



PICO-2000
Digital Surveillance Recorder

PICO-2000
User Manual

UniVision Canada Limited





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Introduction

Overview

The PICO 2000- Series of Digital Surveillance Recorder has inherently been designed with flexibility of different video camera inputs and display different camera images in real time. Notwithstanding the different inputs and display, all models will have the same features which are kept as uniform throughout the series.

Standard Features

- Digital multi-channel video recorder and multiplexer
- Support up to 16 camera inputs with multi display modes
- Supports both PAL and NTSC standards
- Easy to use graphic user interface
- State of the art real-time display and recording under optimum condition of up to 4 channels
- Support full resolution video (768x576 PAL, 640x480 NTSC)
- Real-time digital video compression
- Simultaneous playback and recording
- Playback with sophisticated search functions
- Alarm triggered recording
- Alarm I/O interface
- Pre-alarm recording
- Programmable timer for recording
- Motion detection recording
- Easy to expand by software upgrade and system integration
- Multilingual Capability
- Intelligent remote player with telephone dial up and LAN connectivity to access on-line and recorder videos

Optional Features

- Video displays on SVGA monitor and support a secondary display unit
- Audio Recording attachable to selected video input
- Pan/Tilt/Zoom Control (optionally selected Codec)
- Fast Video Compression/decompression (optionally selected Codec)
- Tamper protection for video recording

Package Models

- The package model of PICO2000 refers to the product package, which includes the necessary application software, peripheral boards and accessories for Input and output interface, to be put into the customer provided PC (Main Processor Unit) workstation to construct the equivalent PICO2000 System.
- There are a number of package models in the series that we can offer to our OEM, distributors, system integrators and dealers etc., and the model number describes the number of real time video display and the number of cameras that the model can support

Generic Model Number

The generic model no. is extractable from the following syntax :

- For System Product PICO2000 – generic model no.<opt>
- For Packaged Product PICO2K – generic model no.<opt>

Through out this manual, **Model** will refer to the generic model no.



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Model No. Structure

Model # UC-PICO2K-XXXYYZZ00

- The first 2 letters signify the manufacturer -UC represents UniVision Canada
- The next block of alpha numeric signifies the product series – PICO2K represents PICO2000 digital video recorder system.
- The next 3 numbers XXX represent the functional requirement of the recorder model. The first number signifies the number of real time video that the model will display, i.e. 4 represents that the model will display FOUR cameras in real time video. The next 2 numbers signify the maximum number of video inputs, including the real time video, that the model will support, i.e. 13 represents that a total of 13 cameras can be connected to the system.
- The presence of the next character indicates that the model will have additional recording features:-
 - A – One channel synchronized Audio recording capability.
 - R – Four real time video-recording capability.
 - M- One channel synchronized Audio recording and four real time video recording capability
- The next two letters ZZ differentiates whether the unit is supplied as a “Demo” – DM or as a “package” - PG.

The next two numbers signify the language to which the version of the software supports, i.e. 00 for English, 01 for Chinese and 02 for French etc.

Example 1

To order a “package” system of PICO2000 digital recorder from UniVision Canada for 9 camera inputs, 3 real time video display and with additional audio recording feature. The system will be assembled in the PC locally by the OEM/distributor. The required language version will be in Chinese.

The model selected will be UC-PICO2K-309APG01

Example 2

To order a “demo” system of PICO2000 digital recorder from UniVision Canada for 16 camera inputs, 4 real time video display, no audio recording required. The system will be assembled in the PC locally by the OEM/distributor. The required language version will be in Chinese.

The model selected will be UC-PICO2K-416DM01

Example 3

To order a “package” system of PICO2000 digital recorder from UniVision Canada for 13 camera inputs, 4 real time video display, one channel audio recording and 4 real time videos recording capability. The system will be assembled in the PC locally by the OEM/distributor. The required language version will be in Chinese.

The model selected will be UC-PICO2K-413MPG01



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Archive Backup System Mode

Considering the total process (record-optional playback-backup-optional restore-erase obsolete video-recycle storage media for record) of recording of the videos for Surveillance purpose, we can come up with two different backup system modes:

Normal Mode – The PICO2000 Digital Surveillance Recorder will record all new video into the Fixed Hard Drive (s). As required, the operator of the PIC2000 can backup the recorded video to an Removable IDE drive via the Housekeeping function from the Utility Menu. The raw copy of video can optionally be deleted during the backup process.

Archive Mode- The PICO2000 Digital Surveillance Recorder will record all new video into one of the assigned Removable IDE drive. When it is about full, it can be removed from the recorder (system control or physically) for additional archiving to DAT or other backup media. The PICO2000 Digital Surveillance Recorder will maintain continuous recording to an alternate removable drive during the archiving operation. When the videos inside a Removable drive is obsolete, they can be erased immediately before video recording is resumed on this drive.

The backup system mode of the PICO2000 Digital Surveillance Recorder should be selected at the very beginning of overall system operation. The normal backup mode is set by default. To switched to the Archive mode, please refer to the Backup Function of the Options Setting Menu. You will need to have two (2) removable IDE drives configured in the PICO2000 Digital Surveillance Recorder to support this mode of system operation. The PICO2000 application needs to be closed and restart to apply the mode switching from each other.

Audio Recording Option

For all models with an “A” suffix, e.g. Model 205A/309A/413A etc, the audio recording function can be enabled and have the recording attached to one of the active camera. To setup audio recording, please refer to the Attaching audio to camera of the Option Setting Menu.

Before you can activate this function, you will need to have a Sound (Capture) board installed and properly configured to the PICO2000 Digital Surveillance Recorder, as follows:

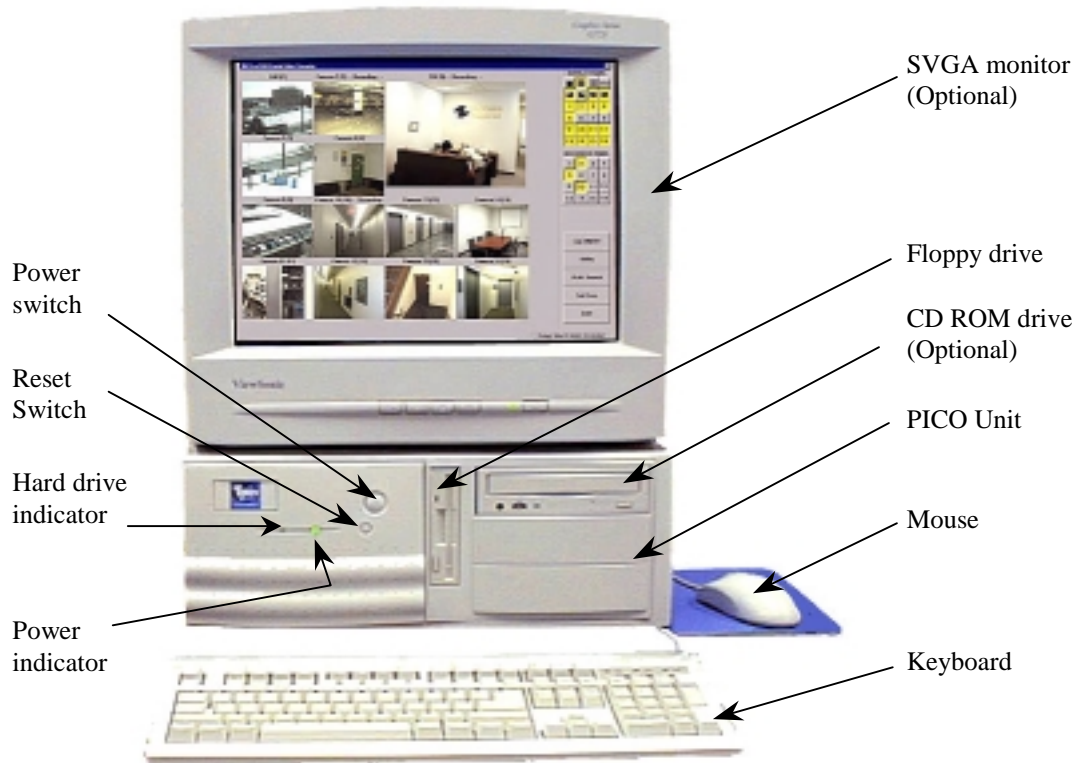
- Click Start-> Programs-> Accessory -> Entertainment (Multimedia, for Windows 95)-> Volume Control, Click Properties from the Options Menu. Select the Playback check: Make sure the Microphone option is selected from the “Show all volume control” list box. Click apply and OK, then make sure the Microphone is Muted at Playback.
- Repeat the same steps for Recording, only for this time, the Microphone (or any other input port you may choose as an input feed to the sound board as the recording source) is selected in this case.
- You will need to adjust the volume of input and output by using the sound recorder which is built in with the Windows 98 Operating System.



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FRONT PANEL



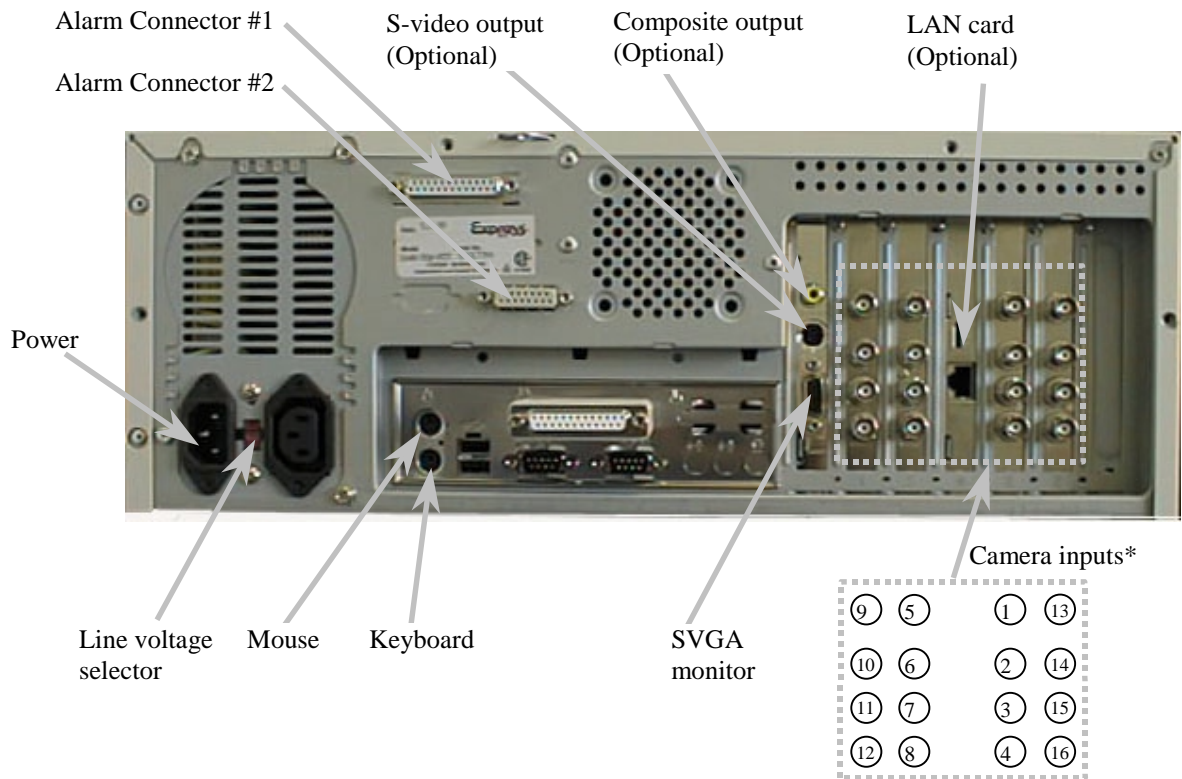


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REAR PANEL

(Shown as Model 416)



***Note:**

Camera Configuration

Camera configuration includes camera connection and the camera title assignment. The camera should be connected to the “Camera inputs” properly prior to do the camera configuration. Assign camera title inside the “Camera Title” message box within the “Utility” menu. Go to “Utility Function” chapter for detail of camera title assignment.

Tip:

Make sure that the “Active” box is unchecked for the non-connected camera(s), in order to perform the optimum video quality.



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STARTING THE PICO-2000

Turn on the power Make sure that the line voltage selector in the rear panel is selected correctly. Press the “POWER” switch in the front panel of the PICO-2000 to power up the unit.

Logon After the system start-up process, the PICO-2000 logo and the main screen will appear as shown in Figure 1. Click the “Too Many Files Warning” message box “X” icon to close the message box. Click the Log ON/OFF button. A Logon Screen dialog box will pop up for input. Two default usernames are available: “SUPER” and “OPERATOR”. The factory default password is “pico” or NULL for either case. When you logon as “SUPER”, you can click on the Utility button to change the logon password (to be discussed in more detail later on page 37). However, if you logon as “OPERATOR”, the Utility button will be disabled to prevent the password and some other system and recording settings from being modified by the operator.



Figure 1

The main screen Two control panels and various common control buttons are displayed on the right hand side of the main screen. The username is shown on the lower left-hand corner. A progress bar located at the bottom of the screen shows the amount of storage occupied and available for video recording. The color of the status bar will gradually change from BLUE – when it is empty to RED – when it is full. The current time/date is shown on the lower right hand corner.



