

Microdigital MDR-i0016(25/36)Manual



Make sure not to lose the provided USB dongle key. Without this key, NVR does not run. If you lose this key, it cannot be supplied again and you need to buy it separately.

This product(s) are a tool for surveillance and security. The company shall not be liable for any damages from accidents or damages from fire or theft. The Microdigital MDR-i0016(25/36) may not record properly if the network connection does not provide sufficient bandwidth.

Microdigital INC.

Symbols



Caution

Indicates important notes or restrictions that must be observed when using this product.



Note

Indicates additional information or explanations for a procedure.

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Chapter 1 Microdigital MDR-i0016(25/36)Overview

1.1 Introduction

MDR-i0016(25/36) is an open platform network video recording device. It records network cameras and video servers from multiple manufacturers. In addition MDR-i0016(25/36) serves video to multiple clients connected over the network via Microdigital CMS. Go to <http://www.Microdigital.co.kr/support> for an up to date list of supported devices.

1.2 Features

- Records 16/25/36 channels of network video (dependent on model purchased)
- Supports 16/25/36 channels audio
- Supports scheduled recording with associated and specified video resolution and frame rate
- Differentiates recording parameters for normal continuous recording and event-driven alarm recording
- Supports DAS(up to 4 internal drives), NAS & SAN as data archiving media.
- Supports 16/25/36 virtual channels sensor input and relay output (assigns camera's on-board sensor input and relay put to NVR's virtual digital I/O channels)
- Manages local administrator and remote users independently
- MDR-i0016(25/36) supports seven simultaneous operations:
 - 1) Local Record
 - 2) Local View Live
 - 3) Local Playback
 - 4) Local Save Clip to USB
 - 5) Network View Live
 - 6) Network Playback
 - 7) Network Backup to Client

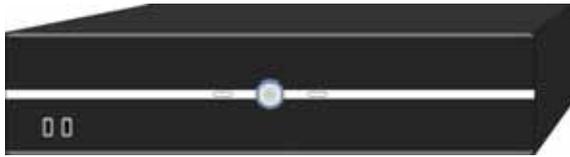
1.3 Recording Performance

Codec	Resolution	MDR-i0016	MDR-i0025	MDR-i0036
MPEG4 & H.264	CIF	480ips	750ips	1080ips
	2CIF	480ips	750ips	1080ips
	4CIF & D1	480ips	750ips	1080ips
	720p HDTV	480ips	750ips	1080ips
	1080i HDTV	480ips	750ips	1080ips
JPEG	CIF	480ips	750ips	1080ips
	2CIF	480ips	750ips	1080ips
	4CIF & D1	480ips	750ips	1080ips
	1.3 Megapixel	160ips	250ips	360ips
	2.0 Megapixel	120ips	180ips	270ips

** Tested with MICRODIGITAL camera under medium quality image settings

1.3 Contents

Please check to ensure the items specified below are included. If items are missing, please contact your local vendor. Microdigital's MDR-i0016(25/36)packaging contains the main unit and its components as specified below:



Microdigital MDR-i0016(25/36)



Power Cord



Quick Reference Guide



Software CD



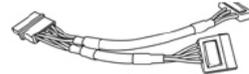
Mouse



Keyboard



SATA drive data cable

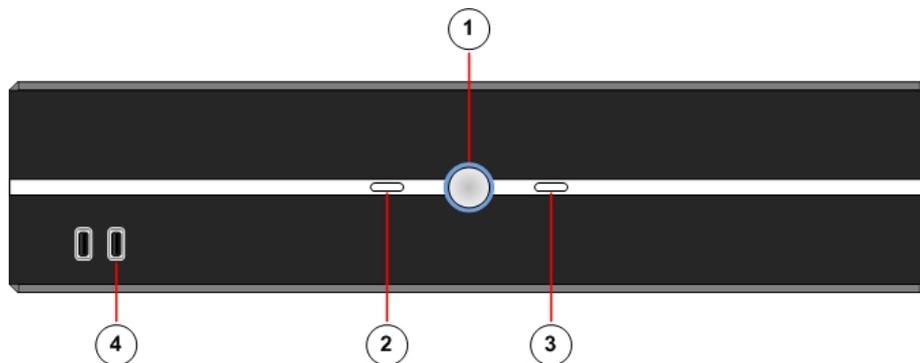


SATA drive power cable



Hard disk fastening screws

1.4 Front View



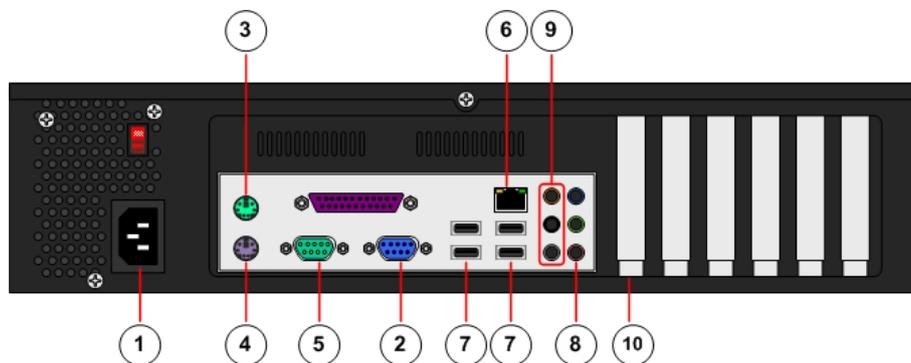
Power button: Press to Turn on. Once on, the button glows blue.

HDD LED: Indicates that MDR-i0016(25/36) is writing, or reading data from the Hard Disk.

Network LED: Blinks when MDR-i0016(25/36) receives data from network cameras or accessed by a remote user.

USB port: Attach USB devices (i.e. keyboard or mouse).

1.5 Rear View



Power: Supply AC110V power

VGA: Connect a VGA monitor

Mouse: Connect a PS2 style mouse

Keyboard: Connect a PS2 style keyboard

RS232: **Factory Use Only**

Network: Connect Ethernet cable

USB: Connect USB devices

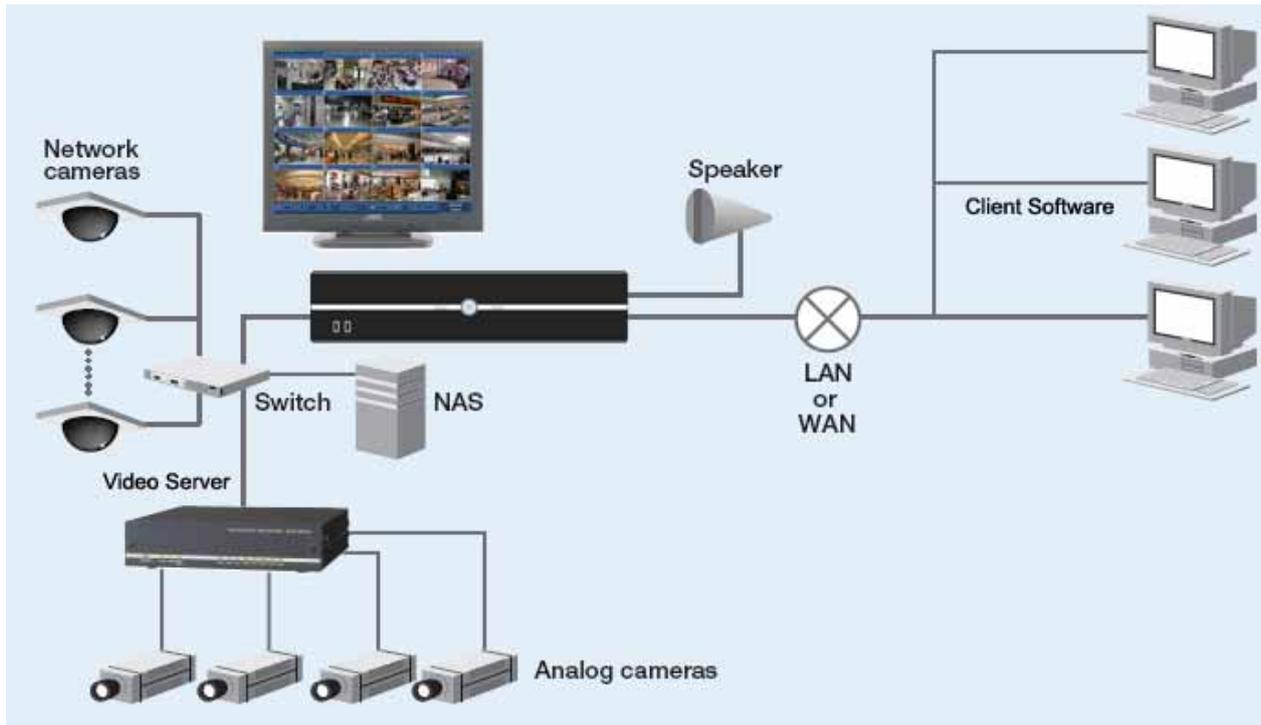
Mic.: Connect microphone here

Speaker: Connect speaker(s) here

Slot: Approved PCI Card Devices here (i.e. external storage)

1.6 System Topology

The figure below demonstrates a typical MDR-i0016(25/36) topology. MDR-i0016(25/36) supports many different types of HDD storage including NAS and internally/externally attached storage. Externally attached storage, other than network attached storage is only supported by professionally installed PCI bus cards. Please see Appendix A for a list of supported PCI bus cards. Microdigital has a limited number of approved PCI card devices to insure simple and reliable installation and configuration. See appendix a for a list of supported devices.



Chapter 2 System



- *MDR-i0016(25/36) requires a monitor that supports 1024x768 or higher resolution.*
- **For North American Markets:** *Before connecting the power cable to the unit, double check that the input power voltage is set to 110V AC. Otherwise switch it from 230V to 110V*



2.1 Install MDR-i0016(25/36) and Start Up

In the following order:

Place MDR-i0016(25/36) on a secure level surface, or rack mount with included hardware

Plug in the **USB key** to **one of the rear USB ports**. ***(MDR-i0016(25/36) will not run without the USB Key)***

Plug in a monitor to the VGA port

Plug in the supplied PS2 Mouse and Keyboard (rear panel)

Connect an Ethernet cable to the network

Select power input type between 110V AC or 220V AC on the back

Connect a power code

Press power button on the front

During the boot process MDR-i0016(25/36) displays the Microdigital logo followed by the main screen.



2.2 Main Screen



Local Playback and Live Viewing is Purposely Limited

Although MDR-i0016(25/36) has the capability to simultaneously record network video at high frame rates, on all channels, local playback/live video (at the device) is purposely limited. This is because we focus MDR-i0016(25/36)'s processing resources on serving and recording high frame and high quality video. Therefore, MDR-i0016(25/36) does not support multi-channel full frame rate local playback, or live viewing.

Microdigital Technologies supplies a powerful tool, Microdigital CMS, for multi-channel playback and live viewing at full frame rates. Microdigital CMS is included on the CD packaged with your purchase. Install and run Microdigital CMS on a separate computer and connect to MDR-i0016(25/36) through the network.

MDR-i0016(25/36) only displays local video at 1 Frame-Per-second. MDR-i0016(25/36)'s "on-screen controls" are diagrammed below. MDR-i0016(25/36) displays live video from network connected cameras in 16-, 25-, or 36-split formats. To View Live and Playback video at Full Frame Rates, install Microdigital CMS (included) on a separate network connected PC.





Setup: Launches setup program

Instant Viewer: Launches a single channel live POP-UP window

Instant Player: Launches a single channel Playback POP-UP window

Keyboard: Launches a virtual keyboard on the screen

Date & Time: Current system time & date information

Volume: Adjust MDR-i0016(25/36) sound volume

Login Status: Displays login status (login or logout)

Power: Restart the device / Shut down the device

Live Video & Recording Status: Displays live and recording video status

2.2.1 Setup

Please refer to '**Chapter 3 Setup**' for detailed information.

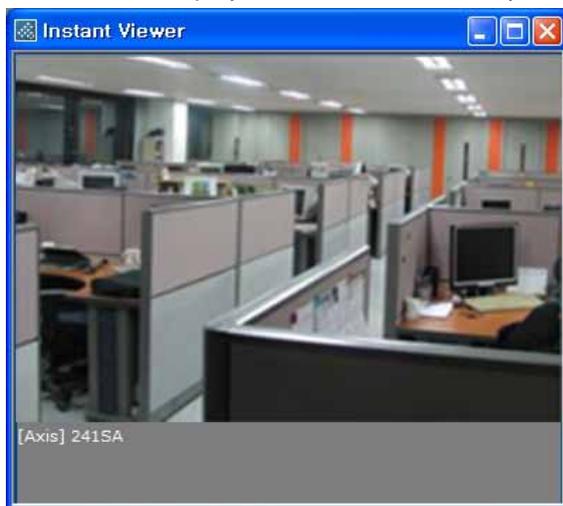
2.2.2 Instant Viewer



The main screen only displays live video at 1 frame per second, regardless of the number of cameras connected. A single channel pop-up window, 'Instant Viewer' plays live video of a selected channel at maximum 30FPS on the attached monitor.

