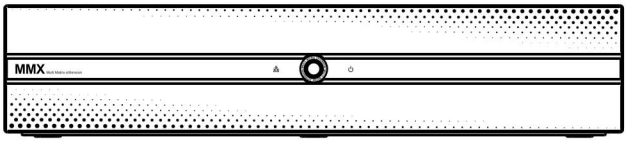
MULTI MATRIX EXTENSION

USER'S MANUAL



WARNING

RISK OF ELECTRIC SHOCK
DO NOT OPEN

WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED
SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

COMPLIANCE NOTICE OF FCC:

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE, IN WHICH CASE USERS WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT THEIR OWN EXPENSE.

WARNING: CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

THIS CLASS OF DIGITAL APPARATUS MEETS ALL REQUIREMENTS OF THE CANADIAN INTERFERENCE-CAUSING EQUIPMENT REGULATIONS.

The information in this manual is believed to be accurate as of the date of publication. IDIS Co., Ltd. is not responsible for any problems resulting from the use thereof. The information contained herein is subject to change without notice. Revisions or new editions to this publication may be issued to incorporate such changes.

Important Safeguards

1. Read Instructions
All the safety and operating instructions should be read before the appliance is operated.

2. Retain Instructions
The safety and operating instructions should be retained for future reference.

3. Cleaning
Unplug this equipment from the wall outlet before cleaning it. Do not use liquid aerosol cleaners. Use a damp soft cloth for cleaning.

4. Attachments
Never add any attachments and/or equipment without the approval of the manufacturer as such additions may result in the risk of fire, electric shock or other personal injury.

5. Water and/or Moisture
Do not use this equipment near water or in contact with water.

6. Accessories
Do not place this equipment on an unstable cart, stand or table. The equipment may fall, causing serious injury to a child or adult, and serious damage to the equipment. Wall or shelf mounting should follow the manufacturer's instructions, and should use a mounting kit approved by the manufacturer.

This equipment and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the equipment and cart combination to overturn.

7. Power Sources
This equipment should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power, please consult your equipment dealer or local power company.

8. Power Cords
Operator or installer must remove power and TNT connections before handling the equipment.

9. Lightning
For added protection for this equipment during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the equipment due to lightning and power-line surges.

10. Overloading
Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.

11. Objects and Liquids
Never push objects of any kind through openings of this equipment as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the equipment.

12. Servicing
Do not attempt to service this equipment yourself. Refer all servicing to qualified service personnel.

13. Damage requiring Service
Unplug this equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:

A. When the power-supply cord or the plug has been damaged.
B. If liquid is spilled, or objects have fallen into the equipment.
C. If the equipment has been exposed to rain or water.
D. If the equipment does not operate normally by following the operating instructions, adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the equipment to its normal operation.
E. If the equipment has been dropped, or the cabinet damaged.
F. When the equipment exhibits a distinct change in performance ─ this indicates a need for service.

14. Replacement Parts
When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

15. Safety Check
Upon completion of any service or repairs to this equipment, ask the service technician to perform safety checks to determine that the equipment is in proper operating condition.

16. Field Installation
This installation should be made by a qualified service person and should conform to all local codes.

17. Correct Batteries
Warning: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

18. Tmra
A manufacturer's maximum recommended ambient temperature (Tmra) for the equipment must be specified so that the customer and installer may determine a suitable maximum operating environment for the equipment.

19. Elevated Operating Ambient Temperature
If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

20. Reduced Air Flow
Installation of the equipment in the rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.

21. Mechanical Loading
Mounting of the equipment in the rack should be such that a hazardous condition is not caused by uneven mechanical loading.

22. Circuit Overloading
Consideration should be given to connection of the equipment to supply circuit and the effect that overloading of circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

23. Reliable Earthing (Grounding)
Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

WEEE (*Waste Electrical & Electronic Equipment*)

Correct Disposal of This Product
(Applicable in the European Union and other European countries with separate collection systems)

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

Table of Contents

Chapter 1 — Introduction

1.1 In This Manual

This manual is intended for users of the matrix system (MMX) and includes instructions for using and managing the MMX on the network.

1.2 Features

This MMX receives live video from multiple DVRs and displays user-desired camera channels on monitors in various layouts. The MMX can be accessed, configured and managed by using the INIT (Integrated Network Installation Tool) program over Ethernet connections. A network keyboard provided with the MMX allows you to control DVRs connected to the MMX remotely creating virtual matrix environment. The MMX offers the following features:

Standard Features

- 16 composite video input connectors
- Multiple monitor connectors: 1 main out, 4 quad, 4 spot, 16 loop (BNC)
- Operating modes: master, slave (max. 63), spot (max. 4)
- Convenient firmware upgrades via Ethernet
- Firmware duplication and autorecovery functions to enhance system stability
- Management of multiple MMXs via Ethernet connections
- Event detection functions: alarm-in, motion, video loss
- 16-channel alarm in and 2-channel alarm out

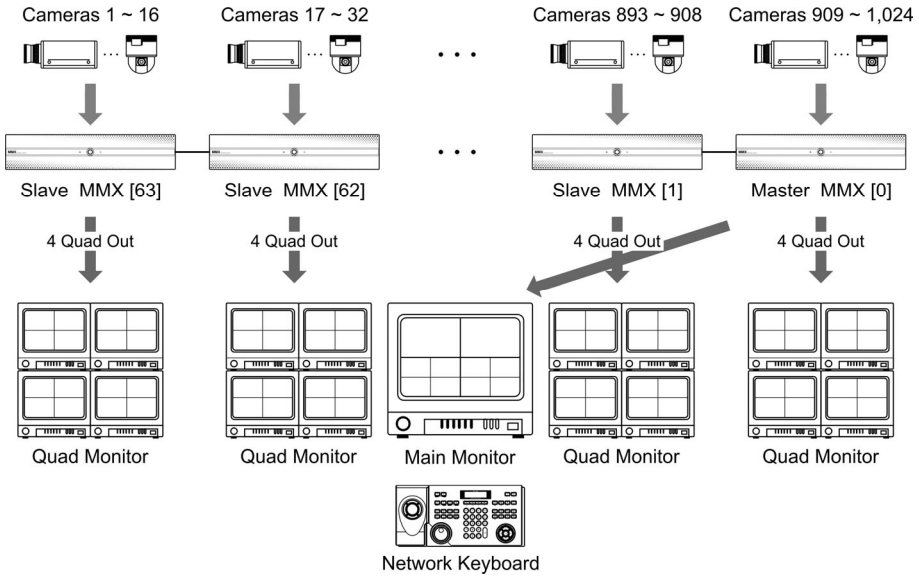
NOTE: The MMX is controlled by a network keyboard via Ethernet. Refer to the user's manual of the network keyboard on instructions for using the network keyboard.

Outstanding Features

- Easy installation, easy cabling and easy setup
- Replacement of previous matrix and quad by single MMX
- Daisy chain of several MMXs for monitoring of video from multiple DVRs in various layout
- Sequence or event monitoring of event detected video from multiple DVRs
- Controls of multiple MMXs by using a network keyboard via Ethernet

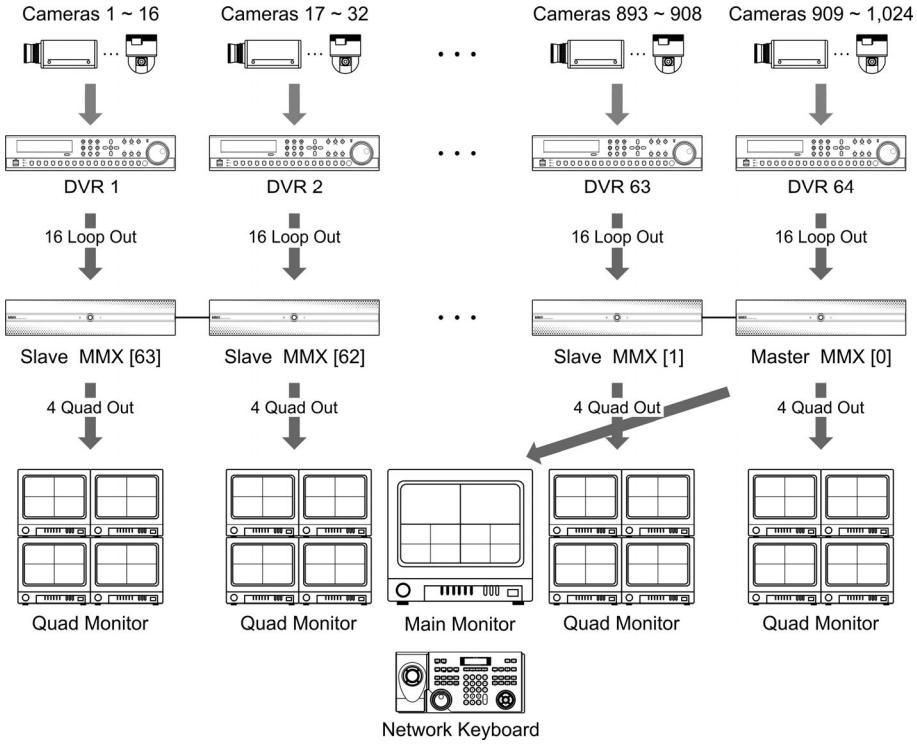
1.3 Typical Applications

Camera Connection



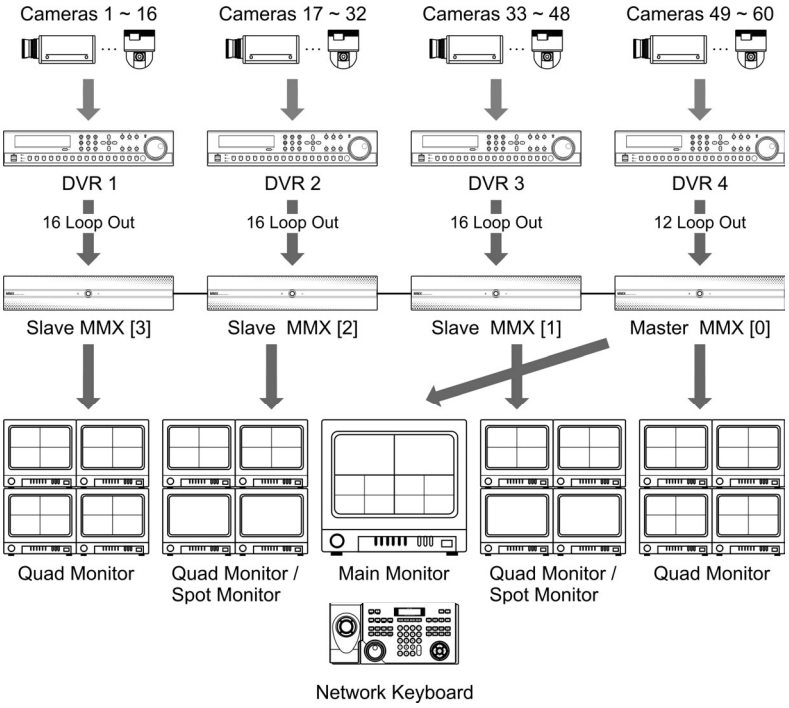
✓ Max. 1,024 channel cameras can be connected directly to the MMXs for live monitoring. Live video from any cameras can be displayed on the monitors of MMXs in the user-defined layouts including sequence monitoring and event monitoring. The PTZ control of the PTZ camera is not supported. Refer to Chapter 3 — Case Installation, 3.1 Camera Only or Uncontrollable DVR Connection (p. 13) for details on installation and configuration.

Uncontrollable DVR Connection



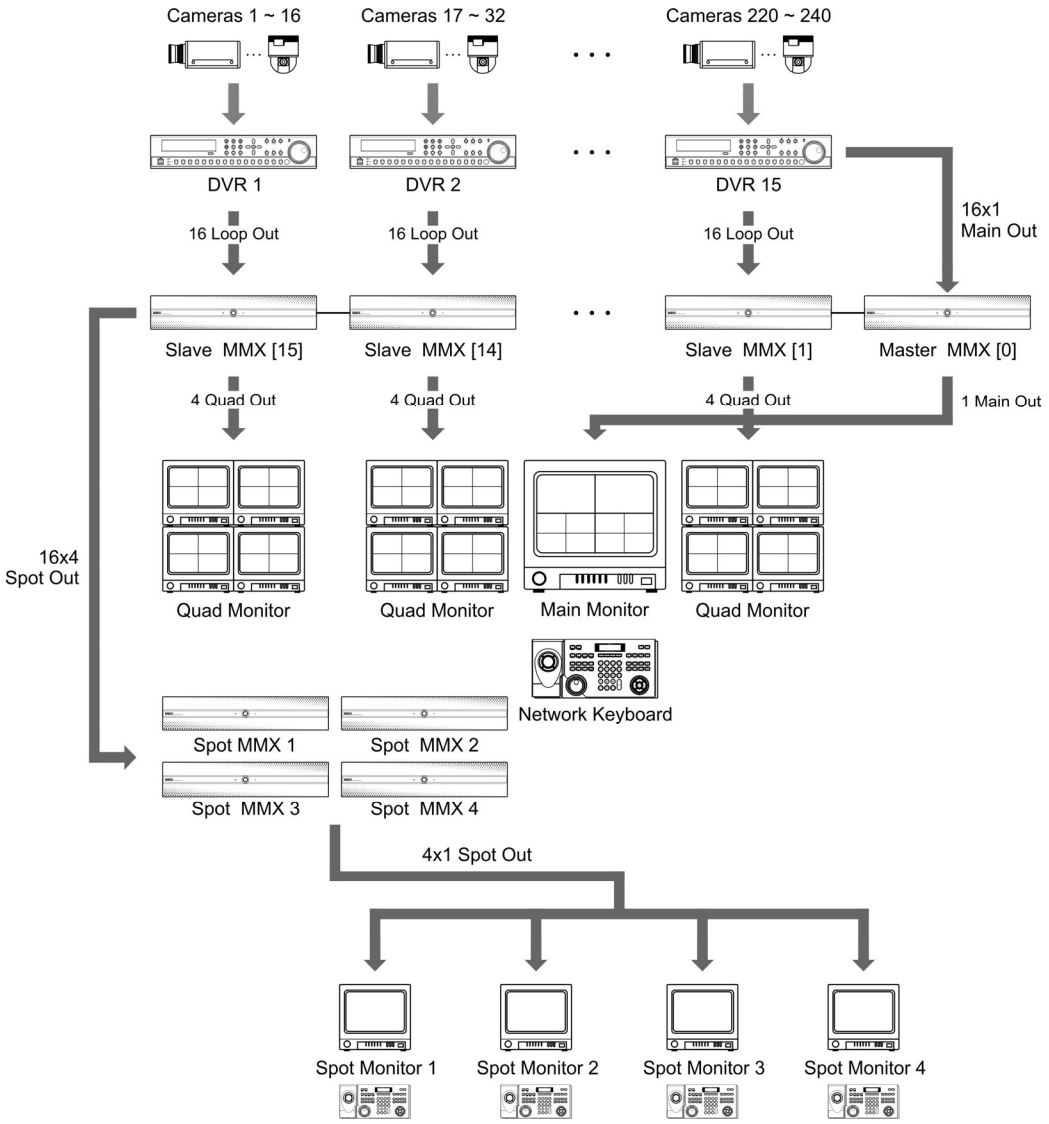
✓ Max. 64 DVRs can be connected to the MMXs for live monitoring. Live video from any cameras can be displayed on the monitors of MMXs in the user-defined layouts including sequence monitoring and event monitoring. In this connection, the DVRs cannot be controlled in the MMX system. Ask your dealer or distributor for DVRs if you want to control DVRs by a network keyboard via Ethernet. Refer to Chapter 3 — Case Installation, 3.1 Camera Only or Uncontrollable DVR Connection (p. 13) for details on installation and configuration.

Medium-Sized System



✓ DVRs can be connected to MMXs for live monitoring on a main monitor, quad monitors and spot monitors connected to MMXs. Live video from any cameras can be displayed on the monitors of MMXs in the user-defined layouts including sequence monitoring and event monitoring. In this case, you can playback video recorded in DVRs and change DVR settings on the main monitor of a master MMX by connecting the main out of DVRs to MMXs. Refer to Chapter 3 — Case Installation, 3.2 Medium-Sized System (p. 18) for details on installation and configuration.

Enterprise-Sized System



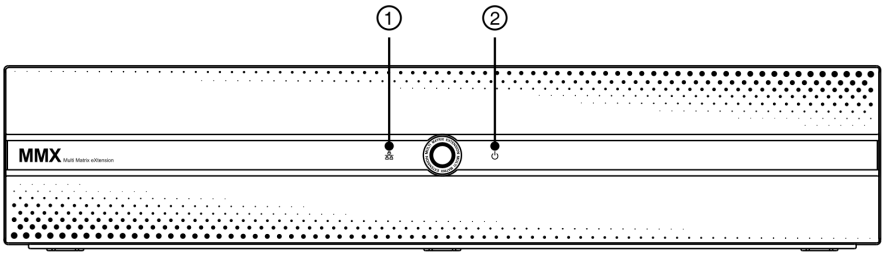
✓ DVRs can be connected to MMXs for live monitoring on a main monitor, quad monitors and spot monitors connected to MMXs. Live video from any cameras can be displayed on the monitors of MMXs in the user-defined layouts including sequence monitoring and event monitoring. The spot MMX connection supports live monitoring of the same channel on the spot monitors of up to four at the same time. In this case, you can playback video recorded in DVRs and change DVR settings on the main monitor of a master MMX by connecting the main out of DVRs to MMXs. Refer to Chapter 3 — Case Installation, 3.3 Enterprise-Sized System (p. 23) for details on installation and configuration.

Chapter 2 — Installation

2.1 Package Contents

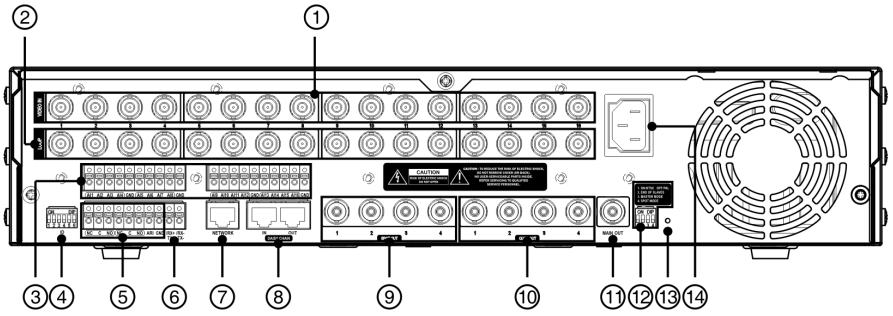
- MMX (Multi-Matrix Extension)
- Power Cord
- User's Manual (MMX, INIT)
- Installation CD (INIT)
- Rack-mount Kits

2.2 Front Panel



No.	Designation	Details
1	Network LED	The LED is lit when the unit is connected to a network via Ethernet.
2	Power LED	The LED is lit when the unit is on.

