

EXPAND YOUR CONCEPTS OF SECURITY



# DETEXI NVR – Network Video Recorder



The DETEXI NVR supplies the basis for video management, monitoring, analysis, and recording. Allows centrally manage and configure the network video products.

**USER GUIDE** 

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EXPAND YOUR CONCEPTS OF SECURITY

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## Introduction

#### What is NVR?

NVR stands for Network Video Recorder. NVR is a collection of hardware and software components that enables full digital, live, and recorded video surveillance over the Internet or Local Network from any connected computer.

NVR consists of three major components:

- NVR device is an intelligent storage and authentication server. In theory it can have unlimited number of IP-video/audio suppliers (such as IP-cameras, Digital Video Recorders, or IP-Servers) logically attached to it. Any device that is attached could be used by NVR. Video/audio source or source of the remote event (motion events or remote I/O port event) are examples of attached devices.
  - NVR is also an authentication server for the workstations with Remote NVR Client.
- **Remote NVR Client** a software that can be used to see live video/audio, control cameras, search archive database and playback the archive.
- **IP-Video Device** supplies video/audio to the rest of the system.

#### NVR device structure (in full configuration):

NVR Services

-	Authentication Server	-	Authenticates remote users connected to NVR through the Remote Client or Archive Viewer
		-	Creates statistics about the remote users connections
-	Recorder	-	Writes information from each video input in to the video archive according to the schedule.
-	FTP Server	-	Receives FTP-streams from cameras (if set) and writes
			Deises on alarm when it receives on alarm acquence
		-	from camera
-	Touring module	-	Moves the camera according to the tour schedule
-	Remote I/O Listener (Click	-	Monitors remote inputs on I/O block of the camera
	on "Start Test", and the "Port	-	The main purpose are to test for correct Hardware and
	Test" window will appear		Software settings
	(Fig. a.).	-	<b>Port test</b> provides information about the camera that is
			sending data (Data could be just the connection signal
			or the signal about any alarm events.) Fig. b.
-	Check Alive module	-	Checks to see if camera is online and video inputs are
			active
-	Check Drive Module (It is	-	Checks to see if there is enough space for the NVR
	used for testing purposes)		Video archive
	Fig. c.	-	Also checks the Archive Storage Path
-	Alarm Central	-	Responsible for raising alarm using:
			- Voice
			- Phone (analog line with voice modem
			installed)
			- E-mail (Note: Sender name must be put in
			double quote).

- Startbar module
- Port Listener
- NVR Socket Server
- NVR Remote Control Server
- Internal service to start/stop other NVR's services
- Monitors all local alarm devices
- Internal service to support remote TCP/IP access to the NVR
- Internal service for intercommunications between NVRs

Alarm Listener	
Start Test	
Bytes per minute Camera 2400	507.75

Fig. a. Alarm Listener

#### \* NVR Interactive Modules

- NVR Setup module
- Billing Module
- NVR Archive Viewer
- NVR Client
- Remote NVR Client module

Data from: 2400 Data from: 2400	1
Alarm for 2400 port=3	
Data from: 2400	
Data from: 2400	
Data from: 2400	
Data from: 2400 Data from: 2400	
Alarm for 2400 port=2	
Data from: 2400	
Data from: 2400	
Alarm for EDH HECUHDEH port=0	
	>
<u></u>	

Fig. b. Port Test Window

- Responsible for the setup information for all NVR's services and components
- Supports billing information about user and produces reports/bills about user activity
- Searches and plays back video information from NVR's archive
- Live cameras view, cameras control, and playback the archive
- Same as NVR Client after successfully receiving authentication from Remote NVR Site



Fig. c. NVR Check Drive

#### \* NVR Supplementary Software

- Port-Mapper module
- Responsible for mapping some ports to another IP addresses and ports (usually works as a service)

#### Remote NVR Client structure:

- Remote NVR Client module
- Remote Archive Viewer Module

#### NVR

#### **IP-Video Device:**

- IP-Cameras
  - Axis IP-Cameras
  - SONY IP-Cameras
  - JVC IP-Cameras
  - ELMO IP-Cameras
  - IDVIEW IP-Cameras
- IP-Servers
  - Axis IP-Servers
- Digital Video Recorders
  - EDR400
  - ERNITEC (DigiOp)

**NVR Network** consists of several NVRs that are logically attached to the **main NVR** (**NVR Domain Controller**). Thus, it is possible to control every NVR remotely from the domain controller.

**NVR** services can be managed from the "Control Panel" by choosing "Administrative Tool" window and selecting "Services" from the pull down menu (Fig. 1.)

***							
Services (Local)	Services (Local)	- 200					
	NVR StartBar	Name /	Description	Status	Startup Type	Log On As	
		Network DOE	Provides n		Disabled	Local System	
	Stop the service	Network DDE DSDM	Manages D		Disabled	Local System	
	Restart the service	Network Location A	Collects an	Started	Manual	Local System	
		Network Provisionin	Manages X		Manual	Local System	
		SNT LM Security Sup	Provides s		Manual	Local System	
		NVR Alive		Started	Manual	Local System	
		MR CamServer		Rarted	Manual	Local System	
		SNR CamTour		Started	Manual	Local System	
		NVR Check Drive		Started	Manual	Local System	
		NNR FTP Server		Started	Manual	Local System	
		SNR GetCamShot		Rated	Automatic	Local System	
		SNVR 10Listener		Rarted	Manual	Local System	
		SNVR PortAlarm			Manual	Local System	
		SNVR PortMapper		Rated	Automatic	Local System	
		SNVR Recorder		Rarted	Manual	Local System	
		SMR Remote		Started	Automatic	Local System	
		MR Socket Server		Started	Automatic	Local System	
		NVR StartBar		Rarted	Automatic	Local System	
		Performance Logs a	Collects pe		Manual	Network S	
		Plug and Play	Enables a c	Started	Automatic	Local System	
		Portable Media Seri	Retrieves t		Manual	Local System	
		Print Spooler	Loads files	Started	Automatic	Local System	
		Protected Storage	Provides pr	Started	Automatic	Local System	
		Good RSVP	Provides n		Manual	Local System	
		Remote Access Aut	Creates a		Manual	Local System	
		Remote Access Con	Creates a	Started	Automatic	Local System	
		Remote Desktop He	Manages a		Manual	Local System	
		Remote Procedure	Provides th	Started	Automatic	Network S	
		Remote Procedure	Manages t		Manual	Network S	2

Fig. 1. Services

As it is depicted on Fig .1., **NVR Start Bar** service has *automatic* Startup Type. In this case NVR activates as soon as computer is on, even before the login.

Since NVR StartBar runs as a service, it also starts/stops all other NVR components as services.

## **NVR Setup program**

The heart of the Network Video Recorder is the *NVR Setup* program. This is where the setting for all modules is done.

NVR Setup program deals with certain components and sets specific properties for each of them.

Major components of the NVR Setup program are as follows:

- **General:** which in turn consists of the following sub-components:
  - Global settings
  - NVR Locations (*only for "NVR Domain controller"*)
  - Camera location
  - Voice setup
  - FTP server
  - Advanced
- Cameras: which in turn consists of the following sub-components:
  - Camera list
  - Cameras setting
  - Security and Alarm
  - Description
  - Recording
    - Schedule setting
    - Motion setting
  - Tour (for PTZ cameras only)
    - Setup tour
      - Setup schedule
- Users: which in turn consists of the following sub-components:
  - User information
  - Groups of cameras
  - Billing information and restrictions
- **Tasks:** which in turn consists of the following sub-components:
  - Action
    - Record Camera
    - Move Camera
    - Control Relay
    - Control Tour
  - Notification
    - Network Client
      - Phone
    - Email
    - Speak
- **Monitor:** which in turn consists of the following sub-components:
  - Camera ID
  - Camera name
  - Alarm status
  - Touring status
  - Alive status
  - Recording status
- Report

Components and sub-components of the NVR setup system will be investigated in the following sections.

1. NVR General Settings

	If checked, will connect immediately (Used in <b>R</b>	camera ecording)
Database Path has to be defined first. Exit the program after changing the Database Path.	Image: NVR Control Center      General    Cameras    Users   Tasks    ID Devices Monitor   Reports    Synchronize  Synchronize Synchronize  Synchronize Synchronize Synchronize Synchronize Synchronize Synchronize Synchronize Synchronize Synchronize Synchronize Synchronize Sync	Synchronize if any changes have been made.

Fig. 2. NVR Setup  $\rightarrow$  General  $\rightarrow$  Global Settings

Press "**General**" on NVR setup window to start the General setup process (Fig. 2.): As it has been mentioned before, each of the components has its sub-components.

1.a. Global Settings
1.b. NVR Locations (only for "NVR Domain controller")
1.c. Camera Location
1.d. Voice Setup
1.e. FTP server
1.f. Advanced

## <u>1.a. Global Settings</u>

**Archive Storage** – controls the video data retention time, the minimum space allowed for storage on the drive(s) and whether or not to overwrite the oldest information when the drive has reached its minimum available space. Detailed overview of the archive storage is provided in Fig. 3.



