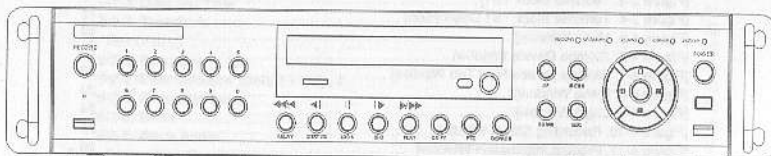


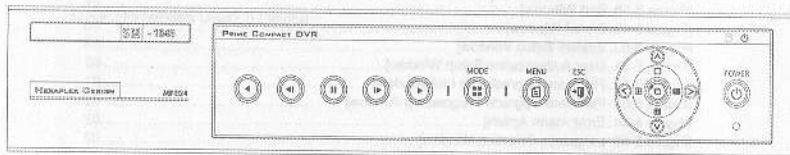
Chapter 1. Introduction

1-1. MM/MH-Series Major Features



	MM/MH-1648	MM/MH-824	MM/MH-412
System	Reliable Standalone DVR		
Channel & Frame Rate	16Ch - 480/480	8ch - 240/240	4ch - 120/120
OS	Embedded Linux - Built in Flash Memory		
Video Input	16 BNC	8 BNC	4 BNC
Video Output	1 BNC, 1 VGA		
Monitor	1 BNC, 1 VGA		
Loop	16 BNC	8 BNC	X
Spot	1 BNC		
Audio Input	Line Input : 4 RCA	Line Input : 2 RCA	Line Input : 1 RCA
Audio Output	Line Output : 1 RCA		
Compression Format	[Video : Standard (MM-Series : MPEG4) (MH-Series : H.264)] / [Audio : G.723]		
Recording Speed	Max. 480(400)fps	Max. 240(200)fps	Max. 120(100)fps
Recording Resolution	Max. 704 x 480(576)		
Recording mode	Automatic, Continuous, Manual, Events(Sensor and Motion)/Schedule Recording		
Storage	[Internal : Max. 2HDD, Max. 1.5TB]		
Video Output Resolution	LCD : SXGA(1280x1024), TV : SDTV(720x480/576)		
Sensor Input	16 Sensors	8 Sensors	4 Sensors
Relay/TTL Output	[1ea NC/NO][3ea TTL Out]	[1ea NC/NO][1ea TTL Out]	[1ea NC/NO]
Backup & Copy Access	DVD-RW, USB2.0, Network		
Network Access	Various Network Interface (Ethernet 10/100, ADSL, Cable modem)		
PTZ Access	RS-485		
Internal HDD / Internal ODD	SATA HDD Max. 2ea / SATA Type DVD		
System Operation & Adjustment	Front Button, Mouse, IR Remote Controller, Keyboard Controller, Network		
System Upgrade	USB2.0 Memory Stick, Network System Automation (Controlled by CMS)		
Network	NTP Supported CMS / Monitoring by Web Browser / PDA / Mobile Viewer 15 Languages Supported, Automatic E-mail		
Others	Power [12V/5A] / Max. Power Consumption[40W] / Operating Temperature[5~40°C] Weight without HDD[4kg] / Dimension[430*86*270mm]		