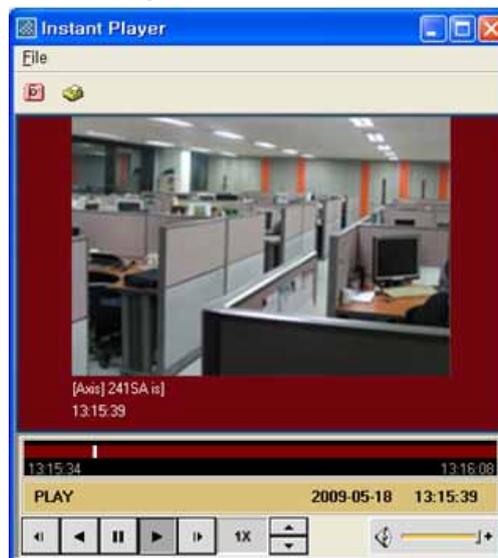
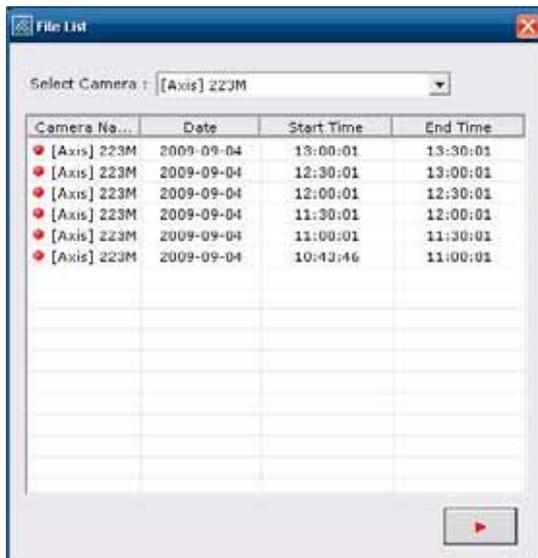
See using Microdigital CMS for viewing multiple channels of high frame rate video.

This pop-up window displays live video for the selected channel/camera on the main screen. This single channel window plays video at 30FPS locally on the MDR-i0016(25/36).



2.2.3 Instant Playback

This pop-up plays a single channel of playback video at the full recorded frame rate and resolution. Clips are recorded in 30 minute increments and are found in the list diagrammed below.



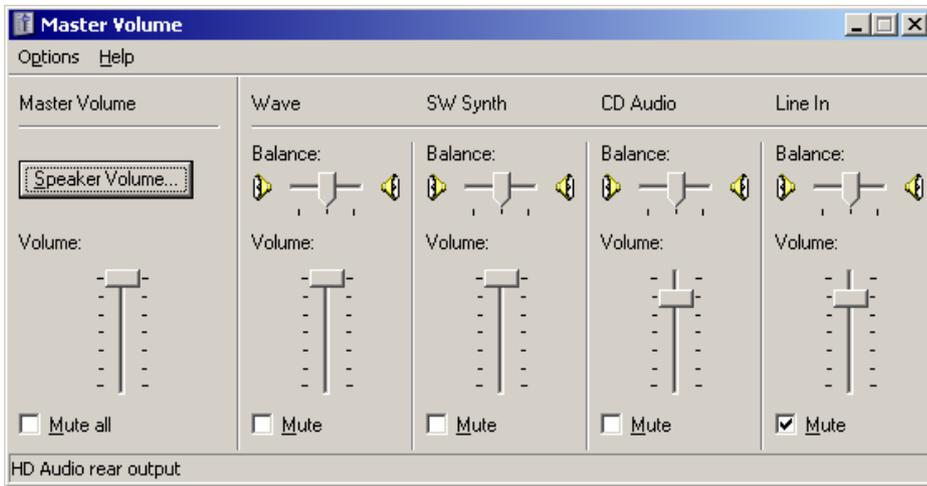
2.2.4 Keyboard

If you prefer not to use the included keyboard, take advantage of the MDR-i0016(25/36)'s virtual keyboard.



2.2.5 Volume

Control MDR-i0016(25/36) speaker volume (speakers not included).



2.2.6 Login Status



To avoid unauthorized use, or system changes, make sure to log off when away from MDR-i0016(25/36).

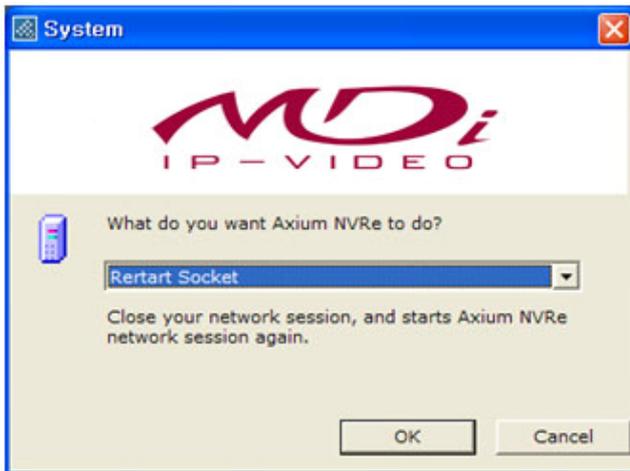
Once a user logs into the system, the login button (key icon) toggles from 'OFF' colored yellow to 'ON' colored green.



2.2.8 Power

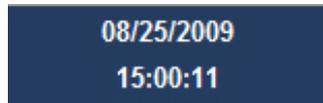
Upon clicking, MDR-i0016(25/36) pops up a window with three options 'Restart System' and 'Shut Down'.

- Restart CMS Connection: This is to restart the socket that creates connections to remote client (CMS)
- Restart System: This is to restart the device
- Shutdown System: This is to shut down the device



2.2.8 Date & Time

Current system time & date



2.2.9 Live Video & Recording Status

Each channel of the main screen displays live video from the connected camera on the remote location at 1 FPS. At the right top, there is an icon that shows recording status of the respective channel.

Detailed channel information is available by dragging the mouse pointer over the channel number (top left of each screen). The following information displays: (All parameters are configurable through 'Setup' menu.)

- Channel No. & Name: Name of the channel
- Recording Status Icon: Current recording status (On or Off)
- Recording Status Tooltip: Defined recording parameters
 - Mode: Defined recording mode
 - Video Format: Video format to record
 - Resolution: Video resolution to record
 - Frame Rate: Recording speed



Chapter 3 Setup

Menu Tab	Feature	Remark
Camera	Register cameras, sensors, and relays	
Record	Schedule recording parameters by channel	
Storage	Assign storage space to archive data	
Time	Set date, time, and time zone of the device	
Network	Set network address of the device	
Change Password	Change local administrator's password	
Remote User	Add/edit/remove remote users	
System	Configure system with specific features	



For easy setup configure MDR-i0016(25/36) in the following order:

Set device time

Set network address

Change the local administrator password

Confirm storage settings

Register cameras

Configure desired recording parameters

Add remote user(s)

Configure general system settings

MDR-i0016(25/36) has default record settings. MDR-i0016(25/36) starts recording automatically upon device/camera registration. (Default settings are as below)

Recording mode: Continuous (not motion or event driven recording)

Frame rate: All-Frames the camera is streaming

Resolution: Auto (whatever the camera is streaming)

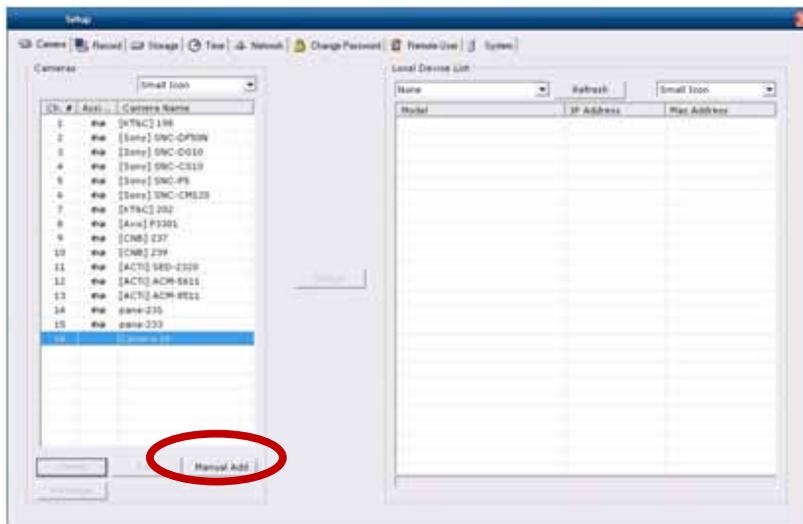
Image Quality: Auto (whatever the camera is streaming)

3.1 Registering Video Source Devices (Cameras, Video Servers & Their On-Board Sensors/I/O)

Register IP video source devices (cameras and video servers) and their on-board I/O devices, (relays and sensors I/O).

3.1.1 Registering Cameras Manually

1. Click on the 'Camera' tab, and the configuration pane appears.



2. In the far left column select a virtual channel and click the "Manual Add" button in the bottom right hand section of the Camera area.
3. Enter required connection parameters for the device. Items in bold are mandatory.



- Name: Camera name to display on the screen
- Vendor: Camera manufacturer
- Model: Camera model
- Connection Type: Static IP or Dynamic IP
- Port: Video service port number
- Video Format: Video format to receive from the camera
- Camera: Camera number to connect
- Sensor Input: Sensor input channel on the camera
- Relay Output: Relay output channel on the camera
- User Name: Login user name to access the camera
- Password: Password to access the camera

4. Click 'OK'. The registered component will now appear 'Camera List'.

3.1.2 Auto-Recognize, Camera Registration via MDR-i0016(25/36)'s Auto-Recognize Feature

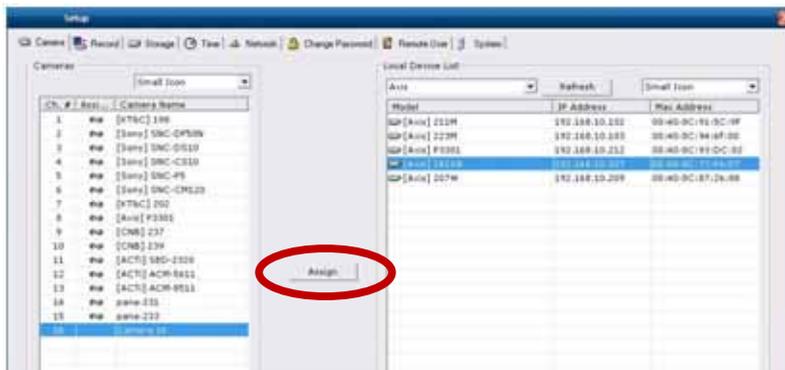


It is recommended to register a source device with a 'Static IP Address' to secure stable data stream as long as a static IP address is available for the source device.



This method only works with devices on a LAN (local area network). In addition the devices must not reside behind a firewall and must reside in same domain, and/or IP address subnet. Auto-Recognize feature does not work over WAN connections.

1. Click on the 'Camera' tab, and the configuration pane appears.
2. Select a channel in the 'Camera' pane to the left and select a source device in the 'Local Device List' pane to the right.
3. Click 'Assign' button in the middle of those two panes.



4. Enter login information to a source device and select its component to register.



- Name: Camera name to display on the screen
- Port: Video service port number
- User Name: Login user name to access the camera
- Password: Password to access the camera
- Video Format: Video format to receive from the camera
- Camera: Camera number to connect
- Sensor Input: Sensor input channel on the camera
- Relay Output: Relay output channel on the camera

5. Click 'OK' button, and then the registered component appears in the list of the pane. The camera name on the list is updated with the entered value.

3.2 Record Parameters



MDR-i0016(25/36) supports scheduled record modes by day and by hour

'Recording Mode' is to be registered by channel independently from other channels.

User may combine 'Normal Recording' and 'Alarm Recording' in a mode with different parameters.

*With a source device that supports dual-streaming, it would be efficient to set '**Video Model**' as '**Adjust video transmission rate to match recording rate**' and '**Frame Rate**' as '**Advanced**' in securing desired frame rate. User may set desired frame rate for each mode respectively.*

Without registering a camera to MDR-i0016(25/36) channel, it is not possible to schedule recording to the channel (virtual channel) of MDR-i0016(25/36).

