Touch your Imagination Today

GENERAL Touch

Desk Top Touchmonitor Users Guide

DTL Series

World Leading
GENERAL Touch
Touch Solutions Provider

www.generaltouch.com

October 2008 Version 1.1

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Disclaimer

Trademark Acknowledgments

FCC Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received, including interference that may cause undesired operation.

Table of Contents

Important safety notice

Please read this manual carefully and save to use in the future.

⚠️ Make sure to unplug the power lead before cleaning the product. Unplug the power lead from the power outlet and wipe the product using a soft, dry cloth.

⚠️ Do not use components except those recommended by the manufacturer, failure to do so may cause damage.

⚡ Do not try to move the monitor by pulling only the cord nor touch the plug with wet hands.

⚠️ Do not excessively bend the plug and wire nor place heavy objects upon them, which could cause damage.

⚡ Keep the product away from places exposed to oil, smoke or moisture; do not install inside a vehicle, this may cause malfunction, an electric shock or fire. Especially avoid operating the monitor near water or outdoors where it could be exposed to snow or rain.

⚡ Do not cover the vents on the monitor case, do not place the monitor or power adapter on the bed, sofa, carpet etc, as bad ventilation may cause a breakdown or fire.

⚠️ When installing the product, make sure to keep it away from the wall (more than 76mm (3 inch) for ventilation purposes.

⚠️ Only the type of power listed in the label of the LCD can be used. If you have questions of power type, please contact local dealer or power supply department.

⚡ Use only a properly grounded plug and receptacle. An improper ground may

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cause electric shock or equipment damage. If you can't insert the plug into outlet, please change the outlet.

Make sure the outlet can support total electricity of products be plug into it, do not connect too many extension cords or plugs to an outlet. Otherwise it may cause fire.

Do not place the product on an unstable or small surface area. Place the product on an even, stable surface, as the product may fall and cause harm to someone walking by, specifically children.

Do not try to extend the power wire, otherwise it may cause fire.

Do not open the monitor cabinet by yourself, if monitor needs to be examined or repaired, please contact the professional service.

Firstly pull out the power plug and connect the professional service when it happens following:
    a. power wire or power cable is damaged.
    b. monitor fall into ground or monitor cabinet is damaged.
    c. monitor displays obviously out of the way, needs to be repaired.

Unplug the power cord from the power outlet when monitor is not used.

Do not install the product in places with poor ventilation, high light, high temperature or moisture.

1

Introduction

About this Manual

This manual is intended as a reference guide for the *GeneralTouch* Open Frame Touch Monitors.

This Manual provides the information needed to install, set up and maintain the *GeneralTouch* Open Frame Touch Monitors. In addition, this manual describes basic technical information about the touch sensor, troubleshooting and contact information.

This manual is organised as follows;

Chapter 1   Introduction and general information.
Chapter 2   Unpacking care and maintenance
Chapter 3   Hardware Installation guide
Chapter 4   Software Installation guide
Chapter 5   Warranty information
Chapter 6   Troubleshooting
Appendix A   Lcd Display specifications
Appendix B   Touchscreen specifications

Contact information

Representatives of GeneralTouch can be contacted on the numbers/emails below for further information and to resolve any issues you might have with our products.

GeneralTouch Technology Co., Ltd
No.6 Keyuan South Road,
High Tech Zone,
Chengdu
China, Zip Code: 610041
Telephone: (86)28-85124114
Fax: (86)28-85124115

Web:http://www.generaltouch.com

info@ generaltouch.com
sales@ generaltouch.com
technicalsupport@ generaltouch.com
customersupport@ generaltouch.com

Please check our web site on a regular basis for updates, press information, application notes, latest software drivers and utilities.

Overview

Thank you for purchasing the DTL Series Touchmonitor, they are smart multi-frequency scanning LCD with an active matrix TFT LCD that displays sharp and brilliant images of text and graphics.
The embedded touchscreen by manufactured by GeneralTouch, will enhance the whole interface between man and machine in multimedia application.

The features for the DTL Series touchmonitor

DTL153
TFT Panel
Resolutions up to   1024x768 (15")
Colours   16.2M (15") colours
Viewing angle   60/60 (left/right), 40/60 (Up/Down) for 15"

Technology   Surface Acoustic Wave touchscreen or Resistive touchscreen
Interface   USB or Serial communication port
                              VESA DDC1/2B data communication
                              VESA standard compliant

DTL152

TFT Panel

Resolutions up to	1024x768 (15")
Colours	16.2M (15") colours
Viewing angle	60/60 (left/right), 40/60 (Up/Down) for 15"

Technology	Surface Acoustic Wave touchscreen
Interface	USB/serial communication port
	VESA DDC1/2B data communication
	VESA standard compliant

DTL173

TFT Panel

Resolutions up to	1280x1024 (17")
Colours	16.7M (17") colours
Viewing angle	80/80 (left/right), 80/80 (Up/Down) for 17"

Technology	Surface Acoustic Wave touchscreen
Interface	USB/serial communication port
	VESA DDC1/2B data communication
	VESA standard compliant

DTL190

TFT Panel

Resolutions up to	1440x900 (19W")
Colours	16.7M (19W") colours
Viewing angle	80/80 (left/right), 80/80 (Up/Down) for 19W"

Technology	Surface Acoustic Wave touchscreen
Interface	USB/serial communication port
	VESA DDC1/2B data communication
	VESA standard compliant

DTL220

TFT Panel

Resolutions up to	1680x1050 (22W")
Colours	16.7M (22W") colours
Viewing angle	80/80 (left/right), 80/80 (Up/Down) for 22W"

Technology	Surface Acoustic Wave touchscreen
Interface	USB/serial communication port
	VESA DDC1/2B data communication
	VESA standard compliant

Physical Specifications

Model Parameter	DTL153
Length	368mm
Width	312mm
Thickness	56mm
Active area	304.1x228.1mm
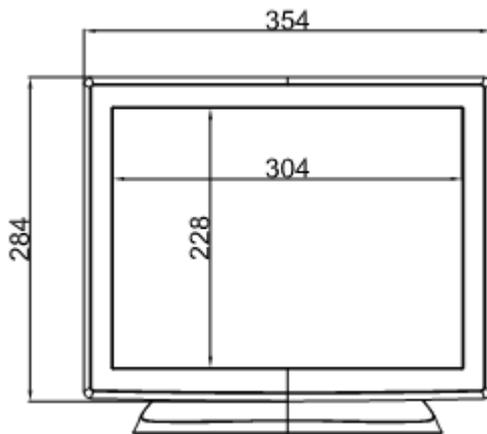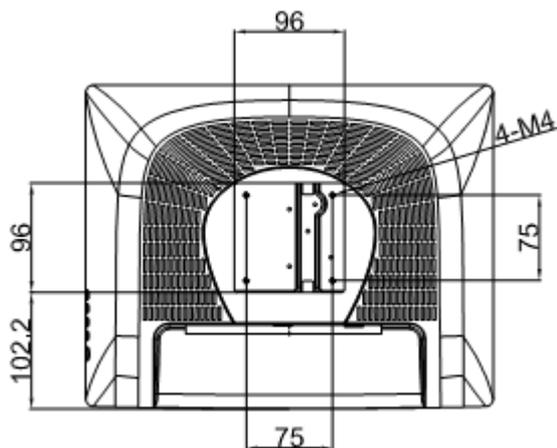
Top view

Side view

Back view

Model Parameter	DTL152
Length	368mm
Width	312mm
Thickness	57mm
Active area	304.1x228.1mm
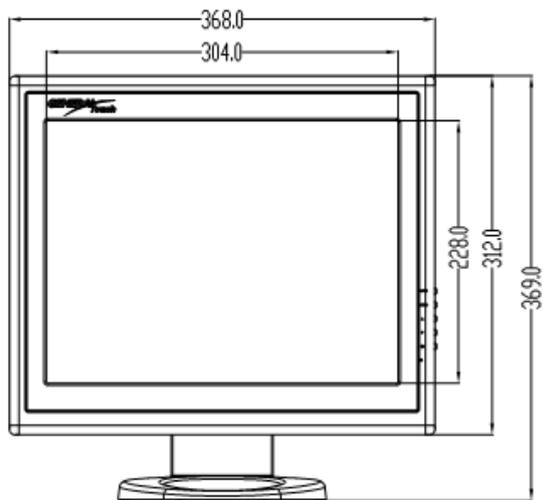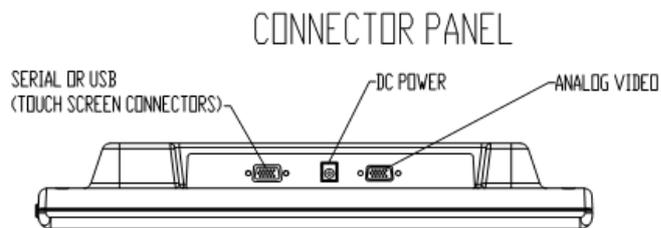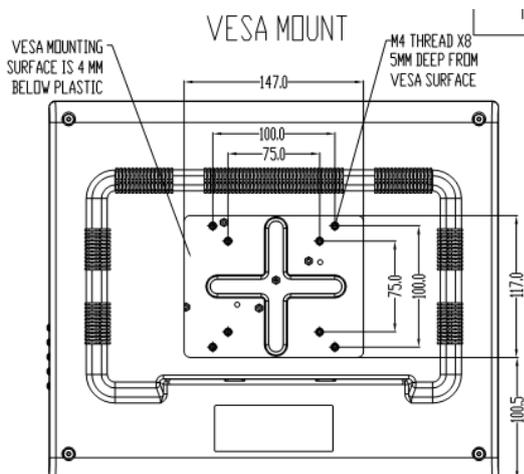
Top view

