



---

# NextWindow 2500 Series Optical Touch Screen Approval Specification

Confidential

DRAFT

Specifications subject to change without notice

Copyright NextWindow Ltd. 2010. All rights reserved.

# Table of Contents

<b>1. Introduction .....</b>	<b>1</b>
<b>2. System Overview .....</b>	<b>1</b>
2.1. Features .....	2
2.2. Components .....	2
2.3. Cameras .....	2
2.4. Controller Board .....	3
<b>3. Specification Details.....</b>	<b>3</b>
3.1. System Characteristics.....	3
3.2. Electrical Specification .....	4
3.3. Mechanical Specification.....	4
3.4. Software Specifications .....	4
3.5. USB Interface .....	5
3.6. Standards .....	6
<b>4. Absolute Maximum Ratings.....</b>	<b>6</b>
4.1. Electrical Absolute Maximum Ratings.....	6
4.2. Environmental Absolute Maximum Ratings .....	6
<b>5. Product Options.....</b>	<b>6</b>
5.1. Kit Options .....	7
5.2. On-Glass Options.....	8
<b>6. Appendix B – NextWindow Touch Screen Calibration Utility .....</b>	<b>9</b>

## Revision History

Name	Date	Reason for change	Version
S.Whitaker	07/05/10	Second draft release	0.2

# 1. Introduction

This document details the specification for NextWindow's 2500 Series optical touch screen. The touch screen is supplied in either a kit form requiring assembly onto a glass substrate or fully assembled on glass. For each option the touch screen requires integration into the bezel of a monitor. To ensure robust operation the supplied integration guidelines must be followed.

## Related Documents

Title	Description	Version
Touch Screen Calibration Utility Specification	Specification for NextWindow Touch Screen Calibration Utility	2.0
2500 Kit TSI Production Process	Defines production process for kit product option where touch screen components require assembly onto glass substrate	TBD
2500 On-Glass TSI Production Process	Defines production process for on-glass product option.	TBD

# 2. System Overview

The 2500 optical touch screen consists of two cameras located in the upper corners of the display and three retro-reflective strips located along the side and bottom edges. The touch screen is assembled onto a glass substrate. Each camera consists of an infrared light source and a sensor that views the entire substrate in a 90-degree sweep, measuring the reflected light. When no touch is present the two cameras see a relatively uniform level of light across the substrate. If a finger or other object touches the substrate it blocks the light from the reflectors, causing the cameras to see a silhouette (shadow) of the object.

A Universal Serial Bus (USB) connects the touch screen DSP controller board to the host computer. A NextWindow driver is installed on the host computer to analyse the output of the touchscreen to provide touch coordinates to the operating system.

