RTP120

All-in-One 12.1” TFT LCD Panel PC

User’s Manual

Disclaimers

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Safety Approvals

- **CE Marking**
- **FCC Class A**

FCC Compliance

This equipment has been tested and complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. If not installed and used in accordance with proper instructions, this equipment might generate or radiate radio frequency energy and cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measurers:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded interface cables must be used in order to comply with emission limits.

Safety Precautions

Before getting started, read the following important cautions.

1. The RTP120 series does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the RTP120 series before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the RTP120 series is properly grounded.
4. The brightness of the flat panel display decreases with usage. However, hours of use vary depending on the application environment.
5. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen. The RTP120 series may come with or w/o a touchscreen. Although the touchscreen is chemical resistant, it is recommended that you spray the liquid cleaner on a cloth first before wiping the screen. In case your system comes without the touchscreen, you must follow the same procedure and not spray any cleaner on the flat panel directly.
6. Avoid using sharp objects to operate the touchscreen. Scratches on the touchscreen may cause malfunction or internal failure to the touchscreen.
7. The flat panel display is not susceptible to shock or vibration. When assembling the RTP120 series, make sure it is securely installed.

8. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

   - ✓ Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
   - ✓ When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

Trademarks Acknowledgments

Table of Contents

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Chapter 1
Introduction

This chapter contains the general information and detailed specifications of RTP120 series. Chapter 1 includes the following sections:

- **General Description**
- **System Specification**
- **Utilities Supported**
- **Dimensions**
- **I/O Outlets**

1.1 General Description

The RTP120 series super slim industrial panel PCs are mainly designed for industrial automation and some space-constricted embedded applications. For some space-concerned industries, a traditional PC with a separate main system, display monitor and keyboard is simply not integrated enough.

Ruggedly designed, the **RTP120 series** is 100% IBM PC/AT compatible and it integrates super I/Os, 12.1" TFT touch screen, Ethernet, and packs special industrial features like watchdog timer all in a single system. The full PC functionality coupled with its industrial-grade construction easily tailors the system for any embedded applications -- allowing the system to endure continuous operation in any hostile industrial environments where stability and reliability is a must.

The RTP120 series feature a versatile stand suited for a wide variety of applications. With the pedestal kit assembled to the main unit, both can transform into different positions such as desktop free standing, 30° table standing, panel mount and wall mounting. Its cable management device also trims the operation environment. The NEMA 4/12 water/dust-proof front panel is specially designed for the continuous operation in outdoor environments. Common applications of these PANEL PCs include POS, POI terminals, Hospitality.

Designed by the PC experts for PC professionals, the RTP120 series are virtually the ultimate one-step solution for your space-limited applications.

1.2 Specifications

1.2.1 Core System for RTP120 series system with SBC85610VE

- **CPU:**
  Socket370 for Intel Celeron/Pentium III and VIA C3 processor
- **System Chipset:**
  VIA VT8601T, VT82C686B with integrated real-time clock
- **BIOS:**
  Phoenix-Award BIOS, 4Mbit with RPL/PXE LAN Boot ROM
- **System Memory:**
  Two 168-pin DIMM Socket Maximum of 1GB SDRAM
- **Watchdog Timer:**
  Generates a system reset or NMI by jumper selectable; software programmable Time interval; 64 levels, 0.5~8 / 5~80 / 50~800 / 100~1600 seconds

1.2.2 System I/O outlet

- **Standard I/O:**
  - 3 x serial ports with power; 2 x RS-232(COM1,4), 1 x RS-232/422/485(COM2) jumper selectable
  - 1 x parallel port, SPP/EPP/ECP
  - 1 x VGA port
  - 1 x keyboard interface
  - 1 x PS/2 mouse interface

- 4 x USB ports
- 1 x LAN
- 1 x dallas key(option)
- 2 x RJ-11 cash drawer ports (610e only)

- **Cash Drawer Port:**
  RJ-11 cash drawer x 2 (610e only)
- **Ethernet:**
  - Realtek 8139C PCI Bus 10/100M Base-T
  - Wake-On-LAN
  - RJ-45 interface equipped
- **VGA/Flat Panel Controller:**
  - VIA VT8601T chip with integrated Trident 2D/3D accelerator
  - 2/4/8 MB frame buffer sharing system memory
  - LCD/Simultaneous mode:
    1024x768 @ 16bpp (60Hz)
  - CRT mode:
    1024x768 @ 16bpp (85Hz)