2.3 Rear Panel



No.	Designation	Details
1	Video In	Connect coaxial cables to the MMX from the video sources (NTSC or PAL). Cameras can be connected to the MMX directly or through loop out ports of DVRs.
2	Loop	Connect coaxial cables to connect the video source of the MMX to another device.
3	Alarm In	Connect alarm-in devices. Mechanical or electrical switches can be wired to the AI (Alarm-In) and GND (Ground) connectors. Connect the ground side of the alarm inputs to the GND connector. The threshold voltage is 4.3V, and it should be stable at least 0.5 seconds to be detected.
4	MMX ID Switch	Configure the MMX ID. Every MMX should have identical MMX ID. Refer to MMX ID Switch (p. 9) section for details on MMX ID switch setting.
5	Alarm Output	Connect an alarm-out device to the NC (Normally Closed) and C (Common) connectors or the NO (Normally Open) and C (Common) connectors. NC/NO is a relay output which sinks 2A @ 125 VAC and 1A @ 30 VDC. An external signal to the Alarm Reset In can be used to reset the Alarm Out signal. Mechanical or electrical switches can be wired to the ARI (Alarm Reset In) and G (Ground) connectors. The threshold voltage is below 0.3V and should be stable at least 0.5 seconds to be detected. Connect the wires to the ARI (Alarm Reset In) and G (Ground) connectors.
6	RS485 Port	Connect a PTZ camera for controlling PTZ preset. Connect TX+/RX+ and TX-/RX- of the PTZ camera to the RX+/TX+ and RX-/TX- (respectively) of the MMX. Refer to 5.3 Video, Camera (p. 47) and the PTZ camera manufacturer's manual for configuring the RS485 connection.
7	Network Port	Connect a UTP Cat5 cable with an RJ-45 jack. Refer to 5.2 Network, IP Address (p. 44) for details on network connection setup.
8	Daisy Chain In/Out Port	Connect the STP Cat5E cable with an RJ-45 jack to daisy-chain slave MMXs (Out) and a master MMX (In). See the Daisy Chain In/Out (p. 9) section for details.
9	Spot Out	Connect to a spot monitor (NTSC or PAL) for monitoring video in single screen layout. Port connection might be different depending on the MMX's operation mode.
10	Quad Out	Connect to a quad monitor (NTSC or PAL) for monitoring video in quad or single screen layout.
11	Main Out	Connect to a main monitor (NTSC or PAL) for monitoring video in various screen layout (master MMX only).
12	Option Switch	Set the switch to On (upward) of Off (downward) depending on the video signal format, termination or operation mode. See the Option Switch (p. 10) section for details.
13	Factory Reset Switch	Use to return all settings to the original factory settings. See the Factory Reset (p. 11) section for details.
14	Power In	Connect the power cord to the MMX and then to a wall outlet. The MMX starts booting when power is applied.

NOTES:

- Do NOT connect a cable to the Loop BNC unless it is connected to another device because it will cause poor quality video.
- To make connections on the Alarm Connector Strip, press and hold the button and insert the wire in the hole below the button. After releasing the button, tug gently on the wire to make certain it is connected. To disconnect a wire, press and hold the button above the wire and pull out the wire.
- Camera surveillance may be prohibited by laws that vary by region. Check the laws in your area before using this product for surveillance purposes.

NOTE: Use a STP Cat5E cable when daisy-chaining MMXs. Using other cables may cause video noise.

CAUTIONS:

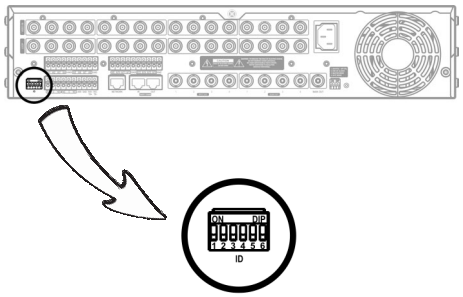
- **The network connector is not designed to be connected directly with cable or wire intended for outdoor use.**
- **This product is also designed for IT power system with phase-to-phase voltage 230V.**

WARNING: ROUTE POWER CORDS SO THAT THEY ARE NOT A TRIPPING HAZARD. MAKE CERTAIN THE POWER CORD WILL NOT BE PINCHED OR ABRADED BY FURNITURE. DO NOT INSTALL POWER CORDS UNDER RUGS OR CARPET. THE POWER CORD HAS A GROUNDING PIN. IF YOUR POWER OUTLET DOES NOT HAVE A GROUNDING PIN RECEPTACLE, DO NOT MODIFY THE PLUG. DO NOT OVERLOAD THE CIRCUIT BY PLUGGING TOO MANY DEVICES INTO ONE CIRCUIT.

MMX ID Switch

Set up the MMX ID by using the MMX ID switch to distinguish the MMX from other MMXs for hardware distinction. Every MMX should have a unique ID, and the MMX system might not work properly if more than one MMX has the same ID. The MMX ID switch is set up with the binary scale, and setting all switches to On (upward) indicates 0 and to Off (downward) indicates 63. Set up the switch to 0 for a master MMX, 1 to 63 for slave MMXs and 1 to 4 for spot MMXs. Refer to Appendix: MMX ID Switch Settings (p. 59) for details on setting the switches for each ID from 0 to 63.

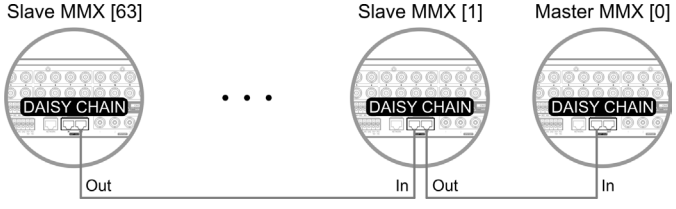
NOTE: When setting the switch for slave MMXs, the ID should be assigned in order starting from *1*. Otherwise, the MMX system might not work properly.



ID	MMX ID Switch
0	
1	
63	

Daisy Chain In/Out

When you use more than one MMX, you have to daisy-chain all slave MMXs to a master MMX by using the STP Cat5E cable with an RJ-45 jack. Connect a cable from the DAISY CHAIN IN port of a slave MMX of higher number of ID to the DAISY CHAIN OUT port of a slave MMX of lower number of ID in descending order to the master MMX as follows:



NOTES:

- Daisy chain in this manual refers to the connection between a master MMX and slave MMXs through the DAISY CHAIN ports on the back panels of the master MMX and slave MMXs. All slave MMXs are connected to the master MMX in hardware and software through the daisy chain.
- The slave MMXs should be daisy-chained in descending order to the slave MMX of ID *1* and the slave MMX of ID *1* should be daisy-chained to a master MMX directly. Otherwise, the MMX system might not work properly.
- The total number of daisy-chained MMXs including a master MMX will be displayed with the number of MMXs connected properly at the bottom right corner on the monitor. ('the number of MMXs connected properly' / 'the total number of daisy-chained MMXs')
- You have to perform factory reset in all daisy-chained MMXs to complete the connections. Refer to *Factory Reset* (p. 11) section for details on the factory reset.
- You have to set up setting values of the system newly after performing factory reset. The MMX system might not work properly when applying previously saved settings to the MMXs.

Option Switch

Set the switch On or Off depending on the usage as follows:

No.	Description	ON (upward)	OFF (downward)
1	ON / OFF	Video signal format: NTSC	Video signal format: PAL
2	END OF SLAVES	• The MMX ID is the highest among all MMXs. • The MMX is a spot MMX.	Other cases except when the switch is set to ON.
3	MASTER MODE	The MMX is a master MMX.	The MMX is a slave MMX or spot MMX.
4	SPOT MODE	The MMX is a spot MMX.	The MMX is a master MMX or slave MMX.

NOTES:

- The option switch settings decide the mode of MMXs: Master MMX, slave MMX, spot MMXs.
  - A master MMX is a basic MMX in the MMX system and has information of slave MMXs daisy-chained to the master MMX. A main monitor connected to the master MMX allows more functions than other MMXs.
  - A slave MMX is subjective to a master MMX and daisy-chained to the master MMX for proper function. A master MMX's settings are applied to slave MMXs automatically.
  - A spot MMX receives live video from a master MMX and slave MMXs and displays it on up to four spot MMX monitors at the same time.
- You have to perform factory reset after changing the option switch setting. Refer to *Factory Reset* (p. 11) section for details on the factory reset.
- You have to set up setting values of the system newly after performing factory reset. The MMX system might not work properly when applying previously saved settings to the MMXs.

Factory Reset

This switch will only be used on the rare occasions that you want to return all the settings to the original factory settings.

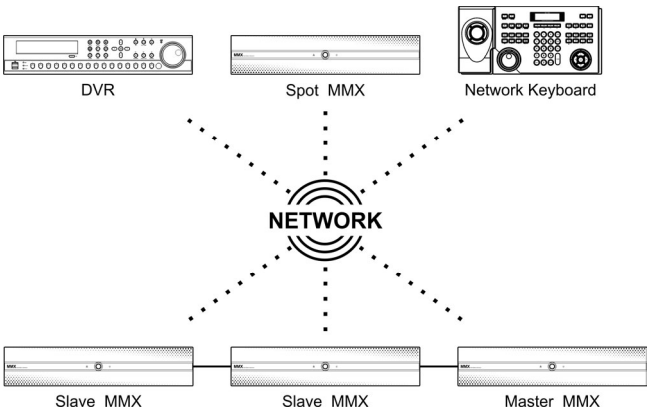
CAUTION: When performing a Factory Reset, you will lose any settings you have saved.

Turn the MMX off. → Turn it on again. While the MMX is initializing, the front panel LEDs will blink. → When the front panel LEDs blink, poke a straightened paperclip into the factory reset switch hole. → Hold the switch until a buzzer sounds. → The MMX resets to factory defaults and restarts after completing the factory reset.

You can perform a factory reset remotely while the MMX is turned on by running the INIT program and selecting the Reset – Factory Reset menu. The MMX restarts after completing the factory reset. Refer to the INIT User's Manual for details on remote factory resetting.

Chapter 3 — Case Installation

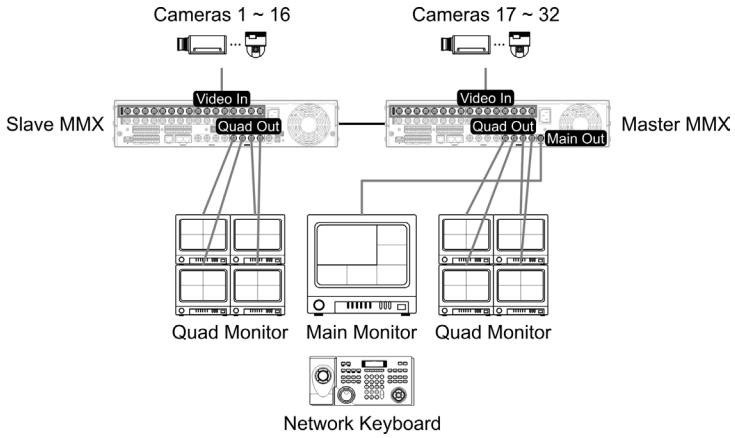
All devices including MMXs should be networked via Ethernet.



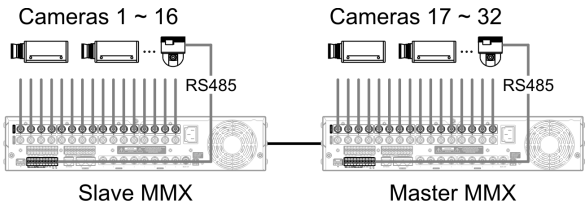
3.1 Camera Only or Uncontrollable DVR Connection

When connecting cameras directly or uncontrollable DVRs to the MMXs, you can monitor live video from cameras in the user-defined layout on monitors connected to the MMXs and control the PTZ preset by a network keyboard via Ethernet if the camera is a PTZ camera.

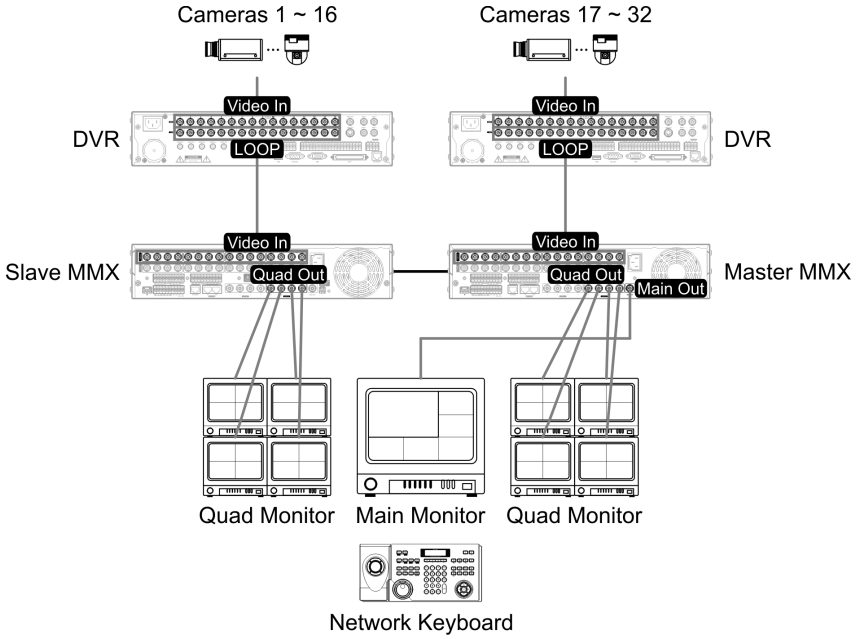
Camera Only Connection



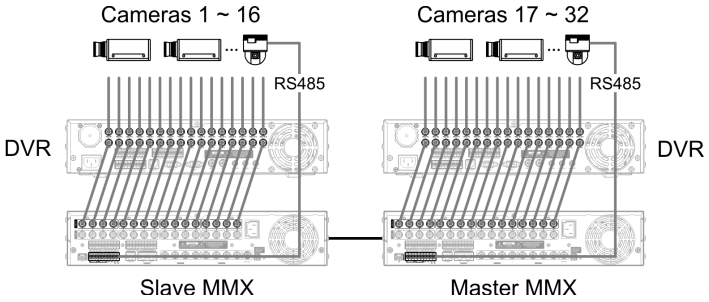
1. Connect cameras to the Video In ports of a master MMX and slave MMXs when connecting cameras directly to MMXs. If the camera is a PTZ camera, connect the camera to the RS485 port of the MMX to control the PTZ preset by a network keyboard.



Uncontrollable DVR Connection

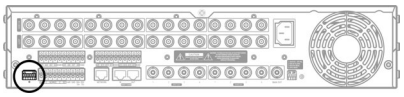


1. Connect the loop out of DVRs to the Video In ports of a master MMX and slave MMXs when connecting uncontrollable DVRs. If the camera connected to a DVR is a PTZ camera, connect the camera to the RS485 port of the MMX to control the PTZ preset by a network keyboard.

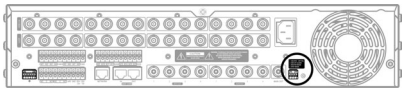


2. Set up the MMX ID and options by using the MMX ID switch and option switch on the back panel of the MMX. Refer to, 2.3 Rear Panel, MMX ID Switch (p. 9) and 2.3 Rear Panel, Option Switch (p. 10) for details on setting up the MMX ID switch and option switch.

[Master MMX] Set up the MMX ID to 0 and the MASTER MODE switch to On by using the MMX ID switch and option switch on the back panel of the MMX.

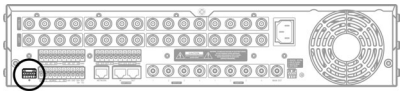


ID	MMX ID Switch
0	

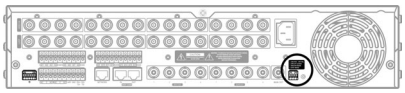


Option Switch


[Slave MMX] Set up the MMX ID from 1 to 63 and the END OF SLAVES switch set to On or Off depending on the MMX ID by using the MMX ID switch and option switch on the back panel of the MMXs. The MMX ID should be assigned to each slave MMX in order from 1 to 63.

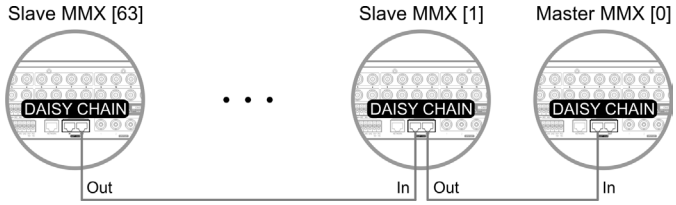


ID	MMX ID Switch
1	

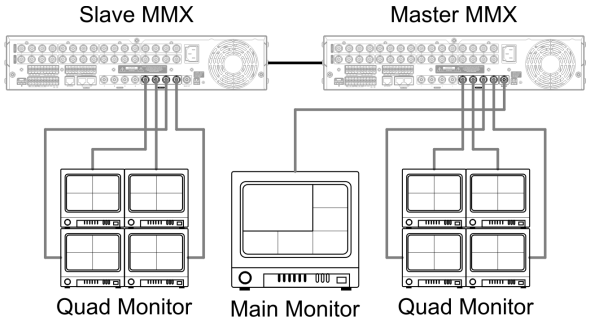


Option Switch

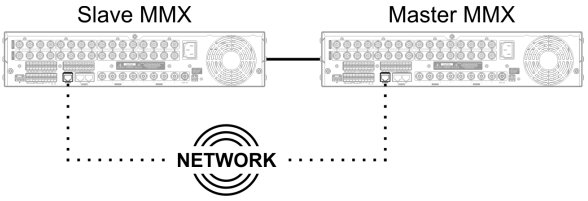

3. Connect slave MMXs to a master MMX by using the DAISY CHAIN port on the back panel. Refer to 2.3 Rear Panel, Daisy Chain In/Out (p. 9) for details on daisy chain connection.



