User's Manual

MP-2258

8.4" Fanless Compact POS System

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Safety and Warranty

1. Read these safety instructions carefully.
2. Keep this user's manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
14. If any of the following situations arises, get the equipment checked by service personnel:
    A. The power cord or plug is damaged.
    B. Liquid has penetrated into the equipment.
    C. The equipment has been exposed to moisture.
    D. The equipment does not work well, or you cannot get it to work according to the users manual.
    E. The equipment has been dropped and damaged.
    F. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60° C (140° F). IT MAY DAMAGE THE EQUIPMENT.

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Chapter 1

Introduction

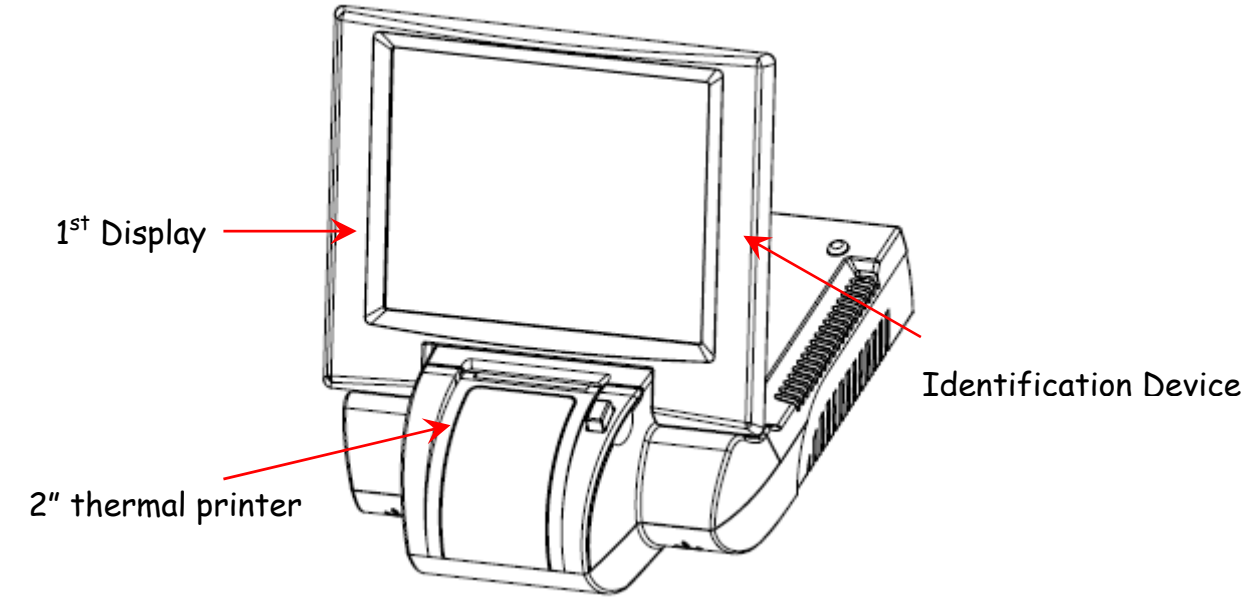
MP-2258/P Introduction

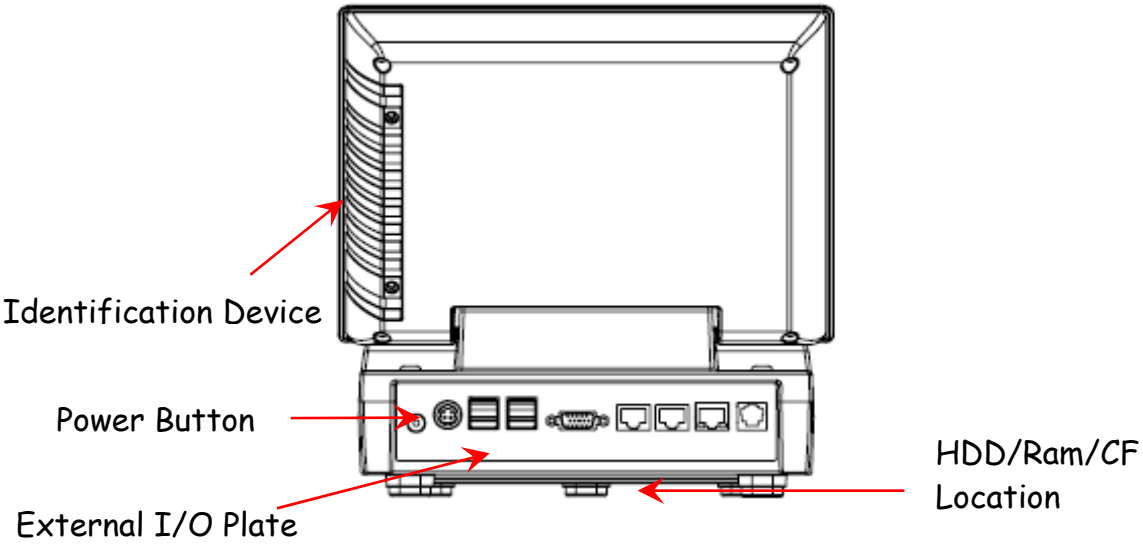
MP-2258/P is the most unique one of FEC POS solution. The Compact, Multi-platform and Fanless design makes it a best solution for boutiques, personal stores and specialty stores, where the counter space is precious and the environment is stylish. Furthermore, with build in 2" thermal printer, you don't need the extra adaptor and wiring. A Perfect solution for space saving.

- **System:** Tiny system structure and more function than a POS
- **Dimension:** Less than A4 size
- **Integration:** With 2" thermal printer could support print speed up to 60mm per second It can be adapted for a variety of uses with the addition of any of the following options: Magnetic Card Reader, VFD/LCD customer

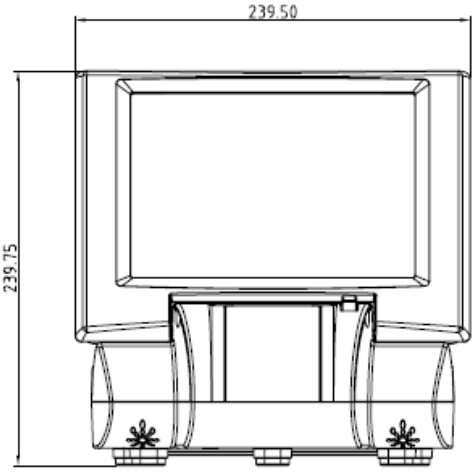
A Quick Tour of MP-2258/P

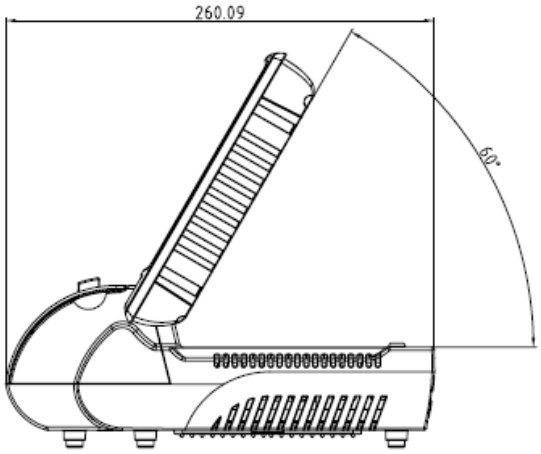
Before you start, take a moment to become familiar with **MP-2258/P**.

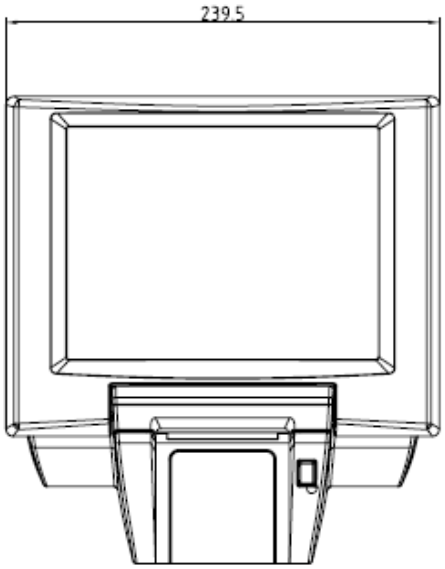


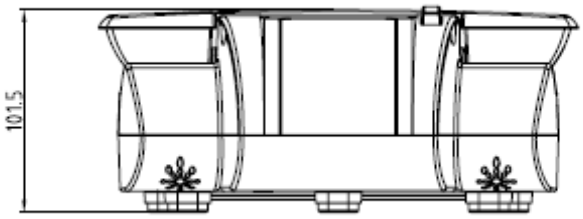


MP-2258/P Dimension

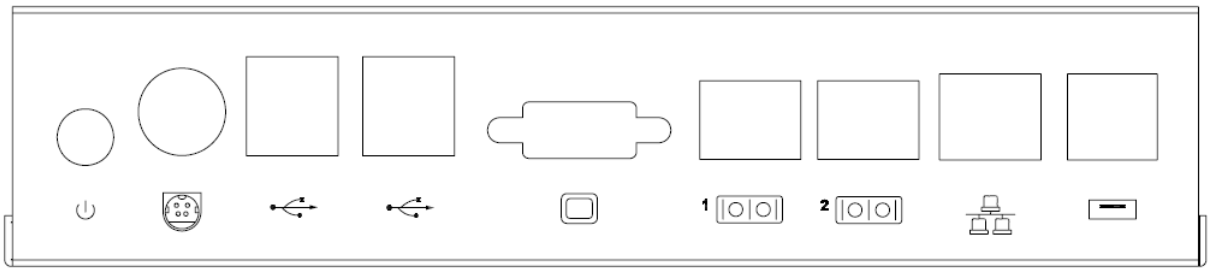








Rear I/O Panel



I/O Port	Connector Type	Description
DC12V	DC Power connector	Connect the adaptor to MP-2258/P
Cash Drawer	RJ11 connector	Cash Drawer Connector, 12 V actuation support
LAN	RJ45 connector	Connect MP-2258/P to the Ethernet
COM1& COM2	RJ45 connector	The serial ports COM1 & COM5 can be used to connect serial devices
USB	USB type A connector	Standard USB connector for external device

Packing List

- MP-2258/P Main System
- Power adapter
- Driver & Manual CD
- MSR to PS/2 Converter cable
- RJ45 to DB9 converter cable X 2
- AC power cord
- Test Paper Scroll

Optional:

- Identification module
- Wall mount kits
- Standalone wiring cover
- Wall mounted wiring cover

Chapter 2

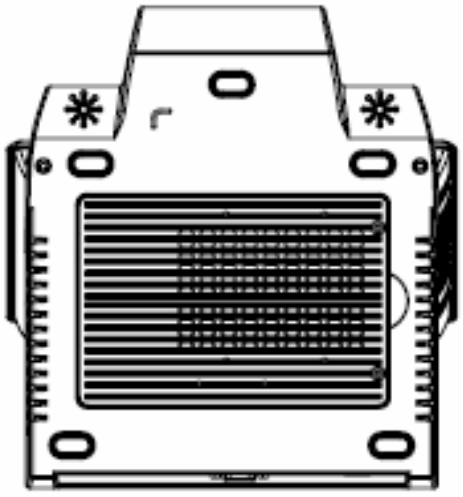
Hardware Installation and Upgrading

Do not remove the rear cover until you have verified that no power is flowing within the system. Power must be switched off and the power cord must be unplugged. Every time you service the system, you should be aware of this.

Do NOT touch the HDD cover while the system operating!!

Hard Disk Drive/Memory/CF card Installation

1. Turn off power and remove power cord from the system
2. Remove the HDD cover of by releasing 4 screws



3. Install/replace the HDD/Memory/CF to its slot
4. Connect the SATA and SATA power cable to the HDD
5. Screw the HDD cover back
6. Connect the power cord to the system

Note: If the HDD does not work normally, please refer to **troubleshooting**

MCR Parameter Modification

This option is for users who need to customize the MCR parameters for a particular task.

Some of the useful parameters include:

- The selection of country code, other than the default English.
- The choice of track combinations.
- The preamble/post amble codes.

The MCR parameters can be modified by using the supplied utility program.

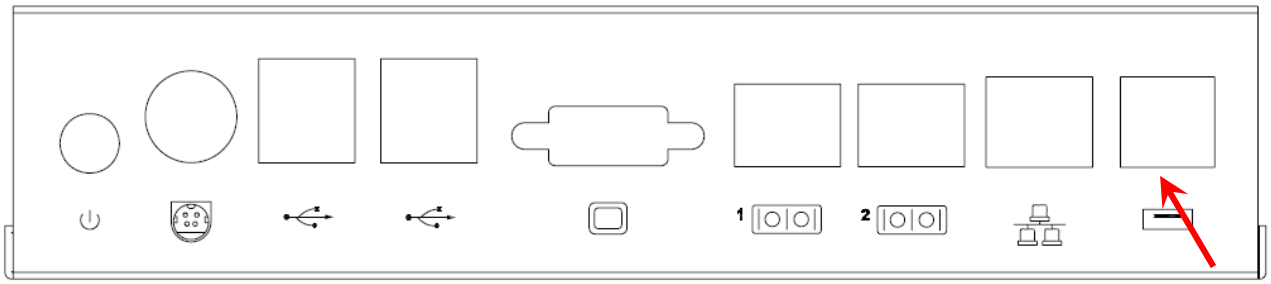
The utility can be found on the CD that came with your system in the “Utilities” folder. The program name is msr_v12_win.zip.

Cash Drawer Installation

Before connecting the cash drawer to the MP-2258/P, please make sure the drive voltage and cable pin assignment of the cash drawer matches the definition of the cash drawer port of MP-2258/P. Please refer to chapter 3.8.1 in the appendix motherboard manual for more information on the Cash Drawer.

Plug cash drawer cable into cash drawer port.

Note: If the cash drawer cannot be detected by the system, please refer to **troubleshooting**.



Up to two cash drawers may be driven from this port. Driving voltage of the solenoid is DC+12V. I/O port 280h is used for drawer operation. A test program is supplied, for Linux and Windows, source code of which is available on request by software developers.

Hardware logic is as follows.

To open drawer1, write 01h to port 280h, wait 200 msec, then write 00h to turn off the drive.
To open drawer2, write 02h to port 280h, wait 200 msec, then write 00h to turn off the drive.

To test for drawer open, read port 280h, if bit 0=1 then drawer is open, if bit 0=0 drawer is closed.

Chapter 3

Software Installation and Setup

Driver Installation

MP-2258/P comes with a variety of drivers for different operating systems.

You will find the CD with **MP-2258/P** which has all necessary drivers for this system.

Please follow this installation sequence.

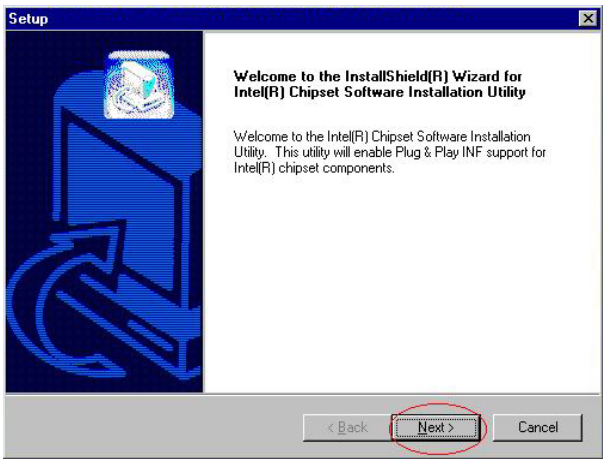
Driver installation sequence:

Chipset Driver -> VGA Driver -> LAN Driver -> Audio Driver -> USB Driver -> Touch Tools

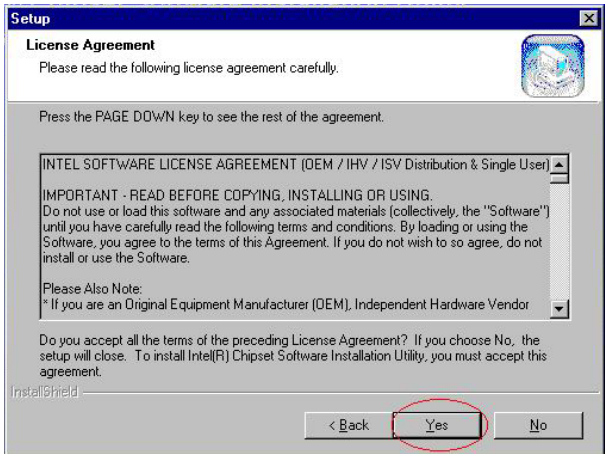
The reason to follow our sequence is that IRQ settings will be changed by Windows 2000 and XP to non supported values, and you may encounter unnecessary problems later.

Intel Chipset Driver Installation

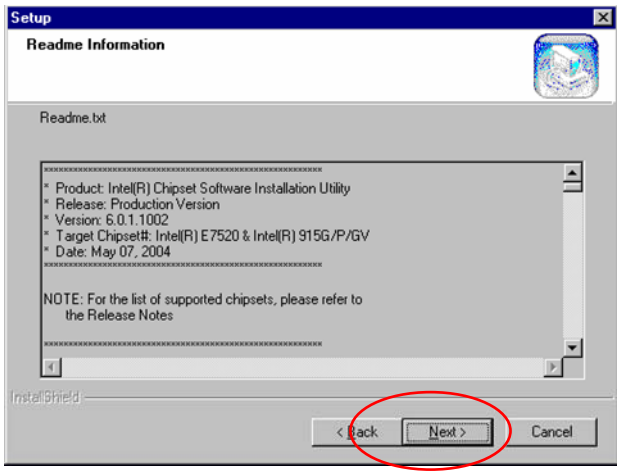
1. Insert the CD into your CD ROM Drive.
2. Locate the folder of D:\Driver\CHIPSET\INF
3. Open Setup.exe



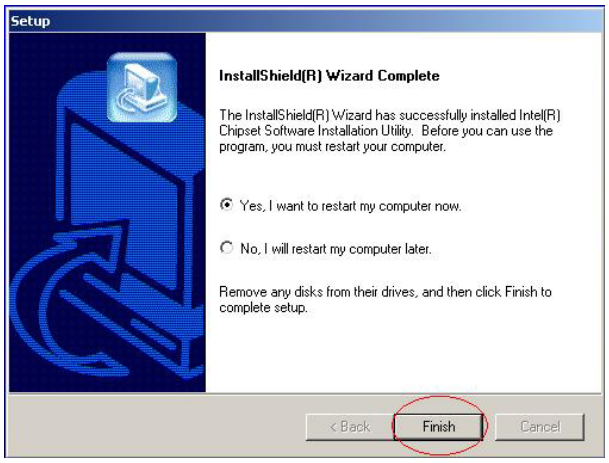
4. Click Next.



5. Read the License Agreement and click Yes.



6. Click Next and the drivers for the Intel Chip set will install.



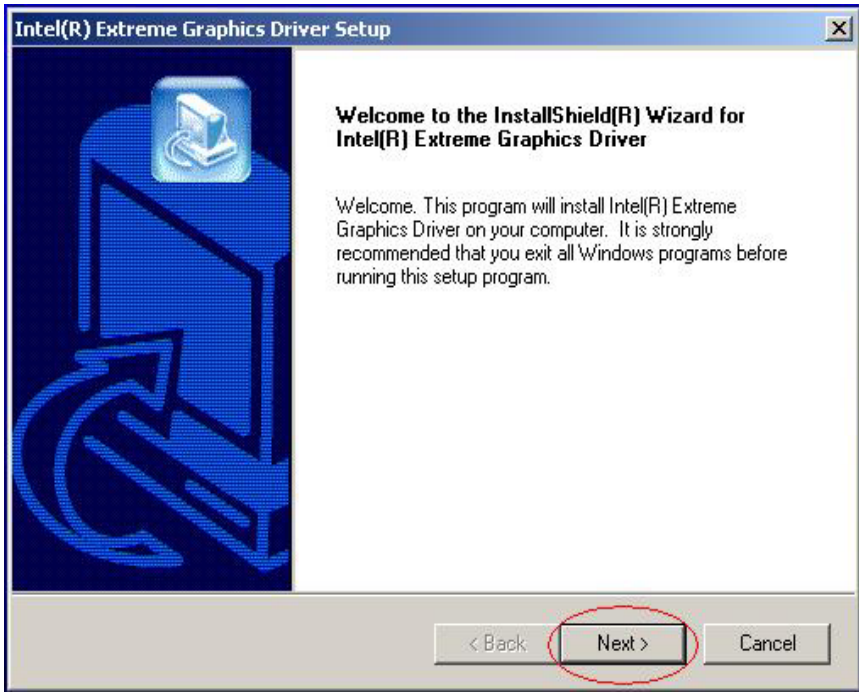
7. When the 'Setup COMPLETE' message appears click Finish to restart your computer.

