



DN-700 HDV / DV Hard Disk Recorder



Instruction Manual

www.datavideo-tek.com

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Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
 - a. When the power cord is damaged or frayed;
 - b. When liquid has spilled into the unit;
 - c. When the product has been exposed to rain or water;
 - d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
 - e. When the product has been dropped or the cabinet has been damaged;
 - f. When the product exhibits a distinct change in performance, indicating a need for service.

To avoid any possible static damage to your equipment please ensure your camcorder / deck is switched off when connecting or disconnecting the IEEE-1394 cable.

Warranty

Datavideo warrants that the equipment it manufactures shall be free from defects in material and workmanship for a period of 12 months from the date of product purchased. If equipment fails due to such defects, Datavideo will, at its option, repair or provide a replacement for the defective part or product. Equipment that fails after the warranty period, has been operated or installed in a manner other than that specified by Datavideo, or has been subjected to abuse or modification, will be repaired for time and material charges at the Buyer's expense.

This warranty does not affect your statutory rights within the Country of purchase.

Disposal

For EU Customers only - WEEE Marking.



This symbol on the product indicates that it will not be treated as household waste. It must be handed over to the applicable take-back scheme for the recycling of electrical and electronic equipment. For more detailed information about the recycling of this product, please contact your local Datavideo office.

Outline and Features

- ◆ Portable recorder with removable media. The DN-700 features rugged, industry standard, 2.5-inch hard disc drives in a metal case with patented shock protection mounts.
- ◆ DN-700 is available in recording times ranging from 3 to 9 hours per drive.
- ◆ DN-700 can be used in a docking bay for PC, stand-alone as portable media device, or with any of the PC interface adapters offered.
- ◆ Record and Playback as you would a tape recorder with familiar operational settings.
- ◆ Connects to a computer as a standard Hard Disk Drive (HDD) with all recorded content appearing as files inside folders for immediate download in a “drag and drop” fashion in faster than real time and ready to edit. No more wasted capture time.
- ◆ Record and playback using rugged internal Transactional File System technology and data presented in HDD mode through emulation of standard file systems compatible with Windows and Mac.
- ◆ Firmware update via simple file transfer in HDD mode.

Packing List:

The following items should be included in the box. If any items are missing please contact your supplier.

1	x	Power Supply (12V 1.5A)
2	x	2.5" Removable HDD Enclosure
1	x	USB mini to standard USB (Y type)
10	x	M3 X 4 m/m Screws
2	x	2.0 X 6 m/m Screws
2	x	L Type Rack
4	x	Label
1	x	Quick Start Guide

How to mount 2.5" hard drive into removable caddy

N.B Hard Drive Support.

At the time of writing this manual the largest capacity HDD tested with the DN-700 is the WD3200BEVT Western Digital 320GB.

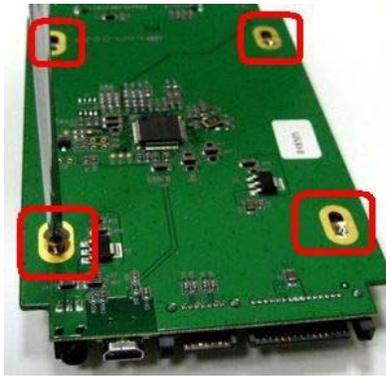
For up to date information about HDD compatibility contact your local Datavideo Office

If your DN-700 does not come with a hard drive pre-fitted in the caddy please follow these instructions to fit your own drive. Always check compatibility before buying hard drive.

1. Remove two screws from the 2.5" removable HDD rack rear cover then pull out the PCB



2. Assemble four screws to fasten 2.5" HDD on PCB



3. Push PCB into the HDD rack

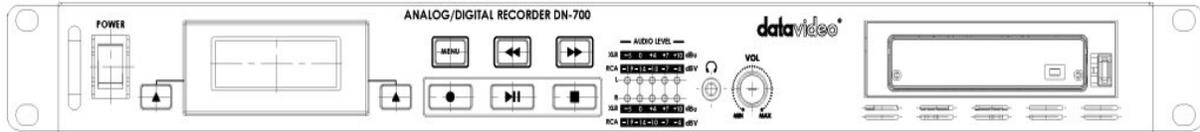


4. Assemble two screws to fasten HD rack rear cover



5. Lock caddy into DN-700 by pushing lever to left.

Front Panel



Power On / Off

Power On/Off Switch. Switches the power On / Off



LCD Display

There are four lines in the LCD Display. The first line is used to display icons that reflect some of the current settings of the unit. These settings include:

- ◆ Battery Level
- ◆ ANA / DIG(Video Source is Analog / Digital) /HDV(Unit is set for HDV mode)
- ◆ Loop Play enabled
- ◆ Time Remaining

The second line will display the recording file type set for the selected bin (.MOV e.g.). While playing or recording it also displays the current clip number and the total number of clips in the bin.