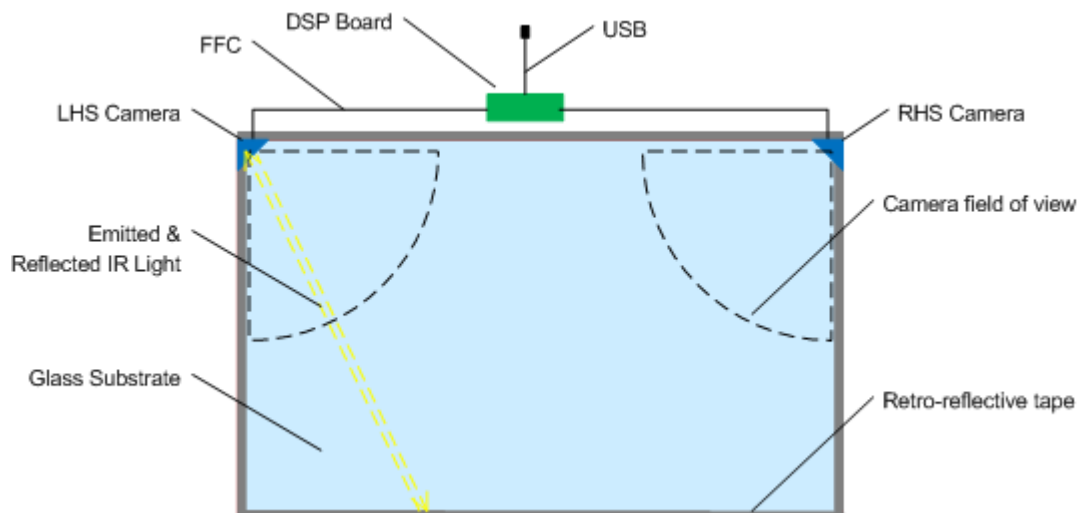


Figure 1 2500 Optical Touch Screen System

## 2.1. Features

- Accurate, reliable, low-cost touch technology.
- Simple integration into OEM monitor
- Light touch: no pressure required.
- Any touch: finger, gloved hand or pointer.
- Calibration: once-only, four-points with no drift.
- USB: one cable for power and communications.

## 2.2. Components

The NextWindow 2500 series touch screen is comprised of the following:

1. Glass substrate (Supplied by customer for kit option)
2. Base retroreflective bar
3. Side retroreflective bars
4. Left hand camera assembly
5. Right hand camera assembly
6. Adhesive UV cure DYMAX 4-20418 (Supplied by customer for kit option)
7. DSP controller board



Figure 2 NextWindow 2500 series Components

## 2.3. Cameras

The 2500 touch screen has two camera modules located at the top corners of the display. The camera is mounted onto a clip for ease of assembly onto the glass substrate. The clip is bonded to the glass substrate in a two stage process leveraging VHB tape and UV cure adhesive. Each camera is connected to the DSP controller board through a Flexible Flat Cable(FFC).

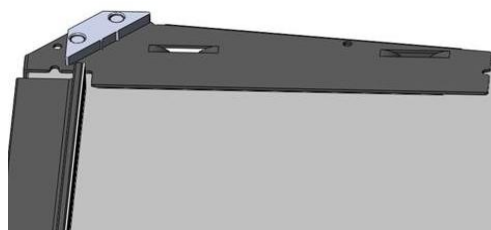


Figure 3 2500 series camera clip

## 2.4. Controller Board

The controller board includes the signal processor and the USB interface. When integrated the controller board needs to be mounted within the monitor bezel or at the rear of the monitor. The integration guidelines must be followed for robust operation to meet EMI/EMC and ESD requirements. In most cases it is the intention that a custom USB cable will be developed by the integrator.

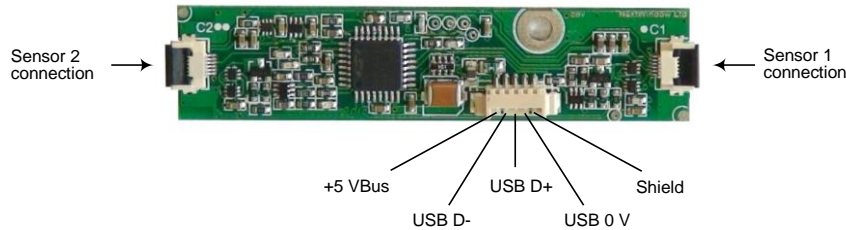
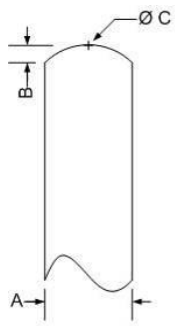


Figure 3 NextWindow 2500 series DSP Controller Board (not to scale)

