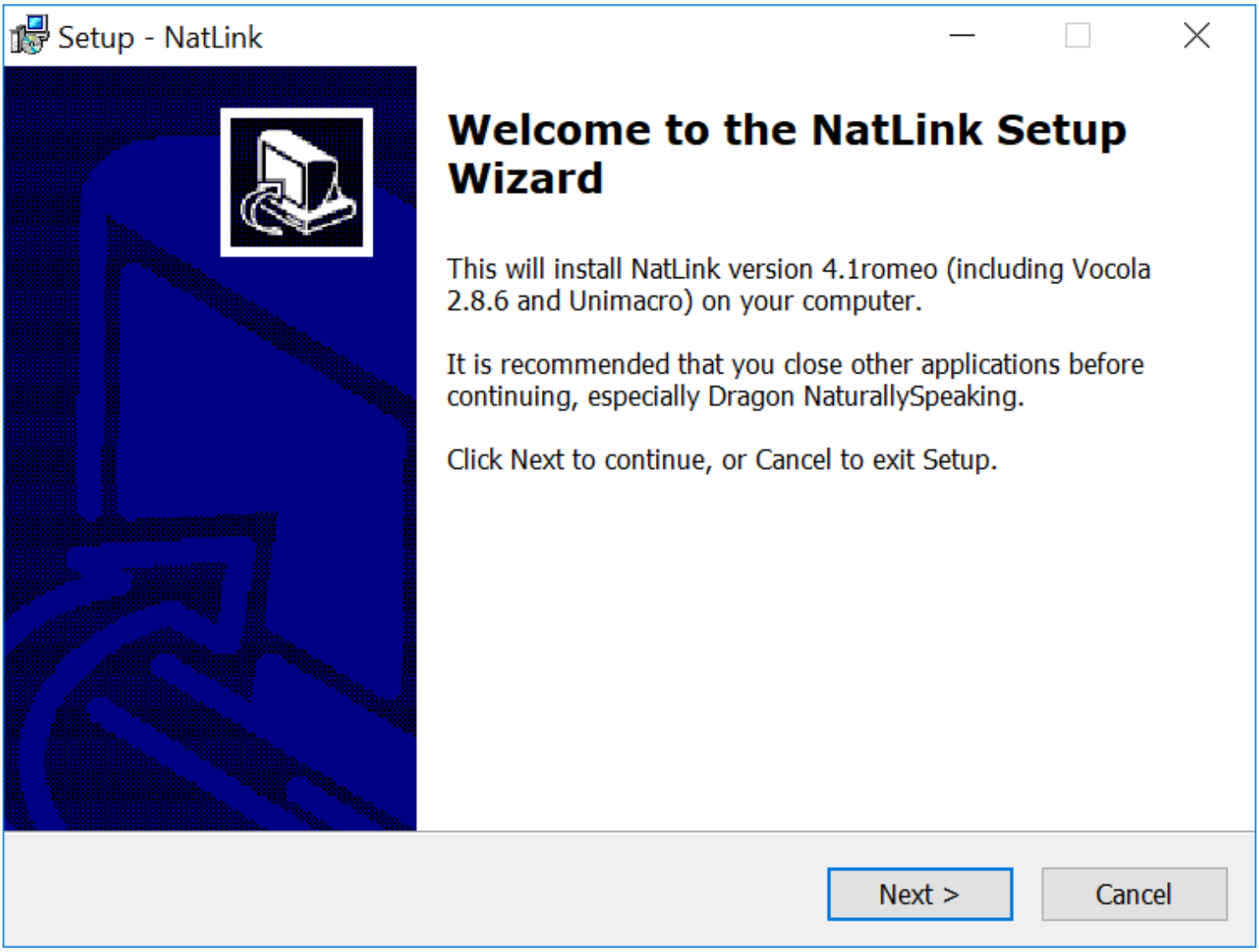
The "View README.win32.txt check box can be turned off, or just close the readme file when it opens:

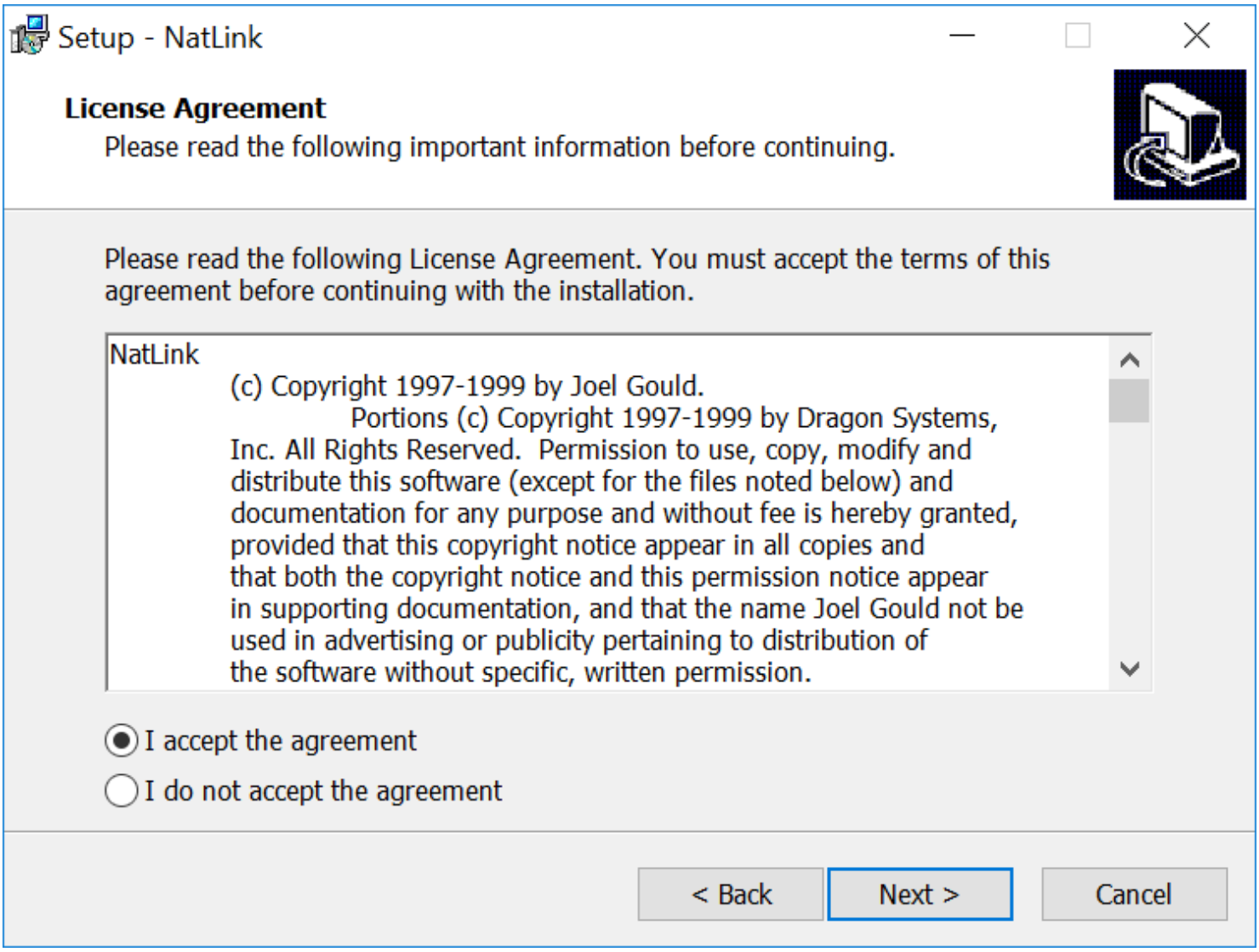


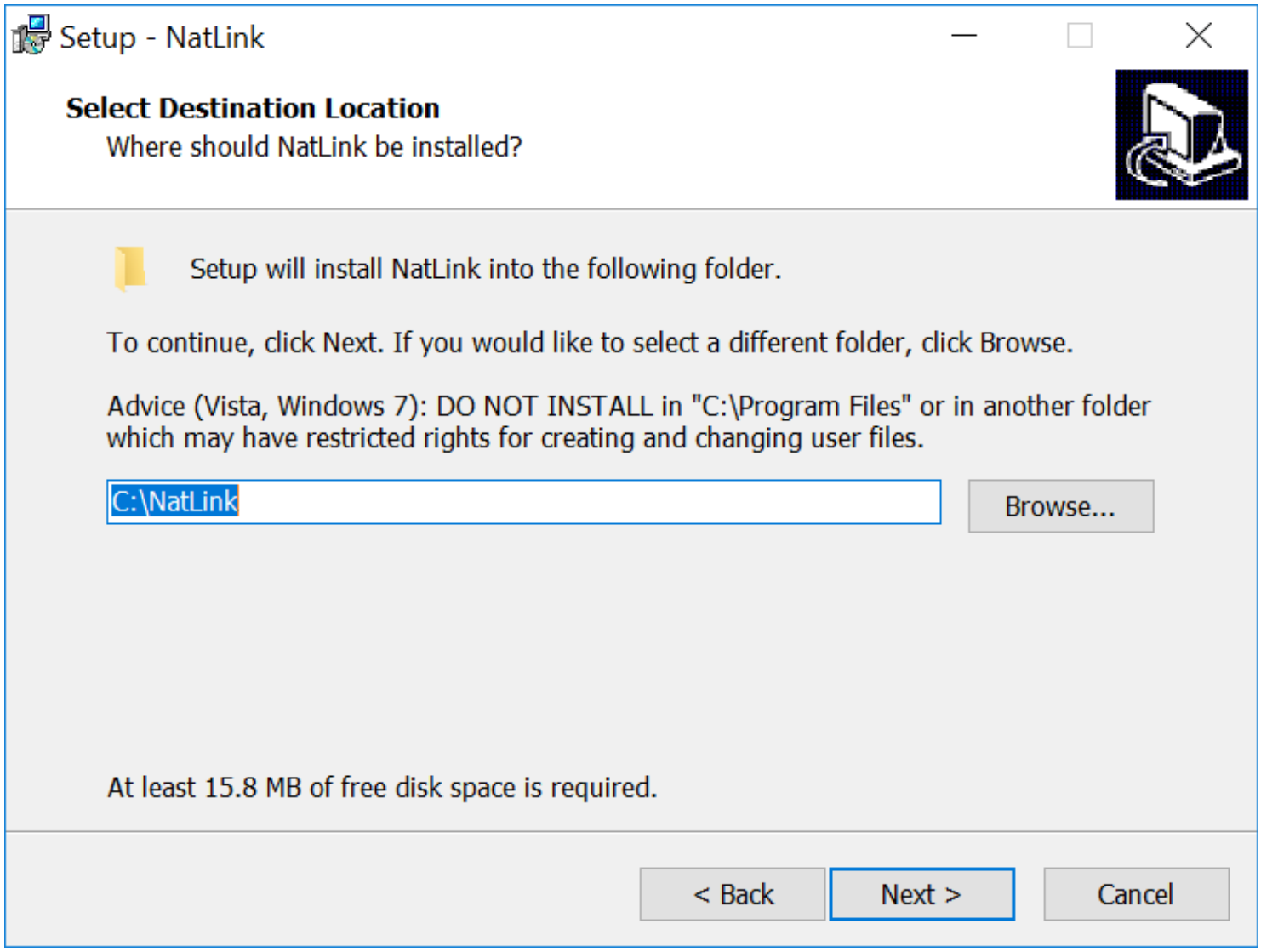
This window will show for a few minutes:

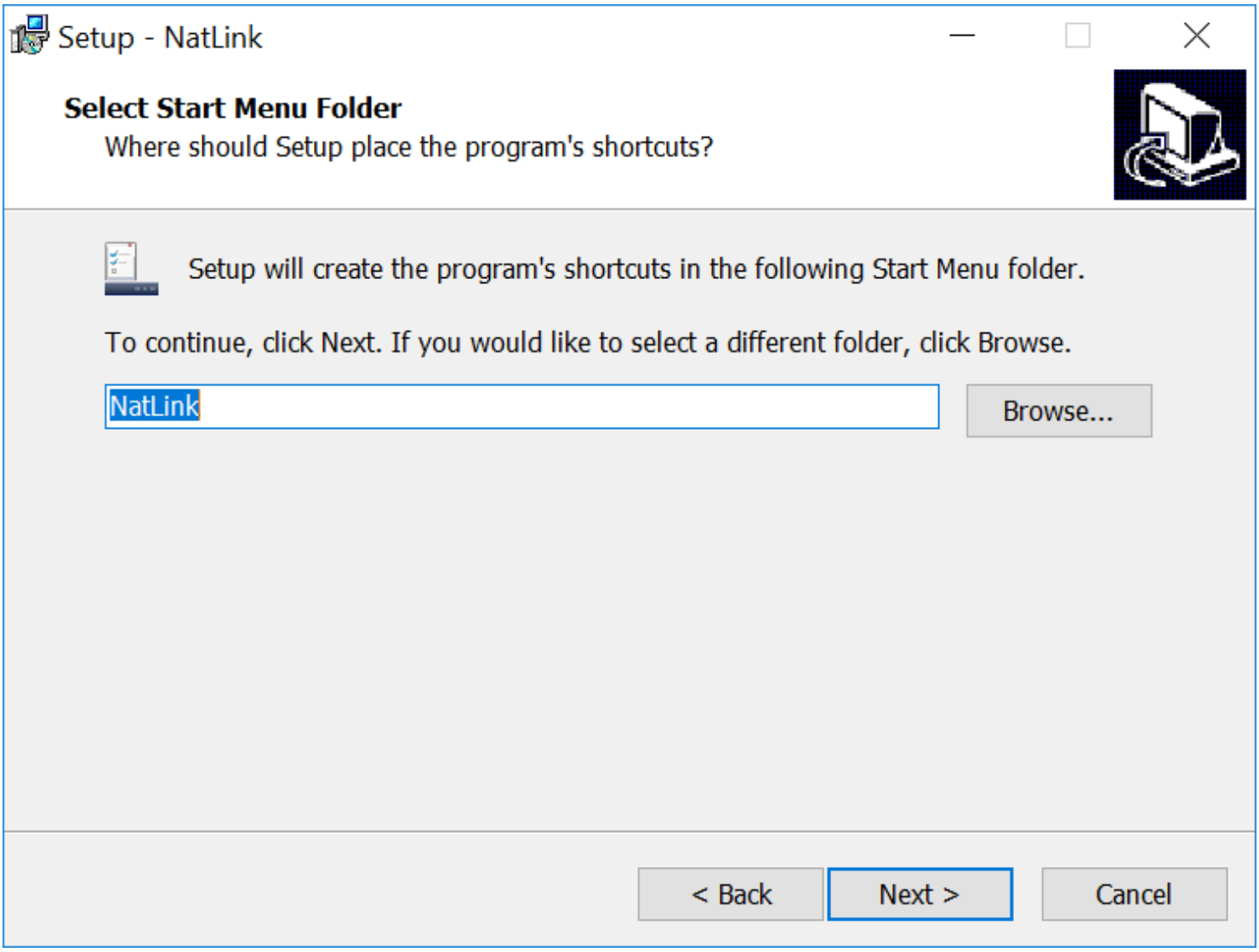


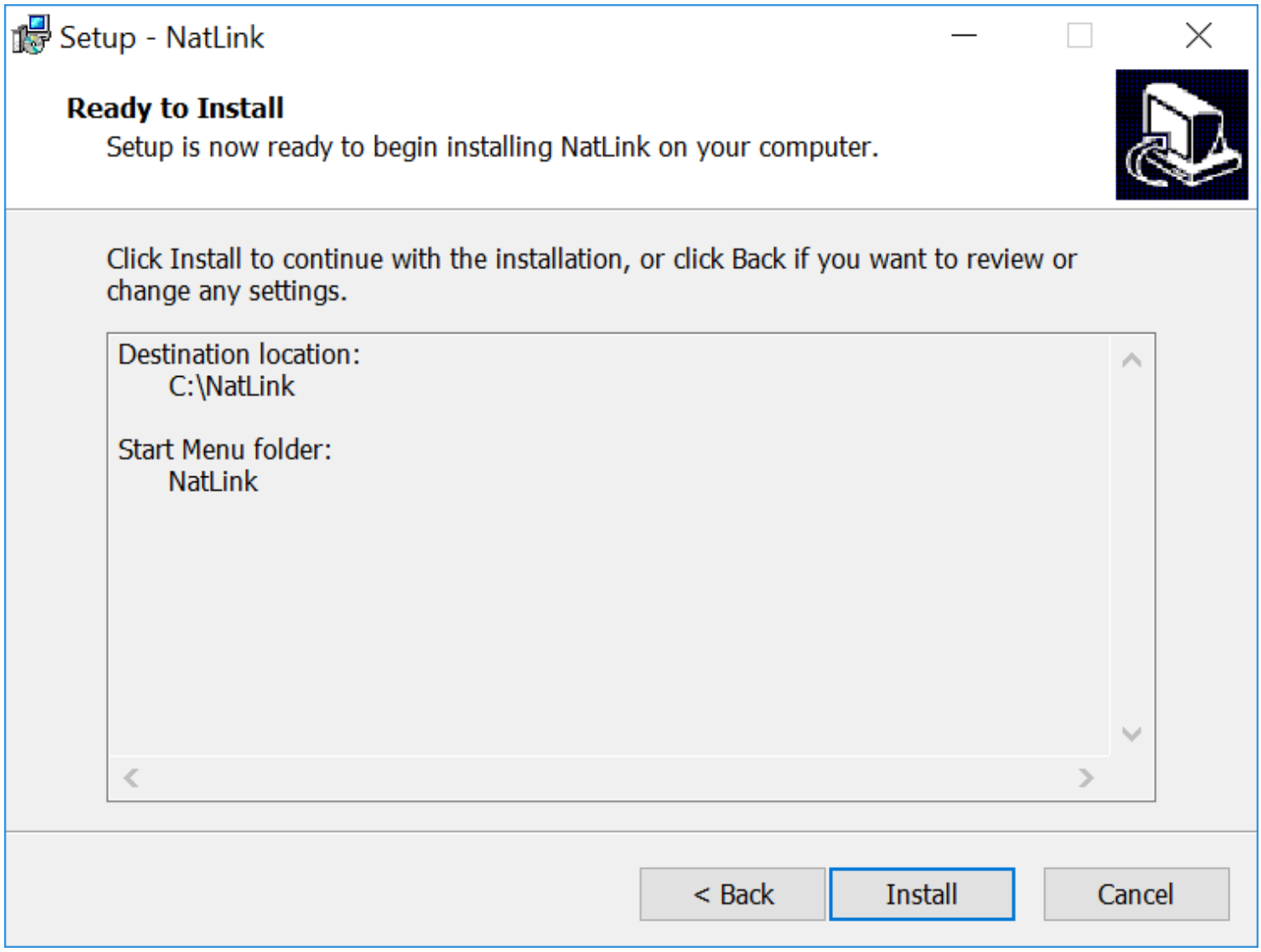
Once the prerequisite Python programs are installed, Natlink and Vocola will install:

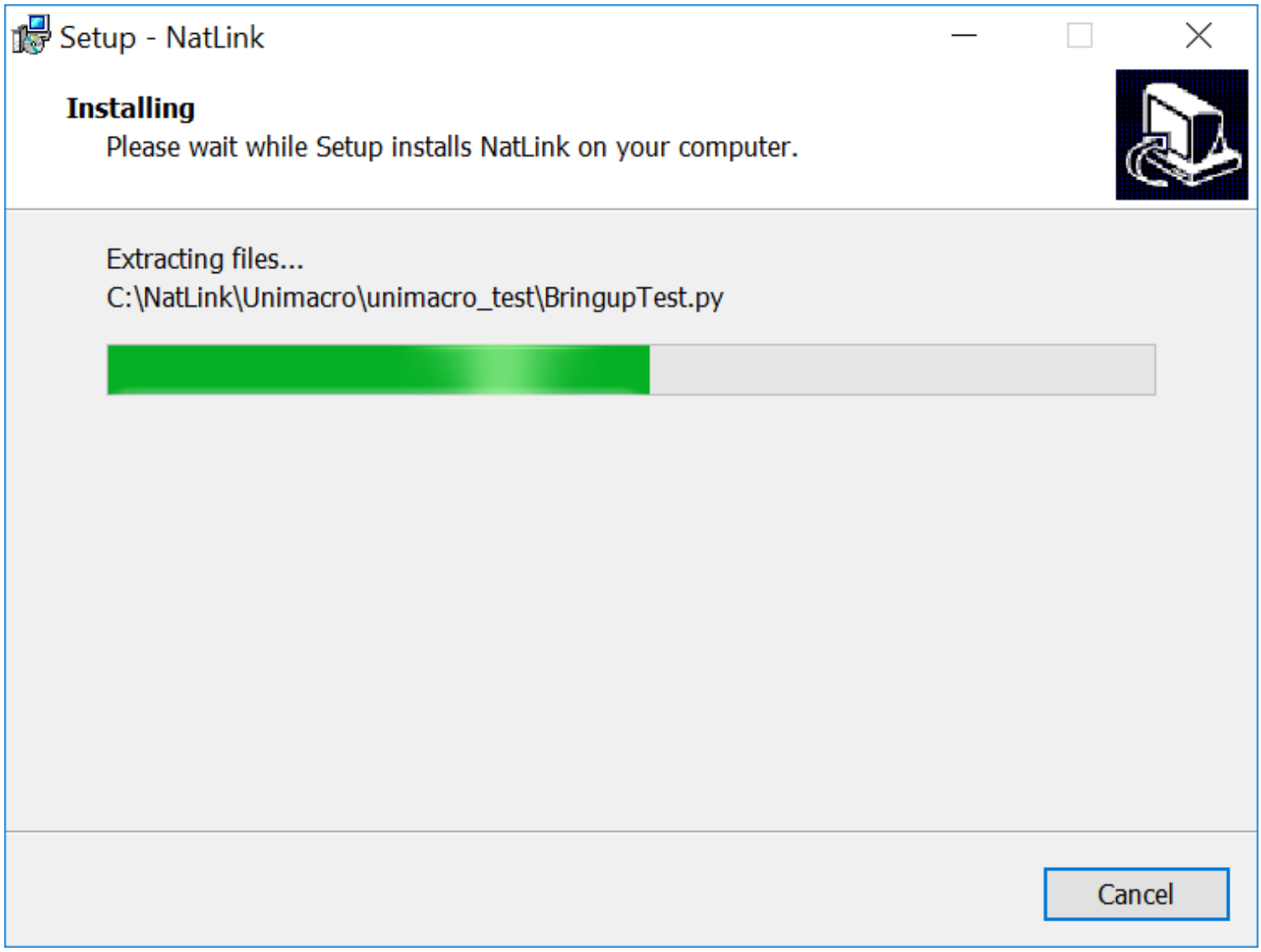

Setup - NatLink
Welcome to the NatLink Setup Wizard
This will install NatLink version 4.1romeo (including Vocola 2.8.6 and Unimacro) on your computer.
It is recommended that you close other applications before continuing, especially Dragon NaturallySpeaking.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

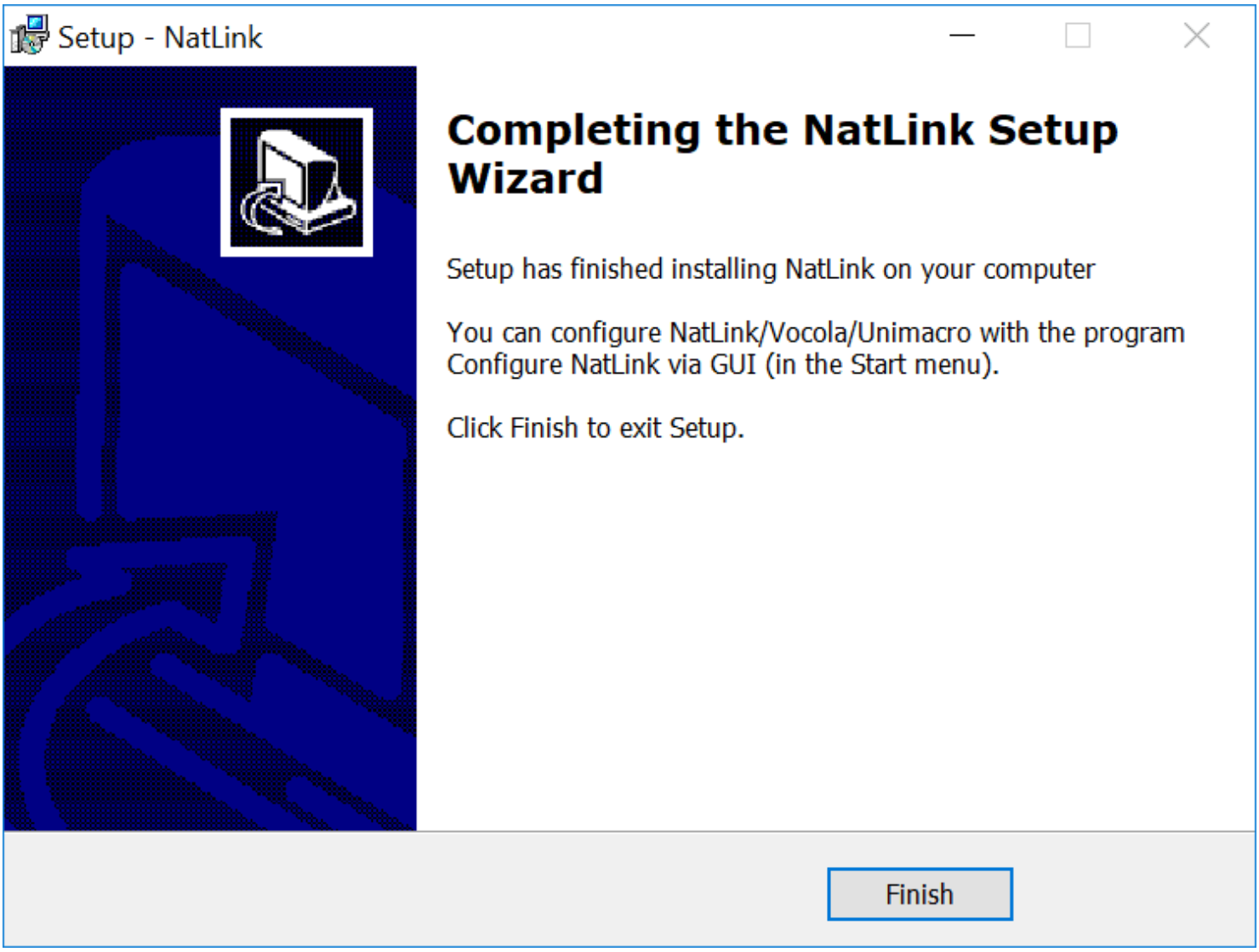

Setup - NatLink
License Agreement
Please read the following important information before continuing.
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.
NatLink
(c) Copyright 1997-1999 by Joel Gould.
Portions (c) Copyright 1997-1999 by Dragon Systems, Inc. All Rights Reserved. Permission to use, copy, modify and distribute this software (except for the files noted below) and documentation for any purpose and without fee is hereby granted, provided that this copyright notice appear in all copies and that both the copyright notice and this permission notice appear in supporting documentation, and that the name Joel Gould not be used in advertising or publicity pertaining to distribution of the software without specific, written permission.
I accept the agreement
I do not accept the agreement
< Back
Next >
Cancel


Setup - NatLink
Select Destination Location
Where should NatLink be installed?
Setup will install NatLink into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
Advice (Vista, Windows 7): DO NOT INSTALL in "C:\Program Files" or in another folder which may have restricted rights for creating and changing user files.
C:\NatLink
Browse...
At least 15.8 MB of free disk space is required.
< Back
Next >
Cancel