The third line will display the bin number (01-99) and a time number (Hr:Min:Sec:Frame). The time number will represent the absolute time address or the time code of the frame being recorded or played. When selecting a new bin, the time number will be the length of the content in this bin. The fourth line annotates the significance of the soft keys.



Menu Navigation Left / Right soft key

The functions of the two Soft Keys found below the LCD are dependent upon the current operation mode. Each function changes with each different operation mode. The Soft Key's current functions are displayed on the bottom line of the LCD panel, directly above each respective left / right Soft Key.



Menu Navigation Menu key

Use this button to start navigating as well as exiting the various options offered by DN-700. The functions are called out in the bottom two rows of the LCD. Stepping through options is done by following the directions set in the LCD annotations. At any time, an option can be exited by pressing this key.

Note: Main menu selection can be accessed from a Stop or Idle mode. Specialized menu selections are accessed while playing.



Fwd / Rew Buttons

In playback mode these buttons will operate as Fast Forward and Rewind Buttons. If the Menu Button is pressed these buttons will navigate backwards and forwards between the various menu options.



Record

In Idle Mode, pressing the 'PLAY' while the 'REC' button is held down will make the unit ready to record.



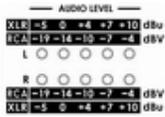
Play / Pause

From the Stop or Idle mode, pressing the 'PLAY' button plays back video from the selected bin. While playing, pressing the 'PLAY' button will toggle between 'PLAY' and 'PAUSE'.



Stop

In PLAY Mode, pressing the 'STOP' button will end play back and enter the Stop mode. In RECORD Mode, pressing the 'STOP' button will end recording and enter the Stop mode.



Audio Level

The Audio Input Level LEDs show the audio input levels from the incoming source.



Level Adjustments

The Audio Level Adjustments allow you to adjust the headphones volume.



headphones Jack

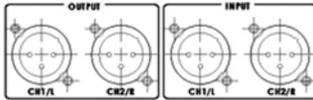
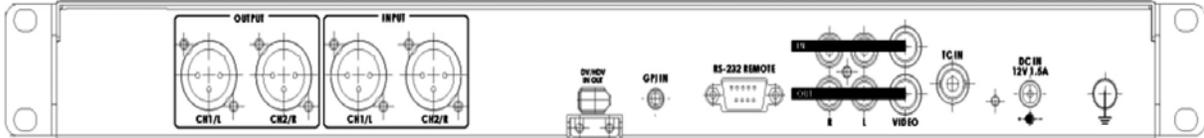
Accepts a stereo mini jack plug for stereo headphones. The headphone volume is controlled by the Audio Level Adjustments.



2.5" Removable HDD Rack

SATA & USB interface connecting to a PC for file transfer.

Rear Panel



Audio input & output.

2 channels XLR Balanced Audio input & output.



IEEE 1394

Six-pin IEEE1394B (400Mbps) connector used to send and receive digital signals as well as to connect as an HDD to a computer. Power is not accepted from this connector.



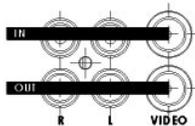
GPI IN

The GPI socket can be used for simple external control. The DN-700 can accept pulse or level trigger inputs, which can trigger record or playback and pause commands



RS-232

Used to remotely control the DN-700.



Composite Video input & output

The connection is composite video input.

AUDIO IN

Accepts a RCA jack plug for audio input (Left &Right).



TC IN

The connection is for time code single input.



DC In Socket

The connection is used for the battery or the AC adapter.



Grounding Terminal

When connecting this unit to any other component, make sure that it is properly grounded by connecting this terminal to an appropriate point. When connecting, use the socket and be sure to use wire with a cross-sectional area of at least 1.0 mm².

Providing Power

The DN-700 comes with an AC Adapter. Plug the output of either one into the DC Power connector located on the Rear Panel. It is recommended that you have a DN-700 inserted in the Bay before power up. Not having one at this time, does not influence normal device operation. Move the power switch to the ON position. The DN-700 will turn on and will wait for 5 seconds for you to press the Menu key to go into HDD mode, after the wait period it will go into the VTR mode.

VTR MODE

Formatting the DN-700

The DN-700 will format a DN-700 to handle one of three signal types; HDV (all frame rates), or NTSC DV or PAL DV. If an unformatted DN-700 is inserted, the DN-700 will recognize it and suggest it be formatted to its signal type. If a DN-700 is inserted and is format for a signal type different than that of the DN-700, the choice will be given to either re-format the DN-700 or set the DN-700 to the DN-700's signal type.

Organize your shoot

A recorded length of video between its start point and following pause or stop point is called a clip. A clip can be as short as one frame or as long as the whole storage capacity. Clips are stored in bins; a bin is analogous to a tape. 99 bins are made available; Clips can be added to any bin at any time as long as there is room available. The DN-700 always displays the clip number as well as the bin number.

