FCC Compliance Statement
Model Name: MX-SDI Series (MX4-SDI)

This device complies with Part 15 of the FCC Rules. Operation is Subject to the following two conduction: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operations.

- **WARNING**
  - Unauthorized reproduction of all or part of this manual is strictly prohibited.
  - The figures in this manual are for illustration purposes only (may differ from the actual product).
  - The specifications and design of the product are subject to change without prior notice for purposes of quality improvement.

- **CAUTIONS**
To get the best use out of the product, be sure to read the cautions before using the product. For safety, please take note of the following.

  - **Instructions before using the product**
    1. To prevent electric shock when installing, moving, or opening the DVR and peripheral devices, connect and disconnect the cables as instructed. All cables must be connected to grounded power outlets.
    2. If the product is installed near a power outlet, make sure it can be unplugged easily.
    3. Do not use the DVR in water or in wet places.
    4. Keep the plastic packing materials used for the DVR or other peripheral devices out of reach of children (may cause suffocation).

  - **Installation Environment of the DVR**
    1. Maintain the following conditions: operating temperature of 5°C ~ 40°C; operating humidity of 10% ~ 80%.
    2. Install the DVR in a safe place that is free from external vibration.
    3. Install the DVR in a well-ventilated place.
    4. To protect the hard disk from data loss and breakdown, install the DVR away from magnetic materials.
    5. When using a rack other than the standard one, use a separate table with sufficient spacing, i.e., 60cm from the floor, 50cm from the ceiling, and 20cm from the side and back walls and other objects.

  - **Safety Notes on the DVR**
    1. When installing additional boards and HDD, separate the power cable and turn OFF power supplied to the DVR completely.
    2. Keep the product away from heat-generating devices such as heaters.
    3. Do not use a damaged power cord.
    4. To prevent problems due to magnetic interference and electric surge, use only grounded cables and power outlets.
    5. If the power cord is connected, do not touch the power unit. If the power cord is connected, electric current is still flowing internally even after the switch is turned OFF.
    6. Do not place a heavy object on top of the product.
    7. Do not drop a conductive object in the ventilation holes.
    8. Allot sufficient space for system cabling.
    9. Use only the parts indicated in the manual. Do not disassemble, repair, or modify the product without permission.
    10. Incorrect system setup may cause malfunction.
    11. Shut down the system normally as instructed in the manual.

  - **Safety Notes on the Lithium Battery**
    1. Replace lithium batteries as instructed to avoid danger.
    2. Dispose used lithium batteries properly.

<table>
<thead>
<tr>
<th>[Warnings and Cautions are indicated as follows]</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Warning" alt="Possible injury or product damage" /></td>
</tr>
<tr>
<td><img src="Caution" alt="Risk of minor injury or product damage" /></td>
</tr>
<tr>
<td>Cautions for the usage of the product</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Information for the usage of the product</td>
</tr>
</tbody>
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### Chapter 1. Introduction

#### 1-1 MX-SDI series Major Features

<table>
<thead>
<tr>
<th><strong>MX4-SDI</strong></th>
<th><strong>System</strong></th>
<th>Reliable Standalone DVR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Channel type</strong></td>
<td>4 BNC - HD-SDI</td>
<td></td>
</tr>
<tr>
<td><strong>OS</strong></td>
<td>Embedded Linux - Built in Flash Memory</td>
<td></td>
</tr>
<tr>
<td><strong>Video Input</strong></td>
<td>4 BNC</td>
<td></td>
</tr>
<tr>
<td><strong>Video output</strong></td>
<td>1 VGA, 1 HDMI</td>
<td></td>
</tr>
<tr>
<td><strong>Audio Input</strong></td>
<td>Line Input : 4 RCA</td>
<td></td>
</tr>
<tr>
<td><strong>Audio Output</strong></td>
<td>Line Output : 1 RCA</td>
<td></td>
</tr>
<tr>
<td><strong>Compression Format</strong></td>
<td>[Video: Standard H.264] / [Audio: G.711]</td>
<td></td>
</tr>
<tr>
<td><strong>Recording Speed</strong></td>
<td>Max. 20fps@1080p, 45fps@720p</td>
<td></td>
</tr>
<tr>
<td><strong>Recording Resolution</strong></td>
<td>Max. 1080p</td>
<td></td>
</tr>
<tr>
<td><strong>Recording Mode</strong></td>
<td>Automatic, Continuous, Manual, Events(Sensor and Motion, Sound)/Schedule Recording</td>
<td></td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Internal Max. 2HDD, Max. 4TB, 1 DVD</td>
<td></td>
</tr>
<tr>
<td><strong>External</strong></td>
<td>1 eSATA</td>
<td></td>
</tr>
<tr>
<td><strong>Video Output Resolution</strong></td>
<td>HDMI : Full HD(1080p), HD(1080i), WSXGA, SXGA</td>
<td></td>
</tr>
<tr>
<td><strong>Sensor Input</strong></td>
<td>VGA : WSXGA (1680 x 1050), SXGA (1280 x 1024), 4 Sensors</td>
<td></td>
</tr>
<tr>
<td><strong>Relay/TTL Output</strong></td>
<td>[1ea NC/NO]</td>
<td></td>
</tr>
<tr>
<td><strong>Backup &amp; Copy Access</strong></td>
<td>DVD-RW, USB2.0, Network</td>
<td></td>
</tr>
<tr>
<td><strong>Network Access</strong></td>
<td>Various Network Interface (Ethernet 10/100/1000, ADSL, Cable modem)</td>
<td></td>
</tr>
<tr>
<td><strong>PTZ Access</strong></td>
<td>2ea of RS485</td>
<td></td>
</tr>
<tr>
<td><strong>System Operation &amp; Adjustment</strong></td>
<td>Front Button, Mouse, IR Remote Controller, Keyboard Controller, Network</td>
<td></td>
</tr>
<tr>
<td><strong>System Upgrade</strong></td>
<td>USB2.0 Memory Stick, Network</td>
<td></td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td>System Automation (Controlled by VMS)</td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td>Power [12V/5A] / Max. Power Consumption[60W] / Operating Temperature [5 ~ 40]</td>
<td></td>
</tr>
<tr>
<td><strong>Weight without HDD</strong></td>
<td>[4kg]</td>
<td></td>
</tr>
<tr>
<td><strong>Dimension</strong></td>
<td>[430 86 270mm]</td>
<td></td>
</tr>
</tbody>
</table>
1 - 2 About the Product
As a digital image monitoring equipment that can display images inputted from up to 4 cameras, MX-SDI Series digitally records high-quality images using various video recording modes and displays them as clean quality images.
For users’ convenience, front panel button, remote controller, and mouse are provided. Powerful network functions including remote monitoring and remote system setup modification are also supported.