DISPLAY (THE MULTIPLEXER FUNCTION)

Display control panel

PICO-2000 uses a unique Graphical User Interface (GUI) design for display control. A “DISPLAY” panel is implemented on the upper right hand corner of the main screen so that the user can interact with the unit more easily. The “DISPLAY” panel consists of “display mode” buttons, “camera” buttons and a “sequence” button respectively (see Figure 2-1 for Models 104, 309A, 413A & 416, Figure 2-2 for Models 205A & 208). All of the push buttons have their individual built-in indicator lights. Once the button is pressed, it toggles on and off with the indicator light on and off to indicate its status correspondingly.

Tip:

You are able to know which camera(s) is/are being displayed by the “DISPLAY” panel indicator lights, and you can press the buttons on the “DISPLAY” panel to enter your display input right away.

For Models 104, 309A, 413A & 416

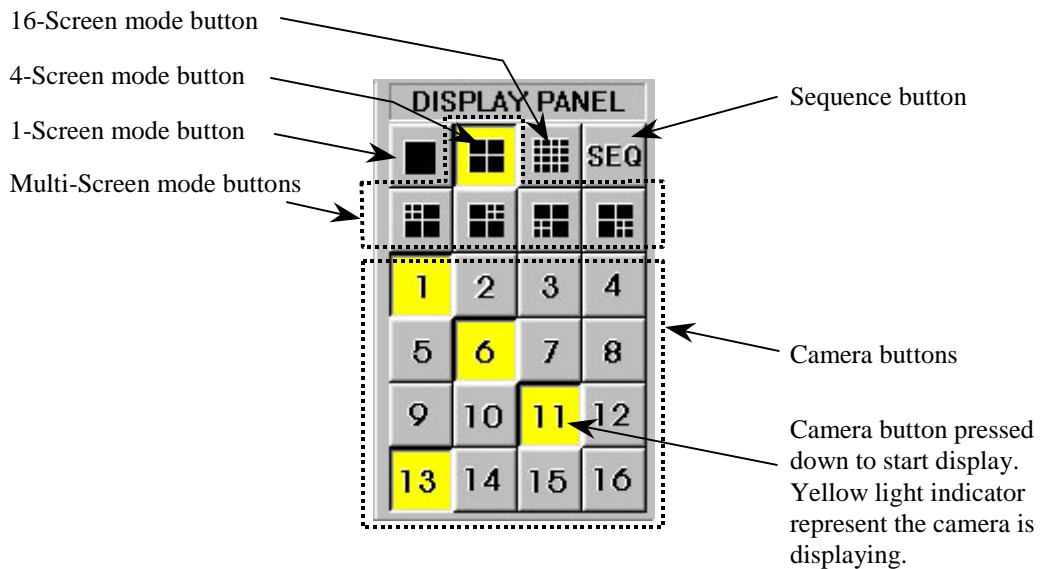


Figure 2-1 (Models 416 & 104)

Tip:

No camera button can be selected prior to the mode selection. User should click on one of the display mode button first.



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For Models 205A & 208

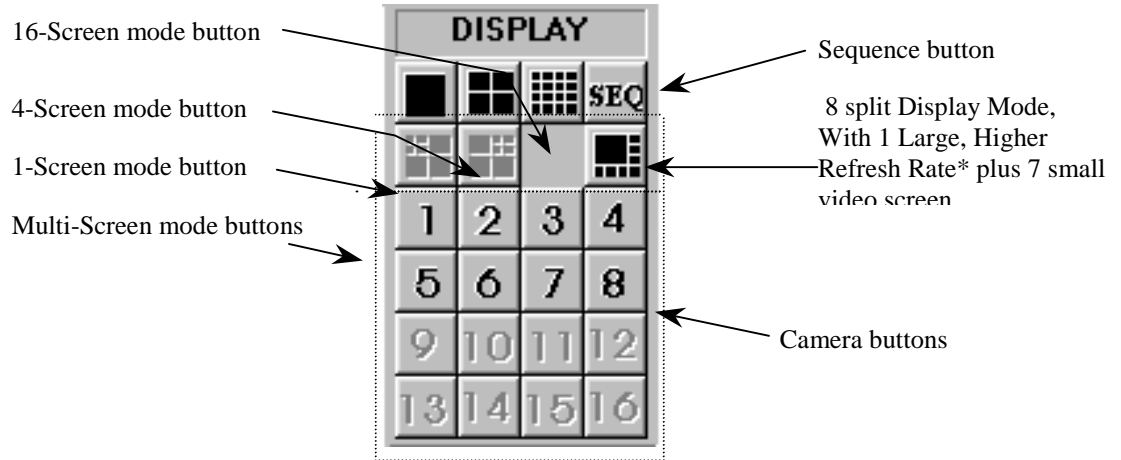


Figure 2-2(Model 208)

Tip:

No camera button can be selected prior to the mode selection. User should click on one of the display mode button first.

1-Screen mode

Click the 1-Screen mode button to select this mode.
Only one camera can be selected for display.
Click the camera button to select camera to display in this mode.
The down button will light up in yellow.

4-Screen mode

Click the 4-Screen mode button to select this mode.
Four cameras can be selected for display simultaneously.
Click the camera buttons to select camera(s) to display in this mode.
The down buttons will light up in yellow to indicate the display status.

The camera display in 4-Screen mode is assigned as the following figure for easy operation.

For Model 104

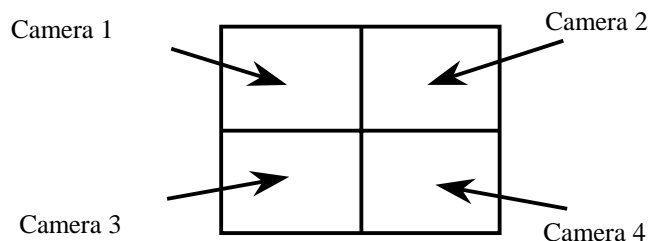


Figure 3-1



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For Model 205A, 208, 309A, 413A & 416

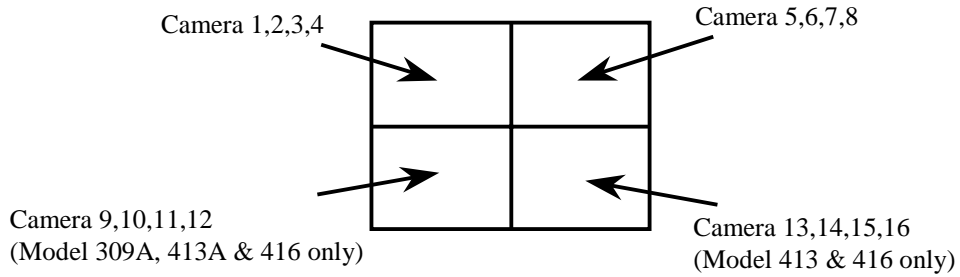
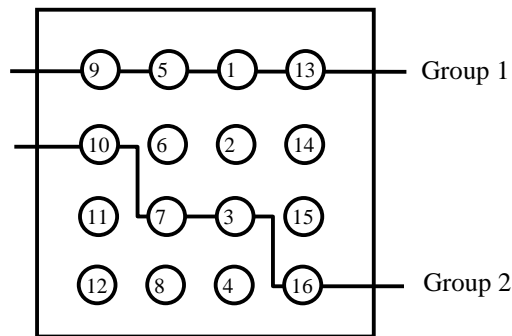


Figure 3-2

Tip:

To make the most use of the 4-Screen real time display of the unit, consider the arrangement of your camera connections to the unit. You can think of the cameras that you want to display simultaneously in a 4-Screen mode as a group. Connect the grouped cameras to the inputs of the unit in a horizontal arrangement instead of in a vertical arrangement.

Example: Two possible horizontal arrangements of the grouped cameras are shown in Figure 4.



Camera Inputs in Rear Panel

Figure 4

(Shown as the standard version of PICO2000 system product, for packaged products, the actual location of camera assigned will vary with the motherboard and slots being used)



Multi-Screen mode A group of four multi-screen buttons is implemented for multi-screen display control.
The multi-screen buttons are enabled only under the 4-screen mode.
You can click on any of these mode buttons to further split any quadrant of the original 4-Screen display into a smaller quad display (quad within a quad).
All multiscreen mode buttons can be selected simultaneously.

Example:

Using the following multi-screen buttons configuration (as that shown in Figure 5-1) as an example, the camera display will be assigned as Figure 5-2.

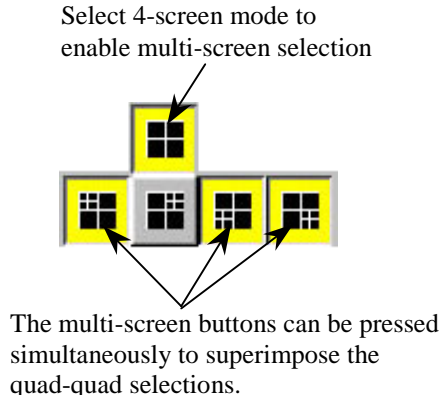


Figure 5-1

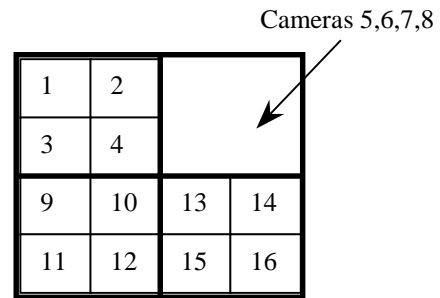


Figure 5-2

8-Screen mode

Click on the 8-Screen mode button to select this mode.
All cameras will be displayed simultaneously at first time entry to this mode.
Click the camera buttons to select or de-select camera(s) to display in this mode .
The down buttons will light up in yellow to indicate the display status
Click on the surrounding (small) screen will cause the camera on display to be swapped with the one at the center(Large) screen. Keep doing the swapping until the designed cameras is assigned to the respective screen. The assignment will be maintained even if there is a momentary change to other multi-screen modes, but it will return to its default by logging out and on again.

The camera display in 8-Screen mode is assigned as in Figure 6-1 by default.

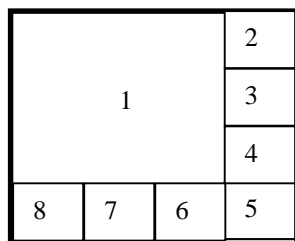


Figure 6-1
(For Model 205A & 208 only)

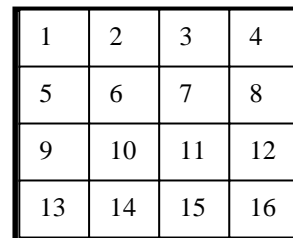


Figure 6-2



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16-Screen mode Click on the 16-Screen mode button to select this mode. All cameras will be displayed simultaneously. The camera buttons will then all light up in yellow to indicate the selection of all the cameras.

The camera display in 16-Screen mode is assigned as in Figure 6-2

Rapid Zoom You can switch any camera display to one-screen display mode rapidly. Simply double-click on the desired image on screen, and the image of that screen will be switched to “one screen” mode immediately. For an example, you can change the camera 3 display from 4-Screen display mode to 1-Screen display mode by double click the camera 3 image on screen. You can return to the original display mode by a click on the previous display mode button.

Full screen display Click on the “Full Scrn” button to display the video(s) in full screen. All the control panels and buttons will be hidden and only videos will be displayed on the screen in order to fully utilize the display area of the monitor. Right-mouse click on any part of the full screen to restore the normal control panel display.

Sequence Click the “SEQ” button in the “DISPLAY” panel to toggle the sequence function on or off. The indicator of the button lights up in yellow to indicate the sequence function. The function of sequencing is effective for all display modes, except for the 16-Screen mode. The user can select individual camera(s) for sequencing display. For the sequence parameter setup and the implementation example, please see the “Display Sequencing” under “Option Setting” section of this manual.

Note:

When the unit is in sequence mode, all the camera selection buttons inside display panel will be inhibited. You should click the “SEQ” button to off position to re-gain manual access of the camera selection.

REMOTE ONLINE VIEWING AND PLAYBACK RECORDED VIDEO

The Intelligent Remote Player An intelligent remote player is designed to provide online viewing and playback recorded video functions in the remote client station. While the remote client is doing online viewing, the Pico2000 will automatically switch to 16-screen display mode. Please refer to the Intelligent remote player manual for detailed operation procedure of the intelligent remote player.

PICO Server Button



The appearance of the icon of the “PICO Server” button on the PICO200 Main Screen indicates the server is on for Online Viewing & Dialing in. The user can turn off this service by clicking the button and click the “close” icon on the menu bar of the control window. To re-open this service, click the “Utility” button and select the “PICO SERVER” function. The icon will re-appear in the Main Screen.



RECORDING

Storage drive

PICO2000 will automatically detect available fixed hard disk(s) in the unit for recording for “Normal” backup mode of operation.

PICO2000 will directly record into the active removable hard disk in the unit for “Archive” backup mode of operation.

Notes: The active (selected) drive should be assigned properly before the overall backup and restore operation is executed. Assign the target drive inside the “Insert drive” message box by clicking the “Swap Drive” button while the system is operated in “Archive” backup mode. Go to the “Option Setting” chapter for further detail.

Recording modes

According to the recording initiation method, four different modes are available for selection in PICO-2000:

- Instant recording
- Scheduled recording
- Pre-alarm recording
- Alarm recording

Multiple camera recording

All cameras can be recorded independently.

