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Main Unit Specifications

Main Unit Specifications

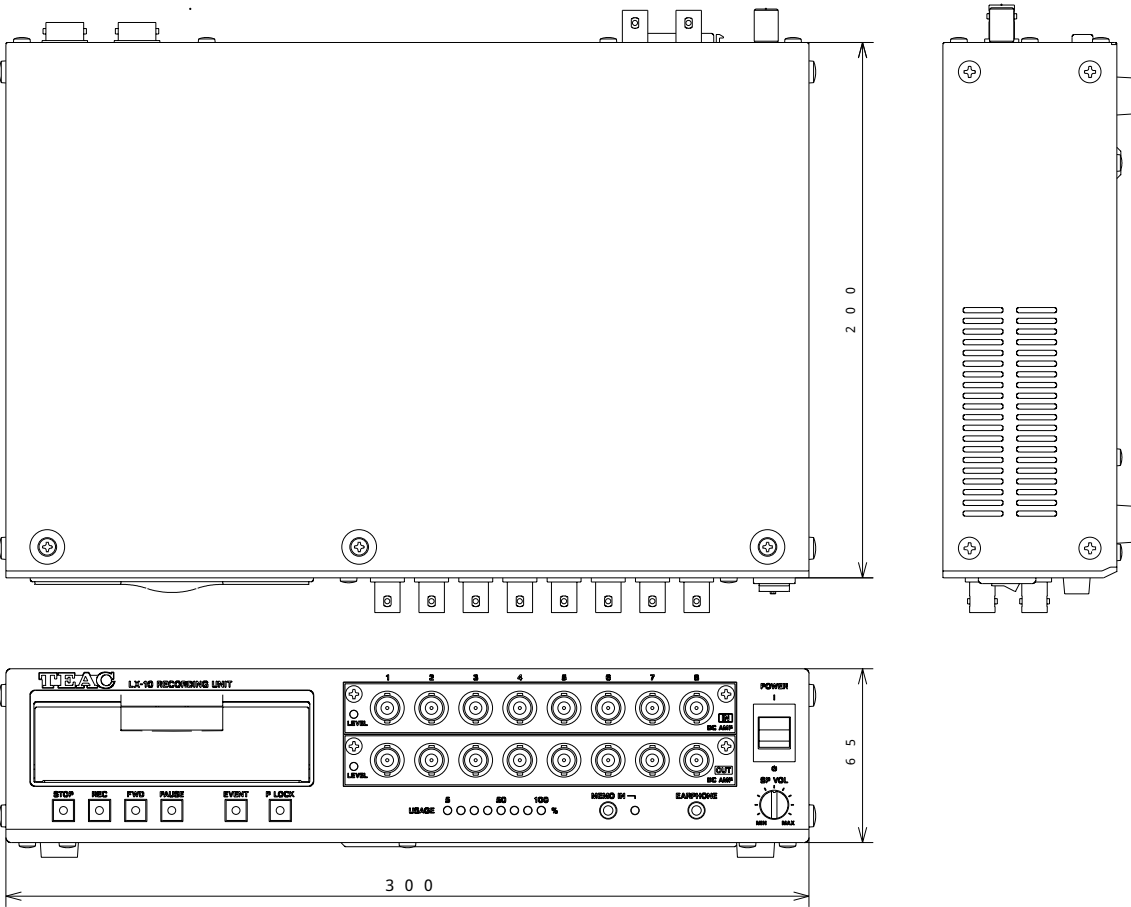
Recording Media	MO disk and memory, PC card and memory, or memory
Capacity of MO Disk	1.3 GB
Capacity of Memory	64 MB, up to 512 MB memory can be added as optional
Amp Slot	2 in the main unit
Interface	IEEE 1394-1995 compatible (LX-10/20)
	100BASE-TX (LX-10L/20L)
Sampling frequency	(Value in brackets is the recording bandwidth with tolerances of +/-0.5 dB)

LX-10/10L							
96-1.5 kHz	96 kHz (DC-40 kHz)	48 kHz (DC-20 kHz)	24 kHz (DC-10 kHz)	12 kHz (DC-5 kHz)	6 kHz (DC-2.5 kHz)	3 kHz (DC-1.25 kHz)	1.5 kHz (DC-625 Hz)

LX-20/20L							
96-1.5 kHz	96 kHz (DC-40 kHz)	48 kHz (DC-20 kHz)	24 kHz (DC-10 kHz)	12 kHz (DC-5 kHz)	6 kHz (DC-2.5 kHz)	3 kHz (DC-1.25 kHz)	1.5 kHz (DC-625 Hz)
100-1 kHz	100 kHz	50 kHz	20 kHz	10 kHz	5 kHz	2 kHz	1 kHz
65.536-1.024 kHz	65.536 kHz	32.768 kHz	16.384 kHz	8.192 kHz	4.096 kHz	2.048 kHz	1.024 kHz
102.4-1.28 kHz	102.4 kHz	51.2 kHz	25.6 kHz	12.8 kHz	5.12 kHz	2.56 kHz	1.28 kHz

Voice Memo	Sampling frequency: 8 kHz, WAV file
Internal Clock Precision	+/-1 ppm (at 25 degree C)
Operating Temperatures	5 to 35 degree C (MO model) 0 to 45 degree C (PC card model)
Storage Temperatures	-20 to 60 degree C
Operating Humidity	10 to 85% (no condensation)
Storage Humidity	5 to 90% (no condensation)
Power	+11 to 30 V DC Use AC adaptor for AC source.
Power Consumption	Approx. 35 W (LX-10, AR-LXDC and AR-LXAO)
External Dimensions	300W x 65H x 200D (mm) excluding protrusions
Mass	Approx. 3.8 kg

