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3M™ Multi-touch Display M2256PW User Guide

Read and understand all safety information
contained in this document before using this product.



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Contents

Chapter 1	Introduction	
	Overview	5
	Important Safety Information.....	5
	Important Notes.....	7
	Maintaining Your Touch Display	7
	Touch Sensor Care and Cleaning.....	8
	3M Touch Systems Support Services	8
	Contact 3M Touch Systems	9
Chapter 2	Setting up Your M2256PW Multi-touch Display	
	System Requirements	10
	Unpacking Your Touch Display	11
	Connecting the Touch Display.....	12
	Testing the M2256PW Multi-touch Display.....	12
	Arm Mounting Option.....	12
	Video Card Requirements	13
	Using the Standard Controls for the Video Card	13
	Supported Video Display Modes and Refresh Rates	13
	Configuring the Display Settings	14
	Multimedia Features.....	14
	Access to the Video Controls.....	14
	Adjusting the M2256PW Video Display	15
Chapter 3	Enabling Your M2256PW Multi-touch Display	
	Windows™ 7 USB Compatibility.....	18
	All Other Platforms	18
	Multitouch Application Support	18
	Installing 3M™ MicroTouch™ Software.....	19
	Video Alignment.....	19

Appendix A	3M™ PX USB Controller Communications	
	Overview of USB Firmware Communications	21
	Communication Basics.....	21
	Receiving Reports from the Controller.....	22
	Command Set	22
	Set Feature - Calibration	22
	Get Feature - GetStatus	24
	Get Feature - GetMaxCount.....	25
	Set Feature - Reset	26
	Set Feature –Restore Defaults.....	27
	Asynchronous Reports	27
Appendix B	3M™ PX Serial Controller Communications	
	Overview of Firmware Commands	29
	Controller Default Settings	30
	Communicating with the Controller.....	30
	Firmware Commands	32
	Calibrate	33
	Guidelines for Calibrate Command	34
	Get Copyright.....	35
	Mode Down Up.....	35
	Mode Inactive.....	35
	Mode Stream	35
	Name Command.....	36
	Null Command	36
	Output Identity	36
	Soft Reset	36
	Restore Defaults.....	37
	Unit Type	37
	Touch Data Format	38
Appendix C	Regulatory Information	
	Regulatory Agency Approvals.....	40
	FCC Warning	41
	CE Conformity for Europe.....	41

CHAPTER 1

Introduction

Overview

Congratulations on the purchase of your 3M™ Multi-touch Display M2256PW. This guide describes how to set up your M2256PW Multi-touch Display.

The M2256PW Multi-touch Display is a 22” LCD with 16:10 aspect ratio with an attached desktop stand. 3M Multi-touch Technology, based on 3M Projected Capacitive touch technology and electronics, offers fast, accurate and simultaneous 20-finger touch functionality for next-generation, multitouch applications.

This display provides true multi-touch functionality supporting up to 20 independent touches as well as traditional pinch, expand and rotate features. Each touch is independently recognized thereby supporting true multi-touch and multi-user input.

The M2256PW Multi-touch Display uses projected capacitive technology with an all glass front surface and provides multi-touch functionality in a highly durable form factor. The fast response rate enables the creation of multitouch applications and supports real time rendering of maps and other speed sensitive applications.

Important Safety Information

Read and understand all safety information before using this product. Follow all instructions marked on the product and described in this document. Pay close attention to the following installation warnings and safety precautions.

Intended Use
The 3M Multi-touch Display M2256PW was designed for touch input and tested to replace an existing display. These displays are intended for indoor use only and are not designed for use in hazardous locations.

Explanation of Signal Word Consequences

⚠ DANGER: Indicates a potentially hazardous situation, which, if not avoided, will result in death or serious injury and/or property damage.

⚠ WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury and/or property damage.

⚠ CAUTION: Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and/or property damage.

CAUTION: Indicates a potentially hazardous situation, which, if not avoided, may result in property damage.

⚠ DANGER

To avoid the risk of fire and/or explosion which will result in serious injury or death:

- Do not install or use this product in a hazardous location.