## 3. Specification Details

### 3.1. System Characteristics

Ref.	Item	Description
3.1.1.	Touch technology	Optical
3.1.2.	Touch method	Any IR opaque object, including: Finger, gloved hand, brush or stylus.
3.1.3.	Touch activation force	None. No physical pressure required to activate touch
3.1.4.	USB reported resolution	32767 x 32767
3.1.5.	Typical aspect ratio	16:9; others available on request
3.1.6.	Typical screen sizes	32", to 52"; other sizes available on request
3.1.7.	Model Number	2500
3.1.8.	Number of Touches	The touch screen can resolve up to two simultaneous touches
3.1.9.	Accuracy	±3 mm over 95% of touchable area
3.1.10.	Minimum Stylus diameter – Spherical Tip	 <p>A = 7mm B = 2mm C = 4mm</p>
3.1.11.	Simultaneous touch reporting rate	> 50 Hz
3.1.12.	Drift	No drift within operating temperature range
3.1.13.	Static touch height	< 3 mm
3.1.14.	Touch durability	NextWindow's optical touch technology has no limit to the number of touches

3.1.15.	Scratch resistance	NextWindow's optical touch technology is not affected by scratches on the screen
3.1.16.	Capabilities	Point-and-click Sketching and painting 2-point multi-touch

### 3.2. Electrical Specification

Ref.	Item	Min.	Typ.	Max.	Unit	Notes
3.2.1.	Supply voltage	4.75	5	5.25	V	
3.2.2.	Active average current	-	-	100	mA	
3.2.3.	Idle average current	-	-	80		
3.2.4.	Sleep mode average current	-	-	80	mA	

### 3.3. Mechanical Specification

Ref.	Item	Description
3.3.1.	Touch Screen Dimensions	See section 5
3.3.2.	Weight of kit	Less than 50 g without glass
3.3.3.	Glass Substrate	For on-glass variants the standard glass is 4.0 mm thick tempered; other thicknesses available on request
3.3.4.	Recommended glass hardness	6 on Mohs scale of hardness
3.3.5.	Warp and Flatness of substrate and mounting	Maximum $\pm 2$ mm
3.3.6.	Controller board dimensions	70 mm x 16 mm x 5 mm
3.3.7.	FFC width	3.5 mm $\pm 0.07$ mm
3.3.8.	FFC length	See section 5
3.3.9.	FFC thickness	0.3 mm $\pm 0.03$ mm
3.3.10.	FFC Connector	Flip lock type.

### 3.4. Software Specifications

Ref.	Item	Description
3.4.1.	NextWindow driver	For all modes of operation a software driver needs to be installed on the host computer.
3.4.2.	Operating systems supported by driver	<ul style="list-style-type: none"> <li>Windows7 64 bit &amp; 32 bit</li> <li>Vista 64 bit &amp; 32 bit</li> <li>XP</li> </ul>
3.4.3.	Operating systems not supported	<ul style="list-style-type: none"> <li>Mac OS</li> <li>Linux</li> <li>Windows 2000 and earlier versions</li> </ul>
3.4.4.	Driver functionality	<ul style="list-style-type: none"> <li>Mouse emulation: Left click, left drag, left double-click and right-click.</li> </ul>

		<ul style="list-style-type: none"> <li>Digitizer<sup>1</sup>: supports flicks, handwriting and visual feedback.</li> <li>Windows7 multi-touch<sup>2</sup></li> </ul>
3.4.5.	Operating system supported driver capabilities	<ul style="list-style-type: none"> <li>Windows7: Windows7 multi-touch and digitizer</li> <li>Vista: Digitizer and mouse emulation</li> <li>XP: Mouse emulation</li> </ul>
3.4.6.	Wakeup from Windows sleep (S3) mode <sup>3</sup>	Touch and hold for 4 seconds
3.4.7.	Software installation packages	<ul style="list-style-type: none"> <li>End user installation: Microsoft certified driver in EXE format and optional TSCU</li> <li>Factory installation: Microsoft certified driver in INF format and optional TSCU</li> </ul>
3.4.8.	Language support	Czech, Danish, Dutch, English, French, German, Greek, Hebrew, Italian, Japanese, Korean, Polish, Portuguese (Brazilian), Russian, Simplified Chinese, Spanish (European), Traditional Chinese, Turkish
3.4.9.	User calibration	Calibration can be initiated via NextWindow TSCU, Windows 7 calibration routine, or NextWindow API

