DW DIGITAL WATCHDOG

STAND-ALONE DVMR

16 Channel Digital Video Multiplex Recorder

User's Manual VER 2.0

16 channel
Stand-alone DVMR

The most stable and reliable real stand-alone Digital Video Multiplex Recorder

ALL ABOUT IMAGE RECOGNITION & PROCESSING

DIGITAL VIDEO RECORDER

DW DIGITAL WATCHDOG

STAND-ALONE DVMR

ALL ABOUT IMAGE RECOGNITION & PROCESSING

SAFETY PRECAUTIONS

	CAUTION	
⚡	**RISK OF ELECTRIC SHOCK. DO NOT OPEN!**	⚠

CAUTION : TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT OPEN COVERS.
NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This label may appear on the bottom of the unit due to space limitations.

The lightning flash with an 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 to persons.

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

WARNING : TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE UNITS NOT
SPECIFICALLY DESIGNED FOR OUTDOOR USE TO RAIN OR MOISTURE.

Attention: installation should be performed by qualified service Personnel only in accordance with the National Electrical Code or applicable local codes.

Power Disconnect. Units with or without ON-OFF switches have power supplied to the unit whenever the power cord is inserted into the power source ; however, the unit is operational only when the ON-OFF switch is in the ON position.
The power cord is the main power disconnect for all unites.

FCC INFORMATION

A CLASS A computing device subject to certification by the Commission shall be identified pursuant to par.2.925 et Seq of the chapter. In addition, the label shall include the following statement:

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

Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified in this Section is required to be affixed only to the main control unit.

The users manual or instruction manual for the EUT shall contain the following statement or eqivalent.

Caution : Changes or Modifications not expressly approved by the party responsible for compliance could void the users authority to operate the equipment.

If the EUT requires accessories such as special shielded cables and/or connectors to enable compliance with emission limits, the instruction manual for the EUT shall include appropriate instructions on the first page of the text concerned with the installation of the device that these special accessories must be used with the device.
It is the responsibility of the user to use the needed special accessories supplied with the equipment.

For a CLASS A digital device or peripheral, the instructions furnished the user shall include the following or similar statement placed in a prominent location in the text of the manual.

Note : This equipment has been tested and found to comply with the limits for a CLASS a digital device, pursuant to Part 15 of 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 the this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Speed of playback in DVMR unit according to scan rate set in 4-7-b).

Scan rate set in **4-7**-b)	◄ or ►	◄◄ or ►►
1x	1x	1x
2x	1x	2x
4x	1x	4x
8x	1x	8x
16x	1x	16x
32x	1x	30x
64x	1x	60x

Maximum playback speed of DVMR is 60x.

10 : **Command button**.
   We have 3 different buttons, that are, save, print, and event, and those buttons work only when stop
   button is pressed.
 a) Save
   During searching recorded pictures, you can save pictures one by one in the folder in client PC by
   pressing save button. Press Save button while you see recorded picture, and picture you selected
   by pressing Save button shall be save on the folder you already assigned under the file name of
   year-month-day-hour-minute-second in jpg format.
 b) Print
   During searching recorded pictures, you can print picture, one by one, you see, by pressing Print
   button.
 c) Event
   Press event button to see alarm list saved in DVMR unit, and you can search recorded pictures
   based on event list by clicking any one of list.

11 : **Calendar**.
   You can select date and time to search pictures recorded at selected time and date.
   You can refer to start and end of recording in **7**.
  Notice : From time to time, connection shall be cut unexpectedly due to conditions of network line.
                Whenever it is cut, quit search window by pressing power switch(**1**), and then press connect
                button in live-view window and scan button to enter into search window again, to continue
                searching.
  Notice : Compatibility of Remote Viewer Software with different kinds of operating systems and PC
                hardware may not be simply specified due to the characteristics of network that it is much related
                with not only PC hardware and operating system but also other software installed on the client PC
                and conditions of network (internet) line. Basically, Remote Viewer Software is compatible with
                typical Windows operating system from Windows 98 to Windows XP.
  Notice : To see continuous live view, we recommend not to select motion recording in RECORD SETUP
                menu of DVMR. If it is set at motion recording in SETUP menu of DVMR, image transmission is
                done only there is motions detected.
  Notice : While you search recorded data using client software in client PC, DVMR unit to which you access
                via IP network is in playback mode, and no recording is done as far as you search recorded data.
                However, while you are in connection with DVMR unit via IP network for live view, DVMR unit
                continues to record but at a little lowered recording rate. Therefore we recommend you to access
                to DVMR unit only when it is necessary.

5. Search recorded pictures via IP network

Function of each button in search window :
1: **Power** switch. Press power switch to quit.
2: **Full screen** button. Press full screen button to search recorded picture channel by channel in full screen.
3: **Quad** button. Press Quad button to search recorded pictures in quad screen, 4 pictures from 4 channels
  at the same time.
4: Screen division button : If press "+" button, it screen division is changed from 4 to 9 or from 9 to 16.
  "-" button reduce screen division.
5: **Time** of recording. It indicates when the pictures you see recorded.
6: **Channel selection** button. Press any one from 1 to 4 to see picture of corresponding channel,
  if you first chose full screen button(**2**).
7: **Time selection** button. You can set time to search by dragging yellow mover to the left or right.
  See time displayed in green color and find an exact time from which you search.
8: **Start and end** of recording. It shows time from which recording started and recording ended. Further it
  show time from which search will start.
9: **Search operation** button. You can search recorded data using various buttons useful for searching
  effectively as follows.

◄◄ : Play fast backward
  (Speed set in SYSTEM SETTING)

◄ : Play Backward(x1)

► : Play forward(x1)

►► : Play fast forward
  (Speed set in SYSTEM setting)

■ : Stop

I◄ : Move to start of recording
  (Press stop button first before this button)

◄I : Move to previous hour (on the hour).
  Press stop button first before this button.

I► : Move to next hour (on the hour)

►I : Move to end of recording
  (Press stop button first before this button)

About this document

Before installing stand alone DVMR, be sure to thoroughly review and follow the instructions in this
User's Manual. Pay particular attention to the parts those are marked **NOTICE**.
Also, when connecting with external application, first turn the power OFF and follow manual
instruction for appropriate installation.

**Before reading this
document**

1. This document is intended for both the administrator and users of stand alone DVMR.

2. This manual contains information for configuring, managing and using stand alone DVMR properly.

3. To prevent fire or electrical shock, do not expose the product to heat or moisture.

4. Be sure to read this manual before using stand alone DVMR Model, even before installing HDD.

5. Check electricity at the place you want to install the DVMR unit is stable and meets our
  electricity requirements.
  Unstable electricity will cause malfunction of the unit or give critical damage to the unit.

6. Several chips on the main board of the DVMR unit and hard disk drive inside the unit generate
  heat, and it must be properly discharged.
  Do not put any objects just beside exhaust port(fan) on the left side of the unit and do not close
  up an opening (fresh air in-take) on the right side of the unit..

7. Put the DVMR unit at well-ventilated place and do not put heat-generating objects on the unit.
  When it is installed inside 19 inch mounting rack together with other devices, please check built-
  in ventilation fan of the rack is properly running.

8. For questions and technical assistance of this product, contact your local dealer.

Chapter 1 . Product Package

1-1. The contents of package

1. 16 ch stand-alone DVMR unit

Record data of pictures from camera on hard disk drive, after converting it into digital data.
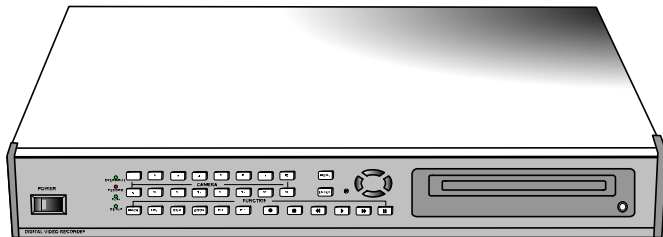
2. User's manual for 16ch DVMR

Describe how to install and operate this DVMR unit.

3. Remote controller

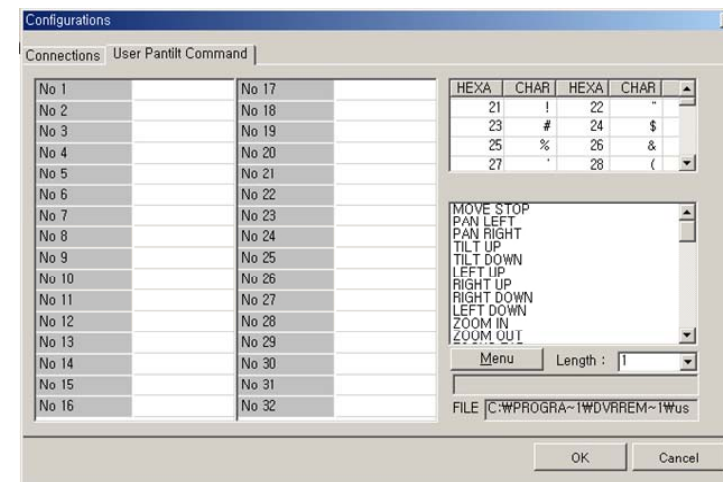IR remote controller enables an user to operate DVMR unit apart from the unit.

4. DC power adapter and power cable

Convert AC 110V or AC 220V into DC 12V to supply to DVMR unit.

5. Accessories (Rack mount bracket and bolts)

Mounting bracket and bolts necessary for fixing DVMR unit into 19 inch rack, and batteries for remote controller.

USER PANTILT COMMAND
- It is to input protocols for specific PTZ camera you will connect to 16ch DVMR unit, to control PTZ camera while you see live pictures in the client program.
- You can save protocols of specific PTZ camera in the form of computer file (text file). Prepare text file of protocol for PTZ camera and save it on your PC. In the User Pantile Command window, press [Menu] button and again press [Load User PT File]. Then you can assign text file of protocol for PTZ camera you pre pared in advance. It is very convenient function.
- If you want to control PTZ camera using buttons on the front of 16ch DVMR unit, you must input the same protocol into DVMR unit in PAN/TILE CMD SETUP.

8) PTZ control. You can control Zoom, Focus, and Pan/Tilt of camera while you see live pictures via IP network. Of course, you must first input PTZ protocol for a specific PTZ camera you connected to your DVMR unit, into your DVMR unit. You can control PTZ camera with various of commands in USER PANTILE COMMAND window above.

When you press corresponding buttons for Pan/Tilt control, press a couple of second every time you Press to take care of data transmission speed through IP network. Otherwise, there is a possibility that given protocol is transmitted repeatedly, regardless of your intention.

Notice : From time to time, connection shall be cut unexpectedly due to conditions of network line, and you will see disconnect button(**3**) is activated. Just press connect button(**2**) again, and you can continue to see live pictures.

7) : **Set** button. 2 different set buttons
   a) Setting : Press this button to input IP Address (or select a unit of 16ch DVMR unit among many)
   and others and to set circular monitoring interval and scan rate, to assign folder where you
   want to save pictures you will select during search, to input protocol for PTZ cameras or
   select any model of PTZ cameras among many models whose protocols you already input,
   as following dialog box.