Each camera will be recorded into individual video file(s).

The camera ID, start date/time, and the recording mode of the individual camera will be logged with database management.

The recorder control panel

Pico2000 has a “RECORDER” panel (see Figure 7) to let the user interact with the unit for recording control with enough indication.

There are sixteen camera buttons in the “RECORDER” panel, all of which can be toggled on or off.

Each button has four built-in indicators with different colors to indicate different recording modes and statuses.

The available indicator colors are yellow, red, light blue and green, respectively.

- Yellow -- the corresponding camera is performing instant recording, which is initiated by the pressing down of the button manually.
- Red -- the corresponding camera is under alarm recording, which is initiated by the alarm input or by motion detection.
- Light blue -- that the pre-alarm function of that camera is activated.
- Green -- the corresponding camera is under scheduled recording, which is controlled by the programmable timer.

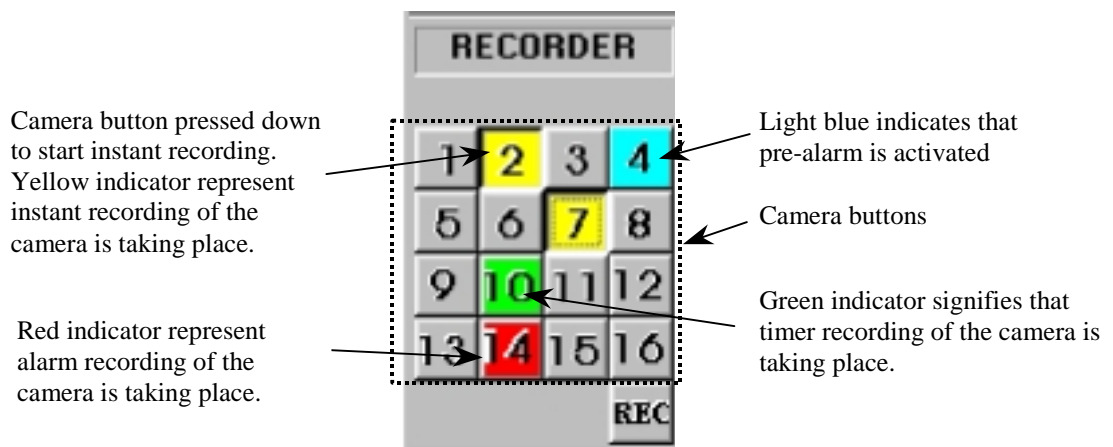


Figure 7



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Instant recording

Instant recording is the most interactive way and easy to use recording method. It is designed to start instantly to capture some unexpected special events. It works as a complement of the scheduled background recording. You can simply toggle on or off the video recording by clicking the camera button in the “RECORDING” panel. The down button with a yellow light indicator indicates that the camera is under instant recording. Instant recording parameters of each camera can be programmed. Please see the section of “Recorder Setting” for parameter setup.

Tip:

Instant recording is expected to work in a real frame rate for short time recording while scheduled recording is expected to work in a lower frame rate for longer time recording.

For quick, instant recording of all installed cameras, the user can click on the “REC” button in the “RECORDER” panel (as shown in Figure 8 on the lower right hand corner) to activate/deactivate this function.

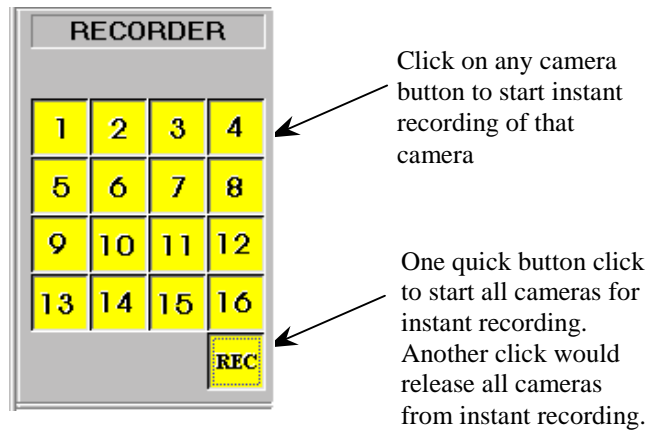


Figure 8



Alarm recording

The alarm recording will be triggered by the alarm inputs or the motion detection.
Sixteen alarm inputs are assigned one to one corresponding to the 16 cameras. Once the alarm is triggered either by the alarm input or the motion detection, the corresponding camera will start recording automatically.
A red indicator indicates that the camera is now under alarm recording. The alarm recording function of an individual camera can be disabled, also the alarm recording duration and the frame rate of each camera can be programmed individually.
Please see the section of “Recorder Setting” for the setup details.

Note:

Only the logon username of “SUPER” can access the utility for alarm enable and alarm recording parameter settings.

Tip:

In order to verify that alarm recording of particular camera(s) is actually taking place, the user can try and see if the red indicator light(s) in the RECORDER PANEL is/are being displayed.

Pre-alarm recording

Pre-alarm recording works together with the alarm recording. Pre-alarm function enables you to capture images before the alarm event is happened. Pre-alarm allows images to be temporarily recorded for a short period of time (1 to 60 second) at normal situation. Once an alarm is actually being triggered, the pre-alarm images become permanent files, which can be retrieved and played back.
Using “Play Search” function can playback the pre-alarm images. The pre-alarm function is setup in the “Alarm”, “Recorder Setting” inside “Utility”.
You can activate the pre-alarm function accordingly when the alarm function is selected.
Please see the section of “Recorder Setting” for the setup details.

Note:

Pre-alarm images are stored into two temporary files alternatively under normal situation. Therefore, when alarm is being triggered, there will be two pre-alarm files accompanies with the alarm file.

Tip:

Pre-alarm recording provides an effective way of using the hard disk storage:

- **The pre-alarm image will be kept in the hard disk only when an alarm is actually taken place.**
- **Since it provides the image happened before the alarm, you can review what is happening right before the alarm triggering, it is no longer necessary to do schedule recording at all time.**

For an example, the door was opened, and it triggered the alarm recording and you can also know who opened the door by playback the pre-alarm recording video.



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Scheduled recording

A programmable timer is implemented for scheduled recording. PICO-2000 supports both weekday and weekend scheduled recording. The timer will start and stop scheduled recording automatically according to your input. A green indicator indicates that the camera is recording under the timer control. The default recording duration value is 0, which represents infinity or continue recording. During schedule recording, you can manually over ride to instant recording mode by pressing down the camera button. The indicator will change to yellow to indicate that the camera is under instant recording. However, it will automatically resume scheduled recording once you click the camera button again to turn off instant recording of that camera. The indicator will then resume to green. Please see the section of "Recording Setting" for the setup and implementation example of the schedule recording.

Note:

Only the logon username of "SUPER" can access the utility for configuring settings of scheduled recording parameters.

Tip:

The user can verify if scheduled recording is actually taking place by trying to see if the green indicator light(s) in the RECORDER panel is/are lit.



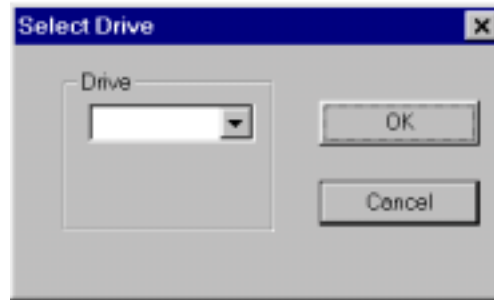
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PLAYBACK

Playback the video Recorded video in all hard disk(s) and removable disk(s) can be retrieved for playback.
Click the “Play Back” button in the main screen to activate the Select Drive dialog box. (as shown in Figure 9)

Figure 9



Select Drive Click the Downward arrow and select desired drive no. C, D, E...from the pull down list



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The video player (Figure 10)

Click the "Play search" button in the Pico2000 and select which camera to playback by the play search functions of the Pico2000. Once the video is selected, click the "Play" button to invoke the video player.

List File Record

Click the "File Record" button in the Video Player Dialog Menu bar to display the list of video files for the selected camera. Click on the desired file from the list and Click Open File Button to start the playback. The File List will change as the video search engine is manipulated, to match with only those files appear on the video bar window. Click the Reset Button to resume the List of all files on Selected Camera title.

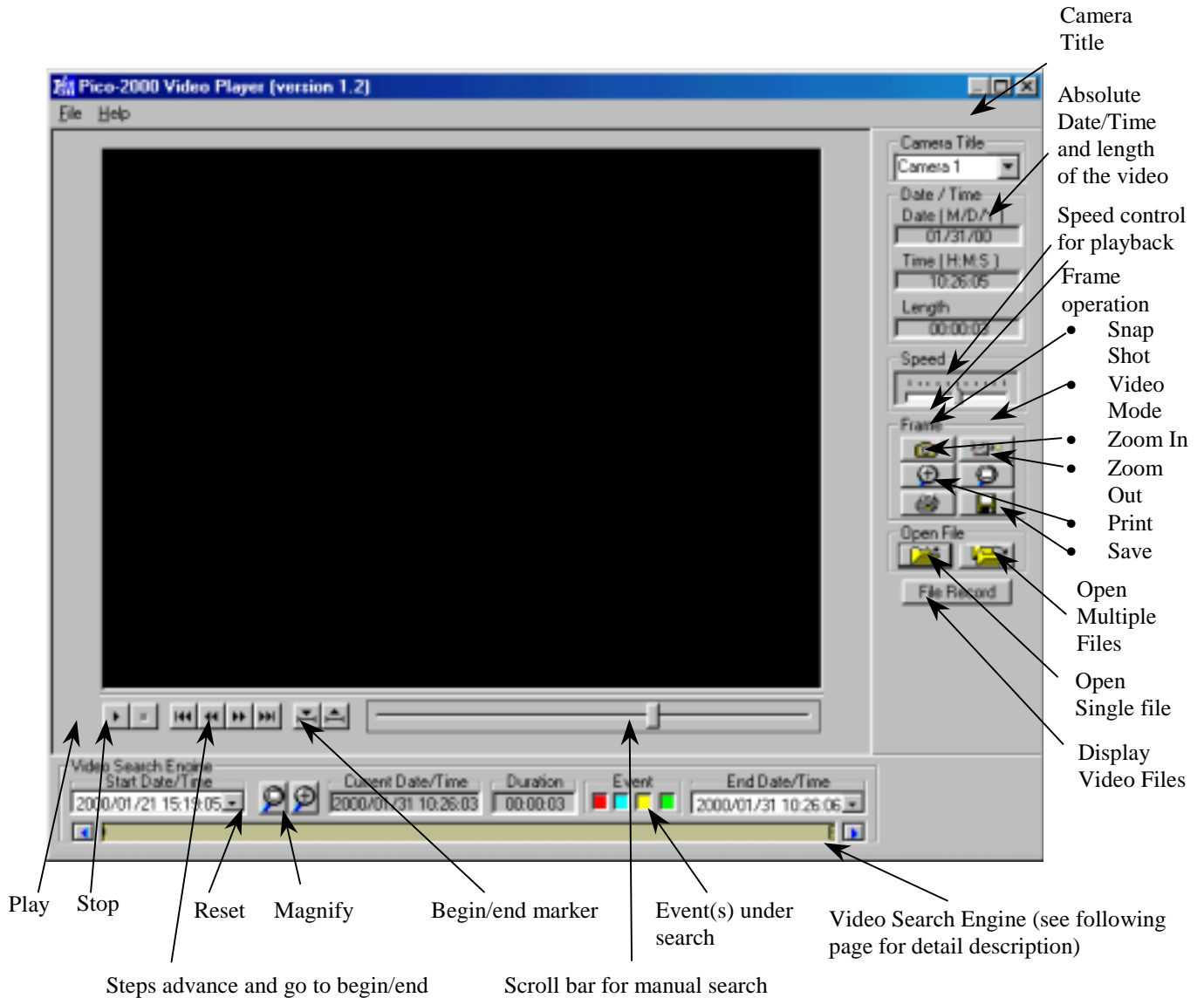


Figure 10



PICO-2000 **Digital Surveillance Recorder**

Video playback controls

The video file selected in “Play Search” will be loaded and played automatically. Use the video playback controls beneath the video image to control the video playback function.

- User can stop the video and use the scroll bar to search the video if needed.
- Press the “two-arrow” keys to advance one frame at a time.

Playback camera control

Using the camera title control box can select the camera by name or title for playback. Click the downward arrow and click the desired camera for playback. During other playback operation, repeat the same procedure to select the new desired camera for playback, the playback action of the previously selected camera will terminated.

(Simultaneous playback of two or more recorded videos is possible by invoking the playback operation from the main menu but this is not recommended.)

Absolute date/time and length display

The absolute date/time of the playback and the length of the video will be displayed on the control panel.

Playback speed control

Using the sliding control box can adjust the playback speed. Drag the control button to the right side to increase the playing speed. Drag it left to decrease the playing speed. The normal playback speed is indicated in the speed control box when the control button is put in the middle.

Rewind and replay

Using the Begin/end Marker can select a portion of the current video file to be replay in a loop. Drag the scroll bar (Scroll bar for manual search) to the desired beginning position, click the “Begin” button to enter the marker, then repeat the process to enter the “end” position with the “end” marker button. Click “Play” button to begin the playback with auto-rewind.