The following is a list of Archive storage contents:

✓ Path

#### ✓ Keep information for (days)

Controls the duration in which the information is kept in the archive. The space required for the archive, and the number of frames per second, which will be received from all cameras in the network, should be calculated according to the user's requirements.

✓ If free space less than (stop saving/overwrite)

The user has the opportunity to choose the time in which, overwrite of the data should take place. The example presented in Fig. 2 shows a retention rate of 20 days. When drive space falls to 3 GB free (3000 meg.), program overwrites the oldest data.

✓ Use Temporary space Effective if the archive is stored on a network device. In this case this checkbox should be checked.

The following is a list of Global settings' other attributes:

#### o Task Executed when

Writing error

When writing error in archive occurred, the selected task from the pull down menu will be executed.

- Drive limit reached
  - If Drive limit (free space allocated in archive storage) is reached, the selected task from the pull down menu will be executed.

*Note:* If a task is already selected from the pull down menu, to **deselect** it, press delete on the keyboard.

#### • Port to Listen

Port number used by all clients to connect to the Server.

#### • Connect camera immediately

- If checked, selected camera's view will be shown immediately (The camera view on the recording page)
- If unchecked, it gives the opportunity to the user, to connect/stop the selected camera's view (cameras "recording page" Fig. 14.).

#### o Resolve IP addresses

Attempts to resolve the client IP address for statistical information. Use of this option is not recommended (due to its prolonged nature).

#### Login/Logout task

If a task is selected from the pull down menu, it will be executed at login/logout. For instance if a sound notification task has been made and used in this part, that sound notification will be executed at entering and exiting the system.

*Note:* If a task is already selected from the pull down menu, to **deselect** it, press delete on the keyboard.

#### o Database path

#### • SCADA path

<u>Supervisory</u> <u>Control</u> <u>And</u> <u>Data</u> <u>A</u>cquisition path

 NVR Controller Settings – This setting could be used when one needs to become part of the NVR network. The NVR Domain Controller address and port are to be provided in this part (For more information, please refer to "Building NVR Domain" section of this document.

# *If any changes have been made during NVR setup process, SYNCHRONIZE button must be clicked.*

## **1.b.** NVR Locations (only for "NVR Domain controller")

When a request to connect to **Domain controller** is sent, this request can be:

- Either from a computer that is sending a connection request from within the same LAN (local IP address is used)
- Or from a computer that is sending a connection request from another LAN (external IP address is used).

For more information please refer to <u>*How to set up NVR Domain Controller*</u> section provided later in this document.

🖳 NVR Setup		
General Cameras Users Tasks	Monitor Reports	Synchronize
Global Settings NVR Locations Camera Lo	cations   Voice Setup   FTP Server   Advanced	
Servers Locations		
Vlad	Name Vlad	Inactive 🕅
	Camera Server connect settings	
	Address 192.168.10.208	Port 2080
	Proxy Address	Port
	Host name VLADIMIR/192.168.10.208	
	INTERNET Name or address 192.168.10.208	
	Connect Import Unregister	Save
	Controlling   Monitoring	
	Get NVR Status	
	Synchronize Location	
	Restart Remote OS	

Fig. 4. NVR Setup  $\rightarrow$ General $\rightarrow$  NVR Location  $\rightarrow$ Controlling

NVR Setup		T I	14 N	0.1				
aeneral Lameras	Users	Tasks	Monitor	Heports			Synchro	nize
Global Settings NVF	R Locations	Camera I	_ocations	Voice Setup	FTP Server Advan	ced		
- Servers Locations -								
Vlad				Name	/lad		Inactive	Г
				Camera Ser	er connect settings			
				Addre	ss 192.168.10.208		Port 2080	
				Proxy Addre	88		Port	
					·		,	
					Host name VLADIN	/IR/192.168.10.208		
			P	NTERNET Na	me or address 192.16	8.10.208		
							C	
					Import Onlegis			ve
			Co	ntrolling Mor	itoring			
			~	Check alive				
			Inte	erval for monit	ring (sec): 60	Attempts: 2 ea	ach 10 sec	
			т	ask when NV	R does not response:	Test		•

Fig. 5. NVR Setup  $\rightarrow$  General $\rightarrow$  NVR Location $\rightarrow$  Monitoring

## 1.c. Camera Locations

Setup "Location Name" and reference to "Location Map" if one exists.



Fig. 6. NVR Setup→General→Camera Locations

Reference to this location can be made later in the NVR Cameras Setup (Description: Section 2.d.).

Note: If user has assigned cameras to a map (done in section 2. d.),

- Click on **Map** button on the **camera locations** window to view the list of assigned cameras
- Drag and drop them on their respective place on the map.
- Save and Synchronize
- As a result, **MAP** button will be enabled on the **Remote NVR Client module** main page.

## 1.d. Voice Setup

**Voice Setup** button (Fig. 7.) – These settings are not only for voice, but also for phone and e-mail on alarm.

Voice Setup button brings up Alarm Server voice configuration dialog box (Fig. 7.1.)

	etup Camaras	Heare	Tacke	Monitor	Benotts			Voice test
Global S	ttings   Ca This is a Press on	rera Location	NV Voice Voi	Setup   F anew gree arm centr	TP Server   ting messag al.	dvanced	Speak Record Voice setup →Voice Set	MUST be clicked if any changes were made to voice setup (Save) Click on this button brings up Alarm Server Voice Configuration
		C			Ĩ			window (Fig. 7.1.)

Alarm Server Voice Configuration	
Voice type Microsoft Sam	
and speed	<u>T</u> est over speakers
Format for writing Wave files: GSM610 44kHz	Mono 💌
Information for recording to file	2
	1 A C
	<u></u>
	×

Fig. 7.1. Alarm Server Voice Configuration dialogue box

## 1.e. FTP Server

FTP Server receives ftp-sequences from the cameras (AXIS, JVC and SONY cameras only). For JVC and SONY cameras, ftp-sequence is treated as an alarm sequence. FTP-client settings must be setup inside the cameras in conjunction with FTP Server settings.

In order for the FTP Server to work properly one needs to setup the path in the "Images path for FTP Server" field for each camera (see cameras, Fig. 11.). The path for each camera server (or camera) must be unique and created before the setup can proceed.

Server must be configured after the installation. User setup must be done after the server configuration (Fig. 8.).

#### Note: User must define "Root Directory"; this implies the creation of Root Directory on hard drive.

ieneral Cameras Users Tasks Mi	onitor Reports	Synchronize
Global Settings Camera Locations Voice Setu	p FTP Server Advanced	
Root Directory c:\ftp		
Port to listen 21		
Test [Test] cnsg [cnsg]		
	User Name   Test	
	User Real Name   Test	
	User password	
	User Password confirmation	
	User Home Directory  c:\	
	🔲 Do not Filter Files 🛛 Enable 📀 Disable	
Add Save Delete		

Fig. 8. NVR Setup→General→FTP Server

**Home directory** could be the absolute or the relative path. If **Home directory** is the absolute path, the destination directory will be **Home directory** + **Directory inside the Camera** If **Home directory** is the relative path, the destination directory will be **Server Root directory** + **Home directory** + **Directory inside the Camera** 

Destination path must be in the path field of the "**Images path for FTP Server**" field (see cameras, Fig. 9. shown later in document).

FTP Server could be started when cameras database is not empty (refer to section 2 of this document), **Root Directory** is defined, and setting is completed (Fig. 9.).

	FTP S	erver	×
Actions	Tools	Help	
Start	server		d in
Stop s	server		
Check	connec	tions	_
Exit			

Fig. 9. NVR FTP Server dialogue box

To setup FTP-clients inside the cameras, see the camera manual.

NVR software has special needs for the "image file name" format settings. Some of which are as follows:

- SONY cameras: "image file name" must have name "asony" with the suffix "Date/Time".
  - JVC cameras: "image file name" must have name "**alarm\_jvc**".
  - AXIS cameras: for continuous uploading "base file name" must be "cam1\_image" or "cam2\_ image" or "cam3\_ image" or "cam4\_ image" with "Date/Time Suffix" selected.
  - AXIS cameras: for uploading in case of alarm "base file name" must be "alarm\_cam1", "alarm\_cam2", "alarm\_cam3", or "alarm\_cam4".

To stop the FTP Server, select "Exit" from the menu (Fig. 9.).

## 1.f. Advanced

By clicking on the "Advanced" tab in the GENERAL window, you will be able to set up some templates for the Recorder. Those setting and templates will be used tohelp you to create the "Recorder schedule".

#### Proxy Settings panel

If a company uses web-proxy server that requires authentication to get to the Internet, proxy setting must be done in this panel.

Get current button helps to get the following information:

- Current domain name
- Computer name
- Current user name

If "**Disable Recorder Load Balancing**" is checked< the NVR will always start only one instance of the Recorder (by default the NVR loads as many instances as many CPU cores is presented)

#### General Settings panel

- **Backup**  $\rightarrow$  backups NVR general setting
- **Resrore**  $\rightarrow$  restores previously saved settings.

