Navigator Control Center and View Manager 5.0 User Manual

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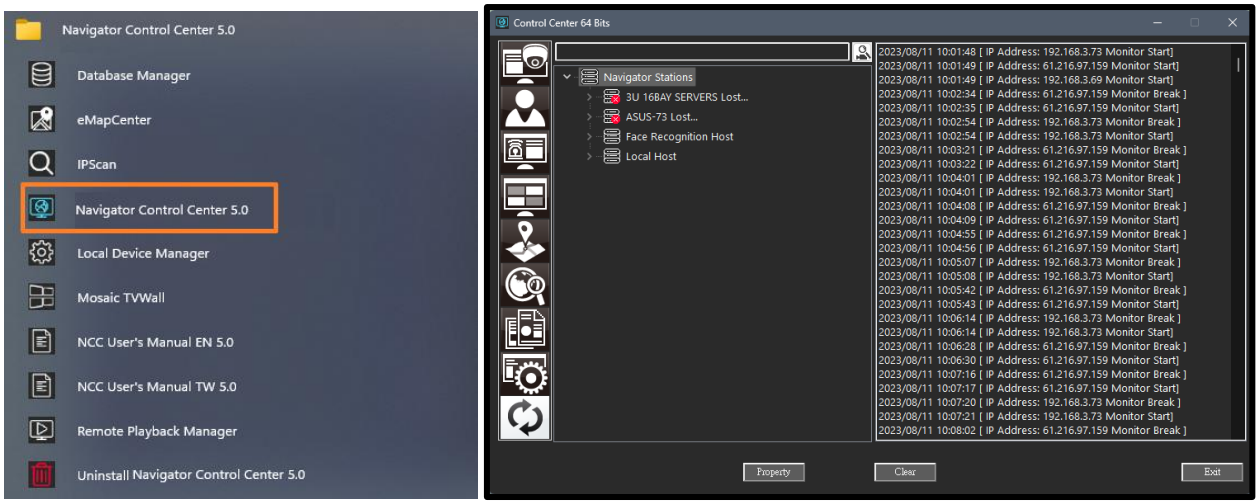
Introduction

Navigator Control Center 5.0

The Navigator Corporate servers, Navigator Control Center software can be installed on Windows® and is designed for the hierarchical management of NAV video recorders, NVR/DVRs, and IP cameras. It enables remote, 24/7 camera video management, remote video playback and backup, device status reporting, PTZ control, user authentication, and combines live video and video playback in a single window. The user can simultaneously view real-time monitoring screens and video playback of multiple channels on dual screens, allowing for a quick grasp of the overall monitoring situation.

- Centralized management for Navigator Corporate servers
- Each group supports up to 144 channels of network real-time video
- Flexible split screen and dual-screen monitoring and recording playback
- Centralized management with customizable arrangement of remote camera groups
- Support exclusive fisheye image dewarping technology
- Support web page link display
- Dual-screen display and group sequence
- Centralized alarm management for cameras under Navigator servers
- Support Aida counters and statistical charts
- Centralized HDD/device report management
- Emap online electronic map control with GPS tracking
- Mosaic TV Wall for multi-screen video wall display
- User Manager for login user, device group, and viewing group permission management
- Support P2P NVR remote connection.

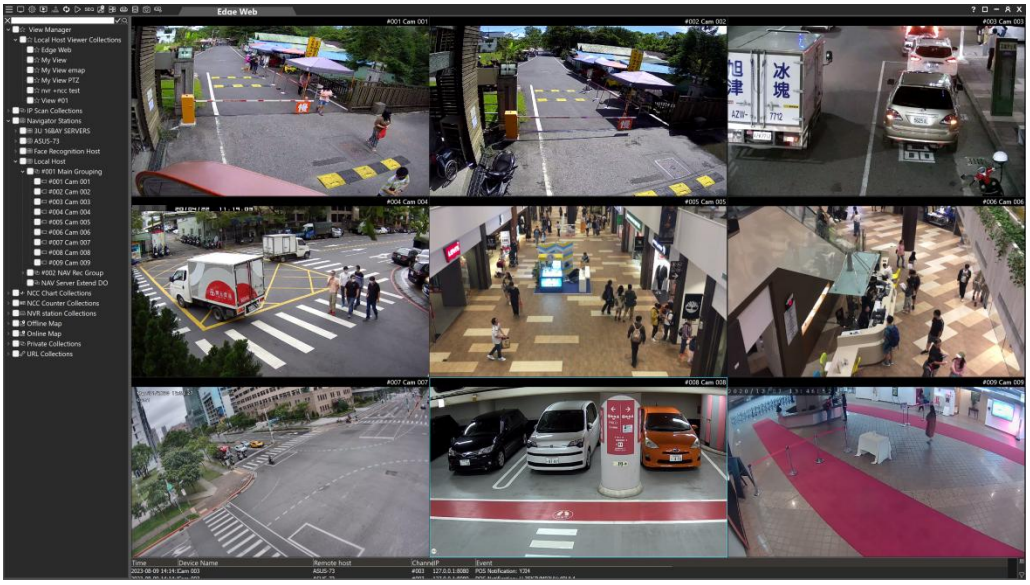


Note 1: Navigator Client 5.0 is available for free download and installation.
Note 2: The paid version of Control Center 5.0 cannot be installed simultaneously with the free version.

Copyrights

View Manager 5.0

View Manager 5.0 CPU decoding, literally means decoding using software, but in fact, it still requires hardware CPU support. During the software decoding process, a large amount of video information needs to be processed, so there is a high demand for CPU performance, especially for high-resolution streaming. The more channel videos, the higher the CPU usage. However, software decoding is in terms with compatibility and decoding convenience, can save the cost of an external graphics card as long as the CPU performance is strong and there is no multi-screen output requirement.



Some brands of server hosts may not have a physical graphics card, or the environment does not allow the connection of a physical monitor. In such cases, as long as your device has HDMI output, you can install an EDID emulator. This device can simulate the physical monitor Direct3D, and the real-time video will be displayed normally.

- It is necessary to connect a physical monitor or install a virtual EDID emulator, otherwise Direct3D will not work normally, resulting in black screens in real-time and playback videos.
- Please do not connect Virtual EDID emulator and external output simultaneously.
- When using a virtual monitor, the built-in or external graphics card must support Direct3D for the EDID emulator to function.

User Manual

The User Manual for Control Center is presented in PDF format. To read this user manual, please go to Start → All Programs → Navigator Control Center → NCC User's Manual. Before opening the user manual, make sure you have installed Acrobat Reader or use Google Chrome or Edge to open it.

Uninstall Control Center

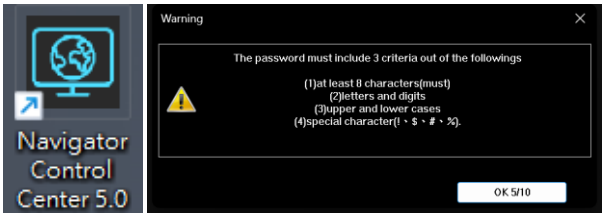
To uninstall Control Center, please select Start→All Programs→Navigator Control Center->Uninstall Navigator Control Center. Before proceeding, make sure you have backed up your database. You can import the database into the newly installed Control Center. Please refer to the "Local Backup" section in this document for details.

Acronym

NCC: Navigator Control Center
VM: View Manager
NAV: Navigator Corporate
PTZ: Pan, tilt, and zoom camera
DVR: Digital video recorder
NVR: Network video recorder
HDD: Hard disk drive
FPS: Frame rate per second
OSD: On-screen display
ANPR: PC based number plate recognition system
LPR: Edge license plate recognition camera

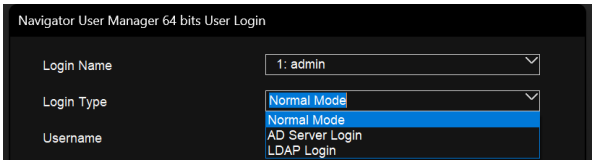
How to Login Navigator Control Center

To log into Control Center, open it from the desktop or execute Navigator Control Center through the Start menu. For information security considerations, the first time you log in, a warning window will appear, reminding you to use a password that meets the required strength to ensure the security of your system. (Please refer to Chapter 1 for creating user accounts and passwords).



Note: For system default account, enter "admin" and empty as username and password to login.

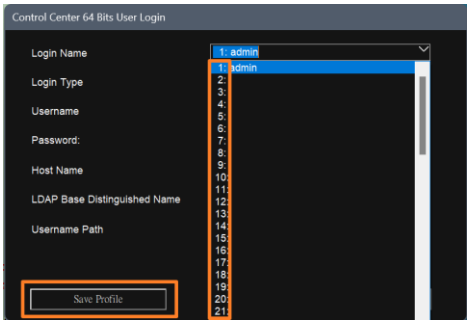
When logging into the system, a user login dialog box will pop up. Please select "Normal Mode". For advanced usage, there are other login system modes available, such as LDAP and Active Directory (AD) modes.



User Account Bookmark

Before logging into the system, there is a user account bookmark feature available for easy and quick access to switch between accounts. It supports multiple account memory locations and up to 128 groups can be set.

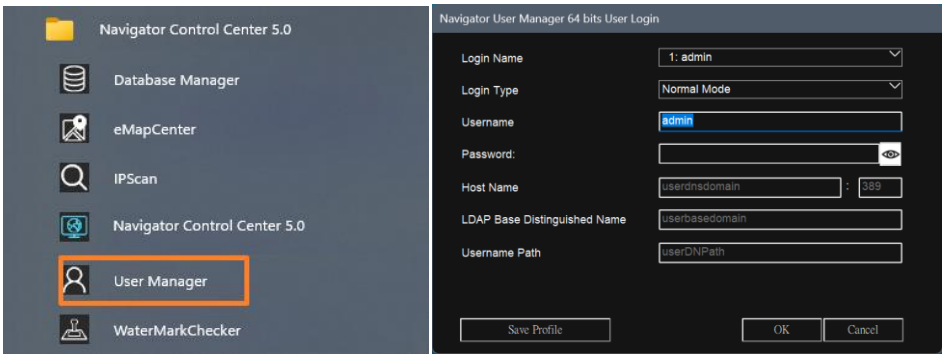
The username and password need to be created in advance by the admin user administrator. (Please see Chapter 1).



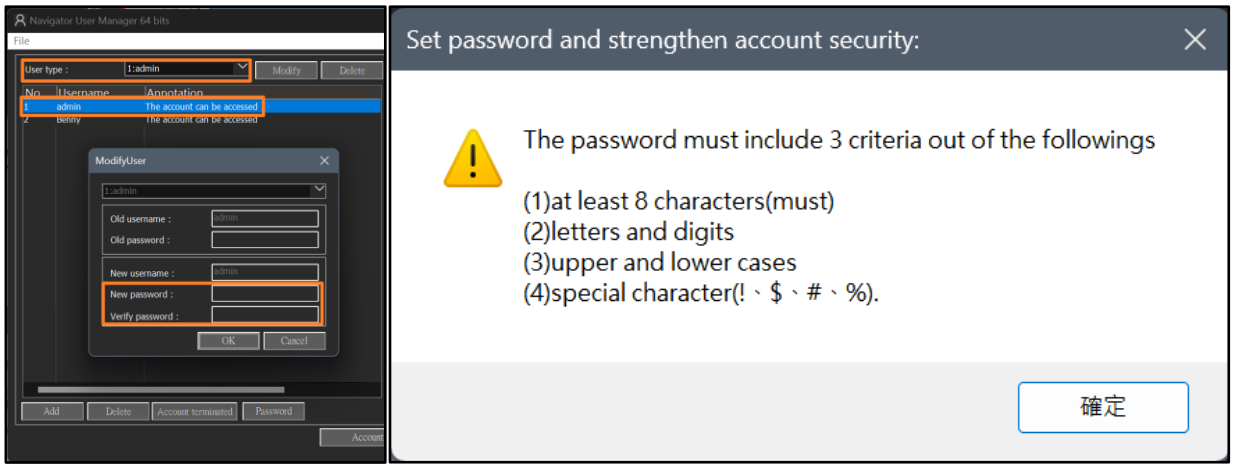
Chapter 1 User Management

The admin user account has administrative privileges and can manage various permissions including camera monitoring, playback, and settings for the accounts.

When logging in as a user administrator for the first time, a security warning will pop up, prompting you to create a new password.

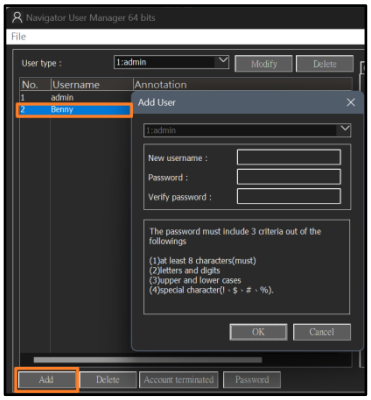


For the highest user administrator group, the default account is “admin” and the password is empty.
To strengthen the password security, the following four conditions must be met when creating a password.



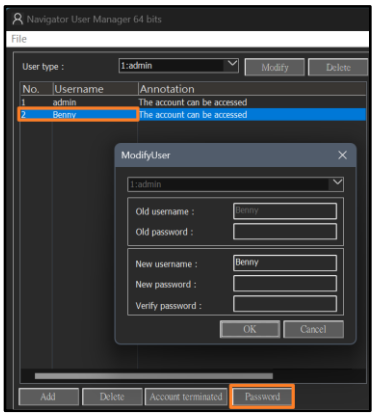
Chapter 1.1 Add a User

Please select access permission for the user, then, click on “Add**”** and enter the necessary information in the **Add User** dialogue box. Click on “OK**”** to save the settings.



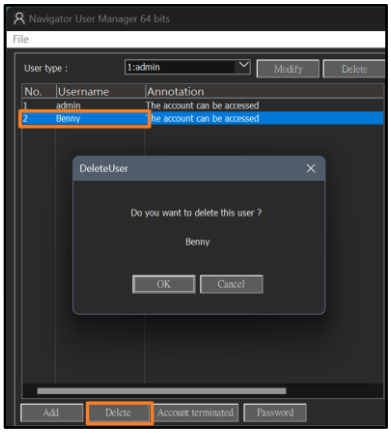
Chapter 1.2 Edit an Existing User:

Please select user type and a user, and click “Password” to change the password of the user.



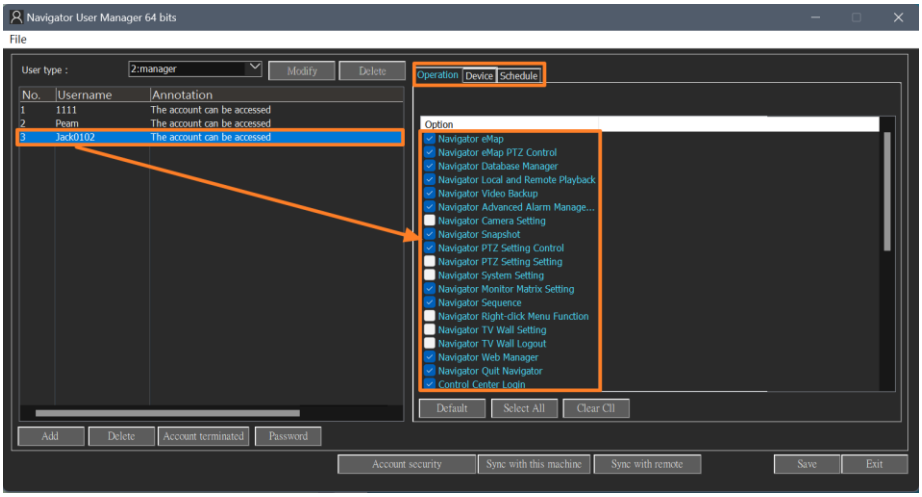
Chapter 1.3 Delete a User:

To delete a user, select user type and a user. Then, click “Delete” and “OK”.



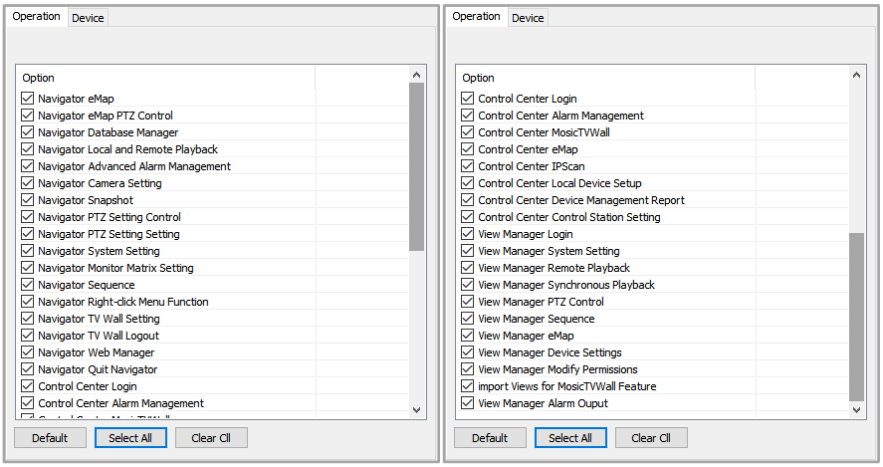
Chapter 1.4 User Authorization

You can specify each user access privileges to Navigator function. To authorize a user to have access in the function, click “Operation”. Then, check on the functions to grant the user the access rights.



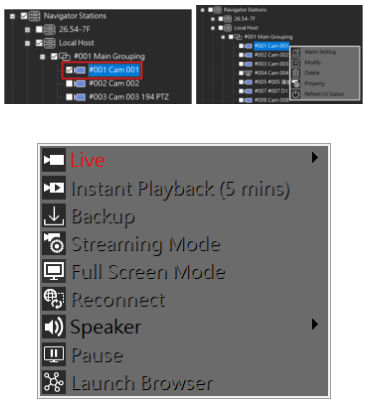
Chapter 1.5 Operation Access Management

Select user type and click on user. Then, click on “Operation” option, please check the required permissions. Then click on “Save” and “Exit” to save the settings.



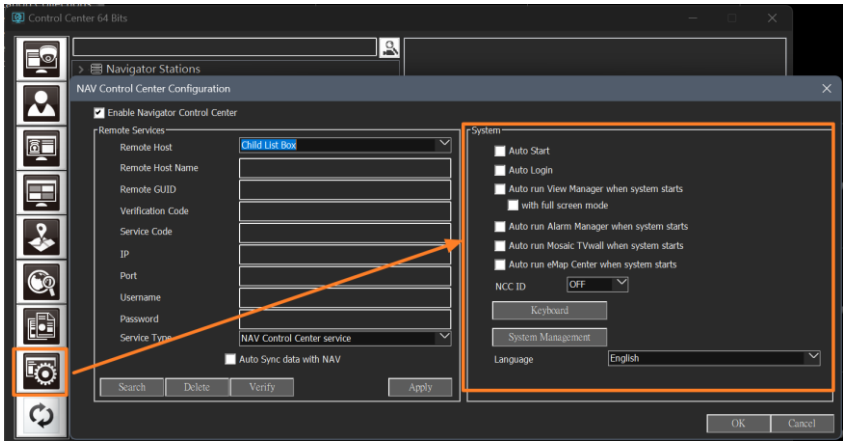
Function Permission Icons			
	Navigator eMap		Control Center Login
	Navigator eMap PTZ Control		Control Center Alarm Management
	Navigator Database Manager		Control Center MosaicTVWall
	Navigator Local and Remote Playback		Control Center Image Decoder Function
	Navigator Video Backup		Control Center eMap
	Navigator Advanced alarm Management		Control Center IPSan
	Navigator Camera Setting		Control Center Device Management Report
	Navigator Snapshot		Control Station Settings
	Navigator PTZ Setting Control		View Manager Login
	Navigator PTZ Setting Setting		View Manager System Setting
	Navigator System Setting		View Manager Remote Playback
	Navigator Monitor Matrix Setting		View Manager Synchronous Playback
	Navigator Sequence		View Manager Video Backup
	Navigator Right-click Menu Function		View Manager PTZ Control
	Navigator TV Wall Setting		View Manager Sequence
	Navigator TV Wall Logout		View Manager eMap
	Navigator Web Manager		View Manager Modify Permissions
	Navigator The Sofware Power Down		import Views for MosaicTVWall Feature
	-		View Manager Alarm Output
	-		View Manager Snapshot
			View Manager Window Close
			View Manager Window Minimize

Additional Description:

View Manager Modify Permissions		Tick or drag the mouse to the screen group to restrict permissions.

Chapter 2 Control Center Centralized Configuration System Settings

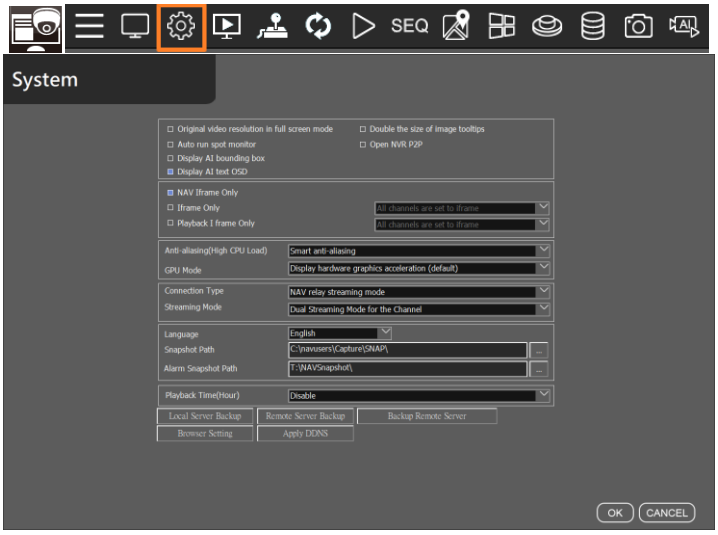
This is a tutorial on how to set the Control Center for automatic login and program startup, eliminating the need for tedious account login.



- Auto Start: Automatically launches Control Center when the system starts.
- Auto Login: Automatically log in to Control Center when the system starts.
- Auto run View Manager when system starts: Automatically execute View Manager when the system starts.
- With full screen mode: Automatically starts View Manager in full-screen mode when the system starts.
- Auto run Alarm Manager when system starts: Automatically logs in to Alarm Manager when the system starts.
- Auto run eMap Center when system starts: Automatically logs in to the Centralized EMap when the system starts.
- NCC ID: 931 keyboard ID, default setting is OFF.
- System Management: Memory and CPU usage upper limit control setting.
- Language: Select a language from the drop-down menu.

Chapter 2.1GPU Graphics Decode Setting

With hardware advancement in high-resolution movies, in addition to bringing better picture quality, it also brings more CPU usage. The GPU decoding method enables the system to perform multitasking operations while viewing CCTV. At present, GPU decoding supports NVIDIA 1030-level graphics cards and Intel® 530-level built-in displays. It also supports GPU hardware decoding functions for both NVIDIA graphics cards and built-in Intel displays. When the host has both NVIDIA graphics cards and motherboard Intel® built-in, Navigator optimizes resources based on system usage to achieve more channels or high-frame devices.



- Turn Off Graphics Hardware Acceleration
  Turn off Direct3D software decode acceleration, GDI traditional graphics mode display, and support old type without Direct3D graphic card.
- Graphics Hardware Acceleration Display(Default)
  Turn on CPU software decode acceleration, Direct3D graphic mode display, and supports new Direct3D graphic card.
- GPU Decode And Display, Display High Priority
  Turn on GPU hardware decode acceleration, graphic display is prioritized.
- GPU Decode And Display, Decode High Priority
  Turn on GPU hardware decode acceleration, decode display is prioritized.

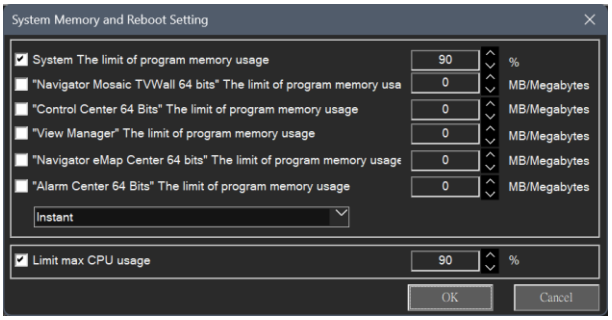
Note: If you want to experience more live image channels and high-frame video cameras, please upgrade the graphic card and computer memory, recommended NVIDIA graphic card memory is 4GB or more, and computer memory is 16GB or more.

Note: Standard Video Display Card with Windows Version		
NVIDIA Chip Architecture	Windows 10&11	NVIDIA Display Card Model (Support super*Ti)
Pascal Architecture GraphicsCard	Version 1607 or later	10 Series:GT1030,GTX1050,GTX1060,GTX1070, GTX1080,TITAN X/XP
Turing Architecture GraphicsCard	Version 1709 or later	16 Series:GTX1650&1660
		20 Series:RTX2060&2070&2080,Titan RT
		Quadro Series:RTX 4000,5000,6000,8000
		Tesla Series: Tesla T4
Ampere Architecture Graphics Card	Version 1803 or later	30 Series:RTX 3060,3070,3080,3090
Ada Lovelace Graphics Card	Version 22H2	40 Series: RTX 4060,4070,4080

Note: If you want to experience more real-time video channels and high-definition video cameras, please upgrade your graphics card and physical memory. The recommended NVIDIA graphics card memory is 4GB or more, and recommended physical memory is 32GB or more.

Chapter 2.2 Memory Protection and Watchdog Settings

When a computer system has multiple programs running at the same time, the system often divides the main memory into several areas and assigns them to each program. In order to avoid mutual interference when the program is running, the Navigator watchdog memory protection control mode must be used to limit the activity in the memory area of each program. This is the memory protection.



Memory Protection Setting

- System memory use limit: preset is 80%.
- “Navigator Mosaic TVWall 64 Bits” memory use limit: Mosaic TVWall, preset max limit 6144MB.
- “Control Center 64Bits” memory use limit: Control Center, preset max limit 6144MB.
- “View Manager 64Bits” memory use limit: View Manager, preset max limit 16387MB.
- “Navigator eMap Center 64Bits” memory use limit: eMap Center, preset max limit 16384MB.
- “Alarm Center 64Bits” memory use limit: Alarm Center, preset max limit，6144MB.

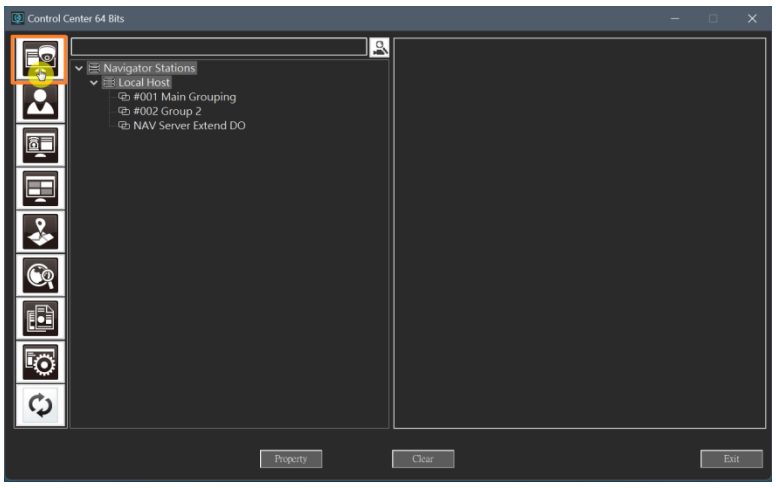
Watchdog detection reopening mechanism:

- Instant：When the system detects an abnormality, the software restarts immediately.
- Reboot at system reboot time: When the system detects an abnormality, the software automatically restarts at preset 00:00 night time.
- Limit max CPU usage: Set CPU usage to 95%

Note：When the system detects an abnormality 3 times consecutively, and still detected within 10 minutes, the computer will restart.

Chapter 3 View Manager Login

From the Control Center main menu, please click on button to access the View Manager monitoring screen.

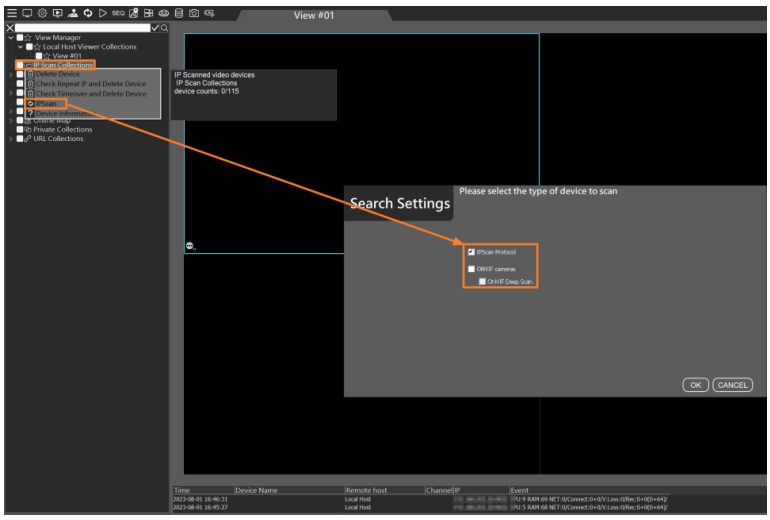


Chapter 3.1 How to Add a Device

The Navigator Control Center supports IPScan protocol. IPScan protocol is quite easy for adding NAV, NVR/DVR, and IP cameras.

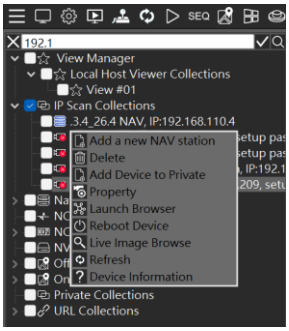
Chapter 3.1.1 IPScan

Mouse right click on “IP Scan Collection”, select “Refresh” and search for the supported DVR/NVR or IP camera within the LAN. The devices will be automatically scanned and archived to the IP Scan Collection.



For IP Scan feature, there are menu systems when mouse right click on the device. The features are described below:

- Add a new NAV station: Add a new device to the NAV video recording host.
- Delete: Delete all devices from IP Scan.
- Add Device to Private: Add a device to a custom group.
- Check Repeat IP and Delete Device: Delete IP duplicate LAN devices.
- Check Timeover and Delete Device：Remove LAN devices that have not been connected for an extended period.
- IP Scan: The IPScan scan the devices on a local area network (LAN).
- Device Information: IP scan details. (The total number of network devices scanned and the time of last scan.

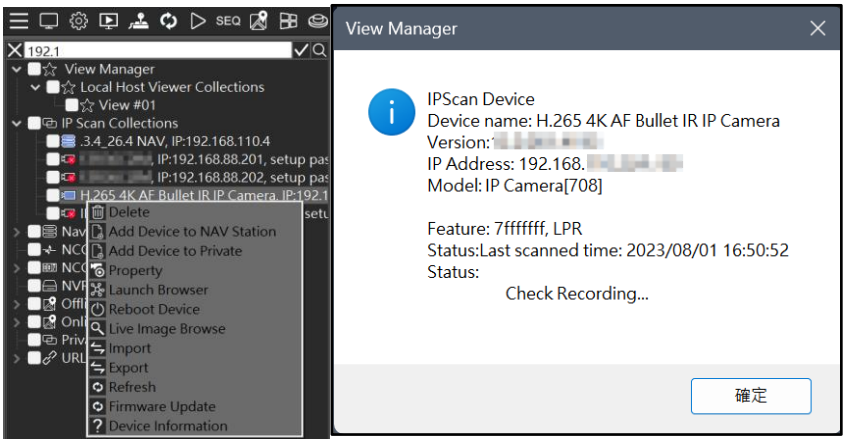


IPScan Function Description:

- IPScan Protocol: Quickly scans IP network area, all Navigator/DVR/DHD/NVR/IPCAM and other devices.
- ONVIF Cameras: Supports scanning various brands of IP camera or NVR devices, compatible with the ONVIF standard.
- Deep Scan: For each area IP network segment, performs a more detailed scan of various broadcast IP device addresses.

