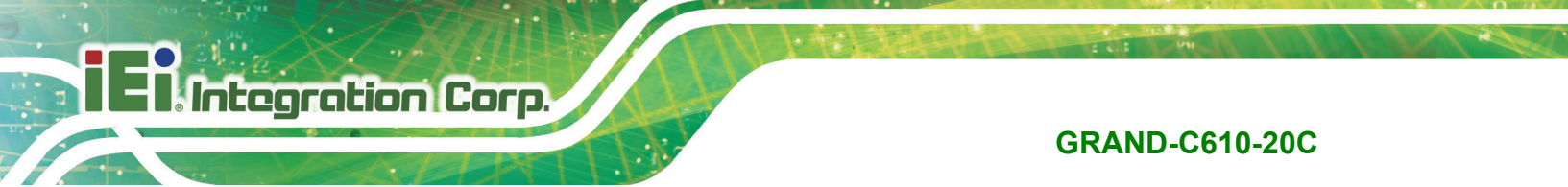




MODEL:
GRAND-C610-20C

Storage Server with Dual Intel® Xeon® E5 Processor, Up to 1TB DDR4 RAM, Triple SAS 12Gb/s Controller, PCIe SSD NVMe, 3U Rack Mount Chassis, 650 W Redundant PSU, RoHS

User Manual



Revision



Date	Version	Changes
April 13, 2018	1.00	Initial release



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Manual Conventions



WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.



CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.



NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.



HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

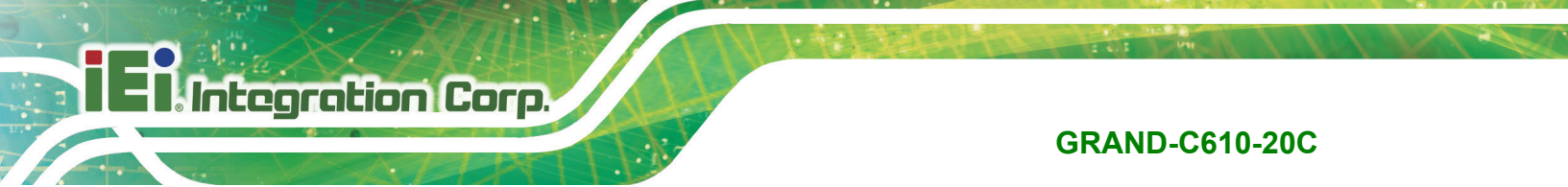
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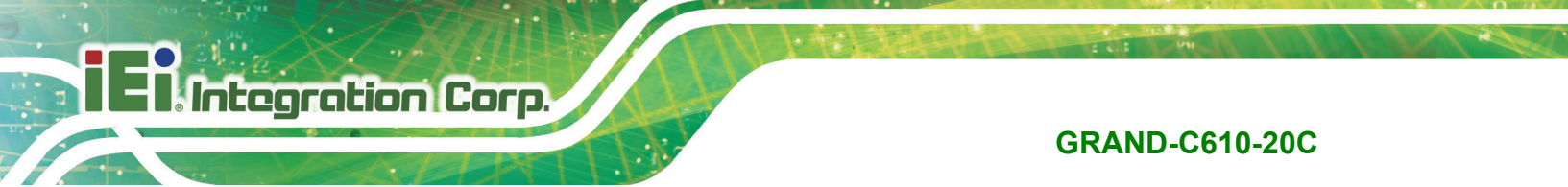
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Chapter

1

Introduction



1.1 Overview



Figure 1-1: GRAND-C610-20C Storage Server

The GRAND-C610-20C storage server is powered by dual Intel® Xeon® E5 processor with RAM expandable to 1 TB, and with a server-grade hardware design that optimizes mission-critical tasks and boasts unrivaled performance for Big Data computing.

The GRAND-C610-20C has three LSI 12Gb/s SAS controllers, with each controller supporting 7 ports of 12Gpbs SAS, for connectivity with up to 16 HDDs and 4 SSDs, ensuring each controller can fully utilize the maximum bandwidth to optimize performance and reliability.

The GRAND-C610-20C supports network expansion cards with 10/40 Gigabit Ethernet connectivity to deliver the most cost-effective computing.

1.2 Features

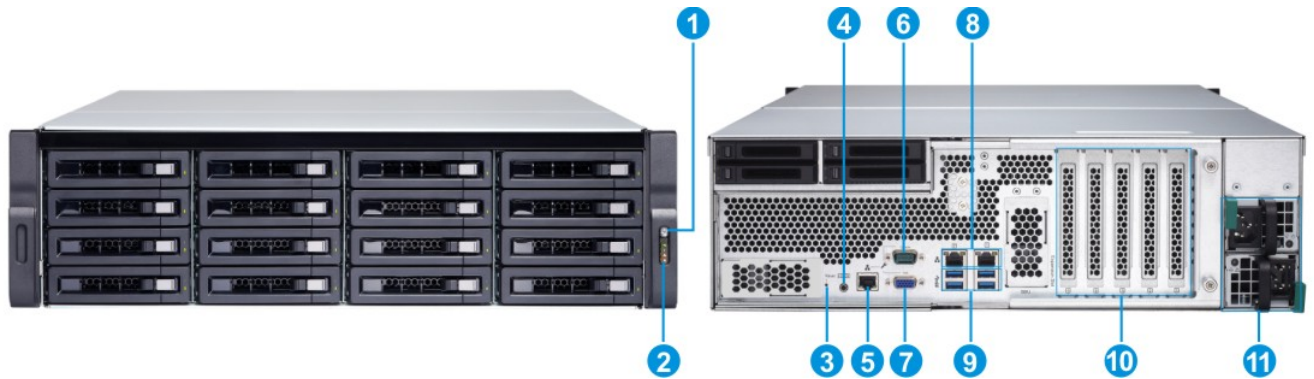
The GRAND-C610-20C has the following features

- Dual Intel® Xeon® E5 processor (with 4-core, 6-core and 8-core configurations)
- Up to 1TB DDR4 2133MHz RDIMM/LRDIMM RAM (16 DIMM)
- Triple SAS 12Gb/s controller increase I/O performance
- 10 / 40GbE card support
- PCIe SSD NVMe for cache acceleration
- IPMI helps ease server management

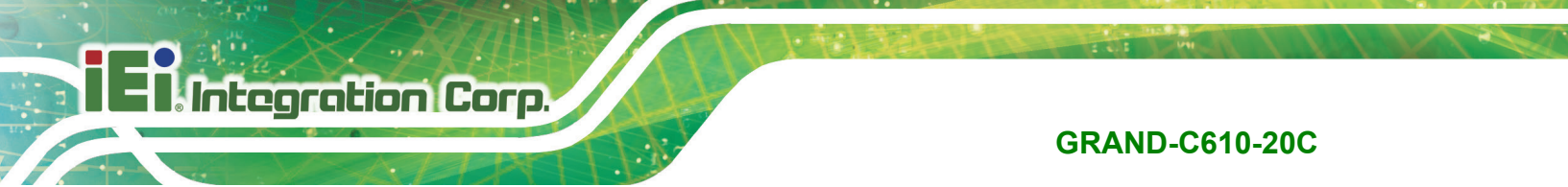


GRAND-C610-20C**1.3 I/O Interface**

The GRAND-C610-20C contains the following external I/O connectors, buttons and LED indicators:



1	Power button	7	IPMI VGA
2	LED Indicator: 10 GbE, status, LAN, storage expansion port status	8	Two Gigabit LAN ports (Left: LAN1; Right: LAN2)
3	EC GPIO	9	Four USB 3.0 ports
4	Audio jack (mic-in and line-out)	10	Four PCIe slots (Left: 3 x PCIe Gen3 x8; Right: 1 x PCIe Gen3 x16)
5	IPMI LAN port	11	Power connectors
6	IPMI console		



1.3.1 LED Indicator Specifications

The LED indicators of the GRAND-C610-20C indicate the system status and information. The following table lists the LED indicator behavior. Note that the following information is applicable only when users have properly installed the hard drive, and connected the system to the network and the power supply.

LED	Color	LED Status	Description
System Status	Red/ Green	Red	1. The hard drive is invalid. 2. The disk volume has reached its full capacity. 3. The disk volume is going to be full. 4. The system fan is out of function. 5. An error occurs when accessing (read/write) the disk data. 6. A bad sector is detected on the hard drive.
		Green	The system is ready.
		Deep flashes of orange	The system is in sleep mode.
		Off	All the hard drives are in standby mode.
LAN	Orange	Orange	The disk data is being accessed from the network and a read/write error occurs during the process.
		Flashes orange	The system is connected to the network.
10 GbE	Green	Green	The 10GbE network expansion card is installed.
		Off	No 10GbE network expansion card is installed.
HDD	Red/ Green	Red	A hard drive read/write error occurs.
		Flashes green	The disk data is being accessed.
		Green	The hard drive can be accessed.
USB	Blue	Flashes blue every 0.5 sec	1. A USB device (connected to the front USB port) is being detected. 2. A USB device (connected to the front USB port) is being removed from the system. 3. The USB device (connected to the front USB port of the system) is being accessed. 4. The data is being copied to or from the external USB or eSATA device.
		Blue	A front USB device is detected (after the device is mounted).