⚠ WARNING

To avoid the risk of fire which could result in serious injury or death:

- Do not remove the cover or back of the display.

To avoid the risk of electric shock which could result in serious injury or death:

- Plug power cord into appropriate grounded power source.
- Do not use a damaged power supply.
- Do not use a power cord that is frayed or otherwise damaged.

⚠ CAUTION

To avoid the risk of electric shock which may result in minor or moderate injury:

- Do not service the Flat Panel Display yourself. There are no user serviceable parts inside. Refer all servicing to qualified service personnel.
- The backlight inverter output is at high voltage.
- Do not use non-conforming replacement parts.
- Do not place wet or damp objects on the display.
- Do not expose the display to rain or other sources of water, steam, or moisture.
- Do not place foreign objects on the display or its cables.
- Do not remove the cover or back of the display.
- Ensure that connecting the unit to the power source will not overload the power source.

To avoid the risk of glass breakage which may result in minor or moderate injury:

- Handle the display with care to avoid breaking the touch sensor. The display contains glass parts. Dropping the display may cause the glass parts to break.
- Ensure mounting screws are tightened fully to prevent instability.
- Do not place foreign objects on the display.

⚠ CAUTION

To avoid the potentially hazardous situations associated with the use of isopropyl alcohol which may result in minor or moderate injury or property damage:

Follow all instructions and recommendations in the manufacturer's Material Safety Data Sheet and product label.

To avoid possible environmental contamination which may result in minor or moderate injury:

- The lamp(s) inside this product contain mercury (Hg) and must be recycled or disposed of in accordance with local, state, or federal laws. Check your individual state's requirements to see if specific recycling requirements exist for mercury-containing products or other electronic products. Refer to <http://www.nema.org/lamprecycle/> or call 3M Touch Systems 1-866-407-6666 for further information.
- Dispose of the flat panel display according to applicable governmental regulations.

Important Notes

- In extreme temperature and humidity situations, you may observe condensation between the touch screen and the display. To minimize this condition, place the unit where it will be used and allow a 24-hour environmental stabilization period prior to powering on the display. Any noticeable condensation is temporary and will have no long term affect on the operation of the display.
- When unplugging power supply cord, hold the plug, do not pull by the cord.
- Do not connect or disconnect this product during an electrical storm.
- Install the display in a well-ventilated area. Always maintain adequate ventilation to protect the display from overheating and to ensure reliable and continued operation.
- Do not expose this display to direct sunlight or heat. Passive heat may cause damage to the housing and other parts.
- An inherent characteristic of the PCT sensor is a fine grid pattern that may be visible under certain lighting conditions.
- Do not install this display in areas where extreme vibrations may be generated. For example, nearby manufacturing equipment may produce strong vibrations. The vibrations may cause the display to exhibit picture discoloration or poor video quality.
- To avoid ergonomic concerns:
Do not install the display in a manner or location with awkward accessibility. Extended use may result in muscle, tendon, or fixed posture strains. It is recommended you take periodic breaks from continuous use.

Maintaining Your Touch Display

To maintain your display and keep your display operating at peak performance:

- Keep your display and touch sensor clean.
- Adjust the display video controls.

- Do not install the display in a place where ventilation may be hindered. Always maintain adequate ventilation to protect the display from overheating and to promote reliable and continued operation.

Touch Sensor Care and Cleaning

The touch sensor requires very little maintenance. 3M Touch Systems recommends that you periodically clean the glass touch sensor surface. Be sure to turn off your display before cleaning.

Typically, an isopropyl alcohol and water solution ratio of 50:50 is the best cleaning agent for your touch sensor. You can also use straight isopropyl alcohol.

CAUTION

To avoid the potentially hazardous situations associated with the use of alcohol or other solvents which may result in minor or moderate injury or property damage:

- Follow all instructions and recommendations in the manufacturer's Material Safety Data Sheet and product label.
 - Be sure to follow solvent manufacturer's precautions and directions for use when using any solvents
 - It is important to avoid using any caustic chemicals on the touch sensor. Do not use any vinegar-based solutions.
- Apply the cleaner with a soft, lint-free cloth. Avoid using gritty cloths.
 - Always dampen the cloth and then clean the sensor. Be sure to spray the cleaning liquid onto the cloth, not the sensor, so that drips do not seep inside the display or stain the bezel.