For the device feature on IPScan tree diagram, there are menu systems when mouse right click on the device. The features are described below:

- Delete: Delete a device from IP Scan.
- Add Device to NAV Station: Add a device to the NAV Station.
- Add Device to Private: Add a device to a specified group.
- Property: The property of a device.
- Launch Browser: Open the device with a browser via port 80.
- Reboot Device: Remotely reboot a device
- Device Information: Display the detailed device information including device name, firmware, IP address, MAC, model, and etc.
- Live Image Browse: Quick real-time image preview.
- Firmware Update: Device firmware update.
- Device Information: Provides detailed information about the device, including its name, firmware version, IP address, MAC address, model, and other relevant details.



The device information is described as follows:

- Device name: The device name.
- Version : The device firmware version.
- IP Address: The device IP.
- Model: The device type.
- Status: The device status.

The status is described as follows:

- Last scanned time: The last scan time of the device.
- Check connection: The device has not been detected on the Internet for more than a day (ex:Device lost).
- Check Recording: The device has not been added to any NAV host for recording.
- View setup: The device has not been added to any view group.
- Setup Device: The device (has an account and password set) but has not been connected to obtain information (ex: IP Cam profile, DVR/NVR max channel...).
- Setup password: The connection account password of the device has not been set.

Chapter 3.2 Device Status Icon

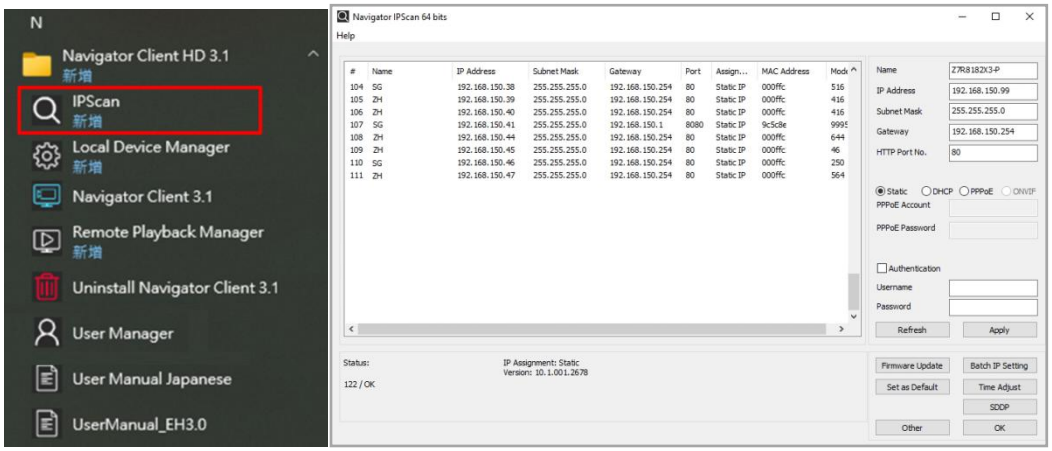
Navigator Control Center can display the device connection status. Device status icons are useful for system installers to identify and to diagnose the issues of remote devices.

The statuses of devices are described below. These can help installers to troubleshoot the settings of an installation site.

Icon	Device status	Icon	Device status
	NAV: IPScan OK		Camera: IPScan OK
	NAV: IPScan NG, connection: NG		Camera: IPScan NG, connection: NG
	NAV: IPScan OK, connection OK, authentication: OK		Camera: IPScan OK, connection OK, authentication: OK
	NAV: IPScan OK,NCC OK		Camera: IPScan OK,NCC OK
	NAV: IPScan OK, View Manager OK		Camera: IPScan OK, View Manager OK
	NAV: IPScan OK, NCC OK, View Manager OK		Camera: IPScan OK, NCC OK, View Manager OK
Icon	**Device status**	**Icon**	**Device status**
	NVR/ DVR: IPScan OK		PTZ: IPScan OK
	NVR/ DVR: IPScan NG, connection: NG		PTZ: IPScan NG, connection: NG
	NVR/ DVR: IPScan OK, connection OK, authentication: OK		
	NVR/ DVR: IPScan OK,NCC OK		
	NVR/ DVR: IPScan OK, View Manager OK		
	NVR/ DVR: IPScan OK, NCC OK, View Manager OK		

Chapter 3.3 Find Device

IPScan utility can scan through all IP address in the LAN to locate devices.



Press IPScan and select a device in IPScan to manually add devices of IP Fast Dome, IP camera, video server, or DVR.

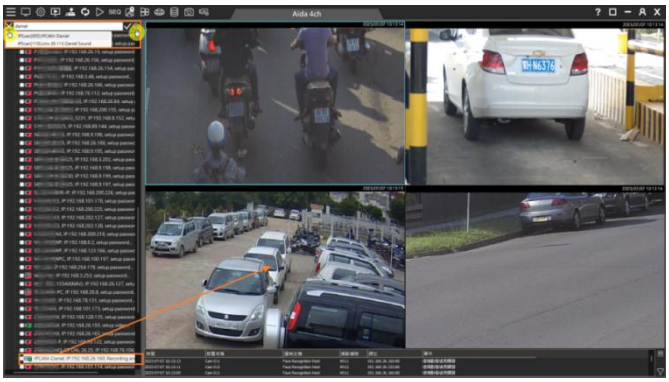
Note: IPScan can only work under a LAN environment and does not support an Internet environment.

Chapter 3.4 Device Status Message

- Check connection: If the device is not scanned by NAV Control Center or NAV View Manager, the message, device lost, gets shown after the device name for showing to the operator for troubleshooting.
- Check Recording: The device has not been assigned to any NAV recorder, if you need the device for recording. Please assign the device to an NAV recorder.
- View setup: The device has not been assigned to any View Manager. If you want live monitoring, please assign the camera to a View.
- Setup Video: The device has passed the authentication, but the camera's video profile or DVR/NVR's streaming information cannot be acquired. Make sure that the camera or the DVR/NVR is supported by NAV Control Center or NAV Recorder.
- Setup password: The device has not been setup for it username and password. Please enter the username and password for this device.

Chapter 3.5 Device Filter & Quick Camera Browsing

To create a camera display screen, drag the camera and DVR/NVR to the **camera view**. If you want to quickly browse the camera screen, move the mouse to the scanned IP camera and the camera information along with the snapshot will be displayed.

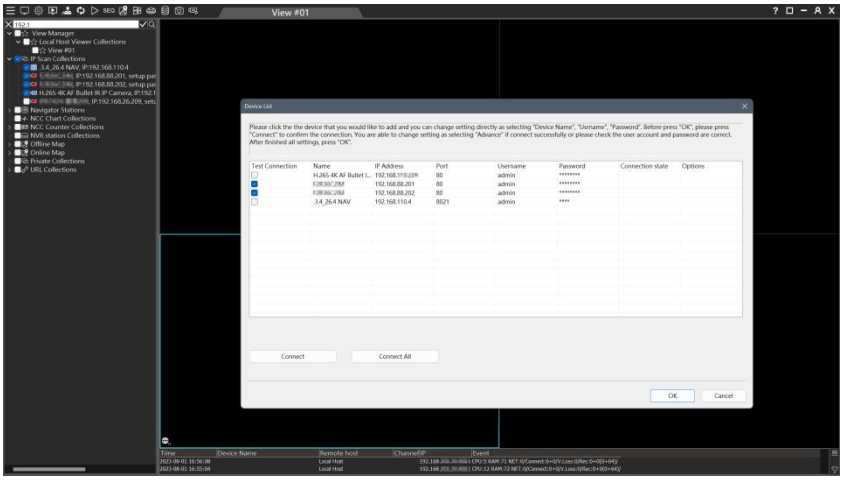


To manage hundreds or thousands of cameras, you can use the device filter to quickly search for the device. Enter the keyword of the device to be searched, and click ☑ to select the searched camera in the quick box. Then, drag the camera to **camera view** to quickly create and manage the camera.

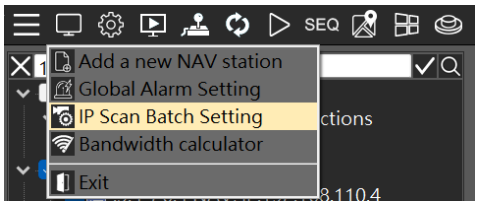
Click on 🔍 to search for the device. To end search, click on ✖ to clear the search keyword.

Chapter 3.5.1 Batch IP Cameras Settings for Username and Password

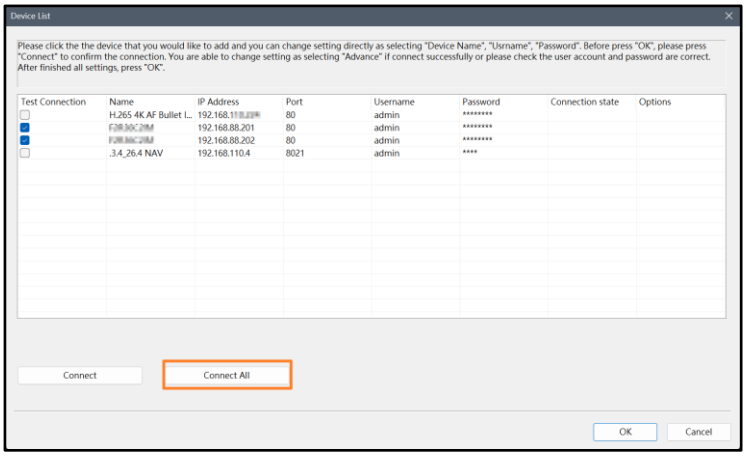
For quick setup of cameras all at once, enter the device name in the Device Filter. Click ☑icon for selecting the cameras for setting username and password.



Click the menu ☰icon in the upper left corner. Then, click on IP Scan Batch Setting

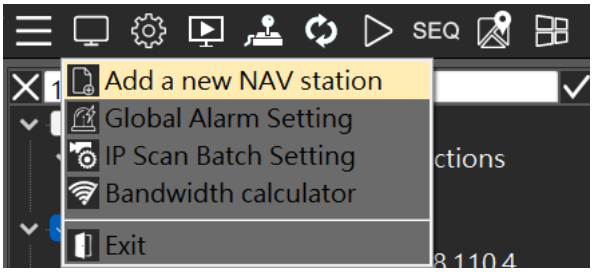


Please confirm the connection status of the device, and then enter a valid account and password. Then, click OK.

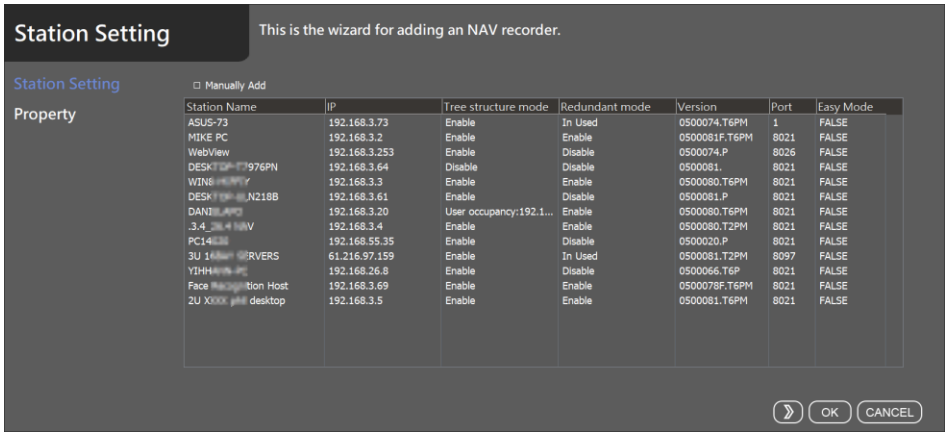


Chapter 3.6 How to Add a Navigator to View Manager

To add a Navigator, click on “Main Menu” and select “Add a new NAV station”. Then, the online NAV station can be added.



On the Station Setting page, click on the scanned NAV station, and click OK. The NAV station will be added in the Navigator Control Center.

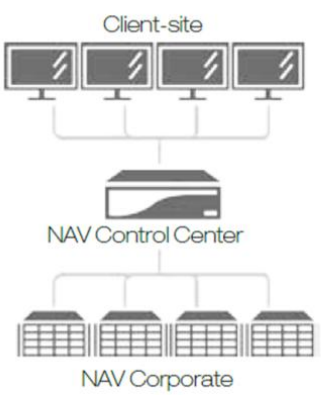


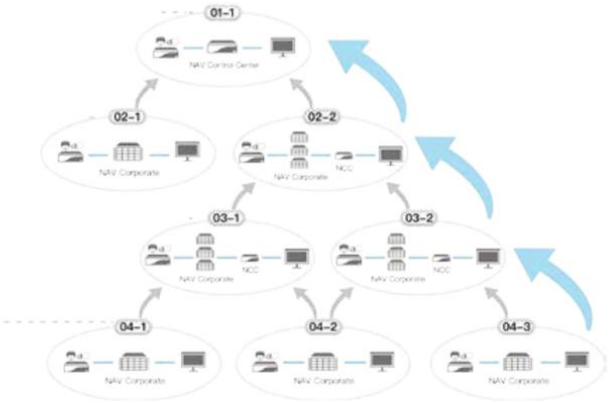
For adding NAV station manually, click on **Property** and fill in the related information on the fields below to connect to remote Internet devices. For information security, below data must be set to connect to the remote NAV station:

- Verification Code (Default)：Please use the default value. Advanced use of NAV station and NCC should be matched.
- Service Code (Default)：Please use the default value. Advanced use of NAV station and NCC should be matched.
- IP (Required)：IP address of the NAV station.
- Port (Required)：Port number of the NAV station. The default port is 8021.
- Username (Required)：The username of the NAV station.
- Password (Required)：The password of the NAV station.
- Service Type： NAV station redundant mode or NAV station tree structure mode. The service type is described below:

The service types include redundant mode and tree structure mode. Below left diagram is the NAV station redundant mode, and below right diagram is the NAV station tree structure mode.

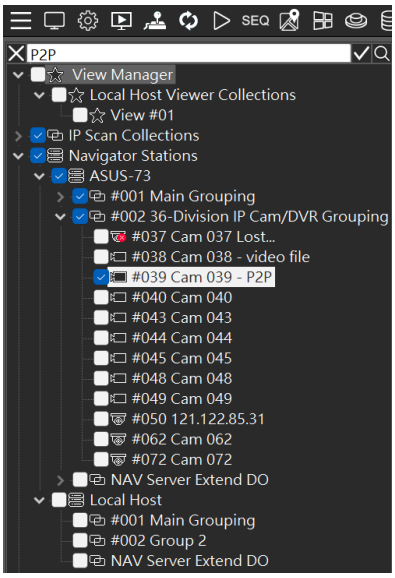
- NAV Redundant Mode: suitable for single point multiple camera installation.
- NAV Tree Structure Mode: suitable for multiple points, multiple layers camera installation.



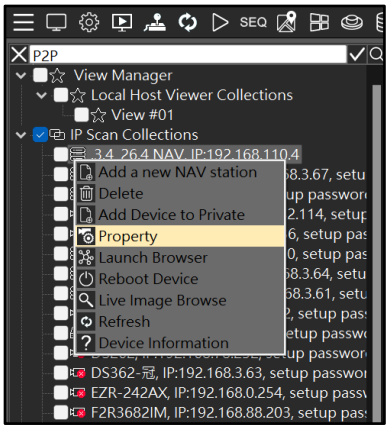


Chapter 3.7 Add a DVR/NVR to the View Manager

Add the DVR/NVR to IP Scan Collection, and the scanned devices can be quickly added.



Mouse right click on the menu **Property** to set the NVR/DVR related settings including IP address, username and password.



- Name: Name of the camera.
- IP/DNS (Required Field): IP address of the camera
- HTTP (Ex 80): The network communication port for the camera, DVR, or NVR.
- HTTPS Port (Ex 80): The HTTP port number of the camera, DVR or NVR.
- Onvif Port (Optional Field): Standard ONVIF protocol third-party device.
- Camera Video Port: RTSP URL for a camera if you want to use RTSP URL for video connection.
- Subnet Mask: Device's subnet mask.
- Gateway: Gateway address of the device.
- Username: The username for the camera.
- Password (Required Field): The password for the camera.
- Main Stream: Main stream resolution.
- Sub Stream: Sub stream resolution.
- Synchronize Time with PC: Time and date can be synchronized to NVR/DVR through the View Manager server. (Excluding time zone and other settings.)

Chapter 3.7.1 Video Settings of Device IPCAM Property

This page describes how to set the video parameters.

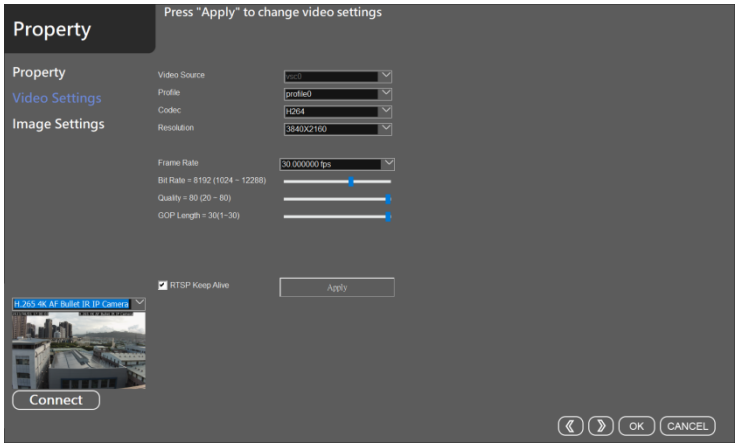
- Video Source: IPCAM image source device.
- Profile: Main Stream, Sub Stream, JPEG compression codec settings.
- Codec: H.265, H.264, JPEG compression mode.
- Resolution: Screen resolution switch.
- Protocol: RTP/UDP/TCP/HTTP Network protocol settings.
- Frame Rate: Frame rate of the device image.
- Bit Rate: Device bit rate.
- Quality: Device video quality.
- GOP Length: Video stream is the arranged succession of pictures between I frame and I frame.
- RTSP Keep Alive: Supports traditional cameras to force open RTSP connection.

Chapter 3.7.2 Image Settings of Device IPCAM Property

This page describes how to set the image parameters.

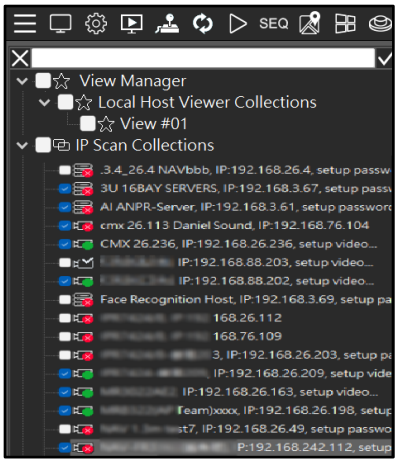
- Brightness: Camera image brightness.
- Contrast: Camera image contrast.
- Saturation: Camera image saturation.
- Sharpness: Camera image sharpness.
- White Balance Mode：Camera color temperature and white balance (Cb: Chromacity of blue and green, Cr: Chromacity of red and green).
- BLC Mode: Increase light exposure for low bright area.
- WDR Mode: When exposed to strong light sources and low-brightness areas simultaneously.
- IR Cut: When there is sufficient visible light (for example: daytime), the infrared filter will block infrared rays from entering the image sensor, and the camera will only receive visible light, and its image will show true colors. When the visible light is insufficient (for example: at night), the infrared filter will be disabled, allowing infrared rays to enter the image sensor, so that the camera can make full use of all

the light and improve the low-light performance. In practical applications, when the infrared filter is disabled, the camera will automatically switch to black and white mode.



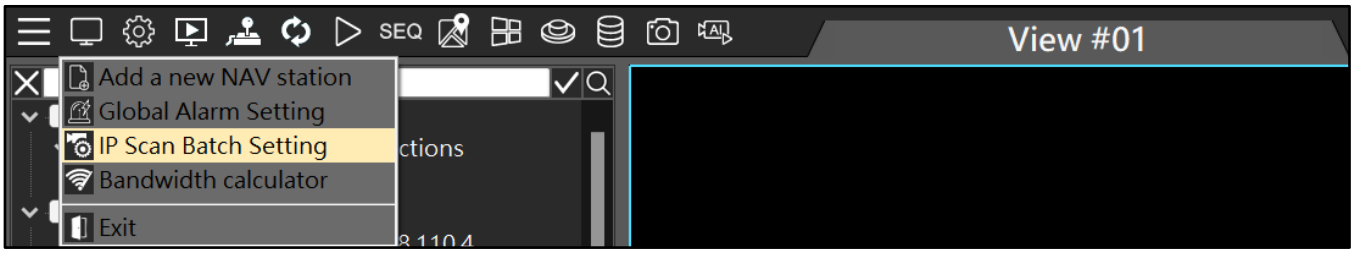
Chapter 3.8 Quick Add a Device Group IP Camera / NVR / DVR

You can customize and select a different IP camera, NVR and DVR. And quickly set the connection account password at the same time.

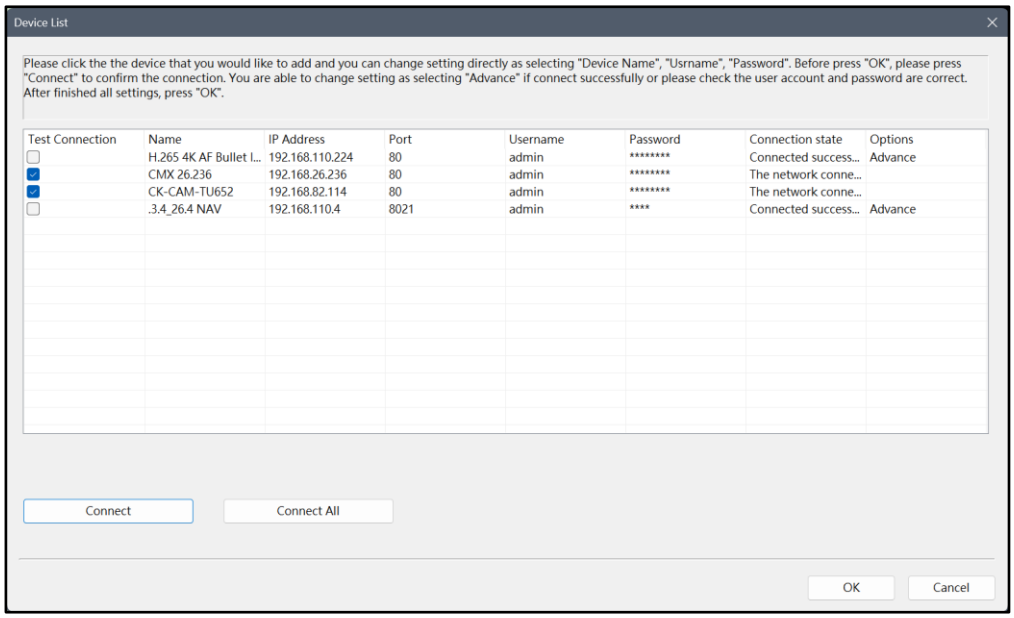


Note: The View Manager supports connecting multiple DVRs. If the connected 16-ch DVR reached 3 units and above, the View Manager will display I frame.

Click the ☰ "**Menu"** in the upper left corner, click on ⚙ "**Device Connection Setting**"

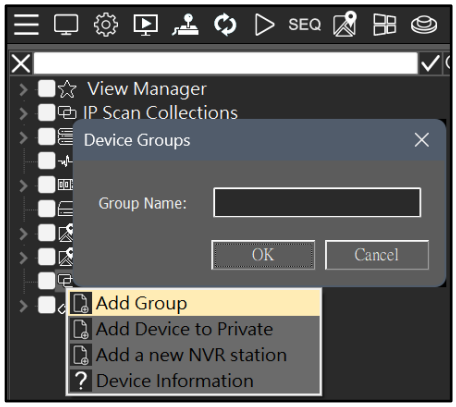


Please confirm the device's connection state and enter a valid username and password. Then, click on "**OK**".

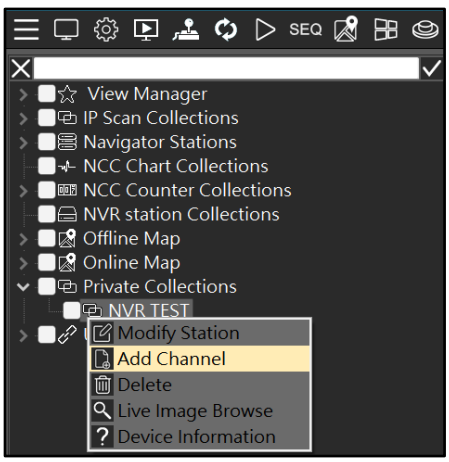


Chapter 3.8.1 Add a Remote DVR/NVR to View Manager

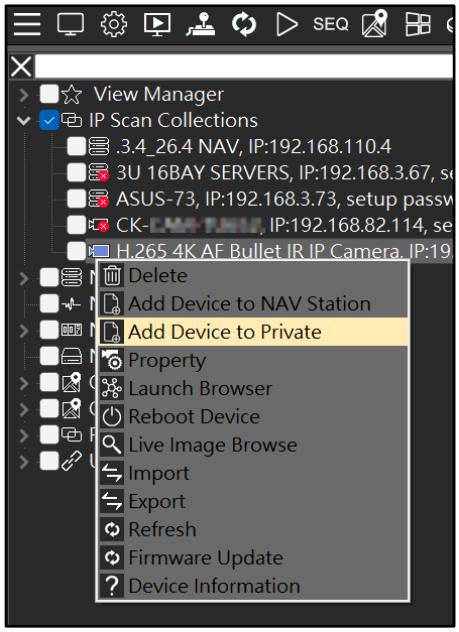
For adding a remote DVR/NVR via Internet, right-mouse-click on "Private Collection" for select "Add Group" for a DVR/NVR.



Select the added group, right-click on "Add Channel".

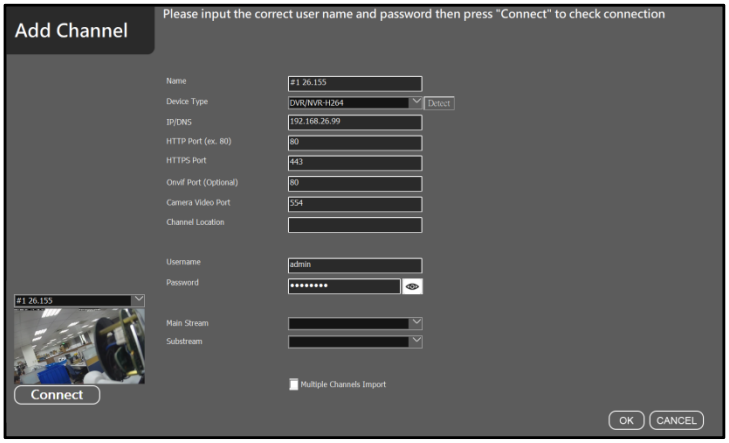


Or search IPCAM/DVR/NVR from IPScan and add the device to private.

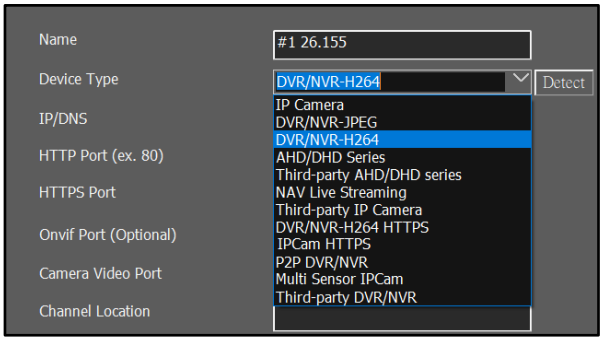


Please enter the IP/DNS address, HTTP communication port, ONVIF communication port, image port, username, and password.

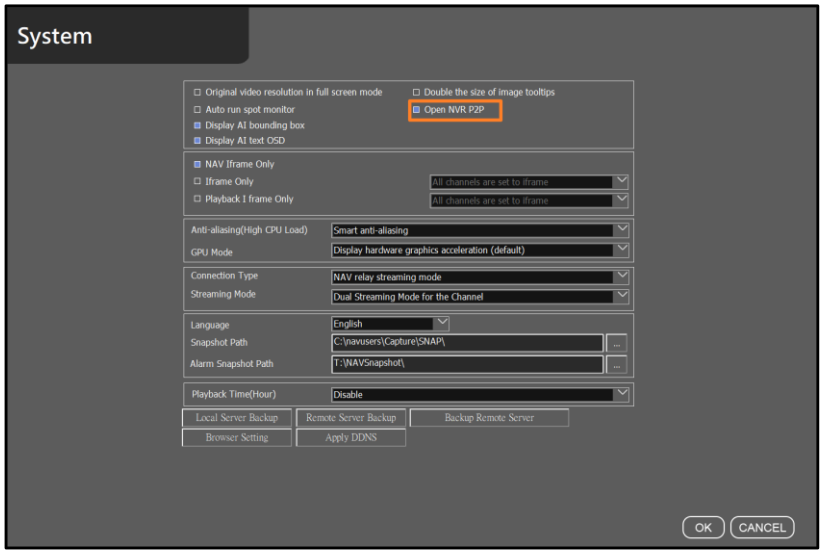
Click on “Connect” button to connect to the DVR/NVR image screen. And access the live video, remote playback, and backup functionalities after the settings are completed.



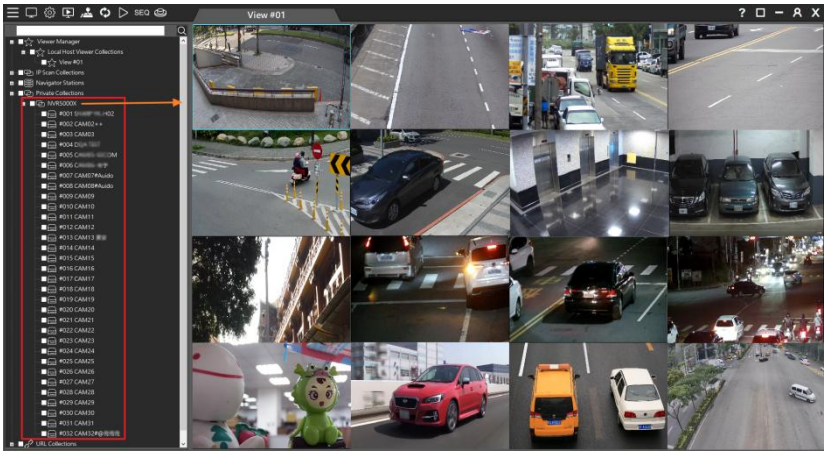
If you forget the device type, please click on "Detect" to automatically select the device type.



Before adding a P2P NVR/DVR model, please go to the setting page and tick on "Open NVR P2P".

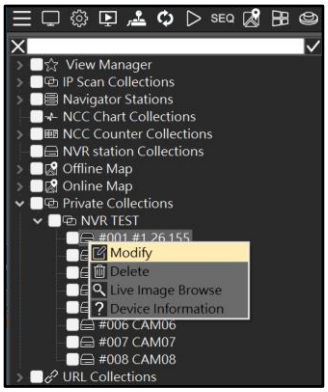


After completing the setting, drag the mouse to add it to the screen group, and you can start to watch real-time images, remote playback, and backup and other functions.