4. Connect a main monitor to the Main Out port of a master MMX for live monitoring in various layouts, and quad monitors or spot monitors to the Quad Out or Spot Out ports of the master MMX and slave MMXs for live monitoring in quad or single-screen layout. Sequence and event monitoring are supported in each monitor.



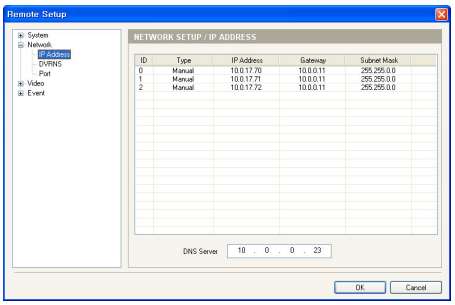
5. Connect MMXs to network via Ethernet connections by using the NETWORK port on the back panel. All MMXs should be networked via Ethernet. Otherwise, the MMX system might not work properly.



6. Run the INIT program and connect to the master MMX. Refer to the INIT User's Manual for details on the INIT program.

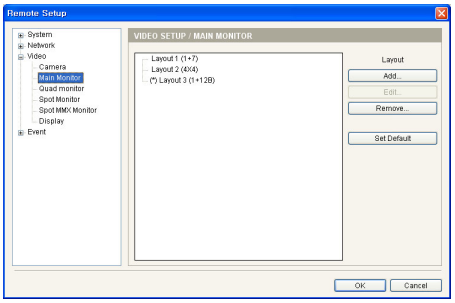
   6.1. Go to the following menus: Remote Setup → Network → IP Address

   Set up the network connection information of a master MMX and slave MMXs. The MMX IDs of a master MMX (0) and slave MMXs (1 to 63) set by using the MMX ID switch on the back panel are displayed in the list. Settings of a master MMX are applied to slave MMXs if the option switch setting and daisy-chain connection are set up properly.



   6.2. Go to the following menus: Remote Setup → Video → Main Monitor, Quad Monitor, Spot Monitor

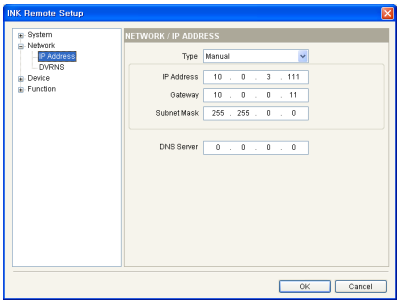
   Select a monitor and click the Edit button to set up layouts. Refer to 4.1 Main Monitor, Configuring Main Monitor Layout (p. 31) for details on setting up monitor layout.



7. Run the INIT program and connect to a network keyboard. Refer to the User's Manual of the network keyboard for details on setting up the network keyboard.

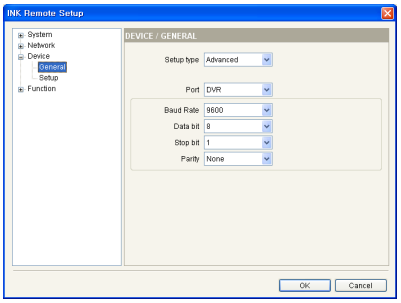
   7.1. Go to the following menus: Remote Setup → Network → IP Address

   Set up the network keyboard's network connection information.



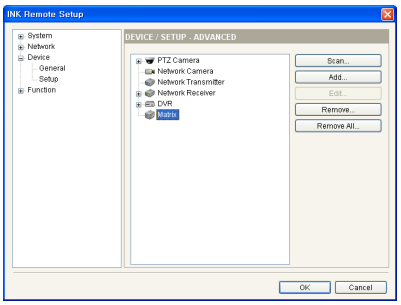
7.2. Go to the following menus: Remote Setup → Device → General

Select Advanced from the Device type drop-down menu.

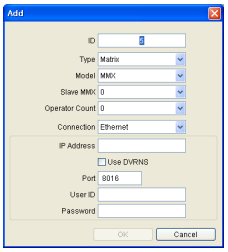


7.3. Go to the following menus: Remote Setup → Device → Setup

Select MMX in the list and click the Add button to register the MMX on the network keyboard. Slave MMXs are registered on the network keyboard automatically when the master MMX is registered.



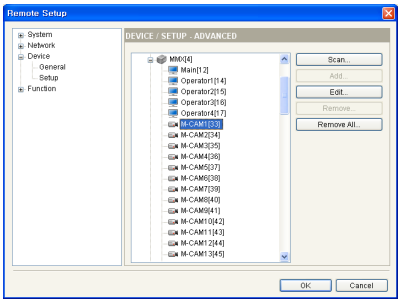
7.4. Set up the registration information.



- ID: The network keyboard assigns the ID automatically in registration order and you can change it. The ID will be used when controlling the MMX by a network keyboard.
- Slave MMX: Select the number of slave MMXs daisy chained to the master MMX. The slave MMXs are registered on the network keyboard automatically when the master MMX is registered.
- IP Address, Port, User ID, Password: Enter the IP address, port number, user ID and password for the connection to the MMX.

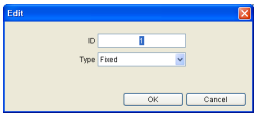
7.5. Click the OK button.

7.6. Click the registered MMX, and monitors and cameras connected to the MMX are displayed in the list.



- Main [ID]: Indicates the ID of the main monitor connected to the master MMX
- M-CAM No. [ID]: Indicates the Video In number and ID of the camera connected to the MMX. (M: master MMX, S1: slave MMX (1))

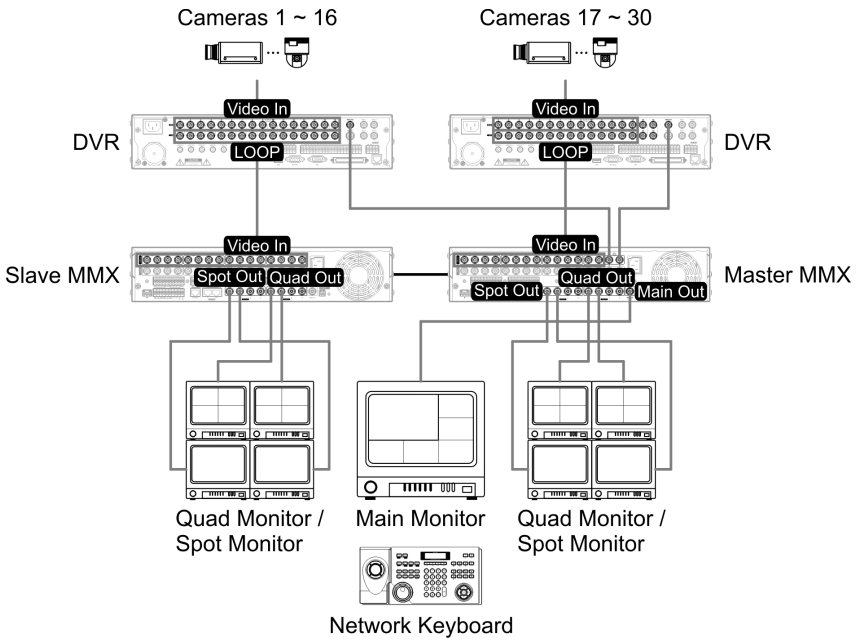
7.7. Click a camera in the list and the Edit button to change the settings of camera.



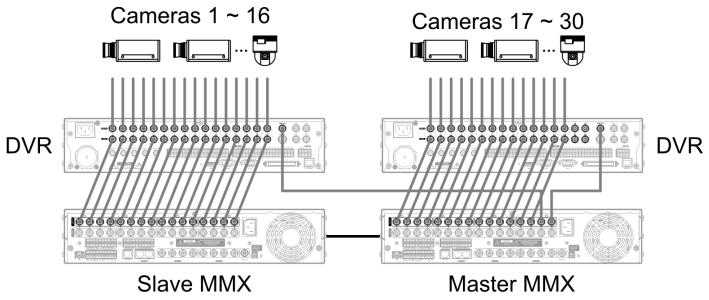
- ID: The network keyboard assigns the ID automatically in registration order when the device is registered and you can change it. The ID will be used when controlling the camera by a network keyboard.
- Type: Set up the camera type.
  - Fixed: Select if the camera is not a PTZ camera.
  - PTZ Camera: Select if the camera is a PTZ camera and set up the device that the PTZ camera is connected. You should select PTZ Camera when the camera is connected to the RS485 port of the MMX.

3.2 Medium-Sized System

When connecting controllable DVRs, you can monitor live video from cameras connected to the DVRs, play back video recorded in DVRs and change DVR settings.

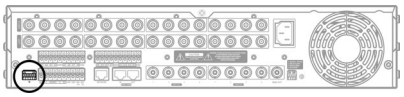


1. Connect the loop out of DVRs to the Video In ports of a master MMX and slave MMXs for live monitoring of video from DVRs on the monitors connected to the MMXs in various layouts.
2. Connect the Main Out of DVRs to the Video In ports of a master MMX and slave MMXs for playback of video recorded in the DVRs and change of DVR settings. The number of cameras that can be connected to the DVRs decreases as the number of DVRs. Connect the Main out of DVRs to the Video In ports of MMXs from the last slave MMXs to the first slave MMXs in order. You can also connect the Main Out of DVRs to Video In of MMXs in one to one. You will use the Video In number when configuring a network keyboard for the remote control so please write down the Video In numbers of MMXs.

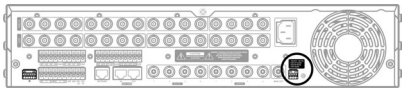


3. Set up the MMX ID and options by using the MMX ID switch and option switch on the back panel of the MMX. Refer to 2.3 Rear Panel, MMX ID Switch (p. 9) and 2.3 Rear Panel, Option Switch (p. 10) for details on setting up the MMX ID switch and option switch.

[Master MMX] Set up the MMX ID to 0 and the MASTER MODE switch to On by using the MMX ID switch and option switch on the back panel of the MMX.

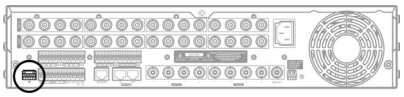


ID	MMX ID Switch
0	

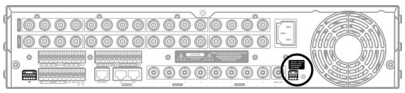


Option Switch


[Slave MMX] Set up the MMX ID from 1 to 63 and the END OF SLAVES switch set to On or Off depending on the MMX ID by using the MMX ID switch and option switch on the back panel of the MMXs. The MMX ID should be assigned to each slave MMX in order from 1 to 63.

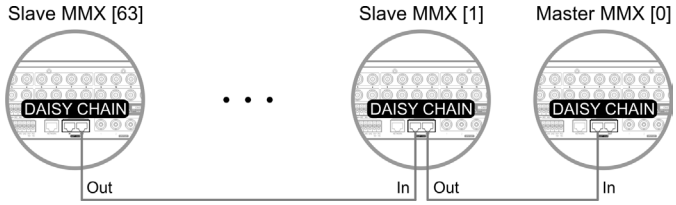


ID	MMX ID Switch
1	

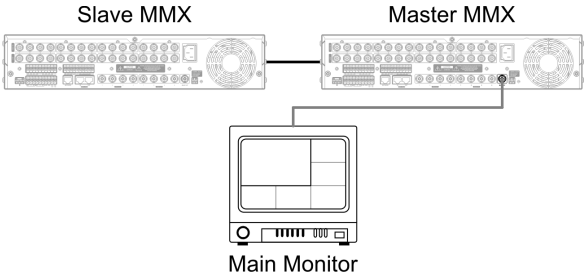


Option Switch

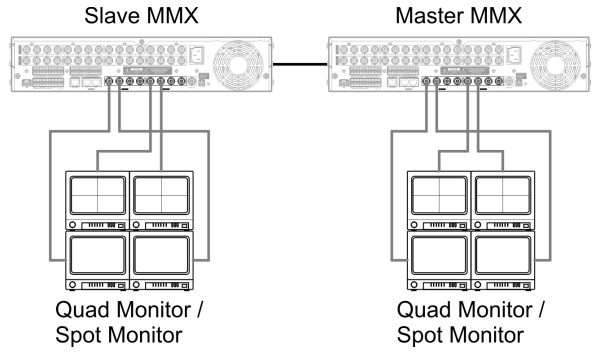

4. Connect slave MMXs to a master MMX by using the DAISY CHAIN port on the back panel. Refer to 2.3 Rear Panel, Daisy Chain In/Out (p. 9) for details on daisy chain connection.



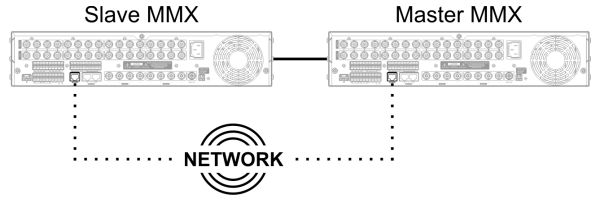
5. Connect a main monitor to the Main Out port of a master MMX for live monitoring in various layouts, playback of video recorded in the DVRs and change of DVR settings. Sequence monitoring and event monitoring also are supported.



6. Connect quad monitors or spot monitors to the Quad Out or Spot Out ports of the master MMX and slave MMXs for live monitoring in quad or sing-screen layout. Sequence and event monitoring are supported in each monitor.



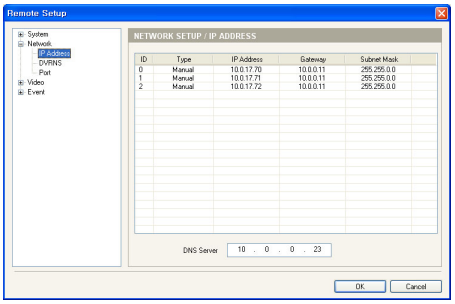
7. Connect MMXs to network via Ethernet connections by using the NETWORK port on the back panel. All MMXs should be networked via Ethernet. Otherwise, the MMX system might not work properly.



8. Run the INIT program and connect to the master MMX. Refer to the INIT User's Manual for details on the INIT program.

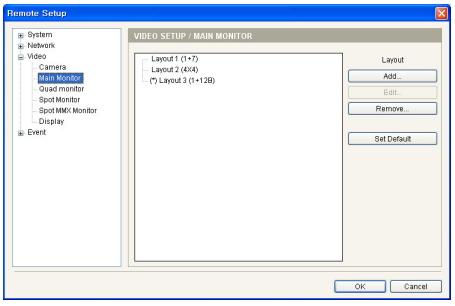
   8.1. Go to the following menus: Remote Setup → Network → IP Address

   Set up the network connection information of a master MMX and slave MMXs. The MMX IDs of a master MMX (0) and slave MMXs (1 to 63) set by using the MMX ID switch on the back panel are displayed in the list. Settings of a master MMX are applied to slave MMXs if the option switch setting and daisy-chain connection are set up properly.



   8.2. Go to the following menus: Remote Setup → Video → Main Monitor, Quad Monitor, Spot Monitor

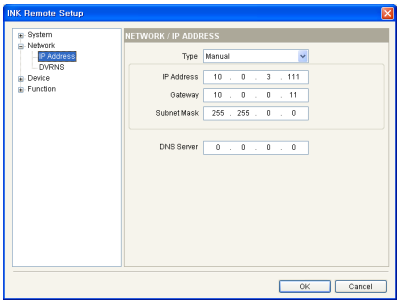
   Select a monitor and click the Edit button to set up layouts. Refer to 4.1 Main Monitor, Configuring Main Monitor Layout (p. 31) for details on setting up monitor layout.



9. Run the INIT program and connect to a network keyboard. Refer to the User's Manual of the network keyboard for details on setting up the network keyboard.

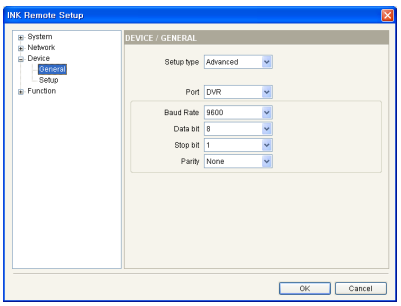
9.1. Go to the following menus: Remote Setup → Network → IP Address

Set up the network keyboard's network connection information.



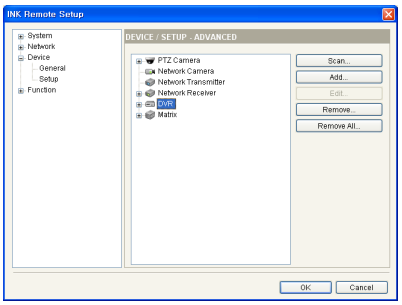
9.2. Go to the following menus: Remote Setup → Device → General

Select Advanced from the Device type drop-down menu.



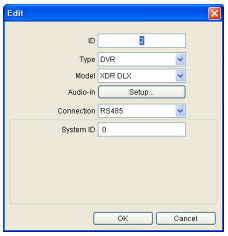
9.3. Go to the following menus: Remote Setup → Device → Setup

Select DVR in the list and click the Add button to register the DVR on the network keyboard. You should register DVRs to play back video recorded in the DVRs or change the DVR settings by a network keyboard.



9.4. Set up the registration information.

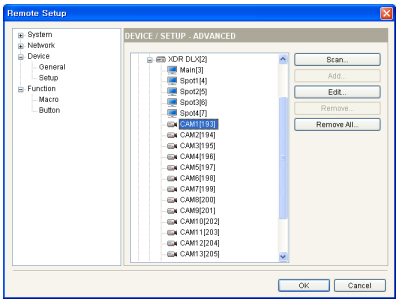
- ID: The network keyboard assigns the ID automatically in registration order and you can change it. The ID will be used when controlling the device by a network keyboard.
- Connection: Select Ethernet and enter the IP address, port number, user ID and password for the connection to the MMX.



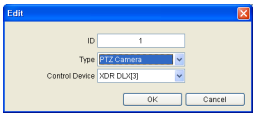
9.5. Click the OK button.

9.6. Click the registered DVR, and monitors and cameras connected to the DVR are displayed in the list.

- Main [ID]: Indicates the ID of the main monitor connected to the DVR.
- Spot No. [ID]: Indicates the Spot out number and ID of the spot monitor connected to the DVR.
- CAM No. [ID]: Indicates the Video In number of the DVR and the camera ID.