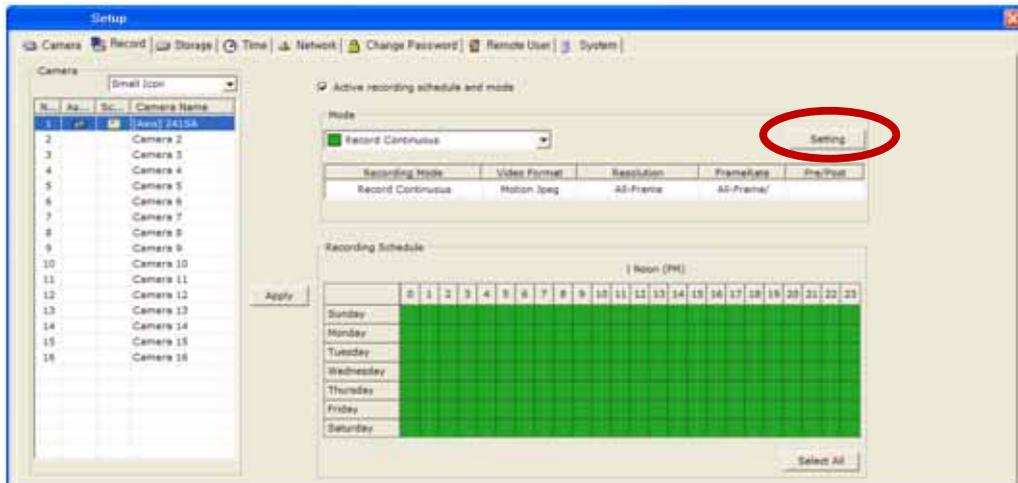
As soon as a recording schedule applied to a selected channel, MDR-i0016(25/36) starts recording data accordingly.

Network bandwidth can affect recording speed. Especially it may slow down the recording frame rate regardless settings.

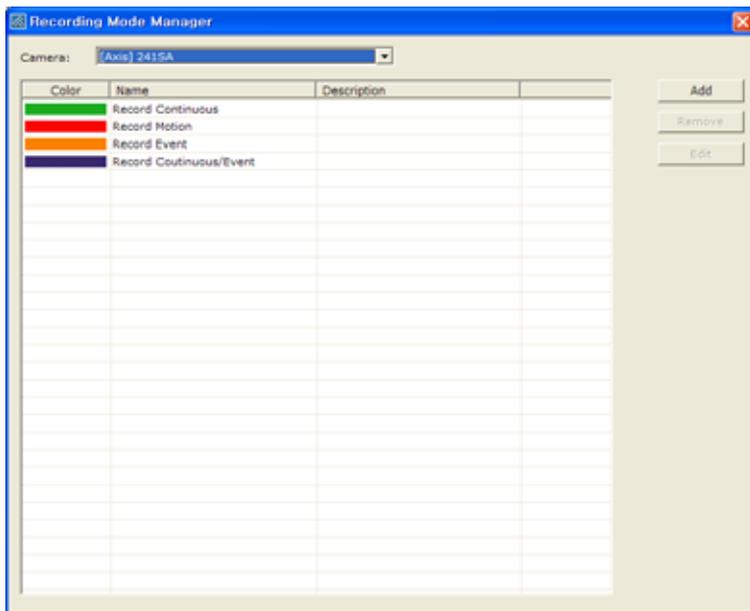
3.2.1 Adding a new Record Mode

Add recording modes with desired parameters for each channel. You can configure as many record modes as you like, there are no limits.

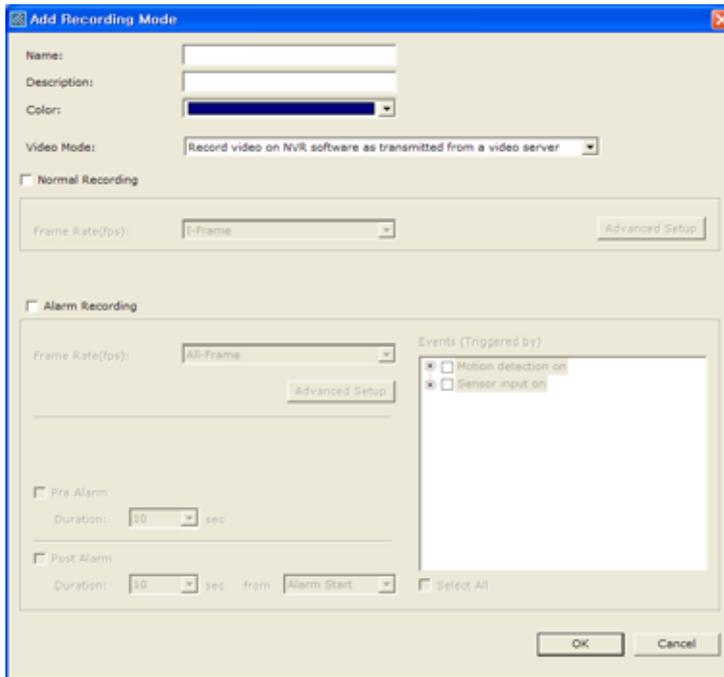
1. Click on the 'Record' tab, and then setup pane appears to the right.



2. Click on a camera in the left pane, next, click the 'Setting' button.
3. Click 'Add' button in the 'Recording Mode Manager' window. This window displays a list all modes for a selected channel.



4. Configure a new recording mode in 'Add Recording Mode' window.



Configuration options are as follows:

Name	Defines the Name displayed in the recording setup pane.
Description	Description of recording mode.
Color	Defines a color code for a record mode.
* Video Mode	Defines the video transmission and recording parameters for a source device/camera. <i>Please refer to following paragraph for detailed information.</i>
Normal Recording	Continuous recording at predefined parameters.
Alarm Recording	Only records on alarm with predefined parameters (i.e. video motion detection and/or digital signal input.)
**Frame	Defines record frame rate.
Pre-Alarm	Defines amount of pre-alarm video recording (in seconds)
Post-Alarm	Defines amount of post-alarm video recording (in seconds)
Events	Define event types that trigger alarm recording.

* 'Video Mode' selects one of two options:

- '**Record video on MDR-i0016(25/36)as transmitted from the network camera**'.
MDR-i0016(25/36)records video at the same speed that is transmitted from the source device/camera.
- '**Adjust video transmission rate to match recording rate**'.
MDR-i0016(25/36)changes video transmission speed on a source device/camera to match the user-defined recording setting made here.

'**Record video on MDR-i0016(25/36)as transmitted from the network camera**' mode provides

two options to set video recording frame rate as below.

- **'I-Frame'** (Intraframe only) records video at roughly 1ips speed while skipping other images in between each Intraframe. If a source device does not transmit video as fast as one image per second, MDR-i0016(25/36)records Intraframe video at whatever the device is capable of streaming.

- **'All-Frames'** records video at the rate received from the source device.

'Adjust video transmission rate to match recording rate' mode provides frame rate options from 1fps to 30fps. Under this mode, the image configuration menu ('Advanced Setup') button is activated.

- **'1~30fps'** records video at the selected frame rate.

- **'Advanced Setup'** provides controls for users to set video resolution and image quality on a source device independently for each stream. ***(This option is only available for devices that support simultaneous dual-streaming video.)***

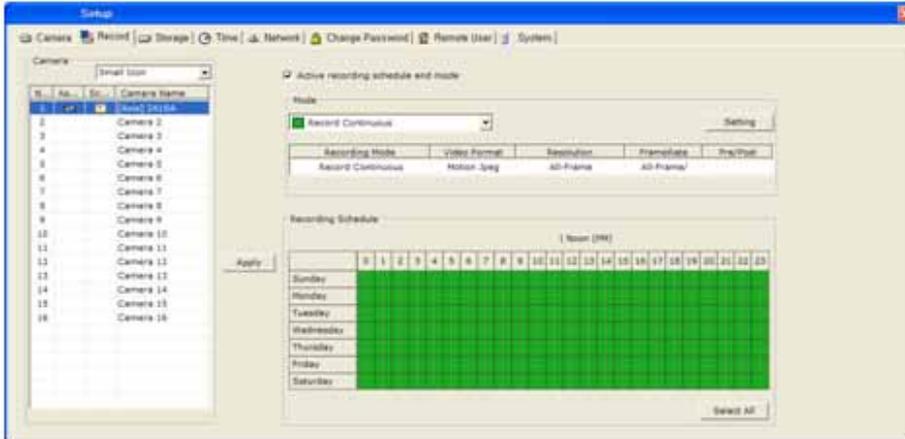
The options of 1~30fps frame rate and controls of 'Advanced Setup' are only available when video mode is set to "adjust video transmission rate to match recording rate."

5. Click 'Apply' button.

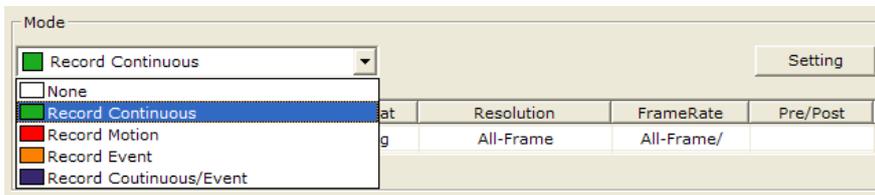
3.2.2 Scheduling

User may schedule weekly recoding by 30 minutes.

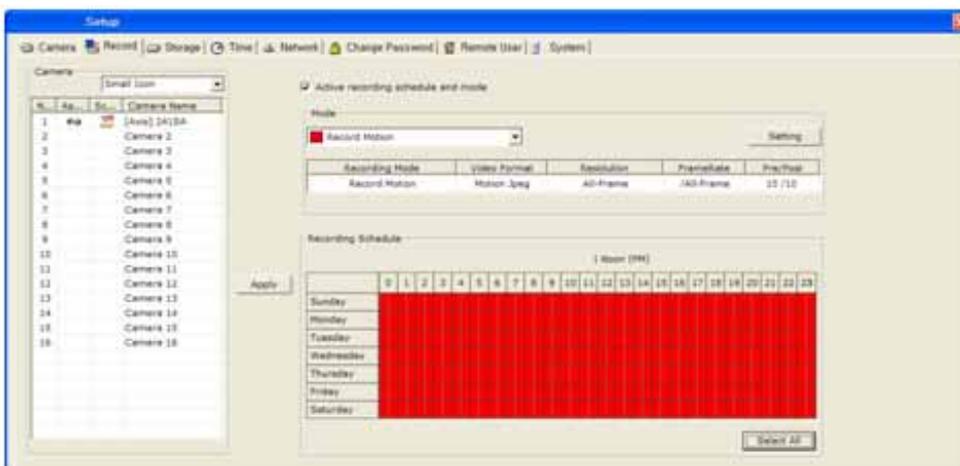
1. Go to 'Record' tab, and then setup pane appears to the right.



2. Select a camera to schedule recoding.
3. Select a recording mode in the pane.



4. Select square(s) of desired time (by 30 minutes) in 'Recording Schedule' pane. User may drag and release with a mouse. With clicking 'Select All' button, the entire squares are selected at once.



5. Click 'Apply' button.

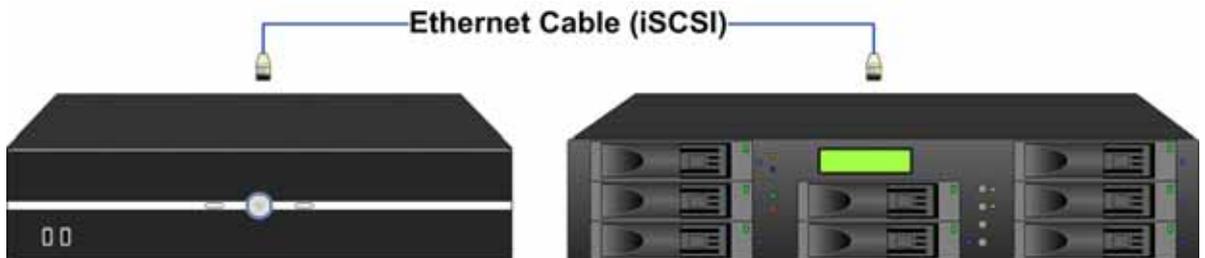
3.3 Assigning Storage Space

This is to configure data storage space in the device. The storage space is to be DAS, SAN or NAS.

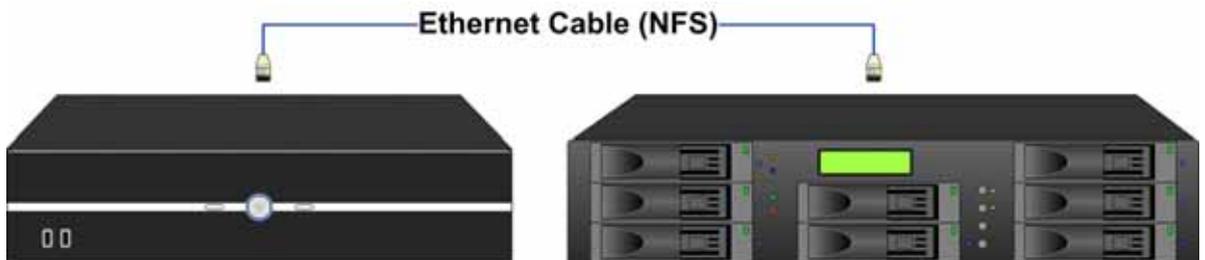
- Directly Attached Storage (DAS) is a hard drive that is attached to MDR-i0016(25/36) directly. It could be inside the MDR-i0016(25/36) or attached from outside through optional card (eSATA, SAS, SCSI, etc). To utilize a desired card, it is necessary to upgrade firmware that supports the desired model. Go to http://www.microdigital.co.kr/supported_devices for an up to date list of supported cards.



- Storage Area Network (SAN) is a storage system that is accessed over Ethernet. SAN system is independent and runs by itself with using MDR-i0016(25/36)'s file system in archiving data. SAN system is operated as locally attached device like DAS. 'iSCSI Initiator' is supported by MDR-i0016(25/36) as default.