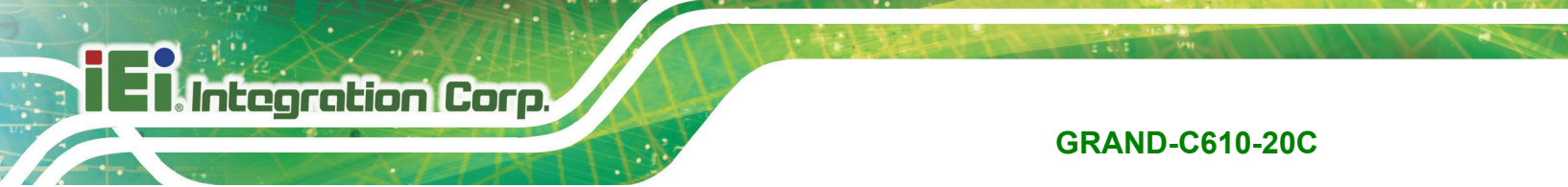
GRAND-C610-20C

LED	Color	LED Status	Description
		Off	<ol style="list-style-type: none"> No USB device is detected. The system has finished copying the data to or from the USB device connected to the front USB port.
eSATA	Orange	Flashes orange	The eSATA device is being accessed.
		Off	No eSATA device can be detected.

1.4 Specifications

The specifications for the GRAND-C610-20C are listed below.

	GRAND-C610-20C
CPU	Intel® Xeon® E5-2600 v3 Family processor: Intel® Xeon® Processor E5-2623 v3 (4-core, 10M Cache, 3.00 GHz)* Intel® Xeon® Processor E5-2620 v3 (6-core, 15M Cache, 2.40 GHz) Intel® Xeon® Processor E5-2630 v3 (8-core, 20M Cache, 2.40 GHz) Intel® Xeon® Processor E5-2640 v3 (8-core, 20M Cache, 2.60 GHz)* *Available with customization requirement
Memory	System memory: RDIMM / LRDIMM
	Total memory slots:16
	Memory expandable up to 1 TB (16 x 64 GB)
USB	4 x USB 3.0 port
Hard Drive	16 x 3.5-inch SAS (12Gbps/6Gbps), SATA (6Gbps/3Gbps) hard drive, or 2.5-inch SAS/SATA SSD
	4 x 2.5-inch SAS (12Gbps) SSD, or SAS/SATA (6Gbps/3Gbps) SSD
Max. Raw Capacity	128 TB
Hard Drive Interface	SAS 12Gb/s, backward compatible with SAS/SATA 6Gbps



LAN	2 x 10/100/1000 Mbps LAN port
PCIe Slot	4 (3 x PCIe Gen3 x8, 1 x PCIe Gen3 x16)
Form Factor	3U, rack mount
Dimensions	130.8 mm (H) x 444 mm (W) x 744 (D) mm
Weight	Net (system only): 22.42 kg/ 49.43 lb
	Gross (with packing and accessories): 30.19 kg/ 66.56 lb
Sound Level	Sound pressure (LpAm): 37.8 dB(A)
Power Consumption	Sleep mode: 254.21 W
	In operation: 362.86 W
Power Supply	650 W (redundant power)
Fan	4 x 6-cm smart cooling fan (12V DC)

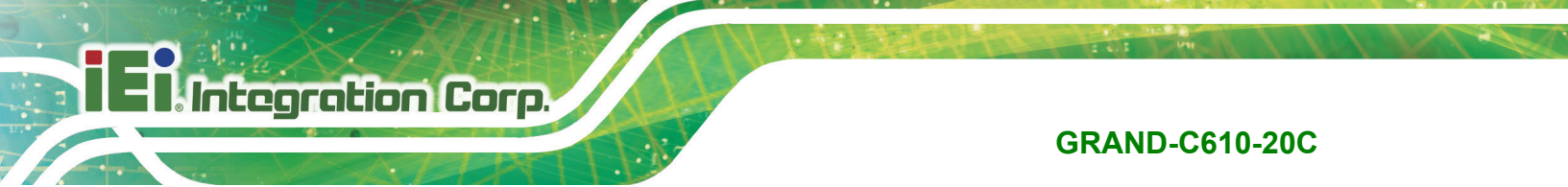
Table 1-1: Specifications



Chapter

2

Unpacking



2.2 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the GRAND-C610-20C was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The GRAND-C610-20C is shipped with the following components:












Quantity	Item	Image
1	GRAND-C610-20C storage server	
2	Ethernet cable	
2	Power cord	
1	Screw pack for 3.5" HDD installation	
1	Screw pack for 2.5" HDD installation	

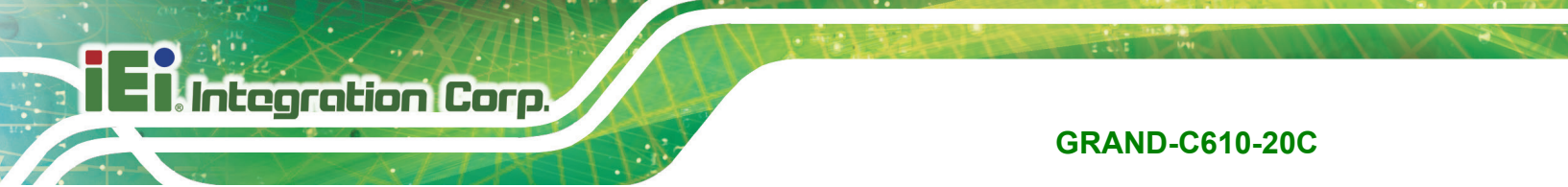
Table 2-1: Package List



GRAND-C610-20C**2.3 Optional Items**

The following are optional components which may be separately purchased:

Item and Part Number	Image
Dual-port 40GbE QSFP+ network expansion card (P/N: LAN-40G2SF-MLX)	
Dual-port 10GbE SFP+ network expansion card (P/N: LAN-10G2SF-MLX)	
Dual-port 10GBASE-T network expansion card (P/N: LAN-10G2T-X550)	
USB 3.1 Gen 2 10Gbps Type-A dual-port PCIe card (P/N: USB-U31A2P01)	
Dual-port storage expansion, SAS 12Gbps (P/N: SAS-12G2E)	
Rail kit for rackmount, maximum load 57 kg (P/N: RAIL-A03-57)	





Item and Part Number	Image
MiniSAS cable (SFF-8644 to SFF-8644), 1.0 m (P/N: CAB-SAS10M-8644)	
MiniSAS cable (SFF-8644 to SFF-8644), 0.5m (P/N: CAB-SAS05M-8644)	

Table 2-2: Optional Items



Chapter

3

Installation

3.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the maintenance of the GRAND-C610-20C may result in permanent damage to the GRAND-C610-20C and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER series motherboard and the power module. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the GRAND-C610-20C is opened and any electrical component handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the GRAND-C610-20C, place it on an anti-static pad. This reduces the possibility of ESD damaging the GRAND-C610-20C.

3.2 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual:** The user manual provides a complete description of the GRAND-C610-20C, installation instructions and configuration options.
- **DANGER! Disconnect Power:** Power to the GRAND-C610-20C must be disconnected during the installation process. Failing to disconnect the power may cause severe injury to the body and/or damage to the system.
- **Qualified Personnel:** The GRAND-C610-20C must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs

GRAND-C610-20C

may only be carried out by qualified personnel who are familiar with the associated dangers.

- **Air Circulation:** Make sure there is sufficient air circulation when installing the GRAND-C610-20C. The GRAND-C610-20C's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the GRAND-C610-20C. Leave at least 5 cm of clearance around the GRAND-C610-20C to prevent overheating.
- **Grounding:** The GRAND-C610-20C should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the GRAND-C610-20C.

3.2.1 High Surface Temperature



WARNING:

Some surfaces of the equipment may become hot during operation.

The surface temperature may be up to several tens of degrees hotter than the ambient temperature. Under these circumstances, the equipment needs to be protected against accidental contact.

The equipment is intended for installation in a RESTRICTED ACCESS LOCATION.

- Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

3.3 Installation Procedure

To properly install the GRAND-C610-20C, the following steps must be followed. Detailed descriptions of these instructions are listed in the sections that follow.

- Step 1:** Unpacking
- Step 2:** Install CPU and memory modules
- Step 3:** Install the hard disk drive (HDD)
- Step 4:** Mount the GRAND-C610-20C
- Step 5:** Connect peripheral devices
- Step 6:** Power the system up

3.4 Memory Module Installation

The GRAND-C610-20C has 16 memory slots and supports DDR4 RDIMMs and LRDIMMs operating at up to 2133 MT/s.

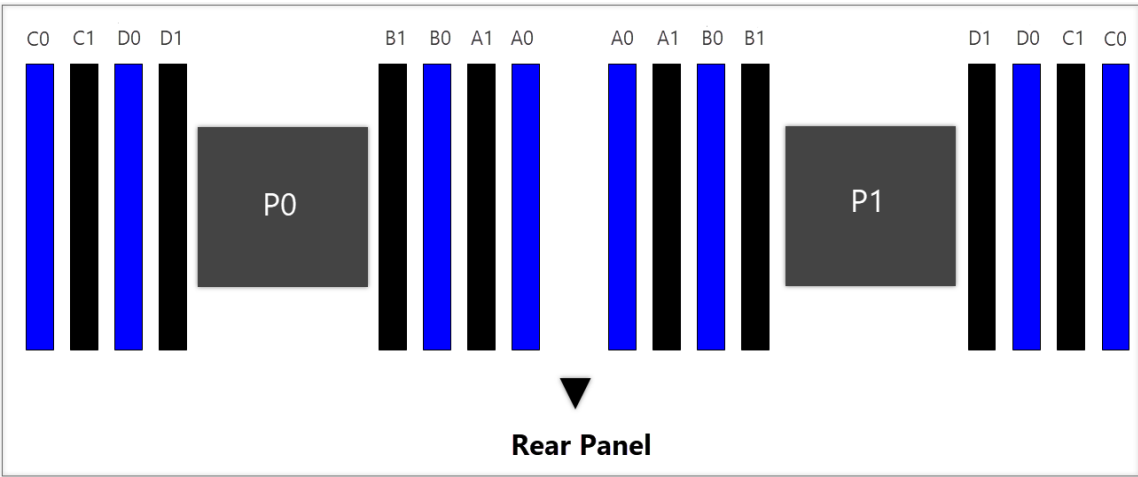


Figure 3-1: Memory Slot Locations

When installing memory modules, ensure the following:

- Using unsupported modules may degrade performance, cause errors, or prevent the operating system from starting.
- Install memory modules only if the corresponding processor is installed.