Chapter 3.8.2 Modify Custom Groups Connection Information IPCAM/NVR/DVR

Select the group, right-click on "Modify".

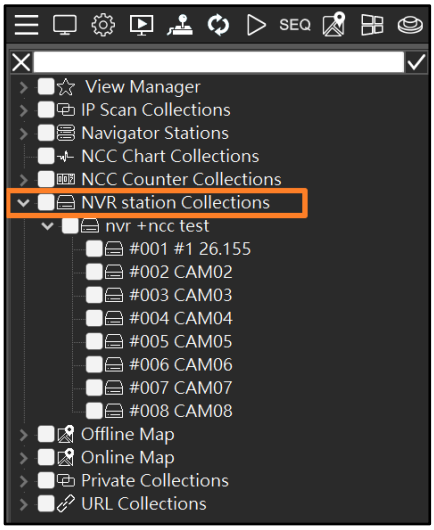


Modify the IP/DNS address, HTTP port, ONVIF port, video port, username and password. Then click the Connect button to connect to the IPCAM/DVR/NVR video screen. When the settings are completed, you can start to use the functions including live view, remote playback, and backup.

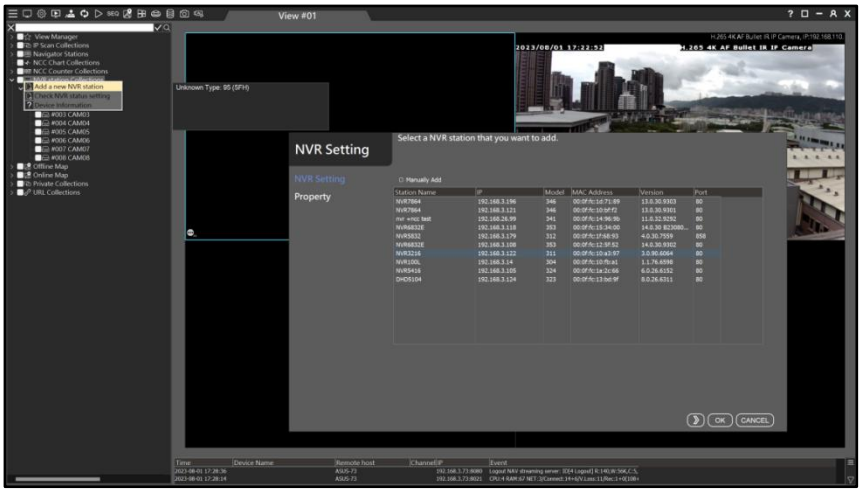
Chapter 3.8.3 NVR Station Collections

NVR Station Collections have evolved into a tree diagram concept of the host group, while also have the synchronized remote alarm settings, channels, and hard disks information

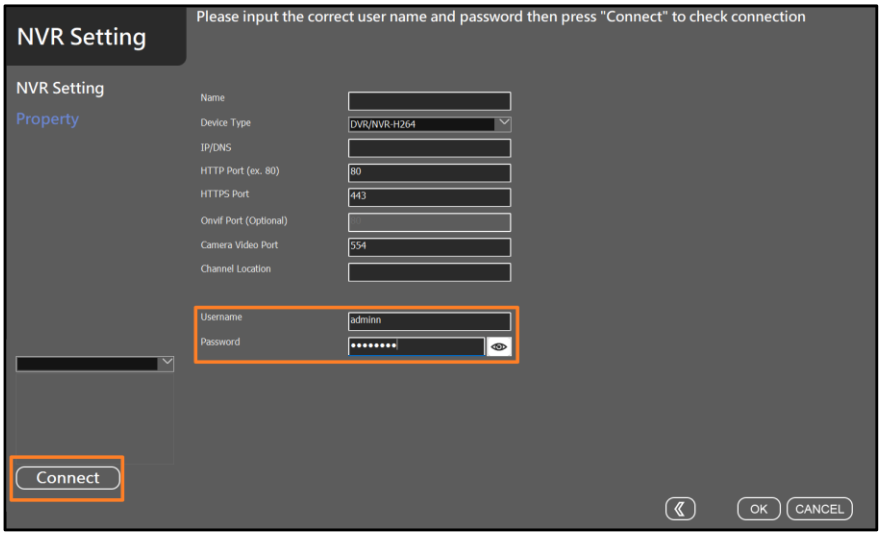
.



Now there's a simpler way to add NVR hosts to NVR Station Collections. On a custom group mouse right-click menu, select "Add a new NVR station," and all NVR hosts in the local area network will be scanned.

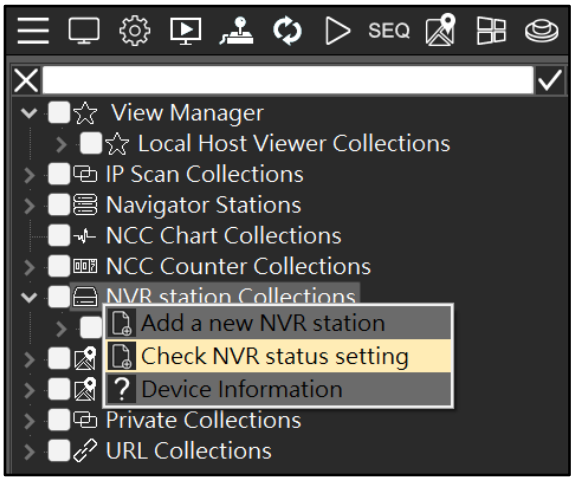


After selecting the NVR host, click on the properties page and confirm the account and password to connect. It will be automatically added to Station Collections.

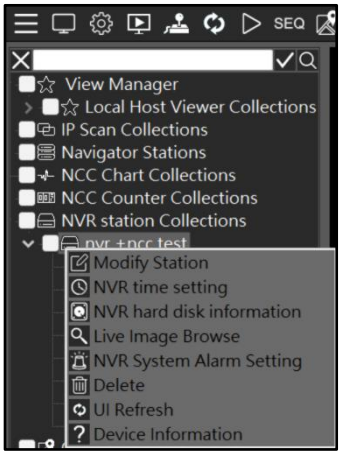


The NVR Station Collection right-click menu functions are as follows:

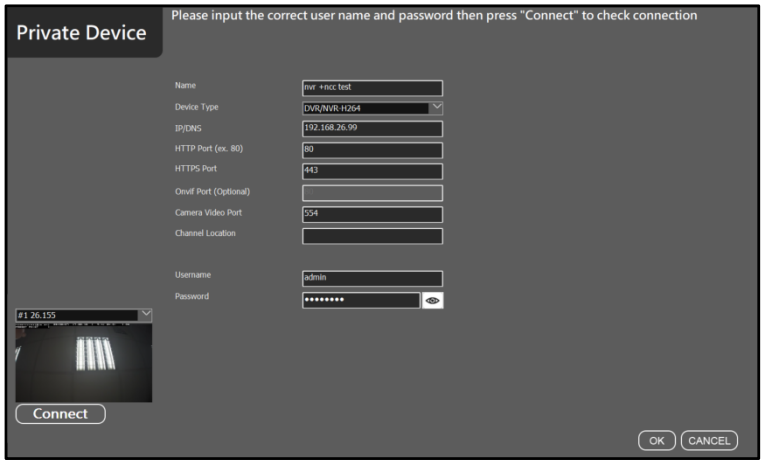
- Add a new NVR station: Add all NVR hosts in the local area network.
- Check NVR status setting: Quickly check the status of the added NVR hosts.



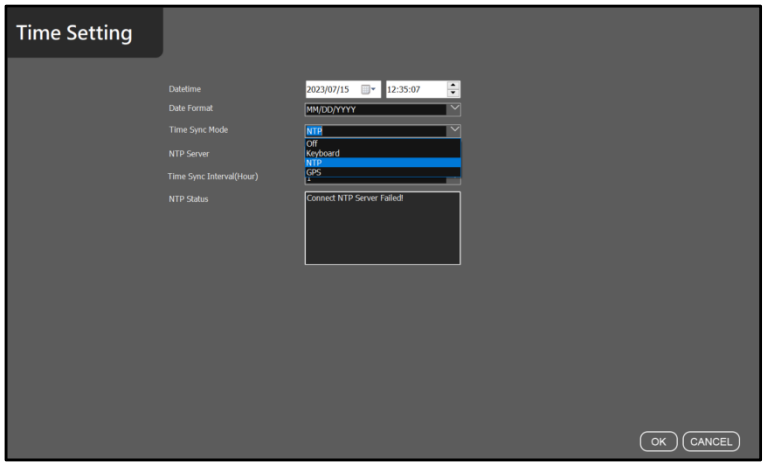
The NVR host right-click menu functions are as follows:



- Modify Station：Modify the added NVR host settings, such as account password and web port.

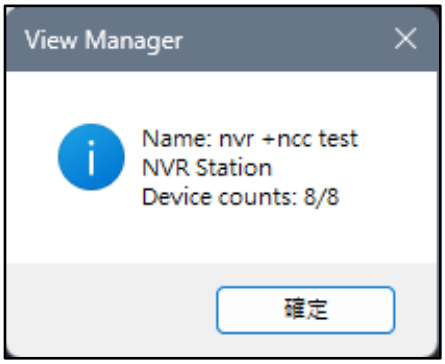


- NVR time setting: Modify NVR date and synchronize the time with the NTP server.



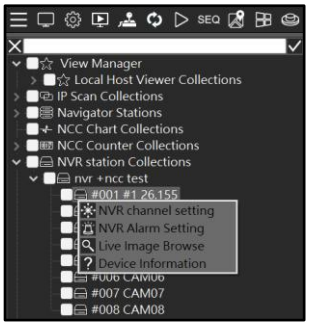
- NVR hard disk information: Check the NVR hard disks status, model, capacity, and health status.

- Live Image Browse: For added devices or NVRs, quickly view real-time video and automatically create group split screen for viewing.
- NVR System Alarm Setting: Temporarily not available.
- Delete: Delete the device.
- UI Refresh: Update the status of remote devices.
- Device Information: NVR device name and the total number of connected channels.



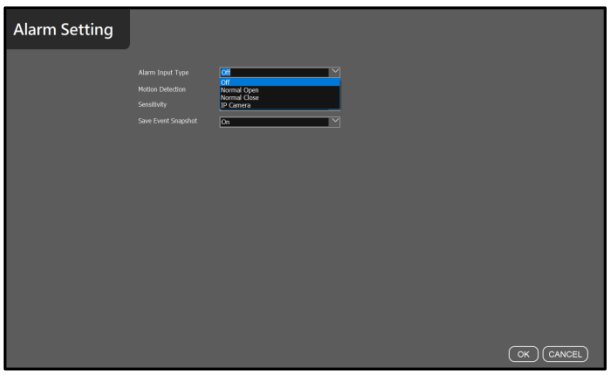
Chapter 3.8.4 NVR Host Group Channel and Alarm Settings

NVR host group, connected IPCAM right-click menu function.



NVR channel setting: Remotely synchronize the settings of IPCAM connected to the NVR, such as account password, number of streams, and connection types.

NVR Alarm Setting: After the NVR DO or NVR connection IPCAM DO is triggered, the alarm starts the event screenshot.



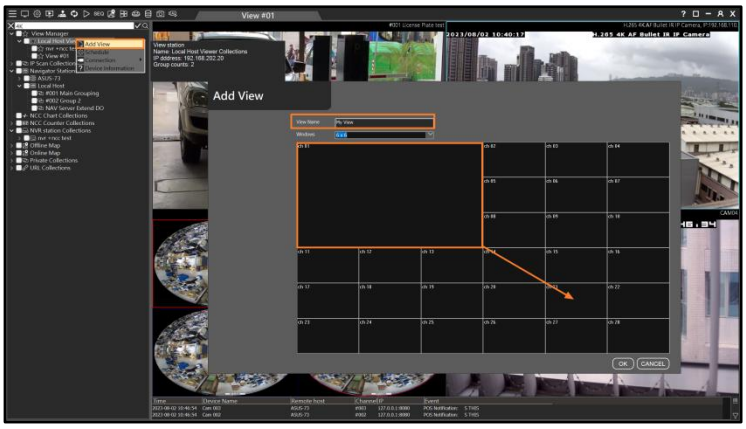
Chapter 3.9 Window View

Create different layouts to suit various usage scenarios and organize them through canvas editing and categorization.

Under “**View Manager”**, mouse right-click and select “**Add View”**, then fill in the following fields:

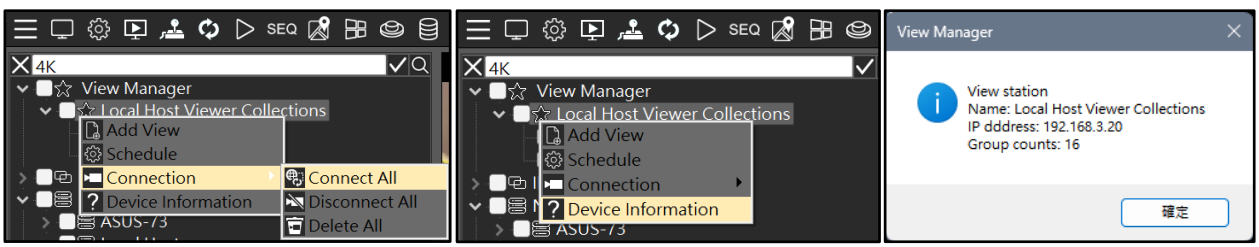
- View Name：Enter the view name.
- Windows：Select the camera split screen view.

To flexibly set the camera group, please use the mouse cursor to drag the grid for defining the split screen.



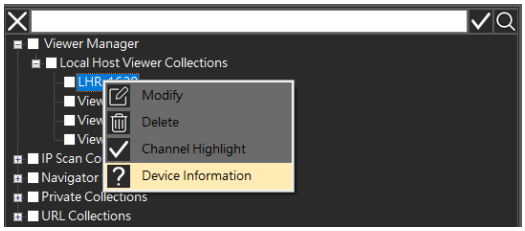
Chapter 3.9.1 Local Host Viewer Collections Right-Click Menu

- Add View: Add group view on split screen.
- Schedule: Set the viewing permissions of the view group.
- Connection: All devices are connected, all devices are disconnected, and delete all channels of the group.
- Device Information: The Local Host connected IP address and connected group.



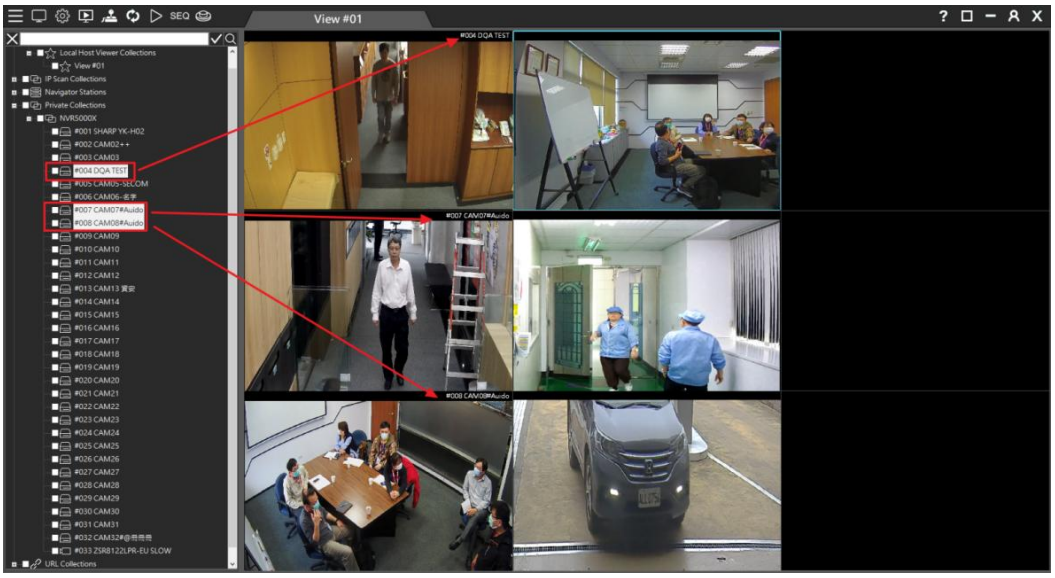
Chapter 3.9.2 View Group Right-Click Menu

- Modify: Modify group name and split screen.
- Delete: Delete a group.
- Channel Highlight: Quickly fine new devices in the group.
- Device Information: Group name, group number, number of divisions, number of connections.



Chapter 3.9.3 Select On-Screen Camera

Quickly find the added devices in the group and highlight them to get attention and serves as a reminder.

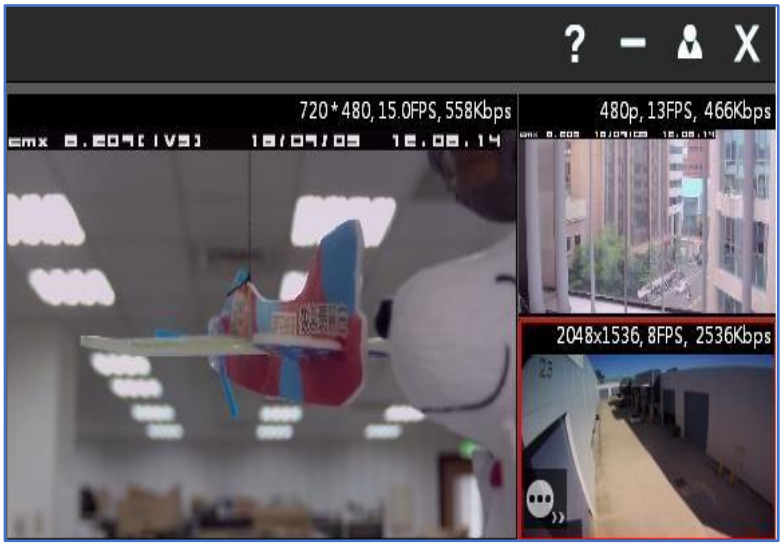


Chapter 4 Live Monitoring of View Manager

You can view the monitoring screens of multiple cameras simultaneously on the View Manager, and can display up to 144 live video streams across dual screens. You can view and manage a large number of camera real-time images on a single channel, and have full control over all monitoring information at once.

Chapter 4.1 Function Keys of Channel Screen

Press **F2** to see the bitrate and frame rate (FPS) information, which can be used to determine the smoothness of the video. When the bandwidth is very low, a user chooses a proper stream according to the bandwidth information.



Press F2 to see the device name and time combination display mode. There are 6 display modes as follows:

Hide Device Name	Display Device Name	Display Device Name and Time (HMS)
		
Display Device Name, Date (YMD) and Time (HMS)	Display Time (HMS)	Display Date (YMD) and Time (HMS)
		

The device streaming has 2 display modes available.
The following information can be displayed:

1. Resolution, Number of Frames (FPS), Streaming Size (bitrate), channel number
2. Resolution, Number of Frames (FPS), Streaming Size (bitrate), channel number [QXX,CXX,4p/5p]

The Q, C, P, i, j numerical description is as follows:

Q (Queue Value)	Image processing buffer reference value, theoretically Q10 is the best. ● The lower queue reduces the delay, but it will be affected by network packets and the video data will not be received completely. ● The higher queue will lead to the delay that will cause uneven picture.
C1	CPU processing thread “C1~C4”. If the image needs higher CPU processing, for example: 60/120/4K fisheye camera.
I	Intel GPU Decode
N	Nvidia GPU Decode
4P	H.264 P-frame
5P	H.265 P-frame
4i	H.264 i-frame
5i	H.265 i-frame
j	JPEG

GPU Decode is described as follows:

- CPU Decode(C)：The Intel CPU system automatically determines how many threads the device requires (C1~C4)
- Intel GPU Decode(I)：Supports Intel HD530 series and above.
- Nvidia GPU Decode(N)：Supports Nvidia GTX 1030 series and above.

In the early days when monitoring computers have to display multiple channels, but the CPU performance is insufficient, GPU decoding functions are used to greatly reduce the burden on the CPU and provide more analytic video monitoring through the graphics card. But now, the CPU performance is sufficient to cope with it and additional graphics card GPU is no longer required to aid the CPU.

List of Display Resolution is as follows:

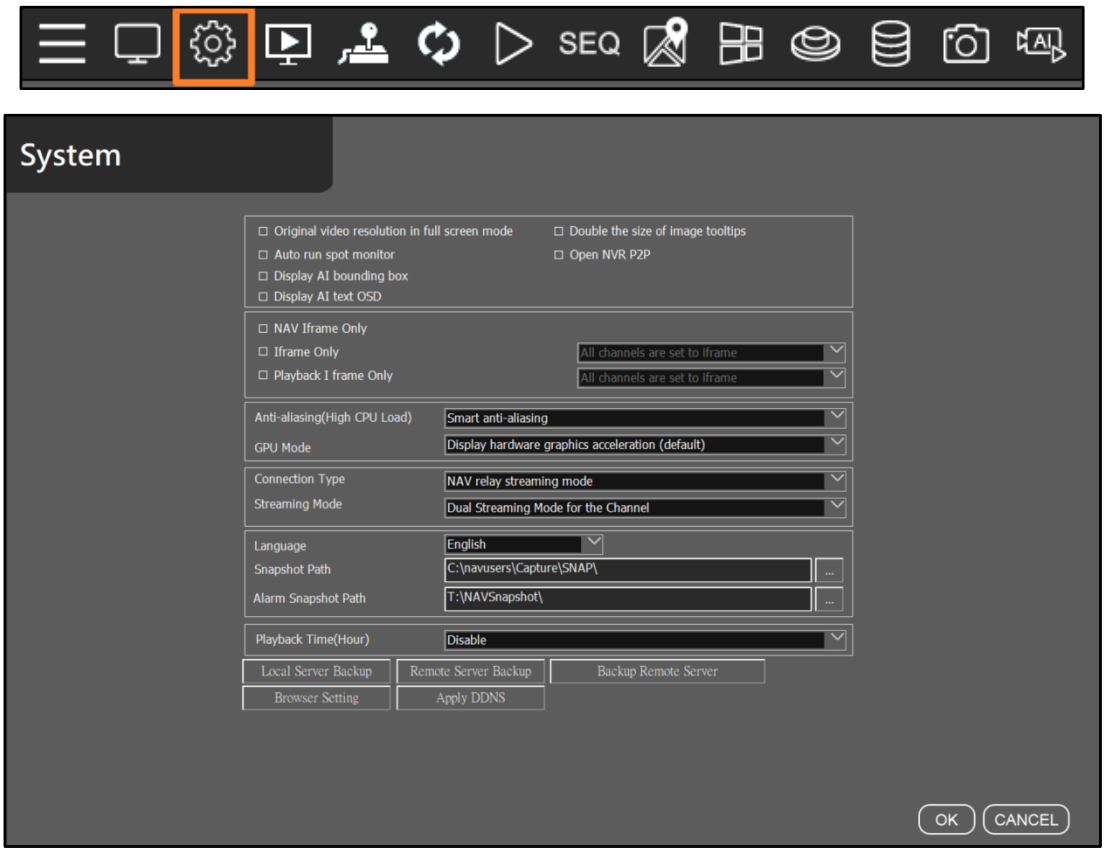
CIF	320x240
VGA	640x480
480p	720x480
720p	1280x720
FHD	1920x1080
WFHD	2560x1440
QFHD	3840x2160

Chapter 4.2 Configure Live View Group

Click “Private Collections” to drag a device from the left pane to the right pane. You can also check multiple devices and drag them to the right.

Chapter 4.3 View Manager System Settings

Click on “System” to set the view manager’s image decoding settings. The instructions are as follows:



1. Original video resolution in full screen mode: The size of the device original image (if not checked, the system will automatically adjust the image to the best suitable display area).
2. Auto run spot monitor: Automatically activate the spot monitor every time the View Manager is launched.
3. Display AI bounding box: Whether to display the detected AI object frame on the Edge front-end or AI Engine camera.
4. Display AI text OSD: Whether the Edge front-end or AI Engine camera displays the detected AI alarm triggered SOD (Scene Object Detection) text.
5. Double the size of image tooltips: The size of the tree diagram detailed device information is doubled.
6. Open NVR P2P: Check to enable the NVR P2P connection function.
7. NAV Iframe only: When running with NAV simultaneously, the NAV real-time video channel displays one frame per second to reduce CPU load.
8. Iframe Only: The live view channel only displays one frame per second to reduce CPU load.
9. Playback I frame Only: The playback channel only displays one frame per second to reduce CPU load.
   - All channels are set to iframe: All channels display one frame per second to reduce CPU load.
   - Channels not selected are set to iframe: The selected channel displays normally, and the remaining channels only display one frame per second.
10. Smart Anti-aliasing: Smart channel image edge smoothing.
    - Anti-aliasing mode (High CPU Load): Utilize CPU resources to soften image edges.
    - Disable anti-aliasing: Disable image edge smoothing.
11. GPU Mode: CPU hardware accelerated video decoding (Default)

- GPU decode and display, display high priority: Intel or NVIDIA graphics card GPU hardware accelerated display and decoding. Image displays first priority, image quality and bandwidth second priority.
- GPU decode and display, decode high priority: Intel or NVIDIA graphics card GPU hardware accelerated display and decoding. The video channel will be displayed after decoding.

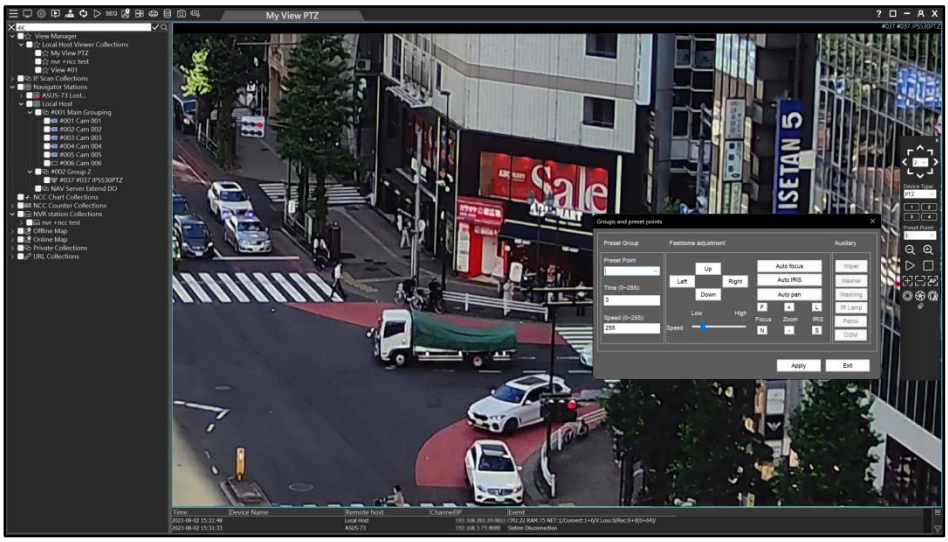
12. Connection Type: IPCAM/NVR/DVR device connection mode and NAV server image relay mode. (**Note**: NAV recorder only)
13. Streaming Mode: The default streaming mode of the device, when the device is dragged to the View Manager, this streaming mode will be used to create the camera canvas. If the network bandwidth is very low or the CPU computing power is limited, the SD Streaming (720 x 480) standard can be used. If the network bandwidth is good, please use Dual Streaming mode. If Streaming Mode is set at "Low Bitrate Mode", it will display one frame per second, which can be used to decode more than 144 frames to reduce CPU computing requirements and use lower bandwidth.
    - Dual Streaming Mode: Dual Streaming Mode (Multiple split screen SD, Full screen HD)。
    - HD Streaming: Main stream HD mode.
    - SD Streaming: Sub stream SD mode.
    - SD Streaming at Low Bitrate Mode: Substreaming low bandwidth mode.
    - HD Streaming at Low Bitrate Mode: Mainstreaming low bandwidth mode.
    - Dual Streaming at Low Bitrate Mode: Dual-streaming low bandwidth mode .

    Note: Streaming at Low Bitrate Mode supports connected to NAV recorder only.
14. Language: View Manager display language.
15. Snapshot Path: Snapshot storage path.
16. Alarm Snapshot Path: The storage path of the alarm screenshot.
17. Playback Time (Hour): The maximum duration for playback mode, in hours.
18. Local Server Backup: Backup of device IP tree diagram, user account, license plate, face recognition list and NAV group device setting on the local device.
19. Remote Server Backup: Backup the configuration file from the remote end, or backup to the remote end.
20. Backup Remote Server: Save the configuration file back from the remote end, or save it to the remote end
21. Browser Setting: Support Edge, chrome, IE browser call default mode.
22. Apply DDNS: This new function is not available yet.

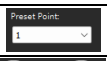
Chapter 4.4 PTZ Control& Setting

Select a PTZ camera and click “**PTZControl”** . Features include preset positions, PTZ controls, auto focus, and zoom in and out among others. These features can be operated via the network.

Click on PTZ “Advance Setting” button. You are able to setup the PTZ position and save the preset positions.



PTZ Control Panel Description:

Icon	Function	Description
	Direction Button	Rotate the PTZ to 8 different directions including up and down, left and right, upper right and lower right, upper left and lower left.
	Moving Speed	Select to adjust the speed of PTZ rotation (up to 7x).
	Device Type	Select supported camera device type, ePTZ, PTZ, auto focus, Fish Eye.
	Preset Recall	Up to 4 preset points can be recall instantly.
	PTZ Preset Point	Up to 128 preset points can be programmed.
	Zoom -/+	Adjust digital zoom out/in.
	PTZ Auto Pan	Enable Auto Pan, Disable Auto Pan
	Auto Focus	Manual Focus +/- , Auto Focus AF
	Auto Iris	Manual Iris Far/Near, Auto Iris
	Preset Point Setting	Set auto pan preset positions.

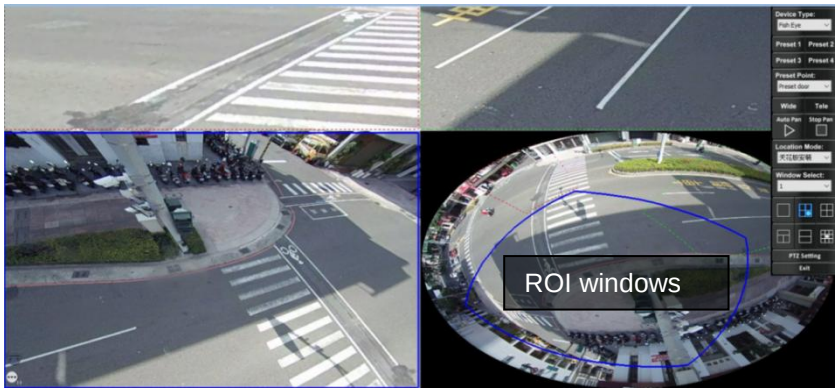
Chapter 4.4.1 On-screen PTZ Control

In full screen mode, click on  on-screen control icon that can enable PTZ control by using a mouse. Use mouse scroll wheel for PTZ zoom in and zoom out.

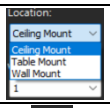
Chapter 4.4.2 On-screen Panoramic Camera Control

In full screen mode, click on  on-screen control icon to enable panoramic camera control by using a mouse. Use mouse scroll wheel for camera zoom in and zoom out.

Drag the window at the panoramic view to adjust the ROI window. There are three mount types available - ceiling mount, desk mount, and wall mount.



Panoramic Control Panel Description:

Icon	Function	Description
	Location	Location: Ceiling Mount, Table Mount, Wall Mount
	R Mode	Full-screen panoramic view
	3R1O Mode	Three ROI views and one panoramic view
	4R Mode	Four ROI views
	2R1P Mode	One panoramic view and two ROI views
	2P mode	Two 180 degree views
	8R1O Mode	One panoramic view and eight ROI views
	Preset Point Setting	Provide up to 128 preset points storage.

