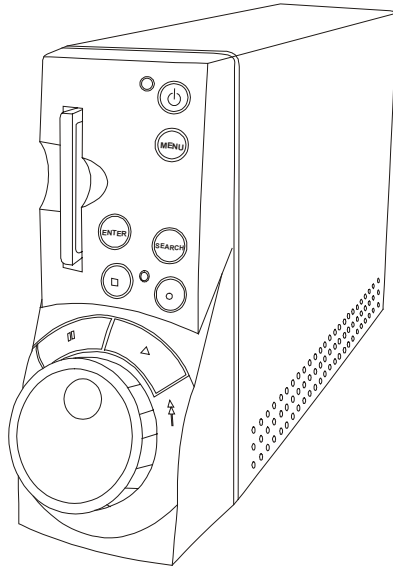


INSTRUCTION MANUAL

SINGLE CHANNEL DIGITAL VIDEO RECORDER



Please read this manual thoroughly before use, and keep it handy for future reference.

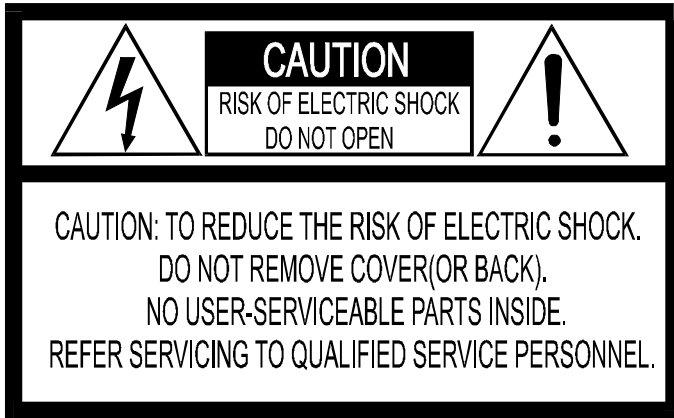
LIMITATION OF LIABILITY

THE INFORMATION IN THIS PUBLICATION IS BELIEVED TO BE ACCURATE IN ALL RESPECTS, HOWEVER, WE CANNOT ASSUME RESPONSIBILITY FOR ANY CONSEQUENCES RESULTING FROM THE USE THEREOF. THE INFORMATION CONTAINED HEREIN IS SUBJECT TO CHANGE WITHOUT NOTICE. REVISIONS OR NEW EDITIONS TO THIS PUBLICATION MAY BE ISSUED TO INCORPORATE SUCH CHANGES.

WARNINGS AND CAUTIONS

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECTS THROUGH THE VENTILATION GRILLS OR OTHER OPENINGS ON THE EQUIPMENT.

CAUTION



EXPLANATION OF GRAPHICAL SYMBOLS



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



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

FCC COMPLIANCE STATEMENT

FCC INFORMATION : 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 HIS OWN EXPENSE.

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

THIS CLASS A DIGITAL APPARATUS COMPLIES WITH CANADIAN ICES-003.
CET APPAREIL NUMÉRIQUE DE LA CLASSE A EST CONFORME À LA NORME NMB-003 DU CANADA.

IMPORTANT SAFEGUARDS

1. **READ AND RETAIN INSTRUCTIONS**

Read the instruction manual before operating the equipment. Retain the manual for future reference.

2. **CLEANING**

Turn the unit off and unplug from the power outlet before cleaning. Use a damp cloth for cleaning. Do not use harsh cleansers or aerosol cleaners.

3. **ATTACHMENTS**

Do not use attachments unless recommended by manufacturer as they may affect the functionality of the unit and result in the risk of fire, electric shock or injury.

4. **MOISTURE**

Do not use equipment near water or other liquids.

5. **ACCESSORIES**

Equipment should be installed in a safe, stable location. Any wall or shelf mounting accessory equipment should be installed using the manufacturer's instructions. Care should be used when moving heavy equipment. Quick stops, excessive force, and uneven surfaces may cause the equipment to fall causing serious injury to persons and objects.

6. **VENTILATION**

Openings in the equipment, if any, are provided for ventilation to ensure reliable operation of the unit and to protect it from overheating. These openings must not be blocked or covered

7. **POWER SOURCES**

The equipment should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied at the installation location, contact your dealer. For equipment designed to operate from battery power, refer to the operating instructions.

8. **GROUNDING OR POLARIZATION**

Equipment that is powered through a polarized plug (a plug with one blade wider than the other) will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. Do not defeat the safety purpose of the polarized plug.