3M Touch Systems Support Services

3M Touch Systems, Inc. provides extensive support services through our website and technical support organization. Visit the 3M Touch Systems website at <http://www.3m.com/touch>, where you can download MT 7 software and drivers, obtain regularly updated technical documentation on 3M Touch Systems products, and learn more about our company.

Whenever you contact Technical Support, please provide the following information:

- Touch display size, part number and serial number
- Current driver version
- Operating system used
- Information on additional peripherals

Technical Support is available Monday through Friday 8:30 a.m. to 5:30 p.m. with limited call back service after 5:30 p.m. until 8:00 p.m. US Eastern Standard Time – 9 a.m. to 5 p.m. throughout Europe.

You can contact 3M Touch Systems, Inc. Technical Support (US only -- Eastern Standard Time) by calling the hot line, sending email or a fax.

- Technical Support Hot Line: 978-659-9200
- Technical Support Fax: 978-659-9400
- Toll Free: 1-866-407-6666 (Option 3)
- Email: US-TS-techsupport@mmm.com

Contact 3M Touch Systems

Contact information for all offices can be found on our website at:

<http://www.3m.com/touch>

CHAPTER 2

Setting up Your M2256PW Multi-touch Display

This chapter describes how to set up your 3M Touch Systems M2256PW Multi-touch Display. You need to complete the following tasks:

- Unpack the components
- Connect the video, touch display cables, and power cables
- Power on the display and test your setup
- If you are not running Windows 7 (or Tablet PC), install MT7 software from the enclosed CD. Note that this will not make multitouch happen -- it is up to your application to enable multitouch.

System Requirements

The M2256PW Multi-touch Display requires a personal computer (PC). The requirements for your PC are as follows:

- Your PC must have an available USB or RS-232 serial communication (COM) port. You connect the touch sensor cable to this port.
- Your PC must have a video card and video driver already installed for the display. If you need to install a video card or a video driver, refer to your computer documentation for instructions.

When choosing your workspace, select a sturdy, level surface. Also, make sure you can easily access the back of the touch display and the computer. Easy access helps ensure a smooth setup of the touch display.

Note: Before setting up your M2256PW Multi-touch Display, refer to the “Important Safety Information” section at the beginning of this document.

Unpacking Your Touch Display

Carefully unpack the carton and inspect the contents. Your M2256PW Multi-touch Display includes the following cables and accessories:

- USB and RS-232 serial communication cables
- DVI and VGA video cables
- Audio cable
- US and European power cables
- Software CD and documentation

Cables Included with Your M2256PW Multi-touch Display



USB Cable



9-pin RS-232 serial cable



EU power cable



US power cable



VGA cable



DVI cable



Audio cable

Connecting the Touch Display

⚠ CAUTION

You are cautioned that any change or modification to the equipment not expressly approved by the party responsible for compliance could void your authority to operate such equipment.

To connect the M2256PW Multi-touch Display:

1. Turn off your computer. You should always turn off the computer before connecting or disconnecting a device.
2. Select either the DVI or VGA cable. Connect one end of the video cable to the video connector on the display. Connect the other end to the video card in your computer.
3. Connect one end of the touch sensor cable (either USB or serial) to the LCD. Connect the other end to an available port on your computer.
4. Plug the AC power cord into the display.
5. Connect the power cable to an appropriate power source.

Testing the M2256PW Multi-touch Display

Note: The M2256PW Display has a power status light located on the front of the bezel.

After connection, turn on the power switch located at the bottom of the front bezel.

Before testing your touch display, make sure all cables are connected properly. Be sure to tighten all cable screws.

To test that the display is working properly:

1. Turn on your computer.
2. Make sure the video image is displayed. If it is not, check the LED to ensure that the display is not in power save mode (orange).
3. Make sure the video image is centered within the screen area. Use the display controls to adjust the image, if necessary.

You can adjust the horizontal and vertical position, contrast, and brightness to better suit your video card and your personal preference.