Frame mode for print and save a frame

Use “Snap shot” to grab a frame from the video and enter the frame operation mode.

User can select area of interest using mouse movement and the mouse left button and then click “Zoom” button to zoom in the image. Click “Unzoom” to return to normal display.

Click the “Print” button to print out the image captured.

The frame can be saved to floppy disk in drive A by clicking the “Save” button. The saved filename has the following format:

x-mmddy-hhmmss.bmp

x: camera number

mmddy: month/day/year

hhmmss: hour:minute:second

bmp: bmp file extension

Tip:

The user can set up printer properties for printing hard copy and previewing the hard copy before actual printing.

Return to Video mode

Click the “Video mode” button to go back to video playback mode.



PICO-2000 Digital Surveillance Recorder

The video search engine*

A video search engine is a separate functional block for video searching of a camera graphically. Two date/time pickers are used for begin and end date/time input and indication. All the available recorded videos within this date/time limits will be presented inside the video bar window.

Different types of video will be presented in different colors, codes as follows:

- Yellow - Instance recording video
- Green - Schedule recording video
- Blue - Pre-alarm recording video
- Red - Alarm recording

Down the event-search button to select types of event under search, they are color coded in the same manner the event. By default all types are selected when the Player is activated.

A marker, which is a small rectangle box inside the video bar window (which shows multiple video files), marks the “video header” position of the video. Point the mouse cursor and click inside the video bar window, the video marker will snap to the nearest “video header” position of a video.

A date/time display box in the middle of the video search engine displays the current date/time value of the marker position.

Playback the current file

Click the “Open Single file” icon button to open the marked video for viewing. Once the button is pressed down, the video will be playback until the end of the file is reached.

Open the video files and playback continuously

Click the “Open Multiple files” icon button to open the marked video for viewing. Once the icon button is pressed down, the videos will playback one by one continuously. Or user can click the “Open Multiple files” icon button to release the button to disable the continuous playback.

Search the video interactively

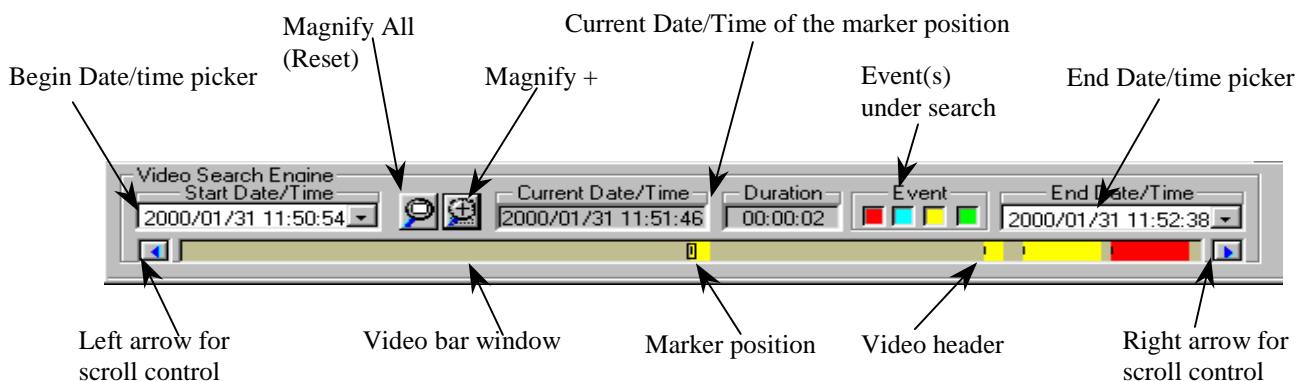
User can directly input the begin/end date/time by using the “begin and end date/time picker” to select interesting portion of the video bar window to show in more detail.

User can also use the mouse click to mark the interesting “video header” and then click the “Magnify +” icon to magnify the interesting portion.

Use the left and right arrow icon buttons to scroll the video bar window.

Repeat the mark and magnify actions to search for the video of interest.

Click the “Magnify all (Reset)” icon to resume to present all available video.



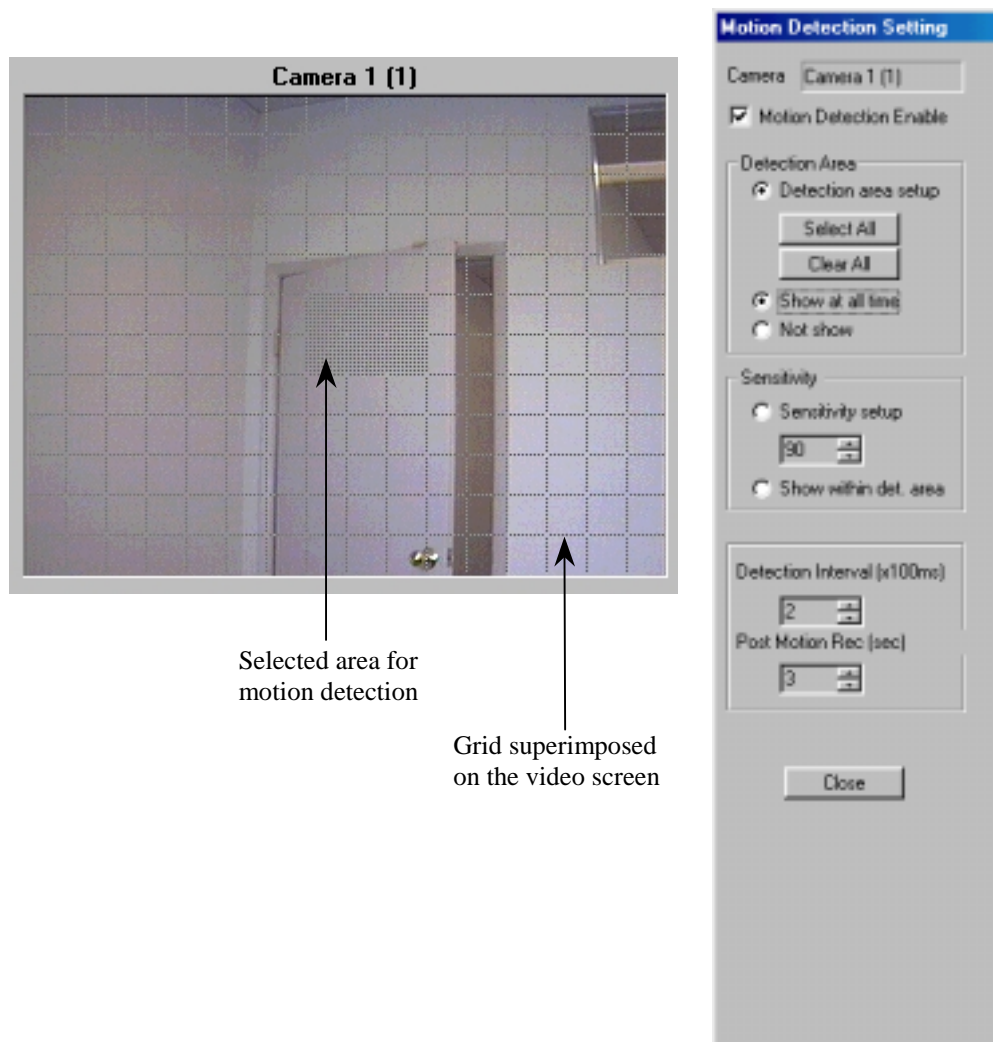
*The video search engine is designed to search the available video in the selected hard disk(s) only.



MOTION DETECTION

Motion detection An advanced digital video-processing algorithm is used to implement motion detection function in Pico2000. The motion detection function is designed to automatically detect any activities within a selected detection area(s), and to start recording of that camera when activity is detected inside the detection area(s).

Set up the motion detection Right click the mouse button on the video screen of the camera you want to set motion detection.
A “Motion detection setting” dialog box will pop up for motion detection setting.





PICO-2000 **Digital Surveillance Recorder**

- Set detection area** The first thing to do is to input the detection area(s). Click the “Detection area setup” button to show the grid on video screen for detection area selection. Simply click on any spot to select/de-select the grid(s) to form detection area(s) of any shape in the video screen for motion detection. The “Select all” button is used to rapidly select the whole video screen for detection. The “Clear all” button is used to de-select all the selected areas.
- Indicate the detection area** If you want the detection area to be presented on the video screen during normal operation, click the “Show at all time” button. If you don’t want the detection area to be presented in the video screen during normal operation, click the “Not show” button.
- Set sensitivity for motion detection** Click the “Sensitivity setup” button to display the “activity blocks” for sensitivity setup. The “activity blocks” will superimpose on the moving object to highlight the activities on the video screen. You can adjust the sensitivity by using the sensitivity control box. Click the up arrow button to increase the sensitivity and click the down arrow button to decrease the detection sensitivity respectively. The sensitivity value display inside the control box, which is an arbitrary value, indicates the relative detection sensitivity. Adjust the sensitivity by monitoring the “activity blocks” on the screen to determine that the sensitivity is adjusted to an optimal condition for motion detection and without false alarm. User can check the “Show within detection area” button to confine the “activity blocks” only to display within the detection areas you have selected.
- Detection interval** The occurrence of motion is detected by correlating the successive frames of the video. The “Detection interval” control box can adjust the detection interval between these successive frames. The detection interval is in unit of 100mS. The default value is at 200mS.
- Recording time extension** The motion detected in the detection area(s) will be used as an event to trigger the alarm recording of the corresponding camera. Once the recording is started, it will continue with an extension time even the motion is stopped. This extension time can be adjusted by using the “Post motion rec.” control box. The time interval is in unit of second show inside the control box and the default value is 3 seconds.
- Enable the motion detection function** Check the “Motion detection enable” box to enable the motion detection function once you have set all the parameters. (User can temporarily disable the motion detection by uncheck the “Motion detection enable” box. All the settings of the motion detection will stay unchanged, which let the user to enable the motion detection back again afterward more easy). Click the “Close” button, the corresponding camera button in the display panel will light up with a yellow grid indicator to indicate the motion detection function. The detection area will be presented in the video screen if the “Show at all time” button is checked.

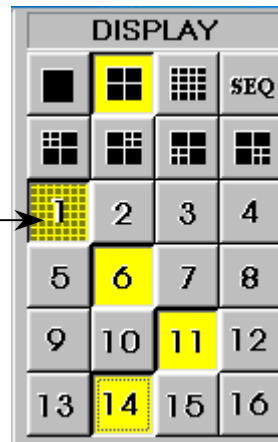


PICO-2000

Digital Surveillance Recorder

(Show as Model 416)

Yellow grid indicator indicates that the motion detection is enabled



Tips

Use the same image resolution for displaying and recording to get better and stable performance of the motion detection function.

- When display at QUAD mode; use “High” resolution mode for motion detection recording.
- When display at 16-screen mode; use “Low” resolution mode for motion detection recording.
- When display at one screen mode use “Supper” mode for motion detection recording.
- Without displaying the motion detection camera.



PAN-TILT ZOOM CONTROL

Pan-tilt Zoom

Using the pan-tilt zoom function, the camera can zoom in or out to adjust the view angle of the camera for a better image, or it can pan and tilt the camera to different position of interest for better surveillance.

Click the PTZ icon button besides the “EXIT” button to activate the PTZ panel.

Note:

The camera number setting of the On Site Receiver Driver (OSRD) should be set up correctly with the same camera number as the camera attached to it.

Driver Mode Setting

Right click the mouse on anywhere of the PTZ Panel, a menu will appear which can select the MODE, PORT SETTING or EXIT.

Select the MODE item, a sub menu will show up the item MV912RS, Old OSRD Code, PTZ Receiver Driver and/or other available Custom's option. After your selection, a tick will appear left to the item.

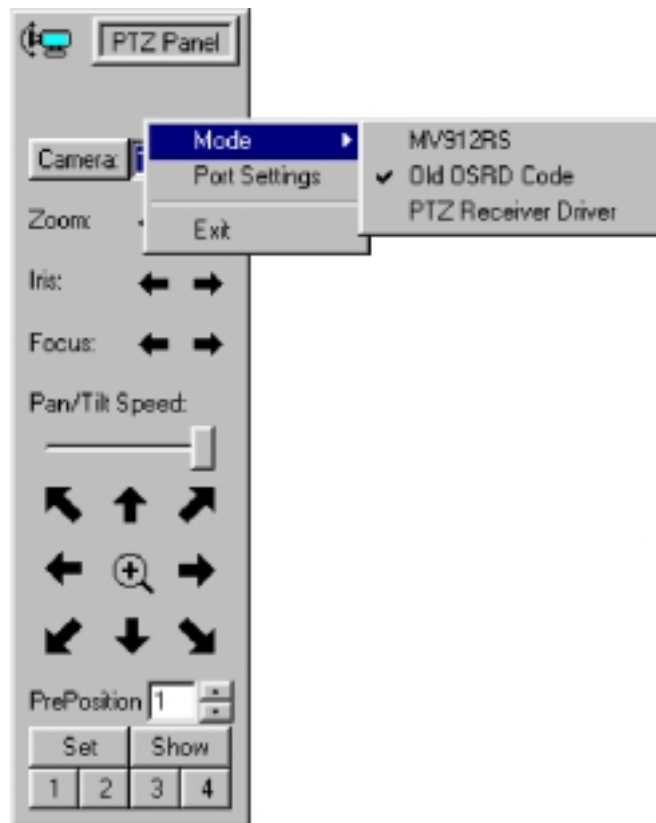
Note :

To run the pan-tilt function properly, you should match the OSRD with the selected protocol.