1.2.3 Built-in Peripherals

- AT80W power supply(PW-080A-03Y)
- 3.5" Hard disk drive bay
- 3M 12.1" resistive 8-wire FG Touch Screen(R812.112) with RS-232(COM3)
- System cooling fan
- Dallas key(option)

1.2.4 Net Weight

- **RTP120 series:** 4.2 Kgs

1.2.5 12.1" TFT LCD Specification

- Display area 245(H)x184(V)(12.1" diagonal)
- Resolution 1024x768 (XGA)
- Pixel pitch 0.240(H)x0.240(V)(TYP.)
- Contrast Ratio 200 (MIN.)
- Average Luminance 150cd/m²(TYP.)
- Viewing Angle **θ**L(40)**θ**R(40)**Φ**H(10)**Φ**L(30)

1.2.6 Environmental

- **Operating Temperature Range:** 0°C ~ 40°C
- **Relative Humidity:** 20% ~ 85%; non-condensing
- **EMC:** FCC
- **Safety:** CE

1.2.7 Dimension (main body size)

- **RTP120 series:** 360 x 277 x 81.2 mm (WxHxD)

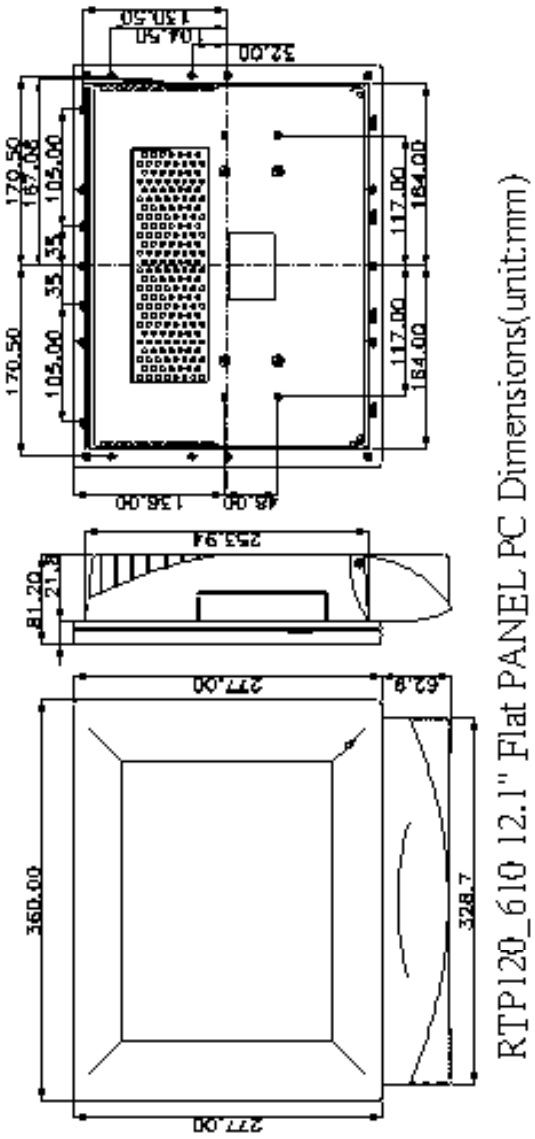
NOTE1 *For more detailed information on the system engine board used in your PANEL PC, refer to the system board User's Manual that came with the system packaging.*

NOTE2 In order to avoid system over load, therefore a system power limitation list is necessary to limit power load of key parts and user's devices. For more detailed information on the **Appendix B System Configuration Limitation Notice**.

