



DIGITAL IO BOX **DIO 8**

**Owner's Manual**



### FCC INFORMATION (U.S.A.)

1. **IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!** This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.
2. **IMPORTANT:** When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product **MUST** be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.
3. **NOTE:** This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures: Relocate either this product or the device that is being affected by the interference. Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s. In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable. If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA 90620

The above statements apply **ONLY** to those products distributed by Yamaha Corporation of America or its subsidiaries.

**WARNING: THIS APPARATUS MUST BE EARTHED**

### **IMPORTANT**

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW : EARTH

BLUE : NEUTRAL

BROWN : LIVE

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  $\perp$  or coloured 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.

\* This applies only to products distributed by YAMAHA KEMBLE MUSIC (U.K.) LTD.

### Trademarks

- ADAT is registered trademark of Alesis Corporation.
- TEAC is registered trademark of TEAC Corporation.

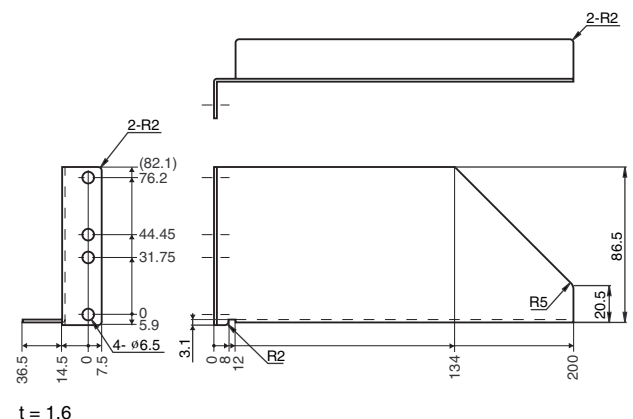
## ■ Precautions

- Do not place a container with liquid or small metal objects on top of this unit. Liquid or metal objects inside this unit are a fire and electrical shock hazard.
- Do not allow water to enter this unit or allow the unit to become wet. Fire or electrical shock may result.
- Connect this unit's power cord only to an AC outlet of the type stated in this Owner's Manual or as marked on the unit. Failure to do so is a fire and electrical shock hazard.
- Be sure to connect to an appropriate outlet with a protective grounding connection. Improper grounding can result in electrical shock.
- Do not scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard.
- Do not place heavy objects, including this unit, on top of the power cord. A damaged power cord is a fire and electrical shock hazard. In particular, be careful not to place heavy objects on a power cord covered by a carpet.
- If you notice any abnormality, such as smoke, odor, or noise, or if a foreign object or liquid gets inside the unit, turn it off immediately. Remove the power cord from the AC outlet. Consult your dealer for repair. Using the unit in this condition is a fire and electrical shock hazard.
- Should this unit/AC adapter/power supply be dropped or the cabinet be damaged, turn the power switch off, remove the power plug from the AC outlet, and contact your dealer. If you continue using the unit without heeding this instruction, fire or electrical shock may result.
- If the power cord is damaged (i.e., cut or a bare wire is exposed), ask your dealer for a replacement. Using the unit with a damaged power cord is a fire and electrical shock hazard.
- Do not remove the unit's cover. You could receive an electrical shock. If you think internal inspection, maintenance, or repair is necessary, contact your dealer.
- Do not modify the unit. Doing so is a fire and electrical shock hazard.
- When setting up the product, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet. Even when the power switch is turned off, electricity is still flowing to the product at the minimum level. When you are not using the product for a long time, make sure to unplug the power cord from the wall AC outlet.
- When rack-mounting the unit, allow enough free space around the unit for normal ventilation. This should be: 10 cm at the sides, 15 cm behind, and 30 cm above.
- For normal ventilation during use, remove the rear of the rack or open a ventilation hole.
- If the airflow is not adequate, the unit will heat up inside and may cause a fire.
- This unit has ventilation holes at the top and bottom to prevent the internal temperature rising too high. Do not block them. Blocked ventilation holes are a fire hazard.
- Hold the power cord plug when disconnecting it from an AC outlet. Never pull the cord. A damaged power cord is a potential fire and electrical shock hazard.
- Do not touch the power plug with wet hands. Doing so is a potential electrical shock hazard.
- The digital circuits of this unit may induce a slight noise into nearby radios and TVs. If noise occurs, relocate the affected equipment.