VGA Driver Installation

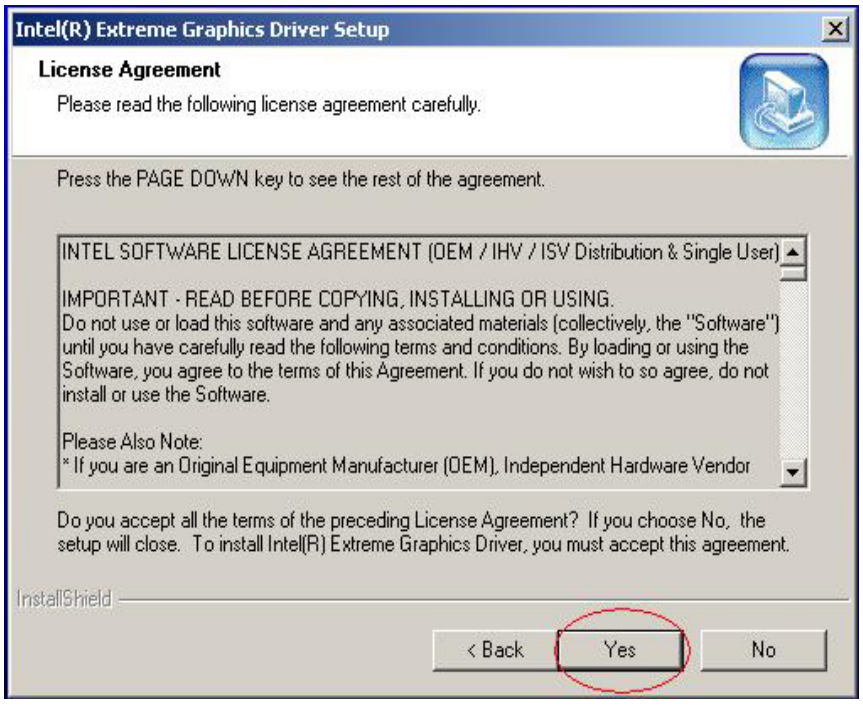
852GM driver installation Windows 2000 & XP

1. Locate the folder of D:\Driver\VGA\INTEL\WIN2K_XP

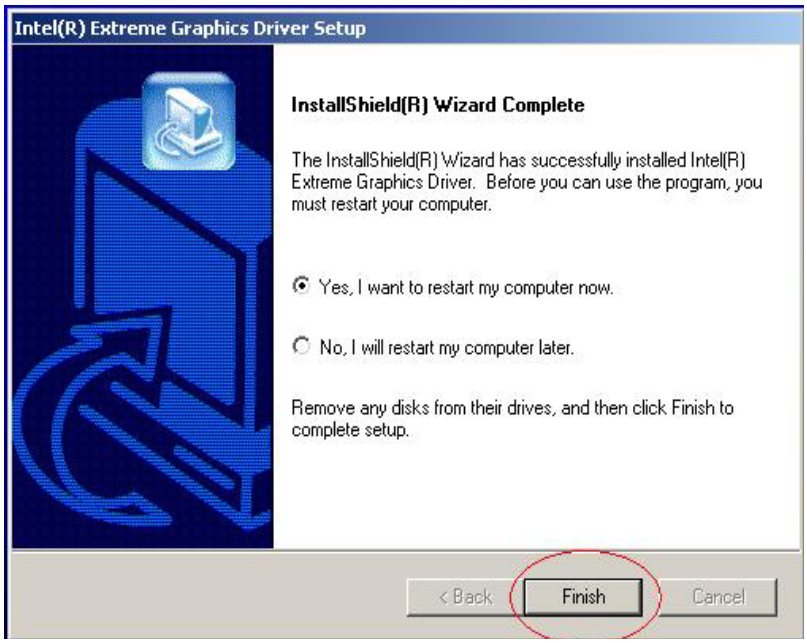
2. Open setup**.exe**



3. Select **Next** to continue.



4. Read the License Agreement and click **Yes.**



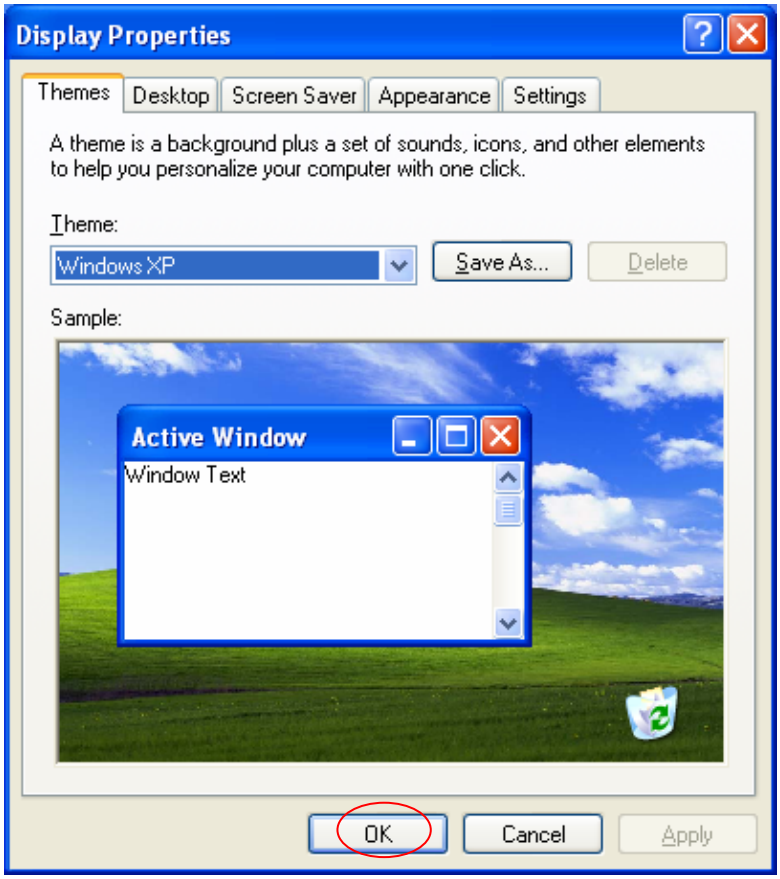
5. Click **Finish** to complete the installation procedure and restart the system.

Enable second LCD panel setting Windows 2000/Windows XP.

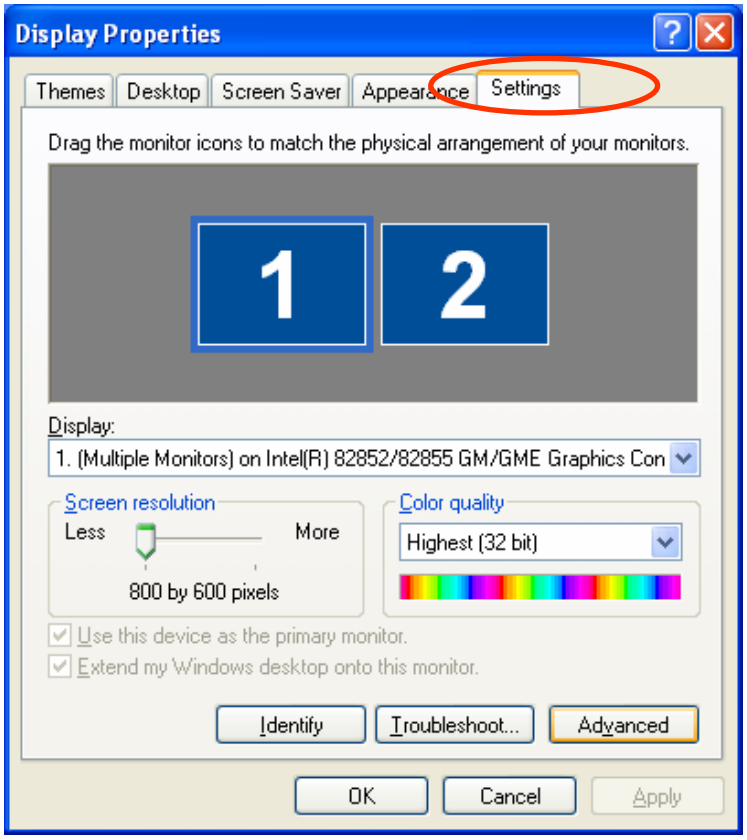
After you have installed the VGA driver you must adjust the settings.

.

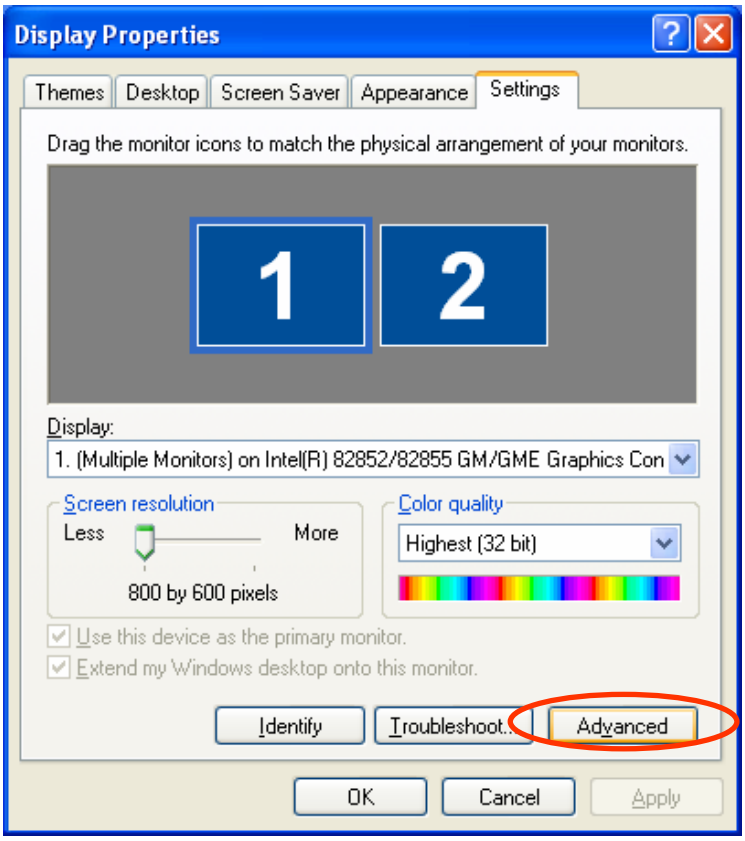
1. Right click your mouse anywhere on the desktop then click **properties**.



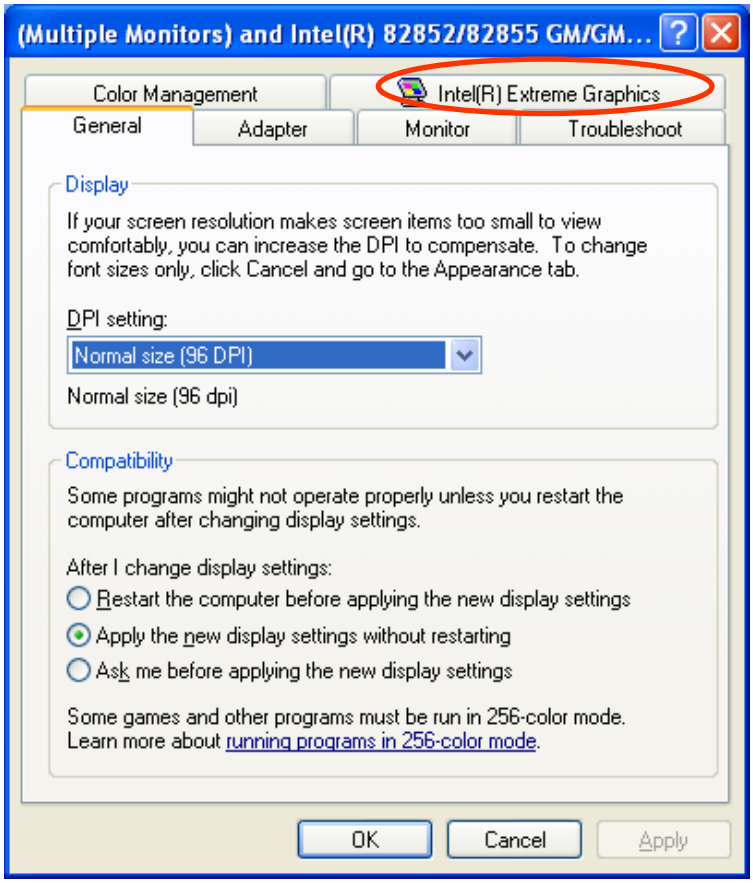
2. Click the settings tab.



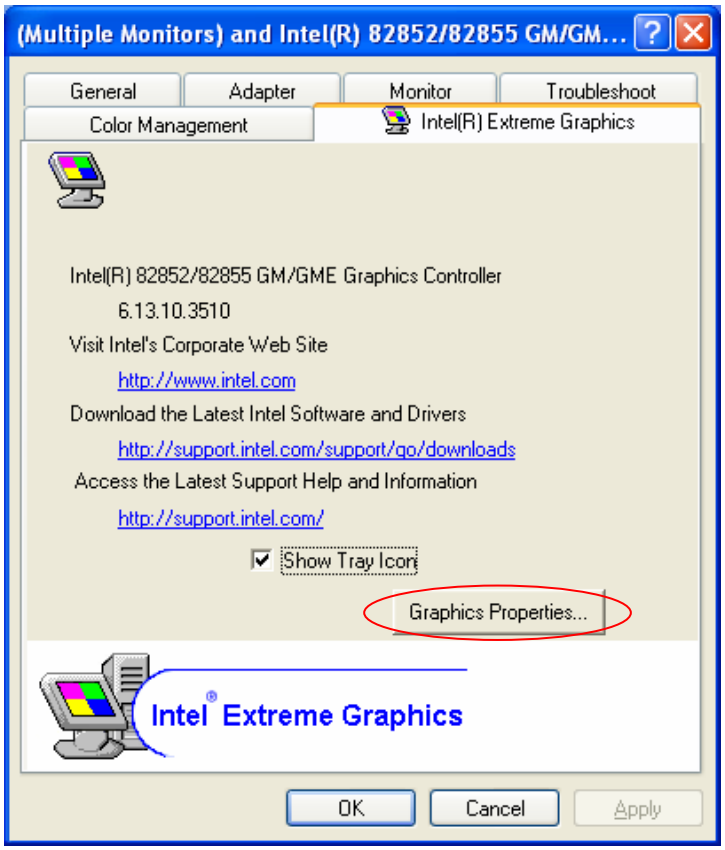
3. Click **Advanced**.



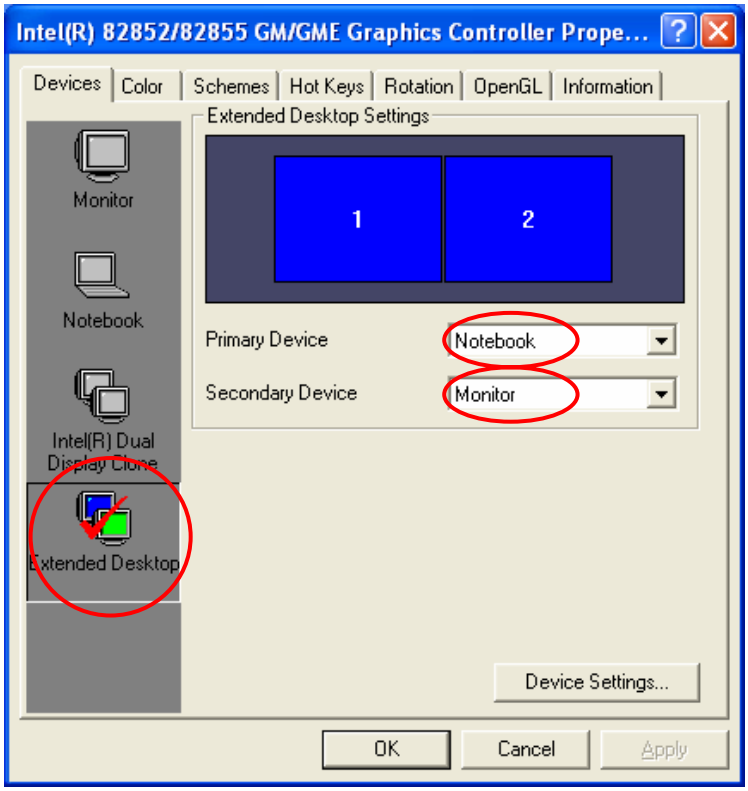
4. Click **Intel(R) Extreme Graphics**.



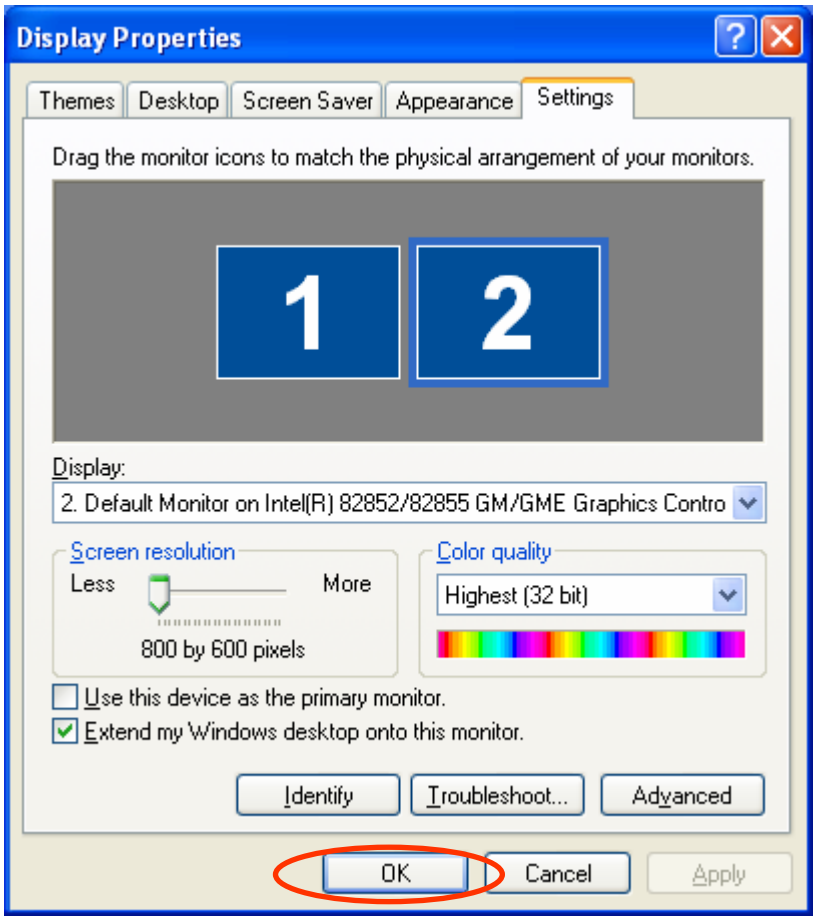
5. Click **Graphics Properties**.

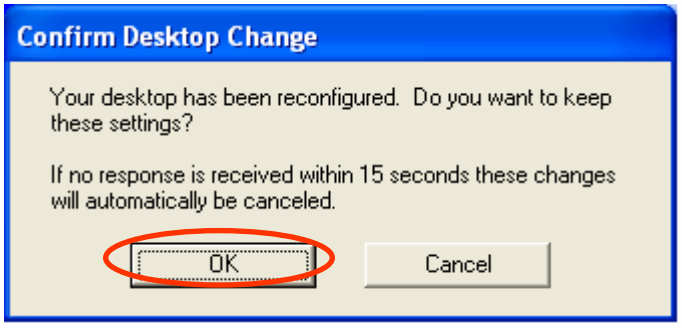


6. Click **Extended Desktop** and select **Notebook** for primary device, **monitor** for secondary device.



7. Click **OK.**





8. Select the second LCD panel. This is done either by clicking on the number 2 or selecting from the dropdown menu.

   For the second LCD panel make sure that **Extend my Windows desktop onto this monitor** is selected.

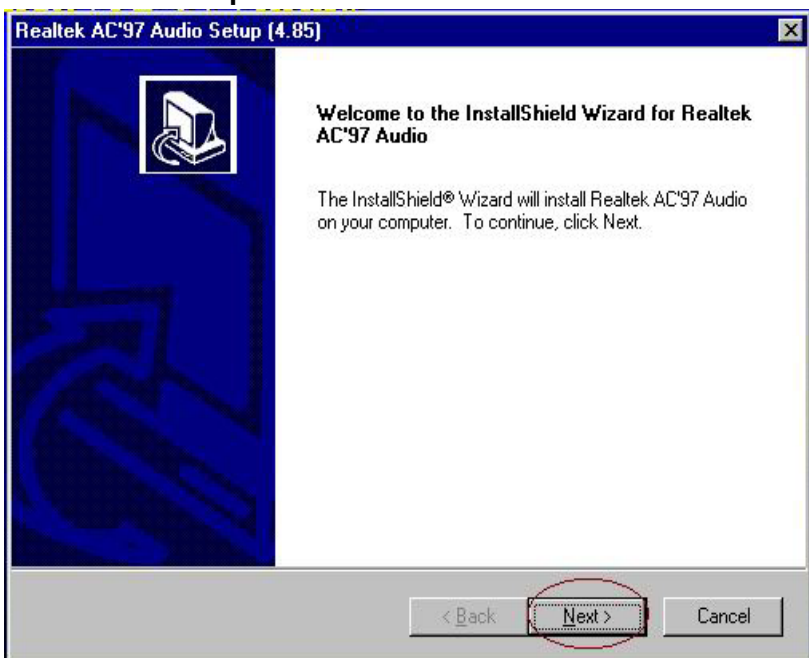
9. Click **Apply** then click **OK** to finish the settings.

Note： During boot sequence “**No Sync**” will appear on the second LCD panel.
The boot sequence can take a minute or so when a second LCD panel is installed.

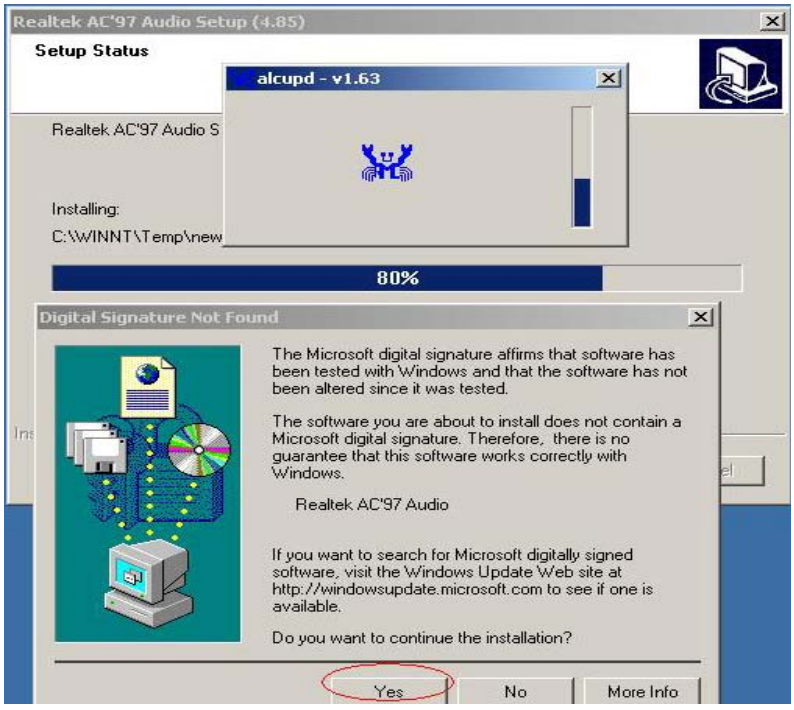
Audio Driver Installation

Audio Driver Installation for all Windows Operating Systems.