- Network Attached Storage (NAS) is a storage system that is accessed over Ethernet (mostly LAN). NAS system is independent and runs by itself and it runs its own file system.



3.3.1 Configuring Internal Hard Drive



Microdigital MDR-i0016(25/36) has an internal hard disk drive that is already configured to archive data. Therefore it is not necessary to configure storage for MDR-i0016(25/36) unless adding a disk into MDR-i0016(25/36).

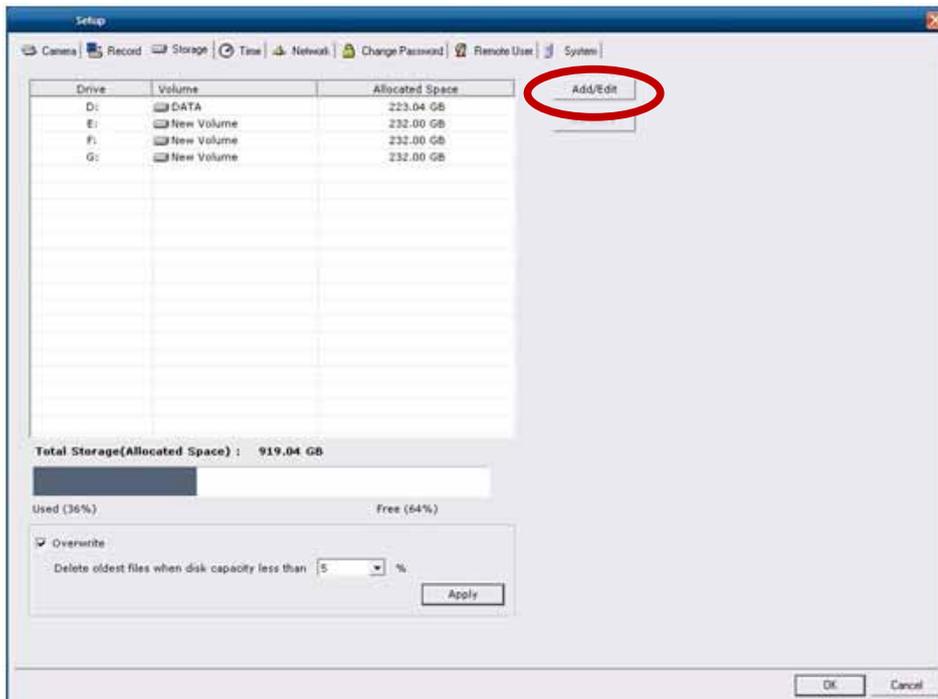
For information on adding internal hard drive, external DAS system, NAS system or SAN system to MDR-i0016(25/36), please refer to the appendix.



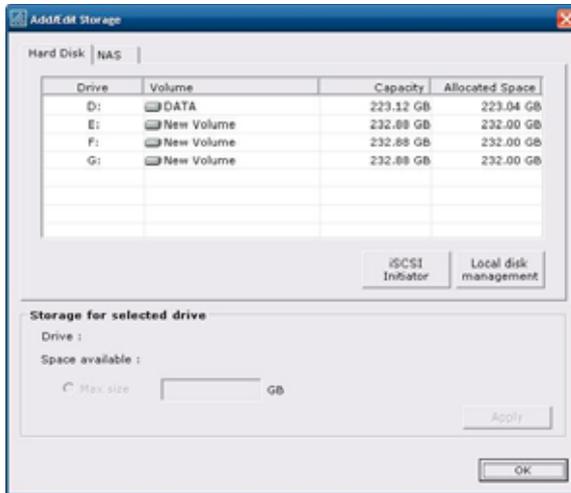
It is not recommended to add hard disk(s) inside MDR-i0016(25/36), which avoids warranty. To add more storage space to MDR-i0016(25/36), please contact a dealer from which you bought the MDR-i0016(25/36).

After adding a new disk, it is necessary to assign the disk as storage device for MDR-i0016(25/36). Otherwise, MDR-i0016(25/36) does not use the attached but unassigned hard disk(s) as storage space.

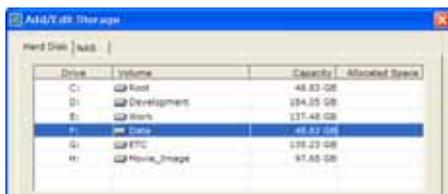
1. Go to 'Storage' tab and click 'Add/Edit' button.



- Go to 'Hard Disk' tab in 'Add/Edit Storage' window. 'Hard Disk' pane displays the entire hard disks that are attached to MDR-i0016(25/36) directly. (internally or externally)



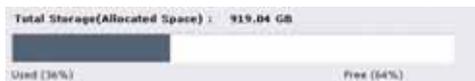
- Select a hard disk in the list



- Configure space size to utilize in archiving data. Then click 'Apply' button.



- Click 'OK' button to close the 'Add/Edit Storage' window.
- Once applied the settings, the configured drive(s) are displayed in the list.
- The assigned disk size is displayed to the bottom. If additional drive is added as storage space, it displays the total size of the archiving space in the pane.



- Configure option of 'Overwrite' feature that deletes data automatically from the oldest to put new data in the storage. As default those feature is set to use.

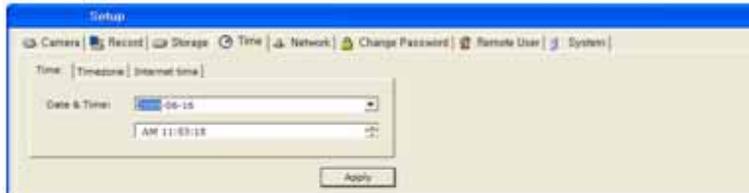
3.4. Setting Date & Time

This is to set up data & time of the device.

3.4.1 Setting data & time

User may set data and time of the device.

1. Go to 'Time' tab.

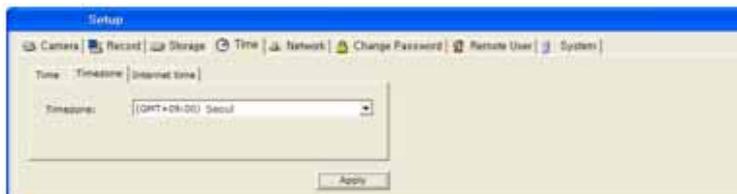


2. Set up data & time.
3. Click 'Apply' button.

3.4.2 Setting time zone

User may set time zone of the area where MDR-i0016(25/36) is installed.

1. Go to 'Time' tab and then 'Time Zone' tab in turn.

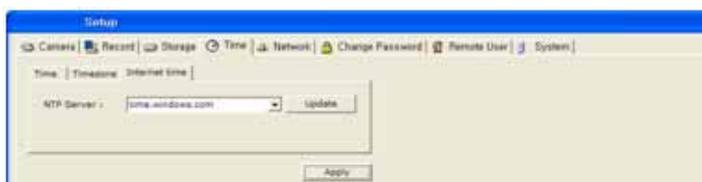


2. Select a proper time zone of the installed area.
3. Click 'Apply' button.

3.4.3 Synchronizing device time to Internet time server

User may synchronize MDR-i0016(25/36) time and data information to a public time server on Internet.

1. Go to 'Time' tab and then 'Internet time' tab in turn.



2. Select an NTP server and click 'Update' button.

3.5. Configuring Network Address



It is necessary for remote user to register Microdigital MDR-i0016(25/36) on Microdigital CMS program with its IP address and 'Control Port' number.

Microdigital CMS connects to MDR-i0016(25/36) with the registered IP address and control port. Once connected, Microdigital CMS finds out the remaining ports and makes connection through those ports to service live or recorded data.



The assigned port numbers to Microdigital MDR-i0016(25/36) should not be occupied by other devices in the same network. Otherwise, a remote user cannot access Microdigital MDR-i0016(25/36) over the network.

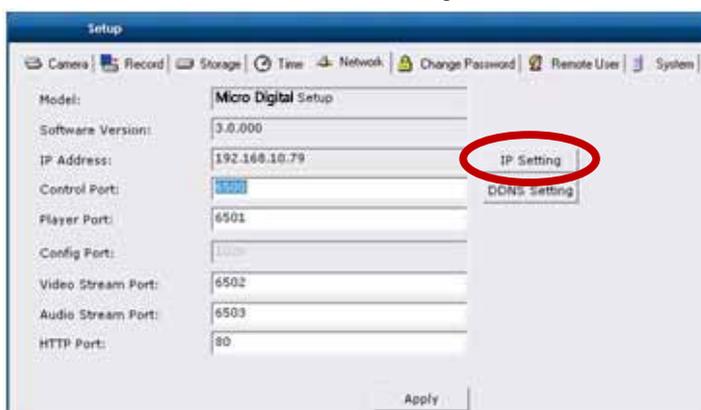
3.5.1 Changing IP address



To avoid IP conflict on LAN, Microdigital MDR-i0016(25/36) is set to get IP address automatically from a local router with DHCP feature as default settings. Therefore it is necessary to assign a proper IP address of the network when MDR-i0016(25/36) is installed permanently.

User may change IP address of the device to run on the installed network.

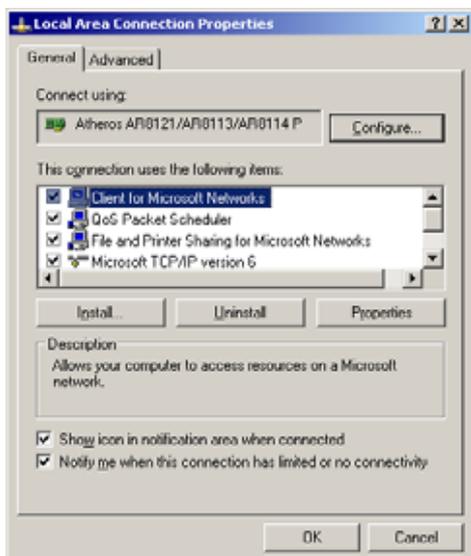
1. Go to 'Network' tab and click 'IP Setting' button.



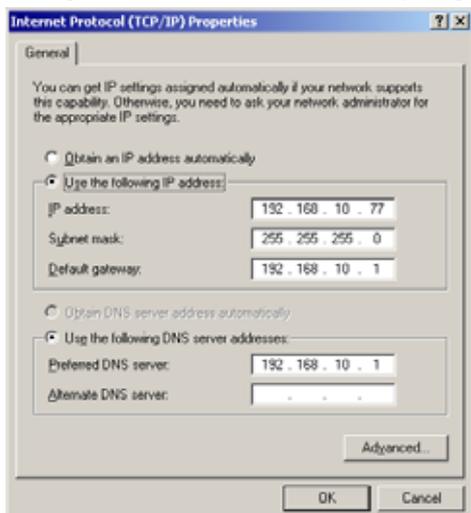
2. Place a mouse point on 'Local Area Connection' and click right button of the mouse. Select 'Properties' option in the pop-up menu.



3. Select 'Microsoft TCT/IP version 4' and click 'Properties' button.



4. Configure network address properly to get connected on the installed network and click 'OK' button



5. Click 'Apply' button in the 'Network' tab.

3.5.2 DDNS Settings



When a dynamic IP is used for MDR-i0016(25/36), it is necessary to register the unit to DDNS server. Otherwise, any remote user cannot find the unit's IP address to access over Internet.

User may register MDR-i0016(25/36) to DDNS server for remote user. The registration requires two different steps as below instructions. For detailed information, please refer to appendix.

1. Subscribe DDNS service and create an URL
2. Configure MDR-i0016(25/36) to update its IP address status on the DDNS service site.

3.5.3 Changing port number

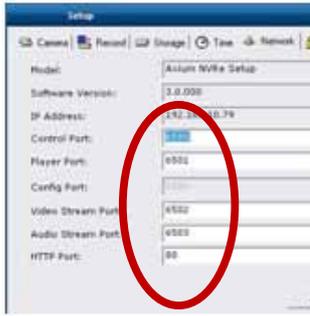


Microdigital MDR-i0016(25/36) runs a streaming server that receives live video from the source device (IP camera) and provides the stream to CMS client over network. With aid of 'Streaming' feature, MDR-i0016(25/36) may forward live video feed from IP cameras of private IP address to CMS client on Internet with using a single official IP address.

User may configure CMS whether to utilize 'Streaming' feature on MDR-i0016(25/36) or not. If configured not to use 'Streaming' feature, MDR-i0016(25/36) routes live video request from CMS to IP camera, so that CMS receives live feed from IP camera directly.

User may change port numbers that MDR-i0016(25/36) occupies to service video and audio data.