Alternate Warning: If the equipment is powered through a three-way grounding-type plug, a plug having a third (grounding) pin, the plug will only fit into a grounding-type power outlet. This is a safety feature. Do not defeat the safety purpose of the grounding-type plug. If your outlet does not have the grounding plug receptacle, contact your local electrician.

9. **CORD AND CABLE PROTECTION**

Route power cords and cables in a manner to protect them from damage by being walked on or pinched by items placed upon or against them.

10. **LIGHTNING**

For protection of the equipment during a lightning storm or when it is left unattended and unused for long periods of time, unplug the unit from the wall outlet. Disconnect any antennas or cable systems that may be connected to the equipment. This will prevent damage to the equipment due to lightning or power-line surges.

11. **OVERLOADING**

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

12. **SERVICING**

Do not attempt to service the video monitor or equipment yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

13. **DAMAGE REQUIRING SERVICE**

Unplug the equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- A. When the power supply cord or the plug has been damaged.
- B. If liquid has spilled or objects have fallen into the unit.
- C. If the equipment has been exposed to water or other liquids.
- D. If the equipment does not operate normally by following the operating instructions, adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage to the unit.
- E. If the equipment has been dropped or the casing damaged.
- F. When the equipment exhibits a distinct change in performance.

14. **REPLACEMENT PARTS**

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

15. **SAFETY CHECK**

Upon completion of any service or repairs to the equipment, ask the service technician to perform safety checks to verify that the equipment is in proper operating condition.

16. **FIELD INSTALLATION**

The installation of equipment should be made by a qualified service person and should conform to all local codes.

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1 Digital Video Recorder Features

The Single Channel Digital Recorder is a true VCR replacement. The single channel recorder features one video/audio input and output. The unit operates as a simplex recorder offering a minimum of 48 hours at 30 images/second of high quality video and audio (based on the minimum hard drive size). The recorder may also be used as a time-lapse recorder to record up to about 3 months.

A trigger output is also available to be connected to most multiplexers to record multiplexed video. Used as an event recorder, the single channel recorder also features a pre alarm memory buffer storing images up to 20 seconds prior to the event.

The unit has low power consumption less than a typical VCR. The embedded operating system allows for instant power up less than 6 seconds. With selectable video quality and frame rates, the unit automatically calculates the amount of recording time available. Audio recording is also available in time-lapse modes.

Combined with an easy to use jog shuttle for video/audio playback, the recorder offers instant search capabilities by time, date, event, or by recording session for easy access to video and audio.

A front panel Compact Flash socket is available for easy video archiving. The Compact Flash allows storage of audio/video AVI files and JPG files requiring no special GUI to review audio/video on a PC or the recorder. Integrity of the archived video files is maintained with authentication software. A simple GUI verifies the content of the archived files. In addition, JPEG images are archived when in PAUSE mode by pressing the RECORD button.

When playing back the archived high resolution images, the video images may be displayed as a wide-screen picture on the computer display.

The small mechanical size allows several recorders to fit in the space of an existing VCR.

- True low cost VCR replacement
- High Resolution 640-horizontal pixels.

- 48 hours of real-time recording at 30 images/second (recording times vary for larger hard drives)
- Time lapse recording up to about 3 months at 1 image/second
- Event recording with programmable dwell time and frame rate
- Compact Flash socket for video archiving with authentication
- Compatible with most multiplexers
- Low power consumption (less than a VCR)
- Small mechanical packaging
- Automatic pre alarm buffering up to 20 seconds
- Quick search by time, event, or recording session
- Selectable single channel audio recording
- Easy jog/shuttle control of video playback for single step, slow motion, and fast forward/reverse play
- Password protected and keypad lock out
- Instant power up cycle
- Selectable video quality and recording image speed rate.
- One alarm input for the event recording and one alarm output N.C or N.O.
- Trigger output for multiplexer
- Date and Time Stamp

2 Installation

2.1 Unit Installation

Qualified service and installation personnel must install the Digital Video Recorder. The installation must be in accordance with all local and federal electrical and building codes.

Perform the following steps to install the Digital Video Recorder.

- A. Unpack the Digital Video Recorder unit
- B. Place the Digital Video Recorder unit in a convenient location. Do not plug the power cord into a power outlet until step H
- C. Place the monitor in a convenient location.
- D. Connect the “Video Output” of the unit to the monitor by BNC cable
- E. Connect the “Audio Output” of the unit to the monitor audio in by RCA cable
- F. Connect the “Video In” of the unit to the video source that is being recorded by BNC cable
- G. Connect the “Audio In” of the unit to the line level audio source that is being recorded by an RCA cable



Caution:

Be careful when routing the cable from the Digital Video Recorder to the monitor. Try not to put unnecessary strain on the cable or connectors. The cable can be damaged if pulled by the connectors. Do not place the cable next to fluorescent lights; interference may result. Do not use staples to support the cable, as you may damage the cable.