1. Locate **D:\Driver\audio\Realtek**
2. double click **Setup.exe.**



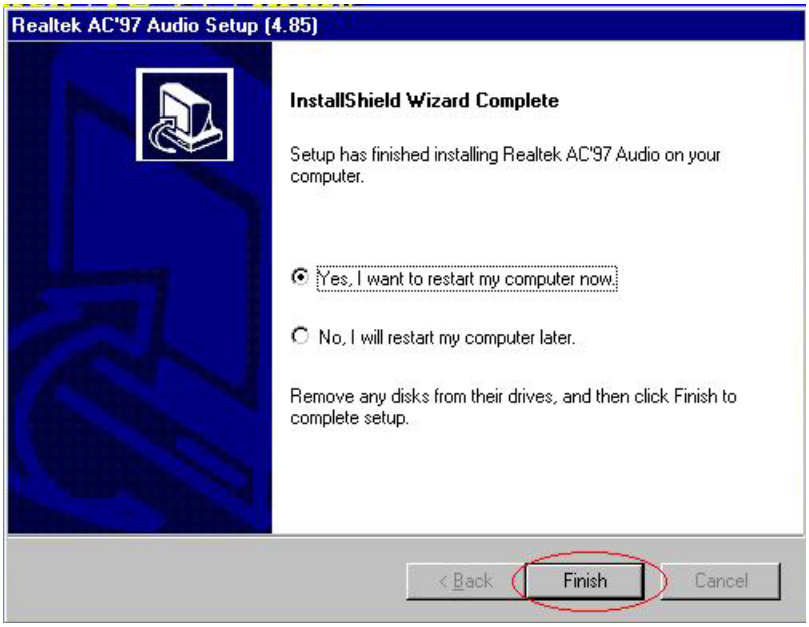
3. Select **Next** to continue.



Note: For Windows 2K. If you receive this warning message, please click **Yes** to continue.

Note: For XP If you receive this warning message, please click Continue Anyway.

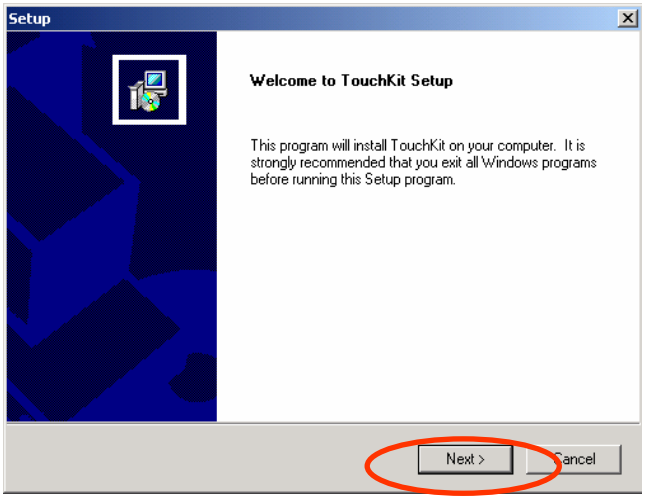
4. Click **Finish** and restart the system.



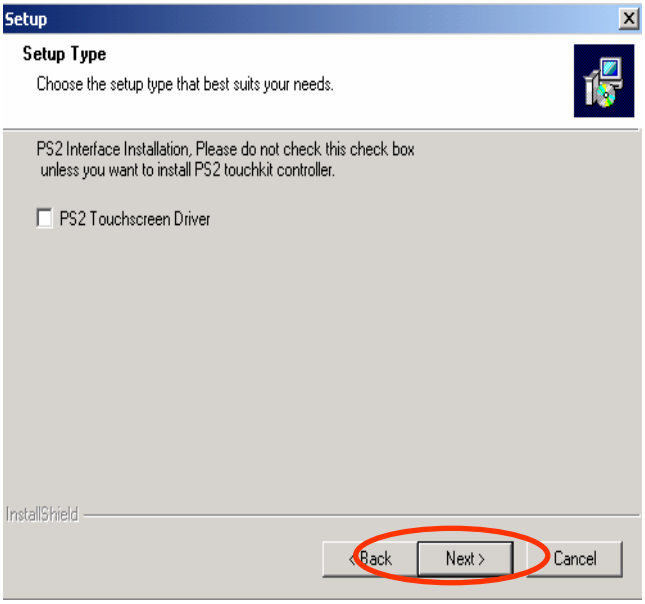
TouchKit Tools Installation

TouchKit Tools Installation for Windows Operating Systems

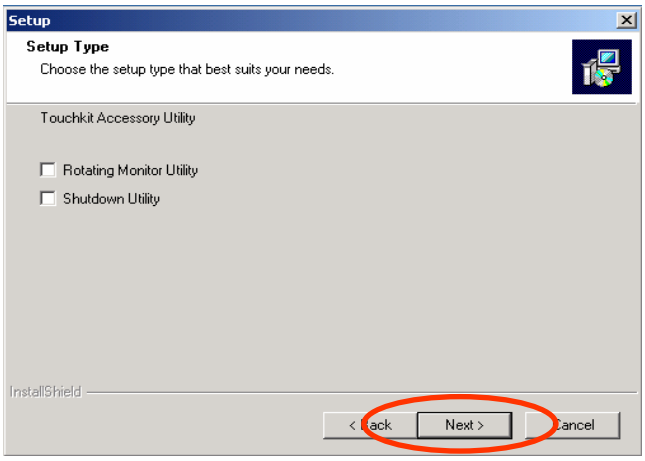
1. Locate D:\Utility\TOUCHSCREEN\TouchKit(Fujitsu)\Driver
2. Select the relevant folder for the operating system that you are using.
3. Open Setup.exe
4. Click **Next**



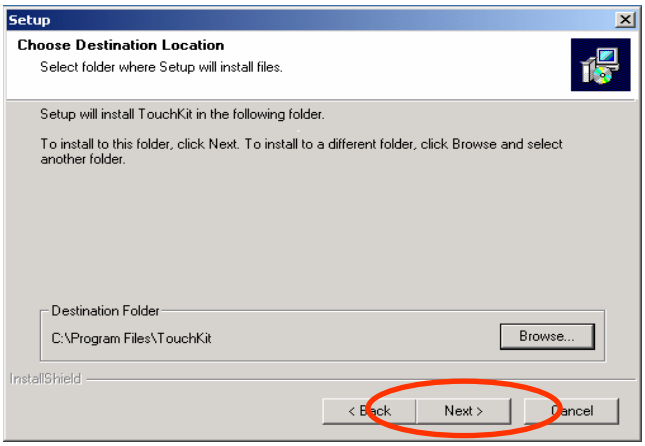
5. Click **Next**



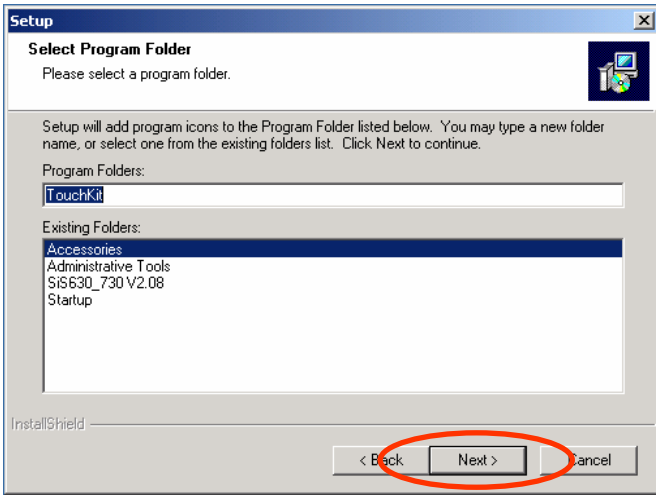
6. Click **Next**



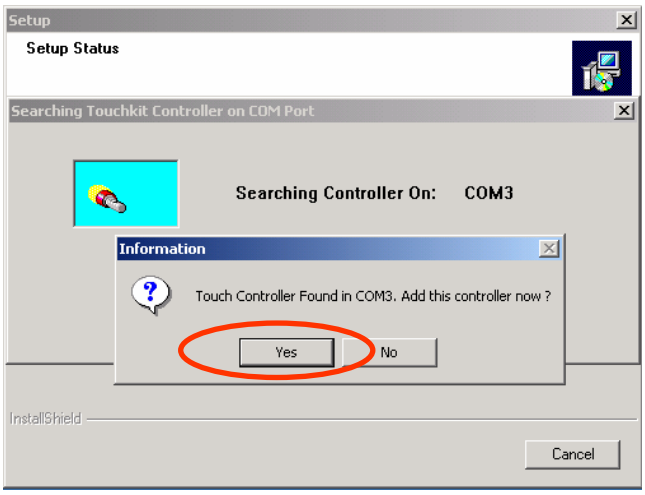
7. Click **Next**



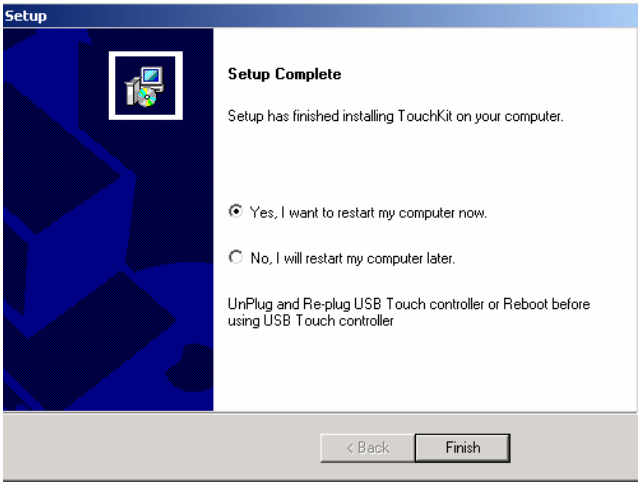
8. Click **Next**



9. Click **Yes**



10. Click **Finish** to restart your computer again.



After the system finish rebooting follow the directions to calibrate the Touch screen.

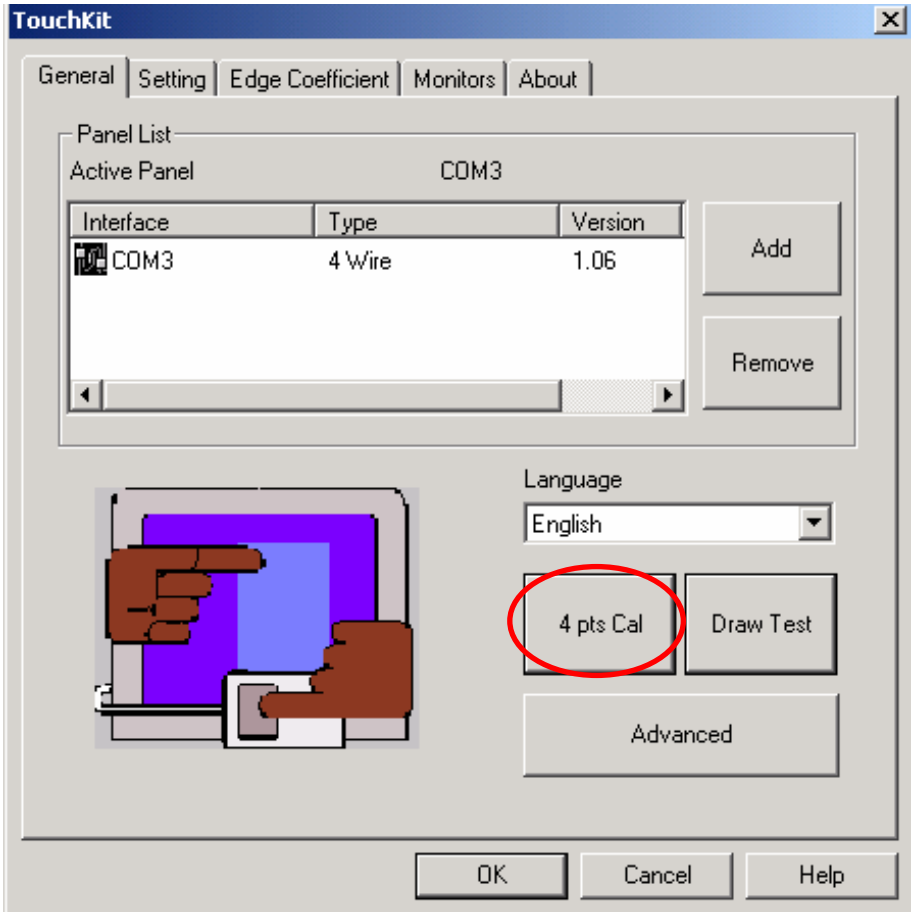
TouchKit Control Panel

This section explains the different options in the TouchKit control Panel.

General tab

The general tab allows you to:

- Change the COM port your touch screen is set to.
- Calibrate the touch screen with the **4 pts Cal** button.

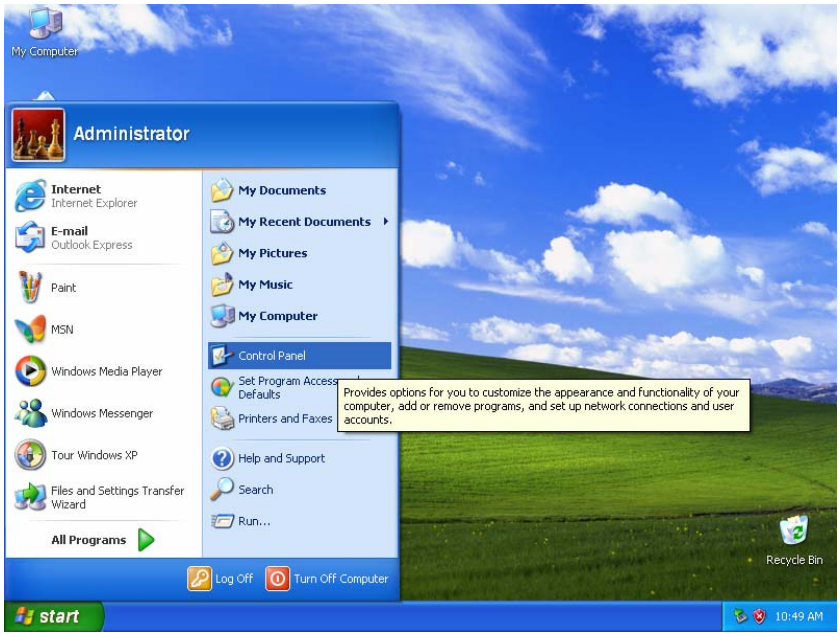


Printer Driver Installation Guide

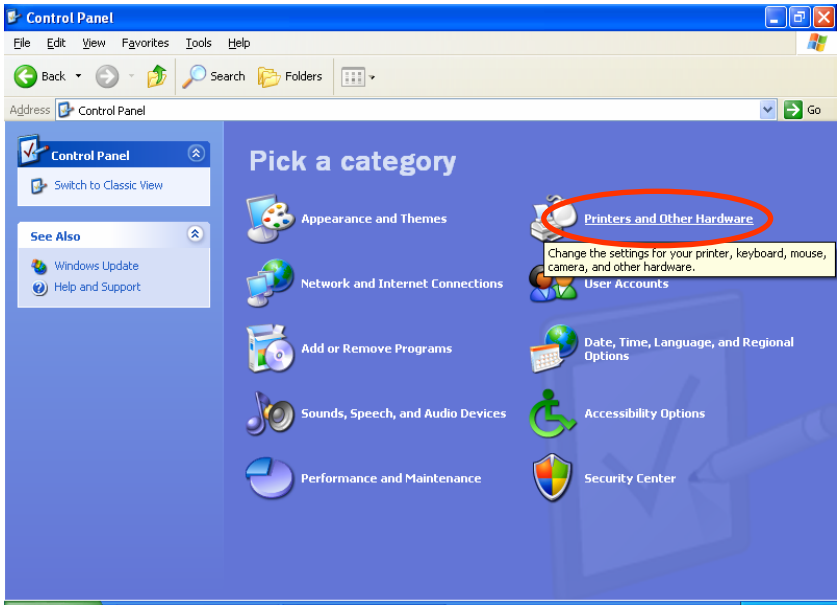
1. Installing the Printer driver
2. Setting the Communication protocol
3. Print the test page
4. Setting of Printer features

A. Installing the Printer driver

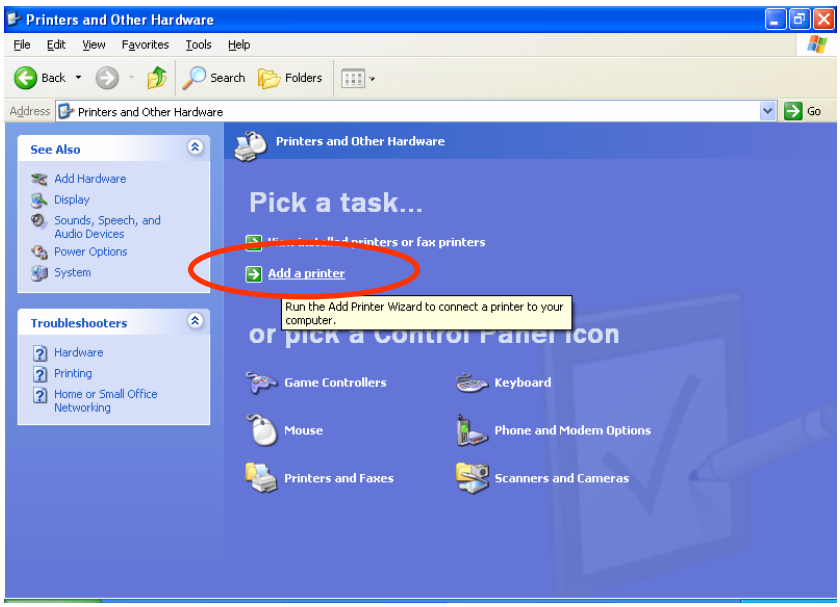
1. Click “**Control Panel**” from WinXP Start menu



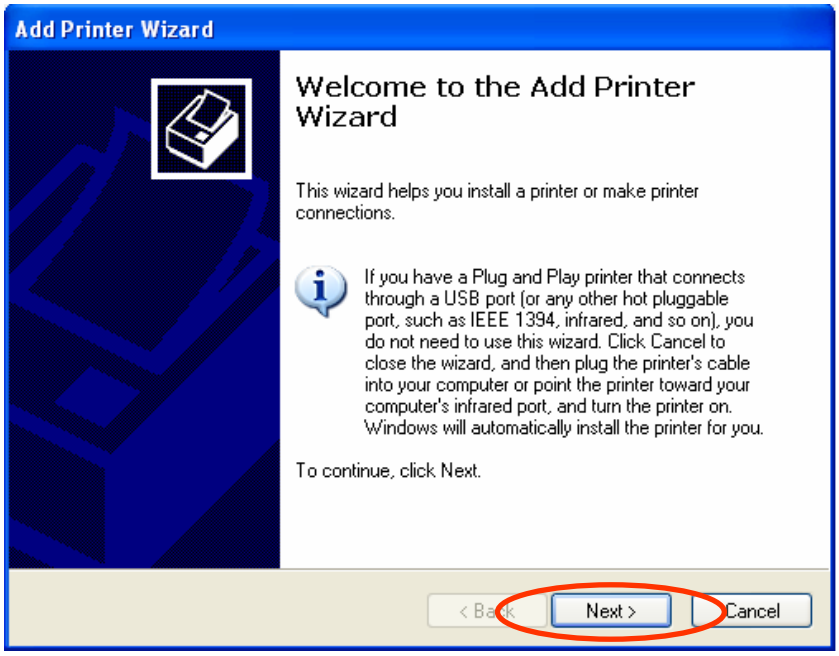
2. Click “Printers and other Hardware”



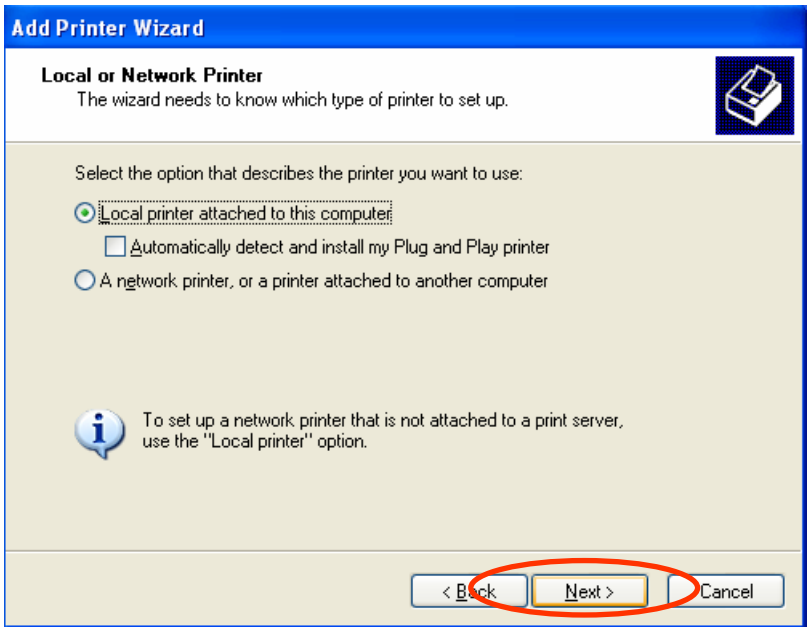
3. Click “Add a printer”



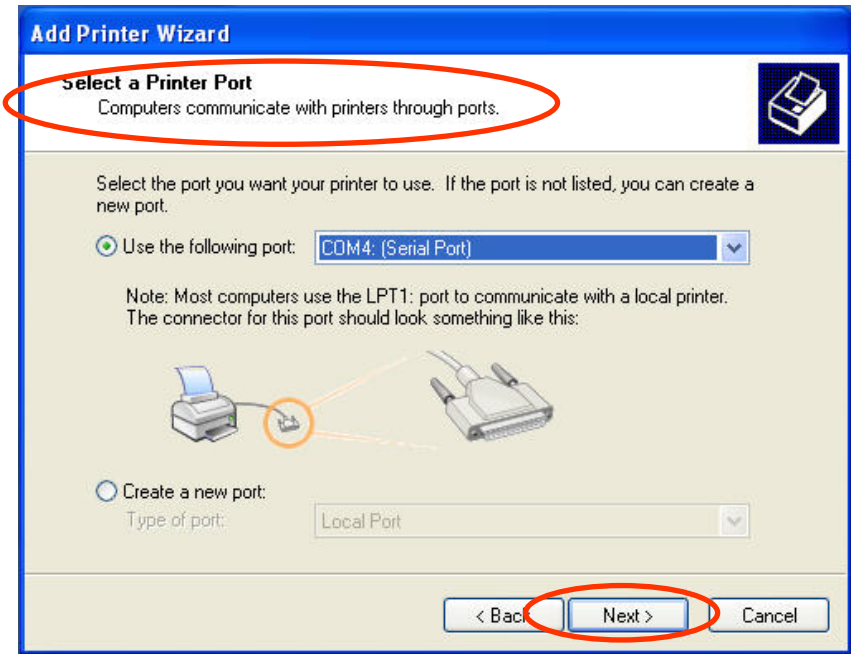
4. Click “Next >”



