RECORDING STORAGE

The goal of video surveillance is to capture an incident. Preservation of this recording for retrieval is paramount. Uniview tec systems have several means of safekeeping and managing video storage. This is accomplished through Camera Storage, Allocating Recording Space, RAID Hard Drive configurations and expanded storage with a Disk Enclosures.
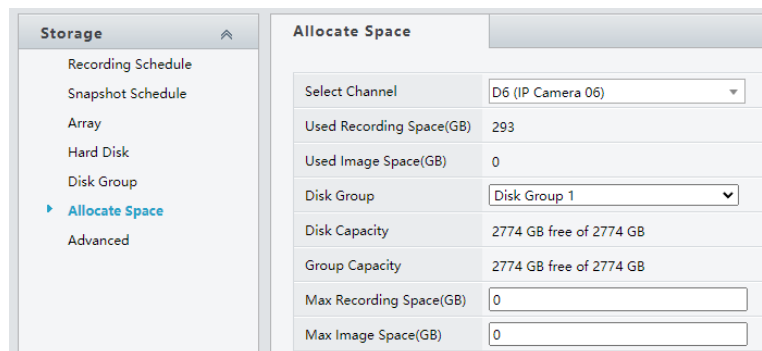
Camera Storage

Almost all of uniview tec cameras support onboard storage with a micro SD card. It can be a secondary means of storage, but uniview tec also supports Network Replenishment. Network Replenishment allows the NVR to recover missing recordings, if data-transmission between the camera and NVR is temporarily lost. Refer to TN1007 for complete information on this topic. As for secondary recording, if the NVR fails or is stolen, recent recordings would be accessible from the camera(s). How much video is available is determined by factors such as SD card size, recording schedules, and camera encoding settings. For example, a 256GB SD card can hold ~2 weeks of 1080P@30FPS video, or ~1 week of 5MP@25FPS video, using H.265 compression.

Allocating Recording Space

NVR storage available to each camera can be individually adjusted. Less important cameras could be limited, so that the remaining storage is available to more important cameras, giving those cameras longer recording times.

1. Go to **Menu** > **Storage** > **Allocate Space.**
2. Click the dropdown by **Select Channel.**
3. Adjust **Max Recording Space** to limit space reserved for that channel.

To estimate storage space, use the calculator found in Guard Tool. This is available under Client Software on our website.

Raid Storage

When multiple hard drives (HDD) are installed, RAID Arrays can be set up for data protection(parity). In a RAID configuration, if one HDD fails, there are data checks in place, so that when the drive is replaced, the other HDD(s) can rebuild the data. If used, RAID should be setup prior to configuring the recording settings in the NVR, as changing a RAID configuration is virtually making a new drive and data is lost in the process.

RAID 0

Two or more HDDs are used as one large storage device. Sometimes called JBOD or "Just a bunch of drives". This is the default configuration in the NVR's. Since all HDD's are used for storage, there is no data protection(parity). RAID 0 makes a group of drives look like, but behave better than, 1 drive.

RAID 1

A minimum of two HDDs are needed and must be set up in pairs. The video recording on HDD one is mirrored on HDD two. If one HDD fails, the second HDD will still have the video recording. The biggest drawback of this RAID is the total storage is decreased by 50%.

RAID 5

A minimum of three HDDs are needed and there is no maximum. The data is written in such a way that there is always one drive worth of parity. Total storage can be calculated by the formula:

$$\text{Drive Capacity} \left(1 - \frac{1}{\text{\# of Drives}} \right)$$

This is the most used configuration because it offers data protection with the least reduction in total storage.

RAID 6

A minimum of four HDDs are needed. The two parity drives will now be produced, which means up to two HDDs can fail without complete loss of data. This offers the best protection but has slightly less efficiency, the formula for storage is now:

$$\text{Drive Capacity} \left(1 - \frac{2}{\text{\# of Drives}} \right)$$

Nested Raid Levels

THE FOLLOWING RAIDs SHOULD ONLY BE CONSIDERED WHEN A LARGE NUMBER OF HARD DRIVES ARE USED

RAID 10

This is also known as RAID 1 + 0. A minimum of four HDDs are needed and must be in pairs. The video recording on HDD one is mirrored on HDD two and the video recording on HDD three is mirrored on HDD four, making 2 sets of RAID 1. The two sets are then put into a RAID 0.

RAID 50

This is also known as RAID 5 + 0. A minimum of six HDDs are needed and must be installed in groups of three. Disks 1 – 3 (group 1) and disks 4 – 6 (group 2) will each have one drive of parity and two of data. Those groups are then placed inside a RAID 0. One HDD from each group can fail without data loss.