- H. Plug the power DC cord of the power adaptor into the DC jack on the rear of the unit.
- I. Plug the power cord of the Digital Video Recorder into a power outlet.
- J. Turn on POWER button of the Digital Video Recorder.
- K. The unit should display a picture of the video source.

2.2 Installation With Alarm Devices

The unit can be activated to record by an external alarm device. A pre alarm buffer is always recording prior to the alarmed event.

Perform the following steps after the installation of the unit.

- A. Obtain one of the alarm device units
- B. Locate a suitable location for the alarm device
- C. Mount the alarm device using the manufacturer's instructions
- D. Route the alarm device cable from the alarm device to the Digital Video Recorder
- E. Connect the ends of the cable to the alarm device following the manufacturer's instructions
- F. Do not plug the power cord into a power outlet until step H
- G. Plug the RJ-11-E connector of the alarm device cable into the RJ-11 connector on the rear of the Digital Video Recorder

Caution:

Be careful when routing the cable from the Digital Video Recorder to the alarm device. Try not to put unnecessary strain on the cable or connectors. The cable can be damaged if pulled by the connectors. Do not place the cable next to fluorescent lights; interference may result. Do not use staples to support the cable, as you may damage the cable. All connections should be properly connected and insulated to prevent electrical shock and fire hazards.

- H. Plug the power DC cord of the power adaptor into the DC jack on the rear of the unit
- I. Plug the power cord for the power adaptor into a power outlet
- J. Turn on POWER button of the Digital Video Recorder
- K. Place the unit in the desired operating mode

3 Digital Recorder Operation

3.1 Play Operation

MODE	BUTTON	ACTION
PLAY OPERATION	POWER	Pushing this button will power down the unit unless the keypad lock feature is enabled.
	MENU	Pushing this button when in Play Mode will overlay the Menu on top of the video that is playing back from the recorder.
	ENTER	This button is only functional when in the Menu Mode or Search Mode.
	SEARCH	Pushing this button when in Play Mode will overlay the Search Menu on top of the video that is playing back from the recorder. This menu allows quick access to recorder video on the recorder.
	STOP	Pushing this button causes the playback mode to stop. The video input source is displayed.
	RECORD	Pushing this button in Play Mode has no operation.
	PAUSE	This button pauses the video being played back.
	PLAY	Pressing this button plays back to the recorded speed. Pushing this button again in Play Mode plays back the video at the real-time speed regardless of the recorded speed.
	JOG	The inner Jog ring has no effect in this mode unless in Menu mode. In Menu mode the inner jog ring moves the highlighted cursor.
	SHUTTLE	Rotating the outer shuttle ring changes the forward and reverse playback speed from 1x, 1.5x, 2.0x, 3.0x, 4.0x, 6.0x, and 8.0x. Rotating and releasing the outer shuttle ring quickly to the maximum value will continue playback in 8.0x speed.

3.2 Pause Operation

MODE	BUTTON	ACTION
PAUSE OPERATION	POWER	Pushing this button will power down the unit unless the keypad lock feature is enabled.
	MENU	Pushing this button when in Pause Mode will overlay the Menu on top of the video that is paused from the recorder.
	ENTER	This button is only functional when in the Menu Mode or Search Mode.
	SEARCH	Pushing this button when in Pause Mode will overlay the Search Menu on top of the video that is paused from the recorder. This menu allows quick access to recorder video on the recorder.
	STOP	Pushing this button causes the playback mode to stop. The video input source is displayed.
	RECORD	Pushing this button in Pause Mode will record a *.JPG image to the Compact Flash if inserted.
	PAUSE	This button pauses has no function in Pause Mode.
	PLAY	Pushing this button in Pause Mode will continue playback.
	JOG	The inner Jog ring will increment or decrement the video playback by a single frame.
	SHUTTLE	Rotating the outer shuttle ring changes the forward and reverse playback speed from 0.1x, 0.2x, 0.3x, 0.5x, 0.7x, 0.8x, and 1.0x.