Side view

Back view

Model Parameter	DTL173
Length	391mm
Width	331mm
Thickness	64mm
Active area	338.1x270.1mm
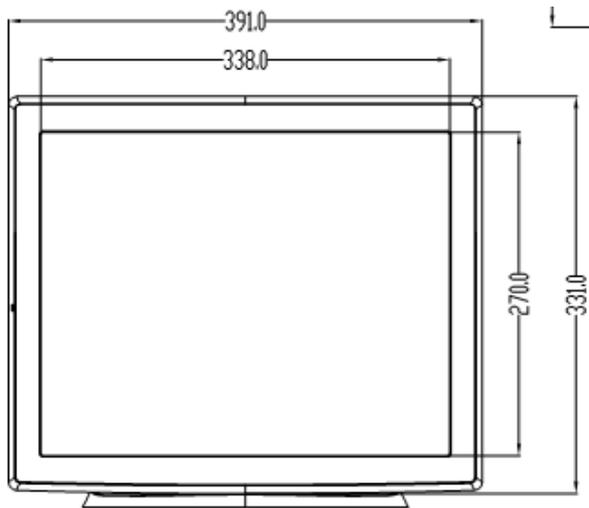
Top view
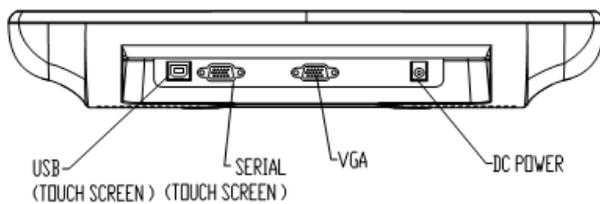
Side view
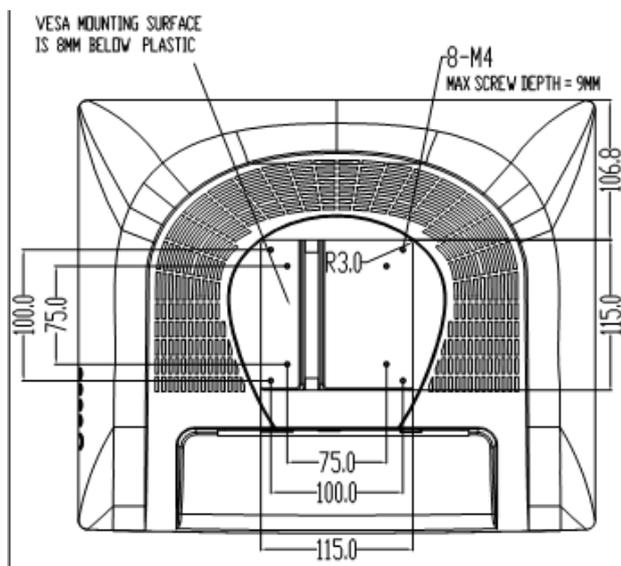
Back view

Model Parameter	DTL190
Length	470mm
Width	323mm
Thickness	65mm
Active area	410.1x257.1mm
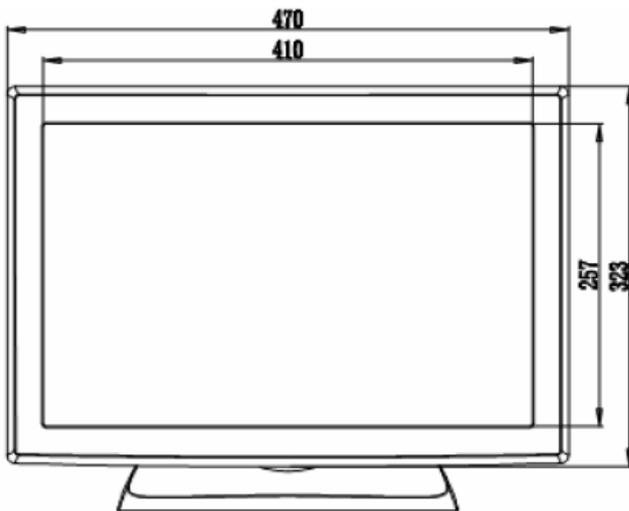
前视图
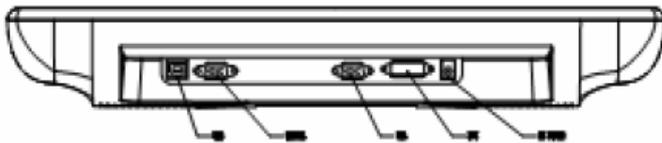
侧视图
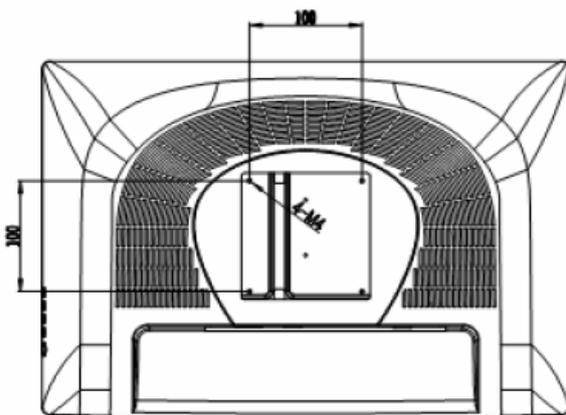
后视图

Model Parameter	DTL220
Length	530mm
Width	355mm
Thickness	65mm
Active area	473.76x295.1mm
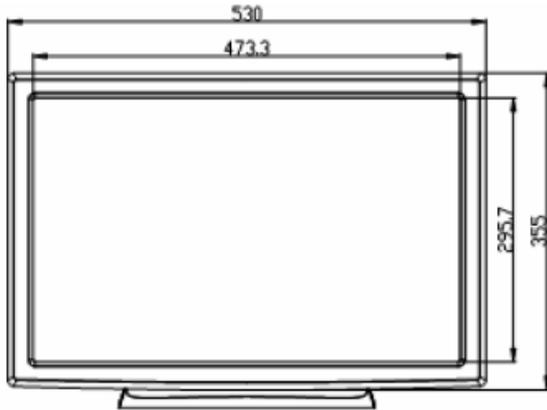
前视图
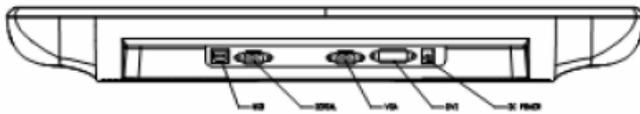
侧视图
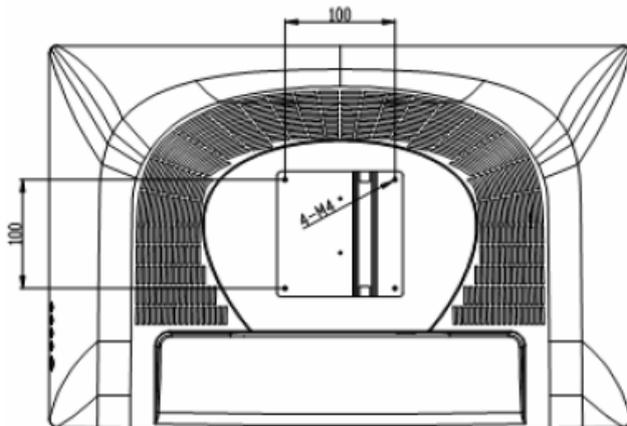
后视图

2

Unpacking

Shipping Damage/Unpacking

GeneralTouch takes every precaution in testing and packing its products prior to shipment.

On delivery of the products, check the shipping carton for damage. If any damage is seen that could have caused damage to the contents, keep all packing materials for later inspection by GeneralTouch or the carrier who are responsible for any shipping damage.

Handle the monitor with care. Take care not to mark or scratch the glass touchscreen when removing it from its packing.

Care and Cleaning of the touch sensor

Cleaning of the touch sensor should be performed regularly in order to assure optimum performance.

The touch sensors surface should be kept free of dust, dirt, fingerprints and other foreign material as contamination of the surface can affect its optical properties such as brightness and clarity of image.

Use a soft, clean, slightly damp cloth with any commercially available window cleaner for cleaning the glass surface of the touch sensor. Avoid applying the cleaner directly onto the sensor but apply it to the cloth instead

Packing list

Please open the package carefully and check the items below are in the package:
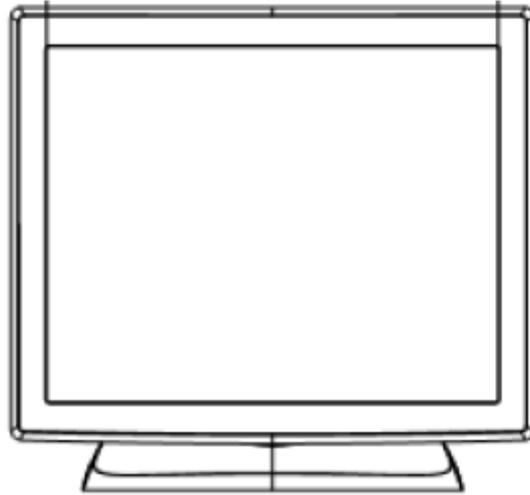
Touchmonitor
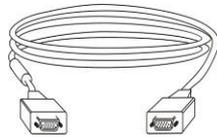
VGA cable
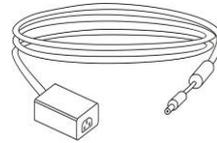
Power adapter
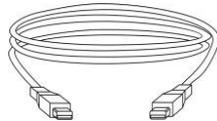
USB cable
(RS-232 cable)
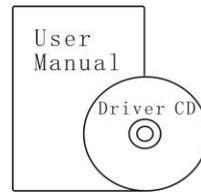
driver CD and this manual
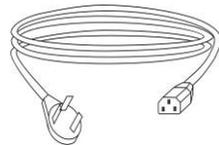
Power cable

If any items are missing, please contact your local dealer or the GeneralTouch Service Department.

   Note: please save the original package in order to ship the monitor in the future.

3

Hardware Installation

VESA standard installation

The DTL153 touchmonitor's mounting functions include Desktop, removable base VESA and wall mount.
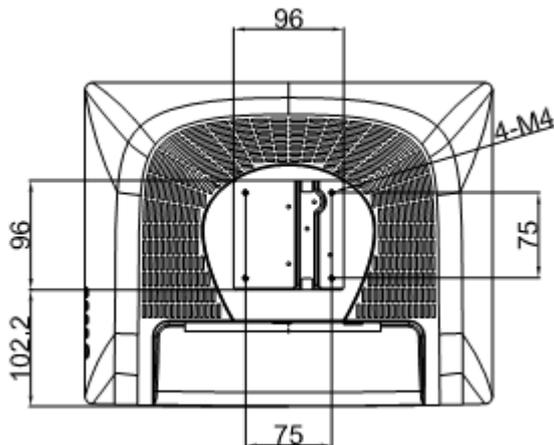
VESA installation holes

Connecting to the computer

Connect the OSD controller to the port on the monitor
Connect the monitor VGA cable to the PC's VGA cable
Connect the monitor to the serial or USB port of PC (depending on interface supplied)
Connect the power cable to the monitor
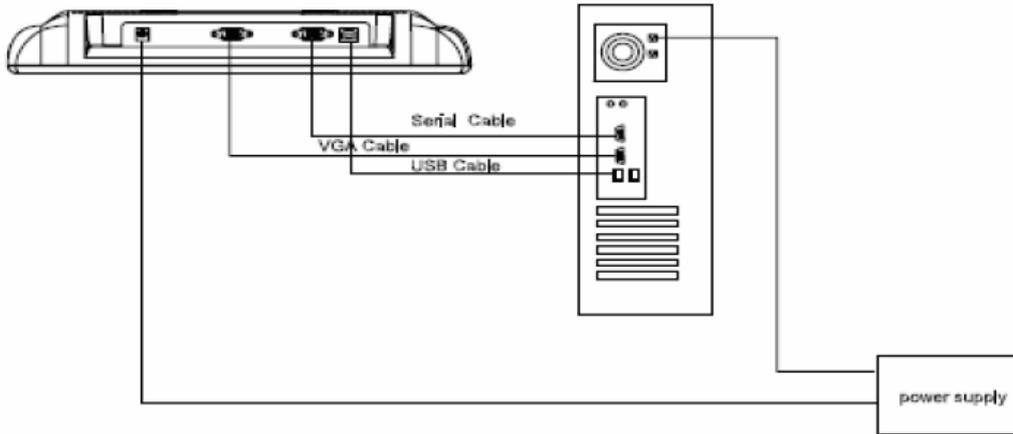
Configure Graphics card

Configure the graphics card of the computer to the native resolution of the supplied monitor (or less than) and make sure the timing frequency is set to the standard frequency to ensure the LCD display will function.