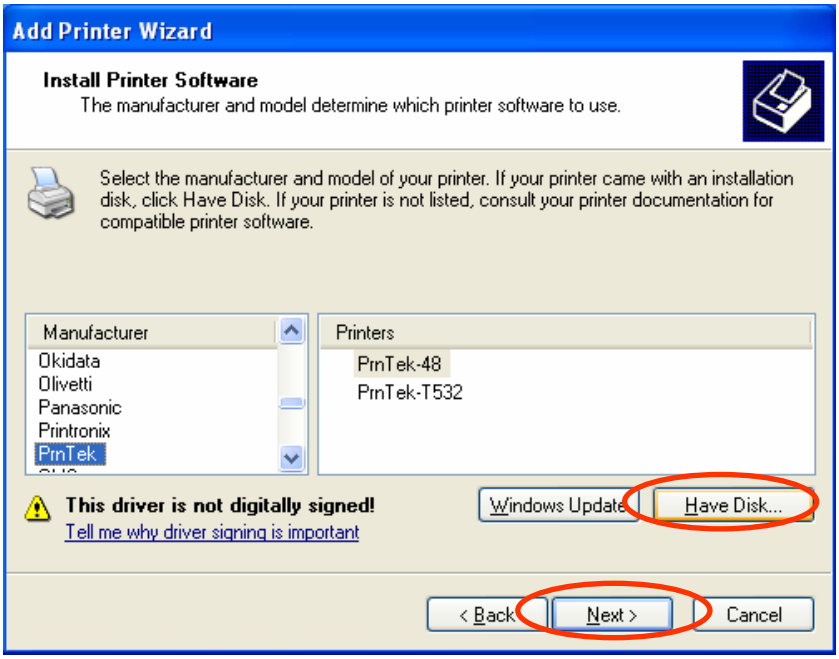
5. Click “Next >”



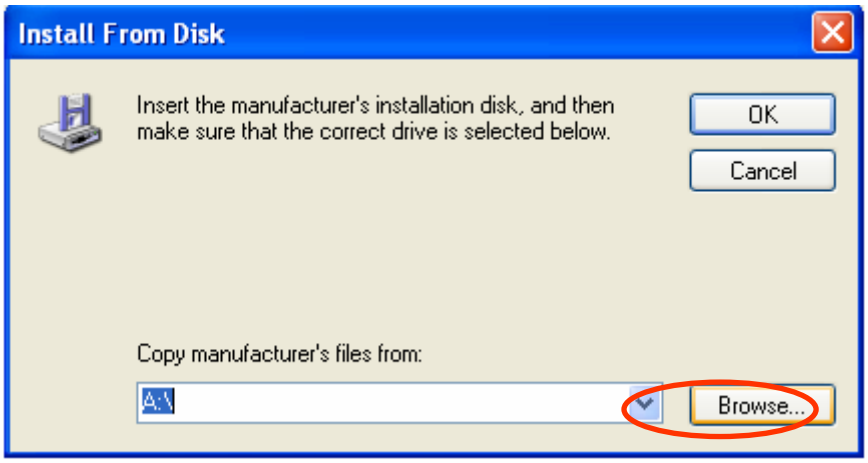
6. Select a printer Port, Then Click “Next >”.



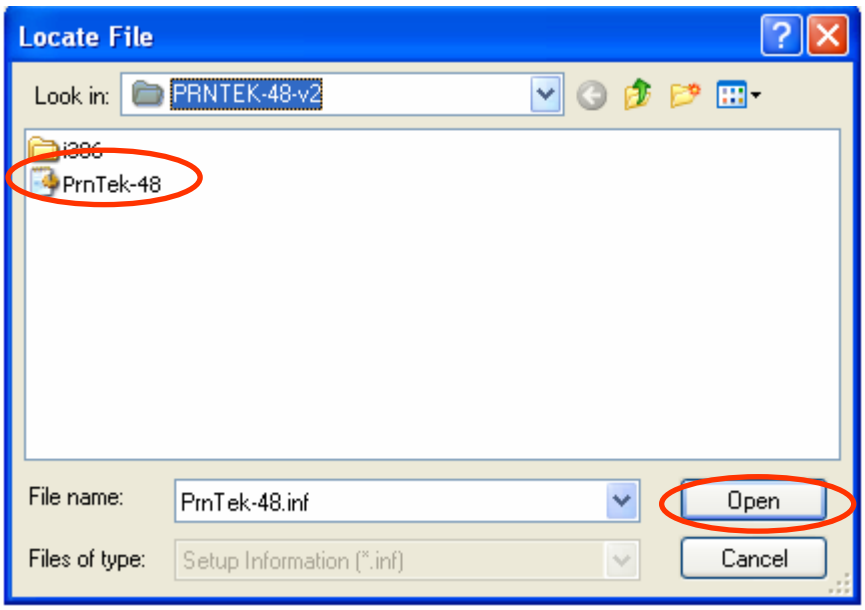
7. Click “**Have Disk**” and then click **next**



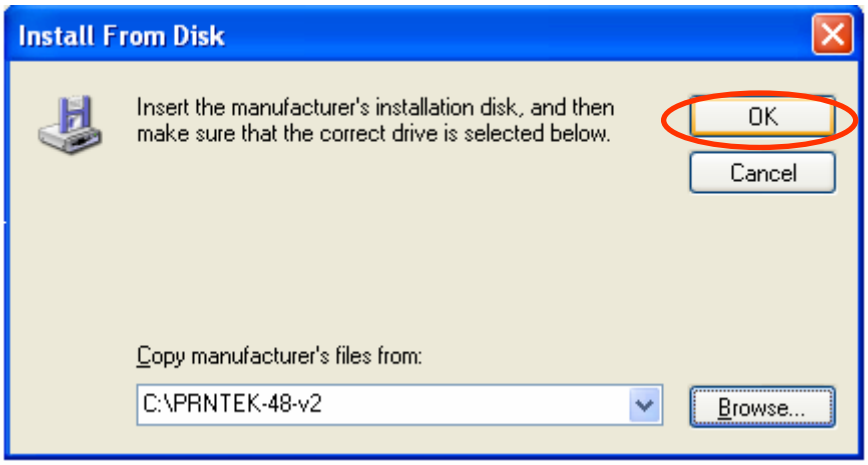
8. Click “Browse …”



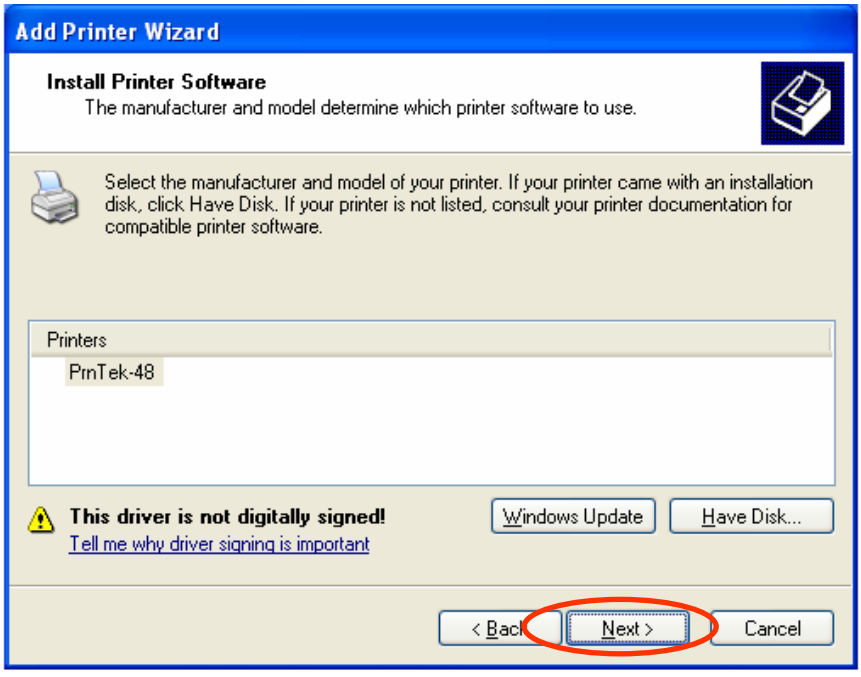
9. Browse to the location where the driver file located on the PC, then Click “Open”.



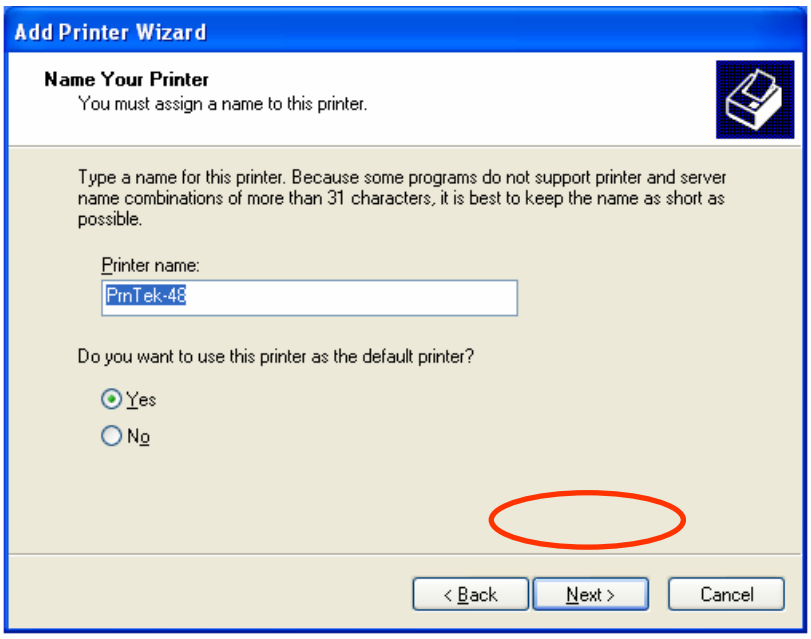
10. Click “OK”



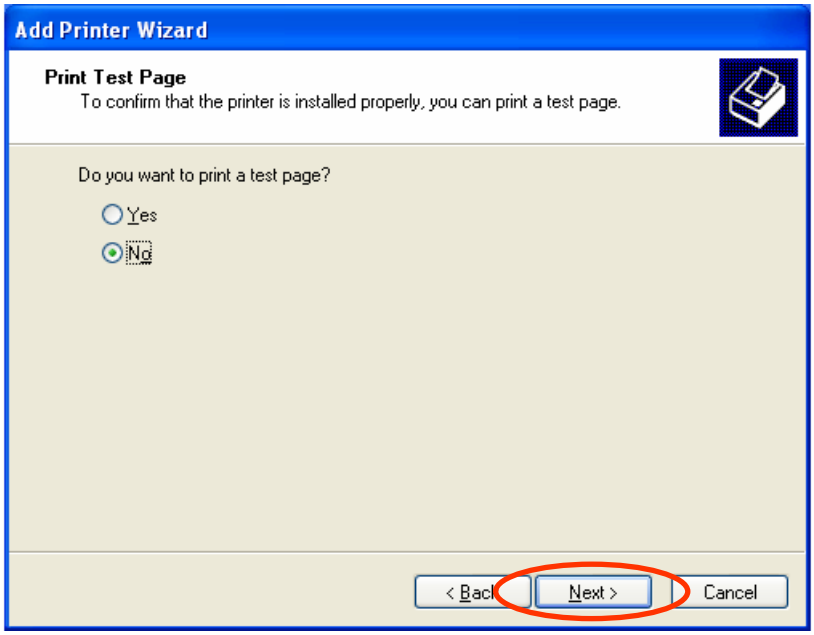
11. Click “Next >”



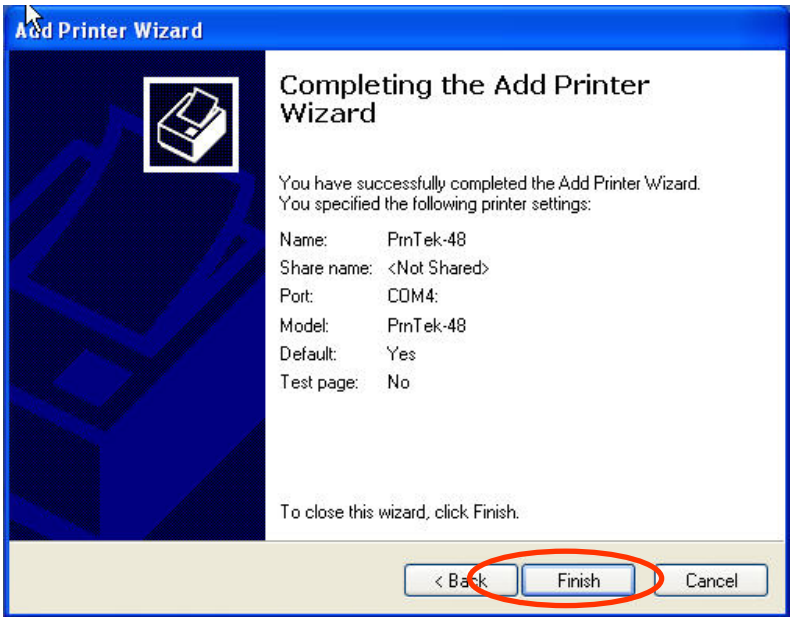
12. Click “Next >”



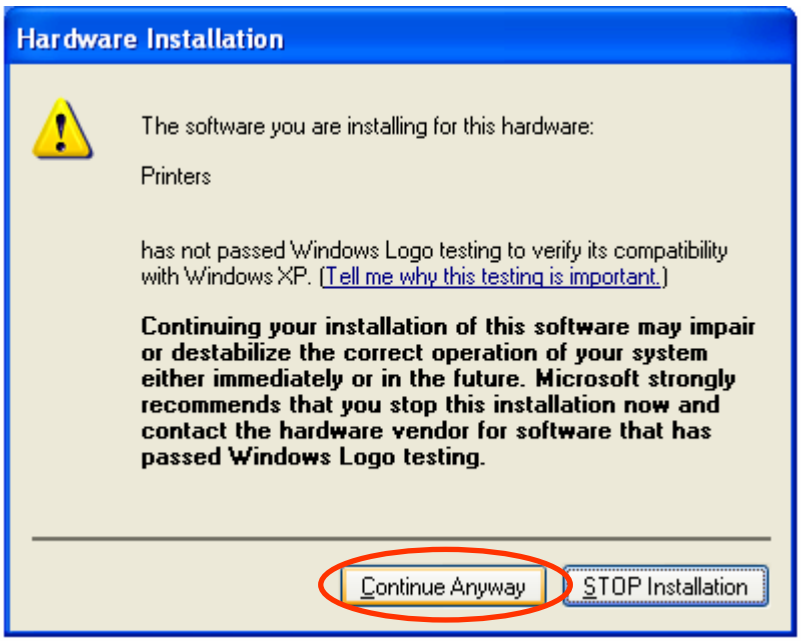
13. Click “Next >”



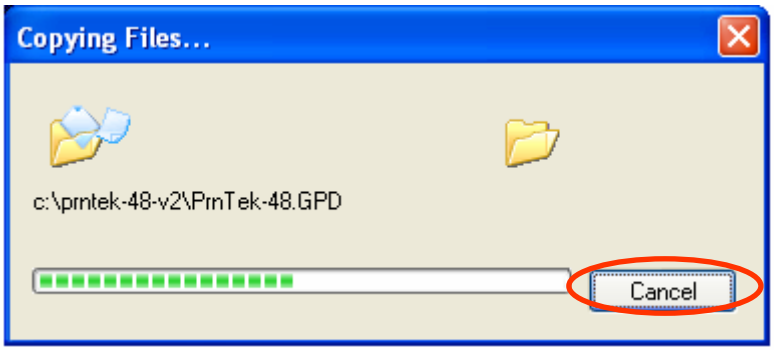
14. Click “Finish”



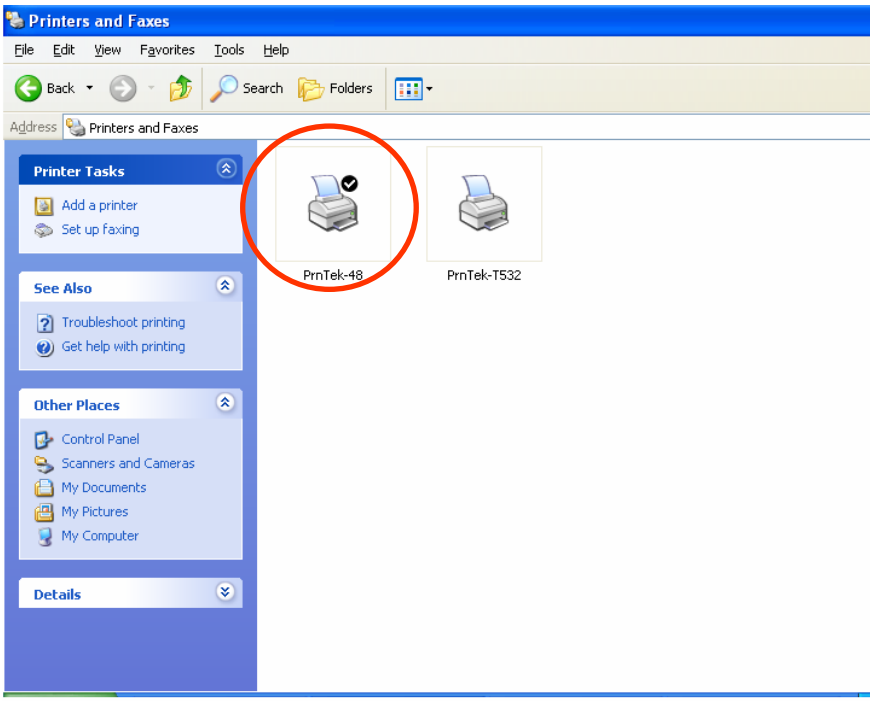
15. Click “Continue Anyway”



16. Copy Files …

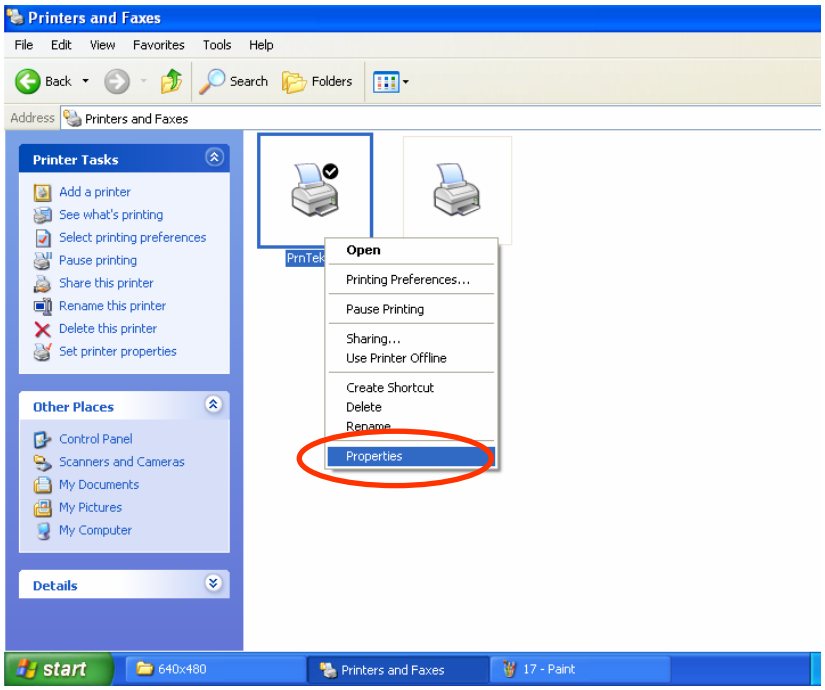


17. To display the new PrnTek-48 icon.

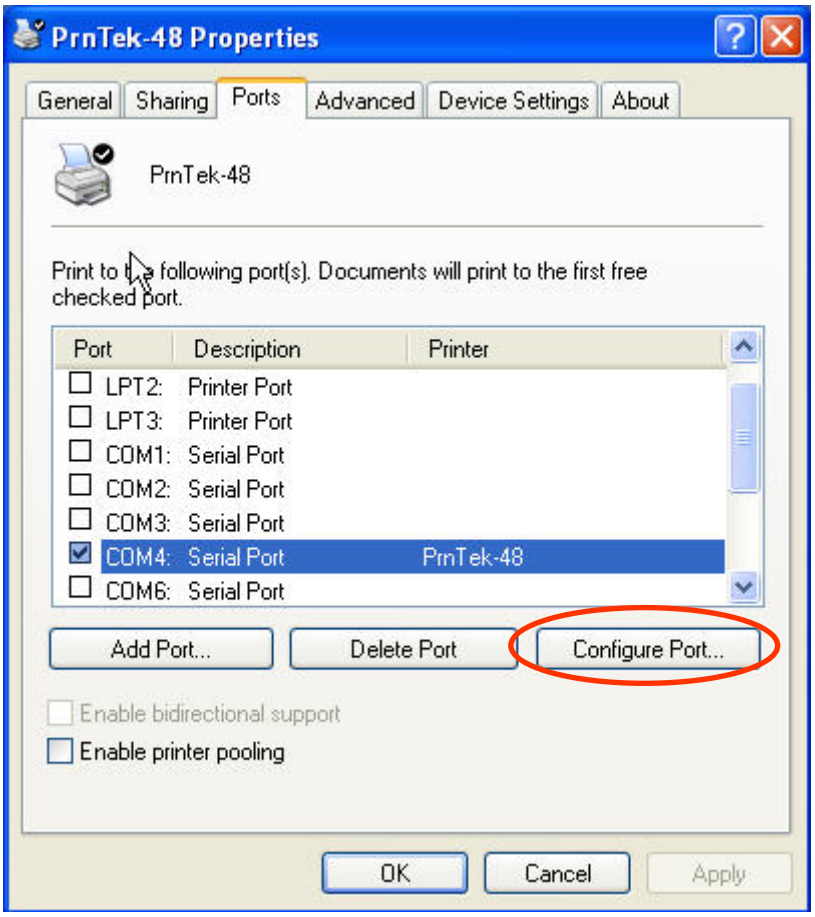


B. Setting the Communication protocol

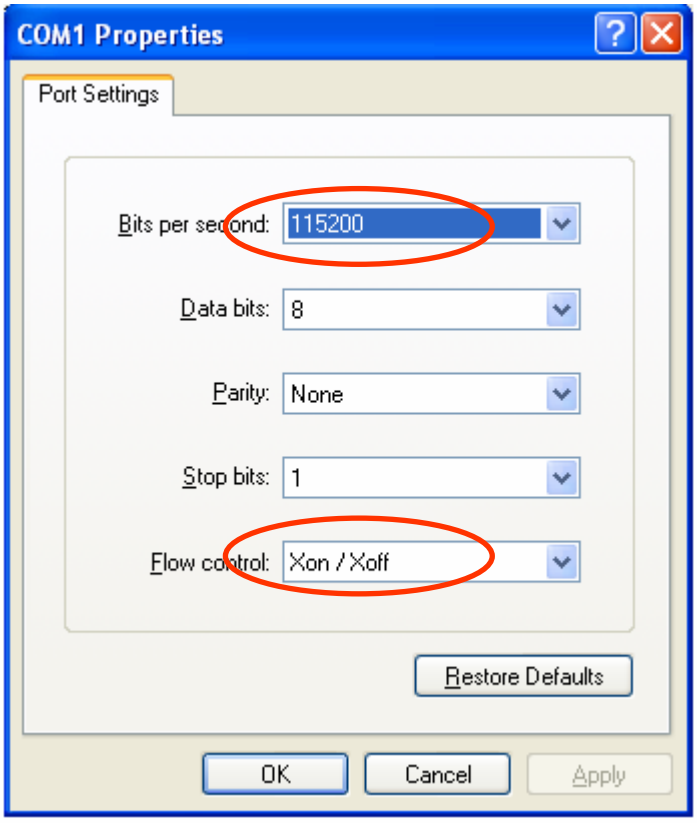
1. Click the right button of the mouse, then click “**Properties”**