3.3 Record Operation

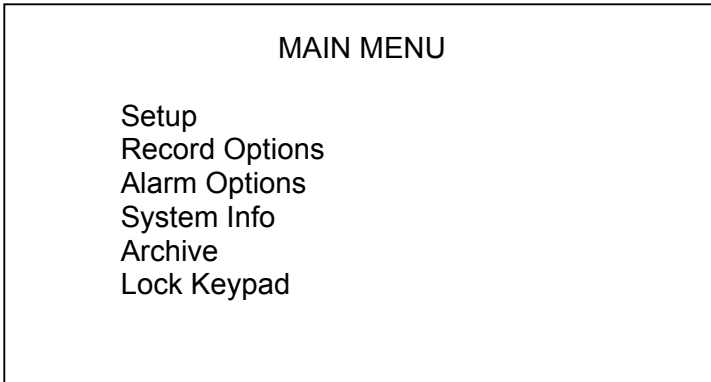
MODE	BUTTON	ACTION
RECORD OPERATION	POWER	Pushing this button will power down the unit unless the keypad lock feature is enabled.
	MENU	Pushing this button when in Record Mode will overlay the Record message only.
	ENTER	This button is only functional when in the Menu Mode or Search Mode.
	SEARCH	Pushing this button when in Record Mode will display the Record message.
	STOP	Pushing this button causes the record mode to stop unless the keypad lock feature is enabled.
	RECORD	Pushing this button in Record Mode has no effect.
	PAUSE	Pushing this button in Record Mode has no effect.
	PLAY	Pushing this button in Record Mode has no effect.
	JOG	The inner Jog ring has no function in Record Mode unless in the Menu Mode.
	SHUTTLE	Rotating the outer shuttle ring has no function in Record Mode unless in the Menu Mode.

4 Menu Operation

Pressing the front panel menu button enters the Menu operation. Navigation of the menus is accomplished with the use of the jog shuttle. The enter button is used for menu selection. The outer shuttle ring is used as a tab to advance to the next field.

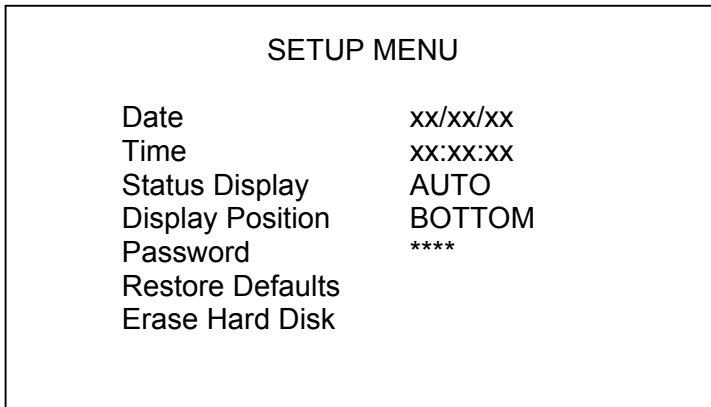
4.1 Main Menu

The main menu is as follows:



Note: *When a multiplexer doesn't display the menu screen, select the multiplexer to the preview mode.*

4.2 Setup Menu



4.2.1 Date

Enter date.

4.2.2 Time

Enter Time.

4.2.3 Status Display

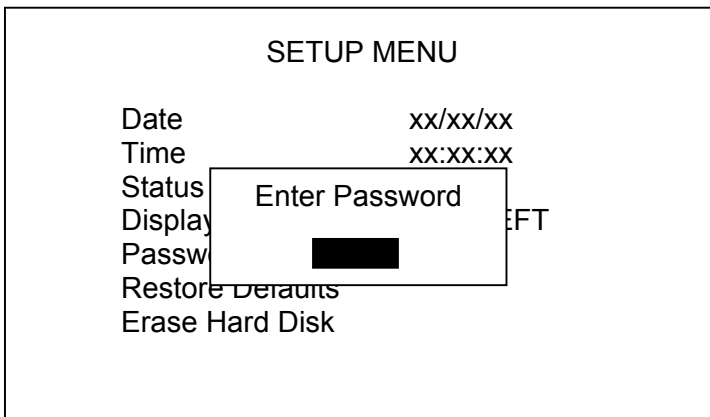
The Status Display options are: AUTO, ON, and OFF. The AUTO option allows for the OSD to automatically time out and is removed from the display and automatically turns on when status changes. The ON option always has OSD information Displayed. The OFF option disables the OSD status bar.

4.2.4 Display Position

The Display Position options are: TOP and BOTTOM. This feature allows the OSD status bar to be located at the top or bottom of the display.

4.2.5 Password

A four-button password allows the Menus to be password protected. The Default password is “STOP, RECORD, STOP, RECORD”.



4.2.6 Restore Defaults

The user is prompted YES or NO to restore factory defaults.

4.2.7 Erase Hard Disk

A four-button password is required to erase video from the disk. The User is prompted Yes or No to erase the video from the Hard Drive.