1.3 Utilities Supported

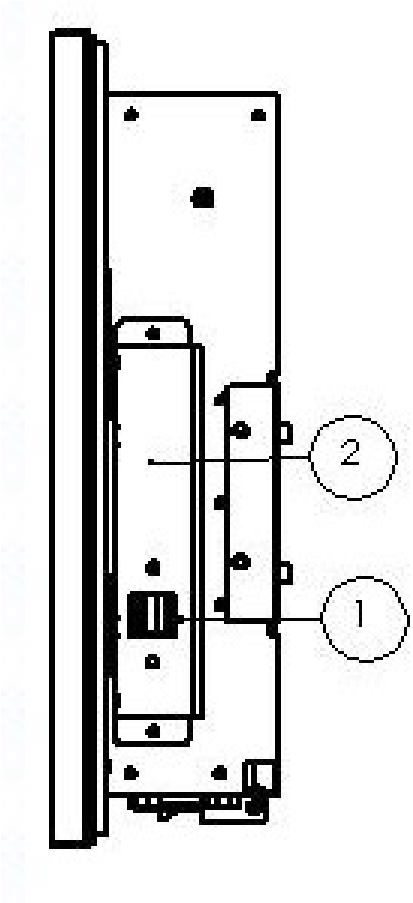
- Watchdog Utility
- Ethernet Utility
- VGA Drivers
- Touchscreen Utility(3M 8-wire)

1.4 Dimensions



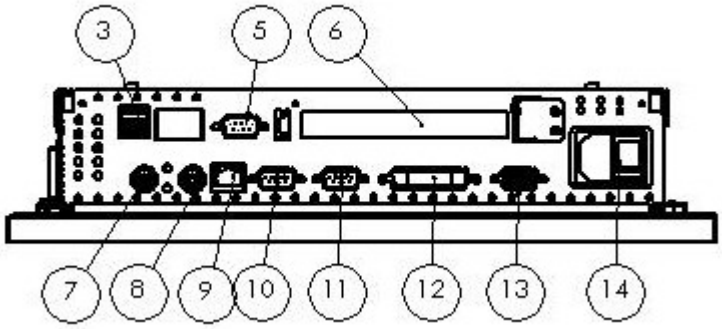
1.5 I/O Outlets

The following figure shows the I/O arrangement of the RTP120 series.

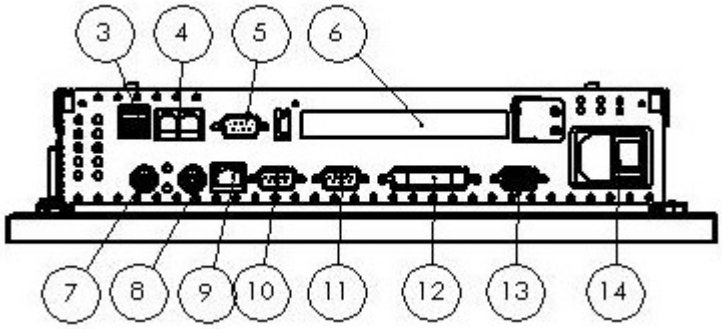


RTP120-610/ 610e Side View

1 2XUSB ports **2** Dallas Key (option)



RTP120-610 Bottom View



RTP120-610e Bottom View

3	2x USB ports	**9**	LAN port
4	2x cash drawer ports (RTP120-610e only)	**10**	COM1 port
5	COM4 port	**11**	COM2 port
6	PCI expansion slot outlet	**12**	printer port
7	mouse	**13**	VGA port
8	keyboard	**14**	power switch ON/OFF

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Chapter 2
System Configuration

This chapter details the system parts and components with figures. Sections include:

- **System Major Parts**
- **Pedestal Versatility**
- **System Key Components**

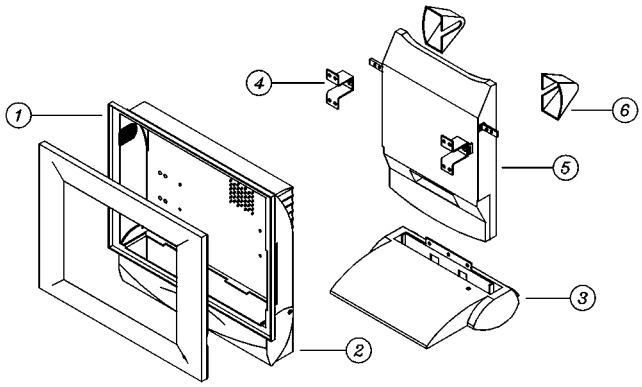
2.1 Pedestal Versatility

The RTP120 series features a versatile stand designed for various environmental applications. A complete set of pedestal is provided to make up the various stands.