2. Select “Ports”, Then Click “**Configure Port …**”

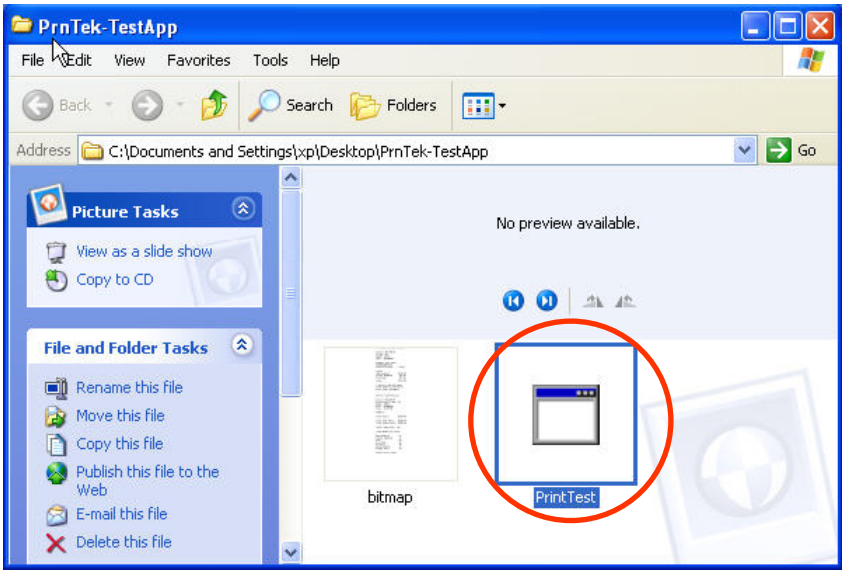


3. Setting the Bits per second to **115200**, the Flow control to **Xon/Xoff**.

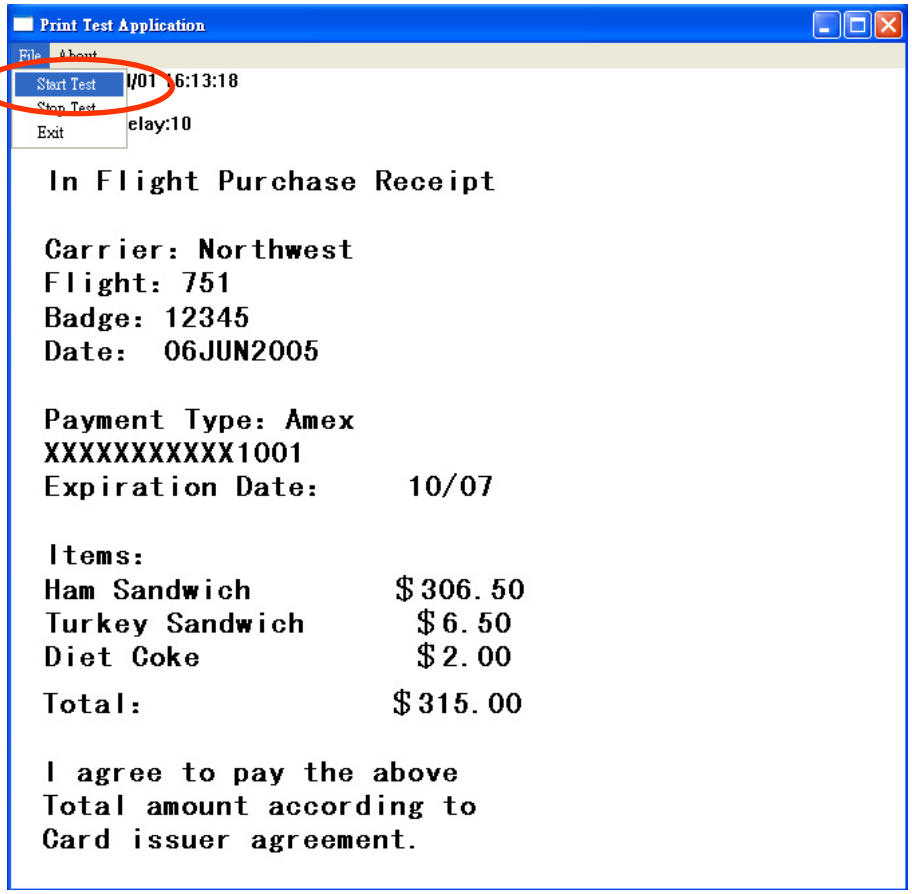


C. Print the test page

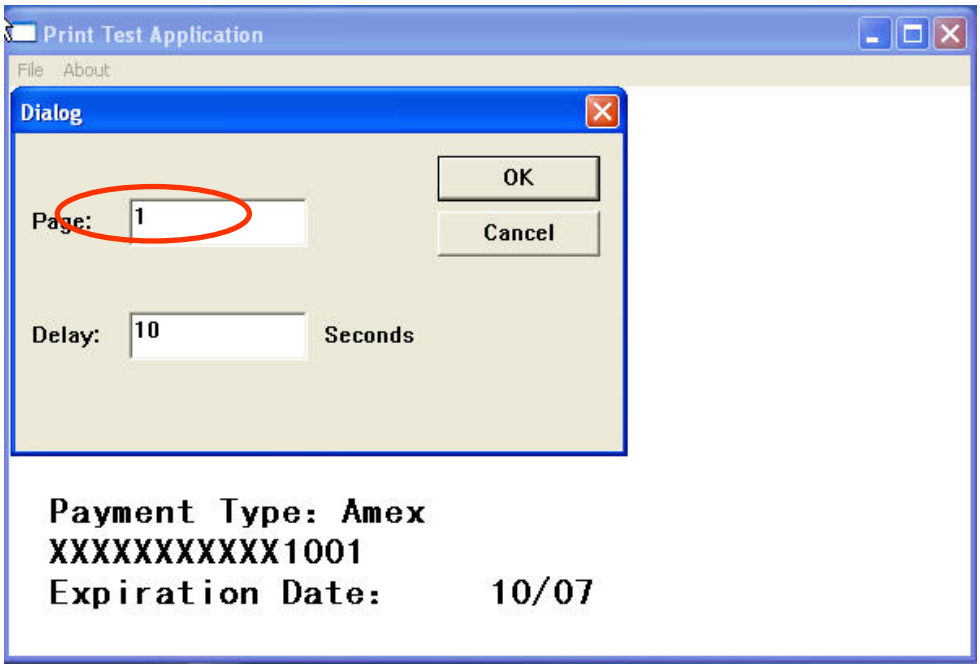
1. Double click the **PrintTest.exe**



2. Select "**Start Test**"

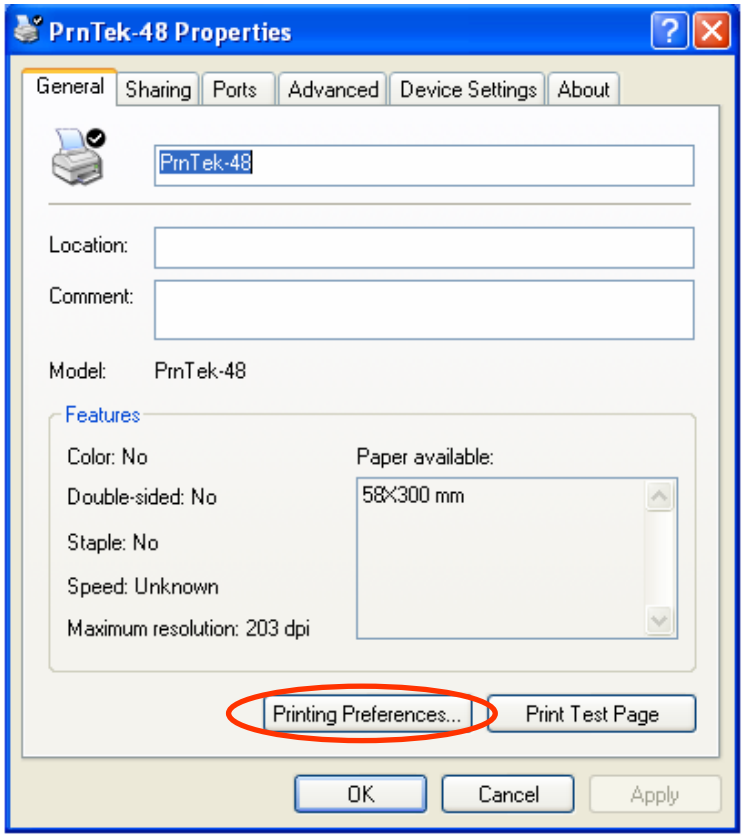


3. Set the page you want to print

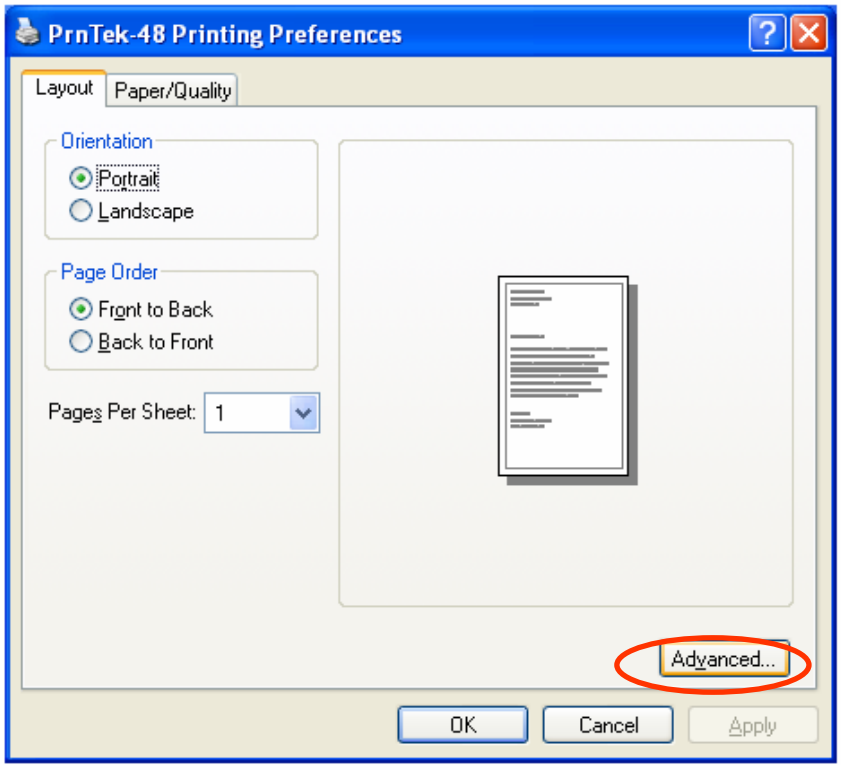


D. Setting of Printer features

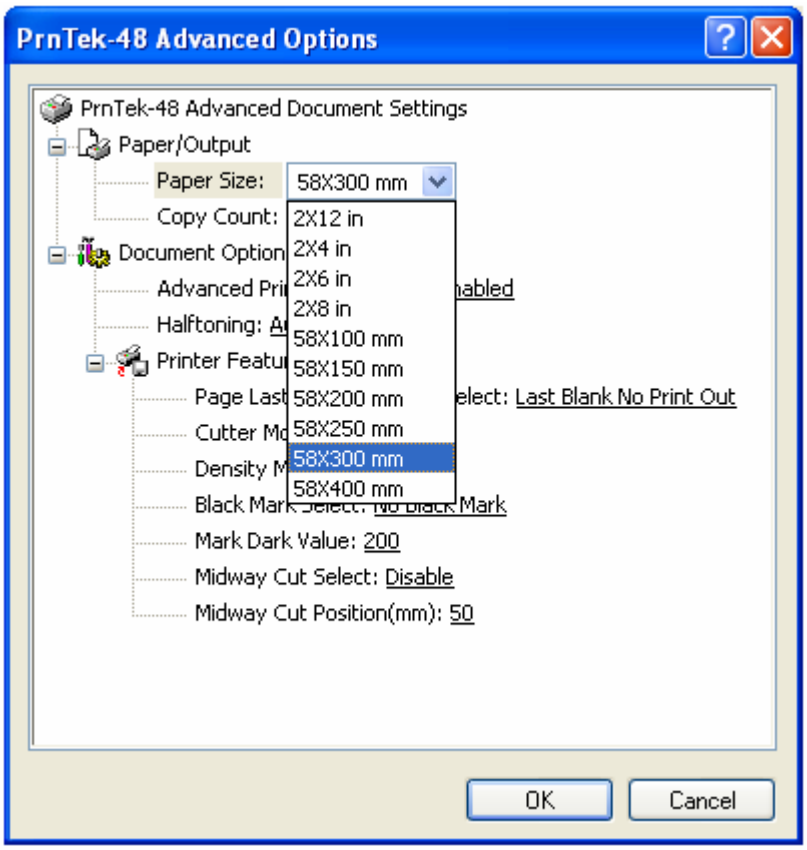
1. Click "**Printing Preferences …**"



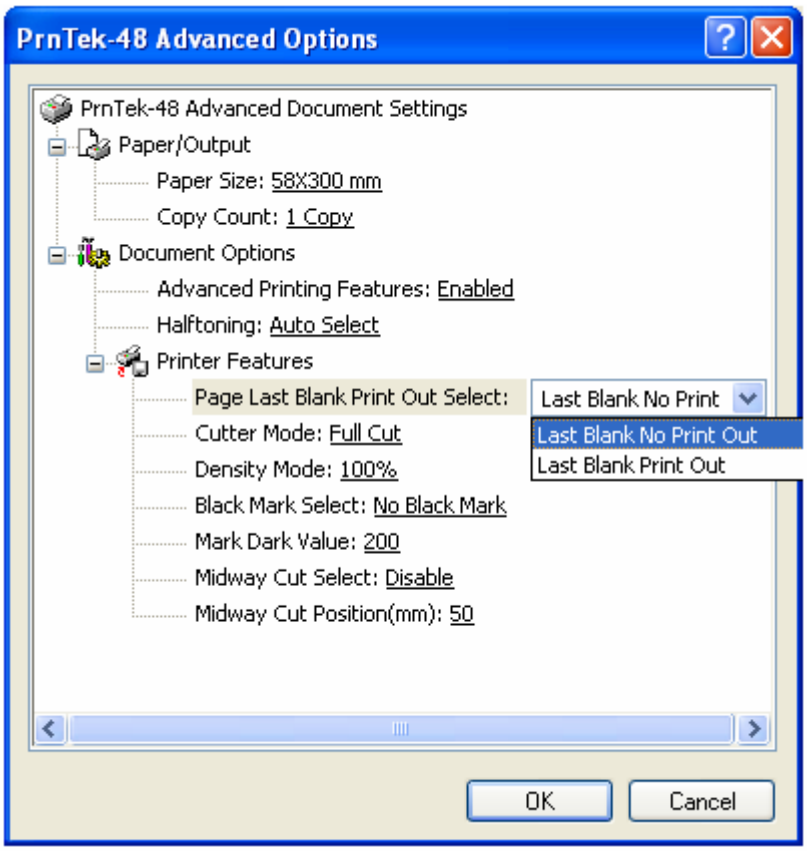
2. Click "**Advanced …**"



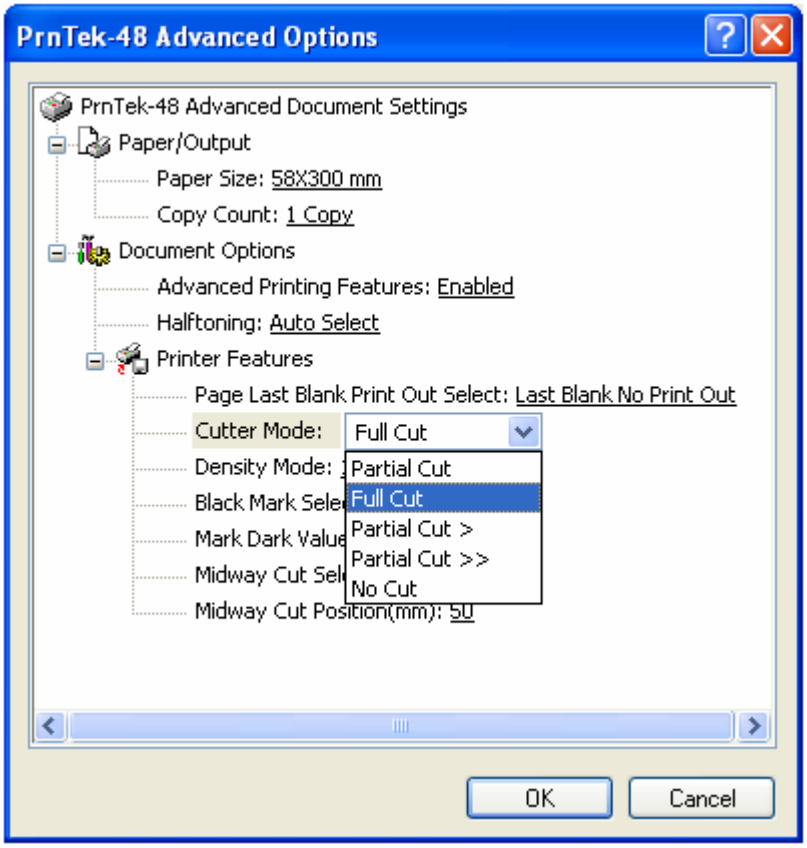
3. Choose **“Paper Size ”**



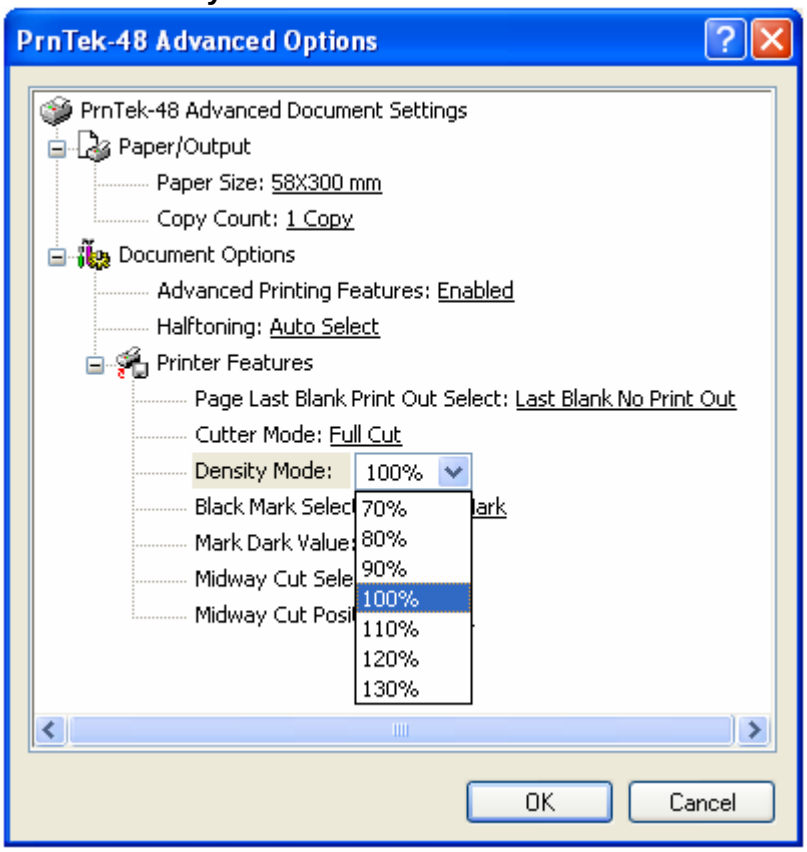
4. Choose “**Page Last Blank Print Out Select**”