**Current Video Codec** settings is used by internal automated conversion procedure in order to create an AVI file from the alarm sequence when client requests is (by pressing F12 on the Client side)

	ontrol Cen	iter									2		_
General Global Se Recorde Cor Templa	Cameras ttings NVR er Encoder Se npression leve te Gray a	Users	Tasks Camera	IO Devices Locations Voi	Monitor ce Setup   F	Reports TP Server Proxy sett Addres: Por	Advanced   ngs :   :	_	C	vnchroni: iet currer Reset	User of langua restart progra	can select a age (to enable, t <b>NVR Setup</b> am)	
Gray analysis Compression roughness: Key-frame every Recorder Recovery Settings Template Attempts in Recovery Procedure (RP) 5 Delay Between Attempts (in sec) 30 Delay Between RP (in sec) 600 Task on First Error Task on First Error Task on Recovery Procedure Failure Task on Restore			Current Vide	o Codec: Fr	Ill frames (Unco	mpressed)	•		User can get the information about has copy of the <b>DETEXI NVE</b>	- e <b>R</b>			
General	le Recorder L settings	.oad Balanc	ore					Langua	age: 🔀 E	nglish 🗸			~

Fig. 10. NVR Setup→General→Advanced

## 2. NVR Cameras Setup

To setup cameras, the "Cameras" tab on the NVR Setup Window must be selected (Fig. 11.). As it has been mentioned before, each of the components has its sub-components. Sub-components of the Cameras are as follows:

**2.a.** Cameras list

- **2.b.** *Cameras settings*
- **2.c.** Security and Alarm
- 2.d. Description
- **2.e.** *Recording*
- 2.f. Tour (for PTZ cameras only)
- 2.h. Camera Tasks

L NVR Control Center								
General Cameras Users Ta	sks IO Devices Monitor Reports Synchronize							
Cameras List	ameras Settings Security&Alarm Description Tour Cameras tasks							
SONY Z20P	Name [374] SONY V704 Show Camera							
SONY RX550N	Type Sony SNT-V704 rel.2.12 Determine camera driver							
SONY RX550P	Driver Sony Standard							
SONY RX50P	Address 202.238.124.40 80 Vith PTZ							
SONY CS50P	Proxy Type Direct Check Alarm							
SONY RZ30N-N	Proxy 0 VExclude from recording							
SONY DE70	Stop touring while active							
SONY DF70P	Location This location Restore for Recorder							
SONY SNC-P1	Max FPS on Write 30 Max FPS on Request 30							
SONY SNC-P5	Images path for FTP Server							
SONY DF50P	Number of sub-cameras: 4 Alarm Inputs: 4 Outputs: 1 ComPorts: 0							
SONY DE80N	Nr. Active PTZ Audio (R/T) Name maxFPS Alive							
SONY RX530N	1 Video Input 1 0							
SONY RX570P	Preset position on close:							
SONY RX570N	Fill presets Get ideal image							
Add 🔻 Dup Save Delete	Sub-cameras Alarm inputs Outputs ComPorts/MUX							

Fig. 11. NVR Setup→Cameras→Cameras Settings And "Sub-cameras" button

## <u>2.a. Camera list</u>

Add, Dup, Save, and Delete buttons are provided to enable the user to add, duplicate, save, or delete cameras respectively.

- User must "Add" cameras to its camera list. In order to do so, click on Add button and fill out the camera information in the spaces provided on "cameras settings" (for more details refer to the next section).
- To speed up the process to create cameras, an existing camera can be duplicated. First choose an available camera and then click on "**Dup**" button (Fig. 11.d.). The duplicated camera will have the same specifications as the original camera. Any changes can be made to the duplicated camera.
- Save the new camera using the "save" button.

• In order to delete a camera, select a camera from the list of existing cameras, and click on the Delete button.

Cameras can be sorted in a camera list. To start the sorting process, double-click on the camera list header (Fig. 11d) After double-clicking on the camera list, select any camera and move it up/down (Fig. 11.e.). To save the sorted list, click on "**Save cameras order**" button (Fig. 11.e.) To cancel the changes click "**Cancel**" (Fig. 11.e.).

#### 2.b. Cameras Settings

Contains the following parameters that should be set:

- Camera name
- Type
- Address and address port

Select a non-standard port number if the camera is setup to listen to a non-standard port *Note:* By default all cameras listen to port 80. In this case you can leave "0" in the field

• Proxy type

Internet access type, set to "Direct" if HTTP proxy is not used. Some of the proxy types are listed bellow:

• Use Default

- Direct
- Named Proxy
- From the WEB
- Use as External Address

If a proxy is used, "Direct" method can also be used in most cases.

- Proxy address and Proxy port
  - Proxy address/port setups
- Flip Image

It is sometimes necessary for Sony cameras.

- With PTZ
- Check Alarm

Used by "Remote I/O Ports Listener", if unchecked, "Remote listener" does not check the status of inputs on this camera.

#### • Exclude from Recording

Recorder software uses this option. If checked, "Recorder" software does not see this camera.

• Sound

This box needs to be checked if an Axis 2191 sound module is attached to camera.

• Stop touring while active

Stop touring if any client is trying to connect to camera.

Restore for Recorder

Restore image settings for camera, if client has changed it.

- Image size: initial size of images when connection to camera has been established.
- Max FPS on write
- Max FPS on Request
- Images path for FTP server

This setting is used for *FTP Server* only. Should be unique for each camera It must have the same setting as "FTP Directory" path inside the camera (camera that is FTP-ing images).

#### • Position on close

Used for JVC Cameras, returns camera to one of the preset positions (if setup) upon leaving the camera.

- Number of sub-cameras Defines the number of video-inputs this device has.
- Alarm inputs Defines the number of device Input ports.
  Alarm outputs
  - Alarm outputs Defines the number of device Outputs ports.
- Alarm ComPorts
   Defines the number of device COM-ports ports.
- Sub-cameras Tab

It is used to set sub-cameras parameters for video servers. (Fig. 11.)

- ✓ Number
  - Number of sub-cameras
- ✓ Active

Reflects if sub-camera is connected to the video input

✓ PTZ

Defines which sub-camera has Pan/Tilt/Zoom capability.

✓ Alive

Defines if it is necessary to check "video-signal-lost" for sub-camera

#### Alarm Inputs Tab

It is used to set device Inputs' properties (Fig. 11.a.).

- ✓ Input number
- ✓ Name

Any unique name, (If the standard names are not preferred)

✓ Normal Status Open/Closed.

#### • Outputs Tab

It is used to set Outputs' properties (Fig. 11.b.).

✓ Name

Any unique name, (If the standard names are not preferred)

- ✓ Output number
- ✓ Normal status ON/OFF

#### ✓ Behavior

If "Toggle", it will work similar to a light contact. If "Momentary", it will work similar to a door contact.

✓ State on close

**Unchanged**, light must be turned on/off manually. **ON**, light will turn on automatically upon leaving the camera. **OFF**, light will turn off automatically upon leaving the camera.

#### • ComPorts/MUX Tab

Sets up the type of multiplexer attached to one of the video COM ports. (Fig. 11.c.)

- ✓ ComPort number
- ✓ Multiplexer

Defines device type that is connected to the selected Com-Port

✓ Sub-camera

Defines video input associated with the selected Com-Port.

Note: A special setup must be done inside the Axis server to make the multiplexer work properly.

	Name: Output 1
Input number: Name: Input 1	Output number: 🚺 💌 Normal status: 💿 OFF 🔿 ON
Normal status: 🙃 Open 🛛 Close	Behaviour; 🔽 Toggle 🛛 Momentary State on close: ⓒ Unchanged ◯ ON ◯ OFF
Sub-cameras Alarm inputs Outputs ComPorts/MUX	Sub-cameras Alarm inputs Outputs ComPorts/MUX
Fig. 11.a. "Alarm Inputs" button	Fig. 11.b. "Outputs" button
ComPort 2 Multiplexer: MV16p Sub-camera: 2	
Sub-cameras Alarm inputs Outputs ComPorts/MUX	

Fig. 11.c. "ComPorts/MUX" button

Note: Also, setup User name(s) and password(s) in the "Security" table (This depends on the individual camera settings. Usually Axis cameras require this setting.)