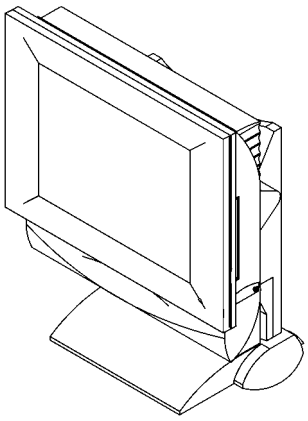
2.1.1 Desktop Standing

The standard kit that makes up a free-standing computer include:

1	System main body	**4**	Small back metal fixtures
2	Cable management shroud	**5**	Main prop
3	Pedestal	**6**	Small hinge caps

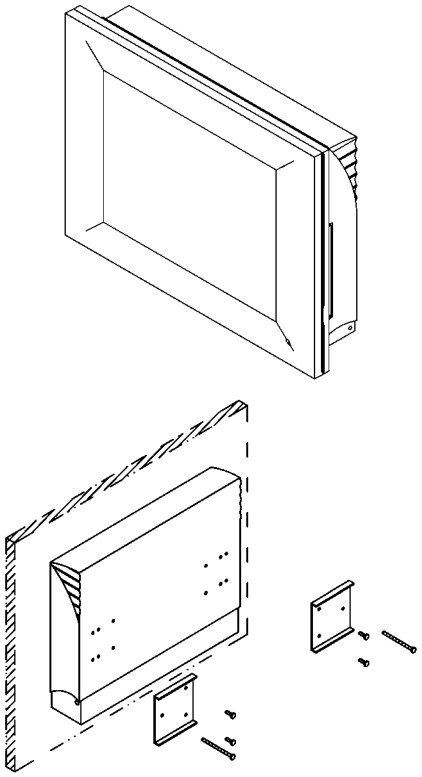


By assembling these components to the main body of RTP120 series, the computer stands on the table as an independent unit. This space-saving computer is commonly adapted for office automation, video conference and hotel information counter. The unit after proper assembly would look as illustrated below.



2.1.2 Vertical Wall Mounting

For panel mounting only a set of mounting kit is needed, there is no pedestal kit or cable management shroud required. Please refer to the following figures.