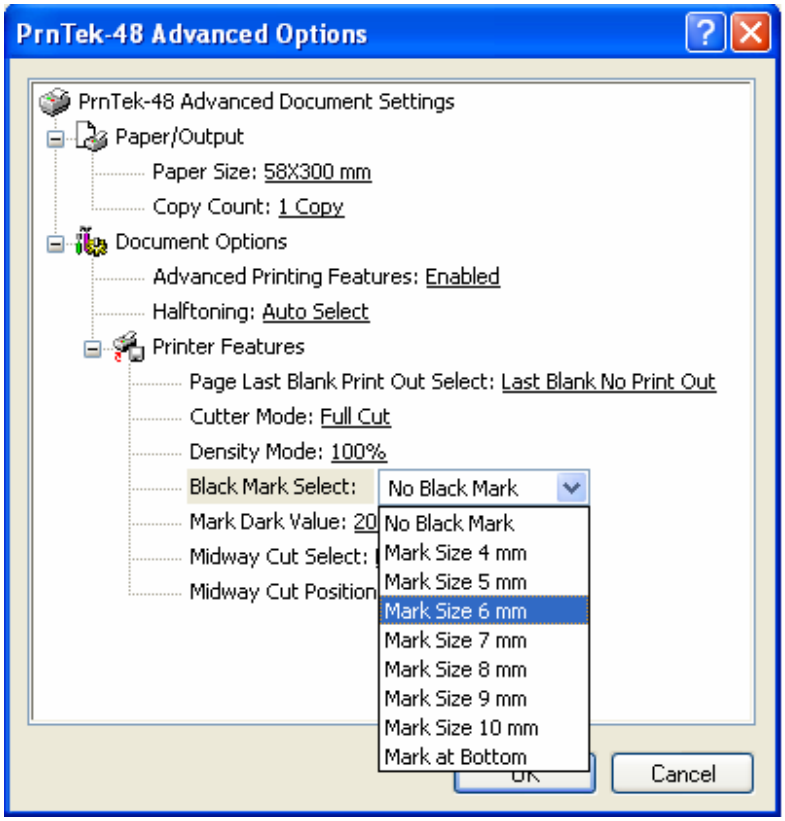
5. Choose “**Cutter Mode**”



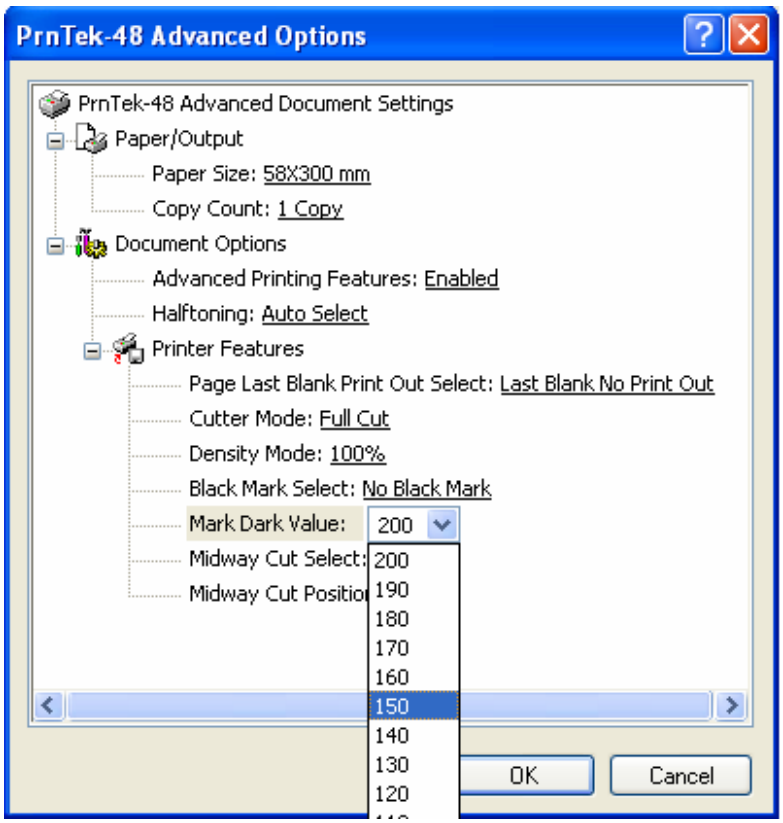
6. Choose “**Density Mode**”



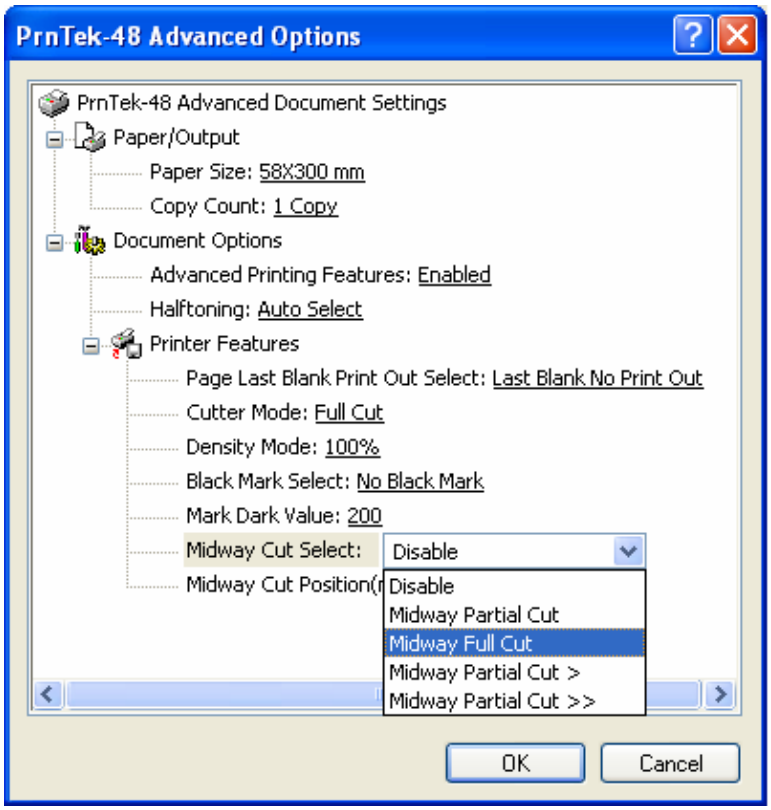
7. Choose “**Black Mark Select**”



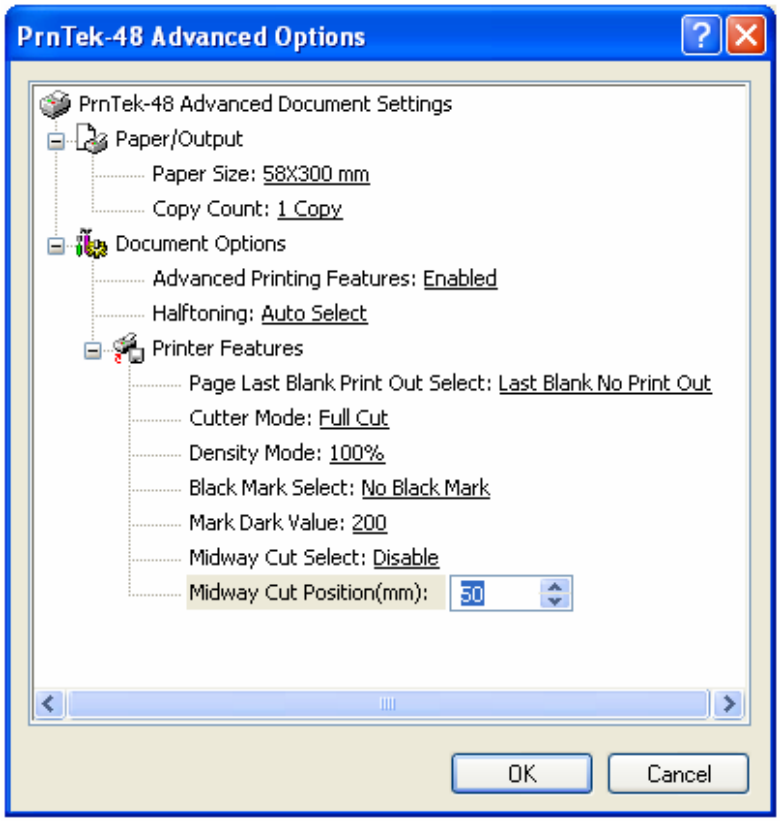
8. Choose “**Mark Dark Value**”



9. Choose “**Midway Cut Select**”



10. Choose “**Midway Cut Select**”



Chapter 4

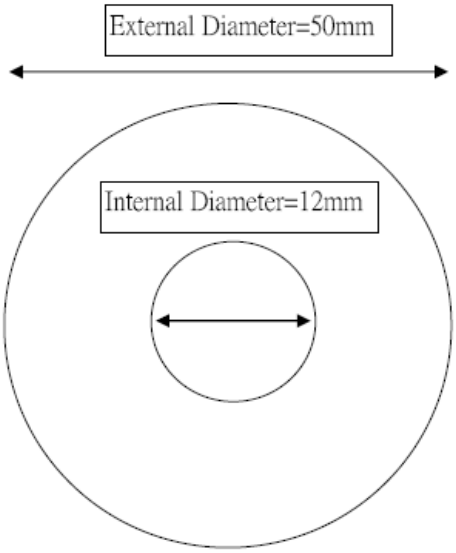
Specifications

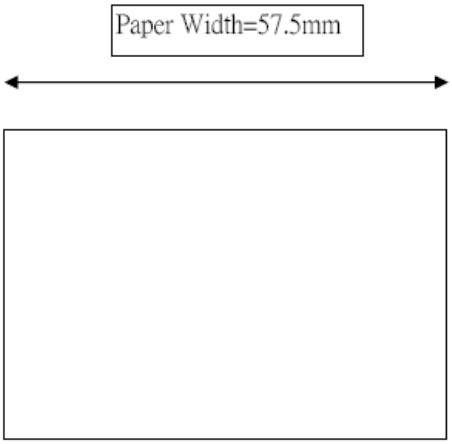
MP-2258/MP2258P Specifications

System Configuration	
CPU (BGA 478)	INTEL® ULV Celeron-M 1GHz w/0KB L2
Chipset	i82852GM GMCH
South Bridge	INTEL 82801DB (ICH4)
Memory	One 200-pin SODIMM support DDR SDRAM up to 1GB
VGA controller	Integrated in 852GM, shares system memory up to 32MB
LCD Panel	8” TFT LCD Panel support resolution 800X600
Touch Panel	Fujitsu 4-wire resistive touch panel
Storage	Internal 2.5” SATA hard disk drive Type I/II Compact Flash™ Disk with IDE interface
Power	60W/150 watt external power adapter
I/O Port	
Serial Port	2 User available COM ports (COM1 & COM2) 2 System assigned COM ports (COM3 & COM4) ➢ COM3 for Touch Screen ➢ COM4 for Build-In Thermal Printer
USB port	4 User available USB 2.0 ports 2 System assigned USB ports
Cash drawer port	RJ11 Cash drawer port, 12V actuation. Controlled through DIO port 280H
LAN Port	10/100Mbps Ethernet Controller, Realtek RTL8100C
VGA Port	Standard VGA Port for second LCD panel.

Audio Port	Integrated Sound Blaster compatible, AC97 Audio Codec. (Realtek ALC655)
Optional Features	
MSR	External Magnetic Stripe Card Reader track 1/2/3
Identification Device	External Finger Print Receiver and RFID receiver(USB)
Power Consumption	
Power consumption	30W Idle
Operating temperature	
Operating temperature	0 ℃ ~ 40 ℃

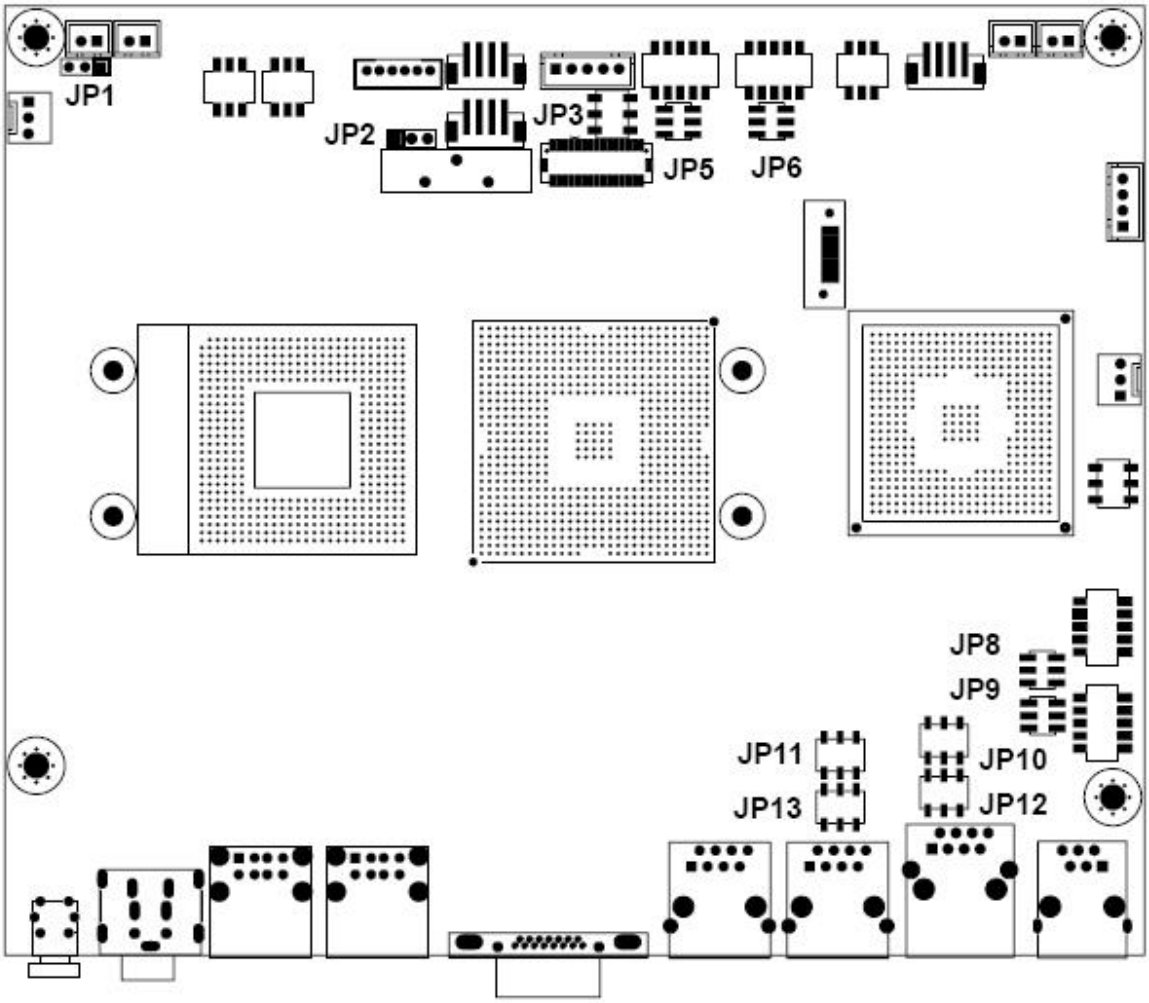
MP-2258 paper spec





Motherboard Configuration

M/B Layout



Jumper Setting

JP1: ATX & AT Mode Selection

JP2	Function
1-2 Short	ATX Mode ★
2-3 Short	AT Mode

JP2: CMOS Clear

JP2	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS Contents

JP3: TFT LCD Voltage Selection

JP3	Function
1-2 short	+3.3V TFT LCD★
3-4 short	+3.3V TFT LCD
5-6 short	+5V TFT LCD

JP5: COM3 RI function Selection

JP5	Function
1-2 short	+5V★
3-4 short	Ring In
5-6 short	+12V

JP6: COM4 RI function Selection

JP6	Function
1-2 short	+5V★
3-4 short	Ring In
5-6 short	+12V

JP8: COM5 RI function Selection (Option)

JP8	Function
1-2 short	+5V
3-4 short	Ring In★
5-6 short	+12V

JP9: COM6 RI function Selection (Option)

JP9	Function
1-2 short	+5V
3-4 short	Ring In★
5-6 short	+12V

JP10: COM2 RI function Selection

JP10	Function
1-2 short	+5V
3-4 short	Ring In★
5-6 short	+12V

JP11: COM1 RI function Selection

JP11	Function
1-2 short	+5V
3-4 short	Ring In★
5-6 short	+12V

JP12: COM2 Mode Selection

JP12	Mode
1-2, 3-5, 4-6 short	VFD Mode
1-3, 2-4 short	RS-232 Mode★

JP13: COM1 Mode Selection

JP13	Mode
1-2, 3-5, 4-6 short	VFD Mode
1-3, 2-4 short	RS-232 Mode★

Connector Allocation

I/O peripheral devices and flash disk are connected to the interface connectors and CF socket on this board computer (Figure 2-2 and Figure 2-3).

Top-Side Connector Allocation:

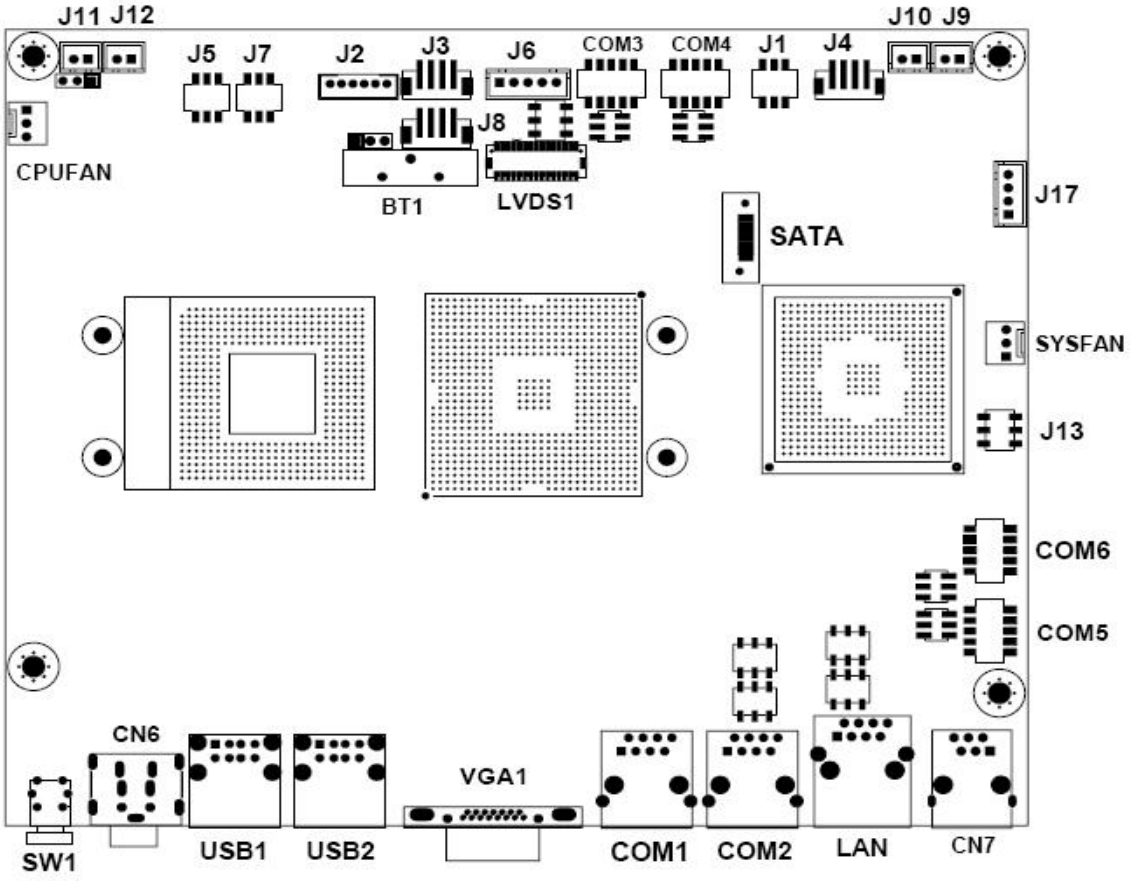


Figure 2-2 FEB-8522 Top-Side Connector Location

Bottom-Side Connector Allocation:

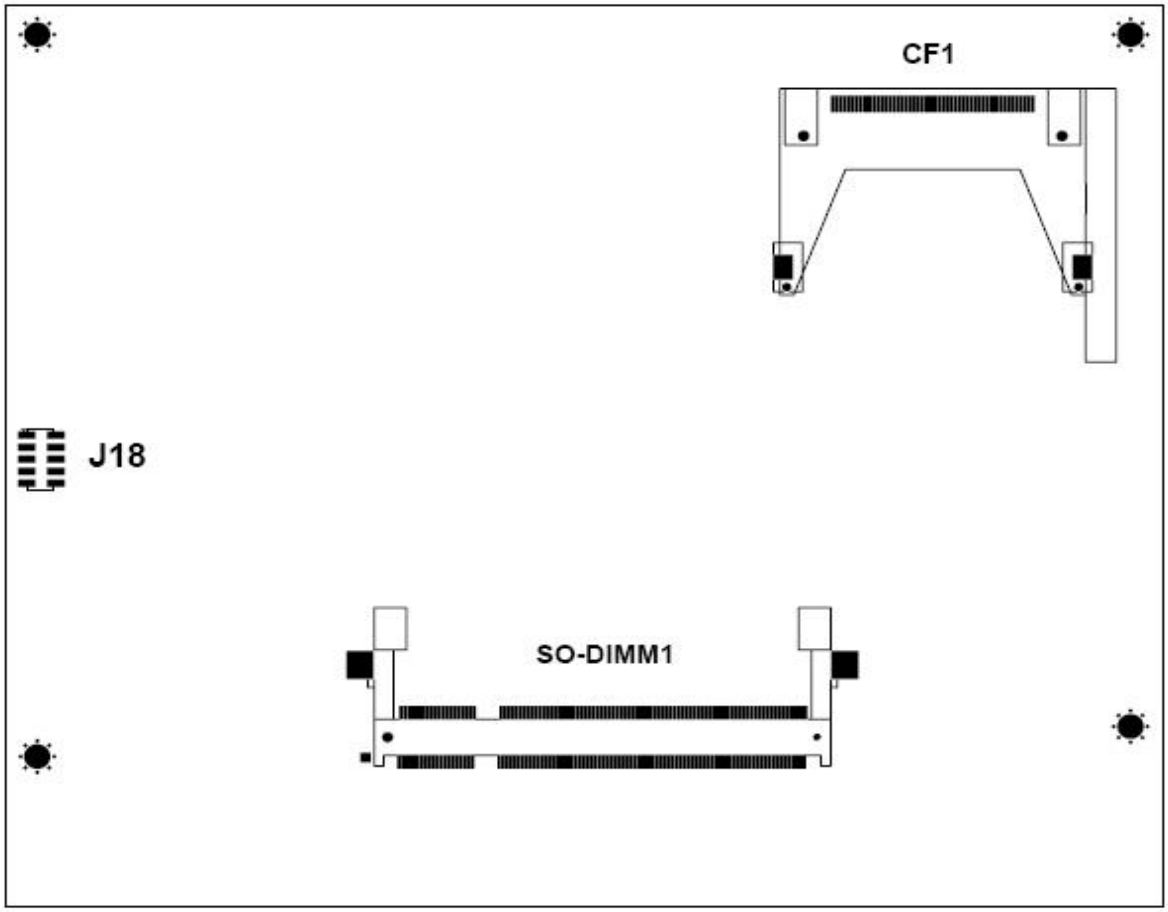


Figure 2-3 FEB-8522 Bottom-Side Connector Location

Connector Function List

Connector	Function	Remark
CN6	+12V DC-In Power Connector	
CN7	Digital I/O with RJ-11 Connector	
CF1	Compact Flash Connector	
COM 1, 2	Serial port with RJ-45 Connectors	
COM 3, 4	Serial port with Wafer Connectors	
COM 5, 6	Serial port with Wafer Connectors	Option
CPUFAN, SYSFAN	Fan Connectors	
J1	+8V Power Output Connector	
J2	PS2 Keyboard & Mouse Connector	
J3, J8	USB port with Wafer Connectors	
J4	Speaker out Connector	
J5	+5V Power output Connector	
J6	LVDS Inverter Power Connector	
J7	+12V Power output Connector	
J13	Front Panel Connector	
J17	SATA Power Connector	
J18	Debug Connector	