Arm Mounting Option

The unit has a 100 mm VESA mounting pattern on the back to allow for arm mount capability. Use M4 x 8 mm screws to secure the VESA mount stand. Follow the manufacturer's instructions included with the mounting device to properly attach your display.

Note: Do not use longer screws as they could potentially damage electronics inside the display.

Video Card Requirements

Before you connect your touch display, make sure your computer has a video card installed that supports the native video resolution of 1680 x 1050 for the M2256PW Multi-touch Display. If you need information on installing a video card or video driver, refer to the manual that came with your video card.

Using the Standard Controls for the Video Card

In addition to the standard controls on the display, each video card has several controls that let you adjust the display settings. The software and driver for each video card is unique. In most cases, you adjust these settings by using a program or utility provided by the manufacturer of the video card.

For example, you can use the Windows Display Properties control panel to adjust the desktop area (resolution), color depth, and refresh rate. Whenever you change these settings, the image size, position, or shape may change. This behavior is normal. You can readjust the image using the display controls described in this chapter.

For more information on adjusting the desktop area/resolution, color depth, or refresh rate, refer to the user manual that came with your video card. If you change the resolution, it is a good idea to calibrate your touch screen.

Supported Video Display Modes and Refresh Rates

Your video card should support one of the display modes specified in Table 1. If you select an unsupported video mode, the display may stop working or display unsatisfactory picture quality.

Table 1. Applicable Display Mode and Refresh Rate

Display Mode	Refresh Rate (Hz)
640 x 350	70
640 x 480	60, 70, 72, and 75
720 x 400	70
800 x 600	56, 60, 70, 72, and 75
1024 x 768	60, 70, and 75
1280 x 720	60 and 75
1280 x 1024	60 and 75
1360 x 768	60 and 75
1680 x 1050	60

Configuring the Display Settings

After you connect your M2256PW Multi-touch Display and turn on your computer, you may need to configure one or more of these display settings. The ideal setting for the M2256PW Multi-touch Display is as follows:

- Display mode (also called desktop area or video native resolution) 1680 x 1050
- Refresh rate (also called vertical scan rate or vertical sync) 60 Hz
- Color depth (also called color palette or number of colors) at least 16-bit (high color)

Multimedia Features

The M2256PW Multi-touch Display comes with speakers built into the back of the display housing and includes audio cables. These cables can be connected underneath the display.



Access to the Video Controls

This section provides guidelines for adjusting the video display and using the display controls to adjust the image to your liking. The controls for adjusting the video display are located on the bottom right of the M2256PW Multi-touch Display. These buttons let you display the on-screen menu and adjust the phase, image position, contrast, and brightness. Before you make any adjustments:

- Be sure to adjust the controls in your normal lighting conditions.
- Display a test image or pattern whenever you adjust the video.



Menu/Select Down Up Auto/Exit Power LED

Adjusting the M2256PW Video Display









Your M2256PW Multi-touch Display has four controls to adjust the video display.

















- Menu – Shows or hides the on screen display menu.
- Select -- Highlights the current menu option or saves the current setting. Press ▲ or ▼ to change the value.
- ▲/Up -- Enables you to scroll forward through items on the menu -- increase the value of selected option or move to the next menu item.
- ▼/Down -- Enables you to scroll backwards through items on the menu -- decrease the value of selected option or move to the previous menu item.











If you do not press the Menu, Select, or ▲/up or ▼/down adjust buttons for up to 45 seconds, the display adjustment program times out and hides the menu options. You can press the Menu button at any time to display the options again.

Pressing Menu will pull up the On Screen Display (OSD) menu, as shown below.