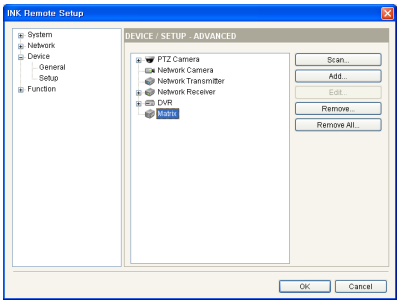
9.7. Click a camera in the list and the Edit button to change the settings of camera.



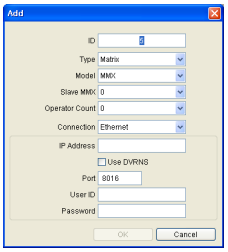
- ID: Set up a camera ID to distinguish the camera from others when controlling the camera by a network keyboard. You should press the camera ID button when controlling the camera by a network keyboard.
- Type: Set up the camera type.
  - Fixed: Select if the camera is not a PTZ camera.
  - PTZ Camera: Select if the camera is a PTZ camera and set up the device that the PTZ camera is connected.

9.8. Go to the following menus: Remote Setup → Device → Setup

Select MMX in the list and click the Add button to register the MMX on the network keyboard. Slave MMXs are registered on the network keyboard automatically when the master MMX is registered.



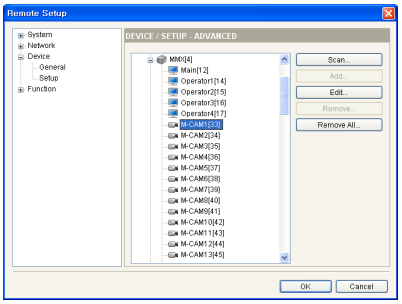
9.9. Set up the registration information.



- ID: The network keyboard assigns the ID automatically in registration order and you can change it. The ID will be used when controlling the MMX by a network keyboard.
- Slave MMX: Select the number of slave MMXs daisy chained to the master MMX. The slave MMXs are registered on the network keyboard automatically when the master MMX is registered.
- IP Address, Port, User ID, Password: Enter the IP address, port number, user ID and password for the connection to the MMX.

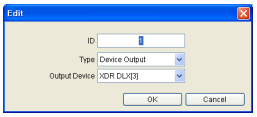
9.10. Click the OK button.

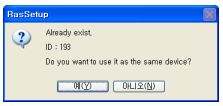
9.11. Click the registered MMX, and monitors and cameras connected to the MMX are displayed in the list.



- Main [ID]: Indicates the ID of the main monitor connected to the master MMX
- M-CAM No. [ID]: Indicates the Video In number and ID of the camera connected to the MMX. (M: master MMX, S1: slave MMX (1))

9.12. Click a camera in the list and the Edit button to change the settings of camera.



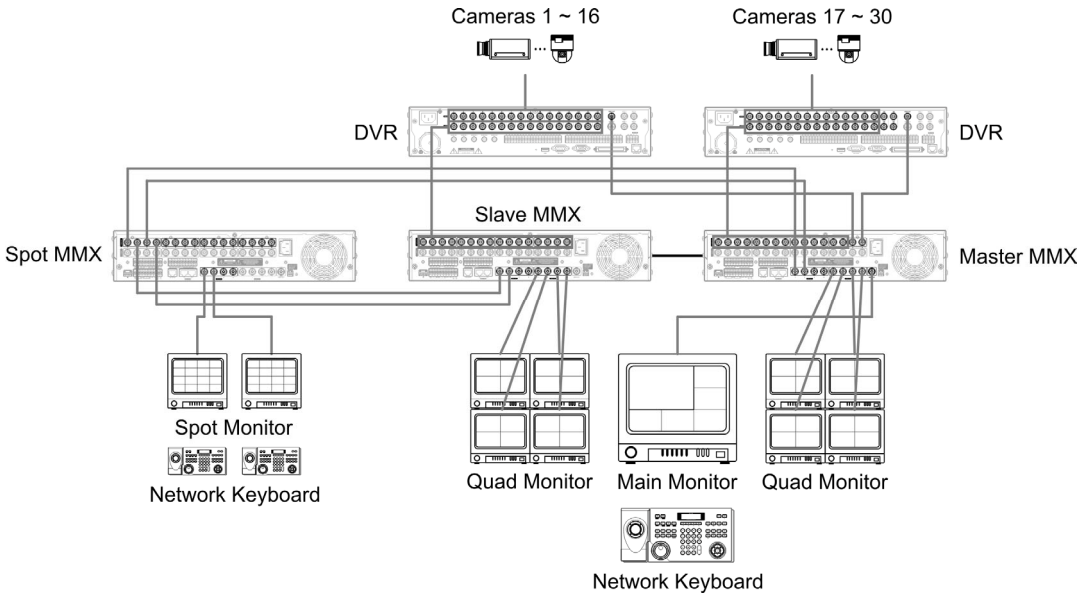


- ID: The network keyboard assigns the ID automatically in registration order when the MMX is registered and you can change it. The camera ID should be identical to the camera ID set up when registering a DVR. The number of possible cameras decreases if the camera ID is different from the camera ID set up when registering a DVR. When clicking the OK button displays a message box to confirm using the same ID. Click the OK button to complete the changes. The ID will be used when controlling the camera by a network keyboard.

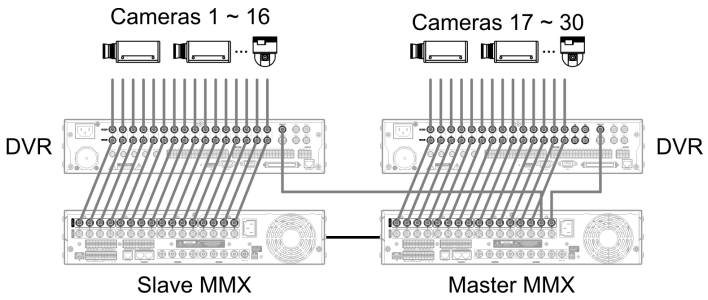
- Type: Set up the camera type.
  - Device Output: Select if the Main Out of the DVR is connected to the Video In port of the MMX and select the DVR.
  - Fixed: Select if the camera is not a PTZ camera.
  - PTZ Camera: Select if the camera is a PTZ camera and set up the device that the PTZ camera is connected.

3.3 Enterprise-Sized System

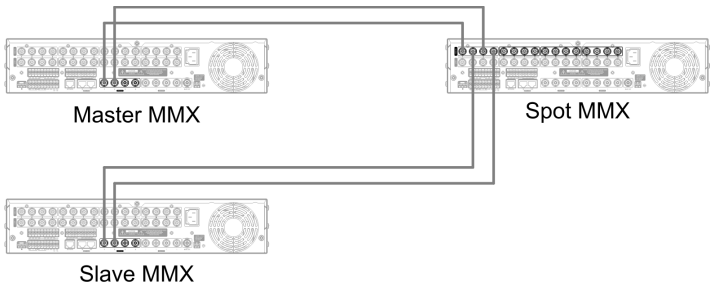
When connecting controllable DVRs, you can monitor live video from cameras connected to the DVRs, play back video recorded in DVRs and change DVR settings. When connecting spot MMXs (max. 4) to a master MMX and slave MMXs, you can monitor live video from cameras connected to the DVRs on the spot MMX monitors (max. 4) at the same time.



1. Connect the loop out of DVRs to the Video In ports of a master MMX and slave MMXs for live monitoring of video from DVRs on the monitors connected to the MMXs in various layouts.
2. Connect the Main Out of DVRs to the Video In ports of a master MMX and slave MMXs for playback of video recorded in the DVRs and change of DVR settings. The number of cameras that can be connected to the DVRs decreases as the number of DVRs. Connect the Main out of DVRs to the Video In ports of MMXs from the last slave MMXs to the first slave MMXs in order. You can also connect the Main Out of DVRs to Video In of each MMXs in one to one. You will use the Video In number when configuring a network keyboard for the remote control so please write down the Video In numbers of MMXs.



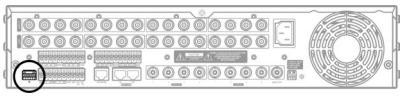
3. Connect the Spot Out of a master MMX and slave MMXs to the Video In ports of spot MMXs. The number of spot outs of a master MMX and each slave MMX should be the same. The port connection order might be different depending on the number of DVRs and spot MMX monitors. Check the port connection order in 5.3 Video, Spot MMX Monitor (p. 50) setting. The master or slave MMXs should be connected to the spot MMXs in order set in the program. Otherwise, the MMX system might not work properly.



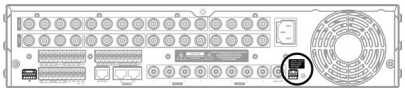
Master MMX and Slave MMXs				Spot MMX
Master MMX: Spot Out 1	→	To	→	Video In 1
Slave MMX: Spot Out 1	→	To	→	Video In 2
Master MMX: Spot Out 2	→	To	→	Video In 3
Slave MMX: Spot Out 2	→	To	→	Video In 4

4. Set up the MMX ID and options by using the MMX ID switch and option switch on the back panel of the MMX. Refer to 2.3 Rear Panel, MMX ID Switch (p. 9) and 2.3 Rear Panel, Option Switch (p. 10) for details on setting up the MMX ID switch and option switch.

[Master MMX] Set up the MMX ID to 0 and the MASTER MODE switch to On by using the MMX ID switch and option switch on the back panel of the MMX.

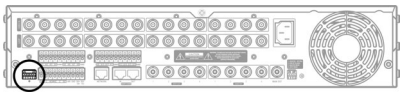


ID	MMX ID Switch
0	

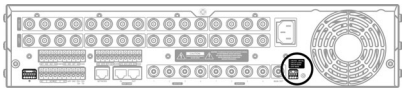


Option Switch


[Spot MMX] Set up the MMX ID from 0 to 3, the END OF SLAVES switch set to On or Off depending on the MMX ID and SPOT MODE switch set to On by using the MMX ID switch and option switch on the back panel of the MMX. The MMX ID should be assigned to each spot MMX in order from 0 to 3. Otherwise, the MMX system might not work properly. Refer to 2.3 Rear Panel, MMX ID Switch (p. 9) and 2.3 Rear Panel Option Switch (p. 10) for details on setting up the MMX ID switch and option switch.

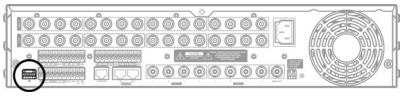


ID	MMX ID Switch
0	

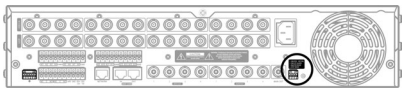


Option Switch


[Slave MMX] Set up the MMX ID from 1 to 63 and the END OF SLAVES switch set to On or Off depending on the MMX ID by using the MMX ID switch and option switch on the back panel of the MMXs. The MMX ID should be assigned to each slave MMX in order from 1 to 15.

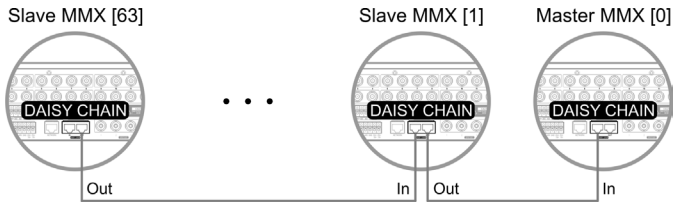


ID	MMX ID Switch
1	

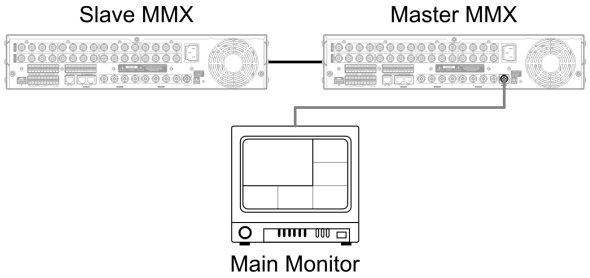


Option Switch

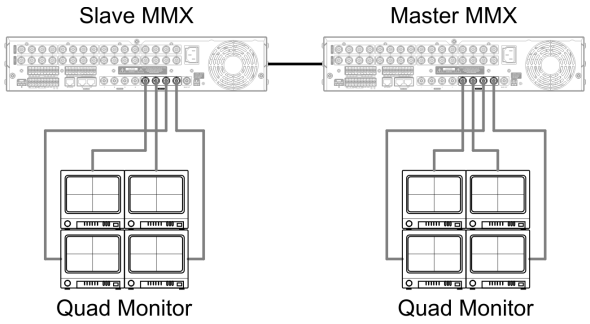

5. Connect slave MMXs to a master MMX by using the DAISY CHAIN port on the back panel. Refer to 2.3 Rear Panel, Daisy Chain In/Out (p. 9) for details on daisy chain connection.



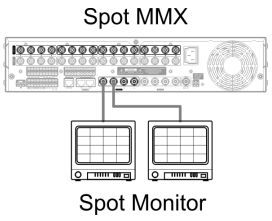
6. Connect a main monitor to the Main Out port of a master MMX for live monitoring in various layouts, playback of video recorded in the DVRs and change of DVR settings. Sequence monitoring and event monitoring also are supported.



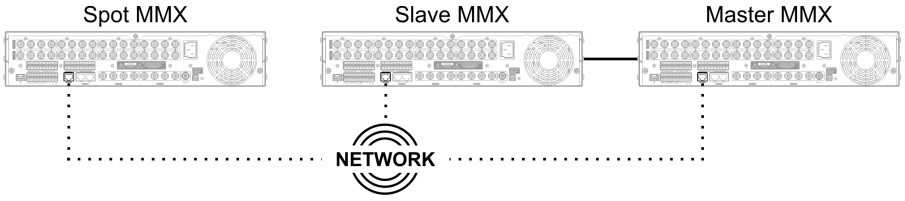
7. Connect quad monitors or spot monitors to the Quad Out or Spot Out ports of the master MMX and slave MMXs for live monitoring in quad or single-screen layout. Sequence and event monitoring are supported in each monitor.



8. Connect spot monitors to the Spot Out ports of the spot MMXs. Live monitoring of the same channel on the spot monitors of up to four at the same time is supported.



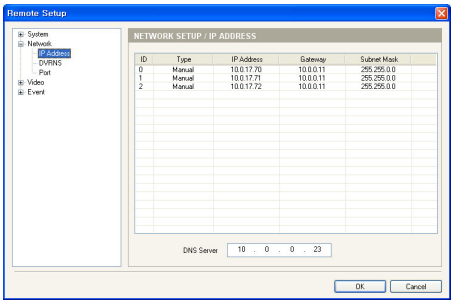
9. Connect MMXs to network via Ethernet connections by using the NETWORK port on the back panel. All MMXs should be networked via Ethernet. Otherwise, the MMX system might not work properly.



10. Run the INIT program and connect to the master MMX. Refer to the INIT User's Manual for details on the INIT program.

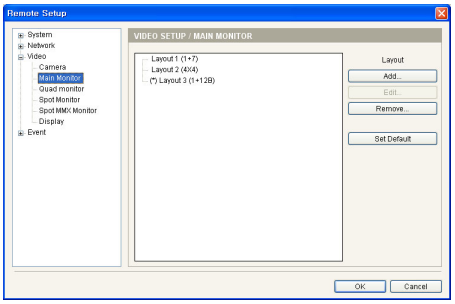
    10.1. Go to the following menus: Remote Setup → Network → IP Address

    Set up the network connection information of a master MMX and slave MMXs. The MMX IDs of a master MMX (0) and slave MMXs (1 to 63) set by using the MMX ID switch on the back panel are displayed in the list. Settings of a master MMX are applied to slave MMXs if the option switch setting and daisy-chain connection are set up properly.



    10.2. Go to the following menus: Remote Setup → Video → Main Monitor, Quad Monitor, Spot Monitor

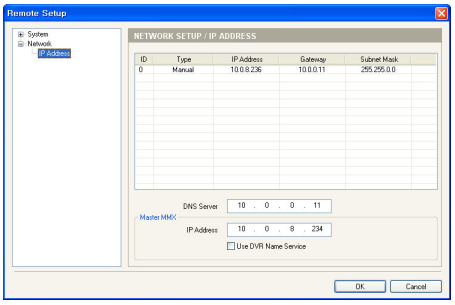
    Select a monitor and click the Edit button to set up layouts. Refer to 4.1 Main Monitor, Configuring Main Monitor Layout (p. 31) for details on setting up monitor layout.



11. Run the INIT program and connect to the spot MMX. Check the MMX ID switch and option switch settings on the back panel of the spot MMX if the spot MMX is not displayed in the list. (Installation process 0)

    11.1. Go to the following menus: Remote Setup → Network → IP Address

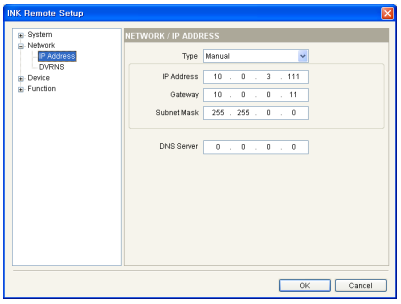
    Set up the network connection information of a spot MMX and enter the IP address (or name) of the master MMX that the spot MMX is connected. The spot MMX is registered on the master MMX.



12. Run the INIT program and connect to a network keyboard. Refer to the User's Manual of the network keyboard for details on setting up the network keyboard.

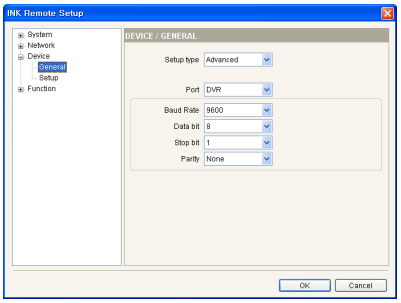
    12.1. Go to the following menus: Remote Setup → Network → IP Address

    Set up the network keyboard's network connection information.



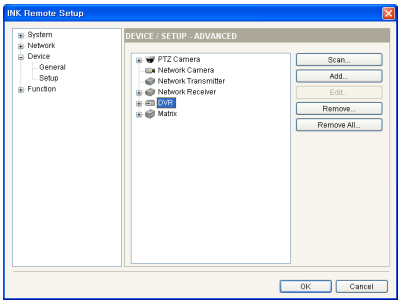
12.2. Go to the following menus: Remote Setup → Device → General

Select Advanced from the Device type drop-down menu.