MV912RS must match the OSRD model of MV360.

Old OSRD Code must match the OSRD model of MV561.

PTZ Receiver Driver must match the OSRD model of PTZ100



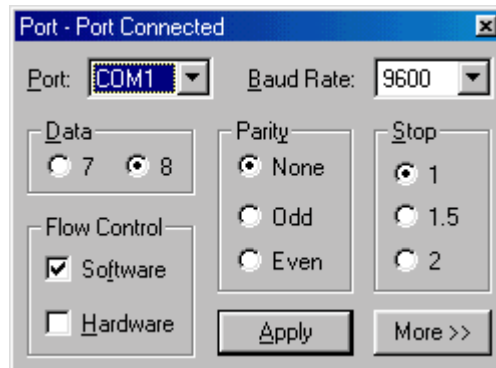


PICO-2000

Digital Surveillance Recorder

Port Setting

The port setting is about the COM port (the serial port) connection preferences. The default of the connection preferences is as the following figure. Please refer to individual OSRD connection preferences for correct setup of the connection preferences.



Camera Selection

The camera selection box in the PTZ control panel is for selecting the desired camera for PTZ control.

Monitor Selection

While the MV912RS protocol is selected, there will be a monitor selection box in the PTZ control panel.

Monitor selection is for use with the video switcher product MV900 of UniVision Engineering Limited (UEL).

For the MV900 switcher system, there will be 176 possible cameras which can be distributed to 16 individual monitor outputs.

The monitor selection box is for monitor selection.

In order to control PTZ of the desired camera through the MV900 switcher, you should select the monitor number and the camera number accordingly prior to do so.

Speed control

The speed of movement of the pan-tilt head can be controlled. The slide bar is to control the speed of movement.

Pan-tilt zoom control

Once the camera is selected, click the arrow buttons for corresponding direction movement, the focus and zoom control.

Pre-position

The positions of the pan tilt head can be saved so that camera can repeat its position when wanted.

Set Pre-position

Use the "Pre-position" box to enter the pre-position number.

Once the number is selected, pan/tilt the camera to a desired position and then, press "Set" button to assign this position into that particular pre-position number.

Show Pre-position

Use the "Pre-position" box to enter the pre-position number.

Once the number is selected, press the "Show" button to send the camera to the saved pre-position.

Pre-position hot keys

Four hot keys are implemented for four frequently used pre-positions.

Once programmed, press these hot keys will send the camera to it's pre-position accordingly.



UTILITY FUNCTIONS

Access to Utility Functions

When the user logged on as “SUPER”, he/she is authorized to use the Utility functions.

However, if the user logged on as “OPERATOR”, the Utility button will be disabled to prevent the password and some other system and recording settings from being modified by the operator.

Click on the Utility button on the main screen, and the Utility menu will then pop up as shown in Figure 12.

Re-activate the disabled Housekeeping Functions

The Housekeeping Function of the Utility Menu is disabled in case the PICO2000 is operated in the “Archive” Backup mode. To activate those build-in housekeeping functions from PICO2000, switch the system back to “Normal” backup mode. Go to the Option Setting Chapter for further details.

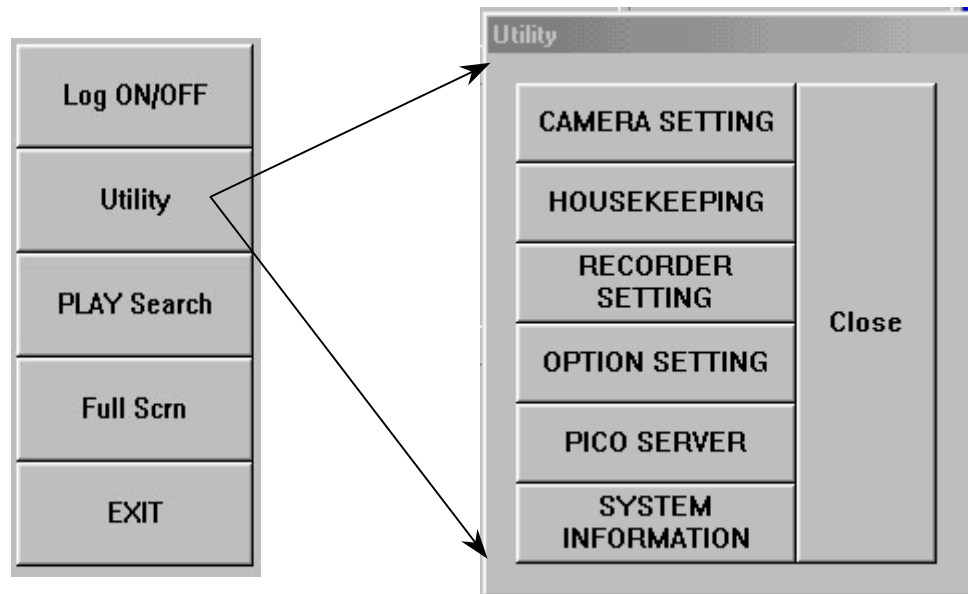


Figure 12



CAMERA CONFIGURATION

- Camera title assignment** To assign the Camera title correctly for individual camera connected to the Pico2000 unit, Click the “Utility” button and then select the “Camera Setting” button for camera title input. A camera setting dialog box (as seen in Figure 13) will be displayed for camera title input.
The default camera title is Camera 1 to Camera 16 respectively.
Click the desired input area for data entry, and then input the camera title accordingly. User can use the Backspace and Del keys in the keyboard to edit the text in the input field.
- Maximum no. of camera imposed by software** The max. no. of cameras is limited to 4 for model 104 and 8 for model 208 etc. This is to match with the design no. of cameras shown in the corresponding part of the generic model no. The camera assignment check box(es) will turn to Grey color and no manual assignment is possible.
- Check the active connected cameras** The “Active” check box should be unchecked for the non-connected camera inputs.
When the “Active” check box is unchecked to the Cam ID, then the corresponding buttons in the “Display” and “Recorder” panels will be **disabled** to stop the display and recording function of these camera inputs.
- Apply the camera title** Click the “Apply” button to apply the camera titles right away.
Click OK to confirm the inputs and close the dialog box.
Or you can click “Cancel” button to close the dialog box without change.
The camera title will be displayed on the screen to indicate the camera title.
The camera title will also be used for the video playback search.
The camera number buttons will be disabled in the “Display” and “Recorder” panels for the non-connected camera inputs.



Figure 13





RECORDER SETTING

The recording parameters

The instant recording, alarm recording and the scheduled recording modes should have their individual sets of recording parameter settings. Click the “Utility” button and then select the “Recording Setting” to start program the recording parameters of individual cameras for different recording modes.

Frame rate

Frame rate is the most important parameter for recording setting. The value of frame rate is in f/s (frame per second), which controls how many frames will be recorded for every second. PICO-2000 provides a selection list for frame rate input. The possible frame rates are 25, 12.5, 8, 4, 1, 1/2 and 1/60 frames per second respectively. The 1/2 frame per second frame rate selection is interpreted as one frame recorded every two seconds, and a 1/60 frames per second frame rate selection means the recording of one frame every 60 seconds.

Note: The actual frame rate of recording will be same as this setting if the system resource at the condition taken care of other system setting permits. However, the PICO2000 may regard this setting as the target maximum frame rate.

The start and end times for scheduled recording

The start time and end time is needed for scheduled recording. The input time is in the 24-hour HH:MM format. The factory default setting of the weekday recording start time is 0:0 and the default end time is also 0:0. Under this default setting, the camera will start at Monday 0:0 and end at Tuesday 0:0 and then start right away at Tuesday 0:0 and repeat all over again for the rest of the weekdays. Therefore, weekday recording will record at all times from Monday 0:0 through Saturday 0:0. Weekend scheduled recording also has the default 0:0 start time and 0:0 end time. Under default start and end time the unit will start recording at Saturday 0:0 and end at Monday 0:0.



PICO-2000

Digital Surveillance Recorder

Instant recording

Select the Instant tab inside the Recording Setting menu and a screen similar to that of Figure 14 is shown.

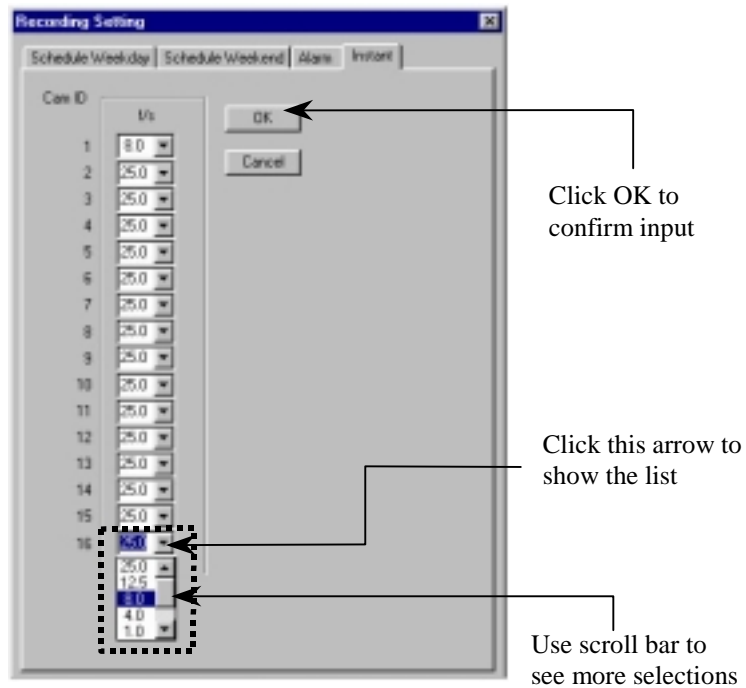
Input the desired frame per second for individual cameras.

The default frame rate is 25 frames per second.

Click OK to confirm the input and close the dialog box or click the X box in the upper right corner to close the dialog box after use.

Tip:

Eight frames per second or above is recommended for instant recording to capture real-time video.



Recording setting for instant recording

Figure 14



PICO-2000

Digital Surveillance Recorder

Alarm recording

Select the Alarm tab inside the Recording Setting menu (a screen similar to that in Figure 15 would then pop up).

Check the “ON” box for corresponding camera to enable the alarm input and the alarm recording function.

Input the alarm recording duration in the (in sec) column.

Check the Nopen (Normally open) box if the switch connected to the alarm input is a normally opened switch.

Input the frame per second for individual cameras. The default frame rate is 25 f/s.

Pre-alarm recording

Check the “ON” box in the pre-alarm column to enable the pre-alarm function of the corresponding camera(s).

Input the pre-alarm duration from one to 60 seconds.

Every time when the alarm is triggered, the pre-alarm recording image will be saved into a permanent file, which can be retrieved for playback.

Click OK to confirm the input.

Tip:

Pre-alarm lets you review images prior to the actual happening of the alarm event. Also, pre-alarm keeps the images only when the alarm is actually taking place, so that storage space can be used more effectively. This mode is more effective than that in scheduled recording.

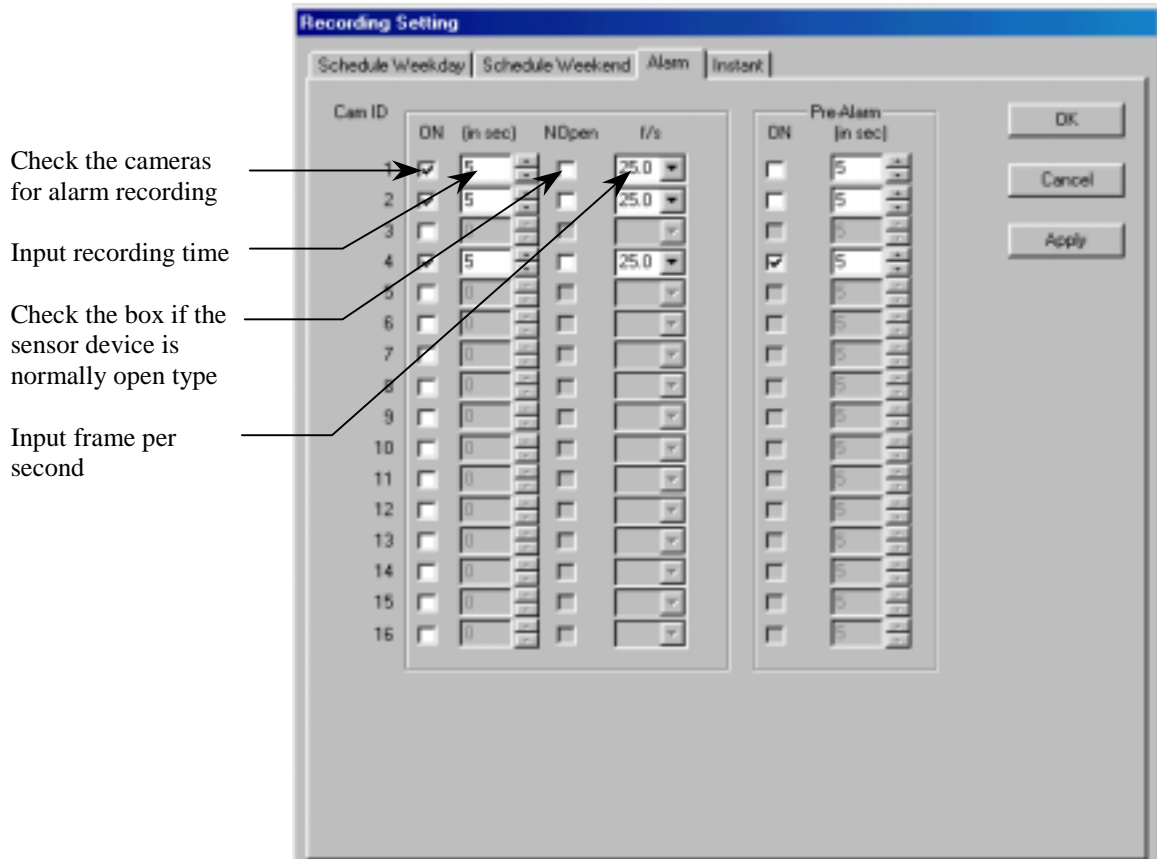


Figure 15



PICO-2000

Digital Surveillance Recorder

Scheduled weekday recording (Figure 16)

Select the Schedule Weekday tab inside the Recording Setting menu.
Check the camera you want to record.
Input the start time and the end time for scheduled weekday recording.
Input the frame per second for individual cameras.
The default frame rate is 1 frame per second.

