

RC-520

BBS-2520

Small Box Bare Bone System

- **Small Box •**
- **5.25" MainBoard •**
- **Slim CD-ROM •**
- **180W ATX Power Supply •**

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Safety Instructions

Before getting started, read the following important cautions.

- 1.** The RC-520/ BBS-2520 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 RC-520/BBS-2520 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 RC-520/BBS-2520 is properly grounded.
- 4.** 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.

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 measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.
5. Shielded interface cables must be used in order to comply with emission limits.

This chapter contains the general information and the detailed specifications of the RC-520/BBS-2520.



The BBS-2520 small box manages to equip itself with connectors for VGA, LAN, COM, USB, keyboard and mouse for friendly connections. The front panel features two USB ports and HDD/power LED.

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1.2 Features

- Small box bare bone system design
- Built-in mainboard, slim CD-ROM, 180W ATX P/S
- Provides Intel® Pentium® M/Celeron® M processor
- Onboard graphics controller
- Onboard Ethernet controller
- Onboard 3D audio controller
- Two COM, four USB2.0 ports
- Two 4cm ball bearing cooling fans

1.3 Specifications

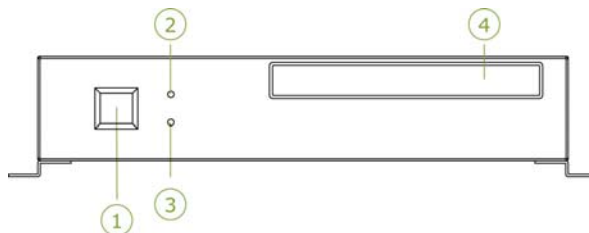
- **CPU:**
ULV Intel® Celeron® M processor 600MHz/512K
Intel® Pentium® M processor 760 2.0GHz
Intel® Pentium® M processor 745 1.8GHz
Intel® Celeron® M processor 370 1.5GHz
Intel® Celeron® M processor 320 1.3GHz
- **Memory:** One DDR socket supporting up to 1GB
- **VGA:** Onboard graphics controller
- **Ethernet:** Onboard 10/100 Based LAN
- **Audio:** Onboard 3D audio controller
- **HDD/FDD/CD-ROM:** One 3.5" HDD space and one slim CD-ROM
- **Serial Port:** One RS-232/422/485 and one RS-232
- **USB:** Four USB2.0 ports, two on front panel and two on back panel
- **Keyboard:** PS/2 6-pin Mini DIN
- **Mouse:** PS/2 6-pin Mini DIN
- **BIOS:** AMI PnP Flash BIOS
- **Watchdog Timer:** Software programmable time-out intervals from 1~256 sec.
- **Power In:** 180W ATX power supply
- **Thermal Solution:** Two 4cm ball bearing cooling fans
- **Temperature:** 0~+55°C (operating); -20~+70°C (storage)
- **Dimensions:** 33.45(L) x 25.5(W) x 5.0(H) cm

NOTE: For more detailed information on the mainboard used in your Bare Bone, refer to the mainboard User's Manual that came with the system packaging.

1.4 I/O Outlets

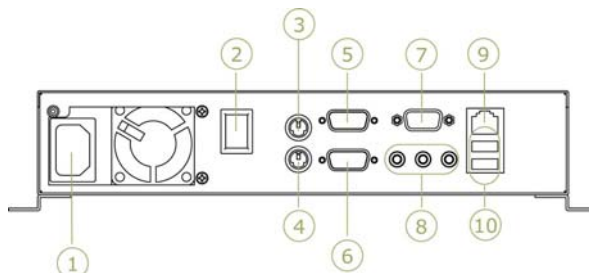
The following figure shows the I/O arrangement of the BBS-2520.