Preset Timing Modes

No.	Display Mode	Resolution	Vertical Frequency (Hz)
1	VGA	640×480	60
2			72
3			75
4	SVGA	800×600	60
5			72
6			75
7	XGA	1024×768	60
8			70
9			75
10	SXGA	1280×1024	60
11			75
12	WXGA	1440×900	60
13	SWXGA	1680×1050	60

For the DTL touchmonitor:
The native resolution for the DTL153   1024x768@60Hz
The native resolution for the DTL152   1024x768@60Hz
The native resolution for the DTL173   1280x1024@60Hz
The native resolution for the DTL190   1440x900@60Hz
The native resolution for the DTL220   1680x1050@60Hz

OSD adjusting
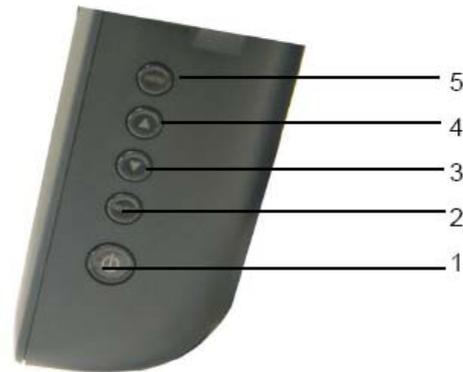
5--------- Automatically adjust the image position, horizontal size and fine settings
4--------- Select highlight items of OSD menu upward and adjust contrast when the
           key is pressed directly
3--------- Select highlight items of OSD menu downward and adjust brightness when
           the key is pressed directly
2--------- Turn on/off OSD setup menu, confirm the selection
1--------- Power on/off the monitor
LED----- Indicates the monitor status, it has modes as   follows:
          Green: LCD operational
          Orange: LCD is in power saving mode.

OSD Menu Functions

To display the OSD Menu press the **Menu** button.
1、 Press the **Up** button or **Down** button to select the different OSD control option.
2、 When the function you want to change is displayed, press the **Menu** button.

To adjust the Value of the function:
1、 Pressing the **Up** button increases the value of the selected OSD control option.
2、 Pressing the **Down** button decreases the value of the selected OSD control option.
After adjusting the values, the monitor will automatically save the changes.

NOTE: The OSD screen will disappear if no input activities are detected

OSD Control Options

Brightness

• Background luminance of the LCD panel is adjusted.

Contrast

• Adjusts the contrast or the values of color gain (red, green or blue).

Sharpness

• The sharpness can be adjustable.

Phase

• Adjusts the phase of the dot clock.

Gamma

• Adjusts the gamma of the picture's luminance.

Auto Color

• Color auto adjustment (under 5 seconds).

Auto Adjust

• Clock system auto adjustment (under 5 seconds).

OSD Left/Right

• The OSD screen is moved horizontally right and left.

OSD Up/Down

• The OSD screen is moved vertically up and down.

Clock

• Adjusts the ratio of dividing frequency of the dot clock.

Color Temperature

• Sets R, G, B gain.

OSD Position

• Allows the OSD indicator position to be selected.

Language

• Select the language used for the OSD menu from among English, Italy, German,

Chinese.

Touch controler LED indicator status

The indicator stays on for 2 seconds after turning on the computer and then it will turn off after finishing it's self-test. The indicator flashes a slow 2 seconds on and 10 seconds off while in idle mode (no touches).

The indicator stays on constantly while a touch is registered.
When touch removed, the indicator will go off instantly then resumes the idle slow flashing.

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Software Installation

To allow an operating system's cursor to move to the location touched on the touchscreen, software needs to be installed on to the computer system to take the output from the touch controller and convert it into cursor positions.

You can get these drivers from the supplied driver CD, or from our website at: www.generaltouch.com and going to the download section. The drivers on the web will always be up to date so always check the age or version of software CD that is supplied.

Touch Driver installation

The DTL153 can work with the following operating systems:
Windows 98/ME
Windows NT 4.0 (RS232 only)
Windows 2000/XP
Windows embedded XP
Windows CE
Linux
DOS

Windows 98/ME Installation

1) Insert the CD into the CD drive;
2) Double click to open folder **driver for win9X**;
3) Double click to open file **Setup.exe**;
4) Click "yes, go next";
5) Choose one of the computer ports and click **"next"**;
6) Click **"yes, reboot now"** to restart the computer and the touch driver program is loaded.

Calibration

1) After successful installation of the driver, the system will automatically enter the calibration interface when the computer is rebooted for the first time, then click **"Calibrate"**;
2) Click the centre of the bull's eye with your finger according to the prompt;
3) Click "Confirm" to complete the calibration;

Re-calibration is required if the following changes occur:

    a. Change of monitor's resolution.
    b. Change of touchscreen or controller.
    c. Change of computer or monitor.
    d. After cleaning the dust.

Enter Touchscreen calibration program through following steps:

1) Click **"Start"—"Setup"—"Control board"—"GeneralTouch touchscreen"**;
2) Click **"Calibrate"**;
3) Click the centre of the bull's eye with your finger according to the prompt;
4) Click "Confirm" to complete the calibration.

Setup

Click "Touchscreen" in "Control panel". Working mode of touchscreen can be
modified.
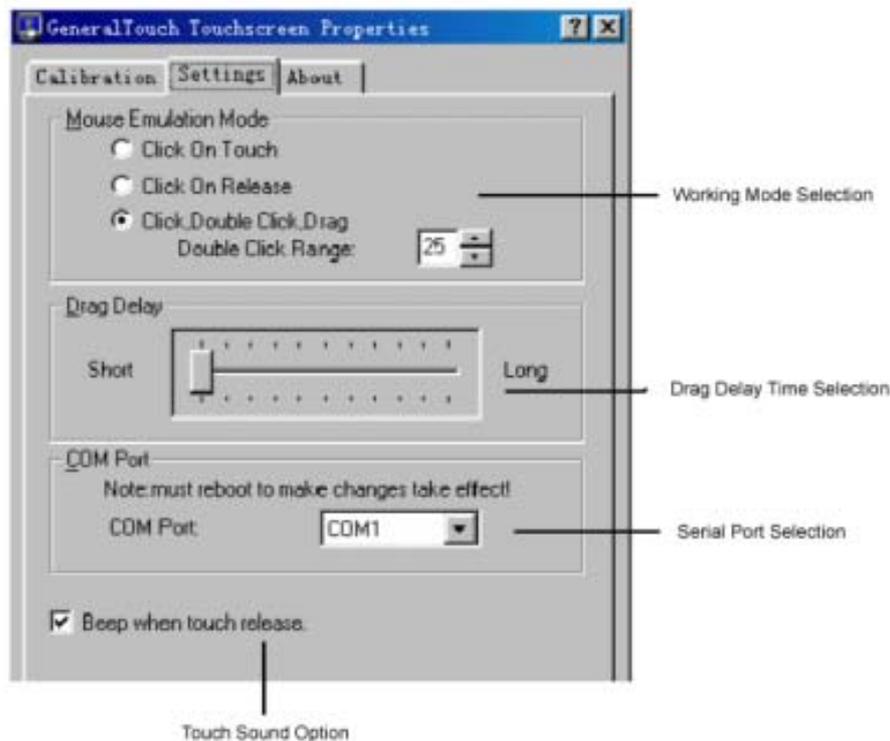
Working Mode (mouse emulation mode)

Click on touch indicates the response when your finger touches the screen.
Click on release indicates the responses when your finger leaves the touchscreen.
Click, double click, drag double click range support click and drag simultaneously,
while indicates the double click area, the unit of double click range is in pixels.
Drag Delay Time delay of dragging

Serial Port Selection (COM Port)

Choose the serial port that the Touchscreen is connected to the computer on reboot for the change to take effect.

Beep when Touch Release

If selected, the speaker on the computer will generate a sound when the screen is touched.

Uninstall

⚠ Only after any older versions of the driver have been uninstalled, should the new one be installed.

Click *"Start" — "Setup" — "Control panel" — "Add/Delete Program"*—under which choose "Install/Uninstall" and click "Acoustic Wave Touchscreen" — click "Add/Delete".

Reboot the computer after uninstalling according to the prompt.

Windows 2000 (Serial installation):

It is the same as Win 9x.

Windows XP

The only difference compared with Win 9x is that the system will prompt you with a dialogue box which supplies information about digital signature. Please select "Ignore" to continue. The installation method is same as Win 9x.

WinCE

Installation:

1) Execute GeneralTouch Touchscreen Driver 1.0 for CE. Net. msi. You will be prompted by the interface below,
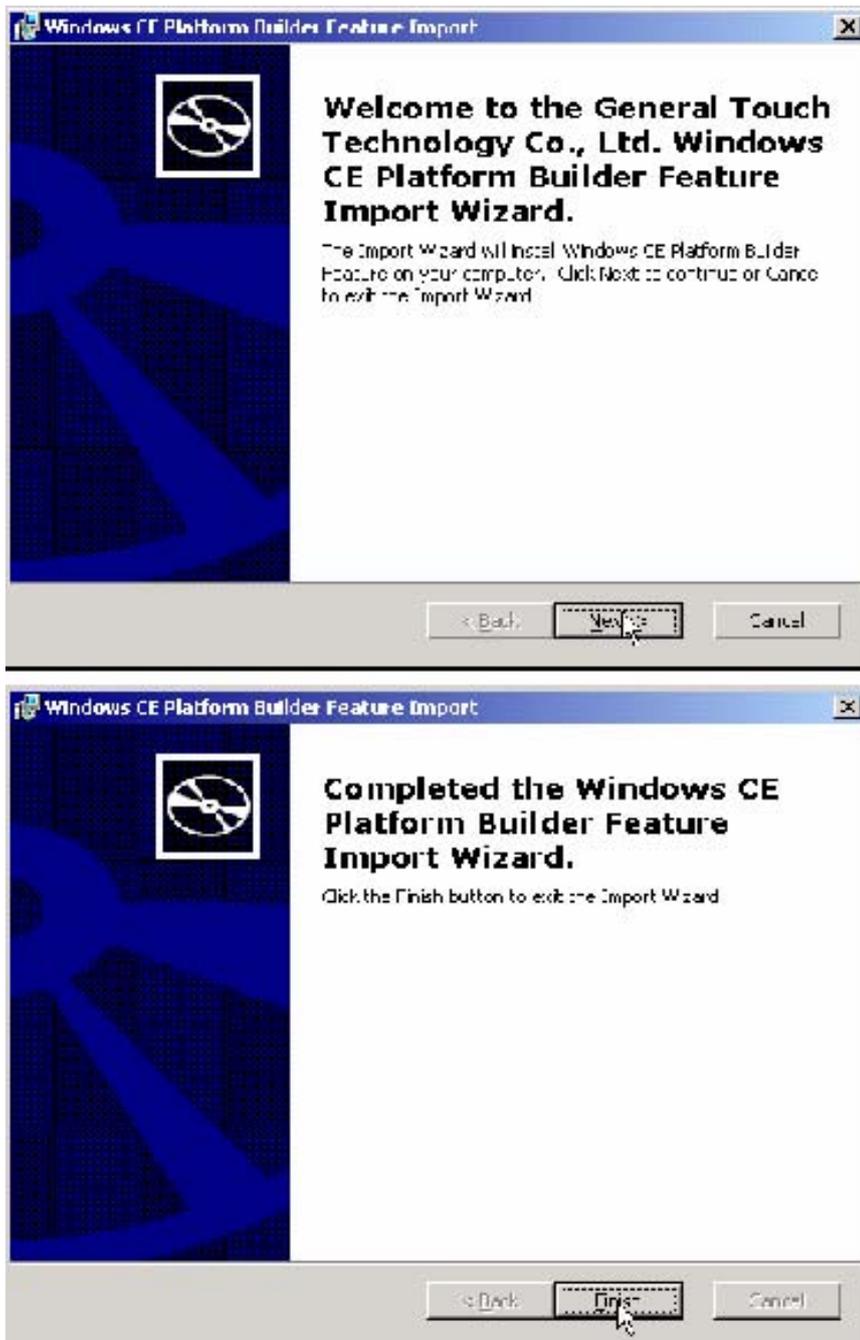
2) Then select "Next" to continue.