### 3.5. USB Interface

Ref.	Item	Description
3.5.1.	USB	USB 1.1 full speed (12 Mbps); USB bulk transfer
3.5.2.	USB VID	0x1926
3.5.3.	USB PID	0x09C4
3.5.4.	USB speed	Full speed (12 Mbps)
3.5.5.	USB socket	5 wire (USB + Shield)
3.5.6.	USB male connector	Supplied on NextWindow controller board Neltron <sup>4</sup> 1251TM: 1.25 mm terminal housing
3.5.7.	USB female connector	Not supplied by NextWindow Neltron 1251HM-05: 1.25 mm 5-way wire-to-board housing, supplied by integrator

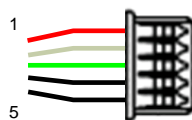


Figure 4 USB Connector to System Motherboard Pin Assignments (Not supplied)

<sup>1</sup> Digitizer input to Windows refers to touch digitizer as opposed to pen digitizer in tablet PCs

<sup>2</sup> Windows7 multi-touch support: Home Premium, Ultimate, Professional, Enterprise

<sup>3</sup> Set as default by Microsoft

<sup>4</sup> [www.neltron.com.tw](http://www.neltron.com.tw)

### 3.6. Standards

Ref.	Item	Description
3.6.1.	RoHS	Compliant
3.6.2.	EMC standard	Depends on final system configuration; integrator responsible
3.6.3.	TCO	Depends on final system configuration; integrator responsible
3.6.4.	ESD handling	JEDEC JESD625-A

## 4. Absolute Maximum Ratings

Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the devices at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

### 4.1. Electrical Absolute Maximum Ratings

Ref.	Item	Min.	Max.	Unit	Notes
4.1.1.	Power Supply Voltage	-0.3	5.25	V	
4.1.2.	Voltage on any USB interface signal with respect to GND	-0.3	5.8	V	

### 4.2. Environmental Absolute Maximum Ratings

Ref.	Item	Min.	Max.	Unit	Notes
4.2.1.	Operating altitude	0	2500	m	
4.2.2.	Storage altitude	0	4572	m	
4.2.3.	Operating temperature	0	50	° C	
4.2.4.	Storage temperature	-30	85	° C	
4.2.5.	Relative humidity	10%	90	%	1

Notes: 1. Non-condensing, operating and storage

## 5. Product Options

The touch screen is supplied as either:

- A component kit form requiring assembly onto a glass substrate
- A fully assembled touch screen on glass



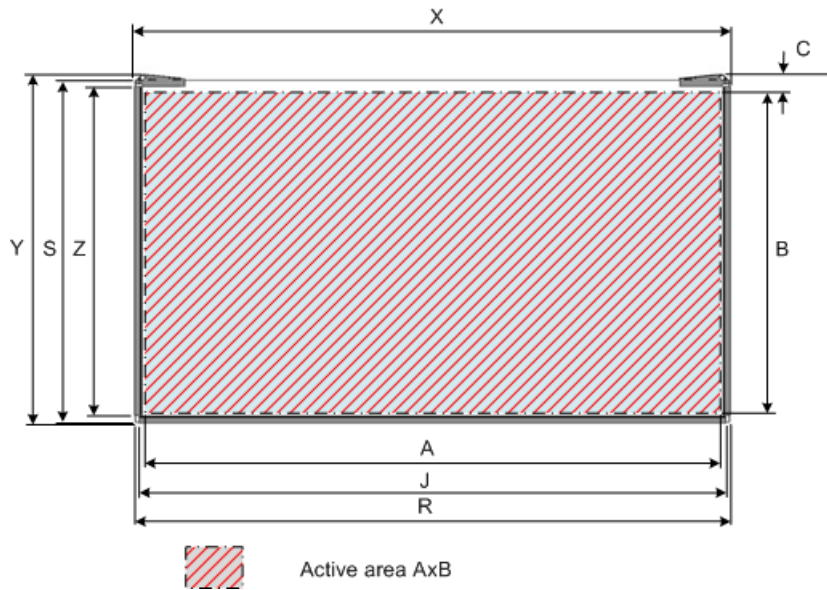


Figure 5 2500 Dimensions

### 5.1. Kit Options

For the 2500 kit option each touch screen unit is supplied as six components for assembly by the integrator. The dimensions of the components will vary with screen size as defined in Table 2 below. The integrator is required to supply the glass substrate.