1 - 3 Components
Please check the components after unpacking the product.
- Remote controller
- CD (CMS, CMS Manual, PDA Viewer Software)
- AAA 1.5V Batteries 2es
- Adapter (12VDC/ 5A)
- User Manual
- Rack Mounting Handle
Chapter 2. Installation and Connection

1-4 MX-SDI Series Name and Features of each part
MX-SDI series has buttons on the front panel and various interfaces on the rear panel. Also, it has rack handles of the left and right side for the convenience of the standard rack installation.

1-4-1 MX-SDI Series Front Panel

1-4-2 MX4-SDI Channel Rear Panel
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Function</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC-IN Power</td>
<td>100~240V, 50/60 Hz, 5A</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>CONFIGURE</td>
<td>Select the type of video input and output</td>
<td>Switch</td>
</tr>
<tr>
<td>3</td>
<td>RS485 DIO</td>
<td>PTZ Camera Control Connection, Sensor/ Relay Connection</td>
<td>Terminal Block</td>
</tr>
<tr>
<td>4</td>
<td>Ethernet</td>
<td>Network connection (ADSL, Cable Modem, Ethernet 10/100/1000 Base-T)</td>
<td>RJ-45</td>
</tr>
<tr>
<td>5</td>
<td>HDMI</td>
<td>HDMI Video output</td>
<td>HDMI type-C</td>
</tr>
<tr>
<td>6</td>
<td>eSATA</td>
<td>External SATA Storage</td>
<td>eSATA</td>
</tr>
<tr>
<td>7</td>
<td>VGA-OUT</td>
<td>VGA Monitor or LCD Monitor connection</td>
<td>D-SUB 15P</td>
</tr>
<tr>
<td>8</td>
<td>AUDIO OUT</td>
<td>Audio output connection (Line Only Output)</td>
<td>RCA</td>
</tr>
<tr>
<td>9</td>
<td>AUDIO IN</td>
<td>Audio input connection (Line Only Input)</td>
<td>RCA</td>
</tr>
<tr>
<td>10</td>
<td>CAMERA IN</td>
<td>HD-SDI Camera connection</td>
<td>BNC</td>
</tr>
</tbody>
</table>

1-5 Installation and Connection

[Figure 2-1. MX4-SDI Basic Connection and Device Connection]
1 - 5 - 1 Basic Connection
By referring to above [Figure 2-1] and [Figure 2-2], Connect the CCTV camera, HDMI monitor (or VGA monitor), and USB mouse to the DVR and set up CONFIG SWITCH.

<table>
<thead>
<tr>
<th>Connecting Device</th>
<th>DVR Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 CCTV camera</td>
<td>Rear Panel Video Input</td>
</tr>
<tr>
<td>2 VGA Monitor / LCD Monitor</td>
<td>Rear Panel VGA-OUT</td>
</tr>
<tr>
<td>3 Mouse</td>
<td>MX-SDI series: on front panel</td>
</tr>
<tr>
<td>4 CONFIG SWITCH</td>
<td>Rear Panel NTSC/PAL or VGA/TV Setup</td>
</tr>
</tbody>
</table>

Refer to the CONFIG SWITCH description as below.
1. The input video type must be either NTSC or PAL; these two types must not be used together.
2. Select the input video format (NTSC/PAL) using the CONFIG switch on the rear side of the product.
3. Select the input video resolution between 1080p and 720p. These two types must not be used together.

1 - 5 - 2 Connection of Other Devices
Connect the PTZ controller cable, audio in/output, network and sensors as below.

<table>
<thead>
<tr>
<th>Connecting Device</th>
<th>DVR Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mike / Speaker</td>
<td>Rear Panel Audio Input / Audio Output</td>
</tr>
<tr>
<td>2 LAN Cable</td>
<td>Rear Panel Ethernet</td>
</tr>
<tr>
<td>3 PTZ Camera</td>
<td>Rear Panel Terminal Block</td>
</tr>
<tr>
<td>4 Sensor / Relay / TTL OUTPUT</td>
<td>Rear Panel Terminal Block</td>
</tr>
<tr>
<td>5 Key controller</td>
<td>Rear Panel Terminal Block</td>
</tr>
</tbody>
</table>

1) Audio In/Output
Audio supports 4 inputs and 1 output.

2) Terminal Block
Terminal Block on the rear panel is for the connections of PTZ / Sensor / Relay.
4) PTZ Camera/Keyboard Controller
Connect PTZ camera to TRX+(No.4) and TRX-(No.5) and GND(No.10). You may refer to APPENDIX for supported PTZ camera list in this manual. Keyboard Controller has same connection way of PTZ camera.

Caution
PTZ Camera may not be working properly if GND is not connected.

