

TEAC

DISK RECORDING SYSTEM

DS Series

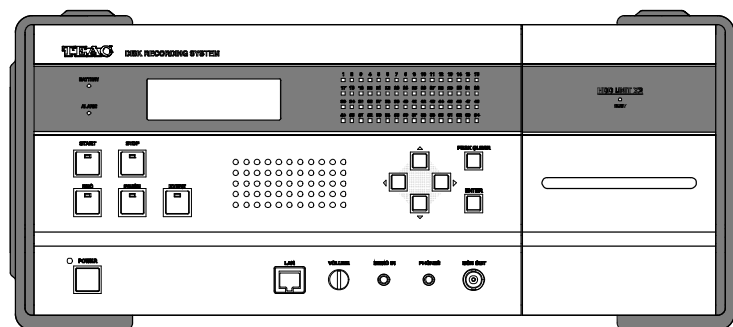
INSTRUCTION MANUAL

Please read this manual before using the product, and keep this manual handy.

DISCLAIMER

TEAC disclaims all warranty, either expressed or implied, with respect to this product and the accompanying written materials. In no event shall TEAC be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information or other loss) arising out of the use of or inability to use this product.

- This product is not an approved medical device.
- The names of products that appear in this document are registered trademarks of the respective holders.
- Specifications are subject to change without notice.



Compliances for the following regulations are currently pending.

FCC Part 15

~~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 to this equipment not expressly approved by TEAC CORPORATION for compliance could void the user's authority to operate this equipment.~~

For the customers in Europe

WARNING

~~This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.~~

Pour les utilisateurs en Europe

AVERTISSEMENT

~~Il s'agit d'un produit de Classe A. Dans un environnement domestique, cet appareil peut provoquer des interférences radio, dans ce cas l'utilisateur peut être amené à prendre des mesures appropriées.~~

Für Kunden in Europa

Warnung


~~Dies ist eine Einrichtung, welche die Funk-Entstörung nach Klasse A besitzt. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen ; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.~~

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IMPORTANT SAFETY INSTRUCTIONS

 CAUTION <ul style="list-style-type: none">■ Read All Instructions.■ Save Instructions for Later Use.■ Follow All Warnings and Instructions Marked on the Product.
--

- 1) Read Instructions - All the safety and operating instructions should be read before the product is operated.
- 2) Retain Instructions - The safety and operating instructions should be retained for future reference.
- 3) Heed Warnings - All warnings on the product and in the operating instructions should be adhered to.
- 4) Follow instructions - All operating and use instructions should be followed.
- 5) Cleaning - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- 6) Attachments - Use only manufacturer-approved attachments. The use of non-approved attachments may cause hazards.
- 7) Water and Moisture - Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool, etc..
- 8) Accessories - Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious personal injury and/or serious damage to the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
- 9) Ventilation - Slots and openings in the cabinet are provided for ventilation, to ensure reliable operation of the product, and to protect it from overheating. These openings must not be blocked or covered. Keep the openings clear from such items as; a bed, sofa, rug, or other similar obstacles. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
- 10) Power Sources - This product 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 supply to your home, consult your product dealer or local power company. For products intended to operate from battery power or other sources, refer to the operating instructions.
- 11) Grounding or Polarization - This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug 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. If the plug still fails to fit, contact your electrician to replace your outlet which may be obsolete. Do not defeat the safety purpose of the polarized plug.
- 12) Power-Cord Protection - Power-supply cords should be routed so that they are not likely to be walked on, pinched, pulled, or otherwise strained by items placed upon or against them. Pay particular attention to the cord ends where the plugs exit the product and where they enter the wall outlet or power supply.
- 13) Lightning - For added protection during a lightning storm or prolonged periods of unuse, unplug it from the wall outlet. This will prevent possible damage to the product due to lightning strikes or power-line surges.
- 14) Overloading - Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in the risk of fire or electric shock.
- 15) Object and Liquid Entry - Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
- 16) Servicing - Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

17) Damage Requiring Service – If damaged, unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a) If the power-supply cord or plug is damaged.
- b) If liquid has been spilled onto, or objects have fallen into the product.
- c) If the product has been exposed to rain or water.
- d) If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. An improper adjustment of other controls may result in further damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- e) If the product has been dropped or damaged in any way.
- f) If the product exhibits a distinct change in performance.

18) Replacement Parts - When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

19) Safety Check - Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper and safe operating condition.

20) Heat - The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

Note

Note

1. INTRODUCTION

The DS series disk recording system is a wideband hard disk recorder that has been developed to record signals of higher frequency, multiple channels, and longer time.

There are two models based on their recording channels, 32 channels and 64 channels per unit. For example, they can record for example 32 channels of 100 kHz bandwidth at 256 kHz sampling signals for 2.5 hours continuously into the internal hard disk drive.

Synchronization recording of multiple channels with multiple units is possible without sacrificing the sampling rate per unit.

Recorded data can be transferred by using a Gigabit Ethernet interface (1000BASE-T) on the unit. Simultaneous data transfer to PC via network while recording data into the internal hard disk drive is possible depending on combinations of the recording channel and the sampling rate.

The DS unit can operate as a standalone recorder using front panel key controls to set record conditions and to control recordings. It can also operate as a front end system controlled by PC.

In addition to 32/64 channels' input models, TEAC recently introduced 32 channels' input/output model.

This manual is applicable to the following models:

DS-320R	32 channels' input disk recording system
DS-640R	64 channels' input disk recording system
DS-320RP	32 channels' input/output disk recording/playback system

1.1 Overview

- 70 minutes of 16 channels 16 bits high resolution data at 1 MHz sampling.
 - Simultaneous sampling by using multiple A/D converters per channel, selectable from 20 kHz to 1 MHz.
 - Continuous recording to the internal hard disk drive at the maximum rate of 16M words/sec.
 - Playback from the internal hard disk drive at the maximum rate of 8M words/sec and the maximum playback sampling frequency of 500 kHz.
 - Types of the input amplifier selectable from IEPE/TEDS or DC.
 - Endless recording by using the internal hard disk drive as a ring buffer.
 - High speed data transfer over network by using 1000BASE-T interface.
 - Monitor signal output of a specified channel.
 - Monitoring data over network while recording to the internal hard disk drive.
- IEPE: Integrated Electronics Piezoelectric

1.2 Notes before Using

- Check whether the delivered product is exactly the one you ordered. Although thorough quality control is implemented at TEAC, when you receive the package, please confirm that the delivered product has exactly the same configuration as the one you ordered. If there is any deficiency or if parts are missing, please contact TEAC promptly.

Accessories

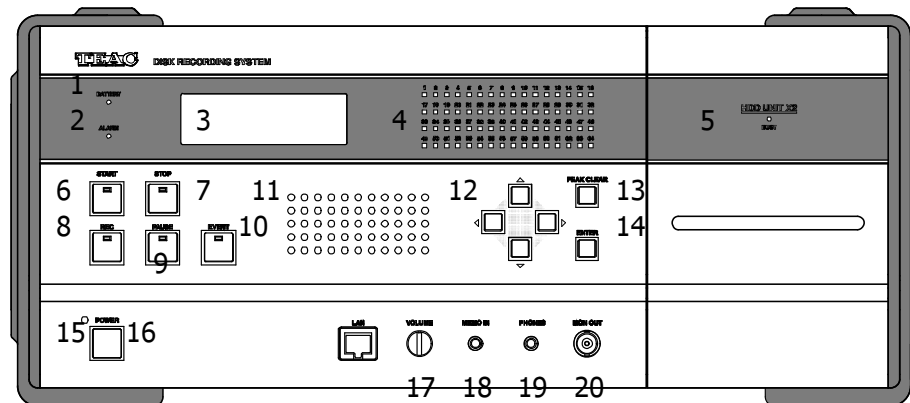
AC Cable x 1
 3P Adapter x 1
 Earphone x 1
 Microphone x 1
 Instruction Manual x 1
 Clamp filter for the I/O cable x 4 ※Refer to Page 4 for the installation.

- Use the specified power supply.
Do not connect a power supply that is not specified for this product. Using a power supply that does not meet the specifications may damage the product.
- Use Uninterruptible Power Supply (UPS).
Although the unit equips the internal battery to protect recorded data by closing the data file from accidental power failure. We recommend using an external UPS in parallel.
- To remove the plug from the unit
To remove the AC cable from the unit, hold the unit with one hand, and pull the plug straight with the other hand. Do not pull the cable.
- To operate the unit after storing at no power state for a long time
It will take approximately 11 hours for the internal battery to become fully charged. During the charging period, it is imperative to keep the DS power on.

1.3 Keys and Controls

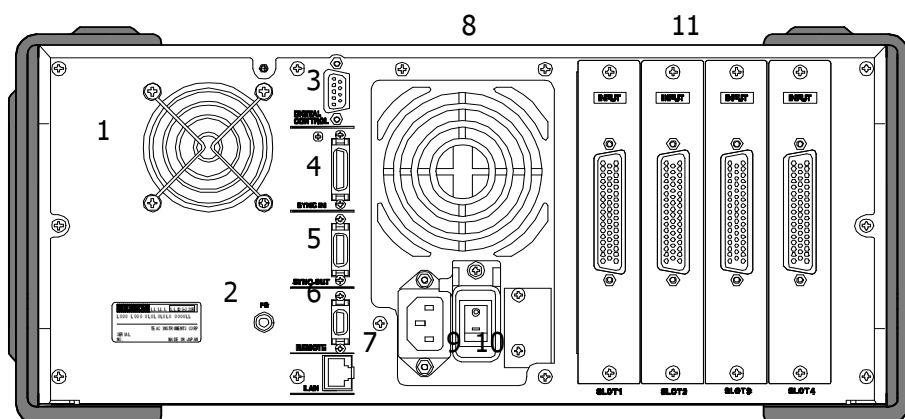
In this paragraph, we will explain the functions of the keys and controls of the unit.

Front Panel



No.	Description	Function
1	BATTERY LED	Turn ON if the battery operates and if the battery voltage becomes lower.
2	ALARM LED	Turn ON if the unit detects any failure.
3	LCD	20 characters x 4 lines LCD. Key setting messages and the unit status are displayed.
4	Level Display LED	Indicate signal input levels of each channel. No flash: Input level +/- less 5 % Green: +/- 5 % to approximately +/- 50 % Orange: +/- 51 % to approximately 125 % Red: Excess input approximately more than +/- 125 %
5	Hard Disk Drive Tray	The removable hard disk drive (Proprietary) is installed inside of the tray.
6	START	Press to start recording.
7	STOP	Press to stop recording. Press to return to the previous menu without change of settings.
8	REC	Press to enter the record standby state.
9	PAUSE	Press to pause recording (to enter the record standby state).
10	EVENT	Press to write an event mark.
11	Speaker	Speaker
12	Up/Down/Left/Right Keys	Press to move the cursors at the LCD, or to change display items.
13	PEAK CLEAR	Press to clear a peak of the level display LED.
14	ENTER	Press to set settings and selections.
15	POWER LED	POWER LED Turn ON red when the main power switch is turned to ON, then change to green when the power switch on the front panel is turned to ON. The slave unit of the synchronization recording will flash orange instead of green.
16	POWER	POWER switch
17	VOLUME	Adjust output level of the speaker.
18	MEMO IN	Connect a microphone to record voice memo.
19	PHONES	Connect a headphone to listen to monitor output. Speaker output is disabled when connecting the headphone.
20	MON OUT	Monitor output connector. Analog signal output of a specified channel is available as a through output of the input signal.

Rear Panel

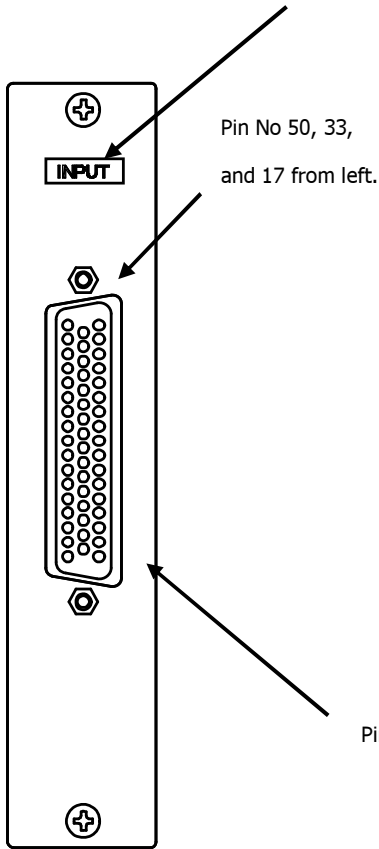


No.	Description	Function
1	FAN 1	Fan for cooling the unit. Do not block the exhaust vent.
2	FG	Frame ground terminal to connect the earth line.
3	DIGITAL CONTROL	Connector to input an external sampling frequency and an external trigger. D-SUB 9 pin HIROSE RDED-9SE-LAN(4-40) Pin 1: To input the external sampling (+) (5 V – 4.7 kohm Pull-up register equipped) Pin 6: GND (External sampling) Pin 2: To input the external trigger (+)(5 V – 4.7 kohm Up-up register equipped) Pin 7: GND (External trigger) Pin 3/Pin 8: Reserved Pin 4/Pin 5/Pin 9 (GND): Do not connect. External trigger is detected at H to L state. Input the external sampling/the external trigger with TTL. The external sampling clock needs an accuracy of a crystal oscillator.
4	SYNC IN	Connector for synchronization signal input for synchronization recording. HIROSE DX10G1M-26SE
5	SYNC OUT	Connector for synchronization signal output for synchronization recording. HIROSE DX10GM-20SE
6	REMOTE	Connector for an optional remote control unit ER-GXRC. No PAUSE operation at the remote control unit. This connector can be used to start and stop the unit with contact closure signal. HIROSE DX10G1M-14SE
7	LAN	1000BASE-T connector to connect to a PC. You can also use 10BASE-T or 100BASE-TX by using the auto negotiation function. It recommends using under 1000BASE-T network environment.
8	FAN 2	Fan for cooling the unit. Do not block the exhaust vent.
9	AC IN	Apply 100 to 230 V AC.
10	MAIN Switch	Power Main power switch
11	INPUT	Input connectors to input the signals to be measured. Channel numbers become higher from left to right. 16 channels per connector. D-SUB 50 pin HIROSE RDDB-50S
11	OUTPUT	For the unit being equipped with the playback function Output connectors to output the signals. Channel numbers become higher from left to right. 16 channels per connector. D-SUB 50 pin HIROSE RDDB-50S

1.4 Pin Assignment of Input/Output Connector

This paragraph explains the relationship between the pin assignment and the channel numbers.

To be labeled as "OUTPUT" for the output connector



Channel Number	Pin Number		
	+	-	Ground
1	15	16	32
2	13	14	30
3	11	12	28
4	9	10	26
5	7	8	24
6	5	6	22
7	3	4	20
8	1	2	18
9	48	49	33
10	46	47	31
11	44	45	29
12	42	43	27
13	40	41	25
14	38	39	23
15	36	37	21
16	34	35	19

Add $16 \times (\text{Slot Number} - 1)$ to the channel number above for Slot 2 or later.

Pin No 34, 18, and 1 from left

Input/Output Connector:

D-SUB 50 pin HIROSE RDDB-50S

Connector of Signal Input Cable:

HIROSE HDDB-50P(soldering type), JAE DD-50PF-N(soldering type), or equivalent.



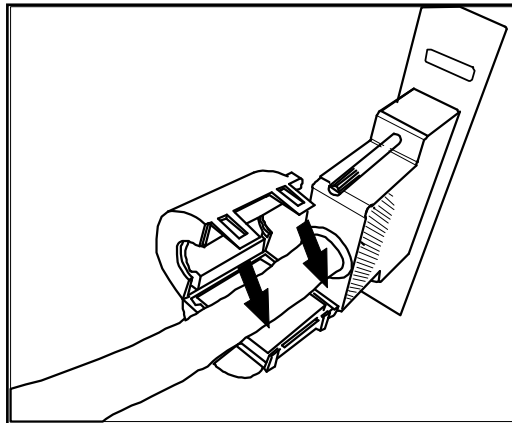
CAUTION

Do not connect any signal at Pin 17.

Installation of accessory clamp filter

Install the clamp filter included in the accessory around the INPUT/OUTPUT cable to reduce unnecessary electric wave radiation.

Install one clamp filter on a cable by latching it in the vicinity of the connector which attaches to the DS amplifier.



Note:

There are four clamp filters (ferrite cores) included regardless of the number of installed amplifiers or type of models.

2. MANUAL INFORMATION



WARNING

Do not connect a power supply that is not specified for this product. Using a power supply that does not meet the specifications may cause a fire-hazard/electric shock or may damage the product.

Follow the information below to use the DS series. A related section number is shown with this instruction book.

- 1.** Turn ON the power of the unit. How to turn ON the power and to shut down the unit are explained in Section 3.
- 2.** Enter the necessary settings by using the main and sub menus to be displayed on the LCD. How to operate the menus is explained in Section 4.
- 3.** Set the record conditions such as the sampling rate, etc. How to set the record conditions is explained in Section 6.
- 4.** Use the keys and the controls on the front panel to start and stop recording. It is explained in Section 7.
- 5.** Also, use the keys and the controls on the front panel to start and stop playback. It is explained in Section 10.
- 6.** You can also operate the unit by using the browser on the PC connected via network. How to connect to the PC is explained in Section 11, and how to set the network parameters of the unit is explained in Section 12.

Note

3. TURN ON AND TURN OFF SYSTEM

You can learn how to turn on and off the system by reading this section.

3.1 Cautions on Power Supply

Connecting Ground Line

Connect a common ground line of all test instruments to be connected to the FG terminal on the rear panel.

Power Supply Voltage

Use the power supply voltage range of 100 V AC to 230 V AC.

Internal Battery

A built-in battery in the DS unit has the function to protect recording data. During a power cut or power interruption, the unit closes a file to protect important data from unexpected power cut and interruption.

The built-in battery charge takes approximately 11 hours to complete. When not used for an extended period of time, allow the internal battery to energize by charging beforehand.

When the power service interrupts for more than 10 minutes while recording, a recording is stopped automatically, a file is closed, and the power source is turned off.

Turning on the BATTERY LED of the front panel shows a degradation of the built-in battery. Inquire about changing of the internal battery with our service department.

3.2 Turn On System

1. Use the accessory AC cord to connect to the DS main unit.
2. Connect the cord to apply AC power with care to AC source voltage.
3. Press the main power lower part (| display side) on the rear panel to turn on the main power source.
4. Press the power switch on the front panel.
5. Initial screen is displayed with flashing LED on the front panel.

```
TEAC DS Series
  Initializing... █
```

6. When the system boots up, the next <READY> is displayed.

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

Amount of free space of HDD displayed in <Free> is different based on the system recording conditions.

Turning Power ON Procedure for DHCP Enable State

Make sure to DHCP server in the network activated before turning on the power of the DS system to acquire the IP address to be used at the DS system.

Re-stat System

If the following screen is displayed after the initial screen is displayed, turn off the power switch once to restart the system.

```
TEAC DS Series
SYSTEM DOWN!!
Please restart!
```


3.3 Calibration at Power On State

Time to Analog Circuit Stable State

At a cold start state, the analog circuit of the DS can be stable for guaranteed accuracy at approximately 10 minutes after power activation.

When a power source is applied, the DS unit reads an internal pre-set calibration value automatically. This process reads the pre-set calibration value recorded beforehand at ROM of each amplifier card.