	Double click here to the cameras (Fig. 11.	start sorting e.).
RVR Control Center		
General Cameras Users Ta	sks The onces Monitor Reports Synchronize	
Cameras List	Cameras Settings Security&Alarm Description Recording Cameras tasks	
This Location		
🛨 🏟 AXIS AUDIO	Name [401] AXIS AUDIO Show Camera	
🙀 vdg	Type Axis 2410A rel.4.30 Determine camera driver	
🛃 VDG-emulation 📃		
🛃 CNSG DETEXI	Driver Axis V5 - Quad	iet appropriate
🗄 🤵 2400	Address 65.96.23.181 6603 with pt7	river to deal
axis16FD		
61 C205	W Check Alamit	71th this device
BUI SONY PTZ TEST	Proxy 0 Exclude from recording	
EN IDVIEW	♥ Souna	
EN IDVIEW2	Stop touring while active	
IN INC	Restore for Recorder	
ANYO	Image Size 2CIF  Max FPS on Write 30 Max FPS on Request 30	
Pixord	Images path for ETP Server	
🕺 AXIS 2130		
ELMO	Number of sub-cameras: 4 Alarm Inputs: 1 Outputs: 1 ComPorts: 1	
🛃 Local SONY RZ30N	Nr. Active PTZ Audio (R/T) Name maxFPS Alive	
🙀 Vivotek TEST		
EDR REMOTE	1 Video Input 1	
	Preset position on close;	1
	Hill presets         Get ideal image	
Add 🔻 Dup Save Delete	Sub-cameras Alarm inputs Outputs ComPorts/MUX	

Fig. 11.d.



LING PANASONIC LING PAnasonic Wireless LING Pixord LING Pixord LING Pixord LING Pixord LING Pixord LING PIXON LING PIXON LING PANASONIC LING PANASON 🛃 Vivotek TEST CM VIVORA TEST CM VIVORA TEST EDR REMOTE CM EDR RECORDER CM DigiOp DigiOP DEMO CM DigiOP LOCAL + + Select a camera to move. + +

Fig. 11.e. Sorting cameras

For SONY and AXIS cameras it is recommended to use "Determine camera driver" button. You need to setup only name, type, address and port and proxy type for the device and press "Determine camera driver" button. If device has a password and you have not set it jet you will be asked about it and the password will be saved in "names and password: fields (see Fig.12). System will connect to the device and bring in all the necessary information about the device.

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## 2.c. Security and Alarm

🛋 NVR Setup	
General Cameras Users Ta	sks Monitor Reports Synchronize
Cameras List	Cameras Settings Security&Alarm Description Recording Tour Names and Passwords
	User name  root User pwd ***** Oper name  root Oper pwd ***** Adm name  root Adm nwd *****
Line and Lin	Actions on alarm Check status task: Task on status check 104_104
Panasonic Wireless     ANYO     SANYO     Voirelev     Voirelev     Voirelev     ELMO	Number of sub-camera     1       WAV File phone message     Image: Comparison of the state

Fig. 12.NVR Setup→Cameras→Security and Alarm

• Names and Passwords, for access to each camera.

#### • Actions on Alarm:

- **Check status task**, user can select a task from the pull down menu to be executed when camera status changes (checks the physical status of the camera, if any problem is detected, executes the selected task).
- **FTP alarm task,** user can select a task from the pull down menu (This is used when **Images path for FTP server** is set for a camera.)

**Images path for FTP server** located at the "Cameras settings" is used for *FTP Server* only. It should be unique for each camera, and must have the same setting as FTP Directory path inside the camera (the camera that is FTP-ing images)

**Note**: If a task is already selected from the pull down menu, to **deselect** it, press delete on the *keyboard*.

- **Number of sub-cameras,** sub camera number can be selected from the pull down menu. User can then select any of the following choices for a chosen sub-camera:
  - WAV File phone message
  - Location to play message from
  - **Play Alarm, if checked,** select and perform one of the following in order to create a default message to be played when "**Message can be changed Automatically**" is checked in "Task" (for more information please refer to part 4.e., 4.g., and 4.h. of this document):
    - $\checkmark$  *Message*, user can create a message.
    - ✓ *WAV file*, user can select a message from previously saved material.

## 2.d. Description



Fig. 13. NVR Setup→Cameras→Description

When a specific alarm event occurs, information provided in **Description** window will be used to inform the user of the alarm event (Fig. 13.).

Description window contains the following information:

- Camera location: The location in which camera resides.
- Customer name
- Site address
- Site sector
- Contract number
- Special instructions

Note: For a camera to be assigned to a map,

- Select a camera from the list
- Select a location, from the **camera location** pull down menu (The available locations were created in Section 1. c. of this document).
- Save and Synchronize
- As a result, the chosen camera will be assigned to the selected camera location.
- User will be able to put each camera in its respective place on the map (For more information please refer to Section 1. c. of this document).

## 2.e. Recording

Recorder is part of the NVR software. It is responsible for getting the video streams from the cameras according to the schedule (refer to schedule box in recording). Also, it writes the information into the archive.

Recorder can supervise AXIS, JVC, SONY, Panasonic, Pixord, IDVIEW, EverFocus (EDR400), ENRITEC (DigiOp), Convision and some other Internet-cameras.



Many **lines** can be added to the schedule for each sub-camera. It is worth mentioning that, **lines** are the scheduled recordings, located at the schedule box (Fig. 14.).

Different sections are to be set for each line of the schedule (Fig. 14):

- 1. Schedule section
  - Click on "Add", "Save", or "Delete" buttons to add, save, or delete schedules respectively.
- 2. Connect/Stop Button
  - Gives permission to **Start** (connect)/**Stop** recording
  - This option is enabled on the "cameras recording" window, when the option "connect camera immediately" is not selected (Fig. 2).
  - This feature enables the user to have the ability to setup a camera and record, while not mounted.
- 3. Motion settings
  - Please refer to Motion setting section provided later in this document (Fig. 15.).
- 4. *Time restrictions* section
  - No time restrictions (recording at all times)
  - Restricted between (records only on selected days between specific hours (FROM/TO).
  - **Take shots between** (records predefined number of shots on selected days between specific hours (FROM/TO).
- 5. *Image and position setup* section
  - Image size
  - **Recording frequency (FPS):** number of frames per second
  - Image compression
- 6. *Move to position* section
  - "Pan/Tilt/Zoom" OR "Preset": position that camera will move to, before recording starts
- 7. *Motion and Alarm* section
  - **Motion detection** index file by "frames with motion" will be created for playing back from the archive. Only "frames with motion" are always recommended. To create the index file, program uses "*Motion step*" and "*Post motion*" settings. Usually "*Motion step*" and "*Post motion*" should be 1/2 or 1/3 from "FPS" value. In order to detect motion, Recorder uses "Motion Settings" parameters (Fig. 15.).
  - **Motion only** places "frames with motion" in archive (could save archive space). It is possible to move the camera to predefined "**Pan/Tilt/Zoom**" OR "**Preset**" position when motion is detected.
    - Move Camera on Motion area (if checked):
      - $PTZ \rightarrow$  camera will be moved to this position when motion is detected.
      - *Preset*  $\rightarrow$  camera will be moved to this preset position.
      - Zoom area with motion  $\rightarrow$  camera will be moved to the area where motion is detected with the predefined zoom.
      - Reset camera position  $\rightarrow$  indicates that, camera should be pointed to the initial PTZ or Preset position (if set).
  - **Alarm on motion** raises an alarm if motion has been detected. The raised alarm will be selected from the "Execute Task" pull down menu.

*Note:* If a task is already selected from the pull down menu, to **deselect** it, press delete on the keyboard.

Alarm on Input ports – forces to detect alarm on cameras I/O block, and executes the selected task (actions and notification) that has been chosen from "Execute task" pull down menu (Fig. 14). These alarms are bounded to TASKS (for more information on Tasks, please refer to section 4).

*Note: Pre-alarm* (*frame*), *Post-alarm* (*frame*), *and Dwell* (*Second*) *are used for frame settings*.

- 8. *Connection type* section
  - Use locally (without proxy)– forces the "Recorder" to connect to camera without using proxy setting.

#### Motion Settings



Fig. 15. Motion Settings

This screen enables the user to setup motion detection parameters for each line of the schedule (Fig. 15.).

#### o Draw ROI

In order to draw ROI (Region-of-Interest), start with left-top corner, press left-mouse-button and drag mouse down to the right. A red box will appear on the picture that is referred to as ROI.

#### • Enable/disable sub-regions

To enable/disable sub-regions, press "*ctrl*" and *left click* simultaneously.

Only the motions inside the active sub-regions are considered by the system.

o Clear ROI

0

*Double click* on the screen outside the boxes or press *right mouse* button to bring up popup menu. **Move ROI** 

To move ROI click inside the region of interest and *drag* the box.

#### • Roughness and sensitivity adjustments

Use the scroll bars to adjust the *roughness* and *sensitivity* of the motion detection. Vertical red and yellow stripes indicate alarms inside the red and yellow ROI respectively.

## 2.f. Tour (for PTZ cameras only)

Touring can be setup and started for any PTZ-capable AXIS, JVC, or SONY cameras. This must be done according to specific schedules.

In order to enable the "Tour" option, check the "**With PTZ**" box on the Cameras settings page (Fig. 11.). **Cam Tour** application is a part of NVR software that provides all the necessary settings for touring. In order to setup a tour, user must:

- a. Setup tour
- b. Setup schedule



Fig. 16. NVR Setup→Cameras→Tour→Setup Tour

## <u>a. Setup Tour</u>

- The first step to setup a tour is to select a camera from the cameras list (Fig. 16.).
- Then click on add tour button. Camera can be moved by clicking on the image or zoom in/out to point the camera to a specific region.
- When the camera is pointed properly, click on "add position" button, and enter the number of seconds you wish the camera to stay at that position. *Note: Multiple points can be selected by repeating the latter procedure. A tour can consist of many different positions.*
- When all the positions are entered, click on "Save tour" button. At this time a name must be chosen for this tour. *Note:* "*Build Loop*" *is an option provided by setup tour window. When selected, system will*

*Note: "Build Loop"* is an option provided by setup tour window. When selected, system will automatically add additional positions to the path we made. This will enable the camera to have a loop shaped movement (going from left to right and vice versa).

