

Digital Video Recorder

DVR-400

User's manual



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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 the user will be required to correct the interference at the own expense.

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Revision

User's Manual for PLANET Digital Video Recorder

Model: DVR-400

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Part No. EM-DVR400V1

Table of Contents

Chapter 1 Introduction	1
Overview	1
DVR Functions	1
Package Content	2
Physical Details	2
Buttons Definitions	2
Physical Interfaces	4
Chapter 2 Preparations & Installation	5
Installing and Configuring DVR-400	5
On-Screen Display	9
Administration Interface	10
OSD (On Screen Display) administration	10
Chapter 3 DVR- 400 Menu Setup	12
Introduction	12
MAIN MENU	12
CAMERA SELECT	13
RECORD SELECT	14
VIDEO RECORDING MODE	14
RECORD FRAMRATE	15
VIDEO QUALITY	16
RECORD SCHEDULE	17
SUB MENU	18
PASSWORD CHANGE	18
TIME SET	19
DATE DISPLAY FORMAT	19
HDD SETUP	20
SENSOR SETUP	20
How to enable the Motion detection recording in DVR-400	21
NETWORK SETUP	22
PLAYBACK Configurations	23
CONTROL BUTTONS	23
Chapter 4 DVR-400 Client Utility Administration	25
DVR-400 client utility	25
Procedures of DVR Client utility	25
Appendix A Specifications	29

Chapter 1

Introduction



Overview

The DVR-400 (Digital Video Recorder) is for recording/retrieving video streams from up to 4 channels at the same time. It adopts cutting-edge digital image compression technology to compress the analog input channel video streams, and uses HDD to record the compressed video stream.

The following operation guide explains how to operate/manage the DVR-400, and the following installation guide explains how to complete the first DVR-400 installation on your side.

DVR Functions

- High quality M-JPEG compression
- Video loop through
- Real-time 4 concurrent cameras recording
- MAX. 120 FPS video displaying rate
- Motion detection / video lost buzzer
- Matured embedded system remote monitoring and control of DVR
- 4 alarm input for various application
- Swappable HD / Max. 250 GB HD support
- Scheduled/event/continuous recording

Package Content

The contents of your product should contain the following items:

DVR-400 unit

Power adapter

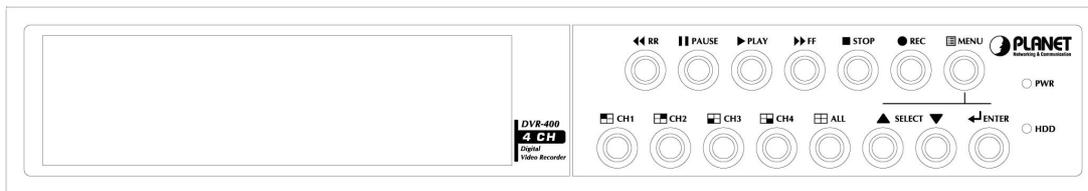
Screws for swappable HDD tray

Keys for swappable HDD tray

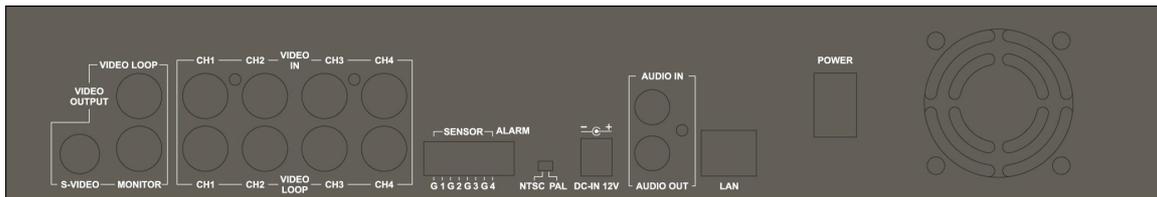
Quick installation guide

User's manual CD

Physical Details



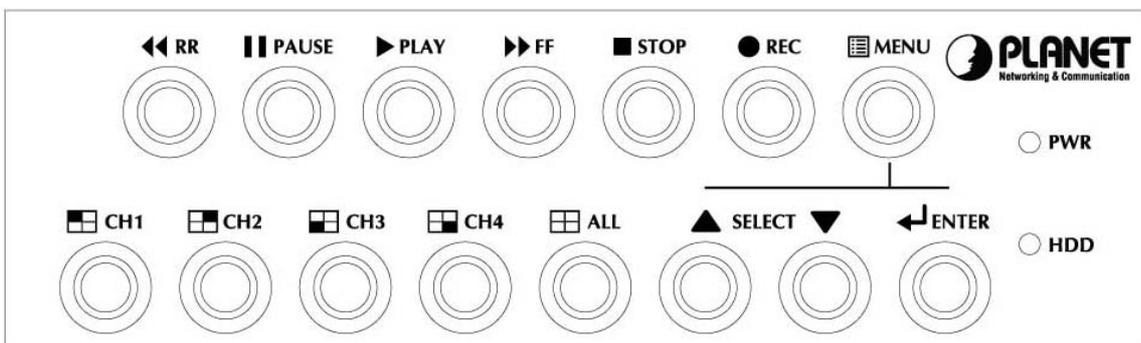
Front Panel of DVR-400



Rear Panel of DVR-400

Buttons Definitions

The following are the introductions of DVR-400 front panel buttons. The definitions of the front are shown below:



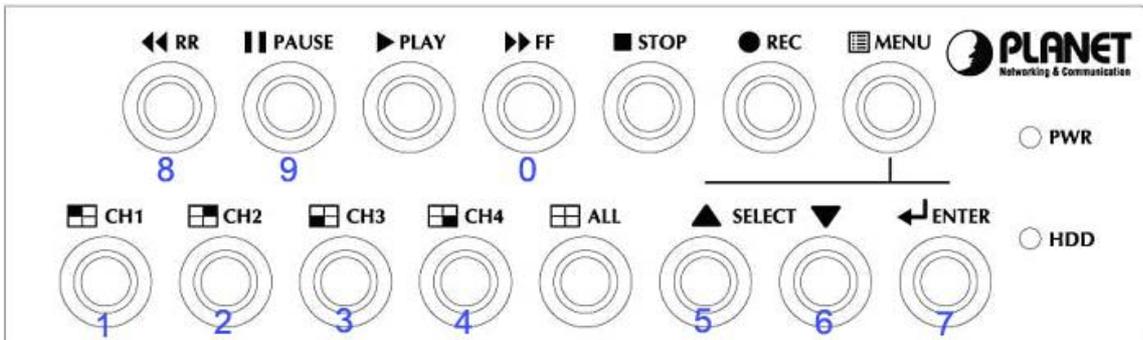
- **MENU:** press to display Operation menu option
- **SELECT:** press to change menu field
- **ENTER:** press to change the setting value or enter into a sub menu
- **RECORDING:** press to start recording.
- **STOP (recording/playback):** press stop video recording/playback

Note

When stopping video recording; it is required to enter the authorization password. The default value is **111111**

- **FAST FORWARD:** press to play the recorded stream faster.
- **PLAYBACK:** press to start playback
- **PAUSE:** press to pause the video playback
- **REVERSE:** press to playback backward
- **CHANNEL 1:** press to select video source on channel 1
- **CHANNEL 2:** press to select video source on channel 2
- **CHANNEL 3:** press to select video source on channel 3
- **CHANNEL 4:** press to select video source on channel 4
- **ALL CHANNELS:** press to select all channels display

When entering or modifying password, the button definitions are shown below:

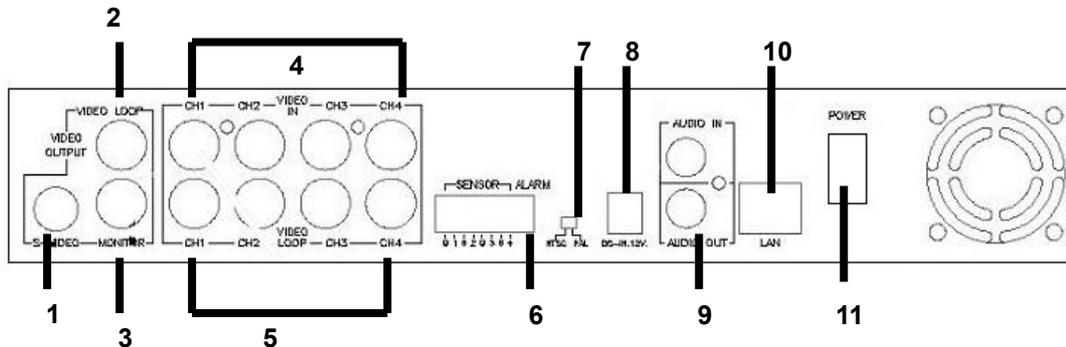


Button definition when entering password

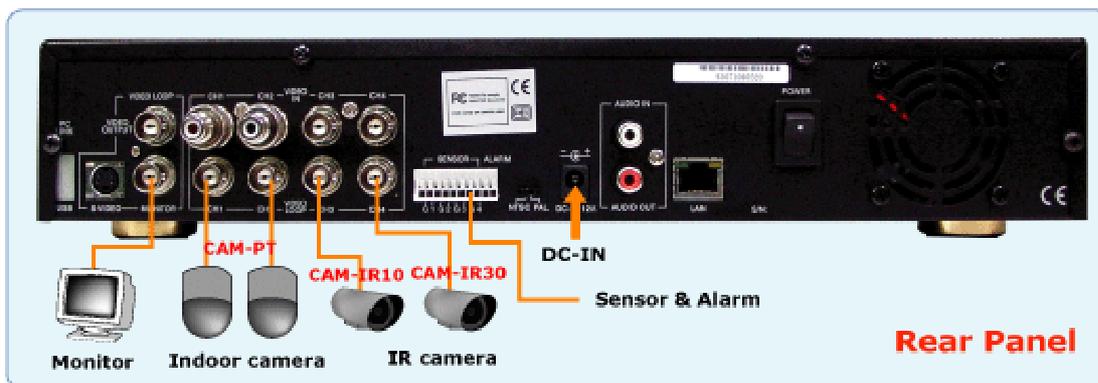
- | | |
|-----------|-----------|
| means "1" | means "6" |
| means "2" | means "7" |
| means "3" | means "8" |
| means "4" | means "9" |
| means "5" | means "0" |

Physical Interfaces

Physical connection interface of DVR-400 are shown and explained in the following descriptions.



1. **S-Video:**
2. **Video output:**
3. **Monitor:** Second Video output.
4. **Video input:** Connect your standard video cameras to these inputs.
5. **Video loop-through:** These outputs provide loop-through connections, and can be used for direct monitoring of the connected video cameras.
6. **Sensor input/alarm output:** 4 sensor inputs and one alarm output.
7. **NTSC/PAL switch:**
8. **DC-in (12Voltage):** Connect the power cable here.
9. **Audio input/output:**
10. **LAN:** 10/100 Ethernet via the RJ-45 socket.
11. **Power switch:** This switch should only be used after shutting down the unit correctly with the help of the Power button on the front panel.



Chapter 2

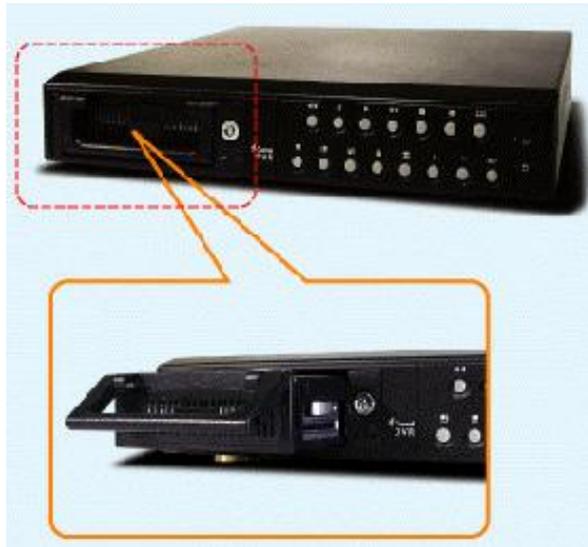
Preparations & Installation

2

Installing and Configuring DVR-400

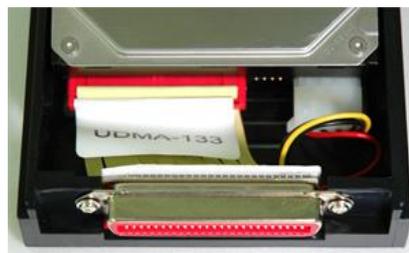
STEP1:

Please power off the DVR-400 and unlock the DVR-400 swappable HDD tray



STEP2:

Remove the harddisk tray cover; connect your harddisk securely with the DC power cable and IDE cable in the harddisk tray. Make sure the installed HDD is set to **“Master”** and secure the HDD using the original HD screws or the screws in the DVR-400 accessory pack.



Place and lock the HDD tray to DVR-400. Power on the DVR-400, the DVR-400 will now automatically detect and format the new disk(s).



Note

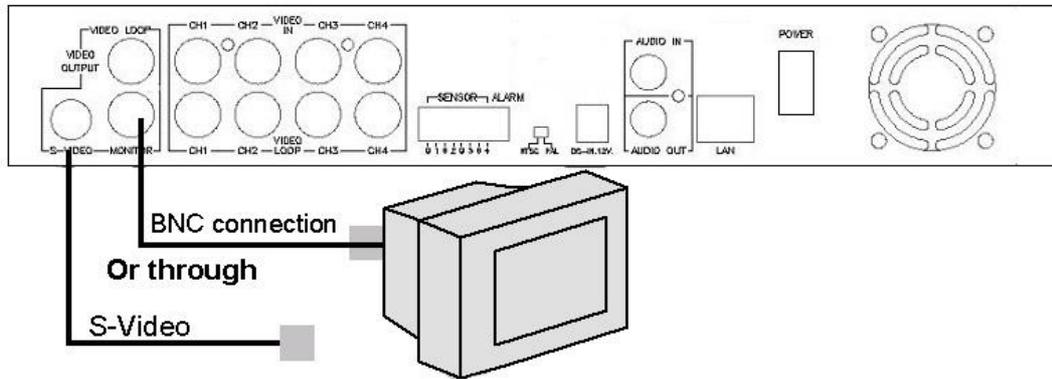
Please be sure to finish the hard disk drive installation before using the DVR. The Maximum HDD capacity support is 250GB.

STEP3:

Please connect TV (monitor) to the Video output connector in the rear panel.

Note

DVR-400 provides one S-Video and two BNC connector for video output.



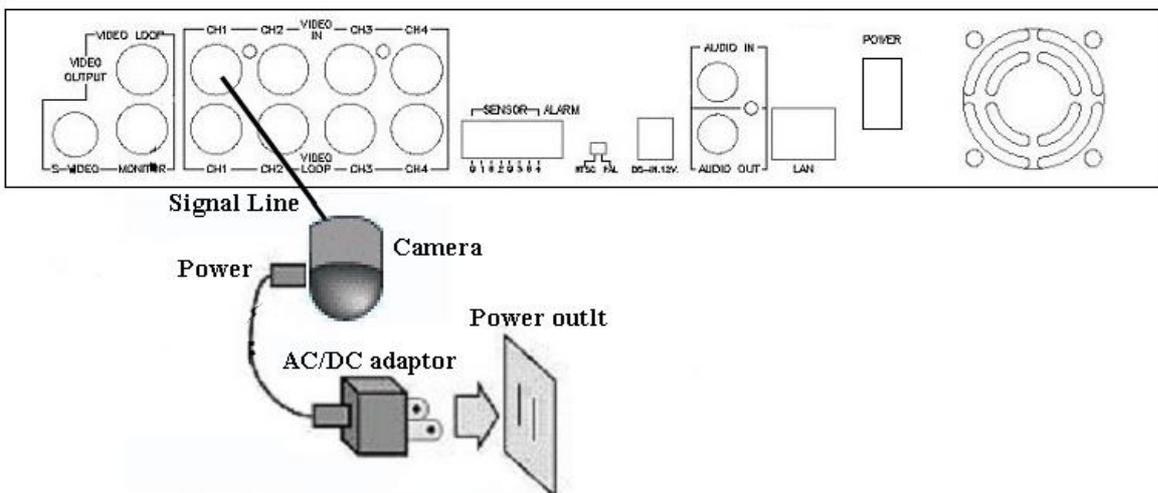
Video Input connection (TV or monitor)

STEP4:

Please use standard analog video cameras to connect to the DVR400. The DVR-400 equipped 4 BNC connectors on the rear panel for video input.

Physical camera installation with DVR-400 is shown as below:

- Connect the camera signal line to video input on DVR-400
- Power on camera, and you may now check the video on the screen.



DVR-400 provides 4 x BNC connectors for video source input.

