GeoVision inc
The Vision of Security

Quick Start Guide

GV-Storage System V3 (Rev. B)

The Vision of Security

Thank you for purchasing GV-Storage System V3 (Rev. B). This guide is designed to assist new users in getting immediate results from the GV-Storage System V3 (Rev. B).

SR3V10-QG-C

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Contents

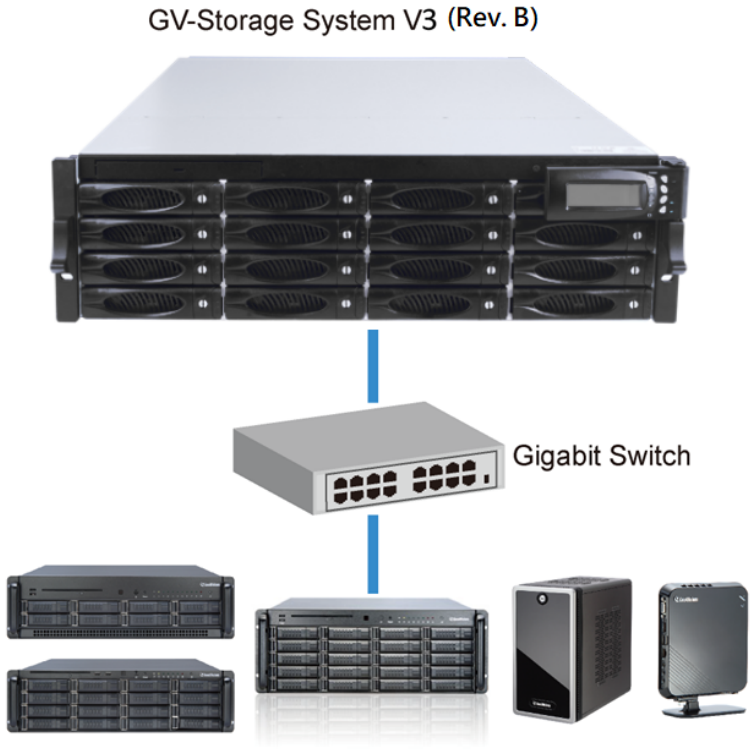
1. Introduction

This quick start guide is designed to assist first-time users in getting immediate results from the GV-Storage System V3 (Rev. B). For advanced information on how to use the GV-Storage System V3 (Rev. B), please refer to *GV-Storage System V3 (Rev. B) User's Manual*.

Prior to using GV-Storage System V3 (Rev. B) and GV-Expansion System V3, make sure you have thoroughly read the usage notice to avoid serious, irreversible damages to the system. See *1.7 Usage Notice*.

1.1 Compatible GeoVision Products

GV-Storage System V3 (Rev. B) can work in conjunction with GeoVision products listed below:



- GV-Hot Swap System V5 Series
- GV-NVR System Lite V2
- GV-Tower / DVR / NVR / VMS System
- GV-DVR / NVR / VMS / Recording Server / Backup Center / Redundant Server / Failover Server

1.2 Storage and Expansion Capabilities

GV-Storage System V3 (Rev. B) comes with 16 HDD bays for readily-available storage and is expandable to a maximum of 256 HDDs by connecting up to 4 GV-Expansion Systems V3, which is available in three different models:

- GV-Expansion V3 16 Bays
- GV-Expansion V3 24 Bays
- GV-Expansion V3 64 Bays

1.3 Packing List

- GV-Storage System V3 (Rev. B)
- Power Cord x 2
- Ethernet LAN Cable x 6
- RS-232 Cable (For UPS, phone jack to DB9 male)
- Rail Kit
- Screws (packet)
- PSFM Blanking Plate
- Download Guide

1.4 Before You Begin

Before starting, note the following items:

- A management computer with a Gigabit Ethernet network interface card (recommended) on the same network as the GV-Storage System V3 (Rev. B).
- Ethernet LAN network cables for connection (supplied):
  - CAT 5e or CAT6 network cables (recommended) for six iSCSI data (LAN) ports
  - Mini-SAS cables for connecting to GV-Expansion System V3
- A Gigabit Layer 2 or Layer 3 managed stackable switch.
- RAID building after starting to maintain system configurations (for example RAID 5 for enhanced storage safety and system performance).
- CHAP security information, including CHAP username and secret (optional).
- Prepare a storage system configuration plan by the network administrator. The plan should include network information for the six iSCSI data (LAN) ports. If using static IP addresses, please prepare a list including the IP addresses, subnet mask and default gateway.
- If you are in an area with unstable voltage, make sure to install an automatic voltage regulator (AVR) or a UPS power supply with AVR function, to maintain a constant voltage.
- All damages to the power supply caused by unstable voltage are not included in the 2-year warranty service.

1.5 Usage Notice

Please pay attention to the following notice when you use the storage system.

- **Recommended Hard Drive**

For system efficiency, we recommend the following enterprise level hard disk drives. Avoid using desktop level or green HDD which may affect system efficiency.

- Seagate Enterprise series
- WD Gold Level series
- HGST Ultrastar series

- **Before Powering On and Off**

If GV-Storage System V3 (Rev. B) is connected to GV-Expansion System(s) V3, you **MUST** turn on the GV-Expansion System(s) V3 **FIRST** and the GV-Storage System V3 (Rev. B) **LAST**.

IMPORTANT: Make sure each of the GV-Expansion System V3 is fully booted (takes about 1 ~ 2 mins) prior to turning on the next GV-Expansion System V3 or at last the GV-Storage System V3 (Rev. B) (takes about 3 mins) to avoid possible serious, irreversible damage to the system.

The model name and IP address of GV-Expansion System V3 and GV-Storage System V3 (Rev. B) will be displayed on their LCD panels, respectively, once they are fully loaded.

For example, if you have 1 x GV-Storage System V3 (Rev. B) and 4 x GV-Expansion Systems V3, make sure to turn on the **GV-Expansion System V3 1 ~ 4 first**. And then turn on the **GV-Storage System V3 (Rev. B) last** *only after the model names and IP addresses of the GV-Expansion Systems V3 are being displayed on their LCD panels*.

Note: To connect GV-Storage System V3 (Rev. B) to GV-Expansion System(s) V3, see *1.7 Connecting to Expansion Systems*.

For powering off, be sure to shut down GV-Storage System V3 (Rev. B) first and then the connected GV-Expansion System V3.

- **Default Settings**

Name		Default
ID		admin
Password	LCD Panel	00000000
	Web Interface	00000000
IP		192.168.0.199
HTTP/HTTPS		80
Subnet Mask		255.255.255.0
LAN Port*6	LAN0	192.168.0.199
	LAN1	Closed by default and can be activated as DHCP-enabled or by assigning static IP addresses. For details, see *3.4.2 Network*, in *GV-Storage V3 User Manual*.
	lan0	
	lan1	
	lan2	
	lan3	

Note: The login password of GV-Storage V3's Web interface and its LCD panel are independent of one another, where if one was changed, the other won't be affected.

- **Order of Hard Drive Slots**

Remember the order of hard drive slots on the storage system. When you see the “Failure” status on the drives’ status indicator (see *2.1.1.1 Status Indicator*) or Web UI (click **Storage Manager / All Disk List**) or a warning message from e-mail notification, remove the failed hard drive in the correct slot.

If you remove the hard drive in the wrong slot, you could suffer data loss.

- **Maximum Recording Channels**

The maximum number of channels supported by GV-Storage System V3 (Rev. B) varies with the resolution, as listed below. It’s highly recommended to keep the total bitrates under 2700 Mbps for better recording performance.