OSD	Choices	Description
	  	SIGNAL SELECT Choices are VGA, DVI, or Exit Selects the applicable input source
	  	VIDEO Choices are Brightness, Contrast, or Exit BRIGHTNESS Selecting the Brightness option will allow you to adjust the brightness of the display. Adjust the brightness using the up and down buttons and press SELECT to confirm the new

OSD	Choices	Description
		setting. CONTRAST Selecting the Contrast option increases or decreases the strength (lightness or dimness) of the image. Adjust the contrast using the up and down buttons and press SELECT to confirm the new setting.
	 	AUDIO Adjust the volume of the speakers
	   	COLOR Submenu Choices are User Defined Color, Preset Color Temperature, or Exit USER DEFINED COLOR Adjust the Red, Green and Blue channels to your preference. COLOR TEMPERATURE Adjusts color temperature to PRESET 1 (6500 color temperature) or PRESET 2 (9300 color temperature).
	     	IMAGE Choices are Auto Tune, Clock, Phase, H. Position, V. Position, or Exit AUTO TUNE Performs automatic configuration of the Clock, Phase, Vertical and Horizontal positions. CLOCK and PHASE If the clock setting of your image is not fine-tuned, you may observe periodic vertical bars of video noise on your image. These bars of noise are usually adjusted out when an Auto Configuration is performed. If the bars of noise are still present, this setting can be adjusted manually. Adjust this setting so that either the vertical bars of noise are replaced by an even amount of noise across the whole screen, or the noise disappears completely. If you do an Auto Tune, the display will try to find the best Clock/Phase setting. If you are not satisfied with the auto adjustment, fine-tune the clock manually as described above. H POSITION (Horizontal Position) Moves image horizontally on screen either left or right. V POSITION (Vertical position) Moves images vertically on screen either up or down
		LANGUAGE Sets the language for the OSD -- the choices are English, French, German, Italian, and Chinese

OSD	Choices	Description
	      	<p>TOOLS Choices are OSD Timing, OSD Horizontal, OSD Vertical</p> <p>OSD TIMING Adjust how long the menu remains on the screen. Submenu choices are: Recall, Sharpness, or Exit</p> <p>OSD HORIZONTAL and VERTICAL Adjusts the position of the OSD on your screen</p> <p>RECALL Resets the control functions back to the original factory preset values. In order for the Recall function to work, the timing must fall under one of the factory preset timing modes.</p> <p>SHARPNESS Adjusts the video quality to be sharp or blurry (special for text mode).</p>
		<p>EXIT Exits the OSD menu.</p>

CHAPTER 3

Enabling Your M2256PW Multi-touch Display

Windows™ 7 USB Compatibility

3M multi-touch technology works seamlessly with the Windows™ 7 operating system. The Multi-touch display supports USB HID for direct communication. The M2256PW Multi-touch Display leverages all the multi-touch functionality that is native to Windows™ 7. Plug the display in to a system running Windows™ 7 and you'll quickly enter the world of true multi-touch functionality.

The M2256PW Multi-touch Display is compatible with Windows 7 with no additional software. Refer to Microsoft's Windows 7 documentation for additional information.

All Other Platforms

When using a Windows™ 7 serial connection or for Windows XP, Vista or Linux operating systems (either USB or serial), 3M provides MicroTouch MT 7 Software for multi-touch drivers. This guide includes information for writing your own drivers to interface with the 3M Multi-touch Technology.

For non-Windows 7 operating system users this document provides the communication protocol necessary to talk directly with the electronics. This enables software developers using other operating systems such as Microsoft Windows™ Vista or Linux® to write their own drivers and achieve the same multi-touch results.

Multitouch Application Support

Remember not all applications are multitouch ready -- Multitouch behavior is a function of YOUR application. Check with your application vendor to determine if your software has multitouch capability.

Installing 3M™ MicroTouch™ Software

Remember that Windows™ 7 does not require any additional software to enable multitouch functionality.

However, for Windows™ XP, Vista or Linux® operating systems, 3M™ MicroTouch™ Software enables your M2256PW Multi-touch Display to work with your computer. 3M™ MicroTouch™ Software includes a control panel for setting your touch sensor preferences and a diagnostic utility. If you are experiencing problems with the touch sensor, you can use the diagnostic utilities provided to test the system.

For more information on installing this software and using the control panel, refer to the 3M™ MicroTouch™ Software User Guide on the accompanying CD or on the corporate website at www.3m.com/touch.