STEP5:

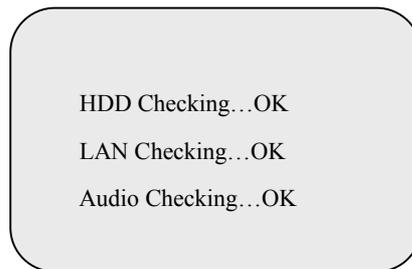
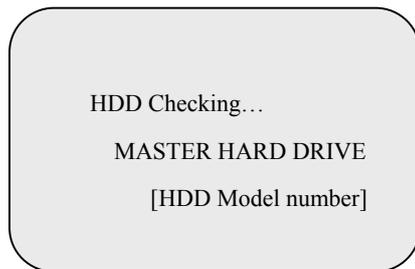
Please ensure DVR-400 is power OFF before commencing, and check the power supply status.

Use standard RJ-45 cables to connect the LAN port on DVR-400.

Connect the supplied Power Adapter and power on machine.

The **PWR** LED Indicator should be Green during normal operation

After powering on the DVR-400, it will check HDD for several seconds; the information will be displayed on the monitor:



After the internal checking completed, DVR-400 will enter into real-time display mode, the images on the connected camera will be displayed in real-time.



Sensor Installation

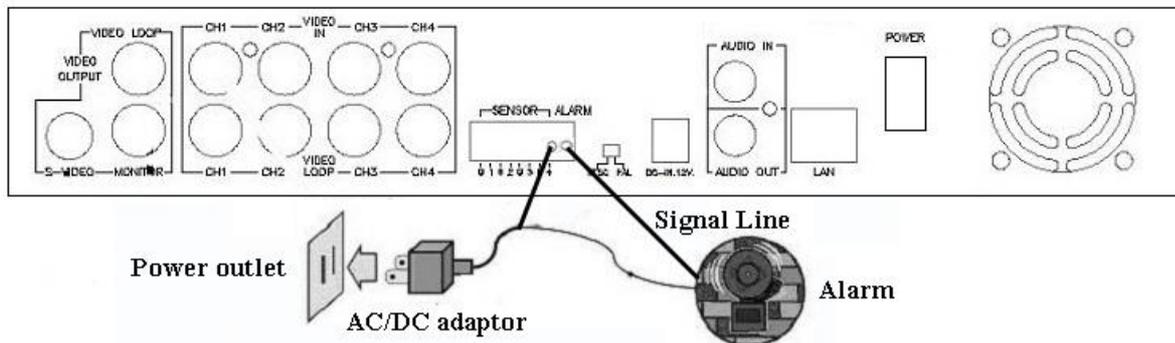
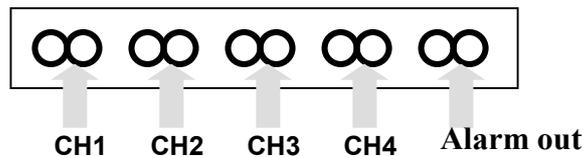
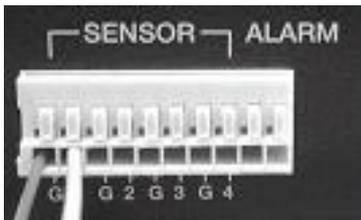
The unit provides 4 sensor input for 4 channels. The sensor installation procedures are as follows.

For the installation of the sensors:

STEP1: Connect the sensor signal line to the alarm signal terminal is at the unit's back panel

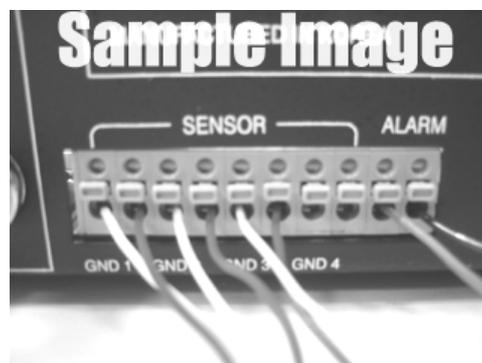
STEP2: Connect the video signal line to the unit. The Sensor signal terminal is at the unit's back panel

STEP3: Connect the sensor adaptor jack into the sensor, and plug in the adaptor.



Alarm installation

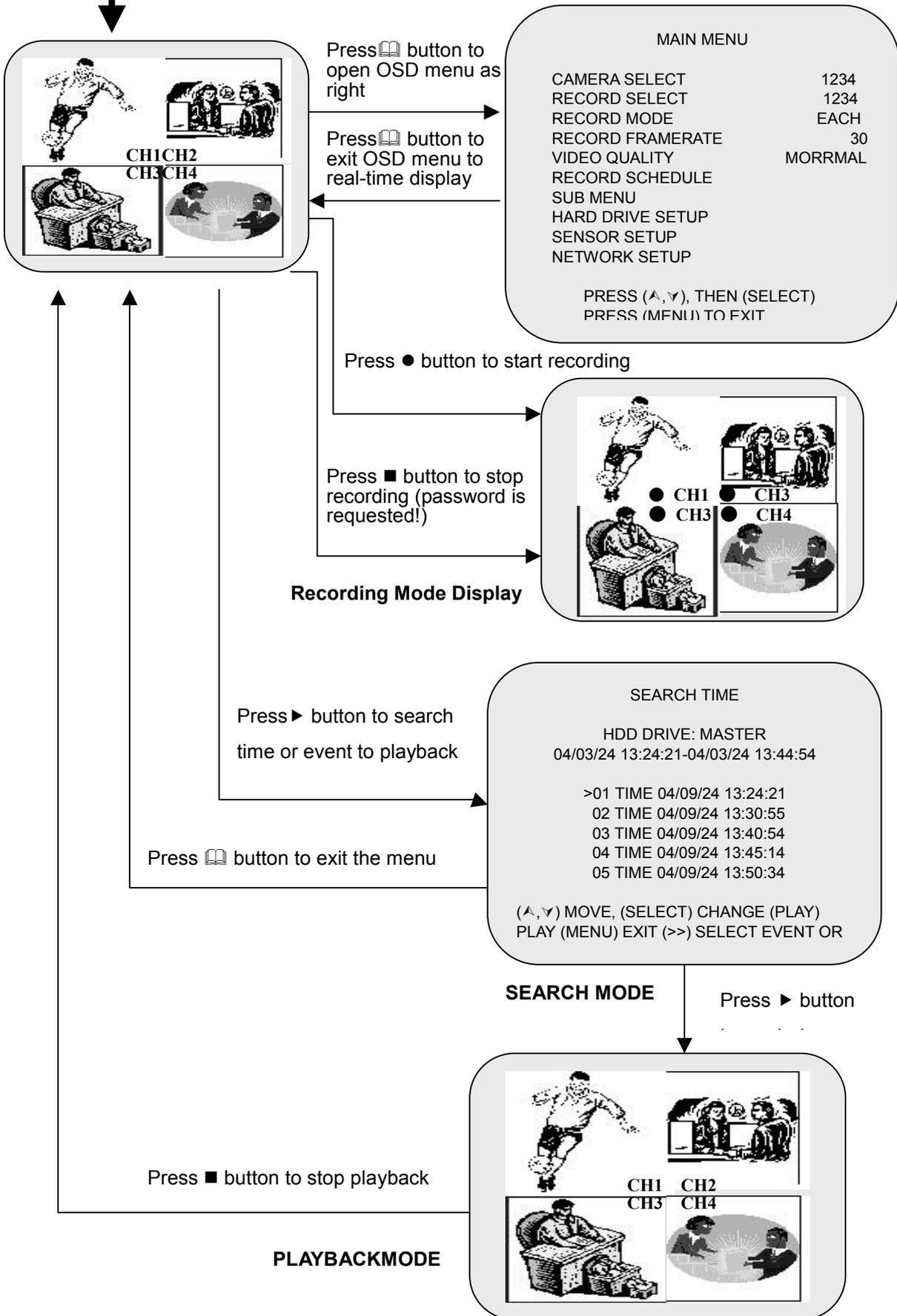
The unit provides 1 internal switch for sounding alarm when the sensor is activated due to the unwanted entrance of anonymous visitor. The switch is open at normal state, but, when the alarm is activated, the switch is closed So that the alarm gets the power. The circuitry is shown as above figure. There are two simple steps for the installation of the alarm



- i. Prepare the power supply: the alarm needs a power supply; the power supply comes with the alarm
- ii. Connect the alarm power line: the alarm power line is connected to the alarm switch terminal.