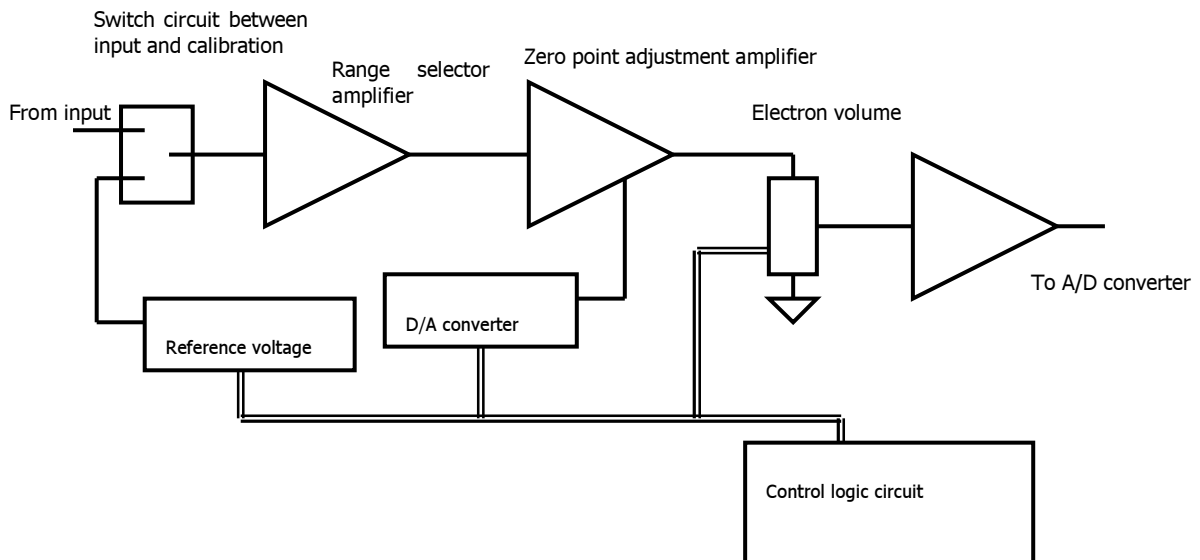
This pre-set calibration value can be renewed and updated by carrying out the manual calibration from <INPUT AMP> menu. This calibration process carries out an internal measurement on each channel range and each sampling frequency with internal reference voltage. This process also calibrates with new offset value and gain of each channel, and then writes the new value into ROM of each amplifier card.

Read "6.1.5 Manual Calibration" on how to carry out the calibration.

Periodical Manual Calibration

Periodical manual calibration each 6 months is recommended to keep good measuring precision.

Calibration Circuit Block Diagram



Overview of Calibration

Adjusting of offset value:

Zero volts are output from reference voltage source, and zero point adjustment amplifier is adjusted in output of a D/A regenerative reactor until A/D value becomes zero.

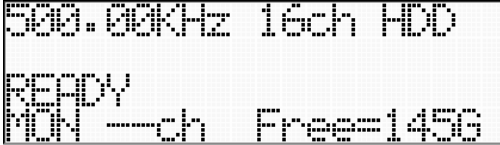
Adjusting a gain:

Voltage of a range full scale is output from reference voltage source, and A/D value adjusts electron volume until it becomes 100% of a range.

These adjusting results are written into a flash ROM of each amplifier.

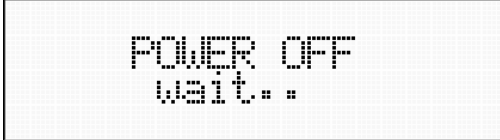
3.4 Turn Off System

1. Confirm that the system is at ready state (<READY> display).



500.00kHz 16ch HDD
READY
MON ---ch Free=1456

2. Press and hold the power switch on the front panel.
While system shut down process is running, <wait..> is displayed.



POWER OFF
wait..

3. LCD display becomes OFF. POWER LED turns on red.

4. Press the main power switch upper part (O display side) on the rear panel to turn off the main power source. POWER LED turns off.

About Main Power Switch

POWER LED keeps turning on red for approximately 4 seconds after turning off the main power switch. Turn on the power switch again by making sure of POWER LED off.

The fan on the power supply keeps rotating at slow speed while the main power switch on, which is the normal operation state of the DS system.

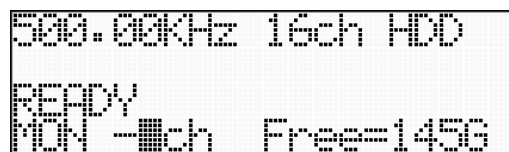
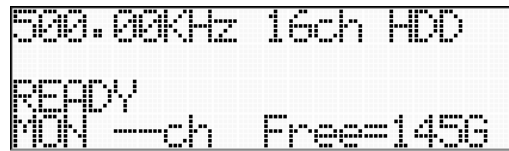
4. MENU OPERATION

You can use menu displayed by LCD on the front panel to control the DS unit with key operations. Use the cursor to select the menu item displayed by pressing the up and down keys.

4.1 Main Menu

Display the main menu.

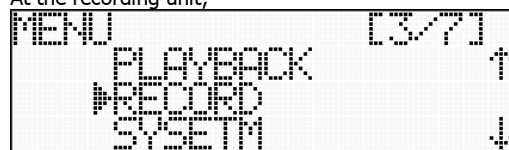
1. Confirm that the system is in ready state (<READY> display).



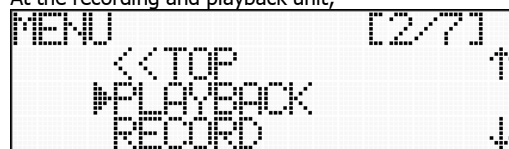
< - - ch > part is flashing.

2. Press the ENTER key.
3. The main menu <MENU> is displayed.

At the recording unit;



At the recording and playback unit;



4. Use the up and down key to move the cursor (▸).
The position at which the cursor is located is an effective selection.
Select the item, then press the ENTER key to move to the lower hierarchic menu.
Each time the down key is pressed, the cursor moves as follows.

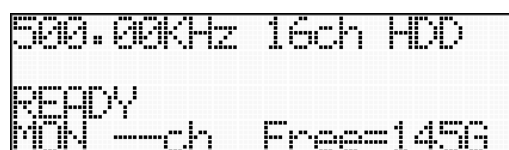
Cursor [PLAYBACK] ⇒ [RECORD] ⇒ [SYSTEM] ⇒ [PARAMETER] ⇒ [MISC] ⇒ [NETWORK]
Show the current selection.



It shows the current selection [SYSTEM] is located at 4th out of total 8 items.

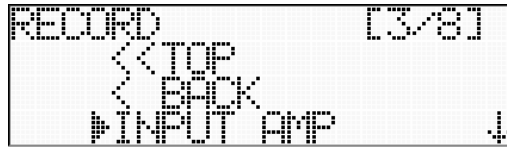
Move the cursor by using the up and down keys.

5. Move the cursor to [<<TOP], then press the ENTER key to return to ready state.



4.2 How to Move Among Menus

Press the ENTER key at the cursor position to move to the lower hierarchic menu.



At the menu displayed [<<TOP], [< BACK],
press the ENTER key by locating the cursor at [<<TOP] to return to ready state (<READY> display).
press the ENTER key by locating the cursor at [< BACK] to move the main menu.

Press the STOP key to return to each menu item without reflecting any changes.
The STOP key works to move to the upper hierarchic menu without changes.

4.3 Functions on Each Menu

The functions of each menu are explained in this paragraph.

Main Menu	Menu	Functions
PLAYBACK Move to playback menu.	You cannot operate the menu at the unit without playback features.	
RECORD Settings related "recordings", such as recording amps, recording device, sampling frequency, and number of channels.	INPUT AMP SAMPLE CHANNEL TARGET DEVICE RECORD MODE TRIGGER	Set the recording amp (*1) Set the sampling frequency. Set the number of recording channels. Select the target device for recording. Select the recording mode. Set for the trigger.
SYSTEM Settings related "system", such as voice memo recording and speaker output, and operations related internal HDD.	MEMO SPEAKER OUT HDD CHANGE HDD FORMAT DEL LAST DATA IRIG-B	Set to use Channel 1 for voice memo. Set the output from the internal speaker. Exchange the internal HDD. Format the internal HDD. Delete the last recorded file. Set to display the time by reading the IRIG-B time code input.
PARAMETER Load and save the setting parameters and initialize the system settings.	PARAMETER LOAD PARAMETER SAVE DEFAULT	Load the setting parameters saved into the DS unit. Save the current system settings into the DS unit. Initialize the system settings, then restart the system.
MISC Settings for LCD contrast, execute self test, and display the system information.	CONTRAST SYS INFO SYNC INFO	Set the LCD contrast. Display the system information. Display the synchronized unit information.
NETWORK Settings related network connections.	SET NETWORK CHANGE PARAM NETWORK DRIVE	Set the parameters entered at [CHANGE PARAM]. Select the network address and parameters. Display the shared folder name of the network drive.

*1 There is a lower hierarchic sub-menu at [RECORD] ⇒ [INPUT AMP].

INPUT AMP Settings related "channels" of the recording amp, such as input range and input mode of each channel.	RANGE AUTO RANGE MODE ZERO SHIFT CALIBRATION	Set the input range of each channel. Set by auto range settings. Set the input mode of each channel. Set the zero shift value at recording. Execute the manual calibration to correct the offset value and the linearity.
---	--	---

5. PANEL LOCK

You can lock the front key operations. Controls from the PC are possible while in panel-lock state.

1. Confirm that the system is in ready state (<READY> display).

```
500.00kHz 16ch HDD  
READY  
MON ---ch Free=145G
```

2. Press the right key for 3 seconds. <*> is displayed and the key operations are locked.

```
500.00kHz 16ch HDD *  
READY  
MON ---ch Free=145G
```

3. To release panel-lock state, press the right key again for 3 seconds. <*> is disappeared and the key operations are effective.

About Power Switch

The power switch OFF operation is effective at the panel lock state when the system is in ready state.

Note

6. RECORD CONDITION SETTINGS

At the <RECORD> menu, you can set recording amp settings and general recording functions of the main unit, such as input range and input mode of each channel, a recording target device, sampling frequency, and number of recording channels, by using the LCD and keys of the DS unit.

To enter the <RECORD> menu,

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

2. Press the ENTER key to display the main menu <MENU>. (Below example is for the recording only unit.)

```
MENU [3/7]
  PLAYBACK ↑
  RECORD
  SYSTEM ↓
```

3. Press the ENTER key by confirming the cursor is in [RECORD].

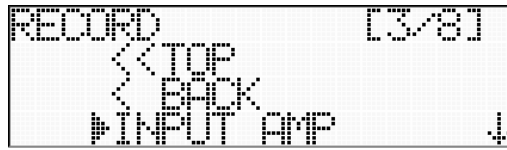
4. The <RECORD> menu is displayed.

```
RECORD [3/8]
  <TOP
  <BACK
  INPUT AMP ↓
```

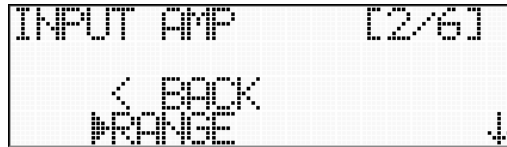
6.1 <INPUT AMP> Menu

You can set the recording amp condition at <INPUT AMP> of the <RECORD> menu.

1. Confirm that the cursor is in [INPUT AMP] at the <RECORD> menu.



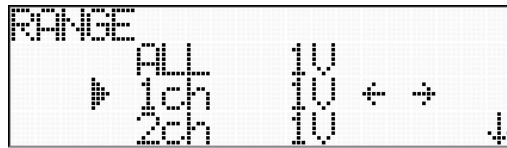
2. Press the ENTER key.
3. The <INPUT AMP> menu is displayed.



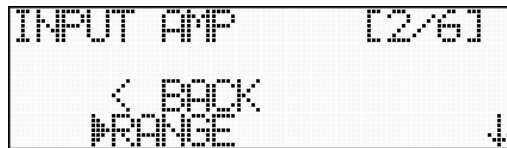
6.1.1 Input Range Setting

You can set the input range of each channel.

1. Press the ENTER key, confirming the cursor is in [RANGE].
2. The <RANGE> menu is displayed.



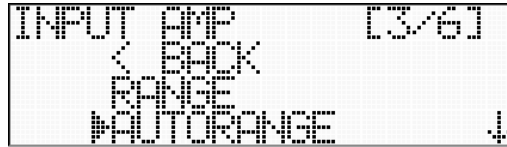
3. Move the cursor to the channel to set its input range by pressing the up and down keys. You can set all effective channels with the same input range at [ALL]. Press the left and right keys to select the desired input range.
4. After setting the input ranges of all channels, press the ENTER key to decide the selections. The <INPUT AMP> menu is displayed. If you do not want to decide the selection, press the STOP key. The selection is not effective. Then return to the <INPUT AMP> menu.



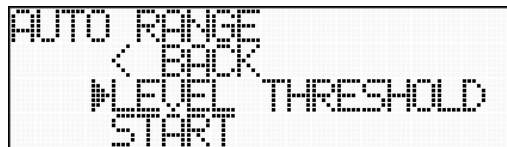
6.1.2 Auto Range

By monitoring input signal states from start measurement and stop measurement, the most suitable channel range setting of each channel is set automatically.
 This menu is carried out after connecting an object signal to the DS input channel.
 The auto range function measures each input signal at the fixed input range fixed of 20 V, which is the maximum input range of each amplifier.

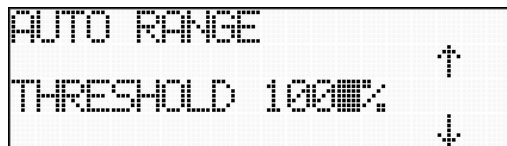
1. Move the cursor to [AUTO RANGE] by pressing the down key at the <INPUT AMP> menu.



2. Press the ENTER key to go to <AUTO RANGE>.



3. Press the ENTER key by confirming the cursor is in [LEVEL THRESHOLD].
 You can set the threshold level to specify the input range automatically by monitoring the input signals.



4. Select the threshold level by changing the percentage in display by using the up and down keys.

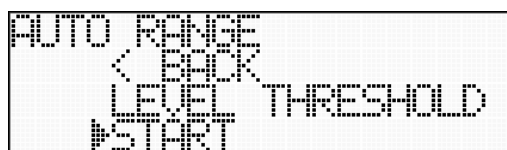
70 %	If the signal exceeds 70 % for measurement, shift to the upper input range.
80 %	If the signal exceeds 80 % for measurement, shift to the upper input range.
90 %	If the signal exceeds 90 % for measurement, shift to the upper input range.
100 %	If the signal exceeds 100 % for measurement, shift to the upper input range.
110 %	If the signal exceeds 110 % for measurement, shift to the upper input range.
120 %	If the signal exceeds 120 % for measurement, shift to the upper input range.
130 %	If the signal exceeds 130 % for measurement, shift to the upper input range.

5. Press the ENTER key to go to the following confirmation after selecting the threshold level.



6. Press the ENTER key to decide the selection value displayed.
 If you do not want to decide the selection, press the STOP key. The selection is not effective. Then return to the <INPUT AMP> menu.

7. The following is displayed when you decide the selection by pressing the ENTER key.



8. Press the ENTER key to start the auto range measurement.

```
AUTO RANGE
          Executing...
ENTER:End /←:Cancel
```

9.

To decide the auto range setting with the measurement result

Press the STOP key after taking a necessary time for auto range measurement. The system automatically sets the suitable input range to each channel based on the measurement.

```
AUTO RANGE
          Finish!!!
Push Enter to Return
```

To cancel the auto range measurement

Press the left key. The system cancels the auto range measurement and does not set the input range to each channel.

```
AUTO RANGE
          Cancel!!!
Push Enter to Return
```

10.

To decide the auto range setting with the measurement result

Press the ENTER key to display the selected input range of each channel. Press the up and down keys to locate the channels to display. Press the ENTER key after confirming the selections. <INPUT AMP> is displayed.

```
INPUT AMP [3/6]
< BACK
RANGE
#AUTORANGE ↓
```

To cancel the auto range measurement

Press the ENTER key to return to <AUTO RANGE> without applying the measured auto range setting.

```
AUTO RANGE
< BACK
LEVEL THRESHOLD
#START
```

About Zero Shift at Auto Range

Adjust the zero shift again after operating the auto range. The auto range measures the signal by canceling the preset zero shift value.

If the auto range results to change the input range, adjust the zero shift percentage according to the specified input range since the zero shift specifies its value in percentages against the input range.

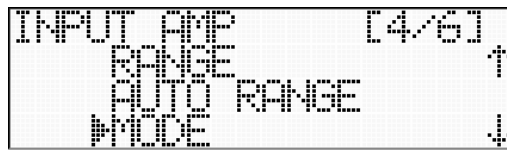
Caution on Using External Sampling Clock at Auto Range

When you set the sampling to external, apply an external sampling clock before starting the auto range function.

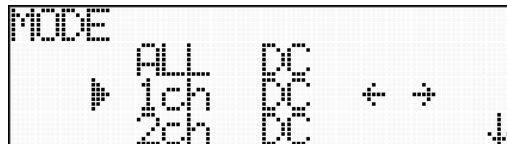
6.1.3 Input Mode Setting

You can set the input mode of each channel.

1. Move the cursor to [MODE] by pressing the down keys at the <INPUT AMP> menu.



2. Press the Enter key to go to <MODE>.



3. Move the cursor to the channel to set its input range by pressing the up and down keys. You can set all effective channels with the same input range at [ALL]. Press the left and right keys to select the desired input mode.

DC	DC coupling mode
IEPE	Turn on the power supply to the sensor connected to the channel. Voltage output type accelerometer and microphone can be directly connected. (IEPE = Integrated Electronics Piezoelectric)
AC	AC coupling mode

4. After setting the input modes of all channels, press the ENTER key to decide the selections. The <INPUT AMP> menu is displayed. If you do not want to decide the selection, press the STOP key. The selection is not effective. Then return to the <INPUT AMP> menu.



6.1.4 Zero Shift

You can set the input zero shift value within +/- 120% of the input range of each channel.

1. Move the cursor to [ZERO SHIFT] by pressing the down keys at the <INPUT AMP> menu.

```
INPUT AMP [5/6]
  AUTO RANGE ↑
  MODE
  ZERO SHIFT ↓
```

2. Press the ENTER key to go to <ZERO SHIFT>.

```
ZERO SHIFT
  ALL +000%
  1ch +000% ← →
  2ch +000% ↓
```

3. Move the cursor to the channel to set the zero shift by pressing the up and down keys.
4. The system outputs a signal of the cursor channel at the MON OUT connector. Press the left or right key to specify the displayed percentage as the zero shift value by monitoring the output signal. An example is connecting to an oscilloscope. You can set all effective channels with the same zero shift value at [ALL]. (The system outputs the signal of Channel 1, and displays the zero shift percentage of Channel 1.) You cannot set the zero shift when you assign Channel 1 for the memo voice channel (refer "6.7.1 Memo Voice Channel Setting", <1ch MEMO> is displayed).

5. Press the ENTER key to choose the zero shift setting on each channel to go to <INPUT AMP>. Press the STOP key to cancel the selections and return to <INPUT AMP>.

```
INPUT AMP [5/6]
  AUTO RANGE ↑
  MODE
  ZERO SHIFT ↓
```

About Zero Shift at Auto Range

Adjust the zero shift again after operating the auto range. The auto range measures the signal by canceling the preset zero shift value.

6.1.5 Manual Calibration

At the calibration at power on state the DS unit reads an internal pre-set calibration value automatically. This process reads the pre-set calibration value recorded beforehand at ROM of each amplifier card. This pre-set calibration value can be renewed and updated by carrying out the manual calibration from the <INPUT AMP> menu. This calibration process carries out an internal measurement on each channel range and each sampling frequency with internal reference voltage, and calibrates with new offset value and gain of each channel, and then writes the new value into ROM of each amplifier card.

When You Operate Manual Calibration

Do not connect any signal on each channel; open the input to execute the manual calibration.

1. Move the cursor to [CALIBRATION] by pressing the down keys at the <INPUT AMP> menu.

```

INPUT AMP      [6/6]
  MODE
  ZERO SHIFT
  CALIBRATION
  
```

2. Press the ENTER key to go to <CALIBRATION>.

```

CALIBRATION
Are You Sure?
  Yes
  No
  
```

If you want to suspend the manual calibration, confirm the cursor is in [No], then press the ENTER key.