Run your WinCE Plat Form Builder. After you build your new platform in the WinCE

environment, please refresh Catalog.
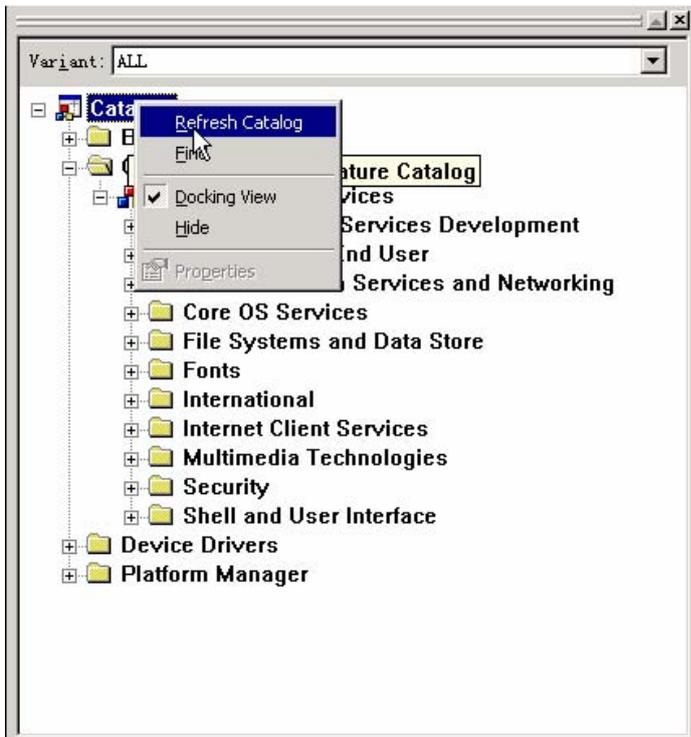
Now, you can see the GeneralTouch Touchscreen Driver is listed in the Catalog.
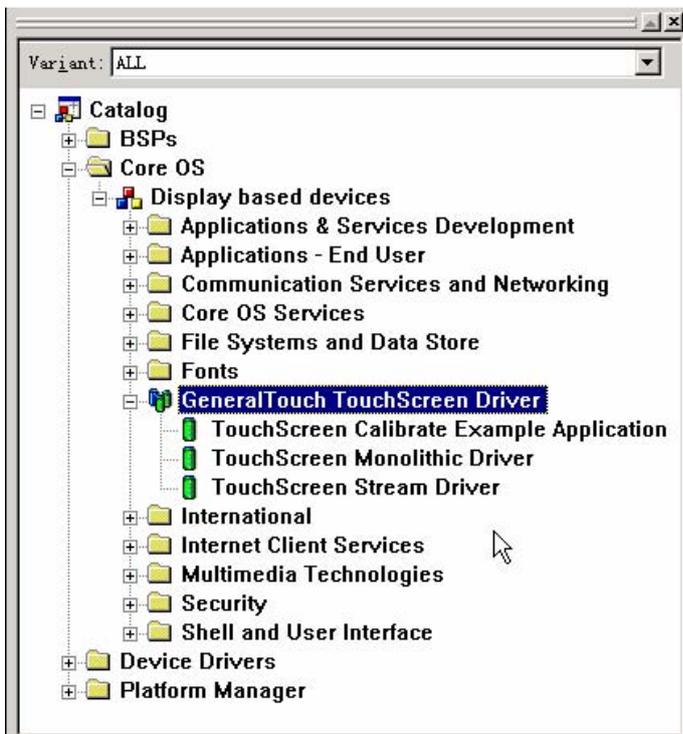
The driver package has three components.

Touchscreen Monolithic Driver: it is the main program.

Touchscreen Stream Driver: it is the accessory program.

Touchscreen Calibrate Example Application: it is the calibration example.

You can select the component which you want to add into your system.
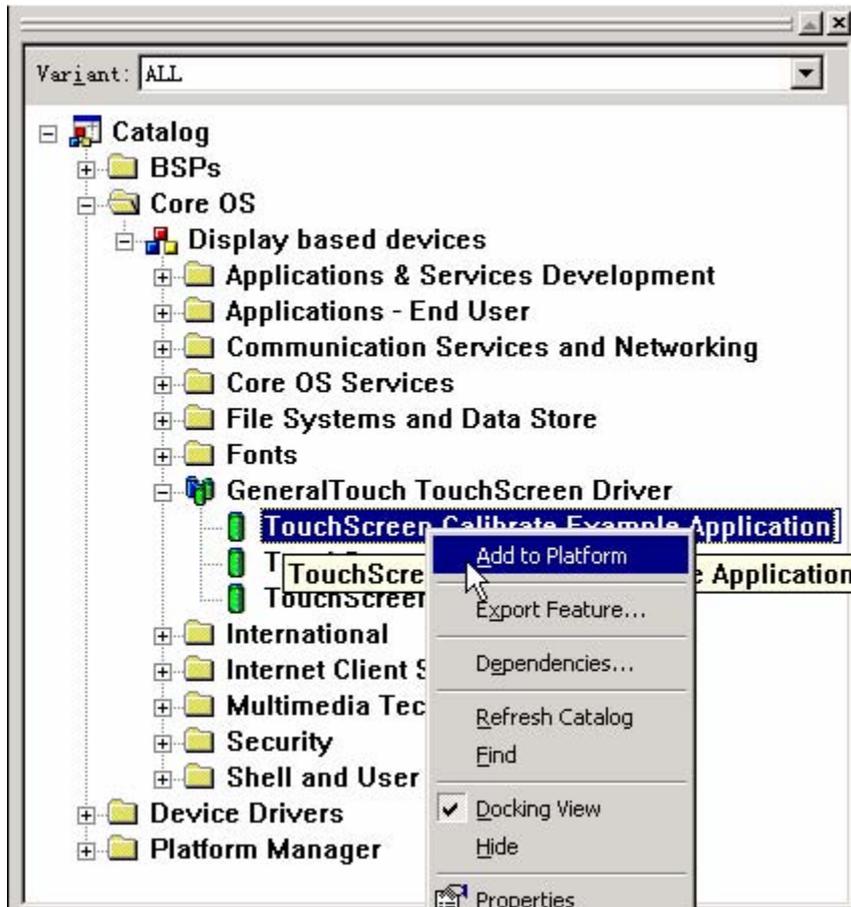
Now, you can see the GeneralTouch touchscreen has been added successfully in the **FEATURE VIEW** of **WORKSPACE**.
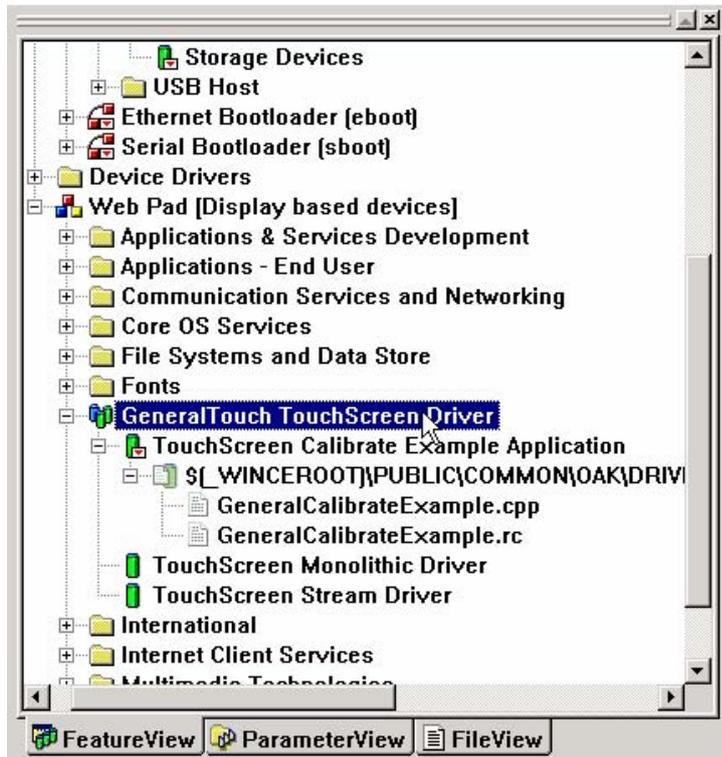
Calibration

After downloading the OS image to your embedded system, please run GeneralCalibrateexample.exe in it. A cross will appear on the monitor, touch it, then the second cross will come forth, touch that until whole processing is over.

Precision

For the best precision, calibration program checks the values you enter. Therefore, the calibration processing will be repeated if the value of calibration error is outside of the Maximum Calibration Error. You can modify parameter "MaxCalError" to adjust the value from 0 to 10. (Smaller value, better precision). If the value is 0, no error is allowed, the recommendation is 5.

Uninstall

Open file menu, select command Manage Catalog Features.