## Rack Mounting Caution

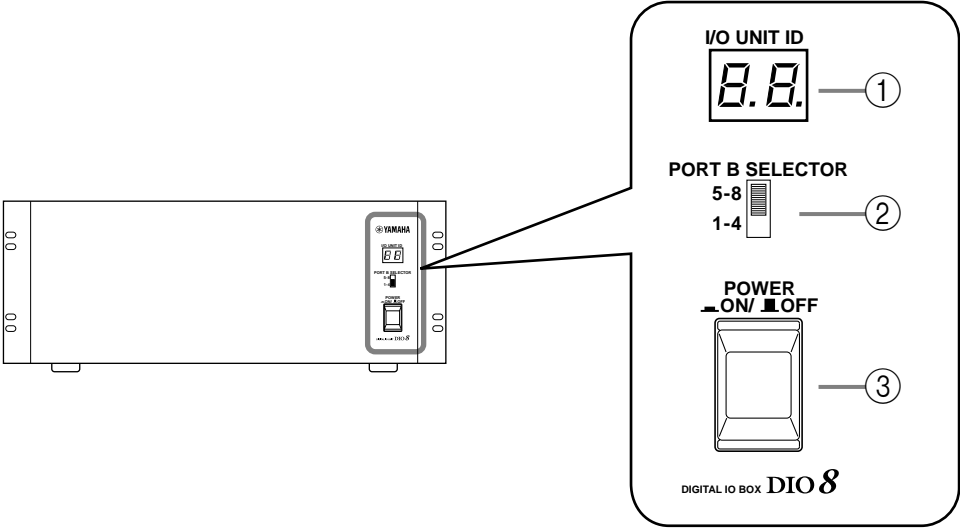
If the unit is rack mounted and transported regularly, for example, when on a tour, we recommend that the rear of the unit be supported by fitting a pair metal brackets, one each side. The following drawing provides the information necessary to make such brackets.

Note that only one bracket is shown here and the bracket for the other side must be bent in the opposite direction.