3. Move the cursor to [Yes] by pressing the up key to execute the manual calibration.

```

CALIBRATION
Are You Sure?
  Yes
  No
  
```

4. Press the ENTER key. The following is displayed to indicate the progress of the manual calibration in percentages. Level LEDs on the front panel are flashing.

```

CALIBRATION
Executing. . 25%
  
```

Time to Complete Manual Calibration

The calibration will take several minutes to measure all channels and all ranges with all sampling frequencies.

5. The following is displayed when completing the manual calibration.

```

CALIBRATION
Finish!!!
Push Enter to Return
  
```

The calibration result of each channel is shown at the level display LED on the front panel. Green LED indicates the channel has successfully passed the calibration. Red LED indicates the channel has failed the calibration, try the calibration again. Press the PEAK CLEAR key to turn off the RED LED.

6. Press the ENTER key to return to <INPUT AMP>.

```
INPUT AMP      [6/6] ↑  
  MODE  
  ZERO SHIFT  
  NOCALIBRATION
```

6.2 Sampling Frequency Setting

You can select the recording sampling frequency of the system.

Effective Sampling Frequency vs. Recording Channels

Lowest limit recording rate (sampling frequency x number of channels) must be 500K words/sec or higher. Highest limit recording rate must be 16M words/sec or lower. See the table below.

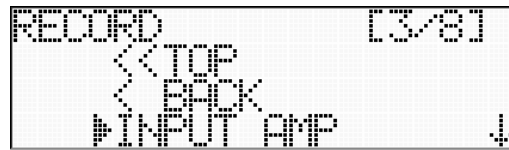
You can select all available channels at the external sampling mode upon the conditions within the applicable sampling frequencies and at a fixed external sampling frequency.

Effective Sampling Frequency vs. Recording Channels

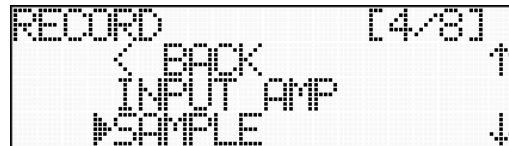
Fields indicating "OK" are effective for setting.

Sampling Frequency (kHz)	Channel Selections					
	2ch	4ch	8ch	16ch	32ch	64ch
1000	OK	OK	OK	OK		
512	OK	OK	OK	OK		
500	OK	OK	OK	OK	OK	
409.6	OK	OK	OK	OK	OK	
400	OK	OK	OK	OK	OK	
384	OK	OK	OK	OK	OK	
256	OK	OK	OK	OK	OK	
250	OK	OK	OK	OK	OK	OK
204.8		OK	OK	OK	OK	OK
200		OK	OK	OK	OK	OK
192		OK	OK	OK	OK	OK
128		OK	OK	OK	OK	OK
125		OK	OK	OK	OK	OK
102.4			OK	OK	OK	OK
100			OK	OK	OK	OK
96			OK	OK	OK	OK
64			OK	OK	OK	OK
62.5			OK	OK	OK	OK
51.2				OK	OK	OK
50				OK	OK	OK
48				OK	OK	OK
40.96				OK	OK	OK
40				OK	OK	OK
32				OK	OK	OK
31.25				OK	OK	OK
25.6					OK	OK
25					OK	OK
24					OK	OK
20.48					OK	OK
20					OK	OK
External Sampling	OK	OK	OK	OK	OK	OK

1. Go to the <RECORD> menu.



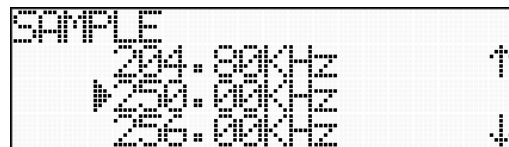
2. Move the cursor to [SAMPLE] by pressing the down key.



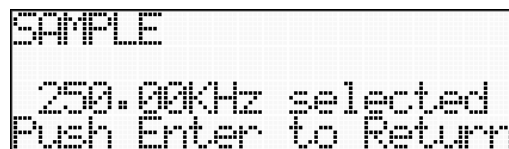
3. Press the ENTER key to go to <SAMPLE>. The selectable sampling frequencies are displayed.



4. Move the cursor to a desired sampling frequency you want to set.



5. Press the ENTER key to display the confirmation for the current selection.



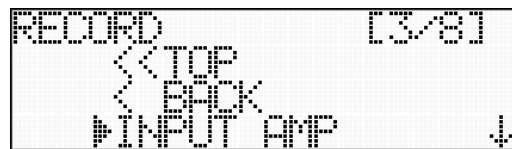
6.3 Number of Recording Channels' Setting

You can set the number of the recording channels.

Effective Sampling Frequency vs. Recording Channels
 Lowest limit recording rate (sampling frequency x number of channels) must be 500K words/sec or higher. Highest limit recording rate must be 16M words/sec or lower. See the table below.

You can select all available channels at the external sampling mode upon the conditions within the applicable sampling frequencies and at available number of channels.

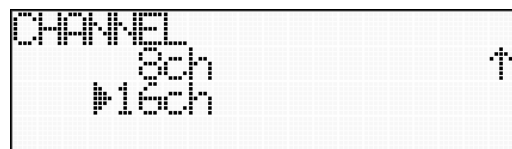
1. Go to the <RECORD> menu.



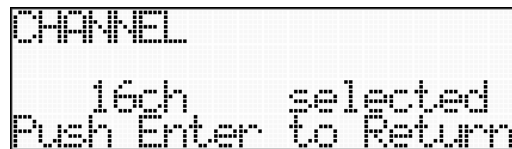
2. Move the cursor to [CHANNEL] by pressing the down keys.



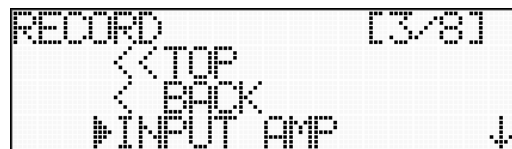
3. Press the ENTER key to go to <CHANNEL>. The selectable numbers of the recording channels are displayed.



4. Press the ENTER key by moving the cursor to a desired number of the recording channels. The confirmation of the current selection is displayed.



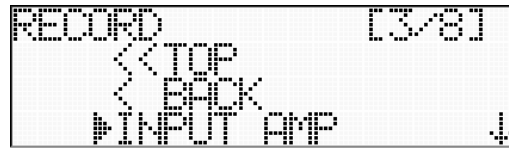
5. Press the ENTER key to decide to go to the <RECORD> menu. Press the STOP key to cancel the selections and return to the <RECORD> menu.



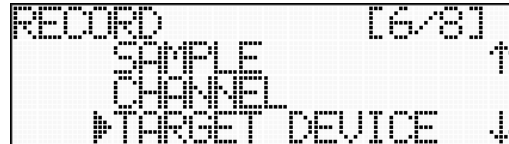
6.4 Recording Target Device Setting

You can select the recording target device.

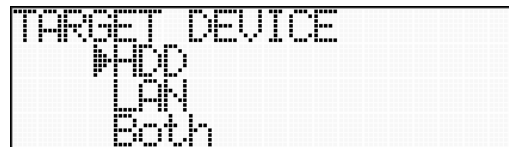
1. Go to the <RECORD> menu.



2. Move the cursor to [TARGET DEVICE] by pressing the down keys.



3. Press the ENTER key to go to <TARGET DEVICE>.



4. Move the cursor to the recording target device to be used with the up and down keys.

HDD	Record to the internal hard disk.
LAN	Record to the mounted network drive.
Both	Record to the internal hard disk and the network drive at the same time.

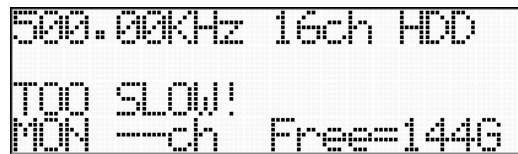
Recording to Network Drive

Set [Net Drive] on the network device setting by using the browser.

You cannot connect to the network drive if its remain capacity is 4GB or less.

You need an extended capacity of 5 GB or more to your expected recording amount.

When you select [LAN] or [Both] to record to the network drive, the recording may not be continued because enough data transmission band via network is not secured. In this case, <TOO SLOW!> is displayed and the recording is stopped right after recording start.



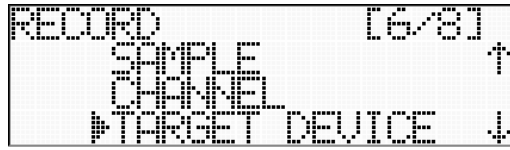
<TOO SLOW!> disappears when moving from the current menu.

If the network drive reaches to full while recording, the DS stops recording and displays <DSIK FULL!!> by terminating the network connection. Secure an empty space first on the network drive and then reconnect and set [Net Drive].

5. For example, select [HDD]. Press the ENTER key by confirming the cursor is in [HDD].



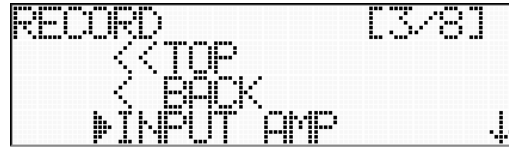
- 6.** Press the ENTER key to decide the selection. The <RECORD> menu is displayed.
If you do not want to decide the selection, press the STOP key. The selection is not effective.
Then return to the <RECORD> menu.



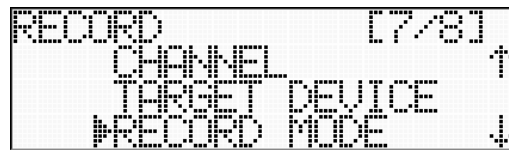
6.5 Record Mode Setting

You can set the recording mode. You can select a mode to stop recording at media full or an endless mode by using the internal HDD as a ring format to continue recording until STOP condition met.

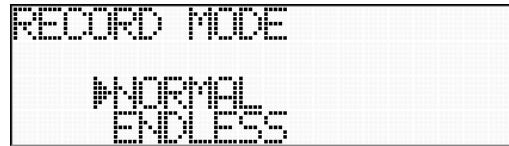
1. Go to the <RECORD> menu.



2. Move the cursor to [RECORD MODE] by pressing the down keys.

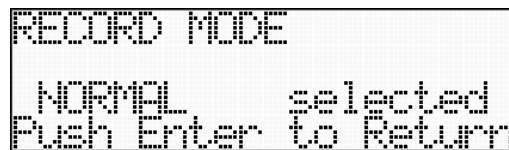


3. Press the ENTER key to go to <RECORD MODE>. The selectable record modes are displayed.



NORMAL	Stop recording at the media full state.
ENDLESS	Record continuously until STOP condition is met by using the internal HDD as a ring format. In this mode, press REC to start recording, refer “7.2 Start and Stop Recording”. The synchronization recording mode does not support the endless recording. The endless mode is effective only when the recording to the internal hard disk is selected. Elapsed time on the LCD returns to 00:00:00 and then counts up again after it reaches to 9999:59:59.

4. Press the ENTER key by moving the cursor to a desired record mode to go to the confirmation of the current selection.



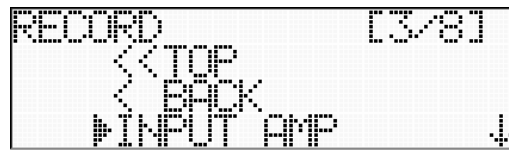
5. Press the ENTER key to decide the selection to go to the <RECORD> menu. If you do not want to decide the selection, press the STOP key. The selection is not effective. Then return to the <RECORD> menu.



6.6 Trigger Mode Setting

You can set the trigger mode. You can set the pre-trigger and the level trigger.

1. Go to the <RECORD> menu.



2. Move the cursor to [TRIGGER SETUP] by pressing the down keys.



3. Press the ENTER key to go to <TRIGGER SETUP> to select a desired trigger mode.



You can select the following trigger mode. You can set both trigger modes at one time.

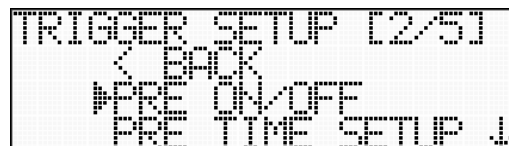
PRE	Pre-trigger mode. Set the pre-trigger area. Selectable pre-trigger times in seconds are displayed by being automatically calculated depending on the current settings of the sampling frequency and the number of the channels. This mode is effecting only when the recording to the internal hard disk is selected.
LEVEL	Level trigger mode. Set the monitor channel for the level trigger (the up or down cross) and the trigger threshold level in % of the input range.

Pre-trigger Mode Setting

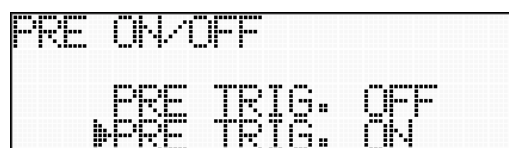
Pre-trigger Mode

The pre-trigger mode is effective only when the recording to the internal hard disk is selected. When entering to REC standby state, <PREBUFFERING> is displayed for specified seconds and then <RECSTANDBY> is displayed. The recording is possible at <PREBUFFERING> state, but the recording time is shorten than the specified seconds.

1. You can set the pre-trigger mode as follows.
Press the ENTER key by confirming the cursor is in [PRE ON/OFF].



2. <PRE ON/OFF> is displayed. Move the cursor to [PRE TRIG. ON] by pressing the down key.



3. Press the ENTER key to go to the confirmation of the current selection.

```

PRE ON/OFF
PRE TRIG. ON
Push Enter to Return
  
```

4. Press the ENTER key by confirming that <PRE TRIG. ON> is displayed.

5. Next, set the times for the pre-trigger data in seconds.
Move the cursor to [PRE TIME SETUP] at <TRIGGER SETUP>.

```

TRIGGER SETUP [3/5]
  <BACK
PRE ON/OFF
PRE TIME SETUP ↓
  
```

6. Press the ENTER key to go to <PRE TIME SETUP>.

```

PRE TIME SETUP
  010 sec
PRE TIME SETUP ↓
  020 sec
  030 sec
  
```

7. Press the ENTER key after moving the cursor to a desired time with the up and down keys.

8. Press the ENTER key by confirming the current selection.

```

PRE TIME SETUP
PRE TRIG. 020 sec
Push Enter to Return
  
```

Data Sorting after Pretrigger Recording

The LED of the STOP key flashes while sorting pretrigger. Next recording will not be accepted after completing this sorting process and the LED turns on. It may take a longer time on the recording condition. Never cut the power while this sorting process, the power back up system for data saving is not available for this moment.

Level Trigger Mode Setting

Condition of Level Trigger Activation

Recording by the level trigger does not start when the input signal already exceeds the up or down cross of the preset trigger threshold level. Recording by the level trigger will start when an input signal first crosses the point that passed set value under the following condition.

When the system detects that the signal goes over the pre-set threshold level 4 sampling times in succession, the system observes the 5th sampling data. If the signal exceeds the threshold level at the 5th sampling, the system activates the trigger.

(This helps to prevent momentary noises from accidentally triggering the system.)

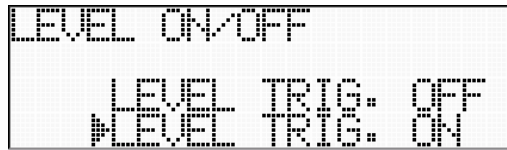
Presence of the trigger is recorded to AD data of CH1, LSB 1 bit.

1. You can set the level trigger mode as follows.
Press the ENTER key by moving the cursor to [LEVEL ON/OFF].

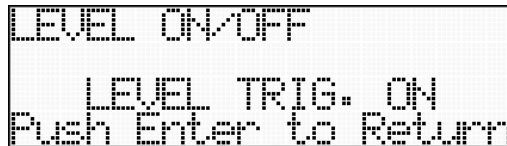
```

TRIGGER SETUP [4/5]
PRE ON/OFF ↑
PRE TIME SETUP
LEVEL ON/OFF ↓
  
```

2. <LEVEL ON/OFF> is displayed. Move the cursor to [LEVEL TRIG. ON] by pressing the down key.



3. Press the ENTER key to go to the confirmation of the current selection.

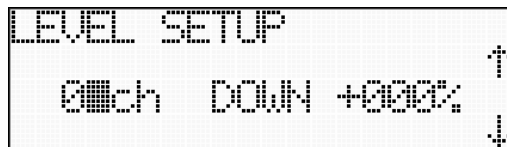


4. Press the ENTER key by confirming that <LEVEL TRIG. ON> is displayed.

5. Next, set the times for the trigger level. Move the cursor to [LEVEL SETUP] at <TRIGGER SETUP>.



6. Press the ENTER key to go to <LEVEL SETUP>.



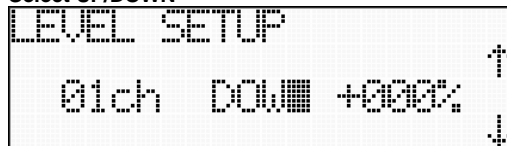
7. Move the cursor to each setup condition with the left and right keys. There are three setup conditions for the level trigger.

Select Level Trigger Monitor Channel



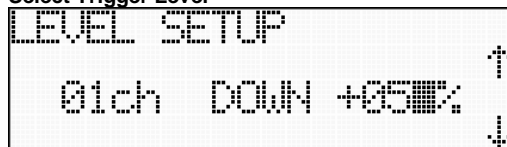
Select the channel to be monitored for the level trigger with the up and down keys.

Select UP/DOWN



Select the up cross (UP) or the down cross (DOWN) to detect the level with the up and down keys.

Select Trigger Level



Select the input level to detect the trigger point in percentage of the input level.

8. Press the ENTER key after setting each setup condition.

9. Press the ENTER key to decide the current selections when the confirmation is displayed.

```
LEVEL ON/OFF
          LEVEL TRIG. SET!
Push Enter to Return
```

About Level Trigger

The LED of the START key flashes fast at the REC standby state.

You can use a combination of the level trigger and the pretrigger on recording to the internal hard disk drive except for the endless recording mode.

6.7 System Settings

You can set the general system settings, such as the voice memo channel and the speaker output, etc., at the <SYSTEM> menu.
To enter the <SYSTEM> menu,

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

2. Press the ENTER key to display the main menu <MENU>. (Below example is for the recording only unit.)

```
MENU [3/7]
  PLAYBACK ↑
  RECORD
  SYSTEM ↓
```

3. Move the cursor to [SYSTEM] by pressing the down key.

```
MENU [4/7]
  PLAYBACK ↑
  RECORD
  SYSTEM ↓
```

5. Press the ENTER key to go to the <SYSTEM> menu.

```
SYSTEM [3/8]
  <TOP
  <BACK
  MEMO ↓
```

6.7.1 Voice Memo Channel Setting

You can use Channel 1 either for recording data or recording voice memo. When turning on the voice memo channel, you can record the voice memo inputted to <MEMO IN> on the front panel at Channel 1.

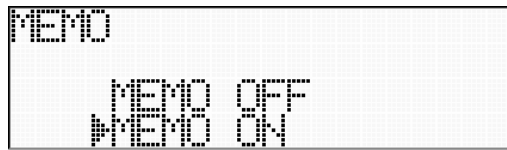
Sampling Frequency of Voice Memo

The sampling frequency of the voice memo recording equals the sampling frequency of the system.