H.264

Video Streaming		Complex Scenes		Normal Scenes	
Resolution	Frame rate	Bitrate	Record Channels	Bitrate	Record Channels
1.3 MP	30 fps	3.99 Mbps	681 ch	0.54 Mbps	5038 ch
2 MP	30 fps	6.12 Mbps	438 ch	0.87 Mbps	3127 ch
3 MP	30 fps	8.68 Mbps	313 ch	1.05 Mbps	2590 ch
4 MP	15 fps	9.21 Mbps	295 ch	1.15 Mbps	2365 ch
5 MP	25 fps	9.19 Mbps	296 ch	1.61 Mbps	1689 ch
8 MP	25 fps	13.5 Mbps	201 ch	2.2 Mbps	1236 ch
12 MP	15 fps	14.47 Mbps	188 ch	3.41 Mbps	866 ch

H.265

Video Streaming		Complex Scenes		Normal Scenes	
Resolution	Frame rate	Bitrate	Record Channels	Bitrate	Record Channels
1.3 MP	30 fps	2.64 Mbps	1030 ch	0.45 Mbps	6045 ch
2 MP	30 fps	4.31 Mbps	631 ch	0.74 Mbps	3676 ch
3 MP	30 fps	5.35 Mbps	508 ch	1.01 Mbps	2698 ch
4 MP	25 fps	7.87 Mbps	345 ch	1 Mbps	2720 ch
5 MP	30 fps	8.29 Mbps	538 ch	1.55 Mbps	1755 ch

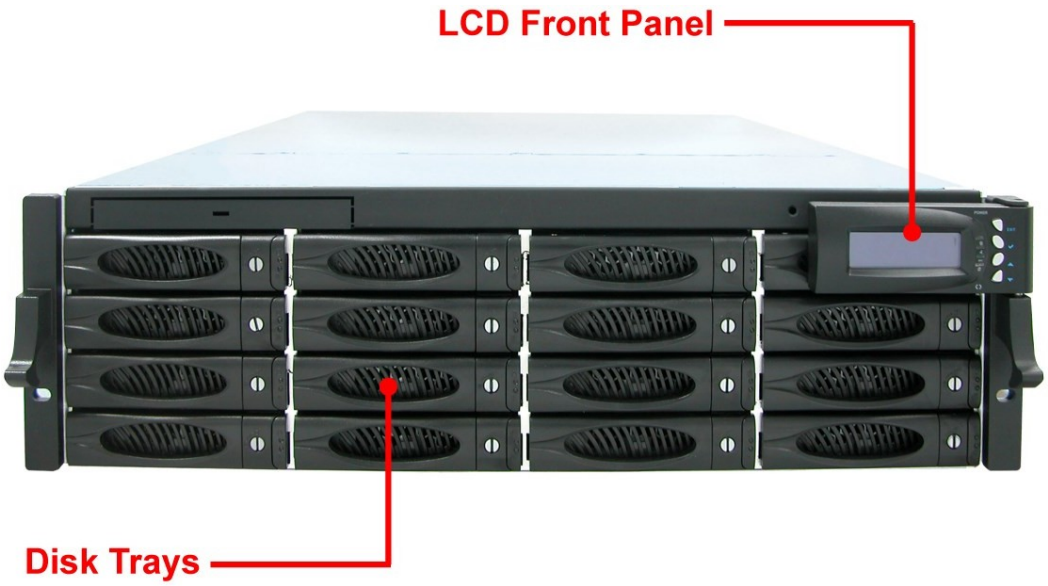
Note: The tests were conducted using RAID 5 with 4 HDD in a group, each HDD of 8 TB.

- **Virtual Volume Restriction**

Don't assign the same virtual volume to more than one host for recording usage; otherwise you may suffer data lost or corruption.

1.6 Overview

Front View



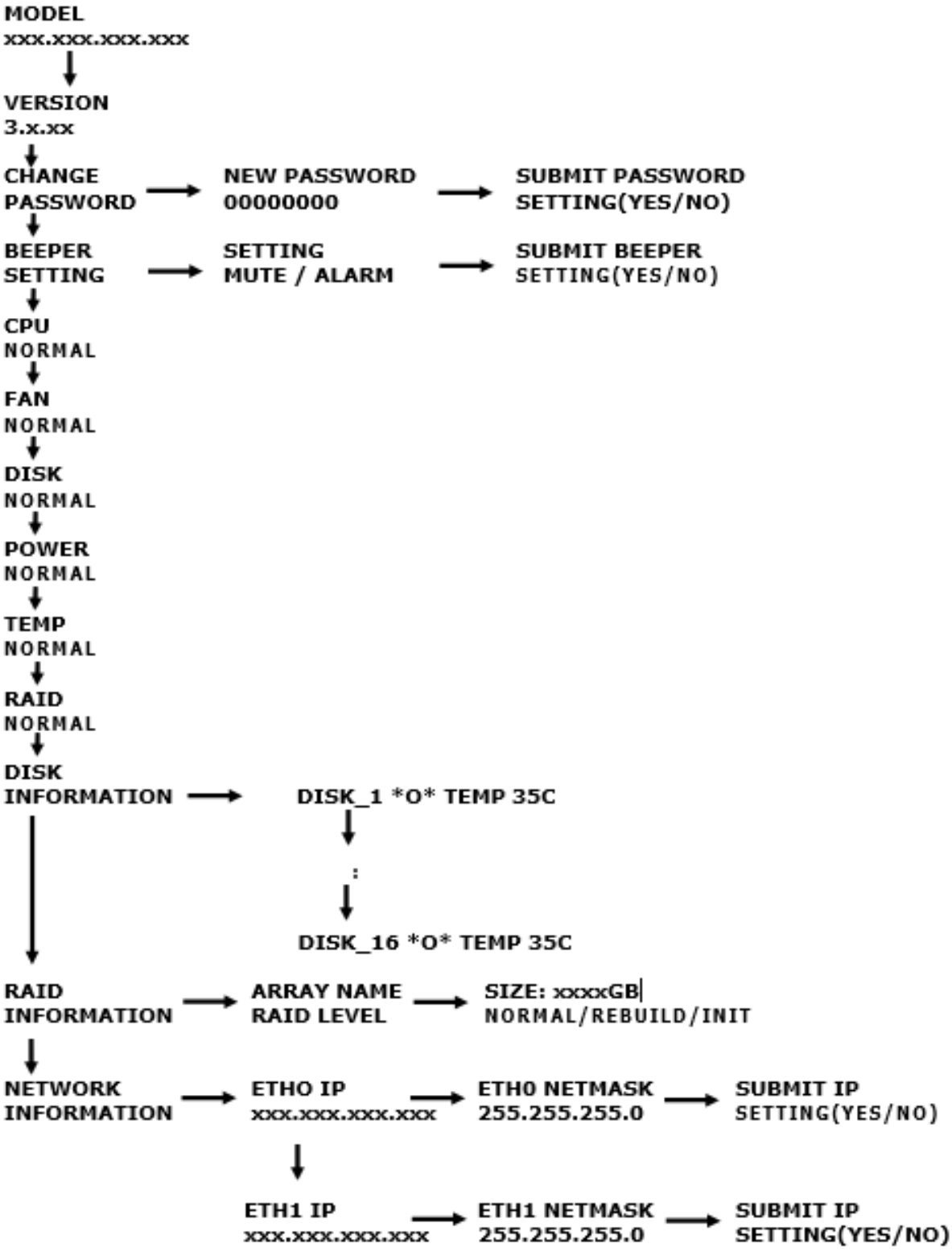
LCD Front Panel

The LCD front panel is an option to set up some basic system settings. To start using the LCD panel, press the Select button to log in and configure the system.

