

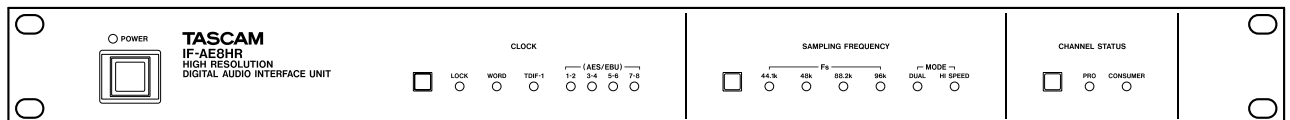
TASCAM

TEAC Professional Division

D00556700A

IF-AE8HR

High Resolution Digital Audio Interface Unit



OWNER'S MANUAL



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



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



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

This appliance has a serial number located on the rear panel. Please record the model number and serial number and retain them for your records.
Model number _____
Serial number _____

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Important Safety Precautions

IMPORTANT (for U.K. Customers)

DO NOT cut off the mains plug from this equipment.

If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain an appropriate safety approved extension lead or consult your dealer.

If nonetheless the mains plug is cut off, remove the fuse and dispose of the plug immediately, to avoid a possible shock hazard by inadvertent connection to the mains supply.

If this product is not provided with a mains plug, or one has to be fitted, then follow the instructions given below:

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

WARNING: This apparatus must be earthed.

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured GREEN-and-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏏ or coloured GREEN or GREEN-and-YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

When replacing the fuse only a correctly rated approved type should be used and be sure to re-fit the fuse cover.

IF IN DOUBT — CONSULT A COMPETENT ELECTRICIAN.

For U.S.A

TO THE USER

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 consumers 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.

IMPORTANT SAFETY INSTRUCTIONS

CAUTION:

- **Read all of these Instructions.**
- **Save these Instructions for later use.**
- **Follow all Warnings and Instructions marked on the audio equipment.**

- 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** — Do not use attachments not recommended by the product manufacturer as they 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; and the like.
- 8) Accessories** — Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
- 9) A product and cart combination should be moved with care.** Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

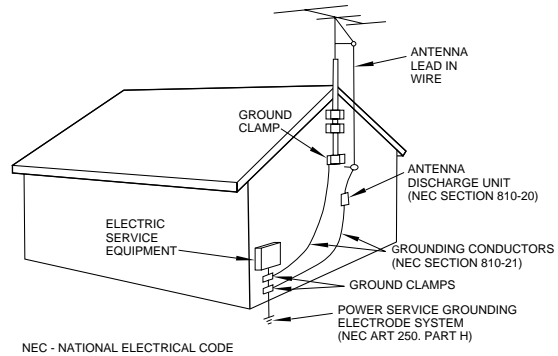


- 10) Ventilation** — Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. 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.
- 11) 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.
- 12) 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 should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
- 13) Power-Cord Protection** — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.
- 14) Outdoor Antenna Grounding** — If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

"Note to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Section 820-40 of the NEC which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Example of Antenna Grounding as per National Electrical Code, ANSI/NFPA 70



- 15) Lightning** — For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.
- 16) Power Lines** — An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
- 17) Overload** — Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in risk of fire or electric shock.
- 18) 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.
- 19) 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.
- 20) Damage Requiring Service** — Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - a) when the power-supply cord or plug is damaged.
 - b) if liquid has been spilled, 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 as an improper adjustment of other controls may result in 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) when the product exhibits a distinct change in performance — this indicates a need for service.
- 21) 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.
- 22) 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 operating condition.
- 23) Wall or Ceiling Mounting** — The product should be mounted to a wall or ceiling only as recommended by the manufacturer.
- 24) Heat** — The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

1 Introduction

The TASCAM IF-AE8HR provides a convenient way of exchanging digital audio data between TDIF-1-equipped devices, such as DTRS recorders, and AES/EBU devices.

A single TDIF-1 connector carries eight channels of digital input and output. Four XLR-type connectors accept four two-channel input signals, and another four XLR-type connectors output four two-channel input signals.

The word synchronization is selectable, using a front panel switch, from any of the four XLR-type inputs, from the TDIF-1 source, or from an external independent word clock source.