• You can test a tour that you setup, by clicking on "Test Tour" button.

*Note:* A tour can also be setup by using preset positions (If preset positions are already created for the camera).

## 2.h. Camera Tasks

This allows user to setup tasks which can be remotely executed by the Remote Client when the appropriate camera (or video input) becomes active on the single-screen of the Client . You just need to move (see Fig.16a) all the necessary tasks from "Available Tasks" list to "Linked tasks" list.

🚊 NVR Control Center	
General Cameras Users Ta	ks IO Devices Monitor Reports Synchronize
Cameras List	Cameras Settings   Security&Alarm   Description   Tour   Cameras tasks
Image: Sonv RxSSonv       Image: Sonv R	Alarm2400     Alarm2400     Client notification     Client     Client     Client     Client

Fig. 16a. NVR Setup→Cameras→Tour→Camera Tasks

## **b. Setup Schedule**

Any of the previously setup tours, can be used in the tours schedule. Sub-cameras can be added to the tour schedule by selecting add button. The setup schedule setting also provides delete and save option (Fig 17.b. & 17.d.)

To Setup a schedule:

- Click on "ADD" button.
- Select "No time restrictions" or "Restricted Between".
- Select a previously setup tour from the "Tour" pull down menu.
- "Use Locally (without proxy)" check box:
  - **Check-** if NVR and cameras are located on the same local network (require internal connection)
  - **Do not check-** if NVR and cameras are not located on the same local network (require external connection).

Note: This option only appears on the camera's" setup schedule" when the selected camera has existing address and proxy address (Fig. 17.a. &17.b.). If the camera does not have proxy address, this option will not be available (Fig. 17. c. & 17.d.)

• Click on "Save" button.





Fig. 17.a. Cameras settings



Fig. 17.c. Cameras settings





Fig. 17.d. Setup Schedule

## 3. NVR Users Setup

To setup users, click on "Users" option provided on the NVR Setup Window. As it has been mentioned before, each of the components has its sub-components. The sub-components of the **Users** are as follows:

3.a. User information
3.b. Groups of cameras
3.c. Tasks
3.d. Billing information and restrictions

## 3.a. User Information



Fig. 18. NVR Setup→Users→User Information

Add, Dup, Save, and Delete buttons are used to add, duplicate, save, or delete users respectively.

User information page is used, to assign passwords, user rights, and cameras to the user (Fig. 18).

The following should be setup in the "Users" dialog box:

- User name
- Password
- Number of active users (at the same period of time)
- Exclusive PTZ: Allows user to forbid control of the camera to other users
- Maximum connection time for any user
- Cameras list available to the user, and user's rights in accordance to each camera
- Users type
- Login task, can be selected from the pull down menu to be executed when user logs in.
- Logout task can be selected from the pull down menu to be executed when user is logged out.

**Note:** If a task is already selected from the pull down menu, to **deselect** it, press delete on the keyboard. **Note:** If Login task and/or Logout task are not selected in **User Information** window, system will execute the selected Login/Logout task from the **General**  $\rightarrow$  **Global Settings**. If there is no designated task for login/logout in global settings, system will not issue any login/logout tasks. There are two kinds of users available: Master User and Exclusive Master User. While an exclusive master user selects a camera, that camera will not be available to other users. It is worth mentioning that "Exclusive Master User" has the ability to halt any active user. To assign a camera to the user, camera has to be moved from the available cameras list to the assigned camera list by clicking on ">" button.

#### Important Note:

If you are going to be a part of the NVR's Domain Network, you have to create "Exclusive Master User" without any cameras attached to it. Its username and password will be used for authorization in intercommunications between NVRs, inside the NVR's Domain Network.

For each assigned camera, assign user rights, and sub-camera settings. This is done by selecting line from **Video-in** combo box and setting **video-in** properties.

Video-in has the following properties:

- Can use (activate/inactivate the video input)
- Can PTZ (allow/forbid to control the camera connected to this video input)
- Max FPS (if not zero restricts MAX FPS from this video-input, for this particular user)

6

## 3.b. Groups of Cameras

To setup Groups of cameras for a user, select "Groups of Cameras" tab. (Fig. 19.). Several cameras can be grouped together to facilitate simultaneous display.



Fig. 19. NVR Setup $\rightarrow$ Users $\rightarrow$ Groups of cameras

In order to create groups of cameras for each user,

- I. Select a user from the "Users list".
- II. List of the cameras assigned to this particular user is shown in the "Available" list.
- III. Click on "Add" button at the bottom of the "Group List"
- IV. Enter a particular name into the "Group Name" space *Note:* Any camera can be selected from the available list and moved in to the "Selected" list.
- *V.* Click on Save button
- *VI.* Click on Synchronize button

Add, Del, or Save buttons can be used to add, delete or save group settings respectively.

## 3.c. Tasks

NVR Contro	ol Center						ıĽ
General Cam	aras Users	Tasks	IO Devices	Monitor Repo	rts	Synchroniz	е
Us	ers List		User Information	Groups of camera	s Tasks	Billing Information&Restrictions	
dave		<u>^</u>		Selected		Available	
mark				50,0000			_
scott			<ul> <li>This location</li> </ul>				
demo			- Alarm240	J		+ task_sony	
mhogg			Recor	d action			
leiite			Sound	I notification		+ Login/Logout Task	
gary			Client	notification		Login/logout task 20051024144	+
volpe						+ Task on status check 104_104	
holinn						+ Task executed when writing err	
vince					>	Task executed when drive limit	
kelsev						Task on motion 59_101_4	
cinex					<		
idview						<ul> <li>Task on status check 48_48</li> </ul>	
paul							
cascom						Ylad to login	
Corv2						Task on FTP alarm 63	
vlad						Task on FTP alarm 80	
alex						Task on FTP alarm 93	
alley						Task on FTP alarm 265	
Itest						TAsk_nov14	
jim						Notification Task	
jim1						TASK_TEST	
t.		_				Sound Notification	
dietmar		~				<ul> <li>Sound for DETEXI43</li> </ul>	~
Add Dup	Save Dele	te				<	
Had Dap	Java Dele						

Fig. 19a. NVR Setup→Users→Tasks

It is possible to assign tasks to the user. It allows the user (Remote Client) to execute assigned task right on the NVR

## 3.d. Billing Information and restrictions

To setup restrictions for the user "Billing Information and Restrictions" option is provided (Fig. 20.).

🗏 NVR Setup		
General Cameras Users Task	s Monitor Reports	Synchronize
Users List	User Information Groups of cameras Billing Information&Restrictions	
vava mark scott demo mhogg eite kessler gary volpe holinn vince volpe1 kelsey cinex idview paul cascom remote Coy2 vilad alex ally	Full Name       Jim Paterson         Time Block (min)       5         Fee (per block)       3         User restricted between       00:00         00:00       00:00         00:00       00:00         00:00       00:00         00:00       00:00	
Add Dup Save Delete		

Fig. 20. NVR Setup→Users→Billing Information and Restrictions

The information in "Full Name", "Time block" and "Fee" fields are selected from the settings in the "Billing module".

Up to three restricted intervals are available when the user is banned to reach the Server.

## 4. NVR Tasks

Tasks are used in:

- Monitoring section of the "NVR Locations", when an NVR does not respond to Domain controller (Section 1.b. Fig. 5. and <u>How to set up NVR Domain Controller</u>).
- Alarm section of the cameras "Recording" (Section 2.e. Fig. 14.).
  - Execute task on (Alarm on Motion)
  - Execute task on (Alarm on Input ports)
- Global Settings
  - Task Executed when writing error
  - Task Executed when drive limit reached
  - Login/Logout Task
- Camera's Security and Alarm
  - Check status task
  - FTP alarm task
- User's Information
  - Login task
  - Logout task

Add, Save, or Delete buttons can be used to add, save or delete Tasks respectively. In order to create a Task:

- Click on Tasks button provided on the NVR Setup window (Fig. 21.).
- Click on Add button.
- Choose a name that best describes the new Task (Task Name: e.g. Task).
- Provide a description for that specific Task (**Description:** testing).
- Save and synchronize





In order to be able to set new *actions* or *notifications*, right click on the space provided on the **Tasks** window (**left pane**, Fig. 21.). As a result, user will be able to create multiple actions or notifications; they are as follows:

#### ✤ New→Action

- 4.a. Record Camera
- 4.b. Move Camera
- 4.c. Control Relay
- 4.d. Control Tour
- ♦ New→Notification
  - 4.e. Network client
  - 4.f. Phone
  - 4.g. Email
  - 4.h. Speak