4.3 Record Options

RECORD OPTIONS	
Image Resolution	NORMAL
Image Quality	HIGH
Images/Second	30
Total Time	48 hours
Record Mode	CONTINUOUS
Audio Recording	ON

4.3.1 Image Resolution

Two options are available for image resolution HIGH, NORMAL. The HIGH selection is 640 x 240. NORMAL is 320 x 240.

4.3.2 Image Quality

Three options are available for image quality, HIGH, MEDIUM, LOW. The HIGH selection is approximately a 10:1 compression ratio. MEDIUM is approximately a 15:1 compression ratio. LOW is approximately a 20:1 compression ratio. When the Image Quality field is changed the Total Time field is automatically updated with the approximate time of recording available on the hard drive.

4.3.3 Image/Second

The available options for Images/Second are: 1, 2, 3, 5, 7.5, 10, 15, and 30 images. When the Image/Second field is changed the Total Time field is automatically updated with the approximate time of recording available on the hard drive.

4.3.4 Total Time

The Total Time field options depend on the hard drive size that is installed in the unit. For a 80 GB drive the following options are available: 48, 84, 132, 180, 240, 384, 540, and 912 hours with audio turned on, Image Quality is High and 320 x 240 pixel Record Resolution (640 x 240 record resolution, divide storage hours by 2). When the Total Time field is changed the Images/Second field is automatically updated with the corresponding images/second.

4.3.5 Record Mode

The options for Record Mode are STOP and CONTINUOUS. The STOP option stops recording when the drive is full. The CONTINUOUS option starts recording over the oldest time when the hard drive is full.

4.3.6 Audio Recording

Audio recording can be turned ON or OFF.

4.4 Alarm Options

ALARM OPTIONS	
Alarm Input	OFF
Dwell Time	10 Seconds
Image Quality	HIGH
Images/Second	30
Relay Out	DISK FULL

4.4.1 Alarm Input

The Alarm input options are: N/C, N/O, and OFF. These options allow the alarm input to be normally closed (active high), normally open (active low), or disabled. Video/audio is automatically recorded in a pre alarm buffer up to 20 seconds prior to the alarm being active. The

length of the pre alarm buffer is dependant on the video quality selected and the video input scene.

4.4.2 Dwell Time

The dwell time is the amount of time after the alarm input is removed to record with the options selected in the fields below the dwell time field. The options are: 5 seconds, 10 seconds, 15 seconds, 30 seconds, 1 minute, 5 minutes, 10 minutes, 15 minutes, and 30 minutes.

4.4.3 Image Quality

Image quality can be adjusted differently for an alarmed event versus normal recording. The options are: HIGH, MEDIUM, and LOW.

4.4.4 Image/Second

Image/Second can be adjusted differently for an alarmed event versus normal recording. The options are: 1, 2, 3, 5, 7.5, 10, 15, and 30 images/second.

4.4.5 Relay Out

Relay Out can be changed the action of the relay.

DISK FULL: when the disk is fully recorded, the relay is activated.

ALARM REC: when an alarm occurs, the relay is activated.

4.5 System Info

SYSTEM INFO	
Disk Capacity	80 GB
Percent Used	20
Percent Free	80
Firmware Version	x.xx

4.5.1 Disk Capacity

This field displays the hard drive size installed in the unit.

4.5.2 Percent Used

Displays the amount of data recorded as a percentage of the total drive size.

4.5.3 Percent Free

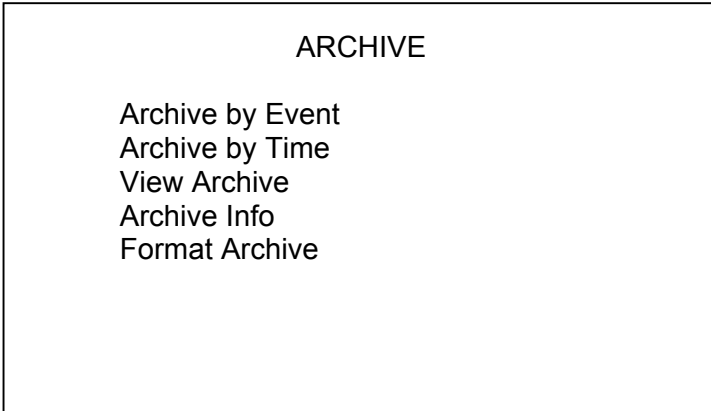
Displays the amount of available space as a percentage of the total drive size.

4.6 Archive

Archiving of video from the Hard Drive is accomplished with a Compact Flash module on the front panel. The user may insert or remove the Compact Flash module in stop mode.

Note: The Compact Flash module should not be inserted or removed while a file is being copied or played back.