RAID 60

This is also known as RAID 6 + 0. A minimum of eight HDD's are needed. They must be installed in groups of four. Disks 1 - 4 and 5 - 8 will each have two HDDs used for data protection and two for used for video storage. Those groups are then placed inside a RAID 0. Two HDDs can fail in each group and when replaced the system will rebuild the missing data.

Rebuild Array

An array can be in one of three states: **Normal**, **Degraded**, or **Damaged**. If **Damaged**, the array cannot be rebuilt without data loss. A **Normal** or **Degraded** array can be rebuilt to add or replace disk(s).

1. Power down the NVR and connect your new drive(s), and power back up.
      (replacing the bad drive if rebuilding a damaged array)
2. Go to **Menu** > **Storage** > **Array** > **Array**.
3. Select the array to be rebuilt and click 🖉.
4. Select the **Rebuild Mode** and select the checkbox by the **Local Disk** you want to rebuild to.
(The Quick rebuild mode takes less time than the Normal rebuild mode but may result in data loss. Please select with caution.)
5. Click **Apply**

For additional information about RAIDs Wikipedia is a good source as well as our support group
https://en.wikipedia.org/wiki/Standard_RAID_levels
https://en.wikipedia.org/wiki/Nested_RAID_levels#RAID_10
For a list of which RAID configurations are supported refer to NVR specification sheets.

External Disks

You can add external disks to the NVR, including NAS, eSATA, or disk enclosures. While eSATA and disk enclosures are automatically added when connected to the NVR, a NAS connection must be configured.

eSATA
External HDDs with enclosures that connect by a cable.
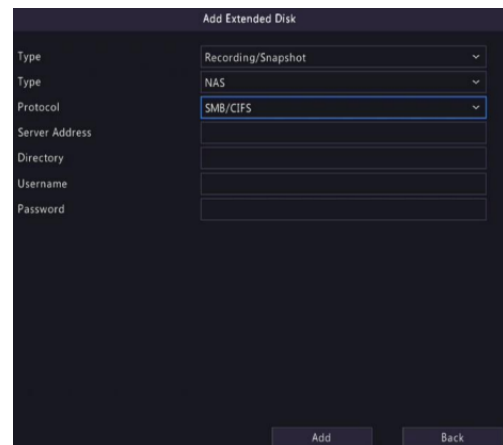
Disk Enclosure
Larger uniview tec NVR's support adding significant additional external storage with Disk Enclosures holding 8 or more drives. For compatibility contact our support group or sales.
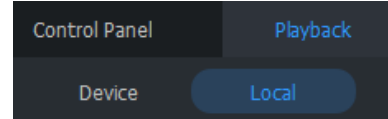
NAS
A NAS is a storage server on your local network. These must be set up independently, but to link your NVR to your NAS refer to the following procedure:

1. Go to **Menu** > **Storage** > **Hard Disk**.
1. Click **Add**. The **Add Extended Disk** page appears.
2. Select a **Protocol** and configure parameters.
        • NFS: Used to add NAS servers to the LAN.
        • SMB/CIFS: Used for public network for security.
3. Enter the **Server Address**. If SMB/CIFS this could be a domain name.
4. Enter the **Directory**, or the location within your NAS where you would like to save recordings.
5. Enter the **Username** and **Password** if required.
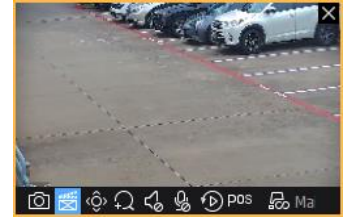6. Click **Add**

Guard Station Storage

The Guard Station software can record live video from your cameras through your PC. You can do this manually or set up a schedule for the software to record by. To control where your video is saved, go to **Control Panel** > **System Configuration**> **Recording** and changing the **Local Recording Path**. Both recording options below will save in that location and can be accessed later with your file explorer or from the **Playback** tab by clicking **Local** at the top.

Manual Recording

1. Open a **Live View** tab and select a camera to view

2. Hover your mouse over the video of that camera and click in the bottom left to start recording.

3. When done, click to stop recording.

Scheduled Recording

1. Click on **Control Panel**, followed by **Recording Schedule**.
2. Select the camera you want to record.
3. Make sure the **Enable** check box is selected.
4. Click the **Select** button and then select the **All Day** template.
5. **Click/drag** on green to remove scheduling and **click/drag** on blank areas to add it back.
    • Clicking the **Clear** button at the top will clear all time periods.
    • Up to 8 time periods are allowed for each day.
6. Click **Save**.