5) Sensor/Relay
Connect Sensor/Relay to Terminal Block directly.

(1) Sensor Connection
① Connect Sensors to the Terminal Block S1 ~ S4.
② Each input terminal may be connected regardless of the channel number.

Sensor has the type of NC(Normal Close) and NO(Normal Open).
For Setup {Menu} → {Setup} → {Action} → {Event} → {Sensor Type}
NC(Normal Close) : Normally closed; opens when a signal is received.
NO(Normal Open) : Normally opened: closed when a signal is received.

(2) Relay Connection
① Outputs alarm signals to external devices such as siren by relaying them to these external devices.
② Connect Relay to R1 of Terminal Block (TB1).

Relay has the type of NC(Normal Close) and NO(Normal Open).
For Setup {Menu} → {Setup} → {Action} → {Alarm} → {Relay Type}
NC(Normal Close) : Normally closed; opens when a signal is received.
NO(Normal Open) : Normally opened: closed when a signal is received.

Chapter 3. Operation and Setup Tools
MX-SDI series are conveniently operated by Front Buttons, Remote Controller and mouse.

1 - 6 MX-SDI series Front Panel Button

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LABEL</td>
<td>Brand Name and Model Name</td>
</tr>
<tr>
<td>2</td>
<td>RECORD</td>
<td>Recording start/stop for all channels</td>
</tr>
<tr>
<td>3</td>
<td>USB</td>
<td>USB Mouse or Memory USB Stick</td>
</tr>
<tr>
<td>4</td>
<td>Number (0~9)</td>
<td>System Login or Number input</td>
</tr>
<tr>
<td>5</td>
<td>ODD</td>
<td>CD-RW, DVD-RW</td>
</tr>
</tbody>
</table>
| 6   | Reverse Play / Fast Reverse RELAY | Backward Playback/Rewind (in Playback mode)  
False Reverse | Relay Control (in Monitoring mode)                                      |
<p>| 7   | Reverse Frame by Frame or TAB STATUS | Backward Playback Frame by Frame (in Playback mode)                    | View System Configuration |
| 8   | PAUSE                       | Pause (in Playback mode)                                               |
|     | LOCK                        | Lock (in Monitoring mode)                                              |</p>
<table>
<thead>
<tr>
<th>9</th>
<th>Forward Frame by Frame or TAB LOG</th>
<th>Playback Frame by Frame (in Playback mode) System Log View (in Monitoring mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Forward Play / Fast Forward PLAY</td>
<td>Playback/Fast Forward (in Playback mode) Play back (in Monitoring mode)</td>
</tr>
<tr>
<td>11</td>
<td>COPY</td>
<td>Copy recording data</td>
</tr>
<tr>
<td>12</td>
<td>PTZ</td>
<td>Change Pan/Tilt/Zoom mode</td>
</tr>
<tr>
<td>13</td>
<td>SEARCH</td>
<td>Search recording data</td>
</tr>
<tr>
<td>14/15</td>
<td>UP/DOWN</td>
<td>Speed control</td>
</tr>
<tr>
<td>16</td>
<td>ESC</td>
<td>Exit the current menu or selects the upper menu.</td>
</tr>
<tr>
<td>17</td>
<td>MENU</td>
<td>Various Modes</td>
</tr>
<tr>
<td>18</td>
<td>RECORD LED</td>
<td>Green LED turned upon HDD operation</td>
</tr>
<tr>
<td>19</td>
<td>NETWORK LED</td>
<td>Green LED turned ON during remote access</td>
</tr>
<tr>
<td>20</td>
<td>ALARM LED</td>
<td>Red LED turned upon the occurrence of event or motion.</td>
</tr>
<tr>
<td>21</td>
<td>ERROR LED</td>
<td>Red LED turned on upon fan defect or recording interruption</td>
</tr>
<tr>
<td>22</td>
<td>POWER LED</td>
<td>Power LED On/Off</td>
</tr>
<tr>
<td>23</td>
<td>SELECT</td>
<td>Select the menu or sequence</td>
</tr>
<tr>
<td>24</td>
<td>MOVE &amp; DISPLAY</td>
<td>Select the menu or change the display mode</td>
</tr>
<tr>
<td>25</td>
<td>USB port</td>
<td>Connection port to the USB mouse and USB memory stick</td>
</tr>
<tr>
<td>26</td>
<td>POWER</td>
<td>Turn the system power ON or OFF</td>
</tr>
</tbody>
</table>
1 - 6 - 1 MX-SDI series Remote Controller

a) Basic Control Button

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>Turn the system power ON or OFF.</td>
</tr>
<tr>
<td>ESC</td>
<td>Exit the current menu or select the upper menu</td>
</tr>
<tr>
<td>MENU</td>
<td>To see the Menu</td>
</tr>
<tr>
<td>MODE</td>
<td>None usable</td>
</tr>
<tr>
<td>SELECT</td>
<td>Select the category or execute automatic screen conversion</td>
</tr>
<tr>
<td>MOVE</td>
<td>Move from one category to another or change the display mode</td>
</tr>
</tbody>
</table>

b) Search Button (Playback Mode)

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Play</td>
<td>Reverse Play</td>
</tr>
<tr>
<td>Play</td>
<td>Play</td>
</tr>
<tr>
<td>Reverse Frame by Frame</td>
<td>Reverse play frame by frame</td>
</tr>
<tr>
<td>Pause</td>
<td>Pause</td>
</tr>
<tr>
<td>Frame by Frame</td>
<td>Play frame by frame</td>
</tr>
</tbody>
</table>

1 - 6 - 2 Mouse

Operate the system by using Mouse. The mouse pointer will be shown when a Mouse is connected to USB port on the front panel.