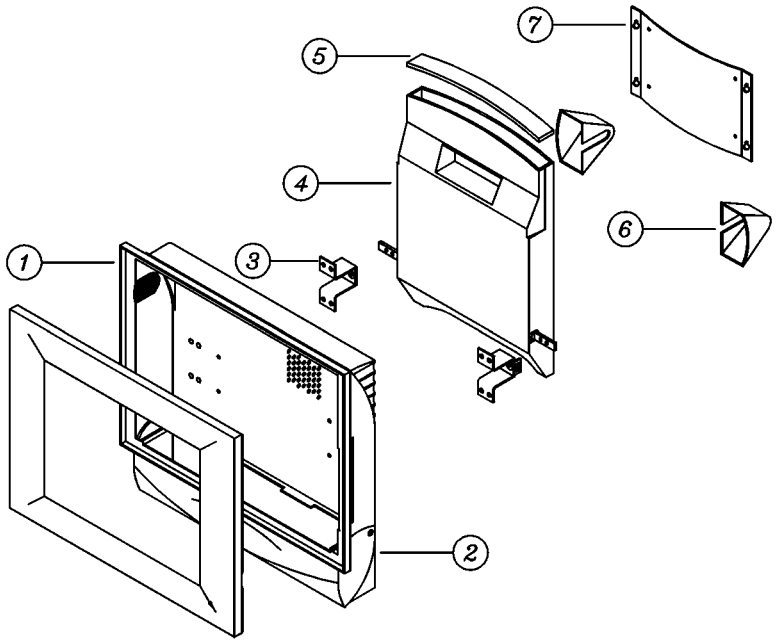


2.1.3 Wall Mounting

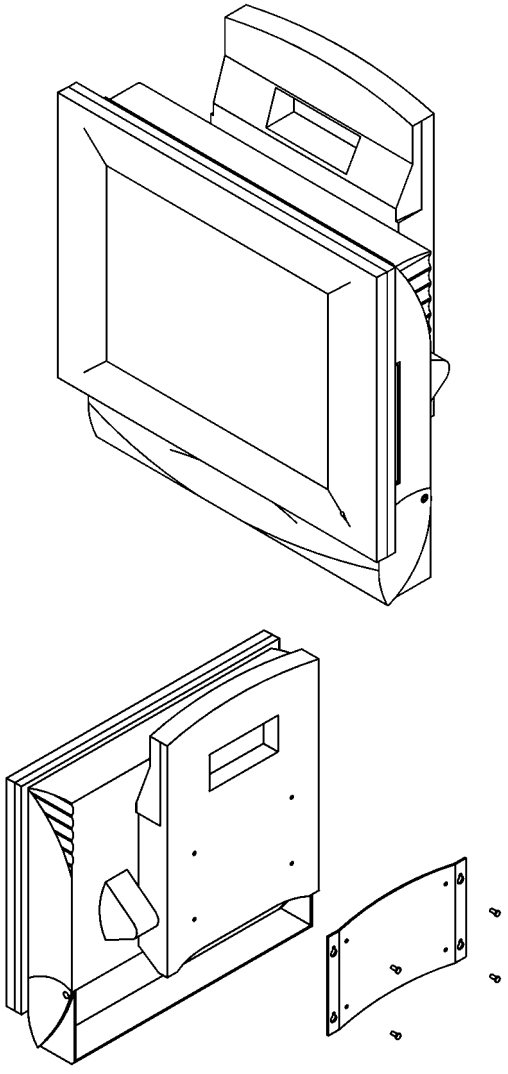
The standard kit that makes up a wall-mount unit includes:

1. **System main body**
2. **Cable management shroud**
3. **Small back metal fixtures**
4. **Main prop**
5. **Rubber slip:**
   The rubber slip has to be inserted to the top opening of the main prop to make the whole unit look complete and integrated.
6. **Small hinge caps**
7. **Metal mounting kit**

   During assembling, the main prop has to be rotated 90° and screwed to the system's main body by the back metal fixture.



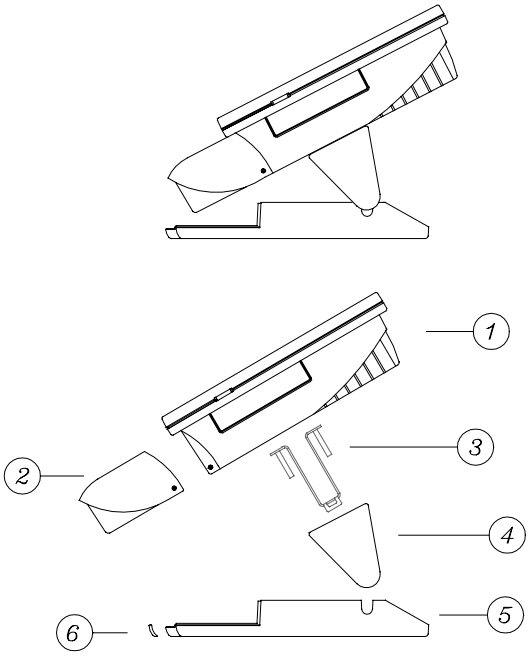
By assembling these accessories to the main body of the RTP120 series, the computer is mounted and forms a 30° angle to the wall as illustrated below. Such unit is commonly used in medical instrumentation, stand-alone POI system.



2.1.4 30° Table Standing

For a 30° table-standing use, only the standard set of mounting kit is needed, there is no pedestal kit or cable management shroud required. The standard kit making up a 30° table-standing unit includes:

1. **System main body**
2. **Cable management shroud**
3. **Large back metal fixtures**
4. **Large hinge caps**
5. **Main prop**
6. **Rubber Slip:**
   When the system is to be assembled as a 30° table-standing unit, the rubber slip has to be inserted to the front opening of the laid-down main prop to make the whole unit look complete and integrated.



Chapter 3
Hardware Installation

This chapter describes the installation and the cable connection to the system connectors. See system board User's Manual that came with your PANEL PC packaging for more details. Sections in this chapter includes:

- **CPU**
- **DRAM**
- **HDD**
- **3 x Serial Ports**
- **Parallel Port**
- **VGA**
- **Ethernet**
- **Keyboard**
- **PS/2 Mouse**
- **Cash Drawer(610e only)**
- **Dallas Key(option)**
- **Expansion Slot**
- **System O/S and Software Installation**

The RTP120 series has either a Pentium or a Pentium III/Celeron little board with a free PCI slot inside and a 3.5" HDD drive bay. These come as standard configuration of the system. Upgrading to a higher performance CPU, higher capacity DRAM modules and hard disk drive can increase system performance. The user can use the I/O ports located at the bottom layer of the chassis to connect external peripheral devices, such as a monitor, serial devices, parallel printer…etc.