LVDS1	LVDS LCD Panel Connector	
VGA1	D-Sub15P CRT Connector	
LAN	RJ45 LAN Connector	
SW1	Power Button Switch	
SATA	SATA Connector	
USB1 & 2	USB dual port Connectors	

CN6: +12V DC-In Power Connector

PIN No.	Signal Description
1	+12V DC-In
2	Ground
3	+12V DC-In
4	Ground

CN7: Digital I/O with RJ-11 Connector

PIN No.	Signal Description
1	Ground
2	DIO Out 0
3	DIO IN 0
4	+12V
5	DIO Out 1
6	Ground

CF1: Compact Flash Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	26	Ground
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	Select 0	32	Select 1
8	Ground	33	N/C
9	Ground	34	IO Read
10	Ground	35	IO Write
11	Ground	36	Pull Up to +5V
12	Ground	37	IRQ 15
13	+5V	38	+5V
14	Ground	39	Slave/Master# Select
15	Ground	40	N/C
16	Ground	41	Reset
17	Ground	42	IORDY
18	SA2	43	DMA REQ
19	SA1	44	DMA ACK#
20	SA0	45	IDE Active
21	Data 0	46	Pull Up to +5V
22	Data 1	47	Data 8

23	Data 2	48	Data 9
24	Pull Up to +5V	49	Data 10
25	Ground	50	Ground

COM1/2: Serial port with RJ-45 Connectors

PIN No.	Signal Description
1	RI/+5V/+12V
2	CTS/+5V/+12V
3	Ground
4	RTS/ Ground
5	DTR
6	DSR
7	TXD
8	RXD

COM3/4: Serial port with Wafer Connectors

PIN No.	Signal Description	PIN No.	Signal Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI/+5V/+12V
9	Ground	10	N/C

COM5/6: Serial port with Wafer Connectors (Option)

PIN No.	Signal Description	PIN No.	Signal Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI/+5V/+12V
9	Ground	10	N/C

CPUFAN/SYSFAN: Fan Connector

PIN No.	Signal Description
1	Ground
2	Fan Power (+12V)
3	Speed Pulse Output

J1: +8V Power Output with Wafer Connector

PIN No.	Signal Description
1	Ground
2	+8V
3	Ground
4	+8V
5	Ground
6	+8V

J2: PS2 Keyboard & Mouse with Wafer Connector

PIN No.	Signal Description
1	+V5
2	KBCLK
3	KBDATA
4	Ground
5	MSCLK
6	MSDATA

J3, J8: USB port with Wafer Connectors

PIN No.	Signal Description
1	+5V
2	Data-
3	Data+
4	Ground

J4: Speaker Output with Wafer Connector

PIN No.	Signal Description
1	Speaker output Right +
2	Speaker output Right -
3	Speaker output Left +
4	Speaker output Left -

J5: +5V Power Output with Wafer Connector

PIN No.	Signal Description
1	Ground
2	+5V
3	Ground
4	+5V
5	Ground
6	+5V

J6: LVDS Panel Inverter Power Connector

PIN No.	Signal Description
1	+12V
2	+12V
3	Ground
4	Ground
5	Back Light Enable

J7: +12V Power Output with Wafer Connector

PIN No.	Signal Description
1	Ground
2	+12V
3	Ground
4	+12V

5	Ground
6	+12V

J13: Front Panel Connector

PIN No.	Signal Description
1	+5V (470 ohm)
2	HDD LED
3	+5VSB (470 ohm)
4	Suspend LED
5	Ground
6	Reset Switch

J17: SATA Power with Wafer Connector

PIN No.	Signal Description
1	+5V
2	+5V
3	Ground
4	Ground

J18: Debug port Connector (Option)

PIN No.	Signal Description	PIN No.	Signal Description
1	Data0	2	Data4
3	Data1	4	Data5
5	Data2	6	Data6
7	Data3	8	Data7
9	Ground	10	N/C

LVDS1: LVDS Panel Signals Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Ground
3	Data A3+	4	Data A3-
5	Clock A+	6	Clock A-
7	Data A2+	8	Data A2-
9	Data A1+	10	Data A1-
11	Data A0+	12	Data A0-
13	Ground	14	Ground
15	Data B3+	16	Data B3-
17	Clock B+	18	Clock B-
19	Data B2+	20	Data B2-
21	Data B1+	22	Data B1-
23	Data B0+	24	Data B0-
25	Ground	26	Ground
27	LVDS VDD	28	LVDS VDD
29	LVDS VDD	30	LVDS VDD

VGA1: D-Sub15P CRT Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	RED	2	GREEN
3	BLUE	4	ID0
5	Ground	6	Ground
7	Ground	8	Ground
9	NC	10	Ground
11	ID1	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		

LAN: RJ45 LAN Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	TXD+	2	TXD-
3	RXD+	4	RXD-
5	N/C	6	N/C
7	N/C	8	N/C

SW1: Power Button Switch

PIN No.	Signal Description
1	Ground
2	Ground
3	Power on signal
4	Power on signal
5	Standby LED
6	Power LED

SATA: SATA Connector

PIN No.	Signal Description
1	Ground
2	TXD+
3	TXD-
4	Ground
5	RXD-
6	RXD+
7	Ground

USB1/2: USB port with Wafer Connector

PIN No.	Signal Description
1	+5V
2	Data-
3	Data+
4	Ground

GPIO

The FEB-8522 provides 1 input and 2 output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

Pin assignment

CN7: Digital I/O with RJ-11 Connector

PIN No.	Signal Description
1	Ground
2	DIO Out 0
3	DIO IN 0
4	+12V
5	DIO Out 1
6	Ground

GPIO Programming Guide

Access CN7 GPIO port

There are two PNP I/O port addresses that can be used to configure GPIO ports,

- 0x2E - **EFER** (Extended Function Enable Register, for entering Extended Function Mode)

  EFIR (Extended Function Index Register, for identifying CR index number)

- 0x2F - **EFDR** (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of GPIOs.

// Enter Extended Function Mode

outp (0x002E, 0x87);

outp (0x002E, 0x87);

// Assign Pin121-128 to be GPIO port 1

outp (0x002E, 0x2A);

outp (0x002F, 0x0FF);

// Select Logic Device 7

outp (0x002E, 0x07);

outp (0x002F, 0x07);

// Active Logic Device 7

outp (0x002E, 0x30);

outp (0x002F, 0x01);

// Select Inversion Mode

outp (0x002E, 0xF2);

*outp (0x002F, **Inversion Register**);*

// Select I/O Mode

// Bit0~bit3 output and bit4~bit7 input

outp (0x002E, 0xF0);

outp (0x002F, 0xF0));

// Access GPIO ports

outp (0x002E, 0xF1);

*outp (0x002F, (Output **Data** & 0x03));*

*or **Input Data** = (inp (0x002F) & 0x10);*

// Exit Extended Function Mode

outp (0x002E, 0xAA);

Definitions of Variables:

Each bit in the lower nibble of each Register represents the setting of a GPIO port.

Bit0 vs. GPIO DIO_OUT0

Bit1 vs. GPIO DIO_OUT1

Bit4 vs. GPIO DIO_IN0

Value of **Inversion Register**:

Only lower nibble is available for this function.

When set to a '1', the incoming/outgoing port value is inverted.

When set to a '0', the incoming/outgoing port value is the same as in Data Register.

Value of **I/O Selection Register:**

Only lower nibble is available for this function.

When set to a '1', respective GPIO port is programmed as an input port.

When set to a '0', respective GPIO port is programmed as an output port.

Value of **Output Data** / **Input Data:**

Only lower nibble is available for this function.

If a port is assigned to be an output port, then its respective bit can be read/written.

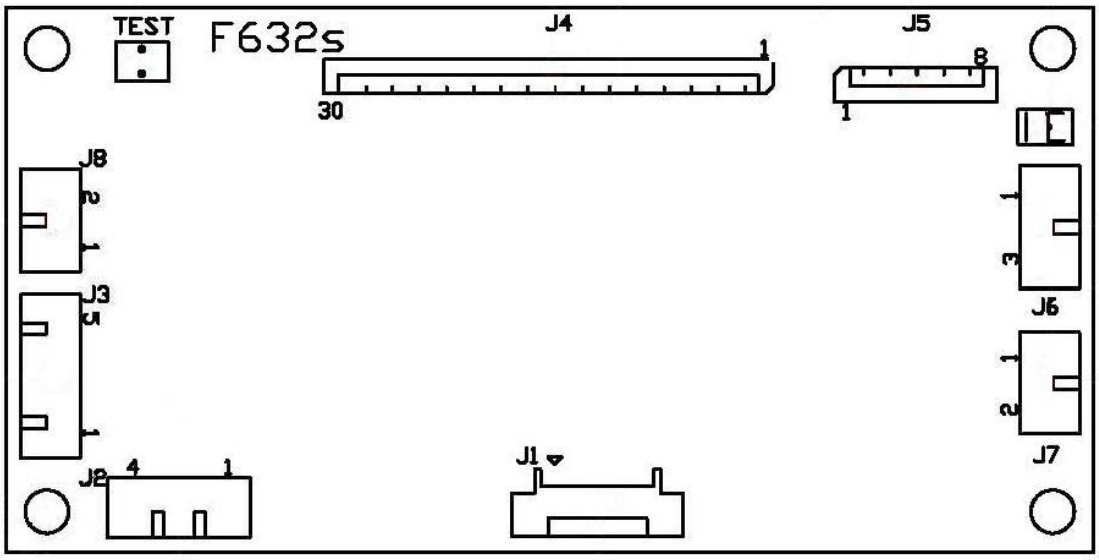
If a port is assigned to be an input port, then its respective bit can be read only.

Note:

Some other functions may occupy the high nibble of the registers. Altering any content in high nibble will be undesired.

Printer Control Board

Connector Allocation



J1: ISP On Board Programming, 6Pins,90degree

J2: RS232, 6Pins

Pin No.	Define	Description
1	GND	
2	RXD	
3	TXD	
4	BUSY	

J3: Power input, 5Pins

Pin No.	Define	Description
1	+5V	< 200 mA
2	GND	
3	GND	
4	+8V	3.0Amp, max
5	+8V	3.0Amp, max

J4: Mechanism connector, 30Pins

J5: Cutter connector , 8Pins

J6: LED, 3Pins

Pin No.	Define	Description
1	Led-1	+5Vindication
2	GND	
3	Led-2	Status

J7: BUTTON, 2Pins

Pin No.	Define	Description
1	SW1	Paper feed
2	GND	

Chapter 5

Troubleshooting

Please note that the following troubleshooting guide is designed for people with strong computer hardware knowledge such as System Administrators and Engineers.

Power is on, but there is no Panel Display

1. Check that the motherboard Power LED is on when the power adapter power switch is in the on position.
   Ensure that the correct AC voltage is selected (the voltage switch is located beside the power switch).
2. Check that the Power are running when system power is on.
   A. Check whether the ATX power switch cable is properly connected to motherboard CN2 (Please refer to Page 2-2 in the **FEB-8522** User's Manual).
3. Please ensure that the SATA cable is properly connected to the HDD.
4. Reset CMOS DATA by shorting motherboard JP1 PIN2 and PIN3 for a few seconds (Please refer to Page 3-2 in the FEB-8522 User's Manual).
5. Check if the system is beeping.
   A. A single long repeated beep indicates that a DRAM error has occurred. Make sure DRAM is properly installed or replace DRAM.
   B. One short beep after power on, means system is ok, but LCD panel or VGA interface could be defective.
      i. INIT display should be set for AGP in the COMS setup.
      ii. LVDS board connection to motherboard LVDS1 could be defective.
      iii. The connection between the LVDS board and the LCD panel is not completely.
      iv. The LCD cable could be defective.
      v. The Inverter cannot produce backlight.
      vi. The LCD panel could be defective.

To check where the problem could be:

Please connect a VGA monitor to the VGA port. If the VGA monitor is display normally, one of the problems above is occurring, otherwise it could be the motherboard is not functioning properly.

Cannot Detect HDD

1. SATA cable is not connected properly to motherboard SATA Connector or it could be defective.
2. Check CMOS setup, set SATA HDD to Auto detects.
3. On-board SATA port could be defective.

Touch Panel Does not Work

1. Check CMOS settings, COM3 needs to be “Enabled”. The correct settings are “3E8h” and “IRQ10”.
2. Check if there are no conflicts between COM3 IRQ10 and any other devices.
3. Check the TouchKit driver has been properly installed. Or try to re-install again (Please refer to the TouchKit driver installaion).
4. Check the TouchKit driver on COM3 has been detected during the TouchKit driver installation. If yes, than check that the flat cable from the TOUCHKIT touch screen has been properly connected to the TouchKit controller.
5. Check the TouchKit controller Green LED is blinking?If no, there is no DC+5V support for the TouchKit controller from the motherboard.
   A. Check that the COM3 cable is properly connected between motherboard and the Touch screen controller.
6. Touch screen controller could be defective or the touch panel could be defective.

Fujitsu Touch Panel Cannot Calibrate Correctly

1. Please replace the Fujitsu controller, and re-calibrate. If this works, change back to the original Fujitsu controller, and re-calibrate.
2. If the Fujitsu touch panel still cannot calibrate correctly after changing to a new Fujitsu controller, the touch panel may be not installed properly or it could be defective.

MCR is not Functioning Properly

1. Check if the green MCR LED is on.

   Check if the MCR is properly connected to the MCR connector board on main system.
   A. Make sure the 6 wire cable is properly connected between 9000PB0610 I/O board CN20 and the MCR connector board.
   B. The MCR connector board could be defective.
   C. The MCR module could be defective.
2. If a keyboard is connected to the PS/2 keyboard port, and functions correctly, then the MCR module could be defective.

VFD Display is not Functioning Properly

1. Ensure that COM4 is enabled in the CMOS setup, and data is written to COM4 in the application.
2. Check if there is any display when system power is ON, if the screen is blank, please follow the steps below.
   A. Make sure the power switch on the VFD display is on before powering the main system.
   B. Make sure that the motherboard JP4 & JP5 jumper settings are correct.

      The proper settings are:

      JP4 Pins 1-2 shorted

JP5 Pins 1-2, Pins 3-5 and Pins 4-6 shorted

3. The on-board COM4 I/O chips could be defective.

LAN is not functioning properly

1. Check if the LAN driver is installed properly. (Please refer to the LAN driver installation)
2. Check if there are any IRQ conflicts.
3. Check if the RJ45 cable is properly connected.
4. The on board LAN chip could be defective.

COM1 or COM2 are not functioning properly

1. Check if the I/O ports are enabled in the CMOS setup.
2. Check if there are any IRQ conflicts.
3. The motherboard could be defective.

Cash Drawer Port is not functioning properly

1. Make sure the pin assignment matches between the cash drawer and the RJ11 cash drawer port.
2. Verify the digit I/O port address and bit are “280h” respectively. Command send “L” level for 200ms (Refer to **FEB-8522** User’s Manual).
3. The motherboard could be defective.

USB device is not functioning properly

1. Ensure that the USB controller is “enabled” in the CMOS setup.
2. Ensure that the USB Legacy is “enabled” in the CMOS setup. (Windows 98、Windows 2000、Window XP Professional)
3. Ensure that the USB Legacy is “Disabled” in the CMOS setup. (Embedded OS: Windows XP Embedded、Window CE. NET、Linux RedHat 9)

Appendix A
Printer Command List

ESC+'2' **16-dot Line Spacing (2 mm)**

Code	0x1B + 0x32, or 27 + 50
Function	Sets line spacing to 16 dots. (16dot x 0.125mm/dot = 2 mm) This is the default setting.

ESC+'0' **4-dot Line Spacing (0.5 mm)**

Code	0x1B + 0x30, or 27 + 48
Function	Sets line spacing to 4 dots. (4dot x 0.125mm/dot = 0.5 mm)

ESC+'A'+'n' **n-dot Line Spacing (0~32 mm)**

Code	0x1B + 0x41 + n, or 27 + 65 + n
Function	Sets line spacing to n dots. n can take on a value from 0 to 0xFF (0 to 255 dot line = 0~32 mm).

ESC+'-'+n **Underline**

Code	0x1B + 0x2D + n, or 27 + 45 + n
Function	Turns on/off underline mode. Only the least significant three bits are valid for n. n = 0: Turn off underline mode(default) n =1 to 7: Set the underline thickness to n dots.

ESC+'W'+n **Double-Width**

Code	0x1B + 0x57 + n, or 27 + 87 + n
Function	Turns on/off double-width mode. Only the least significant bit is valid for n. n = 0: Turns double-width mode off. (default) n = 1: Turns double-width mode on.

ESC+'w'+n **Double-Height**

Code	0x1B + 0x77 + n, or 27 + 119 + n
Function	Turns on/off double-height mode. Only the least significant bit is valid for n. n = 0: Turns double-height mode off. (default) n = 1: Turns double-height mode on.

ESC+ ' ' + n **Character spacing**

Code	0x1B + 0x20 + n, or 27 + 32 + n
Function	Sets the character spacing to n dots.(default = 4 Dots) The least significant 7 bits are valid for n. (0 to 127)

ESC+'I'+n **Reverse**

Code	0x1B + 0x57 + n, or 27 + 87 + n
Function	Turns on/off reverse mode. Only the least significant bit is valid for n. n = 0: resets the reverse mode (prints black characters on a white background), (default). n = 1: prints white characters on a black background.

ESC+'B'+n **Bold**

Code	0x1B + 0x42 + n, or 27 + 66 + n
Function	Turns on/off Bold mode. n = 0: Turns Bold mode off. (default) n = 1: Turns Bold mode on.

ESC+'T'+n **Italic**

Code	0x1B + 0x54 + n, or 27 + 84 + n
Function	Turns on/off Italic mode. n = 0: Turns Italic mode off. (default) n = 1: Turns Italic mode on.

ESC+'V'+nl+nh+Image Data **Bit Image Specify**

Code	0x1B + 0x56 + nl+ nh + Image Data, or 27 + 86 + nl + hn + Image Data
Function	nl, nh: number of dot lines in the vertical direction. nl represents the least significant byte , nh represents the most significant byte. Number of dot lines = nh × 256+nl Image Data = 48 x nhnl Bytes. 0 <= nhnl <= 0xFFFF (65535)

DC2+'~'+n **Print Density Specify**

Code	0x12 + 0x7E + n, or 18 + 126 + n
Function	Sets print density. n: 70 - 130

CR : Carriage Return **Carriage Return**

Code	0x0D or 13
Function	Prints the contents of the line buffer in the currently selected print mode, and then feeds paper a predefined distance.

DC2+'p'+n **Out-of-paper Select**

Code	0x12 + 0x70 + n, or 18 + 112 + n
Function	Specifies whether or not the error processing operation is performed when an out-of paper error occurs. Only the least significant bit is valid for n. n=0 : Out-of-paper error is invalid. n=1 : Out-of-paper error is valid (default).

DC2+'m'+s+nl+nh **Mark Position Detect**

Code	0x12 + 0x6D + s + nl + nh, or 18 + 109 + s + nl + nh
Function	Feeds paper until a mark is detected. s : sets the direction of paper feed, and the conditions of stoppage. s = 0, stop on Mark Position. s = 1, stop Mark Position after.

ESC+'@' **Reset**

Code	0x1B + 0x40, or 27 + 64
Function	Reset on 500 ms after.

ESC+'i' **Full cut**

Code	0x1B + 0x69, or 27 + 105
Function	Cut the paper fully.

ESC+'m' **Partial cut**

Code	1B + 6D, or 27 + 109
Function	Cut the paper partially.

ESC+'J'+ n **Feed Forward**

Code	0x1B + 0x4A + n, or 27 + 74 + n
Function	Feeds the paper forward. n can take on a value from 0 to 0xFF (0 to 255 dot line).

ESC+'j'+ n **Feed Backward**

Code	0x1B + 0x6A + n, or 27 + 106 + n
Function	Feeds the paper backwards. n can take on a value from 0 to 0xFF (0 to 255 dot line).

DC3 + 'B' + 'R' + n **Select Baud Rate**

Code	0x13 + 0x42 + 0x52 + n, or 19 + 66 + 82 + n
Function	It will available after power on rest. n = '1' : Select 115200 <**default , 115200 n 8 1**> n = '2' : Select 230400

DC3 + 'N' + n **Select character code table**

Code	0x13 + 0x4E + n, or 19 + 78 + n
Function	Select a character code table n = 0x00 : ASCII(0x20~0x7F) + 0x80 ~ 0Xff n = 0x01 : ASCII(0x20~0x7F) + GB-2312 0x8020~0xF8FF (Low Byte:0x20 ~ FF)

DC3 + 's' **Enquiry Print Status**

Code	0x13 + 0x73, or 19 + 115
Function	Enquiry the print status. The return value:

0x30, '0'	Hardware error
0x31, '1'	Head-up error
0x32, '2'	Vp Voltage error
0x33, '3'	Auto-cutter error
0x34, '4'	Thermal head Temperature error
0x35, '5'	None
0x36, '6'	Paper end
0x37, '7'	During printing
0x38, '8'	Print-ready status
0x41, 'A'	Paper near end

DC3 + 'v' **Enquiry Vp Voltage**

Code: 0x13 + 0x76, or 19 + 118

Function: Measures the Vp voltage (power voltage for head).
The voltage is represented by hexadecimal 4-byte characters consisting of a 2-digit integer, decimal point and first decimal place figure.