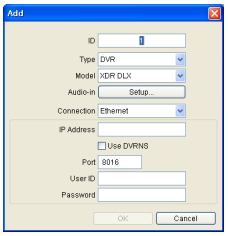
12.3. Go to the following menus: Remote Setup → Device → Setup

Select DVR in the device list and click the Add button to register the DVR on the network keyboard. You should register DVRs to play back video recorded in the DVRs or change the DVR settings by a network keyboard.



12.4. Set up the registration information.

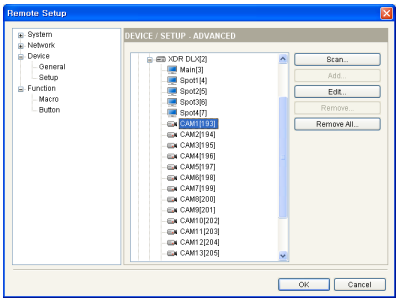
- ID: The network keyboard assigns the ID automatically in registration order and you can change it. The ID will be used when controlling the device by a network keyboard.
- Connection: Select Ethernet and enter the IP address, port number, user ID and password for the connection to the MMX.



12.5. Click the OK button.

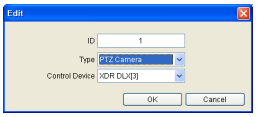
12.6. Click the registered DVR, and monitors and cameras connected to the DVR are displayed in the list.

- Main [ID]: Indicates the ID of the main monitor connected to the DVR.
- Spot No. [ID]: Indicates the Spot out number and ID of the spot monitor connected to the DVR.
- CAM No. [ID]: Indicates the Video In number of the DVR and the camera ID.



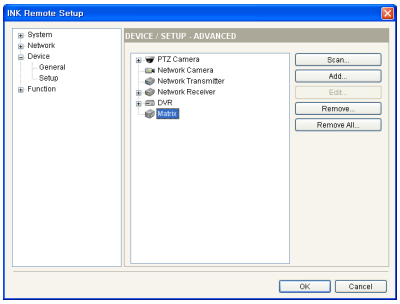
12.7. Click a camera in the list and the Edit button to change the settings of camera.

- ID: The network keyboard assigns the ID automatically in registration order when the DVR is registered and you can change it. The ID will be used when controlling the monitor or camera by a network keyboard.
- Type: Set up the camera type.
  - Fixed: Select if the camera is not a PTZ camera.
  - PTZ Camera: Select if the camera is a PTZ camera and set up the device that the PTZ camera is connected.



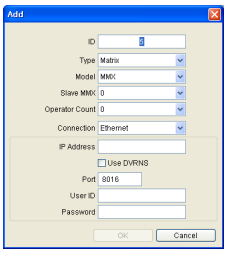
12.8. Go to the following menus: Remote Setup → Device → Setup

Select MMX and click the Add button to register the MMX on the network keyboard. Slave MMXs and spot MMXs are registered on the network keyboard automatically when the master MMX is registered.



12.9. Set up the registration information.

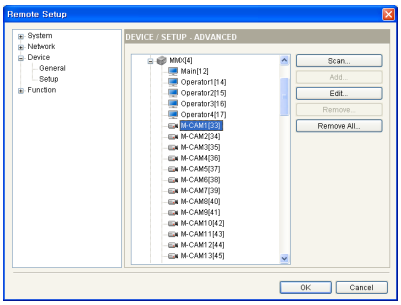
- ID: The network keyboard assigns the ID automatically in registration order and you can change it. The ID will be used when controlling the MMX by a network keyboard.
- Slave MMX: Enter the number of slave MMXs daisy chained to the master MMX. The slave MMXs are registered on the network keyboard automatically when the master MMX is registered.
- Operator Count: Select the number of spot MMX monitors. The spot MMXs are registered on the network keyboard automatically when the master MMX is registered.
- IP Address, Port, User ID, Password: Enter the IP address, port number, user ID and password for the connection to the MMX.



12.10. Click the OK button.

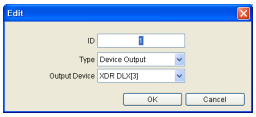
12.11. Click the registered MMX, and monitors and cameras connected to the MMX are displayed in the list.

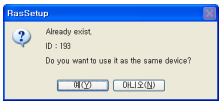
- Main [ID]: Indicates the ID of the main monitor connected to the master MMX
- Operator No.[ID]: Indicates the Spot Out number of the spot MMX and spot monitor ID.
- M-CAM No. [ID]: Indicates the Video In number and ID of the camera connected to the MMX. (M: master MMX, S1: slave MMX (1))



12.12. Click a camera in the list and the Edit button to change the settings of camera.

- ID: The network keyboard assigns the ID automatically in registration order when the MMX is registered and you can change it. The camera ID should be identical to the camera ID set up when registering a DVR. The number of possible cameras decreases if the camera ID is different from the camera ID set up when registering a DVR. When clicking the OK button displays a message box to confirm using the same ID. Click the OK button to complete the changes. The ID will be used when controlling the camera by a network keyboard.



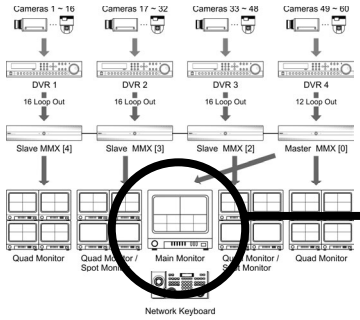


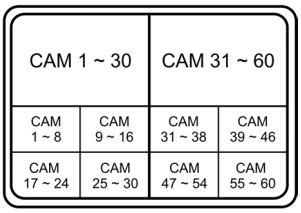
- Type: Set up the camera type.
  - Device Output: Select if the Main Out of the DVR is connected to the Video In port of the MMX and select the DVR.
  - Fixed: Select if the camera is not a PTZ camera.
  - PTZ Camera: Select if the camera is a PTZ camera and set up the device that the PTZ camera is connected.

Chapter 4 — Monitor Layout and Control

The MMX is controlled by the network keyboard provided with the MMX. Make sure that the network keyboard is connected and configured properly referring to the network keyboard's User's Manual.

4.1 Main Monitor





- CAM 1 ~ 30: Event Monitoring
- CAM 31 ~ 60: Event Monitoring
- CAM 1 ~ 8, 9 ~ 16, 17 ~ 24, 25 ~ 30, 31 ~ 38, 39 ~ 46, 47 ~ 54, 55 ~ 60: Sequence Monitoring

A main monitor is connected to a master MMX and controlled by a network keyboard. You can monitor live video on the main monitor in the preset layout or create a new layout by using a network keyboard. Sequence monitoring and event monitoring is supported for live monitoring. You can play back video recorded in DVRs or change DVR settings.

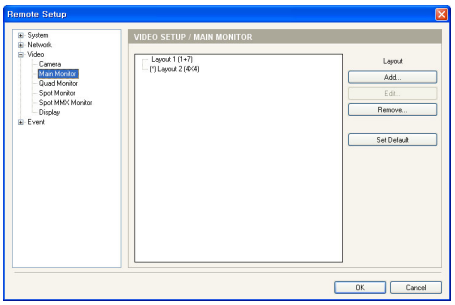
NOTES:

- Sequence monitoring allows you to monitor live video of user-defined cameras during duration time sequentially. Cameras and duration time should be preset for sequence monitoring.
- Event monitoring allows you to monitor event detected video when the user-defined events occur at the user-defined cameras. Cameras and event type should be preset for event monitoring.
- The total number of daisy-chained MMXs including a master MMX will be displayed with the number of MMXs connected properly at the bottom right corner on the monitor. ('the number of MMXs connected properly' / 'the total number of daisy-chained MMX')

Configuring Main Monitor Layout

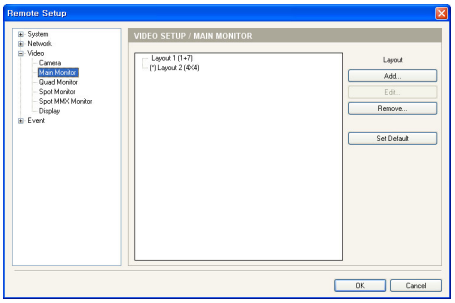
1. Go to the following menus: Remote Setup → Video → Main Monitor

   Saved layouts are displayed in the list. Click the Add button to add new layout (max. 29) and Edit button to edit the saved layout. Selecting a layout and clicking the Set Default button sets the selected layout as a default layout, (*) is displayed in front of the selected layout. Video is displayed on the main monitor in the default layout unless changing the current layout by a network keyboard.



2. Go to the following menus: Remote Setup → Video → Main Monitor

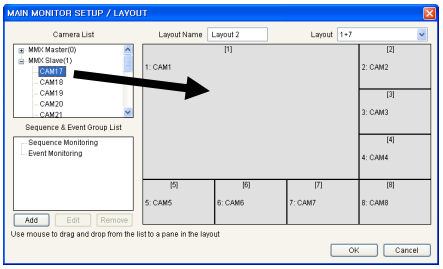
   Saved layouts are displayed in the list. Click the **Add** button to add new layout (max. 29) and **Edit** button to edit the saved layout. Selecting a layout and clicking the **Set Default** button sets the selected layout as a default layout, and video is displayed on the main monitor in the default layout unless changing the current layout by a network keyboard. (*) is displayed in front of the default layout.



NOTE: The layout number and screen division mode is displayed with the layout name in the layout list. For example, *Layout 1 (1+7)* indicates the layout 1 in the 1+7 screen division mode named as *Layout*.

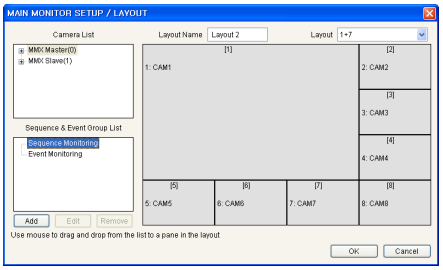
3. Go to the following menus: Remote Setup → Video → Main Monitor → **Add** or **Edit** button

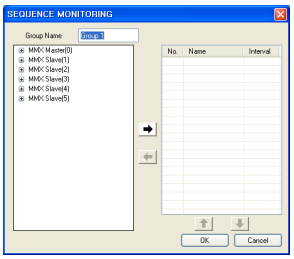
   Select the desired layout from the **Layout** drop-down menu. Click the camera or group in the **Camera List** box or **Sequence & Event Group List** box and allocate the camera or group to the pane in the layout.

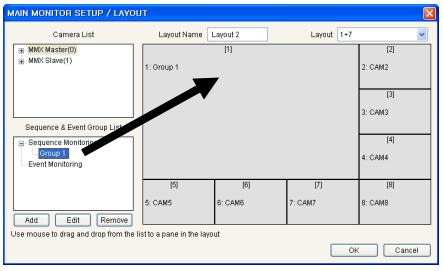


   - General Monitoring
     1. Select a camera in the **Camera List** box.
     2. Allocate the selected camera to the pane in the layout with mouse drag and drop.

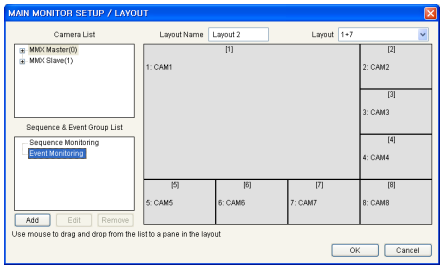
   - Sequence Monitoring
     1. Click **Sequence Monitoring** in the **Sequence & Event Group List** box.
     2. Click the **Add** button and the sequence monitoring setup box is displayed.
     3. Clicking a MMX from the list in the left displays a list of cameras connected to the MMX.
     4. Click a camera (max. 126) for sequence monitoring and the ➡ button. The selected camera is added to the sequence list in the right.
     5. Adjust the sequence order by using the ⬆ and ⬇ button and set up sequence duration.
     6. Enter the group name and click the **OK** button.
     7. Clicking the **Sequence Monitoring** in the **Sequence & Event Group List** displays the registered sequence monitoring group in the list.
     8. Click the group and allocate the selected group to the pane in the layout with mouse drag and drop.

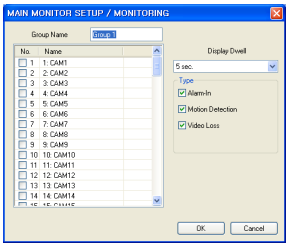


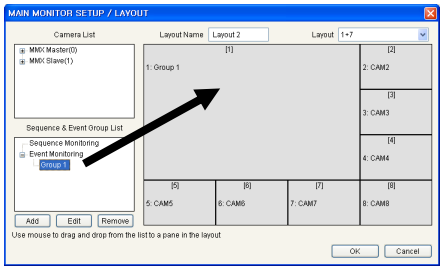




- Event Monitoring
  1. Click Event Monitoring in the Sequence & Event Group List box.
  2. Click the Add button and the event monitoring setup box is displayed.
  3. Cameras connected to the MMX are displayed in the list in the left.
  4. Select a camera for event monitoring.
  5. Select event types and set up the display duration of event detected video.
  6. Enter the group name and click the OK button.
  7. Clicking the Event Monitoring in the Sequence & Event Group List displays the registered event monitoring group in the list.
  8. Click the group and allocate the selected group to the pane in the layout with mouse drag and drop.







4. Video is displayed on the main monitor in the selected layout.

Controlling Main Monitor Display

You can change the channel or layout to be displayed on the main monitor by using a network keyboard. Refer to the User's Manual of the network keyboard for details on control by the network keyboard.

NOTE: A pane in this manual refers to each channel's location in the layout screen.

Loading Preset Main Monitor Layout

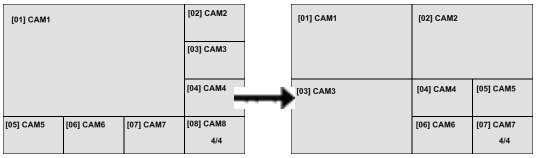
Video is displayed in the preset layout on the main monitor and you can change the layout by using a network keyboard.

1. Press the main monitor's ID on the front panel of the network keyboard. You can check the main monitor's ID by running the INIT program and connecting the network keyboard (Remote Setup → Device → Setup → MMX → Main [ID]).

2. Press the MON button.

3. Press the layout number of the main monitor. You can check the layout number by running the INIT program and connecting the MMX (Remote Setup → Video → Main Monitor) (eg. Layout *1* (3+4)).

4. Press the ⊞ (Display) button.



Controlling Cameras on Main Monitor

You can monitor live video in the desired pane on the main monitor by using a network keyboard.

1. Press the main monitor's ID on the front panel of the network keyboard. You can check the main monitor's ID by running the INIT program and connecting the network keyboard (Remote Setup → Device → Setup → MMX → Main [ID]).

2. Press the MON button. Video is displayed in the layout preset for the main monitor.

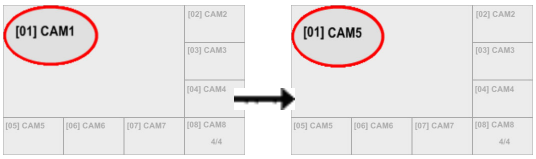
3. Press the pane number.

4. Press the PANE button.

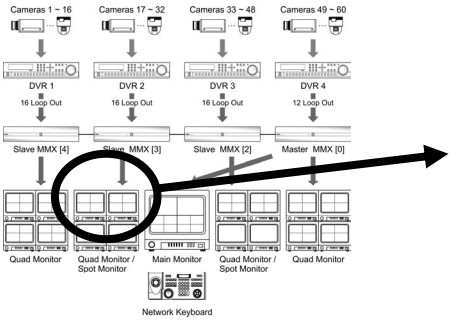
5. Press the camera ID to display on the selected pane. You can check the camera ID by running the INIT program and connecting the network keyboard (Remote Setup → Device → Setup → MMX → M-CAM No. [ID]).

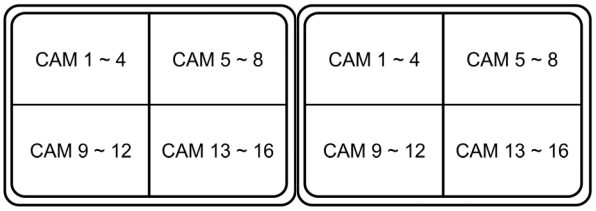
6. Press the CAM button.

7. Video from the selected camera is displayed in the selected pane on the main monitor.



4.2 Quad Monitor





<Event Monitoring> <Sequence Monitoring>

A quad monitor is connected to a master MMX and slave MMXs and displays video (quad or single-screen layout) from the connected MMX. The quad monitor is not controlled by a network keyboard, and you can monitor live video on the quad monitor in the preset layout only. Sequence monitoring and event monitoring is supported for live monitoring depending on the settings.

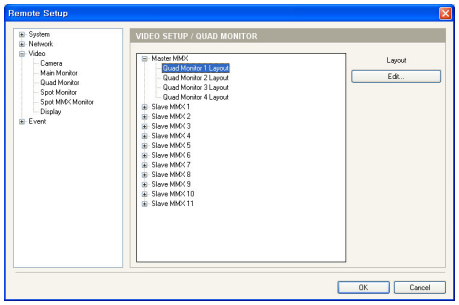
NOTES:

- Sequence monitoring allows you to monitor live video of user-defined cameras during duration time sequentially. Cameras and duration time should be preset for sequence monitoring.
- Event monitoring allows you to monitor event detected video when the user-defined events occur at the user-defined cameras. Cameras and event type should be preset for event monitoring.
- Sequence monitoring and event monitoring at the same time is not supported on the quad monitors.

Quad Monitor Layout

5. Go to the following menus: Remote Setup → Video → Quad Monitor

   Saved layouts are displayed in the list. Click the Add button to add new layout (max. 29) and Edit button to edit the saved layout. Selecting a layout and clicking the Set Default button displays video on the main monitor in the selected layout.

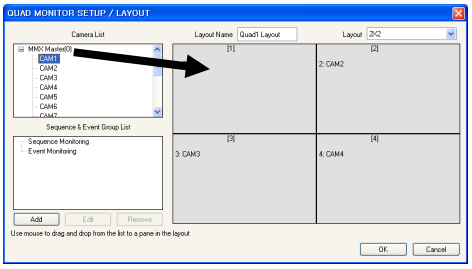


NOTES:

- The layout number indicates the Quad Out number of the MMX that the quad monitor is connected. For example, *Quad Monitor 1* indicates the layout of the quad monitor connected to *Quad Out 1* port of the MMX.
- *(*)* is displayed in front of the selected layout.