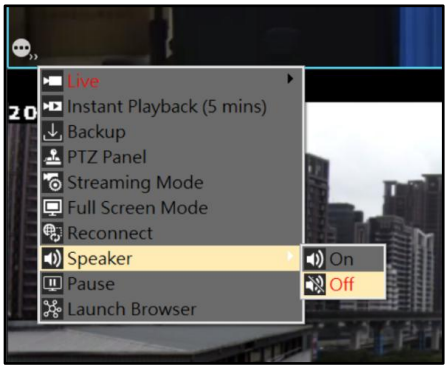
Chapter 4.4.2.1 Wall Mount Installation

The wall mount mode is different in some split screens and angles, please refer to the following.

Icon	Function	Description
	2R1P Mode	One180 degree view and two ROI views
	1WP Mode	One wall mount 180 degree view

Chapter 4.5 Camera Shortcut Keys

Channel setting shortcut key , can set the basic device parameters settings.



- Live: Discontinue an image or remove a channel.
- Instant Playback (5mins): Playback the video archive 5 minutes ago.
- Backup: Single channel backup image data.
- PTZ Panel: PTZ camera mode.
- Streaming Mode: Streaming switch.

  - Station Name: Remote device host name.
  - Station IP: Remote device IP.
  - Channel number of station: Which device is the connected device in the Station list.
  - Current view position: The current selected screen number
  - Index of view: The screen group number currently being viewed

- Full Screen Mode: View Manager channel full screen mode.
- Reconnect: Reconnect the device.

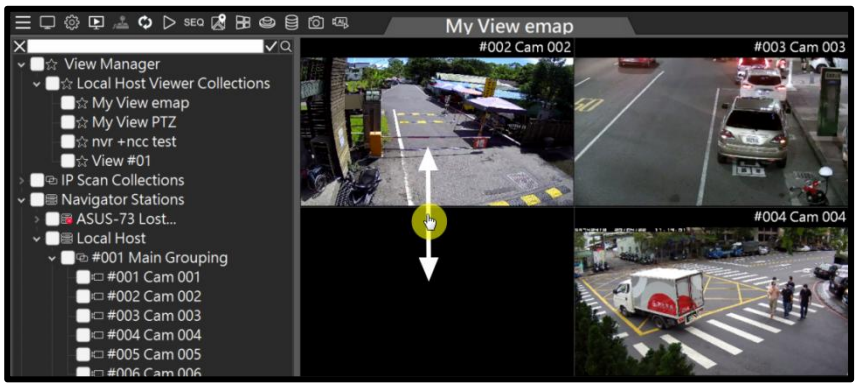
- Speaker: If the device supports audio, select the channel and right-click on the screen. When the speaker is turned on, you can listen to the audio. To change the channel volume, click the volume control.
- Pause: Pauses the real-time video.
- Launch Browser: Connect to the device web page.

Chapter 4.5.1 Short-cut for Audio Monitoring

If a device supports audio monitoring, select the channel and right-click on the screen. When the speaker turned "**On"**, you will be able to listen to the audio. To change the volume of the channel, click the **volume control**.

Chapter 4.6 Dynamic Channel Editing

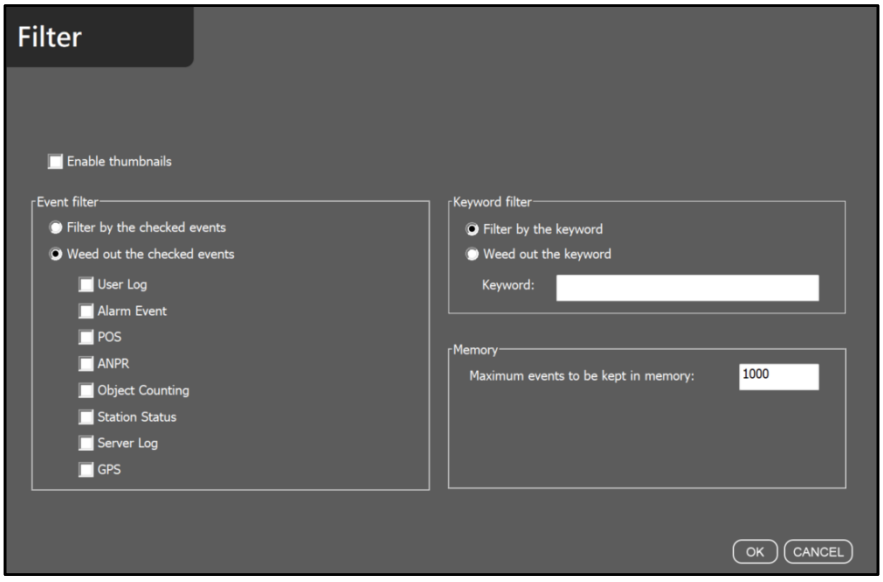
If you want to change the layout of the camera channels, you can drag a camera and drop it to another video channel. This operation swaps the position of the two cameras dynamically in the software. If you need to change the position of a specific camera after the installation is completed, you will not need to re-assign all the IP settings.



Chapter 4.7 Alarm Event List

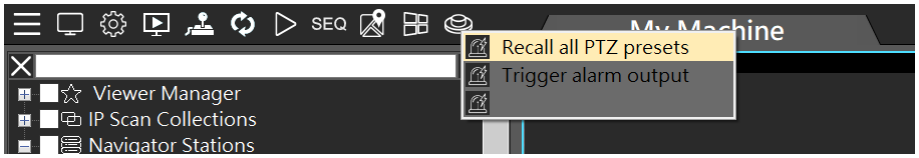
Click on the **alarm event list** to display the alarm event list. The alarm list includes: connection details, alarm events, POS event table, license plate recognition, counter, GPS satellite data, and station status and other data.

To filter the alarm events list, click the filter icon.



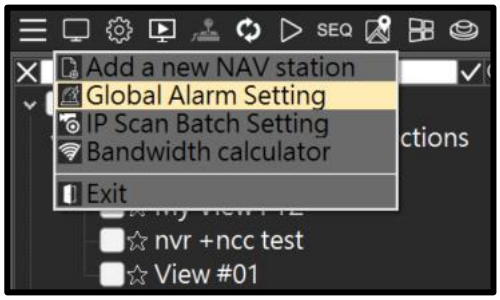
Chapter 4.8 Manual Alarm and Digital Control Shortcut Keys

When an event occurs, the user can use the alarm and the shortcut keys of digital control to manually control the alarm and digital control.

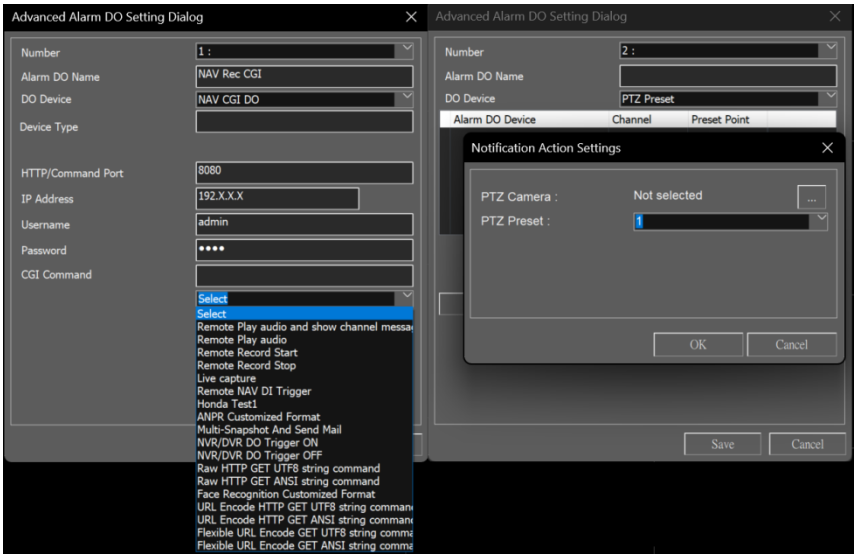


Chapter 4.8.1 Global Alarm Setting

The Global Alarm Setting is to program shortcut menu on the menu bar for triggering digital output devices. This could be IP camera's digital output, Navigator's virtual output, or PTZ presets. Click on Global Alarm Setting for setting up the alarm outputs.

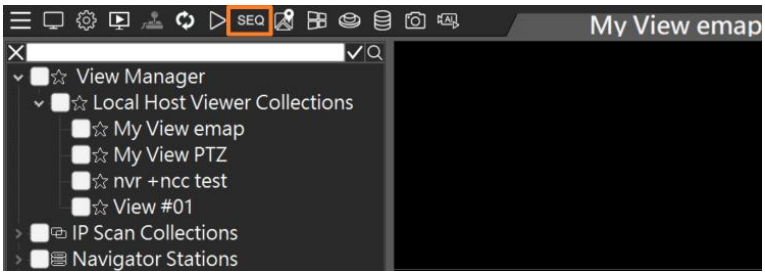


There are total 64 global alarm settings. Click on the Setting icon to access Advance Alarm SettingDialogue box. Select on DO device for the output device of the alarm.

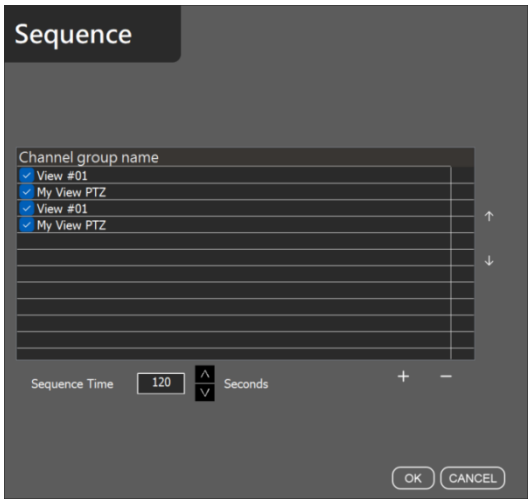


Chapter 4.9 Sequence Display

SEQ Click on SEQ button. The SEQ button allows to sequentially display for the setup views.

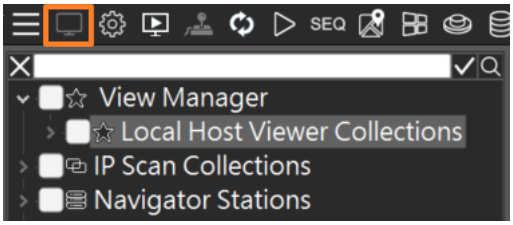


The Sequence dialogue box can add a view into the sequence table. Click the up and down arrow for switching the sequence. Set the sequence time in seconds for the dwell.



Chapter 4.10 Spot Monitor

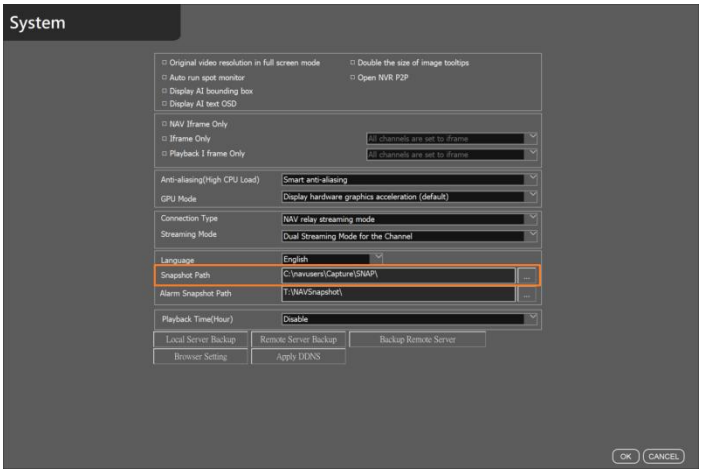
Many PCs have a secondary monitor output. Click on the icon and create another View Manager view. A user is able to setup the second monitor for monitoring purpose.



Note: System settings and channel group configuration can only be set on the main monitor. (Main Monitor, Spot Monitor).

Chapter 4.11 Instant Snapshot

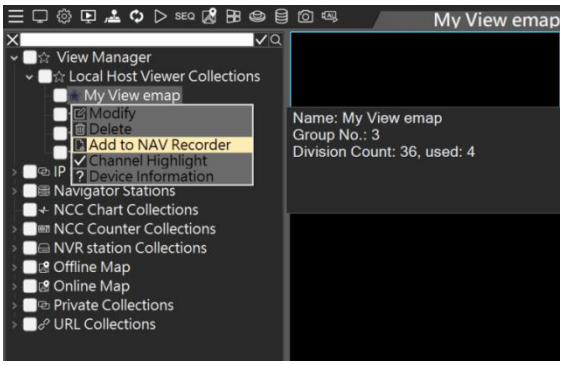
On System settings, set the snapshot directory. And then, click the "snapshot" icon, to capture the group's full image and each channel image on the live screen.



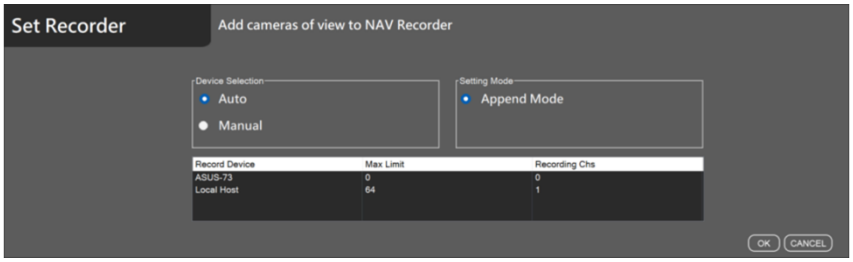
Note: After setting the destination directory, a SNAP folder will be automatically generated, and all subsequent screenshots will be displayed there.

Chapter 5 Assign Cameras for Recording on a Remote Navigator

Once all cameras are configured for views, click on “Add to NAV Recorder” menu. This can assign the cameras for recording on a remote Navigator. This feature makes adding cameras to a remote Navigator quite easy.



“Set Recorder” dialogue box can assign which Navigator for recording. Select a Navigator and click the OK button.



Chapter 6 Playback and Backup

The Navigator Control Center provides integrated playback and backup features within the View Manager. The camera recordings of Navigator recorders and LILIN DVRs/NVRs can be setup in a View based on the function of the view. A user is able to perform camera view playback and backup. The speed bar also supports fast forward and rewind functions.

Chapter 6.1 Playback

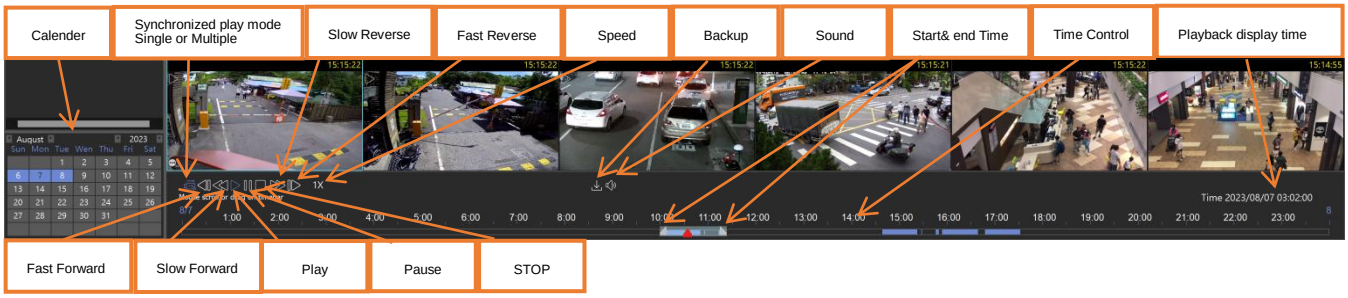
Chapter 6.1.1 Synchronous Playback

Click **Playback** to play synchronous videos in a group. Supported camera recordings include different NVR, AHD camera, DVR, and Navigator. Click the date and drag the time bar for video playback.

Note: The NVR/DVR supports up to 8 connected video playback.

Chapter 6.1.1.1 Multi-channel Synchronous Playback Interface Description

Multi-channel synchronous playback UI



Chapter 6.1.1.2 Multiple-Channel Playback and Overnight Playback.

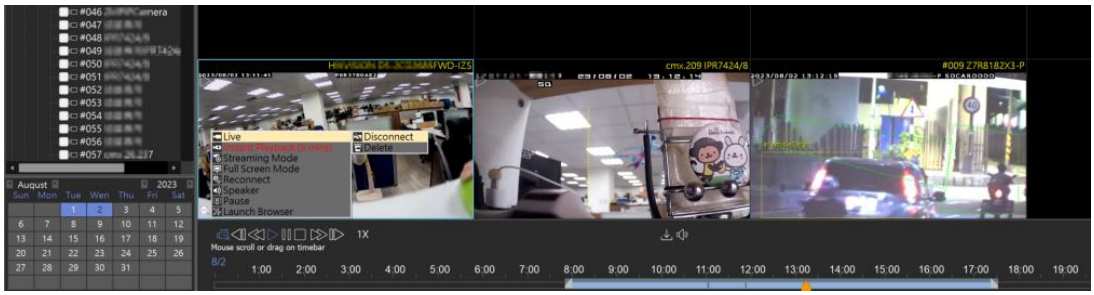
Click on the timeline with the mouse, then, move left and right to search for historical video records. It also support video playback of overnight recordings.

Chapter 6.1.2 Asynchronous Playback

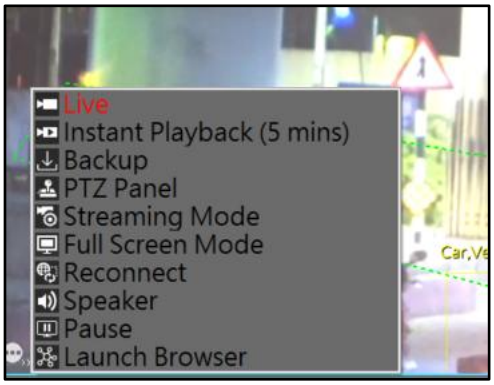
For asynchronous playback, select a camera from left device tree diagram and drag it to the playback view group. Click **Single Playback** icon and select date and time. Select cameras and drag their individual time bar to play videos at different time.

Icon	Function
	Multi-channel synchronous playback
	Single-channel asynchronous playback

In the playback screen, live image mode can be enabled. This will enable user to immediately switch to live view when there is a live event.

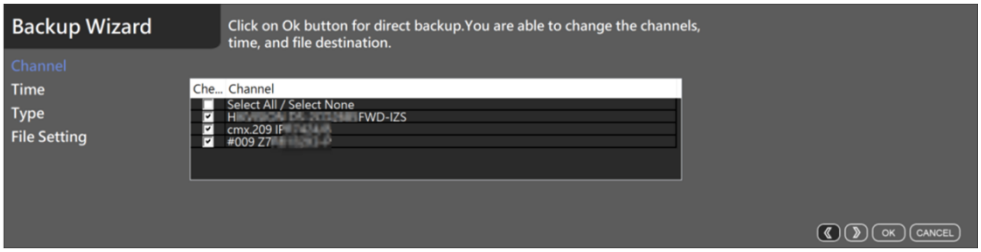


- Live: Real-time video streaming.
- Instant Playback (5mins): Playback the video archive 5 minutes ago.
- Streaming Mode: Streaming switch.
- Full Screen Mode: View Manager channel full screen mode.
- Reconnect: Reconnect the device.
- Speaker: Device speaker switch.
- Pause: Video pause.
- Launch Browser: Launch the device's web browser.

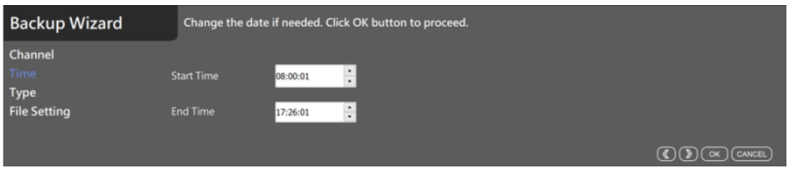


Chapter 6.2 Remote NAV Recording Backup

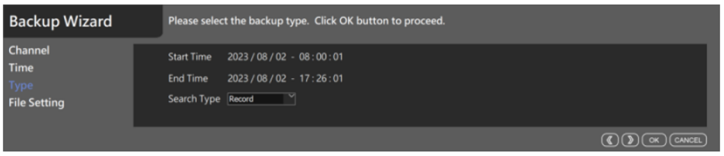
On the playback page, click the backup icon to download recorded video and perform recording backup.



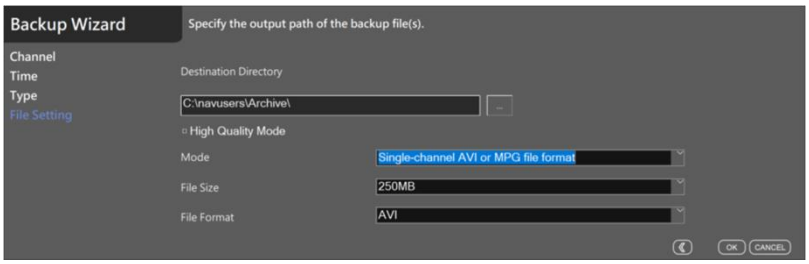
If you need to make further adjustments to the time, you can modify it again.



Confirm the time of backup.

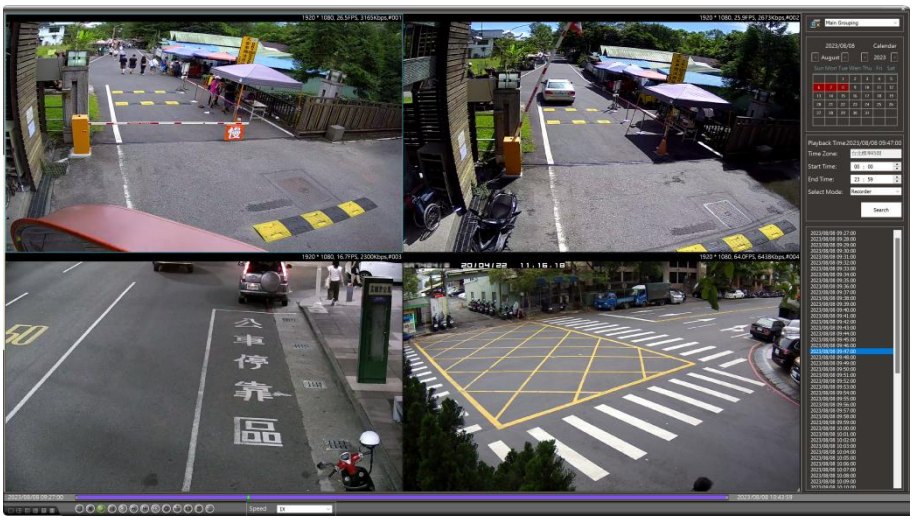


- Destination Directory: Set the backup destination folder.
- Mode: Multi-channel Mplayer NAV file format, Single channel AVI or MP4 file format.
- High Quality Mode: After checking, the backup main stream takes priority.

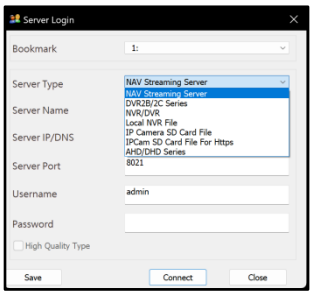


Chapter 6.2.1 Remote NAV/NVR/DVR Event Backup

To perform remote playback on the screen, click **Remote Playback** icon and log in automatically to the remote device. You can remotely playback and backup at any time.



To manually log in to the remote device, please click on **Server Login** icon and fill up the fields. Press **Save** and **Connect** to remotely playback and backup.



- Bookmark: The bookmark of the server.
- Server Type: Select a server type.
- Server Name: Name of the server.
- Server IP/DNS: The IP address of the server.
- Server Port: The port number of the server.
- Username: The username of the server.
- Password: The password of the server.
- High Quality Type: Main stream HD mode.

The following image indicates the taskbar of Remote Playback and Backup.

Icon	Function	Description
	Split Screen	1、4、9、16、25、36 Split screen selection
	Stop	Stop playback
	Play	Start playback
	Pause	Pause playback
	Slow Rewind	Slow rewind speed: -(1/2X)、-(1/4X)、-(1/8X)
	Fast Rewind	Fast rewind: -1X、-2X、-4X、-8X、-16X、-32X
	Fast Forward	Fast forward: 1X、2X、4X、8X、16X、32X
	Slow Forward	Slow forward: (1/2X)、(1/4X)、(1/8X)
	Playback System Setting	Playback System Setting
	Backup Download	Backup channel or download AVI, MP4 file.
	Snapshot	Channel image snapshot (1 group full screen, 1 channel screen)
	Snapshot Path	Set snapshot storage path
	Event Log	Record of various alarm events, (motion detection, POS detection, face detection, license plate detection, etc...)

Chapter 6.2.2 Remote Device Download and Backup

Step1. Click on the date on the calendar.
Step2. Specify starting time and ending time.
Step3. Click “**Search”** button to search the video clips.

To perform remote video backup, click “**Backup”** and select specific channels. Specify date, time, and destination directory. Finally, select Start Backup or Convert AVI for multiple channel video backup.

Chapter 6.2.3 Remote Playback Settings

Playback setting will display the following:

(1) NAV Iframe Only: When performing remote playback, this setting force NAV to show one frame per secondfor reducing CPU load.

(2) Iframe Only: When foreground remote playback, whether to set the channel to display one frame per second, to reduce CPU loading.

- All channels set iframe: When foreground remote playback, all channels in the foreground play back one frame per second.
- Channels not selected are set to iframe: When foreground remote playback, the selected channel in the foreground play back normally, and the remaining channels play back one frame per second.

(3) Default Windows Division: Remember the preset main group split screen when remote playback.

(4) Language: Remote playback display language.

(5) POS Character Setting: Remote playback POS character display settings.

(6) Smart anti-aliasing: Smart channel image edge smoothing.

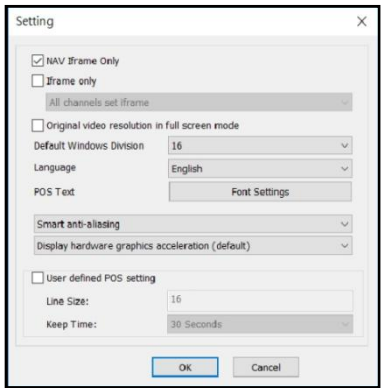
- Anti-aliasing mode (High CPU Load): Utilize CPU resources to soften image edges.
- Disable anti-aliasing: Disable image edge smoothing.

(7) Display hardware graphics acceleration (default):CPU hardware accelerated video decoding (Default)

- GPU decode and display, display high priority:Intel or NVIDIA graphics card GPU hardware accelerated display and decoding. Image displays first priority, image quality and bandwidth second priority.
- GPU decode and display, decode high priority:Intel or NVIDIA graphics card GPU hardware accelerated display and decoding. The video channel will be displayed after decoding.

(8) User defined POS setting: Customize image POS font or color settings。

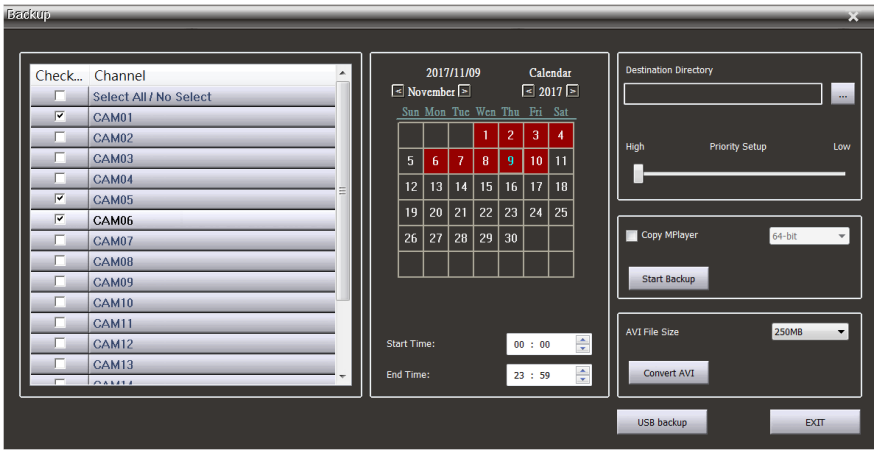
- Line Size: Maximum number of POS line.
- Keep Time: Maximum duration of POS keeps time.



Note: For reducing the CPU load during playback, it is recommended to tick on "NAV Iframe Only" box.
For Video compression picture types, please refer to Wikipedia.

Chapter 6.2.4 Remote Multiple Channel Backup

The software supports multi-channel playback, backup download, and AVI format conversion. To perform remote video backup, click "**Backup**" and select channels. Specify date, time, and destination directory. Finally, select Start Backup or Convert AVI for multiple channel video backup. You can also backup the image to a USB flash drive for multi-channel image backup.



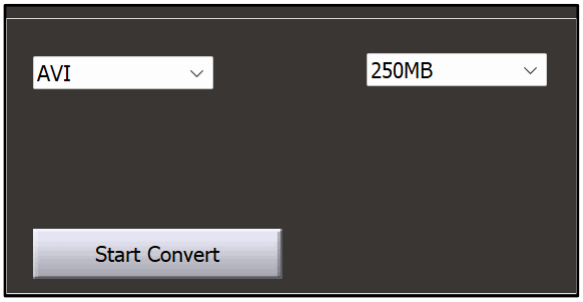
Note: USB backup feature is only limited to NVR/DVR.

Chapter 6.2.4.1 Copy MPlayer

Copy MPlayer program.

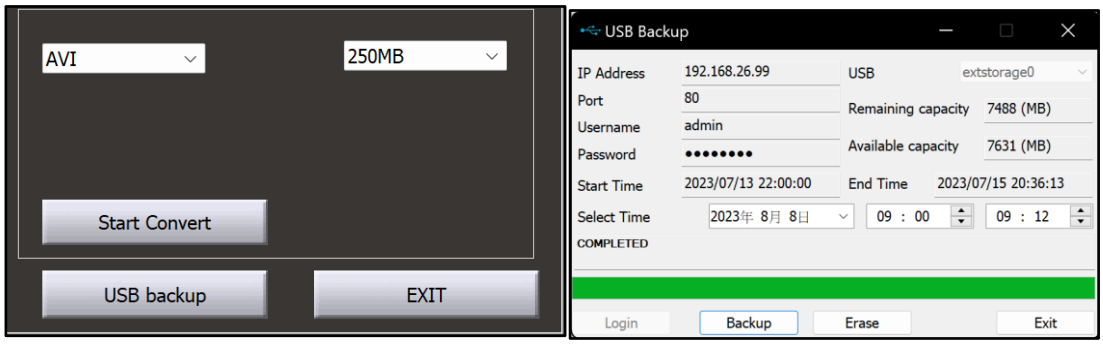
Chapter 6.2.4.2 Backup Image Conversion Format

Backup Image Conversion Format: AVI, MP4.
Image conversion split size: 250MB, 500MB, 1GB.



Chapter 6.2.4.3 USB Backup

Connect the USB to the remote NVR/DVR, click on "Backup" to initiate the process, and wait until "COMPLETED" appears to finish the backup.

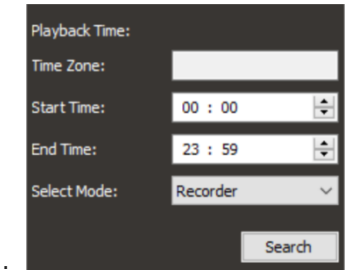


Chapter 6.2.5 Backup andSnapshot

For IP-based devices, you may want to capture still images in videos. Press “**Snapshot”** , and the image will be exportedto a JPEGfileformat.