Menu Navigation

Main Level

From the Idle or Start-up display, pressing the Menu key will enter the first level of options; these options are the most commonly used ones. The lower three lines will look as below:

```

menu = exit
MAKE MEDIA FILES
ENTER      NEXT
    
```

There are 8 options and they are:

```

MAKE MEDIA FILES
EMPTY THIS BIN ?
SELECT SOURCE
EMPTY ALL BINs ?
RECORD SETUP
PLAY SETUP
SYSTEM SETUP
FIRMWARE REVISION
    
```

Pressing the Next key will bring up the next option down on the list and will return to the top option from the bottom. Table 1 details the actions for each option.

Menu Option	Action taken
MAKE MEDIA FILES	Prepares the content to be seen by the computer in the HDD mode. The operating system environment is previously set to either FAT32 or NTFS. When there is recording content, This action needs to be taken before connecting as an HDD.
EMPTY THIS BIN	Empties or erases the content within the presently selected bin, this step is irrevocable once the final question has been asked.
SELECT SOURCE	When in DV mode, the signal to be recorded can be chosen to come either from the Firewire input (DIG) as a digital signal or come from the breakout cable as an NTSC or PAL compatible analog signal (ANA)
EMPTY ALL BINS	Empties or erases the content in ALL of the bins. This step is irrevocable once the final question has been asked.
RECORD SETUP	Enters the Record Setup Menu group detailed in the named section
PLAY SETUP	Enters the Play Setup Menu group detailed in the named section
SYSTEM SETUP	Enters the System Setup Menu group detailed in the named section
FIRMWARE REVISION	Displays the current revision of the recorder's firmware

Table 1 Menu Main Level

Record Setup Level

Entered from the Main Level, this set of options enable various record related parameters and modes to be setup. The lower three lines will look as below:

```

menu = exit
RECORD SETUP
ENTER      NEXT
  
```

There are 8 options and they are:

```

SET RECORD FILE TYPE
SYNCtoTAPE CONTROL
SET RECORD DATE
RECORD PRE-TRIGGER
SET DEFAULT DV AUDIO
SET ASPECT RATIO
TIMELAPSE RECORD
PWR ON AUTO RECORD
  
```

Pressing the Next key will bring up the next option down on the list and will return to the top option from the bottom. Table 2 details the actions for each option. Pressing the Menu key will return to the Main Level.

Menu Option	Action taken
SET RECORD FILE TYPE	Where the choice of file type is made for all unrecorded bins. File types cannot be mixed within a bin. Choices are .mov, 2 types of .avi, .mxf and for HDV, .m2t only. Note that the current type chosen will be marked with an asterisk.
SYNCtoTAPE CONTROL	Where the recorder will look to the time code changing to indicate the need to record. If the time code pauses then the recording is paused. With this setting turned off, the record process will continue regardless of the time code behavior. Note that the current selection will be marked with an asterisk.
SET RECORD DATE	This option modifies the date attribute of the created file when the source is analog always, and when the source is digital if the date in the digital source is invalid.
RECORD PRE-TRIGGER	When enabled, the last 8 seconds of video prior to the record trigger are captured ahead of the video following the trigger. Note that the pre trigger is not remembered across power cycles.
SET DEFAULT DV AUDIO	When the source is analog, this option sets the audio sampling frequency. When the source is digital, this option helps the recorder make a correct guess for the incoming audio sampling frequency. Note that the current selection will be marked with an asterisk.
SET ASPECT RATIO	When the source is analog, this option sets the 16:9 or 4:3 aspect ratio flag in the stream to be recorded.
TIMELAPSE RECORD	Allows the DV recording of video at slower than real time through a choice of one of 6 options. Note that the current selection will be marked with an asterisk.
PWR ON AUTO RECORD	When enabled, the recorder will go directly into a record mode in the last bin selected once power is applied.

Table 2 Record Setup Level

Play Setup Level

Entered from the Main Level, this set of options enable various play related parameters and modes to be setup. The lower three lines will look as below:

```
menu = exit
PLAY SETUP
ENTER      NEXT
```

There are 2 options and they are:

```
SET LOOP PLAY
PWR ON AUTO PLAY
```

Pressing the Next key will bring up the next option down on the list and will return to the top option from the bottom. Table 3 details the actions for each option. Pressing the Menu key will return to the Main Level.

Menu Option	Action taken
SET LOOP PLAY	When enabled and the last frame has been played, the recorder will start playing all over from the start. Note that the chosen mode is indicated by an asterisk as well as the presence or absence of the loop play icon on the first line.
PWR ON AUTO PLAY	When enabled, the recorder will go directly into a play mode in the last bin selected once power is applied.