1. Go to 'Network' tab.
2. Enter a desired number for each port.



- Control Port: Initial connection and control
- Player Port: Recorded data service
- Config Port: Configuration
- Video Stream Port: Video streaming service
- Audio Stream Port: Audio streaming service
- HTTP Port: CGI service

3. Click 'Apply' button.

3.6. Changing Password

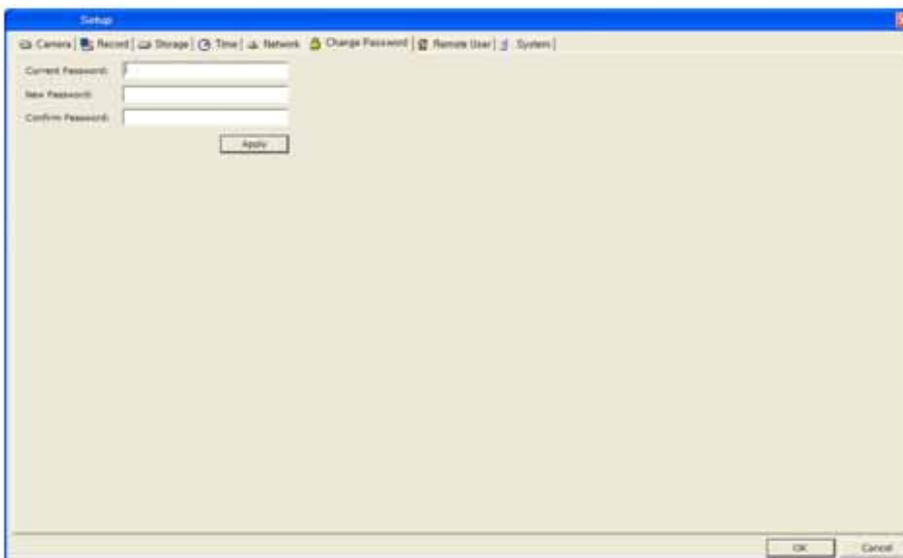


Make sure to make a note of the local Administrator's password and keep it securely. If you lose or forget the password, there is no way to recover the password on site. In the case, the MDR-i0016(25/36)units must be sent back to Microdigital to initialize the password.

This is to change local **'Administrator'** password. The local administrator can set up entire system on the device, thus it is very important change the password into a unique one and keep it securely. The default password is **'1234'**.

User may change the password as below.

1. Go to 'Change Password' tab.



2. Enter current password and new password in turn.
3. Click 'Apply' button.

3.7. Configuring Remote User Account



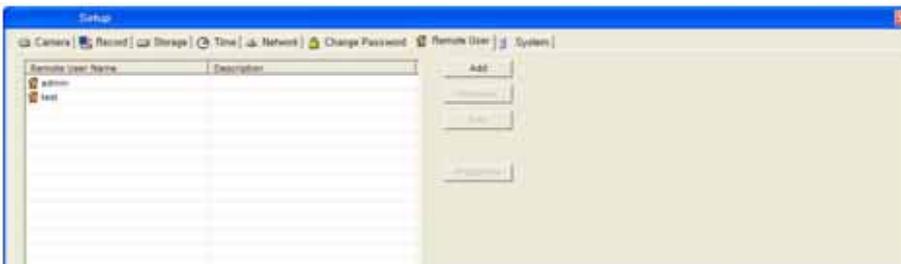
By putting check mark to 'Allow IP Address' option and entering IP address, user can access Microdigital MDR-i0016(25/36) only from the designated IP address.

To access Microdigital MDR-i0016(25/36) from a remote site, local user ID is not valid. Only remote user ID is accessible to MDR-i0016(25/36) over network.

This is to add, edit or delete a user that accesses Microdigital MDR-i0016(25/36) remotely. Microdigital MDR-i0016(25/36) has a registered user as default. The user ID and password are **'admin'** and **'1234'**.

User may add a new user as below.

1. Go to 'Remote User' tab.



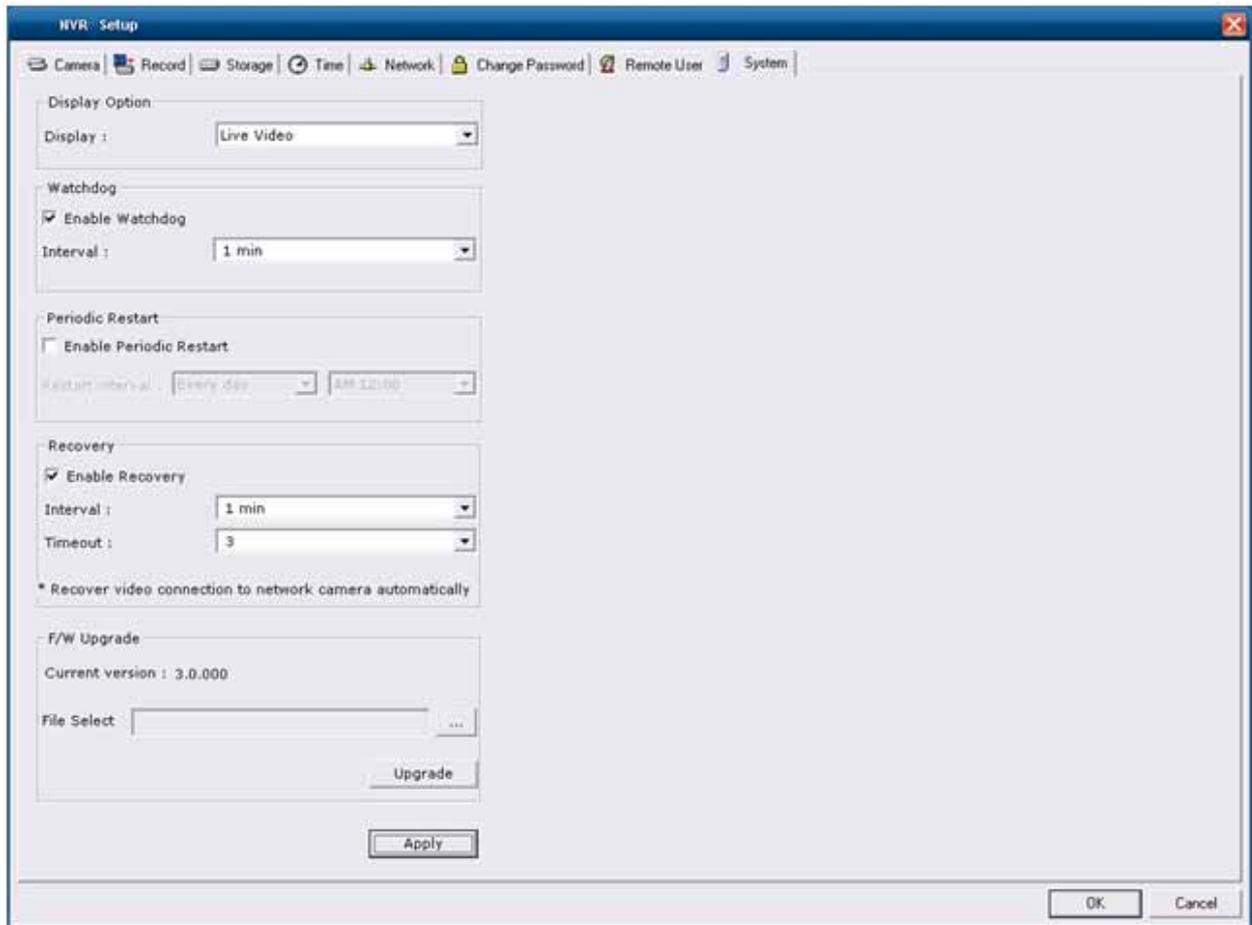
2. Click 'Add' button to the right.
3. Enter values. Items in bold is mandatory information.



4. Click 'OK' button. The newly added user ID appears on the list.

3.8. Configuring General System Settings

This is to configure management options that may increase system availability.



3.8.1 Display Option

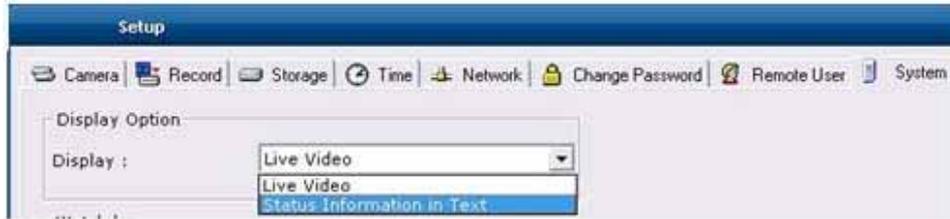
User may configure main screen whether it displays live video or status information in text. 'Status Information in Text' option increases MDR-i0016(25/36) performance for remote users with saving CPU from displaying large-sized pictures.

'Status Information in Text' option recommended especially when MDR-i0016(25/36) is connected with Mega-pixel cameras throughout the entire channels or when the console operation is not required.

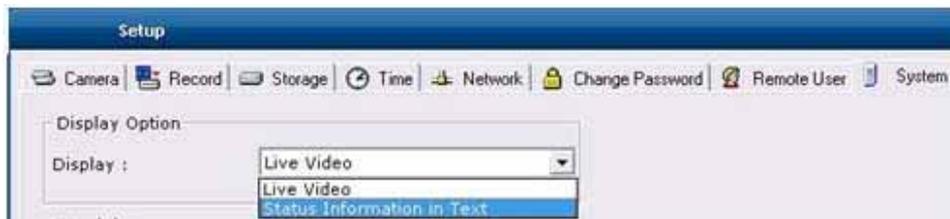
User may configure this option as below order.

1. Go to 'System' tab.
2. Select a desired display option.
3. Click 'Apply' button to the bottom.

<Main screen display under 'Live Video' option>



<Main screen display under 'Status Information in Text' option>



3.8.2 Watchdog

User may configure whether the system runs 'Watchdog' feature or not. With enabling this feature, Microdigital MDR-i0016(25/36) checks system status periodically. If the system does not respond to watchdog routine, this feature reboots the system.

1. Go to 'System' tab.
2. Put check mark on 'Enable Watchdog' menu and define the interval.



3. Click 'Apply' button.

3.8.2 Periodic Restart

User may configure whether the system runs 'Periodic Restart' feature or not. With enabling this feature, Microdigital MDR-i0016(25/36) restarts they system automatically in preset interval.

1. Go to 'System' tab.
2. Put check mark on 'Enable Periodic Restart' menu and define the interval.

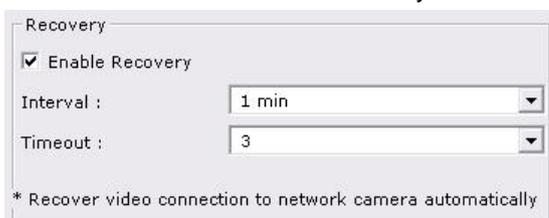


3. Click 'Apply' button.

3.8.3 Recovery

User may configure whether the system recovers connection to network camera automatically or not. With enabling this feature, Microdigital MDR-i0016(25/36) recovers connection to a source device and restores video on the channel automatically.

1. Go to 'System' tab.
2. Put check mark on 'Enable Recovery' menu and define the interval.



3. Click 'Apply' button.

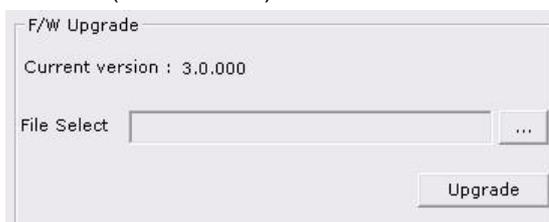
3.8.4 Upgrading Firmware



- *Microdigital MDR-i0016(25/36) stops recording during the upgrade process and it resumes recording when the unit restarts after completion of upgrade process.*
- *If upgrade process is not completed due to power failure or unintended interruption by user, Microdigital MDR-i0016(25/36) restores the current system automatically when it is rebooted.*
- *When firmware is upgraded, the existing settings are applied on the new system automatically as is set on the current system.*

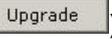
User may upgrade the NVR firmware through USB interfaced memory.

1. Put a new firmware of Microdigital MDR-i0016(25/36) on a USB thumb drive and attach the drive to Microdigital MDR-i0016(25/36).
2. Open 'Setup' menu of Microdigital MDR-i0016(25/36) and go to 'System' tab.
3. Click '...' ( /browse) button.



4. Select 'MDR-i0016(25/36)Upgrade.exe' file in the folder and click 'Open' button.

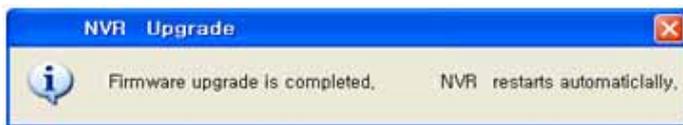


5. Click 'Upgrade' () button.

6. While the firmware is being upgraded, please do not interrupt the system.



7. When the upgrade process is completed, Microdigital MDR-i0016(25/36) restarts the system automatically.



Chapter 4 Client Software

Client software is Microdigital CMS that accesses Microdigital MDR-i0016(25/36)(network video recording server) over the network. Microdigital CMS program is provided as default client software in Microdigital MDR-i0016(25/36)package. This chapter explains how to register Microdigital MDR-i0016(25/36)to Microdigital CMS, access the device and play video remotely.

4.1. Registering Microdigital MDR-i0016(25/36)to Microdigital CMS



Microdigital CMS program accesses Microdigital MDR-i0016(25/36)through 'Control Port' and gets the other port numbers automatically.