GRAND-C610-20C

- Do not mix RDIMMs and LRDIMMs.
- Blue memory slots denote the first slot of a channel (A0, B0, C0 and D0).
- Memory modules should be populated starting farthest from the processor on each channel.
- IEI recommends installing the number of memory modules dividable by 4 at the same time because each processor supports 4 channels.
- When 4 memory modules are installed, use P0-A0, P0-C0, P1-A0, and P1-C0.
- When 8 memory modules are installed, use P0-A0, P0-B0, P0-C0, P0-D0, P1-A0, P1-B0, P1-C0, and P1-D0.
- When 12 memory modules are installed, use P0-A0, P0-B0, P0-C0, P0-D0, P0-A1, P0-C1, P1-A0, P1-B0, P1-C0, P1-D0, P1-A1, and P1-C1.

To install a memory module:

Step 1: Turn off the GRAND-C610-20C. Disconnect the power adaptor, network cable(s), and any other connectors or cables from the GRAND-C610-20C.

Step 2: Put on an antistatic wrist strap to prevent electrostatic discharge. The crocodile clip should be connected to the ground.

Step 3: Loosen the 2 screws on the rear of the GRAND-C610-20C as shown below.

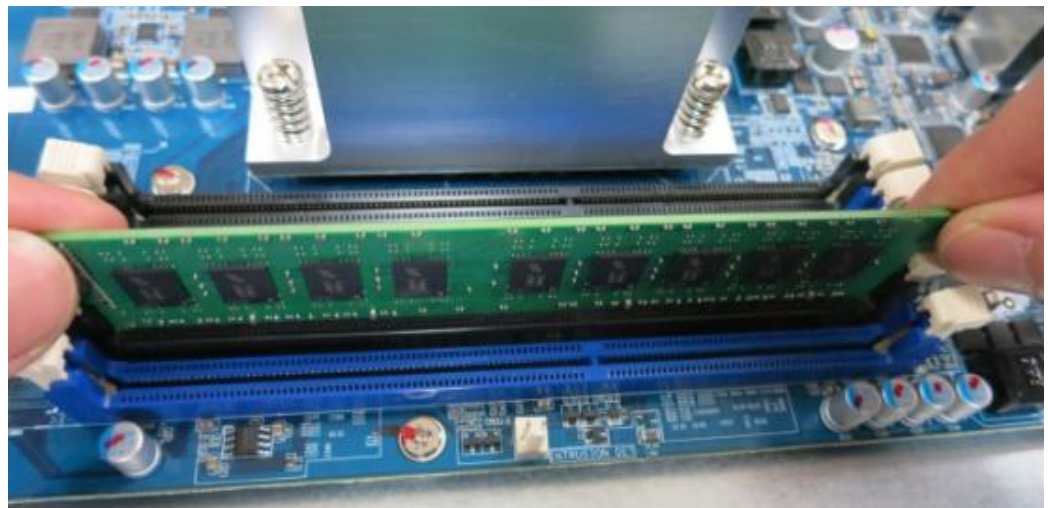


Step 4: Hold the handle and pull backwards to remove the Motherboard Drawer.



Step 5: Release the ejector clips gently by pulling them out of the sides of the RAM slot.

Step 6: Grasp the edge of the RAM module. Align the notch on the gold edge of the RAM module with the notch in the RAM slot. Insert the RAM module to the RAM slot until it cannot go any further.



GRAND-C610-20C

3.5 Network Expansion Card Installation

**WARNING!**

The following instructions should only be performed by an authorized and trained technician.

Strictly adhere to the instructions to install a network expansion card on the system. Failure to do so could result in injury to human body or death.

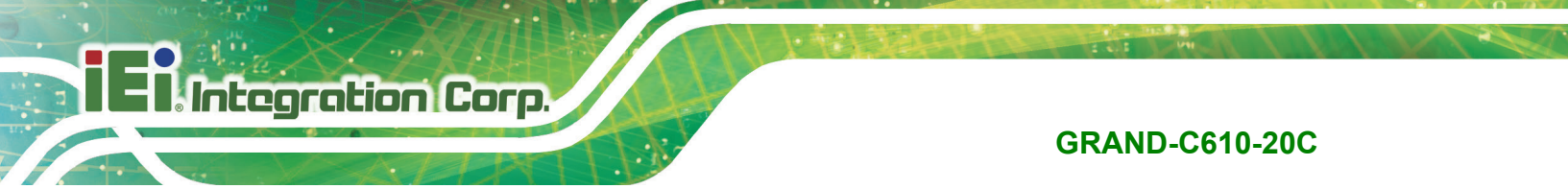
The GRAND-C610-20C provides expansion slots for network expansion. Insert an extra network expansion card (optional purchase) to the motherboard of the GRAND-C610-20C to increase the network bandwidth.

Step 1: Turn off the GRAND-C610-20C. Disconnect the power adaptor, network cable(s), and any other connectors or cables from the GRAND-C610-20C.

Step 2: Before installing the network expansion card, put on an antistatic wrist strap to prevent electrostatic discharge. The crocodile clip should be connected to the ground.

Step 3: Loosen the 2 screws on the rear of the GRAND-C610-20C as shown below.



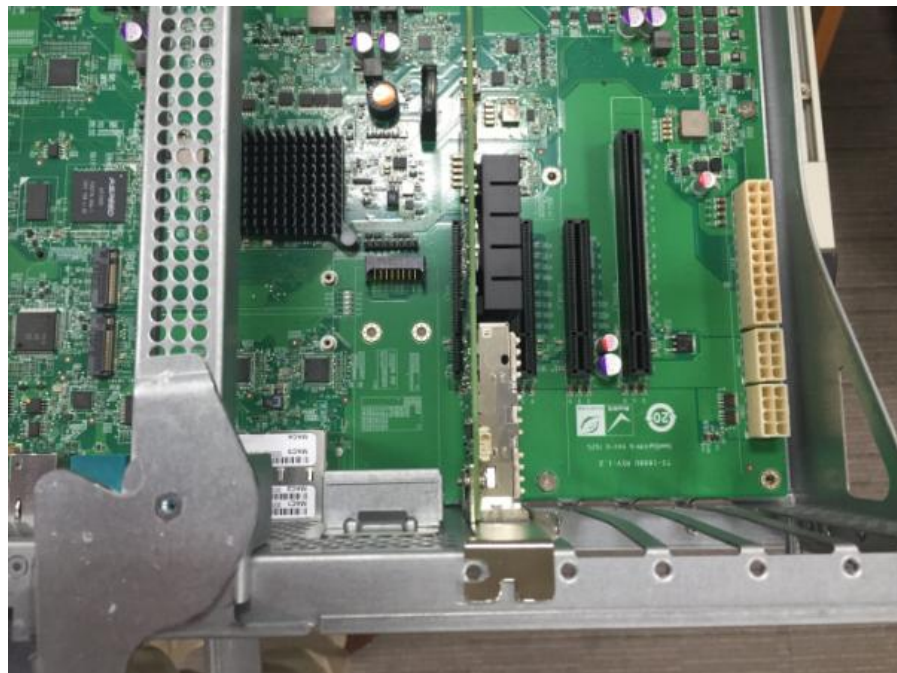


GRAND-C610-20C

Step 4: Hold the handle pulled backwards to remove the Motherboard Drawer.



Step 5: Loosen the screw and remove the expansion slot cover.



GRAND-C610-20C

- Step 6:** Insert the network expansion card to the PCIe slot until it cannot go any further.
Then fasten the screw.



- Step 7:** Push back the Motherboard Drawer. Then fasten the screw.

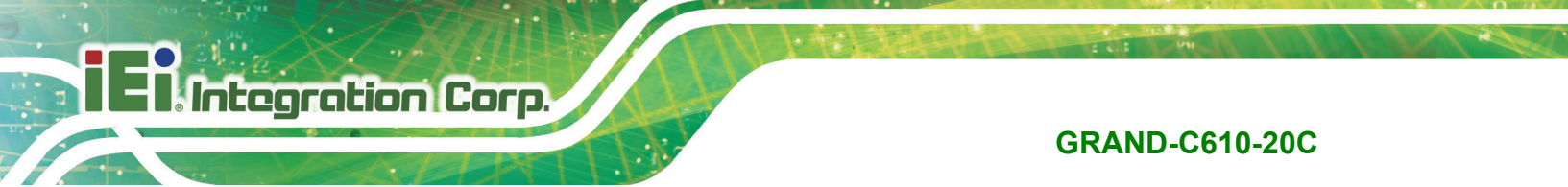
- Step 8:** Connect the power adaptor and cables to the GRAND-C610-20C.