This menu is password protected. The four-button default password is STOP, RECORD, STOP, and RECORD. In order to access these menus a Compact Flash card must be installed.



4.6.1 Archive by Event

This menu displays the Event table. Selecting an event will allow the user to archive an event to the Compact Flash Module.

<u>ID</u>	<u>EVENT</u>	<u>DATE/TIME</u>		<u>LENGTH</u>
1	NO VIDEO	08/15/03	2:32	2:58
2	ALARM	08/22/03	4:02	0:48
3	NO POWER	08/30/03	6:12	0:10
4	NO VIDEO	08/30/03	8:22	0:30

4.6.2 Archive Data

The Archive Data Menu allows the User to enter a start date, time, and length of video within the selected session time that the user wants to copy to the Compact Flash Module. These fields will default to the event selected in the previous menu. The menu will automatically calculate the approximate file size from the length selected. This menu also calculates the available space left on the compact flash module. To create an archive select "Create Archive". The menu then prompts the users "yes" or "no". Selecting "yes" will create an AVI file to the compact flash.

ARCHIVE DATA	
Start Date	08/22/03
Start Time	14:02:05
Length (mm:ss)	1:03
Create Archive	
Approximate File Size	30MB
Free Space on Archive	915KB

4.6.3 Archive by Time

This menu displays the Recording Sessions. Selecting a Recording Session will display the Archive Data Menu.

<u>ID</u>	<u>BEGIN DATE/TIME</u>	<u>END DATE/TIME</u>
1	08/09/03 12:20	08/10/03 12:20
2	08/13/03 08:20	08/13/03 12:20
3	08/20/03 07:20	08/23/03 16:20
4	08/09/03 09:20	08/10/03 08:20
5	08/15/03 12:20	08/20/03 12:20

4.6.4 View Archive

This menu displays the *.JPG files and *.AVI files that are archived on the compact flash module. By selecting a file the video or snapshot will be played back or displayed if the unit is in STOP mode. The Time display is a “ mm:ss” format.

<u>FILE</u>	<u>SIZE</u>	<u>DATE/TIME</u>
DVR-0000.JPG	17KB	08/12/03 00:03
DVR-0001.JPG	10KB	08/12/03 00:03
DVR-0002.JPG	12KB	08/15/03 00:03
DVR-0007.AVI	20MB	08/12/03 03:50
DVR-0003.JPG	15KB	08/12/03 00:03

4.6.5 Archive Info

This menu displays information about the compact flash.

ARCHIVE INFO	
File System Type	FAT16
Capacity	32MB
Percent Used	96
Percent Free	4

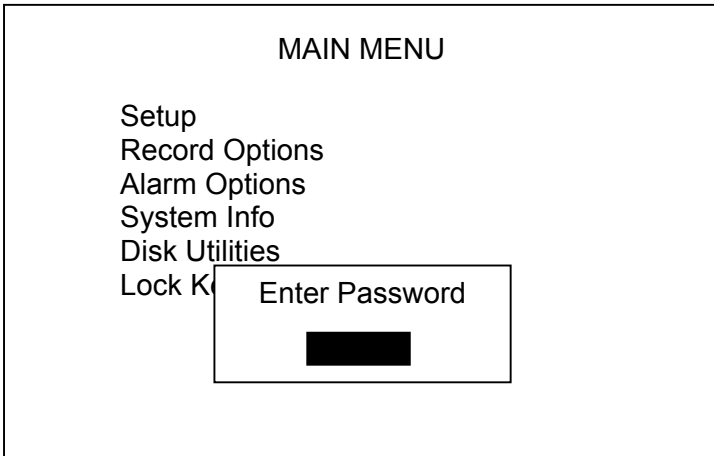
4.6.6 Format Archive

This menu enables the User to format the compact flash card for the digital recorder. FAT16 file system is used enabling the user to view the compact flash files on a Windows PC. The User is prompted YES or NO before formatting occurs. Formatting the Compact Flash card causes existing data to be lost on the card.

ARCHIVE	
Archive by Event	
Archive by Time	
View Ar	
Archive	FORMAT
Format	ARCHIVE?
	NO

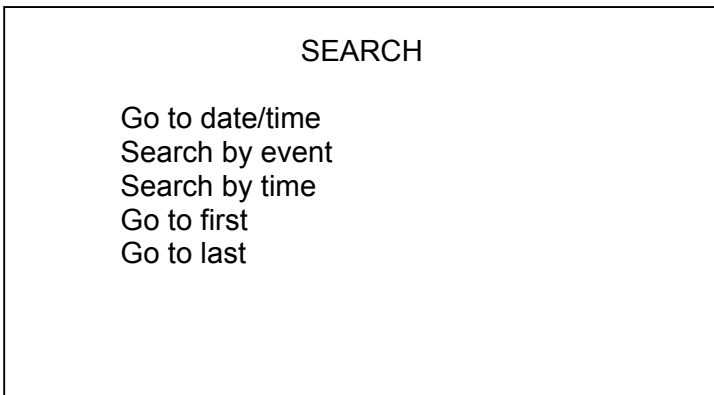
4.7 Lock Keypad

This option allows the user to lock the front panel. The user is prompted for the password and the password is acknowledged. Once the keypad is locked the only button that is functional is the REC button. To unlock the keypad the MENU button must be pressed and the password has to be entered.