<table>
<thead>
<tr>
<th>Mouse control supports the features as below.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Click on the right button</td>
</tr>
<tr>
<td>Click on the left button</td>
</tr>
<tr>
<td>Double click on the left button</td>
</tr>
<tr>
<td>Drag the left button</td>
</tr>
</tbody>
</table>

Chapter 4. DVR Operation Setup
1 - 7 MX-SDI Series Storage Installation

※The recommended HDD specification are shown below.

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
<th>Capacity</th>
<th>Buffer</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATA I, II</td>
<td>3.5” 1, 2 Flat</td>
<td>Max. 2TB</td>
<td>Over 8MB</td>
<td>Over 7200</td>
</tr>
</tbody>
</table>

1) Open the top case by using screw driver.

1) Normal termination of the system and fully unplugged power code are required before conducting HDD installation.
2) Touch a grounded metal substance or ground yourself before installing HDD in order to reduce static electricity. Static electricity may cause a malfunction of the product.
3) After installing HDD, Do not connect to power supply with the top case opened. The top case must be covered before usage.

2) Unscrew and separate the HDD bay from body.

3) Screw the HDDs to the HDD bay hardly.

4) As per the photo, Screw the HDD bay, HDD and DVD to the top bay.

5) Connect the power cable and data cable on HDDs and then reassemble the top case by reversing 1) to finalizing HDD installation.
1 - 8 Power ON.

① Check the adapter (12VDC/5A) and connect the power.
② Booting will be initialized after pressing the power button on the front panel.
③ Menu widow pops up by clicking the right button of the mouse or pressing [MENU] button in the front panel as shown below.

<table>
<thead>
<tr>
<th>Default ID and PW is as below</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ID: Admin, PW: 1111111 ]</td>
</tr>
</tbody>
</table>

[Figure 4-3. Menu Window]
1-9 Storage Setup

1. (Menu) → (Setup) → (Storage) → {Local Storage Management} → (New)

2. Select the HDD on New tap and then select Recording-Init.

3. {Recording-Init} means that it is initializing for recording.

4. After initializing done, HDD on New tab will be moved to Recording tab.

   {Recording-Init} procedure may take time.

   Refer to [6-4 Storage] for better understanding about storage.

---

1-10 Recording Setup

1. (Menu) → (Setup) → (Action) → (Recording)

2. Setup for [Recording Resolution]/[Recording Quality]/[Recording Speed]/[Audio].

1-11 Date/Time Setup

1. (Menu) → (Setup) → (Time)

2. Setup for time
Chapter 5. System Operation

1-1-2 Starting System and Exiting the System
① Press the power button with the power connected.
② All channels connected to cameras will be displayed after booting is completed.
③ The system will be terminated after authentication is completed.

1-1-3 Monitoring

1-1-3-1 Screen Division and Auto Sequence

<table>
<thead>
<tr>
<th>Full Screen(8 groups)</th>
<th>1 2 3 8</th>
</tr>
</thead>
</table>

Use the Full Screen mode button or double click the channel you want

Auto Sequence
① Rotating images (channels) with the certain time.
② Select the certain time (1 sec.~10 sec.) on (Menu) ➔ (Miscellaneous) ➔ (display setting) ➔ (main sequence)
③ Auto sequence is starting after pressing the select button or icons on the status bar as below.

1-1-3-2 Zoom (x16)
Zoom in & out for specific zone on live display.

① Move to the Zoom mode by selecting the icon on the status bar thru Mouse.
② Control the Zoom by using the up/down buttons or Mouse.
③ Menu for zoom will be disappeared after pressing ESC button or the left button of the Mouse.

1-1-4 System Login
1 - 1 - 4 - 1 User Account and Authorization

| admin | The local administrator has all authorities. (But, remote access is not available) Default password is [1111111] |
| User | Up to 15 users are allowed. Each user can access the functions depending on the given authorities. For Authorization Setup, Move to (Monitoring Menu) → (Setup) → (System) → (4. User). |

1 - 1 - 4 - 2 Login

For security purpose, user must log in first.
① Select (Menu) → (Login) on the live display.
② Password for English can be shown after selecting the space of password.

1 - 1 - 4 - 3 Logout

After logout, user can’t use menu.
① Select (Menu) → (Logout) on the live display.

1 - 1 - 5 System Information View and Display Setup Change

Audio/Recording Status/Channel Title/Connection Indicator/Time/HDD status are displayed as shown below.

![Figure 5-5. Recording Status Window]

※Recording Event / Recording mode display ※

<table>
<thead>
<tr>
<th>Recording Event</th>
<th>Recording Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion recording</td>
<td>Video recording</td>
</tr>
<tr>
<td>Sensor recording</td>
<td>Audio recording</td>
</tr>
<tr>
<td>Audio recording</td>
<td></td>
</tr>
</tbody>
</table>

※Live Display ※

- Video is not connected or Video is covert
- Audio is set activated
- Audio is set silent
- Camera has been disconnected
- The channel for PTZ setup

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19

Operating Instruction & User’s Guide

The channel for PTZ tour1 setup
The channel for PTZ tour2 setup

※Control Bar※

<table>
<thead>
<tr>
<th>1Ch display mode</th>
<th>4Ch display mode</th>
<th>Auto Sequence</th>
<th>Date / Time</th>
<th>HDD Status</th>
<th>Playback</th>
</tr>
</thead>
</table>

1-1.6 System Information

① Select {Menu} → {Miscellaneous} → {DVR info.}
② DVR info. Will be displayed as shown below.

[Figure 5-6. DVR Information]
1-17 Display Setup

1. Select {Menu} → {Miscellaneous} → {Display Setup}

![Display Setting Window]

- **Camera Title**, **Control Bar**, **Button Sound**
  Set the title of camera and control bar, button sound.