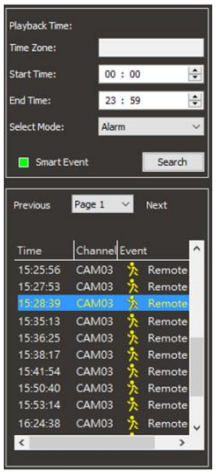
Chapter 6.2.6 Remote NAV/NVR/DVR Event Search and Backup

To view remote NAV/NVR/DVR alarm events and perform video playback and file download, click "Remote Playback" icon and click "Select Mode" in the backup manager to view a recording of events, POS cash register information, license plate recognition, and face recognition.



Chapter 6.2.6.1 Event Playback

When “Smart Event” is checked, all alarm (digital input) events will be automatically played until the end of the alarm events.

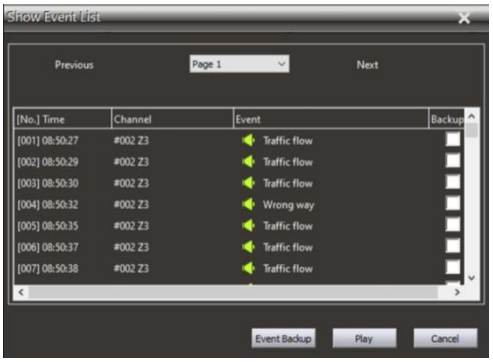


Recording Time Bar Color Coding:

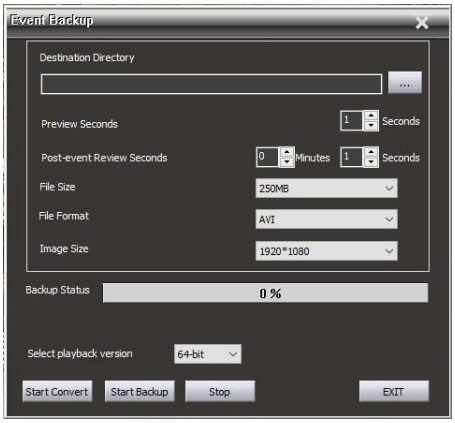
- White: No recording
- Purple: Continuous recording
- Yellow to Green: Event recording. The color depends on the frequency of event. The frequency range is from 1~10. The color changed to green as the event became more frequent.

Chapter 6.2.6.2 Event Backup

To back up an alarm recording, check the "**Smart Event"** box Smart Event and press the "**Event List"** icon . This list all events for backup purpose.



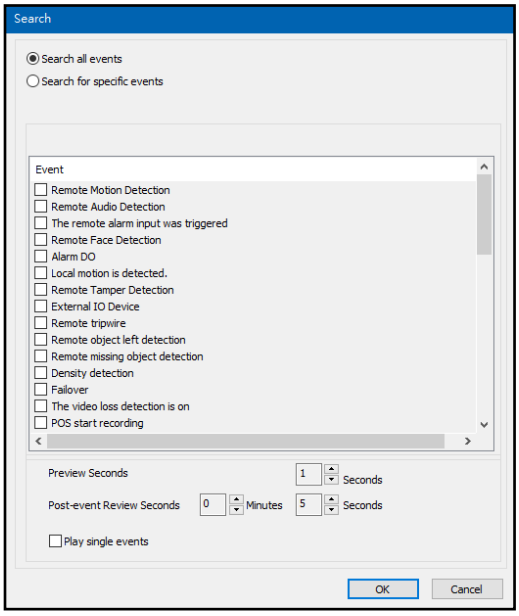
Select the file to backup and click on "**Event Backup**".



- Destination Directory: Set the backup destination folder.
- Preview Seconds: The event recording of pre-alarm.
- Post-event Review Seconds: The event recording of post-alarm.
- File Size: 250MB, 500MB, 750MB, 1GB for each video backup. **Note**: NAV recorder only.
- File Format: AVI or MP4 file conversion. **Note**: NAV recorder only.
- Image Size: The size of the recording resolution, 320*240, 640*480, 704*480, 1920*1080 **Note**: NAV recorder only.
- Backup Status: The progress percentage for backup.
- Select playback version: MPlayer application in Windows 64-bit or 32-bit.
- Start Convert: The button is for starting the process of AVI or MP4 backup conversion.**Note**: NAV recorder only.
- Start Backup: The button is for starting the process of proprietary recording backup.
- Stop: Stop the backup process.
- Exit: Exit the program.

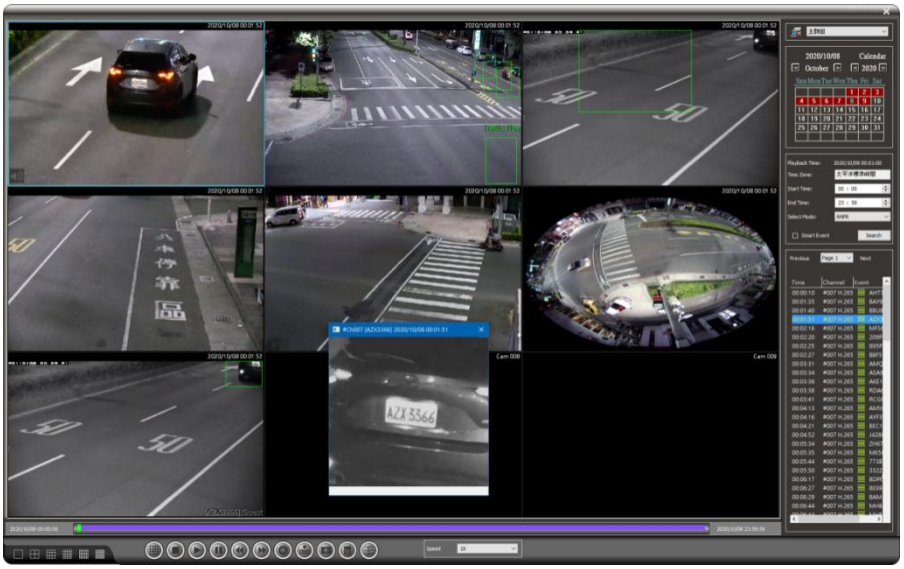
Chapter 6.2.7 Alarm Search for Remote NAV/NVR/DVR

Select "Alarm" in "Select Mode", select "Search all events" or "Search for specific events" in the search dialogue box, the event will be listed. Click the event and the image will be displayedand perform video playback or download backup.

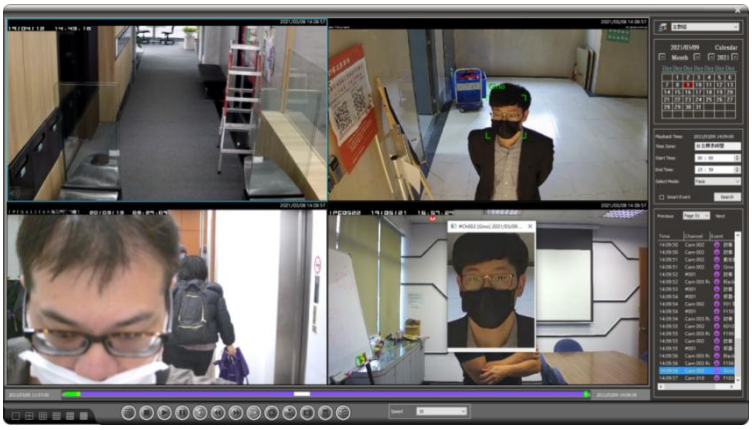


Note: When **"Play single events"** is ticked, only one alarm event will be played back at a time.
Note: "Search for specific events" feature is for NAV recorder only.

Chapter 6.2.8 Remote ANPR Event Search and Backup

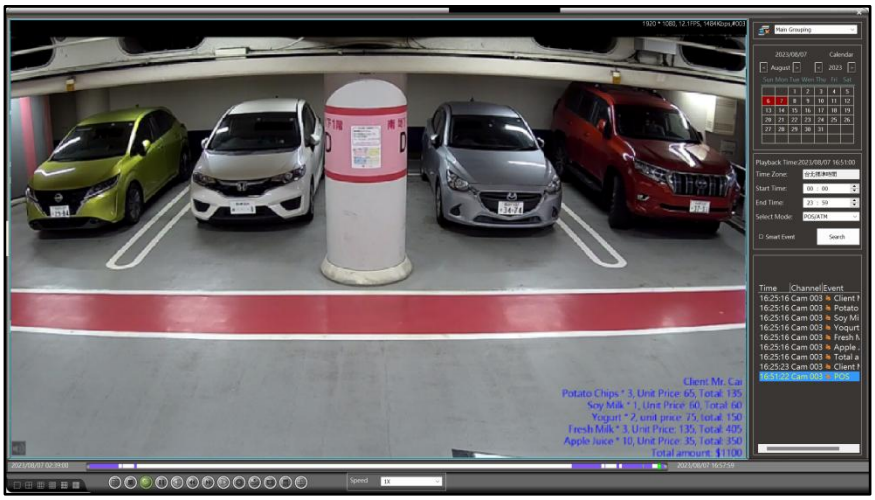


Chapter 6.2.8.1 Remote Face Recognition Event Search

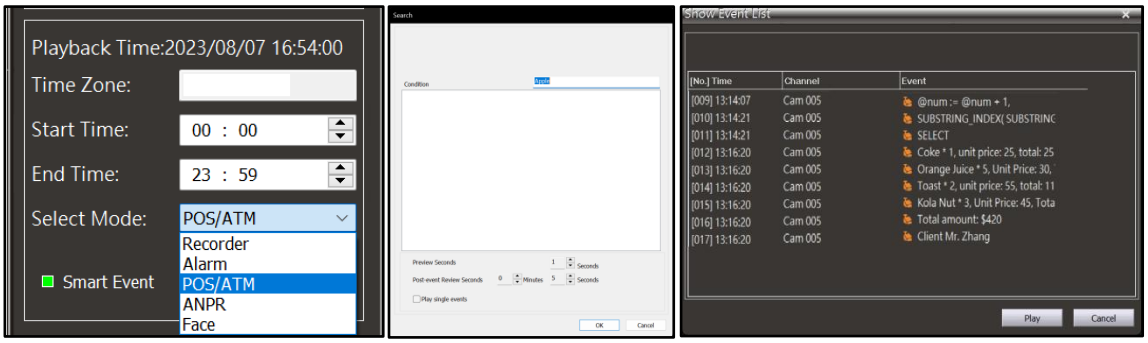


Chapter 6.2.8.2 Remote POS/ATM Transaction Report from NVR

If a POS/ATM is connected to an NVR, View Manager can perform remote POS/ATMtransactionquery. To do so, click “Playback” and specify the date and time to search for the POS/ATM transaction.



Select the “POS/ATM” option and press “**Search**” button, next, “**POS Search Condition**” will be displayed, enter the keyword in the field and press “**OK**”.



Chapter 6.2.9 Digital Water Mark

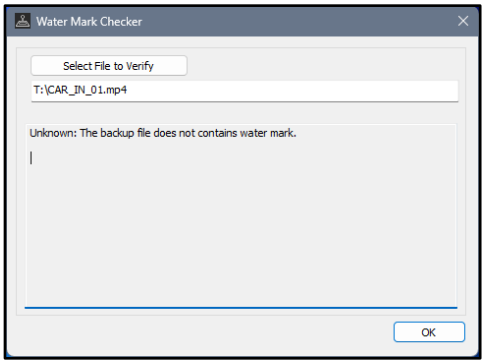
Water Mark Checker is used to verify whether the AVI or MP4 files are backed up from our company's NVR/DVR or NAV series. The video recordings backed up from our product are encrypted with the company's digital watermark, which can be used to check whether the video recordings have been tampered with or not.

- OK: The backup file contains water mark and verified OK.
  The backup AVI&MP4 contains watermark and verified OK

- NG: The backup file contains water mark and verified failed.
  The backup AVI&MP4 contains watermark, but the verification is NG

- unknown: The backup file does not contains water mark.
  The verification failed due to unknown file, non-AVI&MP4 format, or with or without watermark.

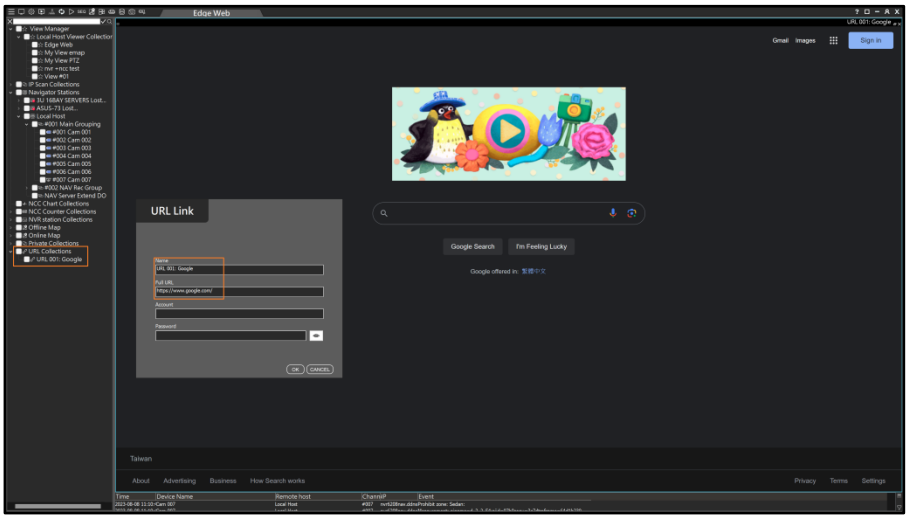
To use this application, Water Mark Checker, please click the "Select File to Verify" button and select the backup file. This program will automatically check whether the file has been altered or is a file producedby the products of our company.



Chapter 7 Third-party Applications & Device Integration

Chapter 7.1 Add Third-party Web Based Application via URL Collection

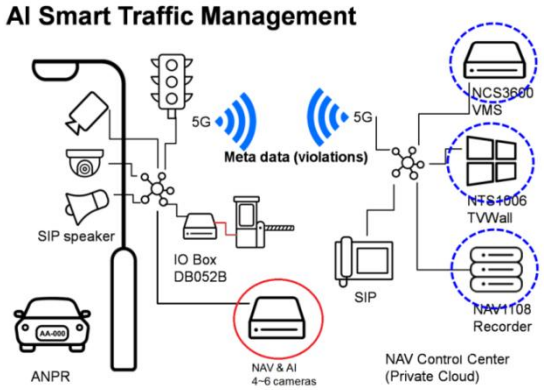
For the integration of third-party web application, click on "**URL Collection**" and enter the "Full URL" to embed the web application into the Navigator Control Center.



Chapter 7.2 Aida Integration

Please install Aida software on NAV Corporate server. Aida software is a plug-in for Navigator software and installed to become edge computing server.

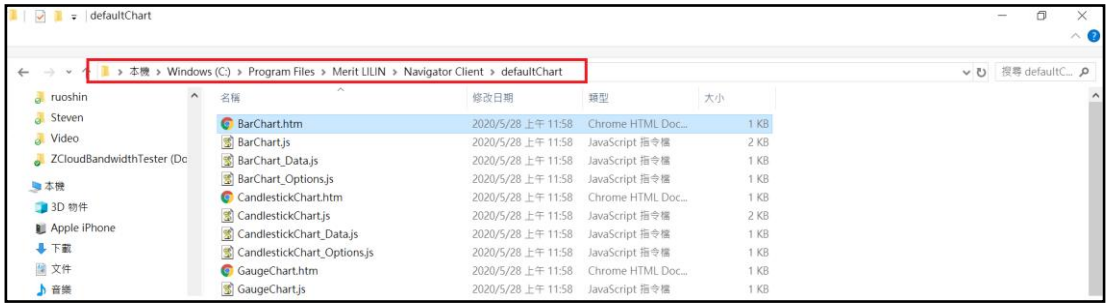
See diagram below. The channel of Aida software and Navigator software is one-to-one mapped. For example, if camera #1 is setup in Aida software, Navigator software should also setup channel #1 for the camera.



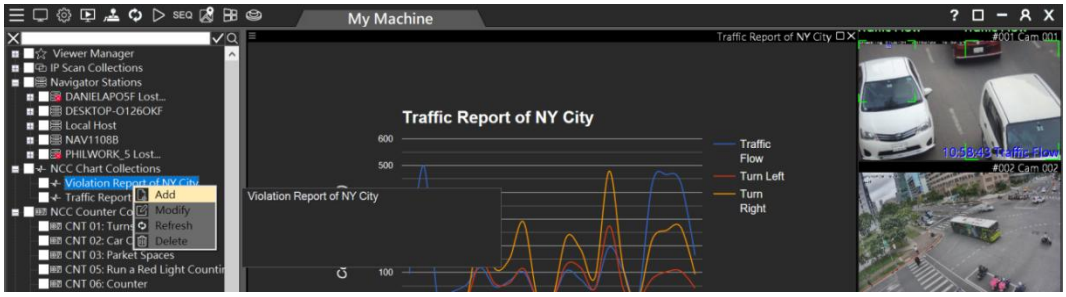
Chapter 7.2.1 Chart

Traffic management reports and other statistic reports are in the NCC Chart Collections. Chart Collection contains HTML5 based reporting system.

The HTML5 chart templates can be found at “C:\Program Files\Merit LILIN\\View Manager\defaultChart.” For advanced users, a user is able to modify the template for customization purpose.



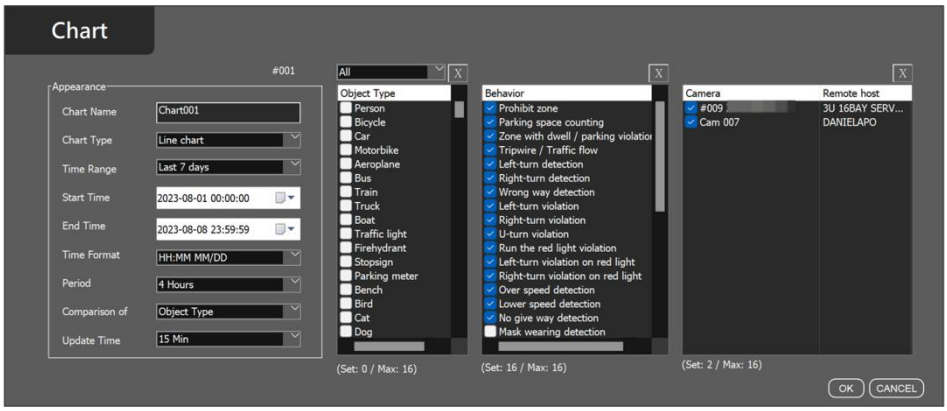
To setup a chart, mouse right-click on NCC Chart Collections for adding, modifying, or deleting a chart.

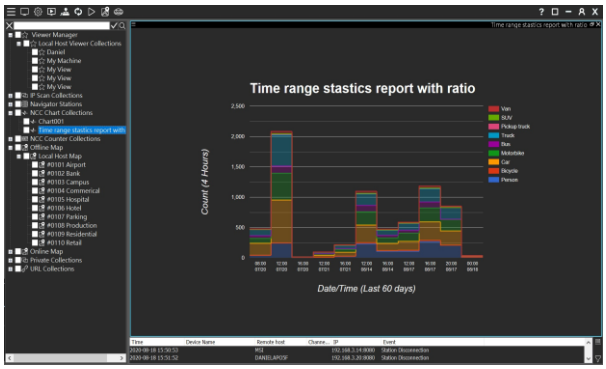


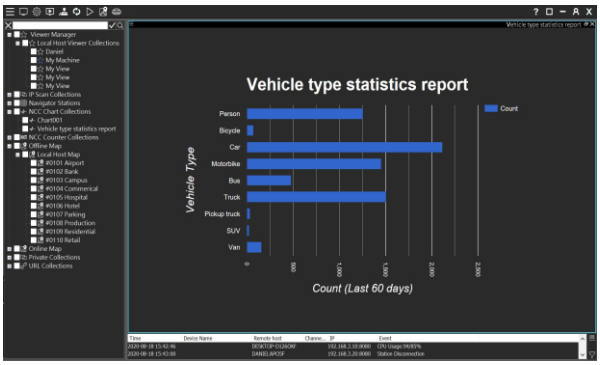
Please enter the following information:

- Chart Name: The Chart Name shown on the chart
- Chart Type: There are bar, line, pie, step and column charts.
- Time Range: Customize the display time range.
- Start and End Time: Define the start and end points of the range.
- Time Format: Custom time display mode.
- Period: Calculation period for the chart
- Comparison of: Categories for Statistics: Object Type, Behavior, Camera Classification
- Update Time: Set a custom time to refresh and obtain new data.

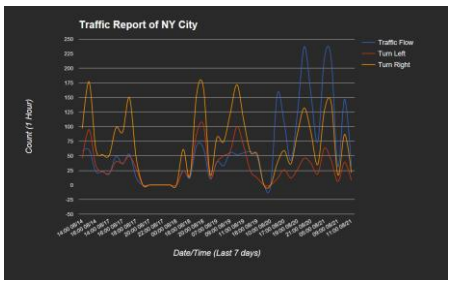
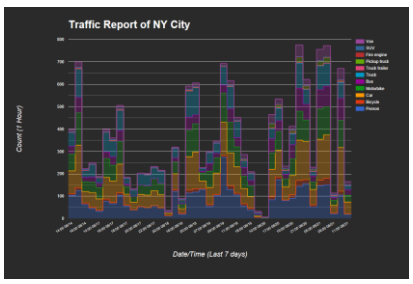
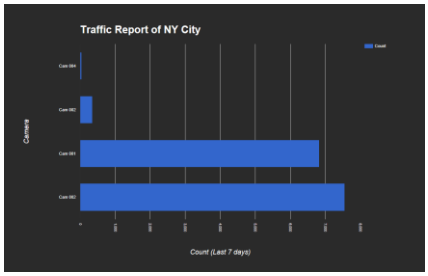
The chart can be setup based on the comparisons of object type, behavior, and camera.





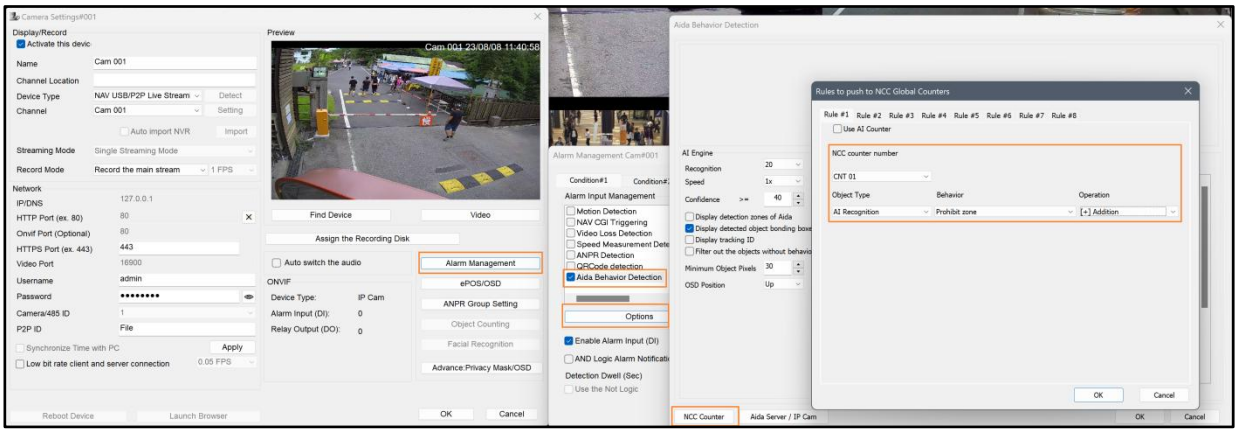


The following graph shows the comparisons of various statistics.

Behavior	Object Type	Camera
		
The statistics report of the traffic flows for counting the behaviors of going straight, turning left, and turning right at the four intersections in NY city.	The statistics report of the vehicle types for counting the number of vehicles at the four intersections in NY city.	The statistics report of the total vehicle count at the four intersections in NY city.

Chapter 7.2.2 Counter

Once LILIN Aida software is installed with Navigator software, please setup the Counters in Navigator software. In Navigator Software, click on “Camera Properties” and select Aida Behavior Detection setting. Click on “NCC Counter” button for setting the counters. There are 64 counters in total per Navigator software for communicating Navigator Control Center.

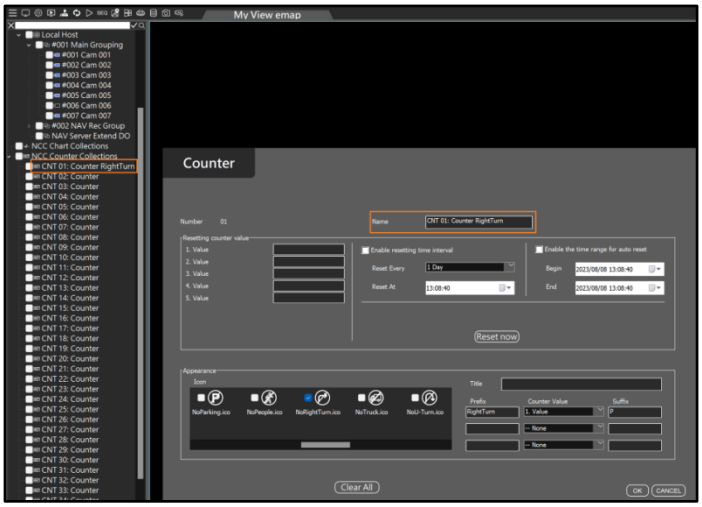


- Use AI Counter: Enable the front-end Edge camera counter and do not select the option to use the back-end AI Engine counter.
- NCC counter number: Counter number, used for NCC setting 4
- Object Type: AI-recognized object category.
- Behavior: AI-recognized behavior.
- Operation: Used for addition and subtraction operations, set to option 5.

Once the Counters of Navigator software are set, a user can go to Navigator Control Center side for using the Counter. Mouse right click on the item of NCC Counter Collection for the Counter Dialogue. Enter the settings below:

- Name: The device title of the Counter.
- Appearance: Select the icon for the Counter.
- Title: The counter title.
- Prefix: The prefix text of the Counter.
- Suffix: The suffix text of the Counter.

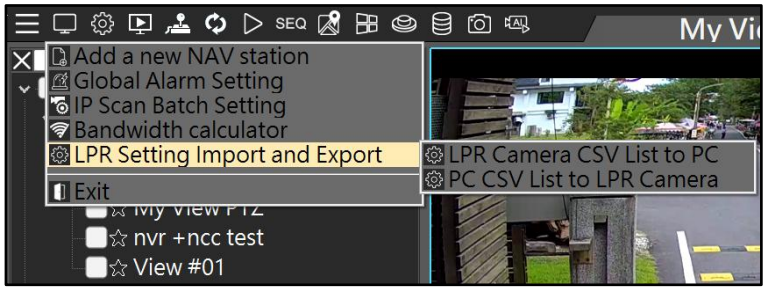
Once the Counter is setup, drag the item into the View.



Chapter 7.2.3 Edge LPR Camera Import & Export

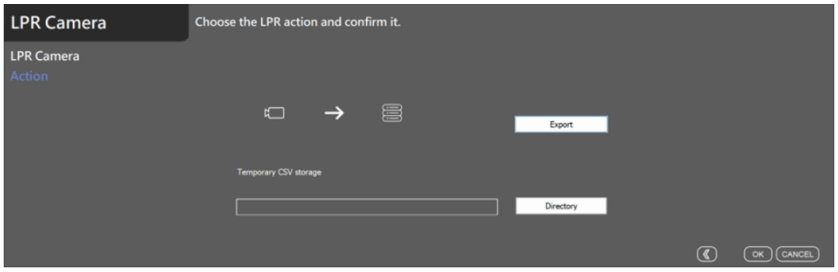
For edge LPR camera, NAV Control Center provides the feature for importing and exporting for the allowed &denial lists.

To use this function, please click the “LPR Camera CSV List to PC” menu for the exporting of the allowed &denial lists.



To export, please click the "LPR Camera CSV List to PC" menu, select a LPR edge LPR camera, and export the allowed and denial lists.

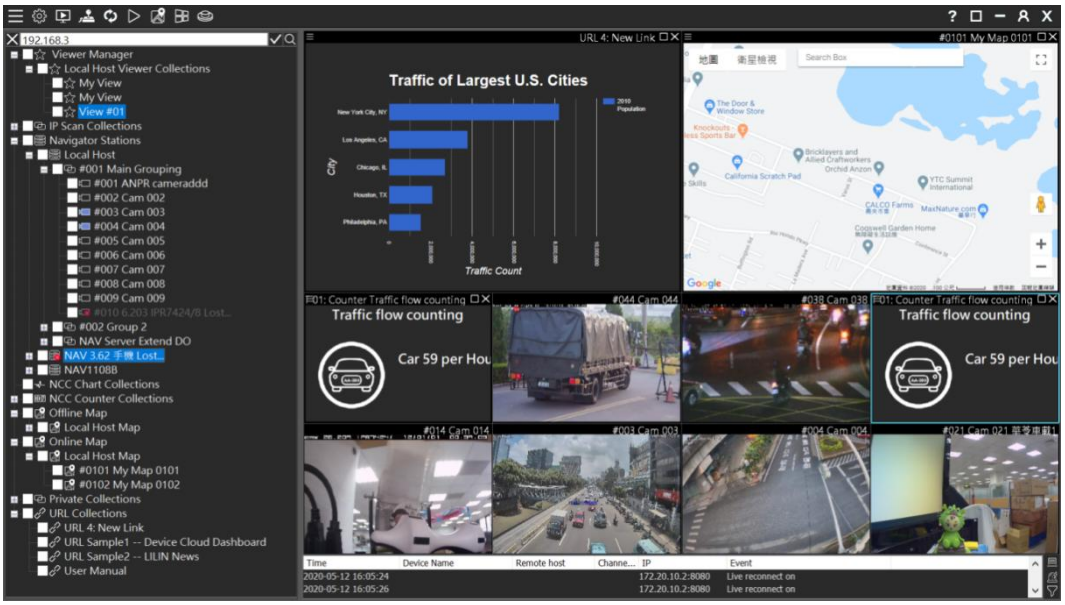
If you need to import the allowed and denial lists for edge LPR cameras, click on the "PC CSV List to LPR camera" menu.



Note: LPR is an early version of license plate camera, NCC default option is disabled. If you wish to enable it, please contact the technical support team. (Note: This feature is not available for Edge cameras.)