3.6 Hard Drive Installation



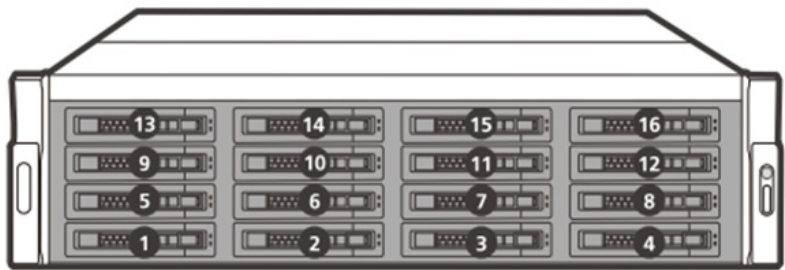
NOTE:

Before installing hard drives, ensure the disk drives (HDDs/SSDs) that you use are compatible with the GRAND-C610-20C.



3.6.1 Front Panel

The front panel of the GRAND-C610-20C has 16 drive slots for installing 2.5"/3.5" SATA HDD/SSD. To install the hard drive into the system, please follow the steps below.



Step 1: Unlock the latch and press the button to release the HDD tray as shown in **Figure 3-2**.

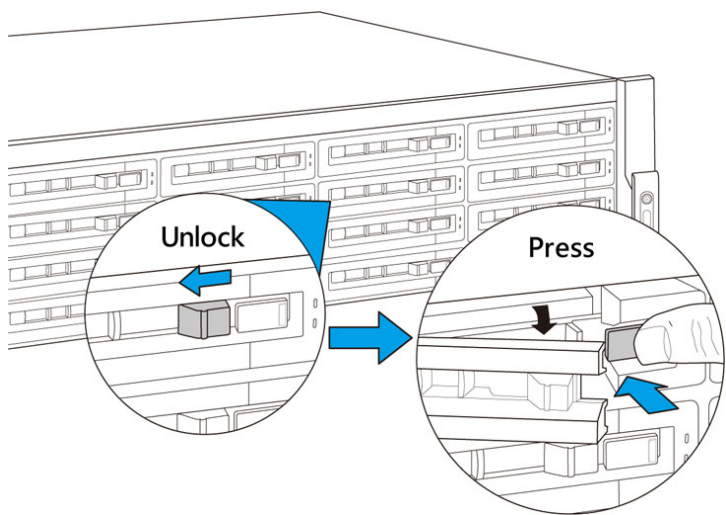


Figure 3-2: Release HDD Tray (Front Panel)

Step 2: Remove the hard drive tray (**Figure 3-3**).



GRAND-C610-20C

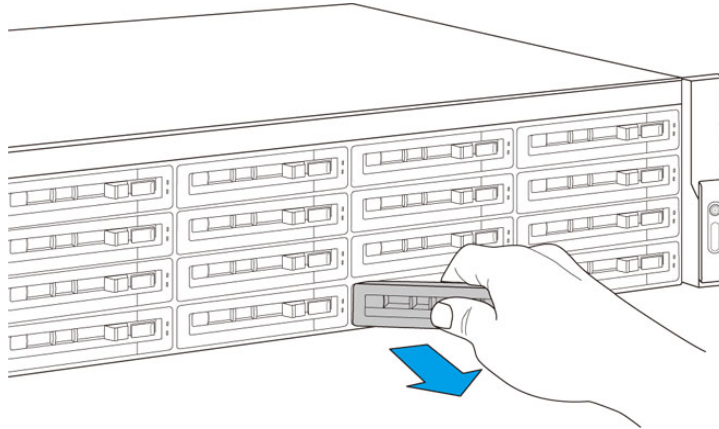


Figure 3-3: HDD Tray Removal (Front Panel)

Step 3: Attach the drive to the tray and secure the four screws in the bottom/sides of the drive tray (**Figure 3-4**).

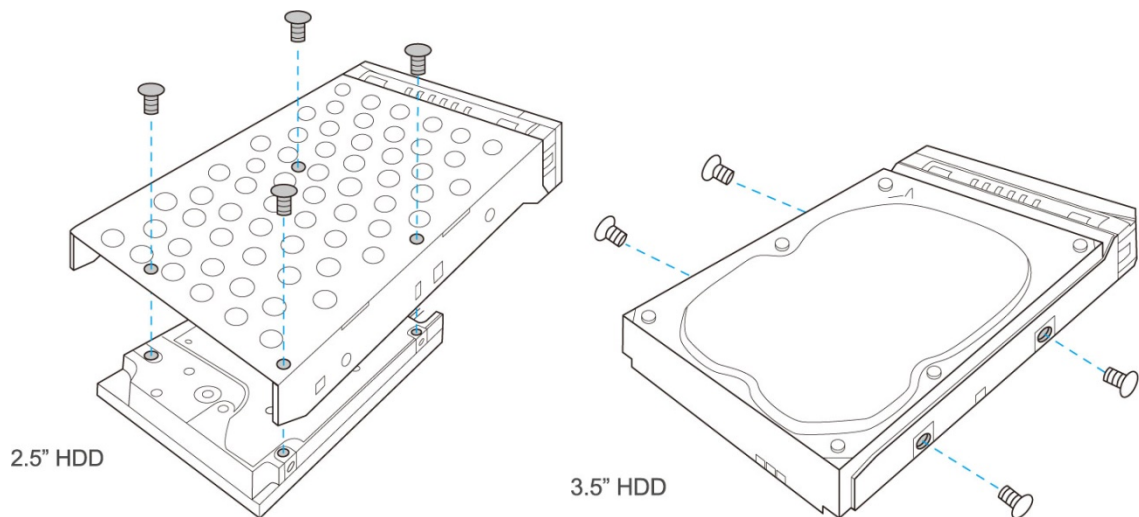


Figure 3-4: HDD Tray Installation

Step 4: Insert the drive tray into the GRAND-C610-20C all the way to the end. Slide the latch to secure the drive tray. See **Figure 3-5**.

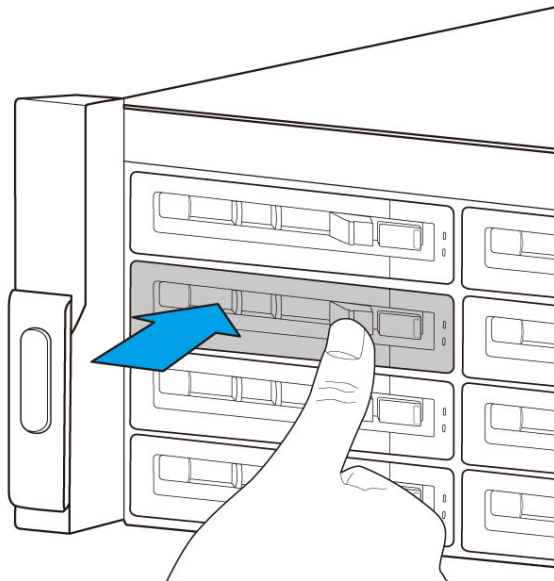


Figure 3-5: HDD Installation (Front Panel)

Step 5: Repeat **Step 1** to **Step 4** to install the remaining drives. Please follow the HDD Sequence shown above.

3.6.2 Rear Panel

The rear panel of the GRAND-C610-20C has 4 drive slots for installing 2.5" SATA SSD. To install the hard drive into the system, please follow the steps below.

Step 1: Unlock the latch to release the drive tray as shown in **Figure 3-6**.

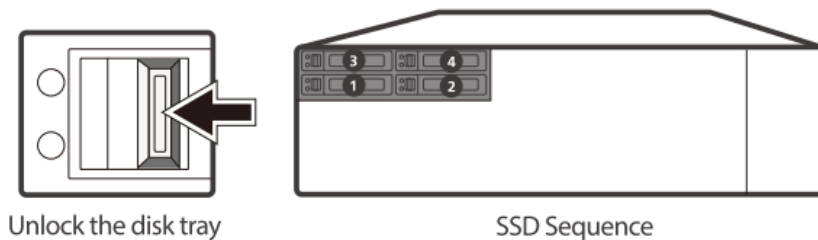


Figure 3-6: Release Drive Tray (Rear Panel)

Step 2: Pull to remove the drive tray.

GRAND-C610-20C

Step 3: Attach the drive to the tray and secure the four screws in the both sides of the drive tray (**Figure 3-7**).

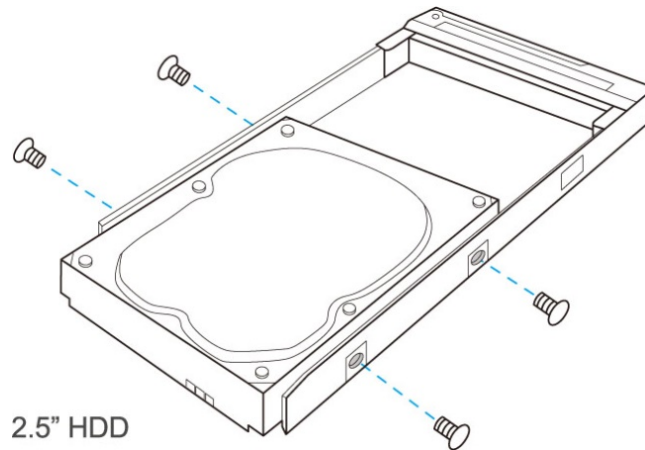


Figure 3-7: Drive Tray Installation

Step 4: Insert the drive tray into the GRAND-C610-20C all the way to the end. Slide the latch to secure the drive tray. See **Figure 3-8**.