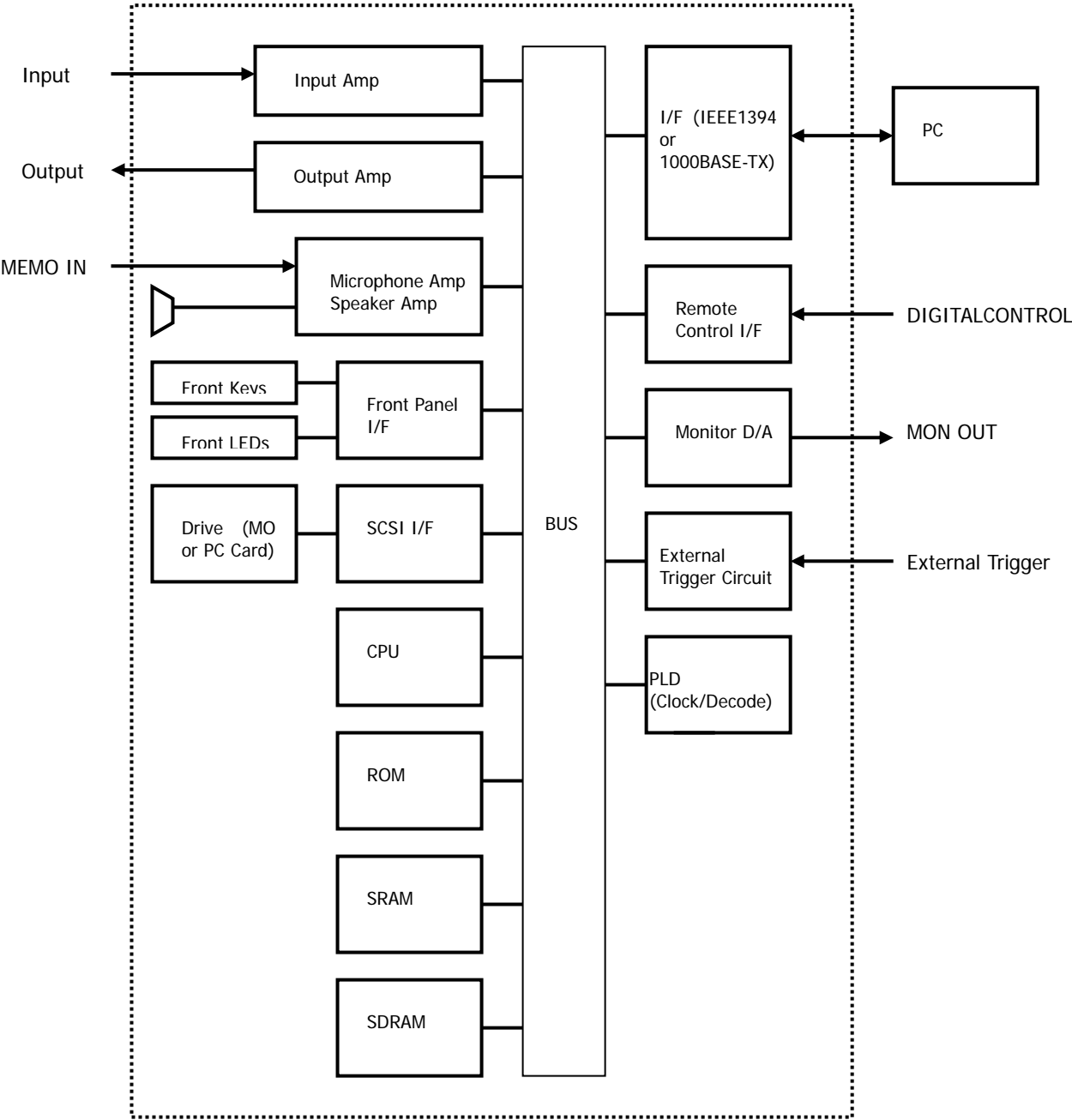
External Dimensions



Main Unit Specifications

Block Diagram

LX-10/10L 8-channel input, 8-channel output



Tachometer Pulse Input Specifications

You can use the tachometer pulse inputs to the PULSE IN A/B connectors of the LX-20/20L.

Number of Inputs	16 bits mode: 2 channels 32 bits mode: 1 channel or 2 channels
Input Method	Threshold Level + 0.5 V, + 1 V, + 2.5 V, + 5 V, + 10 V, + 20 V selectable (Maximum input voltage +/- 50 V) (Applicable input frequency 450 kHz)
Input Impedance	100 kohm
Measurement Mode	<p>(1) pulse (gate): Pulse count mode within the gate time. Range: 1 to 255 times of the sampling frequency. Accuracy: +/- 2 counts</p> <p>(2) pulse (total): Total counts from measurement start to stop Accuracy: +/- ± 5 counts</p> <p>(3) period: Cycle count mode Range: 1 msec, 5 msec, 10 msec, 50 msec, 100 msec, 500 msec, 1 sec Accuracy: +/- 0.3 % (at 16 bits mode) +/- 0.2 % (at 32 bits mode)</p> <p>(4) frequency: Frequency measurement mode Range: 10 Hz, 20 Hz, 50 Hz, 100 Hz, 200 Hz, 500Hz, 1 kHz, 10 kHz, 20 kHz Accuracy: +/- 0.3 % (at 16 bits mode) +/- 0.2 % (at 32 bits mode)</p> <p>(5) rpm: RPM mode Range: 1500 rpm, 3000 rpm, 6000 rpm, 9000 rpm, 12000 rpm, 18000 rpm, 24000 rpm Accuracy: +/- 0.3 % (at 16 bits mode) +/- 0.2 % (at 32 bits mode) Divided Rate: 1 to 255 Moving Average: 1 to 16 Number of Pulse per Revolution: 1 to 255 Tachometer Pulse Timing: Use LSB 1 bit for the tachometer pulse timing Note that this function is available at the sampling frequency 48 kHz or lower.</p>

- 1 x 16 bits tachometer pulse input channel is equivalent to 1 x analog input channel. 1 x 32 bits tachometer pulse input channel is equivalent to 2 x analog input channels. Therefore, if you turn ON tachometer pulse input channel(s), in order keep the same analog input channels, lower the sampling frequency is required by following the setting of tachometer pulse input channel(s).
- Set **Moving Average** to [1] only, when the sampling frequency of 102.4 kHz, 100 kHz, 96 kHz, 65.536 kHz, 51.2 kHz, 50 kHz, 48 kHz, or 32.768 kHz is selected.
- Only 1 x 32 bits tachometer pulse input can be selected when the sampling frequency of 102.4 kHz, 100 kHz, 96 kHz, or 65.536 kHz is selected.
- The LX Navi cannot monitor the tachometer pulse input in wave form display. Use the distal display to monitor.
- The LX cannot playback the recorded tachometer pulse input signals. Process the data as digital data file.
- You cannot use the tachometer pulse inputs and the generator output function at the time.

Generator Output Specifications

Generator Output Specifications

You can use the MON OUT connector of the LX-20/20L for the generator output.

Number of Output Channel	1 channel
Output Level	1 to 5 V at 0.1 V steps (same as the monitor output)
Output Connector	MON OUT (Monitor output) BNC
Types of Outputs	SIN, SWEEP SIN, Pulse, Pink noise, White noise
Noise Level	-70 dB or less (at SIN output)

- You cannot use the tachometer pulse inputs and the generator output function at the time.