Microdigital CMS program registers Microdigital MDR-i0016(25/36)through '[Wizard] – [Device]' or '[Device Manager]' menu. In this chapter, registration through 'Device Manager' menu is explained. (For information, please refer to 'Microdigital CMS manual'.)

User may register Microdigital MDR-i0016(25/36)to Microdigital CMS program as below.

1. Select [Device Manager] menu. "Device Manager' window appears.
2. Click 'Add' button.
3. Enter values and click 'Ok'. Items in bold must have values. For model selection, choose 'Microdigital MDR-i0016(25/36)16/25/36'. Microdigital MDR-i0016(25/36)uses **6500** as default port and '**admin / 1234**' as default 'ID / PW'.

The screenshot shows a dialog box titled "Add Device" with the following fields and values:

- Name: (empty)
- Description: (empty)
- Model: SDVR-4500
- Firmware: 0.9.23
- Cameras: 4
- Serial Number: (empty)
- Connection Type: Static IP Address
- IP Address: 0 . 0 . 0 . 0
- Port: (empty)
- User Name: Administrator
- Password: (empty)
- Confirm Password: (empty)
- Additional: (empty)

Buttons: OK, Cancel

- IP Address: Enter the IP address of Microdigital MDR-i0016(25/36)
- Port: Enter the '**Control Port**' (Default: **6500**) of Microdigital MDR-i0016(25/36).
- User Name: Enter remote user ID (Default: **admin**) to Microdigital MDR-i0016(25/36).
- Password: Enter remote user password (Default: **1234**) of the remote user.

4. Click 'OK' button, then the registered device appears on the list.

4.2. Monitoring Live Video

After registering Microdigital MDR-i0016(25/36) to Microdigital CMS, user may monitor live video by clicking icon of device (Microdigital MDR-i0016(25/36)) or its channel on the sites tree. (For information on monitoring through 'Screen Layout', please refer to 'Microdigital CMS manual'.)

4.2.1. Connecting All Channels of Microdigital MDR-i0016(25/36) at Once



When Microdigital MDR-i0016(25/36) is connected with its entire channels at once, Microdigital CMS splits the screen into proper numbers that match with the number of channels of Microdigital MDR-i0016(25/36).

User may play video from all channels of the registered Microdigital MDR-i0016(25/36) at once.

1. Locate Microdigital MDR-i0016(25/36) icon on the sites tree to the right.
2. Click the icon or name of the Microdigital MDR-i0016(25/36) on the sites tree. Once clicked, Microdigital CMS displays green light (●) in front of the Microdigital MDR-i0016(25/36) icon, and connects Microdigital MDR-i0016(25/36) to display live video on the screen.

To disconnect from Microdigital MDR-i0016(25/36), click again on the icon or name.

4.2.2. Connecting Each Channel at a Time

User may play video from a channel of the Microdigital MDR-i0016(25/36).

1. Locate a desired channel of Microdigital MDR-i0016(25/36) icon on the site tree.
2. Click icon or name of channel on the site tree. Once selected, Maximum displays green light (●) in front of the channel icon, and connects Microdigital MDR-i0016(25/36) to play live video of the channel.
3. To disconnect the channel, click again on the icon or name of the channel.

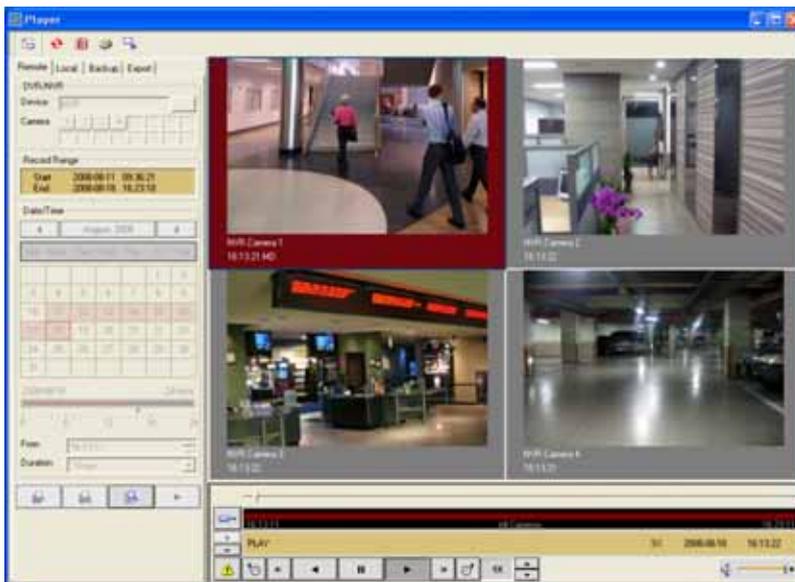
4.3. Playback

Recorded data on Microdigital MDR-i0016(25/36) is played with 'Player' program of Microdigital CMS.

User may search desired data from Microdigital MDR-i0016(25/36) easily with date/time, timeline, and thumbnail menu in Microdigital CMS. Microdigital CMS may make data backup from Microdigital MDR-i0016(25/36) to a PC over the network and converts the backup proprietary video clip to AVI format. (For detailed information on Player software, please refer to 'Microdigital CMS manual'.)

User may play recorded video as below.

1. Select [Player] menu or click Player icon (▶) in the tool bar. Player software appears.
2. Define search parameters in the menus to the left. (MDR-i0016(25/36), Date/Time)
3. Click play button (▶), then recorded video plays on the screen to the right.



Appendix1. Utilizing DDNS Service



- *When a dynamic IP is used for MDR-i0016(25/36), it is necessary to register the unit to DDNS server. Otherwise, any remote user cannot find the unit's IP address to access over Internet.*
 - *There are a few DDNS service companies that provides free of charge registration of IP address. MDR-i0016(25/36)uses 'DynDNS.com' for the DDNS service.*
 - *To register MDR-i0016(25/36)'s IP address, it is necessary to get an URL (Host). 'DynDNS.com' site provides some domain names free of charge.*
 - *Therefore it is necessary to create an account on 'DynDNS.com' and register a Dynamic DNS Host to the site in advance.*
-

This is to attach additional hard disk drive(s) to Microdigital MDR-i0016(25/36). Microdigital MDR-i0016(25/36)support SATA hard disk only.

This is to attach additional hard disk drive(s) to Microdigital MDR-i0016(25/36). Microdigital MDR-i0016(25/36)support SATA hard disk only.

1. Attaching a Hard Disk

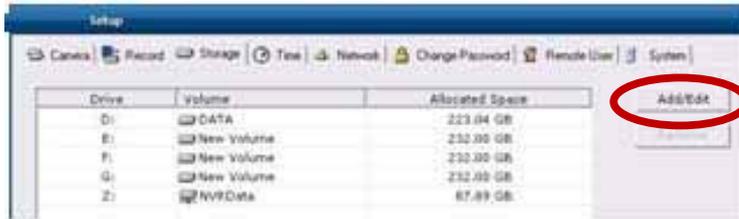
User may attach additional hard disk as below.

1. Turn off Microdigital MDR-i0016(25/36).
2. Unscrew and open the cover plate.
3. Take out a hard disk tray.
4. Confirm the hard disk is set as a master.
5. Fix a hard disk to a tray and put it back into the device and screw the tray.
6. Connect data and power cables to a hard disk.
7. Put the cover plate back.

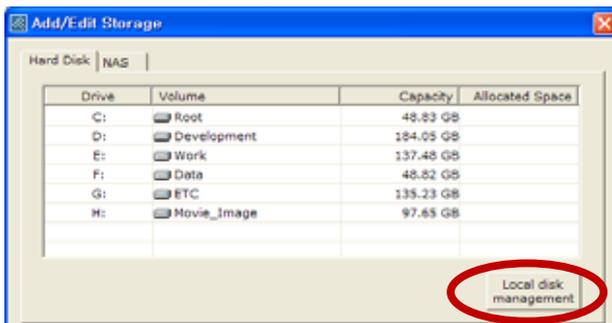
2. Formatting a Hard Disk

User should format a hard disk to utilize in the system as below.

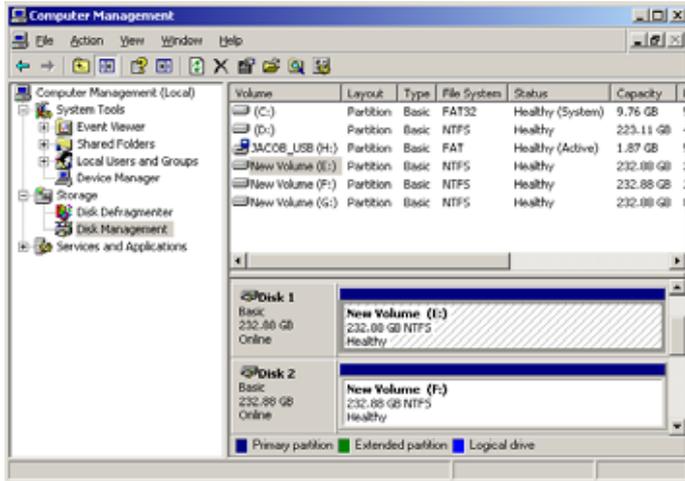
1. Turn on Microdigital MDR-i0016(25/36)
2. Execute 'Setup' menu.
3. Go to [Storage] tab.
4. Click 'Add/Edit' button.



5. Go to [Hard Disk] tab.
6. Click 'Local Disk Management' button.



7. Click 'Disk Management' menu in the tree to the left.
8. Select a newly attached disk and click right button on the mouse.
9. Select 'Format' menu.



- When the format process is completed, assign this disk to storage space with referring to '3.3.1 Configuring DAS'.

Appendix3. Adding Directly Attached Storage Device Externally



- It is not recommended to add interface card into MDR-i0016(25/36), which avoids warranty. To add a new interface card, please contact a dealer from which you bought the MDR-i0016(25/36).
- Make it is sure to turn off power and disconnect the power cable from Microdigital MDR-i0016(25/36) before open the cover plate.
- It is necessary to format a newly attached disk before using. Otherwise the disk cannot be added as storage space into Microdigital MDR-i0016(25/36).
- When you format the disk, make it sure to select the newly attached disk to format; otherwise existing data shall lose the archived data permanently when an existing disk is formatted.
- Microdigital MDR-i0016(25/36) support various interface cards including eSATA, SAS, and SCSI in 'Low Profile' form factor.

This is to attach external storage device to Microdigital MDR-i0016(25/36). An interface card is to be attached in to MDR-i0016(25/36) as below. Go to http://www.microdigital.co.kr/supported_devices for an up to date list of supported cards.

1. Turn off Microdigital MDR-i0016(25/36).
2. Unscrew and open the cover plate.
3. Assemble an interface card into a PCI slot on the main board.
4. Fix a card on the chassis with a screw.
5. Put the cover plate back.
6. Connect a proper cable between MDR-i0016(25/36)and external storage device.
7. Turn on the external storage device.
8. Configure the storage device if not configured. (Refer to the device manual for the configuration)
9. Turn on MDR-i0016(25/36)when the external storage device starts.
10. Assign the device as 'storage space' (Please refer to '3.3.1 Configuring DAS')

Appendix4. Adding NAS system to MDR-i0016(25/36)



NAS (Network Attached Storage) is a storage system that is accessed through Ethernet. The entire storage capacity can be expanded by adding NAS to Microdigital MDR-i0016(25/36) device.

It is recommended to use a dedicated NIC to connect NAS system to secure enough bandwidth to meet the defined recording speed. To add an additional NIC to MDR-i0016(25/36), please contact your dealer from which you bought MDR-i0016(25/36).

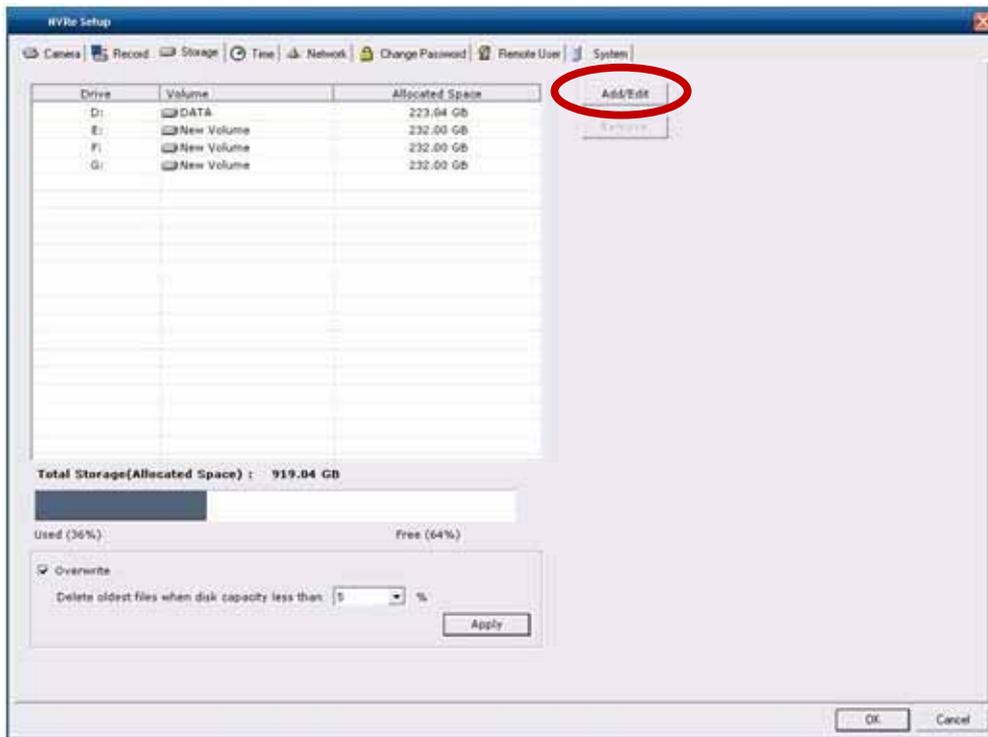
Go to http://www.microdigital.co.kr/supported_devices for an up to date list of supported NIC models.