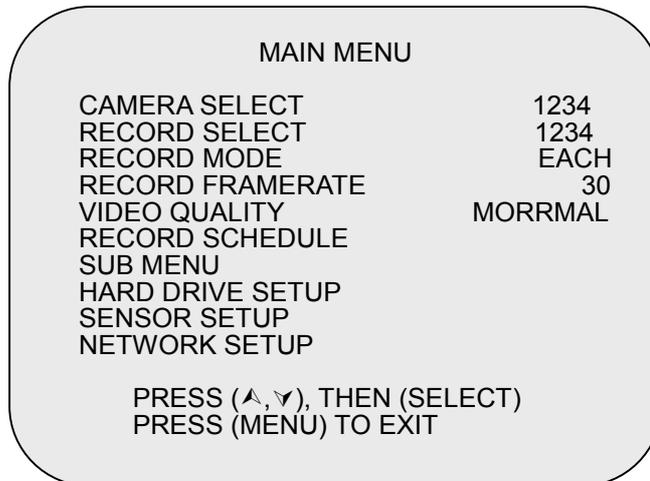
On-Screen Display

Power on the system



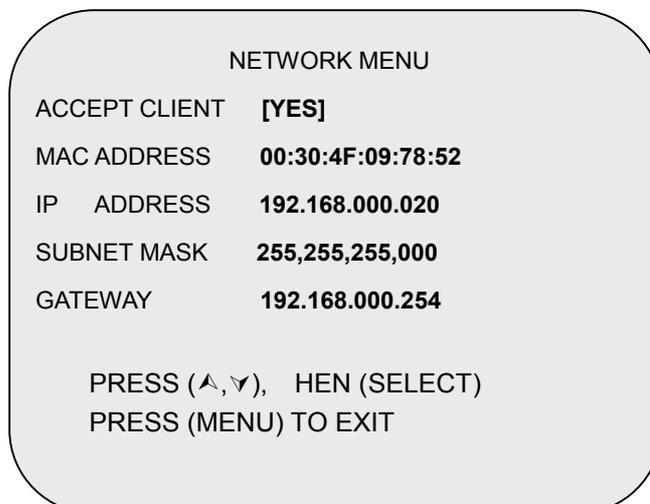
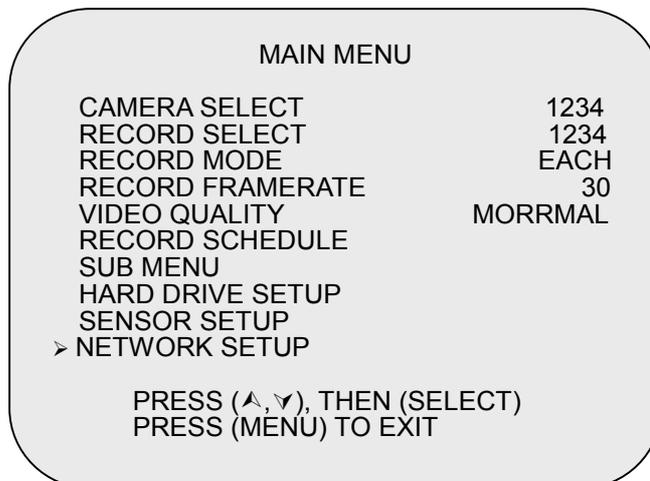
Administration Interface

PLANET DVR-400 provides OSD menu for machine management and administration.



OSD (On Screen Display) administration

PLANET DVR-400 connects with two default IP addresses, and default IP address is "192.168.0.20". You may use any PC to connect to the LAN port of DVR-400 to start machine administration.



The LAN information Parameter Description of DVR-400

ACCEPT CLIENT	YES / NO Default: YES
MAC	MAC address of DVR-400 Default:
IP	LAN IP address of DVR-400 Default: 192.168.000.020
SUBNET MASK	LAN mask of DVR-400 Default: 255.255.255.000
GATEWAY	Gateway of DVR-400 Default: 192.168.000.254

Note

In the first installation, it is suggested to locate your PC in the same network segment (192.168.0.x) of DVR-400. If you're not familiar with TCP/IP, please refer to related chapter on user's manual CD or consult your network administrator for proper network configurations.

Chapter 3

3

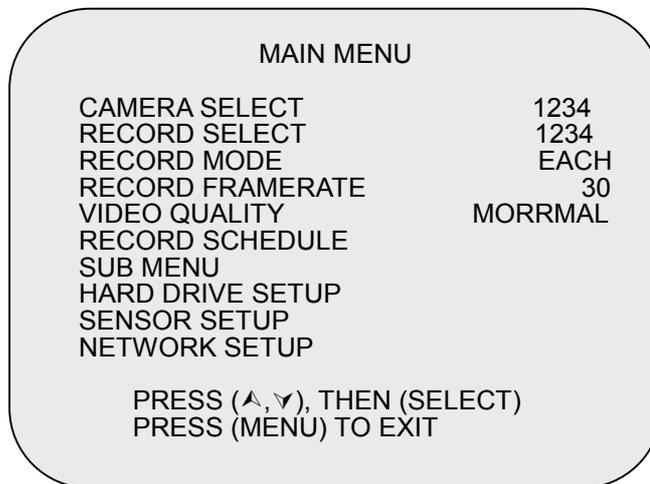
DVR- 400 Menu Setup

Introduction

The DVR-400 OSD menu provides ease-of-use machine configurations; please press the **MENU** button of the front panel, then the OSD menu will appear with a cursor over the first item. The cursor can be moved by the up and down buttons.

MAIN MENU

Please press “” button to display main menu option shown as below figure



Operation Buttons

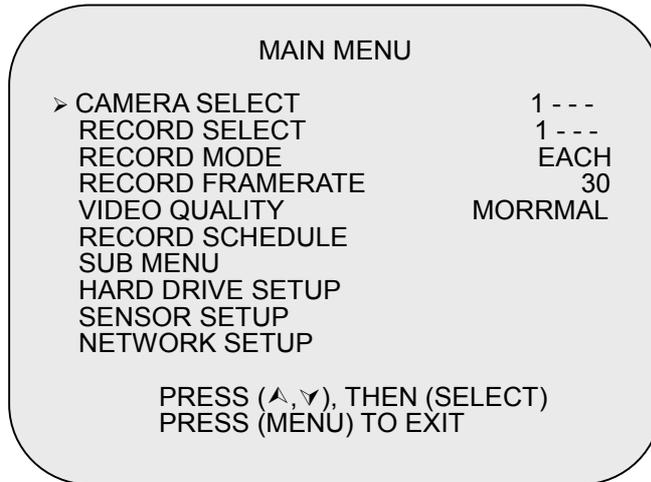
-  --- Press to display menu option.
-  --- Press to change menu field or change the unit's configuration values.
-  --- Press to select menu item or confirm the selection.

Note

Please stop recording or playback before you enter into OSD menu. You will be requested to enter machine admin password to stop recording.

CAMERA SELECT

The DVR-400 provides 4 camera inputs. Please use channel buttons on the front panel to select specified channel for real-time display.



Please use “**SELECT**” button or “CHANNEL” buttons for different combinations for channel display.

Example:

- When you choose (----), all cameras are off
- When you choose (**1234**), video content in all cameras will be displayed.
- When you choose (1---), only the content of channel 1 will be displayed.

Note

While no video connection or connection failure, “**VIDEO LOSS**” signal will be displayed, and the built-in alarm buzzer will be triggered to sound.

Note

Channel Display Control
In “EACH” mode, you can use the following buttons to display Full-screen format of each channel.

Channel Display Control

In “EACH” mode, you can use the following buttons to display Full-screen format of each channel.