BBS-2520 Front Panel



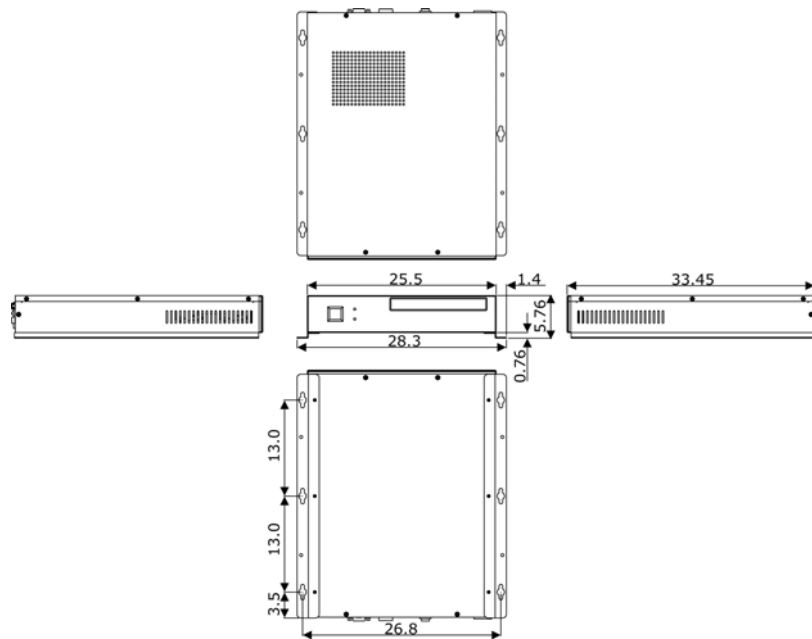
NO.	Description
1	External USB2.0 Ports
2	HDD LED
3	Power LED
4	Slim CD-ROM

BBS-2520 Back Panel



NO.	Description
1	Power In
2	ON/OFF Switch
3	PS/2 6-pin Mini DIN Mouse Connector
4	PS/2 6-pin Mini DIN Keyboard Connector
5/6	Serial Port Connector
7	CRT Connector
8	Audio Connector
9	RJ-45 Connector
10	External USB2.0 Ports

1.5 Dimensions



Chapter 2

Unpacking

2.1 Opening the Delivery Package

The RC-520/BBS-2520 is packed in an anti-static bag. The bare bone system has components that are easily damaged by static electricity. Do not remove the anti-static wrapping until proper precautions have been taken. Safety Instructions in front of this manual describe anti-static precautions and procedures.

2.2 Inspection

After unpacking the bare bone system, place it on a raised surface and carefully inspect the board for any damage that might have occurred during shipment. Ground the board and exercise extreme care to prevent damage to the board from static electricity.

Integrated circuits will sometimes come out of their sockets during shipment. Examine all integrated circuits, particularly the BIOS, processor, memory modules, ROM-Disk, and keyboard controller chip to ensure that they are firmly seated. The RC-520/BBS-2520 delivery package contains the following items:

- ◆ RC-520 Chassis or BBS-2520 Bare Bone System x 1
- ◆ 180W ATX Power Supply x 1
- ◆ AC Power Core x 1
- ◆ Utility Disc x 1
- ◆ RC-520/BBS-2520 User's Manual x 1
- ◆ MainBoard User's Manual x 1

The RC-520/BBS-2520 system along with its accessories is packed in several bags and boxes, all packed in one carton. Before you start, carefully read the safety instructions in front of this User's Manual.

It is recommended that you keep all the parts of the delivery package intact and store them in a safe/dry place for any unforeseen event requiring the return shipment of the product. In case you discover any missing and/or damaged items from the list of items, please contact your dealer immediately.