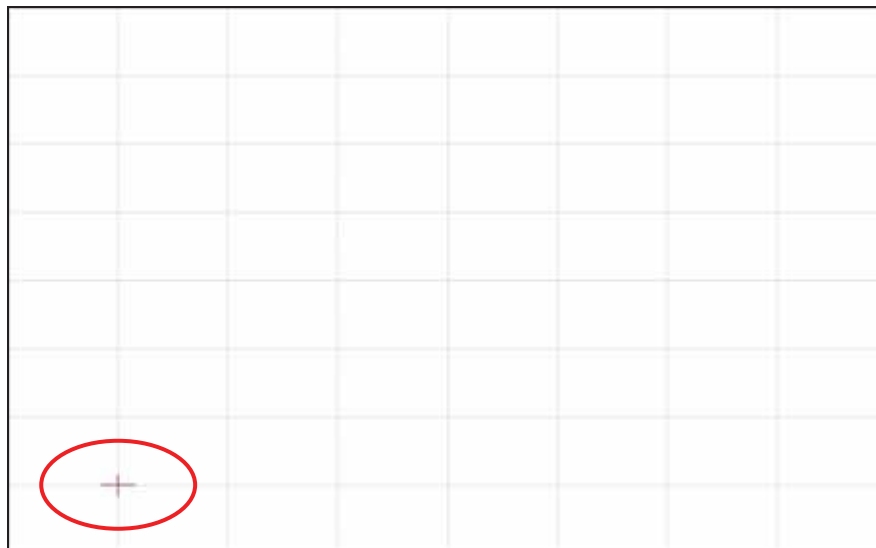
Video Alignment

The M2256PW has been calibrated prior to shipment and the display as delivered should not require video alignment. You should be able to accurately touch icons on the sensor. If for some reason, you cannot do this, the touch sensor's active area may not be aligned to the underlying video.

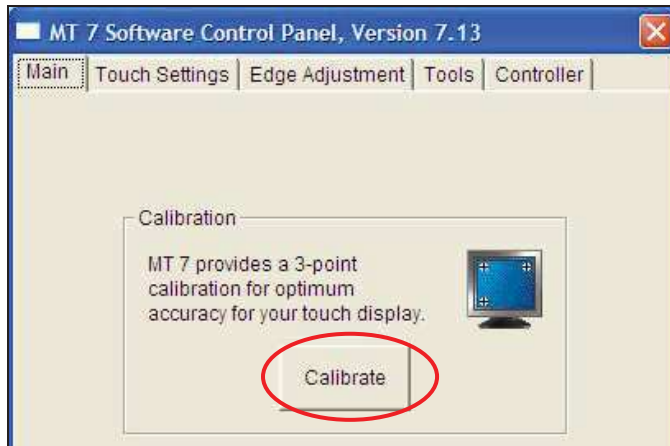
Regardless of the operating system, after you connect your touch display:

- If you are using Windows 7, you may calibrate by accessing the Software Diagnostic Utility (SDU) found on the enclosed CD.

Launch the SDU from the CD. Select the Tools menu and highlight Calibration. The screen below appears and you should touch the 2 targets as they appear. Press Escape to cancel Calibration.



- If you are using 3M™ MicroTouch™ MT 7 Software, launch the MT 7 Control Panel and follow the instructions on the Main tab. You'll be asked to touch 3 targets.



- If you are writing your own drivers, you should provide your own video alignment tool.

Use the Paint program (Start> Programs> Accessories> Paint) to determine if you have multitouch operation. Retest the accuracy after you perform a calibration.

APPENDIX A

3M™ PX USB Controller Communications

This appendix is intended for software developers only and discusses the fundamentals of communicating with the PX controller. The firmware commands, which are usually issued by a driver or utility program on the host system, control the operation of the controller. This appendix lists the recommended firmware commands and describes how to use each of these commands.

Overview of USB Firmware Communications

Developers may use this information when writing touch applications, developing custom drivers or touch configurations, or testing their touch systems. Developers can issue commands to initialize the controller, select operating modes, and execute diagnostic functions.

Note: This document assumes you are familiar with USB standards and modes of communication with USB devices, as well as firmware commands and how to use them. Executing some commands may alter the performance of your sensor and render it inoperable. You should be aware of the results before executing any firmware commands.