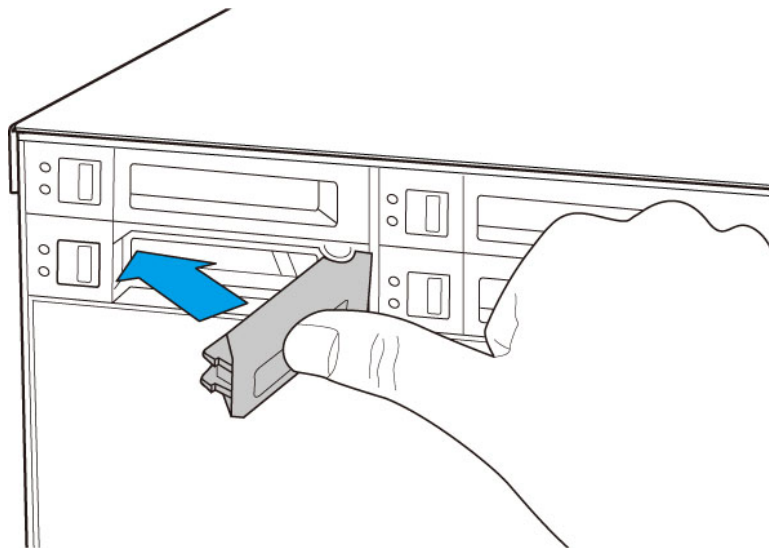


Figure 3-8: HDD Installation (Rear Panel)

Step 5: Repeat **Step 1** to **Step 4** to install the remaining drives. Please follow the HDD Sequence shown **Figure 3-6**.



WARNING:

Users are strongly recommended to turn OFF the GRAND-C610-20C before replacing the hard drive to reduce the risk of electric shock.



CAUTION:

IEI disclaims any responsibility for product damage/malfunction or data loss/recovery due to misuse or improper installation of hard disks in any occasions for any reasons.



CAUTION:

The following items are not recommended for use with this product:

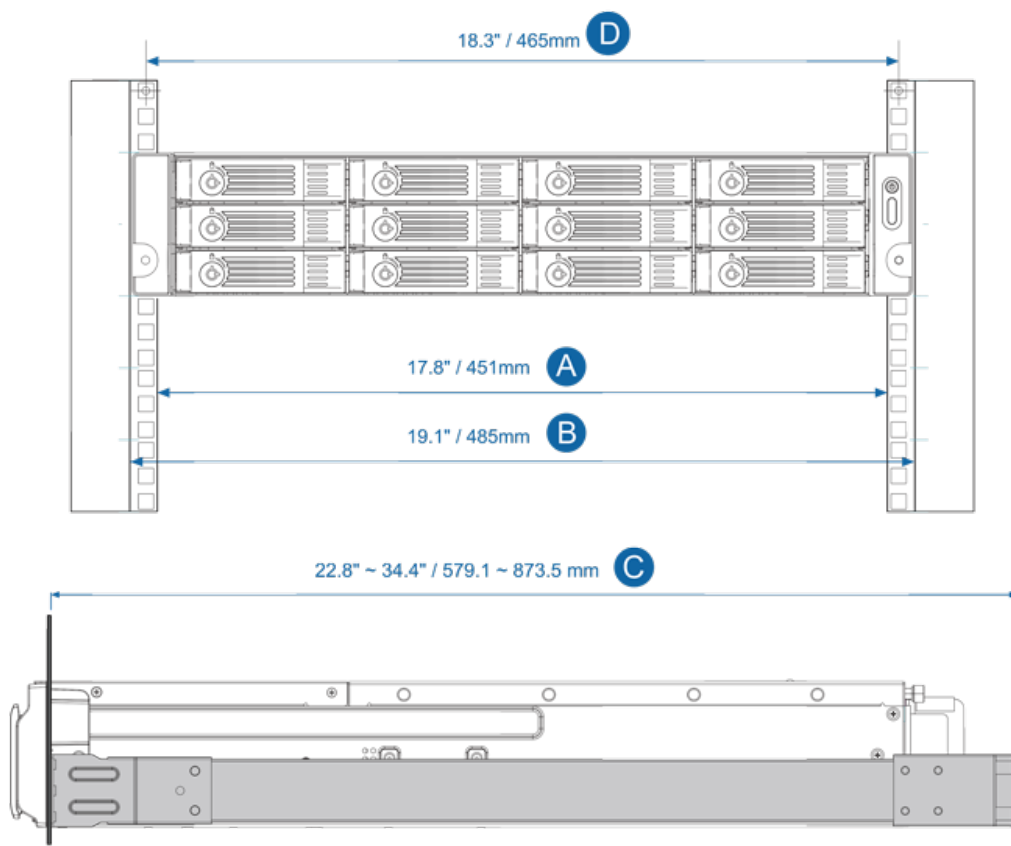
Brand	Model	Rank / Family	Type	HDD Firmware	Capacity
Seagate	ST5000A S0002	Archive HDD	SATA 6Gb/s		5000
Seagate	ST6000A S0002	Archive HDD	SATA 6Gb/s		6000
Seagate	ST8000A S0002	Archive HDD	SATA 6Gb/s		8000
HGST	HUH7210 08AL5200	Enterprise Drives	NL-SAS 12Gb/s	A21D	8000
HGST	HUH7210 10AL5200	Enterprise Drives	NL-SAS 12Gb/s	A21D	10000

GRAND-C610-20C**3.7 Mounting the System**

The GRAND-C610-20C complies with ANSI/EIA-RS-310-D rack mounting standards. Before purchasing the server racks, please make sure the server racks conform to the following criteria:

Rack size

- Mounting post width : $\geq 451\text{mm}$
- Panel width : $\geq 485\text{mm}$
- Mounting post depth : $579.1\text{mm} \sim 873.5\text{mm}$
- The distance between two rack posts is 465mm (center-to-center measurement of the rack's square holes)



The optional rack kits for the GRAND-C610-20C are only compatible with square-hole server racks.



3.8 Power-On Procedure

3.8.1 Installation Checklist



WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

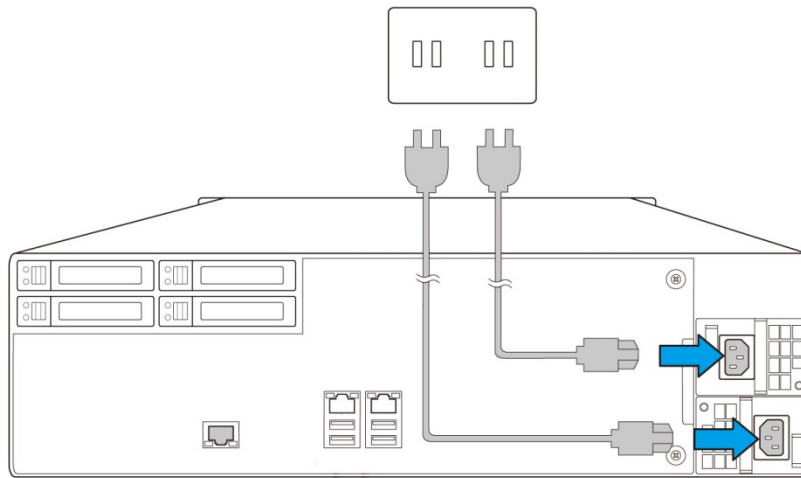
To power on the GRAND-C610-20C, please make sure of the following:

- The HDD/SSD is installed
- The LAN cable is connected
- The power cables are plugged in
- The system is securely mounted

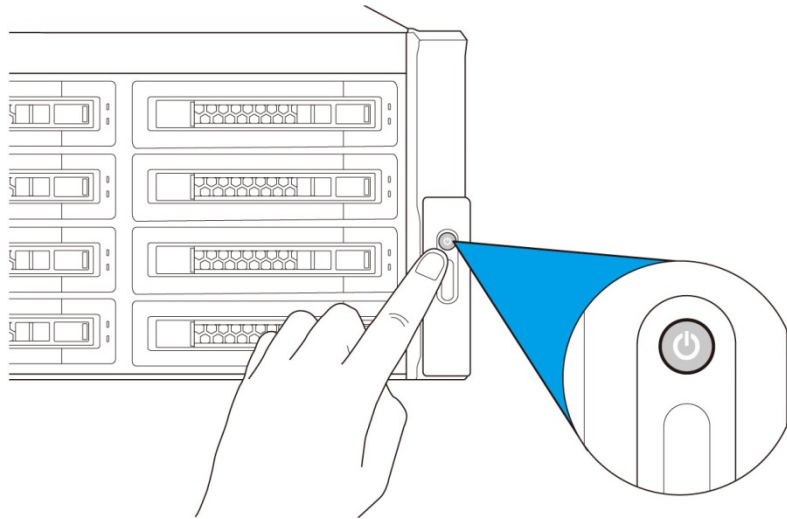
3.8.2 Power-on Procedure

To power-on the GRAND-C610-20C please follow the steps below:

Step 1: Connect the power source to the power input jacks.

GRAND-C610-20C**Figure 3-9: Power Connection**

Step 2: Push the power button (Figure 3-10).

**Figure 3-10: Power Button**

Step 3: To turn off the GRAND-C610-20C, press the power button for 1.5 seconds.

To force turn off, press the power button for 5 seconds.

Chapter

4

Maintenance

GRAND-C610-20C



WARNING:

The following instructions should only be performed by an authorized and trained technician.

Before starting, please ensure that you turn off the GRAND-C610-20C, disconnect the power adaptor, network cable(s), and also remove any other device/cable that is attached to the server.

Take Anti-Static precautions whenever maintenance is being carried out on the system components. Failure to take anti-static precautions can cause permanent system damage. For more details on anti-static precautions, please refer to **Section 3.1**.

4.1 Component Replacement Procedure



WARNING!