Table 3 Play Setup Level

System Setup Level

Entered from the Main Level, this set of options enables various system related parameters and modes to be setup. The lower three lines will look as below:

```

menu = exit
SYSTEM SETUP
ENTER      NEXT
  
```

There are 11 options and they are:

```

SET SIGNAL TYPE
SET FAT32/NTFS
MODIFY HDD VOLUME ID
SETUP HDD PARTITION
TC DISPLAY FORMAT
SET REMOTE CONTROL
TOTAL SPACE
UPGRADE FIRMWARE
SET GPI TRIGGER MODE
SET FACTORY DEFAULT
NTSC SETUP LEVEL
  
```

Pressing the Next key will bring up the next option down on the list and will return to the top option from the bottom. Table 4 details the actions for each option. Pressing the Menu key will return to the Main Level.

Menu Option	Action taken
SET SIGNAL TYPE	Where the recorder is set to operate with one of three signal types, either in DV, NTSC or PAL, or in HDV, all frame rates. Note that changing between types will require ALL contents to be erased. Note that the current type chosen will be marked with an asterisk.
SET FAT32/NTFS	This option chooses the computer's file system to emulate, NTFS or FAT32. Note that FAT32 has a 2GB file size limitation so clips longer than 2GB are split into approximately 2GB files with no frames dropped. Note that the current selection will be marked with an asterisk.
MODIFY HDD VOLUME ID	When connecting to a computer in the HDD mode, the disk will have for volume name Datavideo xx. This option sets the xx value. A useful feature when connecting multiple volumes at the same time as from a multi-shoot.
SETUP HDD PARTITION	A separate 6GB partition can be set up. The recorder will have no affect on this partition so the user is free to name it, format it, store any type of data on it with complete confidence that the recorder will not alter it.
SET TIMECODE DISPLAY	During recording and playback, this option chooses to display either the Internal or the External time code. Note that the current selection will be marked with an asterisk.
SET REMOTE CONTROL	This option either enables or disables the remote control capability. Note that the current selection will be marked with an asterisk.
TOTAL SPACE	Displays the capacity of the DN-700 inserted in the recorder.
UPGRADE FIRMWARE	Allows the user to update the firmware of the recorder, provided a proper file has been loaded on the DN-700.
SET GPI TRIGGER MODE	The GPI socket can be used for simple external control. The DN-700 can accept pulse or level trigger inputs, which can trigger record or playback and pause commands.
SET FACTORY DEFAULT	Recall FACTORY DEFAULT to be loaded into current setup
NTSC SETUP LEVEL	The setup level is set to 7.5 or 0.0 IRE.

Table 4 System Setup Level

General Setup

Before using your DN-700, there are a few basic operational conditions that must be set. These are found under the System Setup Level of the menu tree (see table 4).

Set the signal type

Select HDV or DV. If DV, select between NTSC or PAL. If the format chosen is NTSC, then a choice of setup level is given. This level can be 0.0 or 7.5 IRE units and can be set under the **NTSC SETUP LEVEL** menu.

Note: Changing between signal types will erase the content in all bins.

Set up the HDD partitions to 1 or 2

The storage space can be broken into 2 partitions; the second partition reserves 6GB and is not seen by the recorder. The second partition will appear as a second drive to the computer and the user is then free to use this drive to store any data including spreadsheets, metadata and/or finished work. The DN-700 is guaranteed not to overwrite data in this partition. Deleting all bins will not erase the data in the partition.

Note: Changing partition count will erase the content in all bins.

Choose operating system file system, FAT32 or NTFS

This option will set up the file system type seen by the computer in the HDD mode. NTFS does not have the 2GB file size limitation imposed by the FAT32 file system. With NTFS a recorded clip becomes one file no matter its length. Although this choice can be done at any time before the making media file process it is best to simply make it once.

Set the HDD volume ID

When connecting as an HDD the DN-700 volume name is *Datavideo xx*. If your application calls for multiple DN-700s to be connected to the computer at the same time, it becomes helpful to have the volume name be different for each DN-700. This option allows xx to be set between 00 and 99.

Select which time code to display

With DV, while recording or playing, the time code displayed can be either the externally generated time code or the internally generated one. If the signal is analog and no time code is connected then the External is generated the DN-700 and is in the dropped-frame format. The internal time code referred to here is the absolute frame number of the recording in the selected bin and is in the non-dropped-frame format. The absolute frame number starts at 00:00:00:00 in each bin. When the content is changed to files, the time code presented to the NLE starts with the External value of the first frame of the content; if this value is invalid then 00:00:00:00 is substituted. For HDV, the time code displayed is always the External time code.

Empty the current or all bins

The DN-700 is primarily a capture device, as opposed to an archiving device, and it is best to start out with a fresh DN-700. Emptying (erasing) ALL bins will not only clear the DN-700 at once but it will also conveniently reset the file system.

Updating the Firmware

To update the DN-700's firmware, take a DN-700 that has undergone the MAKE MEDIA FILES process and connect it to your computer. Copy the firmware update file to the root directory, level where all bin folders appear, and rename it **flash.bin**. Next, insert the DN-700 in the DN-700 and select the UPDATE FIRMWARE option and follow the instructions.