Item	Description	Qty
1	Base retroreflective bar.	1
2	Side retroreflective bar.	2
3	Left hand camera assembly.	1
4	Right hand camera assembly	1
5	DSP controller board	1

Table 1 2500 Kit Components

Part Number	Description	Total Width	Total Height	Active Width Max	Active Height Max	Top Buffer min	Glass Width	Glass Height	Base Bar Length	Side Bar Length	FFC Length
		X <sup>1</sup>	Y <sup>1</sup>	A <sup>1</sup>	B <sup>1</sup>	C <sup>1</sup>	R <sup>2</sup>	S <sup>2</sup>	J <sup>1</sup>	Z <sup>1</sup>	F <sup>3</sup>
2500329K	32" , Standard Kit, Landscape	726	430	702	394.5	23.5	723	419	713	398	700
2500429K	42" , Standard Kit, Landscape	958	562	934	525.5	24.5	955	551	945	530	700
2500469K	46" , Standard Kit, Landscape	1046	611	1022	574.5	24.5	1043	600	1033	579	1000
2500479K	47" , Standard Kit, Landscape	1070	625	1046	588	25	1067	614	1057	593	1000
2500529K	52" , Standard Kit, Landscape	1184	691	1160	652	27	1181	680	1171	659	1000

Table 2 2500 Kit Standard Options

Notes:

- 1) Dimension tolerance of  $\pm 1$ mm.
- 2) Integrator supplies glass to dimensions specified in Table 2  $\pm 0.8$ mm

## 5.2. On-Glass Options

For the 2500 on-glass option each touch screen unit is supplied fully assembled<sup>5</sup>.

Part Number	Description	Total Width	Total Height	Active Width Max	Active Height Max	Top Buffer min	Glass Width	Glass Height	Base Bar Length	Side Bar Length	FFC Length
		X <sup>1</sup>	Y <sup>1</sup>	A <sup>1</sup>	B <sup>1</sup>	C <sup>1</sup>	R <sup>2</sup>	S <sup>2</sup>	J <sup>1</sup>	Z <sup>1</sup>	F <sup>3</sup>
25003294	32" , Standard On 4mm Glass, Landscape	726	430	702	394.5	23.5	723	419	713	398	700
25004294	42" , Standard On 4mm Glass, Landscape	958	562	934	525.5	24.5	955	551	945	530	700
25004694	46" , Standard On 4mm Glass, Landscape	1046	611	1022	574.5	24.5	1043	600	1033	579	1000
25004794	47" , Standard On 4mm Glass, Landscape	1070	625	1046	588	25	1067	614	1057	593	1000
25005294	52" , Standard On 4mm Glass, Landscape	1184	691	1160	652	27	1181	680	1171	659	1000

Table 3 2500 Kit On Glass Options

Notes:

- 1) Dimension tolerance of  $\pm 1$ mm
- 2) Dimension tolerance of  $\pm 0.8$ mm
- 3) Dimension tolerance of  $\pm 10$ mm

<sup>5</sup> The DSP board is temporarily attached to the glass and not connected. The board still needs to be connected then mounted in the bezel or at the rear of the panel.

## 6. Appendix B – NextWindow Touch Screen Calibration Utility

NextWindow Touch Screen Calibration Utility (TSCU) provides support for NextWindow 2500 series touch screens in Windows XP and Vista. For full information, refer to *NextWindow Touch Screen Calibration Utility Specification*.

### Settings and Tools Tab

The settings dialog provides the following functionality.