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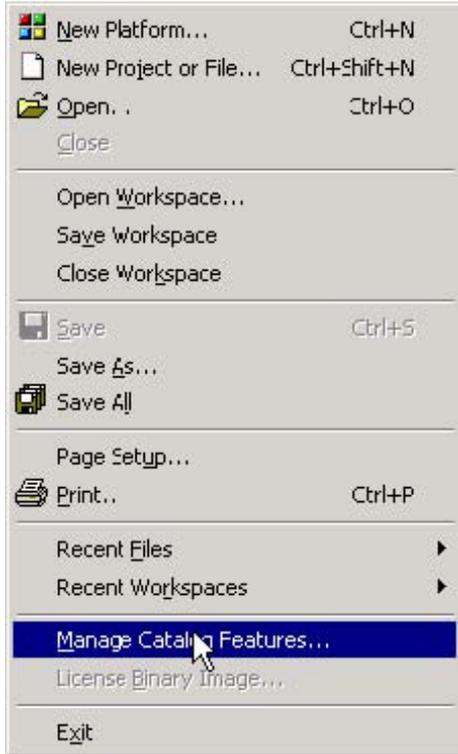
Locate GeneralTouch touchscreen driver, Run command **Remove** then refresh system.
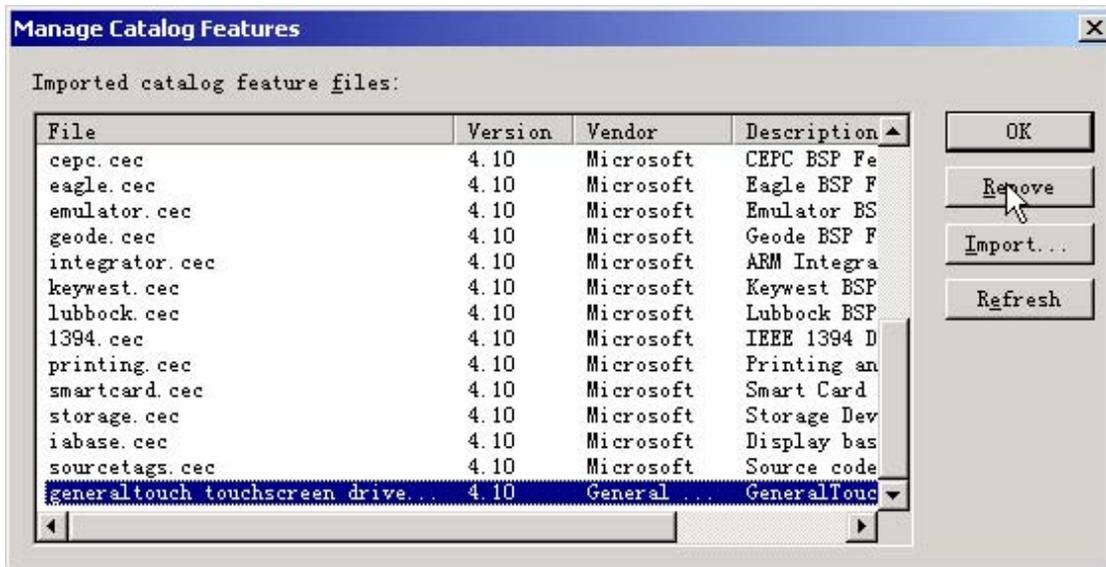
For more information about WinCE driver, please contact us directly.

Linux

1) Package Components
    I. gentouch_drv.o Driver for XFree86
    II. gsxcal: Calibration program for graphics mode
    III. gencal : Calibration program for Text mode
2) Install files
    a) Login as root.
    b) Copy gentouch_drv.o to your input device directory.

For example, in Redhat 7.2.
Copy gentouch_drv.o to / usr/ X11R6/ lib/modules/input.
Command Line: cp gentouch_drv.o /usr/X11R6/lib/modules/input
Copy gsxcal and gencal to /usr/local/bin Command Line: cp
gsxcal gencal/usr/local/bin

3) Edit your XF86Config to enable touchscreen support. Command Line:
    vi/etc/X11/XF86Config-4
    Add Inputdevice "touchscreen1" "SendCoreEvents" in Section "ServerLayout"
    For each device identified in the "ServerLayout" section, a corresponding
    subsection should exist in the "Inputdevice" section. So let's create the section.

Section "Inputdevice"
    Identifier "touchscreen1"
    Driver "gentouch"
    Option "Device" "/dev/ttyS0"
    Option "AlwaysCore"
    Option "screenno" "0"
    Option "MinX" "1176"
    Option "MaxX" "3671"
    Option "MinY" "578"
    Option "MaxY" "2493"
    Option "UntouchDelay" "3"
    Option "ReportDelay" "1"
    EndSection

Finally, replace the serial ports name "/dev/ttyS0" with yours. Fill the calibration data
which you got from the calibration section.
4) Start your XFree86 server.
5) Calibrate your touchscreen (use "gsxcal /dev/ttyS0"--ttyS0 for COM1, ttyS1 for
COM2 etc.)
Run "gsxcal" and follow the program you will get your calibration data.

Those data will store into /tmp/gentouch.dat,too. Change the calibration data in XF86Config-4.

6) Re-Start your XFree86 server for the calibration to take effect.

5

Warranty

GeneralTouch is only under obligation to offer the following Warranty Repair and Services except those authorized formal documents in written form:

Screen   repairable: 5 years   replaceable: 90 days
Controller   repairable: 3 years   replaceable: 90 days
LCD monitor   repairable: 3 years （Except for LCD panel 1 year）

The above warranty period takes the front four places of the Serial Number label on the GeneralTouch products as the starting date.

Warranty products cover panel, controller and communication cable. Accessories included with the products are not included in the warranty

More warranty details, please access

www.generaltouchus.com/support/customer service

6

Troubleshooting

No picture

The signal cable should be fully connected to the graphics card/computer.
The graphics card should be completely seated in its PC slot.
Power Button and computer power switch should be in the ON position.
Check to make sure that a supported mode has been selected on the graphics card or system being used. (Please consult graphics card or system manual to change graphics mode).
Check the monitor and your graphics card with respect to compatibility and recommended settings.
Check the signal cable connector for bent or pushed-in pins.
Check that the BNC or D-SUB button is in the correct position.

Power Button does not respond

Unplug the power cord of the monitor from the AC outlet to turn off and reset the monitor, or simultaneously press the RESET and Power buttons.

Image is unstable, unfocused

Signal cable should be fully connected to the computer.
Use the OSM™ Image Adjust controls to focus and adjust display by increasing or decreasing the Fine control. When the display mode is changed, the OSM Image Adjust settings may need to be re-adjusted.
Check the monitor and your graphics card with respect to compatibility and recommended signal timings.

If your text is garbled, change the video mode to non-interlace and use 60Hz refresh rate.

LED on monitor is not lit (no green or amber color can be seen)

Power Button should be in the ON position and power lead should be connected.
Make certain the computer is not in a power-saving mode (touch the keyboard or mouse if present).

Display image is not properly sized

Use the OSM Image Adjust controls to increase or decrease the H. Size.
Check to make sure that a supported mode and signal timing has been selected on the graphics card or system being used (Please consult the graphics card or system manual to change graphics mode or refresh rate).

Selected resolution is not displayed properly

Select the Display Resolution in the OSM Information menu to confirm that the appropriate resolution has been selected. If not, select corresponding option by pressing the control button.

Intermittent or missing Touch

As the Surface Acoustic Wave (SAW) touch signal is distributed over the whole surface of the touchscreen in operation, If the touchscreen is not cleaned regularly, dust will accumulate over years of operation and block off parts of the reflective stripes (hidden under the bezel) and it will partially or completely block the touch effect.

Solution:
Wipe off the dust on the reflective stripes gently with business card or paper note through the gap between front cover of the screen and Touchscreen or blow air (from an aerosol can) along the edges and then restart the computer. If the problem persists, the unit may need to be returned to your supplier or GeneralTouch for a more intensive cleaning.

No touch function

Check that the software driver is correctly installed. If using serial interface, make sure the correct serial port is selected.
Check there is no conflict with any other devices on your computer. For example, default IRQ of some network card is 3 after the installation is finished, which will collide with that of COM2. Thus IRQ of the network card should adopt the idle one.
Check with your IT department for more information.

A

Appendix A

LCD Display Specifications

Model	DTL153
Description	15"TFT Desktop Touch Monitor
Case/Bezel Color	Ultramarine
Display Type	4:3Ratio 15" Active Matrix TFT LCD
Touch Technology	Surface Acoustic Wave(SAW) Or Resistive
Mounting Options	Desktop,VESA 75&100mm,included
Active Display Area	304.1mmx228.1mm
Native Resolution	1024x768@60Hz
Synchronization Range	30-80KHz horizontal
	60-75Hz Vertical
Pixel Pitch	0.297x0.297mm
Plug & Play	VESA DDC1/2B
On-Screen Display (OSD)	Internal Interface Cable
Temperature Range	Operating:0°C-40°C,
	Storage:-20°C-60°C
Relative Humidity	Operating:10%-90%,
	Storage:5%-90%
Power Supply	External:85-265V,47-63Hz
Power Consumption	50W Max
Weight(approximately)	4.3kg/7kg
Shipping Carton Dimensions	445x445x300mm
Touch screen Interface	Serial(RS232) or USB
Agency Approvals	RoHS
Warranty *	3 years*
Color	16.2million

Brightness	250cd/m^2
Viewing Angle (from center, CR>=10)	Horizontal(left/right) 120°(60° /60°)
	Vertical(up/down) 100°(40° /60°)
Contrast Ratio	450:1
Pixel Response Time	16ms
Backlight Lamp Life	50k
Input Video Format	Analog (VGA)
Touch Response Time	10.4ms
Touch Sensitivity	Adjustable

*Except for LCD panel 1 year

Model	**DTL152**
Description	15"TFT Desktop Touch Monitor
Case/Bezel Color	Ultramarine
Display Type	4:3Ratio 15" Active Matrix TFT LCD
Touch Technology	Surface Acoustic Wave(SAW)
Mounting Options	Desktop,VESA 75&100mm,included
Active Display Area	304.1mmx228.1mm
Native Resolution	1024x768@60Hz
Synchronization Range	30-80KHz horizontal
	60-75Hz Vertical
Pixel Pitch	0.297x0.297mm
Plug & Play	VESA DDC1/2B
On-Screen Display (OSD)	Internal Interface Cable
Temperature Range	Operating:0°C-40°C,
	Storage:-20°C-60°C
Relative Humidity	Operating:10%-90%,
	Storage:5%-90%
Power Supply	External:85-265V,47-63Hz
Power Consumption	50W Max
Weight(approximately)	4.3kg/7kg
Shipping Carton Dimensions	445x445x300mm
Touch screen Interface	Serial(RS232) or USB
Agency Approvals	RoHS
Warranty *	3 years*
Color	16.2million
Brightness	250cd/m^2
Viewing Angle (from center, CR>=10)	Horizontal(left/right) 120°(60° /60°)
	Vertical(up/down) 100°(40° /60°)

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Contrast Ratio	450:1
Pixel Response Time	16ms
Backlight Lamp Life	50k
Input Video Format	Analog (VGA)
Touch Response Time	10.4ms
Touch Sensitivity	Adjustable