The IF-AE8HR allows high-resolution (up to 24 bits) audio data to be transferred between units. No settings are necessary to set word length.

In addition, four channels of high-frequency audio data at 88.2 kHz or 96 kHz may be selected from the front panel and transferred using the IF-AE8HR.

Separate word clock outputs are provided for either high-frequency or normal-frequency data clocks.

When a high-frequency data rate (88.2 or 96) is selected, the IF-AE8HR provides a choice of how the data is physically transmitted: either using a single high-speed connection (**HI SPEED**) or two parallel "normal" speed connections (**DUAL**).

The audio data format output from the XLR-type outputs may be selected from the front panel as either

AES (professional—**PRO**) or as IEC-60958 TYPE II (SPDIF—**CONSUMER**).

Consumer and professional formats received at the XLR-type inputs are automatically distinguished by the unit.

1.1 Mounting, etc.

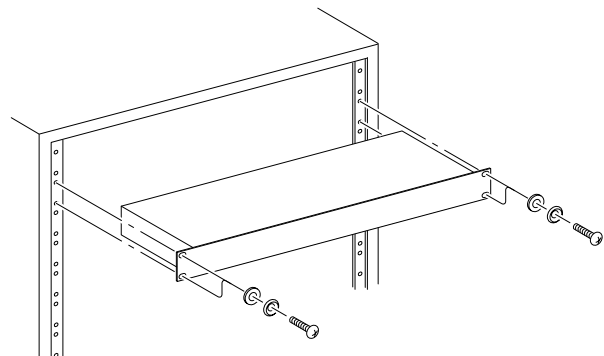
The IF-AE8HR is a 1U unit, designed to fit into a standard 19-inch rack.

Included in the package are;

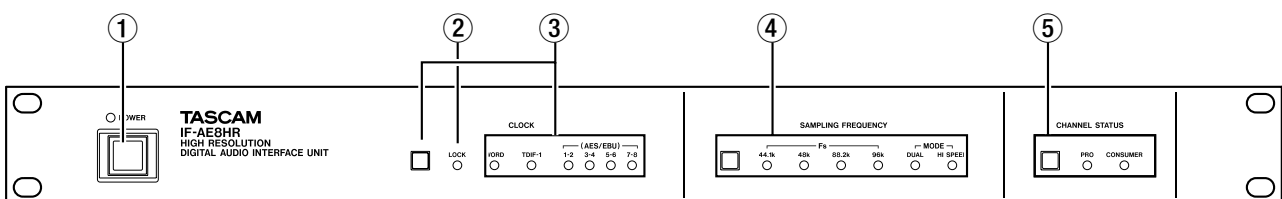
- The unit itself
- This manual
- A rack-mounting kit
- A 2 m (6 ft.) power cord
- Four rubber feet

If any of these items are missing, contact your TASCAM distributor.

Install the unit in the 19" rack as shown below:



2 Front panel



① Power switch and indicator

Push the **POWER** switch once to turn on power, and again to turn it off. The **POWER** indicator lights when power is supplied to the IF-AE8HR.

Note that settings made are not memorized. Whenever the power is turned on, the **CLOCK** source is set to **WORD** ③, the **SAMPLING FREQUENCY** is set to

44.1k ④ and the **CHANNEL STATUS** is set to **PRO** ⑤.

② LOCK indicator

When a valid clock signal is received at the selected clock source, this indicator will light.

If this indicator starts to flash, the IF-AE8HR is not locked to the external clock (as specified by ③). This

occurs if there is no clock signal or the signal is $\pm 6\%$ outside the nominal frequency. In these cases, once a valid clock signal is received again, the indicator will light steadily.

③ CLOCK switch and indicators

This switch allows you to cycle between the six possible clock sources for the IF-AE8HR: the **WORD SYNC – IN** (9) connector, the **DIGITAL I/O (TDIF-1)** (8) connector, or any of the four two-channel AES/EBU connectors (**DIGITAL I/O (AES/EBU) INPUTS (1/2, 3/4, 5/6, 7/8)** (7)), as shown by the indicators to the right of the switch.

NOTE

There should usually never be more than one word clock signal in a digital audio system. If there is more than one word clock, at worst, damage may occur to speakers, amplifiers, etc. as a result of high-frequency noise generated by word clock incompatibilities, etc..