1. Press the ENTER key by confirming that the cursor is in [MEMO] at the <SYSTEM> menu.
2. The <MEMO> menu is displayed.
You can select either memo on or memo off for voice memo recording.

```
MEMO
  MEMO OFF
  MEMO ON
```

3. Move the cursor to [ON] to turn on the voice memo.



```
MEMO
MEMO OFF
MEMO ON
```

4. Press the ENTER key to go to the confirmation of the current selection.

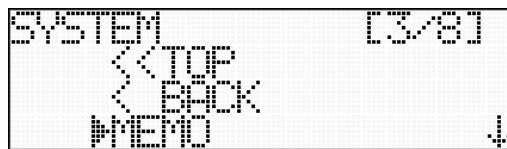
When turning on the voice memo recording, the level display LED of Channel 1 flashes orange. It indicates Channel 1 records the voice memo, not data.



```
MEMO
MEMO ON selected
Push Enter to Return
```

5. Press the ENTER key to decide the selection. The <SYSTEM> menu is displayed.

If you do not want to decide the selection, press the STOP key. The selection is not effective. Then return to the <SYSTEM> menu.



```
SYSTEM [3/8]
<TOP
<BACK
MEMO ↓
```

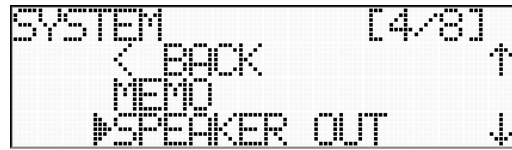
Level Display LED

When turning on the voice memo recording, the level display LED of Channel 1 lights orange at the STOP state (<READY> display). It indicates Channel 1 records the voice memo, not data.

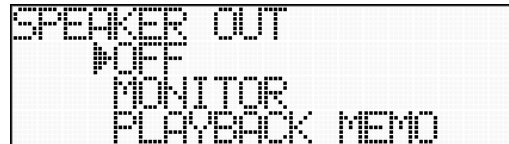
6.7.2 Output from Speaker

You can listen to signals being recorded at a specified channel with the speaker on the front panel. You can turn on or off the speaker output.

1. Move the cursor to [SPEAKER OUT] at the <SYSTEM> menu by pressing the down keys.



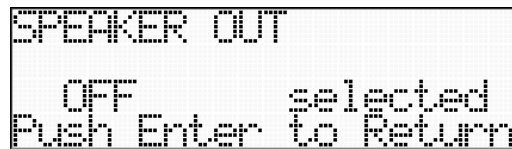
2. Press the ENTER key to go to <SPEAKER OUT>.



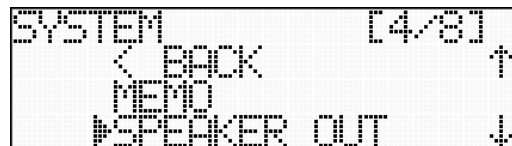
3. Move the cursor to a desired selection with the up and down keys.

OFF	Turn off the speaker output.
MONITOR	Output the signal of the monitor channel selected while recording.
PLAYBACK MEMO	Output the voice memo at the playback state when the voice memo recording is turned on. The function is effective at the DS unit that the playback is available.

4. Press the ENTER key to go to the confirmation of the current selection.



5. Press the ENTER key to decide the selection. The <SYSTEM> menu is displayed. If you do not want to decide the selection, press the STOP key. The selection is not effective. Then return to the <SYSTEM> menu.



6.7.3 Recording IRIG-B Time Code

You can select the IRIG-B mode to record an external IRIG-B time code to Channel 2 as a format of wave form signals. This time code is displayed on the LCD of the front panel.

Data and Time of Data File

Note that the start date and time recorded on the data file is NOT IRIG-B time code here, but the internal DS time code.

1. Move the cursor to [IRIG-B] at the <SYSTEM> menu by pressing the down keys.

```
SYSTEM [8/8]
ADD FORMAT ↑
DEL LAST DATA
IRIG-B
```

2. Press the ENTER key to go to <IRIG-B>.

```
IRIG-B
< BACK
IRIG-B ON
IRIG-B OFF
```

3. To select the IRIG-B recording mode, connect the IRIG-B time code signal to Channel 2, and then press the ENTER key by confirming that the cursor is in [IRIG-B ON].

4. The confirmation of the current selection is displayed.

```
IRIG-B
IRIG-B ON selected
Push Enter to Return
```

5. Press the ENTER key to decide the selection. Connected IRIG-B time code data is displayed at the STOP state (<READY> display).

```
500.00kHz 16ch HDD
17:12:34
READY
MON ---ch Free=145G
```

If the system cannot decode the IRIG-B time code connected to Channel 2, the following is displayed.

```
500.00kHz 16ch HDD
NO SIGNAL
READY
MON ---ch Free=145G
```

If this occurs, make sure the cable connection and/or the input level are/is correct.

7. RECORDING OPERATIONS

You can record data to the internal hard disk drive (HDD) and/or to the network drive by using the keys on the front panel.

If You Record Extreme Numbers of Files.

If you record extreme numbers of the files, the DS will takes a time to enter to the READY mode after processing the system boot up, the disk exchange, and the file delete.

7.1 Check Recording File Name and Record Mode

You can confirm a specified recording file name and a specified record mode.

How to Set File Name

You can set or change a unique file name by using the browser running on the PC connected to the DS via network.

If no unique file name is specified, the default file name (DEFAULT_0001) will be assigned and used.

You can use a long file name by using the browser, however you can see it the last part of file name due to the limitation of its display size.

The maximum size which can be specified is 78 bytes , 78 characters.

1. Confirm that the system is in ready state (<READY> display).

(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

The system displays the remaining recording capacity of the hard disk drive in GB unit. (<Free=145G> in above example). It will be reduced in the progress of the recordings.

Displayed Capacity

The displayed capacity in GB unit is an "approximate" number by converting 1 GB for 1024 x 1024 x 1024. Therefore, the displayed <145GB> is calculated as 155,692,564,480 bytes.

2. Press the left key to display the current settings for 3 seconds.

You can check the file name, the current date and time of the system, the recording mode, and the IP address.

```
DEFAULT_0001
2004-03-25 13:00:10
REC MODE: NORMAL
IP XXX.XXX.XXX.XXX
```

3. After 3 seconds, the system returns to the ready state.

The operation to display the current setting is effecting while the system is in recording state.

7.2 Start and Stop Recording

You can start and stop recording by using the keys on the front panel.

1. Confirm that the system is in ready state (<READY> display).

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

2. Press the REC key. <RECSTANDBY> is displayed and the system enters the record standby state. The LED on the REC key lights red and the LED on the START key flashes green.

```
500.00kHz 16ch HDD
RECSTANDBY
MON ---ch Free=145G
```

Recording at Endless Mode (6.5 Record Mode Setting)

At the endless recording mode, press the REC key to start recording. You do not need to press the START key.

Counter value being displayed while recording is the elapsed time from the start.

Maximum recording capacity is limited at the size of the internal hard disk drive.

3. Press the START key. <REC> is displayed and the system goes into the recording state. The LED on the START key lights green.

```
500.00kHz 16ch HDD
DEFAULT_0001
REC >>>>
MON ---ch 00:07:39
```

<>>> flashes to indicate that the system is in recording.

Elapsed time from the start recording is displayed at the right corner of the LCD.

Recording to Network Drive

When you select [LAN] or [Both] to record to the network drive, the recording may not be continued because enough data transmission band via network is not secured. In this case, <TOO SLOW!> is displayed and the recording is stopped right after recording start.

```
500.00kHz 16ch HDD
TOO SLOW!
MON ---ch Free=144G
```

<TOO SLOW!> disappears by moving from the current menu.

4. Press the EVENT key to record the event mark(s) while recording. Pressing the EVENT key turns the LED of the EVENT key to orange

```
500.00kHz 16ch HDD
DEFAULT_0001
EVENT >>>>
MON ---ch 00:08:15
```

<EVENT> will be displayed for 3 seconds while pressing the EVENT key, then <REC> will be displayed again.

- 5.** Press the PAUSE key to suspend recording, and go to recording standby state (<RECSTANDBY> display). The LED on the START key flashes green.

```
500.00kHz 16ch HDD
RECSTANDBY
MON ---ch Free=140G
```

- 6.** Press the START key to re-start recording to create a new data file.

- 7.** Press the STOP key to stop recording and go to the ready state (<READY> display).

```
500.00kHz 16ch HDD
READY
MON ---ch Free=140G
```

- 8.** Each pressing of the PAUSE key or the STOP key creates a data file and an associated header file.

- 9.** When the recording starts (Press the START key at <RECSTANDBY> display, or press the START key after pressing the REC key at <READY> display), the data file ID will be incremented to record.

About EVENT

Maximum number of EVENT marks within a single recording file is 200.

Elapsed Time Display at External Sampling Mode

The LCD displays --:--:-- on the elapsed time when using the external sampling .

7.3 LED Display while Recording

You can monitor the input signal level on each channel at the channel correspondent level display LED while recording.

LED Status	Input Signal Level
No light	Lower than +/-5%
Green	+/- 5% to approximately +/- 50%
Orange	+/- 51% to +/- 125%
Red	Exceeding +/- 125%

Press the PEAK CLEAR key on the front panel to clear the overload red display.

Voice Memo Recording

Turning on the voice memo recording flashes orange on the level display LED of Channel 1 at Stop state (<READY> display) to indicate Channel 1 is assigned for the voice memo recording.

7.4 Monitor Output while Recording

You can specify a single channel to output its monitor analog signal from the MON OUT connector on the front panel. The output signal is a through output of the analog amplifier.


1. Press the up and down keys to change the monitor output channel being indicated by flashing number in <MON -Ch>.

```
500.00kHz 16ch HDD
DEFAULT_0001
REC
MON 1ch 00:07:39
```

You can listen to the sound of the monitor channel data at the speaker.

7.5 Format

Each recording start and stop creates a data file in the case of the recording to the internal hard disk drive. When the hard disk is full, the system automatically stops recording. In order to record a new file, execute the format to delete the recorded data files. You can select a format option from either one of [QUICK], [NORMAL], or [PURGE].



CAUTION
Executing format will erase all data files recorded on the hard disk drive.

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

2. Press the ENTER key to display the main menu <MENU>. (Below example is for the recording only unit.)

```
MENU [3/7]
  PLAYBACK ↑
  RECORD
  SYSTEM ↓
```

3. Move the cursor to [SYSTEM] by pressing the down key.

```
MENU [4/7]
  PLAYBACK ↑
  RECORD
  SYSTEM ↓
```

4. Press the ENTER key to go to the <SYSTEM> menu.

```
SYSTEM [3/8]
  <TOP
  <BACK
  MENU ↓
```

5. Move the cursor to [HDD FORMAT] by pressing the down keys.

```
SYSTEM [6/8]
  SPEAKER OUT ↑
  ADD CHANGE
  HDD FORMAT ↓
```

6. Press the ENTER key to go to <HDD FORMAT>. Move the cursor to either one of [QUICK], [NORMAL], or [PURGE], then press the ENTER key.

```
HDD FORMAT [2/4]
  <BACK
  QUICK
  NORMAL ↓
```

7. Move the cursor to [Yes] by pressing the up key to execute the format. (Example of QUICK FROMAT.)

```

QUICK FORMAT
Are You Sure?
  Yes
  No
  
```

8. Press the ENTER key to start formatting. The following will be displayed while formatting. (Example of QUICK FORMAT.)

```

QUICK FORMAT

Please Wait...
  
```

9. When completing the format, the systems returns to the ready state (<READY> display).

HDD FORMAT OPTIONS

Options	Description	Estimate Time for Format
QUICK	Fastest format, only write a delete mark.	Approximately 20 seconds
NORMAL	Format to check each sector status along with writng a delete mark.	Approximately 40 minutes
PURGE	Execute the QUICK format first and write dummy data comply with the method specified by US Department of Defense to whole disks. Then delete the dummt data.	Approximately 2 hours

(Estimate time for format above is based on 145GB HDD capacity.)

About Fomat

While the format operation, the DS unit generates the repeated beep sounds. At the NORMAL or PURGE option is selected, the progress of the format in % is displayed at the LCD.

Please note that the HDD may be damaged at the following scenario while the format operation;

- 1) The LCD displays a message of <FORMAT ERROR!>.
- or
- 2) The DS genarets the different beep sounds (Lower beep sounds).
- or
- 3) No progress shown on the % displays, or not to complete formatting when extremely exceeding the estimate time.

In any of above cases, please exchange the HDD by following the procedures explained at "7.9 Exchange Internal Hard Disk Drive".

Turn off the power by the power switch on the rear panel once and reboot the system to exchange the HDD in case of 2) or 3) above.

Format by Using Browser

Only the QUICK format option is supported at the format menu of the browser control.

7.6 Delete Last Recorded Data File

You can delete the last recorded data file at the recording mode to the internal hard disk drive.

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

2. Press the ENTER key to display the main menu <MENU>. (Below example is for the recording only unit.)

```
MENU [3/7]
  PLAYBACK ↑
  RECORDED
  SYSTEM ↓
```

3. Move the cursor to [SYSTEM] by pressing the down key.

```
MENU [4/7]
  PLAYBACK ↑
  RECORDED
  SYSTEM ↓
```

4. Press the ENTER key to go to the <SYSTEM> menu.

```
SYSTEM [3/8]
  <TOP
  <BACK
  MEMO ↓
```

5. Move the cursor to [DEL LAST DATA] by pressing the down keys.

```
SYSTEM [7/8]
  HDD CHANGE ↑
  HDD FORMAT
  DEL LAST DATA ↓
```

6. Press the ENTER key to go to <DEL LAST DATA>.

```
DELETE LAST DATA
Are You Sure?
  Yes
  MEMO
```

7. Move the cursor to [Yes] by pressing the up key to delete the last recorded data file.

```
DELETE LAST DATA
Are You Sure?
  Yes
  No
```

8. Press the ENTER key to delete the last recorded data file.

```
DELETE LAST DATA
LAST DATA DELETE!
Push Enter to Return
```

9. Press the Enter key to return to the <SYSTEM> menu.

```
SYSTEM [7/8]
  HDD CHANGE ↑
  HDD FORMAT
  DEL LAST DATA ↓
```



CAUTION

About DELETE LAST FILE

Repeating 1 to 9 deletes the data files from the latest time stamp to the previous ones.

7.7 About Data File

Data format of the DS series complies with TAFFmat generally being used at TEAC digital data recorders. TAFFmat (an acronym for TEAC Data Acquisition File Format) is a file format composed of the following:

- a data file containing A/D (analog to digital) converted data. The file is in binary format with the extension "dat".
- a header file containing information such as recording conditions. The file is in text format with the extension "hdr".

This document uses the term ID to refer to a collection of data collected from the start of recording on the DS series until the recording is stopped or paused. For each ID, one data file and one header file is recorded. The above files share a common file name, to which is appended an ID number. When a new file name is specified, this ID number becomes 1. Each time recording starts, this number is incremented by 1.

A/D-converted data is recorded as 2-byte integers from -32768 to +32767. Negative numbers are expressed as complements of 2. The byte order is from the lower bytes to the higher bytes. The data order is as follows: first sampling channel order -> second sampling channel order ->...-> last sampling channel order. At the LX series, ADC value +/- 25000 represents +/- 100 % of the input range.

This document uses the term scan to refer to a collection of data resulting from one sampling. A data file is a collection of scan repetitions.

The DS series records the data with 2 GB separated multiple files in case the data exceeds 2 GB. The DS series manages these separated data files by adding 4 digit numbers starting from 0000 after the file ID to control the data sequence.

If the file IDs are used from 0001 to 9999, the DS creates the file name of FILE#_OVF_0001 to record. In such case, change and set the file name.

At recording, some control data areas are created, such as a circular recording area, a pretrigger area, and a post data area. Depending on the recording mode (NORMAL/ENDLESS) and the pretrigger state, data to be subtracted by the keyword information on the header file involves.

Example File Names
 When entering the file name as "TEST" at the browser:
 TEST_0001_0000.DAT
 TEST_0001_0001.DAT
 TEST_0001.HDR

Restart recording after stop
 TEST_0002_0000.DAT (0 Byte data or Pretrigger amount)
 TEST_0002_0001.DAT (2GB)
 TEST_0002_0002.DAT (less 2 GB)
 TEST_0002.HDR

XXXX_****_0000.DAT is the pre-data file, and is the pretrigger data at the pretrigger mode.
 At the normal recording mode, the data size of the file is 0 Byte.
 **** indicates the ID number.

The maximum size which can be specified is limited as follows:

... User specify area(78 bytes) ...	_	n	n	n	n	Null

User specify area(78 bytes)		Reserved area 6 bytes				

Even though the total size of file name is 84 bytes, The maximum size which can be specified is 78 bytes.

For details on the data file format, please contact us.

About Header File Format of DS Series

Header files are ASCII-format text files containing information such as recording conditions. Header files are based on the waveform-analysis software DADISP format. Because the files are in text format, they can be read by Windows applications such as WordPad or NotePad.

In a header file, each recording-condition entry is written on 1 line, with parameters separated by a comma (,). The following shows an example of a header file, with the entries explained after the file.

The keywords up to "DATA" are the same as a header file made in other models. However the keywords after "DATA" are made according to each recorder's supported features. From "DATA" to "DEVICE", each recorder records the common information specified by TEAC, although some contents are based differently on the features supported by each recorder. Model-unique information will be commented after "DATA" keyword.

Software can read the DS data files in TAFFmat format since there is the common part explained above. "DEVICE" keyword following information does not establish an order, and "REM" statements are repeatedly available for comments.

To avoid the possibility of duplicate keywords from other recorders, "DS_" is added to the front of the keyword (except "DEVICE").

Sample Header File Format

A sample of a header file made in DS series is shown as follows.

```
DATASET THISIS~1
VERSION 1
SERIES CH1_MyCh01,CH2_MyCh02,CH3_MyCh03,CH4_MyCh04
DATE 03-10-2003
TIME 18:45:24
RATE 2.500000e+005
VERT_UNITS Volt,Volt,Volt,Volt
HORZ_UNITS Sec
COMMENT This is a test long memo or comment.
NUM_SERIES 16
STORAGE_MODE INTERLACED
FILE_TYPE INTEGER
SLOPE 2.340000e+000,2.340000e+000,2.340000e+000,2.340000e+000
X_OFFSET 0.000000e+000
Y_OFFSET 0.000000e+000,0.000000e+000,0.000000e+000,0.000000e+000
NUM_SAMPS 210100100
DATA
CH1_1 AR-DSPA,RANGE=5V,FILTER=ON
CH2_2
AR-DSPA,RANGE=5V,FILTER=OFF,TEDS=FF11C0192100E5CC1160F415BC049EC118CEDED83B618403E02010
0804028140
CH3_3 AR-DSPA,RANGE=5V,FILTER=ON
CH4_4 AR-DSPA,RANGE=5V,FILTER=OFF
MARK 12345678,12345801,12345924,12346047,12346170,12346293,12346416,12346539
REM -----
REM [Caution]
REM Data below is model dependent and proprietary information.
REM Full care must be taken when handling the data below.
REM -----
DEVICE DS
DS_FILE_TITLE This is a very long file name.
DS_MEMO_FULL This is a test long memo or comment.
DS_START_CONDX SOFT
DS_STOP_CONDX SOFT
DS_CLOCK INTERNAL
DS_SYNC ON SLAVE=03
DS_RECMODE NORMAL
DS_VOICE ON
DS_IRIGB OFF
DS_ZERO_SHIFT 75,0,0,0
DS_PRETRIG_VOL 0
END
```

RATE Keyword at External Sampling Mode

"RATE 1.000000e+000" is used at the external sampling mode.

MARK Keyword After Transferring Data

The MARK keyword changes from MARK to REM MARK of a header file created with the extracting and transferring process.

We will explain the keywords after the "DATA" as follows.