Chapter 3

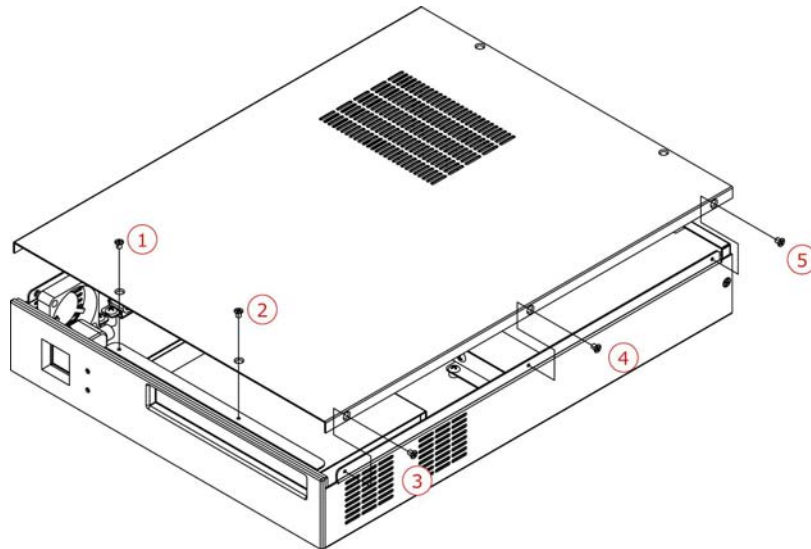
Hardware Installation

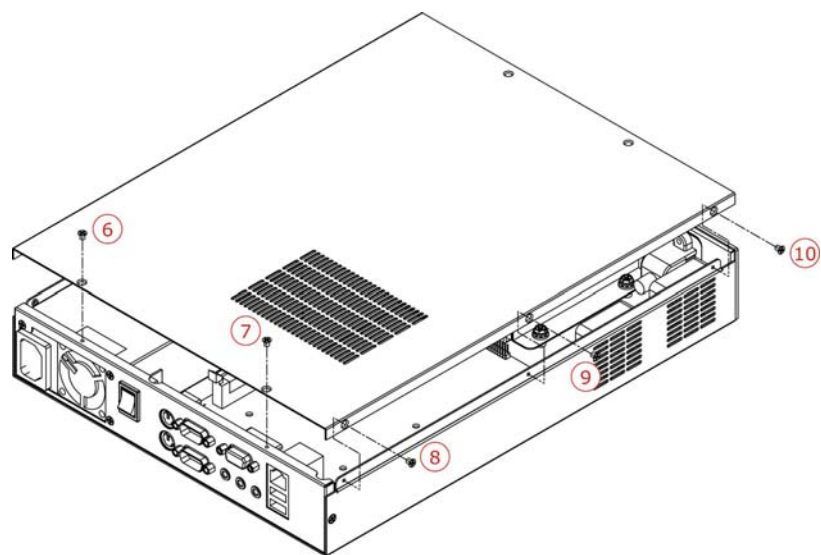
This chapter tells how to install components into the bare bone system.
External Interface please refers to mainboard's manual.

3.1 Procedures

3.1.1 Remove Cover

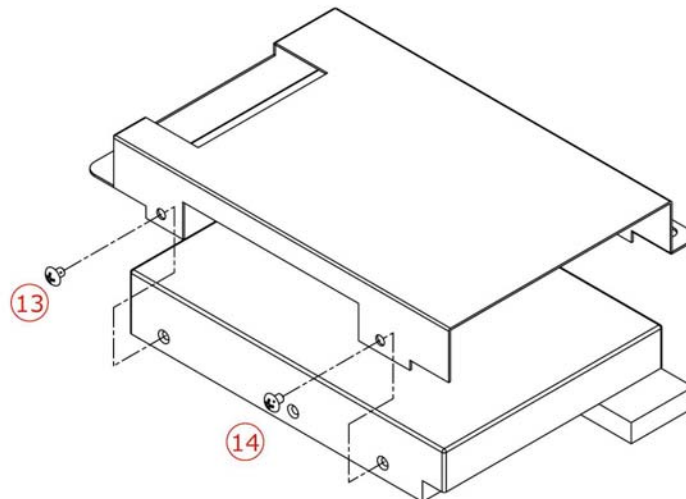
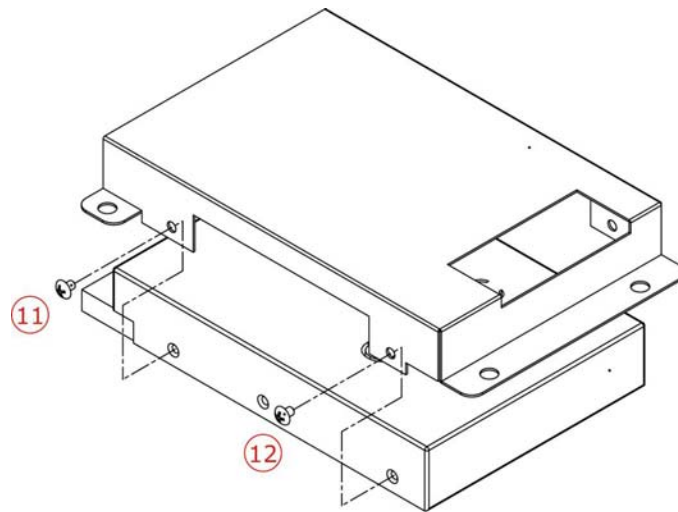
1. Loosen the no.1 ~ no.10 screw to open the upper cover.