- **Border Line**
  Set the border line between channels.

- **Screen Saver**
  Set Monitor saver.

- **Main Sequence**
  Set the Duration for main, and on/off for event.
1-18 Audio, Relay

① Select {Menu} → {Miscellaneous} → {Misc Control}

(1) Audio
Setup for Audio channel and mute.

(2) Relay
Setup for Reply out or cancellation

1-19 Search

<table>
<thead>
<tr>
<th>Search Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calendar Search</td>
<td>Search the recording data by year/month/day/time.</td>
</tr>
<tr>
<td>Go To The Last</td>
<td>Playback the last recorded data by multi-channel mode.</td>
</tr>
<tr>
<td>Go To The First</td>
<td>Playback the first recorded data by multi-channel mode.</td>
</tr>
<tr>
<td>Go To the Last Played Time</td>
<td>Playback the last played time by multi-channel mode.</td>
</tr>
</tbody>
</table>
1-19-1 Calendar Search
Select {Menu} \( \rightarrow \) {Search} \( \rightarrow \) (Calendar Search) on the live display mode and then a searching window pops up as shown below.

![Search Window](image)

Green: Continues recording is in progress
Red: Motion recording is in progress
Blue: Sensor recording is in progress
Yellow: Audio recording is in progress

1-19-2 Time Index
① New folders (directories) are created every time when the time is changed on {Menu} \( \rightarrow \) {Setup} \( \rightarrow \) {Time} \( \rightarrow \) {Date/Time}.
② Many Time Indexes comes out when you select the menu for Time Index on the right side of search mode.

<table>
<thead>
<tr>
<th>Current</th>
<th>Recorded image files with the current set time.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Number</td>
<td>Recorded image files before the time change.</td>
</tr>
</tbody>
</table>

1-19-3 List All
Current recording time list is showed regardless how many times system time has been changed.
① All list comes out after selecting {List All} on the bottom of search mode.
1-20 Log Viewer
DVR records all Log information over the system operation including Power on/off, System Setup and Network Access. Move to {Menu} → {Miscellaneous} → {Log Viewer} to see the logs.

All Logs related to all system operations.

Fail Logs related to system operation failures, e.g., signal loss and network connection failure.

Network Logs related to network operations e.g., network login, network logout, and network live.

Recording Event Logs related to recording, e.g., motion detection and sensor detection, Audio detection.

General Logs related to power ON/OFF, file copy/backup failure, setup start/end, playback, and other basic system operations.
1-2-1 Playback
There are three routes {Live Monitoring}, {Search}, {Log Viewer} to playback on DVR.
On Live display (monitoring), select {Menu} → {Search} → {playback}.

[Figure 5-9. Playback Screen]

1-2-1-1 Playback status and Playback Speed Control

[Figure 5-10. Playback Status and Control bar]

<table>
<thead>
<tr>
<th>Button</th>
<th>Name</th>
<th>Features</th>
</tr>
</thead>
</table>
| ![Forward Play / Fast Forward] | Press one time - Playback forward (x2)  
Press two times - Fast forward (x4)  
Press four times - Fast forward (x16)  
Press six times - Fast forward (x300)  
Pressing one more time in x300 leads to x1 back. |
| ![Forward Frame by Frame] | Playback frame-by-frame  
Pause |
| ![Pause] | Pause              |
| ![Reverse Frame by Frame] | Reverse playback frame by frame  
Pause |
| ![Reverse Play / Fast Reverse] | Press one time - Playback reverse (x1)  
Press two times - Fast reverse (x4)  
Press four times - Fast reverse (x16)  
Press six times - Fast reverse (x300)  
Pressing one more time in x300 leads to x1 back. |
| ESC  | Exit to Playback Mode. |
| ![Status bar] | Status bar indicating information of the hourly recorded image data |
1 - 2 1 - 2 Smart Search
This function is for search an image with the object movement at a specific zone as fast as it can. Searching by each channel is available.

1 - 2 1 - 3 MULTI TIME
Multi-Time is to play the recorded image of the different time over a certain designated channel. The lineup of the recorded image of the different time is the most recent-bottom.

1 - 2 1 - 4 MULTI DAY
Multi-Day is to play the recorded image of the different day over a certain designated channel. The lineup of the recorded image of the different time is the most recent-bottom.

1 - 2 1 - 5 Event
Event is to play the recorded image with [All/Motion/Sensor/Audio].

1 - 2 1 - 6 Panorama Playback
Playback the certain channel by frame by frame..

1 - 2 2 Backup
Before backup process, CD/DVD or external HDD, CD, DVD supporting USB2.0 should be connected to the DVR. Refer to Appendix on the last page of this manual to get information of compatible list. There are three routes to backup on DVR.

[Figure 5-11. Backup]
1. In real-time monitoring mode, select {Menu} → {Backup} → {Backup}. The backup menus will then appear.
2. Show the free and total space, after selecting backup device.
3. Check the time/date and channel.
4. Backup will be progressing after click the start button.

   If the total size is smaller than backup size, it shows as red and not allowed to backup.
   
   If the backup storage device is not formatted, in case the box displaying the size of the file to be backed up is displayed in yellow, and if backup is executed by pressing the Copy (Backup) button, a prompt asking whether to erase the device will appear as shown below. Selecting [YES] causes the storage medium for the selected device to be erased.

1 - 2 - 3 **Snapshot**
The Snapshot function lets the user create a JPG file in live monitoring, playback.
On the live monitoring, Select {Menu} → {Backup} → {Capture} and then directly move to Snapshot menu.
   ① Will see the storage selection window. After selecting storage, backup will be done.