5 Search Operation

The front panel SEARCH button allows quick access to the video data (in PLAY MODE this menu is displayed only).



5.1 Go to date/time

This search menu is displayed by pressing the SEARCH button while in STOP MODE or when “Go to date/time” is selected when in PLAY MODE from the SEARCH menu.

xx/xx/xx	xx:xx:xx	Go
----------	----------	----

By entering the date and time, video will instantaneously start playing at the date and time entered. If the date and time is not on the disk it will find the closest match.

5.2 Search by event

The Search by event table lists all of the alarmed events that are logged on the disk.

<u>ID</u>	<u>EVENT</u>	<u>DATE/TIME</u>		<u>LENGTH</u>
1	video loss	08/12/03	09:20	01:20
2	alarm	08/13/03	10:15	00:05
3	power	08/13/03	16:23	01:24

Note: The event log displays up to 99.

5.3 Search by time

The Search by timetable lists all of the recording sessions that are logged on the disk.

<u>ID</u>	<u>BEGIN DATE/TIME</u>	<u>END DATE/TIME</u>
1	08/12/03 09:20	08/13/03 12:20
2	08/14/03 08:20	08/22/03 11:10

5.4 Go to first

This option lets the user jump to the earliest recorded time.

5.5 Go to last

This option lets the user jump to the last recorded time.

6 Remote Control Protocol

The RS-232 communication protocol is an ASCII based protocol which allows remote users to control the DVR. The commands are broken into three functional groups:

1. Front panel emulation commands
2. Query commands
3. Shortcut commands

6.1 Framing Protocol

Commands are defined as a sequence of ASCII characters followed by carriage-return and line-feed characters (hex codes 0x0d and 0x0a respectively). This sequence is labeled <CRLF>.

A command may be preceded and followed by a <CRLF> sequence to ensure that the command is *framed*. However, the preceding <CRLF> is optional, and may in fact be the trailing <CRLF> of the previous command.

6.2 Command Response

After a command is sent, the DVR will respond with either a status code or a command-specific response. Responses are only returned by the *query* commands.

Status codes are preceded with an explanation point (!) and a space character (' ') to indicate that a status code follows. The following status codes can be returned:

- OK - command completed with no errors
- INVALID - an unrecognized command was received

Responses to query commands are preceded with a question mark ('?') followed by a space to indicate that a command response is being returned. The responses are command specific and are defined with the individual commands.

All DVR responses are terminated with a <CRLF> sequence.

6.3 Front Panel Emulation Commands

The following commands are direct emulations of the buttons on the front panel of the DVR and behave exactly as the buttons on the DVR. Many of the buttons are DVR state dependent and may not perform any action if the DVR is not in the correct state. For example, if the **PLAY** command is sent while the DVR is recording, the command will be ignored (just as the PLAY button on the front panel of the DVR is ignored).

POWER	- toggles power on/off
MENU	- display/exit menus
SEARCH	- display the search menu
ENTER	- perform action for selected menu item
RECORD	- begin recording (ignored if the DVR is in playback mode)
STOP	- return DVR to idle state (stop recording or playback)
PLAY	- enter playback mode (ignored if the DVR is recording)
PAUSE	- during playback mode, pause the playback
SHUTTLE <pos>	- sets shuttle to position indicated by <pos> <pos> is defined as follows: 0: default (not turned) position 1, 2, 3 ... 7: positions to the right (1 is first, 7 is last) -8, -7 ... -1: positions to the left (-1 is first, -8 is last)
JOG <dir>	- jog one position to the left or right as indicated by <dir> <dir> is defined as follows: LEFT: jog is turned left one position RIGHT: jog is turned right one position
TAB	- this is not a front panel button, but is a remote control command to aid in menu navigation. This command is equivalent to executing the command sequence " SHUTTLE 1, SHUTTLE 0 " to tab through fields in a menu

6.4 Query Commands

The following commands request information from the DVR (note that the question mark ('?') is part of the command):