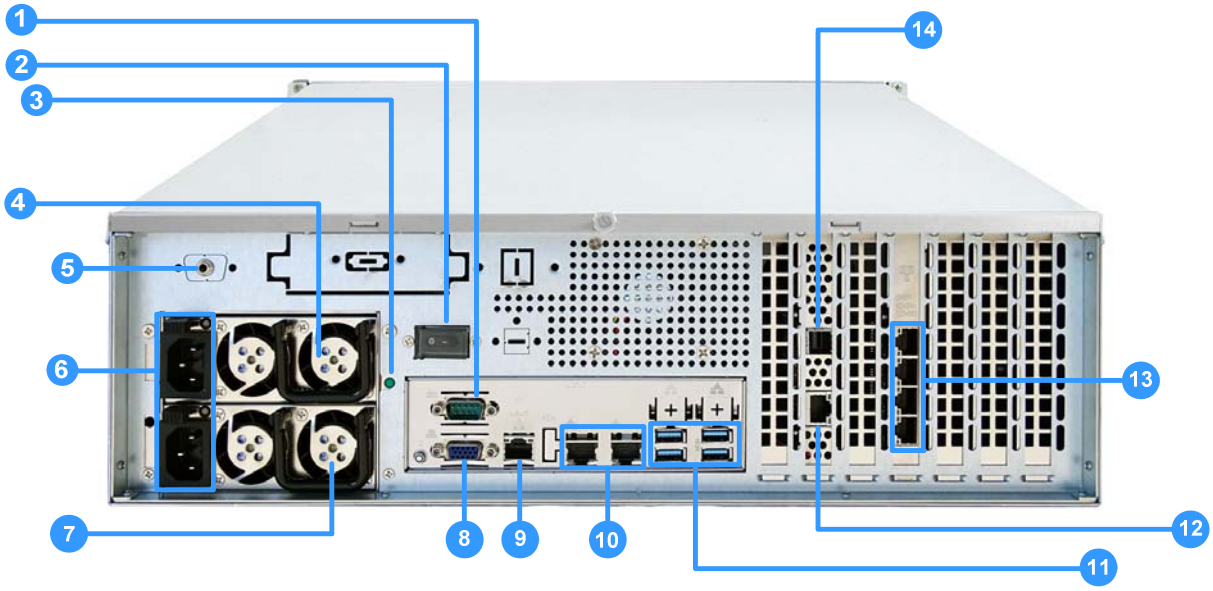
No.	Name	Icon	Description
1	**Exit button**	**EXIT**	Return to the previous menu.
2	**Select button**	✔	Enter the option selected.
3	**Up & Down Arrow buttons**	▲▼	Go through information and jump from one option to the next.

Use the above function keys to navigate through and configure the basic system settings as listed in the following menu diagram.

Menu Diagram



Rear View



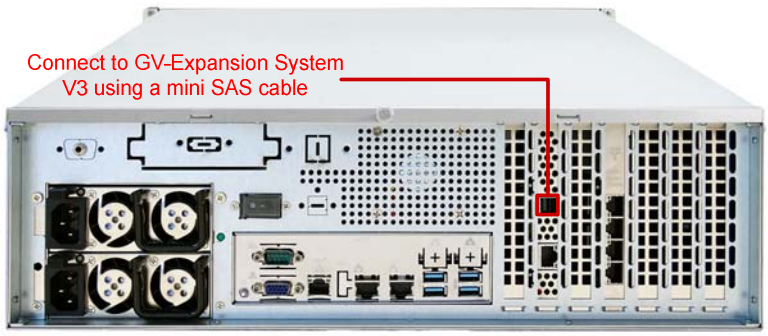
No.	Description	No.	Description
1	COM1 Serial Port	8	VGA Port
2	Power On/Off Switch	9	IPMI LAN Port (Management port of motherboard IPMI)
3	Mute	10	10 Gigabit Ethernet Port x 2 (Right: LAN0, Left: LAN1)
4	PSU-A Port Power Supply A	11	USB 3.0 Port x 4
5	RS232 Port (Phone Jack) for UPS	12	Ethernet RJ-45 Port (Management port of RAID card)
6	AC Power Input Socket	13	1 Gigabit Ethernet Port x 4 (lan0, lan1, lan2, lan3)
7	PSU-B Power Supply B	14	Mini SAS HD Port

IMPORTANT: To configure the system for the first time, connect an Ethernet cable to LAN0 which has a default IP address of 192.168.0.199.

1.7 Connecting to GV-Expansion System V3

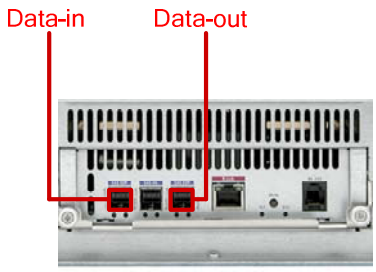
GV-Storage System V3 (Rev. B) can be connected up to four GV-Expansion Systems V3, which are available in 16, 24 and 64 bays.

1. Connect the supplied mini-SAS cable to the mini-SAS port of GV-Storage System V3 (Rev. B).

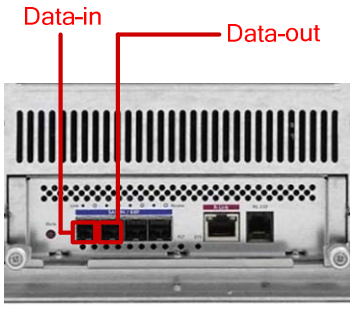


2. Connect the same mini-SAS cable to the Data-in port of a GV-Expansion System V3 16 / 24 / 64 Bay. See below for the location of the ports on the rear panel of the desired model.
3. To interconnect multiple GV-Expansion Systems V3, use another mini-SAS cable to connect from the Data-out port of the GV-Expansion System V3 to the Data-in port of another GV-Expansion System V3 16 / 24 / 64 Bay.