Channel 1 button: Full screen display of channel 1



Channel 2 button: Full screen display of channel 2



Channel 3 button: Full screen display of channel 3

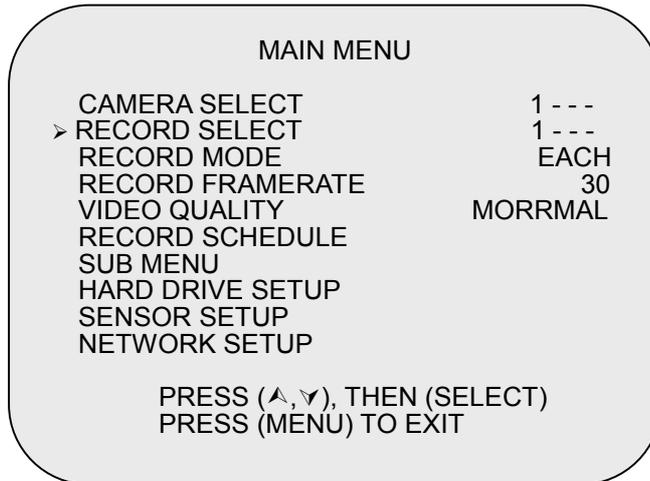


Channel 4 button: Full screen display of channel 4

RECORD SELECT

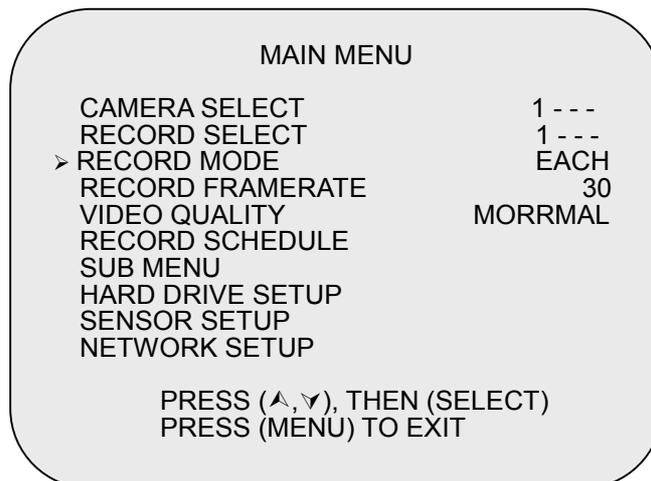
Please select desired video channel on this menu: the machine operation is same as "CAMERA SELECT" options.

Only the video in the selected camera will be recorded in DVR-400 harddisk



VIDEO RECORDING MODE

DVR-400 provides 4 camera inputs. You can use channel buttons on the front panel to select specified channel/camera for real-time video display and recording.



There are two kinds of recording mode: **EACH** mode (full screen mode) and **QUAD** screen mode. When you set to EACH mode, you can view the full-screen display of one specified channel.

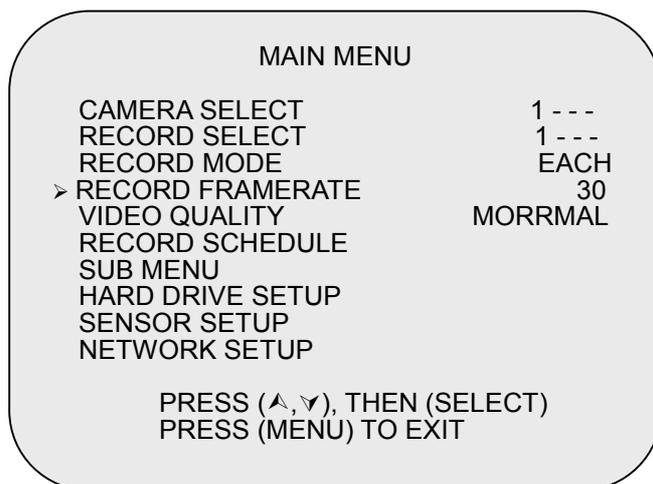
When you set to QUAD mode, quad-screen (**4-camera**) will be displayed.

Please use ▲, ▼ buttons of front panel to select mode and then enter ↵ button to confirm the selection

RECORD FRAMRATE

There are 9 different frame rate settings for operation: 30fps, 15fps, 10fps, 7fps, 5fps, 4fps, 3fps, 2fps, and 1fps. (Factory default setting: 30fps)

Please use ▲, ▼ buttons of front panel to select mode and then **enter** ↵ key to confirm the selection



Note

RECORDING FRAME RATE TABLE

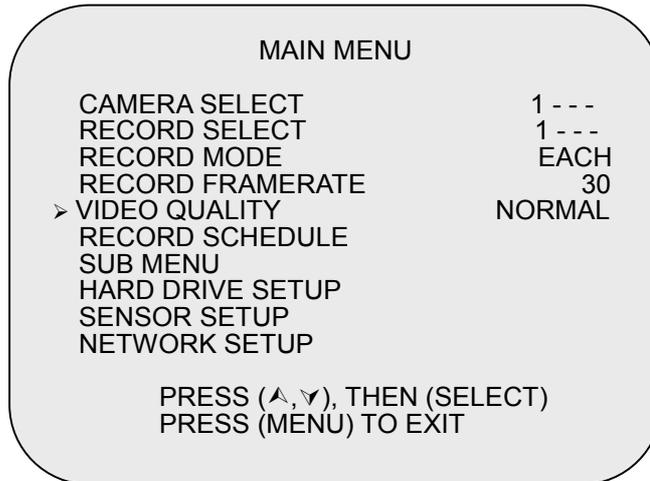
The higher the record frame rate is, the more natural look will be displayed on the screen when playing back. But the lower the record frame rate is, the more you can save the space on HDD. The following is the recording fps table for your reference.

Frame/Second		1	2	3	4	5	7	10	15	30
EACH MODE	1CH	1	2	3	4	8	7	10	15	30
	2CH	0.5	1	1.5	2	2.5	3.5	5	7.5	15
	3CH	0.33	0.67	1	1.33	1.7	2.33	3.33	5	10
	4CH	0.25	0.5	0.75	1	1.25	1.75	2.5	3.75	7.5
QUAD MODE		1	2	3	4	5	7	10	15	30

VIDEO QUALITY

There are 3 different video quality settings for operation: **Normal**, **Low**, and **High**

Please use **▲, ▼** buttons on the front panel to select video recording quality and then press the **enter ↵** key to confirm the selection



↳ Note

DIFFERENT VIDEO QUALITY SETTINGS ON HDD CAPACITY

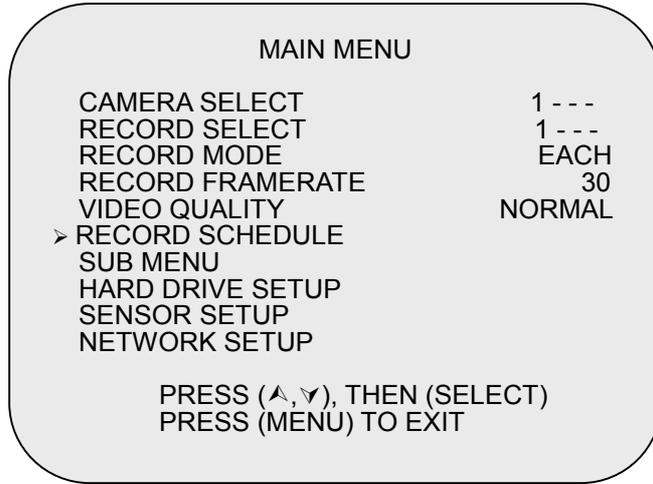
The higher the video quality is, the clearer images the unit plays. But the lower the video quality is, the more you can save the space on HDD. The following is the recording time vs video quality settings table for your reference.

Frame/Second		1	2	3	4	5	7	10	15	30
EACH MODE	HI	733	366	244	183	146	184	73H	48H	25H
	NORMAL	992	496	331	248	192	141	99H	66H	33H
	LO	115	576	384	288	238	153	115	76H	39H
QUAD MODE	HI	556	279	185	139	111	80H	56H	37H	19H
	NORMAL	763	382	255	190	152	110	76H	51H	25H
	LO	877	438	292	228	175	125	88H	58H	29H

The recording hours on 80GB HDD

RECORD SCHEDULE

RECORD SCHEDULE menu in DVR-400 provides changing a recording schedule/type to meet the various surveillance application demands.

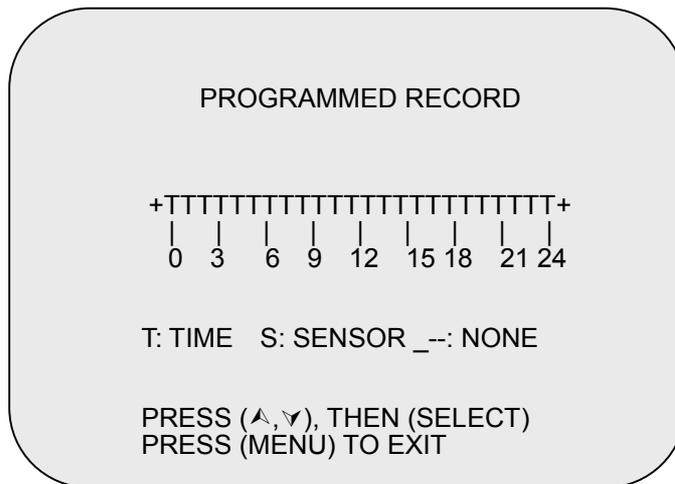


Time format in DVR-400 schedule video recording is 24-hour format.