1-2. SM/SH-Series Major Features



	SM/SH-1648	SM/SH-824	SM/SH-412
System	Reliable Standalone DVR		
Channel & Frame Rate	16Ch - 480/480	8ch - 240/240	4ch - 120/120
OS	Embedded Linux - Built in Flash Memory		
Video Input	16 BNC	8 BNC	4 BNC
Video Output	1 BNC, 1 VGA		
Audio In/Output	Line Input : 1 RCA / Line Output : 1 RCA		
Compression Format	[Video : Standard (SM-Series : MPEG4)(SH-Series : H.264)] / [Audio : G.723]		
Recording Speed	Max. 480(400)fps	Max. 240(200)fps	Max. 120(100)fps
Recording Resolution	Max. 704 x 480(576)		
Recording mode	Auto, Continuous, Manual, Event(sensor, motion)/Schedule Recording		
Storage	[Internal : Max. 2HDD, Max. 1.5TB]	[Internal : Max. 2HDD, Max. 1.5TB]	
Video Output Resolution	LCD : SXGA(1280x1024), TV : SDTV(720x480/576)		
Sensor Input	4 sensors	4 sensors	4 sensors
Relay Output	[1ea NC/NO]	[1ea NC/NO]	[1ea NC/NO]
Backup & Copy Access	USB2.0, Network		
Network Access	Various Network Interface (Ethernet 10/100, ADSL, Cable modem)		
PTZ Access	RS485		
Internal HDD	SATA HDD 2ea		SATA HDD 1ea
System Operation & Adjustment	Front Button, Mouse, IR Remote Controller, Keyboard Controller, Network		
System Upgrade	USB2.0 memory stick, Network System Automation (Controlled by CMS)		
Network	NTP supported CMS / Monitoring by Web Browser / PDA / Mobile Viewer 15 Languages Supported Automatic E-mail Transmission		
Others	Power [12V/5A] / Max. Power Consumption[40W] / Operating Temperature[5~40°C] Weight without HDD[3kg] / Dimension[340*58*300mm]		

1-3. About the Product

As a digital image monitoring equipment that can display images inputted from up to 16/8/4 cameras, MM/MH-Series / SM/SH-Series digitally records high-quality images using various video recording modes and displays them as clean quality images.

For users' convenience, front touch pad, remote controller, and mouse are provided. Powerful network functions including remote monitoring and remote system setup modification are also supported. The maximum recording frame rate for MM/MH-Series / SM/SH-Series is 480fps/240fps/120fps.

1-4. Differences between MM/MH-Series and SM/SH-Series

ITEM	MM/MH-Series 1648 / 824 / 412	SM/SH-Series 1648 / 824 / 412
DVD	OK	NO
Loop Out	OK	NO
Spot Out	OK	NO
Audio Channel	4 / 2 / 1	1 / 1 / 1
Sensor Channel	16 / 8 / 4	4 / 4 / 4
Relay Channel	[1ea NC/NO] [3ea TTL Out]	[1ea NC/NO]
Remote Controller	30 Button (ID not supported)	14 Button (ID supported)
Front Button	29 Button	14 Button
USB port	Front(right & left)	Right Rear side
Dimension	19" RACK SIZE	COMPACT SIZE

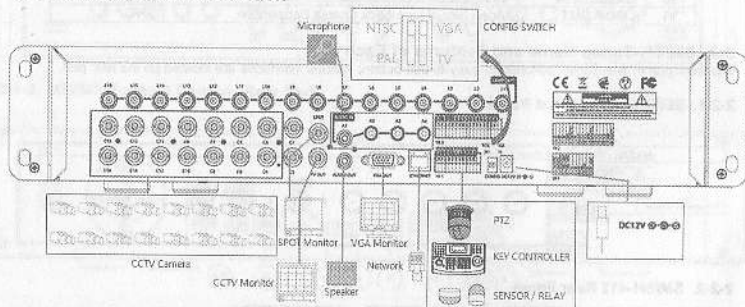
1-5. Components

After unpacking the product, check whether the following accessories are included:

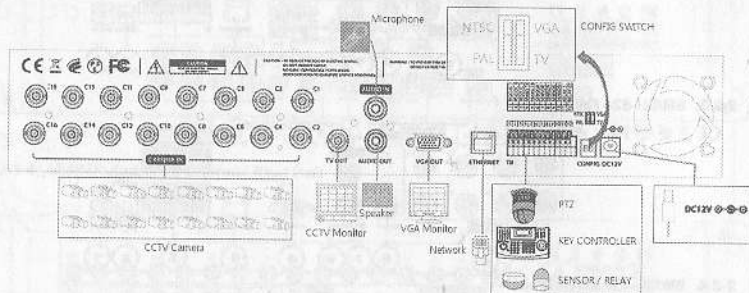
- Remote Controller
- CD (CMS, CMS Manual, PDA Viewer software)
- AAA 1.5V Batteries 2ea
- Adapter (12VDC/3.5A)
- User Manual
- Rack Mounting Handle (MM/MH-Series only)