Expansion Unit Specifications

<AU-LXEPIO>

Expansion Unit for DC Amp

Amp Slot 2 slots

Dimensions 300W × 30H × 200D (mm) (excluding protrusions)

Mass Approximately 1.2 kg

<AU-LXEPIOP>

Expansion Unit for PA Amp/ST Amp

Amp Slot 2 slots

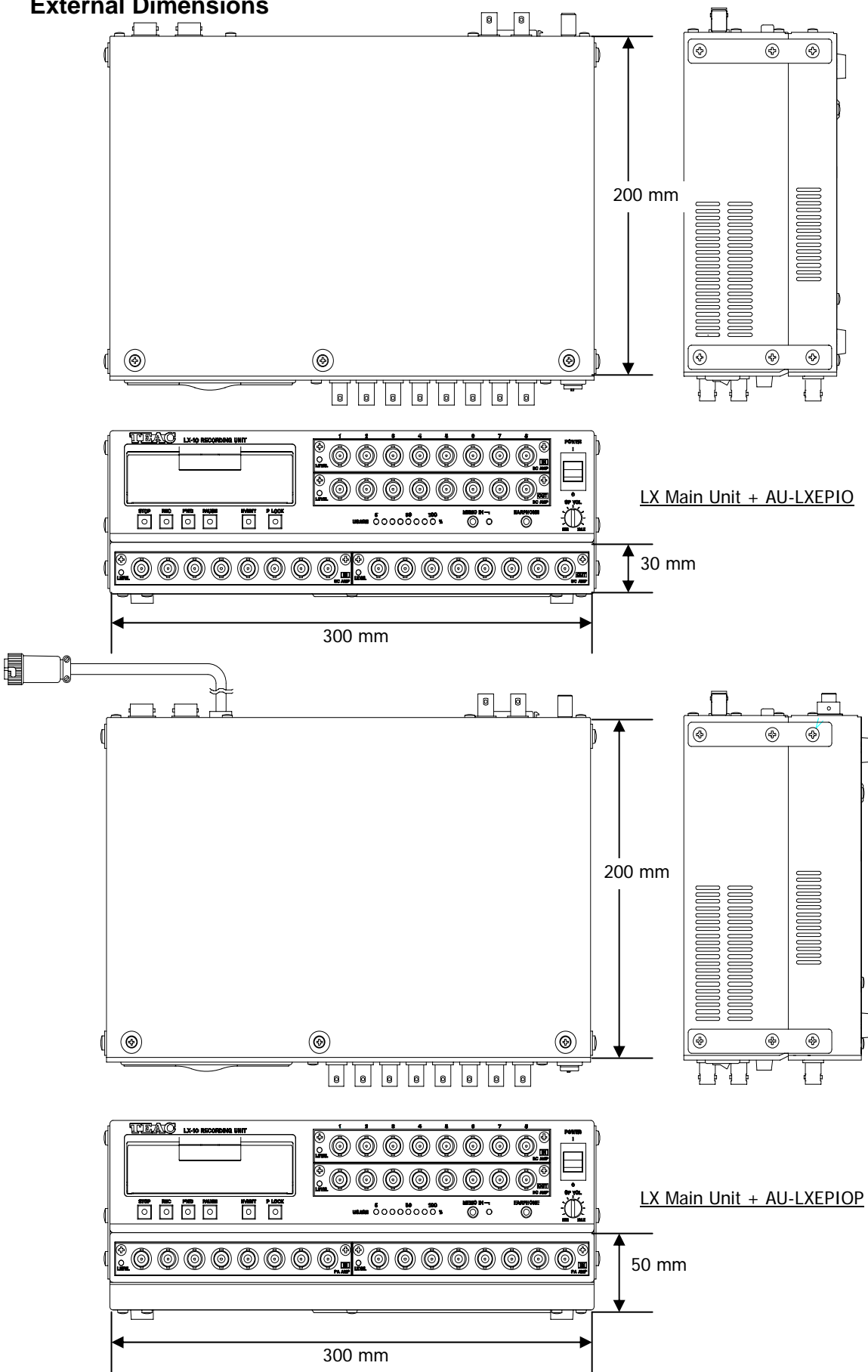
Power Supply +11 to 30 V DC comes with AC adaptor

Dimensions 300W × 50H × 200D (mm) (excluding protrusions)

Mass Approximately 2 kg

Expansion Unit Specifications

External Dimensions



DC Input Amp Specifications

<AR-LXDC>

Quantization Bits	16 bits (simultaneous sampling, use MSB16 bits of 24 bits ADC)
Conversion Method	128 times over-sampling delta-sigma method, 64 times at 96 kHz sampling
Num. of Input Channels	8 channels
Input Range	+/-0.5, 1, 2, 5, 10, 20, 50 Vp (Exceeded range +/-120%)
Absolute Max. Input Voltage	+/-100 V
Input Impedance	100 k ohm unbalanced
Filter	Joint use of digital and analog filters
Linearity	+/-0.1% or less
Distortion	+/-0.05% or less (at bandwidth of 20 kHz)
Drift	+/-0.1% or less
Dynamic Range	80 dB (within bandwidth)
S/N Ratio	78 dB (within bandwidth)
Cross-talk	78 dB (within bandwidth, 48 kHz or lower sampling) 75 dB (within bandwidth, 96 kHz sampling)
Inter-channel Phase Difference	1 degree or less (in same range with bandwidth 20 kHz or less) 3 degrees or less (in same range with bandwidth 40 kHz)

<AR-LXDC2>

Addition to the specifications of the AR-LXDC, Low-speed sampling mode (1 kHz to 1/60 Hz) is available.

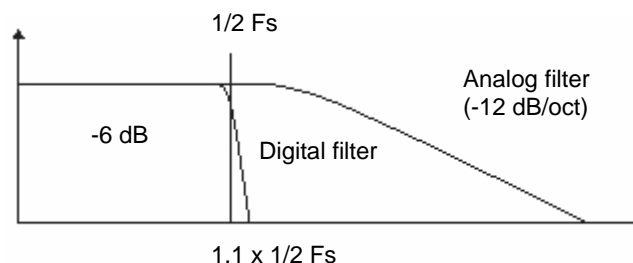
Conversion Method	128 times over-sampling delta-sigma method, 2 kHz sampling
Sampling Frequency	1 kHz, 500 Hz, 200 Hz, 100 Hz, 50 Hz, 20 Hz, 10 Hz, 5 Hz, 2 Hz, 1 Hz, 1/2 Hz, 1/5 Hz, 1/10 Hz, 1/30 Hz, 1/60 Hz (down sampling of 2 kHz sampling data by using DSP)
Recoding Times	Example to use 1.3GB MO in 8 channels' recording 100 Hz sampling, Memo off: Approximately 200 hours Memo on: Approximately 33 hours 1 Hz sampling, Memo off: Approximately 20000 hours Memo on: Approximately 40 hours
Digital Filter Characteristics	Caused aliasing at 100 Hz or lower

Sampling Frequency (Fs)	Cut-off Frequency (Fc)	Attenuation
1 kHz	400 Hz	- 80dB (at 500 Hz)
500 Hz	200 Hz	- 80dB (at 250 Hz)
200 Hz	80 Hz	- 80dB (at 100 Hz)
100 Hz	80 Hz	- 80dB (at 100 Hz)
50 Hz, 20 Hz 10 Hz, 5 Hz, 2 Hz, 1 Hz	40 Hz	- 80 dB (at 50 Hz)
1/2 Hz, 1/5 Hz, 1/10 Hz, 1/30 Hz, 1/60 Hz	20 Hz	- 80dB (at 25 Hz)