CONNECTION
 - On the Name box, you are requested to input name of 16ch DVMR units, in case you want to access
   to any one DVMR unit among more than a unit. You can save IP information in Configurations Window
   and select name of DVMR unit to which you want to access.
 - Input IP Address you already input into DVMR unit (TCP/IP SETUP) in **IP ADDRESS**.
 - Input Port number you already input into DVMR unit in **PORT**. Just input 8000, which is default port
   number.
   In some cases, port number 8000 is blocked by firewall, and you have to input different number like
   8090 which is not blocked.
 - Input "admin" in **ID**.
 - Input the same password you set into DVMR unit in **PASSWORD**. Default password of 16ch DVMR
   unit is blank (null). You are requested to enter your own password using number keys from 1 to 16 on
   front panel of 16ch DVMR unit

OPTION
 - Select **circular monitoring interval** ranging from 0.1 sec to 10 sec. The smaller it is, the faster picture
   of each channel rotates. The absolute circulation interval is a little different from set value depending on
   data transfer rate of IP network.
 - Select **scan rate** ranging from 1x to 64x. The larger it is, the faster search speed is. The absolute
   search speed is a little different from set value depending on data transfer rate of IP network.
 - Reconnection count : In case disconnected due to some reason, client program tries to reconnect after
   this time.

SAVE OPTION
   It is to assign folder on which you want to save pictures you will select while you search recorded
   pictures, picture by picture.

## 1-2. Name and function of each button

[Front Panel]
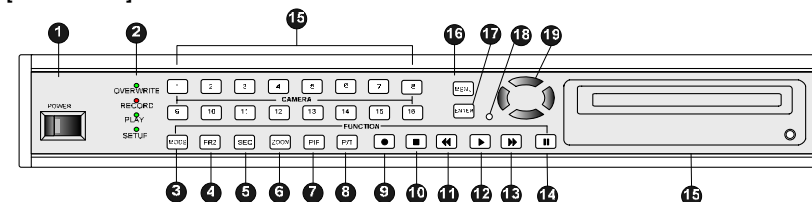
1. POWER SWITCH WITH LED : DC power on-off switch with built-in LED

2. LED : Indicates the status of system

3. MODE : Press [MODE] button and [1], [2], or [3] to change to 4-split, 9-split, or 16-split screen, respectively.
   If you press this button for a long time, it changes monitor type from(to) Composite to(from) VGA,
   in case DVMR unit supplied includes VGA option.
   If you press this button 2 times consecutively, it changes to screen position adjustment mode.
   In case position of 16-split screen is not in the center of display unit, you can adjust screen position
   using [UP], [DOWN], [LEFT], and [RIGHT] button. After adjustment, press [MSD] button once more
   to exit.

4. FRZ : On-off switch to freeze pictures in live mode

5. SEQ : In full screen, this button shows pictures in rotation.

6. ZOOM : In full screen, this button enlarges pictures two times
   (Possible to fix area to be enlarged using direction buttons.)

7. PIP : In full screen, this button creates PIP(Picture In Picture) in rotation.

8. P/T : Enter into or exit from PAN/TILT CONTROL mode

9. Record (●): Records picture data on hard disk drive

10. Stop (■): Stops recording or playback

11. Fast backward (◀◀) : High speed playback in reverse direction in playback mode, or moving to the
   start of recorded data when it is in stop mode

12. Playback (▶) : Playback when it is pressed shortly in stop mode, or playback in reverse direction
   when it is pressed in playback mode.
   Enter into GO TO menu in case pressed in longer time in stop mode.

13. Fast Forward (▶▶): High speed playback in forward direction in playback mode, or moving to the last
   of recorded data when it is in stop mode.

14. Pause (▌▌): Pauses when it is in palyback mode

15. Camera No : Represents camera numbers. Used with MSD button or to enter numbers.

16. MENU : Used to change menu in SYSTEM SETUP

17. ENTER : Used as selection key in SYSTEM SETUP or changes contents displayed in live display.
   By pressing this button repeatedly in live display mode, contents of display, that are, time
   and date, DVMR status, and camera title, is included or excluded, and you can select any
   one of 8 choices.

18. IR receiver : If blocked up by any object, remote controller does not work.

19. Direction key : Used to move in SETUP menu, or to change values

20. CD-RW DRIVE

   Notice : If several keys are pressed at the same time, or improper sequence in pressing
   buttons may cause malfunction of DVMR unit.

1-2. Name and function of each button

[Rear Panel]
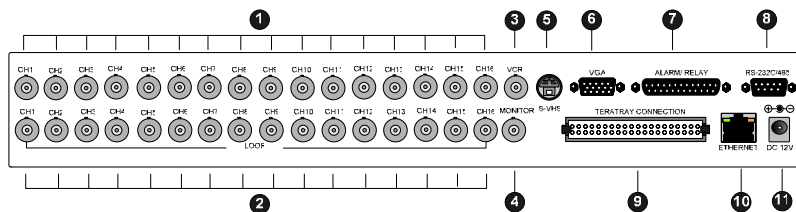
1. CH1~CH16 : Connect cameras of NTSC or PAL system up to 16

2. CH1~CH16 : Loop out from each camera from 1 to 16

3. VCR : Analog Backup output for VCR or video printer

4. MONITOR : Connect to composite monitor in NTSC or PAL system

5. S-VHS : Connect to S-VHS monitor for better quality of display

6. VGA : Connect to PC monitor

7. ALARM/ RELAY : Connect to alarm input and relay output

8. RS-232C/485 : Connect to external device of RS-232C or RS-485 protocol
                 (RS-232C : Control DVMR using PC keyboard, RS-485 : PTZ camera control

9. TERATRAY CONNECTION : Connect to HDD BAY for extension of HDD space

10. ETHERNET : Connect to Ethernet port for TCP/IP option

11. D/C 12V : Port for DC 12V, 4.5A

   Notice : Improper DC power supply to DVMR unit may cause damage to the sysem.
   Notice : When connect to other devices, make sure to turn off DC power switch on the front.
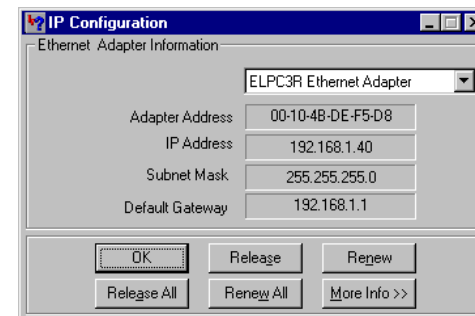

Now, hit the "Release" button and then hit "Renew". If all goes well, you'll get new information, and it is for your DVMR unit. Write down this information on separate paper and input IP Address, Subnet Mask, and Default Gateway into your DVMR to which you want to access via IP network.

(c) Confirm if IP Address is working by executing pingtest
Execute pingtest with IP Address which you assigned to DVMR unit, check if it is successful before you try to access to DVMR unit via IP network. If it is not successful, you may not be able to access to DVMR unit via IP network, and we recommend you to get help from your network administrator.

4. Live view via IP network
   Click Remote Viewer icon to view live pictures via IP network. You will see then following window.
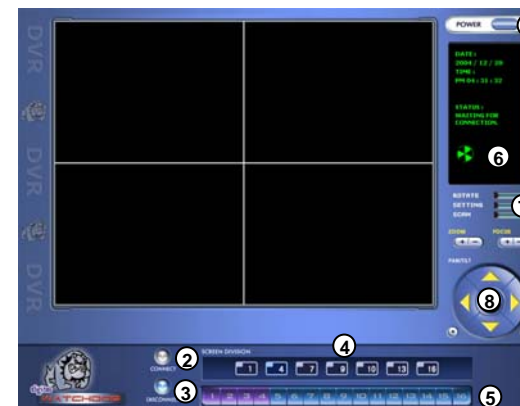
Function of each button in live-view window :
1) : **Power** switch. Press power switch to quit. Before press power switch button, press disconnect button first.
2) : **Connect** button. Press connect button to connect to DVMR unit via IP network to see live pictures of DVMR unit. You will see the same live pictures, which are displayed on monitor of DVMR unit with a certain time delay depending on transfer rate of IP network.
3) : **Disconnect** button. Press disconnect button to cut connection to DVMR unit via IP network.
4) : **Screen division** button. You can select to see pictures of any single channel, 4, 9, and 16 channels at the same time. You can select channel number from 1 to 16 to see pictures of selected channel. If you selected 4, you swill see channel number from 1 to 4 are all activated.
5) : **Channel number** button. You can select channel number to see live pictures from selected channel.
6) : **Status** window. It shows Date and Time. Further it displays "Connection established" and a circular fan on the left bottom is rotating when connection button is activated, or "Waiting for connection" when disconnection button is activated.

3. How to get IP for DVMR unit

There is 2 different ways to input IP address and other data into DVMR unit.
The first way is to make DVMR system get IP address from DHCP server automatically.
It is only possible in case DVMR unit is connected to cable modem (dynamic IP), Intranet under DHCP server or IP sharer which support DHCP. Select "DHCP" in TCP/IP setup to get IP address automatically.
The second way is you get IP address and other data before you connect DVMR unit to network and later input this IP address and other data into DVMR unit. Except the case you already know IP address assigned for DVMR unit, get IP address for DVMR unit as following process in the client PC from which you want to access to DVMR unit via IP network. If you connect DVMR unit to leased line with static IP already known, it is not necessary to follow following process to get IP information.

a) "ipconfig" or "winipcfg"

Execute "ipconfig" command in the client PC with Windows 2000 and Windows XP, and "winipcfg" command in the client PC with Windows 98 and ME, and you will get IP   informations, that are IP Address, Gateway, Subnet Mask. Write down those numbers and input into DVMR unit to which you are going to access via IP network. As far as DVMR is in operation without turning off, it is considered that this IP Address is assigned just to this DVMR unit. Then, restart the client PC to get different dynamic IP address for client PC after you get IP information for DVMR unit. Derail procedure to get IP information in different Windows is as follows.

ⓐ Window 2000

First you need to get to the command prompt using the command shell. The best way is from the run menu. **Start**--> **Run** --> and type in **Command**. Then either hit enter or click OK. At the command prompt, type in **ipconfig**. This will pull up the information that you need to find IP Address for DVMR unit.

ⓑ Windows XP

If you want to get IP Address for your DVMR in Windows XP, you can run **ipconfig** in one easy step. Open Run and type "cmd /k **ipconfig**" without the quotes. This will open the command prompt and start **ipconfig** the easy way. Assign IP Address you get to DVMR unit.

ⓒ Windows 98 and ME
To run winipcfg, grab the Run item from the Start menu and type **winipcfg** into the Open: box. Hit OK (or RETURN). Those comfortable with DOS can launch it from a DOS prompt.