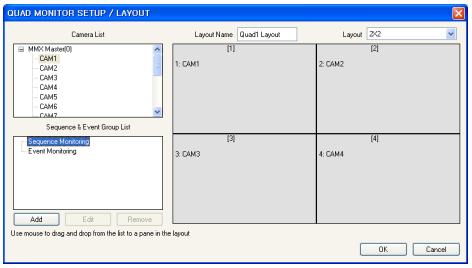
6. Go to the following menus: Remote Setup → Video → Quad Monitor → Add or Edit button

   Select the desired layout from the Layout drop-down menu. Click the camera or group in the Camera List box or Sequence & Event Group List box and allocate the camera or group to the pane in the layout.

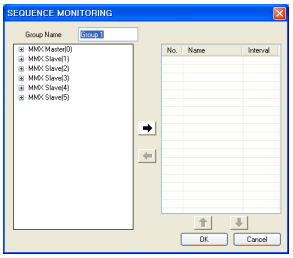


   - General Monitoring
     1. Select a camera in the Camera List box.
     2. Allocate the selected camera to the pane in the layout with mouse drag and drop.

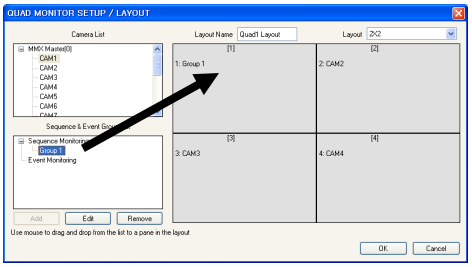
NOTE: You can allocate only cameras of the MMX that the quad monitors are connected.



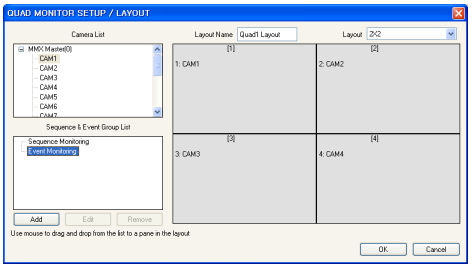
   - Sequence Monitoring
     1. Click Sequence Monitoring in the Sequence & Event Group List box.
     2. Click the Add button and the sequence monitoring setup box is displayed.
     3. Clicking a MMX from the list in the left displays a list of cameras connected to the MMX.
     4. Click a camera (max. 126) for sequence monitoring and the ➡ button. The selected camera is added to the sequence list in the right.
     5. Adjust the sequence order by using the ⬆ and ⬇ button and set up sequence duration.
     6. Enter the group name and click the OK button.
     7. Clicking the Sequence Monitoring in the Sequence & Event Group List displays the registered sequence monitoring group in the list.
     8. Click the group and allocate the selected group to the pane in the layout with mouse drag and drop.



NOTE: You cannot add an event monitoring group if a sequence monitoring group is added. The quad monitors do not support sequence monitoring and event monitoring at the same time.

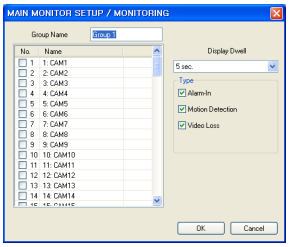


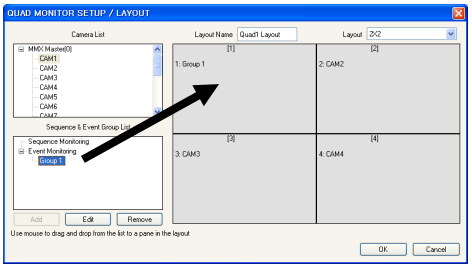
   - Event Monitoring
     1. Click Event Monitoring in the Sequence & Event Group List box.
     2. Click the Add button and the event monitoring setup box is displayed.
     3. Cameras connected to the MMX are displayed in the list in the left.
     4. Select a camera for event monitoring.
     5. Select event types and set up the display duration of event detected video.
     6. Enter the group name and click the OK button.



7. Clicking the Event Monitoring in the Sequence & Event Group List displays the registered event monitoring group in the list.
8. Click the group and allocate the selected group to the pane in the layout with mouse drag and drop.

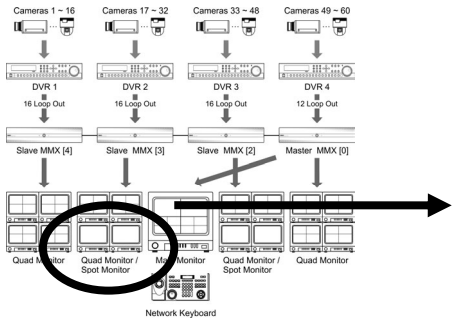
NOTE: You cannot add an sequence monitoring group if a sequence monitoring group is added. The quad monitors do not support sequence monitoring and event monitoring at the same time.

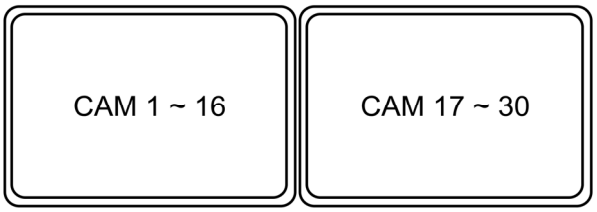




7. Video is displayed on the quad monitor in the selected layout.

4.3 Spot Monitor





- CAM 1 ~ 16: Event Monitoring
- CAM 17 ~ 30: Sequence Monitoring

A spot monitor is connected to a master MMX and slave MMXs and displays video (single screen layout) from the connected MMX. The spot monitor is not controlled by a network keyboard, and you can monitor live video on the spot monitor in the preset layout only. Sequence monitoring and event monitoring is supported for live monitoring depending on the settings.

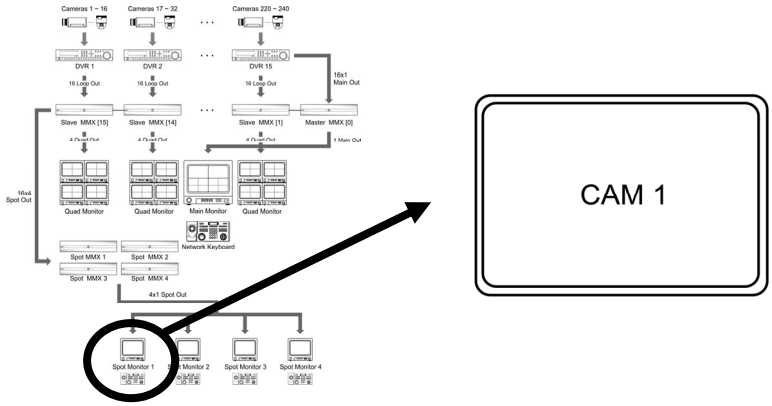
NOTES:

- Sequence monitoring allows you to monitor live video of user-defined cameras during duration time sequentially. Cameras and duration time should be preset for sequence monitoring.
- Event monitoring allows you to monitor event detected video when the user-defined events occur at the user-defined cameras. Cameras and event type should be preset for event monitoring.
- Sequence monitoring and event monitoring at the same time is not supported on the spot monitors.

Spot Monitor Layout

The way to set up layout for quad monitors are identical to the way to set up the layout for spot monitors. Refer to 4.2 Quad Monitor, Quad Monitor Layout (p. 35) for details.

4.4 Spot MMX Monitor



A spot MMX monitor is connected to a spot MMX and controlled by a network keyboard. You can monitor live video on the spot MMX monitor in the preset layout or create a new layout by using a network keyboard. You can play back video recorded in DVRs or change DVR settings.

NOTE: You can monitor live video on the spot MMX monitor in the layout created by a network keyboard only.

Spot MMX Monitor Control

You can change the channel to be displayed on the spot MMX monitor by using a network keyboard. Refer to the User's Manual of the network keyboard for details on control by the network keyboard.

Monitoring Video from Cameras

You can monitor live video from cameras on the spot MMX monitor by using a network keyboard.

1. Press the spot MMX monitor's ID on the front panel of the network keyboard. You can check the spot MMX monitor's ID by running the INIT program and connecting the network keyboard (Remote Setup → Device → Setup → MMX → Operator No. [ID]).

2. Press the MON button. Video from cameras connected to a master MMX is displayed on the spot MMX monitor. (Spot Out 1 of a spot MMX displays video from Video In 1 of a master MMX, and Spot Out 4 of a spot MMX displays video from Video In 4 of a master MMX)

3. Press the camera ID. You can check the camera ID by running the INIT program and connecting the network keyboard (Remote Setup → Device → Setup → MMX → CAM No. [ID]).

4. Press the CAM button.

5. Video from the selected camera is displayed on the spot MMX monitor.

Monitoring and Playback Video from Cameras

You can monitor and play back video from cameras on the spot MMX monitor by using a network keyboard.

1. Press the spot MMX monitor's ID on the front panel of the network keyboard. You can check the spot MMX monitor's ID by running the INIT program and connecting the network keyboard (Remote Setup → Device → Setup → MMX → Operator No. [ID]).

2. Press the MON button. Video from cameras connected to a master MMX is displayed on the spot MMX monitor. (Spot Out 1 of a spot MMX displays video from Video In 1 of a master MMX, and Spot Out 4 of a spot MMX displays video from Video In 4 of a master MMX)

3. Press the DVR ID. You can check the DVR ID by running the INIT program and connecting the network keyboard (Remote Setup → Device → Setup → DVR → XDR DLX [ID]).

4. Press the DEV button.

5. Press the Video In number of the DVR that the camera is connected. You can check the Video In number (CAM No.) by running the INIT program and connecting the network keyboard (Remote Setup → Device → Setup → DVR → XDR DLX [ID] → CAM No. [ID]).

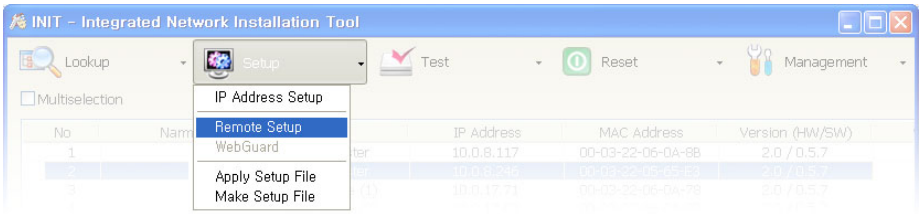
6. Press the CAM button.

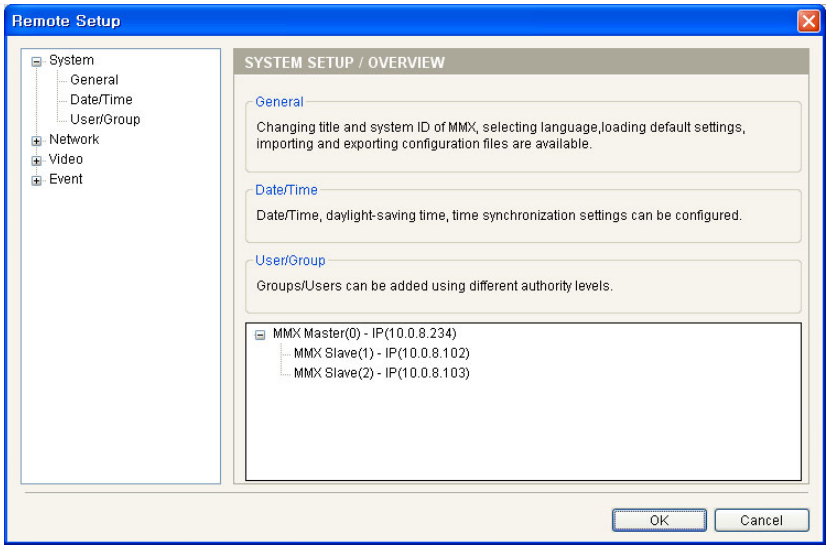
7. Video from the selected camera is displayed on the spot MMX monitor, and you can play back video recorded in the DVR or change the settings by using a network keyboard.

Chapter 5 — Configuration

Remote Setup allows you to change all settings of a master MMX and slave MMXs daisy-chained to the master MMX. Run the INIT program, select a master MMX to change settings and click the Setup icon on the Main screen. You can also display the Setup menu by selecting a desired master MMX and clicking the right mouse button on the Main screen. Select Remote Setup from the Setup menu and the Remote Setup screen appears.

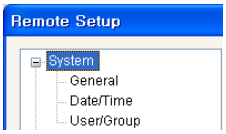
NOTE: The *Multiselection* option for selecting MMXs is not available for the remote setup.





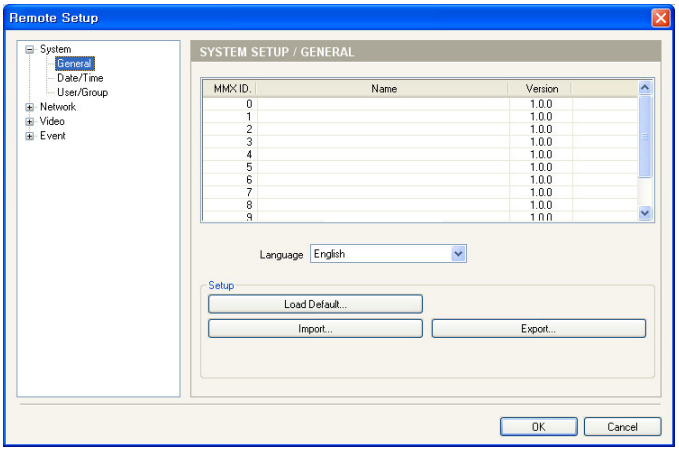
Clicking a menu in the left of the Remote Setup screen displays the current settings for that menu on the right side of the screen. Clicking submenus under each menu allows you to change the settings. Clicking the OK button closes the Remote Setup screen and applies the changes.

5.1 System



You can change a device's system information, import or export all settings, and add users or groups. When you click the System menu on the Remote Setup screen, the current System settings are displayed on the right side of the screen.

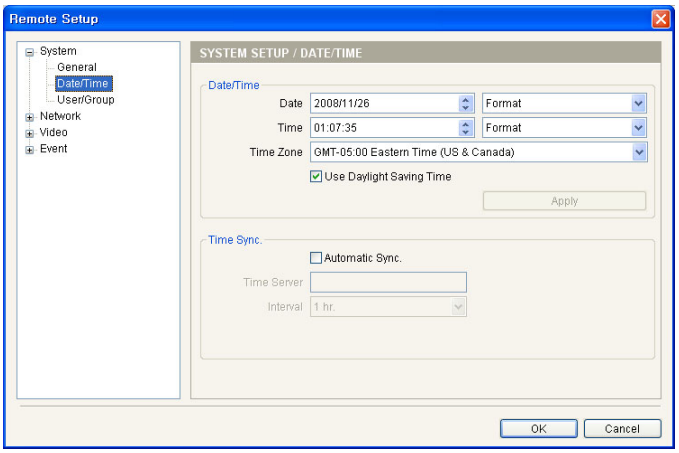
General



- MMX ID, Version: Displays the device's ID and software versions.
- Name: Enter the device's name (up to 31 characters including spaces).
- Language: Choose the language to be used during remote setup.
- Setup
  - Load Default: Click to return all except network related settings to the original factory settings.
  - Import: Click to apply the settings saved as a .mda file format to a master MMX and all slave MMXs daisy-chained to the master MMX at once. A setup screen appears allowing you to select the setup file. You can select whether or not network settings (IP address, port number, DVRNS) will be included when the setup is applied.
  - Export: Click to save the current settings of the master MMX and all slave MMXs daisy-chained to the master MMX as a .mda file format at once. A setup screen appears allowing you to name the setup file.

NOTE: You cannot import saved MMX settings when the number of MMXs is different from the number of MMXs in the saved MMX settings.

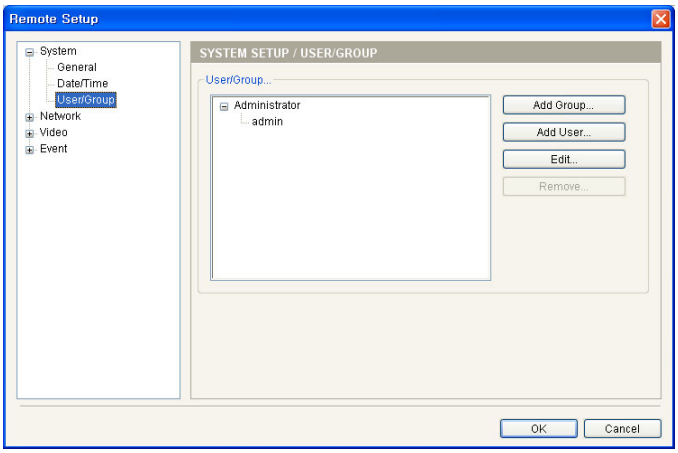
Date/Time



- Date/Time: Change the system date/time, date/time format and time zone, and turn daylight saving time on or off by checking the box. Clicking the Apply button applies the changes immediately.
- Time Sync
  - Automatic Sync: Check the box to automatically synchronize the time with a time server. Enter the IP address or the domain name of the time server and set the time interval for synchronization.

NOTE: You can use the domain name instead of the IP address of the time server during the *Time Sync* setting if you set up the DNS Server when setting up network.

User/Group

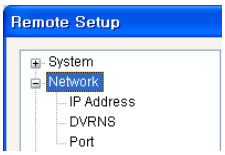


- User/Group: Click the buttons to change the settings for a group or a user allowed to control the MMX remotely.
  - Add Group: Click to add a group. Enter the desired group name and set authority levels for the group to control the MMX remotely.
  - Add User: Click to add a user. Enter the desired user name and select the group that the user will belong to. Enter a password to be assigned to the user.
  - Edit: Select a group and click the button to change authority levels assigned to the group, or select a user and click the button to change the user's password.
  - Remove: Select a group or user and click the button to delete the group or user.

NOTES:

- The *User/Group* changes are permitted only to the users belonged to the *Administrator* group.
- The authority levels that can be assigned are:
  - Upgrade: The user can upgrade the software.
  - Setup: The user can set up the system.