(**T**) Letter indicates recording.

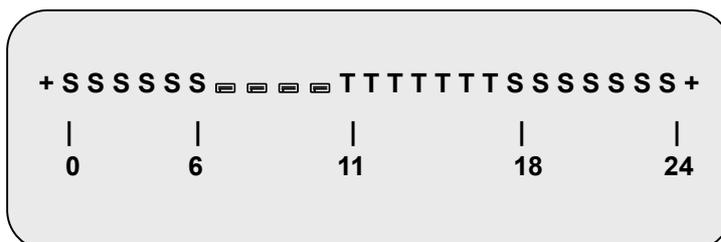
(**S**) Letter indicates sensor recording. It means the unit starts recording as the attached sensors being triggered during this period.

(--) Recording is off during this duration.



SETTING EXAMPLE:

- 00:00 ~ 7:00 SENSOR RECORDING
- 07:00 ~11:00 RECORDING DISABLED
- 11:00 ~18:00 RECORDING
- 18:00 ~24:00 SENSOR RECORDING



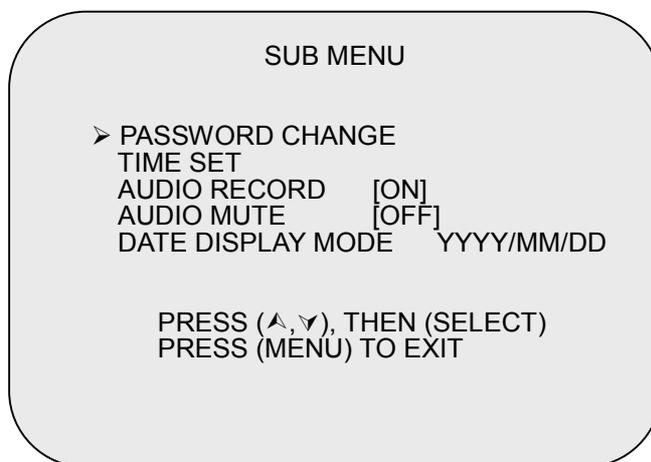
↳ Note

SENSOR RECORDING INSTALLATION

The unit provides 4 alarm inputs, which can be configured as normal close, normal open, motion detection +NC and motion detection+NO over "SENSOR SETUP" menu option. After the sensor configuration, please go back to "RECORD SCHEDULE" menu to enable sensor recording.

SUB MENU

SUB MENU provides the flexibility of changing machine admin password, time /date setting, date format.

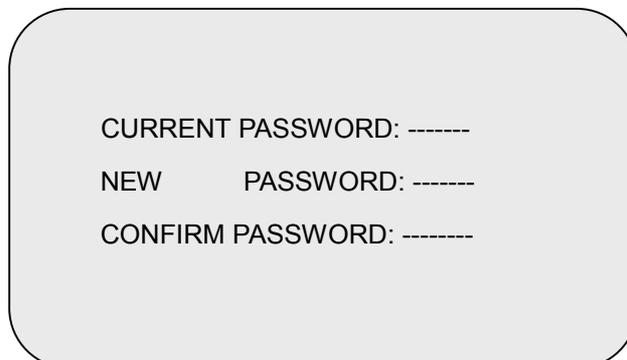


PASSWORD CHANGE

When entering "**PASSWORD CHANGE**" menu; a password change input menu will be displayed on screen (note: machine default password is **111111**)

When the new password is configured and accepted, DVR-400 will prompt message:

"PASSWORD changed!!!"



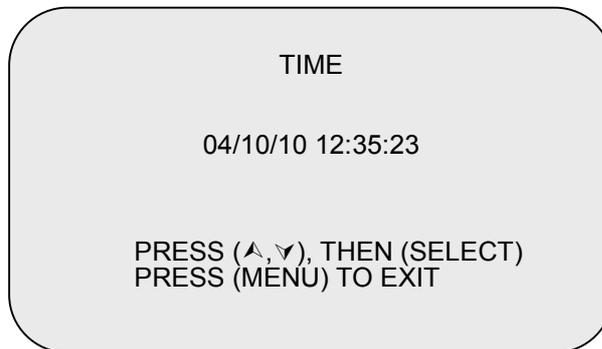
The message will blink 5 times. Then the display goes back to SUB MENU.

If the password was not accepted, DVR-400 will automatically return to SUB MENU.

FRONT PANEL BUTTONS DEFINITION			
	means "1"		means "6"
	means "2"		means "7"
	means "3"		means "8"
	means "4"		means "9"
	means "5"		means "0"

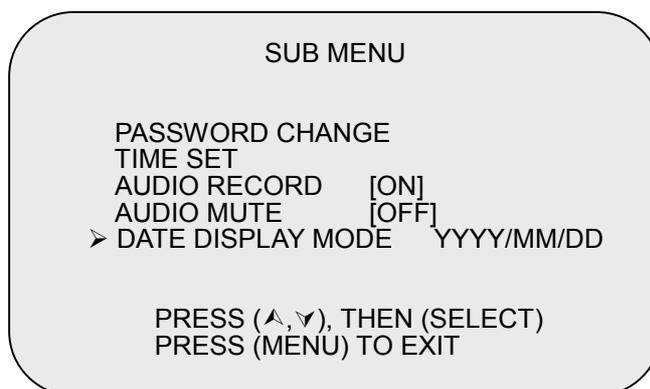
TIME SET

TIME SET menu offers DVR-400 date and hour modification, the time and date settings will affect the recorded video files as well.



DATE DISPLAY FORMAT

DVR-400 provides **yyyy/mm/dd** or **dd/mm/yyyy** format for time display to meet application demands.



HDD SETUP

OVERWRITE ENABLED:

If you choose “**YES**”, DVR-400 will continue recording and overwrite the recorded data when HDD’s space is full

If you choose “**NO**”, the unit will stop recording while HDD’s space is full

MASTER HDD SIZE:

Display the capacity of the installed HDD in DVR-400

MASTER HDD USED:

Display the percentage of HDD’s capacity has been used

MASTER HDD FORMAT:

Erases all the recorded data in harddisk

The machine admin password is required before formatting, after the unit formatted, the message “**HARD DISK FORMATTED**” will appear on the screen.

HARD DRIVE SETUP

OVERWRITE ENABLED	[YES]	
MASTER HDD SIZE	40000MB	
MASTER HDD USED	0MB	0%
MASTER HDD FORMAT		
SLAVE HDD SIZE	N/A	
SLAVE HDD USED	N/A	
SLAVE HDD FORMAT		

PRESS (▲,▼), THEN (SELECT)
PRESS (MENU) TO EXIT

SENSOR SETUP

SENSOR SETUP

SENSOR RECORD TIME	05
ALARM OUT TIME	00
CHANNEL-1	TYPE: NORMAL -OPEN
CHANNEL-2	NOT INSTALLED
CHANNEL-3	NOT INSTALLED
CHANNEL-4	NOT INSTALLED

PRESS (▲,▼), THEN (SELECT)
PRESS (MENU) TO EXIT

SENSOR RECORD TIME:

Recording duration (in seconds) when sensor is triggered.

ALARM OUT TIME:

The **ALARM TIME OUT** controls how long (in second) the alarm sounds after being triggered.

SENSOR TRIGGER MODES:

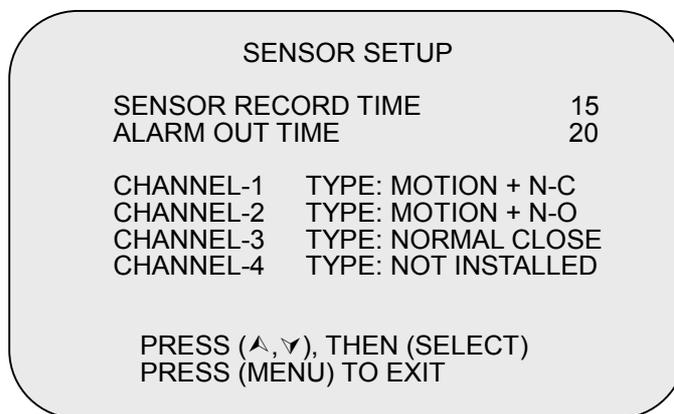
DVR-400 provides 5 different modes to meet the various surveillance application demands:

1. Not installed.
2. Normal open.
3. Normal close.
4. Motion +N-C
5. Motion + N-O

In normal open mode, the cable line Connected between the sensor and the unit is cut off by an intruder, the unit starts recording.

