Nextwindow USB Touch Screen Report Modes

Nextwindow has three USB report mode settings. These can be set with the USB configuration tool. Firmware version must be 2.50 or above.

Mode 1 : Mouse Report Mode (Default)

This mode reports via a HID mouse endpoint and behaves in a similar way to a mouse. The main difference is that the output is in absolute screen coordinates rather than relative coordinates. Mouse messages are filtered through NextWindow's embedded state machine. The results are improved double clicking and dragging without modifying the client's (PC) settings. Typical settings are drag width and double click speed. "Double click speed" enables the slower double click of a finger to be dispatched faster, causing the client to see them as a true double click. "Drag width" settings stop unwanted dragging of icons while clicking, as the second click in a double click is never in the same spot as the first click.

Mode 2 : Multi Touch Report Mode

This mode reports via a HID communications channel. All messages are sent without going through NextWindow's embedded state machine. The client has the option to do filtering for dragging and double clicking if desired. This mode reports up to two simultaneous touch coordinates, with an unscaled touch object size for each camera. The object touch sizes can be scaled with appropriate trigonometry. NextWindow can supply sample Visual Basic source code showing how this can be achieved. The coordinates reported are not limited to the visible screen. If, for example, a 30 inch touch screen were to be fitted to a 19 inch monitor, the area around the 19 inch monitor would generate touch coordinates too. This could be used for static graphics or buttons.

Mode 3 : Multi-Touch Report Mode and Mouse Report Mode

This mode reports both through the USB mouse interface and the HID communications channel simultaneously. This could be use if the client wanted normal mouse operation as a primary objective and a second coordinate for doing an alternate action on a second, simultaneous touch.

Mode Availability Grid

	Mode 0	Mode 1	Mode 2	Mode 3
Mouse endpoint	N	Y	N	Y
Multi-touch coordinates	N	N	Y	Y
Touch size information	N	N	Y	Y
Down messages*	Y	Y	N	N
Two-touch message*	Y	Y	N	N

*may not be supported on future products. Use Multi touch report instead.

Report Mode Details (Using the HID Communications Channel)

Multi-touch report mode: This information is available via Nextwindow's activex control UX.OCX. The event data structure is as follows. Note that a single touch will generate events as well as multiple touches.

Multi-Touch Using the HID Communications Channel

Each of the letters below represents a byte in sequence. This is the binary information that arrives as touch events from the UX.OCX activex control

Header Touch packet 0 Touch packet 1
SL TXXXXYYYYW1W2 TXXXXYYYYW1W2

2 byte header + 13 bytes for each touch

Each letter explained. The number represents the byte position in the packet.

Byte arrangement for multi-touch
0 = S Packet Type Signal (byte)
1 = L Number of bytes to follow this (touches x 13) (byte)

Touch packet 0: This is the first touch
2 = T Touch type (touching lift off etc)
3 to 6 = XXXXx position (IEEE 32 bit floating point)
7 to 10 = YYYYy position (IEEE 32 bit floating point)
11 to 12= W1 touch width camera 1 (unsigned 16 bit integer)
13 to 14= W2 touch width camera 2 (unsigned 16 bit integer)

Touch packet 1: This is the second touch
15 = T Touch type (touching lift off etc)
16 to 19= XXXXx position (IEEE 32 bit floating point)
20 to 23 = YYYY y position (IEEE 32 bit floating point)
24 to 25= W1 touch width camera 1 (unsigned 16 bit integer)
26 to 27= W2 touch width camera 2 (unsigned 16 bit integer)

Multi-Touch Parsing

Byte	Value	Name	Action
S	'X'	Multi-touch	
L	13	Packet Length	Parse one touch
	26		Parse two touches
T	0	Not Touch	Touch object has been removed (lift off) or Hover to location X,Y e.g. Move mouse to X,Y and put mouse button up if its down.
	1	Touch Down	Touch has been initiated, e.g. Move mouse to X,Y and put mouse button down.
	2	Touching	Touch is in progress, e.g. Move mouse to X,Y , touch state has not changed.
XXXX	float	X location	IEEE 32 bit floating point indicating X position of touch.
YYYY	float	Y location	IEEE 32 bit floating point indicating Y position of touch.
W1	uINT16	Width1	touch width camera 1 (unsigned 16 bit integer) unscaled
W2	uINT16	Width2	touch width camera 2 (unsigned 16 bit integer) unscaled

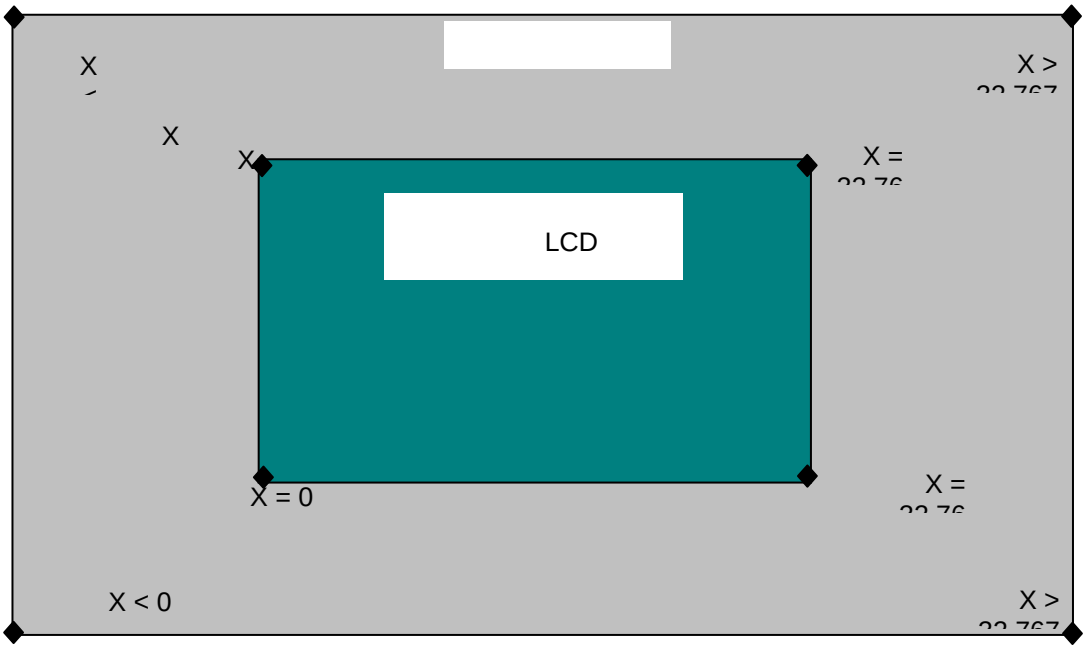
A Visual Basic application example is available from NextWindow. This application example includes source code. It demonstrates how to use multi-touch and touch size information.

Mapping to the Screen

When a calibrated touch screen is used, the coordinates map is as follows.

Pixel_X = (X / 32767) * LCD_Total_Pixels_X

Pixel_Y = (Y / 32767) * LCD_Total_Pixels_Y



X,Y coordinates outside the visible screen scale linearly to the visible screen pixels. This makes non LCD screen area usable for touch. For example, static graphics can be used as buttons if required.

For more information contact Nextwindow software support:

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