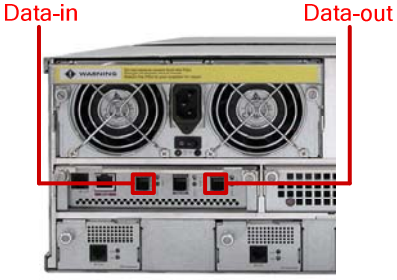
GV-Expansion System V3, 16 Bay



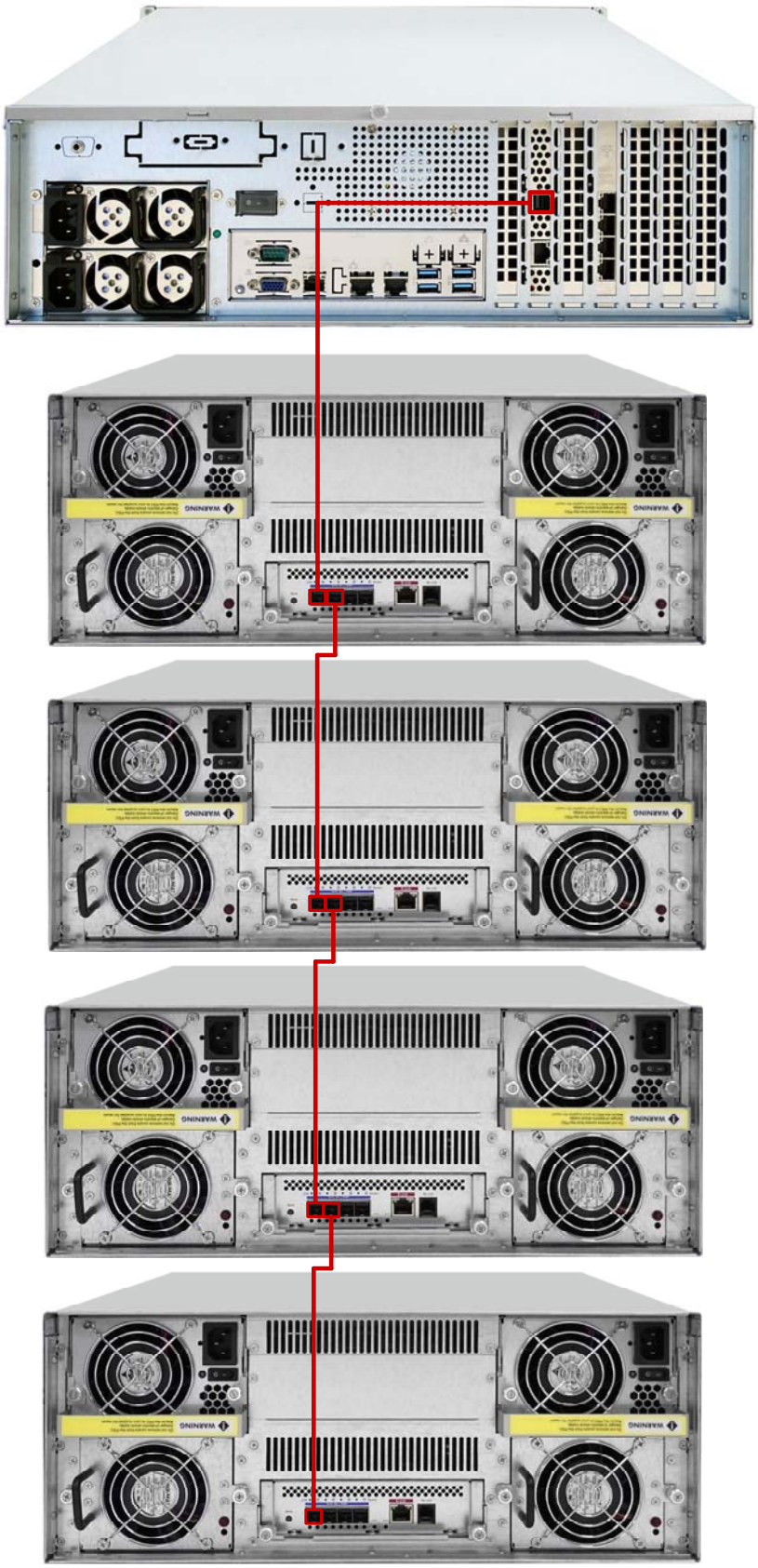
GV-Expansion System V3, 24 Bay



GV-Expansion System V3, 64 Bay



For example, to connect GV-Storage System V3 (Rev. B) to four GV-Expansion Systems V3, 24 Bay:



2. Installation

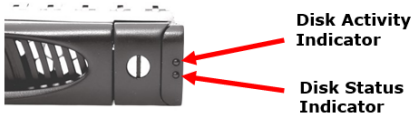
2.1 Installing Hard Drive

Before starting GV-Storage System V3 (Rev. B), insert at least one HDD into its drive slots.

2.1.1 Drive Carrier Module

The Drive Carrier Module houses a 2.5 inch / 3.5 inch hard disk drive. It is designed for maximum airflow and incorporates a carrier locking mechanism to prevent unauthorized access to the HDD.

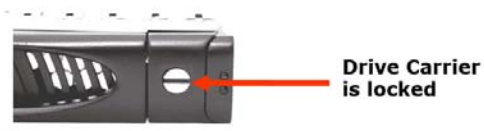
2.1.1.1 Status Indicator



Name	Color	Description
Disk Activity Indicator	**BLUE**	Flashes when the HDD is being accessed.
Disk Status Indicator	**GREEN**	Indicates power on and functioning properly
	RED	Indicates error.

2.1.1.2 Lock Indicator

Every Driver Carrier lockable and equipped with a lock indicator, as illustrated below



2.1.2 Installing 3.5” & 2.5” Disk

1. Make sure the lock indicator is in unlock position. To pull out a disk tray, press the tray open button.

2. Pull out the empty disk tray by pulling the lever handle outwards.
3. Place the hard drive in the disk tray.

3.5”

2.5”

4. Insert and tighten the mounting screws at the bottom of the disk tray to secure the drive.

3.5”

2.5”

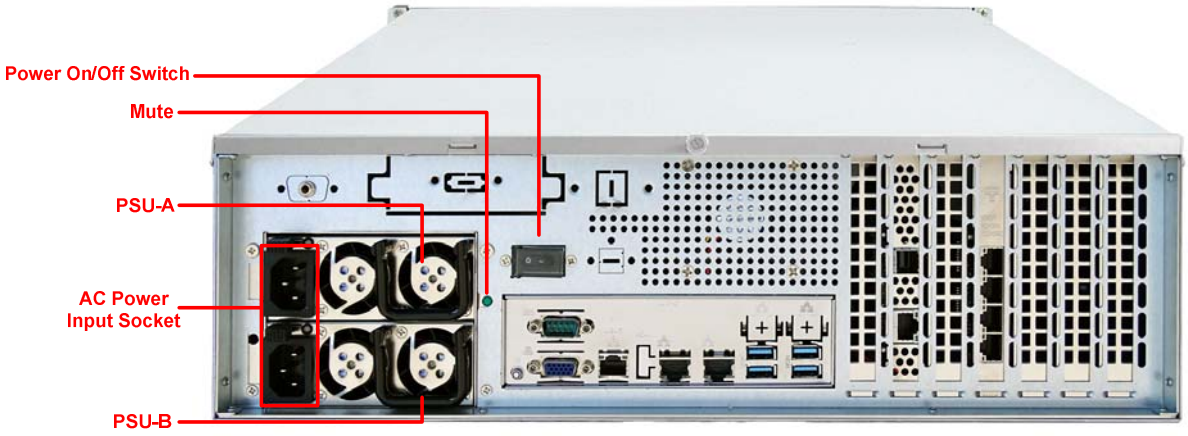
5. Slide the tray into the drive slot.
6. Close the lever handle until the latch click into place

2.2 Preparing the System

1. Attach network cable to Ethernet port LAN0. Connect the other end to your network switch. You may also connect the other Ethernet LAN1 port if needed. Press the power button on the front panel.
2. Optionally connect a monitor to the VGA port.
3. Optionally connect a keyboard and/or mouse to the system.

IMPORTANT: To configure the system for the first time, connect an Ethernet cable to LAN0 which has a default IP address of 192.168.0.199.

2.3 Powering On



1 Plug in the two power cords into the AC Power Input Socket of PSU located at the rear of GV-Storage System V3 (Rev. B).