In normal close mode, the cable line Connected between the sensor and the an intruder, the unit stops recording, cuts off unit.

How to enable the Motion detection recording in DVR-400



STEP 1:

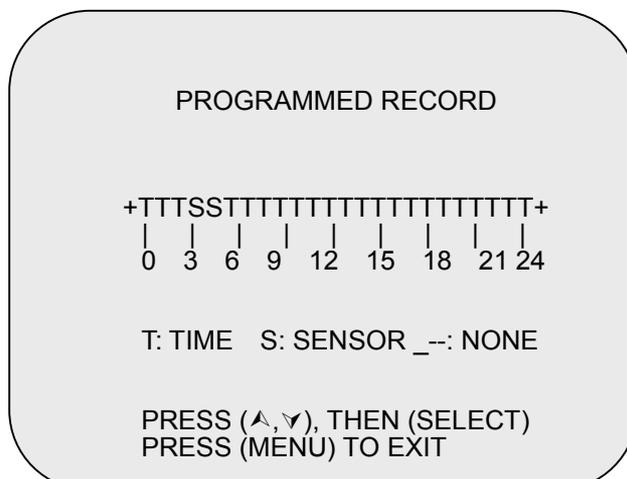
Please go to "SENSOR SETUP" menu

STEP 2:

Toggle the motion detection option.

STEP 3:

After the selection, please browse to **MAIN MENU** and go to "**RECORD SCHEDULE**" menu to enable the alarm setting, so that the motion detection video recording will operate properly.



NETWORK SETUP

ACCEPT IP: select "YES" to allow the remote access, **NO** to disable the machine remote management.

NETWORK MENU	
ACCEPT CLIENT	[YES]
MAC ADDRESS	00:30:4F:09:78:52
IP ADDRESS	192.168.000.020
SUBNET MASK	255,255,255,000
GATEWAY	192.168.000.254

PRESS (▲,▼), THEN (SELECT)
PRESS (MENU) TO EXIT

↳ Note

Minimum requirements for networking video playback:

CPU: 1 GHZ or above

System Memory: 256MB or above

VGA memory: 32MB

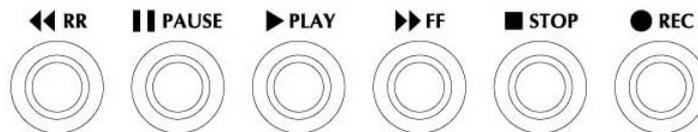
OS: Window2000/XP

PLAYBACK Configurations

If you'd like to view the recorded video files, the front panel buttons can be used to operate various playback functions.

Press ► button, then the playback time /events selection menu as the left figure appears on the screen. Or you can simply press ► twice to start playing directly.

CONTROL BUTTONS



<< Rewind Playing:

Press this button to play recorded video in reverse direction.

Note

The reverse playback speed depends on the fps, the number of the recorded channel, the enabled recording video quality.

|| PAUSE Button:

Press this button to pause the playback, or to advance one single frame upon pause mode.

► Playback:

Press this button to play the recorded video.

You can either enter the specified time/date to playback or select the event or even view the playback over PC



Note

1. Please stop recording before playback.
2. To list the recorded video files, please press ► (PLAY) button to display the video files in DVR-400 local HDD storage

>> (Fast forward button):

Press this button to play the recorded video in forward direction.

The unit provides three levels of fast forward playback speed:

>> 1: play one time faster (x1), press ">>" button.

>> 2: play two times faster (x2) than the normal play.

>> 3: play four times faster (x4) than the normal play.

■ **STOP:** Press this button to stop playing the recorded video.

● **REC:**

DVR recording Hours on 40GB Hard Drive

Recording Results in NTSC format			30 fps	15 fps	7 fps	1 fps
Video Suanal	Display Format	Video Quality				
NTSC	QUAD screen	HIGH	18 Hours	36 Hours	72 Hours	540 Hours
		NORMAL	24 Hours	48 Hours	96 Hours	720 Hours
		BASIC	29 Hours	58 Hours	116 Hours	870 Hours
	Full screen	HIGH	32 Hours	64 Hours	128 Hours	960 Hours
		NORMAL	45 Hours	90 Hours	180 Hours	1350 Hours
		BASIC	56 Hours	112 Hours	224 Hours	1680 Hours
Recording Results in PAL format			25 fps	12 fps	6 fps	1 fps
Video Suanal	Display Format	Video Quality				
PAL	QUAD screen	HIGH	19 Hours	38 Hours	76 Hours	475 Hours
		NORMAL	24 Hours	48 Hours	96 Hours	600 Hours
		BASIC	30 Hours	60 Hours	120 Hours	750 Hours
	Full screen	HIGH	31 Hours	62 Hours	124 Hours	775 Hours
		NORMAL	45 Hours	90 Hours	180 Hours	1125 Hours
		BASIC	59 Hours	118 Hours	236 Hours	1475 Hours

Chapter 4

DVR-400 Client Utility Administration

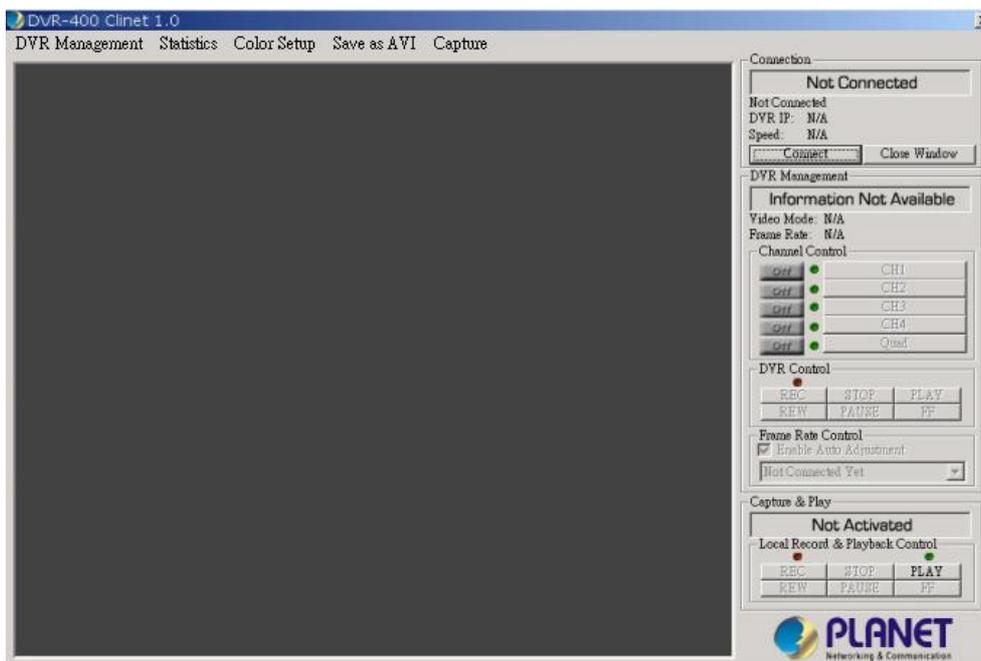
4

DVR-400 client utility

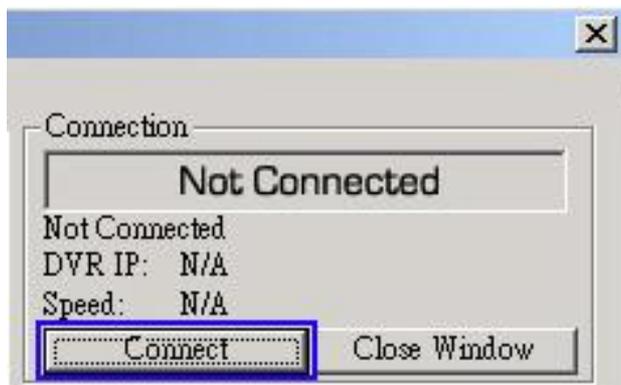
This DVR-400 allows system administrator to manage machine from a remote location to view live and recorded video over private network or the Internet connection. Also, you can capture the video from the unit and play the stored video later on.

Procedures of DVR Client utility

- Please find the DVR_Client.exe in the Utility folder on user's manual CD
- Copy the DVR utility folder to suitable folder, for example, C:\Program Files\PLANET\DVR\Utility
- Double-click the DVR_Client.exe and the main screen will be shown.