1 - 2 - 4 **Log Backup**
All of recorded log data such as Normal/Recording Event/Network/Failure could be backed up.
   ① Select {Log Viewer} → {Log Backup} or {Menu} → {Backup} → {Log Backup}.
   ② Setup after checking device, time and event.
   ③ Backup is started after selecting start button.

   ![Warning]
   Log file is text format so the file could be open easily.

1 - 2 - 5 **Setup Backup**
Backup all setup data which is applied to the DVR.
   ① Select {Menu} → {Backup} → {Setup Backup}.
   ② After selecting storage, backup will be done.
   ③ The file from Setup Backup can be applied to another DVR with {Menu} → {Setup} → {System} → {Upgrade} → {setup}.
1-26 PTZ Camera Control

① PTZ camera setup should be correct on here {Menu} → {Setup} → {Definition} → {PTZ}.

② In real-time monitoring mode, select {Menu} → {PTZ Control}.

③ PTZ Full control window is coming out after selecting MENU button or the right button of the Mouse. If you are okay with PTZ Simple control window, selecting ESC button or the right of the Mouse just after that.

(1) Camera
Select PTZ to be controlled.

(2) Speed
PTZ camera speed is adjustable.

(3) Tour
To use this feature, it should be setup with {Menu} → {Setup} → {PTZ} → {Tour}.

(4) Left/right/up/down/zoom
Control the Left/Right/Up/Down/Zoom of PTZ camera.

(5) Preset
Using Left/Right/Zoom movement of PTZ Camera, zoom or focus a certain spot of the image by designating the coordinates and move to the designated coordinates quickly.

(6) Home Position Time
If there are no controlling signals to PTZ camera after a certain time, it goes automatically to the Preset No.1 position as Preset No. 1 is designated as Home Position.

(7) Menu
Control PTZ Menu directly.
Chapter 6. Setup

1 - 2 7 Time
Select {Menu} → {Setup} → {Time} on the live display(Monitoring).

(1) NTP Sync
Synchronize DVR time with NTP Server time at one time in hour.

(2) Date and Time
Change the system date/time and the time format.

(3) Standard Time Zone
Select {Standard Time Zone}, {Daylight Saving Time}, {Start/End time}.

(4) Auto Rebooting
Select the period for auto rebooting of DVR system.
1 - 2 8 Definition
Select {Menu} \(\rightarrow\) {Setup} \(\rightarrow\) {Definition} on live display (Monitoring).

1 - 2 8 - 1 Camera
(1) Connect
Set on/off of the camera.
(2) Title
Set the name of each camera up to 20 characters.
(3) Covert
Set the live channel not to be shown.
※On the live display (Monitoring), it shows as black. But, it keeps recording as setup.

1 - 2 8 - 2 PTZ
Set the Tour, Protocol, ID, Baudrate of PTZ camera.

1 - 2 8 - 3 Event Source
Set the Motion Area, Motion Sensitivity, Sensor Type, Sound Sensitivity.

1 - 2 8 - 4 Relay
Set the type of Relay.

1 - 2 9 Recording
Set recording, system, main features. {menu} \(\rightarrow\) {setup} \(\rightarrow\) {Recording}
1 - 2 - 9 - 1 schedule (schedule1 - schedule4)
4 different settings can be applied by time and date on schedule table for user convenience. Please go to menu/schedule after setting up schedule1, schedule2, schedule 3, schedule 4 differently.

1 - 2 - 9 - 2 Event
Set the motion, Sensor, Audio.

1 - 2 - 9 - 3 Recording
Set the Resolution, Frame, Quality, Audio.

### Resolution

<table>
<thead>
<tr>
<th>Resolution</th>
<th>NTSC recording resolution</th>
<th>PAL recording resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>720p</td>
<td>1280 x 720</td>
<td>1920 x 1080</td>
</tr>
<tr>
<td>1080p</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Recording frame rate

<table>
<thead>
<tr>
<th></th>
<th>when record continuously</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Speed</td>
<td></td>
</tr>
<tr>
<td>Event Speed</td>
<td>When record by motion, sensor, audio</td>
</tr>
</tbody>
</table>

1 - 2 - 9 - 4 Alarm
Set the Alarm action Buzzer, PTZ Preset, E-mail, Relay, Spot, Popup and Callback when event comes out.

1 - 2 - 9 - 5 Duration
Pre alarm( On / OFF ), post alarm(5sec / 10sec / 15sec / 20sec / 60sec / 150sec / 300sec)
1-29-6 Log
Set On/off of log by motion detection / sensor input / sound detection.

1-30 Schedule
Select {Menu} \(\rightarrow\) {Setup} \(\rightarrow\) {Schedule} on the live display.
{Schedule} is used to save the system configuration as data from {Schedule 1 ~ 4} and to make a recording based on the system configuration for each day/time zone.

1-30-1 Holiday setup
Set the Holiday for recording schedule.
1.3.1 Storage
Select {Menu} → {Setup} → {Storage}.

1. Private Recording
This is to limit the recording days. You can set None/1day/7days/30days/User setting (1-99).

2. HDD Overwrite
Set On/Off for HDD Overwrite.

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>If there is no more hard disk space left, the existing files will be overwritten starting with the oldest.</td>
</tr>
<tr>
<td>Off</td>
<td>If there is no more hard disk space left, further recording will not be executed.</td>
</tr>
</tbody>
</table>