2 Open the protective cover of the Power On/Off Switch and turn on the power.

3 Optionally connect a keyboard and/or mouse to the USB ports. The Power LED on the front Panel turns green.

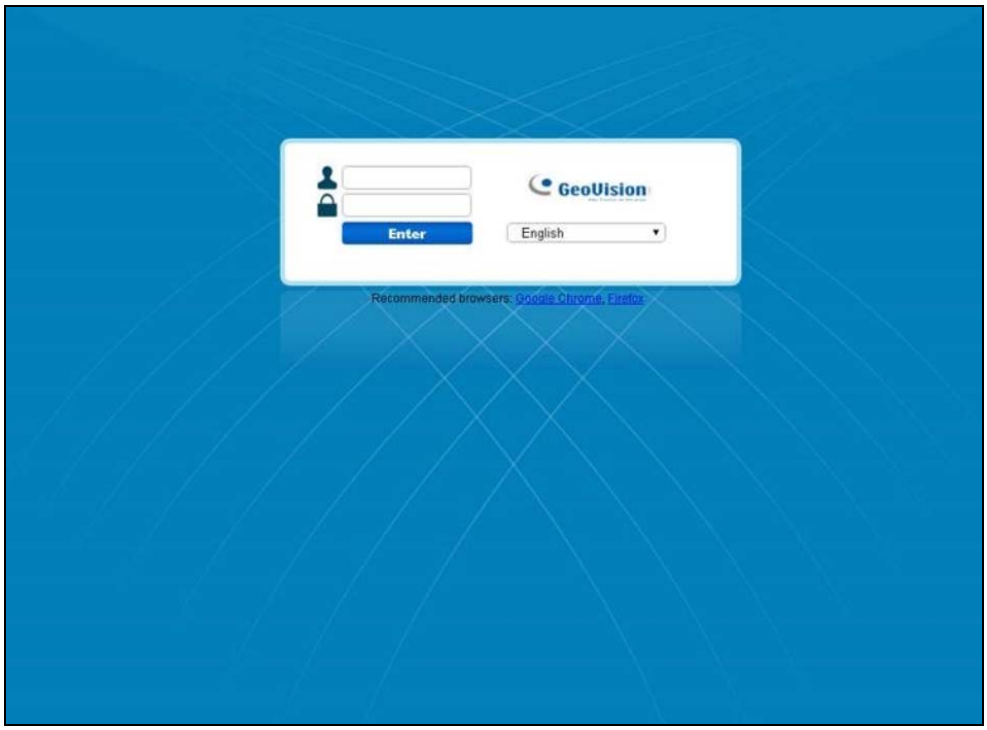
Note: GV-Storage System V3 (Rev. B) is equipped with redundant, full range power supplies with PFC (power factor correction), which automatically adjusts the voltage according to hard drive usage and access activity.

3. System Setup

After powering on GV-Storage System V3 (Rev. B), you can commence to configure system settings from a PC under the same LAN.

3.1 Accessing the Web Interface

1. Open a web browser and access the GV-Storage System V3 (Rev. B)'s Web interface from its default IP address: **192.168.0.199**. The login page appears.



2. Type the default user name **admin** and password **00000000**.
3. Select the language of your choice and click **Enter**.

Note: The login password of GV-Storage System V3 (Rev. B)'s Web interface and its LCD panel are independent of one another, where if one was changed, the other won't be affected.

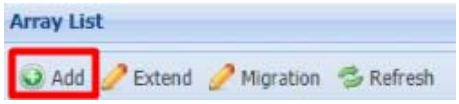
All services and functions are disabled by default. To initialize the system, refer to the sections below:

- To build RAID, see *3.2 Building RAID*.
- To set iSCSI, see *3.3 Configuring iSCSI*.

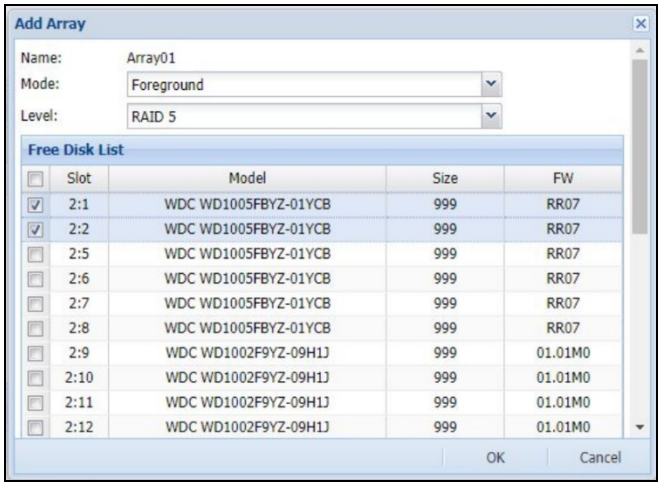
3.2 Building RAID

1. On the left menu, expand **Storage Manager** and select **RAID**.

2. Click **Add** under **Array List**.



3. In the Add Array window, select the desired RAID type for the RAID array to be built.



   A. Select **Foreground** as **Mode** if you want the system to utilize its full loading capacities in building the RAID — *faster* build speed.

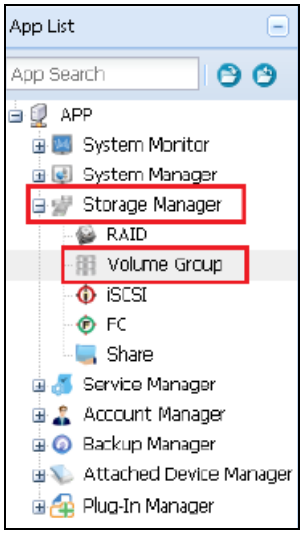
   B. Alternatively select **Background** as **Mode** if you wish to configure and/or use the RAID array while it is being built — *slower* build speed.

4. Select the desired free hard disks you want the RAID array to be built with.
5. Click **OK**.

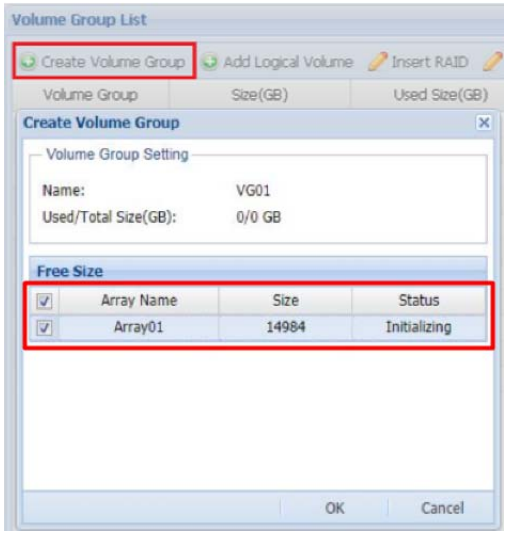
3.2.1 Adding Volume Group

Once a RAID array is built, logical volume(s) must be set, to allocate the storage, before data can be stored.

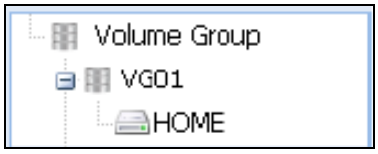
1. On the left menu, expand **Storage Manager** and select **Volume Group**.



2. Click **Create Volume Group**. This dialog box appears.



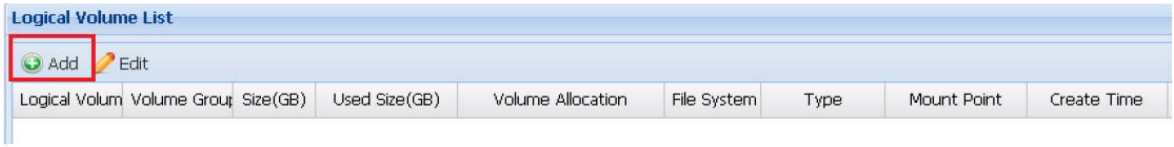
3. Select the RAID array you want to create a volume group with and click **OK**.
4. Once created, the volume group appears on the left menu.