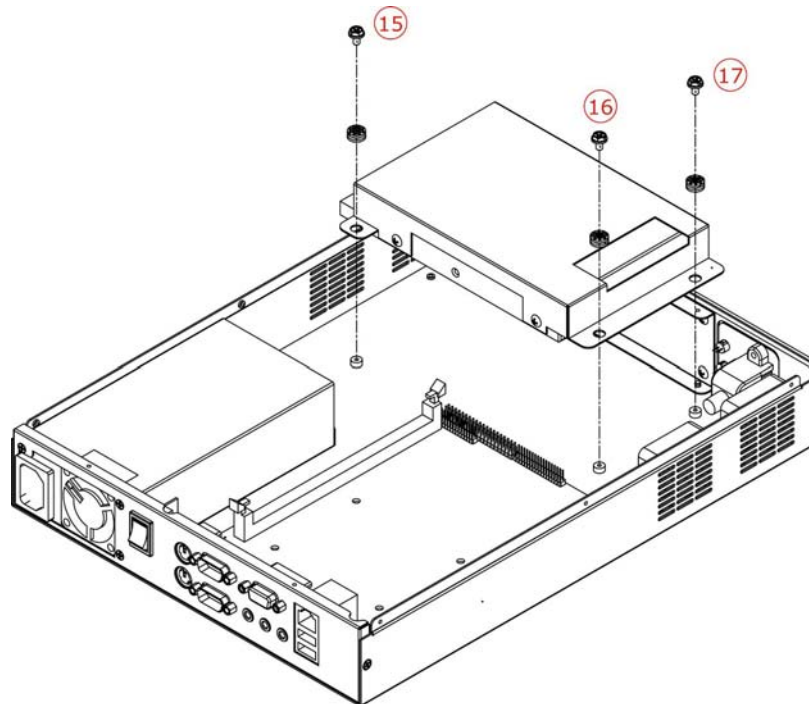


3.1.2 Install HDD

1. Fasten the no.11 ~ no.14 screw to install the HDD device into drive bay.

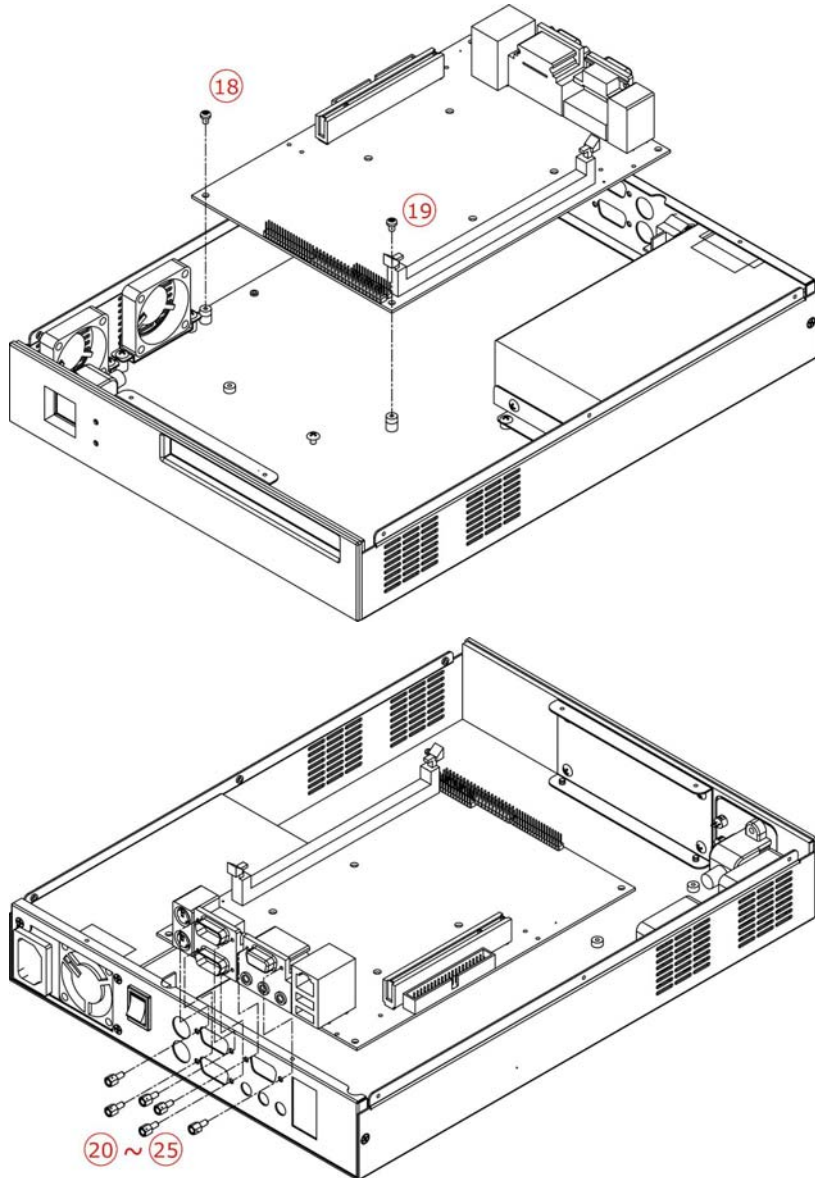


2. When install the HDD, please carefully check the direction of the pin of cable. If wrong direction in use, system fails to function or damage to system will be possible. And it must be connection the HDD cable and HDD power cable then fasten the no.15 ~ no.17 screw to install the drive bay into the chassis.