Users are not advised to attempt to repair or replace any internal or external components of the GRAND-C610-20C storage server other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the GRAND-C610-20C from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@ieiworld.com.

The industrial server components listed below can all be replaced if they fail:

- SO-DIMM module (see **Section 3.4**)
- Hard disk drive (see **Section 3.6**)
- Power supply unit
- Fan module

4.2 Power Supply Unit Replacement

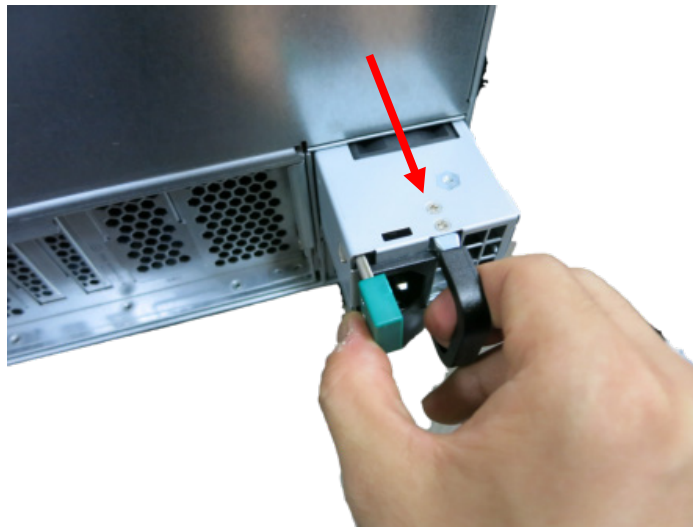
To replace a failed power supply unit, please follow the steps below.

Step 1: Turn off the GRAND-C610-20C. Disconnect the power adaptor, network cable(s), and any other connectors or cables from the GRAND-C610-20C.

Step 2: Hold the black handler and press and hold the green button firmly.

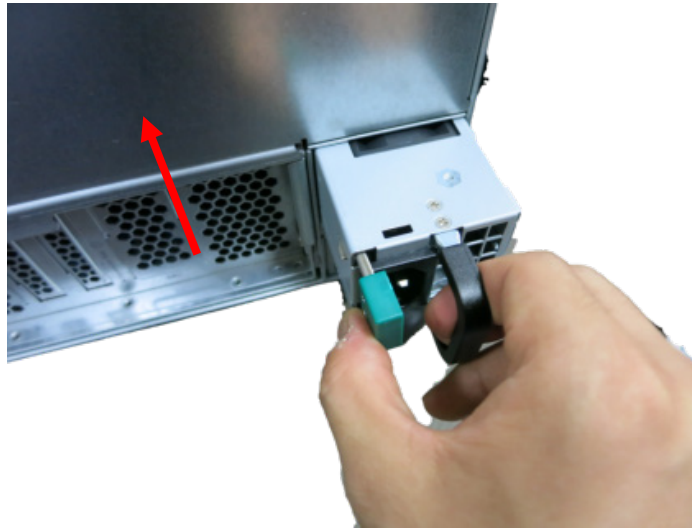


Step 3: Unplug the failed power supply.



GRAND-C610-20C

Step 4: Plug in a new power supply to the GRAND-C610-20C.



Step 5: Turn on the GRAND-C610-20C.

Step 6: Connect the power adaptor and cables to the GRAND-C610-20C.

4.3 Fan Module Replacement

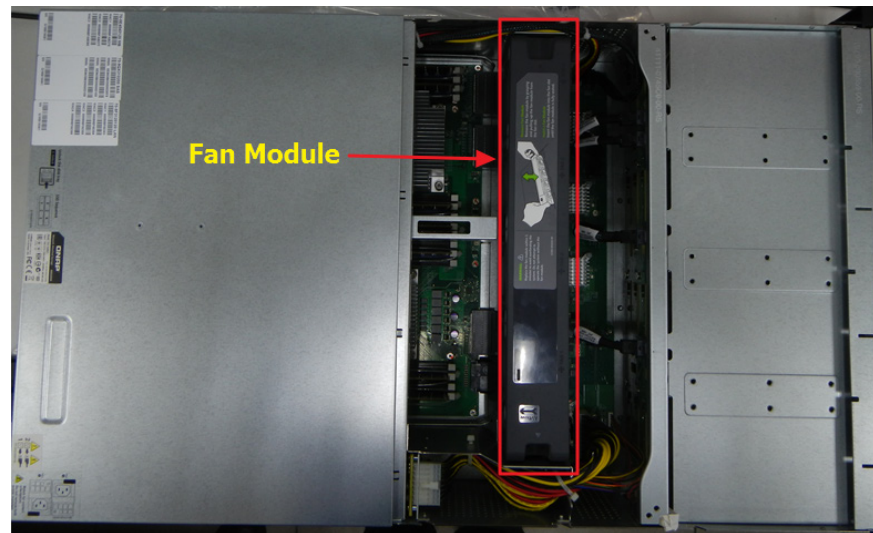


WARNING!

Replace the fan module within 3 minutes to avoid overheating the system. Do not attempt to operate the system without the fan module.

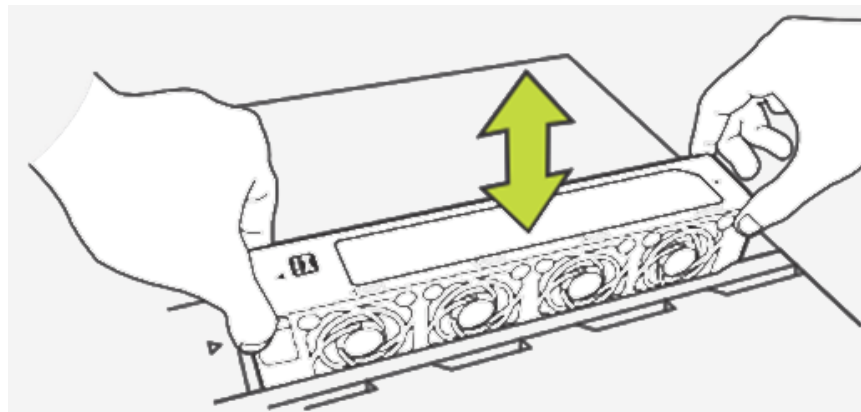
To replace a failed fan module, please follow the steps below.

Step 1: Locate the fan module by removing the bottom cover.



Step 2: Remove the fan module by grasping and pulling up the fan module from the fan slot.

Step 3: Insert the fan module into the fan slot until the fan module is fully seated.



Chapter

5

Interface Connectors

5.1 Peripheral Interface Connectors

The GRAND-C610-20C system motherboard comes with a number of peripheral interface connectors. The connector locations are shown in **Figure 5-1**. The connector pinouts for these connectors are listed in the following sections.

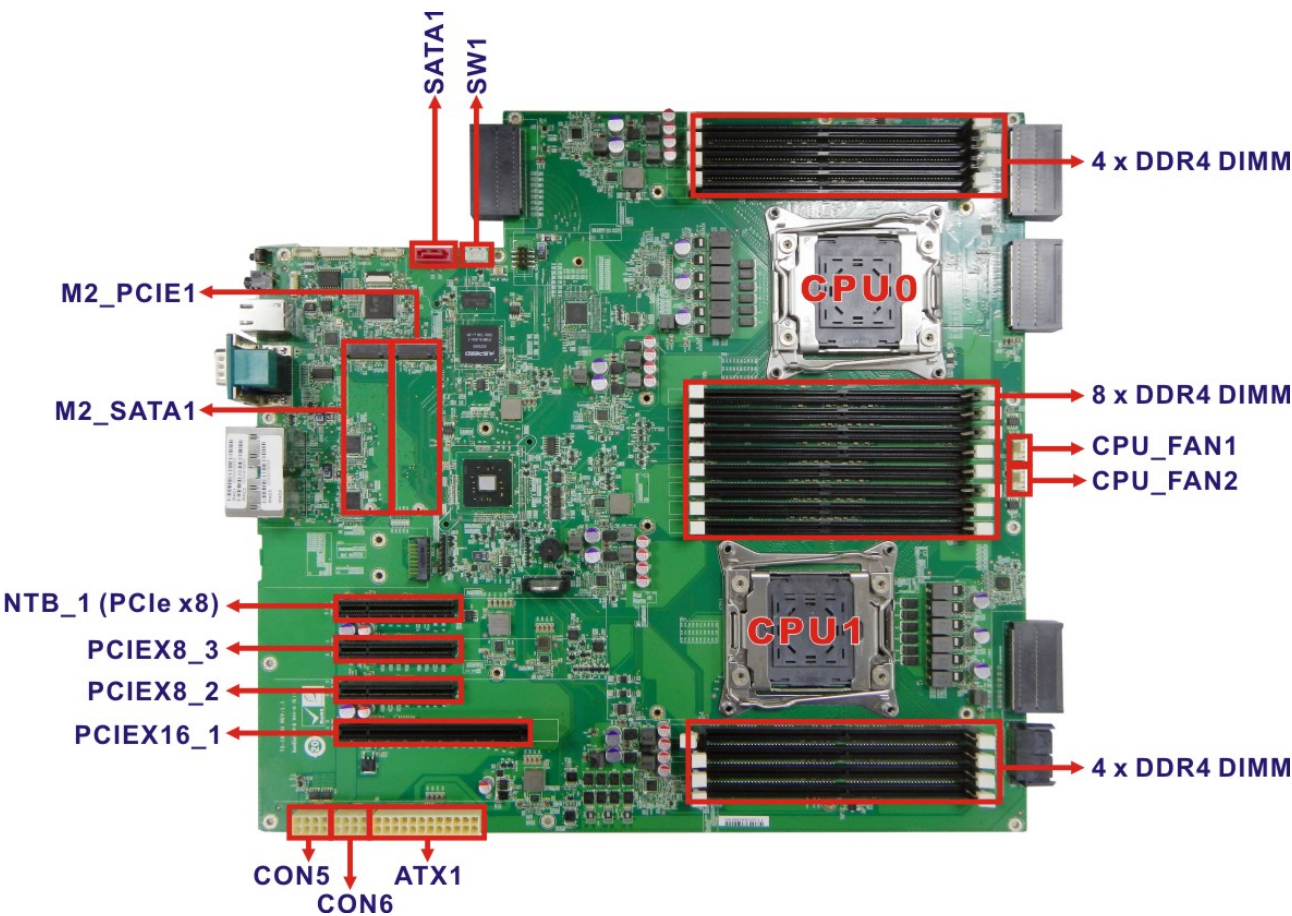


Figure 5-1: Jumper and Connector Locations

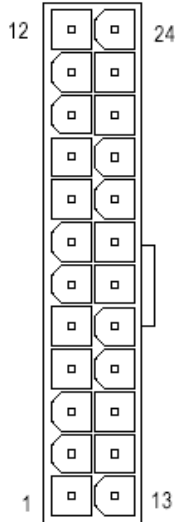
5.1.1 Fan Connector (CPU_FAN1 / CPU_FAN2)