- Click on “**Connect**” option on Main window to enter into “DVR Client connection manager”, the following dialog window will be shown:



- Please insert IP address **192.168.0.20** / password: **111111** to log in the remote DVR-400.



DVR IP: IP address of the remote DVR-400.

Password: The password is same password used for formatting the DVR-400 Hard Drive. The default value is **111111**

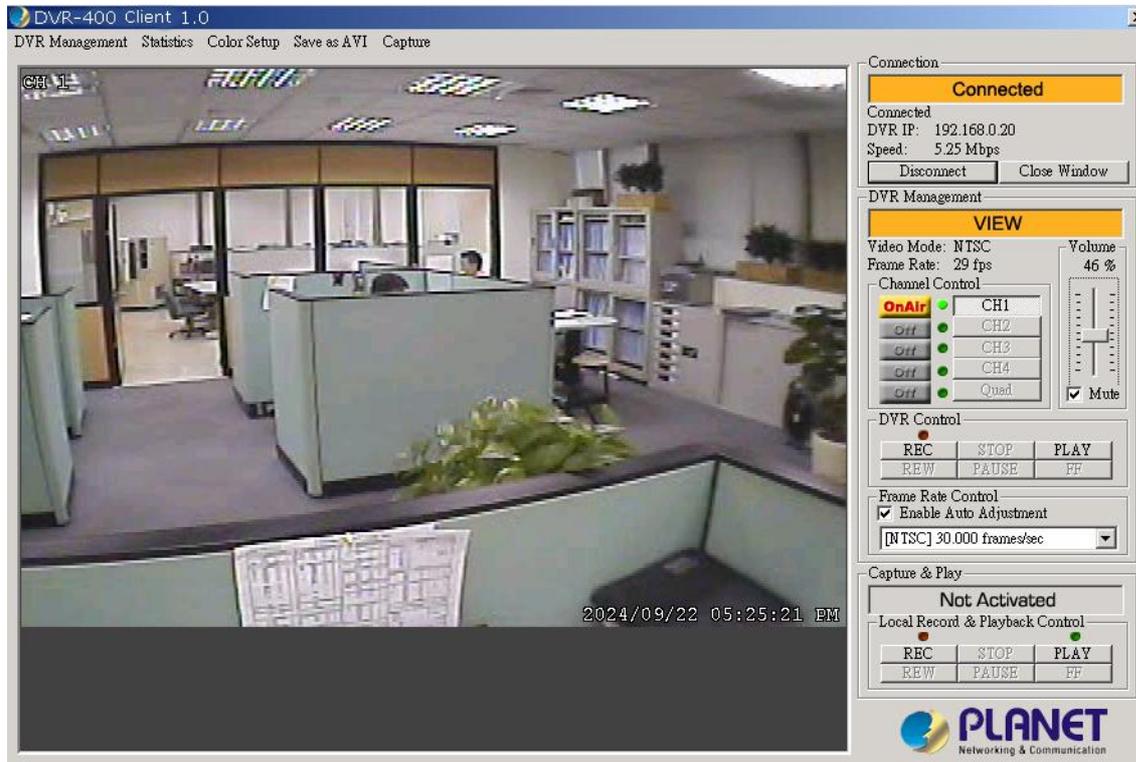
Note

If the DVR-400 installed behind firewall or NAT device, please reserve ports **14337**, **14338** for communication purpose.

- When successfully connected, you would see " **Connected** " sign. This window also displays DVR-400 IP address and status of connection speed.

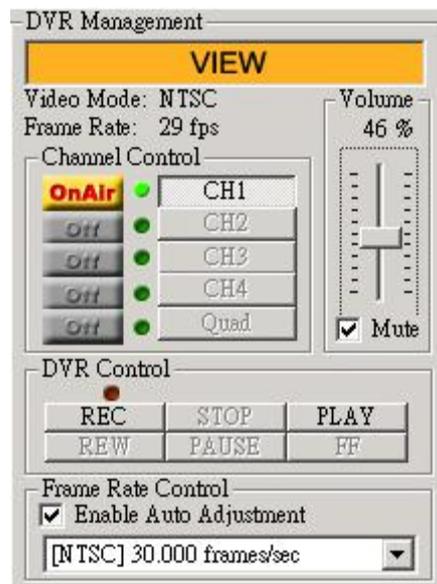


The remote video content will be shown in the main menu:



DVR control

The panel shown as the following figure operates exactly as the remote DVR operational button allows you to control remote DVR to live view, record and playback as well.



Capture & Playback

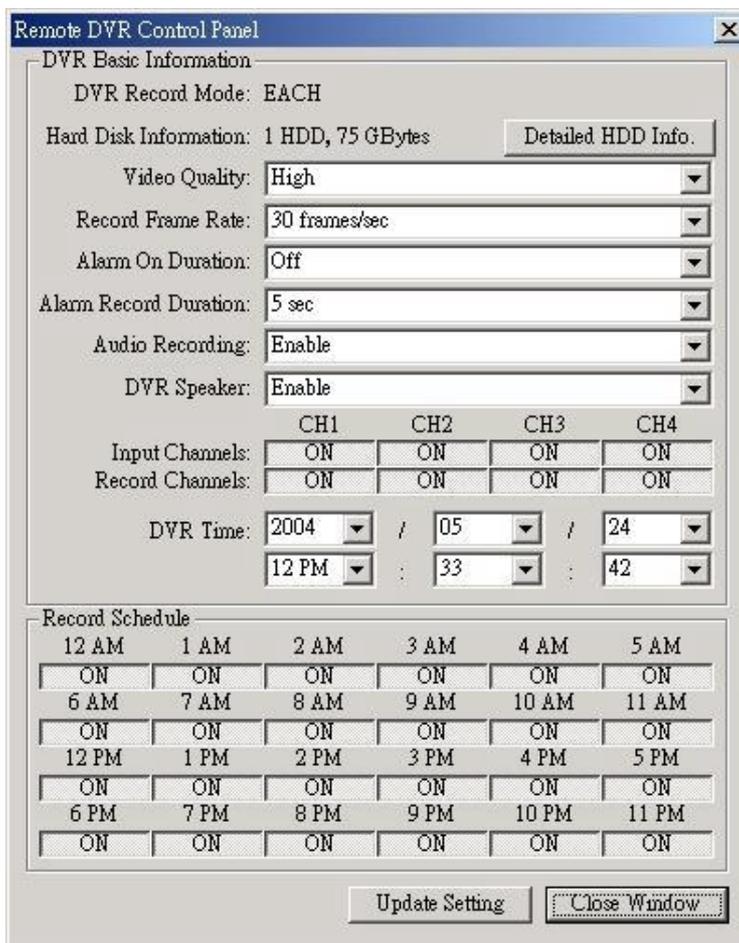
When you click "REC" button, it will start to record the incoming video on your PC hard disk. The DVR client creates "steam_files" folder where the execution file is located. When the client is recording, the Capture &

Play status indicator would show the current status are “Recording”.



After recording is finished, click” Play” button to play the recorded video stream. Then you will see a stream file list of the video stream files previously captured.

DVR management



This option enable you to just remote DVR’s operation setting: Video Quality, Record Frame rate, Alarm On Duration, Alarm record Duration, Input Channels, Record Channels, DVR system time setting and Record Schedule. All of settings operate as you do with DVR itself. Notice: For the record mode change can be made only on DVR, so the display shows the current DVR record mode on connection.

Appendix A

Specifications



Model	DVR-400
Video Input	NTSC/PAL
Operating System	None
Video Input	4ch composite
Video Output	2ch composite + S-Video
Video Loop	4ch composite
Audio Input	1ch RCA
Audio Output	1ch RCA
Built-in Buzzer	Yes
Display Frame	120fps (NTSC) / 100fps (PAL)
Recording Framer Rate (Quad mode)	Max. 30fps (NTSC) / Max. 25fps (PAL)
Recording Frame Rate (Each mode)	Max. 7.5fps (NTSC) / Max. 6.25fps (PAL)
Recording Mode	Continuous, manual, event programmed
Resolution (Display)	NTSC: 720*480 / PAL: 720-576
Resolution (Recording)	NTSC: 320*112, 640*224 / PAL: 320-136, 640*272
Compression Format	Motion JPEG (8-20K bytes/frame)
HDD	Swappable HDD tray (Max. HDD capacity: 250GB)
Search Mode	Time, date, camera
Network	TCP/IP
Ethernet	RJ45
Watch-dog	Auto-recovery capability after power
Dimension	350 x 292 x 60 mm (W x D x H)
Weight	4.15 kg (gross weight)