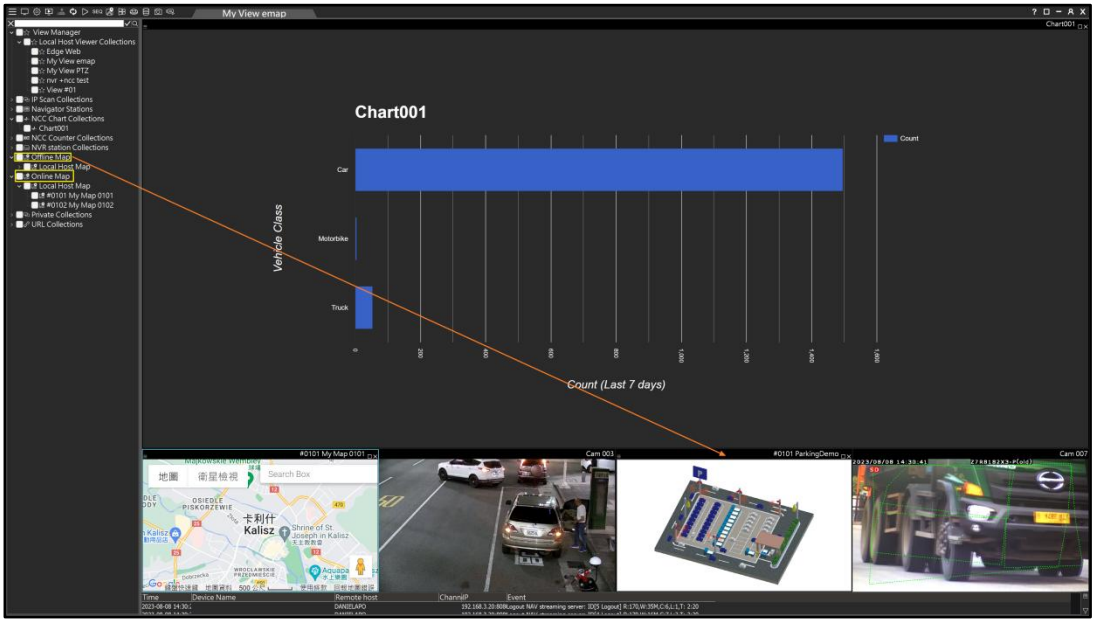
Chapter 8.0 eMap Manager

Navigator Control Center window can integrate eMap, as figure below. For example, after the alarm, the eMap live image will be displayed, GPS fleet management tracker, and find reported road name on search button can all be integrated. Related functions are described as follows:



Chapter 8.1 Create an eMap Manager to the Group View Window

You can drag the eMap created by the eMap Manager including: (1) Online Map, (2) Offline Map. Please use your mouse to drag and drop the node from the left control bar to the right screen.

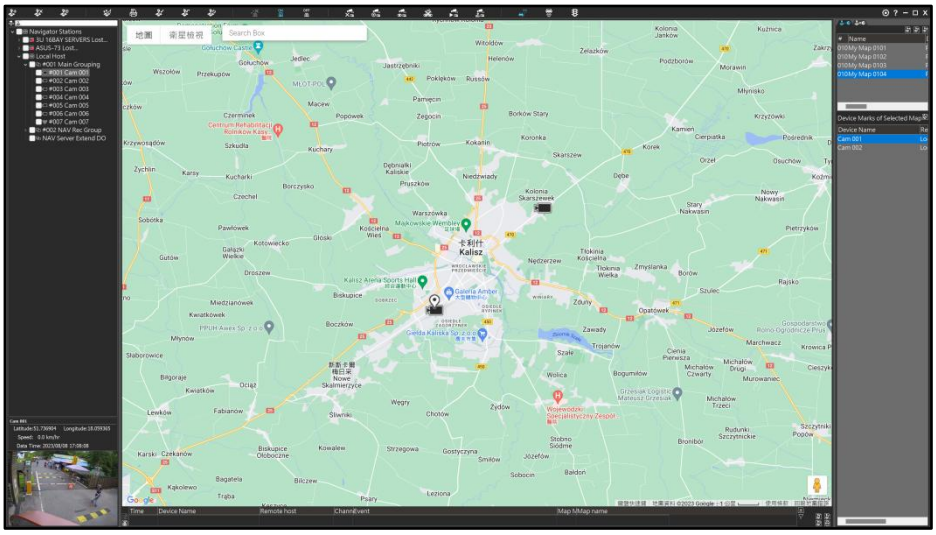


Chapter 8.2 eMap on the Group View Window

Please double-click on the “camera” icon to monitor the live image of the eMap. The road or place name can also be input to quickly access to live image. GPS fleet management tracker and other functions are also supported.

Chapter 8.3 How to Set up an Map via eMap Center

Please click on “**eMap Center”** icon to open the eMap Center and create (1) Online Map, (2) Offline Map. To set up camera on eMap Center, just drag-n-drop cameras into the eMap Center.

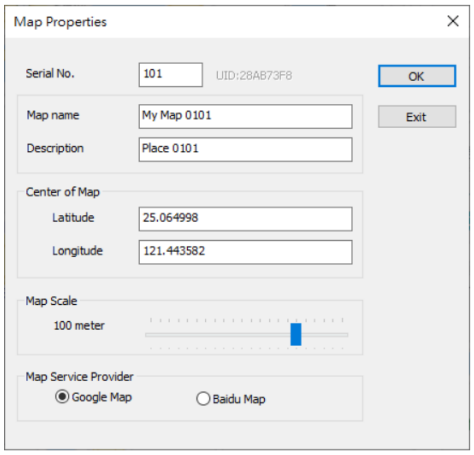


eMap icon functions are described below:

	Add Map, Delete Map, Set eMap Property.
	Remove the camera icon from the eMap
	Print eMap
	Create eMap geographic location window.
	Restore eMap geographic location window.
	Refresh eMap geographic location window.
	Confirm and delete alarm events.
	Enable eMap alarm event notification.
	Disable eMap alarm event notification.

Chapter 8.3.1 eMap Property

To edit eMap properties, please click on “eMap Property” icon and make detailed adjustments.



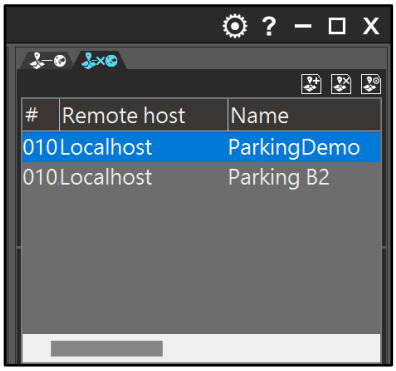
Chapter 8.3.2 Modify Camera on eMap

Below are icon descriptions to add, delete or edit the camera on eMap:

	Remove a camera from eMap
	Edit the camera properties on eMap
	Enable/Disable camera image on eMap.
	Close the camera image on eMap.
	Playback the camera recording on eMap.
	Control the PTZ camera on eMap.
	Enable eMap Car Tracker.
	Enable eMap car follow DVR/NVR GPS mode.
	Turn on the real time traffic flow mode on the eMap.

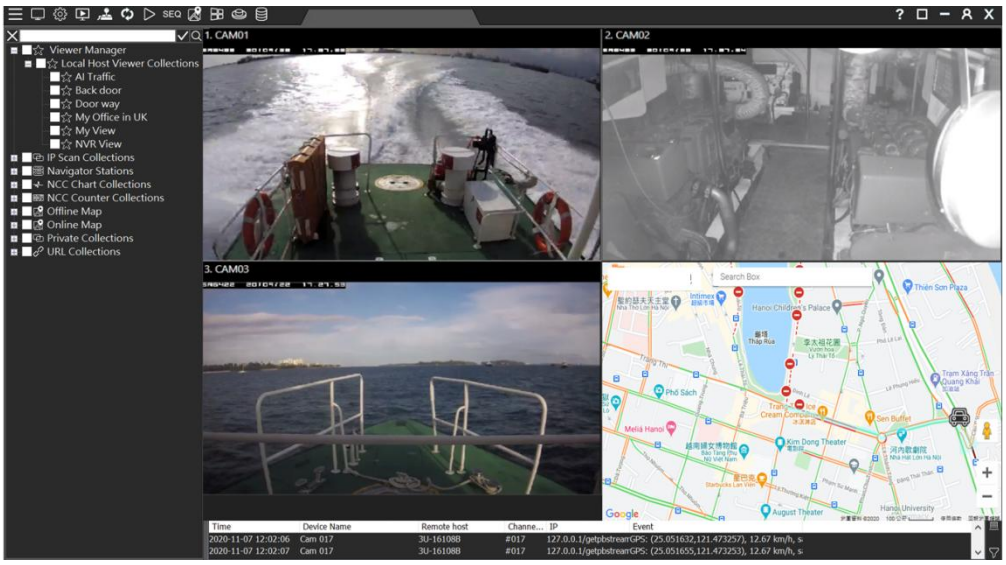
Chapter 8.3.3 Modify Offline eMap

To edit the offline map, click on “**offline mode”** icon.



Chapter 8.3.4 NVR/DVR with GPS Integration for eMap

LILIN NVR/DVR support USB GPS integration and the video can be streamed via 5G for remote access. The GPS signal is streamed via Navigator Corporate and then to Navigator Control Center for fleet management.



Once the NAV Corporate is setup for video recording and the GPS streaming to a remote DVR/NVR, drag the cameras of the NAV connecting to a GPS NVR via 5G into View Manager.

Make sure that the GPS signal gets transmitted to the NAV and is seen in View Manager.

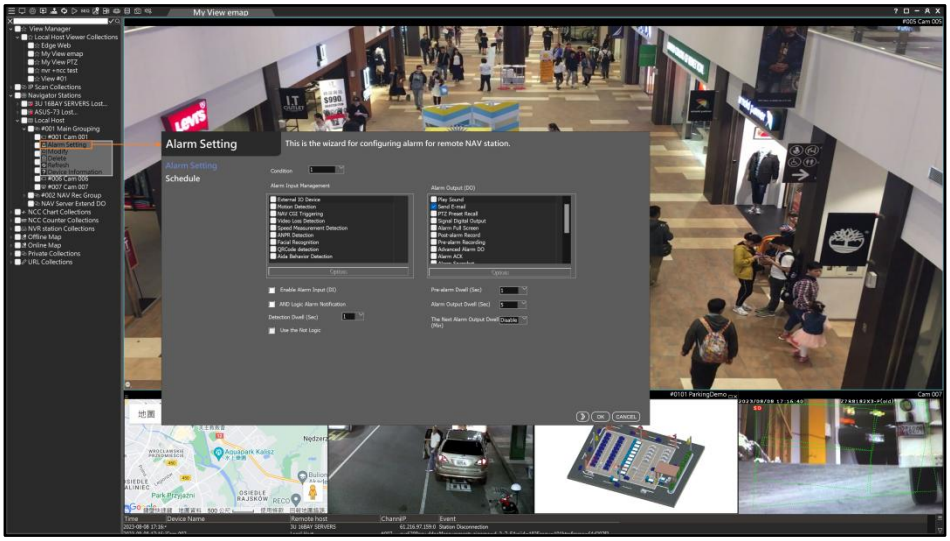
For creating a map, click the “eMap Manager” button. Drag the camera of NAV connecting to a GPS NVR via 5G into eMap.

Click on “Lock focus on car” button for tracking the vehicle. Double click on the icon of the car for live video in eMap. Switch to View Manager, and drag the eMap just created into View Manager. Select the icon of the car for tracking the vehicle.

Note: Please make sure supported GPS integration DVR/NVR models.

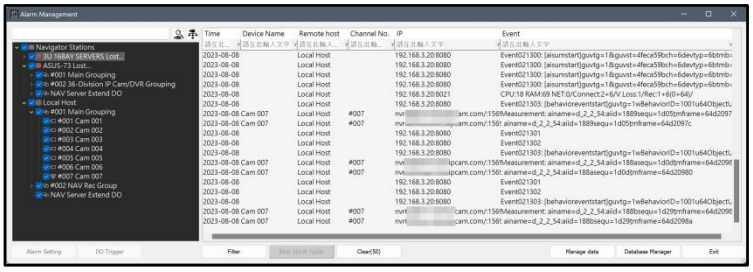
Chapter 9 Alarm Management

Navigator Control Center provides an easy way for configuring the alarm of a camera for a remote Navigator station.

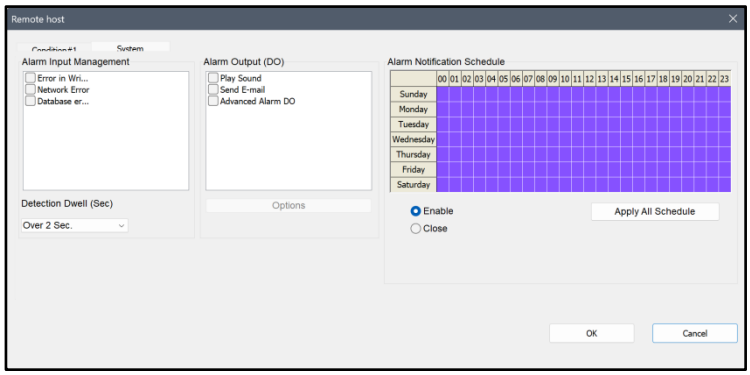


Chapter 9.1 System Alarm Management for Navigator Stations

To monitor IP cameras, DVR, and NVR on the Navigator Corporate stations, see if any Navigator Corporate station is in the list. Once checked, the station will be documented in Database Manager.



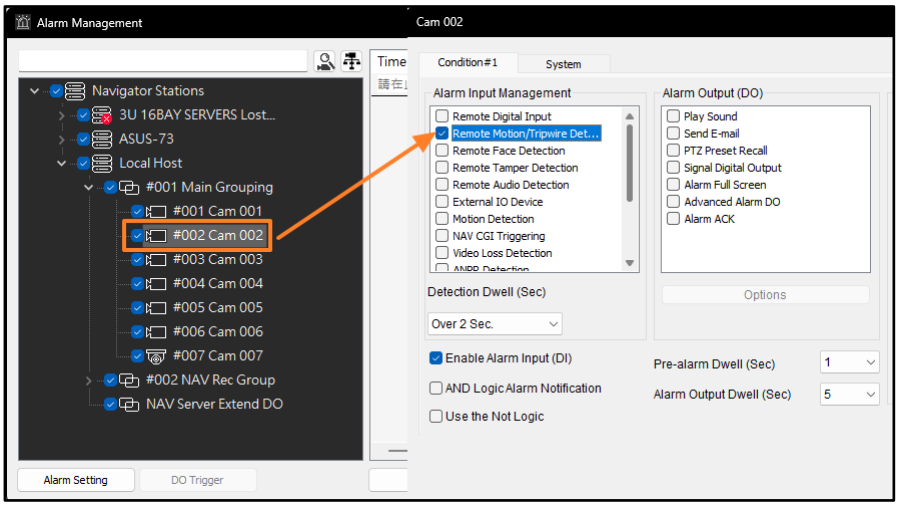
Click “**Alarm Setting”** for remote monitoring: (1) File Write Error, (2) Network Error, and (3) Database Error detections. Specify alarm outputs for Play Sound and/or Send Email, when a station alarm is detected.



Chapter 9.2 Alarm Management for Cameras

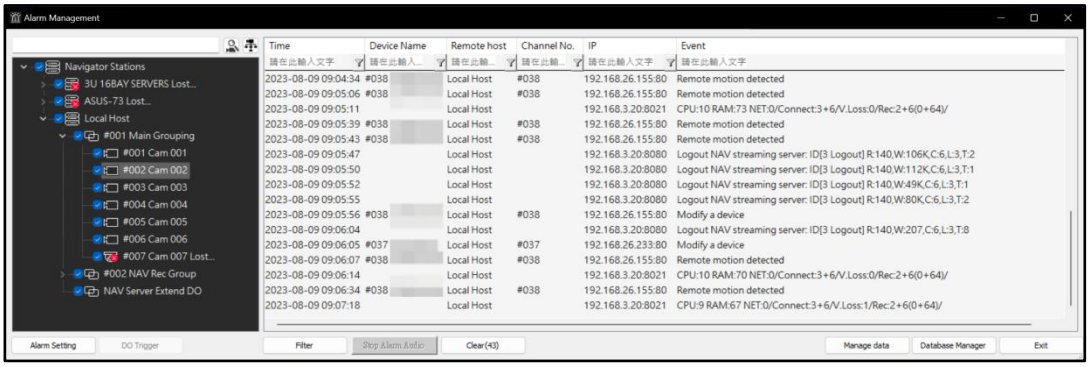
Check a camera and mouse right-click on“Alarm Setting**”** to specify alarm inputs and alarm outputs. Once checked, the camera alarm status will be captured inDatabase Manager.

Features such as “tripwire”, “motion detection”, “alarm digital input”, “tampering detection”, “audio detection”, and “ANPR/LPR detection’ can be activated individually.



Chapter 9.3 Existing Alarm Output for Cameras

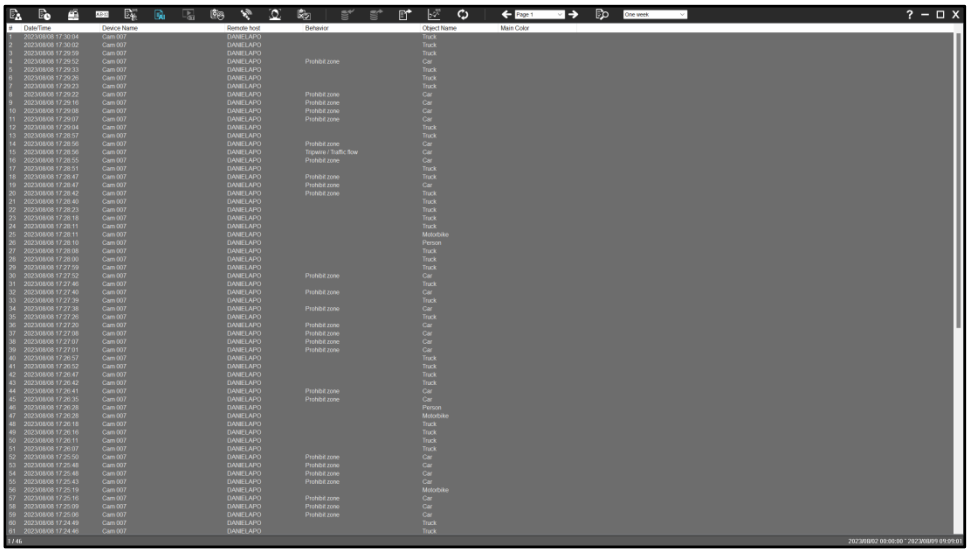
If an alarm has been created via Navigator Corporate, you can trigger the alarm in “**Alarm Management”** of Navigator Control Center.



Note: The pure text alert management feature is no longer maintained. The above can set alarm management and device monitoring from the right mouse button of the View Manager device tree diagram.

Chapter 10 Database Manager

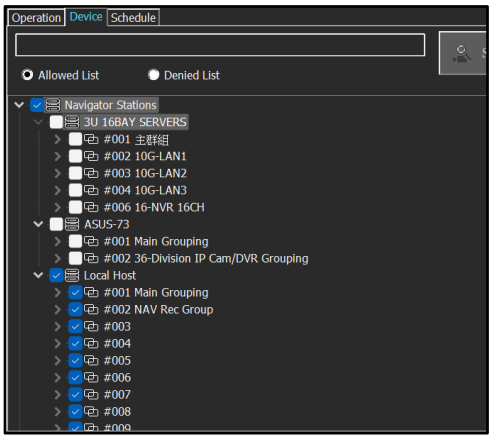
Database Manager can generate user access log, AI event data, events, GPS log, POS log, and system log. In addition, this built-in feature allows database import, export, and repair. Database Manager is a good tool for troubleshoot.



User Log Report		Click User Log Report iconto show a complete user log. Press File→Export Log to export a CSV log file.
EventReport		Click Event Report iconto show a complete event report. Press File→Export Log to export a CSV log file.
POS Event Report		Click POS Event Report iconto show the full POS record. Press "Export Log" to export the CSV log file.
ANPR Event Report		Click ANPR Event Report iconto show the complete license plate record. Press Export Log to export the CSV log file.
Object Counting Report		Click Object Counting Report iconto show the full object counting record. Press Export Log to export the CSV log file.
AI Report		Click AI Report iconto show the full AI record. Press Export Log to export the CSV log file.
TAG Report		Click on Tag Report iconto show full tag record. Press Export Log to export the CSV log file.
NAV Status		Click NAV Status iconto show the complete NAV host status record. Press Export Log to export the CSV log file.
GPS Report		Click GPS Report iconto show the complete satellite positioning record. Press Export Log to export the CSV log file.
Face Report		Click Face Report iconto show the full face recognition record. Press Export Log to export the CSV log file.
Server Report		Click on Server Report iconto show the full server log record. Press Export Log to export the CSV log file.
Import Database		XML format database can be imported into Database Manager. Click Import Database iconand choose the database you want to import.
Export Database		Database Manager supports database export to XML format files. Click Export DB iconand choose the database you want to import.
Export Log		Various event transfer report.
Statistics		Click on Statistics Chart iconand the object counting record will be converted to chart mode.
Refresh Database		Click Refresh Database iconto refresh the new event message.
Search Settings		Customizable search events

Chapter 11 Device Management

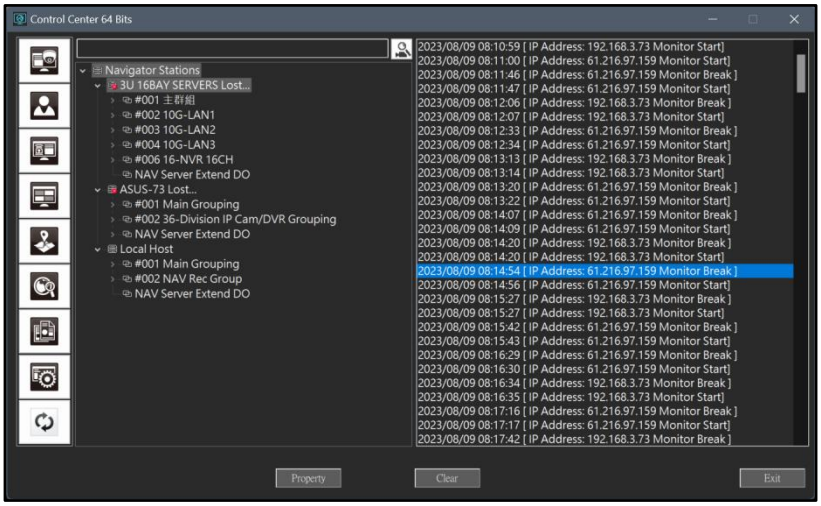
Click one of the users in User Management, and the Device tab will be shown on the right side. Check the devices you need for the said permissions to be accessed. After setting is finished, click the “**Save**” and “**Exit**”buttons.



Note: Please close all the View Manager software and restart the application settings.

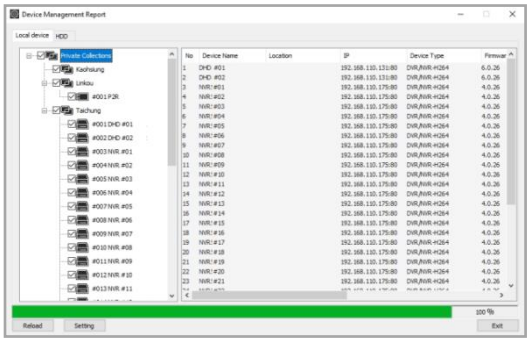
Chapter 12 Local Device Manager

The Local Device Manager is the tool that shows the status of the devices that are currently connected to the system.



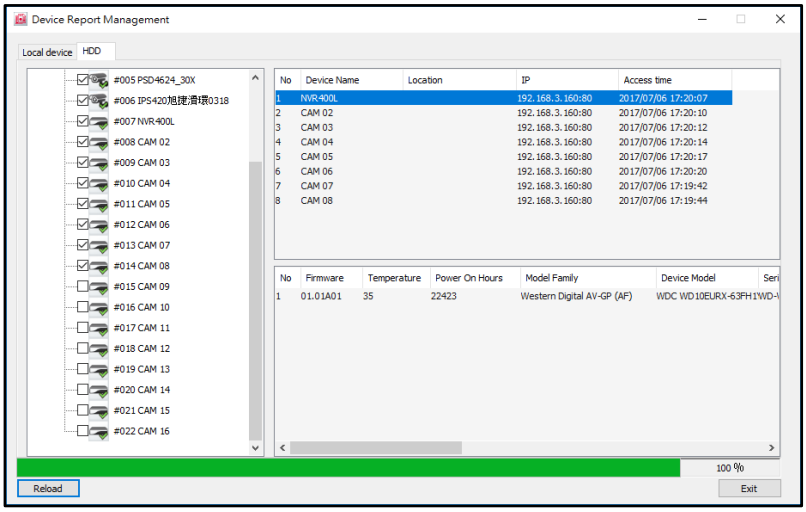
Chapter 12.1 Local Device Status Report

To query Local device status, please click “**Local Device Manager**” icon. Enter the username and password. And then, press “**Local device**” in the “Device Manager” tab. Check the DHD/NVR in the device tree diagram and press “**Reload**” button. This can scan the DHD/NVR and provide a Local device S.M.A.R.T report, which shows all the DHD/NVR information including “device name”, “location”, “IP address”, “device type”, “firmware version”, “channel no.”, “current record time”, “connection status”, “device reboot time” and “access time”.



Chapter 12.2 HDD Status Report

Press “**HDD”** in the Device Manager tab and check the NVR in the device tree. This can scan the NVR and provide a HDD S.M.A.R.T report, which shows all the HDDs installed for all NVRs.



- **Firmware**: Firmware of the HDD
- **Temperature**: Temperature of the HDD
- **Power on Hours**: The length of time between failures of the HDD
- **Model Family**: Manufacturer of the HDD
- **Device Model**: Model of the HDD
- **Device ID:** ID of the HDD
- **Capacity**: Maximum capacity of the HDD
- **S.M.A.R.T.**:S.M.A.R.T. status of the HDD

S.M.A.R.T. report is the potential indicators of imminent electromechanical failure. It does not mean that the HDD is broken. See appendix for details.

Chapter 13 How to Connect via the AD/LDAP Server

The View Manager can support Active Directory (AD)/LDAP for user login management.

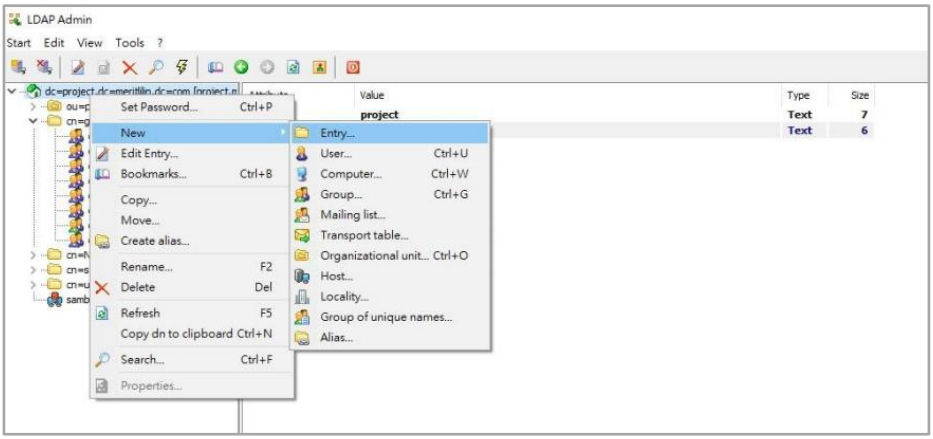
The View Manager is able to login via AD/LDAP for user accounts and to use the “user type” of Navigator Corporate with cameras and features available for the user group.

- Normal Mode: Use the user database of the View Manager’s or NAV Recorder for login.
- AD Server Login: Use the user database of an AD Server. Import these users of an AD Server into NAV’s user group.
- LDAP Login: Use the user database of an LDAP Server. Import these users of an AD Server into NAV’s user group.

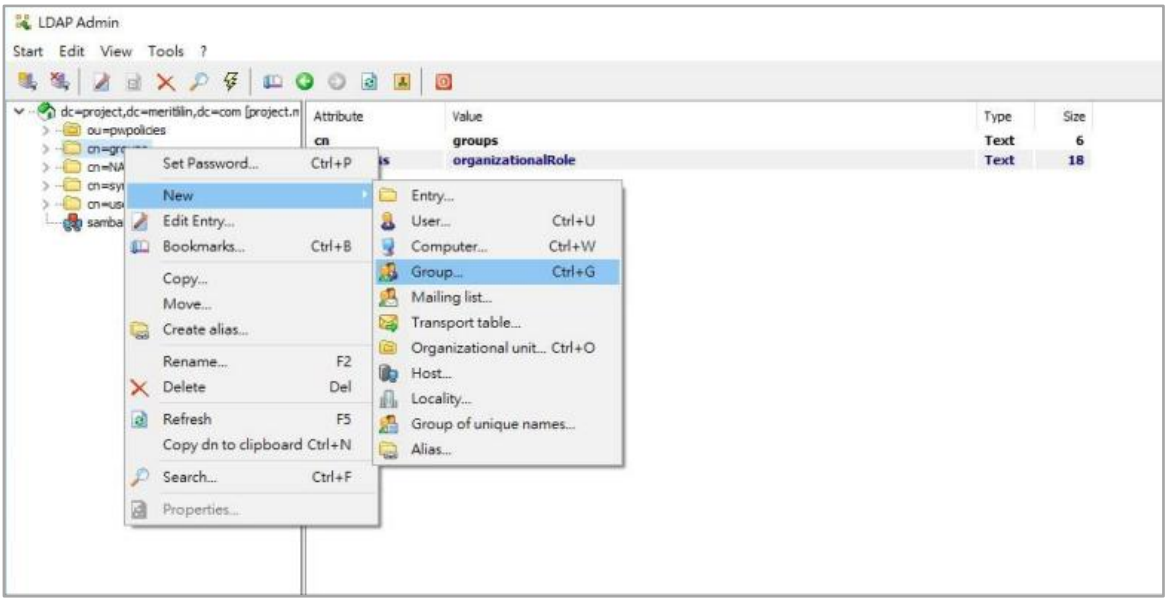
The AD/LDAP server specifies as follows:

- Host Name: The AD/LDAP server host name.
- Basic Distinguished Name: The AD/LDAP server distinguished name.
- DN Path: The AD/LDAP serverdistinguished namefile path.

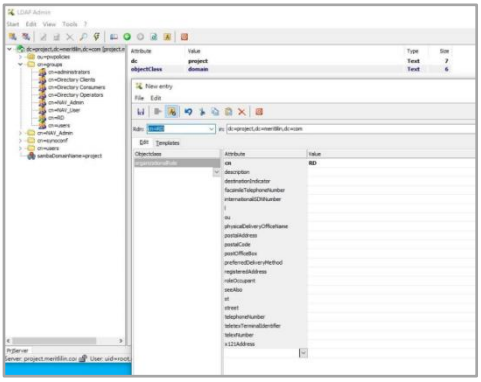
For example the LDAP server has created a new project.



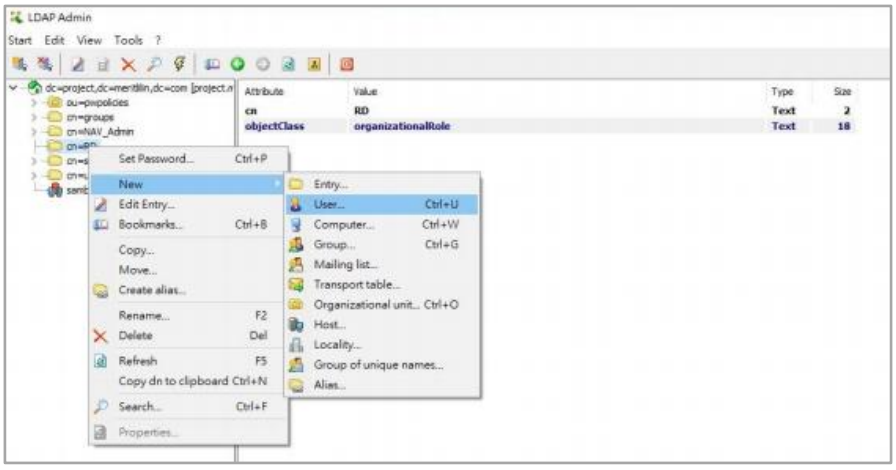
And LDAP server has created a new group.