If you encounter difficulties during connection, loosen the screws on the cable management shroud, then remove the shroud for easy peripheral connection.

NOTE: *Make sure the power cord is disconnected before any installation. To install any internal device such as CPU, DRAM and HDD, take out the plastic rear cover and unscrew the metal rear bracket first.*

3.1 CPU

The standard RTP120 series solely uses a Pentium III/Celeron-grade supported CPU card (**SBC85610VE**). In further classifying the CPU cards of the other systems.

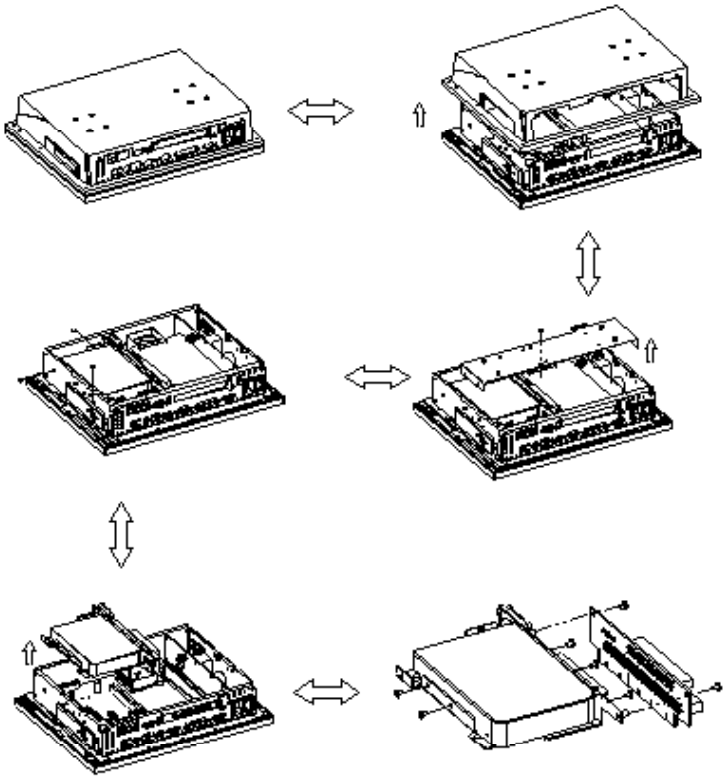
3.2 DRAM

The RTP120 series system control board, SBC85610VE, provides **2 x 168-pin DIMM** supporting system memory up to 1GB.

3.3 HDD

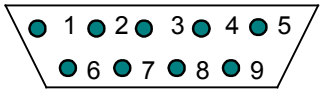
The standard packing will reserve a 3.5" hard disk drive bay. If the user intends to install or remove the device for repair or for a higher-capacity one, then follow the installation instructions and diagram below.

1. Product Finished.
2. There are 19 screws that fasten the rear cover on to the main unit. Take out the screws and pull out the rear cover.
3. To remove the VEA bracket, loosen and take off the 5 screws (2 on each side) that bolts the bracket to the main unit.
4. loosen and take off the 3 screws (2 on each side) that bolts the
5. To remove the HDD bracket and Riser card.
6. Loosen and take off the 7 screws (2 and 3 on each side) that bolts the bracket to the main unit.
7. Repeat step2 to step6 for assembling.



3.4 Three Serial Ports

The RTP120 series provides three onboard serial ports installed on the bottom rear side of the chassis. Arrangements on RTP120 series specify COM1, COM4 providing RS-232 interface, and with its RS-422/485 interface connected to COM2. Each serial port comes with +5V/+12V power capabilities on both Pin 1 and Pin 9, ready to accommodate a wide array of serial devices such as fax modem, scanner, serial mouse, touch screen...etc. If the touch screen option is included, its controller will share COM3.