④ SAMPLING FREQUENCY switch and indicators

This switch allows you to select the sampling frequency at which the IF-AE8HR outputs data, either to the XLR-type connectors, or to the TDIF-1 connector: **44.1k**, **48k**, **88.2k** or **96k**.

There are also two other settings that may be selected with this switch: **DUAL** and **HI SPEED**, which only become options when one of the high-frequency options (**96k** or **88.2k**) has been selected. Repeated presses of this switch will cycle between the following settings:

44.1k	48k	88.2k	96k	DUAL	HI SPEED	Meaning
○	●	●	●	●	●	44.1 kHz
●	○	●	●	●	●	48 kHz
●	●	○	●	○	●	88.2 kHz DUAL
●	●	●	○	○	●	96 kHz DUAL
●	●	○	●	●	○	88.2 kHz HI SPEED
●	●	●	○	●	○	96 kHz HI SPEED

● = LED off

○ = LED on

DUAL mode and HI SPEED mode (AES format)

Usual mode (FS=44.1 or 48)

In this mode, one XLR-type connector carries two channels of data. Since the IF-AE8 is provided with four such XLR-type connectors for input and four for output, the data for eight channels can be transferred in total.

DUAL mode (Fs=88.2k or 96k)

Data is transferred in over two channels in the **DUAL** mode. In high-frequency sampling modes (88.2k and 96k), there is twice the amount of data compared to the usual modes (44k and 48k). In **DUAL** mode, one XLR-type connector carries the data for one channel, allowing four channels in total to be transferred.

In this mode, channel 1 is carried by connector **1-2**, channel 2 by connector **3-4**, channel 3 by connector **5-6**, and channel 4 by connector **7-8**.

HI SPEED mode (Fs=88.2k or 96k)

In the **HI SPEED** mode, data is transferred at double speed. As mentioned above, in high-frequency sampling modes (88.2k and 96k), there is twice the amount of data compared to the usual modes (44.1k and 48k). Here, the transfer speed is doubled, so that one connector can carry two channels' data.

In theory, this would allow eight channels to be transferred at high speed, but for the reason below, only four channels may be transferred using the IF-AE8HR.

NOTE

*In TDIF version 2 format, only the **DUAL** mode is supported. If **HI SPEED** is selected, only **DIGITAL I/O (AES/EBU) connectors 1-2 and 5-6** are used. Therefore, **INPUT and OUTPUT terminals 3-4 and 7-8** cannot be used in this mode.*

Error modes

These LEDs are also used as error indicators, to show an error condition with regard to the input signals. The selected frequency indicator will flash to show an error under the following circumstances. When appropriate steps are taken to correct the problem, as shown below, the indicator will stop flashing and will light steadily.

- The sampling frequency of the signal at the **AES/EBU** inputs and the **TDIF-1** connector differ. Correct the sampling frequency settings of the attached units.
- The **TDIF-1** connection is not made properly. Make sure that it is connected correctly.
- The signals at the four **AES/EBU** inputs have different sampling frequencies. Make sure that all signals received at these connectors are at the same sampling frequency.
- Incorrect data is being received at one of the **AES/EBU** inputs. Make sure that all data sources are correctly set up.

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NOTE

If **WORD** is selected as the clock source, and a high-frequency sampling frequency has been selected (**88.2k** or **96k**), but the incoming word sync clock is normal speed, note that this is not shown as an error by flashing indicators.

⑤ CHANNEL STATUS switch and indicators

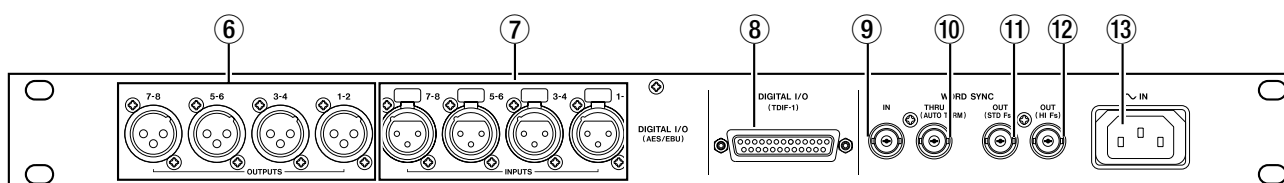
The format of the digital audio output from the AES/EBU output connectors ⑥ may be either professional AES format (**PRO**) or **CONSUMER** IEC-

60958 TYPE II format. The electrical characteristics of the output connectors remain the same, regardless of the data format selected. As mentioned below, the input format is automatically selected, and no setting is necessary to determine the input data type.