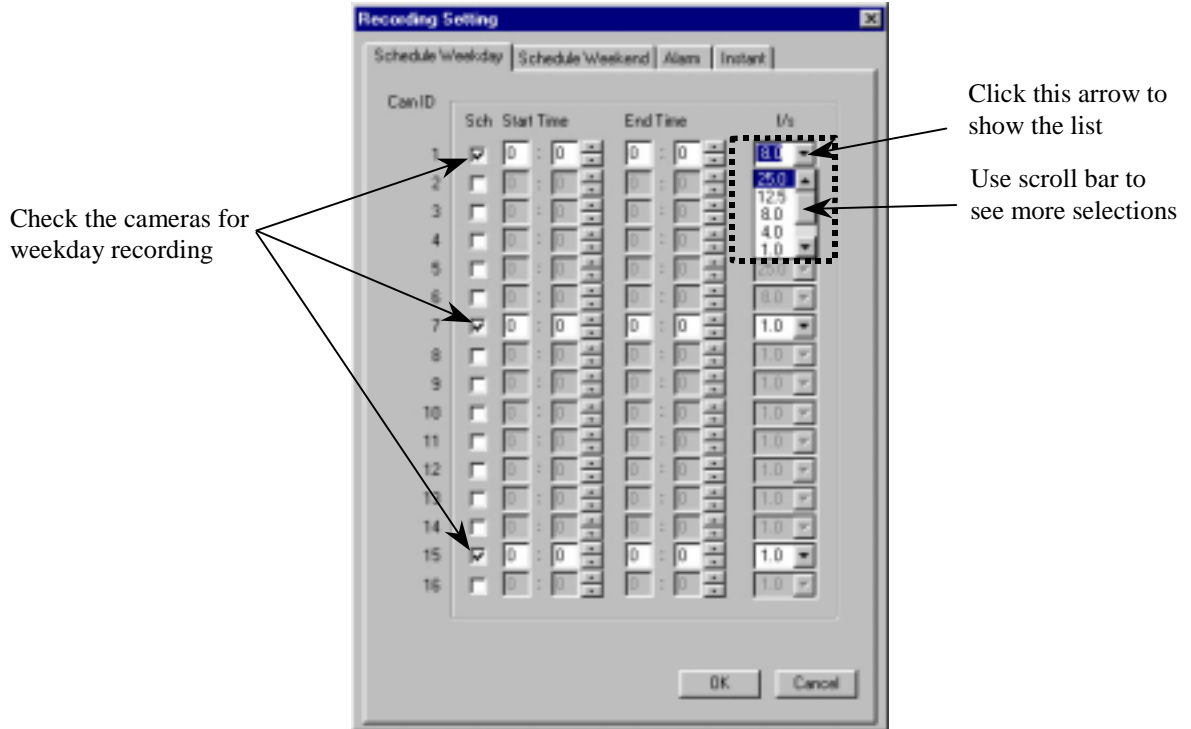


Figure 16



PICO-2000

Digital Surveillance Recorder

Scheduled weekend recording (Figure 17)

Select the Schedule Weekend tab inside the Recording Setting menu.
Check the camera you want to record.
Input the start time and the end time for scheduled weekend recording.
Input the frame per second for individual cameras.
The default frame rate is 1 frame per second.

Tip:
Scheduled recording is a background recording activity of the recorder. A lower frame rate for scheduled recording will much prolong the recording time. It is recommended to use frame rates of four frames per second or lower for scheduled recording.

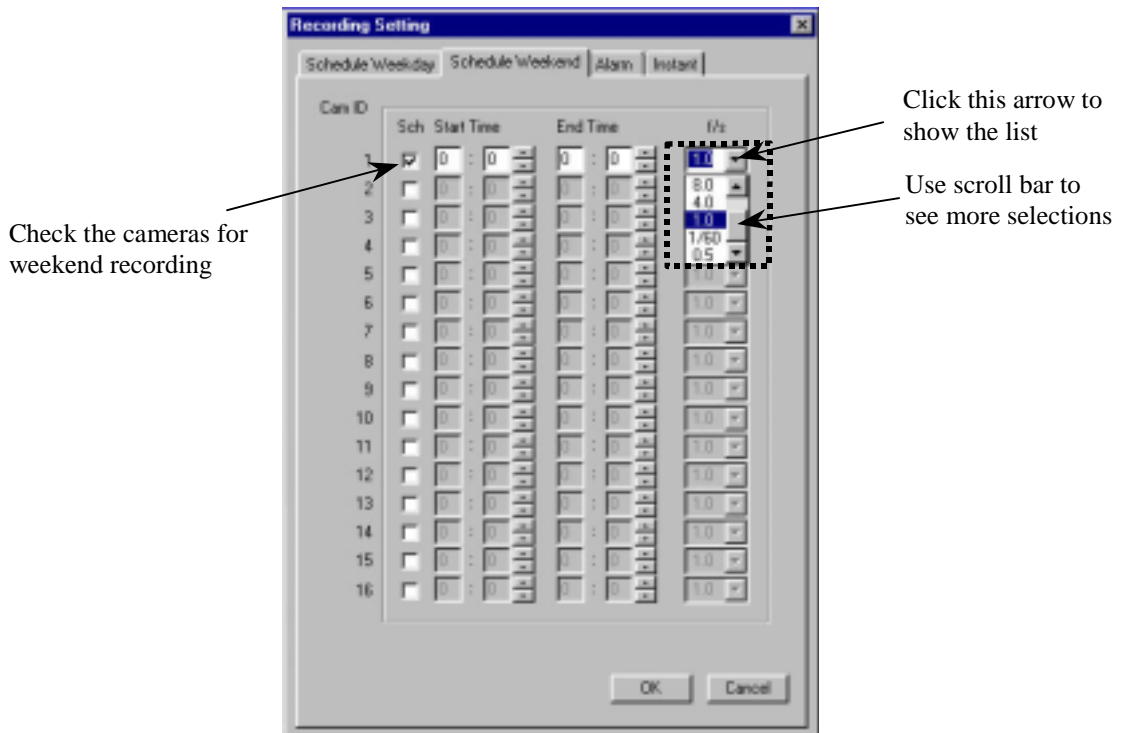


Figure 17



PICO-2000 **Digital Surveillance Recorder**

Example 1

Suppose you want to start and stop your recording on one camera within the same day every weekday, say 9:00 to 17:00 from Monday to Friday. You should go to the schedule weekday recording menu, check on the desired camera, enter 9:00 in the start time input, 17:00 in the end time input, then enter the frame rate you want and finally click OK to confirm.

You will see the green indicator light of that camera in the RECORDER panel at 9:00 to 17:00 to indicate that scheduled recording is taking place.

Example 2

Suppose you want to start recording one camera at 18:00 and stop at 6:00 the next day, for everyday from Monday to Friday.

You should go to the schedule weekday recording menu, check on the desired camera, enter 18:00 in the start time input, 6:00 in the end time input, then enter the frame rate you want and finally click OK to confirm.

In this case, the recorder will start at Monday 18:00 and then stop at Tuesday 6:00 and the schedule continues every weekday. While on Friday, the recorder would start at 18:00 as usual but it would stop on Saturday at 0:0.

Therefore, you should enter another schedule for weekend recording to fit your scheduled planning as a whole.

Audio Recording

This is an optional function only available to models with an "A" suffix to the generic model no. such as 205A, 309A or 413A. Go to the "Options Setting" Chapter for further details.



OPTION SETTING

Display Sequencing Click “Utility”, “Option Setting” and then “Display” to get to the sequence display menu.
 Enter the dwell time for sequencing duration. The default dwell time is 1 second.
 Check the camera(s) you want to display during sequencing.
 Click Apply to apply the input parameters right away.
 Click OK to confirm and close the dialog box.
 For sequencing operation please see the “Display” section of this manual.

Example:
The cameras 3, 4, 5, 7, 8, 9, 12, 13, 14, 15, 16 are checked in Figure 18.

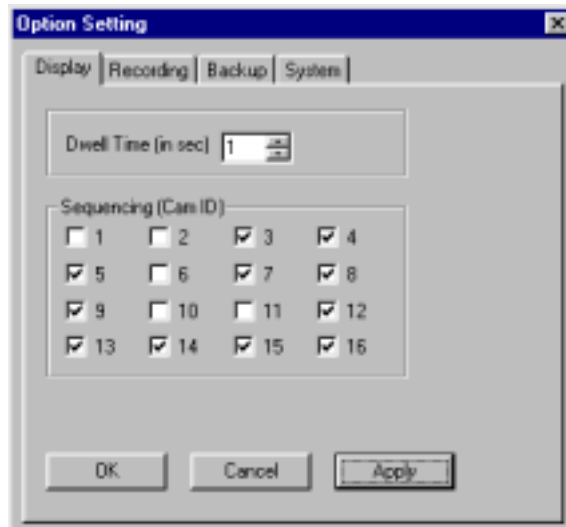
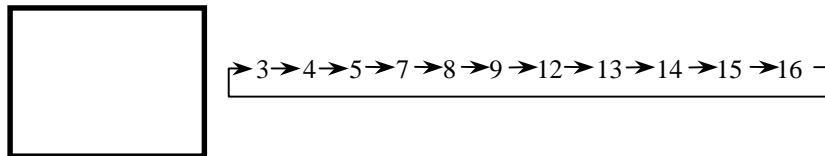
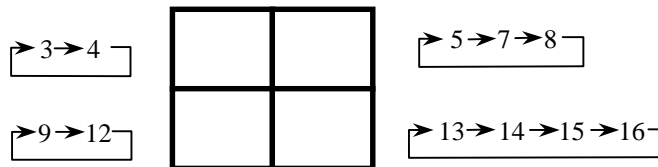


Figure 18

While in the 1-Screen mode, the sequence will be performed as follows:



While in the 4-Screen mode, the sequence will be performed as follows:





PICO-2000 Digital Surveillance Recorder

Image resolution for all recording

Select the Recording tab in the Option Setting menu (Figure 19).

The Resolution check box controls the image resolution for recording.

Super recording mode set the recording in the full resolution, which is 640 pixels by 480 pixels in PAL and NTSC system.

High recording mode set the recording in a standard resolution, which is about 384 pixels by 288 pixels in PAL system and is about 320 by 240 pixels for NTSC system.

Low recording mode set the recording in a low resolution, which is about 192 pixels by 144 pixels in PAL system and is about 160 by 120 pixels for NTSC system.

Tip:

Check the “High” box in Resolution for most of the case. It is to optimize the system performance and storage usage.

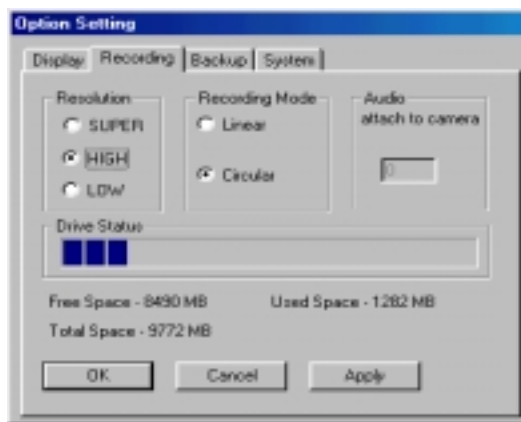


Figure 19

Recording mode selection

Linear recording mode:

When linear mode is selected for recording, the recording (alarm, pre-alarm, instance and schedule) will stop automatically when the storage device(s) is all used.

Circular recording mode:

When circular mode is selected, the recording will keep on by automatically overwriting the oldest files once the storage device(s) is full. However, the alarm image file(s) will be protected in this mode.

Attach Audio to Camera

For Models with Audio Recording support only, make sure the system is properly set up for audio recording, equipped with an audio pickup device and have the volume control setup for both recording and playback etc. The message box is opened for input. Enter the camera no. for attaching recorded audio data. When a “0” is entered, no audio recording will be performed.