PIN NO.	DESCRIPTION	
1	GND	
2	+12V	
3	FANIO	
4	PWM	

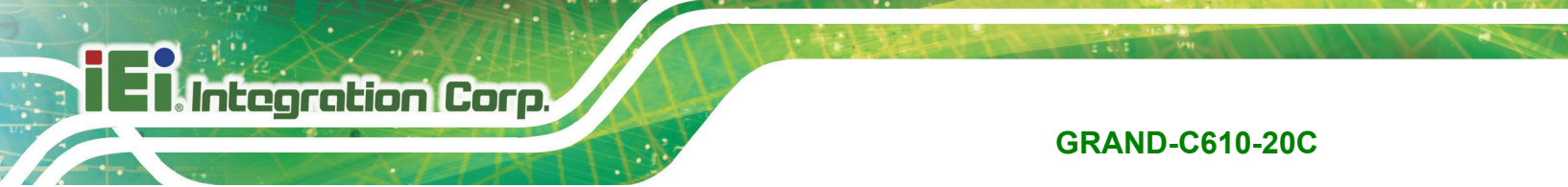
Table 5-1: Fan Connector (CPU_FAN1 / CPU_FAN2) Pinouts

GRAND-C610-20C**5.1.2 ATX Power Connector (ATX1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	N/C	13	N/C
2	N/C	14	N/C
3	GND	15	GND
4	N/C	16	PS_ON
5	GND	17	GND
6	N/C	18	GND
7	GND	19	GND
8	N/C	20	N/C
9	5VSB	21	N/C
10	+12V	22	N/C
11	+12V	23	N/C
12	N/C	24	GND


Table 5-2: ATX Power Connector (ATX1) Pinouts**5.1.3 M.2 PCIe Card Slot (M2_PCIE1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	3.3V
3	GND	4	3.3V
5	PETn3	6	N/C
7	PETp3	8	N/C
9	GND	10	DAS/DSS#(O)(OD)
11	PERn3	12	3.3V
13	PERp3	14	3.3V
15	GND	16	3.3V
17	PETn2	18	3.3V
19	PETp2	20	N/C
21	GND	22	N/C
23	PERn2	24	N/C



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
25	PERp2	26	N/C
27	GND	28	N/C
29	PETn1	30	N/C
31	PETp1	32	N/C
33	GND	34	N/C
35	PERn1	36	N/C
37	PERp1	38	DEVSLP(I)(0/3.3V)
39	GND	40	N/C
41	PETn0	42	N/C
43	PETp0	44	N/C
45	GND	46	N/C
47	PERn0	48	N/C
49	PERp0	50	PERST#(I)(0/3.3V)
51	GND	52	CLKREQ#(I/O)(0/3.3V)
53	REFCLKN	54	PEWake#(IO)(0/3.3V)
55	REFCLKP	56	Reserved/MFG Data
57	GND	58	Reserved/MFG Clock
59	Module Key	60	Module Key
61	Module Key	62	Module Key
63	Module Key	64	Module Key
65	Module Key	66	Module Key
67	N/C	68	SUSCLK(32kHz) (I)(0/3.3V)
69	PEDET(NC-PCIe)	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

Table 5-3: M.2 PCIe Card Slot (M2_PCIE1) Pinouts



GRAND-C610-20C**5.1.4 M.2 SATA Card Slot (M2_SATA1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	3.3V
3	GND	4	3.3V
5	N/C	6	N/C
7	N/C	8	N/C
9	GND	10	DAS/DSS#(O)(OD)
11	N/C	12	3.3V
13	N/C	14	3.3V
15	GND	16	3.3V
17	N/C	18	3.3V
19	N/C	20	N/C
21	GND	22	N/C
23	N/C	24	N/C
25	N/C	26	N/C
27	GND	28	N/C
29	N/C	30	N/C
31	N/C	32	N/C
33	GND	34	N/C
35	N/C	36	N/C
37	N/C	38	DEVSLP(I)(0/3.3V)
39	GND	40	N/C
41	SATA-B+	42	N/C
43	SATA-B-	44	N/C
45	GND	46	N/C
47	SATA-A-	48	N/C
49	SATA-A+	50	N/C
51	GND	52	N/C
53	N/C	54	N/C
55	N/C	56	Reserved/MFG Data
57	GND	58	Reserved/MFG Clock
59	Module Key	60	Module Key

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
61	Module Key	62	Module Key
63	Module Key	64	Module Key
65	Module Key	66	Module Key
67	N/C	68	SUSCLK(32kHz) (I)(0/3.3V)
69	PEDET(GND-SATA)	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

Table 5-4: M.2 SATA Card Slot (M2_SATA1) Pinouts

5.1.5 SATA Connector (SATA1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA_TX+
3	SATA_TX-	7	SATA2_DOM_5V
4	GND	8	N/C

Table 5-5: SATA Connector (SATA1) Pinouts

5.1.6 PCIe Power Connector (CON5 / CON6)

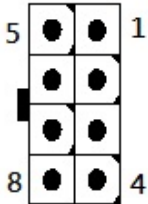
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	GND	5	+12V_PCIE	
2	GND	6	+12V_PCIE	
3	GND	7	+12V_PCIE	
4	GND	8	+12V_PCIE	

Table 5-6: PCIe Power Connector (CON5 / CON6) Pinouts

GRAND-C610-20C

5.1.7 Power and Reset Button Connector (SW1)

PIN NO.	DESCRIPTION
1	Power switch
2	GND
3	Reset switch

Table 5-7: Power and Reset Button Connector (SW1) Pinouts

5.2 External Interface Panel Connectors

The table below lists the rear panel connectors on the motherboard. Pinouts of these connectors can be found in the following sections.

5.2.1 Ethernet and USB 3.0 Combo Connectors

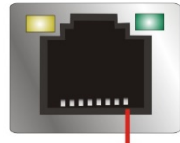
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	MDI0+	5	MDI2+	
2	MDI0-	6	MDI2-	
3	MDI1+	7	MDI3+	
4	MDI1-	8	MDI3-	

Table 5-8: Ethernet Connector Pinouts

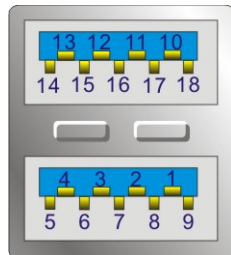
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	+5V	10	+5V	
2	USB2P0_DM0	11	USB2P0_DM1	
3	USB2P0_DP0	12	USB2P0_DP1	
4	GND	13	GND	
5	USB3P0_RXDN0	14	USB3P0_RXDN1	
6	USB3P0_RXDP0	15	USB3P0_RXDP1	
7	GND	16	GND	
8	USB3P0_TXDN0	17	USB3P0_TXDN1	
9	USB3P0_TXDP0	18	USB3P0_TXDP1	

Table 5-9: USB 3.0 Connector Pinouts

5.2.2 IPMI LAN Port Connector

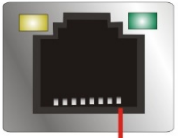
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	<div> <div> <div>ACT/LINK LED</div> <div>SPEED LED</div> </div>  <div>Pin 1</div> </div>
1	LAN3_MDI0+	5	LAN3_MDI2+	
2	LAN3_MDI0-	6	LAN3_MDI2-	
3	LAN3_MDI1+	7	LAN3_MDI3+	
4	LAN3_MDI1-	8	LAN3_MDI3-	

Table 5-10: IPMI LAN Port Connector Pinouts

5.2.3 IPMI VGA Connector

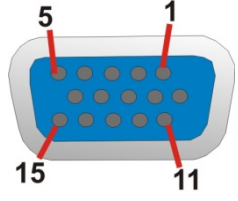
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	Red	2	Green	
3	Blue	4	NC	
5	GND	6	GND	
7	GND	8	GND	
9	VGAVCC	10	GND	
11	NC	12	DDCDA	
13	HSYNC	14	VSYNC	
15	DDCCLK			

Table 5-11: IPMI VGA Connector Pinouts

5.2.4 IPMI Console DB-9 Connector

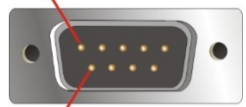
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	DCD	6	DSR	
2	RXD	7	RST	
3	TXD	8	CTS	
4	DTR	9	RI	
5	GND			

Table 5-12: IPMI Console DB-9 Connector Pinouts

GRAND-C610-20C

5.2.5 Audio Jack

The 2-section TRRS connector supports mic-in and line-out connection.