NOTE

Since the consumer standard does not provide for high-frequency (88.2 kHz or 96 kHz) data rates, any attempt to select **CONSUMER** and either of the high-frequency rates (**88.2k** or **96k**) will not work. This is shown by the **PRO** indicator flashing for about two seconds, and then returning to a steadily-lit state.

3 Rear panel



⑥ DIGITAL I/O (AES/EBU) OUTPUTS (1/2, 3/4, 5/6, 7/8)

These balanced XLR-type connectors output digital audio data in AES/EBU professional or in consumer format, depending on the selection made with the **CHANNEL STATUS** switch ⑤.

The sampling frequency of the output data depends on the setting of the **SAMPLING FREQUENCY** switch ④, and the currently-selected clock source ③.

⑦ DIGITAL I/O (AES/EBU) INPUTS (1/2, 3/4, 5/6, 7/8)

These balanced XLR-type connectors accept digital audio data in AES/EBU professional or in consumer format. The data type is automatically selected and no setting is necessary.

Note that there are four independent detection circuits, meaning that a mix of consumer and professional format signals may be input at these four inputs. However, all the signals must be at the same sampling frequency.

Also note that if a signal with emphasis is received at any input, the resulting output signals will all contain emphasis.

The signal received at any of these connectors can be selected as the clock source for the IF-AE8HR using the **CLOCK** switch ③.

⑧ DIGITAL I/O (TDIF-1)

Use this connector to connect a suitably-equipped TDIF-1 digital audio unit (e.g. a DTRS recorder or a TASCAM digital mixing console).

The signals received at this connector can be selected as the word clock source using the **CLOCK** switch ③.

NOTE

Note that you should always use genuine TASCAM cables, or cables which have been approved for use with TDIF-1 interfaces by TASCAM.

Although these cables appear similar to certain types of computer cables and use similar connectors, the cables themselves are very different, and the different electrical characteristics of the cables can cause damage to the equipment connected with the wrong cables.

If the use of cables other than TASCAM cables causes or results in damage, the warranty is voided.

⑨ WORD SYNC – IN

The BNC connector accepts a word clock signal from an external source. It can be selected as the word clock source for the IF-AE8HR using the **CLOCK** switch ③.

If a high-frequency sampling frequency (**96k** or **88.2k**) has been selected, it is possible to use either the appropriate high-frequency word clock, or the corresponding standard-frequency word clock.

⑩ **WORD SYNC – THRU (AUTO TERM)**

This BNC connector echoes the word clock which is input at the **WORD SYNC – IN** connector ⑨.

If no connection is made to this connector, it is automatically terminated.

⑪ **WORD SYNC – OUT (STD Fs)**

This BNC connector outputs a standard-frequency word clock: either 44.1 kHz when **44.1k** or **88.2k** is selected, or 48 kHz when **48k** or **96k** is selected.

⑫ **WORD SYNC – OUT (HI Fs)**

This BNC connector outputs a high-frequency word clock: either 88.2 kHz when **44.1k** or **88.2k** is selected, or 96 kHz when **48k** or **96k** is selected.

