

x2121 - HiRes Wheel

Version 0

High resolution wheel

[0] **getWheelCapability()** → multiplier, hasSwitch, hasInvert

[1] **getWheelMode()** → target, resolution, invert

[2] **setWheelMode(target,resolution, invert)** → target, resolution, invert

[3] **getRatchetSwitchState(target,resolution, invert)** → state

[event0] **wheelMovement()** → resolution, periods, deltaV

[event1] **ratchetSwitch()** → ratchet state

Overview

Reporting of hi-res wheel events.

A hi-res wheel must have a freewheel or microratchet mode (more than one ratchet per normal scroll unit) to make the high resolution useful. It may have a user controlled mechanism to switch to normal ratchet mode. If this ratchet control is motorized or has a mechanical switch for the firmware to detect the state, then the wheel has the "ratchet switch" capability described in this feature.

The high-resolution setting is applied both when the wheel is reported natively via HID and when diverted to software.

The invert setting applies only to values reported natively via HID. Values report via HID++ are unaffected. When active it causes reporting of the additive inverse of normal wheel motion. Normal motion reporting gives positive values when the wheel is moved away from the user. Inverted motion reporting gives negative values when the wheel is moved away from the user.

The period count reported is the number of reporting periods that motion took to be reported. It will normally be 1, but may be greater when the HID report is delayed due to HID++ reports being sent. The initial periods of no motion preceding the first motion report do not count towards the number of periods.

Functions and Events

[0] `getWheelCapability()` → multiplier, hasSwitch, hasInvert

Parameters

none

Returns

multiplier

N = Hi-res multiplier. One normal ratchet distance produces N counts of wheel movement.

hasInvert

1 = Can invert HID reported motion

hasSwitch

1 = Has ratchet switch

Errors

none

Table 1. getWheelCapability() request packet

byte \ bit	7	6	5	4	3	2	1	0
0..15	reserved							

Table 2. getWheelCapability() response packet

byte \ bit	7	6	5	4	3	2	1	0
0	multiplier							
1	capabilities							
	rsv(0)	rsv(0)	rsv(0)	rsv(0)	inv	switch	rsv(0)	rsv(0)
2..15	reserved							

[1] `getWheelMode()` → target, resolution, invert

Parameters

none

Returns

invert

0 = Not inverted, 1 = Inverted

resolution

0 = Low resolution, 1 = High resolution

target

0 = HID, 1=HID++ notification

Table 3. getWheelMode() request packet

byte \ bit	7	6	5	4	3	2	1	0
0	reserved							

Table 4. getWheelMode() response packet

byte \ bit	7	6	5	4	3	2	1	0
0	wheelmode							
	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	inv	res	target
2..15	reserved							

[2] **setWheelMode**(target,resolution, invert) → target, resolution, invert

Parameters

invert

0 = Not inverted, 1 = Inverted

resolution

0 = Low resolution, 1 = High resolution

target

0 = HID, 1=HID++ notification

Returns

invert

0 = Not inverted, 1 = Inverted (echo of the request)

resolution

0 = Low resolution, 1 = High resolution (echo of the request)

target

0 = HID, 1=HID++ notification (echo of the request)

Table 5. setWheelMode() request packet

byte \ bit	7	6	5	4	3	2	1	0
0	wheelmode							
	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	inv	res	target
2..15	reserved							

Table 6. setWheelMode() response packet

byte \ bit	7	6	5	4	3	2	1	0
0	wheelmode							
	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	inv	res	target
2..15	reserved							

[3] `getRatchetSwitchState(target,resolution, invert) → state`

Parameters

none

Returns

ratchet

0 = Free wheel, 1 = Ratchet engaged

Table 7. getRatchetSwitchState() request packet

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byte \ bit	7	6	5	4	3	2	1	0
0	reserved							

Table 8. getRatchetSwitchState() response packet

byte \ bit	7	6	5	4	3	2	1	0
0	ratchet mode							
	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	ratchet
2..15	reserved							

[event0] wheelMovement() → resolution, periods, deltaV

Reported when "target" bit is set to 1 (HID++ notification).

Event report

resolution

0 = Low resolution, 1 = High resolution

periods

Number of sampling periods combined in this report. If this value is greater than 15, then the value 15 is sent.

deltaV

Vertical wheel motion delta. Moving away from the user produces positive values.

Table 9. wheelMovement() report packet

byte \ bit	7	6	5	4	3	2	1	0
0	rsv(0)	rsv(0)	rsv(0)	res	periods			
1	deltaV (MSB)							
2	deltaV (LSB)							
3..15	reserved							

[event1] ratchetSwitch() → ratchet state

Reported when ratchet switch state changes.

Event report

ratchet state

0 = Free wheel, 1 = Ratchet

Table 10. ratchetSwitch() report packet

byte \ bit	7	6	5	4	3	2	1	0
0	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	rsv(0)	ratchet
1..15	reserved							

ChangeLog

- Version 0: Initial version

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