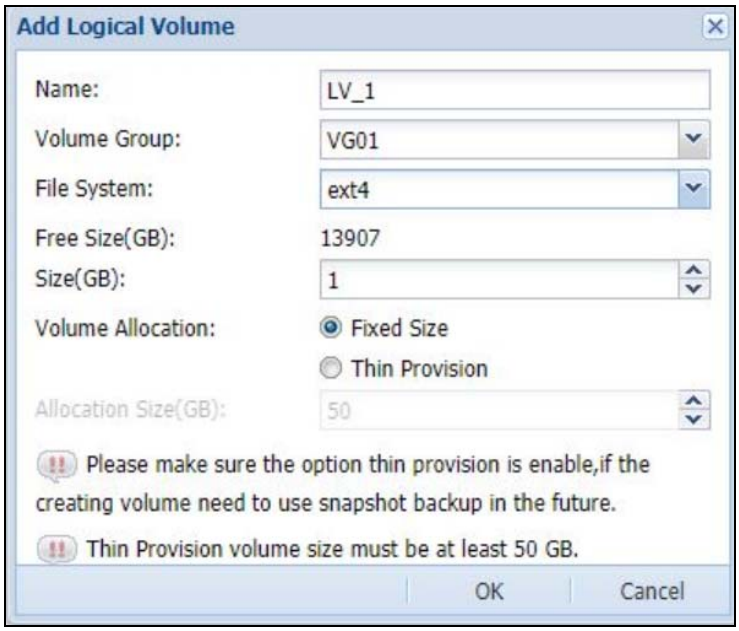
Note: A **HOME** volume is automatically created under the first volume group built, to store the system settings of GV-Storage System V3 (Rev. B), which cannot be removed.

3.2.2 Adding Logical Volume

1. Select the desired volume group and click **Add** under **Logical Volume List**.



2. Type a **Name** for the logical volume and select a **Volume Group** previously defined.



3. Select the desired storage format under **File System**.
   - unformat – select this if you wish to use the logical volume for iSCSI.
   - ext3 — suitable for small I/O, average single-file size of about 4 KB ~ 50 MB.
   - ext4 — suitable for big I/O, average single-file size of about 4 KB ~ 128 MB.
   - xfs — suitable for big I/O, average single-file size of about 128 MB ~ 1 GB.
   - zfs — suitable for big I/O, average single-file size of about > 1 GB.
4. Allocate the desired **Size** of up to the available **Free Size** of storage space for the logical volume.

Note: To use the logical volume as a shared folder, you must select a storage format other than *unformat*, i.e. ext3, ext4, xfs or zfs.

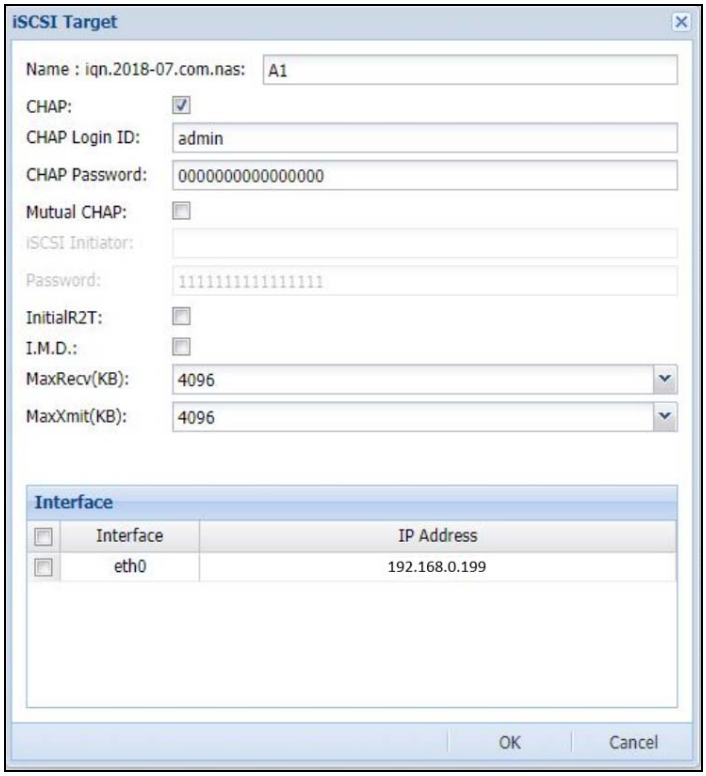
3.3 Configuring iSCSI

Before configuring an iSCSI network storage, a logical volume must first be set, see *3.2.2 Adding Logical Volume*.

3.3.1 Setting iSCSI Target

1. On the left menu, expand **Storage Manager** and select **iSCSI**.

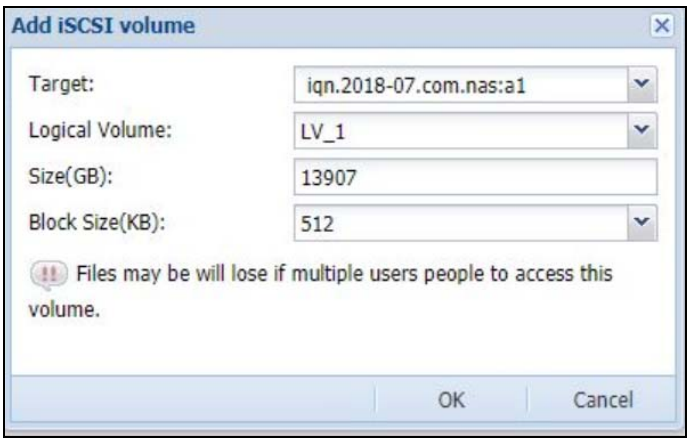
2. Under **iSCSI Target List**, click **Add**. This dialog box appears.



3. Type a desired name for the iSCSI.
4. Optionally enable **CHAP** for network security.
5. Select the desired IP address under **Interface** for the iSCSI connection. Note the number of IP addresses shown here is dependent on the number of LAN ports connected.
6. Click **OK**.

3.3.2 Adding iSCSI Volume

1 Under **iSCSI Volume List**, click **Add**. This dialog box appears.



2 Select the desired iSCSI **Target** and its **Logical Volume** previously set.

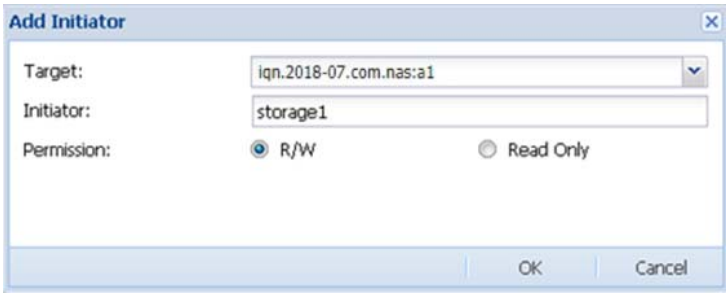
3 Modify the default **Block Size** of 512 KB if necessary.

4 Click **OK**.

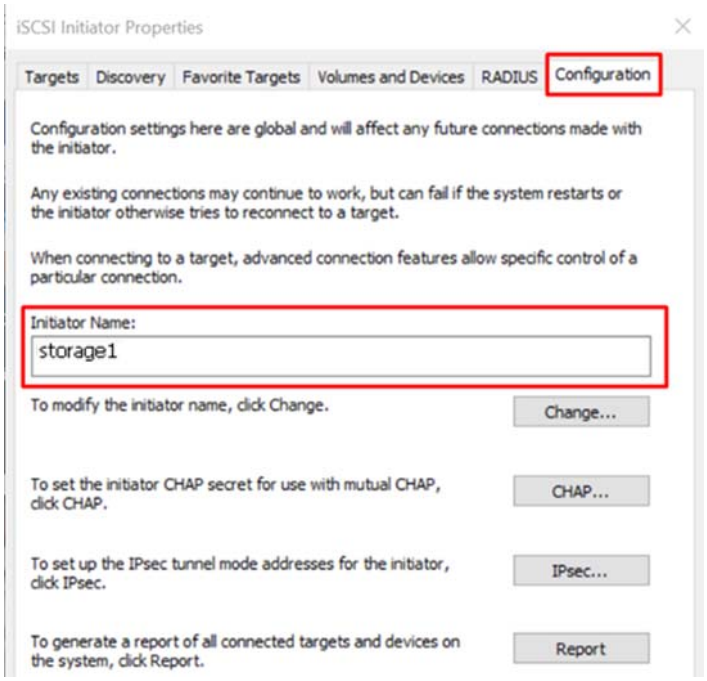
3.3.3 Setting iSCSI Initiator

Configure a designated Initiator if you want the iSCSI volume to be only accessible by one initiator (recommended).