When **winipcfg** launches, you'll get a window like this one:

Chapter 2. Procedure

2-1. Camera Connection

Connect the camera to the CAMERA INPUT on the Rear Panel of the system.
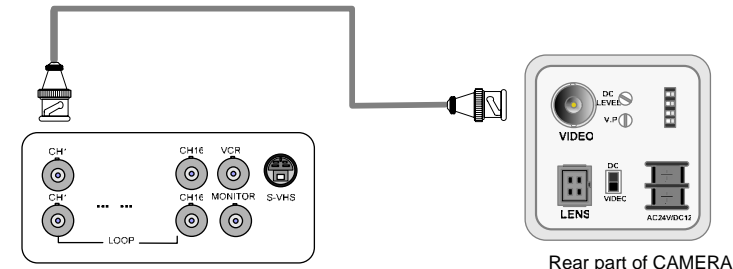
Rear part of CAMERA

Notice : This DVMR system accepts camera with both PAL system or NTSC system, and you are requested to set at PAL or NTSC system when you first boot, as per specified in the procedure for selection of video system in 2-8 power connection.
Connect camera and monitor while DC power switch on the front panel is off.

2-2. Monitor Connection (Composite Connection Method)

Connect the monitor to the MONITOR OUT on the rear panel of unit.
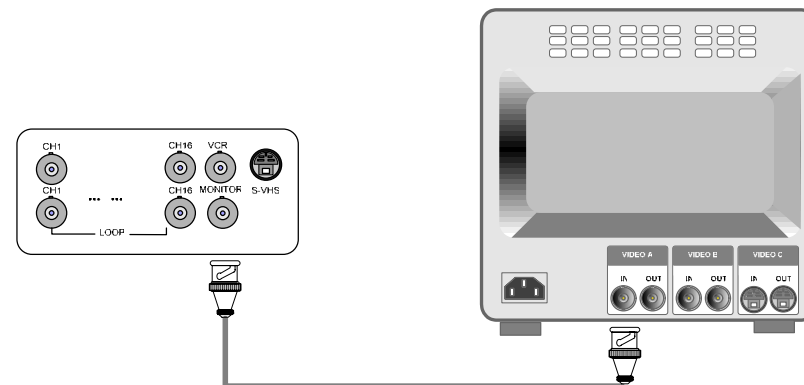
2-3. Monitor (S-VHS) Connection

Connect S-VIDEO Monitor to MONITOR OUT(S-VHS) on the Rear Panel of the system.
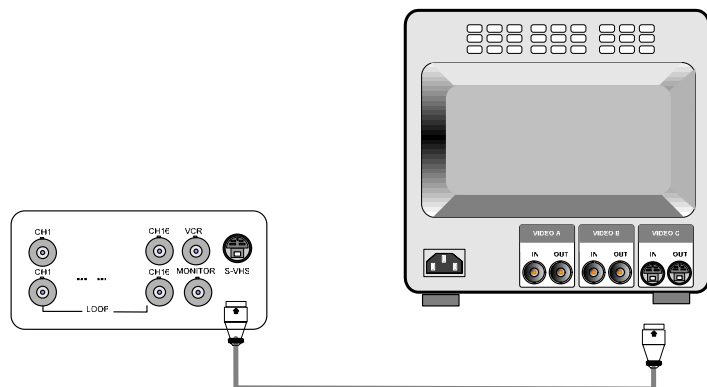
2-4. VCR & VIDEO PRINTER Connection

Connect VCR or VIDEO PRINTER to VCR OUT on the Rear Panel of the system.
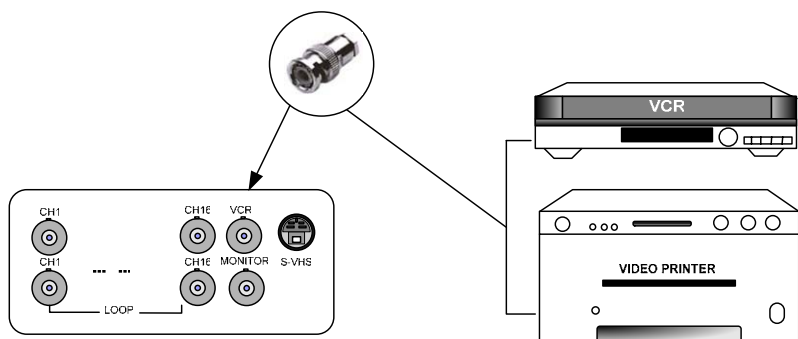
c) ADSL(ADLS modem with PPPoE protocol) line with static IP or dynamic IP.
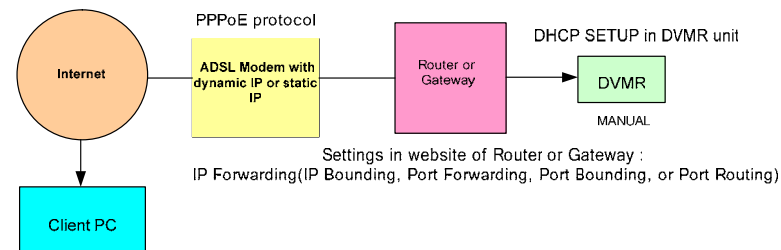
Example of IP Forwarding in website of Router or Gateway
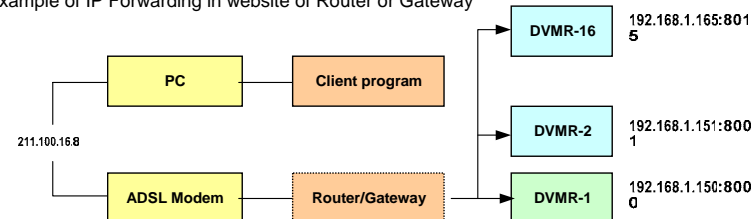
IP forwarding is what we have to set in web site of Router or Gateway to connect external Port to internal IP assigned by Router or Gateway.

d) In the same Intranet : Supports

- LAN under DHCP (Dynamic Host Configuration Protocol) Server

DHCP SETUP in TCP/IP SETUP:
DHCP
(DVMR system automatically gets IP
address)

- LAN under IP share

DHCP SETUP in TCP/IP SETUP:
DHCP
(DVMR system automatically gets IP
address)
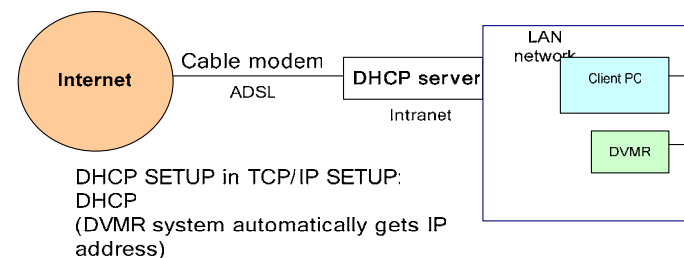
Chapter5. Manual for Remote Viewer Software (TCP/IP)

General description : TCP/IP option enables users to view live pictures, search recorded pictures, or control PTZ camera via Internet line, far apart from the DVMR unit, and users can store selected recorded pictures on HDD of client PC. Our stand-alone DVMR does not adopted web browser method for access to DVMR unit via Internet line, and you must install Remote Viewer software included in the package on client PC before you try to access to DVMR unit over IP network.

1. TCP/IP SETUP in DVMR unit

Before you install Remote Viewer software, be sure to input IP address and others in TCP/IP SETUP of DVMR unit. Then, execute **SETUP.exe** on Remote Viewer software CD included in the package of stand-alone DVMR with TCP/IP option.

PTZ

DVMR

Install client software (Remote viewer) to access to DVMR unit via Internet line.
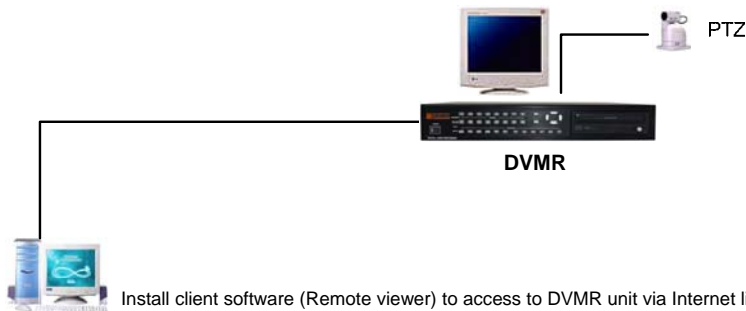
2. Conditions of IP network

To access to our DVMR unit via IP network, you have to connect DVMR unit to IP network as one of followings and assign IP address, Subnet mask, and Gateway to our DVMR unit. Our DVMR unit accepts static IP and it also work in case both DVMR unit and client PC are connected to the same Intranet (LAN).

a) Static IP : If DVMR unit is connected to leased line with static IP, we can access to DVMR unit via Internet line far apart from DVMR unit. (DHCP SETUP in TCP/IP SETUP : **MANUAL** (Input IP address manually)

b)Cable modem with dynamic IP : If DVMR unit is connected to cable modem with dynamic IP, we can access to DVMR unit via Internet line far apart from DVMR unit.
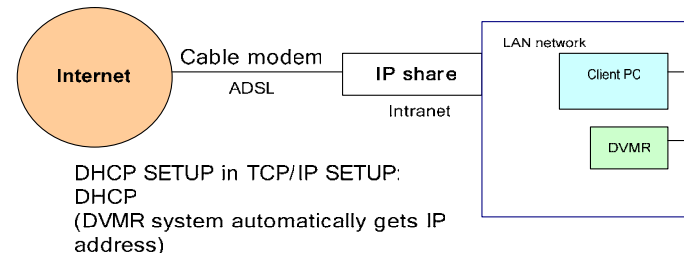

DHCP SETUP in DVMR unit

DHCP

(DVMR system automatically gets IP address)
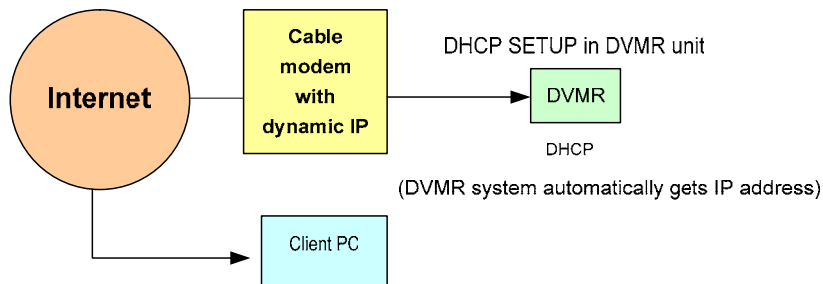
2-5. Sensor Connection

Connect sensors to D-SUB 25 Pin as specified below.

You can connect dry-contact type sensors. In case of sensors with TTL output (5 Volts system), GND of sensor must be connected to GND of DVMR unit and signal line to alarm input from D1 to D16 as shown in following figure.

Short-circuit between any of D1 from D16 and GND is recognized as an alarm.