## New $\rightarrow$ "Action"

## 4.a. Record Camera



Fig. 22. New  $\rightarrow$  Action  $\rightarrow$ Record Camera

Action (*Record Camera*) Setup:

- **Camera:** Select a camera for this action.
- Set camera in position
  - Pan/ Tilt/ Zoom
  - Or Preset
- Record
  - Image size
  - Compression
  - FPS
  - Frames
  - Sec.
- **Take Alarm shot:** For PTZ cameras; if **checked**, takes alarm shots.
- **Delay (ms):** Since actions and notifications in a task take place simultaneously, camera could be pointing in any direction other than the region that alarm shot should be taken from; thus a very small delay time might be required to assure uniformity of task execution.
- Reset camera in position
  - Pan/Tilt/Zoom
  - Or Preset
- **Connect/Stop:** When camera is selected, click on **connect** button in order to connect to that camera (click on **stop** button to disconnect from the selected camera).
- Show Locally
- Uninterruptable alarm
- Use local connection

## 4.b. Move Camera



Fig. 23. New  $\rightarrow$  Action  $\rightarrow$ Move Camera

Action (Move Camera) Setup:

• Camera

•

- Set camera in position
  - Pan/ Tilt/ Zoom
  - Or Preset
  - **Dwell time(s):** The time in which camera stays in a selected position.
- Reset camera in position
  - Pan/Tilt/Zoom
  - Or Preset
- **Connect/Stop:** When camera is selected, press **connect** button in order to connect to that camera (press **stop** to disconnect from the selected camera).
- Show Locally



- Pan/ Tilt/ Zoom
- Get PTZ: When clicked, provides the PTZ value of the position that camera is pointing to.
- Set PTZ: Can be used in order to change PTZ values.
- Zoom IN/OUT
- **Go to Preset:** Choose a preset position from the pull down menu and click on "Go to Preset"; as a result camera will point to the selected preset position.
- Home position
- **Direction control tool:** Can be used to control the direction of the camera towards Right, Left, Up, and Down.

## 4.c. Control Relay



Fig. 25. New  $\rightarrow$  Action  $\rightarrow$ Control Relay

Action (*Control Relay*) Setup:

- **Relay:** An output that can be selected from the pull down menu (e.g. light).
- Turn On: If checked, the selected output turns on.
- Turn Off: If checked, the selected output turns off.
- Activate
- Dwell time(s): the time in which the selected output (e.g. light) stays on/off.
- Reset relay: If checked, resets relay to its previous state.

## 4.d. Control Tour



Fig. 26. New  $\rightarrow$  Action  $\rightarrow$ Control Tour

When "Start tour" is selected, a pre-selected tour will start. When "Stop tour on camera" is selected, the tour that is running will be stopped.

Action (Control Tour) Setup:

- Start Tour: when selected, a camera and a tour must also be selected from the pull down menu
- Stop Tour on camera: when selected, a camera must be selected from the pull down menu
- Reset touring after (e.g. 25) second(s)
- Uninterruptable tour action
- Use local connection (This option exists only for specific cameras).

## New →"Notification"

#### 4.e. Network Client



Fig. 27. New  $\rightarrow$  Notification  $\rightarrow$ Network Client

A sample text **message** that is sent to a client is depicted in Fig. 27.1. Notification Via *Message* Setup:

- Address: address of the client that Domain controller wants to send the message to.
- **Port:** Client port number.
- Proxy address
- Proxy port
- Send always: If checked, sends the message to the client. Note: User can create multiple client notifications (network client) under one Task. At least one "Send always" checkboxes must be checked.
- **Message:** A text Message that will be sent to client when required (e.g. Domain Alex does NOT RESPOND).
- Message can be changed automatically:
  - If **checked**, an automatic default message will be send to the client. Thus, the text message that was written in message box will be ignored.
  - If **not checked**, the text message, which was written in the message box, will be send to the client (Fig. 27.1.).

Camera OFFLINE	×
Domain "ALEX" does NOT RESPOND	
Close	

Fig. 27.1. Sample Message sent to client by Domain controller

## <u>4.f. Phone</u>

Seneral Cameras Users T	asks Monitor Reports	Synchronize
Login/Logout Task     Login/logout task 200510241     Task on status check 104_10     Task executed when writing e     Task executed when writing e	I ask name: <sup>Bask_nov14</sup> Rescription:	
Task Logat     South Logat     South Logat     Task on FTP alam 53     Task on FTP alam 53     Task on FTP alam 33     Task on FTP alam 35     Task on	Location to phone message from Phone/Page to cal 416:111:1111 Number of attempts 1 Aways cal [7]	

Fig. 28. New  $\rightarrow$  Notification  $\rightarrow$ Phone

Notification via Phone Setup:

- Location to phone message from
- Phone/Pager to call
- Number of attempts
- Always call

#### <u>4.g. Email</u>

A NVR Setup		
General Cameras Users T	aska Monitor Reports	Synchronize
<ul> <li>Task</li> <li>Mail notification a@eeeeee</li> </ul>	Lask name (Task Description	
	Location to mail message from.	
	Message Notification message	
	✓ Message can be changed automatically Repeat if unsuccessful times every sec.	
Add Save Delete		

Fig. 29. New  $\rightarrow$  Notification  $\rightarrow$ Email

Notification via Email Setup:

- Location to mail message from
- Email address (es): Email address of the party, which the notification will be send to
- **Subject:** Email subject.
- **Message:** Email message that will be send to client.
- Message can be changed automatically
  - If **checked**, an automatic default message will be send. Thus, the message written in message box will be ignored.
  - If **not checked**, the message, which was written in the message box, will be send as an E-mail notification message.
- **Repeat if unsuccessful (e.g. 2) times every (e.g. 30) sec.:** Repeat the send process for a specific number of times.

## <u>4.h. Speak</u>



Fig. 30. New  $\rightarrow$  Notification  $\rightarrow$ Speak

Sound Notification setup:

- Location to play message from: Address of the location in which message will be played from.
- Message can be changed automatically:
  - If **checked**, an automatic default message will be played. Thus, the message written in message box to be played as sound notification will be ignored.
  - If **not checked**, the message, which was written in the message box, will be played as a sound notification message.
- Message: Message that can be played when required (e.g. Domain "ALEX" is offline).

WAV file: Browse and select a saved WAV file to be played when required.

## 4.g. Composite Task

A composite task consists of the other tasks, which could be executed according to the schedule inside the composite task. This allows you to execute different tasks (or skip the executing at all) at a different time.

Composite task is a powerful instrument because it have schedule embedded in it and could initiate different actions in different time.

## 5. NVR IO Devices

If you have appropriate license you will see "IO Device" tab and will be able to work with:

- Gameport
- IOBoard ET-PCI16IO
- Paradox Spectra device

You have to create right description of the device you are going to use (see Fig. 30.a)

🖳 NVR Control Center								
General Cameras Users Ta	asks IO Devices Monitor	Reports Synchronize						
Interval for reading IO boards: 30 (msec) Minimum interval for task activation: 3000 (msec)								
IOBoard 1 Gameport	Name: Spectra 3	Number of zones: 8						
Spectra 3	COM port settings	Number of partitions: 2						
	Special Events Zone 1	Zone's name: Special Events						
	Zone 2 Zone 3 Zone 4	Active						
	Zone 5 Zone 6	On ALARM task:						
	Zone 7 Zone 8	On INALARM task:						
		On RESTORE task: Login/Logout Task						
	Partition 1 Partition 2	Partition's name: Partition 1						
		Active						
		On ARM task:						
		On DISARM task:						
Add 🔻 Save Delete	P							

Fig. 30.a. IO Device Setup.

You can assign task to any event device could create. On receiving signal from the device appropriate task will be executed.

## 6. NVR Monitor

Monitor allows the user to observe NVR components (Fig. 31.).

A NVR	control Cel	nter								
General	Cameras	Users	Tasks	IO Devices	Monitor	Report	s		Synchronize	
ID	Camera			Alarm	Touring	Alive	Recording	~		Recorder is runn
401	AXIS AUDIO	)		N/A	-	N/A	s=1[N]s=3[N]s=2[1	V]s=4[N]	Monitor	(blue) It will be
48	vdg			N/A	-	N/A	N/A			(blue). It will be
49	VDG-emulat	ion		?	-	N/A	s=1[N]		I Server	restarted if
287	CNSG DETE	×I		N/A	-	N/A	N/A		Recorder	
101	2400			?	-	alive	s=1[Rec]s=2[N]s=	3[N]s=4[N]		
72	axis16FD			N/A	-	N/A	N/A		FTP	
104	C205			?	-	dead	N/A		_	
70	SONY PTZ T	EST		?	-	N/A	N/A		Check Drive	Check Alarm 1s
63	IDVIEW			N/A	-	N/A	N/A		E Charles Aliver	stopped (red)
92	IDVIEW2	courc		N/A	-	N/A	NJA		Check Alive	stopped (red).
93	UNSG PANA	SOMIC		N/A N/A	-	N/A N/A	N/A N/A		Check Alarm	
94	SANNO			N/A N/A	-	N/A N/A	N/A N/A			
100	Divord			N/A N/A	-	N/A N/A	N/A N/A		🗖 Tour	
111	AXIS 2130			N/A	-	N/A	N/A			Health Monitor
126	ELMO			N/A	-	N/A	N/A		Get Shots	ricalui Mollitoi
265	Local SONY	RZ30N		2	-	N/A	N/A		Mapper	button allows yo
291	Vivotek TES	Т		N/A	-	N/A	N/A	~		to assign tasks to
								>	Port Listener	to ussign tusks to
<b>Viewer</b> bi	itton									monitor NVR
a von to a	aa 1aa		me		Dura	Mess	Level Requ	Address		components
s you to s	ee log		-						Alarin Server	components
nation ab	out tasks	3							Remote Server	
		` )								
							<u> </u>		Socket Server	
										//
										1
1								>		

Fig. 31. NVR Setup→Monitor

During normal operation this window could be left open and available. The status of all the cameras that have been installed on the NVR can be seen on NVR monitoring window.