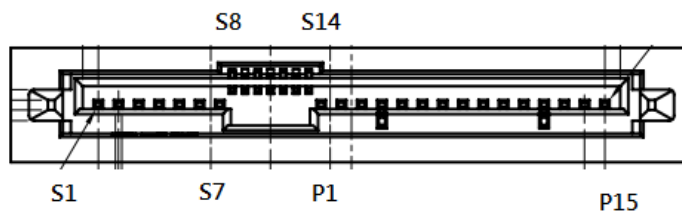
Table 5-13: Audio Jack

5.2.6 EC GPIO

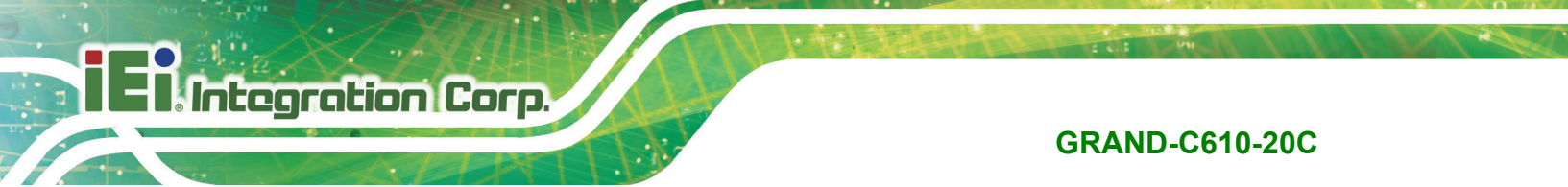
PIN NO.	DESCRIPTION
1	GND
2	EC KSO16/SMOSI/GPC3
3	GND
4	GND

Table 5-14: EC GPIO Pinouts

5.2.7 SAS Connector



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
S1	GND	P1	NC
S2	BP_SAS_TX_P	P2	NC
S3	BP_SAS_TX_N	P3	BP_HDD1_PWR_EN
S4	GND	P4	GND
S5	BP_SAS_RX_N	P5	GND
S6	BP_SAS_RX_P	P6	GND



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
S7	GND	P7	+5V_HDD
S8	GND	P8	+5V_HDD
S9	NC	P9	+5V_HDD
S10	NC	P10	GND
S11	GND	P11	HDD1_LED_ACT#
S12	NC	P12	GND
S13	NC	P13	+12V_PS
S14	GND	P14	+12V_PS
		P15	+12V_PS

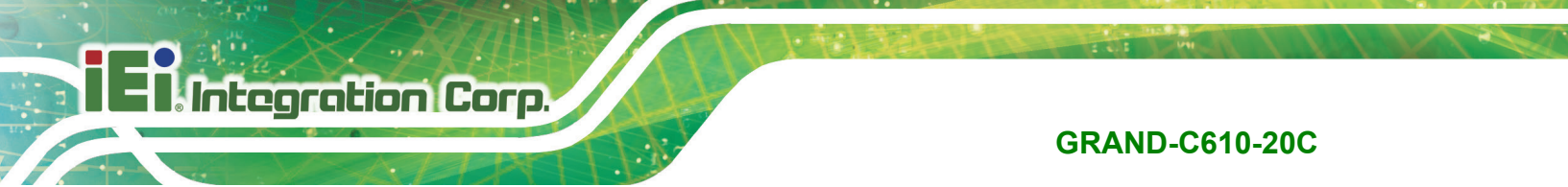
Table 5-15: SAS Connector Pinouts



Appendix

A

Regulatory Compliance



DECLARATION OF CONFORMITY



This equipment is in conformity with the following EU directives:

- EMC Directive 2004/108/EC
- Low-Voltage Directive 2006/95/EC
- RoHS II Directive 2011/65/EU

If the user modifies and/or install other devices in the equipment, the CE conformity declaration may no longer apply.

If this equipment has telecommunications functionality, it also complies with the requirements of the R&TTE Directive 1999/5/EC.

English

IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Български [Bulgarian]

IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложими правила на Директива 1999/5/EC.

Česky [Czech]

IEI Integration Corp tímto prohlašuje, že tento zařzení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.

Dansk [Danish]

IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Deutsch [German]

IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.

Eesti [Estonian]

IEI Integration Corp deklareerib seadme vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

GRAND-C610-20C

Español [Spanish]

IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Ελληνική [Greek]

IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.

Français [French]

IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Italiano [Italian]

IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Latviski [Latvian]

IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 1999/5/EK.

Lietuvių [Lithuanian]

IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

Nederlands [Dutch]

IEI Integration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

Malti [Maltese]

IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Direttiva 1999/5/EC.

Magyar [Hungarian]

IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

Polski [Polish]

IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.

Português [Portuguese]

IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

Româna [Romanian]

IEI Integration Corp declară că acest echipament este în conformitate cu cerințele esențiale și cu celelalte prevederi relevante ale Directivei 1999/5/CE.

Slovensko [Slovenian]

IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.

Slovensky [Slovak]

IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.

Suomi [Finnish]

IEI Integration Corp vakuuttaa täten että I-työteet on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Svenska [Swedish]

IEI Integration Corp förklarar att denna utrustningstyp står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

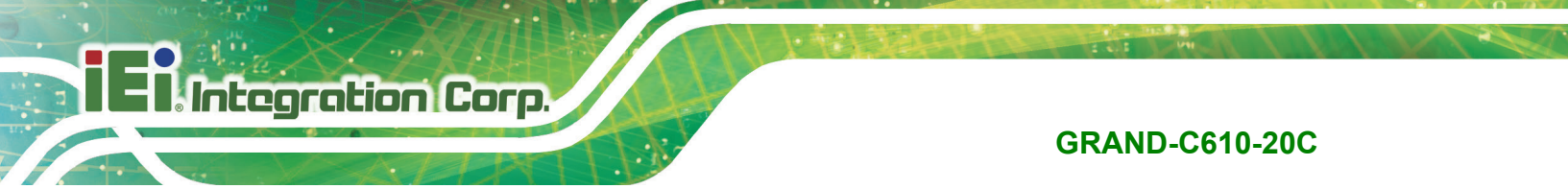
- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Federal Communication Commission Interference Statement

This equipment has been assembled with components that comply with the limits for a Class B 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. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may 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 of the following measures:

- 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.



Appendix

B

Safety Precautions



GRAND-C610-20C



WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the GRAND-C610-20C.

B.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

B.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the GRAND-C610-20C is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the GRAND-C610-20C is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range.*** Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the GRAND-C610-20C chassis is opened when the GRAND-C610-20C is running.
- ***If considerable amounts of dust, water, or fluids enter the GRAND-C610-20C,*** turn off the power supply immediately, unplug the power cord, and contact the GRAND-C610-20C vendor.
- **DO NOT:**
 - Drop the GRAND-C610-20C against a hard surface.
 - In a site where the ambient temperature exceeds the rated temperature

B.1.2 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the GRAND-C610-20C may result in permanent damage to the GRAND-C610-20C and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the GRAND-C610-20C. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the GRAND-C610-20C is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding:*** Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component:*** When handling the electrical component, hold the electrical component by its edges.

GRAND-C610-20C

B.1.3 Product Disposal

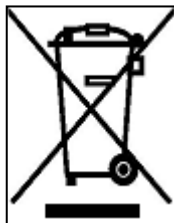


CAUTION:

Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the GRAND-C610-20C, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the GRAND-C610-20C, please read the details below.

- The interior of the GRAND-C610-20C does not require cleaning. Keep fluids away from the GRAND-C610-20C interior.
- Be cautious of all small removable components when vacuuming the GRAND-C610-20C.
- Turn the GRAND-C610-20C off before cleaning the GRAND-C610-20C.
- Never drop any objects or liquids through the openings of the GRAND-C610-20C.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the GRAND-C610-20C.
- Avoid eating, drinking and smoking within vicinity of the GRAND-C610-20C.

B.2.2 Cleaning Tools

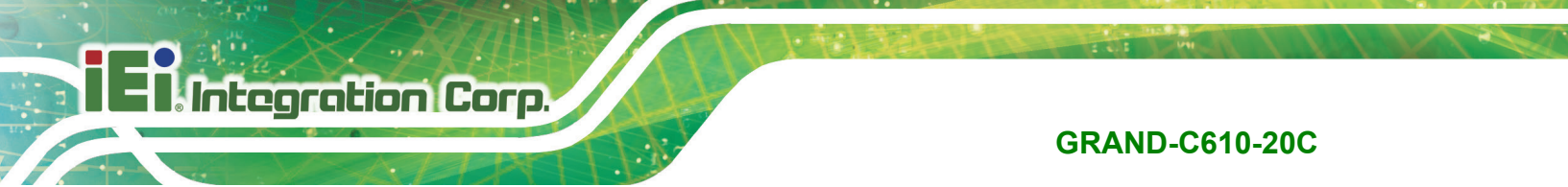
Some components in the GRAND-C610-20C may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the GRAND-C610-20C.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the GRAND-C610-20C.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the GRAND-C610-20C.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the GRAND-C610-20C as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the GRAND-C610-20C. Dust and dirt can restrict the airflow in the GRAND-C610-20C and cause its circuitry to corrode.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

C

Hazardous Materials Disclosure



The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O
O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).						
X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).						



GRAND-C610-20C

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
<p>O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。</p>						