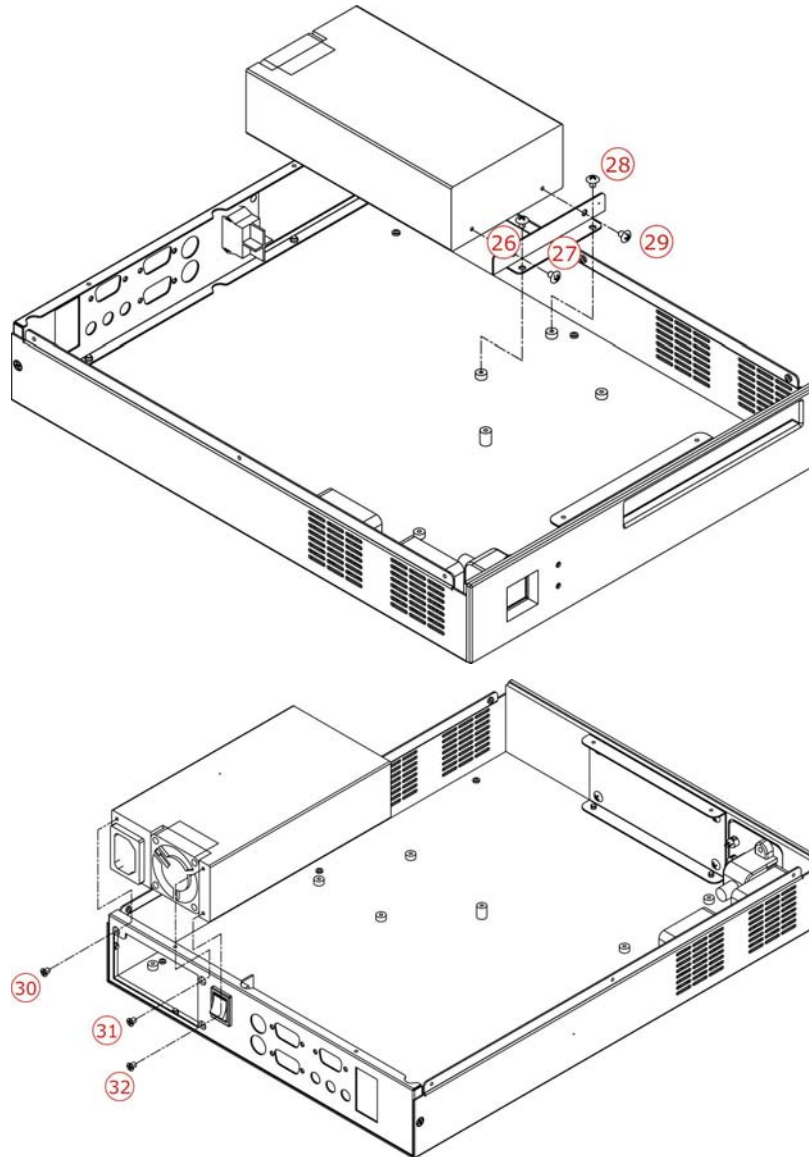
3.1.3 Install MainBoard

1. Fasten the no.18 ~ no.25 screw to install the mainboard.



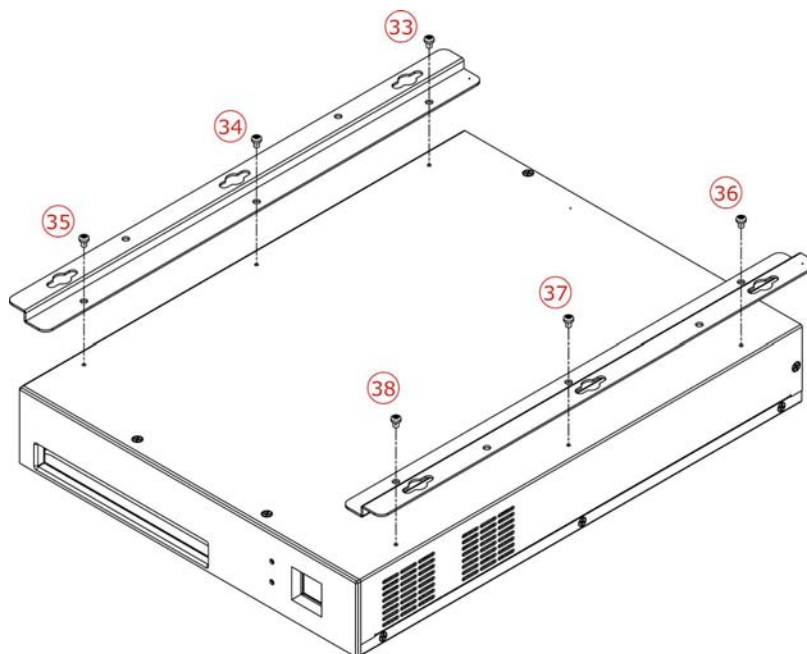
3.1.4 Install Power Supply

1. Fasten the no.26 ~ no.32 screw to install power supply.



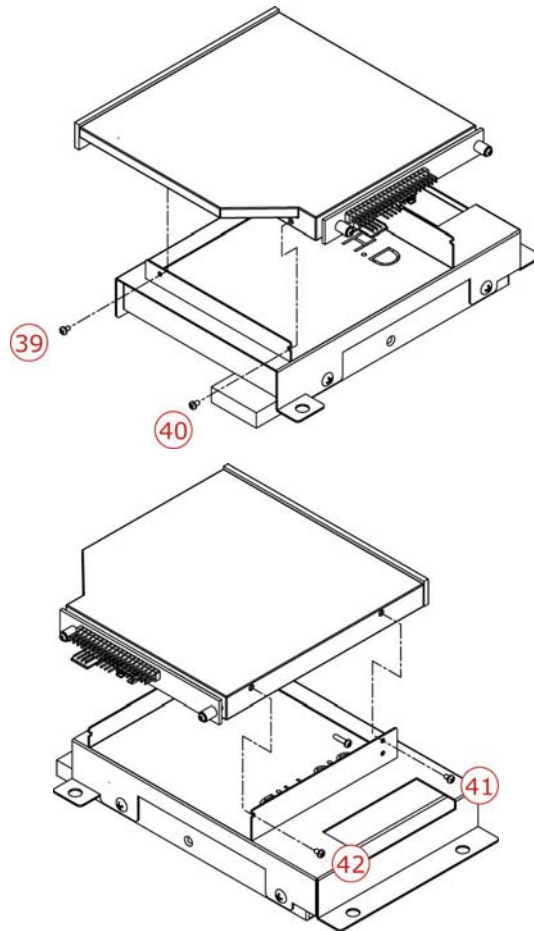
3.1.5 Wallmount

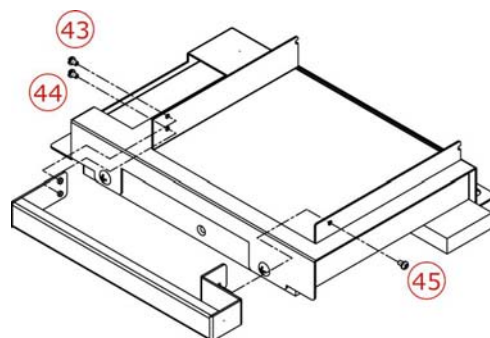
1. Fasten the no.33 ~ no.38 screw to wallmount.



3.1.6 Install CD-ROM

1. Fasten the no.39 ~ no.45 install the CD-ROM on front panel.





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Chapter 4

Power Supply

The specification below is intended to describe as detailedly as possible the functions and performance of the subject power supply. Any comment or additional requirements to this specification from our customers will be highly appreciated and treated as a new target for us to approach.

4.1 Safety Approvals

The subject power supply will meet the EMI requirements and obtain main safety approvals as following:

4.1.1 EMI Regulatory

- FCC Part 15 Subpart J, Class 'B' 115 Vac operation
- CISPR 22 Class 'b' 230 Vac operation

4.1.2 Safety

- NEMKO EN 60950
- TUV EN60950 OR VDE EN60950
- CSA 22.2 NO. 234 LEVEL 3
- IEC 950
- UL 1950
- CE

4.2 Physical Requirements

4.2.1 Mechanical Specifications

The mechanical drawing of the subject power supply, which indicate the form factor, location of the mounting holes, location, the length of the connectors, and other physical specifications of the subject power supply. Please refer to the attachment drawing.