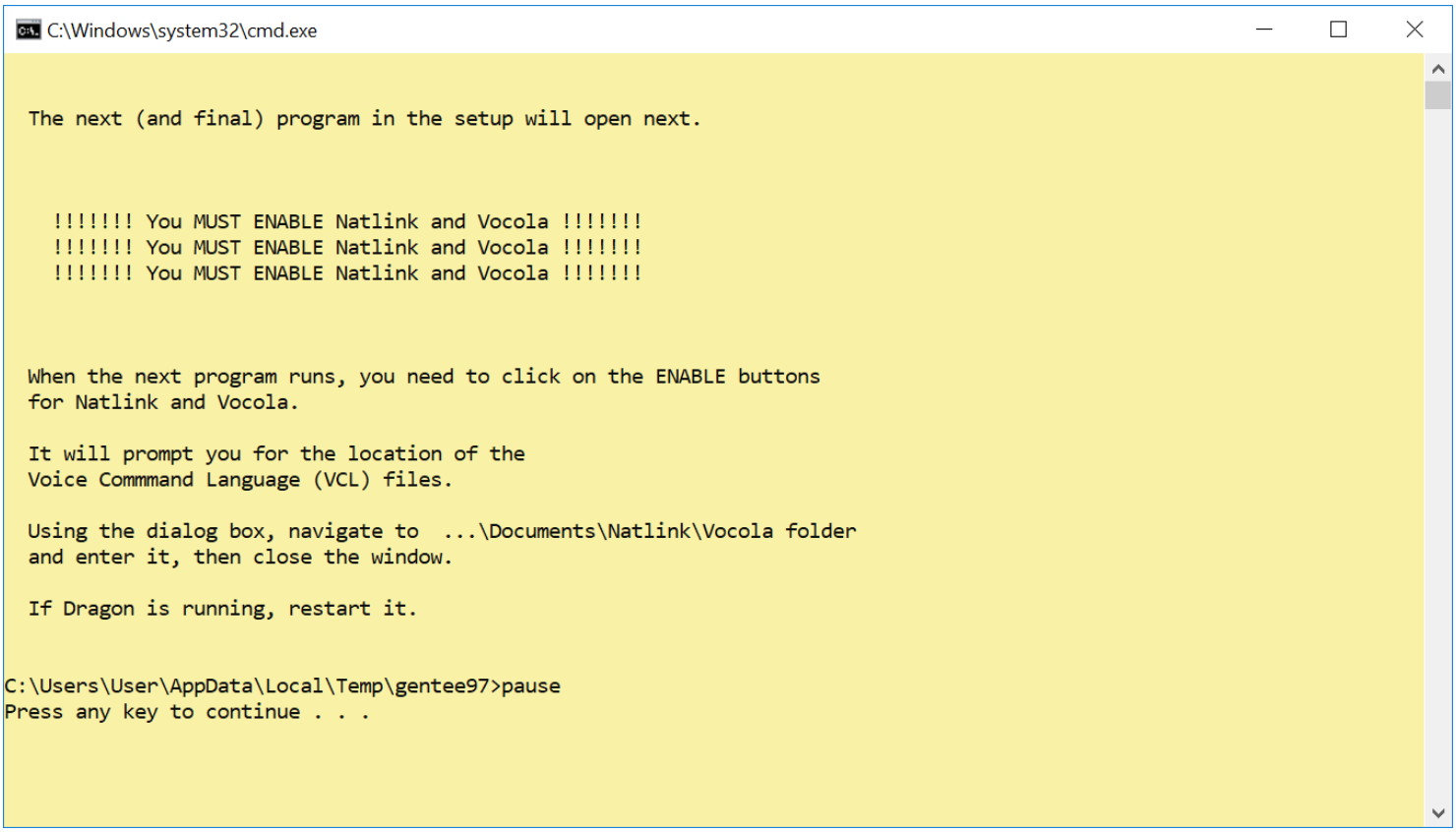

Setup - NatLink
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
NatLink
Browse...
< Back
Next >
Cancel


Setup - NatLink
Ready to Install
Setup is now ready to begin installing NatLink on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\NatLink
Start Menu folder:
NatLink
< Back
Install
Cancel

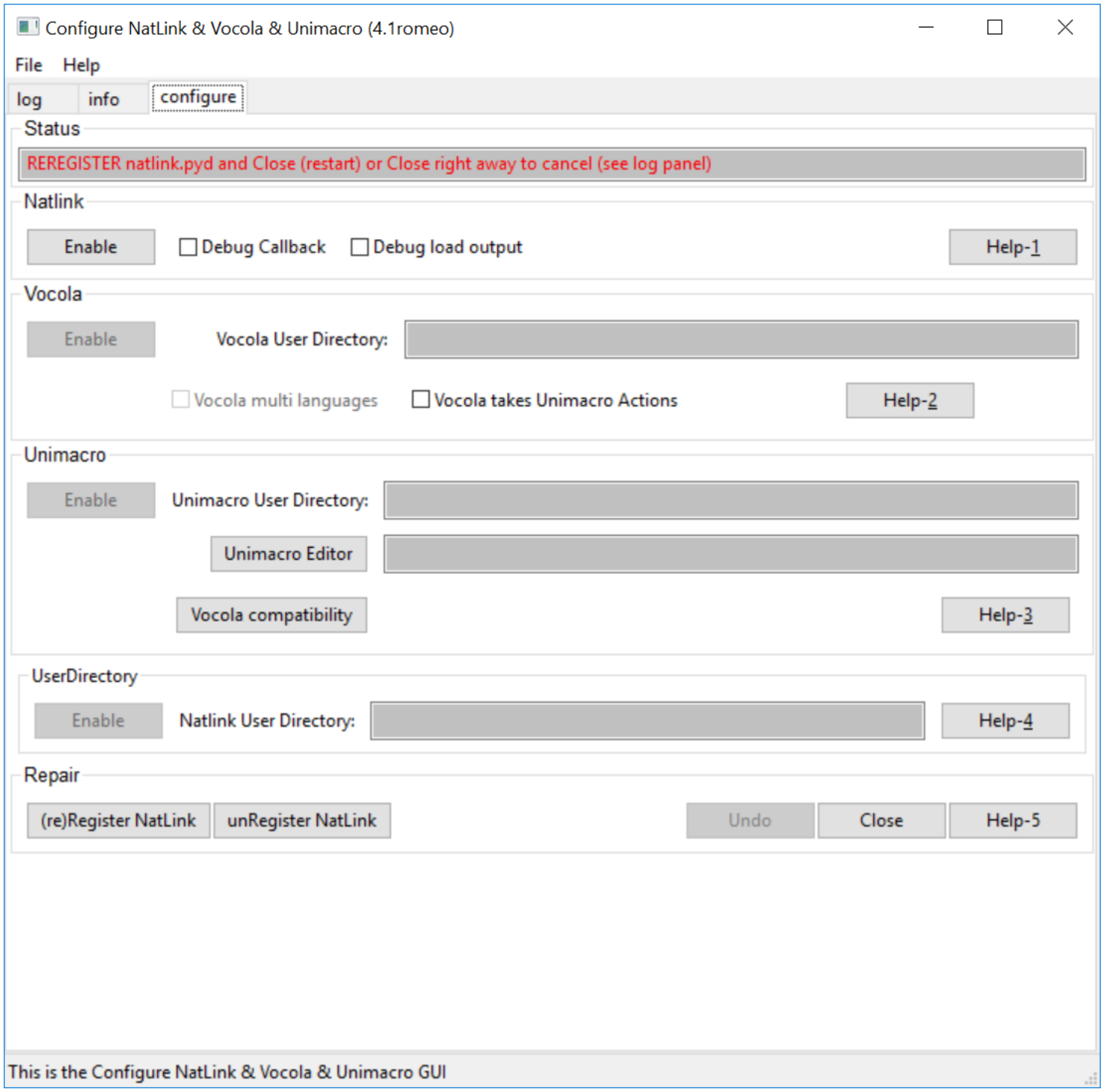

Setup - NatLink
Installing
Please wait while Setup installs NatLink on your computer.
Extracting files...
C:\NatLink\Unimacro\unimacro_test\BringupTest.py
Cancel



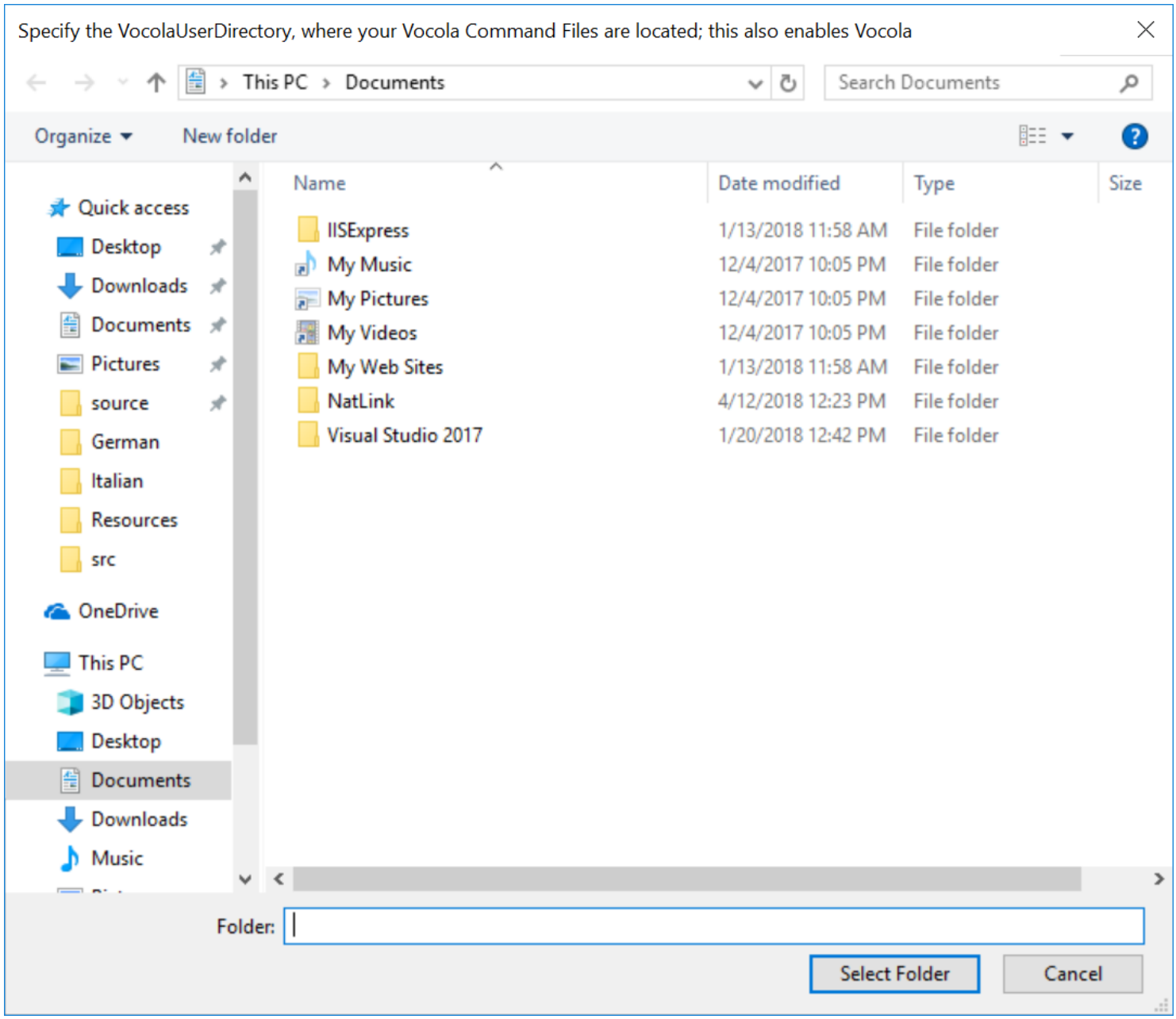
When this program opens, press any key to continue:

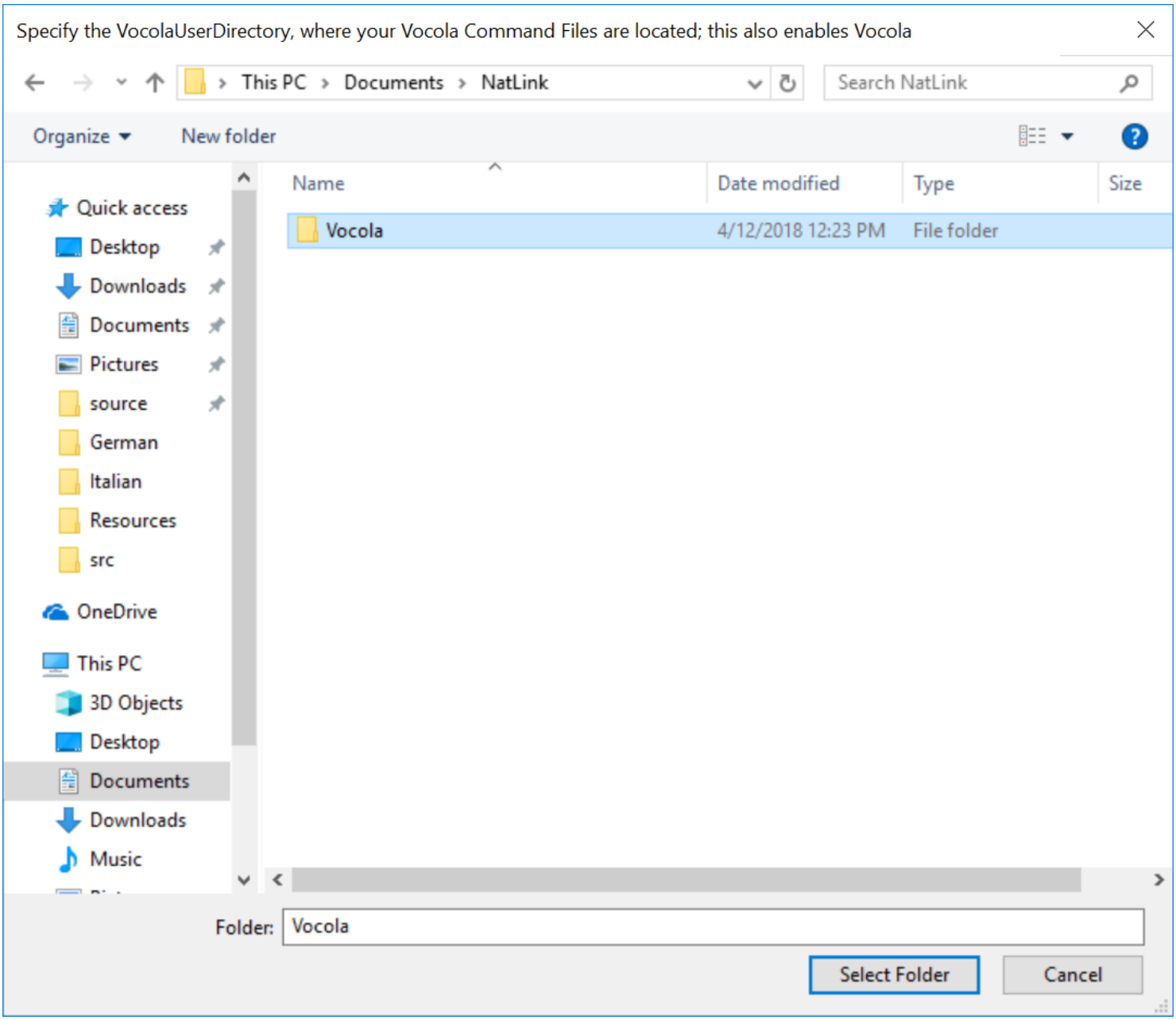


This is where 99% of users that have problems with Vocola make their mistake. You ***MUST*** Enable both Natlink and Vocola before things will run. Click on Natlink Enable, then on Vocola Enable:

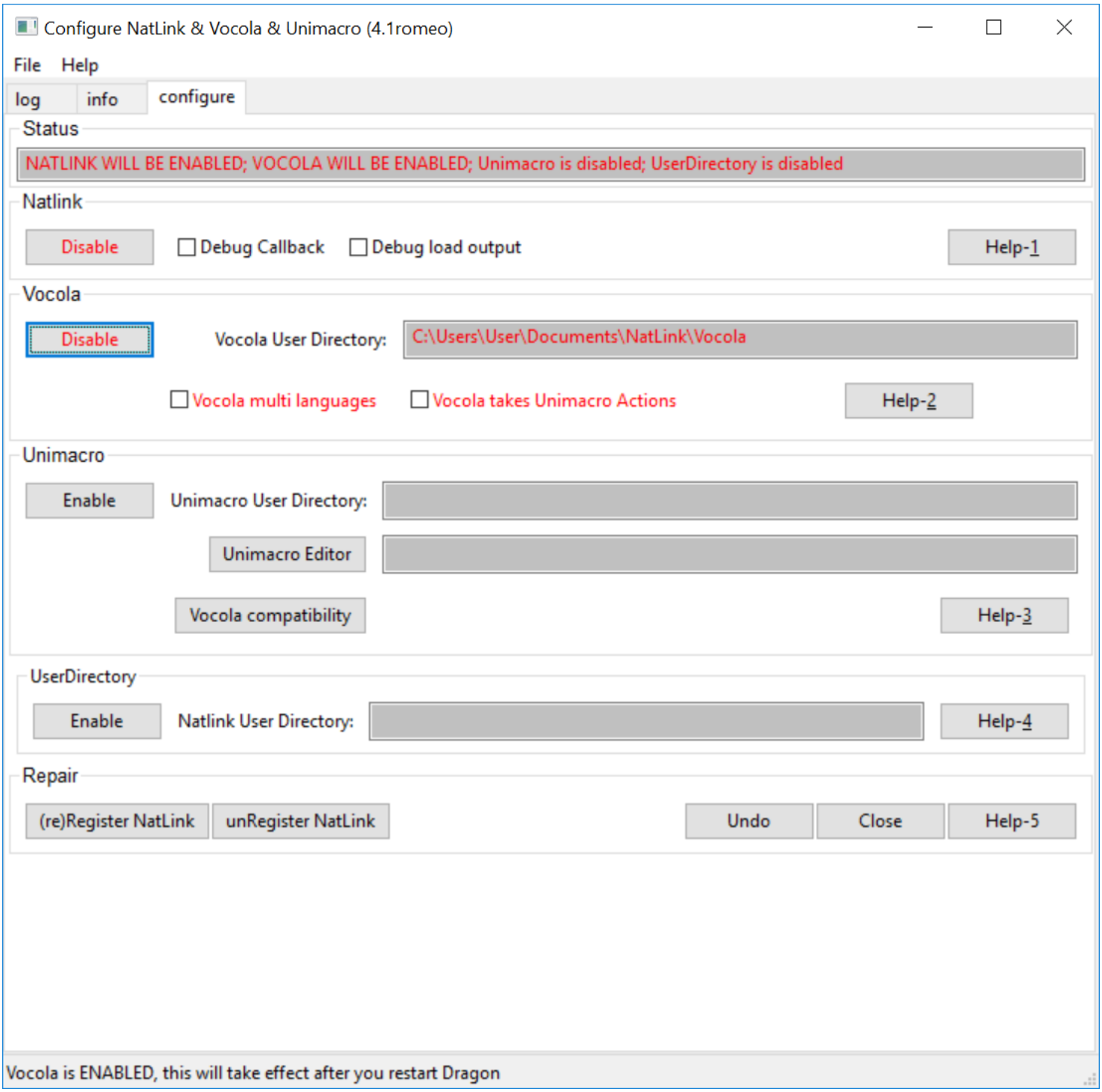


When the Vocola Enable button is pressed, the following window will open. The Vocola folder can be found in the Documents/Natlink folder:

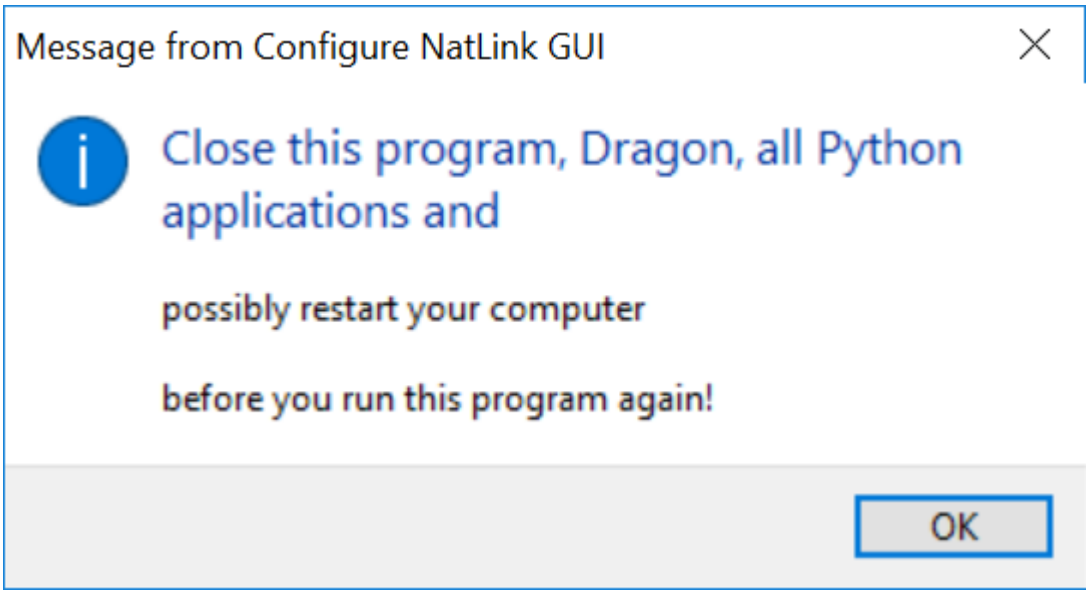

Specify the VocolaUserDirectory, where your Vocola Command Files are located; this also enables Vocola
This PC › Documents
Search Documents
Organize
New folder
Quick access
Desktop
Downloads
Documents
Pictures
source
German
Italian
Resources
src
OneDrive
This PC
3D Objects
Desktop
Documents
Downloads
Music
Name
Date modified
Type
Size
IISExpress 1/13/2018 11:58 AM File folder
My Music 12/4/2017 10:05 PM File folder
My Pictures 12/4/2017 10:05 PM File folder
My Videos 12/4/2017 10:05 PM File folder
My Web Sites 1/13/2018 11:58 AM File folder
NatLink 4/12/2018 12:23 PM File folder
Visual Studio 2017 1/20/2018 12:42 PM File folder
Folder:
Select Folder
Cancel



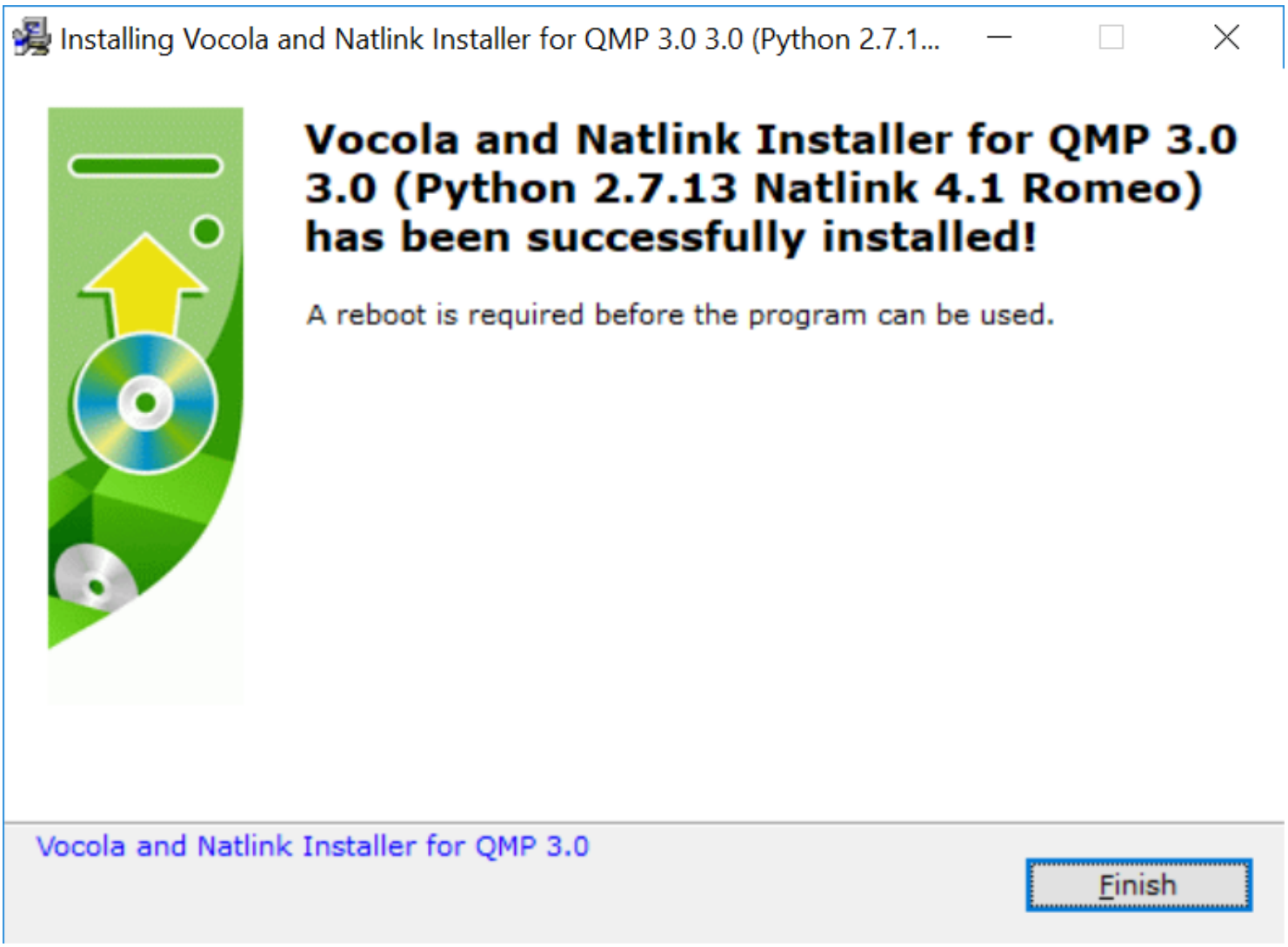
Next click on (re)Register Natlink. This will connect Natlink with Dragon Naturally Speaking.



You will see this reminder to reboot when the installer finishes:



Just in case you forgot..... Another reminder to Reboot...