All GNDs are connected to each other on circuit.
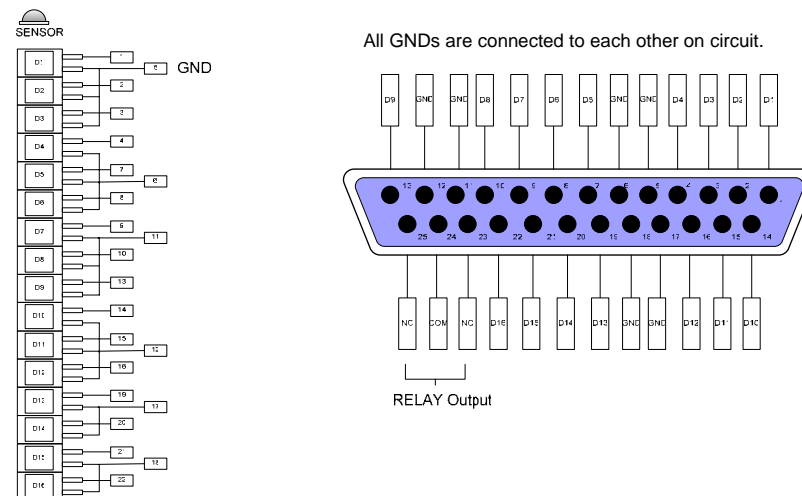
RELAY Output

Relay output is output in case there is an alarm input, and is connected to external device using COM-NO (Normal Open) or COM-NC (Normal Close) contact.

2-6. Network Connection

RS-232C : Connected to RS-232C port of PC to operate DVMR unit with key-board of PC.

RS 485 : Connected to P/T Controller or Speed Dome Camera

RJ-45 (ETHERNET) : Connection to LAN, WAN or Internet
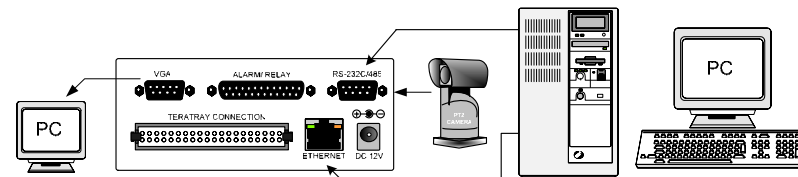
Notice : TERATRAY CONNECTION port must be used for connecting HDD Bay (TeraTray), and can not be used for connecting other device. Connection must be done while power supply to DVMR unit is cut.

When TeraTray is connected to DVMR unit, supply power to TeraTray first and then to DVMR unit.

2-7. HDD connection

Specification of HDD : EIDE, 7200 rpm, LBA mode type(Up to 120GB)
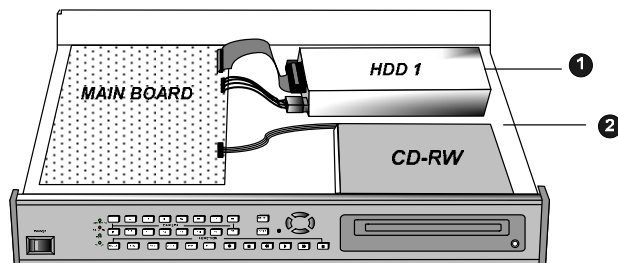
Connect main board and HDD using IDE HDD cable and power cable included in the package.

If you install just a unit of HDD, jumper setting of HDD must be on Master, as specified by HDD manufacturer, and you can install it at any location of HDD1 or HDD2. In case you install 2 HDDs, HDD1 must be Master and HDD2 is Slave, and jumper setting must be done properly as specified by HDD manufacturer.
Fix HDD on the bottom of DVMR case using screws included in the package. Screws must be inserted from outside of the bottom.

Notice : Formatting before installation is not required, because DVMR system automatically detects HDD and formats. In the first operation after installation of HDD, first (clear all data on HDD and) set at FACTORY DEFAULT in SETUP menu of DVMR system.

2-8. Power Connection

Connect DC 12 V power to the POWER CONNECTION on the rear panel of DVMR unit.

▷ **Selection of video system (NTSC/PAL system)**

You can set video system in the process of booting. According to video system of camera, set video system as follows.
    NTSC system : While you press [MENU] button and [LEFT] button at the same time, turn DC power switch on. Press two buttons until you hear beep sound from DVMR unit.
    PAL system   : While you press [MENU] button and [RIGHT] button at the same time, turn DC power switch on. Press two buttons until you hear beep sound from DVMR unit.
    From next booting, it is not necessary to set as above. DVMR system memorize video setting.
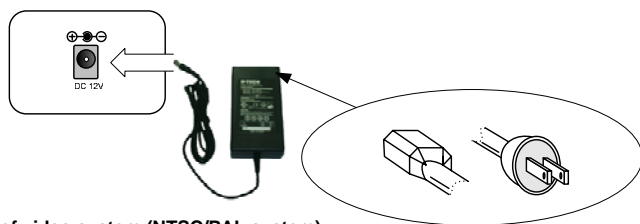   In the process of booting, DVMR system displays "VIDEO SYSTEM SETTING TO NTSC(or PAL)" on bottom of screen to inform you video system you selected.

▷ **Turn on the POWER and Log on the system**

Follow direction of Log-in part of this manual to input own password and start the system.
Just press ENTER button if you do not want to input own password.

▷ **Detail setup in SYSTEM SETUP :** Refer to SYSTEM SETUP of this manual.

    Notice : To connect HDD Bay to DVMR unit, first turn off power to both DVMR unit and HDD Bay. Then turn on power to HDD Bay first and then DVMR unit after more than about 5 seconds.

---

2. Configuration of Stand-alone DVMR

3. RS-232C ASCII-code table

Following ASCII-code are for programmers who want to control DVMR unit via RS-232C port.
RS-232C specification (baud rate/parity/data length/stop bit) : 57600, N, 8, 1

1 Byte ASCII-code.

MODE	'D'	●	'R'	CH1	'1'	CH7	'7'	CH13	'#'	LEFT	'H'
FRZ	'F'	■	'S'	CH2	'2'	CH8	'8'	CH14	'$'	RIGHT	'K'
SEQ	'Q'	◀◀	'<'	CH3	'3'	CH9	'9'	CH15	'%'	UP	'U'
ZOOM	'Z'	▶	'P'	CH4	'4'	CH10	'0'	CH16	'^'	DN	'J'
PIP	'I'	▶▶	'>'	CH5	'5'	CH11	'!'	MENU	'M'		
P/T	'T'	‖	'A'	CH6	'6'	CH12	'@'	ENTER	↵		

4. Arrangement of RS 485 and RS-232C pin

Pin No.	Definition
1	NC
2	RxD
3	TxD
4	SD-(RS 485)
5	GND
6	SD+(RS 485)
7	NC
8	NC
9	NC
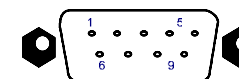
RS-232C

Chapter 4 . Specification and configuration

4-1. SPECIFICATIONS

MODEL NO	16 channel stand-alone Digital Video Multiplex Recorder	
VIDEO I/F	INPUT	16CH INPUT 1.0 VP-P, 75 OHM UNBALANCED (BNC TYPE)
	OUTPUT	3 OUTPUT VBS : 1.0VP~P.75 OHM UNBALANCED (BNC TYPE)
	HORIZONTAL RESOLUTION	480TV LINES
	S/N RATIO	MORE THAN 4dB
	COLOR	16.7 MILLION
MONITORING METHOD	SPLIT SCREEN	FULL, QUAD, 9 SPLIT , 16 SPLIT DISPLAY
	ZOOM	LIVE & PB AVAILABLE
	PIP	AVAILABLE
	SEQUENCE	AVAILABLE
	DIAPLAY QUALITY	FULL : 720(H)X480(V) ACTIVE PIXELS/FULL MOVING PICTURE 1/16 SCREEN :180(H)X120(V) ACTIVE PIXELS
RECORDING /PLAY FUNCTION	SPEED	MAX 30 FRAME/SEC
	STORAGE MEDIA	HDD
	COMPRESSED PICTURE	JPEG
	PICTURE RECORDING METHOD	FIELD SWITCHER METHOD FULL SCREEN RECORDING
	REC, MODE	REAL-TIME/ TIME-LAPSE / EVENT
	TRACK PLAY	SEARCH, STILL
OTHER FUNCTION	BACK-UP	VCR, TIME LAPS VCR : VCR OUTPUT
	OTHERS	RS232C, RS485, 16 ALARM INPUT ,1 RELAY OUTPUT
	CAMERA CONTROL	PAN/TILT/ZOOM AND FOCUS REMOTE CONTROL : EXTERNAL EQUIPMENT, WIPER,PUMP,FAN AND HEATER
	CONFIGURATION	PLUG&PLAY
	CAMERA CONTROL	PAN/TILT/ZOOM AND FOCUS REMOTE CONTROL : EXTERNAL EQUIPMENT, WIPER,PUMP,FAN AND HEATER
	CONFIGURATION	PLUG&PLAY
	HDD EXPANSION	IN DVMR CASE : 1 OR 2 HDD OPTIONAL HDD BAY SUPPORTED MAX 20 HDD EXPANDABLE COMPATIBILITY WITH DIFFERENT MANUFACTURER OF HDD
MECHANICAL	OPERATION TEMPERATURE	41F~ 104F (5C~ +40C)
	OPERATION HUMIDITY	LESS THAN 90%
	IR REMOTE CONTROLLER	BUILT-IN
	DIMENSION	19 INCHES IN WIDTH , 1.5U 434 mm x 360 mm x 66 mm
	WEIGHT	APPROX. 4.8KGs (WITHOUT HDD)
	POWER SUPPLY	DC ADAPTER (12V DC 5A)

Chapter 3 . Operation

3-1. Basic display

Turn on the power switch, and DVMR system shows live display from ch 1 to 16 as following figure. DVMR system already started to record picture data automatically.
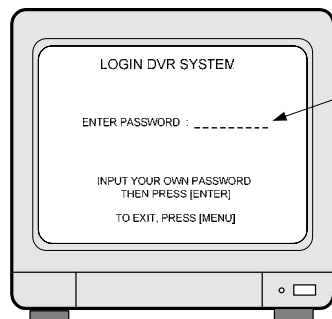

Basic display
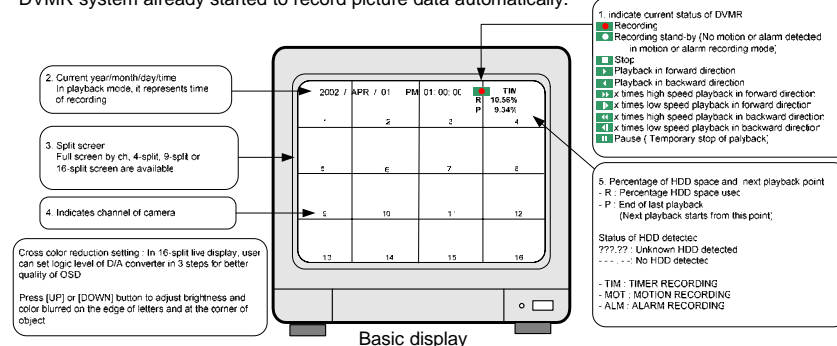
1. First operation

After power supply, DVMR system automatically starts to record on Timer recording mode. It is factory default setting, and user can change to other recording settings.

a. If press [Playback] button(▶) shortly, playback starts from last stop point. If press [Playback] button once more in playback mode, direction of playback is reversed.
If press [Playback] button in long time while DVMR system is in stop mode, you can enter into GO TO menu. For details, refer to playback part of this manual.

b. If press (▶▶) button in playback mode, ▶▶[1x] is displayed, and you can select speed of playback higher than x1.
If press (▶▶) button repeatedly, speed of playback is increased from 1, 2, 4, 8, 16, 32, up to 64.
To the contrary, if press (◀◀) button in playback in x1 speed, playback speed is decreased to ½ and then ¼.

c. To go back to Menu, press [Menu] button while in stop mode.