WARNING: Once the ERASE FLASH option has been selected, DO NOT turn power off until the firmware has been updated. If the update is prematurely ended the recorder will be made inoperable.

Recording

Normal Record Checklist

A few parameters must be set properly for a standard recording and they are mostly grouped in the menu level RECORD SETUP:

Select the DV video source

For DV recordings select the signal source in the Main menu level. It can be from the analog port (ANA) or the 1394 port (DIG). Note that the output analog ports, Composite and S-video, are always live, regardless of the signal source, ANA or DIG. When the source is analog, the signal is converted to DV digital and output on the 1394 port at all times.

If Composite and S-video are connected to the analog input port simultaneously, the S-video signal is given precedence. In HDV, the input and output are always the 1394 port and the analog section is made invalid.

Set the file type:

A choice must be made for the eventual file type of choice should you want to connect the DN-700 in the HDD mode to your computer and drag and drop your video content as files. The choices for DV are Microsoft .avi type II, Canopus .avi type II, both commonly used in PCs, .mov, the QuickTime format used in Macs and .mxf a new universal file format supported by a growing number of applications, Avid being the most well known. In HDV mode, the file type is fixed at .m2t.

Note: The file format started with one bin will apply to all subsequent recordings in that bin and can only be changed after the bin is erased or emptied.

Synchronize to tape motion

The recording of the DN-700 can be synchronized to the camera's record button by turning Sync To Tape ON (**ST1**). Whenever the tape in the camera is rolling, so will the time code. DN-700 recognizes the motion and will record along with the tape. When the motion stops, DN-700 will pause the recording. To record continuously without regard for tape motion, switch Sync To Tape off (**ST0**). Some cameras control the DN-700 directly through the 1394 interface and in these cases, use ST0 and let the camera do the work.

Select the sampling rate of the audio in the DV mode

This option will set the audio sampling rate to 32KHz or 48KHz when the video source is analog. When the video source is digital this setting will be used as the starting guess frequency of the audio portion of the digital stream. If the guess is incorrect then the first two frames of data will be discarded as the DN-700 resets itself.

Note: Only one type of audio sampling rate can be used within a bin.

Set the record date (optional)

The date attribute of the created file is set to this value when the source is analog. Each file representing a clip gets its own date. If the source is digital then the record date from the digital stream is used. If that date is not valid then the current record date set by this option is used.

Recording

Starting

Select one of 99 Bins by pressing the PREVIOUS or NEXT keys in the Idle menu.

Two common ways of starting to record are 1) by entering the record mode manually by holding the REC button down while pressing the PLAY button. Or 2) the camera or device connected to the 1394 port sends a record command. A third way is to issue a record command from the remote serial interface. See the command protocol in Appendix B.

Pausing

The DN-700 will pause recording if time code is not moving and ST1 is set, otherwise it will record. When the video source is digital the time code is embedded in the stream and it is always the time code recorded. When the video source is analog, time code is the SMPTE longitudinal time code at the breakout cable. To cause the recording to pause, that time code must be valid and not moving. If SMPTE time code is not present then a time code is substituted starting at 00:00:00:00 for each bin and incrementing from there in a dropped-frame manner (NTSC only). In this case, ST1 has no meaning. It is also possible to pause a recording by pressing the PLAY key, in this mode, recording is resumed by pressing the PLAY key once more and a new clip is created.

Warning: If power is interrupted while the recording is paused, all clip numbers added during the current record session will be lost. No content however will be lost. Future firmware upgrades may fix this behavior.

Note: If power is interrupted while recording, up to two seconds of the last video may be lost.

Recording

When recording the right soft key is called MARK. Pressing this key while recording will start a new clip with no frames lost. Each time a recording is started a new clip is created. Up to 97 clips can be numbered in each bin.

Note: Recording is done in a bin. A clip is automatically started at the beginning of the bin if the bin is empty or appended to the last clip in the bin. A clip is never inserted between other clips in a bin.

Note: The minimum length of a clip is 2 seconds.

Stopping

It is best to stop a recording by pressing the Stop key before turning power off.

Special Record Setups

Do elapsed time recording

In this option a recording can be set up to capture one of six time lapse settings. They are 1 frame per second, per 2 seconds, per 5 seconds, every 4th frame, every other frame or 1 frame per trigger. The trigger connection is found in the breakout cable.

Note: This mode is not saved when power is interrupted.

Note: A new clip is created only at the beginning of a time lapse recording.

Note: This option is not currently valid with HDV. Later firmware upgrades may turn this function on.

Use Record Pre-trigger

When this option is enabled the DN-700 is always in a record-ready mode when it is not playing. In this mode it is continuously storing live data in its internal buffer which is 8 seconds in length. In this manner, when a recording is started 8 seconds of history prior to the trigger already exists and is then captured to disk.

Note: This mode is not saved when power is interrupted.

Power on auto record

When this option is enabled and DN-700 is powered on in the VTR mode the DN-700 will begin recording immediately.