The audio data is now setup to be recorded and playback in sync. With the video part of the selected camera.

Drive capacity

The total space, free space and the used space of the selected drive are displayed simultaneously.

A progress bar is displayed to indicate the usage level of the recorder drive graphically.



PICO-2000

Digital Surveillance Recorder

Backup function

Make sure to select the intended Backup Mode prior the formal use of the PICO2000 system for routine video recording.

Normal Mode

Make sure to select the backup drive prior to the backup. Click on Utility, then Option setting, and finally the Backup tab (Figure 20). Click the down arrow in the backup drive box to display the available removable drive(s) for backup and select the desired backup drive. The removable device can be a DVD-RAM drive or a removable IDE hard drive. The user can choose to keep copies on hard disk after backup or not. Click Apply to confirm and click OK to close the dialog box.

Archive Mode

The system is set to “Normal” backup mode as system default. To switch to “Archive” mode, check the bullet option next to Archive, then Apply and OK. The PICO2000 application should closed and restarted to effect the change. At the start up on Archive backup mode, the main screen of the PICO2000 will be slightly modified and refreshed as shown in figure 21.

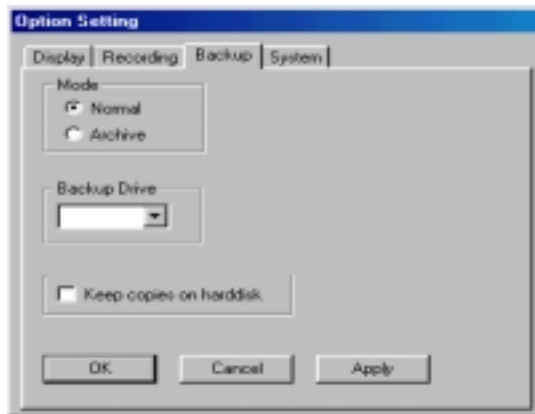


Figure 20



Figure 21

Red – Indicate the Drive is set Active, being used for immediate video recording
Green – Indicates the Drive is dismounted, ready for physically taken out



Swap Drive
(Applicable to Archive
Backup mode of operation
only)

Make sure the system is properly setup with two available “Removable Hard drive” and there is a fixed hard drive to support system operations.

Click the Swap Drive button in the Main Screen and then the “Swap drive” message box will appear as shown in Figure 22.

Click the down arrow in the Select drive dialog box next to the Remove button to display the registered removable drive(s) for removal and select the desired drive. Click Remove button and follow the pop up instruction to complete the REMOVE process.

The entire drive can be back up (Archive) to other long term storage media such as the DAT or equivalent device with huge storage capacity but may not work as fast. This operation on a dismounted drive can be down off-line (while the PICO2000 is closed) or in a separate PC workstation.

**Re-insertion of
Removable Drive**

Click the Swap Drive button in the Main Screen and then the “Swap drive” message box will appear as shown in Figure 22.

Click the down arrow in the Select drive dialog box next to the Insert button to display the registered removable drive(s) for insertion and select the desired drive. Click Insert button and follow the pop up instruction to complete the INSERTION (RE-Insertion) process.

If a blank new drive is inserted in the slot, make sure it is of the same make and configuration as the removed drive for proper operation.

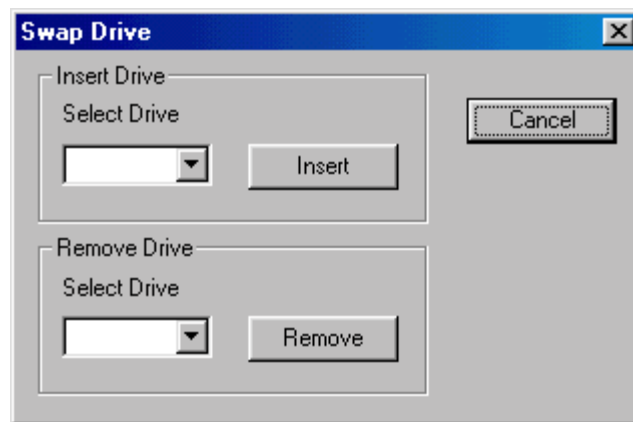


Figure 22



PICO-2000

Digital Surveillance Recorder

System operation data

Click on the System tab in Option Setting menu (Figure 23)
There are two default usernames for PICO-2000: **SUPER** and **OPERATOR**.
Two passwords can be introduced for security use during the logon session. The users should input the correct password to logon to the system.
You can select the date/time display format to 12-hour or 24-hour format.
Click Apply to confirm the input, click OK to confirm and exit or click Cancel to exit without any changes.
Check the “Logout continue display/recording” box if you want the image to continue to be displayed and instant recording still function activated upon logout

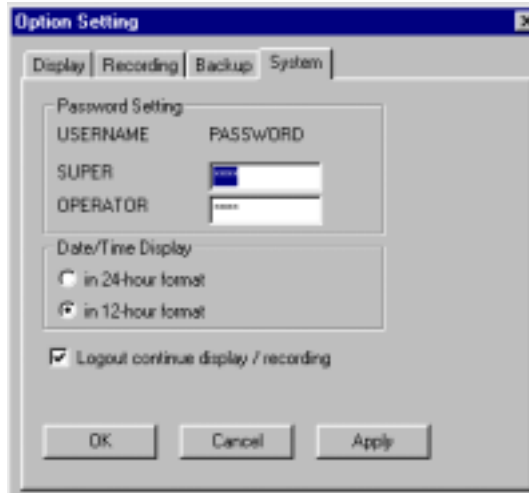


Figure 23



HOUSEKEEPING

Backup

The Housekeeping Menu is disabled when the system is set to “Archive” Backup mode, To revert it to “NORMAL” mode, go to the Options Setting chapter for further details.

Click Utility, Housekeeping then backup to open the backup menu (Figure 24 Select the camera(s) you want to do backup on.

Check the file(s) you want to backup by clicking on the file list, or you can backup all files by checking the backup all files box.

You can keep copies on the hard disk after backup by checking the “Keep copies on hard disk” box.

If you want to clean up old files in the backup device prior to do backup, check the “Delete all files in the backup device” box.

The free storage capacity of the backup device is also shown in the dialog box. Click the “Start” button to start the backup process.

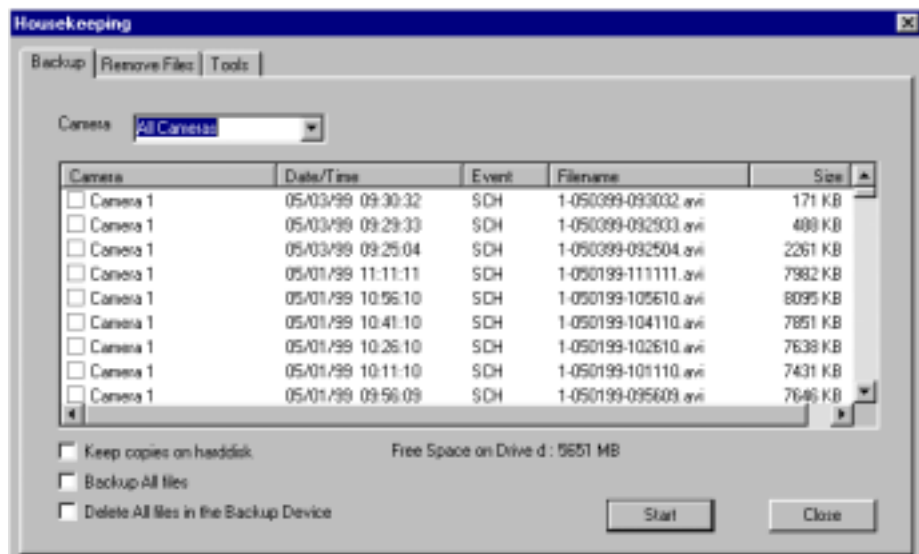


Figure 24

Backup progress Indicator

A progress bar will be shown at the bottom of the main screen to indicate the backup progress. The number of files to backup and the progress will be indicated accordingly.



Tip:
Use the Play Search function of the unit to playback video of the backup drive.



Remove video files

Click Utility, Housekeeping and then Remove Files tab (Figure 25).
Click the down arrow in the camera box to select one or all cameras.
The camera related video files would then be displayed inside the window.
You can check the file(s) to delete by clicking on the camera title or you can check the “Delete all files” box to delete all files.
Click Start button to execute the file delete function.
The video files will be deleted to spare storage space and the database will be updated accordingly.

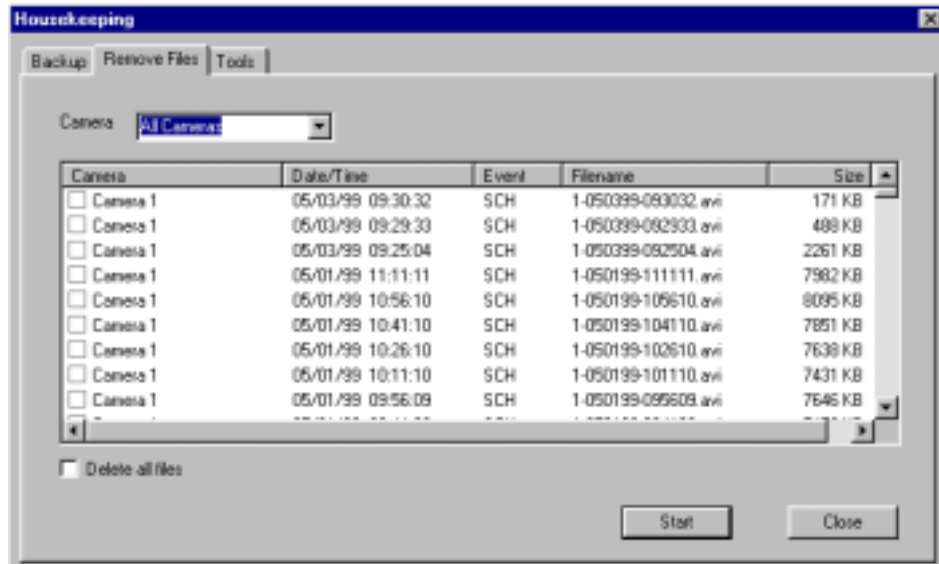


Figure 25

Note:

Camera
Date/Time
Event

The camera column displays the corresponding camera titles
The date/time column displays the record starting date and time
“SCH”, “REC” and “ALM” represents schedule, instant and alarm recording events respectively.

Filename

The filename has the following format:

x-mmddyy-hhmmss.avi

x: camera number
mmddyy: month/day/year
hhmmss: hour:minute:second
avi: avi file extension

Size

The file size in KB



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Housekeeping tools

Click on the Tools tab to enter the tools utility (Figure 26). Users are recommended to use the “Run Scan Disk” and “Run Disk Defragmenter” functions on a frequent basis to optimize and debug the storage device(s) being used.

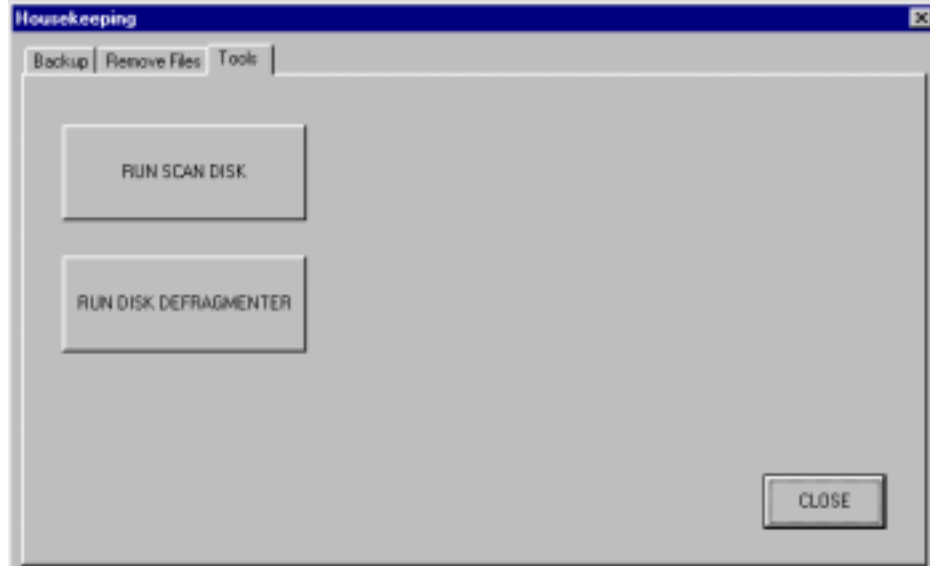


Figure 26



PICO-2000

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System Information

Click the System Information button to display the “About Pico2000” message box, which shows relevant information about the PICO-2000 (Figure 27).