3. Local Storage Management
(1) Local Storage Management Function

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>All initially detected storages are displayed as New</td>
</tr>
<tr>
<td></td>
<td>Recording Initialize – Changed it for Recording</td>
</tr>
<tr>
<td></td>
<td>Backup Initialize – change it for Backup</td>
</tr>
<tr>
<td>Recording</td>
<td>Storage list for Recording</td>
</tr>
<tr>
<td></td>
<td>※ At least, one storage shall be selected as a dedicated storage. Otherwise, the data cannot be stored in real time.</td>
</tr>
<tr>
<td></td>
<td>New – Returns the status of the selected storage device to New</td>
</tr>
<tr>
<td></td>
<td>Online - Changes the selected storage device in online state.</td>
</tr>
<tr>
<td></td>
<td>Offline - Changes the selected storage device in offline state. (Disable to record)</td>
</tr>
<tr>
<td></td>
<td>Format – Format the selected storage. (Available only in Offline.)</td>
</tr>
<tr>
<td></td>
<td>Eject - Separates the selected device completely from the software.</td>
</tr>
<tr>
<td>Backup</td>
<td>Storage list for Backup</td>
</tr>
</tbody>
</table>
### Configuration of the local storage device

<table>
<thead>
<tr>
<th>Status Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>Connected to storage or backup device; currently saving the data.</td>
</tr>
<tr>
<td>Online</td>
<td>Only connected to storage or backup device.</td>
</tr>
<tr>
<td>Offline</td>
<td>Not connected to storage or backup device.</td>
</tr>
</tbody>
</table>

※ There are three software status types.

### Hardware Status Types

<table>
<thead>
<tr>
<th>Status Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>Connected to storage or backup device; functions normally.</td>
</tr>
<tr>
<td>Warning</td>
<td>Connected to storage or backup device, but error was detected; in this case, data storing or backup cannot be made (for more information, see the description below).</td>
</tr>
<tr>
<td>Fault</td>
<td>Not connected to storage or backup device; cannot perform data saving or backup.</td>
</tr>
</tbody>
</table>

※ There are three hardware status types.

1. **Fault State:** The storage device is completely damaged, and none of the S/W operations can be performed. The fault state is not related to a DVR problem. The DVR has detected the fault and stopped the recording.

2. **Warning State:** The storage device has a physical error that can be corrected by the storage device or by the DVR. If the error is not taken care of, however, the storage device is likely to be damaged (and shift to fault state). Backing up data in the corresponding storage device and replacing the device with a normal one are strongly recommended.

3. If there is an active storage device with a warning or a fault, a message is displayed on the upper left part of the screen.
1-3-2 Network
Set the system network. (Menu) → (Setup) → (Network).

[Figure 6-18. Ethernet Window]

1-3-2-1 Ethernet
Set the IP, ADSL, Gateway and DNS as above.

1-3-2-2 DDNS
As part of the DNS system, the Dynamic Domain Name System (DDNS) service updates the IP addresses of host names in real time and allocates fixed domain names to systems linked to dynamic IP addresses to allow users to use the same DNS name regardless of the changes in the IP address.
It provides dynamic DNS to ensure URL access in the dynamic IP environment.
User can monitor the remote place thru internet with web server functions which is equipped in DVR.

※ Access to DynDDNS server(\texttt{http://www.dyndns.org}) and apply for the user account then, register the domain name to use and enter URL.
※ For more information, please access to the server.

1-3-2-3 Port
Set the port for network.
UPnP function will be available on the selection of On. On UPnP, 'Success' will be popped up on the port registration at Router. Otherwise, 'Failure' will be popped up instead.

1-3-2-4 E-mail
Automatic E-mail transmission service when an event occurs.

1-3-2-5 Bandwidth
This sets up the limit of the bandwidth to be used when bringing the live image, adjust resolution/quality and transmitting the data by using the network.

1-3-2-6 Callback
The signal is transferred to callback server for auto-recording when there happens an event at the site.
### System Menu → Setup → System

![System Setup Window](image)

#### System Setup Window

**DVR Name**
- Set to the MAC address for DVR. Available to change whatever user wants.

**ID For Key Controller**
- Set the identify no. of key controller

**Users**
- Adds, edits, or deletes the users who will operate the system.

**Upgrade**
- Firmware – Firmware upgrade
- Setup – Change the setup of DVR

**Factory Setup**
- Initializing it as setup (Except Network setup)

**Error Alarm Action**
- Alarm is to notify system incidents [Video Signal loss/ HDD full/ FAN fail/ HDD fail/ HDD warning] to [Alarm/ E-mail/ Relay01/ System check].

**Error Alarm Duration**
- Set the alarm duration

**Menu Time Out**
- If no input is made in the System Setup menu using the front buttons, remote controller, or mouse, the system automatically shifts to real-time monitoring mode.

**Language**
- Set the system language.
## APPENDIX

### (1) Recommended HDD

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
<th>Capacity</th>
<th>Buffer</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATA I, II</td>
<td>3.5” 1, 2 Flat</td>
<td>Max. 2TB</td>
<td>Over 8MB</td>
<td>Over 7200</td>
</tr>
</tbody>
</table>