Playback

Playing setup

Set up loop play

When loop play is enabled and the last frame of the last clip is reached the DN-700 will start playing over from the first frame of the first clip with no time lost.

Power on auto play

When this option is enabled the DN-700 will begin playing immediately when powered up in the VTR mode.

Playing

Play mode can be entered by one of three ways, the most common is to press the PLAY button; the other two are by issuing a PLAY command through the IEEE-1394 interface or the serial port interface if it is enabled. When playing, the time displayed is controlled by the TC DISPLAY FORMAT option. When play is stopped, the time displayed is the time code of the last frame displayed.

When entering a play the soft keys will be FREV and FFWD for fast reverse and fast forward respectively. Repeatedly pressing either soft key will cause the play to go repeatedly faster in the chosen direction up to 32x speed. A speed other than 1x is displayed in the bottom line. Also while playing pressing the Menu button will give an alternate set of soft keys; SLOW and FAST. These keys, while keeping the same current play direction, will extend the control of the speed down to the slow motion range of 1/32x. The menu button will toggle between the two sets of keys. The Tally light will glow green while playing. If a play is entered after a recording, the play will start at the beginning of the first clip of the last recording. For example, a record starts with clip 12, during the record the Make key is used to create clips 13 and 14. Play will start at clip 12. This will remain until another bin is selected or power is turned off.

Pause and Go To Mark

While playing, pressing the PLAY key will pause the image. Pressing Play again will return to 1x play in the forward direction. While in the play-pause mode, the soft keys will be l< and >l. These keys allow direct access to the marks that are the starting and end frames of each clip. Counting the end frame of the last clip, there will always be one more mark than there are clips. In this mode, the clip number display will be substituted with a mark number display. Again, pressing the Menu key will present an alternate set of soft keys, these will be <ll and ll> for frame stepping reverse and forward respectively. Holding either key down for more than 2 seconds will cause a rapid stepping.

HDD Mode

General

The HDD mode is the mode where the DN-700 appears to the computer as a Hard Disk Drive and not as a VTR. The connection to the computer is done via the IEE-1394 connector. The HDD mode is entered by pressing the Menu key within the 5 seconds after the DN-700 is powered on.

Note: Care must be taken when connecting the IEE-1394 cable in the DN-700 when the other end is already connected to the computer. Do not attempt to insert the connector backwards as DC power from the computer is present on the cable in the cable and can damage the sensitive receiver circuits in the DN-700.

Note: No software drivers are necessary for the computer to recognize the DN-700 as an HDD.

Preparation

Prior to turning on the DN-700 in the HDD mode and seeing your video as files instead of clips the MAKING MEDIA FILES process must be undertaken.

MAKE MEDIA FILES

This operation prepares the recorded content to be seen by a computer by building the file wrappers around the recorded content and emulating the computer's operating file system. Two choices are available, FAT32 and NTFS and they are chosen by the SETUP FAT32/NTFS option.

Operating File System limitations

The FAT32 format is compatible with both Macs and PCs. This format limits the size of a file to a maximum of 2GB, in DV that translates to approximately 9+ minutes of video. A clip that lasts longer than 9min is broken into multiple files each 2GB long with the last one making up the remaining time. If the split files are strung on the time line of an NLE, no frame is lost over the transition. In addition, FAT32 has a clip boundary has a resolution of 2 seconds so the beginning of a clip other than the first in a bin is most likely to contain the end of the previous clip, up to 2 seconds' worth. Conversely the end of a clip is most likely to be found in the first file of the next clip. For an accurate correlation of clip numbers between the VTR and the HDD mode, it is best to keep each clip longer than 2 seconds and to have fewer than 97 per bin.

The NTFS format is fully compatible with PCs and is read compatible with Macs. Its main advantage is that it does not impose a file size limitation to the DN-700 resulting in one file per clip. NTFS' clip boundary is frame accurate and therefore has perfect correlation with clip numbers in the VTR mode.

Note: Some NLEs cannot accept file sizes greater than 40GB, make sure your NLE is not one of them if you plan on shooting one continuous take greater than 3 hours and using NTFS.

File Organization

After the media conversion is made, all bins that contained video will appear to the computer as folders named BINxx where xx represents the BIN number ranging from 01 to 99. Inside each folder, each clip will be represented as a file with an extension name .avi, .mov e.g. depending on the type chosen prior to recording. Each file will be named BxxCnnyy where xx again represents the bin number; nn represents the Clip number ranging from 01 to 97. The number yy is the number of the split file caused by the FAT32 limitation

Connecting the DN-700 directly to the computer

Once the Make Media File is completed it is possible to eject the DN-700 and connect it directly to your computer using the special Firewire cable or the optional USB-2 cable. Connect the 36-pin end of the cable to the DN-700 and the other end to the 1394 or the USB port of the computer depending on the cable at hand. The 1394 cable comes standard with the bundled DN-700 package. In this manner, the DN-700 is connected to the computer while the DN-700 is free to capture more video.