*Except for LCD panel 1 year

Model	**DTL173**
Description	17"TFT Desktop Touch Monitor
Case/Bezel Color	Ultramarine
Display Type	4:3Ratio 17" Active Matrix TFT LCD
Touch Technology	Surface Acoustic Wave(SAW) Or Resistive
Mounting Options	Desktop,VESA 75&100mm,included
Active Display Area	338.1x270.1mm
Native Resolution	1280x1024@60Hz
Synchronization Range	30-80KHz horizontal 60-75Hz Vertical
Pixel Pitch	0.264x0.264mm
Plug & Play	VESA DDC1/2B
On-Screen Display (OSD)	Internal Interface Cable
Temperature Range	Operating:0°C-40°C, Storage:-20°C-60°C
Relative Humidity	Operating:10%-90%, Storage:5%-90%
Power Supply	External:85-265V,47-63Hz
Power Consumption	50W Max
Weight(approximately)	4.3kg/7kg
Shipping Carton Dimensions	445x445x300(mm)
Touch screen Interface	Serial(RS232) or USB
Agency Approvals	RoHS
Warranty *	3 years*
Color	16.7million (6bit+FRC)
Brightness	300cd/m^2
Viewing Angle (from center, CR>=10)	Horizontal(left/right) 160°(80° /80°) Vertical(up/down) 160°(80° /80°)
Contrast Ratio	500:1
Pixel Response Time	16ms
Backlight Lamp Life	50k

Input Video Format	Analog (VGA)
Touch Response Time	10.4ms
Touch Sensitivity	Adjustable

*Except for LCD panel 1 year

Model	**DTL190**
Description	19"TFT Desktop Touch Monitor
Case/Bezel Color	Ultramarine
Display Type	16:10Ratio 19" Active Matrix TFT LCD
Touch Technology	Surface Acoustic Wave(SAW)
Mounting Options	Desktop,VESA 100mm,included
Active Display Area	410.1x257.1mm
Native Resolution	1440x900@60Hz
Synchronization Range	30-80KHz horizontal
	60-75Hz Vertical
Pixel Pitch	0.2835x0.2835mm
Plug & Play	VESA DDC1/2B
On-Screen Display (OSD)	Internal Interface Cable
Temperature Range	Operating:0°C-40°C,
	Storage:-20°C-60°C
Relative Humidity	Operating:10%-90%,
	Storage:5%-90%
Power Supply	External:85-265V,47-63Hz
Power Consumption	50W Max
Weight(approximately)	4.3kg/7kg
Shipping Carton Dimensions	530x460x200mm
Touch screen Interface	Serial(RS232) or USB
Agency Approvals	RoHS
Warranty *	3 years*
Color	16.7million (6bit+FRC)
Brightness	350cd/m^2
Viewing Angle (from center, CR>=10)	Horizontal(left/right) 160°(80° /80°)
	Vertical(up/down) 160°(80° /80°)
Contrast Ratio	800:1
Pixel Response Time	16ms
Backlight Lamp Life	50k
Input Video Format	Analog (VGA)
Touch Response Time	10.4ms
Touch Sensitivity	Adjustable

*Except for LCD panel 1 year

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Model	DTL220
Description	22"TFT Desktop Touch Monitor
Case/Bezel Color	Ultramarine
Display Type	16:10 Ratio 22" Active Matrix TFT LCD
Touch Technology	Surface Acoustic Wave(SAW)
Mounting Options	Desktop,VESA 100mm,included
Active Display Area	473.76x295.1mm
Native Resolution	1680x1050@60Hz
Synchronization Range	30-80KHz horizontal
	60-75Hz Vertical
Pixel Pitch	0.282x0.282mm
Plug & Play	VESA DDC1/2B
On-Screen Display (OSD)	Internal Interface Cable
Temperature Range	Operating:0°C-40°C,
	Storage:-20°C-60°C
Relative Humidity	Operating:10%-90%,
	Storage:5%-90%
Power Supply	External:85-265V,47-63Hz
Power Consumption	50W Max
Weight(approximately)	7kg/9kg
Shipping Carton Dimensions	642x461x173mm
Touch screen Interface	Serial(RS232) or USB
Agency Approvals	RoHS
Warranty *	3 years*
Color	16.7million (6bit+FRC)
Brightness	300cd/m^2
Viewing Angle (from center, CR>=10)	Horizontal(left/right) 160°(80° /80°)
	Vertical(up/down) 160°(80° /80°)
Contrast Ratio	1000:1
Pixel Response Time	16ms
Backlight Lamp Life	50k
Input Video Format	Analog (VGA)
Touch Response Time	10.4ms
Touch Sensitivity	Adjustable

*Except for LCD panel 1 year

B

Appendix B

Touchscreen Specifications

Technology	Surface Acoustic Wave (SAW)
Resolution	4096x4096
Material	Pure glass
Deviation of Error	3mm
Light Transmission	90% ~92%
Dimension	3-D, with Z-axis sensitivity
Colour distortion	Non
Touch Sensitivity	Touch force <90g (adjust allowed)
Surface Durability	More than 50,000,000 times at one point without failure
Surface Hardness	Mohs rating of 7, scratch-resistance even by knifes or sharp metal pieces
Touch Point Drift	No drift, one-time calibration is enough
Response Time	< 16ms
Multi Point Touch	Software identify
EMI	Unaffected by other peripherals around the site
Safety Standard	CE, FCC
Operation Temperature	Screen: -20°C to +50°C
	Controller: 0°C to +65°C
Storage Temperature	Screen: -40°C to 70°C
	Controller: -25°C to +85°C
Humidity	10%-90%
Operation Altitude	3000m
Cleaning	Glass Cleanser or water
Touch Controller	Internal

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C

Appendix C

Physical Specifications

DTL153 Mechanical Drawing
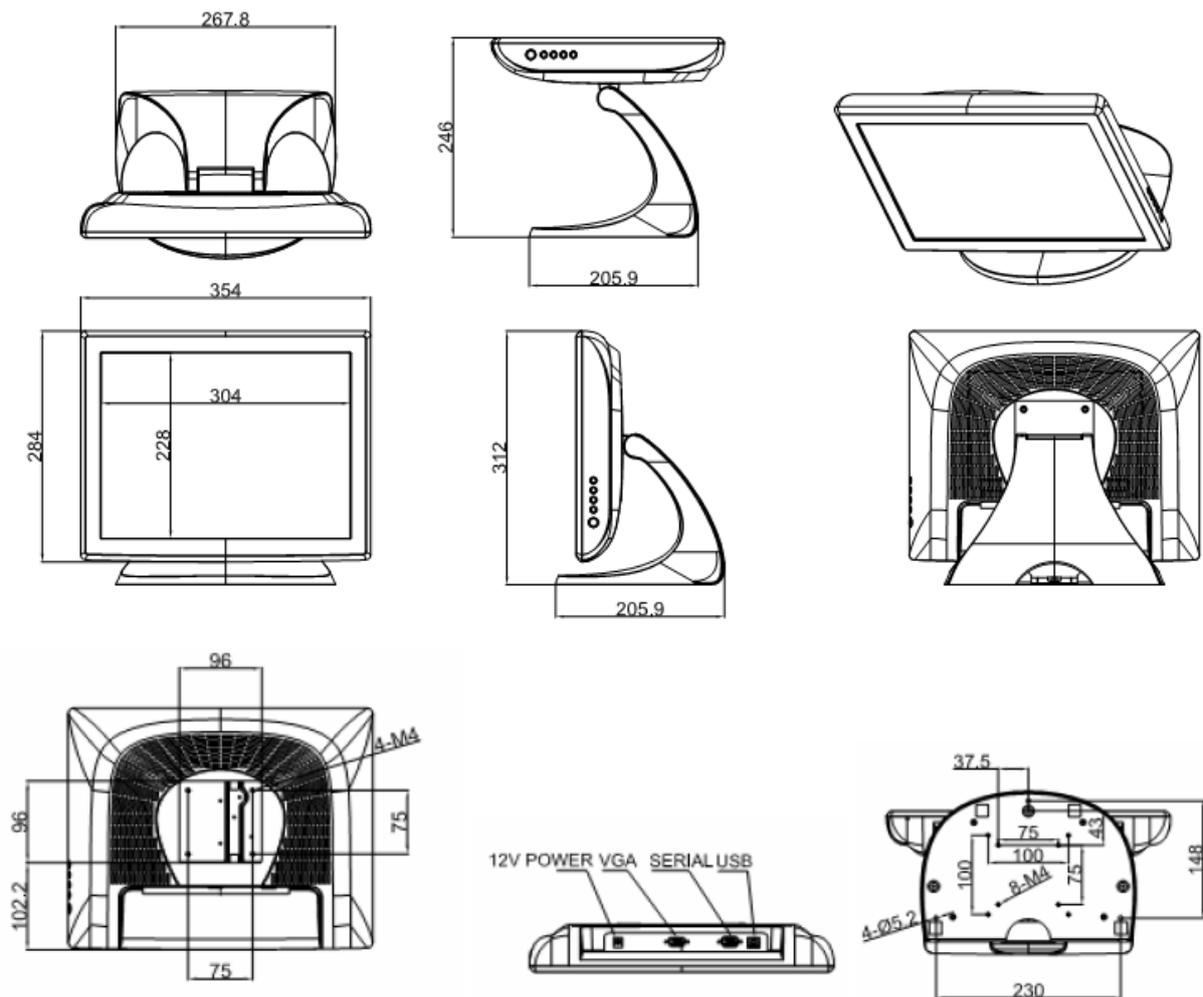
DTL152 Mechanical Drawing