4.2.2 Connector Specifications

The power supply connectors are:

AC Inlet: Standard inlet socket 10A/250V, UL/CSA/VED approved

- **P1:** The equivalent of MOLEX 39-01-2200, 20-pin connector
- **PA, PC, PD:** The equivalent of AMP 1-480424-0, 4-pin connector
- **PB:** The equivalent of AMP 171822-4, 4-pin connector
- **PE:** The equivalent of MOLEX 39-01-2040, 4-pin connector

4.2.3 Connector PIN Designations

	P1		PA, PC, PD		PB		PE	
PIN1	+3.3V	Orange	+12V	Yellow	+12V	Yellow	COM	Black
PIN2	+3.3V	Orange	COM	Black	COM	Black	COM	Black
PIN3	COM	Black	COM	Black	COM	Black	+12V	Yellow
PIN4	+5V	Red	+5V	Red	+5V	Red	+12V	Yellow
PIN5	COM	Black						
PIN6	+5V	Red						
PIN7	COM	Black						
PIN8	PW-OK	Gray						
PIN9	+5Vsb	Purple						
PIN10	+12V	Yellow						
PIN11	+3.3V	Orange						
	+3.3VS	Brown						
PIN12	-12V	Blue						
PIN13	COM	Black						
PIN14	PS-ON	Green						
PIN15	COM	Black						
PIN16	COM	Black						
PIN17	COM	Black						
PIN18	N/C	N/C						
PIN19	+5V	Red						
PIN20	+5V	Red						

4.3 Electrical Requirements

The subject power supply will meet all electrical specifications below, over the full operation temperature range and dynamic load regulation.

● Output Rating

Output	Nominal	Regulation	Ripple / Noise	Min.	Max.
1	+3.3V	+/-5%	50mV	0.3A	16.8A
2	+5V	+/-5%	50mV	0.3A	12.0A
3	+12V	+/-5%	120mV	1.5A	10.0A
4	-12V	+/-10%	120mV	0.0A	0.8A
5	+5VSB	+/-5%	50mV	0.0A	2.0A

NOTE: -12V, +3.3V, +5V, +12V will have the regulation to +/-10% when all load take off.

The +3.3V and +5V total output shall not exceed 61 watts. The +3.3V, +5V and +12V total output shall not exceed 165 watts and the total output for this subject power supply is 180 watts. Ripple and noise measurements shall be made under all specified load conditions through a single pole low pass filter with 20MHz cutoff frequency. Outputs shall bypassed at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.

● Load Capacity Specifications

Load	STM	+ 3.3 V	+ 5 V	+ 12 V	- 12 v
All Max	HHHH	4.5A	9.0A	9.0A	0.8A
+5V Max other Min	LHLL	0.3A	12.0A	1.5A	0.0A
+3.3V Max other Min	HLLL	16.8A	0.3A	1.5A	0.0A
+12V max other Min	LLHL	0.3A	0.3A	10.0A	0.0A
All Min	LLLL	0.3A	0.3A	1.5A	0.0A

● Hold Up Timer (@Full Load)

- 115V/60Hz: 17mSec. Minimum.
- 230V/50Hz: 17mSec. Minimum.

● Output Rise Time (10% to 90% of Final Output Value, @Full Load)

- 115V-rms or 230V-rms; +5Vdc: 20mx Max.

- **Over Voltage Protection**

- +5V_{dc} output: +5.7V_{dc} min.; +6.5V_{dc} max.
- +12V_{dc} output: +13.3V_{dc} min.; +15.6V_{dc} max.
- +3.3V_{dc} output: +3.7V_{dc} min.; +4.5V_{dc} max.

- **Short Circuit Protection**

Output short circuit is defined to be a short circuit load of less than 0.1 ohm.

In the event of an output short circuit condition on +3.3V, +5V or +12V output, the power supply will shutdown and latch off. The power supply shall return to normal operation after the short circuit has been removed and the power switch has been turned off for no more than 2 seconds.

In the event of an output short circuit condition – 12V output, the power supply will not latch off. The power supply shall return to normal operation as soon as the short circuit has been removed and the power switch has been turned off for no more than 2 seconds.

- **Overload Protection**

Overload currents defined as a 10 amp/sec fault current ramp starting from full load, applied to the +3.3V, +5V output, shall not cause that output to exceed 32 amps before the output voltage drops below 0.5 volts and is latched off. The +12V output shall not exceed 20 amps under the same ramp conditions starting at full load before it is latched off.