Keyword	Description
DS_CH_###	"###" is for the channel number. Next, an amplifier name, an input range, a filter setting, and TEDS information are shown in sequence.
MARK	Indicate numbers of scans (samples) on the recorded data when entered "EVENT" or "MARK" while recording. Numbers of scans of multiple MARKs are shown in line separated by commas (,).
REM	Indicate comments not valid for the header information. It can be used the same as "REM" comments used by DOS batch file. You can insert it at any position after "DATA".
DEVICE	Indicate what model was used for recording. "DS" is used when the data is recorded by the DS series.
DS_FILE_TITLE	Indicate the file title being removed, a file path and an extension from a data file and a header file.
DS_MEMO_FULL	You can enter total 1024 characters for "MEMO" or "COMMENT" at the DS series. If there is a line feed in the original sentence, it will be converted to commas to make a single line comment.
DS_START_CONDX	Indicate the recording start condition. SOFT: Recording starts with the front panel control or the browser by user. LEVEL/TTL: Recording starts by the signal level or an external TTL.
DS_STOP_CONDX	Indicate the recording stop condition. SOFT: Recording stops with the front panel control or the browser by user. LEVEL/TTL: Recording stops by the signal level or an external TTL.
DS_CLOCK	Indicate the sampling clock used either "INTERNAL" for internal or "EXTERNAL" for external.
DS_SYNC	Indicate the synchronization mode information. The first item indicates the synchronization recording "ON" or "OFF", the next indicates "MASTER" or "SLAVE". Then "SLAVE ID" is continued in the case of "SLAVE". Example) "ON MASTER", "ON SLAVE 3", etc.
DS_RECMODE	Indicates the recording mode. NORMAL: Normal recording mode. PRETRIG: Pre-trigger recording mode ENDLESS: Endless recording mode
DS_VOICE	Indicate whether or not Channel 1 is assigned to the voice memo recording channel. ON: Voice memo enable (record voice memo instead of data) OFF: Voice memo disable (record data)
DS_IRIGB	Indicate whether or not Channel 2 is assigned to the IRIG-B time code recording channel. ON: IRIG-B recording enable (record the IRIG-B time code instead of data) OFF: IRIG-B recording disable (record data)
DS_ZERO_SHIFT	Indicate the input zero shift percentage entered by user. Range: -120 to 120
DS_PRETRIG_VOL	Actual number of data in pre-trigger area When pre-trigger is not selected, the value is 0. When pre-trigger is selected, the number of data in pre-trigger area is shown.

7.8 Recording Synchronization

You can synchronize the multiple DS units to record data by connecting the proprietary synchronization cables (Standard cable length is 1 m).
The slave units follow with a recording start of the master DS unit. When the master unit stops recording, the slave units stop recording also.

Recording start accuracy between the master unit and the slave unit is within one sampling clock. Sampling clock of the master unit is used for one of the slave units.

Maximum Numbers of Units for Recording Synchronization

Two DS units (Master x 1, Slave x 1) can be synchronized for recording.

Merge Multiple Data Files

Optional PL-S1001 LX View program can merge the recorded data files which are synchronized to one file. However; they shall be 2GB or lower each, and shall be lower than 128 channels total. There is a delay at the slave unit when stopping since the master unit sends the stop command to the slave unit, therefore the file size of the slave unit is larger than one for the master unit. The LX View program merges the data of the master unit and the slave unit at the beginning of their data, the stop point of the merged data is specified with the size of the master unit that NUM_SAMPS keyword value of the header file is smaller.

Operation of Slave Unit

If you set the lower sampling frequency, the activities of the level display LEDs of the slave unit are delayed by following the start recording of the master unit. Starting internal sampling in synchronization follows the start of the master unit.

Proprietary Synchronization Cable

Turn off the power of the units to connect and disconnect the synchronization cable. Disconnecting the cable while turning on the power of the units turns the slave unit power off. When turning on the MAIN Power Switches on the rear panels with connecting the synchronization cable, make sure to turn on the power of the master unit first, and then the slave unit. When turning off, turn off the slave unit first, and then the master unit.

Synchronization Recording with External Trigger

Connect an external trigger signal to the master unit.
Stay at the REC STANDBY state of the units first for recording synchronization with the external trigger.

Recording Mode Limitations on Recording Synchronization

The recording synchronization is available only when the recording to the internal HDD is selected.
The recording synchronization does not support the endless recording.
Pre-trigger recording is not available at the recording synchronization mode.
Event marks are valid at the master unit only.

1. Connect the master unit and the slave unit by using the synchronization cable before turning on the power.

Connect between <SYNC OUT> of the rear panel of the master unit and <SYNC IN> of the rear panel of the slave unit. The DS series can automatically assign the master and slave status with the cable connection.

2. Turn on the power of the master unit after the cable connection. The slave unit will be automatically turned to on with the power on of the master unit. The master unit sends its sampling clock to the slave unit.

3. When the recording synchronization is ready, the LCDs of the master and slave units are displayed as follows.

Master Unit

```
100.00kHz 32ch HDD
MASTER
READY
MON ---ch Free=145G
```

Slave Unit

```
IN SYNC 32ch HDD
SLAVE ID 00
READY
MON ---ch Free=145G
```

POWER LED of the slave unit lights orange.

You can confirm the synchronization status of each unit at <SYNC INFO> of the <MISC> menu. (9.3 Display System Synchronization Status)

Confirm Synchronization Status

If the LCD of each unit does not display above, turn off the power of the units. Then re-try to connect the cable and turn on the power.

4. When you start recording the master unit, the slave unit follows by recording at the same time.
5. When you stop recording the master unit, the slave unit follows by stopping.
6. Turning off the power of the master unit automatically turns off the power of the slave unit.

7.9 Exchange Internal Hard Disk Drive

You can exchange the internal hard disk drive at the stop state with the following procedures.

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

2. Press the ENTER key to display the main menu <MENU>. (Below example is for the recording only unit.)

```
MENU [3/7]
  PLAYBACK ↑
  RECORD
  SYSTEM ↓
```

3. Move the cursor to [SYSTEM] by pressing the down key.

```
MENU [4/7]
  PLAYBACK ↑
  RECORD
  *SYSTEM ↓
```

4. Press the ENTER key to go to the <SYSTEM> menu.

```
SYSTEM [3/8]
  <TOP
  <BACK
  *MEMO ↓
```

5. Move the cursor to [HDD CHANGE] by pressing the down keys.

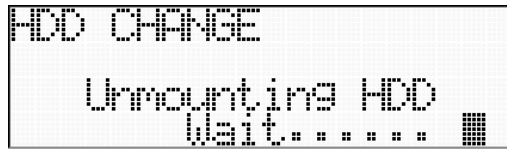
```
SYSTEM [5/8]
  MEMO ↑
  SPEAKER OUT
  *HDD CHANGE ↓
```

6. Press the ENTER key to go to <HDD CHANGE>.

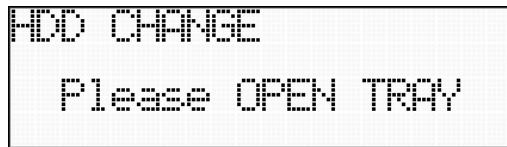
```
HDD CHANGE
HDD UNMOUNT?
  *Yes
  No
```

7. Press the ENTER key to exchange the internal hard disk drive by confirming that the cursor is in [Yes].

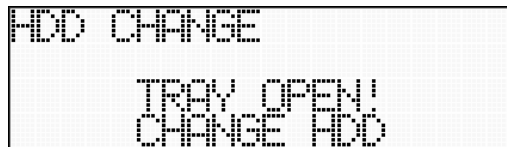
8. The system displays the following message and starts the unmounting process to exchange the hard disk drive.



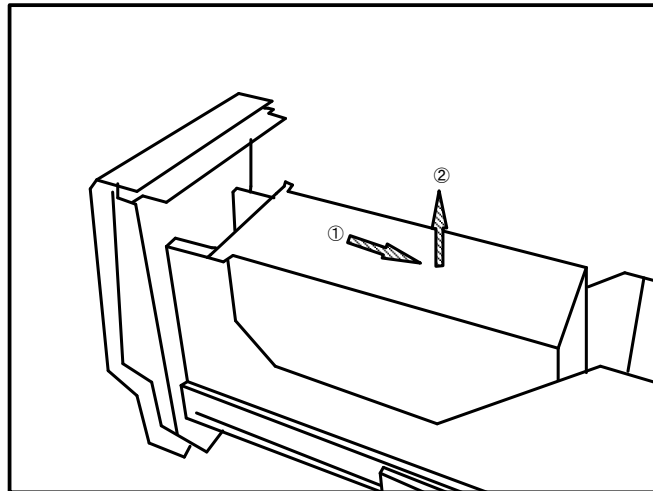
9. The system displays the following and releases the lock of the internal hard disk drive when the unmounting process (approximately 50 seconds) is completed.




10. Withdraw the internal hard disk tray of the front panel. The system displays the following.



11. Loosen two fixed screws for the drive unit. Remove the hard disk drive by slightly lifting up after pulling the tray to the forward direction.



 CAUTION When Removing Hard Disk Drive Be carefully when removing the hard disk drive. Its chassis may be very hot.

12. Exchange the internal hard disk drive.

13. Close the tray after exchanging the hard disk drive. The system displays the following.

```
HDD CHANGE
      TRAY CLOSE!
      wait.....
```

14. Then, the system locks the exchanged hard disk drive with the mounting process by displaying the following.

```
HDD CHANGE
      Mounting HDD
      wait.....
```

15. The system goes to the ready state when the mounting process (approximately 50 seconds) is completed.

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

8. SAVE AND LOAD SETTING CONDITIONS

You can save a total of 20 different setting conditions in the DS unit and you can load one of these setting conditions depending on your experiment.

You can save and load the setting conditions with the <PARAMETER> menu.

1. Confirm that the system is in ready state (<READY> display).

(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch MDD
READY
MON ---ch Free=145G
```

2. Press the ENTER key to display the main menu <MENU>. (Below example is for the recording only unit.)

```
MENU [3/7]
  PLAYBACK ↑
  RECORD
  SYSTEM ↓
```

3. Move the cursor to [PARAMETER] by pressing the down keys.

```
MENU [5/7]
  RECORD ↑
  SYSTEM
  PARAMETER ↓
```

4. Press the ENTER key to go to <PARAMETER>.

```
PARAMETER [3/5]
  <TOP ↑
  <BACK
  PARAMETER LOAD ↓
```

8.1 Save Setting Conditions

1. Display the <PARAMETER> menu.

```
PARAMETER [3/5]
  <TOP ↑
  <BACK
  PARAMETER LOAD ↓
```

2. Move the cursor to [PARAMETER SAVE] by pressing the down key.

```
PARAMETER [4/5]
  <BACK ↑
  PARAMETER LOAD
  PARAMETER SAVE ↓
```

3. Press the ENTER key to display the name list of the places to save the settings.

```
PARAMETER SAVE
  MYPARAML01
  MYPARAML02
```

4. Move the cursor to the name you want to use for the place to save the settings by pressing the up and down keys. Press the ENTER key to display the confirmation.

```
PARAMETER SAVE
  Save to
  MYPARAML01
  Push Enter to Return
```

5. Press the ENTER key to decide the selection. The <PARAMETER> menu is displayed. If you do not want to decide the selection, press the STOP key. The selection is not effective. Then return to the <PARAMETER> menu.

```
PARAMETER [4/5]
  < BACK ↑
  PARAMETER LOAD
  MYPARAMETER SAVE ↓
```

8.2 Load Setting Conditions

1. Display the <PARAMETER> menu.

```

PARAMETER          [3/5] ↑
  < TOP
  <  BACK
  ▾PARAMETER LOAD ▾
  
```

2. Press the ENTER key by confirming that the cursor is in [PARAMETER LOAD].
The name list of the places to load the settings is displayed.

```

PARAMETER LOAD
  ▾MYPARAML01
  ▾MYPARAML02
  
```

3. Move the cursor to the name you want to use for the place to load the settings by pressing the up and down keys. Press the ENTER key to display the confirmation.

```

PARAMETER LOAD
  Load from
  ▾MYPARAML01
  Push Enter to Return
  
```

4. Press the ENTER key to decide the selection. The <PARAMETER> menu is displayed.
If you do not want to decide the selection, press the STOP key. The selection is not effective.
Then return to the <PARAMETER> menu.

```

PARAMETER          [3/5] ↑
  < TOP
  <  BACK
  ▾PARAMETER LOAD ▾
  
```

8.3 Initialize Setting Conditions

You can initialize the setting conditions to the default (factory) settings, and restart the system.

Controls by Using Browser

The initialization process turns off and boots the system automatically. To enable the controls from the browser after the initialization process, manually turn the power off and on again to reflect the changes on the network settings by confirming the IP address.

1. Display the <PARAMETER> menu.

```

PARAMETER          [3/5]
<TOP              ↑
<BACK
PARAMETER LOAD ↓
    
```

2. Move the cursor to [DEFAULT] by pressing the down keys.

```

PARAMETER          [5/5]
PARAMETER LOAD ↑
PARAMETER SAVE
DEFAULT
    
```

3. Press the ENTER key to go to the <DEFAULT> menu.

Move the cursor to [Yes] to execute the initialization. If you do not initialize the system settings, move the cursor to [No].

```

DEFAULT
Are Your Sure?
Yes
No
    
```

4. Press the ENTER key to start initialization of the system settings by displaying the following.

```

Set Default
System Restart...
    
```

5. The system automatically boots up after the initialization.

6. To control the system by using the browser, confirm the IP address of the DS system, and enter <http://xxx.xxx.xxx.xxx/ds.html> to re-connect.

Default Settings

Each setting condition is initialized as follows;

Sampling Frequency	1 MHz
Number of Recording Channels	16 channels
Recording Target Device	Internal HDD
Monitor Channel	Channel 1
Record Mode	Normal
Input Range	+/- 1 V
PA Amp Input Mode	DC
Zero Shift	+/- 0 %
Voice Memo Recording	OFF
Speaker Output	OFF
Network Setting	DHCP ENABLE
File Name	DEFAULT_0001
NTP Server Address	131.107.1.10 (time-nw.nist.gov)

9. <MISC> MENU

You can adjust the contrast of the LCD and display the system information.

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

2. Press the ENTER key to display the main menu <MENU>. (Below example is for the recording only unit.)

```
MENU [3/7]
  PLAYBACK ↑
  RECORD
  SYSTEM ↓
```

3. Move the cursor to [MISC] by pressing the down keys.

```
MENU [6/7]
  SYSTEM ↑
  PARAMETER
  MISC ↓
```

4. Press the ENTER key to go to <MISC>.

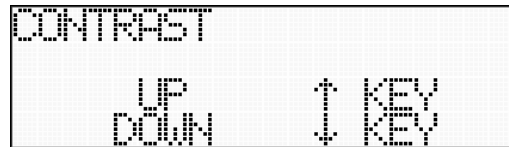
```
MISC [3/5]
  <TOP
  <BACK
  MCONTRAST ↓
```

9.1 Adjust Contrast

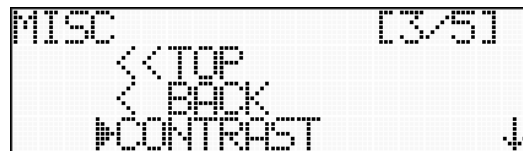
1. Display the <MISC> menu.



2. Press the ENTER key by confirming that the cursor is in [CONTRAST].



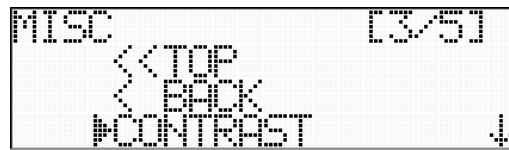
3. Adjust the contrast with the up and down keys.
4. Press the ENTER key when completing the adjustment. The <MISC> menu is displayed.



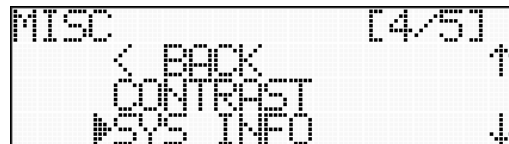
9.2 Display System Information

You can view the system information, such as the firmware version, etc.

1. Display the <MISC> menu.



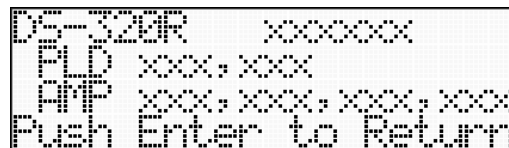
2. Move the cursor to [SYS INFO] by pressing the down key.



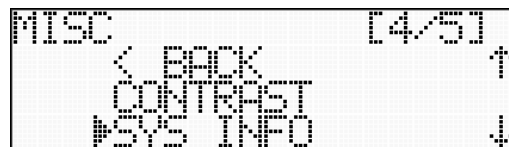
3. Press the ENTER key to view the system information.



4. Press the ENTER key after confirming above to see the next page.



5. Press the ENTER key to return to the <MISC> menu.



9.3 Display System Synchronization Status

You can view the information on the recording synchronization status.

1. Display the <MISC> menu.



2. Move the cursor to [SYNC INFO] by pressing the down keys.



3. Press the ENTER key to view the system recording synchronization status.



4. Press the ENTER key after confirming above to return to the <MISC> menu.



10. PLAYBACK OPERATIONS

You can playback the recorded data files on the system with playback functions ("P" is used for at the recorder model with playback functionality) by using the keys and displays.
You can also playback by using the browser for time search.

10.1 Playback Last Recorded File

You can playback the last recorded file by using the keys.

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
100.000kHz 16ch HDD
READY
MON ---ch Free=120G
```

2. Press the START key to playback the last recorded file.

```
100.000kHz 16ch HDD
DEFAULT_0001
PLAY >>>
MON ---ch ---:---:---
```

>>> at the right of <PLAY> flashes while playback.

5. Press the PAUSE key to suspend the playback, press the start key to re-start playback.

6. Press the STOP key to stop playback for the playback ready state.

```
100.000kHz 16ch HDD
DEFAULT_0001
PLAYREADY
MON ---ch ---:---:---
```

The system will go to the playback ready state when the system playbacks until the last data.

7. Press the START key to playback the same file.

Preview Playback

Preview playback is a function to playback the last part data of 10 seconds (maximum) for a quick check of recording.

After recording stop, press the EVENT key to start flashing the LED, and then press the START key for the preview.

The function is also available when selecting a file to be played.

10.2 Select File to Playback

You can select the file to playback.

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
100.00kHz 16ch HDD
READY
MON ---ch Free=120G
```

2. Press the ENTER key to display the main menu <MENU>.

```
MENU [2/7]
<TOP ↑
▶PLAYBACK ↓
RECORD
```

3. Press the ENTER key to go to <PLAYBACK> by confirming that the cursor is in [PLAYBACK].

```
PLAYBACK [3/6]
<TOP
<BACK
▶FILE SELECT ↓
```

4. Press the ENTER key to go to <PLAY FILE SELECT> by confirming that the cursor is in [FILE SELECT].

```
PLAY FILE SELECT
▶DEFAULT_0000 ↓
DEFAULT_0001
```

5. Move the cursor to select the file to be played with the up and down keys, and then press the ENTER key to go to the confirmation of the file selected.

```
PLAY FILE SELECT
DEFAULT_0000
Push Enter to Return
```

6. Press the ENTER key to the playback read state.