Example: 8.0 V : '8.0'(38_{16}, $2E_{16}$, 30_{16})
7.5V : '7.5'(37_{16}, $2E_{16}$, 35_{16})

If the voltage is out of the Vp voltage tolerance (4.5 to 9.0 V), an error occurs and you cannot enter any function code and data.

DC3 + 'r' **Enquiry Firmware Version**

Code: 0x13 + 0x73, or 19 + 115

Function: Enquiry the printer firmware version.
The version is represented by hexadecimal 4-byte.
Ex: v100

DC3 + 'm' **Enquiry Checksum**

Code: 0x13 + 0x6D, or 19 + 109

Function: Enquiry the checksum of the ROM content.
The value is represented by hexadecimal 4-byte.
EX: 06C0 (HEX)

GS+'k'+ n + DATA + NUL **Bar Code Print Select**

Code: 1D + 6B + n + DATA + 0 or 29 + 107 + n + DATA + 0

Function: Convert data to a bar code according to the specified code and print it.
Only the least significant 4 bits of n are valid.
n=0: UPC A : Input one of '0' to '9' 11 times, then input 0.
n=1: UPC E : Input one of '0' to '9' 11 times, then input 0.
n=2: EAN 13 : Input one of '0' to '9' 12 times, then input 0.
n=3: EAN 8 : Input one of '0' to '9' 7 times, then input 0.
n=4: CODE 39 : Input one of ' ','$','%','+','-','.','/','0'to'9','A'to'Z' a given number of times, then input 0.
n=6: CODABAR : Input a start character 'A' to 'D', one of '0' to '9', '+', '.', '/', ':', '$', '-', a given number of times, a stop character 'A' to 'D', then input 0.
n=8: CODE 128 : Input a start code 103 to 105, 0 to 102 a given number of times, then input 255.
If n is out of range, this command is ignored.

GS+'w'+n1+n2	**Narrow**
Code	0x1D + 0x77 + n1 + n2, or 29 + 119 + n1 + n2
Function	Sets narrow and wide width of a bar code with number of dots. n1 = 0 to 2 : Narrow width 0 = 2 dots 1 = 3 dots 2 = 4 dots n2 = invalid (does not care)

GS+'P'+n	**Bar Code Print Position**
Code	0x1D + 0x50 + n, or 29 + 80 + n
Function	Sets a print position of a bar code. n=0 : Left (default) n=1 : Center n=2 : Right

GS+'h'+n	**Bar Code Height**
Code	0x1D + 0x68 + s + n, or 29 + 104 + n
Function	Sets height of the bar code. n=1 to 255 : Height of the bar code (Unit : dot line) n=95 (default)

FUJITSU THE POSSIBILITIES ARE INFINITE

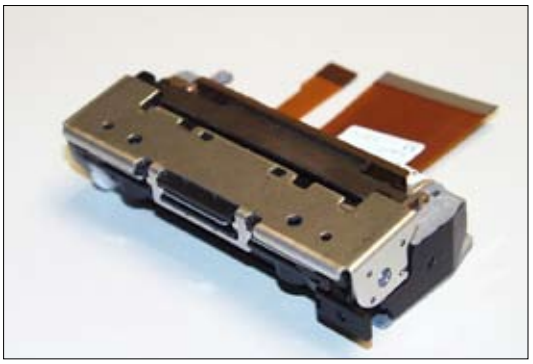
BATTERY DRIVEN, FTP-608 Series 2” HIGH SPEED THERMAL PRINTER

FTP-628MCL401/451

■ OVERVIEW

The FTP-628 MCL Series are battery driven high-speed printers with a 2-inch paper width equivalent.

The FTP-628 MCL Series can be used for a variety of applications, such as portable terminals, POS, banking terminals, and measurement and medical equipment.



FTP-628MCL401

FTP-628DSL491R

■ HIGHLIGHTS

- **Ultra low profile**
  Height 21.8 mm, width 81.2 mm, depth 42.2 mm
- **High speed printing**
  It can print at 60 mm/s (480 dotlines/s) maximum by using Fujitsu's unique head drive control.
- **Auto Cutter**
  Full cut type and partial cut type printers are available by user selection.
- **Easy paper setting**
  Our unique platen release mechanism allows a wide paper route even if the printer is ultra-compact, so paper can be easily inserted. Conventional auto loading is also available.
- **Multifunctional die-cast form**
  Wide operating temperature range, long continuous printing, high ESD absorbtion and discharge of static electricity vibration and shock resistant.
- **RoHS compliant**

■ PART NUMBERS

Name		Part Number
Printer mechanism with cutter		FTP-628MCL401 (Easy Load Model)
Printer mechanism without cutter		FTP-628MCL451 (Easy Load Model with platen bracket + lock lever)
LSI for driving		FTP-629CU451R
Interface board for Mechanism/Cutter	Cutter supported	FTP-628DSL491R Parallel (Centronics) / Serial (RS-232C)
Interface cable	Parallel (Centronics)	FTP-628Y202
	Serial (RS-232C)	FTP-628Y302
Power cables	Head, motor, logic	FTP-628Y402

■ SPECIFICATIONS

Item	Specifications
Part number	FTP-628MCL401
Printing method	Thermal-line dot method
Dot structure	384 dots/line
Dot pitch (Horizontal)	0.125 mm (8 dots/mm)—Dot density
Dot pitch (Vertical)	0.125 mm (8 dots/mm)—Line feed pitch
Effective printing area	48 mm
Number of columns	ANK 32 columns/line (maximum 12 x 24 dot font)
Paper width	58 mm
Paper thickness	60 to 100 μ m (some paper in this range may not be used because of paper characteristics)
Printing Speed	Maximum 60mm/sec. (480 dot line/sec.) at 8.5V
Character types	Alphanumeric, kana: 159 types International characters: 195 types JIS Kanji (Kanji CG loaded board): about 6800 types
Character, dimensions (W×H), number of columns	12 × 24 dots, (1.5 × 3.0 mm), 32 columns: ANK 24 × 24 dots, (3.0 × 3.0 mm), 16 columns: ANK 8 × 16 dots, (1.0 × 2.0 mm), 48 columns: ANK 16 × 16 dots, (2.0 × 2.0 mm), 24 columns: ANK

■ SPECIFICATIONS

Item		Specification	
Interface		Conforms to RS232C / Centronics	
Power supply	For print head	4.2 - 8.5 VDC average current, 1.8 (2.4)A at 7.2V (print ratio: 12.5%, print speed: 60mm/sec.)	
	For motor	4.2 - 8.5 VDC, 1A maximum	
	For cutter motor	4.75 - 8.5 VDC, 1A maximum	
	For logic	5 VDC ± 5%, 0.1 A maximum	
Dimensions	Mechanism with cutter	81.2 x 42.2 x 21.8 mm (WxDxH)	
	Interface board	70 x 60 x12 mm	
Weight	Mechanism with cutter	Approximately 97g	
	Interface board	Approximately 25g	
Life	Head	Pulse resistance: 100 million pulses/dot (under our standard conditions); Abrasion resistance: paper traveling distance 50km (print ratio: 12.5% or less)	
	Cutter	500,000 cuts	
	Platen	5,000 times (open/close)	
Operating environment	Operating temperature*	0˚ C to 50˚ C	
	Operating humidity	20 to 85% RH (no condensation)	
	Storage temperature	-20˚ C to +60˚ C (paper not included)	
	Storage humidity	5 to 95% RH (no condensation)	
Detection function	Head temperature detection	Detected by thermistor	
	Paper out/mark detection	Detected by photo-interrupter	
	Platen release	Detected by sliding switch	
	Movable blade	Detected by photo-interrupter	
Recommended thermal sensitive paper		High Sensitive Paper	TF50KS-E4 (Nippon Paper)
		Standard paper:	TF60KS-E(Nippon Paper), FTP-020PU001 (58mm), PD105R (Oji Paper), FTP-020P0701 (58mm)
		Medium Life Paper	TF60KS-F1, FTP-020P0102 (58mm), PD170R (Oji Paper), P220VBB-1 Mitsubishi Paper)
		Long Life Paper	PD160R-N (Oji Paper), AFP-235 (Mitsubishi Paper), TP50KJ-R (Nippon Paper), HA220AA (Nippon Paper)

*+5˚C to +40˚C printing density assurance rance (-25 to 70˚C capability)

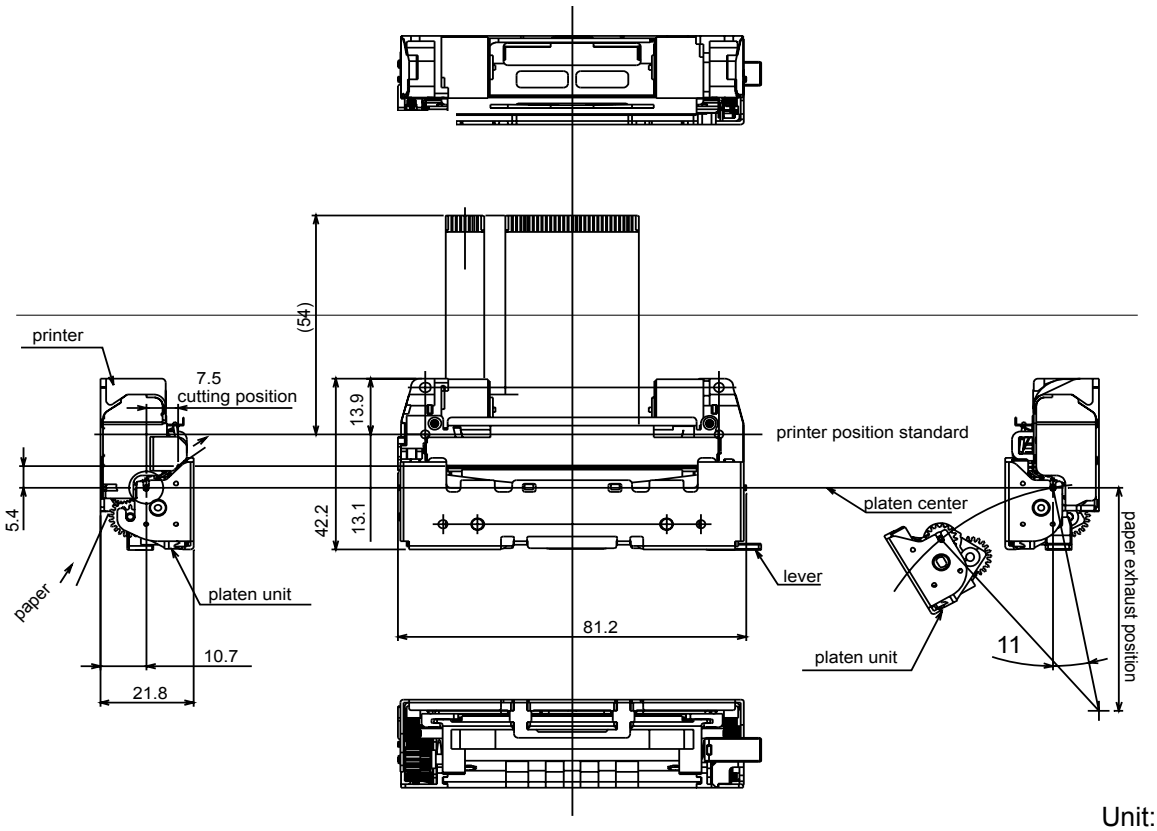
■ FUNCTION OF INTERFACE BOARD

	Item		Item
1.	Test print function	8.	Cutter trouble detect
2.	Paper out detection	9.	Motor power saving function
3.	Paper near end detection	10.	Mark detection function
4.	Platen open detection	11.	MCU operation abnormality detection
5.	Thermal head temperature abnormality detection	12.	Power ON/OFF sequence protection
6.	Blow-out fuse detection	13.	Motor over-current protection
7.	Head voltage abnormality detection	14.	Hardware timer

■ DIMENSIONS

1. Printer mechanism

FTP-628MCL401

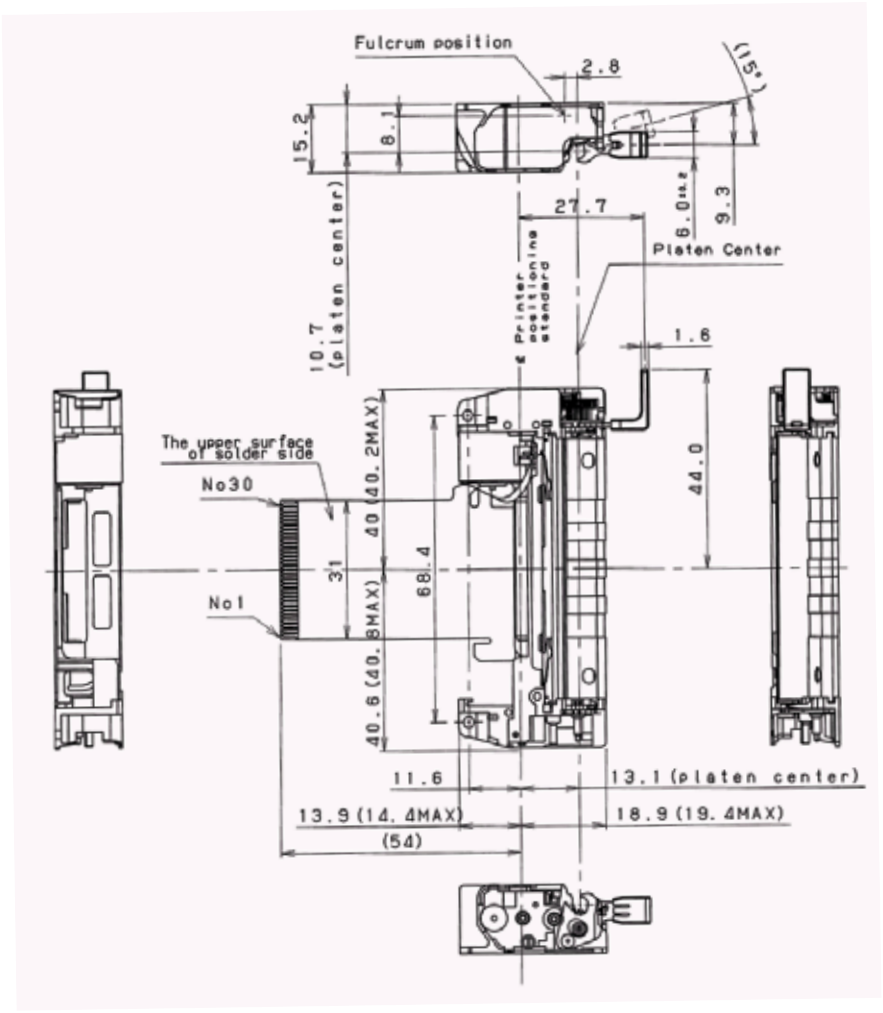


Unit: mm

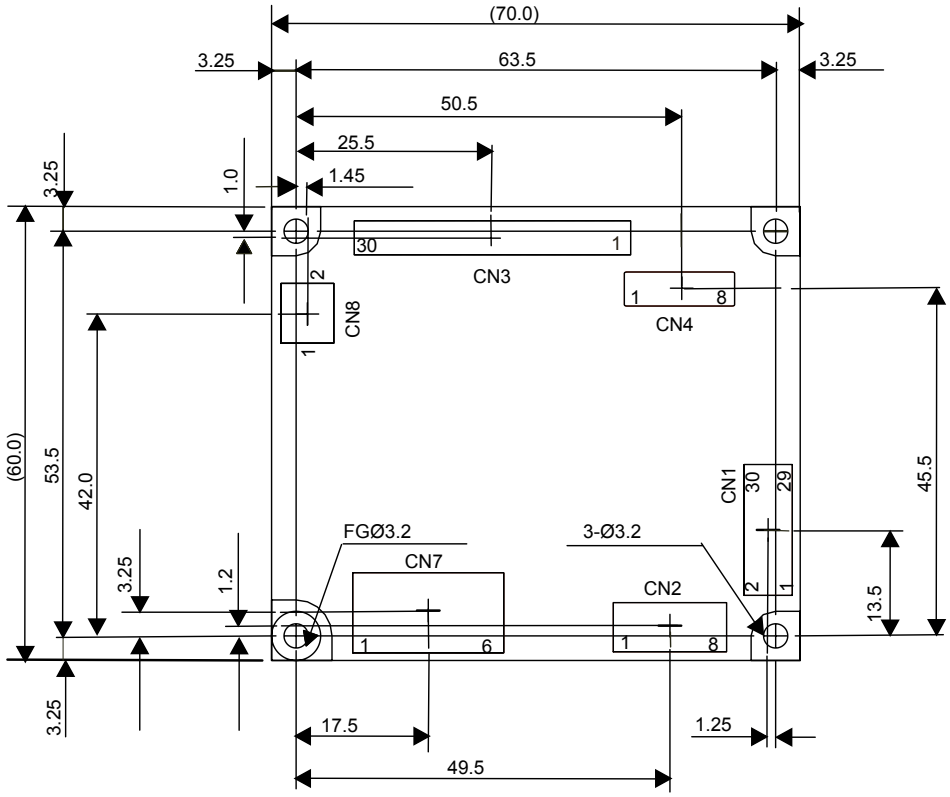
Note: 1. Dimensions are nominal value (tolerance ±5 unless otherwise specified).
2. Platen unit (lever, platen, etc) moves by approximately 0.7mm toward paper insertion direction when platen is open.

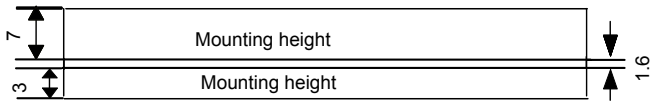
1. Printer mechanism

FTP-628MCL451



2. Interface board





Note:
1. The size with parentheses is a reference value.
2. Part mounting height is maximum.

Unit:mm

FTP-628MCL401 mechanism/cutter FPC PIN Assignment

(1) For thermal head, motor and sensor
Connector on control circuit: 52610-3090 (Molex or equivalent)

No	Signal	Contents
1	PHK	Cathode for photo interruptor
2	VSEN	paper sensor power
3	PHE	Emittor for photo interruptor
4	VH	Head drive power
5	VH	
6	DI	Data in
7	CLK	Clock
8	GND	Head ground
9	GND	
10	STB6	Strobe 6
11	STB5	Strobe 5
12	STB4	Strobe 4
13	Vdd	Logic power
14	TM	Thermistor
15	TM	
16	STB 3	Strobe 3
17	STB 2	Strobe 2
18	STB 1	Strobe 1
19	GND	Head ground
20	GND	
21	$\overline{\text{LAT}}$	Data latch
22	DO	Data out
23	VH	Head drive power
24	VH	
25	SW	Platen release switch
36	SW	
27	MT/A	Excitation signal A
28	MT/$\overline{\text{A}}$	Excitation signal $\overline{\text{A}}$
29	MT/B	Excitation signal B
30	MT/$\overline{\text{B}}$	Excitation signal $\overline{\text{B}}$

FTP-628MCL451 mechanism/platen bracket FPC PIN Assignment

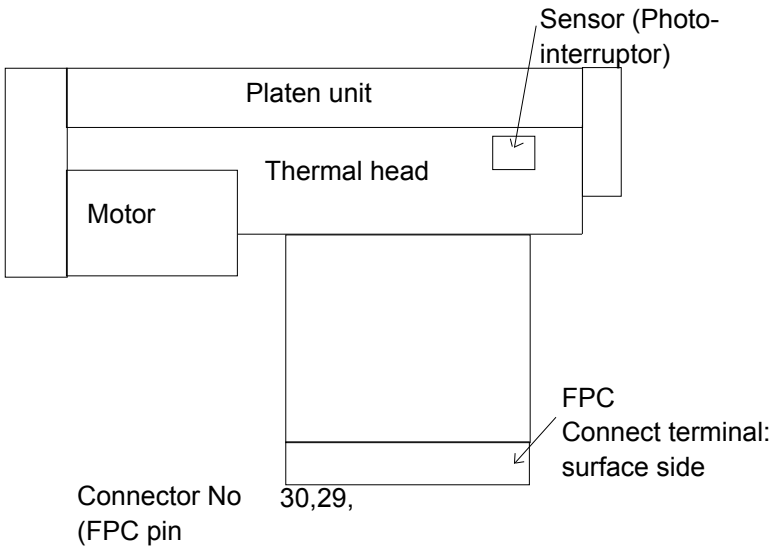
(1) For thermal head, motor and sensor
Connector on control circuit: 52610-3090 (Molex or equivalent)

No	Signal	Contents
1	PHK	Cathode for photo interruptor
2	VSEN	paper sensor power
3	PHE	Emittor for photo interruptor
4	VH	Head drive power
5	VH	
6	DI	Data in
7	CLK	Clock
8	GND	Head ground
9	GND	
10	STB6	Strobe 6
11	STB5	Strobe 5
12	STB4	Strobe 4
13	Vdd	Logic power
14	TM	Thermistor
15	TM	
16	STB 3	Strobe 3
17	STB 2	Strobe 2
18	STB 1	Strobe 1
19	GND	Head ground
20	GND	
21	$\overline{LAT}$	Data latch
22	DO	Data out
23	VH	Head drive power
24	VH	
25	SW	Platen release switch
36	SW	
27	MT/A	Excitation signal A
28	MT/$\overline{A}$	Excitation signal $\overline{A}$
29	MT/B	Excitation signal B
30	MT/$\overline{B}$	Excitation signal $\overline{B}$

(2) For cutter

Connector on control circuit: 52610-0890 (Molex or equivalent)

No	Signal	Contents
1	VSEN	Home position sensor power
2	PHE	Emittor for photo interruptor
3	PHK	Cathode for photo interruptor
4	MT/A	Excitation signal A
5	MT/$\overline{A}$	Excitation signal $\overline{A}$
6	MT/B	Excitation signal B
7	MT/$\overline{B}$	Excitation signal $\overline{B}$
8	NC	Not connected



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