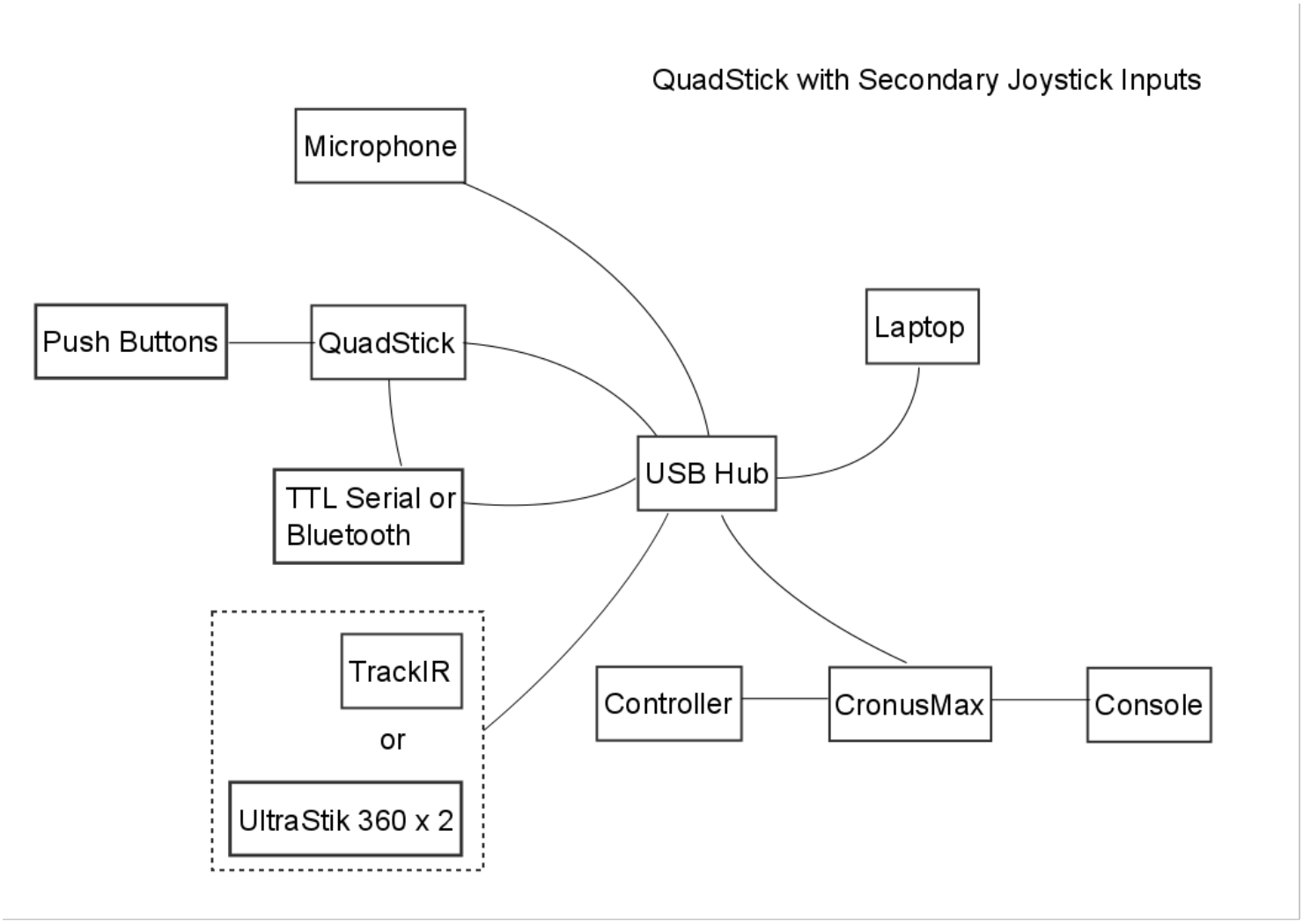
Did I mention, you need to reboot?

External Pointers Tab

Up to two UltraStik 360's can be used in combination with the QuadStick at the same time. The XY position of the UltraStiks can be used in a Game Configuration file just like the Mouth Operated Joystick position itself. This allows a user with some arm movement to map an UltraStik as one of the Analog sticks while the using the mouthpiece as the other.

The UltraStiks and the QuadStick must all be connected over USB to a Windows PC running the QuadStick Manager Program. The QMP relays the data from the UltraStiks to the QuadStick, where it is used in a game configuration. The output from the QuadStick can be used by the PC or through a CronusMax, to a game console. See below for a wiring diagram.

A single UltraStik can be connected directly to the USB-A connector on the back of the Quadstick, but a CronusMax or Brooks Super Converter may be required for the PS4 or XBox One. A PS3 or Nintendo Switch can be used without any converters.



The QMP can relay the values from one or two pointing devices to the Quadstick. The values can be transmitted to the Quadstick over the USB connection or via a serial connection (Bluetooth or cable).

The scenarios are:

1. Single UltraStik 360
2. Two UltraStik 360's
3. An UltraStik 360 and a mouse
4. A mouse.

The mouse pointer can be controlled by any mouse or mouse substitute, like a TrackIR or Tobii Eye Gaze system.

Recognition mode

The QuadStick can recognize a sequence of movements of the joystick (or any sequence of inputs) to trigger an output instead of just a simple single input. This gives the QuadStick the ability to, in-effect, recognize the shapes as letters. A sequence of up to eight input triggers, such as moving the joystick through its discrete zones (as shown in Figure 4), mixed with other inputs, can be strung together to trigger any output.

To use pattern recognition, the user moves the joystick into a zone and momentarily pauses to signal the QuadStick to detect that location. The QuadStick uses the velocity of the joystick dropping to a low value to determine the user's intention and flashes the center Blue LED when it registers that location while recording the pattern. If the user moves through a zone quickly, the QuadStick will not include that zone when matching the pattern, which makes it possible to create patterns that include non-adjacent zones..

Once the pattern matches the sequence of locations in the configuration for an output, the output is triggered. Nearly all patterns start and end at the joystick center position.

The following examples illustrate recognition patterns for the letters A, I and K. The full list of the default recognition patterns used in the Singleton follow:

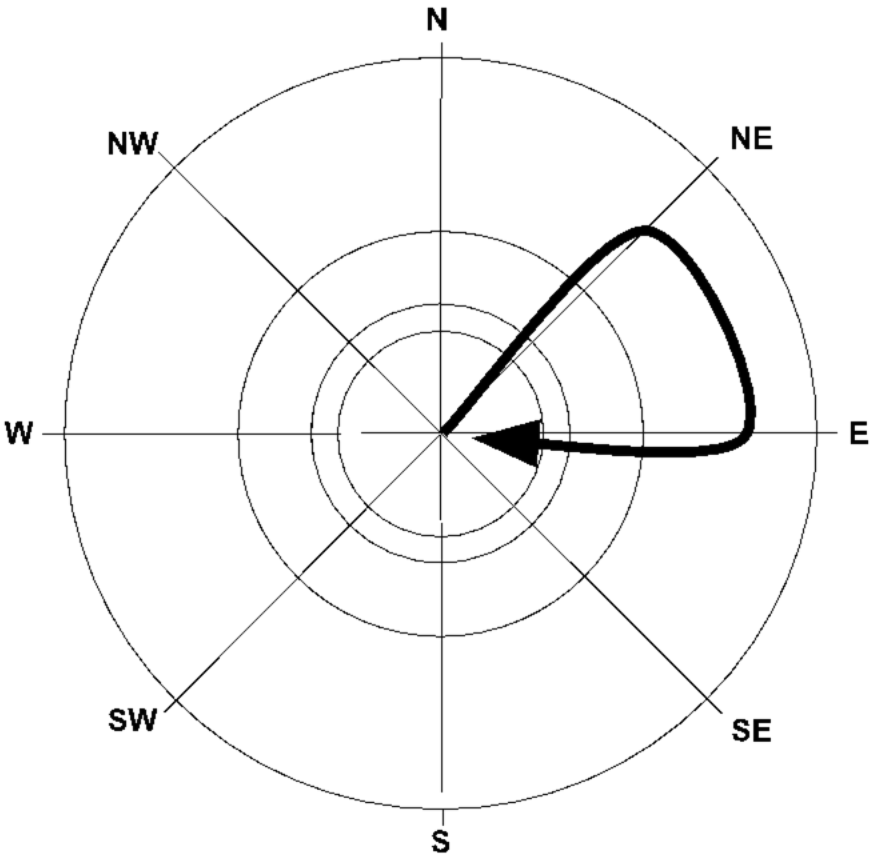


Illustration 1: Pattern for Letter A

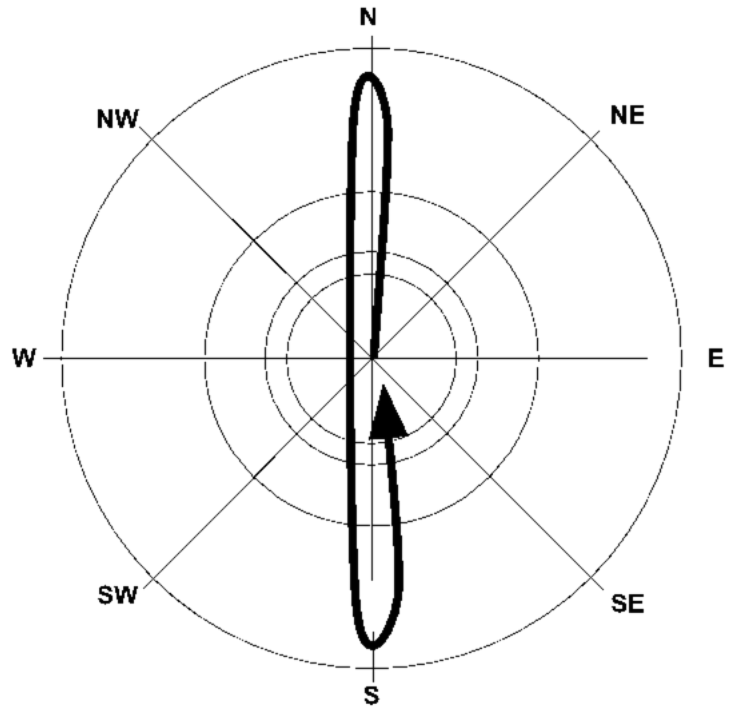


Illustration 2:

Pattern for Letter I

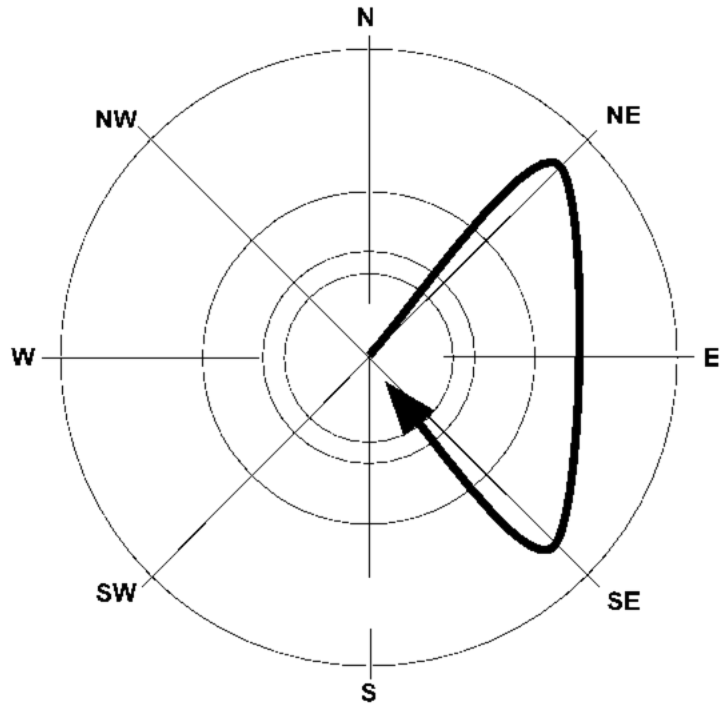
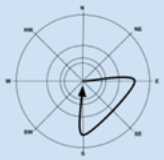
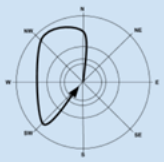
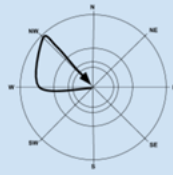
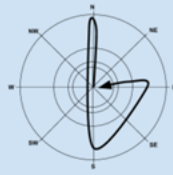
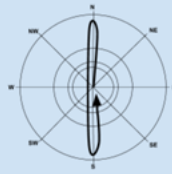
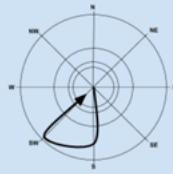
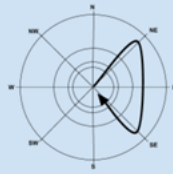
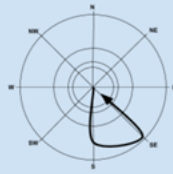
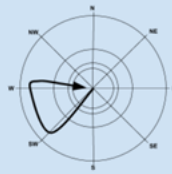
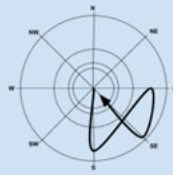
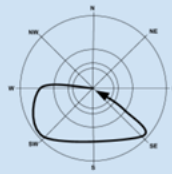
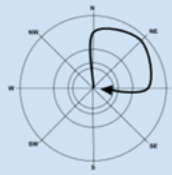
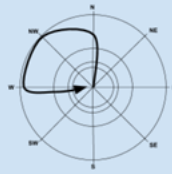
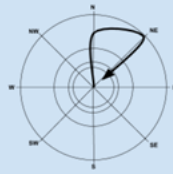
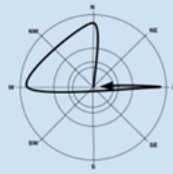
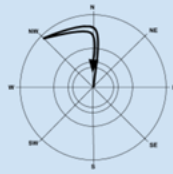
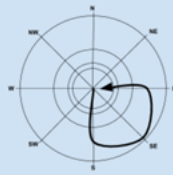
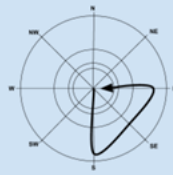
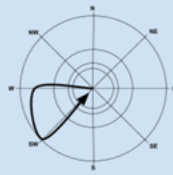
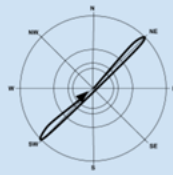
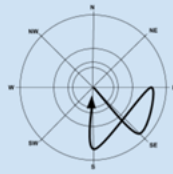
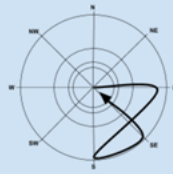
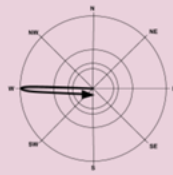


Illustration 3:

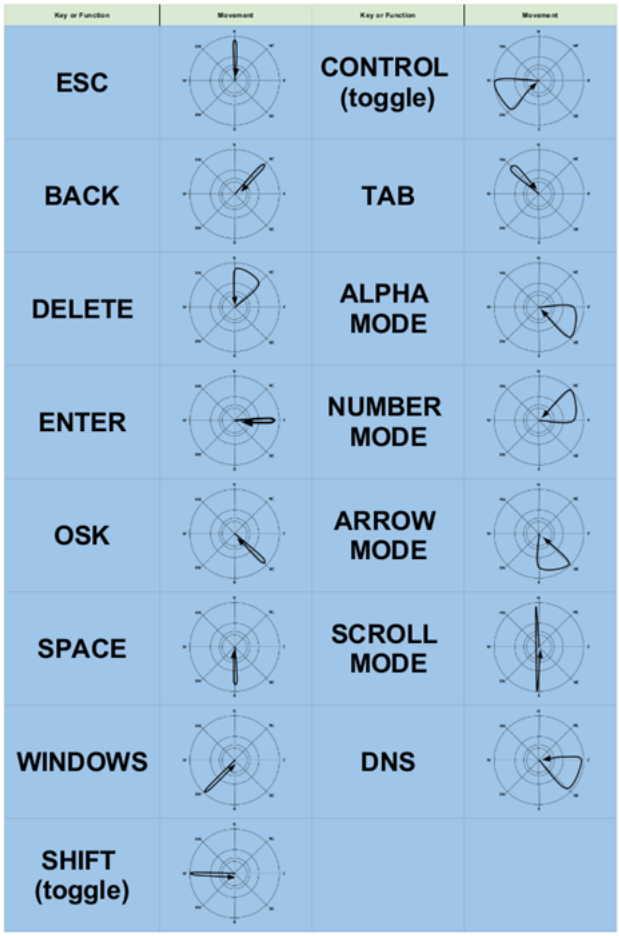
Pattern for Letter K

A		B		C		D	
E		F		G		H	
I		J		K		L	
M		N		O		P	
Q		R		S		T	
U		V		W		X	
Y		Z		0		1	
2		3		4		5	
6		7		8		9	

The Singleton default configuration

The Quadstick Singleton is a single tube version of the Quadstick. With the single tube, four combinations of hard/soft-sip/puff are used along with joystick movement pattern recognition to expand on the number of inputs available.