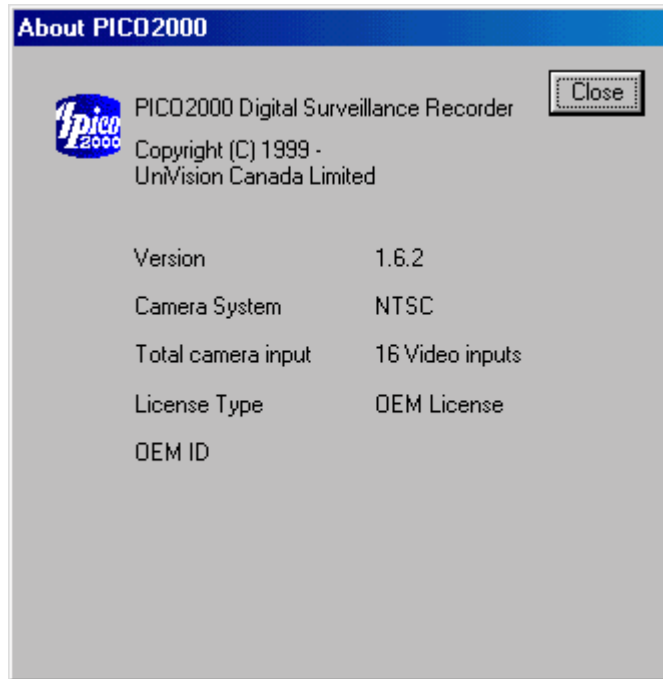


Figure 27



TOO MANY FILES WARNING

Too many files warning message

All of the recording will be logged with a database system. Even a very short video file (such as few seconds long) will occupy as an entry of the database. Large number of entry will affect the performance of the database management. Therefore, a “Too Many Files Warning” message box is designed to provide information to the user about the file number. A warning message and the exact number of file will be displayed in the “Too Many Files Warning” message box.

Invoke the message box

The “Too Many Files Warning” message box will automatically pop up when the number of file is excess the default value. Or user can press the “Ctrl” “Alt” and “1” in the keyboard, do not use the “1” key located on the Numeric Keypad, to show the message box at any time to check the number of file in the unit.

Remove the message box

User can close the message box by clicking the “X” icon at the upper right hand corner. To permanently disable the message box, user can check the “Do not appear in the future” box and then click the “X” icon to close the message box. Once the “Too Many Files Warning” message box is permanently disabled, user should restart the unit (“Exit”, power down and then power up) to re-activate the message box again.

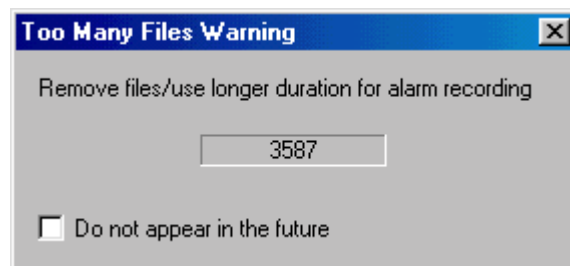
Tip:

False alarm (including by motion detection) will generate many small files. It is recommended to setup the unit properly to avoid false alarm.

When the “Too Many Files Warning” is shown, user should remove the out dated files to decrease the number of file.

Note:

The number of file is not directly related to the storage space usage of the hard drive.





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Setup and the default values

User can adjust the default value of the “Too Many Files Warning” signal. Right click the mouse button inside the dialog box, and then click “Setting”, a setup dialog box will be displayed.

Warning string:

The default warning string is “Remove files/use longer duration for alarm recording”.

Filename string:

The default value is “c:\pico\image*.avi”

Don't change this default or the warning message will not work properly.

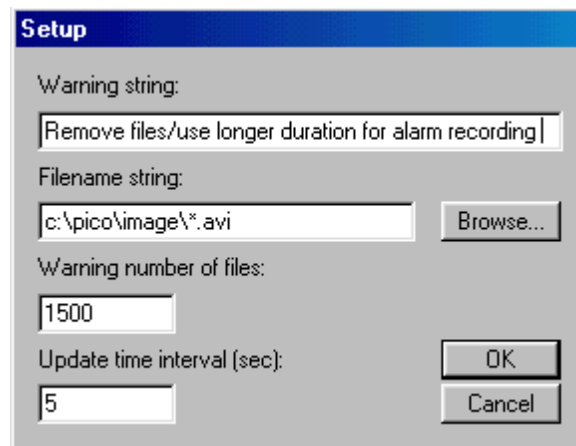
Warning number of files:

The default value is 1500.

Update time interval (sec):

The default value is 5 seconds.

Click “OK” to confirm input or “Cancel” to cancel the change.





WORKING AT LOGOFF

Log off

Click the Log ON/OFF button on the main screen to log off. Once logged off, the unit will not show any video images. The PICO2000 logo will then be displayed on the screen.

Note:

You should re-logout with the correct password to regain operation of the unit.

Note:

In the System menu of Option Settings, check the “Logout continue display/recording” box if you want the image to be continually displayed after logoff.

Recording during log off

The alarm and scheduled recording functions of the unit will keep on working during the logged off period. PICO-2000 will continue recording even if the unit is under the logged off condition.

Note:

In the System menu of Option Settings, check the “Logout continue display/recording” box if you want the instant recording function to be continually functioning after logoff.

SHUT DOWN THE UNIT

Exit

Make sure that all the current recording jobs of the PICO-2000 is closed before shutting down the system to prevent data loss. Click the EXIT button on the main screen and confirm shutdown. The system will automatically shut down and power off.



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SYSTEM MAINTENANCE

Schedule backup and remove the video file

The video files in the Pico2000 unit should be backup and remove in a regular basis with a properly setup schedule.

This will insure that the performance of the Pico2000 unit is working under its optimum condition.

It is also a vital procedure to prevent from data lose due to out of storage space of the hard drive.

Compact Database system

As a normal operation, it is recommended that user should log off and turn off the Pico2000 unit in a monthly basis.

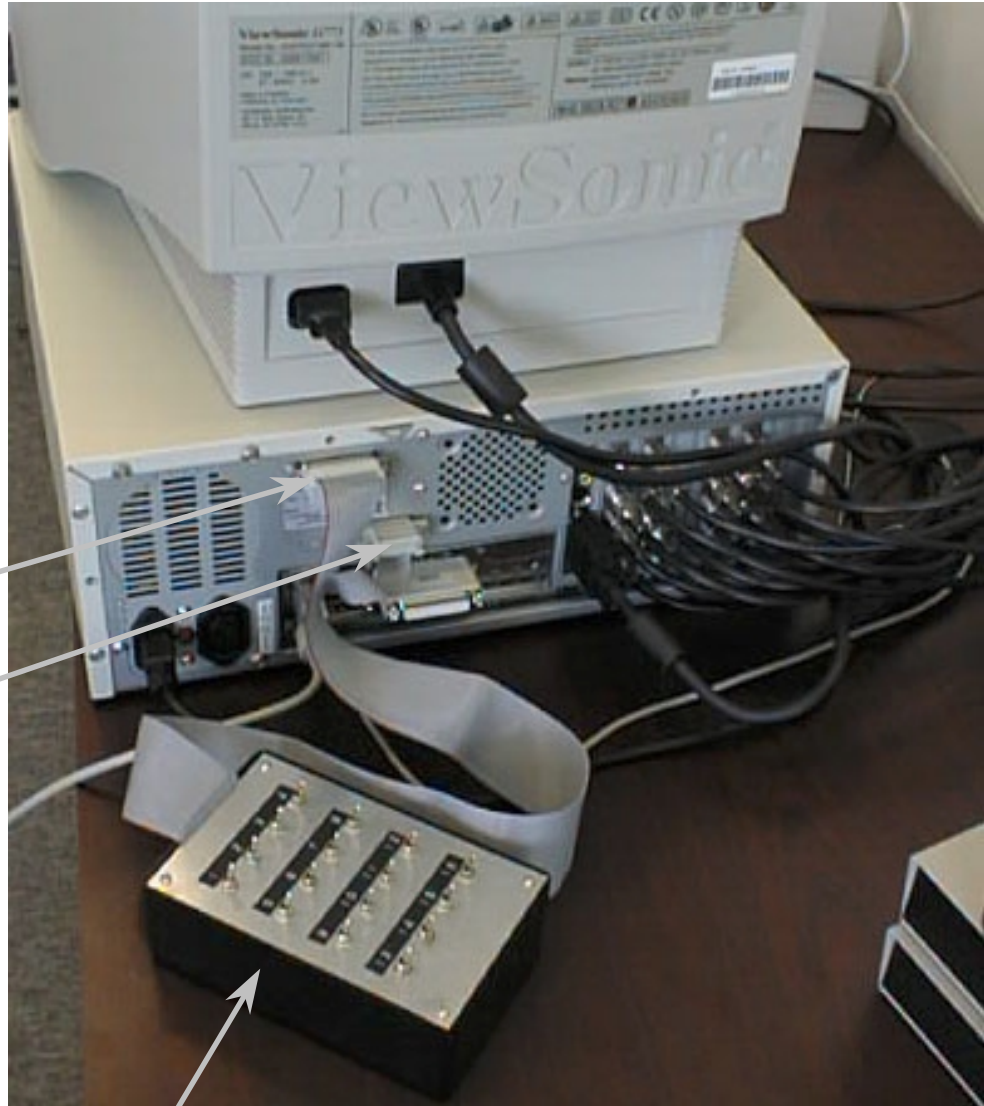
This will allow the database to close and then do some optimization and compacting of the record configuration during the system power up.



PICO-2000

Digital Surveillance Recorder

TYPICAL CONFIGURATION



Alarm input
connector #1

Alarm input
connector #2

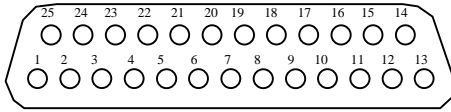
Alarm tester box
(Optional accessory)



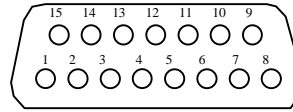
ALARM INPUT CONNECTION

External view of connectors

Connector #1



Connector #2



Alarm Input Connector #1

Pin No.	Designations
1	Alarm input 1
2	Alarm input 2
3	Alarm input 3
4	Alarm input 4
5	Alarm input 5
6	Alarm input 6
7	Alarm input 7
8	Alarm input 8
9	Alarm input 9
10	Alarm input 10
11	Alarm input 11
12	Alarm input 12
13	N.C.
14	Gnd
15	Gnd
16	Gnd
17	Gnd
18	Gnd
19	Gnd
20	Gnd
21	Gnd
22	Gnd
23	Gnd
24	Gnd
25	Gnd

Alarm Input/Output Connector #2

Pin No.	Designations
1	Alarm input 13
2	Alarm input 14
3	Alarm input 15
4	Alarm input 16
5	Alarm output 1
6	Alarm output 2
7	Alarm output 3
8	N.C.
9	Gnd
10	Gnd
11	Gnd
12	Gnd
13	Gnd
14	Gnd
15	Gnd



COLOR CODE OF ALARM INPUT AND OUTPUT CABLES

**1. 24-core cable (Blue ring) to connector #1 (DB25 female connector)
Alarm Inputs #1 to 12**

Color Code for 24-core cable (Blue Ring):

Pin 1-Alarm #1 input: R/Or	Pin 14-Alarm #1 ground: Wh/G
Pin 2-Alarm #2 input: Bk/G	Pin 15-Alarm #2 ground: Wh-Bk/R
Pin 3-Alarm #3 input: Bk/R	Pin 16-Alarm #3 ground: Wh/R
Pin 4-Alarm #4 input: Bk/Or	Pin 17-Alarm #4 ground: Wh/Bl
Pin 5-Alarm #5 input: R/Bl	Pin 18-Alarm #5 ground: R/Bk
Pin 6-Alarm #6 input: Bk	Pin 19-Alarm #6 ground: Wh/G
Pin 7-Alarm #7 input: Wh	Pin 20-Alarm #7 ground: Bk/Bl
Pin 8-Alarm #8 input: G/R	Pin 21-Alarm #8 ground: Bl
Pin 9-Alarm #9 input: G/Or	Pin 22-Alarm #9 ground: R/Wh
Pin 10-Alarm #10 input: Or	Pin 23-Alarm #10 ground: Bk/Wh
Pin 11-Alarm #11 input: Wh-R/Bk	Pin 24-Alarm #11 ground: G
Pin 12-Alarm #12 input: Bk-R/Wh	Pin 25-Alarm #12 ground: Wh/Bk
Pin 13-Not Used	

**2. 8-core cable (Blue ring) to connector #2 (DB15 female connector)
Alarm Inputs #13 to 16**

Color Code for 8-core cable (Blue Ring):

Pin 1-Alarm #13 input: R	Pin 9-Alarm #13 ground: Bk
Pin 2-Alarm #14 input: Y	Pin 10-Alarm #14 ground: Wh
Pin 3-Alarm #15 input: Or	Pin 11-Alarm #15 ground: Br
Pin 4-Alarm #16 input: G	Pin 12-Alarm #16 ground: Bl

**3. 6-core cable (Yellow ring) to connector #2 (DB15 female connector)
Alarm inputs #1 to 3**

Color Code for 6-core cable (Yellow Ring):

Pin 5-Alarm #1 output: R	Pin 13-Alarm #1 ground: Br
Pin 6-Alarm #2 output: G	Pin 14-Alarm #2 ground: Bk
Pin 7-Alarm #3 output: Wh	Pin 15-Alarm #3 ground: Bl
Pin 8-Not Used	

Abbreviation:

R-Red	G-Green	Wh-White	Bl-Blue	Bk-Black
Br-Brown	Or-Orange	Y-Yellow		