### (2) Recommended PTZ Camera Protocol

<table>
<thead>
<tr>
<th>NO</th>
<th>Vendor</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A.D.</td>
<td>SENSORMATIC</td>
</tr>
<tr>
<td>2</td>
<td>CHOU</td>
<td>COHU</td>
</tr>
<tr>
<td>3</td>
<td>Dongyang</td>
<td>DRX-500</td>
</tr>
<tr>
<td>4</td>
<td>DYNACOLOR</td>
<td>DY-255</td>
</tr>
<tr>
<td>5</td>
<td>EYE VIEW</td>
<td>EYE VIEW</td>
</tr>
<tr>
<td>6</td>
<td>FINE SYSTEM</td>
<td>CRR-1600/l/s</td>
</tr>
<tr>
<td>7</td>
<td>GE</td>
<td>GE_KARATEL</td>
</tr>
<tr>
<td>8</td>
<td>GSP</td>
<td>CYBERSCAN_1</td>
</tr>
<tr>
<td>9</td>
<td>HITRON</td>
<td>FASTRAX2</td>
</tr>
<tr>
<td>10</td>
<td>HONEYWELL</td>
<td>HSDN-251</td>
</tr>
<tr>
<td>11</td>
<td>LG</td>
<td>LG_MULTIX,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LG_OLD</td>
</tr>
<tr>
<td>12</td>
<td>MIKAMI</td>
<td>MIKAMI</td>
</tr>
<tr>
<td>13</td>
<td>ORIENTAL</td>
<td>ORX-1000</td>
</tr>
<tr>
<td>14</td>
<td>PANASONIC</td>
<td>WVCS854</td>
</tr>
<tr>
<td>15</td>
<td>PELCO</td>
<td>PELCO – D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PELCO - P</td>
</tr>
<tr>
<td>16</td>
<td>PHILIPS</td>
<td>PHILIPS</td>
</tr>
<tr>
<td>17</td>
<td>PROLINE</td>
<td>PROLINE_UK</td>
</tr>
<tr>
<td>18</td>
<td>RIFATRON</td>
<td>RIFATRON</td>
</tr>
<tr>
<td>19</td>
<td>SAMSUNG TECHWIN</td>
<td>SPD-1600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCC641</td>
</tr>
<tr>
<td>20</td>
<td>SUNJIN</td>
<td>SUNJIN</td>
</tr>
<tr>
<td>21</td>
<td>VICON</td>
<td>VICON</td>
</tr>
<tr>
<td>22</td>
<td>YOKO</td>
<td>YOKO</td>
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</tbody>
</table>

### (3) Recommended USB2.0 Device

<table>
<thead>
<tr>
<th>USB2.0 Device</th>
<th>Media</th>
<th>File System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Stick</td>
<td>Flash Type</td>
<td>FAT32</td>
</tr>
<tr>
<td>2.5” Portable USB HDD</td>
<td>HDD Type</td>
<td>FAT32</td>
</tr>
<tr>
<td>CD</td>
<td>CD R, R/W</td>
<td>ISO9660</td>
</tr>
<tr>
<td>DVD</td>
<td>DVD +R, +R/W</td>
<td>ISO9660</td>
</tr>
</tbody>
</table>
Our MX-SDi DVRs are Dynamic CCTVs next step into true 1080P recording. This HD-SDi recorder is capable of recording full 1080P HD-SDi from any HD-SDi compatible camera. The DVR has excellent LAN capability, and comes with powerful VMS software as standard for viewing multiple sites from one location, or you can use the built in web server to stream video directly to Internet Explorer or to your mobile phone (iPhone, Android, Symbian, Windows Mobile) with the added bonus of an inbuilt DDNS service. Other notable features include the easy to setup email notification and a comprehensive schedule function, topped off with an extremely easy to use backup facility allowing any combination of channels to be backed up. These DVRs usher in a whole new class of CCTV with quality that has to be seen to be believed.

**FEATURES:**
- H.264 Codec
- Pre-alarm recording
- Auto email notification (Built in SMTP server)
- Covert Channel
- Audio Detection
- Smart Search
- Mobile Web Viewer (works with all mobile devices 3G)
- Powerful CMS software
- Water marking & Water marking detection
- Different speed/resolution per channel
- Bi-directional Audio (two way audio)
- Still image capture
- Built in 2 click free DDNS
- Multi stream network support
- Web monitoring via built in web server
- Data backup via USB
- Hexaplex (Live, Recording, Playback, Network, Backup, Setup)

**DISPLAY**
- Input: 4x HD-SDI (1080P/720P)
- Output Call Monitor: N/A
- LCD Display Resolution: SXGA(1280 X 1024), WSXGA (1680x1050), 1080P, 720P
- Live Display: 400fps
- Video Mode: NTSC/PAL Selectable
- O/S: Embedded Linux
- Live Display: 1/4/Sequence

**RECORDING**
- Recording: 32 fps, 48 fps
- Compression: H.264, G.711U(Audio)
- Recording Resolution: 32ips @ 720P, 32ips @ 720P, 20ips @ 1080P, 48ips @ 1080P
- Recording Quality: 5 levels presets
- Recording mode: Auto, Continuous, Motion, Sensor (Sensor, Motion, Audio)
- Pre-alarm: Yes
- Data Life Time: Yes (Programmable)
- Storage Mode: Linear / Circular

**AUDIO**
- Audio Input: Input 4Ch (RCA)
- Audio Output: Output 1 HDMI, 1 RCA
- Compression Method: G.711U

**SENSORS**
- Sensor/Relay: Sensor input(4Ch), Relay output(1Ch)-NC/NO
- Motion Detection: 21 x 18 Grid Array, Sensitivity, Trigger Level Adjustable
- Video Loss Detection: Programmable

**INTERFACE**
- HDD Capacity: SATA HDD X2
- Back up: USB 2.0, DVD, Network
- Language: English, Korean, Japanese, French, German, Hebrew, Italian, Portuguese, Polish, Russian, Spanish, Turkish, S.Chinese, T.Chinese
- Network: ADSL, Cable Modem, LAN(Ethernet)
- Remote Monitoring: CMS, DVR Remote
- Remote Operation: Monitor, Playback, Recording, System Setup, Camera Control, Archive
- Dome Camera Protocol: Pelco P, Pelco D, AD, Chu, DongYang, Dynacolor, Eye View, Fine System, GE, GSP, Hitron, Honeywell, LG, Mikami, Oriental, Panasonic, Philips, Proline, raftron, Samsung, Sungjin, Vicon, Yokka
- IR Remote: Yes

**MECHANICAL**
- Power Supply: DC 12V/5A
- Power Consumption: 40W, 60W
- Weight: 4Kg
- Operating Temperature: 5 ~ 40 ºC
- Dimension: 340(W) X 59(H) X 300(D) mm