DC Input Amp Specifications

Filter Characteristics

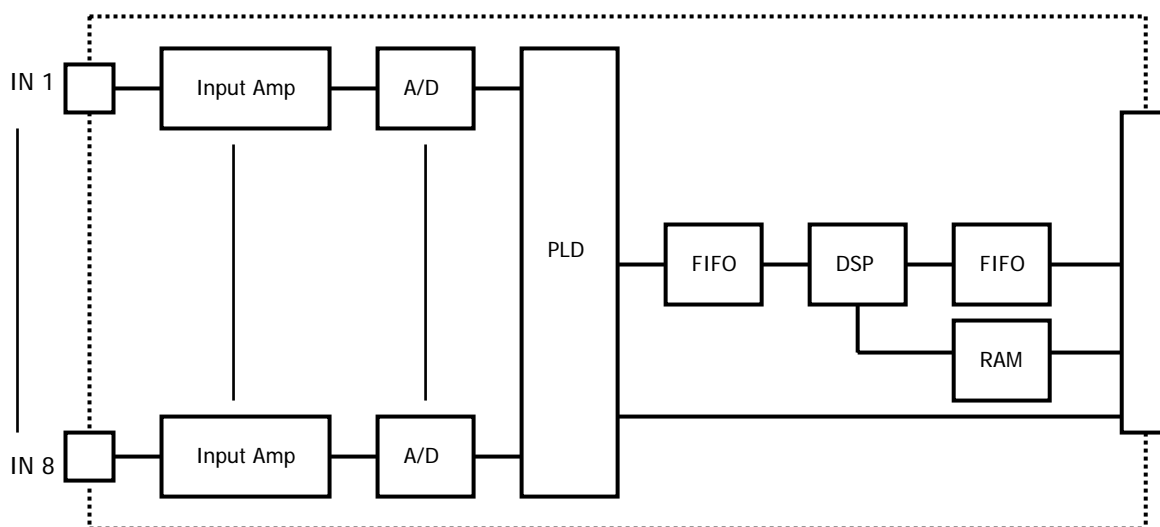
The analog filter is a 2nd-order Butterworth filter, with a cutoff frequency that is about 1.2 times the aliasing frequency ($1/2F_s$). The filter prevents 128-times delta-sigma A/D (analog to digital) high-order aliasing. The digital filter is used when down-sampling 128-times delta-sigma A/D data. The attenuation characteristics are about -6 dB at $1/2F_s$. The aliasing component in -6 dB occurs at a sampling frequency of 1.1 times from 1 of the $1/2F_s$. The attenuation is abrupt so attenuation occurs quickly up to the noise level.



Calibration

When the power is turned on, all channels and all ranges self-calibrate using a DSP. In this operation, when the power is first turned on, the 2 basic signals of zero and + full scale are converted from analog to digital, and the zero point error and gain error are calculated for each range, and then stored. During recording, the data converted from analog to digital is adjusted by the calibration data for each range.

Block Diagram



PA Amp Specifications

<AR-LXPA1>

Num. of Channels	8
Input Format	Balanced and unbalanced
Input Coupling	Balanced AC coupling, balanced DC coupling, unbalanced DC coupling
Input Impedance	150 k ohm
Input Range	+/-0.01 V, 0.0316 V, 0.1 V, 0.316 V, 1 V, 3.16 V, 10 V (over range +/-127%)
Absolute Max. Input Voltage	+/-50 V
Filter	Joint use of digital filter and analog filter
Frequency Response	Flatness: +/-0.5 dB
In AC mode	1 Hz to each bandwidth of the LX main unit.
In DC mode	DC to each bandwidth of the LX main unit.
Quantization Bits	16 bits (simultaneous sampling, use MSB16 bits of 24 bits ADC)
Conversion Method	128-times over-sampling delta sigma modulation.
	at 96 kHz sampling, 64-times over-sampling is used.
Sampling Frequency	Depends on the sampling frequency of the LX main unit.
Range Precision	+/-2% or less
Linearity	+/-0.1% or less
Distortion Factor	At 48 kHz or 96 kHz sampling: When the input range is 0.316 V or more: +/-0.05% or less. When the input range is 0.1 V or less: +/-0.2% or less. At sampling of 24 kHz or less, +/-0.4% or less.
Drift	+/-0.1% or less (10 or more minutes after power is turned on, at an input range of 1.0 V)

S/N and Crosstalk

Input Range	S/N		Crosstalk	
	Within Bandwidth 20 kHz or less	Within Bandwidth 40 kHz or less	Within Bandwidth 20 kHz or less	Within Bandwidth 40 kHz or less
+/- 0.01 V	64 dB	60 dB	- 64 dB	- 60 dB
+/- 0.0316 V	74 dB	69 dB	- 71 dB	- 69 dB
+/- 0.1 V	83 dB	76 dB	- 77 dB	- 73 dB
+/- 0.316 V	87 dB	77 dB	- 77 dB	- 73 dB
+/- 1.0 V	87 dB	77 dB	- 77 dB	- 73 dB
+/- 3.16 V	87 dB	77 dB	- 77 dB	- 73 dB
+/- 10 V	87 dB	77 dB	- 77 dB	- 73 dB

Inter-channel phase Difference 1 degree or less (with same range and a bandwidth of 20 kHz or less)
3 degrees or less (with same range and a bandwidth of 40 kHz)

Power to Sensor	28 V DC, 4 mA
TEDS	Read TEDS information at the LX Navi or the color LCD remote control unit
Power Consumption	Approx. 7 W

PA Amp Specifications

<AR-LXPA3>

Addition to the specifications of the AR-LXPA, +/- 50 V input range and A/C/FLAT filter are available.

Input Impedance 470 kohm or more (+/-0.01 to 3.16 V) 100 kohm (+/- 10 V, +/- 50 V)

Input Range ± 0.01 V, 0.0316 V, 0.1 V, 0.316 V, 1 V, 3.16 V, 10 V, 50 V (Over range +/-127 %)

Absolute max. Input Voltage +/- 50 V (± 0.01 to 3.16 V) +/- 100 V (+/-10 V, +/- 50 V)

HPF 3rd order butterworth filter 10 Hz (+/- 0.5 dB or less), 20 Hz (+/- 0.5 dB or less)

Weighting A curve, C curve, Flat IEC-TYPE1

Power to Sensor 28 V DC/4 mA, 24 V DC/4 mA (internal switch)