```
100.00kHz 16ch HDD
DEFAULT_0001
PLAYREADY
MON ---ch ---:---:---
```

7. Press the START key to start playback.

10.3 Select Playback Sampling Frequency

You can select the different playback sampling frequencies from the recording sampling frequency. Within the same number of channels, the selectable playback sampling frequencies are shown the table below.

Sampling Frequency and Channels

Lowest limit playback rate (sampling frequency x number of channels) must be 500K words/sec or higher. Highest limit recording rate must be 8.192M words/sec or lower. Playback sampling frequency of 1 MHz is not available. See the table below.

You can select all available channels in the external sampling mode within the available sampling frequencies and at the fixed sampling frequency.

Effective Sampling Frequency vs. Playback Channels

Fields indicating "OK" are effective for setting.

Sampling Frequency (kHz)	Channel Selections					
	2ch	4ch	8ch	16ch	32ch	64ch
1000						
512	OK	OK	OK	OK		
500	OK	OK	OK	OK	(250k)	
409.6	OK	OK	OK	OK	(204.8k)	
400	OK	OK	OK	OK	(200k)	
384	OK	OK	OK	OK	(192k)	
256	OK	OK	OK	OK	OK	
250	OK	OK	OK	OK	OK	(125k)
204.8		OK	OK	OK	OK	(102.4k)
200		OK	OK	OK	OK	(100k)
192		OK	OK	OK	OK	(96k)
128		OK	OK	OK	OK	OK
125		OK	OK	OK	OK	OK
102.4			OK	OK	OK	OK
100			OK	OK	OK	OK
96			OK	OK	OK	OK
64			OK	OK	OK	OK
62.5			OK	OK	OK	OK
51.2				OK	OK	OK
50				OK	OK	OK
48				OK	OK	OK
40.96				OK	OK	OK
40				OK	OK	OK
32				OK	OK	OK
31.25				OK	OK	OK
25.6					OK	OK
25					OK	OK
24					OK	OK
20.48					OK	OK
20					OK	OK
External Sampling	OK	OK	OK	OK	OK	OK

About Playback Sampling

Since there are differences between the recording sampling frequency and the playback one, the playback sampling frequency setting is different at the AUTO mode and the FIXED mode.

At the FIXED mode, the playback is possible when the recording is done at combinations of the sampling frequency and the channel shown as "OK" in above chart, otherwise the playback is not possible.

At the AUTO mode, the playback is possible when the recording is done at combinations of the sampling frequency and the channel shown as "OK" in above chart. If the recording sampling frequencies are higher than the available playback frequencies, the DS automatically sets the playback sampling frequency shown within "()" to play back.

You cannot playback below the lowest limit sampling frequency.

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```

100.00kHz 16ch HDD
READY
MON ---ch Free=120G

```

2. Press the ENTER key to display the main menu <MENU>.

```

MENU [2/7]
<TOP ↑
▶PLAYBACK
RECORD ↓

```

3. Press the ENTER key to go to <PLAYBACK> by confirming that the cursor is in [PLAYBACK].

```

PLAYBACK [3/6]
<TOP ↑
<BACK
▶FILE SELECT ↓

```

4. Move the cursor to [SAMPLE MODE] by pressing the down key.

```

PLAYBACK [4/6]
<BACK ↑
FILE SELECT
▶SAMPLE MODE ↓

```

5. Press the ENTER key to go to <PLAY SAMPLE MODE>.

```

PLAY SAMPLE MODE
<BACK
▶AUTO
FIXED

```

6. Move the cursor to either [AUTO] or [FIXED].
You can playback at the same sampling frequency of recording at [AUTO].
You can playback at the specified playback sampling frequency regardless of the recording sampling frequency at [FIXED].

10.3.1 AUTO Mode

You can playback at the same sampling frequency of recording to set [AUTO].

1. Move the cursor to [AUTO] at <PLAY SAMPLE MODE>.

```
PLAY SAMPLE MODE
< BACK
  AUTO
  FIXED
```

2. Press the ENTER key to go to the confirmation of the selection.

```
PLAY SAMPLE MODE
  AUTO      selected
Push Enter to Return
```

3. Press the ENTER key to decide the selection. The <PLAYBACK> menu is displayed. Press the STOP key to cancel the selections and return to the <PLAYBACK> menu.

```
PLAYBACK [4/6]
< BACK ↑
FILE SELECT
  SAMPLE MODE ↓
```

4. Check the AUTO mode setting. Move the cursor to [SAMPLE] at the <PLAYBACK> menu.

```
PLAYBACK [5/6]
FILE SELECT ↑
  SAMPLE MODE
  SAMPLE ↓
```

5. Press the ENTER key to display that the AUTO mode is specified. The display returns to the <PLAYBACK> menu.

```
PLAY SAMPLE
  AUTO !!
```

10.3.2 FIXED Mode

You can playback at the specified playback sampling frequency regardless of the recording sampling frequency to set [FIXED].

1. Move the cursor to [FIXED] at <PLAY SAMPLE MODE>.

```
PLAY SAMPLE MODE
< BACK
  AUTO
  *FIXED
```

2. Press the ENTER key to go to the confirmation of the selection.

```
PLAY SAMPLE MODE
FIXED selected
Push Enter to Return
```

3. Press the ENTER key to decide the selection. The <PLAYBACK> menu is displayed. Press the STOP key to cancel the selections and return to the <PLAYBACK> menu.

```
PLAYBACK [4/6]
< BACK ↑
FILE SELECT
  *SAMPLE MODE ↓
```

4. Select the playback sampling frequency. Move the cursor to [SAMPLE] at the <PLAYBACK> menu.

```
PLAYBACK [5/6]
FILE SELECT ↑
  *SAMPLE MODE ↓
  *SAMPLE ↓
```

5. Press the ENTER key to go to <PLAY SAMPLE>.

```
PLAY SAMPLE
400.00kHz ↑
  *500.00kHz ↓
  Ext. kHz
```

4. Move the cursor to a desired playback sampling frequency with the up and down keys.

5. Press the ENTER key to go to the confirmation of the selection.

```
PLAY SAMPLE
500.00kHz selected
Push Enter to Return
```

6. Press the ENTER key to return to the <PLAYBACK> menu.

10.4 Output Range Setting

You can set the output range of each channel.

1. Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
100.00kHz 16ch HDD
READY
MON ---ch Free=120G
```

2. Press the ENTER key to display the main menu <MENU>.

```
MENU [2/7]
<TOP ↑
PLAYBACK ↓
RECORD
```

3. Press the ENTER key to go to <PLAYBACK> by confirming that the cursor is in [PLAYBACK].

```
PLAYBACK [3/6]
<TOP ↓
BACK ↓
FILE SELECT ↓
```

4. Move the cursor to [RANGE] by pressing the down keys.

```
PLAYBACK [6/6]
SAMPLE MODE ↑
SAMPLE
RANGE
```

5. Press the ENTER key to go to <PLAY RANGE>.

```
PLAY RANGE
ALL 1V
▶ 1ch 1V ← →
2ch 1V ↓
```

6. Move the cursor to the channel to set its input range by pressing the up and down keys. You can set all effective channels with the same output range at [ALL]. Press the left and right keys to select the desired output range.

7. After setting the output ranges of all channels, press the ENTER key to decide the selections. The <PLAYBACK> menu is displayed.
If you do not want to decide the selection, press the STOP key. The selection is not effective. Then return to the <PLAYBACK> menu.

```
PLAYBACK [6/6]
SAMPLE MODE ↑
SAMPLE
RANGE
```

Note

11. CONNECT TO PC

You can operate the DS unit not only by using front panel controls, but also by using a browser running on the PC connected via network in order to set the record conditions and to transfer recorded data files.

You can mount the internal hard disk of the DS unit as a network drive of the PC.

Refer "12 <NETWORK> MENU" for network settings of the unit.

PC Environment to Use Browser Controls

- PC environment to use the browser controls

CPU:	Pentium IV 850 MHz or higher
OS:	Windows 2000/XP
Memory:	256 MB or larger
Free HDD space:	Size must be larger than one of the data files to be transferred.
LAN Port:	1000BASE-T
	Can be used 10BASE-T/100BASE-TX for setting the record conditions.
Browser:	IE 6.0

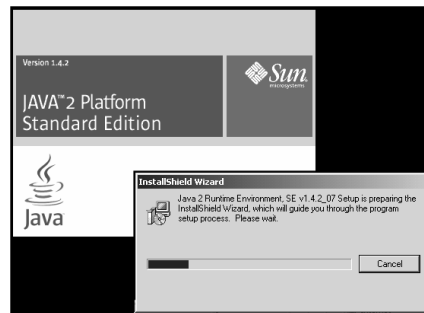
Refer "12. <NETWORK> MENU" for connecting between the PC and the DS unit.

Refer "13. CONTROL BY USING BROWSER" for the explanations of the browser controls of the PC.

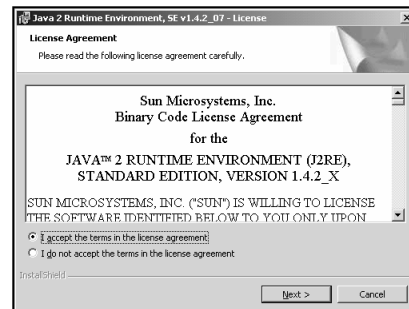
- Installing JRE

Install "Java™ 2 Runtime Environment, Standard Edition (JRE)" before starting the browser operations. When you connect your PC that no JRE is installed to the DS, the JRE download will be started. Follow the instructions on your PC to install the JRE. Then, Java Applet on the DS is downloaded into your PC.

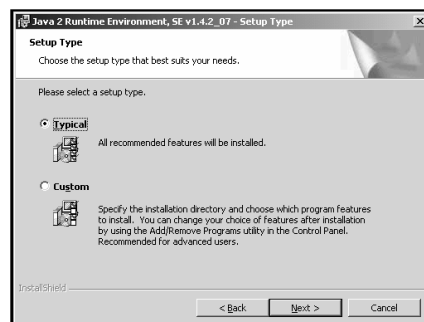
How to Install JRE



(1) Start downloading.



(2) Select <I accept...>, then click <Next>.



(3) Select <Typical>, then click <Next>.



(4) Click <Finish> to complete.



CAUTION

Never use JRE version 1.5.* or higher for correct operations.

- How to access with the browser.
<http://xxx.xxx.xxx.xxx/ds.html> or <http://xxx.xxx.xxx.xxx/>
 Enter the IP address of the DS unit at "xxx.xxx.xxx.xxx".

Note

12. <NETWORK> MENU

You can set the network settings of the DS unit at the <NETWORK> menu.

Cautions on Using a Network Environment

Consult your network administrator on the IP address to be used and other network parameters when connecting the DS unit to your network per the following information. Basic knowledge about Windows network system is required to set the network connection parameters.

Data transmission of the DS unit to the network will affect other device's data transmission within the same network, depending on the sampling frequency of the DS unit.

At shipping time, the DS unit has the factory settings shown below. Modify the settings (such as the IP address) as necessary.

IP address: Not assigned
Subnet mask: Not assigned
Gateway: Not assigned
DHCP client: ENABLE
Host name: DS_XXXXXXXXXX (*s are numbers from 0 to 9)

To communicate at 1000 Mbps, all devices that exist in the path from the DS unit to the controller PC must support 1000 Mbps. Use a cable that is Category 5 or better. To ensure communications quality, we recommend that you use STP cables and a 1000BASE-T switching hub that supports STP cables.

Depending on the network environment being used, it is possible you will encounter delays in data transmission or congestion processing. In such a case, try the following to improve the situation:

- 1) If a repeater hub is being used, change to a switching hub instead.
- 2) As much as possible, reduce the number of broadcast packets.
- 3) As much as possible, use a communications path that does not pass through a router.

However, in a situation such as when the DS unit is in a remote location and communications are constrained by low-speed paths, use the DS unit with a lower sampling frequency.

If the PC enters the standby status while the DS unit is being used, communications will cease, and a timeout will cause a disconnection. If you are using the PC for a long time, make sure the system standby setting in the Windows power options is not selected.

When you select to record to the network drive, the recording may not be continued because enough data transmission band via network is not secured depending on the sampling frequency and numbers of channels settings. In this case, <TOO SLOW!> is displayed and the recording is stopped right after recording start.

If you disconnect the LAN cable, the communication phase is suspended, but also causes congestion processing. Make sure to terminate the application first to detach the DS unit from the network. As well, do not turn off the power of the unit while the application is running.

Make sure DHCP server active before turning on the power of the DS system in case DHCP ENABLE at the DS network setting.

Reflect the changes on the network settings by turning off and on the power of the DS system.

We recommend separating the network segment of the DS and the control PC from other network by using a switch, a router/fire wall.

The DS system does not use any DNS/WINS/HOSTS functions, so assign the IP address directly.

To use the NTP server (131.107.1.10 for default setting), locate the DS system at the environment to access to Internet.

Use the local NTP server if available by entering its IP address from the browser.

- 1.** Confirm that the system is in ready state (<READY> display).
(If the system is not in ready state, press the STOP key a few times depending on the hierarchy of the current menu to move to ready state.)

```
500.00kHz 16ch HDD
READY
MON ---ch Free=145G
```

- 2.** Press the ENTER key to display the main menu <MENU>. (Below example is for the recording only unit.)

```
MENU [3/7]
  PLAYBACK ↑
  RECORDED
  SYSTEM ↓
```

- 3.** Move the cursor to [NETWORK] by pressing the down keys.

```
MENU [7/7]
  PARAMETER ↑
  MISC
  NETWORK ↓
```

- 4.** Press the ENTER key to go to <NETWORK>.

```
NETWORK [4/5]
  < BACK ↑
  SET NETWORK
  CHANGE PARAM ↓
```


12.1 <CHANGE PARAM> Menu

You can set the DHCP client function and enter the IP address and other network parameters. You can decide the entries here by using the <SET NETWORK> menu.

12.1.1 Use DHCP Client Function

If the DHCP server is in a network where you connect the DS unit, you can use the DHCP client function of the DS unit that makes it easy to connect to the network.

1. Display the <NETWORK> menu.

```

NETWORK [4/5]
< BACK ↑
SET NETWORK
CHANGE PARAM ↓

```

2. Press the ENTER key by confirming that the cursor is in [CHANGE PARAM]. The <CHANGE PARAM> menu is displayed.

```

CHANGE PARAM [2/6]
< BACK
DHCP
IP ADDRESS ↓

```

3. Press the ENTER key by confirming that the cursor is in [DHCP].

```

CHANGE PARAM
DHCP
  ENABLED
  DISABLED

```

4. Move the cursor by using the up and down keys to select either [ENABLED] (use the DHCP client function) or [DISABLED] (not to use the DHCP client function). When you use the fixed IP address setting (explained later), select [DISABLE].

5. Press the ENTER key to go to the confirmation display.

```

CHANGE PARAM
DHCP
      DHCP ON
Push Enter to Return

```

6. Press the ENTER key to enter the selection. The <CHANGE PARAM> menu is displayed. If you do not want to enter the selection, press the STOP key. The selection is not effective. Then return to the <CHANGE PARAMETER> menu.

```

CHANGE PARAM [2/6]
< BACK
DHCP
IP ADDRESS ↓

```

12.1.2 User IP Address

You can assign the fixed IP address to the DS unit to connect to the network.

DHCP Client Function

Make sure to set the DHCP client function to [DISABLED] to use the fixed IP address.

1. Display the <CHANGE PARAM> menu.

```
CHANGE PARAM [2/6]
< BACK
DHCP
IP ADDRESS ↓
```

2. Move the cursor to [IP ADDRESS] by pressing the down keys.

```
CHANGE PARAM [3/6]
< BACK
DHCP
▶ IP ADDRESS ↓
```

3. Press the ENTER key to go to the entry menu of the IP address. Press the left and right keys to move the entry positions and press the up and down keys to change the number of the address in each position.

```
CHANGE PARAM
IP ADDRESS
xx■ = xxx = xxx = xxx
```

4. Press the ENTER key to enter the setting. The <CHANGE PARAM> menu is displayed. If you do not want to enter the setting, press the STOP key. The selection is not effective. Then return to the <CHANGE PARAM> menu.

5. Set [SUBNET MASK] and [GATEWAY] as well as [IP ADDRESS].

By pressing the down keys at <CHANGE PARAM> display, the cursor moves to DHCP, IP ADDRESS, SUBNET MASK, GATEWAY, HOST NAME, and NETWORK DRIVE in turn.

12.1.3 Check Host Name

You can check the host name assigned to the DS unit.

Set Host Name

You can assign the host name to the DS unit by using the browser.

1. Display the <CHANGE PARAM> menu.

```
CHANGE PARAM [2/6]
< BACK
WOLP
IP ADDRESS ↓
```

2. Move the cursor to [HOST NAME] by pressing the down keys.

```
CHANGE PARAM [6/6]
SUBNET MASK ↑
GATEWAY
HOSTNAME DISP
```

3. Press the ENTER key to go to the assigned host name display.

```
CHANGE PARAM
HOSTNAME DISP
TEAC_DS640
Push Enter to Return
```

4. Press the ENTER key to return to the <CHANGE PARAM> menu.

```
CHANGE PARAM [6/6]
SUBNET MASK ↑
GATEWAY
HOSTNAME DISP
```

12.2 <SET NETWORK> Menu

You can decide the network parameter entries entered at the <CHANGE PARAM> menu. The entries decided by execution of this menu will be effective. Turn off and on the DS system to reflect the changes.

1. Display the <NETWORK> menu.

```
NETWORK [4/5]
< BACK ↑
SET NETWORK
CHANGE PARAM ↓
```

2. Move the cursor to [SET NETWORK] by using the up key.

```
NETWORK [3/5]
< BACK ↑
SET NETWORK
CHANGE PARAM ↓
```

3. Press the ENTER key to decide the network parameters entered at the <CHANGE PARAM> menu. The following is displayed.