2. Set time when you first operate DVMR unit.

Refer to TIME/DATE SETUP in SYSTEM SETUP in this manual.

3. To enter into 4-split, 9-split, or 16-split screen during live monitoring or playback, press [MSD] button first and then 1, 2, or 3 respectively.

4. Display of camera channel (camera title)
In 16-split screen, camera title is shown in numbers by the system from 1 to 16, and in 4-split and 9-split screen, camera title set by user is shown.

5. Shows how much space in HDD is recorded
a. R(RECORD) indicates percentage of HDD space used until now.
b. P(PLAY) indicates starting point from which next playback will start. It is the point where last playback stopped. To start playback from the first of recording, press (◀◀ button to set P(PLAY) at 0.00%, and then press [Playback] button (▶).
To replay reverse direction from the end of recording, press (▶▶) button to move to the end of recording, and then press [Playback] button (▶).

Notice : If you press [MSD] button for a long time, you can select type of monitor. [MSD] button changes monitor type (defaulf mode is Composite) from(to) Composite to(from) VGA, whenever pressed, in case VGA option is included.
If you press [MSD] button two times continuously, you can adjust screen position by pressing [LEFT], [RIGHT], [UP], and [DOWN] buttons on the front panel of DVMR unit.

3-2. DVMR SYSTEM Log-in

LOGIN DVR SYSTEM

Enter password
Defaull P/W : [ENTER]

ENTER PASSWORD : _ _ _ _ _ _ _ _

INPUT YOUR OWN PASSWORD
THEN PRESS [ENTER]

TO EXIT, PRESS [MENU]

Display of Login

1) After system starts to operate, press [MENU] button to enter into SYSTEM menu.

2) LOGIN DVR SYSTEM is displayed as shown on the left.

3) If you want to input for your own password, press any buttons on the front panel, from 1 button to 8 buttons. If you do not want to have own password, just press [ENTER] button.

4) Then press [ENTER] button.

▷ If password you entered is consistent with password already set, "PASSWORD OK" is displayed, and you enter into SYSTEM SETUP. If it is not, system goes back to live display mode.

▷ Factory default password is [ENTER].

Notice : We recommend users to set own password in the first operation. For details, refer to PASSWORD SETUP IN SYSTEM SETUP-MISCELLANEOUS SETUP.

Notice : Be careful to memorize own password to operate DVMR unit properly. If you forget password, contact this DVMR dealer to know how to enter into SYSTEM SETUP.

Notice : To protect hard drive from damaged, turn off DC power switch of DVMR unit after you first press [MENU] button. If you press [MENU] button, DVMR unit stops recording, and HDD head is not in the process of writing.

▷ Password Input Button

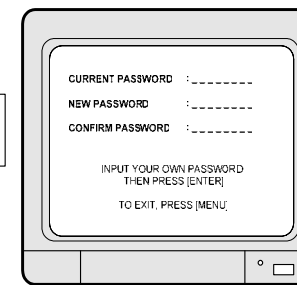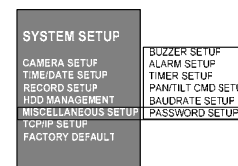|							
1	1	5	5	9	9	13	D
2	2	6	6	10	A	14	E
3	3	7	7	11	B	15	F
4	4	8	8	12	C	16	0

ex) If you'd like to set "3B08" as a password at DVR, you should push the following buttons.
===> 3 11 16 8
Remote Viewer Access P/W is going to be "3B08" as you set.

f. PASSWORD SETUP.
To input user's own password in the first operation or to change pwassword.

SYSTEM SETUP

CAMERA SETUP
TIME/DATE SETUP
RECORD SETUP
HDD MANAGEMENT
MISCELLANEOUS SETUP
TCP/IP SETUP
FACTORY DEFAULT

BUZZER SETUP
ALARM SETUP
TIMER SETUP
PAN/TILT CMD SETUP
BAUDRATE SETUP
PASSWORD SETUP

CURRENT PASSWORD : _ _ _ _ _ _ _ _
NEW PASSWORD : _ _ _ _ _ _ _ _
CONFIRM PASSWORD : _ _ _ _ _ _ _ _

INPUT YOUR OWN PASSWORD
THEN PRESS [ENTER]

TO EXIT, PRESS [MENU]

Current password
New password
New password to confirm

Display of PASSWORD SETUP

Move using [Up] and [Down] buttons and input your own password by pressing any buttons on the front of DVMR unit. Length of password is from 1 to 8. To change password, first input current password and then new password. You have to input new password again to confirm.

Notice : Password set by manufacturer before delivery(FACTORY DEFAULT) is null, and just press [MENU] and then press [ENTER] to enter into SETUP menu.
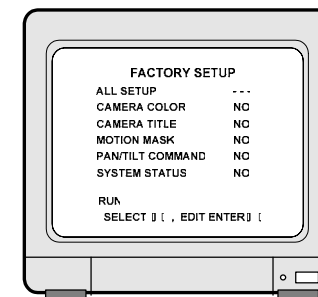
Notice : In the first operation, we recommend you to set own password. In case you forgot own password, contact dealer to know how to get into SETUP menu.

9. TCP/IP SETUP
In case TCP/IP option is included, you have to input IP address, Port number, Subnet Mask and Gateway into TCP/IP SETUP of DVMR unit. If DVMR Unit is connected to leased line with static IP, ADSL with static IP or dynamic IP, or cable modem with dynamic IP, you can access to DVMR unit via Internet line to see live pictures or search recorded pictures, far apart from DVMR unit. In case both DVMR unit and client PC are connected to the same LAN network(Intranet), you can access to DVMR unit from the client PC, but somebody outside Intranet can not access to DVMR unit via Internet line. In all cases, you have to install client program(Remote Viewer) on the client PC from which you want to access to DVMR unit. For more details, refer to Remote viewer manual for 16 ch DVMR included in the package.

10. FACTORY DEFAULT
Initialize system setup as settings recomended by manufacturer (FACTORY DEFAULT).

SYSTEM SETUP

CAMERA SETUP
TIME/DATE SETUP
RECORD SETUP
HDD MANAGEMENT
MISCELLANEOUS SETUP
TCP/IP SETUP
FACTORY DEFAULT

FACTORY SETUP

ALL SETUP - - -
CAMERA COLOR NO
CAMERA TITLE NO
MOTION MASK NO
PAN/TILT COMMAND NO
SYSTEM STATUS NO

RUN
SELECT Ⅱ 〔 , EDIT ENTERⅡ 〔
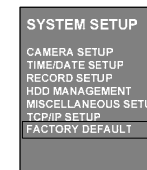
Display of FACTORY SETUP

You can set all groups of settings as a whole or set them group by group. Move to menu items using [Up] and [Down] buttons and select "YES" or "NO", and then move to "RUN". Press [ENTER] button to set at FACTORY DEFAULT for selected group of settings.

Notice : When you connect or replace new HDD, set at FACTORY DEFAULT before starting to record.

ALL ABOUT IMAGE RECOGINITON & PROCESSING
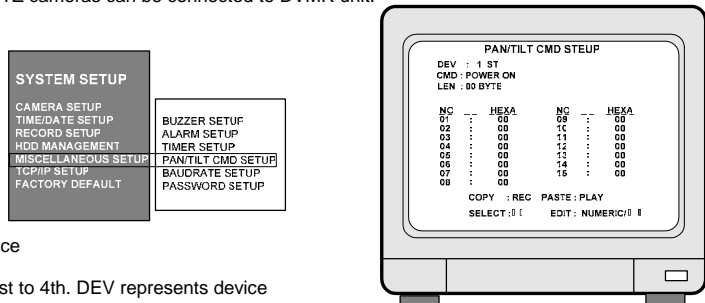
d. PAN/TILT CMD SETUP.

Input protocol of PTZ camera or speed dome camera which shall be controlled by data communication via RS-485. Max. length of protocol for each command is 15 Byte, and Baud rate is settable from 1200 to 19200. Max. 4 PTZ cameras can be connected to DVMR unit.

SYSTEM SETUP

CAMERA SETUP
TIME/DATE SETUP
RECORD SETUP
HDD MANAGEMENT
MISCELLANEOUS SETUP
TCP/IP SETUP
FACTORY DEFAULT

BUZZER SETUP
ALARM SETUP
TIMER SETUP
PAN/TILT CMD SETUP
BAUDRATE SETUP
PASSWORD SETUP

PAN/TILT CMD STEUP

DEV : 1 ST
CMD : POWER ON
LEN : 00 BYTE

NO	HEXA		NO	HEXA
01	00		09	00
02	00		10	00
03	00		11	00
04	00		12	00
05	00		13	00
06	00		14	00
07	00		15	00
08	00		16	00

COPY : REC　PASTE : PLAY

SELECT : [ ]　EDIT : NUMERIC/[ ] [ ]

Display of PAN/TILT CMD SETUP

- Setting sequence

1. DEV : From 1st to 4th. DEV represents device
   (model of PTZ camera).
   We can connect up to 4 cameras with different protocols
2. Select command
3. Set Byte of command : max. 15. Byte of commands not used for each device must be set at 0.
4. Input protocol of selected command
5. Repeat process from 1 to 4 until you complete to input protocol for all commands you need.
* Use [Record] button to copy and [Playback] button to paste, in case there are many protocols similar to each other.
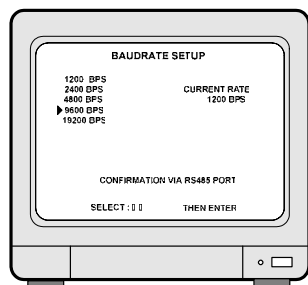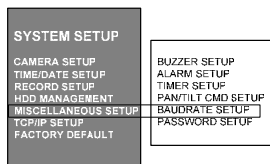
- How to input protocol
User must select commands needed for PTZ cameras (from 1st to 4th DEV), and input LEN and protocol (Hexa-code). For commands not used for your PTZ camaeras, LEN value must be set at 0.
Commands whose LEN are 0 are not shown when you practically control PTZ camera later.

Using [Up] and [Down] buttons, move to item you want to select or set, and use [Left] and [Right] buttons to set values.You can input protocol using numerical buttons on the front of DVMR unit or remote controller.
Following table shows buttons corresponding to each HEX-code for protocol.