S/N and Crosstalk

Input Range	S/N		Crosstalk	
	Within Bandwidth 20 kHz or less	Within Bandwidth 40 kHz or less	Within Bandwidth 20 kHz or less	Within Bandwidth 40 kHz or less
+/- 0.01 V	64 dB	60 dB	- 64 dB	-60 dB
+/- 0.0316 V	74 dB	69 dB	- 73 dB	-69 dB
+/- 0.1 V	83 dB	77 dB	-78 dB	-74 dB
+/- 0.316 V	87 dB	77 dB	-78 dB	-74 dB
+/- 1.0 V	87 dB	77 dB	-78 dB	-74 dB
+/- 3.16 V	87 dB	77 dB	-78 dB	-74 dB
+/- 10 V	87 dB	77 dB	-78 dB	-74 dB
+/- 50 V	80 dB	77 dB	-78 dB	-74 dB

ST Amp Specifications

<AR-LXST1>

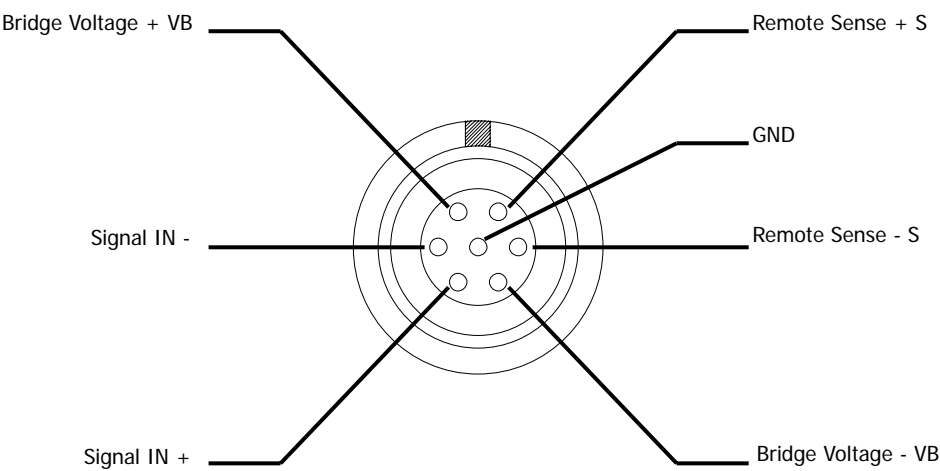
Num. of Channels	8
Input Format	Balanced differential
Input Coupling	Balanced DC coupling, DC bridge method
Input Impedance	1 Mohm
Input Range	ST mode ± 0.25 mV/V, 0.5 mV/V, 1 mV/V, 2.5 mV/V, 5 mV/V, 10 mV/V, 25 mV/V, 50 mV/V (over range $\pm 127\%$) DC mode ± 1 V, 2 V, 5 V, 10 V (over range $\pm 127\%$)
Absolute Max. Input Voltage	± 25 V
Filter	Joint use of digital filter and analog filter
LPF	10/30/100/300/1 k/3 k/10 k/30 kHz/Pass: - 48 dB OCT butterworth (switched capacitor filter) 8 channels independently
Frequency Response	
In ST mode	DC to 30 kHz (-3 dB)
In DC mode	DC to 40 kHz (-3 dB)
Quantization Bits	16 bits (simultaneous sampling, use MSB16 bits of 24 bits ADC)
Conversion Method	128-times over-sampling delta sigma modulation. at 96 kHz sampling, 64-times over-sampling is used.
Sampling Frequency	Depends on the sampling frequency of the LX main unit.
Range Precision	$\pm 1\%$ or less
Linearity	$\pm 0.1\%$ or less
Distortion Factor	

Applicable Gage Register	120 to 2000 ohm
Gage Factor	2.0
Bridge Voltage	2 V (± 1 V) / 10 V (± 5 V)
Bridge Connection	Full bridge
Remote Sense	Available
Temperature Drift	$\pm 0.1\%/1$ degree C(10 or more minutes after power is turned on)
Balance Method	Electronic auto balance
Balance Range	± 10000 microST
Zero Balance	Auto and manual calibration by using 16 bits D/A
S/N and Crosstalk	

ST Mode	SCF					
Bridge Voltage=2V	1 KHz		3 KHz		10 KHz	
	SNR(dB)	Cross Talk(dB)	SNR(dB)	Cross Talk(dB)	SNR(dB)	Cross Talk(dB)
+/-0.5mV						
+/-1mV						
+/-2mV						
+/-5mV						
+/-10mV						
+/-20mV						
+/-50mV						
+/-100mV						
DC Mode	SCF bypass					
Input Level	24 KHz or less					
	SNR(dB)	Cross Talk(dB)	SNR(dB)	Cross Talk(dB)	SNR(dB)	Cross Talk(dB)
+/- 1V						
+/- 2V						
+/- 5V						
+/- 10V						

ST Amp Specifications

Inter-channel phase Difference	1 degree or less (with same range and a bandwidth of 20 kHz or less)
	3 degrees or less (with same range and a bandwidth of 40 kHz)
Conenctor	Lemo 7-pin 10 ø (EGC0B Type)



Power Consumption	Approx. 8 W
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Output Amp Specifications

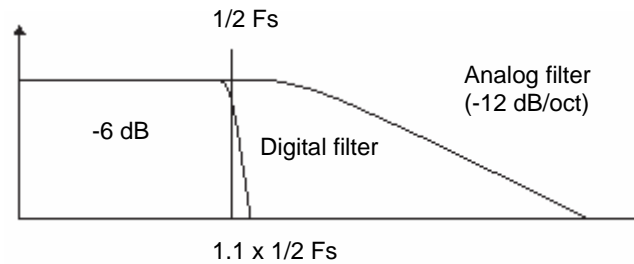
<AR-LXAO>	
Num. of Output Channels	8
Output Voltage	+/-1 to 5 V (0.1 V steps)
Impedance	75 ohm unbalanced
Output Current	+/-1 mA (at 20 ohm load)
Filter	Joint use of digital and analog filters
Linearity	+/-0.1% or less
Distortion	+/-0.05% or less (at bandwidth of 20 kHz)
Drift	+/-0.1% or less
Dynamic Range	80 dB (within bandwidth)
S/N	78 dB (within bandwidth)
Crosstalk	78 dB (within bandwidth, 48 kHz or lower sampling)
	75 dB (within bandwidth, 96 kHz sampling)
Inter-channel Phase Difference	1 degree or less (in same range with bandwidth 20 kHz or less)
	3 degrees or less (in same range with bandwidth 40 kHz or less)