No.	Name	Feature	Format
1	DC IN	Power cable connection to the body	
2	NTSC/PAL VGA/TV	Select the video input format Select the video output	DA-2
3	RS485 DIO	PTZ Camera Control Connection Sensor / Relay Connection	Terminal Block
4	Ethernet	Network Connection (ADSL, Cable Modem, Ethernet 10/100 Base-T)	RJ-45
5	VGA-OUT	VGA Monitor or LCD Monitor Connection	D-SUB 15P
6	AUDIO IN	Audio Input Connection(Line Only Input)	RCA
7	AUDIO OUT	Audio Output Connection(Line Only Output)	RCA
8	TV	CCTV Monitor Connection(Divided Screen)	BNC
9	CAMERA IN	Video Camera Connection	BNC

2-3. Installation and Connection



[Figure 2-1. MM/MH-1648 Basic Connection and Device Connection]



[Figure 2-2. SM/SH-1648 Basic Connection and Device Connection]

2-3-1. Basic Connection

By referring to above [Figure 2-1. MM/MH-1648 Basic Connection and Device Connection] and [Figure 2-2. SM/SH-1648 Basic Connection and Device Connection], Connect the CCTV camera, CCTV monitor (or VGA monitor), and USB mouse to the DVR and set up CONFIG SWITCH.

	Connected Device	DVR Terminal
1	CCTV camera	Rear Video Input
2	CCTV monitor	Rear TV
3	VGA Monitor / LCD Monitor	Rear VGA-OUT
4	Mouse	MM/MH-Series: Front USB / SM/SH-Series: Right Side USB
5	CONFIG SWITCH	Rear NTSC/PAL or VGA/TV Setup

※ Refer to a further description of CONFIG SWITCH below.

- The input video type must be either NTSC or PAL; these two types must not be used together.
- Select the input video format (NTSC/PAL) using the CONFIG switch on the rear side of the product.
- Select the output monitor type (VGA/TV) using the CONFIG switch on the rear side of the product.
- CONFIG SWITCH
 - VGA Mode
Resolution of VGA Monitor is SXGA (1280*1024) and CCTV Monitor output is not supported.
 - TV Mode
Resolution of VGA Monitor SVGA (800 * 600) and CCTV Monitor output is supported.

2-3-2. Connection of Other Devices

ITEM	Difference between MM/MH-Series and SM/SH-Series	
	MM/MH-Series 1648 / 824 / 412	SM/SH-Series 1648 / 824 / 412
Loop Out	OK	NO
Spot Out	OK	NO
Audio Channel	4 / 2 / 1	1 / 1 / 1
Sensor Channel	16 / 8 / 4	4 / 4 / 4
Relay Channel	[1ea NC/NO] [3ea TTL Out]	[1ea NC/NO]

Connect the PTZ controller cable, audio input/output, network, and sensors as shown below.

	Connected Device	DVR Terminal
1	SPOT Monitor(CCTV Monitor)	Rear SPOT
2	Mike / Speaker	Rear Audio Input / Audio Output
3	LAN Cable	Rear Ethernet
4	PTZ Camera	Rear DIO (Digital Input/Output)
5	Sensor / Relay / TTL OUTPUT	Rear DIO (Digital Input/Output)
6	Key controller	Rear DIO (Digital Input/Output)

1) SPOT Monitor

Connect Spot Monitor to the rear SPOT terminal.

2) Audio Input/Output

Depending on models [MM/MH-1648 / MM/MH-824 / MM/MH-412 / SM/SH-Series], each of the models supports [4 / 2 / 1 / 1] line input and 1 line output.