RS-232 Controller Command Set

Rev 3.1 July 29, 2006

Communication format :

Mode : no synchronization
Character Length : 1 start bit + 8 data bits + 1 parity bit + 1 stop bit
Data Rate : 38,400 BAUD
Parity : Odd parity

Command Format :

CMD1, CMD2, DATA bytes, Checksum Byte

A command is made up of two address bytes, CMD1 and CMD2, a variable number of data bytes, DATA, from 0 up to 15 and a checksum byte. The checksum byte is the modulo 256 sum of all preceding bytes.

The most significant nibble of the CMD-1 byte represents the command group. The least significant nibble represents the number of data bytes to follow the CMD-2 byte.

Command Protocol :

CMD1, CMD2, DATA bytes, Checksum Byte
Response: ACK

Other than the sense command, the unit will respond to all commands affirmatively by sending the three-byte acknowledge (ACK) if the checksum is valid. If the checksum is not valid, the unit will ignore the command. Most commands will be responded to within 8msec. A Play command from an Idle state will result in a response delay of up to 700msec. During this busy time, all commands will be ignored.

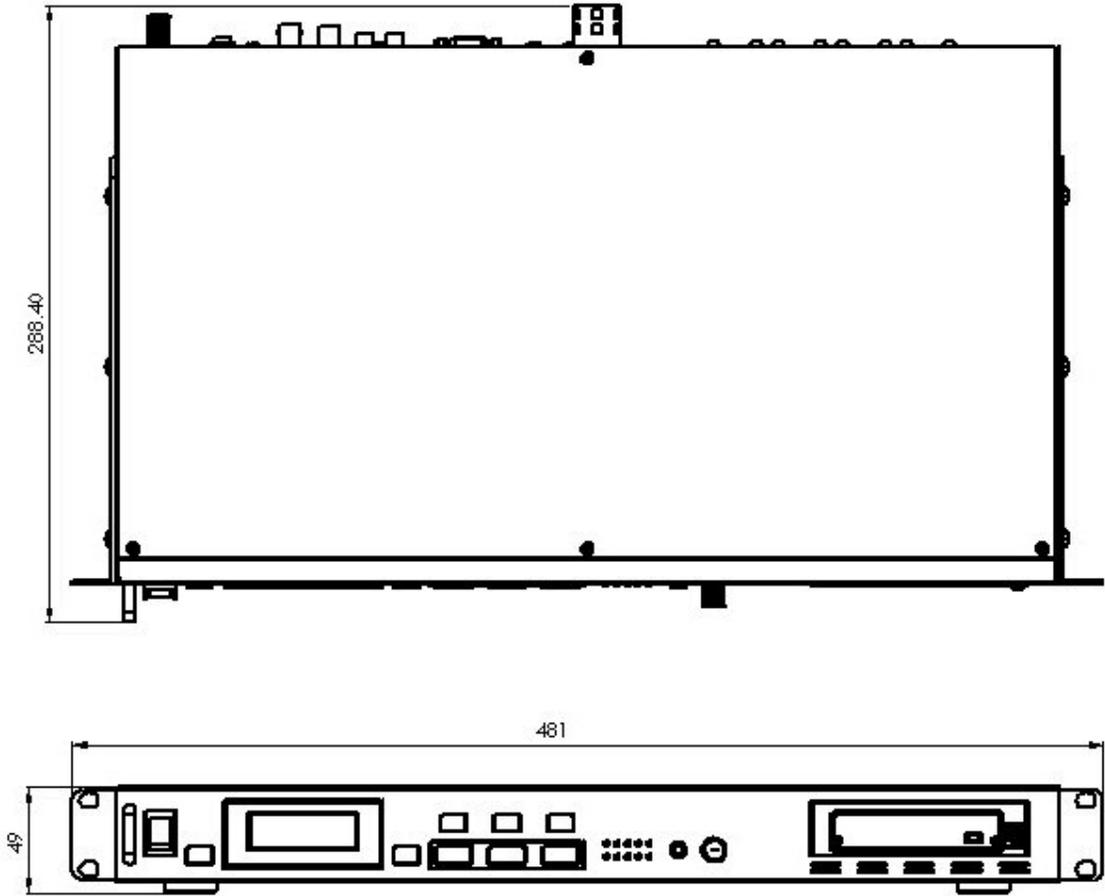
Summary List of Commands :

Command	Name	Response	Name
	System Control		
00h, 11h, 11h	Device Type Request	12h, 11h, 00, 00, 23h	Device Type
00h, F1h, F1h	Next Bin	10h, 01h, 11h	ACK
00h, F2h, F2h	Previous Bin	10h, 01h, 11h	ACK
00h, F4h, F4h	Disable Loop Play	10h, 01h, 11h	ACK
00h, F5h, F5h	Enable Loop Play	10h, 01h, 11h	ACK
01h, F0h, XXh, csum	Select Bin	10h, 01h, 11h	ACK