The following information is displayed on the **Monitor** window:

- Camera ID number
- Camera name
- Alarm Status
- Touring Status
- Camera "Alive" Status
- Recording Status

Module status and control panel are located at the bottom of the window.

Note: The Modules at the bottom of the Monitor are not to be stopped by the user.

The panel allows the user to select which module to run. By default ALL modules start at boot up and are monitored for operation. If, for some reason, the user stops a module and is selected to be monitored, it will be re-started by the Monitor in approx. 30 seconds.

When a module is stopped, its title becomes **RED**. If a module is running, it becomes **BLUE**. By unchecking the box beside the title, that module won't be automatically re-started by the Monitor.

Un-checking the Monitor box disables the Monitor, thus modules won't be automatically re-started and, upon re-boot, the NVR itself will not be re-started either. *Note: It is recommended that the Monitor be active at all times.* 

## 7. NVR Reports

This advanced feature allows the user to run reports that show when various users have been authenticated and logged on to the NVR. It displays date, time, and the host address.

Searches can be made using the following criteria:

- USER NAME
- HOST ADDRESS
- Date range

Click **Run** to view the report.

🖳 NVR Setup	
General Cameras Users Tasks Monitor Reports	Synchronize
From 10 Aug 2005	
User	
Address	
Run	

Fig. 32. NVR Setup→Reports

## Port Mapper Setup

🚯 Port Mapping	
Mapped ports Active connections	
Listen port -> Mapped address & port	Use Cameras database for mapping 🛛 🔽
<ul> <li>Port 2083 mapped to 192.168.10.146:83</li> <li>Port 2081 mapped to 192.168.10.38:80</li> <li>Port 2082 mapped to 192.168.30.49:80</li> <li>Port 2098 mapped to 192.168.10.234:80</li> </ul>	<ul> <li>Port 2084 mapped to 192.168.10.42:80</li> <li>Port 2096 mapped to 192.168.10.154.80</li> <li>Port 2099 mapped to 192.168.10.87:80</li> <li>Port 2087 mapped to 192.168.10.95:80</li> </ul>
Total : 0 connection(s) for 15 active mapped port(s)	
📴 Add 🕼 Delete 🥪 Edit 🖌 All mark	<u> <u>A</u> Start 🗧 Stop 🛛 🚽 Exit</u>

Fig. 40. Port mapper

To map a port use the Add/Delete/Edit buttons (Fig. 40.)

After pressing one of those buttons, port mapping dialog box will appear (Fig. 41.).

Port mapping 🛛 🔀
Mapped port: 80
For Address:
and Port: 80 📁 Debug it
Enable MultiLink Connect 🛛 🔽
Max connection time 0 sec.
Disconnect when idle 3600 sec.
OK Cancel

Fig. 41. Port mapping dialogue box

Fill in the required information in the Port Mapping dialog box (Fig. 41.).

To activate mapping CHECK the required port (Fig. 41.) and press the **start** button (Fig. 40.).

To stop the program, use the "Exit" button only. (Closing the window will force the program to minimize itself).

Note: In order to edit the line, stop (inactivate) listening to the port you want to edit.

## Network of NVRs

There are two challenges that video surveillance systems are facing today, namely scalability and reliability. Large organizations that have multiple sites in local or remote locations could have from ten to over a thousand cameras to manage.

The approach in the past was to have islands of standalone systems that required time consuming and inconvenient maintenance and management.

Taking our cue from existing computer network topologies, a new and exciting approach to digital video surveillance management and control has been developed. We have developed the *Network Video Recorder Domain* model to address scalability and reliability.

Digital video recording consumes a large amount of hard drive storage space. With a large amount of cameras sending information to the archive over a long period of time, the only way to adequately deal with the shear volume of files is to share the load over a distributed NVR network.

The central administration point of this distributed network or *domain* is the NVR Domain Controller.

## NVR Domain Controller permits the following actions:

- 1. To consider the whole NVR Domain consisting of several NVR's as one powerful NVR. Each particular NVR from the domain will be responsible only for recording its own set of cameras and searching its own archive.
- NVR Domain Controller will authenticate all clients' access (connections from computers viewing cameras) via the local area network, or the Internet.
   Domain Controller only needs to maintain the user list. It is not necessary to have a user list for each particular NVR in domain. This centralizes user access control and database management.
- 3. *NVR Domain Controller* allows us to consider each particular NVR in the domain like a computer without keyboard, mouse and monitor. The *Igloo* is a good example for this. We can have set of Internet addressable igloos we can remotely control and search. (See the IGLOO PDF included on your NVR CD for more information)
- 4. *NVR Domain Controller* makes the whole system highly scalable and capable to record from ten to hundreds of cameras. Just add one more NVR in the domain and assign a new set of camera to it. If you have two or more NVRs in different locales, you should explore upgrading with this module.

## **Building NVR Domain**

Whether you have several sites or a single site with hundreds of cameras, you can now plan a security management strategy.

You can create a set of NVRs by dividing cameras by groups, and assigning each group to a corresponding NVR.

Each particular NVR is responsible for its group of cameras and carries the duty of recording, touring, and alarming functions.

We use an NVR Domain Controller to manage the set of NVRs (Fig. 42.)



Fig. 42.

**NVR Domain Controller** gains knowledge of all NVRs in its domain, which in turn leads to the realization of the existing cameras in the corporate network.

NVR Domain Controller can:

- Remotely Create and Update cameras list on any NVR in Domain
- Remotely Create and Update recording schedule for each camera
- Remotely Create and Update touring schedule for each camera
- Obtain and update remote User List from any NVR in Domain as well as support its own local user list.
- Remotely monitor any NVR in Domain
- Start and Stop any NVR's component on any NVR in Domain

*Note:* For security reasons, *NVR Domain Controller* can remotely connect to the NVR only after providing the appropriate username and password.

#### How to set up an NVR as a member of Domain Network

To have any **NVR** as a part of the **NVRs Domain Network**, configure NVR controller settings in the "Global Setting" (Fig. 43.)

Image: NVR Setup         Image: Synchronic line         Sy	20
Archive Storage         Path         Path         dtace         If free space less than 3000         MB       Stop saving         Overwrite         Task executed when         Writing error: <ul> <li>Drive limit reached.</li> <li>If as a Service</li> <li>Stop NVR Service</li> <li>Login/Logout task:</li> <li>Image: Stop Stop Service</li> <li>Stop NVR Service</li></ul>	Set address and port number. Recommended port numbers are: 60000 or 60001 Register/Unre gister site

Fig. 43. General  $\rightarrow$  Global Settings

Place IP address or IP name of the **NVR Domain Controller** in the space provided on "**NVR Controller Settings**" panel.

Once the address of Domain Controller is set, enter location name (choose any) and click on "**Register Site on Domain Controller**".

Username and password will be asked if a connection to Domain Controller already exists. From this point NVR *"introduces"* itself to Domain Controller.

At least one user must be set as "Exclusive Master User". The Exclusive master user has to provide its name and password to the NVR Domain Controller administrator.

Subsequently NVR Domain Controller administrator could accept/reject registration from a specific site.

If the site is accepted, it becomes part of the NVR's Domain Network.

Once became a part of NVR's domain Network, any changes on NVR in cameras table (edit/add /delete) will be mirrored on Domain Controller.

Domain model depends on the connection (locally or through the Internet) between **NVR** and **Domain Controller.** This is important specifically while making changes to camera setting. For instance, if the connections to Domain Controller break temporarily, continue to work and Domain Controller will look after synchronization later.

#### How to set up NVR Domain Controller

Any NVR that holds the "Domain Controller License" could become **NVR Domain Controller**. NVR domain controller has to set one of its users as "**Exclusive Master User**". Exclusive Master User has to provide its name and password to **other NVRs** (children) in domain.

An NVR sends a request to get connected to Domain Controller. When the request is received by NVR Domain Controller, the information about the requester is shown in the **Camera Server connect setting** field (Fig. 44.).