1. Click **Add** under **Initiator List**. This dialog box appears.



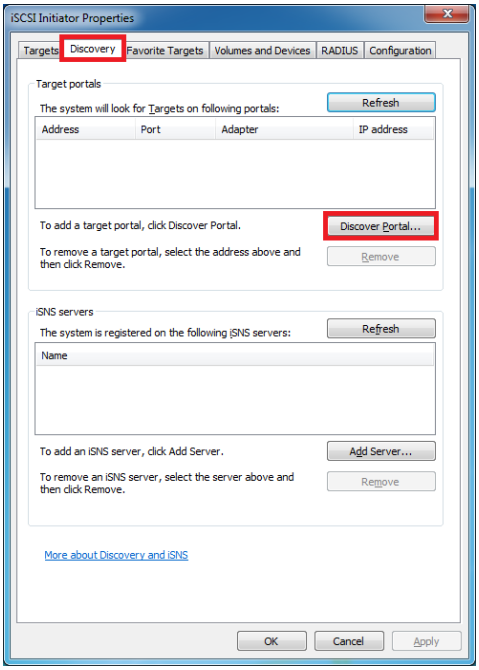
2. Type the name of the initiator PC in which you want to grant access to, which can be found in the **Configuration** tab of **iSCSI Initiator** (search/run from Start menu).



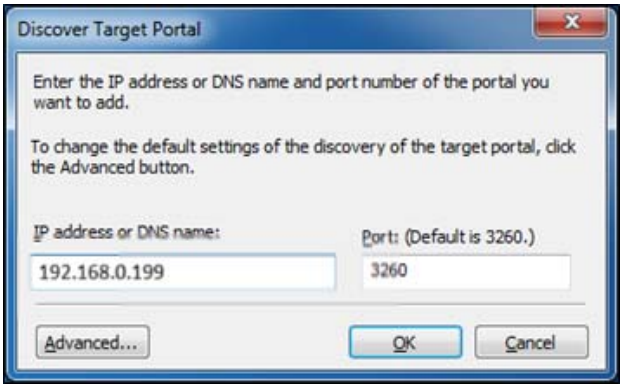
3. Click **OK**.

3.3.4 Connecting iSCSI

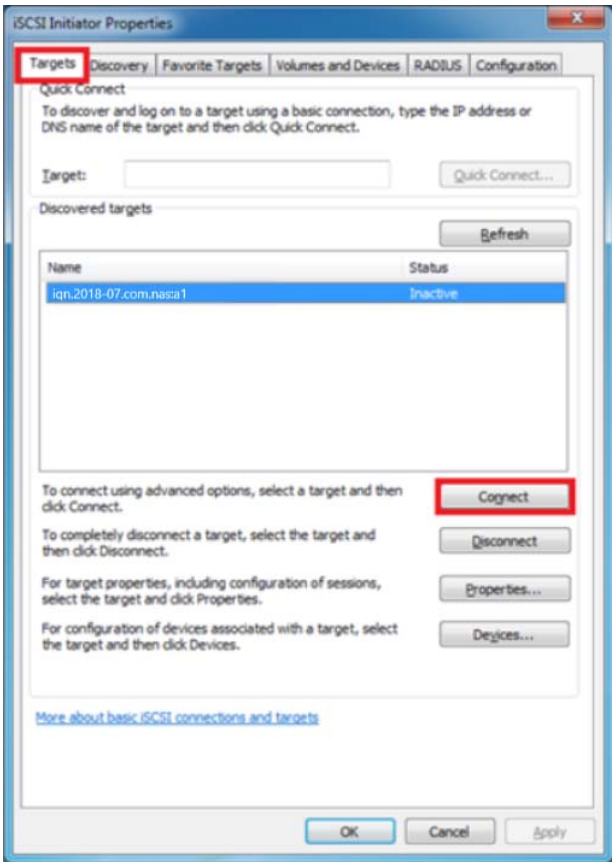
1. Search and run iSCSI Initiator. To add target portals, click the **Discovery** tab and click **Discover Portal**.



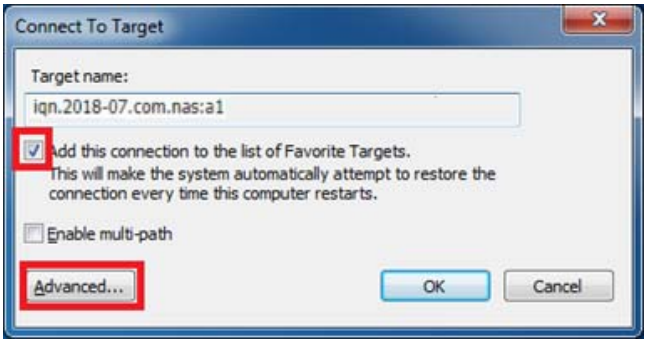
2. Type the IP address of GV-Storage System V3 (Rev. B) and click **OK**.



3. Click the **Targets** tab and click **Connect**.



4. Select **Add this connection to the list of Favorite Targets** and click **Advanced**.



5. Select **Local Adaptor** as Microsoft iSCSI Initiator, select **Initiator IP** as the host IP and select **Target Portal IP** as iSCSI data port 1. If the CHAP authentication is enabled at the storage system (see *3.3.1 Setting iSCSI Target*), select **Enable CHAP log on** and type a valid user name and target secret (password). Click **OK**