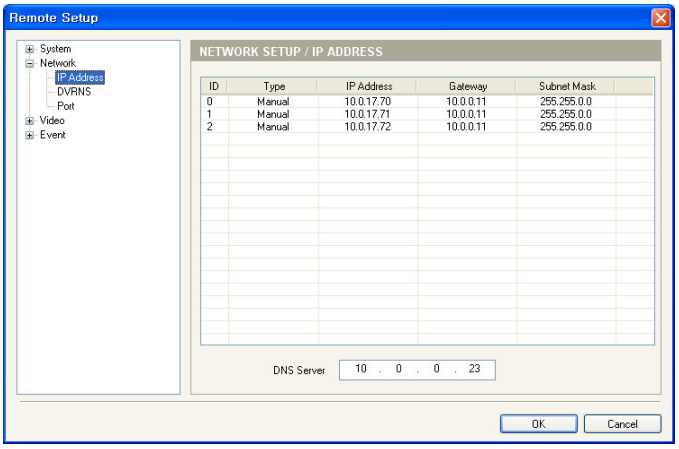
5.2 Network



You can change the network settings and set up DVRNS function. When you click the Network menu on the Remote Setup screen, the current Network settings are displayed on the right side of the screen.

IP Address

Master MMX and Slave MMXs

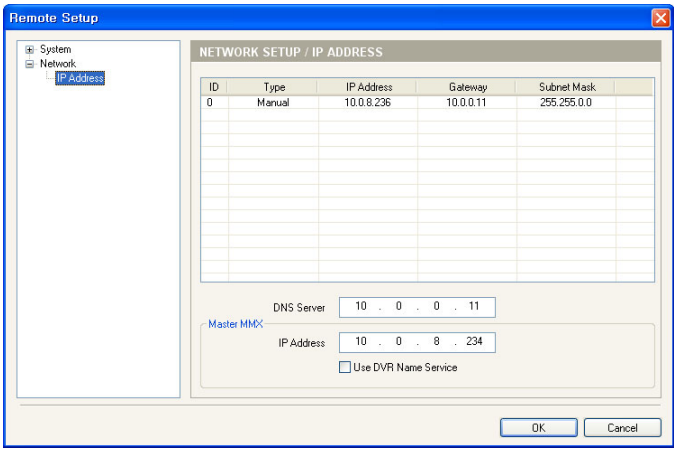


You can set up the network connection information of the master MMX and all slave MMXs daisy-chained to the master MMX.

- Type: Select the type of network configuration.
  - Manual: Select when the MMX is using a static IP address for network connection, and set up LAN parameters manually.
  - DHCP: Select when the MMX is networked via DHCP (Dynamic Host Configuration Protocol). Click the OK button, and a temporary IP address is automatically assigned to the MMX. The MMX periodically will be issued a new IP address automatically.
- DNS Server: Enter the IP address of the DNS server. If you set up the DNS server, the domain name of the server can be used instead of the IP address when the DVRNS, time and SMTP servers are set up. Ask your Internet service provider for the IP Address of the DNS Server.

Spot MMXs

When a spot MMX is connected to the master MMX and slave MMXs, you have to connect to a spot MMX and register the spot MMX on the master MMX. Run the INIT program and select a spot MMX and click the Setup icon on the Main screen. You can also display the Setup menu by selecting a desired spot MMX and clicking the right mouse button on the Main screen. Select Remote Setup from the Setup menu and the Remote Setup screen appears.

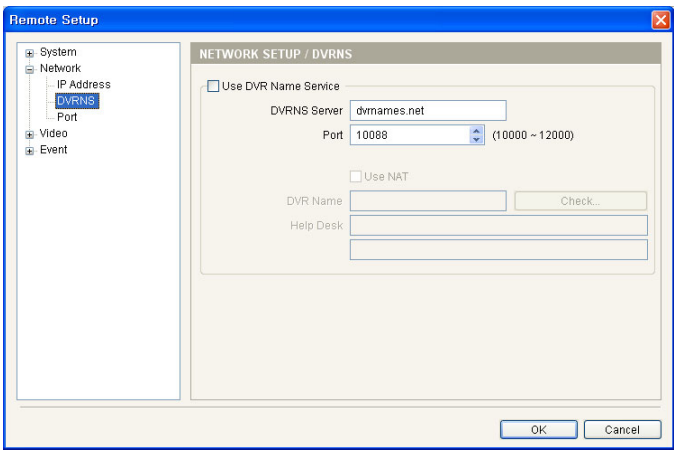


- Type: Select the type of network configuration and set up the network information.
- DNS Server: Enter the IP address of the DNS server that the master MMX is registered on.
- Master MMX IP: Enter the IP address of the master MMX that the spot MMX is connected. You can enter the name instead of the IP address by using the DVR Name Service function when checking the DVR Name Service box.

NOTES:

- Ask your network provider for details about the network connection type and connection information for the MMX.
- If the MMX is configured for a DHCP network, it is best to use the DVRNS function because the MMX's IP address might change frequently. Ask your Internet service provider for information about the IP Address of the DNS Server.

DVRNS



Check the DVR Name Service box to use the DVR Name Service function.

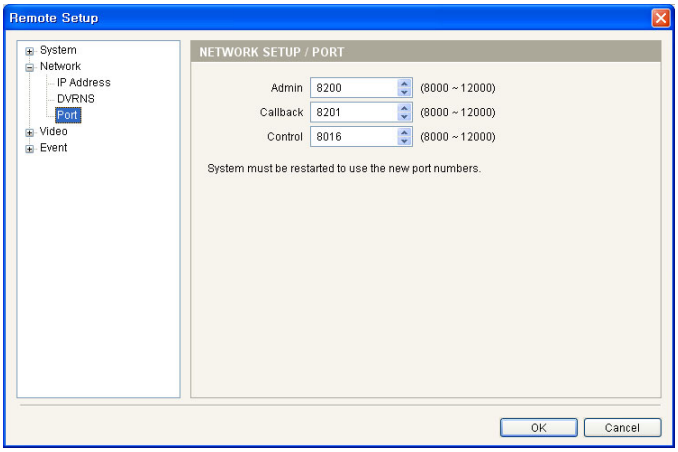
- DVRNS Server: Enter the IP address or domain name of the DVRNS server. You will need to get the IP address or domain name of the DVRNS server from your network administrator. You can use the domain name instead of IP address if you set up the DNS server during the IP Address setup.

- Port: Set up the port number of the DVRNS server.
- Use NAT: Check the box when using NAT (Network Address Translation). When using a NAT (Network Address Translation) device, refer to the NAT manufacturer's instructions for the proper network settings.
  - DVR Name: Enter the MMX name to be registered on the DVRNS server. Check whether or not the name is available by clicking the Check button.
- Help Desk: Choosing the OK button registers the transmitter on the DVRNS server. Proper DVRNS settings will display the help desk information of the DVRNS server.

NOTES:

- The DVRNS (DVR Name Service) allows you to connect to the MMX using either the dynamic IP addresses or the domain name. For the DVRNS feature to work properly, the MMX should be registered on the DVRNS server, and the DVRNS server settings in the INIT program for the MMX should match the settings registered on the DVRNS server. Any changes on the DVRNS server might cause improper operation.
- When LAN settings have been changed, set up the DVRNS settings after saving your LAN changes by clicking the *OK* button.
- The MMX's name you entered in the *DVR Name* field should be checked by clicking the *Check* button, otherwise the DVRNS changes will not be saved. When entering no name or a name already registered on the DVRNS server, an error message displays.

Port

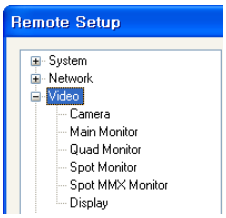


- Admin: Set up the admin port number for remote connection to the MMX.
- Callback: Set up the callback port number to be notified of event detection from the MMX when using the event monitoring function.
- Control: Set up the port number for remote control by a network keyboard. When changing the port settings, you must change the port settings on a network keyboard also.

NOTES:

- The MMX restarts automatically after changing the port settings.
- Do NOT use the same port number for more than one function, or else, the MMX cannot be connected remotely.

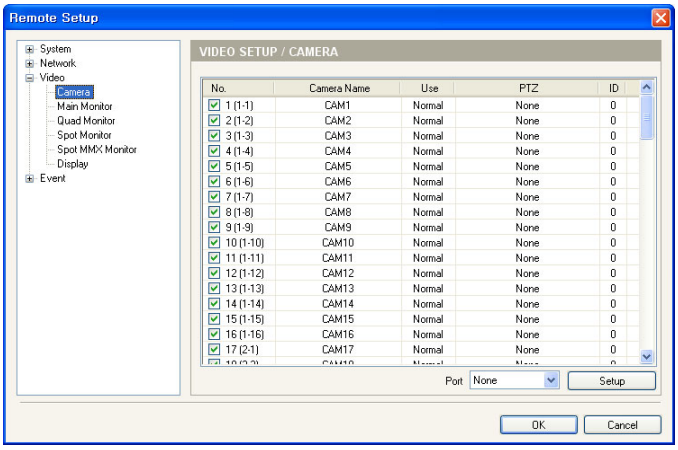
5.3 Video



You can set camera features, monitors and display. When you click the Video menu on the Remote Setup screen, the current Video settings are displayed on the right side of the screen.

Camera

The list of cameras connected to master and slave MMXs is displayed, and you can set up cameras to use.

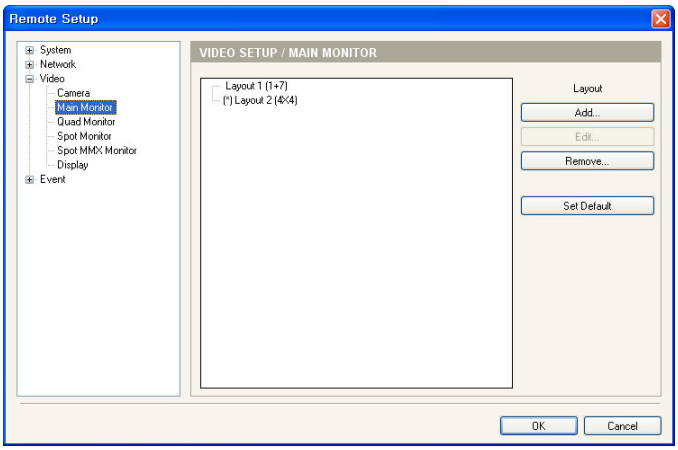


- No.: Check the box to use the camera input. The number will be used when controlling the camera by a network keyboard.
- Camera Name: Click the field and enter the camera name.
- Use: Select the way camera video is displayed on the screen. Selecting Normal displays video and OSD information on the screen. Selecting Covert 1 displays only OSD on the screen but no video. Selecting Covert 2, neither video nor OSD information displays, and the camera input appears to be unused.
- PTZ: Choose a PTZ model when a PTZ camera is connected to the MMX.
- ID: Assign an ID number to the PTZ camera.
- Port: Select a port for PTZ camera control and click the Setup button to set up the baud rate, data bit, stop bit and parity by referring to the PTZ camera manufacturer's instructions.

NOTE: You will not be able to control a PTZ camera if it is not connected to the RS485 port properly. See *2.3 Rear Panel, RS485 Port* (p.8) and the PTZ camera manufacturer's manual for configuring the RS485 connection.

Main Monitor

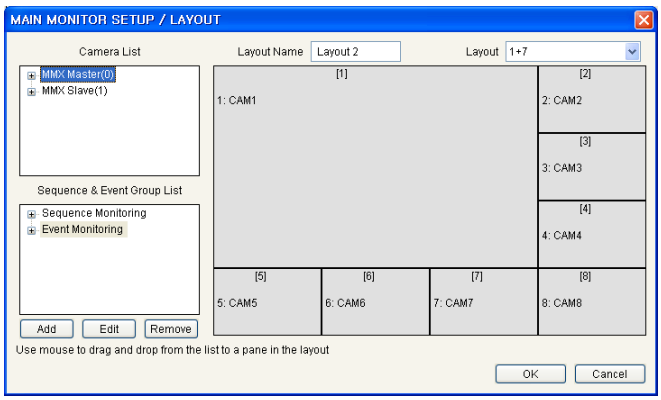
You can configure the screen layout and set up cameras to be displayed sequentially (sequence monitoring) or to display event detected video (event monitoring) on the main monitor connected to a master MMX.



The list of registered screen layouts is displayed.

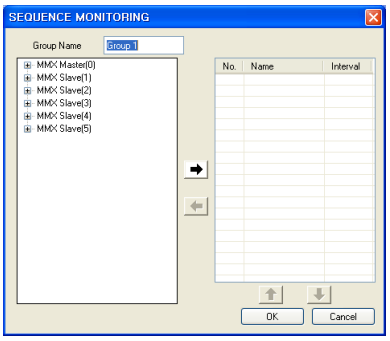
- Add: Click the button to register a screen layout (max. 29) and the Main Monitor Setup/Layout setup screen appears. See the Main Monitor Setup/Layout (p. 48) section below for details.
- Edit, Remove: Select a layout in the list and click the button to edit the setting or delete the layout.
- Set Default: Select a layout to apply on the main monitor and click the button. The selected layout is set as a default layout, and video is displayed on the main monitor in the default layout. (*) will be displayed in front of the default layout in the layout list.

Main Monitor Setup/Layout

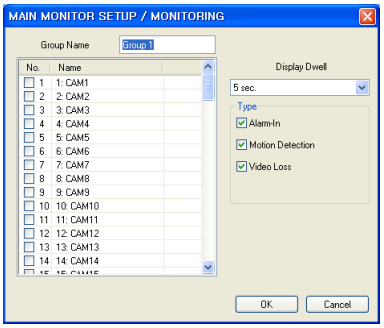


- Layout Name, Layout: Enter a layout name to register and select a layout mode from the Layout drop-down list. Select a camera or a group to display on the main monitor in Camera List or Sequence & Event Group List, and drag and drop it from the list to a desired pane in the layout. Clicking the OK button registers the layout.
- Camera List: A list of a master MMX and slave MMXs daisy-chained to the master MMX is displayed. Clicking a MMX in the list displays a list of cameras connected to each MMX.

- Sequence & Event Group List: Each list of registered sequence and event groups is displayed. Select Sequence Monitoring to add a group for sequence monitoring or Event Monitoring to add a group for event monitoring, and click the Add button (max. 30 in total for sequence and event monitoring).
  - Sequence Monitoring: Enter a group name, select cameras to register on the group from the camera list in the left, and click the ➡ button. The selected camera will be added to the list in the right. Clicking a camera in the right and the ⬅ button deletes the selected camera from the sequence monitoring list. Clicking the Interval field allows you to select the sequencing interval for each camera. Clicking the ⬆ or ⬇ button changes the sequencing order.

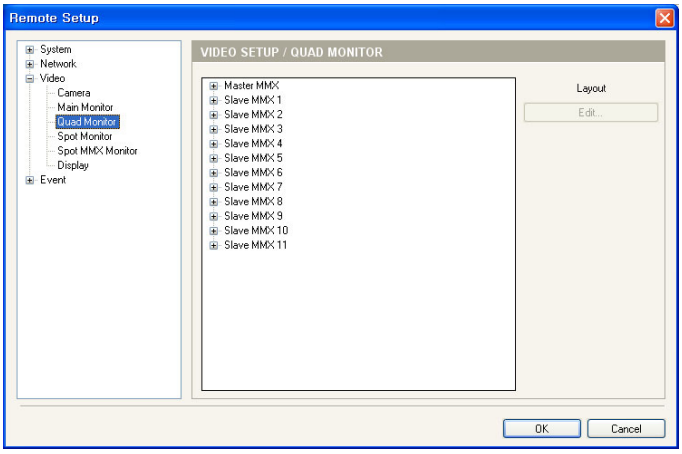


  - Event Monitoring: Enter a group name and select cameras to register on the group in the camera list. Select time for event detected video displayed on the monitor from the Display Dwell drop-down list, and select event types to monitor in the Type option.



Quad Monitor

You can configure the screen layout and set up cameras to be displayed sequentially (sequence monitoring) or to display event detected video (event monitoring) on quad monitors connected to a master MMX and slave MMXs.



The list of quad monitors connected to a master MMX and slave MMXs is displayed, and you can change the screen layout on each quad monitor.

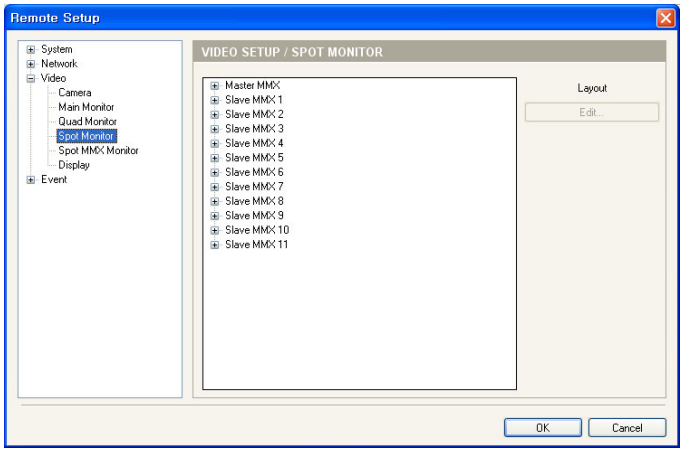
- Edit: Select a quad monitor in the list and click the button to change the screen layout on the selected quad monitor. See the Main Monitor – Main Monitor Setup/Layout (p. 48) section for details.

NOTES:

- The number of quad monitor layouts displayed in the list changes depending on the number of a master MMX and slave MMXs. You can set up only one layout for each quad monitor.
- You can register only one group for sequence or event monitoring.

Spot Monitor

You can configure the screen layout and set up cameras to be displayed sequentially (sequence monitoring) or to display event detected video (event monitoring) on spot monitors connected to a master MMX and slave MMXs.



The list of spot monitors connected to a master MMX and slave MMXs is displayed, and you can change the screen layout on each spot monitor.

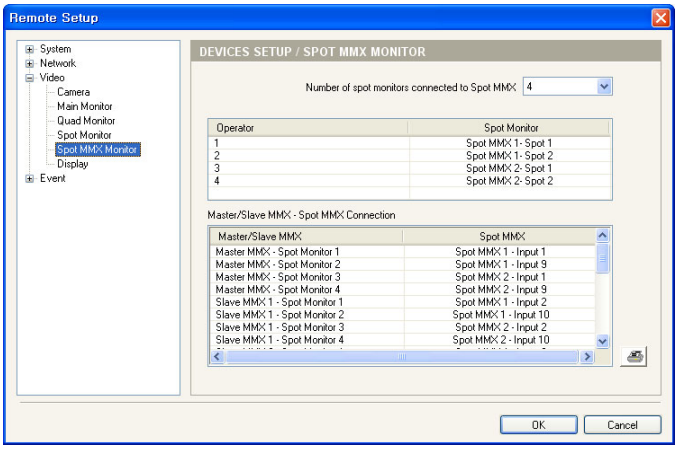
- Edit: Select a spot monitor in the list and click the button to change the screen layout on the selected spot monitor. See the Main Monitor – Main Monitor Setup/Layout (p. 48) section for details.