Output Amp Specifications

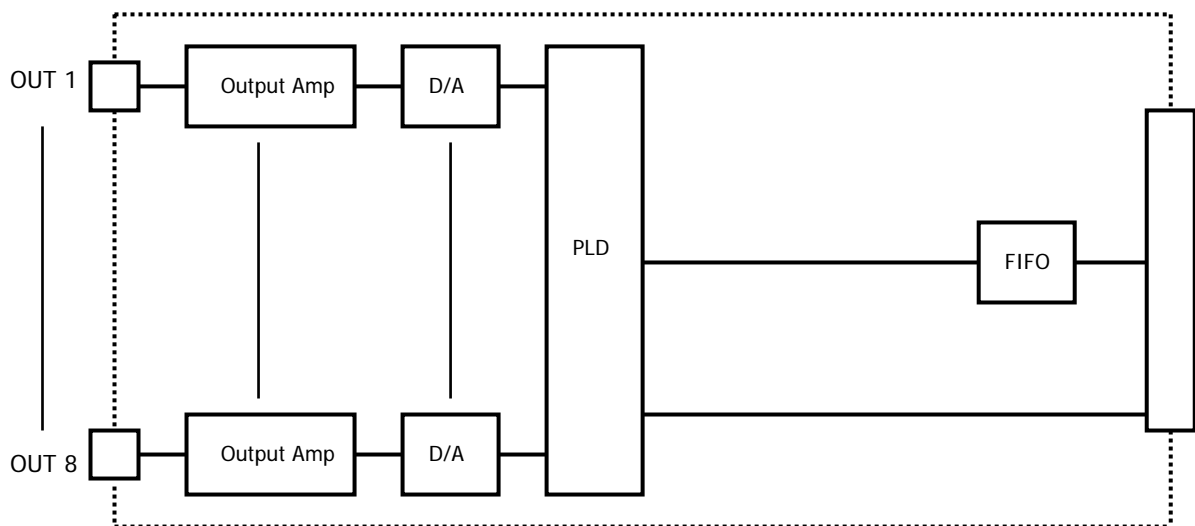
Filter Characteristics

The analog filter is a 2nd-order Butterworth filter, with a cutoff frequency that is about 1.2 times the aliasing frequency ($1/2 F_s$).

The digital filter attenuation characteristics are about -6 dB at $1/2 F_s$. The input amp and output amp are both added for the input signal, so (as shown in the following diagram) the attenuation is about -12 dB at an aliasing frequency ($1/2 F_s$).



Block Diagram



File Format

Type of Files

The LX makes a binary-format data file and ASCII-format header file each time recording stops or pauses.

Data file: Contains A/D data in binary format. The file extension is dat.

Header file: Contains recording conditions, etc., in text format. The file extension is hdr.

- The files are stored in DOS format on the media.
- When a voice memo is recorded, a WAVE file is made in addition to the above. You can play this WAVE file in the Windows Media Player.

File Name

The file name is common to the data file and header file. An ID number is added to the end of the specified file name. When you specify a new file name, the ID number starts from 1. After recording is stopped or paused, the ID number is automatically incremented each time the recording restarts. If a data file with the same name or same ID number already exists when recording to the media or PC, the next ID number is used.

- When Recording to Memory or to the media

To specify a file name, choose File and New, and then specify the file name in Dataset. For the file name, use up to 5 alphanumeric characters. You cannot use the following characters:

. , ; < > [] * ? = " / ¥ ¦

The system attaches a 3-digit ID number (starting from 001) to these 5 characters to make a total of 8 characters. If you specify 4 or fewer characters, the system changes the total number of characters to 8 by using a 0 before the 3-digit ID number to pad each of the missing locations.

- When Recording to a PC

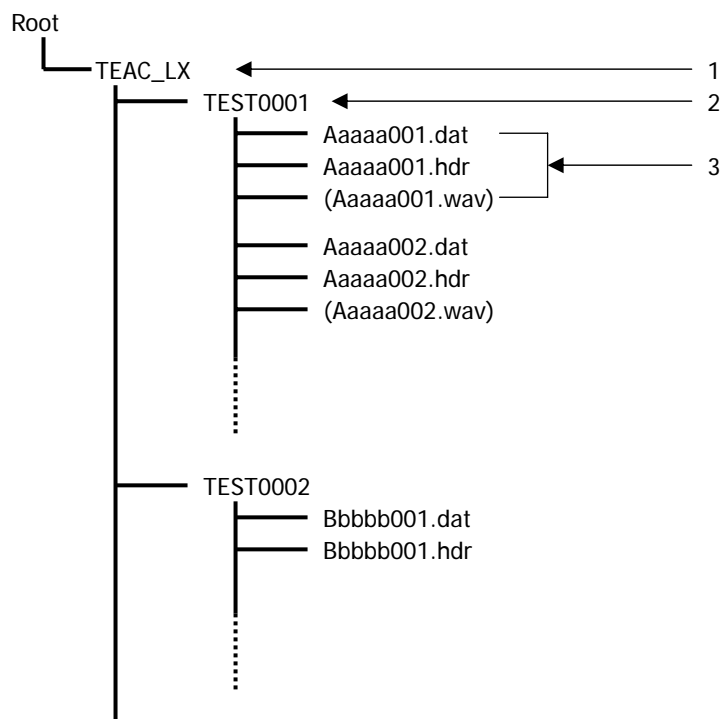
When recording to a PC, or when recording to a PC while recording to memory or the media, there is no restriction on the length of the file name. You cannot use the following characters:

. , ; < > [] * ? = " / ¥ ¦

An ID number of up to 8 characters can be added to that file name.

Directory Structure on Media

The following diagram shows how directories are organized on the media:



1. TEAC_LX

This directory is made automatically when the media is formatted. When the media is inserted in an LX, this directory is made automatically if it does not already exist.

2. TEST0001

Name of the directory entered in Directory, which is in the dialog box displayed by choosing **File** and then **New**.

3. Aaaaa001.dat, Aaaaa001.hdr, Aaaaa001.wav

The data file, header file, and voice-memo file (if a voice memo was recorded) generated for each ID.

Data File

Data converted from analog to digital 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 (Intel format)*1.

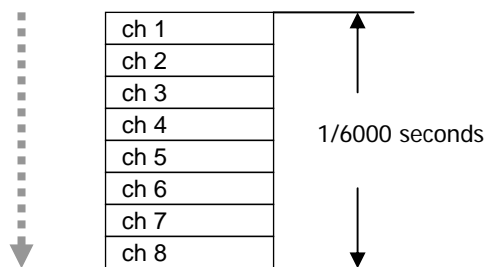
The order of data is as follows: first sampling channel order, second sampling channel order,, last sampling channel order. This order is called the INTERLACED format*2, and the format name is recorded in STORAGE_MODE in the header file.

The organization of a data file is shown in the following diagram. In this document a collection of data as shown in the example is called one scan. A data file consists of scan repetitions.

Example

Data of 1 scan when recorded with a sampling frequency of 6 kHz:

Data Sequence



Notes

*1. The byte order from the higher to the lower bytes is called the Motorola format. It is used in components such as FFT analyzers that used Motorola CPUs and in workstations.

*2. The order of data of the SEQUENTIAL format is as follows: first channel sampling order, second channel sampling order,, last channel sampling order.

Data File When Turning on Tachometer Pulse Inputs

The LX-20/20L can record the tachometer pulse input channel(s) assigned at either one of the following 4 tachometer pulse inputs modes along with analog channels.