```
SET NETWORK
Completed
Push Enter to Return
```

4. Press the ENTER key to return to the <NETWORK> menu.

Caution After Changing Network Parameters

Make sure to reboot the system after changing the network parameters.

The reboot process enables to the changed parameters and the displays related to the network address.

When using the DHCP function, make sure to connect the LAN cable to the DHCP server in the network before turning on the power.

12.3 <NETWORK DRIVE> Menu

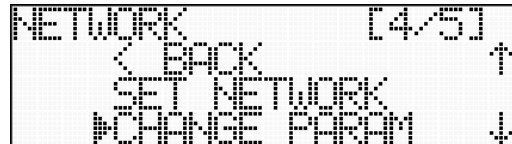
You can check the name of the mounted share drive on the PC in the network. You can record the data directly to the shared network drive. To set the recording target device to the network drive, see "6.4 Recording Target Device Setting".

Set Shared Network Drive

You can set the network drive by using the browser.

Specify it from the browser at "\\HOST IP ADDRESS\Share Folder Name"

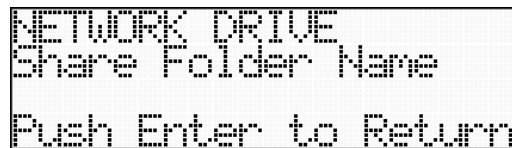
1. Display the <NETWORK> menu.



2. Move the cursor to [NETWORK DRIVE] by pressing the down key.



3. Press the ENTER key to go to the display of the share drive folder name of the assigned network drive.



4. Press the ENTER key to return to the <NETWORK> menu.



Note

13. CONTROL BY USING BROWSER

13.1 Basic Operation

You can set setting conditions, operate, and monitor the data of the DS unit by using the browser running on the PC within the same network.

Data Monitor

The data monitor function on the browser will not display all contiguous data streams, subject to available network bandwidth. (The recording function takes highest priority and will continue to record all data.) The monitoring feature is for convenience only. It is not available for playback.

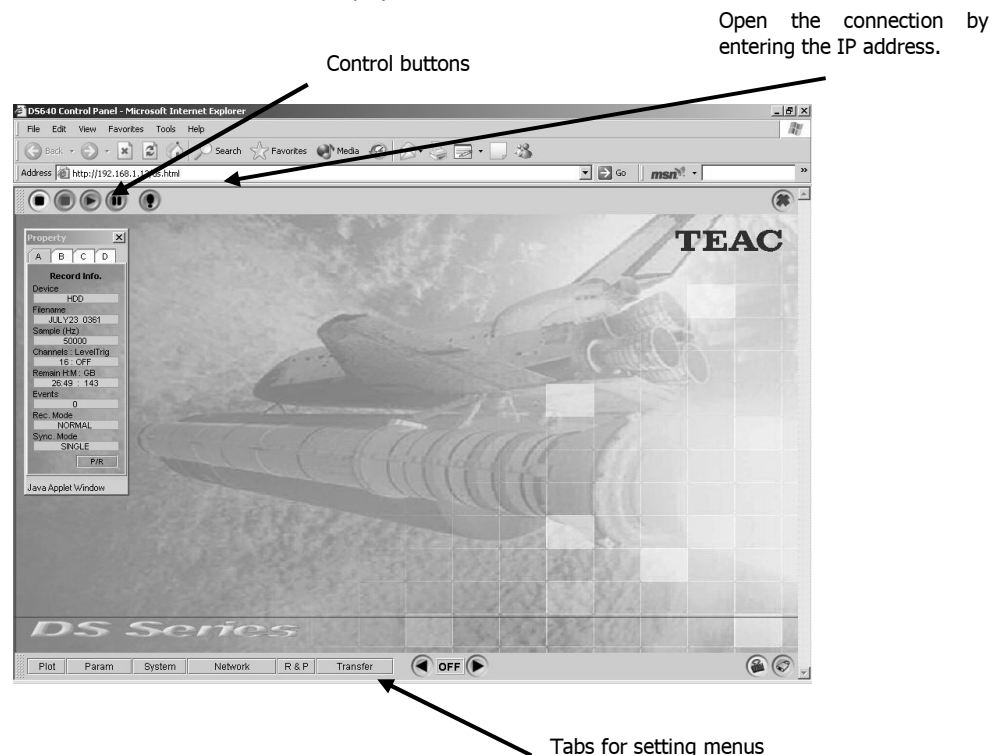
Update of Monitor Display

If you select the lower sampling frequency with a lower channel count, the first monitor data will take some time to appear. The same holds true as it refreshes monitoring data in following cycle. The data buffer size of the DS unit is optimized for the higher sampling frequency and the higher channel count, so it takes a time to fulfill the buffer for the lower sampling frequency and the lower channel count scenario.

Applicable Browser Recommendation

We recommend to use Internet Explore 6.x or later from Microsoft Corporation.

1. Check the right network connection between the DS unit and the PC.
2. Run the browser of the PC, enter "http://xxx.xxx.xxx.xxx/ds.html (xxx.xxx.xxx.xxx is the fixed IP address assigned to the DS unit.)" at [Address (D)].
3. Main browser window will be displayed.



The following setting menus on the browser are correspondent to those on the DS unit controlled by keys and displays.

Help Function

Each menu has its help function. Locate the cursor on the setting item to open the tool tip shown below.

The 'Record Amp' dialog box has tabs for Zero, Range, AutoRange, Name, Unit, and Teds. It contains a table with columns CH, UNIT, SLOPE/GAIN, and OFFSET. Below the table are 'Reset All' and 'Copy Val' buttons. A tooltip is displayed over the table with the following text:

Define **UNIT**, **SLOPE/GAIN** and **OFFSET** here.
UNIT: engineering unit name such as m/s2, degree, psi
SLOPE/GAIN: gain factor for the engineering value conversion. (=gain factor per volt)
OFFSET: engineering offset value
 Double click to open data the entry window

CH	UNIT	SLOPE/GAIN	OFFSET
1	Volt	1.00000E-000	0.00000E+000
2	Volt	1.00000E-000	0.00000E+000
3	Volt	1.00000E-000	0.00000E+000
4	Volt	1.00000E-000	0.00000E+000
5	Volt	1.00000E-000	0.00000E+000

Plot

Click [Plot] of the bottom of the main window to set the monitor display.

At the <Channels> tab, you can turn on and off the plot of each channel, along with setting the display scale and the line color. The channel marked at <Plot> is displayed.

At the <General> tab, you can set the trigger point on the view data.

The 'Plot' dialog box has tabs for Channels, All Channel, and General. The Channels tab is active, showing a table with columns Ch, Label, Plot, YScale, AutoZero, Color, and Measure. Below the table are 'Start' and 'Clear Plot' buttons.

Ch	Label	Plot	YScale	AutoZero	Color	Measure
1	channel 1	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
2	channel 2	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
3	channel 3	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
4	channel 4	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
5	channel 5	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
6	channel 6	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
7	channel 7	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
8	channel 8	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
9	channel 9	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
10	channel 10	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
11	channel 11	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF
12	channel 12	<input checked="" type="checkbox"/>	x1	<input type="checkbox"/>		OFF

Click [Start] to open the data view windows by following the settings.

You can monitor the live input data at the REC STANDBY state or the recording state.

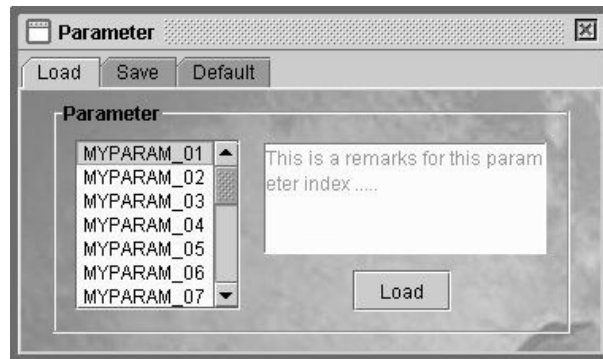
The 'DS640 Control Panel' shows a grid of 16 channel monitors (ch-1 to ch-16). Each monitor displays a waveform and numerical data. The interface includes a menu bar, a toolbar, and a status bar at the bottom.

About Monitor Data

Viewed data here are created by data transferred to the PC via network. Depending on the selected sampling frequency, the viewed data will be decimated. It is not available for playback

Param

[Param] is used to save and load the setting conditions and to initialize the settings.



System

[System] is used to format the hard disk drive, to set the date and time, and to shut down the system.

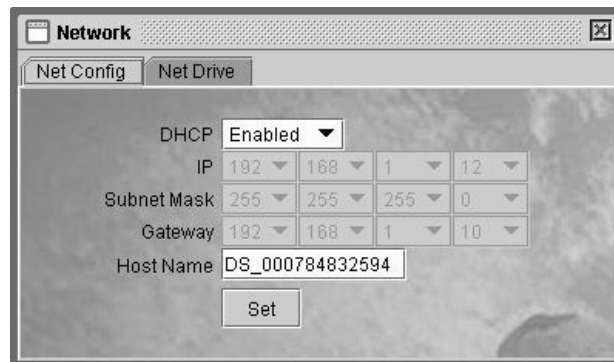


Network

[Network] is used for setting the network parameters.

At the <Net Config> tab, you can set the network parameters of the system.

At the <Net Drive> tab, you can specify the shared folder name to transfer the data. Make sure to set the shared folder name before operating the data transfer. Use the fixed IP address to set. You cannot use the host name to mount the network drive.



R & P

[R & P] is used for settings related to the recording and playback.

<R.Record> is used for setting the recording target device, the sampling frequency, and numbers of the recording channels, etc.

The screenshot shows the 'Record' dialog box with the 'R.Record' tab selected. The settings are as follows:

- Save To: DS HDD
- Record Title: JULY23_0361
- Sample Hz [Band]: 50.00K [20.0K]
- Channels: 16
- Voice Memo: ON
- Text Memo: Text Memo

A 'Set' button is located at the bottom of the dialog.

<R.Mode> is used for setting the record mode.

The screenshot shows the 'Record' dialog box with the 'R.Mode' tab selected. The settings are as follows:

- Record Mode: Normal
- Pre Trig(Sec): 20

A 'Set' button is located at the bottom of the dialog.

<R.Level Trig> is used for setting the trigger level .

The screenshot shows the 'Record' dialog box with the 'R.Level Trig' tab selected. The settings are as follows:

- Level Trigger Channel: Disabled
- Direction: Up
- Threshold: 100

A 'Set' button is located at the bottom of the dialog.

<P.Playback> is used for settings related to the playback.

The screenshot shows the 'Record' dialog box with the 'P.Playback' tab selected. The settings are as follows:

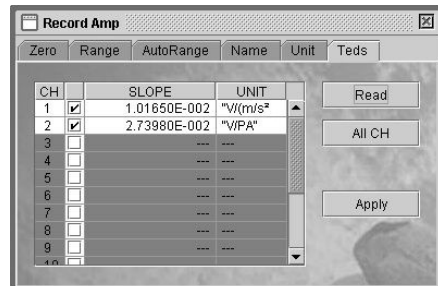
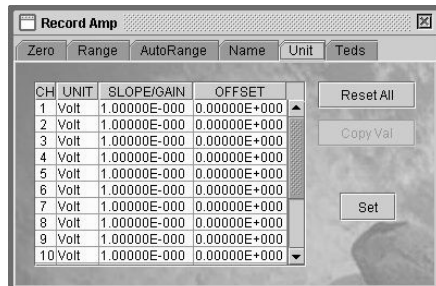
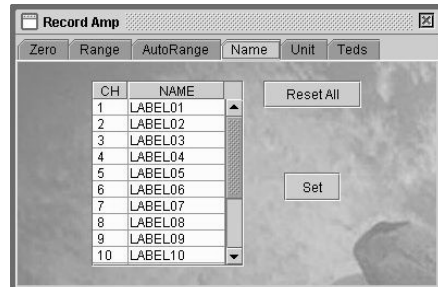
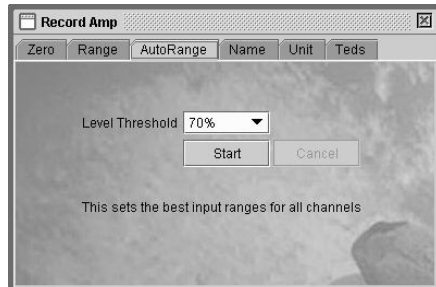
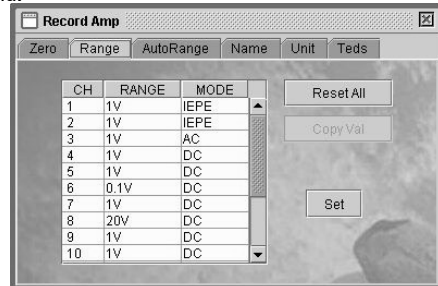
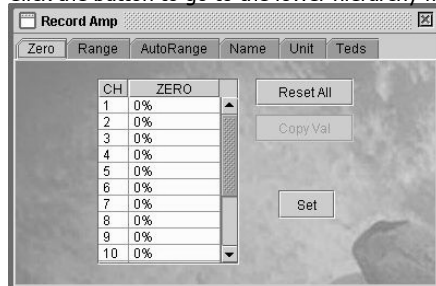
- File Name: NET_0004
- Sample Mode: FIXED
- Sample Hz: 250.00K [100.0K]

A 'Set' button is located below the settings, and a 'Playback' button is located at the bottom of the dialog.

There are lower hierarchy menus to set the amplifier parameters at the <R.P.Amp> tab.

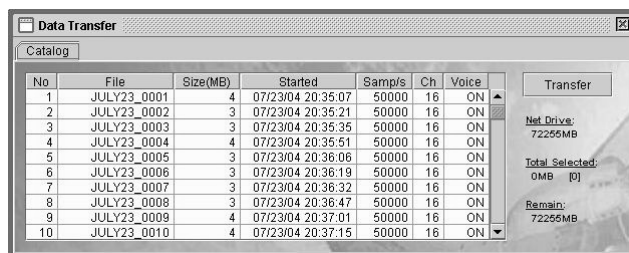


Click the button to go to the lower hierarchy menu.



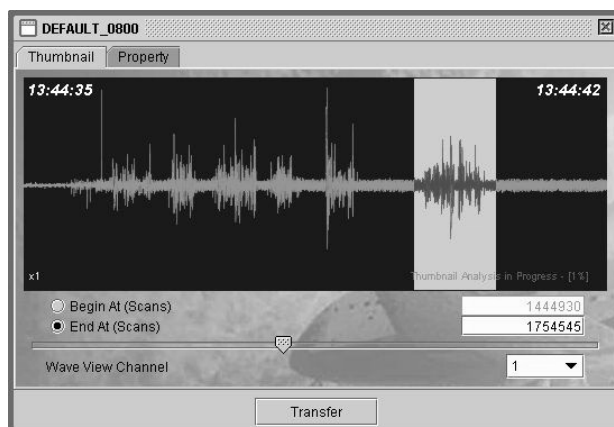
Transfer

[Transfer] is used for listing the recorded files and transferring the recorded file to the PC.



Click the data file to be transferred.

Double click the line of the selected file to display its thumbnail data. You can specify the part of the transferring data from the data file.



About Transferring Data

Make sure to set the network drive setting prior to the operation.

Secure an enough capacity at the network drive to enable to transfer a target data.

A subfolder named by the data and time (YYMMDDhhmmss) of the data transfer start is automatically created, the transferred data are saved into this subfolder.

Data transfer is possible for the external sampling data except for data extracting.

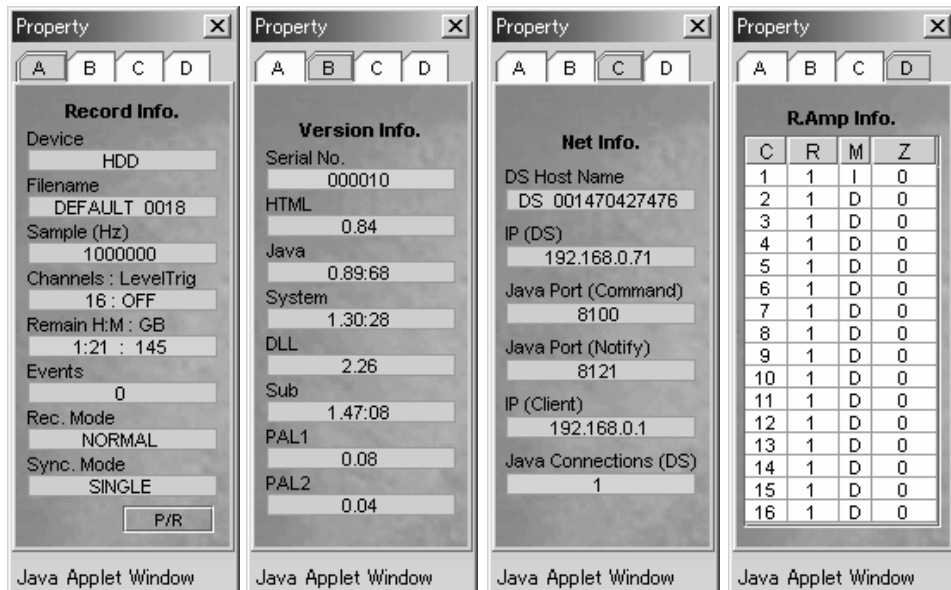
Data Extracting at Event Mark

The thumbnail displays an approximately location of an event mark due to compressed display process. Therefore there is a discrepancy between the scan position of the displayed mark line and the actual MARK value on the header file. When extracting to transfer data by using the thumbnail menu, take a consideration this issue to set the affordable start and end positions.

In addition to the main page window, the property window which displays the DS status and the counter window are shown.

• <Property > window

Various status can be viewed by selecting <A>, , <C> or <D> tab.



Example of Property Window

• <Counter> window

In the Counter window, the elapsed time from the recording start is shown. The playback time is also shown if the DS is capable of playback.



When REC STANDBY



When REC/PLAYBACK (display example)

It displays in red when recording, and in green when playing back.

The Counter window's show/hide status can be selected simultaneously with the Property window show/hide button.



Click the button shown to the left to select the show/hide status.

The Counter or Property window can be independently closed with the window's "X" button.

Elapsed Time

The elapsed time displayed in the browser is retrieved from DS and it may have some time lag against the elapsed time in the DS LCD display.

In case of the external sampling mode, it appears as "----:--:--" as shown in the DS LCD display.

13.2 Data File Deletion of DS Recorder and Data Transfer from PC

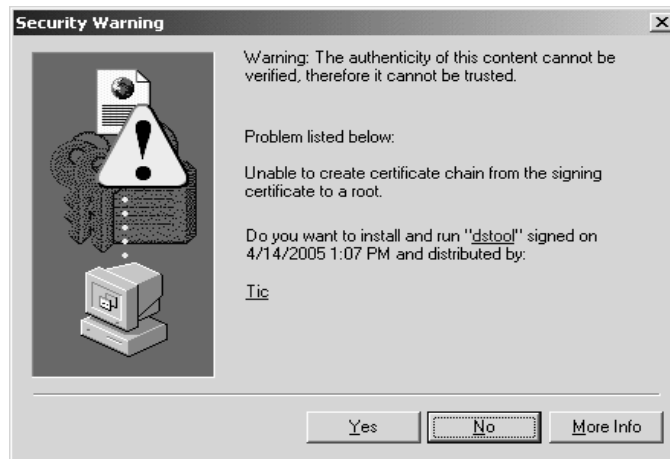
By using the Windows PC connected to DS via the network, unnecessary data files in DS can be deleted or data files in PC can be sent back to DS.

- Access from browser

Connect to "http : //***.***.***.***/ds2.html". (replace "***.***.***.***" portion with the IP address of the DS)

- Download the Active-X control

When the PC does not have the Active-X installed, the following dialog appears on the first connection to the DS. Press "Yes" to proceed with the Active-X installation.



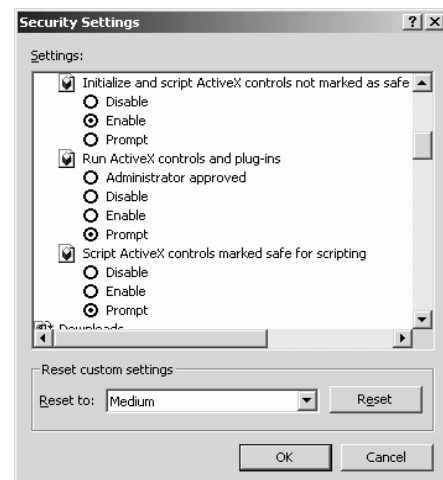
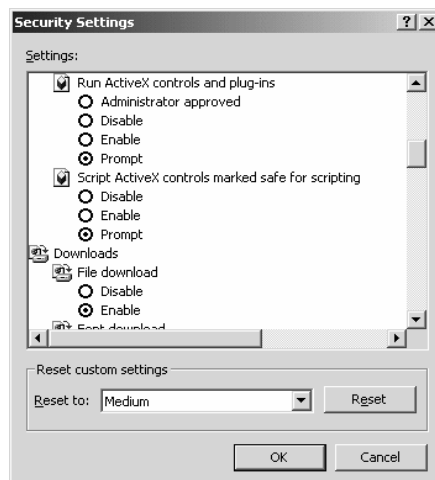
The Active-X name for the data file deletion is "dstool" (distributed by Teac Instruments Corp.)

About Internet Explorer security

In order to use the "dstool" Active-X, the "Run ActiveX controls and plug-ins" under "ActiveX controls and plug-ins" item in the browser's security setting must be set to "Enable" or "Prompt".