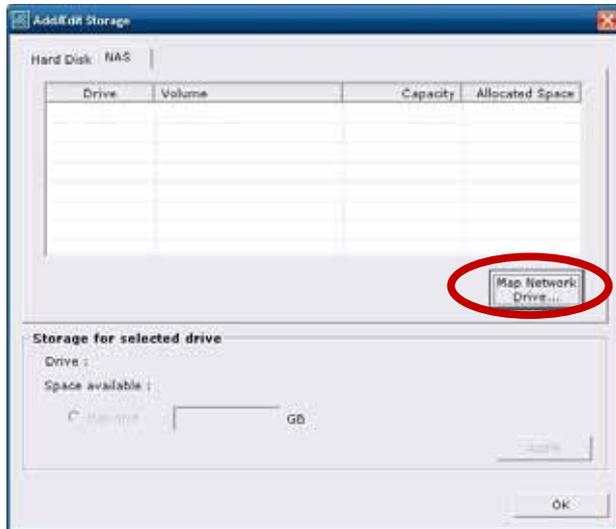
Without clicking 'Apply' button, settings are not applied to the program.

User may assign NAS as the storage space of MDR-i0016(25/36) as below order.

1. Go to 'Storage' tab and click 'Add/Edit' button.



2. Go to 'NAS' tab in 'Add/Edit Storage' window and click 'Map Network Drive' button.



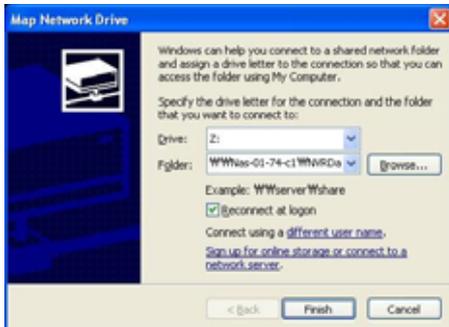
3. Select a drive folder name and click 'Browse' button in 'Map Network Drive' window.



4. Select available storage folder in NAS system and click 'OK' button.



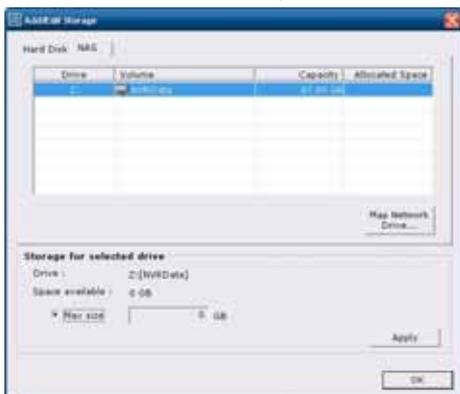
- Click 'Finish' button.



- Once the NAS storage space is added successfully, the space appears as a drive in 'NAS' pane.

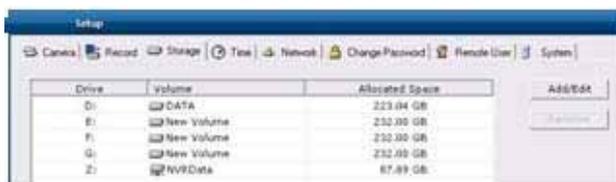


- Select the added NAS system in the list, configure maximum size to use, and click 'Apply' button.

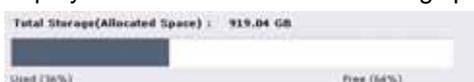


- Click 'OK' button to close 'Add/Edit Storage' window.

- The configured storage is displayed in the list.



- The assigned disk size is displayed to the bottom. If additional drive is added as storage space, it displays the total size of the archiving space in the pane.



Appendix5. Adding SAN system to MDR-i0016(25/36)



SAN (Storage Area Network) is a storage system that is accessed through Ethernet. Different to NAS, SAN system is operated like locally attached storage like DAS.

It is recommended to use a dedicated NIC to connect SAN system to secure enough bandwidth to meet the defined recording speed. To add an additional NIC to MDR-i0016(25/36), please contact your dealer from which you bought MDR-i0016(25/36).

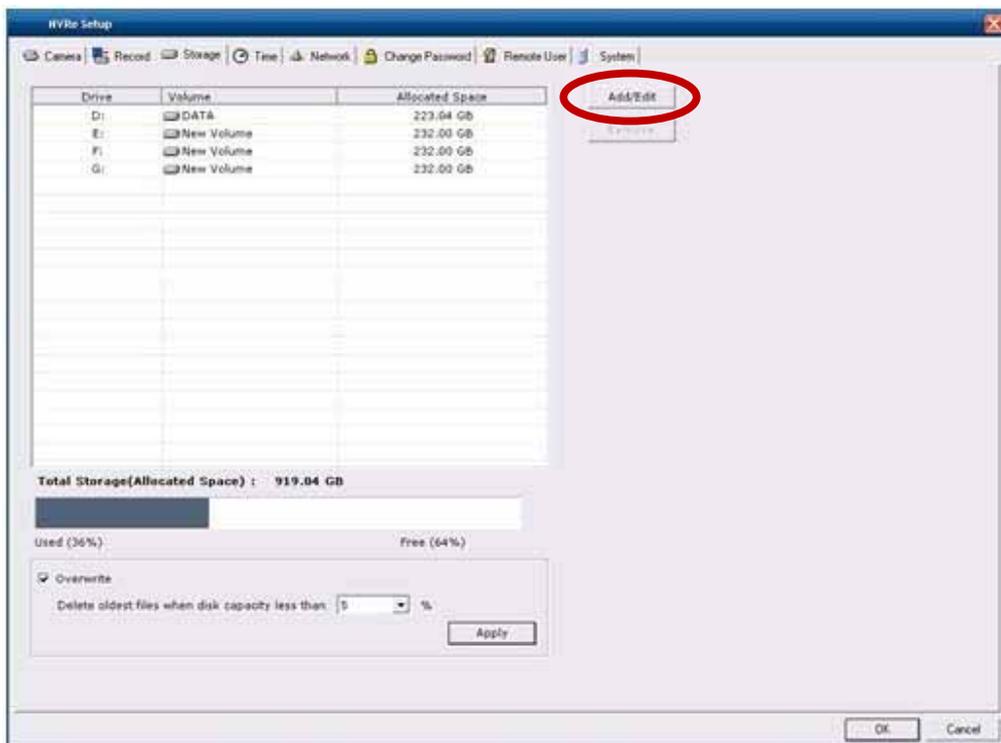
Go to http://www.microdigital.co.kr/supported_devices for an up to date list of supported NIC models.



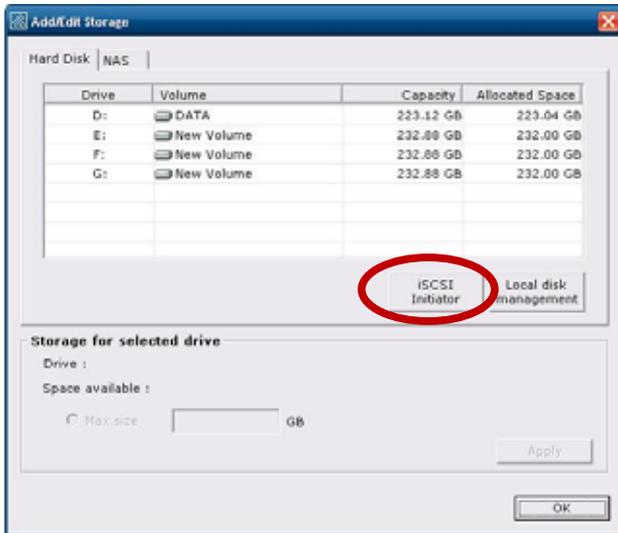
Without clicking 'Apply' button, settings are not applied to the program.

User may assign SAN as the storage space of MDR-i0016(25/36) as below order.

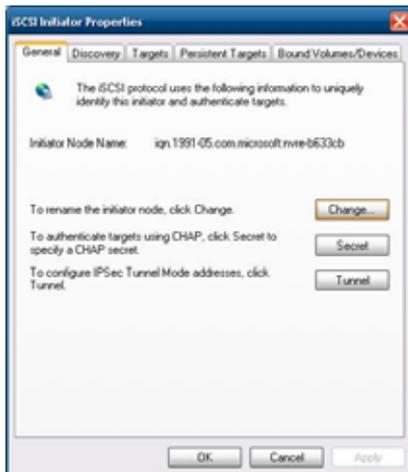
1. Go to 'Storage' tab and click 'Add/Edit' button.



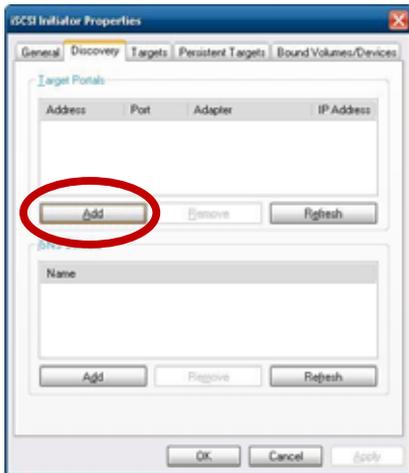
2. Go to 'Hard Disk' tab in 'Add/Edit Storage' window and click 'iSCSI Initiator' button.



3. 'iSCSI Initiator Properties' window appears.



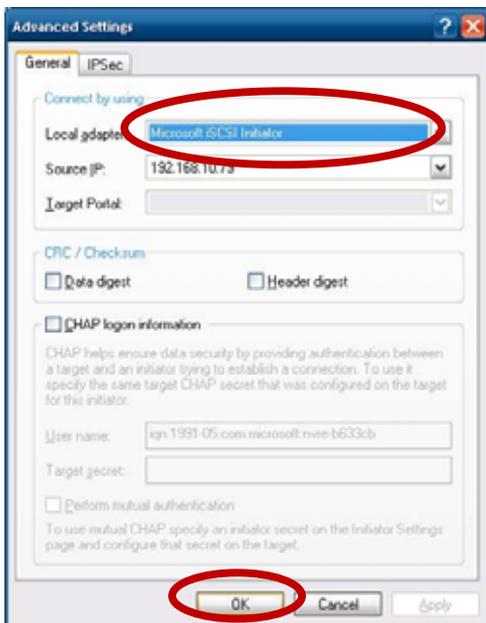
4. Go to 'Discovery' tab and click 'Add' button. Then 'Add Target Portal' window appears.



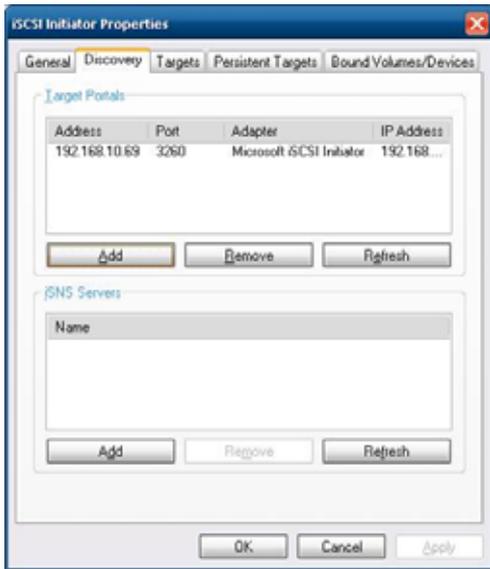
5. Enter IP address of the target SAN system and click 'Advanced' button in 'Add Target Portal' window.



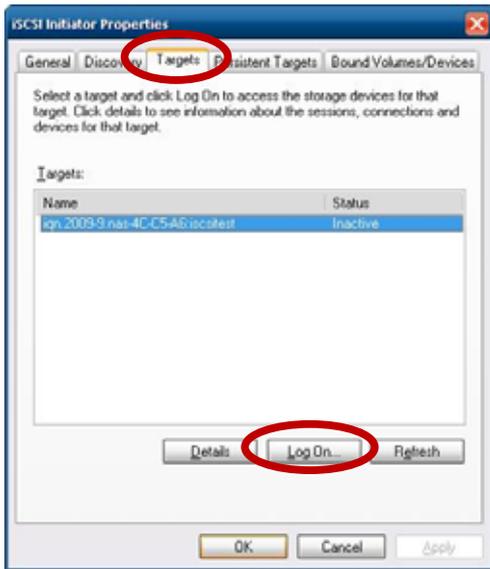
6. Select 'Microsoft iSCSI Initiator' in the 'Local adapter' menu and click 'OK' button.