2 x 16 bits tachometer input channels (Tachometer pulse input channel A and B)

1 x 32 bits tachometer input channel (Tachometer pulse input channel A)

1 x 32 bits tachometer input channel (Tachometer pulse input channel B)

2 x 32 bits tachometer input channels (Tachometer pulse input channel A and B)

25,000 is 100% range value at 16 bits mode.

1,638,400,000 is 100% range value at 32 bits mode.

The LX-20/20L records the tachometer pulse input data by reflecting the number of pulses per revolution and /or the pre-set divided rate.


The tachometer pulse input data are recorded at the next to the last analog channel of each scans. See the following.

Example

8 analog channels, and 2 x 16 bits tachometer pulse input mode:

(Keyword on the header file for the tachometer pulse input channels are PULSE_CH_A 9 and PULSE_CH_B_10.)

1 scan



Channel 1 (Analog)	Bit7.....Bit0	Bit15.....Bit8
Channel 2 (Analog)	Bit7.....Bit0	Bit15.....Bit8
Channel 3 (Analog)	Bit7.....Bit0	Bit15.....Bit8
Channel 4 (Analog)	Bit7.....Bit0	Bit15.....Bit8
Channel 5 (Analog)	Bit7.....Bit0	Bit15.....Bit8
Channel 6 (Analog)	Bit7.....Bit0	Bit15.....Bit8
Channel 7 (Analog)	Bit7.....Bit0	Bit15.....Bit8
Channel 8 (Analog)	Bit7.....Bit0	Bit15.....Bit8
Tachometer Pulse Input	Channel A	Bit15.....Bit8
Tachometer Pulse Input	Channel B	Bit15.....Bit8

8 analog channels, and 2 x 32 bits tachometer pulse input mode:

(Keyword on the header file for the tachometer pulse input channels are PULSE_CH_A 9 and PULSE_CH_B_10.)

1 scan

Channel 1 (Analog)	Bit7.....Bit0	Bit15.....Bit8	
Channel 2 (Analog)	Bit7.....Bit0	Bit15.....Bit8	
Channel 3 (Analog)	Bit7.....Bit0	Bit15.....Bit8	
Channel 4 (Analog)	Bit7.....Bit0	Bit15.....Bit8	
Channel 5 (Analog)	Bit7.....Bit0	Bit15.....Bit8	
Channel 6 (Analog)	Bit7.....Bit0	Bit15.....Bit8	
Channel 7 (Analog)	Bit7.....Bit0	Bit15.....Bit8	
Channel 8 (Analog)	Bit7.....Bit0	Bit15.....Bit8	
Tachometer Pulse Input	Channel A		
Bit7.....Bit0	Bit15.....Bit8	Bit23.....Bit16	Bit31.....Bit24
Tachometer Pulse Input	Channel B		
Bit7.....Bit0	Bit15.....Bit8	Bit23.....Bit16	Bit31.....Bit24

Converting Data to Physical Quantities

Data converted from analog to digital is 2-byte integers from -32768 to +32767.

When the input is +/-100% of the set input range, the value is +/-25000.

The input value is obtained from the following formula:

Input value = (A/D conversion value of the data file) x SLOPE + Y_OFFSET

- About the tachometer pulse input data

25,000 is 100% range value at 16 bits mode.

1,638,400,000 is 100% range value at 32 bits mode.

The LX-20/20L records the tachometer pulse input data by reflecting the number of pulses per revolution and /or the pre-set divided rate.

Header File

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.

- Example of Header File (LX-10/10L)

```

DATASET TEST0001
VERSION 1
SERIES CH1_LX10_DC100K,CH2_LX10_DC100K,CH3_LX10_DC100K,CH4_LX10_DC100K,
CH5_LX10_DC100K,CH6_LX10_DC100K,CH7_LX10_DC100K,CH8_LX10_DC100K
DATE 06-23-2001
TIME 16:32:55.00
RATE 1500
VERT_UNITS V,V,V,V,V,V,V,V
HORZ_UNITS Sec
COMMENT <LX-10>
NUM_SERIES 8
STORAGE_MODE INTERLACED
FILE_TYPE INTEGER
SLOPE 0.00008000,0.00008000,0.00008000,0.00008000,0.00008000,0.00008000,0.00008000,0.00008000
X_OFFSET -5
Y_OFFSET 0,0,0,0,0,0,0,0
NUM_SAMPS 59200
DATA
DEVICE LX-10
SLOT1_AMP AD_AMP,8,00000006,
SLOT2_AMP DA_AMP,8,00000006,
CH1_1 LX10_DC100K,RANGE=2V,FILTER=ON
CH2_2 LX10_DC100K,RANGE=2V,FILTER=ON
CH3_3 LX10_DC100K,RANGE=2V,FILTER=ON
CH4_4 LX10_DC100K,RANGE=2V,FILTER=ON
CH5_5 LX10_DC100K,RANGE=2V,FILTER=ON
CH6_6 LX10_DC100K,RANGE=2V,FILTER=ON
CH7_7 LX10_DC100K,RANGE=2V,FILTER=ON
CH8_8 LX10_DC100K,RANGE=2V,FILTER=ON
ID_NO 1
TIME 20010623163255,20010623163335
REC_MODE MO
START_TRIGGER COMMAND,PRE
STOP_CONDITION COMMAND,POST
START_PRE_COUNT 7500
STOP_POST_COUNT 15000
MARK 100,200,300
ID_END
VOICE_MEMO 8BITS,327680
LX10_VERSION PAL1_VER,PAL2_VER,V0.03,02200000

```

- Explanations of Header File

DATASET	File name
VERSION	1 (This is a fixed value.)
SERIES	Number of the channel used for recording. The channel name is after the underscore.
DATE	Date when recording started (month-day-year)
TIME	Time when recording started (hour: minute: second)
RATE	Sampling frequency (Unit: Hz)
VERT_UNITS	Physical/engineering units of each channel
HORZ_UNITS	Time axis units (Sec: This is a fixed value)
COMMENT	Comment entered using File and New .
NUM_SERIES	Number of recording channels
STORAGE_MODE	Data order. Fixed as INTERLACED because this is the scan order.
FILE_TYPE	Fixed as INTEGER because this is a 2-byte integer for 1 data item.
SLOPE	Coefficient used when converting data to physical/engineering units
X_OFFSET	Location of the beginning data on the time axis. Usually is 0. The set value (in seconds) is written using minus for the pre-trigger time. Even if you set the number of scans for Pre-trigger, this will be in seconds. (Values below the decimal point are discarded.)
Y_OFFSET	Offset used for converting data to physical/engineering units.
NUM_SAMPS	Number of data items recorded per channel
DATA	The information written after this entry is proprietary to this device, and indicates information different from the DADISP format. The information below is not recorded when recording to a PC. Also, it is not recorded in the header file on the PC when recording to a PC while recording to memory or the media.
DEVICE	LX-10/LX-20 (This is a fixed value.)