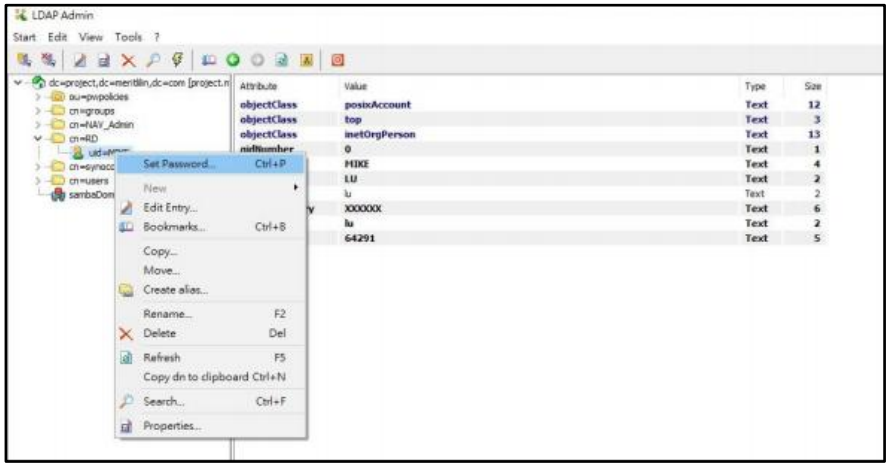
The following is an example, create a name with cn=RD.



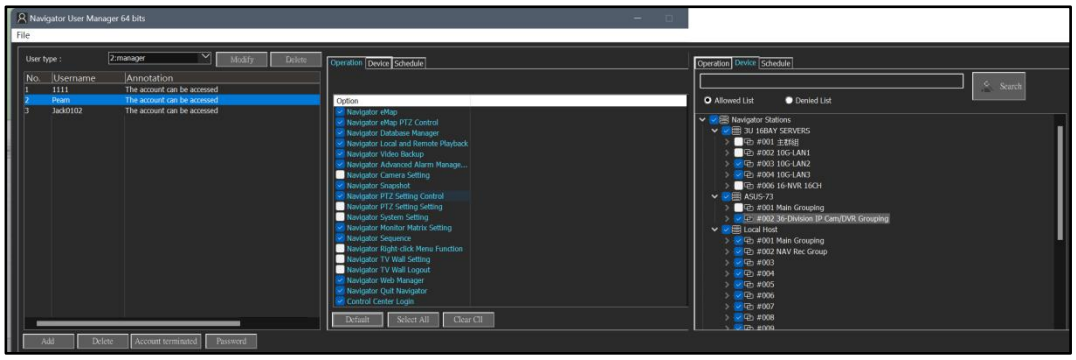
Ensure that the CN account has established an RD name.



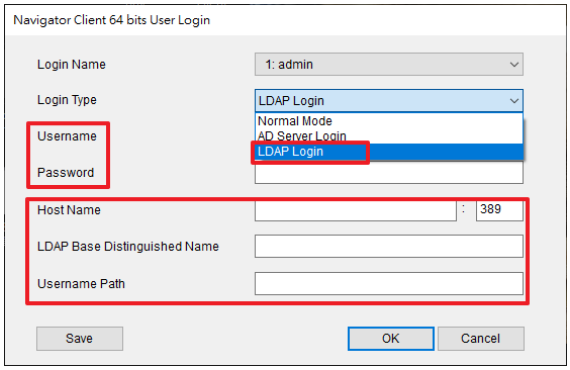
Ensure these accounts have established passwords.



Create user type:
After creating an account on the LDAP server, please create an RD to enable the user type. Please enable the account permission setting and camera viewing permission.

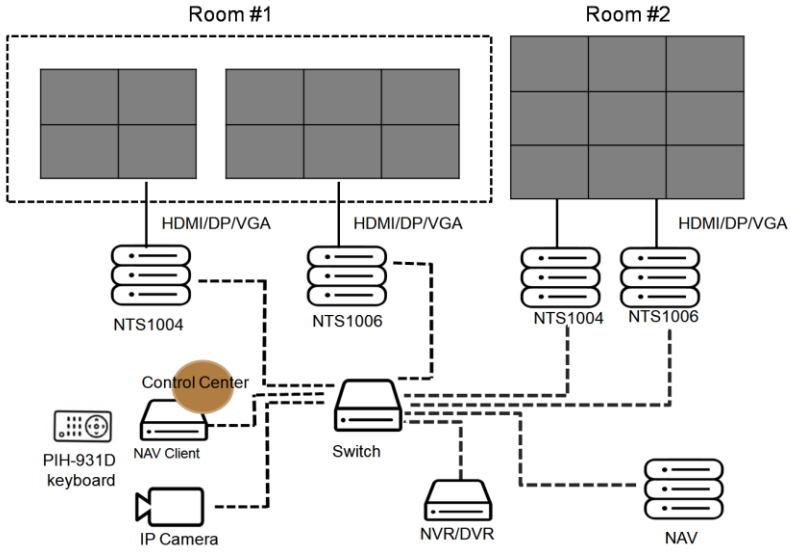


Login: Please select the AD/LDAP server to log in.



Chapter 14 Mosaic TVWall

The View Manager can manage to configure and to display the existing camera views to Mosaic TV Wall for controlling and streaming the views to the HDMI/VGA outputs of Mosaic TVWall.LILIN provides TV wall products NTS1004 (4-display) and NTS1006 (6-display). To wire the TV walls in a control room, the system is described below. Each monitor is connected to a TV wall station. Mosaic TV Wall application of Navigator Control Center can virtually direct video streams to TV wall station. The system diagram is as below:



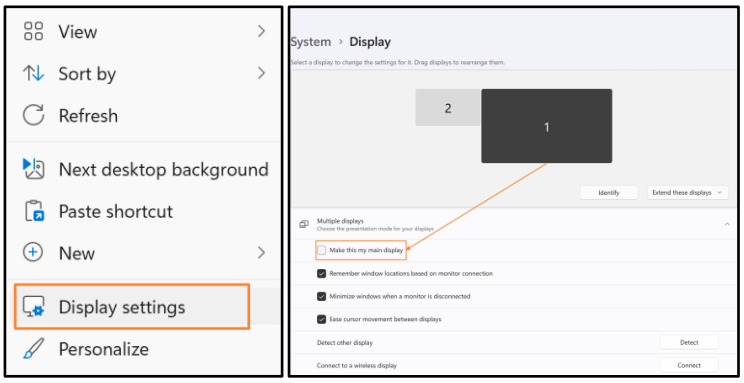
Major features are described below:

- **Monitor Template**: Monitor set up for Mosaic TVWall.
- **Run**: Display assigned monitor template for monitors.
- **Sequence**: Display all the monitor templates.
- **Channel setting**: Drag and drop cameras on monitors.
- **Monitor setting**: Add monitors to a Mosaic TVWall.

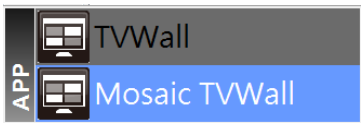
Note: HDMI and DP support 4K resolution, while DVI and VGA outputs only support 1080P resolution.
Note: It is recommended to set all screen to a uniform resolution of 1080P and adjust to 60Hz.

Chapter 14.1 Computer Setting the Main Display

Mouse right-click on the desktop, and click on "Display Settings", the computer host slot 1 display card HDMI output. It is recommended that the main display is set at the position of the physical monitor 1.



How to configure Mosaic TVWall function
Open the Control Center management software and access the Mosaic TVWall control function.



Chapter 14.2 Mosaic TVWall Setup

To setup Mosaic TVWall, click the “Mosaic TVWall “ icon for opening Mosaic TVWall application via View Manager.

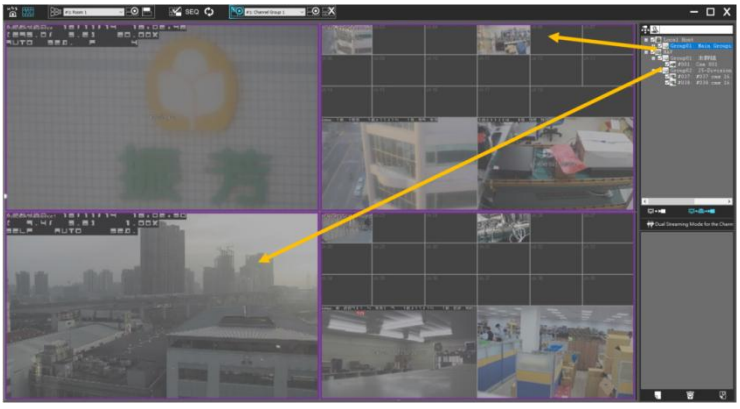
A dialogue box will pop up, “Do you want to import the camera view to Mosaic TVWall”. Please click OK.

Chapter 14.3 How to Set up Camera View for Mosaic TVWall

Click on “Mosaic TVWall” icon that can import the existing View for TV wall display. Navigator Control Center will pop up a dialogue box for importing the existing camera view to the Mosaic TVWall application. This feature is important and easy-to-use. Once a camera view is setup, the view is then used for the TV wall display. There is no need to configure the camera view again.

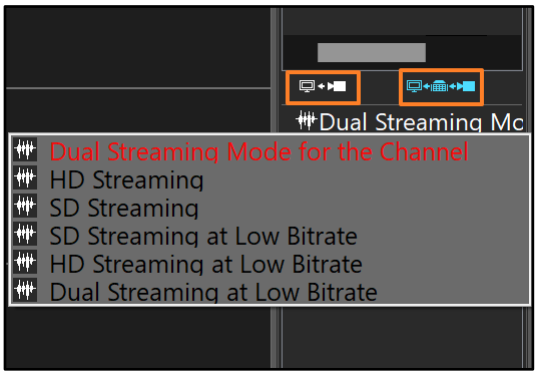
Chapter 14.3.1 Manually Add Camera to Mosaic TVWall

To add the camera configuration manually into the TVWall, drag the mouse cursor on the camera to camera view for the TVWall display.



Chapter 14.3.2 Mosaic TVWall Connection Mode

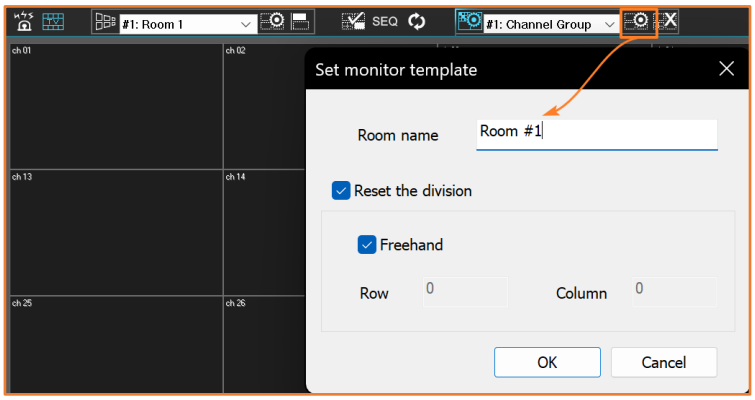
For device connection mode source, you have the option to choose between streaming from the NAVhost or directly obtain the stream from the devices.
Depending on the network environment, the device streaming can be adjusted to either dual-stream or single-stream, low-bandwidth mode.



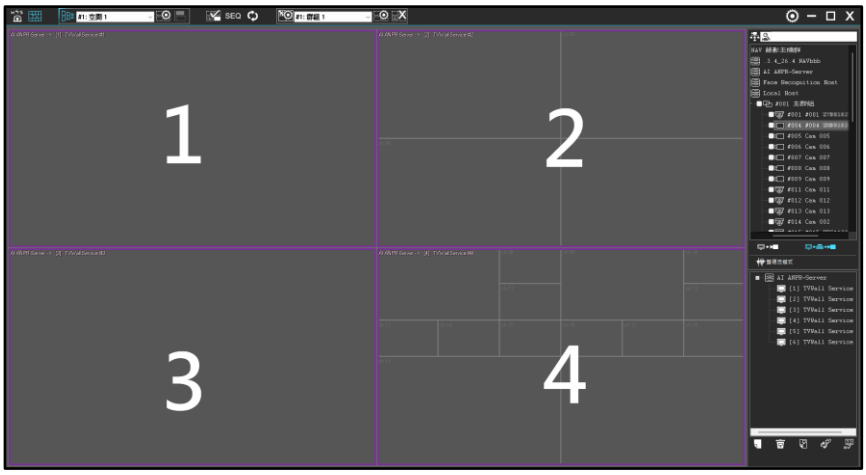
Note: The connection default is set to use NAV streaming.

Chapter 14.4 Mosaic TVWall Monitor Layout Setting

To set up Mosaic TVWall, open "**Mosaic TVWall"**, and select "**Set monitor template"** and specify Room # to create M x N TVWall for a room.



The example below shows Room #1, and there are four monitors.



Chapter 14.5 Mosaic TV Wall Monitor Output Assignment

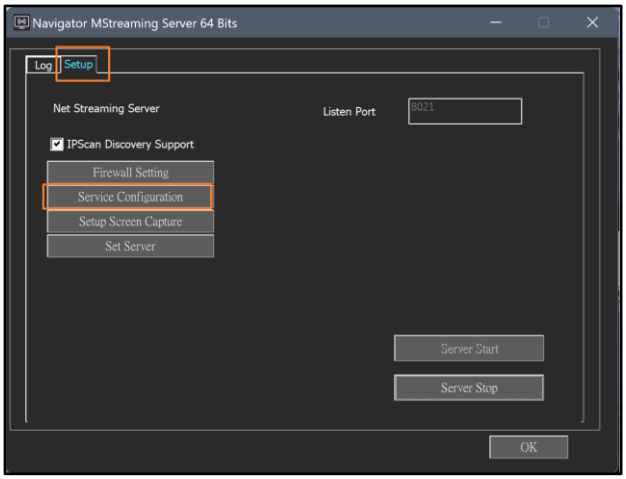
To add TV Wall monitors, click "**Add**" icon at the bottom right. Click "**Search**" to discover available TV Wall stations. Next, click "**OK"** and enter required information. Click "**Verify"** to test if the TV Wall station is working properly. If two monitors are connected to the station, the outputs (HDMI, VGA, or display port) will be shown on the TVWall window.

After the outputs of the TV Wall stations are configured, follow the steps below to finish set up:

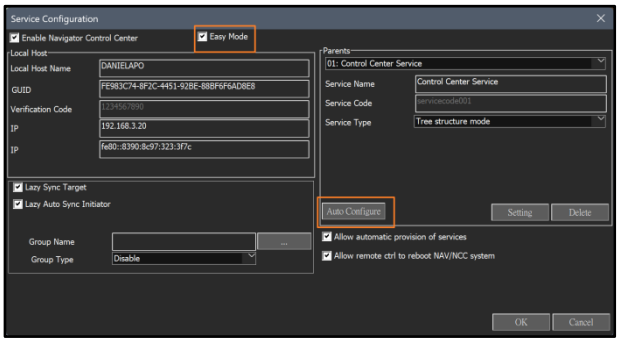
- Drag and drop monitor outputs to the left pane to assign a monitor.
- Drag cameras into the position of a monitor.

Chapter 14.6 How to Set up Communication for Mosaic TVWall Stations

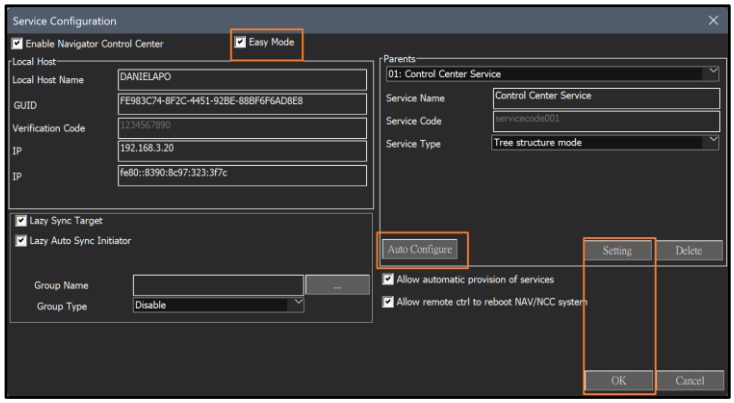
To add Mosaic TVWall to Navigator Corporate, please click on Windows->Start->LILIN Navigator->Streaming Station->Setup-> Service Configuration.



Make sure that the Service Configuration is set to "Easy Mode". "Easy Mode" can simplify the system setting. Click "**Auto Configure"** button to fetch the configuration automatically.



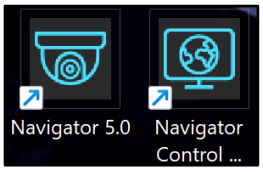
Enable Auto Set TV Wall. This can invoke the TV Wall and display the TV Wall when the system reboots.



For example, one company, the headquarter, wants to display their branch office NAV device camera all in a customized Mosaic TVWall.

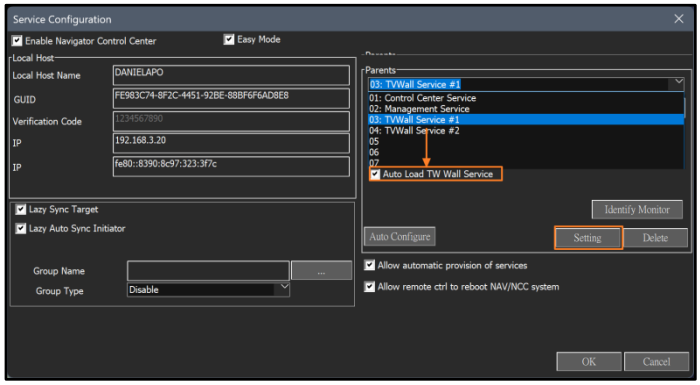
Assume the Navigator at each branch supports 4 monitors. Each branch office has one or several NAV recorders.

Please make sure that every branch office NAV Corporate recorder has LILIN Navigator Corporate and LILIN Control Center launched.

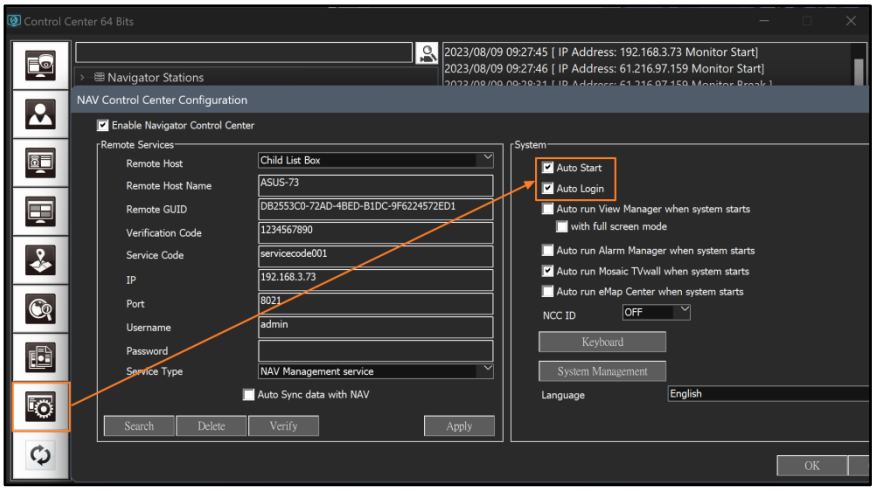


Chapter 14.7 Automatic Invoke Remote Mosaic TVWall Setting

To enable automatic invoke remote mosaic TVWall function, tick in “Auto set TV viewer” box.



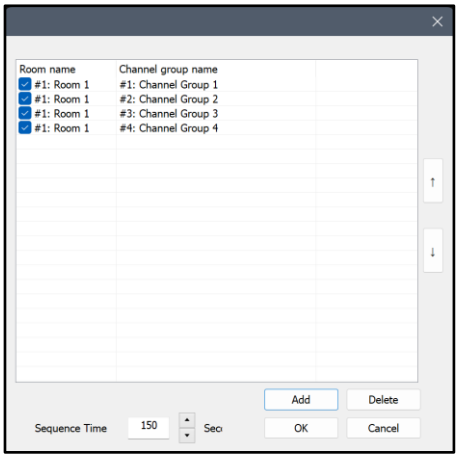
To set up LILIN NAV Control Center Configuration remote TVWall, please tick in the “Auto Start” and “Auto Login” boxes. When the computer or Control Center restarts, the automatic enable Mosaic TVWall will be determined according to streaming server setting, whether the "Auto set TV viewer" is set or not.



Chapter 14.8 Sequence Display for Mosaic TVWall

Press “**Run”** on the top of the window to start using the TVWall. Press “**Sequence”** SEQ to change the view according to the preconfigured time slot.

The screen setting “**space**” supports the same screen position. And in the “**group**” setting, the various display template can be changed to achieve real-time monitoring of the group.



Chapter 14.9 Mosaic TVWall Camera Groups

Once the monitors are set, press the **“Group”** drop-down menu 

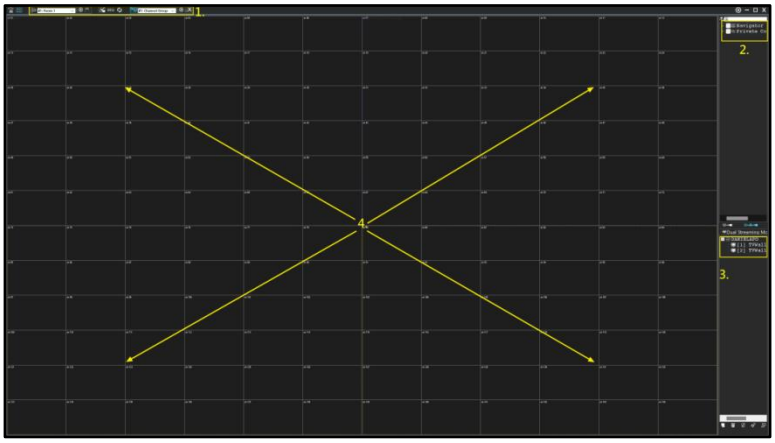
nd select a group layout.

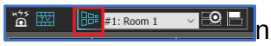
Click “**all channels**” to delete all channel settings.

Chapter 14.10 How to Setup TV Wall Application

The Mosaic TVWall consists of the following:

1. Monitor setting.
2. Camera setting
3. Mosaic TVWall service
4. Main screen.

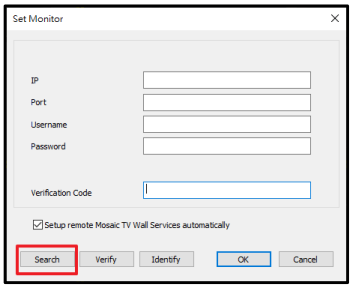


On the top left, click on “**Layout Monitor**” icon. 

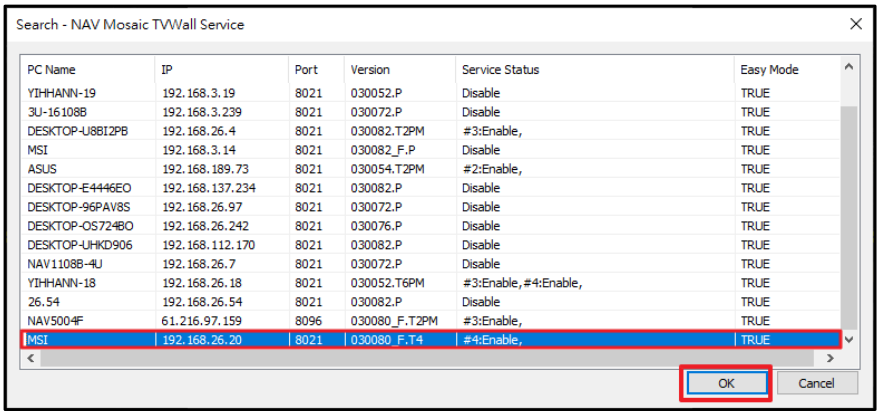
n the bottom right, click on “**Add**” icon.


Click on “**Search**”button.

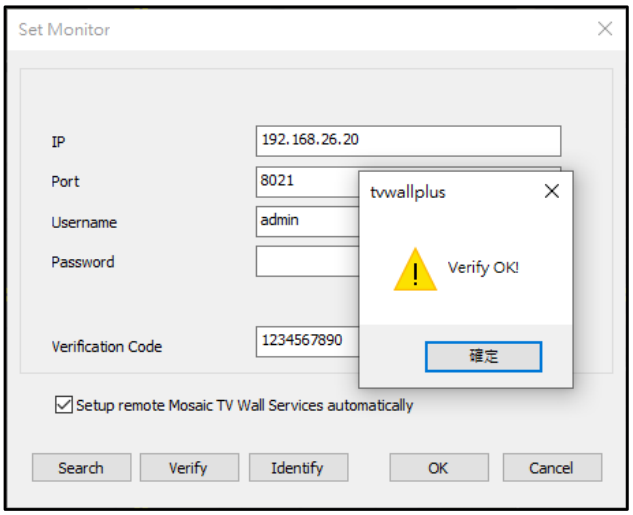
Note: The “Setup remote Mosaic TVWall Services automatically” is ticked as default. If LILIN Navigator and LILIN Control Center is open at the other party, the remote TVWall service is automatically invoked.



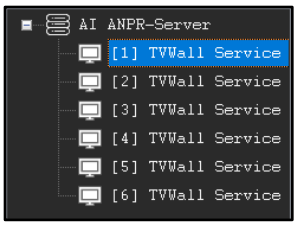
Select the computer that is being used as station. Click on “**OK**” button.

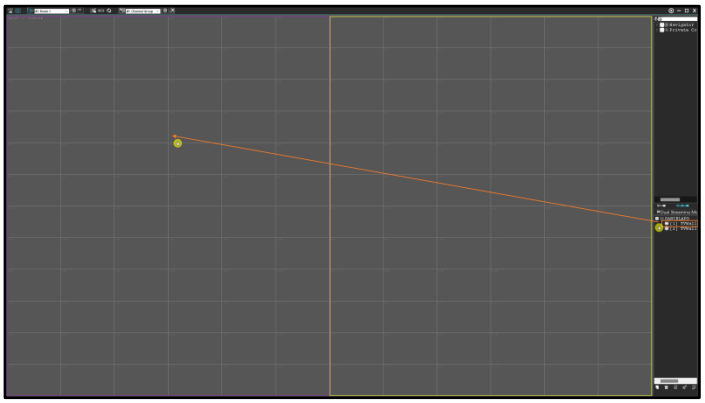


Click on **Verify** button. It will pop up **Verify OK** if the station is working properly. If not, please check your Navigator Control Center

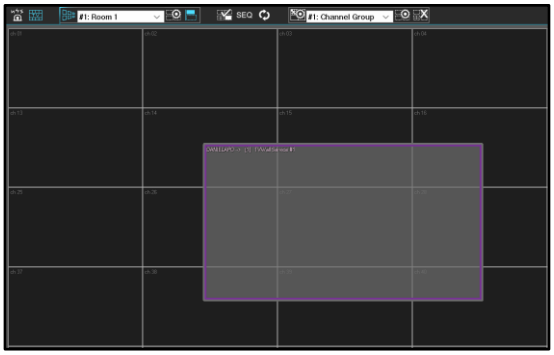


Pull the first Mosaic TVWall service icon by maintaining mouse left click.

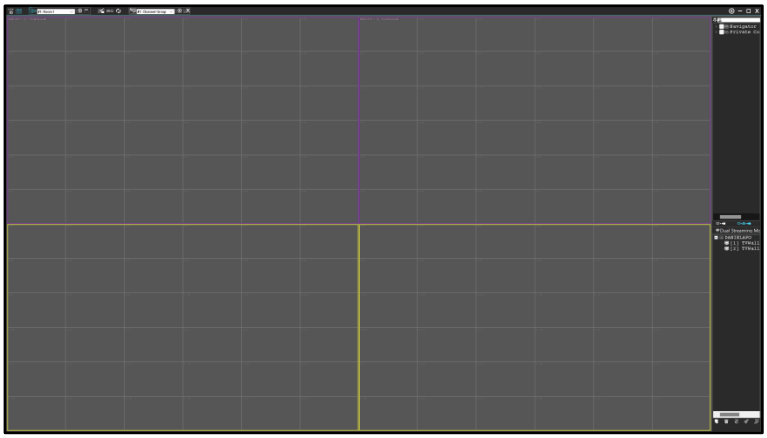




An adjustable purple window will appear.

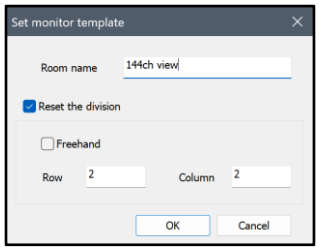


Please follow the same step for the second Mosaic TVWall service. Readjust the size of each TVWall.

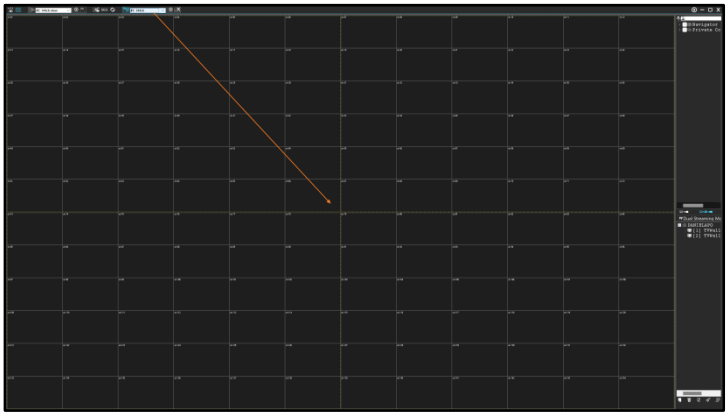


You can also define how the channels are displayed by clicking on this layout channel. Furthermore, by clicking on the camera template settings, you can define multiple channels and create any combinations, but please be aware that images may become distorted.

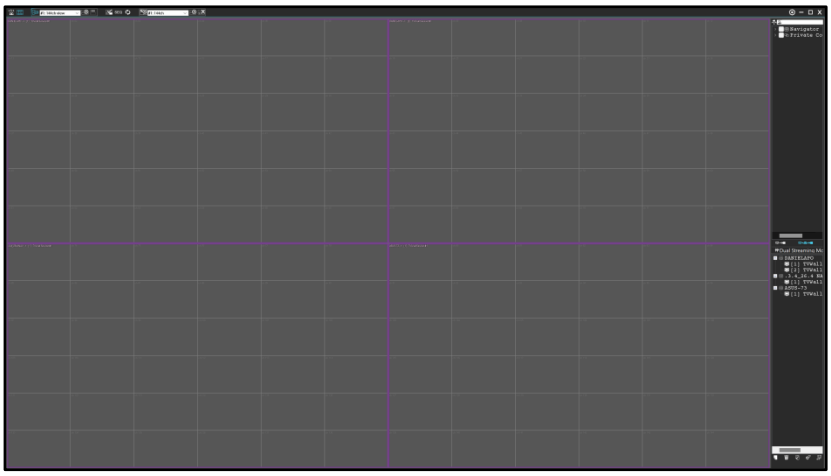
In this example, we will select the 12x12 camera template, choose the row 12 and column 12, and then click "OK."



After adjusting some channels size, it will show below image:



Click on the layout monitor icon to display the four TVWall preview.