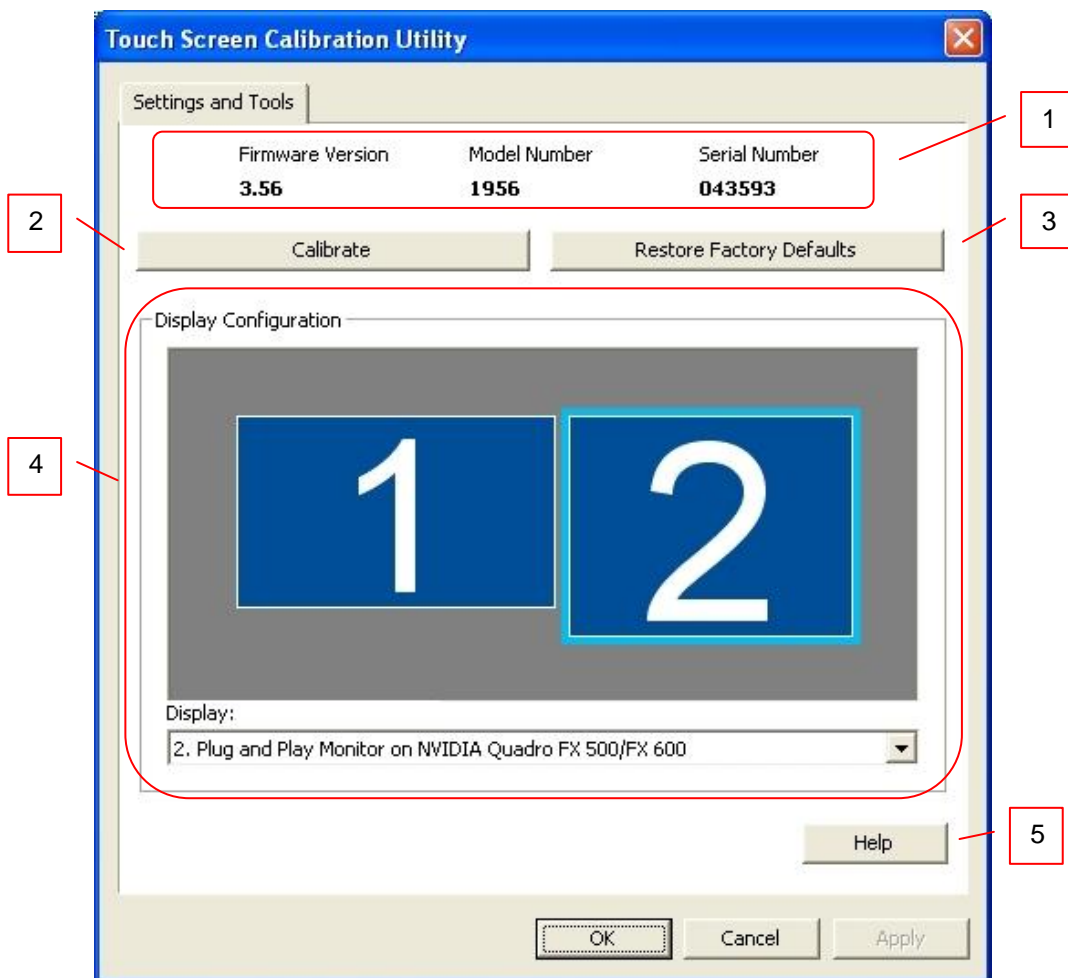


Figure 6 - TSCU Settings and Tools Tab

1. System ID numbers to assist with customer support.
2. Calibration if the monitor aspect ratio is changed or custom calibration is required.
3. Restoring calibration to factory default settings.
4. Drop-down list for selecting touch display.
5. TSCU Help.



New Zealand  
PO Box 91383, Victoria Street West  
Auckland, 1142, New Zealand  
t +64 0 353 6608  
f +64 9 353 6609

[nextwindow.com](http://nextwindow.com)