When power is first applied, the Singleton is in the mouse pointer mode (mode 1), where the joystick movement controls the mouse location. The puff is mapped to Left Mouse Button, sip mapped to Right Mouse Button, and the soft puff mapped to the Middle Mouse Button. This is summarized in the image below for Mouse mode:



Mode:	Mouse	Keys	Scroll	Arrow	Letters	Numbers
Soft Puff:	MMB	Ctrl-X cut	END	ESC	ESC	ESC
Puff:	LMB	Ctrl-V paste	Page Up	Enter	Enter	Enter
Sip:	RMB	Ctrl-C copy	Page Down	Backspace	Backspace	Backspace
Soft Sip:	Key Mode	Mouse Mode	Mouse Mode	Mouse Mode	Mouse Mode	Mouse Mode
Joystick:	Mouse pointer	Pattern	Mouse wheel	Arrow keys	Pattern	Pattern

A soft sip is used to control the active mode. From the Mouse mode, a soft sip puts the Singleton into a pattern recognition mode where the next sip/puff or movement triggers a keyboard key or performs a specific function, like selecting a new mode for the Singleton.
For example: Starting from the Mouse mode, to press the Windows key, a soft-sip followed by moving the joystick diagonally down and left (Southwest-SW), then re-centering, will press the Windows key and return the Singleton to the Mouse mode.
If a desktop shortcut has been created to open the On Screen Keyboard (OSK) with a ctr-alt-K (see appendix), then a soft-sip, followed by moving the joystick to the South-East corner, then back to the center, will open the OSK and return the Singleton to the Mouse mode.
Similarly, if Dragon Naturally Speaking (DNS) is installed and a set up with a hot-key to toggle the microphone on and off with the numeric keypad + key, a soft sip, followed by moving the joystick to the SE, then E, then center, will toggle the DNS microphone and return the Singleton to the Mouse mode.

Cleaning Mouthpiece

The mouthpiece can be removed and cleaned with soap and water, rubbing alcohol or hydrogen peroxide. Any debris blocking the air holes can be pushed out from the barbed fitting end with a small wire or compressed air. Soaking can help.
In multi-user settings, individual mouthpieces are recommended.

Once clean, any calcium deposits, which can show up as white specks, can be removed by soaking in a mild acid, like vinegar or lemon juice.

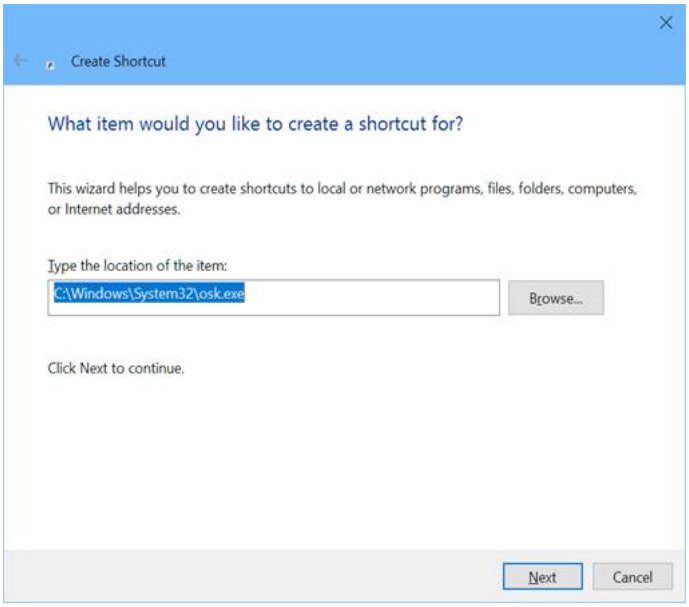
The PLA material currently being used is compatible with ETO and can be autoclaved after cleaning.

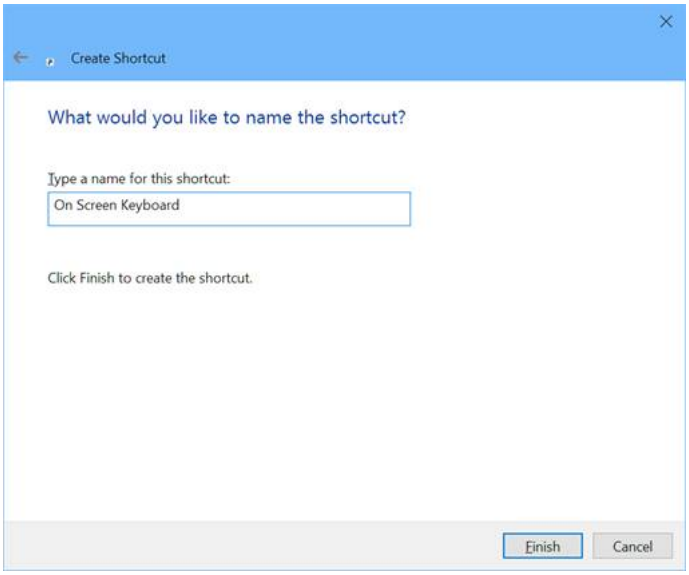
Appendix

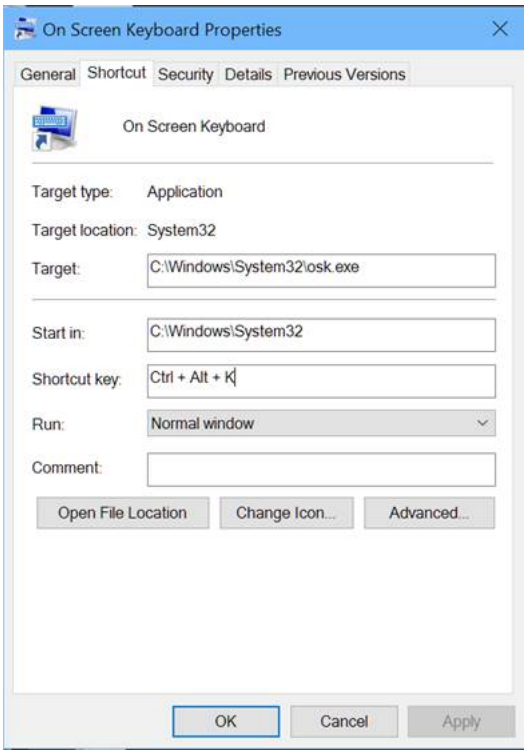
Creating an OSK Shortcut

Creating a Desktop shortcut to launch the On Screen Keyboard (OSK):

1. Right click on the Desktop and select new→Shortcut from the context menu.
2. Browse to the location of the OSK.EXE file.
3. Give it a name, click on Finish.
4. Find the new shortcut icon and Right Click on it.
5. Choose Properties
6. In the Shortcut key field, simultaneously press Ctrl+Alt+k.
7. Click on OK and test the shortcut.






On Screen Keyboard Properties
General
Shortcut
Security
Details
Previous Versions
On Screen Keyboard
Target type:
Application
Target location:
System32
Target:
C:\Windows\System32\osk.exe
Start in:
C:\Windows\System32
Shortcut key:
Ctrl + Alt + K
Run:
Normal window
Comment:
Open File Location
Change Icon...
Advanced...
OK
Cancel
Apply

Platform Notes

Android

Used with a Google Nexus 7 pad. Bluetooth Device mode=Mouse, Keyboard, Combo or Gamepad, Authentication Mode= 1, Connection Mode=Pair.

The Quadstick can also be used with a USB OTG cable and get power from the Android host instead of using Bluetooth and being powered by another source. The catch is, the Android device will not accept external power while in this mode (unless Rooted and running special software), so both the Android device and the QuadStick will get their power from the device's battery. It's useful for portable situations, but for a more permanent setup, powering both and connecting via Bluetooth works better.

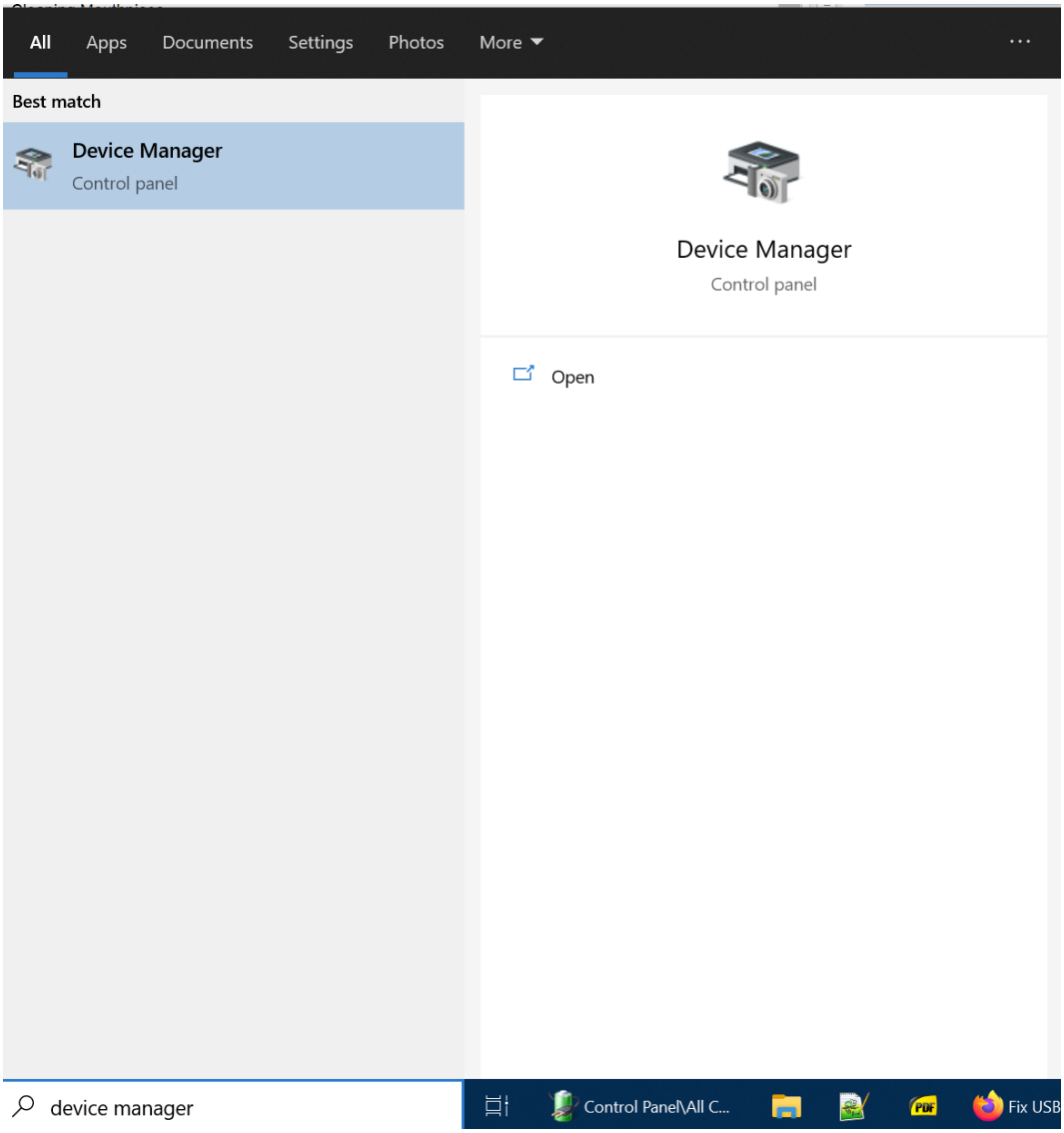
Windows 10

Power settings.