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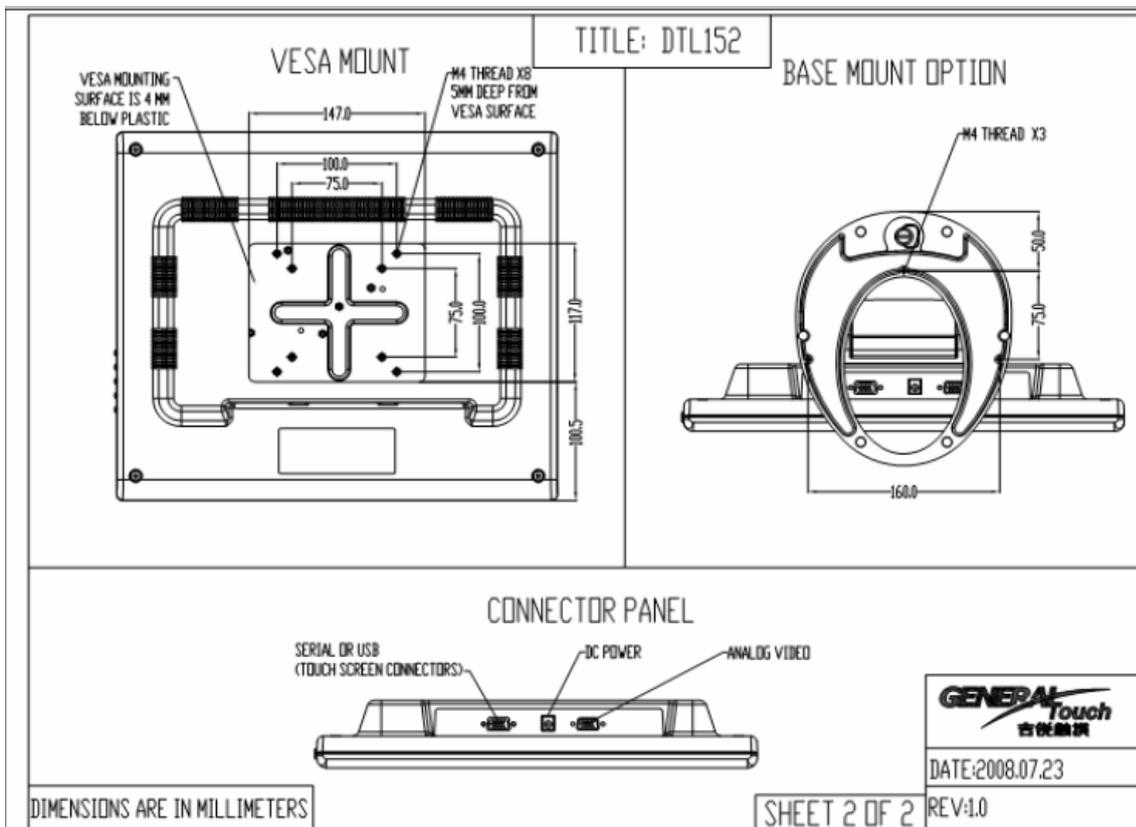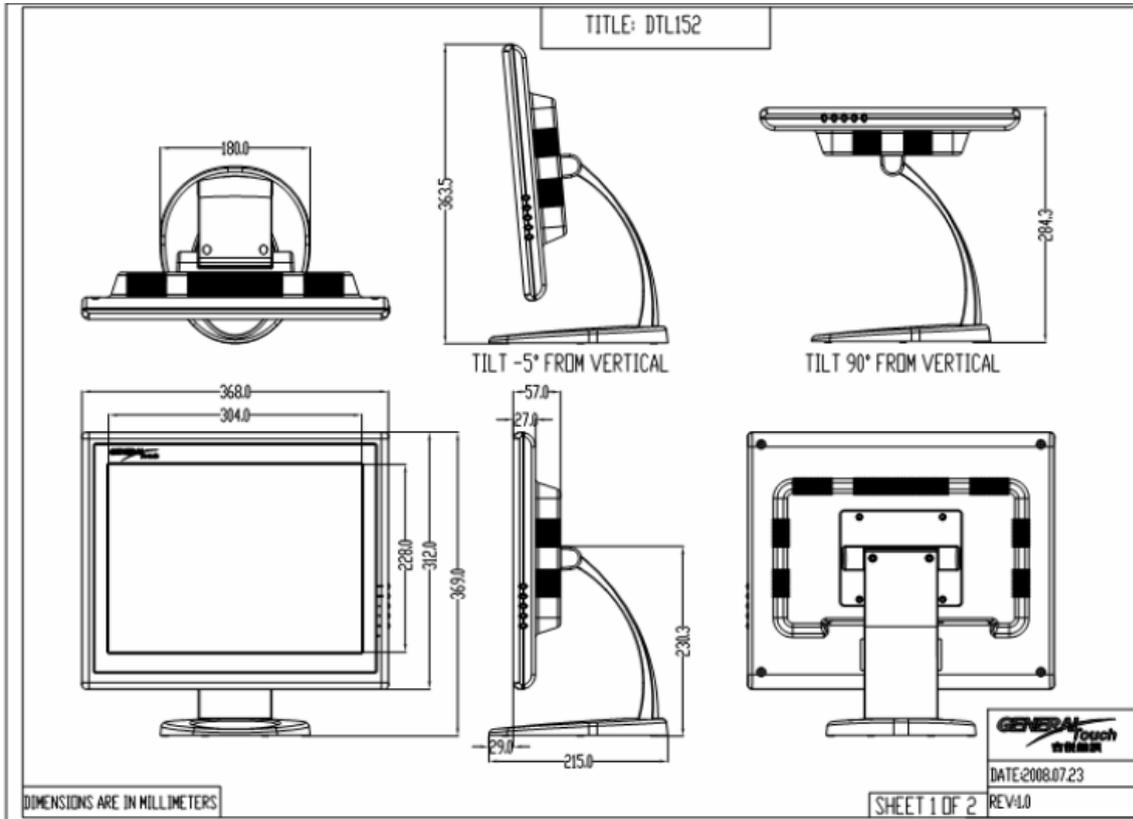
DTL173 Mechanical Drawing