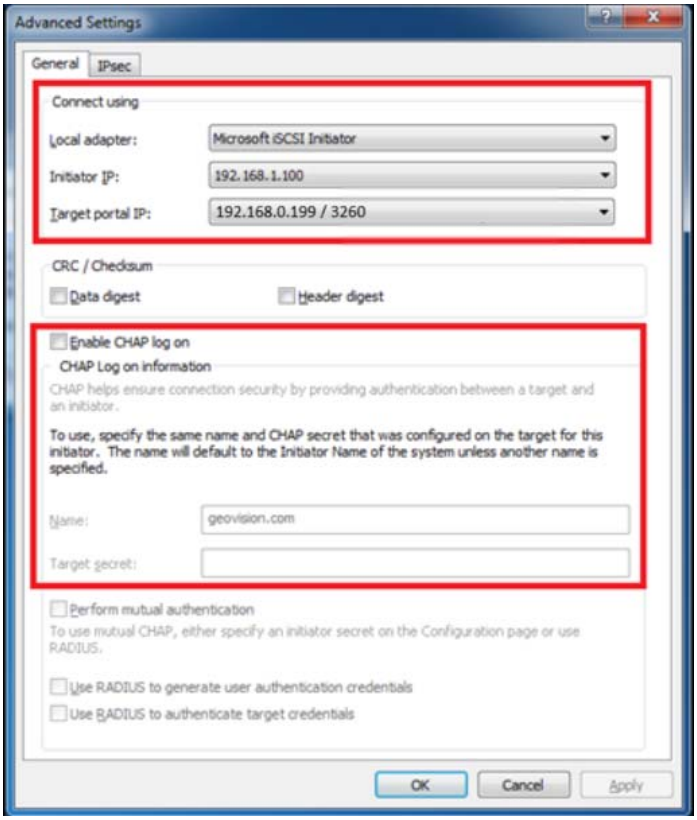
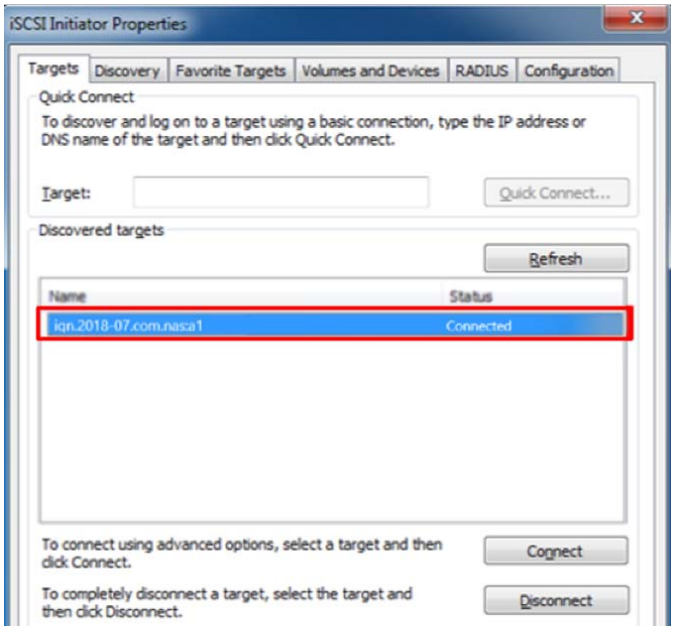
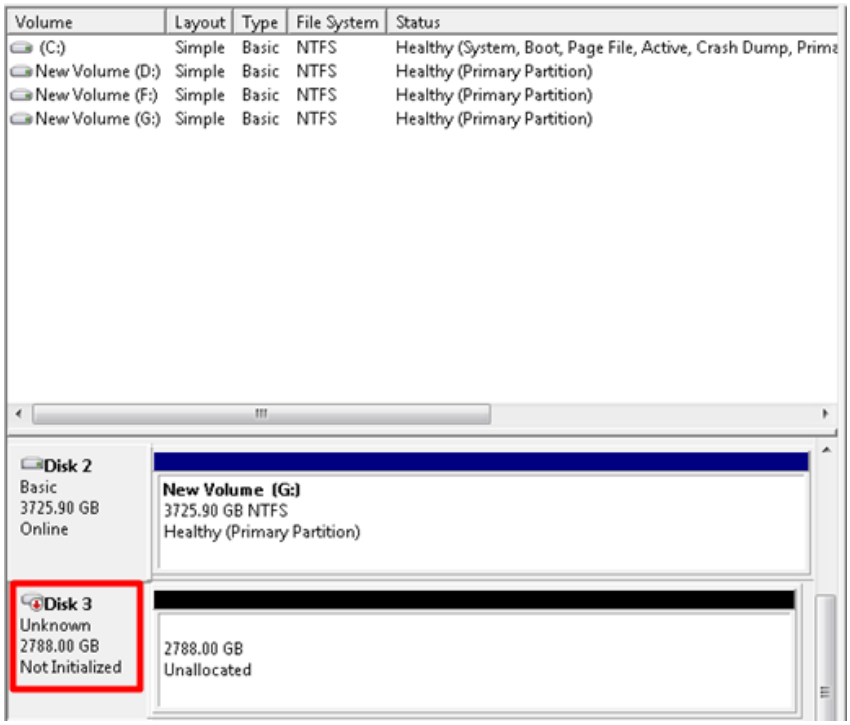


Figure: In this example, the Host IP address is 192.168.1.100 and the LAN0 port is 192.168.0.199.

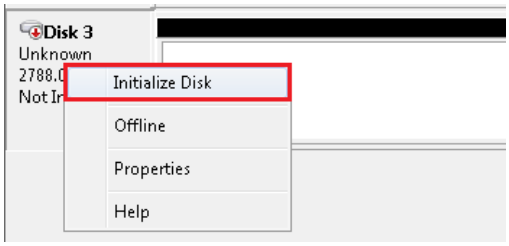
6. When the connection with the storage system is established, the status changes into “Connected”.



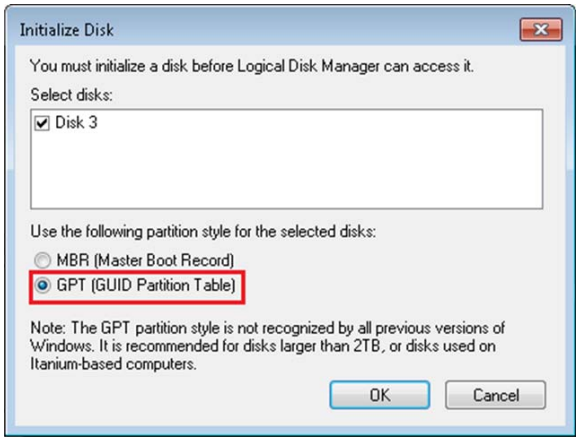
7. When connecting to the iSCSI disk for the first time, it is necessary to format it similar to that of a local disk. Search for and run Windows **Disk Management** from the Start menu. This window appears.



8. Right-click on the unformatted iSCSI storage and click **Initialize Disk**.

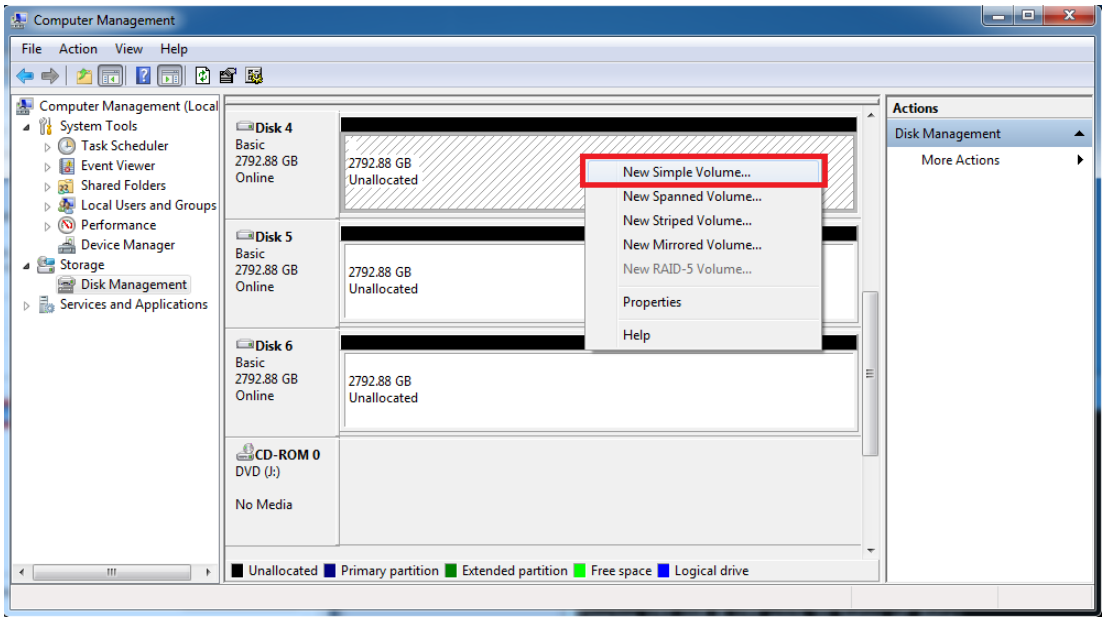


9. Select the disk to be initialized and select **GPT** if the disk is larger than 2TB, otherwise select **MBR** as the partition style.



10. Click **OK** to initialize.

11. Note the settings of the formatted partition should be **Basic disk storage** and **NTFS file system**.



4. Accessing Video Recordings

To access the video recordings of GV-Storage System V3 (Rev. B) with GeoVision surveillance systems and video management software, please refer to the user's manuals of the software used from GeoVision's website.