This information could be:

- The address and port number of a requester that is within the Domain server's NVR network (local network having internal address).
- Or the address and port number of a requester that is from another NVR network (for communication between NVR Domain Controller and a particular NVR).

The Red "**NEW**" on the NVR location window (Fig. 44.) indicates that NVR from a requester (e.g. Graphics) wishes to be part of **NVR Domain controller**.

This request can be accepted by pressing "Import" button or rejected by pressing "Unregister" button.

*Note: Proxy address and port* information exist according to the Internet setup of the requester. This is when the requester is using a setup, which uses proxy address and port in order to connect to the Internet.

The following information about the communication between Domain controller and a requester is also provided on the **NVR Location** window:

- Controlling
  - Get NVR status
  - *Synchronize location*: Remote location can be forced to synchronize, if some changes are made remotely.
  - Restart remote OS
- *Monitoring*: uses the **Tasks** that are created in **NVR Setup** in order to take an action or issue a notification when required.
  - *Check Alive*: If **checked**, enables the use of a Tasks (Action or Notification)
  - Interval for monitoring (sec.)
  - Attempts (e.g. 2) each (e.g. 10) sec.
  - *Task when NVR does not response*: can be selected from the pull down menu (e.g. Test, Fig. 5.).

*Note:* The address in the *Camera Server connect setting* must be identical with the content of *INTERNET Name or address* field.

🖳 NVR Setup			Disable remote site. It is useful if there are technical
General Cameras Users Tasks	Monitor Reports	Synchronize	problems connecting
Global Settings NVR Locations Camera L	ocations Voice Setup FTP Server Advanced		to this site.
Graphics	NEW Name Graphics Camera Server connect settings Address 192.168.10.32 Proxy Address Host name GRAPHICS/192.168.10.32 INTERNET Name or address 192.168.10.32 Connect Import Unregister Controlling Monitoring Get NVR Status Synchronize Location Restart Remote OS	Pot 2080 Pot Save	Changes to settings can be saved.
Fi	g. 44. <b>NEW</b> connection request	cameras fror copied using There are no about using	n remote site is this option. restrictions this option.

The following is a list of possible actions when a request to join the NVR is sent:

- Press "Import" button  $\rightarrow$  request to join is Accepted  $\rightarrow$  location will go to Normal Mode
- Press "Unregister" button  $\rightarrow$  request is Rejected  $\rightarrow$  location will be deleted
- Do not press any buttons  $\rightarrow$  Ignored  $\rightarrow$  location stays in NEW mode

If REMOTE NVR is in "Normal" mode,

- System will keep up-to-date information about the remote cameras settings.
- Allows remotely updates (from the **NVR Domain controller**).
- Allows updating "**users**" information on the remote site.

If REMOTE NVR is in **NEW** mode,

- NVR's request to join the domain is not accepted.
- o Domain Controller will not know camera database from the remote NVR.

Connection from the Domain Controller to the Remote NVR is supported in both modes. One can control remote NVR's components, and watch processes on the remote site.

Note: Remote Site can be accepted at all times. Both sites could have Cameras, users and/or schedules list already created.

## Updating Camera lists across Domain

If Remote NVR is in "Normal" mode, you can remotely update Cameras list. To do this, find remote location (e.g. Graphics), and change camera setting locally. (Fig. 45.)

	NVD Setup	
	General Cameras Users Tas	sks Monitor Reports Synchronize
Remote Location	General Cameras Users Tax Cameras List	ixs       Monitor       Reports       Synchronize         Cameras Settings       Security&Alarm       Description       Recording         Name       Flip Image       With PTZ         Address       Check Alarm       Exclude from recording         Proxy Type       Stop touring while active       Restore for Recorder         Location       Image Size       fullsize       Max FPS on Write 30         Images path for FTP Server       Position on close       None       Name For sub-cameras:         Number of sub-cameras:       0       Alarm Inputs:       0       ComPorts:       0
	Add Dup Save Delete	Nr. Active PTZ Name maxFPS Alive

Fig. 45. NVR Setup  $\rightarrow$  Cameras  $\rightarrow$  Cameras Settings

## Updating User lists across Domain

General     Cameras     Users     Tasks     Monitor     Reports     Synchronize       dave     Users List     User Information     Groups of cameras     Billing Information&Restrictions       worka     User Information     Groups of cameras     Billing Information&Restrictions       worka     User Information     Groups of cameras     Billing Information&Restrictions       worka     User Name     dave     Image: Cameras       scott     User Password     Image: Cameras     Cameras       demo     Monitor     User Password     Image: Cameras       worka     User Password confirmation     Image: Cameras     Exclusive Master User       gary     Number of Active Users     Image: Cameras     No map transfer       volpe     Number of Active Users     Image: Cameras     Image: Cameras       holinn     Volpe     Login task     Image: Cameras     Image: Cameras       vince     Volpe1     Cameras     Image: Cameras     AOU Tril     AOU Tril       ADU Tri2     AOU Tri2     AOU Tri2     AOU Tri2     AOU Tri2       ADU InviteW     IDVIEW2     AOU Derver front door     AOU Derver front door       ADU Paragereris for House Camera     Volpe IDVIEW     AOU Paragereris for ADU Derver front door       ADU Paragereris for House Camer	NVR Setup		
Users List       User Information Groups of cameras       Billing Information&Restrictions         dave       ✓ Master User         mark       User Name       dave         scott       ✓ User Password       ✓ Can Search Archive         demo       ✓ User Password confirmation       ✓ Exclusive Master User         mhogg       ✓ User Password confirmation       ✓ Can Search Archive         eite       Number of Active Users       ✓         gary       Max connection time (min)       3939       ✓         volpe       Login task       ✓       Logout task         volpe1       Login task       ✓       Logout task       ✓         Kelsey       C205       IDVIEW/2       AOU IDVIEW       AOU IDVIEW         paul       C205       IDVIEW/2       AOU IDVIEW       AOU Deriver front door         AOU Deriver front door       AOU Perver front door       AOU Deriver front door       AOU Deriver front door         Cong2       Volpe IDVIEW       ✓       AOU Deriver front door       ADU Deriver front door	General Cameras Users Task	Monitor Reports	Synchronize
Viad     Joint Draw     ADU Pixord       alex     Vivotek TEST     ADU Pixord       alley     EDR REMOTE     A	General Cameras Users Task Users List Users List dave vova mark scott demo mhogg elite kesser gav volpe holinn vince volpe1 kelsey cinex cinex cascom remote Cory2 Vidd alex alley test	Monitor       Reports         User Information       Groups of cameras         User Name       dave         User Password       Image: Comparison of cameras         User Password       Image: Comparison of cameras         Number of Active Users       5         Max connection time (min)       9999         Login task       Image: Cameras         Cameras List       AOU Tril         AOU Tril       AOU IVIEW         SANYO       AU DOPNOV FION AOU DOPNASIONIC         House Camera       AOU Denver front door         Volpe IDVIEW2       AOU DRAMASINIC         SANYO       AU DOPNAS PRASINIC         House Camera       AOU Driso Pranasonic Wireless         Vivotek TEST       AOU Prixord         EDR RECORDER       Diglop         Diglop       A_ ELMO	Synchronize  Master User Can Search Archive Exclusive Master User No map transfer Prohibit to record  User Rights User Rights User User User

Fig. 46. NVR Setup  $\rightarrow$  Users  $\rightarrow$  User Information

If Remote NVR is in "Normal" mode, you can remotely update Users list. To update the USER, select the location that needs to be updated from the "User" table (Fig. 46.)

First time users will be asked for the authentication information by the system (Fig. 47.)

	Remote Site: Graphics
	User Name :
	Password :
	OK Cancel
	Fig. 47. Authentication window
	for Remote User
Always	contains the name of the remote user, e.g. G

After successful authentication, the User List will be accessed from Remote Location.

#### Troubleshooting across Domain

When connection between "NVR domain controller" and another NVR (child) in its domain is broken, the system has to have the ability to continue its work and do the synchronization later.

In case of a "broken connection" between Domain controller and a remote site such as site "A":

- 1. If
  - o The whole situation is looked at from remote site "A" standpoint,
  - User (e.g. site "A") is still allowed to change its own site

 $\Rightarrow~$  NVR will go into "Synchronization failed" mode and will not update information across domain.

Only Domain Controller can bring site "A" to "Normal" mode. Click on **"Import"** button in order to bring site "A" into "Normal" mode (Fig. 44.)

2. If

0

- The whole situation is looked at from "Domain Controller" standpoint,
  - ✓ Either, site "A" (Remote NVR) is in "Synchronization failed" mode
  - $\checkmark$  Or a "broken connection" between "domain controller" and site "A" has occurred
- $\Rightarrow$  No update will be allowed to site "A".

To synchronize Domain database with the remote database click on **"Import"** button for appropriate Remote Site (see "**Import**" button on Fig. 44.).

## **Technical Information about TCP Ports for NVR**

List of TCP ports used by NVR by default:

To Guarantee the full functionality of NVR, administrator should open the provided TCP ports. In addition, if **PortMapper** is used, open all TCP ports, which are being used by it.