To optimize the performance of the PX controller and simplify the development of custom drivers, 3M Touch Systems recommends you use the commands listed in this appendix for current development.

Communication Basics

This section provides information on sending firmware commands to the controller and interpreting the responses that the controller returns. The default operation of the PX controller is USB Rev 2.0 full speed.

The USB command set is implemented by using vendor requests and vendor reports, i.e., vendor specific transactions. The controller issues some reports without prompting the computer. The computer can also send requests to the controller to change how it operates or receives information about the controller. The controller issues a

synchronous report in response to some of these requests.

You need to know product ID (0502H) and the vendor ID (0596H) to write your own driver. These values are required for identifying the controller.

Receiving Reports from the Controller

The controller sends a variety of reports to the computer. The first byte of each report is the Report ID that defines the structure and content of the report. The controller sends some reports as a direct response to a computer request (synchronous). The controller will also send some reports as the result of an external event, such as a touch (asynchronous).

Command Set

The USB command set is implemented by using HID Get Feature and Set Feature commands. The various requests and reports are grouped together by report size under a common feature ID.

HID Class Requests

The following table summarizes the available HID class requests.

Table 1. HID Class Requests Summary

HID Report	Command Name	bmRequest Type	bRequest	Feature Report ID	Report Subtype	Data Stage Bytes
Get Feature	GetStatus	0xA1 (D2H)	0x01	0x06	--	8
Set Feature	Calibrate	0x21 (H2D)	0x09	0x03	4	8
Set Feature	Reset	0x21 (H2D)	0x09	0x03	7	8
Set Feature	Restore Defaults	0x21 (H2D)	0x09	0x03	8	8
Get Feature	GetMaxCount	0xA1 (D2H)	0x01	0x12	--	2

Set Feature - Calibration

This is a command to do a Calibrate Extended style calibration. The controller will auto-orient on this 2 point calibration.

Table 2. Calibration Setup Stage

Offset	Field	Size	Value	Description
0	bmRequestType	1	0x21	Class,H2D,Interface
1	bRequest	1	0x09	Set Report
2	wValue	2	0x0303	Msb 03 = Feature Lsb 03 = Feature Report ID
4	wIndex	2	0	Always 0
6	wLength	2	8	Always 8

Table 3. Data Stage

Offset	Field	Size	Value	Description
0	Report ID	1	0x03	Feature report ID
1	Report Subtype	1	0x04	Indicates a calibration request
2	bCalType	1	0x01	0x01 = Extended cal (CX)
3--7	Not used	5	0	Not used

The device stalls endpoint 0 if the command cannot be processed successfully. The request cannot be processed if an invalid calibration type is given in the wValue field. The request will also fail if the 2 calibration points do not fall within certain bounds established by the firmware. These bounds require that the 2 calibration points be in opposite quadrants of the sensor.

The host should issue a GetStatus request to determine the status of this request. The status report includes a command status byte which will be set as shown below.

Table 4. Calibration Response

Command Status Byte	Description
0	Calibration Failed
1	Controller is waiting for a touch in the lower left corner. Calibration software paints a target in the lower left corner.
2	Controller is waiting for a touch in the upper right corner. Calibration software paints a target in the upper right corner.
3	Calibration completed successfully.

The controller does not timeout waiting for touch. Use the soft reset command to abort the calibration.