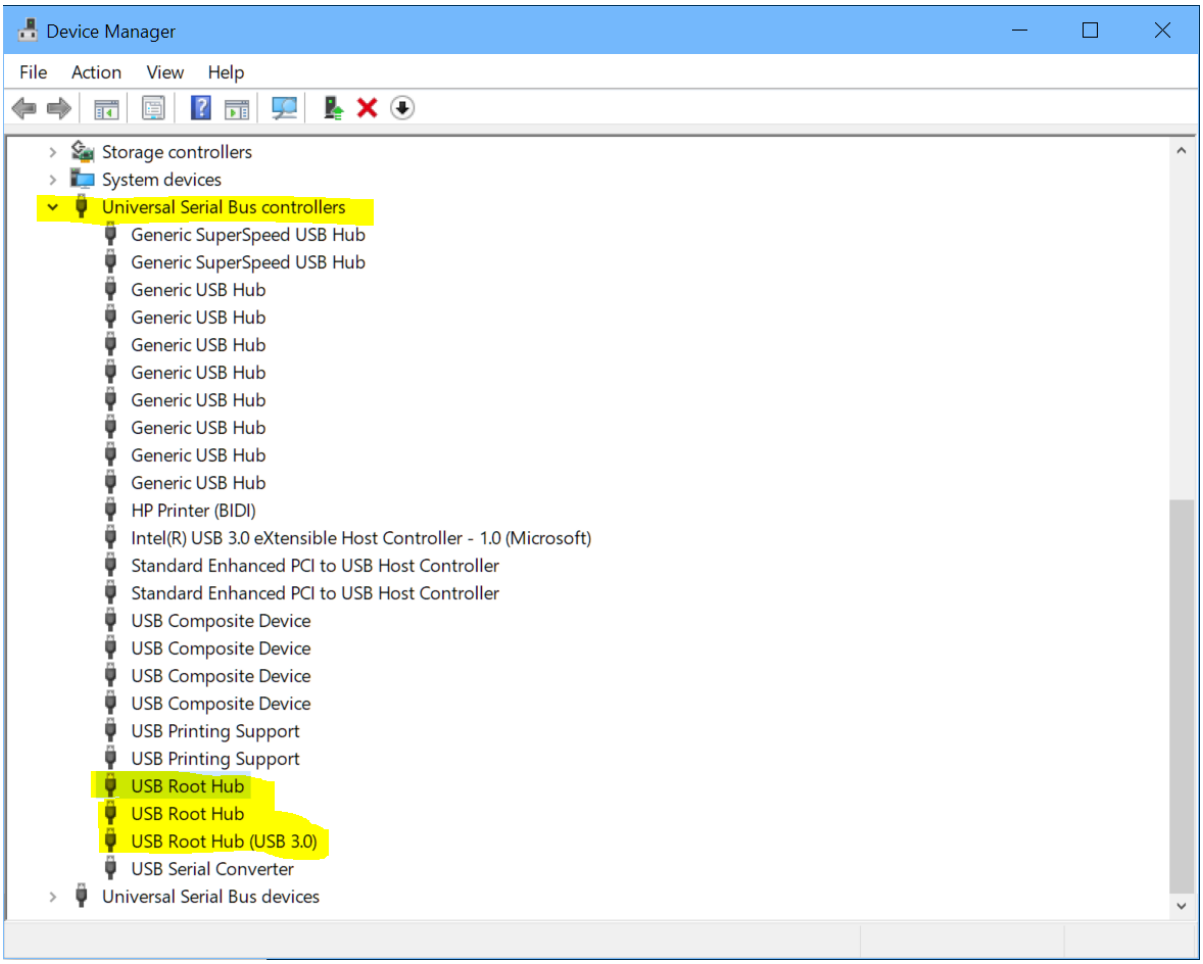
Windows can sometimes be very aggressive in trying to save power and will try to "suspend" the flash drive in the quadstick. It doesn't realize that this causes problems with the other USB interfaces. The description of the problem is usually that the Quadstick continually tries to reconnect or reset.

Turning off a setting called Selective Suspend can sometimes correct this problem. This is done in two separate places, in the **Device Manager** and in the **Power Settings**.

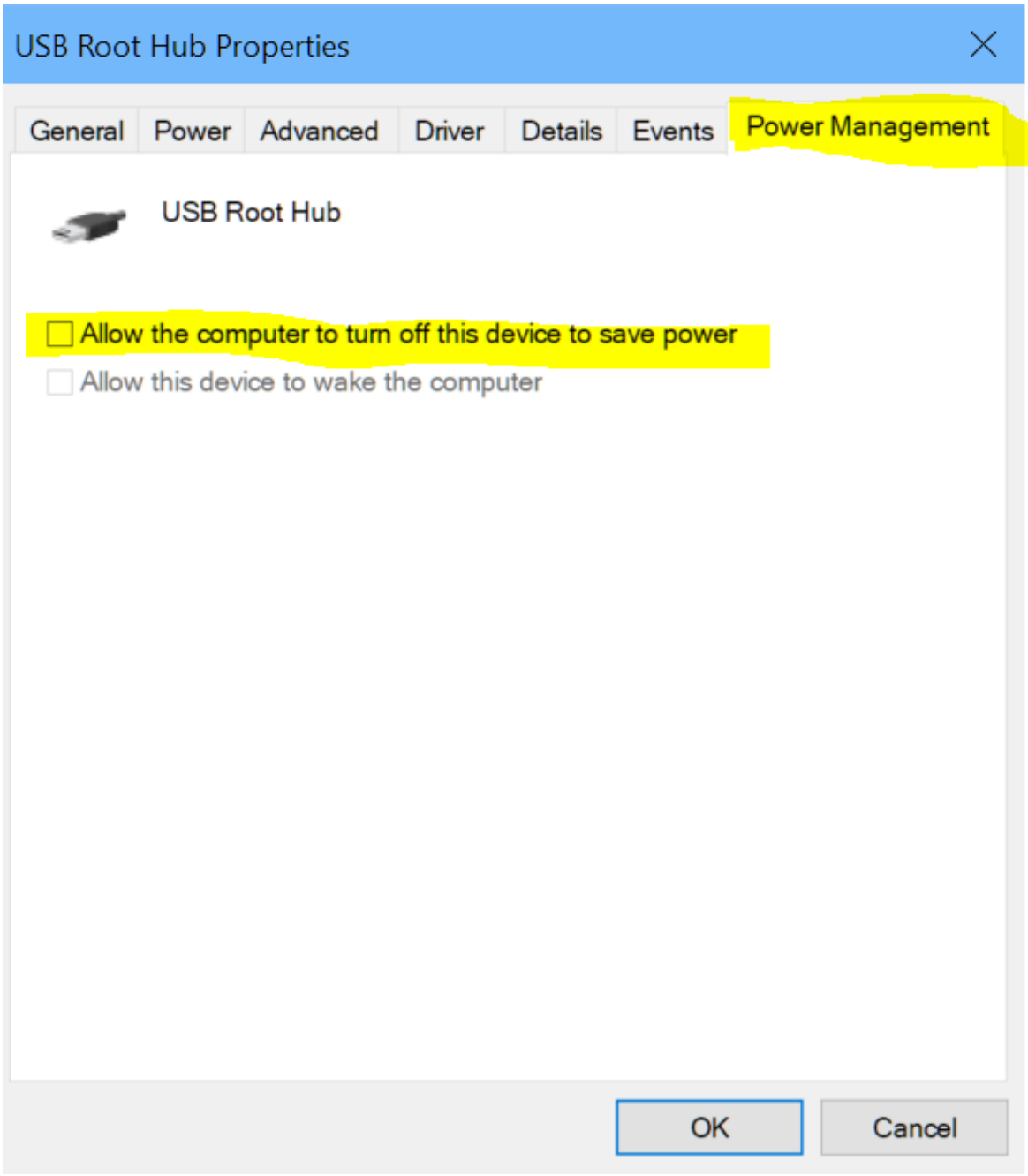
• In the Windows search box type in "device manager", then launch the Device Manager.



Find the Universal Serial Bus Controllers > expand.
Find the USB Root Hub on the list and double click to open its Properies box:



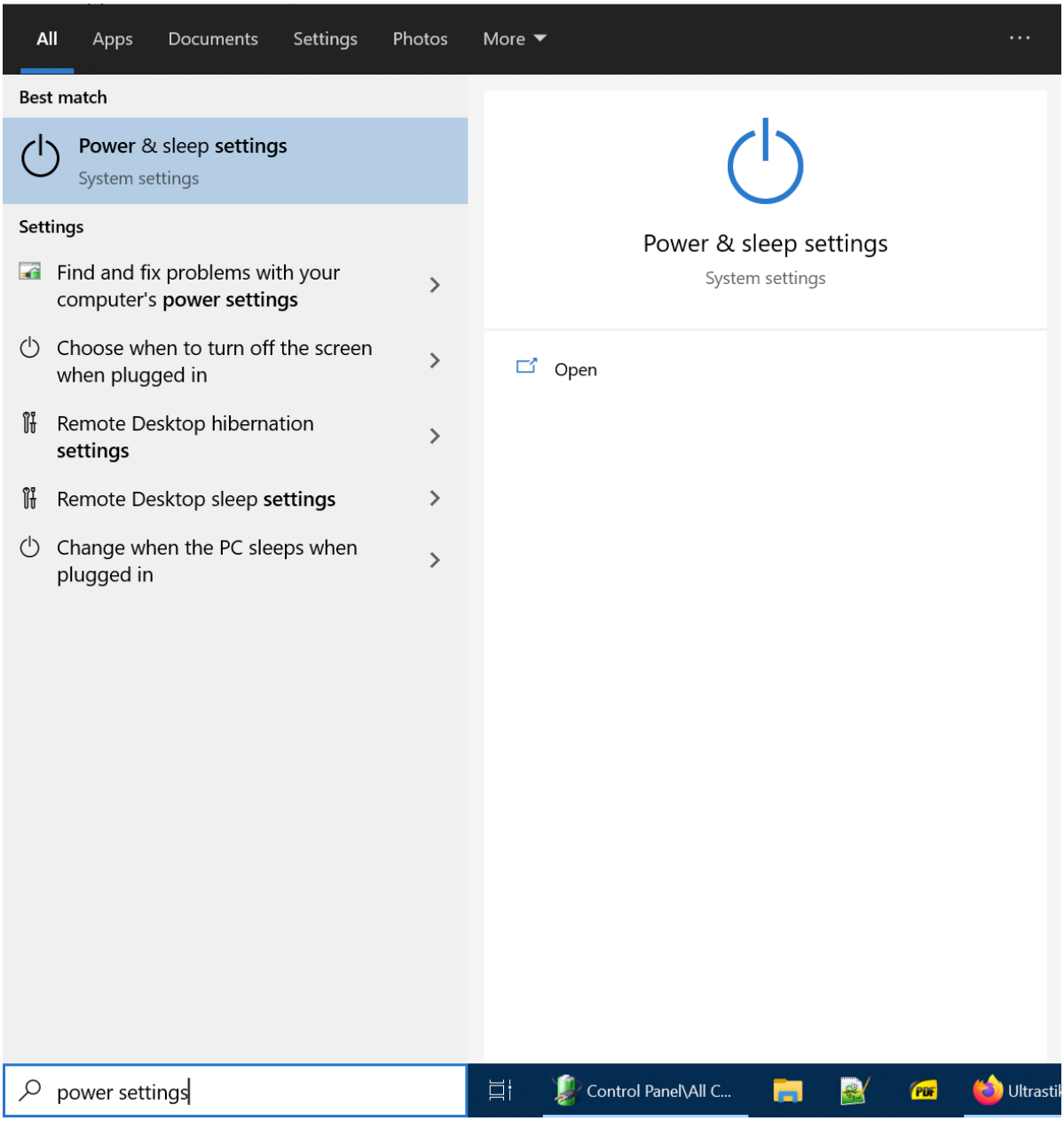
Go to the Power Management tab.
Un-check the Allow the computer to turn off this device to save power > OK.



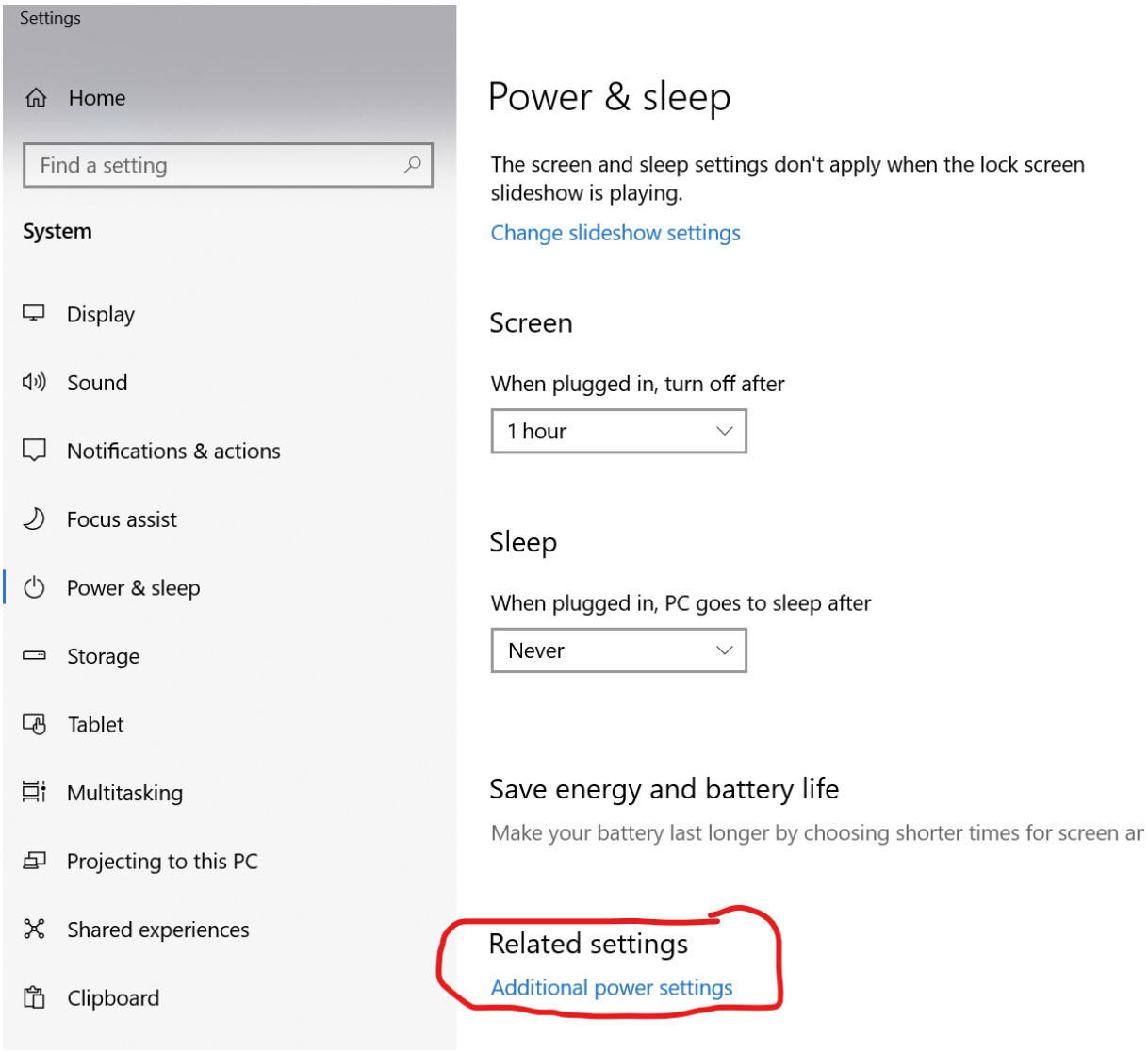
Note: Do the same process for Other Installed USB Root Hub devices.