- **Power Good Signal**

The power good signal is a TTL compatible signal for the purpose of initiating an orderly start-up procedure under normal input operating conditions. This signal is asserted (low) until +5V_{dc} has reached 4.75 volts during power up. Characteristics:

- TTL signal asserted (low state): less than 0.5V while sinking 10mA.
- TTL signal asserted (high state): greater than 4.75V while sourcing 500uA.
- High state output impedance: less or equal to 1Kohm from output to common.

Power Good @ 115/230V, Full Load	100~500mSec.
Power Fail @ 115/230V, Full Load	1mSec. Minimum

- **Output Transient Load Response**

+5V and +12V must be within specification for a step change in current as specified below. The outputs will be tested one section at a time with all other sections at maximum load. The test transition will be from IA to IB and IB to IA.

	+ 5V vdc	+ 12V vdc	+ 3.3V vdc
IA	12.0 amps	9.0 amps	16.8 amps
IB	8.4 amps	7.0 amps	13.0 amps
Volts Variation	+5V +/-5%	+12V +/-5%	+3.3V +/-5%
Setting Time	10ms max.	10ms max.	10ms max.
Transient Load Slew Rate Is	0.5A/uS	0.1A/uS	0.1A/uS

NOTE: +5Vsb: 0.5A; -12V: 0.1A

- **AC Input Line Requirements**

Parameter	Min.	Nom. ⁽¹⁾	Max.	Unit
V_{in} (115VAC)	90	115	135	VAC _{rms}
V_{in} (230VAC)	180	230	265	VAC _{rms}
V_{in} Frequency	47	----	63	HZ

NOTE: Nominal voltages for test purposes are considered to be within +/-1.0V of nominal.

- **Inrush Current (Cold start – 25 deg. C)**

115V	50Amps-peak
230V	80Amps-peak

- **Input Line Current**

115V	4.0 Amps – rms max.
230V	2.0 Amps – rms max.

- **Efficiency**

115VAC @ Full Load	68% min.
230VAC @ Full Load	68% min.

- **PS_ON**

	Min.	Max.
V_{IL}, Input Low Voltage	0.0V	0.8V
V_{IL}, Input Low Current (V_{in}=0.4V)		-1.6mA
V_{IH}, Input High Voltage (I_{in}=-200uA)	2.0V	
V_{IH}, Open Circuit, I_{in} =0		5.25V

4.4 Environmental Requirements

The power supply will be compliant with each item in this specification for the following Environmental conditions.

- **Temperature Range**

Operating	0 to +50 deg. C
Storage	-20 to +80 deg. C

- **Humidity**

Operating	5~95% RH, Non-condensing
Storage	5~95% RH, Non-condensing

- **Vibration**

The subject power supplies will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Vibration Operating – Sine wave excited, 0.5G maximum acceleration, 10~250Hz swept at one octave/min. Fifteen minute dwell at all resonant points, where resonance is defined as those exciting frequencies at which the device under test experiences excursions two times large than non-resonant excursions.

Plane of vibration to be along three mutually perpendicular axes.

- **Shock**

The subject power supplies will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

- **Storage:** -40G, 11mSec. Half-sine wave pulse in both directions on three mutually perpendicular axes.
- **Operating:** -10G, 11mSec. Half-sine wave pulse in both directions on three mutually perpendicular axes.

- **Cooling Specifications**

The PS is cooled by a self-contained, 40mm, 12VDC

4.5 Safety

In addition to the UL CSA and NEMKO safety requirements, the leakage current from AC to safety ground will not exceed 1mA-rms at 240Vac, 50Hz

4.6 Electromagnetic Compatibility

- **Line Conducted EMI**

The subject power supplies will meet FCC and VFG class B requirements.

- **Radiated EMI**

The subject power supplies will meet FCC and CISPR 22 requirements.

4.7 Labeling

Label marking will be permanent, legible and complied with all agency requirements.

- **Model Number Label**

Labels will be affixed to the sides of the power supply showing the following:

- Manufacturer's name and logo
- Model no., serial no., revision level, location of manufacturer
- The total power output and the maximum load for each output
- AC input rating

- **DC Output Identification**

Each output connector will be labeled.

4.8 Reliability

- **MTBF**

The power supply have a minimum predicted MTBF of 100,000 hours of continuous operation at 25 deg. C, maximum-output load, and nominal AC input voltage.

4.9 Safety Requirements

- **Safety**

The subject power designed to meet the following safety regulations.

- NEMKO
- TUV or VDE
- UL 1950
- CSA 22.2 LEVEL 3
- CE

4.10 Dimensions