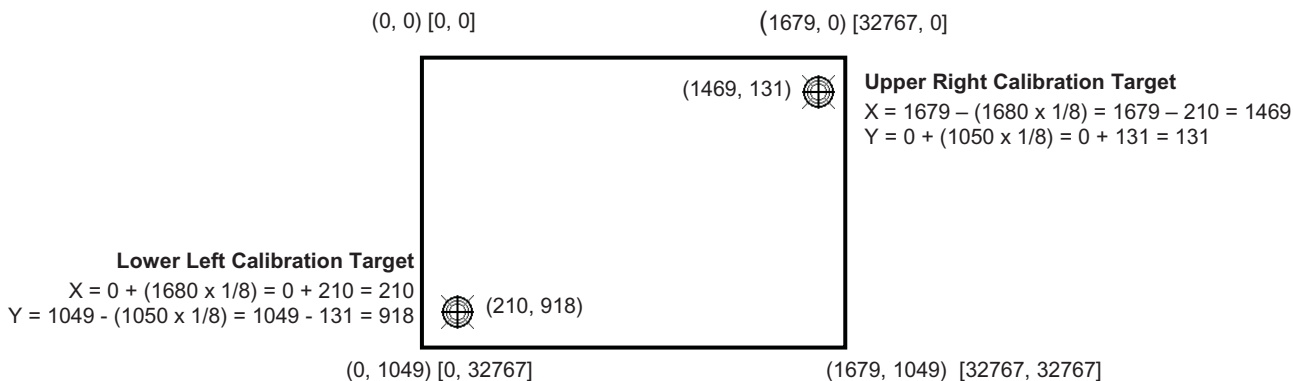
Determining Target Areas

The default calibration targets (points) are located 12.5% (1/8) inward from the corners of the video image. For example, suppose the resolution of your Windows-based display is 1680 x 1050. The Calibrate Extended command calculates the amount to move inward as follows:

- Amount to move inward in the X direction: $1680 \times 1/8 = 210$
- Amount to move inward in the Y direction: $1050 \times 1/8 = 131$

The Calibrate Extended command then positions the first calibration target inward from the lower left corner (0,1049) and the second calibration target inward from the upper right corner (1679,0). The following illustration shows how the calibration targets are calculated for a Windows-based system. Your operating system may be different.

The illustration below shows the coordinates of the calibration targets and display corners. The corners show the video coordinates in parentheses and the touch screen coordinates in brackets.



Get Feature - GetStatus

This is a request to send information that indicates the status of the controller. Among the uses for this request are determining whether there were any power on check errors and determining whether the last request was completed successfully.

Table 5. Controller Status Setup Stage

Offset	Field	Size	Value	Description
0	bmRequestType	1	0xA1	Class,D2H,Interface
1	bRequest	1	0x01	Get Report
2	wValue	2	0x0306	msb=03=Feature lsb=06= Feature Report ID
4	wIndex	2	0	Always 0
6	wLength	2	8	Always 8

Table 6. Controller Status Data Stage (controller response)

Offset	Field	Size	Value	Description
0	Report ID	1	0x06	Feature Report ID
1	POC Status	1	0xFF	Power On Check Status
2	Cmd Status	1	0xFF	Status of last command
3	Touch Status	1	0	Not used
4	Async Reports	1	0xFF	0x00 = async touch output off 0x01 = async touch output on
5-7	Not used	3	0	Not used

POC Status – The status of the Power-on Checks. Various controller systems are checked at power-up. If any failures in these systems are detected, a POC flag is set. The POC status field reports the state of these flags.

Table 7. Power On Check Bit Fields

Bit Number	Description	Notes
0	Not used	
1	ROM_ERROR	Code area checksum error
2	PWM Error	Touch screen not connected or potential problem
3	NOV_ERROR	Parameter blocks checksum error
4	HDW_ERROR	Problem with ADCs
5--7	Not used	

Cmd Status – The status for the last command request. This field is used to determine whether the last request was processed successfully. It is also used to track the progress of a multi-stage request, such as 2 point calibration. The Status Request does not affect the contents of this field, i.e., successful or unsuccessful processing of a previous status request does not cause the command status field to be updated.

Table 8. Valid Command Status Field Entries

Response	Description
0	Failure in command processing
1	Command being processed
2	Stage 1 processing complete (for multi-stage commands)
3	Command complete
4	Soft Reset Occurred
5	Hard Reset Occurred
6 -- 7	Not used

Get Feature - GetMaxCount

This is a request to send information that indicates the maximum number of simultaneous touches supported by the controller.

Table 9. Setup Stage

Offset	Field	Size	Value	Description
0	bmRequestType	1	0xA1	Class,D2H,Interface
1	bRequest	1	0x01	Get Report
2	wValue	2	0x0312	msb=03=Feature lsb=12 Feature Report ID
4	wIndex	2	0	Always 0
6	wLength	2	2	Always 2