Command	Name	Response	Name
01h, F3h, XXh, csum	Select and Empty Bin	10h, 01h, 11h	ACK
	Transport Control		
20h, 00h, 20h	Stop	10h, 01h, 11h	ACK
20h, 01h, 21h	Play	10h, 01h, 11h	ACK
20h, 02h, 22h	Record	10h, 01h, 11h	ACK
20h, 0Dh, 2Dh	Eject	10h, 01h, 11h	ACK
20h, 10h, 30h	Fast Forward	10h, 01h, 11h	ACK
20h, 20h, 40h	Fast Rewind	10h, 01h, 11h	ACK
20h, 14h, 34h	Frame Step Forward	10h, 01h, 11h	ACK
20h, 24h, 44h	Frame Step Reverse	10h, 01h, 11h	ACK
21h, 11h, nnh, csum	Jog Forward	10h, 01h, 11h	ACK
21h, 12h, nnh, csum	Variable Forward	10h, 01h, 11h	ACK
21h, 13h, nnh, csum	Shuttle Forward	10h, 01h, 11h	ACK
21h, 21h, nnh, csum	Jog Reverse	10h, 01h, 11h	ACK
21h, 22h, nnh, csum	Variable Reverse	10h, 01h, 11h	ACK
21h, 23h, nnh, csum	Shuttle Reverse	10h, 01h, 11h	ACK
21h, 11h, 00h, 32h	Play Pause	10h, 01h, 11h	ACK
21h, F0h, nn, csum	Select Bin and Play	10h, 01h, 11h	ACK
24h, F1h, nn (4 x), csum	Play Offset	10h, 01h, 11h	ACK
24h, F2h, nn (4 x), csum	Play from Offset	10h, 01h, 11h	ACK
24h, F3h, bb, nn (4 x), csum	Select Bin and Play Offset	10h, 01h, 11h	ACK
24h, F4h, bb, nn (4 x), csum	Select Bin and Play from Offset	10h, 01h, 11h	ACK
24h, F5h, nn (4 x), csum	Play to Offset	10h, 01h, 11h	ACK
25h, F5h, XXh, YYh, YYh, YYh, YYh, csum	Select Bin and Play to Offset	10h, 01h, 11h	ACK
29h, F6h, XXh, YYh, YYh, YYh, YYh, ZZh, ZZh, ZZh, ZZh, csum	Select Bin and Play from Offset Y to Offset Z	10h, 01h, 11h	ACK
	Sense Request		
61h, 0Ch, 04h, 71h	Current Time Sense	74h, 00h, TC(3:0), csum	Time Code

Command	Name	Response	Name
61h, 20h, CL, csum	Status Sense	7Lh, 20h, Stat(L), csum	Status
61h, F0h, 04h, 55h	Current Frame Offset	74h, 00h, FO(3:D), csum	Frame Offset
61h, F1h, 01h, 53h	Current Bin	71h, 00h, nn, csum	Bin Number

Dimension



Specifications

Analog Video Inputs	Composite video	1.0Vp-p, 75 Ohms internally terminated
Analog Video Outputs	Composite video	1.0Vp-p, must be terminated
Audio:	<ul style="list-style-type: none">• Bandwidth 20~20KHz < +/- 3dB• S/N Ratio > 50 dB• THD. < 0.15%	
Time Code In	SMPTE, 0.5V to 5.0V p-p, BNC	
Digital Video In/Out	IEEE-1394, 400Mbps max, 6-pin	
GPI Trigger	1.65V Threshold, 100K Ohms input, contact closure	
Recording and Playback Formats	Analog Inputs and Outputs: DV25 Digital Input and Output: DV25, HDV, DVCPRO-25	
Recording time (minutes per 10GB)	DV25: 46.3 HDV: 49.4 at 1080i, 64.3 at 720p	
Media File Format	DV25: *.avi (Type II, Microsoft, Canopus), *.mov, *.mxf (OP1A) HDV: *.m2t	
Operating File System Compatibility	FAT32, NTFS	
Input Voltage Requirement	12V typical	
Power Consumption	@ 12V Idle: 4.3W, Play/Record: 6W, HDD mode: 5.3W	
Size (W x H x D)	440mm x50mm x 300mm	
Weight	3.5 kg	
Temperature	Operating: +40°F to +104°F (+4°C to +40°C) Non-Operating: -40°F to +149°F (-40°C to +65°C)	
Vibration	Operating: 1.0G (5-500 Hz) Non-Operating: 5.0G (10-500 Hz)	
Shock	Operating: 250G (2ms) Non-Operating: 5,000 (0.5ms)	

Service & Support

It is our goal to make your products ownership a satisfying experience. Our supporting staff is available to assist you in setting up and operating your system. Please refer to our web site www.datavideo-tek.com for answers to common questions, support requests or contact your local office below.

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