MODE?	- returns current DVR state. Responses are:
PWROFF:	power is off
IDLE:	idle or stopped (not recording or playing)
PLAY:	playback mode
RECORD:	recording
DATE?	- returns current date in mm/dd/yy format
TIME?	- returns current time in hh:mm:ss format

6.5 Shortcut Commands

The following commands are shortcuts to some of the DVR menu items. These commands are supplied so that some remote actions are easier to perform:

SETDATE	- sets current date in mm/dd/yy format
SETTIME	- sets current time in hh:mm:ss format
GOTO <date-time>	- begin playback at date/time indicated

<date-time> - is a string in the following format "mm/dd/yy
hh:mm:ss"

6.6 Examples

The following examples are given to aid in understanding the remote control protocol. Commands to the recorder are shown in **BOLD**, while DVR responses are shown in *ITALICS*. Note that all commands and DVR responses are followed with a <CRLF> sequence which has been left off the examples below for readability.

Turn DVR on and begin recording:

```
POWER  
! OK
```

MODE?
? PWROFF

MODE?
? PWROFF

MODE?
? IDLE

RECORD
! OK

An invalid command is sent to the recorder:

REC
! INVALID

Query DVR for current mode and time:

MODE?
? PLAY

TIME?
? 09:36:14

Set the date and time:

SETDATE 03/17/03
! OK
SETTIME 09:37:00
! OK

Begin playback at indicated time:

GOTO 02/25/03 17:05:00
! OK

Begin playback with the oldest data:

SEARCH
! OK

JOG LEFT
! OK

ENTER
! OK

7 Viewing and Verifying Archived Files on a PC

The *.AVI files that are created on the compact flash from the digital recorder may be viewed on a PC with Windows Media Player. Viewing the compact flash files on a PC requires a USB compact flash reader. Verification of the file content on a PC is accomplished with the DVR Validator software.

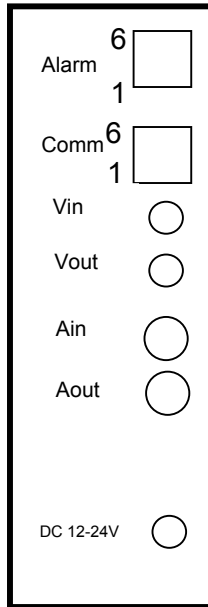
7.1 Viewing Archived Files on a PC

Viewing the *.AVI files on the compact flash is possible with Windows Media Player. If Microsoft Windows Media Player is unable to display the AVI file created by the digital recorder, then Microsoft DirectX must be installed on your computer.

7.2 Verifying Archived Files on a PC

Verifying the content of the *.AVI file is accomplished with the DVR Validator software. Double clicking on the setup.exe file will install the validation software. To run the validation software go to program files and click on DVR Validator.

8 Rear Panel



8.1 RJ-11 Alarm Connector Pin Out

The pin out of the RJ-11 connector is:

1. Trigger out
2. Ground
3. N.C.
4. TTL level Alarm in
5. Center
6. N.O.

8.2 RJ-11 Comm Connector Pin Out

The pin out of the RJ-11 connector is:

1. NC
2. RS-232 Tx
3. Ground
4. RS-232 Rx
5. No Connect
6. No Connect

8.3 AOUT

RCA line level audio out

8.4 AIN

RCA line level audio in

8.5 VOUT

BNC 1.0 Vp-p 75 Ohm output

8.6 VIN

BNC 1.0 Vp-p 75 Ohm input

8.7 DC12-24V

The DC power connector is a regulated from 12.4V up to 27V DC input. Typical power consumption is 10-12 Watts. Maximum power consumption is 30 Watts.

9 Equipment Specification

Storage	80GB EIDE (other options available)
Resolution	Record Resolution 320 x 240 640 x 240 Display Resolution 720 x 480
Display Rate	30 fps
Video Format	NTSC
Video Input	1.0Vp-p 75 Ohms
Video Output	1.0Vp-p, 75 Ohms
Audio Input	RCA, Line level
Audio Output	RCA, Line level
RS-232	RJ-11, 9600, 1 stop, no parity
Alarm Output	RJ-11, N.O./N.C
Alarm Input	RJ-11, TTL
Trigger Output	RJ-11, TTL
Compact Flash	Type I
Front Controls	JOG/SHUTTLE, PLAY, PAUSE, STOP, REC, SEARCH, ENTER, MENU, and POWER
Power Requirements	12-24 VDC input
Power Consumption	30W max 12W typical
Ambient Temperature	32° - 95°F (0° - 35°C)
Dimensions (W x H x D)	2.4" x 5.6" x 7.4"
Weight	6lbs

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