HEX-code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	0
Button on the front	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Button on remote controller	1	2	3	4	5	6	7	8	9	0,0	0,1	0,2	0,3	0,4	0,5	0,6

Note : For more details, refer to "How to incorporate PTZ protocol for 16 ch DVMR" included in the package.

e. BAUDRATE SETUP

SYSTEM SETUP

CAMERA SETUP
TIME/DATE SETUP
RECORD SETUP
HDD MANAGEMENT
MISCELLANEOUS SETUP
TCP/IP SETUP
FACTORY DEFAULT

BUZZER SETUP
ALARM SETUP
TIMER SETUP
PAN/TILT CMD SETUP
BAUDRATE SETUP
PASSWORD SETUP

BAUDRATE SETUP

1200 BPS
2400 BPS
4800 BPS
▶ 9600 BPS
19200 BPS

CURRENT RATE
1200 BPS

CONFIRMATION VIA RS485 PORT

SELECT : [ ] [ ]　　THEN ENTER

Display of BAUDRATE SETUP

Set baudrate of PTZ camera to be connected.
(1200, 2400, 4800, 9600, and 19200 BPS)

If you connect DVMR unit to your PC by 485 to 232 converter,
you can see data transmitted using program like Windows Hyper-terminal.

ALL ABOUT IMAGE RECOGINITON & PROCESSING

3-3. Recording

1. Basic recording method
Press [Record] button (●), then recording icon (●) is displayed on the top of screen.
If DVMR system is booted again, it is not necessary to set recording settings, because recording setting remains unchanged and memorized.
Refer to SYSTEM SETUP-RECORD SETUP in this manual. (PAGE. 20)

2. FRZ (FREEZE)
If press [FRZ] button, "FRZ" is displayed on top left.
Then press number of channel you want to freeze. Picture of channel you selected is freezed, and (F) icon is displayed on the left of camera title. Press [FRZ] button again to exit.

3. SEQ (SEQUENCE)
If press [SEQ] button in live display when it is in full screen of any channel, it shows full screen Pictures in rotation.
Rotation time interval can be set in SYSTEM SETUP-MISCELLANEOUS SETUP-TIMER SETUP.

2002 / APR / 01　PM 01:00:00
SEC
R 10.56%
P 9.34%

AB

Pictures of 16 channel are displayed in rotation
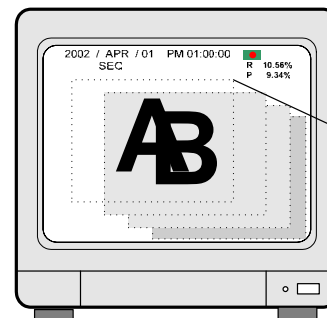
Channel rotation in full screen

4. ZOOM
If press [ZOOM] button in full screen of one of 16 channel, system enlarges this picture two times.
Using direction keys on the left of front panel, you can select area to be enlarged.

2002 / APR / 01　PM 01:00:00
ZOOM
R 10.56%
P 9.34%

Current area of picture enlarged

Enlarged area moves whenever pressing direction button, and continuous pressing make it move faster.

CH-01
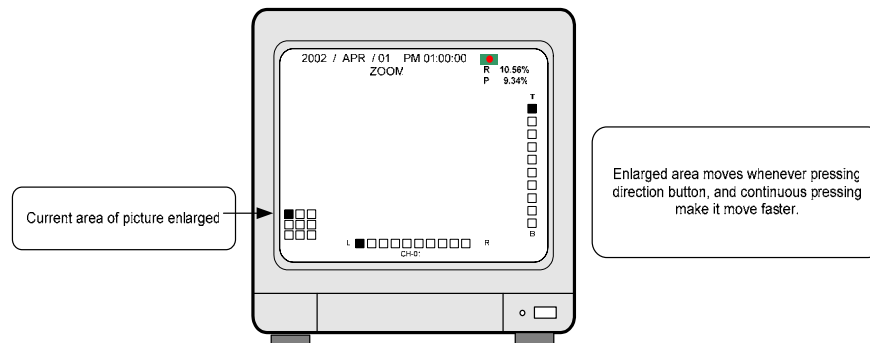
Display of ZOOM

5. PIP (PICTURE IN PICTURE)

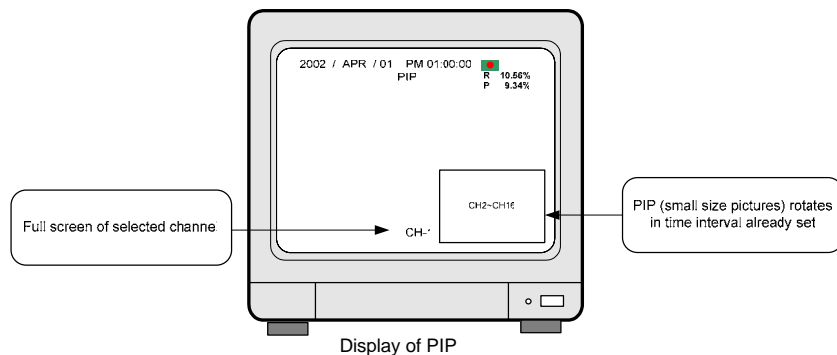While you see picture of specific channel in full screen, you can see small size pictures of remaining channels in rotation, if you press [PIP] button. Time interval of PIP (small size picture) can be set in SYSTEM SETUP-MISCELLANEOUS-TIMER SETUP.
If press [SEQ] button while it is in PIP mode, picture in full screen and PIP (small size picture) are all rotate.
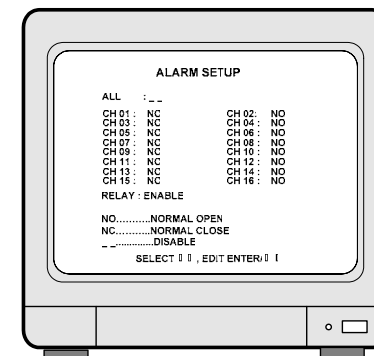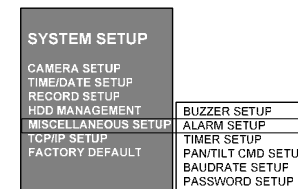

Display of PIP

6. P/T (PAN/TILT)

You can connect PTZ camera or speed dome camera to DVMR unit, and you must input protocol of camera to control camera while you see live pictures, using buttons on the front of DVMR unit or remote controller.

a. Basic control button : ENTER - Transmit COMMAND while pressed
         UP/DOWN - Selection of menu item
         LEFT/RIGHT - Select Command
         For details, refer to SYSTEM SETUP-MISCELLANEOUS-PAN/TILT CMD SETUP.
 b. Operation : 1. Press [P/T] button.
         2. Select device (PTZ camera) using [UP] and [DOWN] buttons.
         3. Select Command using [LEFT] and [RIGHT] buttons.
         4. After completing input protocols of PTZ camera, press [P/T] button to exit.

Notice : Maximum numbers of PTZ camera can be connected to DVMR unit is 4.

b.Set type of sensor(alarm)

Display of ALARM SETUP

Set type of alarm sensors connected to DVMR unit. Set at NO (Normal Open) or NC (Normal Close) for alarm sensors. Set at DISABLE or ENABLE for relay output.
Move to item you want to change using [Up] and [Down] buttons, change type using [Left] and [Right] button. To set altogether as a whole, locate cursor at "ALL ; --" and select type you want using [Left] and [Right] button.
Just exit and all setting is memorized by the system.

c. Time Interval Setting
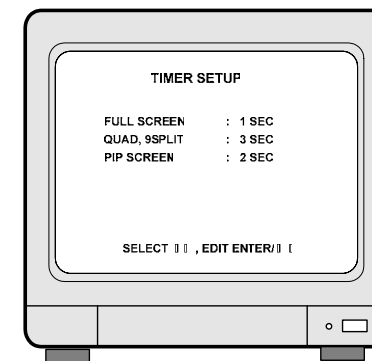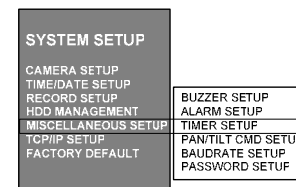
Display of TIMER SETUP

Set time interval for SEQ, PIP (Picture in picture)
FULL SCREEN : Time interval of pictures rotating in channel sequence when [SEQ] button is pressed.

QUAD, 9 SPLIT : Time interval of pictures rotating in a certain sequence when [SEQ] button is pressed.

Pattern of rotation in quad rotation is 1/2/3/4, 5/6/7/8, 9/10/11/12, 13/14/15/16, 1/2/3/4, and so on.
Pattern of rotation in 9-split is 1/2/3/4/5/6/7/8/9, 1/2/10/11/12/13/14/15/16, 1/2/3/4/5/6/7/8/9, and so on.

PIP SCREEN : Time interval of small pictures rotating in sequence when [PIP] button is pressed.

7. HDD MANAGEMENT
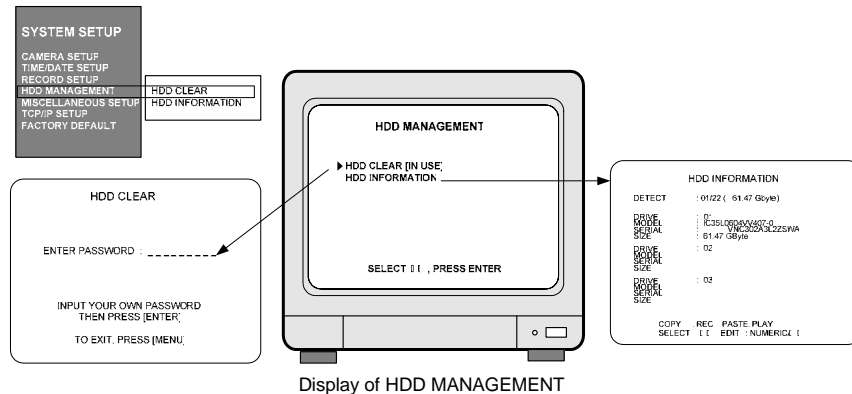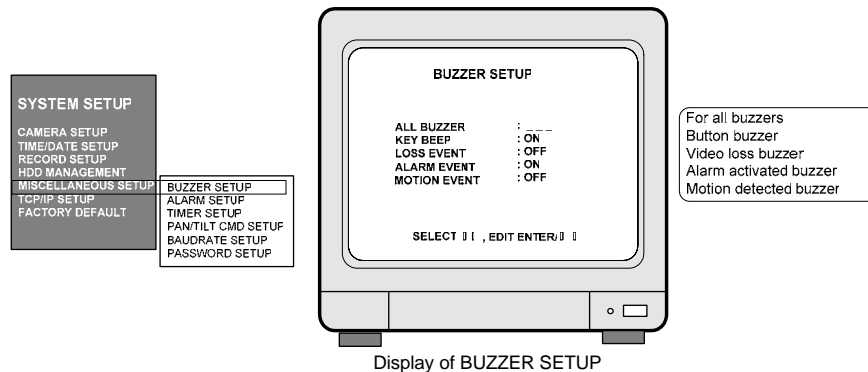

Display of HDD MANAGEMENT

a. Clear data stored on HDD.
   When "HDD CLEAR [IN USE]" is displayed, press [ENTER] button and input password you already set.
   If you entered correct password, HDD shall be cleared and "HDD CLEAR [EMPTY]" is displayed.

b. Show information of HDDs installed inside DVMR unit or HDD Bay.