NOTES:

- The number of spot monitor layouts displayed in the list changes depending on the number of a master MMX and slave MMXs. You can set up only one layout for each spot monitor.
- You can register only one group for sequence or event monitoring.

Spot MMX Monitor

You can set up the number of spot monitors connected to spot MMXs and check the cable connection of spot MMXs between spot outs from a master and slave MMXs and spot inputs to spot MMXs.

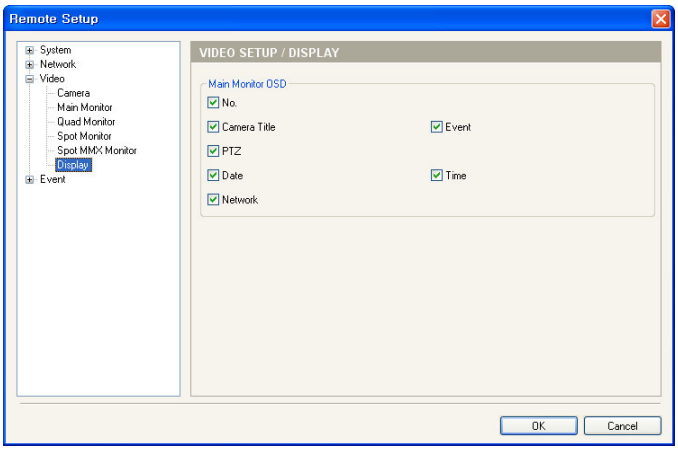


- Number of spot monitors connected to Spot MMX: Select the number of spot monitors connected to spot MMXs, and the operator information for each spot monitor is displayed.
- Master/Slave MMX – Spot MMX Connection: Displays the cable connection between spot outs from a master and slave MMXs and spot inputs to spot MMXs. Clicking the icon displays the connection information on a web page.

NOTE: When connecting a master or slave MMXs to spot MMXs, you should connect them in order of *Master/Slave MMX – Spot MMX Connection* above. Otherwise, spot MMX will not work properly.

Display

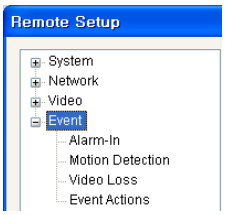
You can set up the OSD (On-Screen Display) information to display on the main monitor connected to a master MMX.



- No.: Check the box to display the pane number.
- Camera Title: Check the box to display the camera name.
- Event: Check the box to display the event status ( ).
- PTZ: Check the box to display the PTZ icon when the camera is set to a PTZ camera. The PTZ icon flickers during the PTZ operation.
- Date: Check the box to display date.

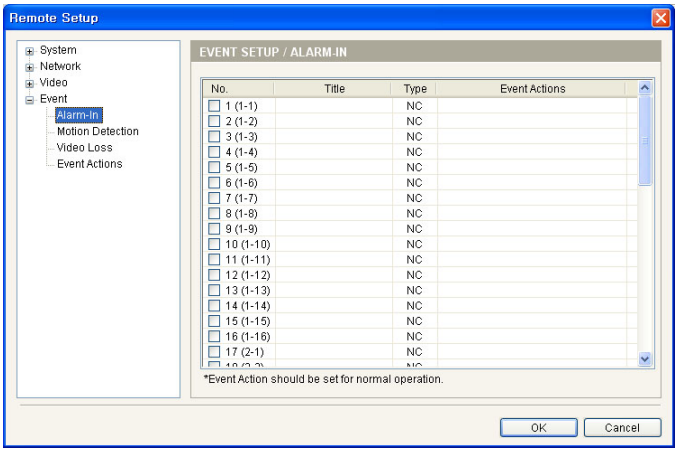
- Time: Check the box to display time.
- Network: Check the box to display the icon during the remote connection to or from the MMX.

5.4 Event



You can set up event detection and actions to be taken. When you click the Event menu on the Remote Setup screen, the current Event settings are displayed on the right side of the screen.

Alarm In

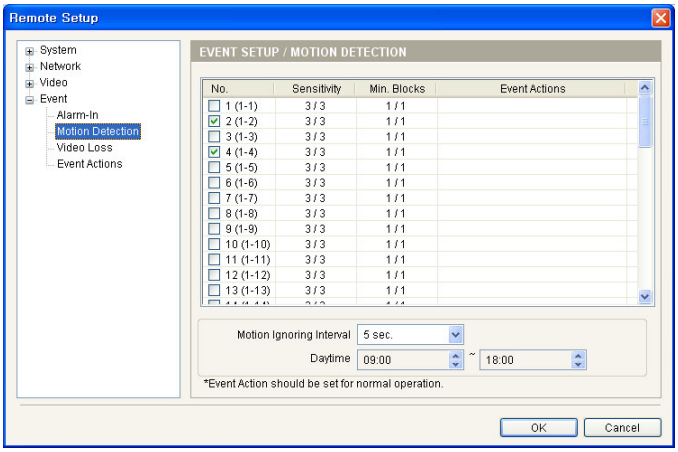


When the MMX senses an input on the alarm input connector, it considers it as an event.

- No.: Select the desired alarm-in devices.
- Title: Click the field and enter the alarm-in device's name.
- Type: Click the field and select the alarm-in type from the drop down list.
- Event Action: Click the field and the Event Action Setup screen appears. Check the box for each action the MMX will take whenever it detects an alarm-in event.
  - Alarm Out: Select to trigger an alarm-output signal.
  - Email Callback: Select to send an Email.
  - Callback: Select to send a message to remote sites and select the desired remote sites.
  - PTZ Preset: Click the desired PTZ camera and select the desired preset number to move a PTZ camera to the previously saved preset location. You must set up preset locations of PTZ cameras during the PTZ setup on the DVR or by using the network keyboard.

NOTE: You must properly configure the settings related to each event action during the *4.6 Event – Event Action* setup to enable event actions.

Motion Detection

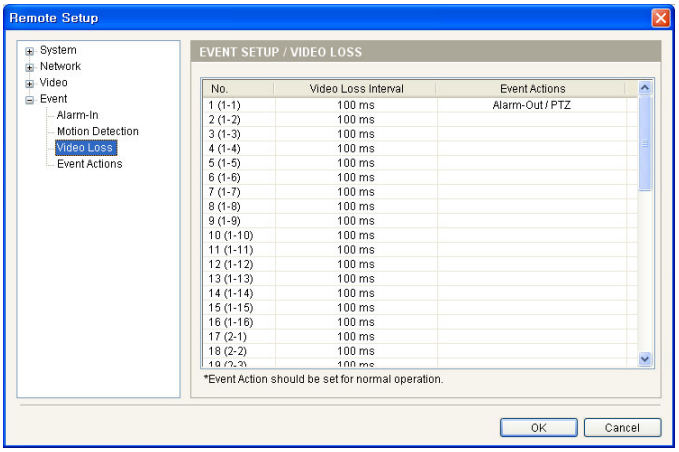


When the MMX detects any motion on the screen, it considers the motion as an event.

- No.: Select the desired cameras.
- Sensitivity: Set the motion sensitivity for daytime and nighttime independently.
- Minimum Blocks for Detection: Adjust the minimum number of detection blocks that must be activated to be considered as a motion event for daytime and nighttime independently.
- Event Action: Click the field and the Event Action Setup screen appears. Check the box for each action the MMX is to take when it detects a motion detection event.
  - Alarm Out: Select to trigger an alarm-output signal.
  - Send Email: Select to send an Email.
  - Remote Callback: Select to send a message to remote sites and select the desired remote sites.
  - PTZ Preset: Click the desired PTZ camera and select the desired preset number to move a PTZ camera to the previously saved preset location. You must set up preset locations of PTZ cameras during the PTZ setup on the DVR or by using the network keyboard.
- Motion Ignoring Interval: Select the motion ignoring dwell time from the drop-down list. The MMX will not log or send notifications of motion events occurring during the preset interval range. You can control excessive event logging and remote notifications of motion detection events by adjusting the motion ignoring dwell intervals.
- Daytime: Set up the daytime range. The MMX will consider the remaining time range as the nighttime.

NOTE: You must properly configure the settings related to each event action during the *4.6 Event – Event Action* setup to enable event actions.

Video Loss



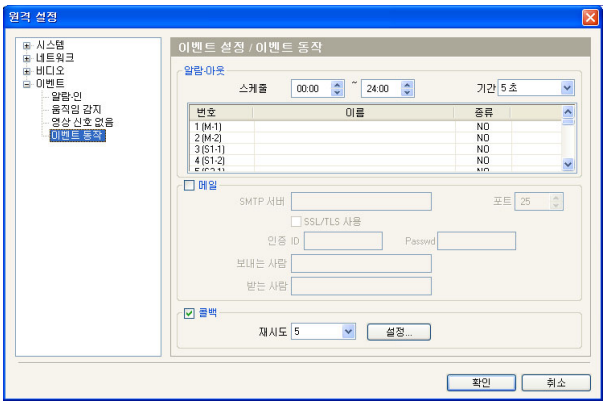
When a camera has lost video, it considers the video loss as a video loss event.

- No.: Select the desired cameras.
- Video Loss Interval: Select the video loss dwell time from the drop-down list. The MMX will not log or send notifications of video loss events occurring during the interval range. You can control excessive event logging and remote notifications of video loss events by adjusting the video loss intervals.
- Event Action: Click the field and the Event Action Setup screen appears. Check the box for each action the MMX will take whenever it detects a video loss event.
  - Alarm Out: Select to trigger an alarm-output signal.
  - Send Email: Select to send an Email.
  - Remote Callback: Select to send a message to remote sites and select the desired remote sites.
  - PTZ Preset: Click the desired PTZ camera and select the desired preset number to move a PTZ camera to the previously saved preset location. You must set up preset locations of PTZ cameras during the PTZ setup on the DVR or by using the network keyboard.

NOTE: You must properly configure the settings related to each event action during the *4.6 Event – Event Action* setup to enable event actions.

Event Action

You can set up event actions to notify the event detection when the MMX detects events.

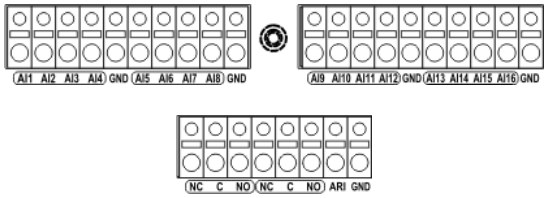


- Alarm Out: Check the box to activate alarm out.
  - Schedule: Set up the period to enable alarm out. An alarm out can be activated only during this period.
  - Dwell Time: Select the alarm-out dwell time. An alarm out is activated for the preset dwell time after detecting an event.
  - Name: Click the field and enter the name of alarm-out device.
  - Type: Select the type of alarm-out device.
- Email: Check the box to send an email.
  - SMTP Server, Port: Enter the IP address or domain name and port number of the SMTP server. You will need to get the IP address or domain name of the SMTP server from your network administrator. You can use the domain name instead of the IP address if you set up the DNS server when setting up the network. Select Use SSL/TLS if the SMTP server requires SSL (Secure Sockets Layer) authentication.
  - Authentication ID, Password: Enter the ID and password if the SMTP server requires user authentication.
  - Sender, Recipient: Enter a sender's and recipients' email address. An email address must include the "@" character to be a valid address.
- Callback: Check the box to send a callback message to remote sites.
  - Retry: Select the number of times to try sending a message if it fails to send.
  - Setup: Enter the IP addresses and port numbers of the remote sites to send a message.

Appendix

Connector Pin Outs

I/O Connector



AI (1 to 16)	Alarm Inputs
GND	GND (Chassis Ground)
NC	Alarm Out (Normally Closed)
C	Common
NO	Alarm Out (Normally Open)
ARI	Alarm Reset In

RS485 Connector

Master Unit				Slave Unit
RX+/TX+	→	To	→	TX+/RX+
RX-/TX–	→	To	→	TX-/RX-

Troubleshooting

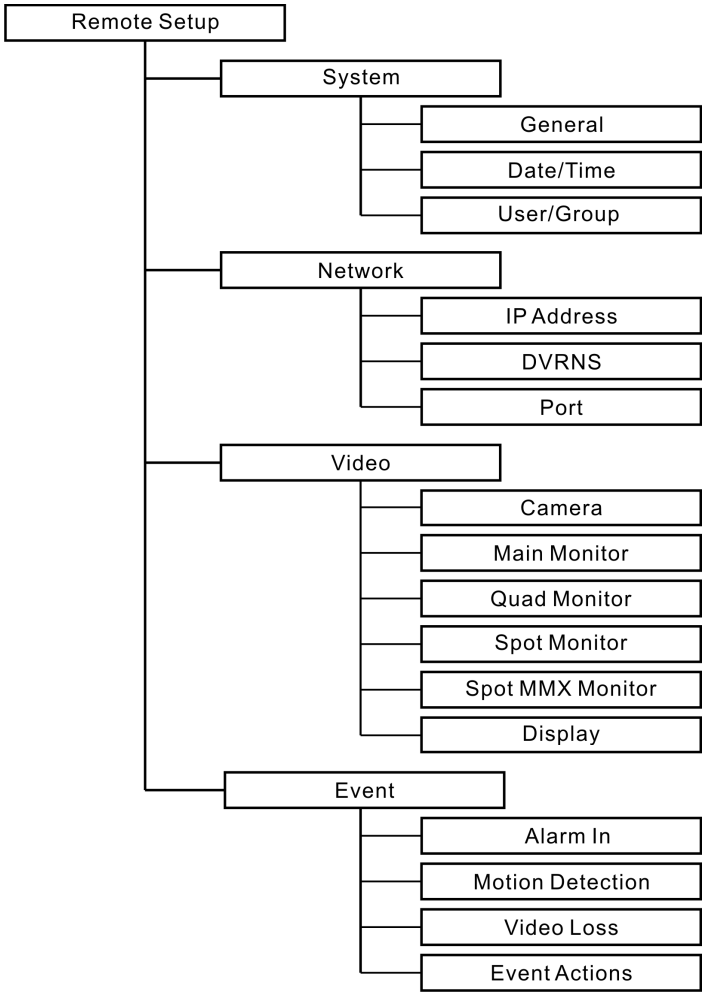
Problem	Possible Solution
No Power	• Check power cord connections. • Confirm that there is power at the outlet.
INIT program cannot find the MMX.	• Check power cord connections. • Check that the MMX is networked via LAN. You can find the MMX by selecting Manual Connect (WAN) in the Lookup menu. • Check the network connection.
INIT program cannot find the master MMX.	Check that the option switch 3 on the back panel is set to On.
Connection to the INIT program is not available because of wrong ID and password.	If you lost the administrator ID and password, do a factory reset. The factory reset returns all the settings including network settings to the original factory settings. You must customize all settings including network settings after a factory reset.
No Live Video	• Check connections between DVRs and MMXs. • Check that video is displayed on the monitor connected to a DVR. If video is not displayed, check the DVR settings and camera connections to the DVR referring to the DVR User's Manual. • Check network connections on the DVR and MMX.
Video is not displayed properly.	Check the video sources of DVRs and set the option switch 1 on the back panel to On or Off to match video sources of MMXs to video sources of DVRs.
Main monitor is not controlled.	• Check the connection between a master MMX and the main monitor. • Connect to a network keyboard and check the main monitor's ID of the MMX.
Camera title is not displayed.	• Check the daisy chain connection between a master MMX and slave MMXs. • Check the network connection of a master MMX and slave MMXs.
The OSD icons are overlapped.	It is possible that OSD icons of both a DVR and a MMX are displayed at the same time when both the DVR and MMX are set to display OSD icons. Release OSD icon display on one of the DVR and MMX.

MMX ID Switch Settings

1: On (upward), 0: Off (downward)

ID	Switch setting	ID	Switch setting	ID	Switch setting
0	000000	1	100000	2	010000
3	110000	4	001000	5	101000
6	011000	7	111000	8	000100
9	100100	10	010100	11	110100
12	001100	13	101100	14	011100
15	111100	16	000010	17	100010
18	010010	19	110010	20	001010
21	101010	22	011010	23	111010
24	000110	25	100110	26	010110
27	110110	28	001110	29	101110
30	011110	31	111110	32	000001
33	100001	34	010001	35	110001
36	001001	37	101001	38	011001
39	111001	40	000101	41	100101
42	010101	43	110101	44	001101
45	101101	46	011101	47	111101
48	000011	49	100011	50	010011
51	110011	52	001011	53	101011
54	011011	55	111011	56	000111
57	100111	58	010111	59	110111
60	001111	61	101111	62	011111
63	111111				

Map of Screens



Specifications

VIDEO	
Signal Format	NTSC or PAL (programmable)
Input	Composite: 16 BNC, 1 Vp-p, autoterminating, 75 Ohms
Output	1 Main Out, 4 Quad, 4 Spot, 16 Loop (auto-termination)
Switch	6 Pin switch (MMX ID), 4 Pin switch (Signal, termination, mode)

INPUT/OUTPUT	
Video Input/Output	BNC, 1 Vp-p, 75 Ohms
Alarm Input	16 TTL, terminal block, programmable as NC or NO, 4.3V threshold
Alarm Output	2 Relay out, terminal blocks, programmable as NC or NO, 2A@125VAC, 1A@30VDC
Alarm Reset Input	1 TTL, terminal block
RS485 Serial Port	Two-connector terminal block
Network Connectivity	10/100 Mbps Ethernet (UTP Cat5 RJ-45)
Daisy Chain In/Out	1 /1 (STP Cat5E RJ-45)

MISCELLANEOUS	
Dimensions (W x H x D)	16.9" x 3.5" x 15.7" (430mm x 88mm x 400mm)
Unit Weight	10.7 lbs. (4.9kg)
Shipping Weight	16.6 lbs. (7.5kg)
Shipping Dimensions (W x H x D)	21.3" x 11.4" x 23.2" (540mm x 290mm x 590mm)
Operating Temperature	32°F to 104°F (0°C to 40°C)
Operating Humidity	0% to 90%
Power Supply	100 – 240 VAC, 0.4 – 0.2 A, 50/60Hz
Power Consumption	Max. 30W
Approval	FCC, UL, CE, CB

Specifications are subject to change without notice.