Close the Device Manager and then turn off Selective Suspend:

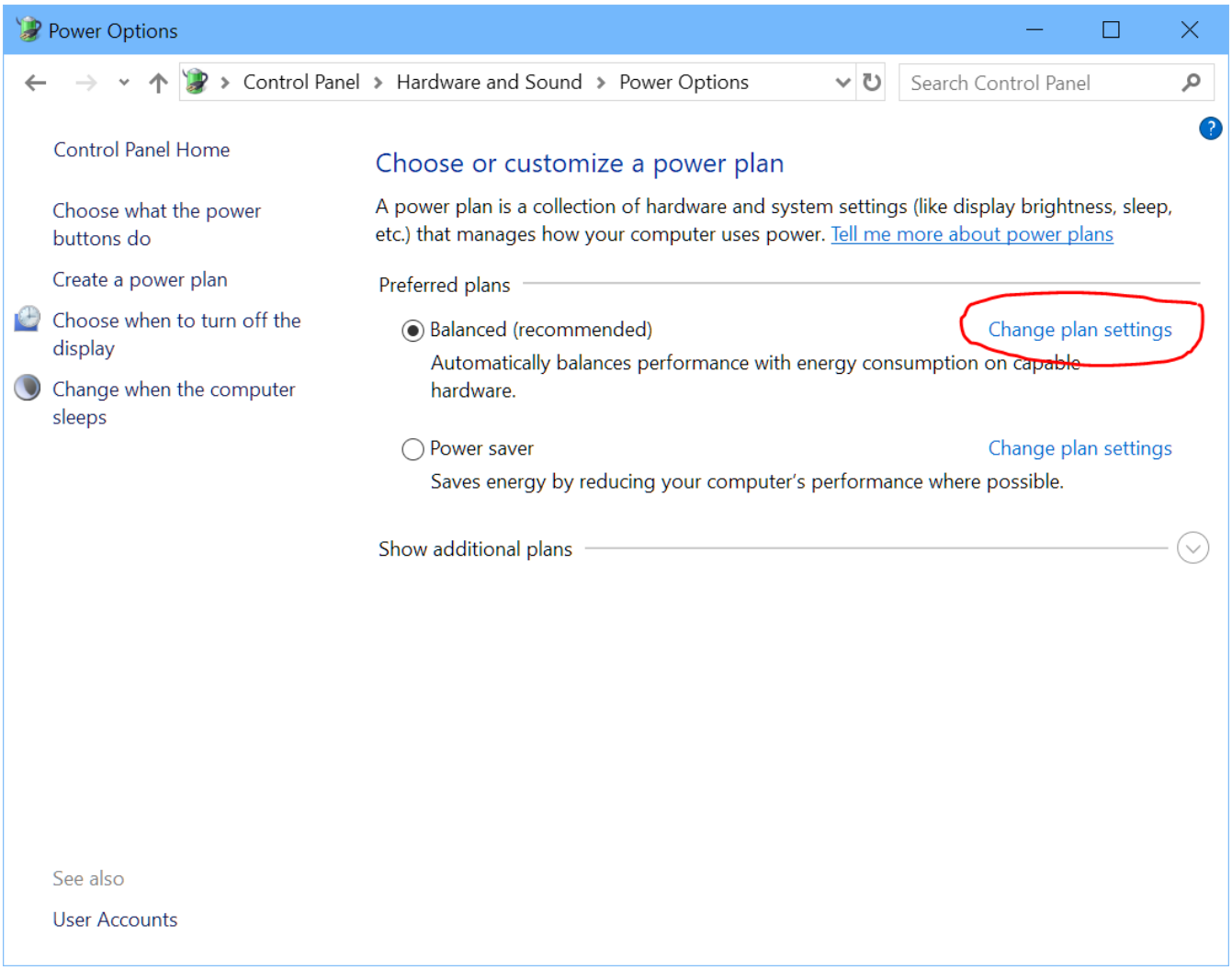
• In the search box, type in "power settings" and launch the Power & sleep settings



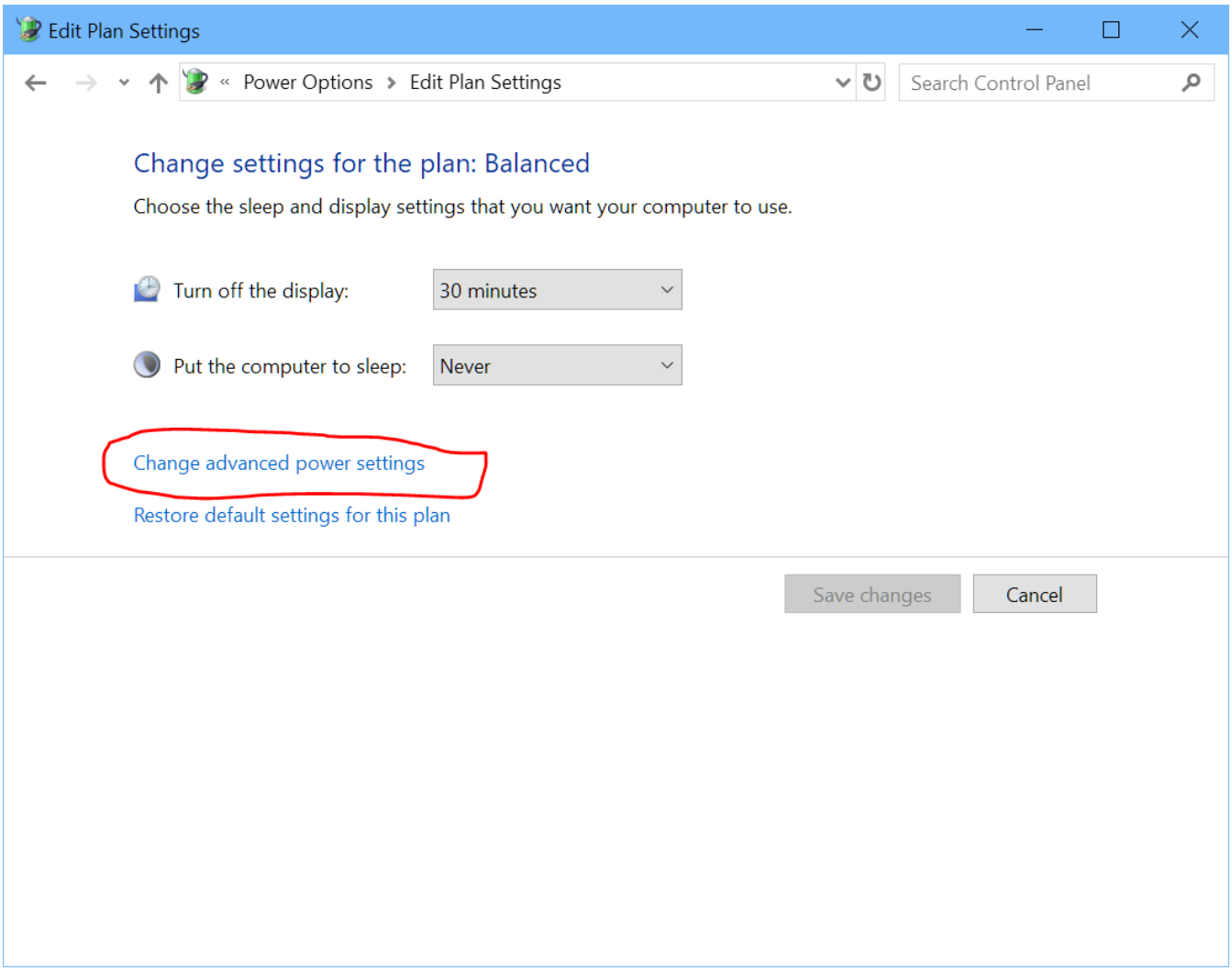
-
- Select "Additional power settings"



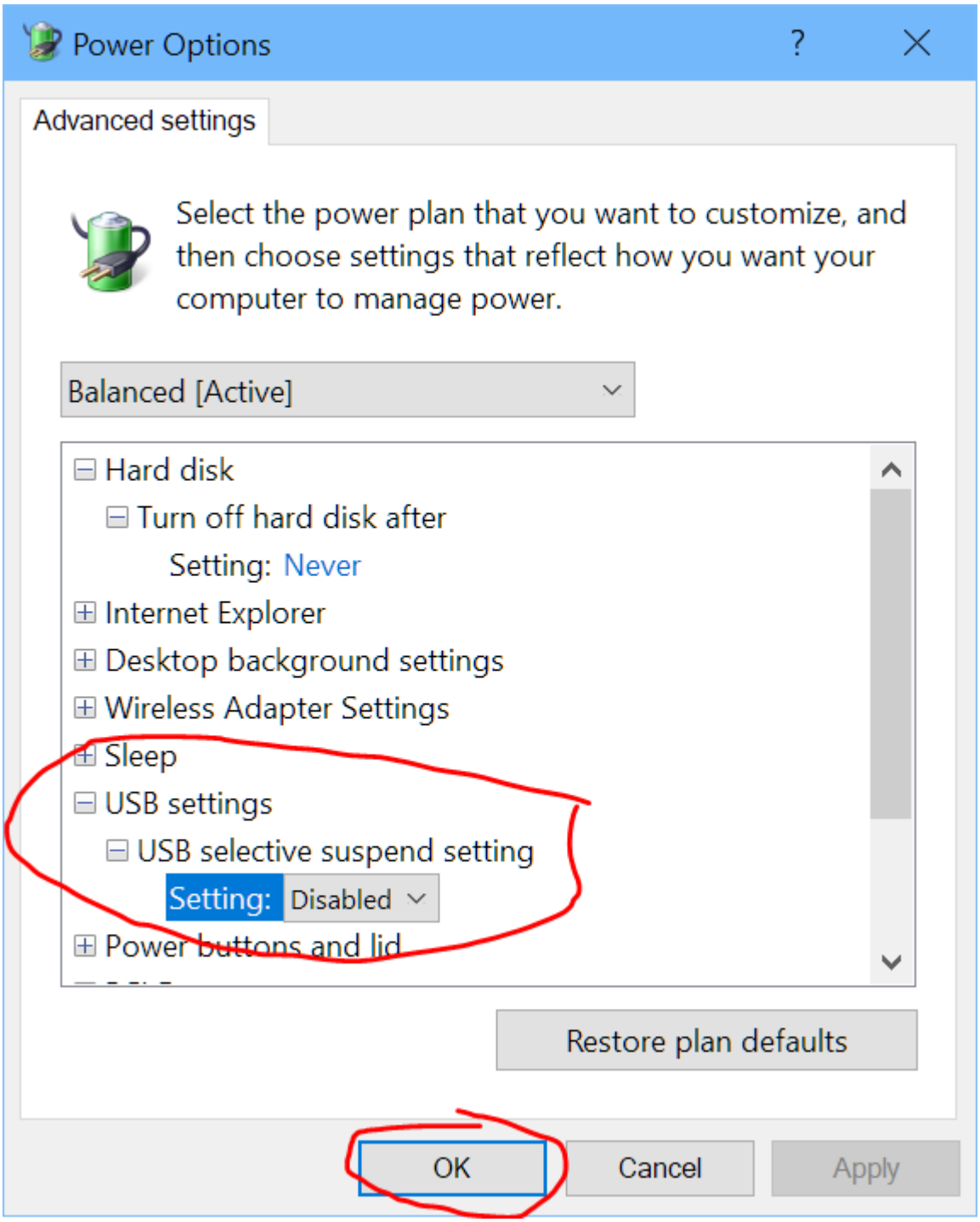
-
- Select "Change plan settings"



-
- Select "Change advanced power settings



- Make sure USB settings -> USB selective suspend setting is Disabled:


Power Options
Advanced settings
Select the power plan that you want to customize, and then choose settings that reflect how you want your computer to manage power.
Balanced [Active]
Hard disk
Turn off hard disk after
Setting: Never
Internet Explorer
Desktop background settings
Wireless Adapter Settings
Sleep
USB settings
USB selective suspend setting
Setting: Disabled
Power buttons and lid
Restore plan defaults
OK
Cancel
Apply

•
• Next

Erasing the Quadstick Configuration Flash

If the Quadstick is misconfigured and the flash drive is not available due to problem with the configuration files, first try to change to a different configuration file which may have flash access. If that does not work, the flash can erased which will cause the Quadstick to revert to a simple configuration, similar to the Default Configuration, with controller modes in modes 1 through 4, and a mouse mode in mode 5.

This should work with either the FPS or original models if the firmware is greater than 1142:

When the Quadstick powers up, it goes through sequence where the leds flash in a specific pattern. While they are all flashing pink just after it is plugged in, push the lip button all the way in while simultaneously sipping on the center hole. Hold that for several seconds after the boot up completes until the Quadstick resets again and all the lights start flashing pink. If necessary, you can remove the tube for the center hole and have an assistant sip on it while holding the lip button all the way in.

For many original models:

While the leds are flashing pink, just after, but not before, power is applied, press directly in on the mouthpiece to activate the switch in the base of the joystick and hold it until a couple of seconds after the leds stop flashing. This is probably too painful for you to do with your mouth. An assistant can press in on the mouthpiece with both thumbs. You should hear a click when the switch activates.

Afterwards, you can copy the Default Configuration and Default Preferences into the drive using QMP, then update the firmware to the latest version, then load in all your custom CSV files.

Keep a backup

You can copy the CSV files that configure the Quadstick to a folder on your computer to make it easy to recover from a misconiguration accident.