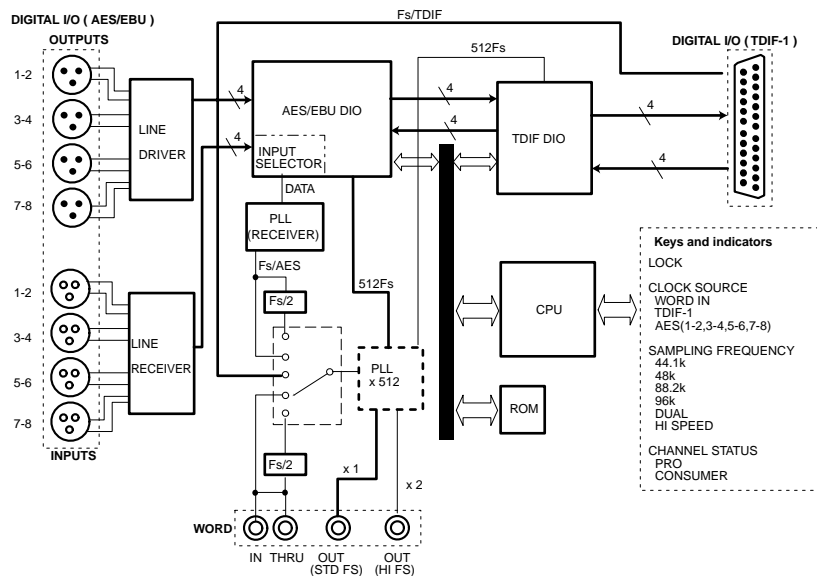
NOTE

These clocks output from ⑪ and ⑫ may or may not be the same as the clock received at **WORD SYNC – IN** ⑨ and retransmitted through **WORD SYNC – THRU (AUTO TERM)** ⑩. However, they are **always** the word clock selected using the **CLOCK** switch ③.

⑬ **~ IN (power in)**

Use the supplied power cable to connect the IF-AE8HR to the power supply. Always ensure that your power supply matches the requirements marked on the rear panel of the unit. If you are in any doubt, consult a qualified electrician.

4 Block Diagram



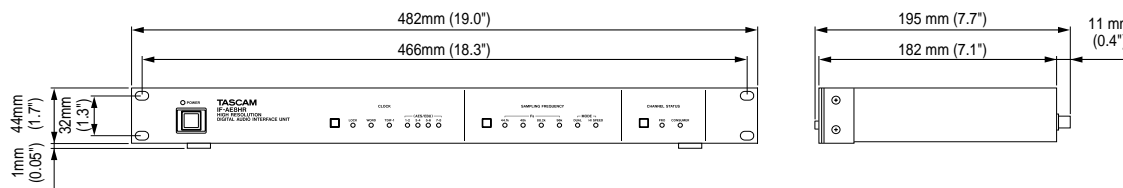
5 Specifications

DIGITAL I/O (AES/EBU) INPUTS	
connector type	XLR3-31-type, balanced, 110Ω
input format	Auto-detect PRO AES3-1992 Amendment 3-1999 (AES) and CONSUMER IEC-60958 TYPE II formats
DIGITAL I/O (AES/EBU) OUTPUTS	
connector type	XLR3-32-type, balanced, 110Ω
output format	Switchable between PRO AES3-1992 Amendment 3-1999 (AES) and CONSUMER (IEC-60958 TYPE II) formats
DIGITAL I/O (TDIF-1)	
connector	D-sub 25-pin female unbalanced
format	Follows the TDIF-1 version 2 specification
Word clock source	AES/EBU, TDIF-1, or WORD SYNC IN
Valid input and output Fs rates	96 kHz, 88.2 kHz, 48 kHz, 44.1 kHz (all ±6%)
Word length	Up to 24 bits
WORD SYNC IN	
Connector	BNC

TASCAM IF-AE8HR

Level	TTL level (75Ω)
WORD SYNC OUT (STD Fs)	
Connector	BNC
Level	TTL level (75Ω) (44.1 kHz, 48 kHz)
WORD SYNC OUT (HI Fs)	75Ω outputs high-frequency clock
Connector	BNC
Level	TTL level (75Ω) (88.2 kHz, 96 kHz)
WORD SYNC THRU	
Connector	BNC
Level	TTL level (75Ω) auto terminating, echoes clock at WORD SYNC IN
Dimensions (w x h x d)	482 x 44 x 195 mm (19.0 x 1.75 x 7.7 in.)
Weight	2.6 kg (5.7 lb.)
Power supply	120 V AC, 60 Hz (USA/Canada model) 230 V AC, 50 Hz (Europe/UK model)
Power consumption	6 W
Applicable electromagnetic environment	E4
Peak inrush current	0.5A

5.1 Dimensional drawing



TASCAM

TEAC Professional Division

IF-AE8HR

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