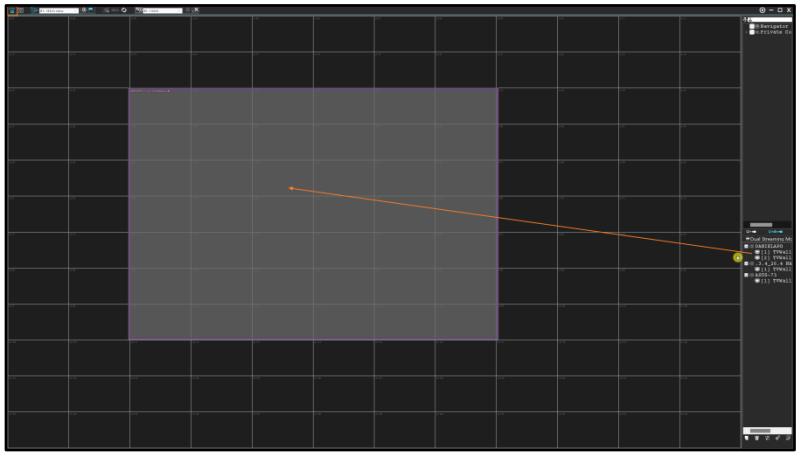


Click on "Apply to Remote Monitors" on the top bar. In this example, a 12x12 channel display divided into four screens has been selected. Once your TV wall is correctly configured, it will appear as shown in the following image:

Click "Apply to Remote Monitors" to view the result.

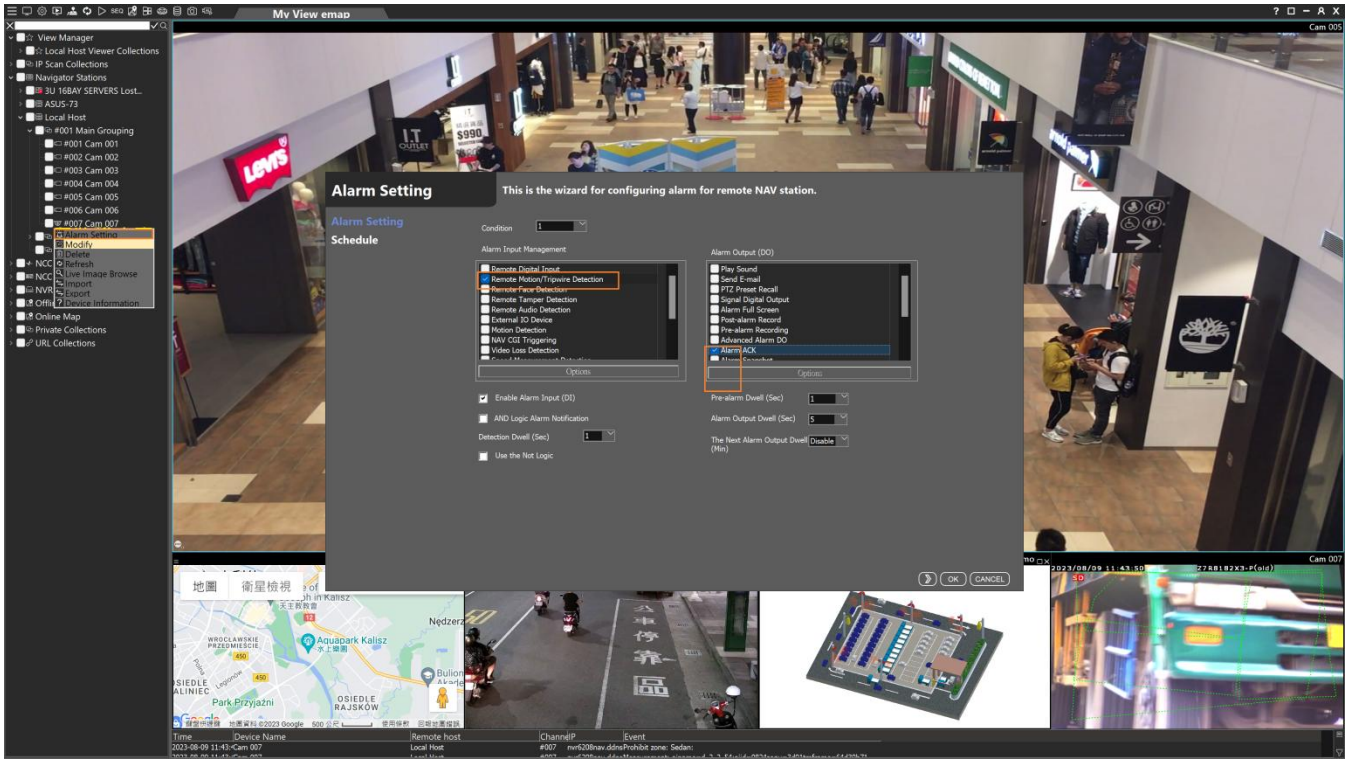
Chapter 14.11 Alarm Acknowledge Feature of TV Wall

Open “**Alarm ACK**” and specify the screen location to show the alarm confirmation in the display mode.



Chapter 14.11.1 Alarm Center Setting for TV Wall

Click on “ViewManager”, mouse right click on selected channel, enter “alarm setting” and tick in “NCC TVWall ACK” box.



After Alarm Center received alarm notifications, the ACK will be imported to the following screen. Click “ACK OFF” for acknowledging the alarms.

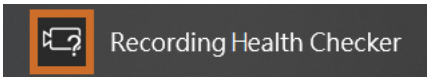
Chapter 15 Maintenance

Chapter 15.1 Recording Health Checker

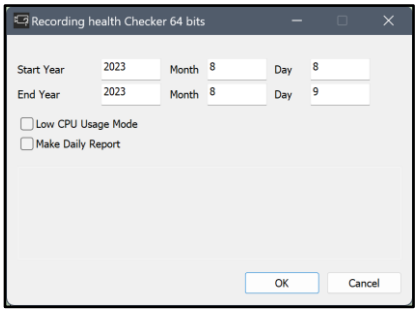
For the following circumstances, a user might use the “Recording Health Check App” for checking if the recordings are well for playback purpose.

1. Rebuild a RAID after HDDs failure.
2. Move HDDs from one NAV machine to another.
3. Re-install Windows on NAV machine,

For above circumstances, please perform Recording Health Checker to scan through all the recordings. Go to “Windows”->”LILIN Navigator 5.0”->”Recording Health Checker”.



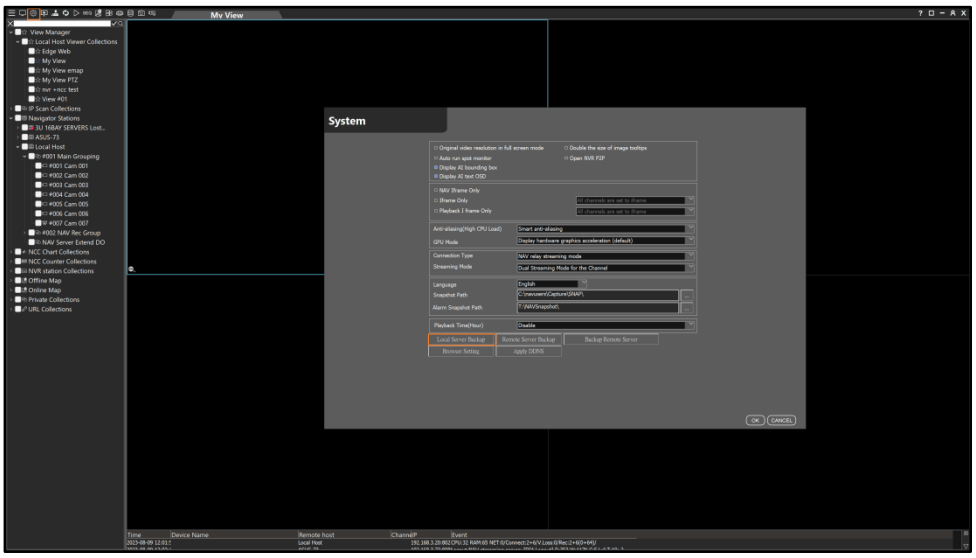
Enter start time and end time and click “OK” for scanning recordings for all HDDs. Select “Low CPU Usage Mode” for background scanning.



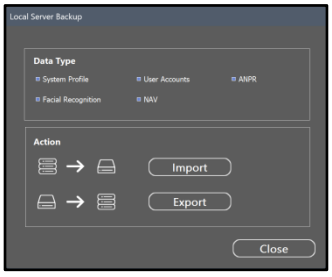
Chapter 16 System

Chapter 16.1 Import and Export for System Configurations

Select the "System Settings" icon and click "Local Server Backup" button to import and to export the local configuration file for future use.



As shown in the figure below, you can export databases such as “electronic maps”, “user accounts”, “license plate recognition”, and “face recognition”. Sensitive information such as user passwords has been encrypted with AES256 to ensure network information security protection.



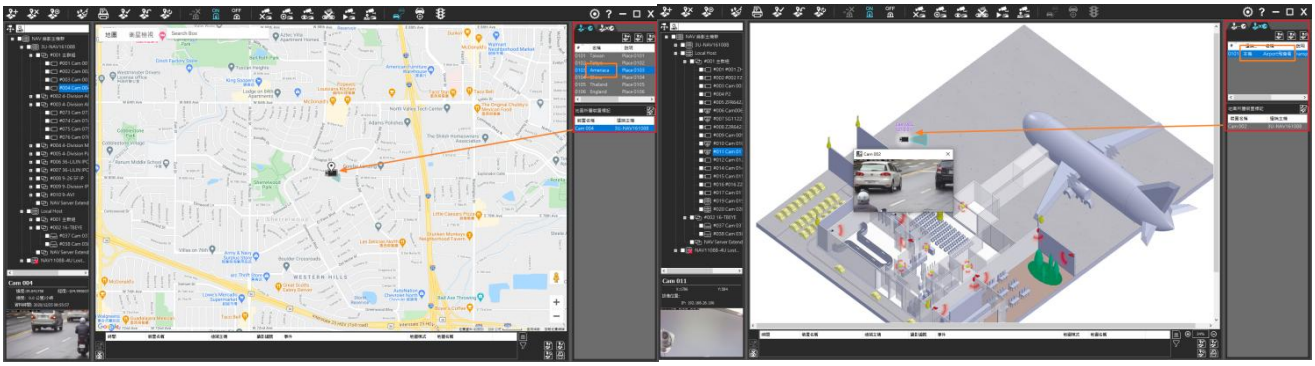
- System Profile: View Manager tree diagram connection devices, canvas groups, and alarm settings.
- User Accounts: User account permission management settings.
- ANPR: License plate recognition lists and groups settings.
- Facial Recognition: Face recognition lists and groups settings.
- NAV: NAV main program channel groups and alarm settings.

Note: The Navigator Client free version only supports the import and export of system configuration files and user account permissions.
Note: Version 5.0.0.60 and above supports system configuration file backup to another computer.

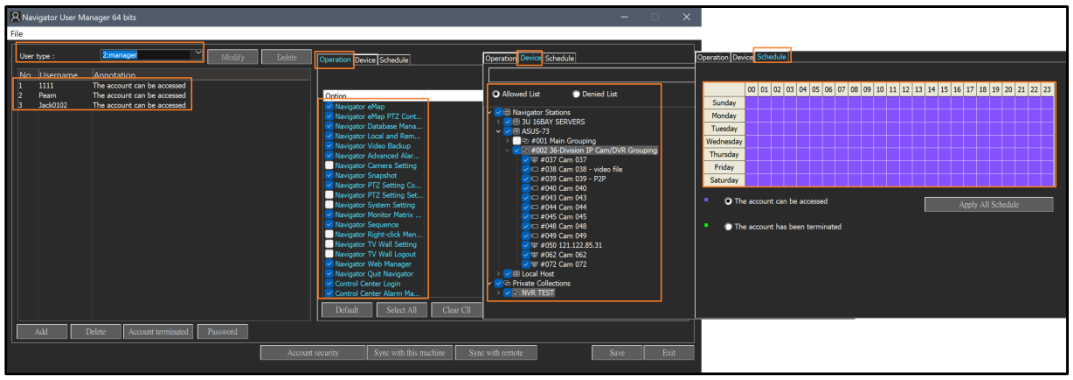
Chapter 16.1.1 Back up Import Location

The local host back up import location is as follows:

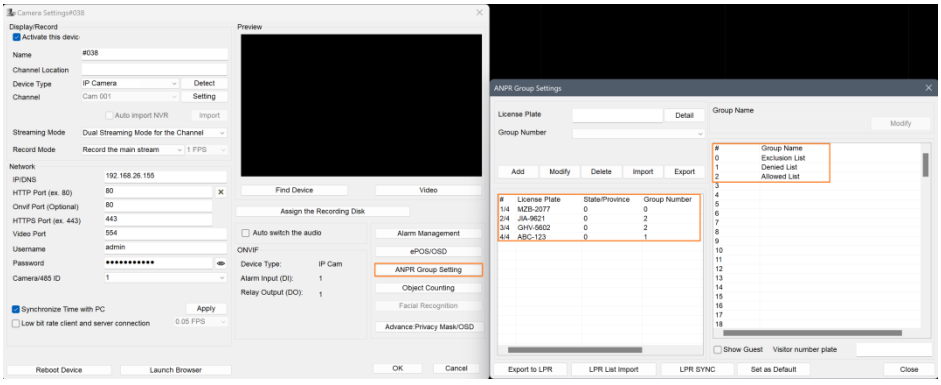
- eMap: NCC Navigator Control Center online eMap and offline eMap backup.



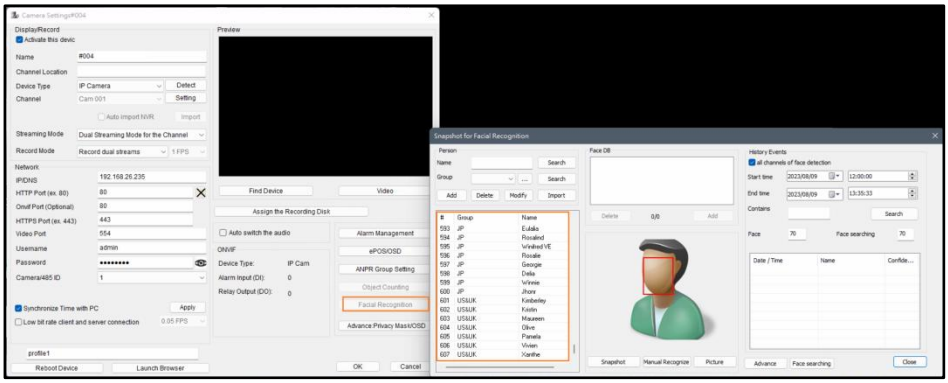
- User Account: NAV, NCC &View Manager user accounts authorization manager backup.



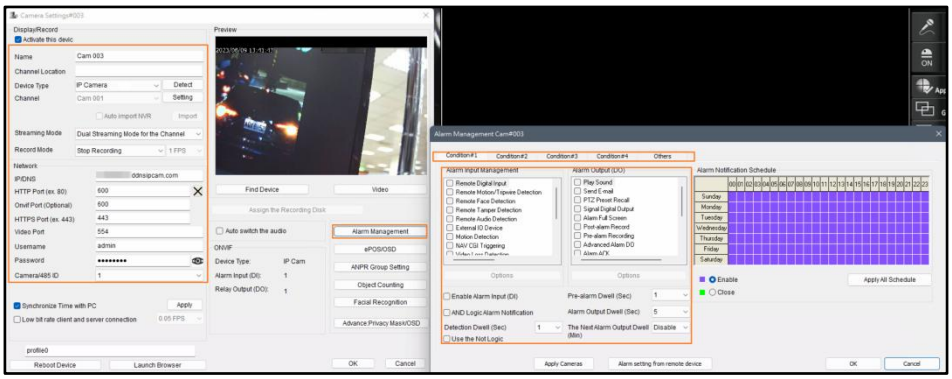
- License Plate Recognition: NAV license plate list back up.



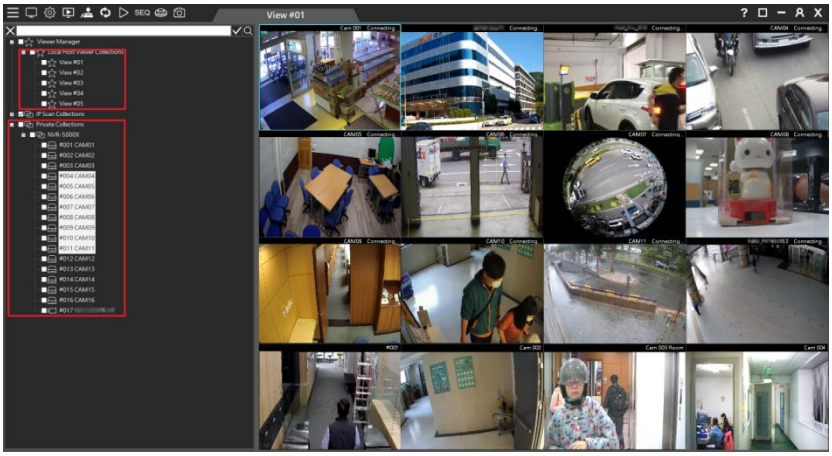
- Face Recognition: NAV Face list back up.



- NAV: NAV IP, groups, alarm setting back up.



- NCC: The content of the NCC data backup is the View group and the connection information of the IP Cam/NVR/DVR/NAV.

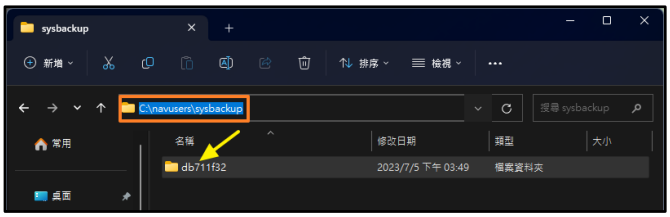


Chapter 16.2 Remote Backup

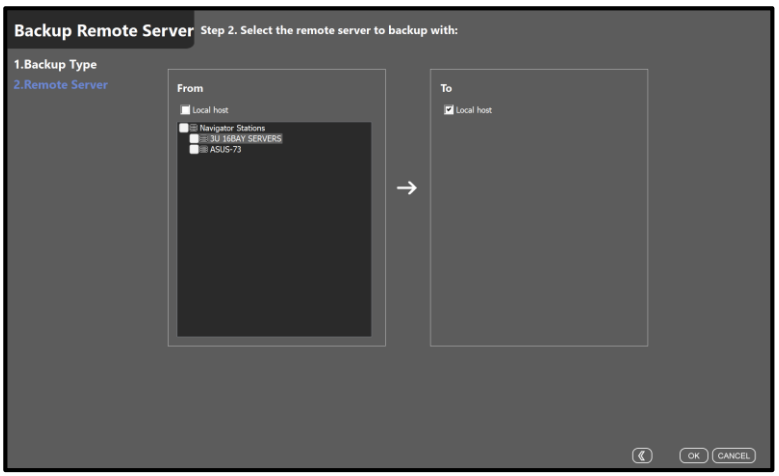
Click on "System Settings" button and execute "Remote Server Backup", select the desired backup mode for storing the configuration files.

NAV to NCC Data Backup: Backs up the configuration files from the remote host to the local storage.
NCC to NAV Data Backup: Allows tree-structured NAV hosts to back up files to each other.

- NAV to NCC Data Backup: When you select the data type to back up, a remote host code folder will be automatically created in the local directory C:\navusers\sysbackup. The selected backup configuration will be stored in this folder. In case of any issues with the remote host in the future, you can restore the data from here, saving you time and effort of reconfiguring.

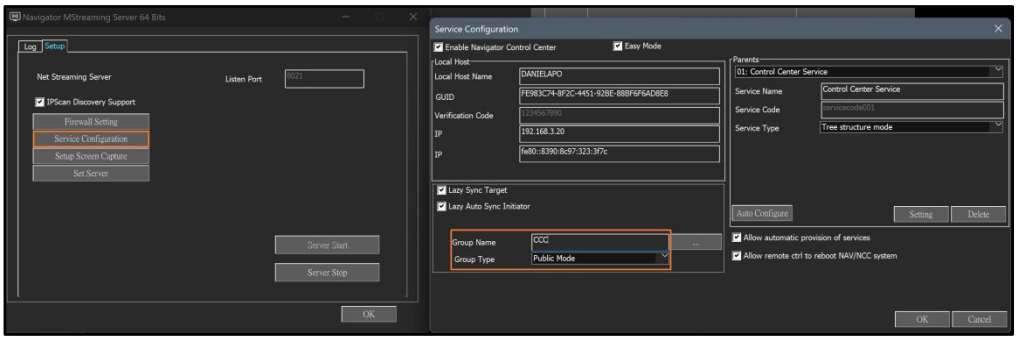


- NCC to NAV Data Backup:



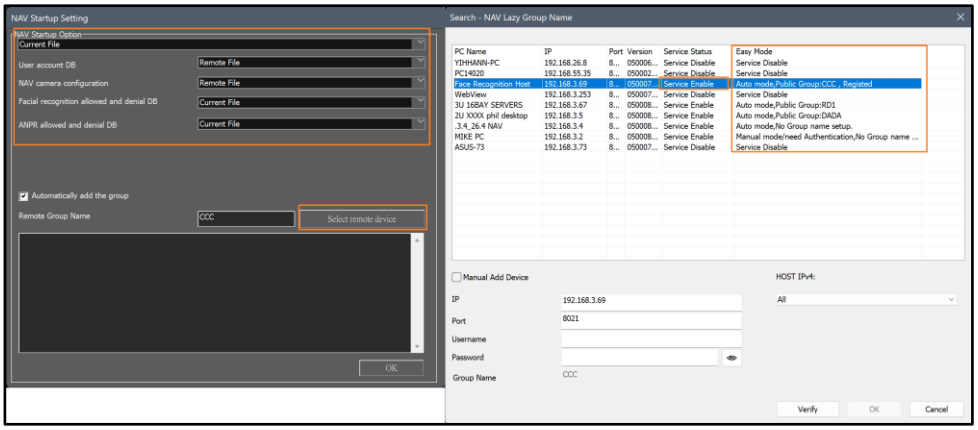
Chapter 16.3 Remote Data Backup

To synchronize data between the same groups, first, you need to set the group names for both the local and remote NAV MStreaming.
Service Configuration->Group Type-> Public Mode -> Group Name (should be the same as the remote name)

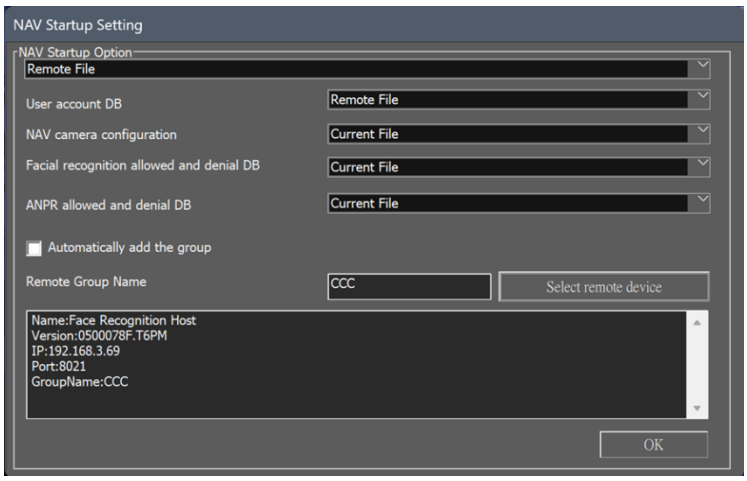


After selecting the data type to be backed up to the remote, enter the remote group name. You will see the status bar for Easy Mode. After confirming, enter the account and password for connection verification.

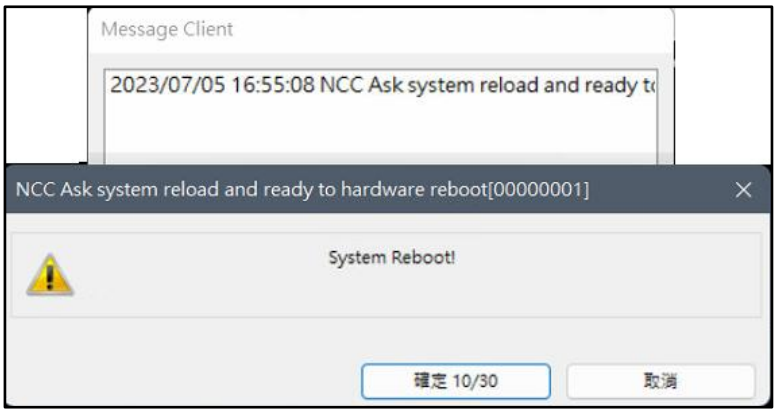
Condition 1: Service Enable
Condition 2: Auto mode, same group name, Registered status



At this time, it will automatically return to the backup home page, and you will be prompted to confirm again. If everything is fine, you can press "OK" to start the backup process.



The remote host pops up a reminder message window and countdown for 30 seconds, indicating that it is preparing to reboot...



Chapter 17 Troubleshooting

Chapter 17.1 Choosing between SMR and CMR in Hard Drives

Many people ask what is the right hard drive for the intended use. Because different recording methods have different performance. SMR is used for cold data storage and CMR is used for repeated reading and writing data. Both technologies have their own characteristics for reasonable and right application.

In our guide, it is usually recommended to use CMR hard disks. When the recording host often reads and writes or important data transmission is important, CMR hard disks are a good choice. It is recommended to choose the NAS Pro series and above of the same model, which can read and write for a long time. To maintain life and warranty, the following are WD and Seagate series hard drives.

Apart from the limitation of the number of hard disk in the series, for systems with more than 72 channels or multiple clients connecting for playback and retrieval, it is highly recommended to use database-type hard disks for their durability. (WD DC HC570 or Seagate Exos7e8 enterprise database series or higher.)

For more detailed hard drive model brands, please consult the original manufacturer's technology.

Brand	Model #	Format	Application	RAID 5
WD	Purple Surveillance AI	CMR	DVR&NVR monitoring power saving or small video recording	8 Bay
WD	Red Pro NAS	CMR	NAS RAID small and midsize video recording	16 Bay
WD	Ultrastar DC HC530	CMR	NAS or medium-scale video recording database	16 Bay
WD	Ultrastar DC HC550	CMR	Database and recording a connected large number of channels	24 Bay
WD	Ultrastar DC HC570	CMR	The database is frequently written and read, and JBOD has more channel recordings.	24 Bay
WD	Gold Enterprise	CMR	The database is frequently written and read, and JBOD has more channel recordings.	24 Bay

Brand	Model #	Format	Application	RAID 5
Seagate	SkyHawk AI	CMR	DVR&NVR monitoring power saving or small video recording	8 Bay
Seagate	IronWolf Pro NAS	CMR	NAS RAID small and midsize video recording	16 Bay
Seagate	Enteprise Exos 7E8	CMR	Database and recording a connected large number of channels	24 Bay
Seagate	Enteprise Exos X16	CMR	The database is frequently written and read, and JBOD has more channel recordings.	24 Bay

Note: Technically speaking, SMR also uses a vertical magnetization method, so in order to segregate, the original PMR is renamed CMR.

Note: Depending on the grade or type of the hard disk, the hard disk will decline for a certain period of time when reading and writing, and then return to the normal writing speed. It is generally recommended to use the enterprise-level hard disk of the database to process a large amount of images or retrieving data. In addition, please ensure to keep more than 10% of the reserved space, which aids in buffering hard disk writing.

Chapter 17.2 Computer Room Guidelines

Generally, the computer room should maintain a temperature of 24 ± 4℃ and a humidity level of 50 ± 20%. Too high temperature and humidity can lead to component corrosion, shortened lifespan and equipment failure. Clean regularly to reduce dust accumulation and reduce the risk of overheating. Please ensure that these assets are protected from any moisture-related environment.

Chapter 17.3 5.0 System Requirement

View Manager, Mosaic TVWall system requirement:

5.0 View Manager System			
Minimum System Requirements		Basic System Requirements	Recommended System Requirements
Operating System	Win10 Pro 22h2(64 Bit)	Win10 Pro 22h2(64 Bit)	Win10 Pro 22h2(64 Bit)
Processor Frequency	2.9Ghz or higher	2.9Ghz or higher	3.0Ghz or higher
Core Processor	6C/8T or higher	8C/16T or higher	8C/16T or higher
Processor	Intel® Core 10th i5 or higher	Intel® Core 10th I7 or higher	Intel®Core 12th i7 or higher
Recording Channel	Dual Monitor 36-ch	Dual Monitor 72-ch	Dual Monitor 108-ch or more
Built in Graphics Card	Intel® HD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 730
Dedicated Graphics Card	Nvidia GT1030	Nvidia GT1050 or higher	Nvidia GT1050 or higher
Memory	16GB or higher	16GB or higher	32GB or higher
System Disk Space	System SSD 500GB or higher	System SSD 500GB or higher	System SSD 500GB or higher
Database Event Storage	1TB or higher	1TB or higher	1TB or higher
Internet Connection	1000Mbps RJ45 or higher	1000Mbps RJ45 or higher	1000/10000Mbps RJ45 or higher
Resolution	1280 X 1024 Minimum Resolution	1920 X 1080 Recommended Resolution	1920 X 1080 Recommended Resolution

*The number of channels depends on the CPU cache speed. (Simulated scenario calculation: Multiple split screens at 480P 15FPS). *

Recommended H.264 video decoding CPU type:

- Single Monitor 36ch, CPU: i5-9500 / RAM:16GB / VGA: GT1050
- Single Monitor 72ch, CPU: i7-9700 / RAM:32GB / VGA: GT1050
- Dual Monitor 100ch, CPU: i7-10700 / RAM:32GB / VGA: GT1050
- Dual Monitor 144ch, CPU: i9-10900 / RAM:32GB / VGA: GT1050

Recommended H.265 video decoding CPU type:

- Single Monitor 18ch, CPU: i5-9500 / RAM:16GB / VGA: GT1050
- Single Monitor 36ch, CPU: i7-9700 / RAM:32GB / VGA: GT1050
- Dual Monitor 50ch, CPU: i7-10700 / RAM:32GB / VGA: GT1050
- Dual Monitor 72ch, CPU: i9-10900 / RAM:32GB / VGA: GT1050

Note:

1. GPU decoder does not support AMD display cards
2. Windows 2012 R2 operating system is not recommended
3. Video recording HDD compatibility table, please contact the original manufacturer technical support.

Chapter 17.4 Supported External Hardware DevicesList

Third-party or external hardware device supported list.

5.0 Mosaic TVWall System		
4 Monitors System Requirement		6 Monitors System Requirement
Operating System	Win10 Pro 22h2(64 Bit)	Win10 Pro 22h2(64 Bit)
Processor Frequency	3.0Ghz or higher	3.0Ghz or higher
Core Processor	6C/8T or higher	8C/16T or higher
Processor	Intel® Core 12th i7, or higher	Intel® Core 12th i9, or higher
Surveillance Channel	4 Monitors 100-ch	6Monitors 144-ch
Built in Graphics Card	Intel® HD Graphics 730	Intel® UHD Graphics 730
Dedicated Graphics Card	Nvidia GT1050*2 or higher	Nvidia GT1050*2 or higher
Memory	64GB or higher	64GB or higher
System Disk Space	System SSD 256GB or higher	System SSD 256GB or higher
Storage Disk Level	-	-
Internet Connection	1000Mbps RJ45 or higher	1000Mbps RJ45 or higher
Monitor Resolution	1280 X 1024 Minimum Resolution	1920 X 1080 Recommended Resolution

*The number of channels depends on the CPU cache speed. (Simulated scenario calculation: Multiple split screens at 480P 15FPS). *

TV Wall host image decoding H.264/265 CPU types:

Recommended H.264 video decoding CPU type:

- 4 Monitor 100ch,CPU: i7-12700E / RAM:64GB / VGA: GT1050
- 6 Monitor 144ch, CPU: i9-12900E / RAM:64GB / VGA: GT1050

Recommended H.265 video decoding CPU type:

- 4 Monitor 72ch,CPU: i7-12700E / RAM:64GB / VGA: GT1050
- 6 Monitor 100ch, CPU: i9-12900E / RAM:64GB / VGA: GT1050