Pin #	Signal Name	
	R2-422	RS-485
1	TX-	DATA-
2	TX+	DATA+
3	RX+	No connector
4	RX-	No connector
5	GND	GND
6	No connector	No connector
7	No connector	No connector
8	No connector	No connector
9	No connector	No connector

3.5 Parallel Port

The printer interface is a 25-pin D-SUB connector located at the bottom side. To connect any parallel device, just plug in the device connector to the 25-pin D-SUB.

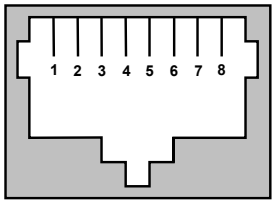
3.6 VGA

The RTP120 series has an analog RGB interface connector installed on the bottom side. It is able to connect to an expansion CRT monitor, and the system can display on both the flat panel and the CRT simultaneously.

Since the RTP120 series adapts a flat panel with a resolution of 1024 x 768, simultaneous support of a CRT monitor requires the setting of the CRT's VGA resolution to 1024 x 768 too. The connection to a CRT monitor is also an easy plug-in of the CRT connector to the RGB interface.

3.7 Ethernet

The RTP120 series provides an NE2000 compatible Ethernet (RJ-45) interface. For network connection, just plug in one cable end of a 10-Base-T Hub *or* 100-Base-T Hub into the standard Ethernet phone jack. The pin assignment of the RJ-45 is listed below;



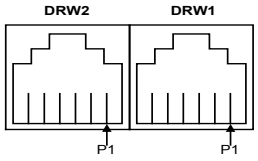
RJ-45

RJ-45 Connector Pin Assignment

Pin	Description
1	Tx+ (Data transmission positive)
2	Tx- (Data transmission negative)
3	Rx+(Data reception positive)
6	Rx- (Data reception negative)
others	Not use

3.8 Cash Drawer (RTP120-610e only)

The RTP120-610e provides two cash drawer port. It can be used to control the opening and closing of the cash drawer on a POS system. The cash drawer Jack is follower Epson cash drawer spec. pin position and pin assignment are shown below.



RTP120-610e Cash Drawer Pin Assignment

Pin	DRW1	DRW2
P1	FG(GND)	FG(GND)
P2	Drawer SOL-1	Drawer SOL-2
P3	Drawer SW-1	Drawer SW-2
P4	+24V	+24V
P5	N/A	N/A
P6	GND	GND

3.9 Keyboard and Mouse

The RTP120 series provides a standard PS/2 keyboard and a PS/2 mouse connector located at the bottom of panel.

3.10 Expansion Slot

The RTP120 series can be equipped with or without any expansion slot. As for the RTP120 series, this comes as a standard system feature. If the system comes with expansion capability, then the system includes a PCI expansion riser card to accommodate a PCI device at a given time. Due to the internal space limitation, only a half-size expansion card can be adapted. To use the PCI expansion, refer to the following figure and follow the installation instructions below;

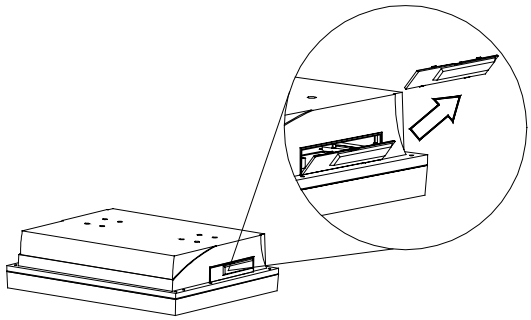
Plug a PCI card into the PCI slot on the riser card and fix all connectors of the expansion card will come out from the expansion outlet on the bottom side of the chassis for further cable connection.

- Unscrew the metal slip located inside the expansion outlet.
- Plug the riser card into the onboard PCI slot first.
- Screw the metal opening to the power supply bracket and the multi-I/O conversion metal piece.
- Plug a PCI card into the PCI slot on the riser card and screw the expansion card to the metal front compartment. All the connectors of the expansion card will come out from the opening on the rear cover for further cable connection.
- Screw the rear cover to the chassis.

Please also note that the total height of the system with expansion slot is 93 mm.