(The information below is not recorded when recording to a PC.)

SLOT1_AMP	The ID-name, number of channels, and versions of the amp in slot 1, next to SLOT2_AMP. Depending on the system configuration.
CH1_	The following information is written after the underscore: channel number, amp type, range setting, filter setting. (This is always ON for a DC amp.)
ID_NO	ID number
TIME	Recording start date and time, recording stop date and time (YYYYMMDDhhmmss)
REC_MODE	Recording destination device (MEMORY, MO, PC CARD, PC)
START_TRIGGER	Recording start conditions: <ul style="list-style-type: none"> COMMAND: Interface command PANEL: FWD button of the front panel LEVEL: Level trigger DATE: When Repeat Count is 1 in the interval action TIMER: When Repeat Count is 2 or more in the interval action EXT: External trigger TIME_OUT: Timeout ,PRE: Added for a pre-trigger
STOP_CONDITION	Recording stop conditions: <ul style="list-style-type: none"> COMMAND: Interface command PANEL: STOP button of the front panel LEVEL: Level trigger TIMER: Specified recording time EXT: External trigger MEMORY_FULL: Memory is full MEDIA_FULL: Media is full POST: Added for a post-trigger
START_PRE_COUNT	Number of scans recorded by a pre-trigger
STOP_POST_COUNT	Number of scans recorded by a post-trigger
MARK	Number of scans at the instant an event mark was attached.
ID_END	The following information applies to the LX hardware, etc.
VOICE_MEMO	The number of bits per sample for voice-memo data. Data size (bytes)
LX10_VERSION	Firmware and PAL version of the LX-10
(LX20_VERSION)	for LX-20

- The LX-20/20L attaches the following information after DEVICE.

When the tachometer pulse input channel is set

PULSE_CH_A	Tachometer pulse input channel number, 9 for the LX has 8 analog inputs.		
PULSE_MODE_A	Tachometer pulse input mode, number of bits, measurement mode number, range setting		
	Measurement Mode	0: Pulse counter mode, gate	
		1: Pulse counter mode, total	
		2: Cycle count mode	
		3: Frequency mode	
		4: RPM mode	
PULSE_LEVEL_A	Threshold level		
DIVIDE_RATE_A	Divided rate		
MOVE_AVERAGE_A	Moving average		
PULSE_PER_1R_A	Number of pulse per revolution		

The LX-20/20L may not generate some of above information depending on the selected measurement mode.

When the tachometer pulse input channel B is assigned, the information above will be changed to B from A.

Connector Specifications

Connector Specifications

DIGITAL CONTROL Connector

<Functions>

Contact input: REC FWD, REC, FWD, STOP, PAUSE, event, panel lock, internal clock adjustment

Status output: REC, FWD, STOP, PAUSE, event, panel lock

<Input/Output Circuit>

Input: L level: 0.4 V or less

H level: Open or 2 V or more

Pulse width: 100 ms or more

Output: Open drain, maximum sync current: 8 mA

<Connector>

Angled half pitch 36-pin (DHA-RC36-R1xxx series)

Pin Assignment

Pin No.	Signal	Function	Pin No.	Signal	Function
1	GND	Ground	19	GND	Ground
2	RESERVED	Reserved	20	RESERVED	Reserved
3	RESERVED	Reserved	21	RESERVED	Reserved
4	GND	Ground	22	AGND	Reserved
5	RESERVED	Reserved	23	AGND	Reserved
6	RESERVED	Reserved	24	AGND	Reserved
7	GND	Ground	25	AGND	Reserved
8	RESERVED	Reserved	26	RESERVED	Reserved
9	RESERVED	Reserved	27	RESERVED	Reserved
10	RTCADJIN	Internal clock adjustment input	28	NC	
11	RECFWDIN	REC FWD input	29	NC	
12	RECIN	REC input	30	RECSTS	REC output
13	FWDIN	FWD input	31	FWDSTS	FWD output
14	STOPIN	STOP input	32	STOPSTS	STOP output
15	PAUSEIN	PAUSE input	33	PAUSESTS	PAUSE output
16	EVENTIN	EVENT input	34	EVENTSTS	Event output
17	PLOCKIN	Panel Lock input	35	PLOCKSTS	Panel Lock output
18	GND	Ground	36	GND	Ground

For PANEL LOCK input, the control buttons on the front panel of the LX cannot be used to perform operations. The first signal locks the control buttons; the second signal releases the lock.



Recording Synchronization Specifications

Number of Units to be Synchronized	4
Inter-channel Phase Differences	Channels with the different units 5 degree or less (with same range and a bandwidth of 20 kHz or less) 7 degree or less (with same range and a bandwidth of 40 kHz)
Total Synchronization Cable Length	Within 10 m

Section 7 Appendixes

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Supplied Accessories	7-3
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Troubleshooting

Troubleshooting

If you encounter one of the following problems, check whether the recommended actions solve the problem before you request a repair.

Problem	Possible cause and recommended action
No power.	Check whether the DC voltage is low.
The LX Navi software does not recognize the LX.	Make sure that the IEEE 1394 interface card is one of the recommended cards. Make sure that both the LX and the PC have matched IP addresses. Power on the LX again, and then restart LX Navi.
The MO disk is not recognized in the New dialog box.	Make sure the media is formatted. Make sure you are using the specified media.
You cannot record to the media.	Make sure that the media is inserted. Make sure that the media is formatted. Make sure that the MO disk is not write-protected.
The Auto Saving function for automatically saving to the media is not working.	Make sure that the media is formatted. Make sure that the media is not full. Make sure that the Auto Saving option is selected. Note that turning off the power will disable the Auto Saving option. You must enable it each time you turn the power on.
The buttons on the main unit are disabled.	Make sure that panel is not locked (P LOCK button). If the panel is locked, release the lock.
The eject button on the main unit is disabled at the MO model.	Note that while LX Navi is running, the eject button on the LX MO drive is disabled.
You cannot set the sampling frequency.	Make sure that number of the channels you activate is larger than available number of the channels at the sampling frequency in case turning on the tachometer input channels.
A write or read error occurred on the MO disk.	Clean the MO disk and the lens. To clean the MO disk, use the cleaning kit TZ-381. To clean the lens, use the cleaner 0240470.

If you perform the recommended action but the problem remains, contact TEAC's service department.

Supplied Accessories and Options

Supplied Accessories

DC Power Cable	1
Microphone	1
Earphone	1
Ferrite Core	2
CD-ROM (LX Navi)	1
MO Disk	1(Only for the MO model)
Instruction Manual (this manual)	1
AC Adaptor	1

Options

MO Disk	T0005380
MO Cleaning Kit	TZ-381
Lens Cleaner	0240470
Expansion Unit	AU-LXEPIO (for DC input amp) AU-LXEPIOP (for PA amp and ST amp)
Battery Enclosure	BU-80
Battery Pack	

Note

Note

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