To make the security setting, open the Internet Explorer and select "Tools" - "Internet Options..." - "Security" - "Internet" - "Custom Level".

When "Prompt" is selected in the security setting, a prompt dialog appears when connecting. Press "Yes" to proceed.



An example of the security setting in Internet Option

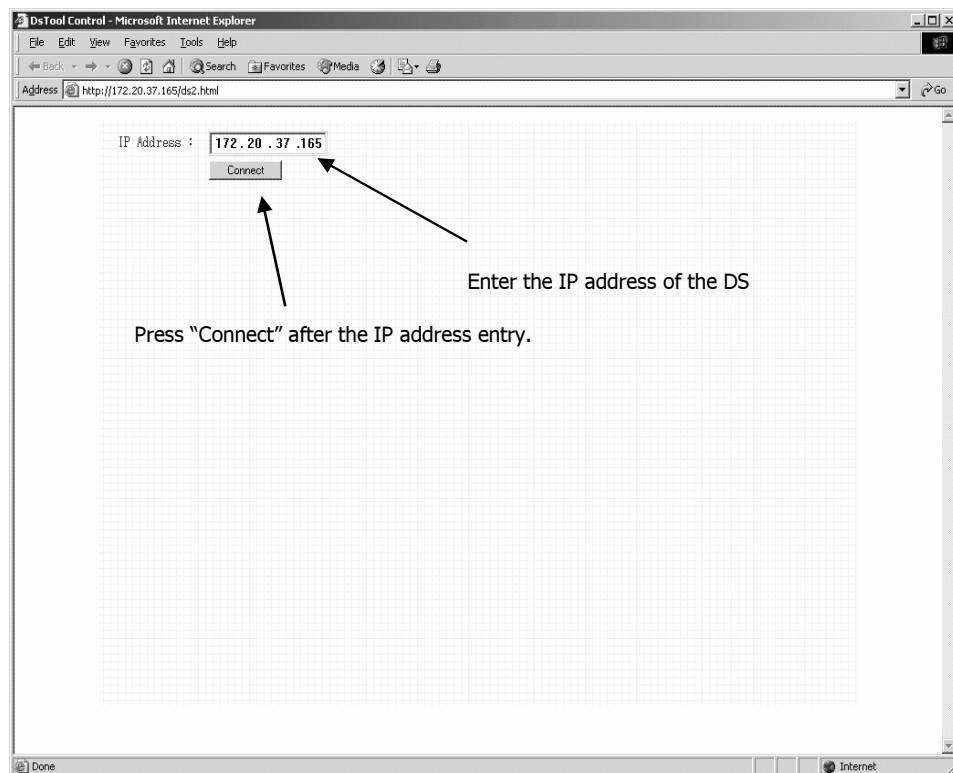
Notes on Operation

- Before connecting to DS from the browser, select the recording device to "HDD".
- Note that the data file cannot be restored once it is deleted.
- The data transferring operation is performed only on one folder at a time. Repeat the process if you want to operate on multiple folders.
- Keep the original file name and the header file content in the source PC, or DS may not function normally.
- An exception is a use of the optional software "LX-View". It is capable of extracting a portion of the data or channels out of original data file to create a second file. If such a file follows the file naming rule found in section 7.7 of this manual, "Data File Format" section, and the DS supporting channel number, they can be played-back after transferred back to DS. (Due to the LX-View specification, the maximum file size is 2GB. Contact us for more detail)
- If the same file name exists in the DS, the file cannot be transferred.
- When the file deletion and transfer is performed, a fragmentation occurs in the DS hard disk, and the data rate in recording and playing back is reduced. If such speed reduction is observed, format the DS hard disk after saving important data files.
- When the data is transferred to the DS unit from the PC, the data in the PC remains without being lost.
- Do not operate the main control page (ds.html) and the special feature page (ds2.html) from multiple browsers. If both pages are open, the connection may be lost during operation.

1. Open the browser in the PC and enter "<http://xxx.xxx.xxx.xxx/ds2.html>" ('xxx.xxx.xxx.xxx' is the IP address of DS) in the Web address box

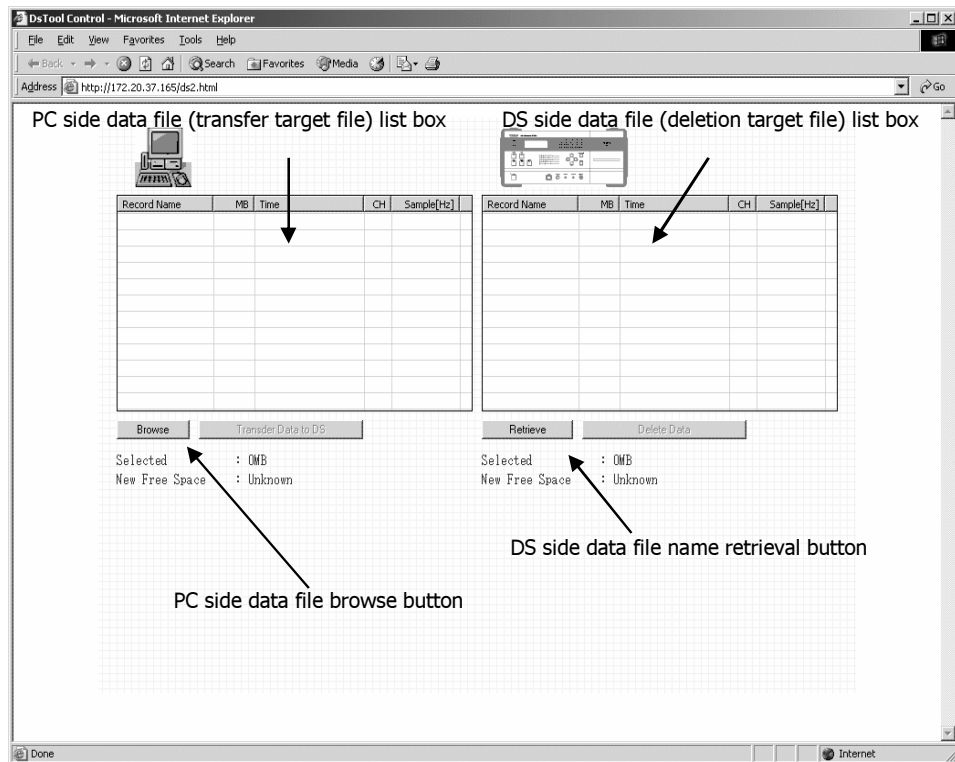
2. The following window appears.

Enter the IP address of the DS recorder in the [IP Address :] entry, and press "Connect".

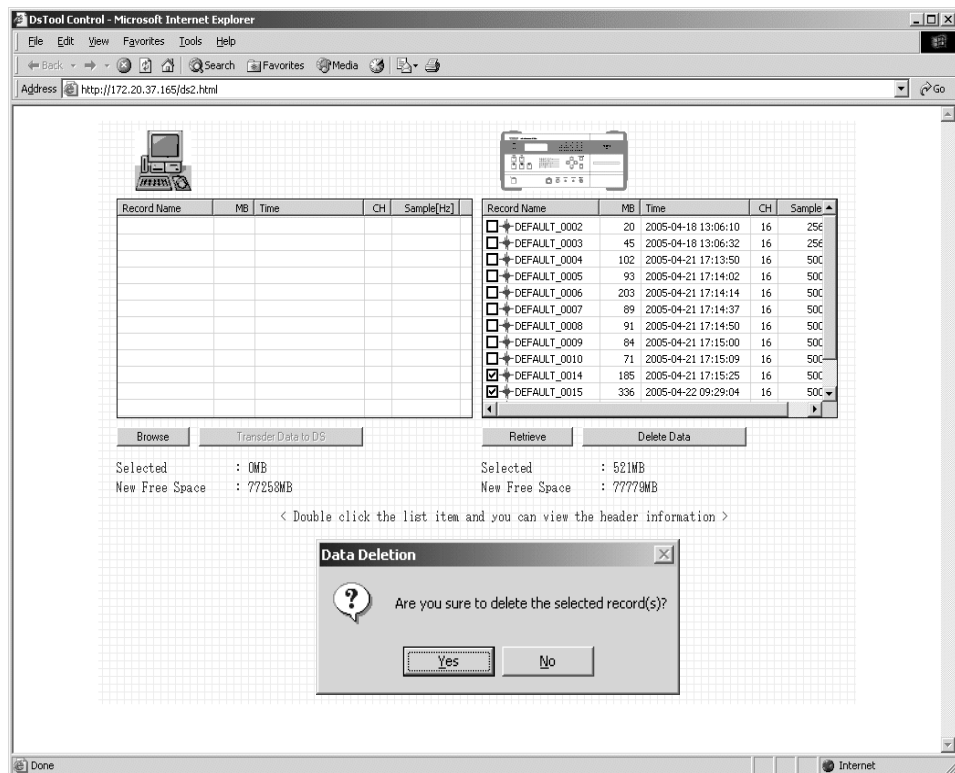


※ The IP address shown is an example

3. The browser window as shown in the figure below appears when connecting to DS. The data file deletion and the data transfer operation are available in this window.

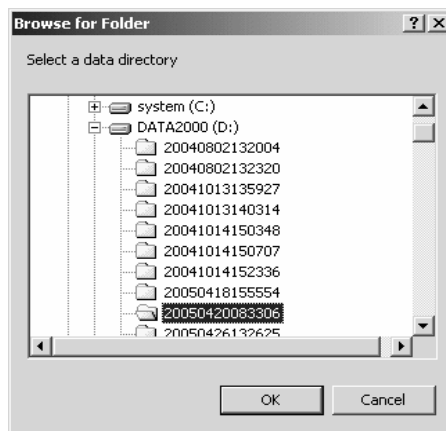


4. Press the "Retrieve" button and the data files in DS are shown in the list. Put a check mark on the files to be deleted and press "Delete Data". Press "Yes" in the confirmation dialog if you want to proceed and the file deletion begins. When the file deletion completes, the confirmation dialog appears. Press "OK" and the data file list is automatically updated.



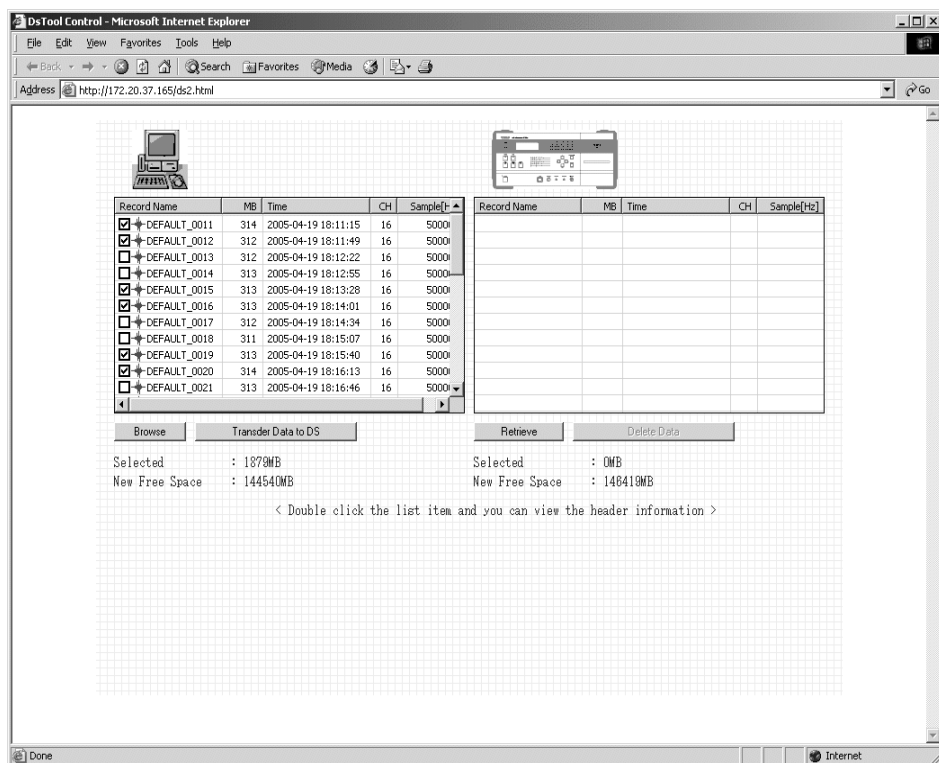
5. The data transfer is available in the same browser screen.

5-1. Press "Browse" and the "Select a data directory" dialog appears. After selecting the directory where the data files resides, press "OK".



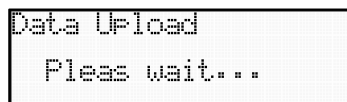
Example

5-2. All data files in the specified directory of the client PC are displayed in the list. Check the box to select the file to be transferred, then press the "Transfer Data to DS" button. Press the "OK" button in the confirmation dialog and the data transfer to DS starts. The transfer progress is shown during the transfer process. When the data transfer completes, "Data transfer was successfully finished" message appears. Click "OK" and the files in the DS appears in the list.



LCD Display During Data Transfer

During the data transfer, the LCD on the main unit displays as shown below, and all key operations are disabled.



Returns to READY after the data transfer completion.

Note

14. TROUBLE SHOOTING

1. <SYSTEM DOWN!!> is displayed at boot-up of the system.

Re-start System

If the following screen is displayed after the initial screen is displayed, turn off the power switch once to restart the system.



2. <Notify Communication port failed to open. Please close all browsers to terminate residual Applets and re-open the browser. The browser will be closed now.> is displayed when connecting by using the browser.

The DS system uses a special port number to communicate the status with the browser. The message will be displayed if connecting multiple PC clients or refreshing the browser screen exceeds the pre-secured communication ports.

Reduce the numbers of the PC clients connected or close and re-open the browser.

A connectable number of the PC clients will be varied depending on the port usages of the DS system.

Within 10 units of the client PC is suggested.

20 units is a theoretical number, however; the more connection the more busy traffics affects to the response of the network operation of the DS system.

Use <Java Port (notify): Port Number/Java Connection (DS): Client number to DS> of the browser applet window <C> for traffic estimation.

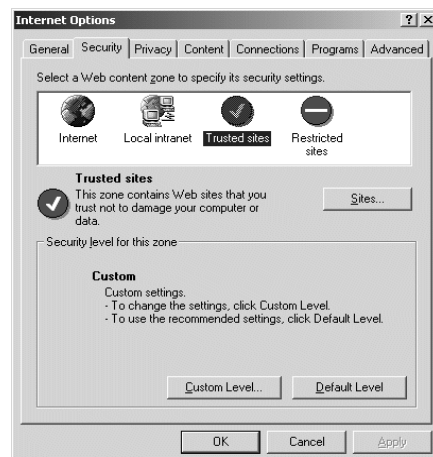
3. <Failed to Read Cookie! Cookie usage is disabled or reached the cookie limit.> is displayed when trying to display the waveform by using the browser.

The DS system uses the cookie to save three sets of the waveform display settings at the client PC. Old cookies that exceed the limit number are deleted by accordance with RFC2109. The message may be appeared when the cookies to use for the waveform display settings are deleted by other cookies to browse the Internet services. In such case, save the waveform display settings again.

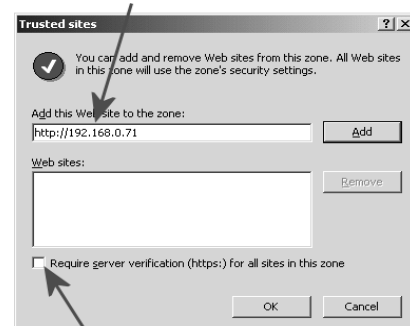
You cannot save the display settings if you set your browser option not to accept cookie.

4. When opening "ds2.html", the page does not appear or it shows "If you see this text, your browser does not support the OBJECT tag" in the browser.

The Active-X is automatically downloaded and executed when "ds2.html" page is accessed. However in few cases the OS internal security setting prohibits the Active-X to execute. Register the IP address of the connecting DS in the Internet Explorer "Tool" -> "Internet Option" -> "Security" -> "Trusted Site", and press the "Site" button. Then add the IP address in the "Web Site" list.



Enter the IP address of the DS following "http://", and press the "Add" button.



Remove this check mark

- Confirm that the "Active-X Controls" is enabled in the "Custom Level..." setting.

Note

15. SPECIFICATIONS

Item	Specifications
Input	Balanced input for AC coupling mode and DC coupling mode (need an optional BNC unit for unbalanced input), unbalanced input for IEPE.
Input Mode	AC coupling/DC coupling/IEPE
Input Range	+/- 0.1 Vp, 0.2 Vp, 0.5 Vp, 1 Vp, 2 Vp, 5 Vp, 10 Vp, 20 Vp Approximately +/- 130 % full range
Maximum Applicable Voltage	± 30 Vp
Input Impedance	100 kohm
Sensor Power Supply	24 V DC/4 mA
TEDS	IEEE 1451.4 Basic TEDS V0.9
Input Connector	Recorder Main Unit: Multi-connector 16 channels/connector x 2 (32 channels input model)
Anti-aliasing Filter	1 MHz sampling: analog filter 400 kHz (-3 dB) 6 th order butterworth fixed Switched Capacitor Filter Method at 512 samples/sec or less: Set a cut-off frequency automatically at 1/2.5 (40 %) of the selected sampling rate. (ON/OFF setting available) Fixed at OFF when using an external sampling (Above 400 kHz filter is effective.)
No. Of Channels	2/4/8/16/32/64 Max. 16 channels at 1 MHz sampling Max. 32 channels 500 kHz sampling or less (16 channels/board x 2) Within the recording and playback rate specified below.
Frequency Response (Recording)	AC coupling mode: 0.1 Hz (-1.5 dB) – 400 kHz (-3 dB) DC coupling mode: DC – 400 kHz
Quantization	16 bits 15 bits at Channel 1 only to be used for Trigger condition status bit of LSB 1 bit (fixed)
Recording File Format	Header file contains the setting parameter information and Binary data files. Remarks: There are a system management data area to be offset on the binary data. Copy function of the browser control or the LX View software can negotiate it to be invisible for the actual numbers of recording data.
Max. Sampling Rate	1 MHz
Max. Recording and Playback Rate	16 M words/sec (32 MB/sec), support a direct recording to the internal hard disk drives only at the maximum recording rate. (In order to ensure the maximum recording rate, use it after disk format.) Maximum playback rate: 8 M words/sec (cannot playback at 1 MHz sampling rate.) Minimum recording and playback rate: 500 k words/sec or higher.
Sampling Method	Simultaneous sampling for all channels
Sampling Rate	<ul style="list-style-type: none"> ● 1 MHz/500 kHz/250 kHz/125 kHz/62.5 kHz/31.25 kHz ● 400 kHz/200 kHz/100 kHz/50 kHz/25kHz ● 40 kHz/20 kHz ● 256 kHz/128 kHz/64 kHz/32 kHz ● 512 kHz/409.6 kHz/204.8 kHz/102.4 kHz/51.2 kHz/25.6 kHz ● 40.96 kHz/20.48 kHz ● 384 kHz/192 kHz/96 kHz/48 kHz/24 kHz Within the recording and playback rate specified above.
Recording Times	Depends on setting combination of the recording channels and the sampling rate. Example: 16 channels 1 MHz sampling approximately 70 minutes, 32 channels 250 kHz sampling approximately 2.5 hours
Sampling Clock	Internal, External (TTL)
Sampling Start	Internal, External (TTL)
Range Accuracy (Recording)	+/- 2 % or less (Target)
Linearity (Recording)	256 kHz sampling or lower +/- 0.2 % 384 kHz – 1 MHz sampling +/- 0.5 %
Distortion (Recording)	0.2 % (512 kHz sampling or lower) 0.5 % (1 MHz sampling)
Drift (Recording)	+/- 0.2 % (10 minutes after power ON to Hard disk full recording state)
Dynamic Range (Recording)	77 dB (within recording bandwidth, 256 kHz sampling filter ON +/- 1 Vp range) (Typical)
S/N (Recording)	76 dB (within recording bandwidth, 256 kHz sampling filter ON +/- 1 Vp range) (Typical)
Level Trigger Method	By using a digital comparator, selectable trigger rising/falling edge.
Pre-trigger	Yes, effective only when the recording to the internal hard disk drive is selected.
Event	Yes (200 marks within a single recording file)
Voice Memo Recording	Use Channel 1 for either data or voice memo channel. Voice memo input jack Voice memo is recorded at the same sampling rate of one for data. After transferring recorded data file to a PC, use the LX View to extract and to convert WAV file to listen to at the PC. (Memo voice playback is possible at the DS unit installed the analog output amplifier.)
Storage	Internal removable hard disk drive (RAID0) x 2
Recorder Key Operations	REC/START/STOP/PAUSE/EVENT
Input Level Display	By using LED to display the input status of each channel. No flash: Input level +/- less 5 % Green: +/- 5 % to approximately +/- 50 % Orange: +/- 51 % to approximately 125 % Red: Excess input approximately more than +/- 125 %
Interface	Ethernet 1000BASE-T x 1 (with Auto negotiation 10/100/1000)
Internal Clock Set	By using the PC.
Power Supply/Consumption	100 V – 230 V AC 140 VA (DS-320R)
Vibration	Equivalent specification to one of a general personal computer
Operating Temperature/Humidity	5 degree C - 35 degree C 85 % RH or less (no condensing)
Dimensions	380 (W) x 162 (H) x 450 (D) mm
Mass	23 kg (DS-320R)

Note

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Note

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