3.11 USB and Dallas Key Installation

To install an USB device or to access a Dallas key to the system from side panel, you must get access to the connectors located on the side panel. Take off the dust/spill cap located at the side panel by pushing it downward to loosen its grip on top. Once loosened, pull the cap upward to disengage completely.



3.12 System O/S and Software Installation

The RTP120 series is not equipped with any operating system. It reserves a 3.5" HDD drive bay for its storage device space. As both devices are built in the system chassis, to load any O/S or application software into the computer, an external device is needed to act as a bridge. There are three major ways to load software into the system.

- **Use an external USB flash memory:**
  Attach a USB flash memory to the USB port. Then, configure the system BIOS setup and containing necessary software and start the installation.
- **Use Ethernet:**
  If the Ethernet bootrom is already included in the system, the user can boot up the system via bootrom and download the system O/S or application software from the net.
- **Use external USB CD-ROM/ HDD:**
  Attach a USB CD-ROM or USB HDD to the USB port. Then, configure the system BIOS setup and containing necessary software and start the installation.

Appendix A
Power Supply Specifications

Introduction

The power supply used in the RTP120 series is an AT 80W open frame power supply. The specifications and features of this special power supply are listed in the following sections.

Specifications

- AT 80W output
- Input voltage 90~132VAC (MIN.) 180~264VAC (MAX.)
- Over voltage, over load protection
- Continuous short circuit protection
- Conductive EMI meets FCC class B

Input Requirements

Description	MIN.	TYP.	MAX.	Condition
Input Voltage	90~132V	115/230V	180~264V	47/63Hz
Input Current	-	-	2A	115V/50Hz
Line Freq.	47Hz	50/60Hz	63Hz	-
Inrush Current	-		50A	Cold Start
Efficiency	-	65%	-	115V at full load

Output Characteristic

- Static DC load, Ripple and Noise

Nominal Voltage	Total Regulation	Output Current	Ripple & Noise
+5V	+5%	0.8A~8A	50mV
+12V	+8%	0.3A~3A	120mV
-12V	+10%	0.03A~0.3A	150mV

- **Hold-up time:** 10ms at least.
- **Over voltage protection:** From +5.6VDC to 6.5VDC
- **Short circuit protection:** Continuous

Environmental Specifications

- **Operating temperature range:** 0°C to 50°C
- **Storage temperature range:** -10°C to +70°C
- **Humidity, non-condensing:** 10% ~ 90%
- **MTBF:**
  80000hours min. at max. load for 25°C ambient temperature

International Standards

EMI Standards(meet)

- **FCC Requirements**
  The power supply shall comply with the FCC"Class B" conducted
- **CE Requirements**
  The power supply shall confirm to meet the "Class B" requirements of EN55022

Appendix B
System Configuration Limitation Notice

Processor Limitation List

Processor	Power Consumption	Recommend
Celeron-850E	+5V@6.37A/+12V@0.41A	NO
Celeron-1.2G/256K (Tualatin)	+5V@5.56A/+12V@0.45A	YES
Pentium III-850E	+5V@6.15A/+12V@0.45A	NO
PentiumIII-1.13G/256K (Tualatin)	+5V@5.45A/+12V@0.42A	YES
Pentium III-1.26G/512K(Tualatin)	+5V@6.17A/+12V@0.42A	NO
VIA C3-800MHz(133)	+5V@4.53A/+12V@0.40A	YES
VIA C3-1000MHz(133)	+5V@4.8A/+12V@0.40A	YES
VIA C3-1200MHz(133)	+5V@5.2A/+12V@0.40A	YES

For over all, the CPU power consumption must be under +5V@5.9A/+12V@1.0A

RTP120-610 Configuration Limitation List

Parts	Power Consumption	Remark
Processor	Refer to Processor Limitation List	
HDD	+5V@0.72A/ +12V@0.35A	Max.
PCI slot expansion	+5V@0.8A/+12@1.0A	Max.
USB peripheral	+5V@0.5A	Max.

RTP120-610e Configuration Limitation List

Parts	Power Consumption limitation	Remark
Processor	Refer to Processor Limitation List	
HDD	+5V@0.72A/ +12V@0.35A	Max.
PCI slot expansion	+5V@0.8A/+12@1.0A	Max.
USB peripheral	+5V@0.5A	Max.
Cash Drawer Device	24V@0.125A(+12V@0.25A)	Max.