8. MISCELLANEOUS SETUP

a. BUZZER ON/OFF


Display of BUZZER SETUP

Press [Up] and [Down] buttons to move to item you want to set, and select using [Left] and [Right] button. Press [ENTER] button to set. To set altogether at ON or OFF, move to ALL BUZZER and set at ON or OFF.

---

7. Record setting
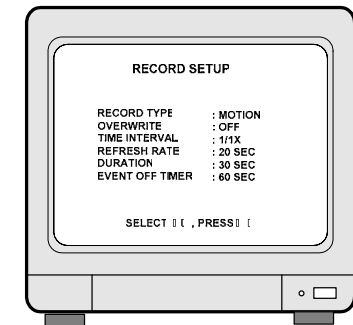
a. TIMER recording : Recording by time (at set recording rate, fields/sec)

    Example : Record all images at set recording rate(fields/sec) and overwrite when HDD is full.

        1. Log-in to SYSTEM SETUP.
        2. Mover to RECORD SETUP and enter.
        3. Using direction keys, set as figure-a.
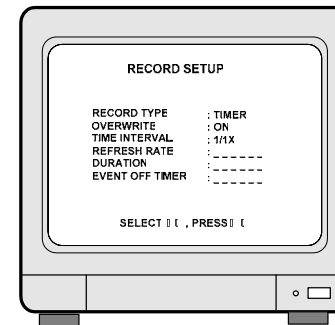
a. TIMER recording   b: MOTION recording

TIME INTERVAL : Images from cameras are coming every 1/60 sec in NTSC system and 1/50 sec in PAL system, respectively, and it is switching time.

    TIME INTERVAL represent recording rate, however it practically indicates if it records images at time interval of switching time, at time interval of double of switching time, at time interval of triple of switching time, and so on.

    1/1X : Records at all images from all cameras at a time interval of 1/60 or 1/50 second according video system.

    1/2X : Records images from all cameras at a time interval of 2/60 or 2/50 second according to video system.

b. MOTION recording : Recording when motion is detected (MOTION DETECTION)
    Example : Just record for 30 seconds whenever motion is detected, and stop recording when HDD is full.
        1. Log-in to SYSTEM SETUP.
        2. Move to RECORD SETUP and enter.
        3. Using direction keys, set as figure-b.

c. ALARM recording : Recording when alarm is activated

    ☛ For details, refer to RECORD SETUP (PAGE. 20) in this manual.

8. Cautions

    1) When you are in SYSTEM SETUP, recording is stopped.
    2) While DVMR system is in playback mode, recording is stopped.
   3) No recording is done in channel to which you did not connect camera.

3-4. Playback

1. Basic operation

 a. If press [Playback] button(▶) shortly, DVMR system starts to replay.
 b. If press [Playback] button(▶) once again, direction of playback is reversed.
 c. If press [Playback] button(▶) in long time when DVMR system is in stop mode,
    you can enter GOTO MENU.
 d. Then you can select search by percentage, by time, and by event in GOTO MENU.
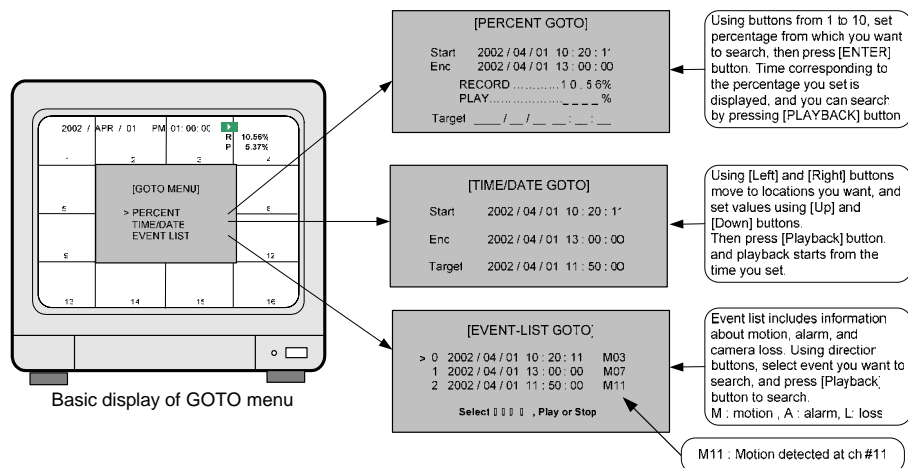
2. Example of operation

 a. In the picture on the right, ❶ represents 10.56% of total HDD space is spent for data recording,
    and next playback will start from the point of 5.37% of total HDD space.
 b. Press [Playback] button(▶).
 c. Playback will start at the point of 5.35% of total HDD space.
 d. When [Stop] button(■) is pressed at the point of 9.34%,
    DVMR system memorize it(Memorize stop point of last
    playback).
 e. If press [Playback] button(▶) again, playback starts from
    9.34 %(stop point of last playback).
 f. When playback proceeds up to 10.56% of total HDD space,
    playback is stopped.
 g. If press [Playback] button(▶), playback starts again from
    the end of data in reverse direction.
 h. If press [Stop] button(■), system goes to live display mode.
    Unless you press [RECORD] button, DVMR system does
    not record.
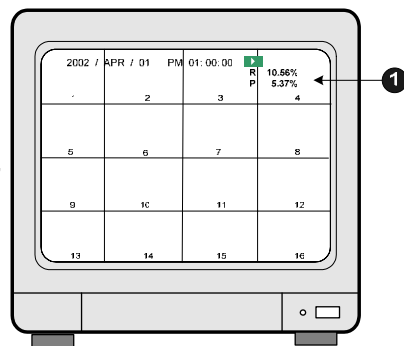
Basic display of playback

3. Search

When DVMR system is in stop mode, press [Playback] button(▶)
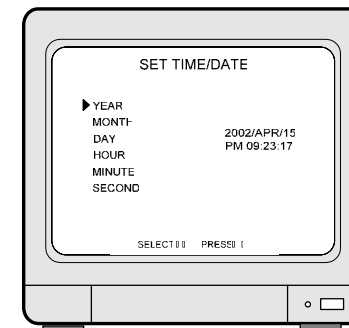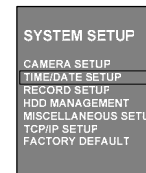for a couple of seconds, and you can enter into GOTO MENU.

[PERCENT GOTO]

Start   2002 / 04 / 01 10 : 20 : 1′
Enc   2002 / 04 / 01 13 : 00 : 00
RECORD ....10 . 5 6%
PLAY........................ _ _ _ _ %
Target ____ / __ / __ __ : __ : __

Using buttons from 1 to 10, set percentage from which you want to search, then press [ENTER] button. Time corresponding to the percentage you set is displayed, and you can search by pressing [PLAYBACK] button

[TIME/DATE GOTO]

Start   2002 / 04 / 01 10 : 20 : 1′
Enc   2002 / 04 / 01 13 : 00 : 0O
Target   2002 / 04 / 01 11 : 50 : 0O

Using [Left] and [Right] buttons move to locations you want, and set values using [Up] and [Down] buttons. Then press [Playback] button. and playback starts from the time you set.

[EVENT-LIST GOTO]

> 0 2002 / 04 / 01 10 : 20 : 11   M03
  1 2002 / 04 / 01 13 : 00 : 00   M07
  2 2002 / 04 / 01 11 : 50 : 00   M11
Select ▯▯▯▯ , Play or Stop

Event list includes information about motion, alarm, and camera loss. Using direction buttons, select event you want to search, and press [Playback] button to search.
M : motion , A : alarm, L: loss

M11 : Motion detected at ch #11

Basic display of GOTO menu

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5. SET TIME/DATE

Sets Year/Month/Day/Hour/Minute/Second.

Using [Up] and [Down] buttons, move to menu item,
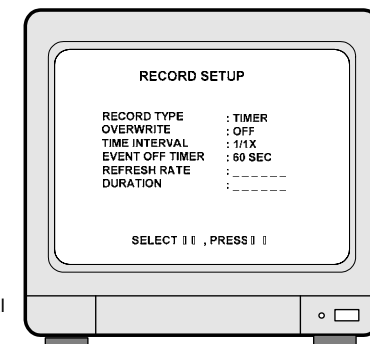and change value using [Left] and [Right] buttons.

SYSTEM SETUP

CAMERA SETUP
TIME/DATE SETUP
RECORD SETUP
HDD MANAGEMENT
MISCELLANEOUS SETUP
TCP/IP SETUP
FACTORY DEFAULT

6. RECORD SETUP
   Setting for recording

a. Press [MENU] button and enter password and press
   [ENTER] button to enter into main SETUP menu.
   In the main SETUP menu, select RECORD SETUP.
   Default password set by manufacturer is null, therefore
   just press [ENTER] button after you press [MENU] button
   to enter into main SETUP menu, in case you did not
   change password.

b. Select RECORD TYPE.
   -TIMER : Recording at a certain time interval (DEFAULT)
   -MOTION : Recording when a motion detected
   -ALARM :   Recording when an alarm is activated

c. Decide to overwrite or not when HDD is full.
   -OFF : Stop recording when HDD is full.
   -ON : Overwrite when HDD is full (DEFAULT).

d. Total recording rate (Fields/sec)
   -1/1X : Records at maximum rate/60(50) Fields/sec in total
        (FACTORY DEFAULT)
   -1/2X: Records at half of maximum rate/
        30(25) Fields/sec in total
   - Possible to set from 1/1X to 1/999X.
   - If you set at 1/480X, it corresponds to 960 hours recording mode in Time Lapse VCR.

e. REFRESH RATE : In Motion or Alarm recording mode, DVMR system records pictures at a certain time
                interval (REFRESH RATE) even though there is no motion detected or alarm activated.
   -20 SEC : Records pictures from all channels at time interval of 20 sec, regardless of motion detected
                or alarm activated.

f. DURATION : Records for DURATION time when a motion is detected or an alarm is activated.
    - 20 SEC : Records pictures from a channel where motion is detected or alarm is activated, for 20 sec.
    - 1 SEC : FACTORY DEFAULT

g. EVENT OFF TIMER : To limit numbers of motion detected, alarm activated or video loss to be enlisted
                     to event list, we set EVENT OFF TIMER.
   - 60 SEC : Just in case time interval between previously detected motion (alarm or loss) and currently
                detected motion (alarm or loss) is longer than 60 sec, currently detected motion(alarm) is
                enlisted in event list. 60 SEC is FACTORY DEFAULT.
   - EVENT OFF TIMER is to protect event list from being filled with motion, alarm, or video loss detected
                very frequently. If time interval between previous motion(alarm or loss) and current motion
                (alarm or loss) is shorter than set EVENT OFF TIMER, motion, event, or video loss is not
                enlisted in event list, but recording is done as set(if it is set at Motion recording or Alarm
                recording).