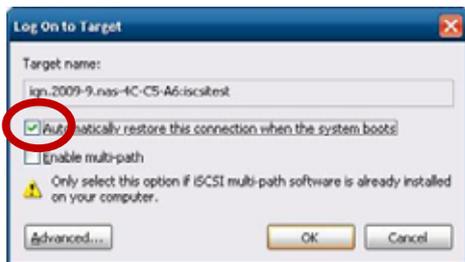
7. Newly added SAN system is displayed in the list.



- Go to 'Targets' tab and click 'Log On' button. A new SAN system appears in the list with its status as 'Inactive'.

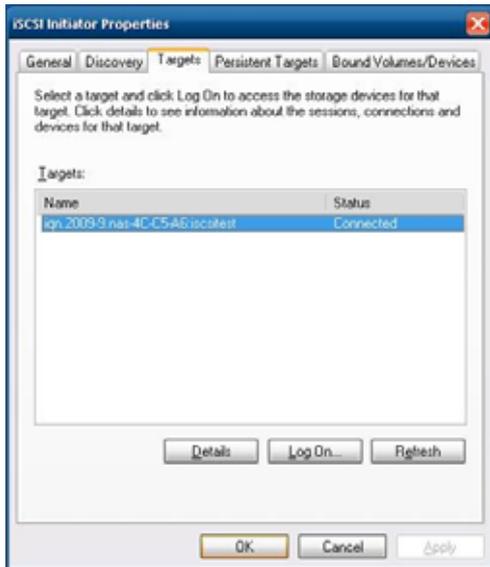


- Select 'Automatically restore this connection when the system boots' option and click 'OK' button.



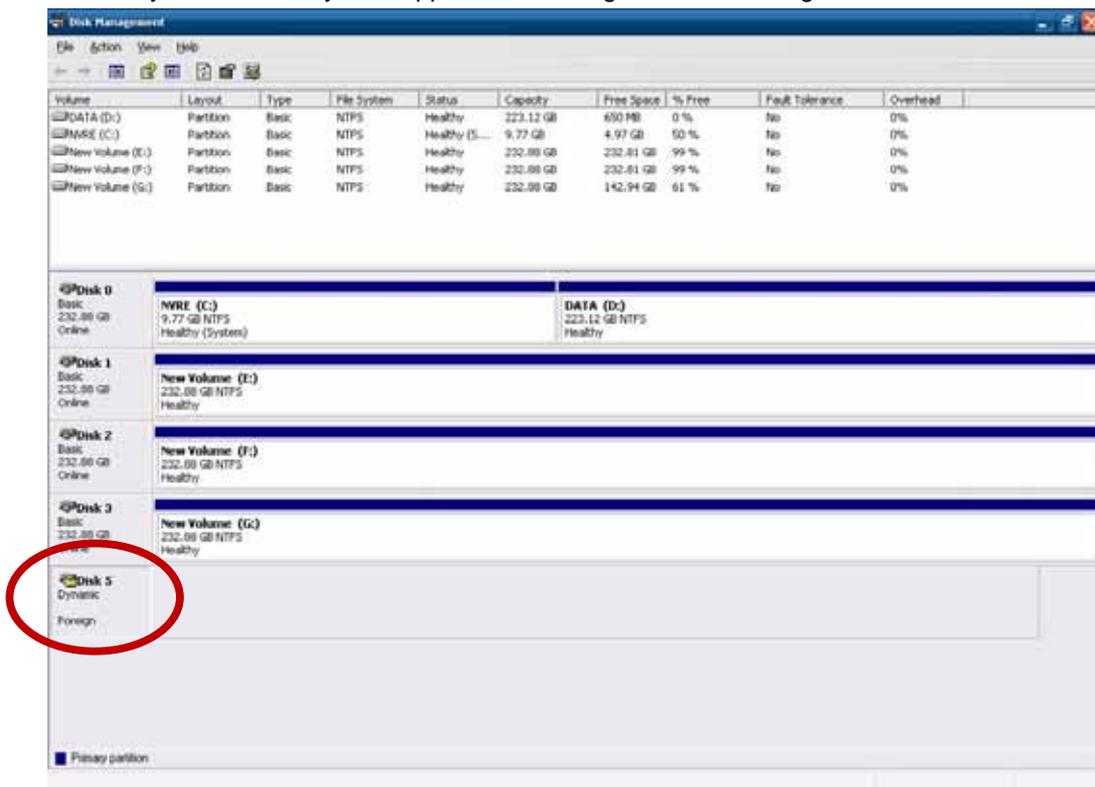
- The new SAN system changes its status to 'Connected'.



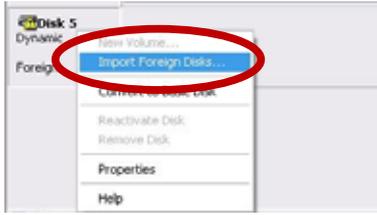


11. Click 'OK' button.

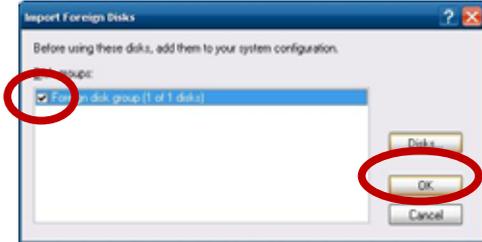
12. The newly added SAN system appears as 'Foreign' in 'Disk Management' window.



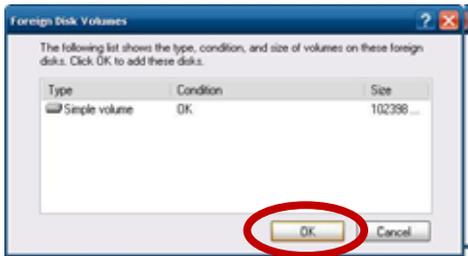
13. Select 'Import Foreign Disks' option.



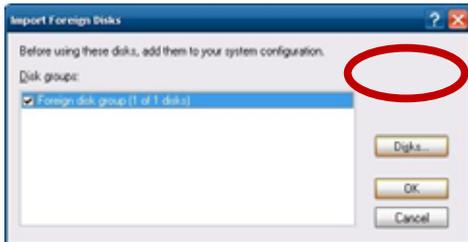
14. Put a 'Check' mark on the newly added SAN system and click 'OK' button.



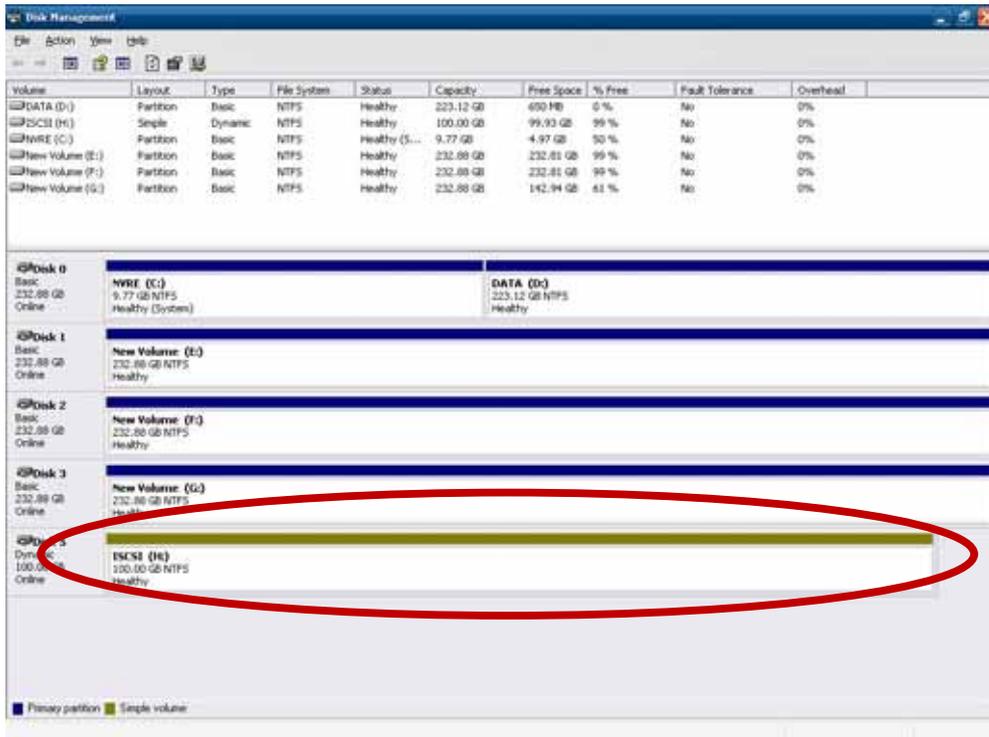
15. Click 'OK' button in 'Foreign Disk Volumes' window after confirm the information.



16. Click 'OK' button in 'Import Foreign Disks' window.

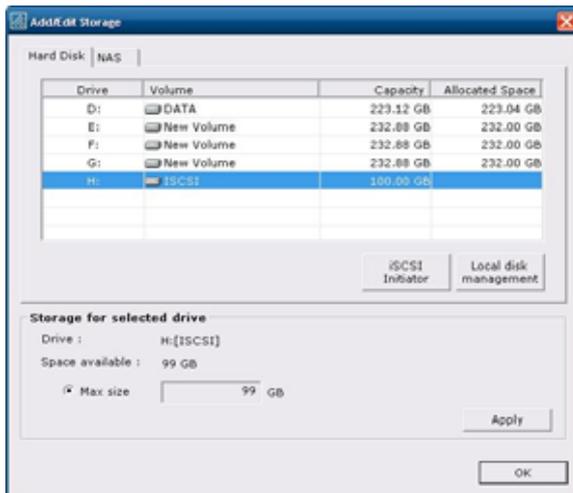


17. The newly added SAN formats and displays its information like a local disk.



18. Close 'Disk Management' window and go back to 'Add/Edit Storage' window.

19. 'Add/Edit Storage' window displays the newly added SAN system as storage space.



20. Click 'Ok' button to close 'Add/Edit Storage' window.

21. The assigned storage size is displayed to the bottom. If additional drive is added as storage space, it displays the total size of the archiving space in the pane.



Appendix6. Troubleshooting

If there are problems in operation, please refer to the items below. If the problem persists, please contact the agent you purchased this product from.

Problem	Solution
Device does not turn on	<ul style="list-style-type: none"> ■ Check if power cable is connected to MDR-i0016(25/36). ■ Check if voltage type is set properly. ■ Check if USB dongle key is attached to the PC.
Device does not display on the attached monitor	<ul style="list-style-type: none"> ■ Confirm if a monitor is connected to VGA port on MDR-i0016(25/36) properly. ■ Check if the monitor supports 1024x768 or higher resolution.
Device displays “Invalid system disk, Replace the disk,..” on a monitor	<ul style="list-style-type: none"> ■ Operating system (Windows) is damaged. Please contact the agent you purchased this product to replace the system disk drive.
Device boots up but does not proceed	<ul style="list-style-type: none"> ■ Recycle the power. ■ If the same problem happens again, it could be from bad system disk drive. In the case, please contact the agent you purchased this product to replace the system disk drive.
Device does not record video	<ul style="list-style-type: none"> ■ Check if Microdigital MDR-i0016(25/36) has at least a disk that is assigned as storage space. ([Setup] – [Storage] menu) ■ Check if Microdigital MDR-i0016(25/36) is configured to overwrite data when storage is full. Otherwise, Microdigital MDR-i0016(25/36) stops recording when its storage space is full.
Device does not practice ‘Alarm Recording’ as scheduled	<ul style="list-style-type: none"> ■ Check if ‘motion detection’ or ‘sensor input’ feature is ‘On’ on the network camera or video server. ■ Check if the desired ‘Sensor Input’ or ‘Relay Output’ is assigned to the corresponding video channel of Microdigital MDR-i0016(25/36). ([Setup] – [Camera] – [Add/Edit] menu)
Device does not record audio	<ul style="list-style-type: none"> ■ Check if a network camera or video server is configured to use audio through its web site. ■ Check if you can hear audio when you log in to a network camera or video server web page.
Device displays ‘Recording Fail’ icon on a screen	<ul style="list-style-type: none"> ■ Check the camera registration information on Microdigital MDR-i0016(25/36), especially for IP address and port number of the registered camera. ([Setup] – [Camera] menu) ■ Check if you can access admin (configuration) page of the source device with the ID and password that you used in registered the camera to Microdigital MDR-i0016(25/36). ■ Check if a network cable is connected to Microdigital MDR-i0016(25/36) and a source device properly. ■ Check if a router, switch or hub is working properly. ■ Practice ‘Ping command’ on user’s PC to see if the PC can reach

Problem	Solution
	Microdigital MDR-i0016(25/36)and a source device.