DTL190 Mechanical Drawing

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# DTL220 Mechanical Drawing

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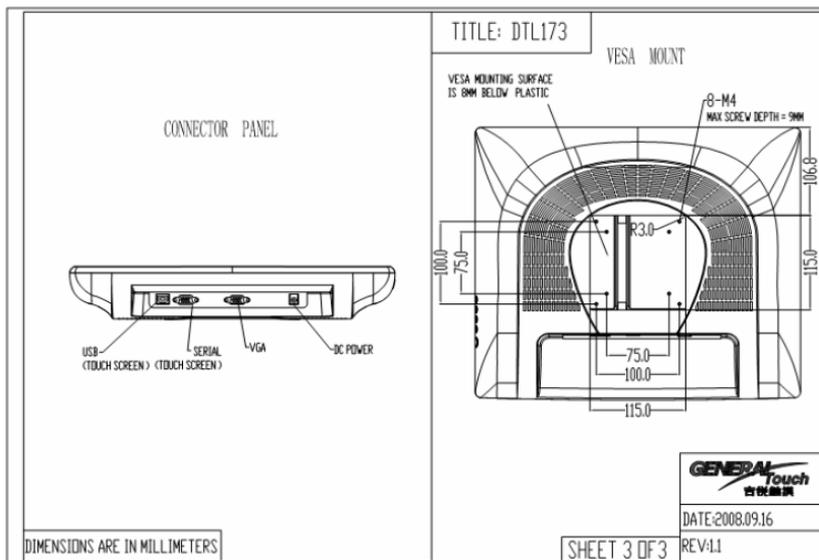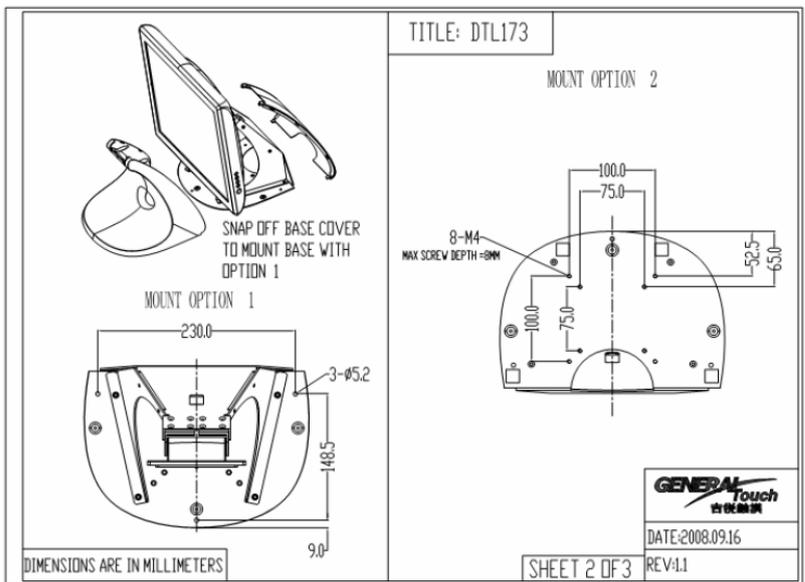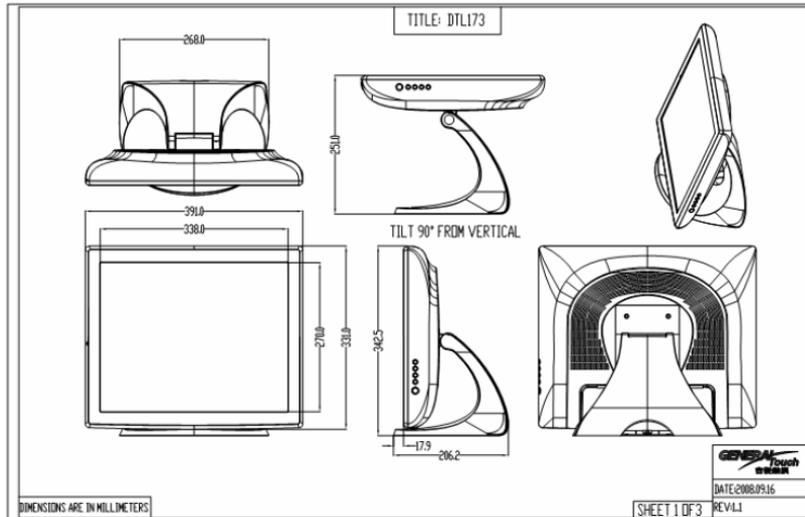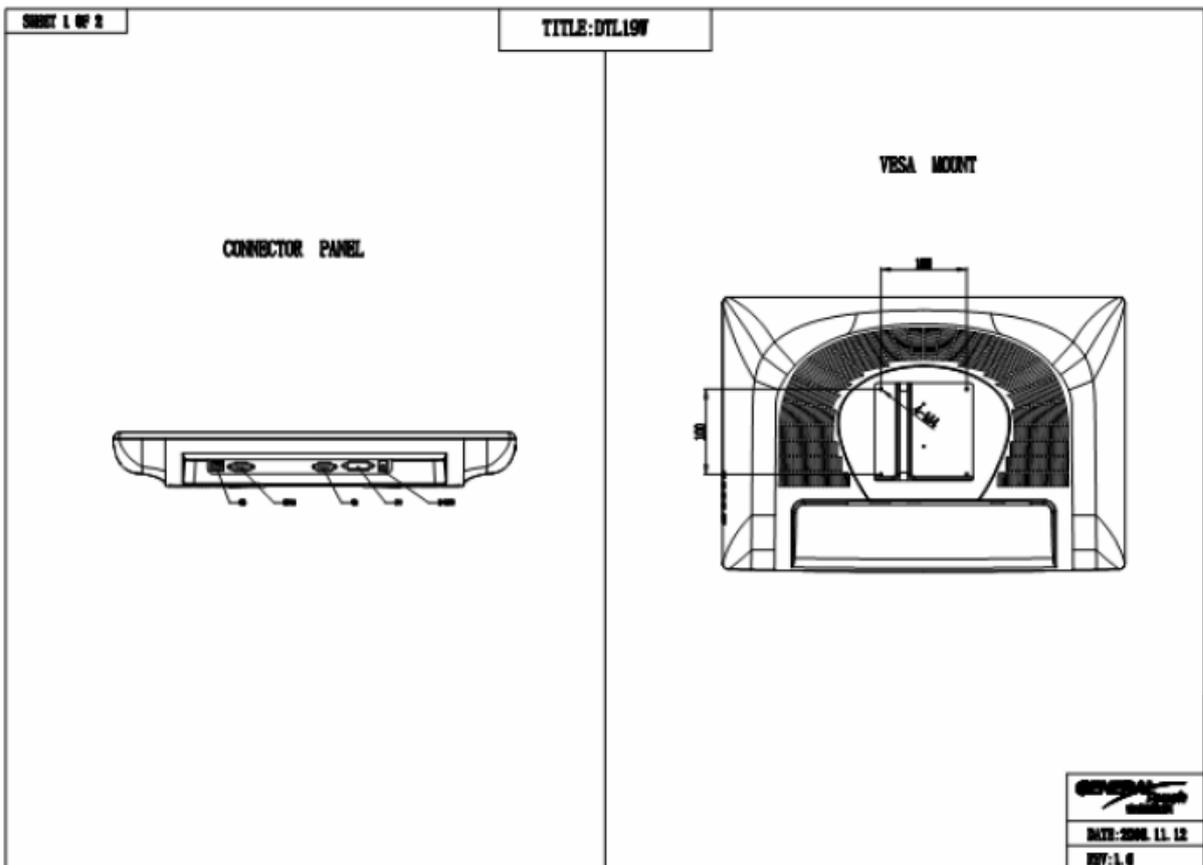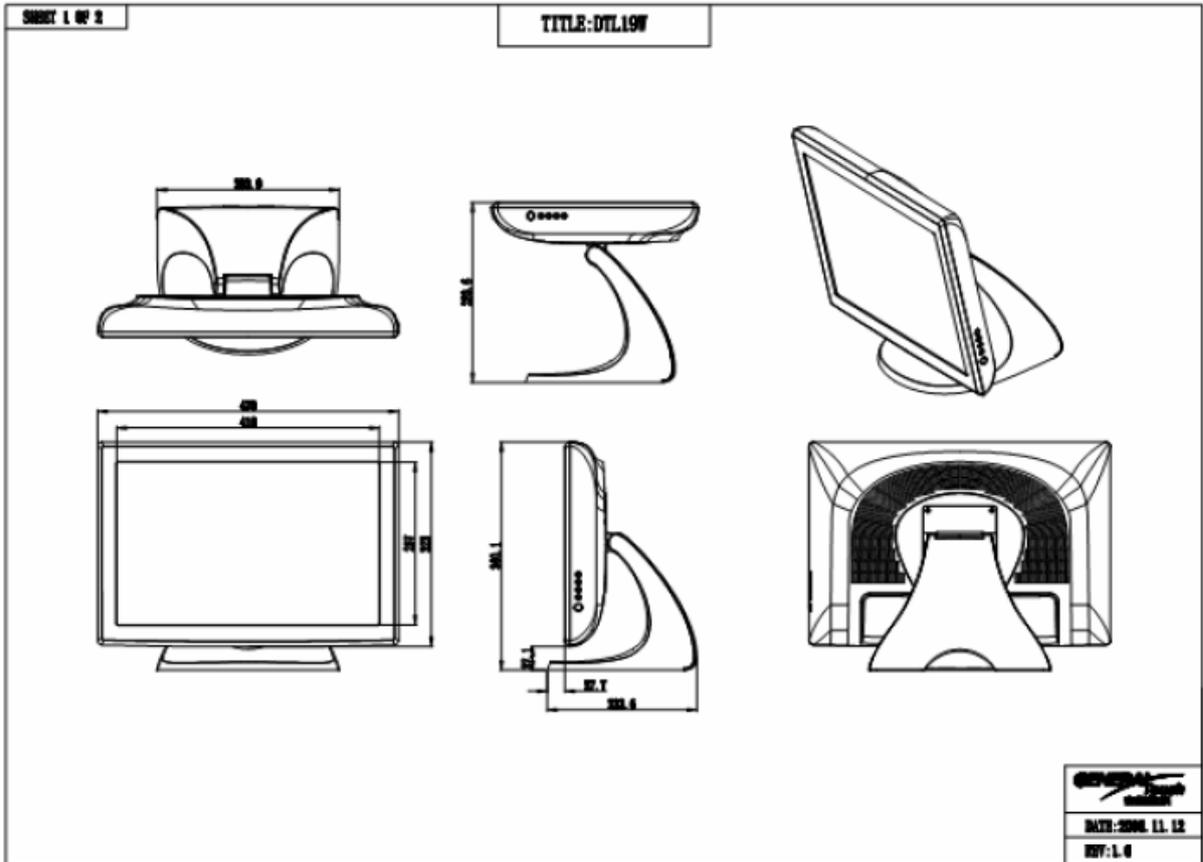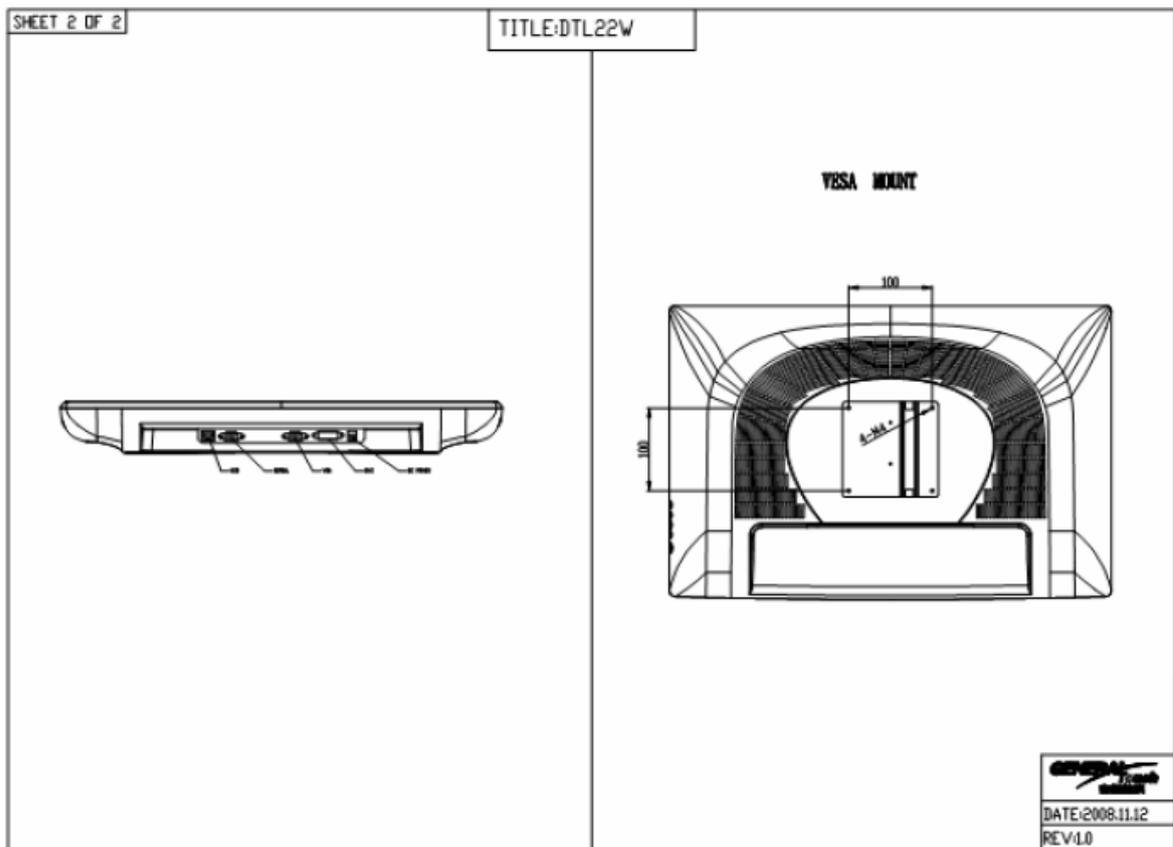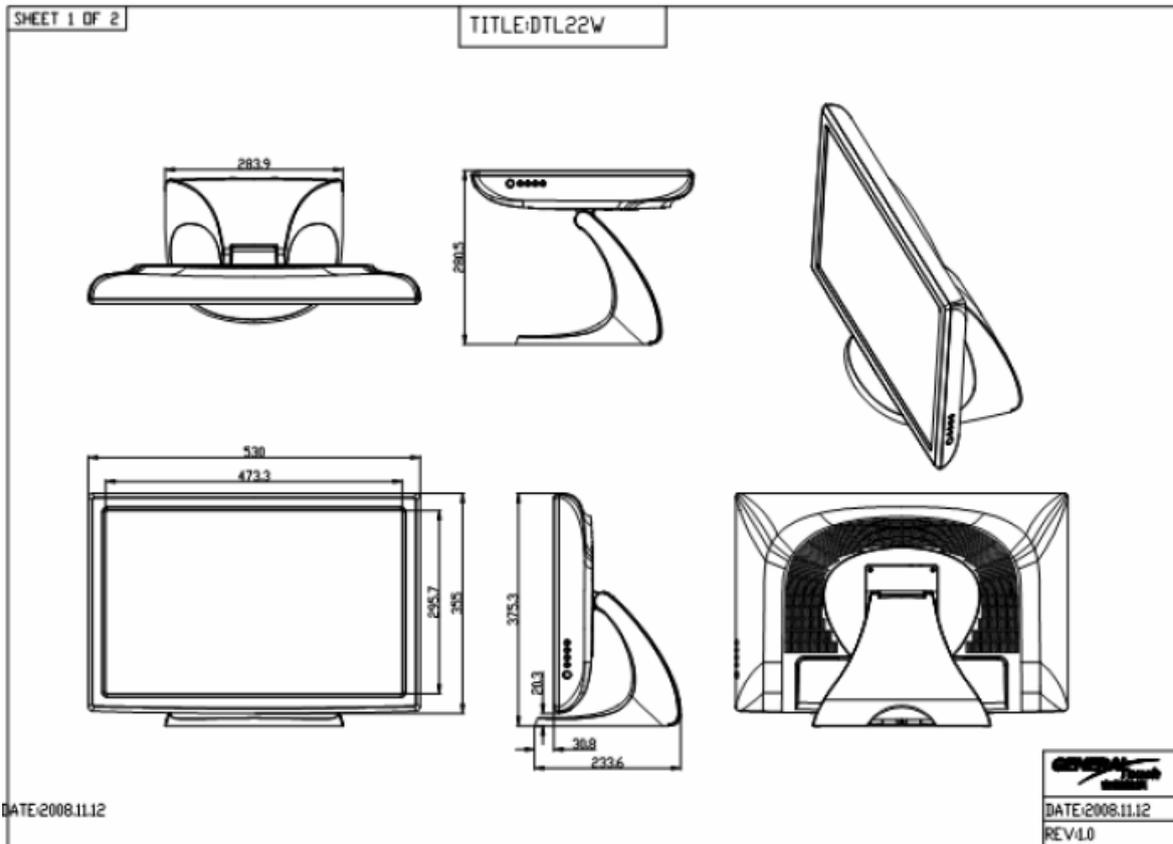
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