SET TIME/DATE

▶YEAR
MONTH
DAY   2002/APR/15
HOUR   PM 09:23:17
MINUTE
SECOND

SELECT ▯▯   PRESS ▯

Display of SET TIME/DATE

RECORD SETUP

RECORD TYPE   : TIMER
OVERWRITE   : OFF
TIME INTERVAL   : 1/1X
EVENT OFF TIMER   : 60 SEC
REFRESH RATE   : _ _ _ _ _ _
DURATION   : _ _ _ _ _ _

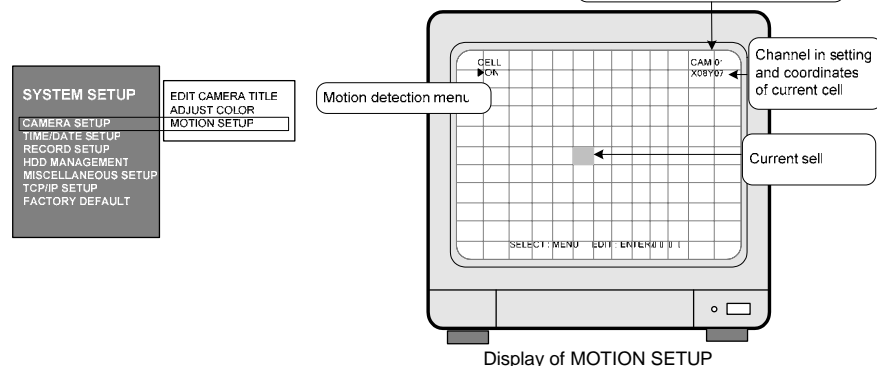SELECT ▯▯ , PRESS ▯ ▯

Display of RECORD SETUP

ALL ABOUT IMAGE RECOGINITON & PROCESSING

4. MOTION SETUP

Sets motion detection area and sensitivity of motion to be detected.

When motion is detected, it is changed to green color and glittering

SYSTEM SETUP
EDIT CAMERA TITLE
ADJUST COLOR
MOTION SETUP

CAMERA SETUP
TIME/DATE SETUP
RECORD SETUP
HDD MANAGEMENT
MISCELLANEOUS SETUP
TCP/IP SETUP
FACTORY DEFAULT

Motion detection menu

CELL
►ON

CAM 01
X:08 Y:07

Channel in setting and coordinates of current cell

Current sell

SELECT : MENU   EDIT : ENTER／││││

Display of MOTION SETUP

Basic display : Press [MENU] button repeatedly until you find menu item to set, and select by pressing [ENTER] button.
In basic display of MOTION SETUP, green colored cell represent motion detection area.

CELL
►ON(OFF)

Sets motion detection area cell by cell.
Using direction keys, select cell to set and press [ENTER] button. Color of cell set Is changed to green.

BLOCK ON
 BEGIN
 END

Sets motion detection area by block(X x Y).

Using direction keys, select the first location of cell and press [ENTER] button, and then select the second location of cell using direction keys and again press [ENTER] button.
You will see color of all cells inside 2 coordinates is changed to green, motion detection area.

ALL
►OFF(ON)

All cells are set as a detection area or no detection area.

When it is in ALL-OFF, press [ENTER] make all cells no detection area. When it is in ALL-ON, press [ENTER] to make all cells detection area.

SENSITIVITY
 LEVEL 10

Sets sensitivity of motion detection.

Using [Up] and [Down] buttons, choose sensitivity level.

LEVEL 01(Dull) ◄──────► LEVEL 10(Sensitive)

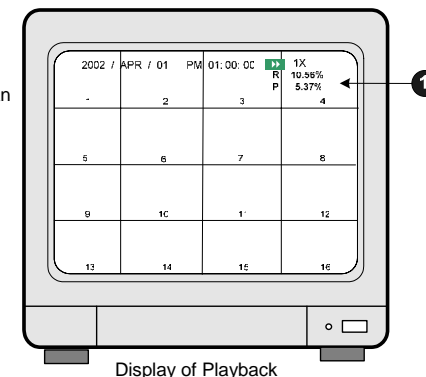DETECT WINDOW
NUMBER 01

Sets numbers of cells corresponding to size of motion.

Just in case numbers of cell detected (green colored) is more than set numbers, motion is detected.
If you set DETECT WINDOW NUMBER at bigger number, motion by small object is not detected.
Press [Up] and [Down] buttons to increase or decrease cell number.

Exit

To exit, press [ENTER] button.

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ALL ABOUT IMAGE RECOGINITON & PROCESSING

4. Speed of playback

a. Press [Fast forward](▶▶) in playback mode.
b. As shown on the left, ▶▶ 1x is displayed, and you can select high and low playback speed.
c. Press [Fast forward] button repeatedly to increase playback speed, 1,2,4,8,16,32,64. Press [Fast backward] button to decrease playback speed to ½ or ¼.
d. You can select high speed and low speed when ◄◄ 1x is displayed, by pressing [Fast forward] button or [Fast backward] button.

2002 / APR / 01   PM 01: 00: 00   ▶▶ 1X
                                   R   10.55%
                                   P   5.37%

①

Display of Playback

High speed/Backward   High speed/Forward

◄◄   ▶▶

64X - 32X - 16X - 8X - 2X - 1X - 1/2X - 1/4X - 1/4X - 1/2X - 1X - 2X- 4X- 8X - 16X -32X - 64X

5. ZOOM

Press [ZOOM] button in full screen mode, and picture of that channel is enlarged two times.
Using direction keys, [Up], [Down], [Left], and [Right], you can select area to be enlarged.
This function is available for both in live mode and playback mode.

6. PAUSE

Pauses pictures during playback.
After pressing [Pause] button, press [Fast forward] or [Fast backward] buttons to move forward or backward in the unit of field. If you see pictures in 16-split screen, you can move picture by picture in every channel whenever you press [Fast forward] or [Fast backward] button.

7. Others

a. DVMR system memorizes status of last playback.
   For instance, you searched recorded data in backward playback and stopped at the point of 45% of total HDD space. In the next playback, DVMR system automatically starts from the point of 45% in reverse direction. It is for efficiency in search recorded data.
b. If you want to search recorded data from the first of data, press [Fast Backward] button in stop mode. Then, "P 0.00%" is displayed on the top left, and you can search from the first if press [Playback] button. If you want to search from the end of recorded data, press [Fast forward] button when in stop mode, then next playback location is changed to the end of recorded data. If you press [Playback] button, playback starts from the end in backward direction.
c. During playback, DVMR system does not record.
d. If image data on the date and time you entered in GOTO menu is not exist, playback starts from the picture which is the nearest to the date and time you set. If the date and time you entered is not between start of recording and end of recording, playback starts from the nearest point, from the start of recording or end of recording.

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3-5. SETUP

1. Basic operation

Display of SETUP
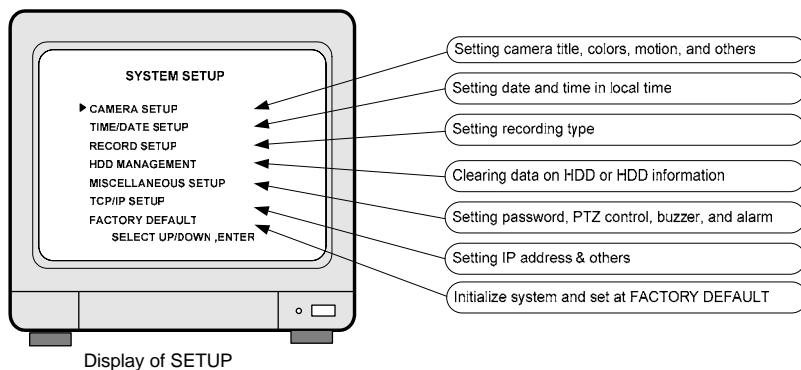
a. Press [MENU] button.

b. Enter PASSWORD and log on the system.

c. Select SETUP item using [Up] and [Down] buttons.

d. Press [ENTER] button to move to Sub-menu.

e. In Sub-menu, press [Up] and [Down] buttons to move and press [Left] and [Right] button to set values.

f. Press [ENTER] button to select and [MENU] button to exit.

g. All settings done in SYSTEM SETUP is memorized automatically when you exit SETUP menu.

▷ Settings remain unchanged after setting at FACTORY DEFAULT

1. TIME/DATE SETUP	2. All data on HDD
3. Password	4. ALARM LIST SETUP

Notice : We recommend users to clear all data on HDD and set at FACTORY DEFAULT in the very first operation of this DVMR unit.
In case you added HDD, replaced HDD or replaced EPROM (Program for DVMR unit), also clear data on HDD and set at FACTORY DEFAULT again.

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2. CAMERA SETUP

Sets camera titles for display in full screen, 4-split screen, and 9-split screen.

Display of CAMERA SETUP
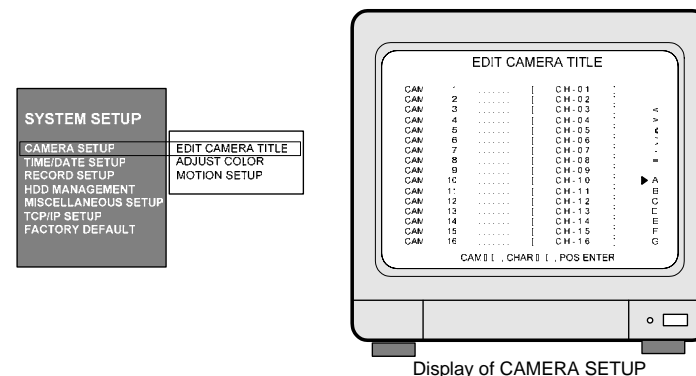
a.Press [ENTER] button to move to menu item you want to set.
b.Enter letters (Alphabet, numbers, and symbols) using [Left] and [Right] buttons.
c.Move to next camera for settings using [Up] and [Down] buttons.
d.If you have same word repeated in camera title for each channel, move to the word you want to copy and press [Record] button for copy and move to the location to put it and press [Playback] to paste.

3. ADJUST COLOR

Display of COLOR SETUP
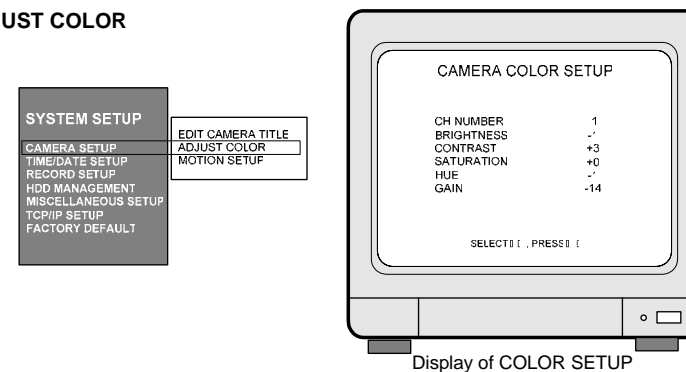
Adjust colors of images from cameras.

CH NUMBER	: Select camera # from 1 to 16	
BRIGHTNESS	: Sets brightness	(-31~ +32)
CONTRAST	: Adjust color contrast	(-31~ +32)
SATURATION	: Adjust color saturation	(-20~ +32)
HUE	: Adjust color hue	(-31~ +32)
GAIN	: Adjust image signal level	(-31~ +32)