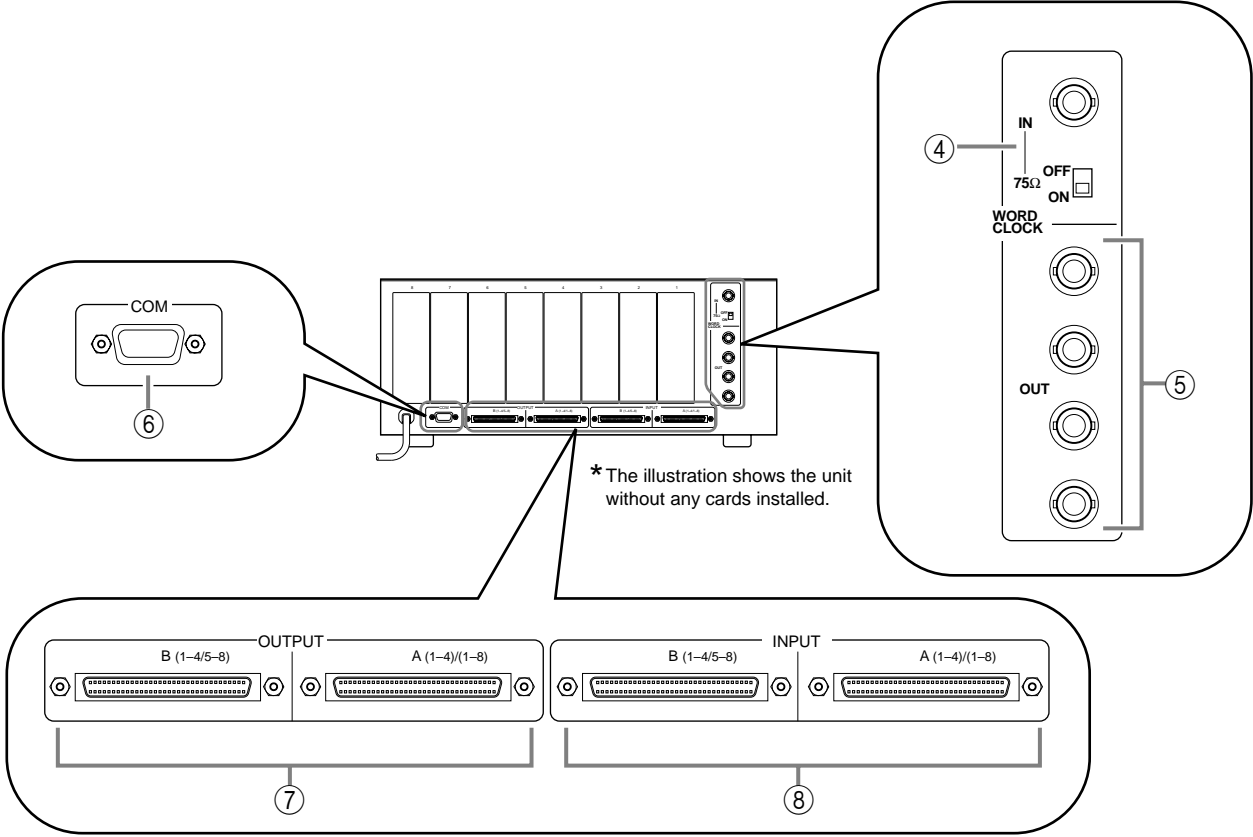


Thank you for choosing the DIO8 digital IO box, specifically designed for the Yamaha PM1D digital audio mixing system. The DIO8 outputs and inputs digital signals (such as ADAT, TASCAM, and AES/EBU) as well as analog signals to and from the DSP1D/DSP1D-EX engine controlled via the CS1D control surface. Up to eight digital I/O cards and analog I/O cards can be installed on each DIO8.

■ Front panel



■ Rear panel



## ① I/O UNIT ID indicator

This indicates the connector number (the number of the connector used to control the DIO8) of the engine DSP unit (DSP1D/DSP1D-EX) connected to the DIO8. If more than one connector is connected, either A or B will be automatically selected as the connector for control, according to the connection status of the INPUT and OUTPUT jacks.

If there is a problem such as an incorrectly connected DSP unit or if the word clock is not locked, this will be indicated by one of the following error displays.

### Error displays

**E1:** The OUTPUT connector of the DIO8 is connected to the OUTPUT connector of the DSP unit. Please connect it to the INPUT connector.

**E2:** The INPUT connector of the DIO8 is connected to the INPUT connector of the DSP unit. Please connect it to the OUTPUT connector. (This will not be displayed if the OUTPUT connector of the DIO8 is connected.)

**E3:** Either the cable connected to the INPUT or OUTPUT connector has become disconnected, or the connection destination is incorrect. If the connection is correct, try replacing the cable. (This will be displayed only if both INPUT and OUTPUT are abnormal.)

**UE:** Control signals are not being received correctly. Make sure that the power of the DSP unit is on.

These error displays indicate an error for the INPUT/OUTPUT A connectors if the PORT B SELECTOR switch is set to 5-8, and indicate an error for the INPUT/OUTPUT B connectors if the PORT B SELECTOR switch is set to 1-4. Even if there is an incorrectly connected connector, the error display will not appear if there is another control connector that is usable.

**UL:** The word clock is not locked. Make sure that the word clock source is selected correctly, and that the cable is connected correctly.

#### Note:

You can change the PORT B SELECTOR setting by sending the control signal from the CS1D. At this time, two dots (“.”) light up besides the indicator message described above.

If the PORT B SELECTOR switch setting on the unit is different from the actual operation, one of the following messages and the indicator message described above will appear alternately.

- If the PORT B SELECTOR switches to slots 1-4: “ .b.”
- If the PORT B SELECTOR switches to slots 5-8: “ .R.”

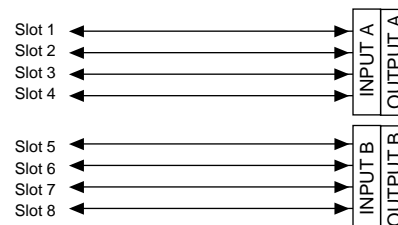
## ② PORT B SELECTOR switch

Use this switch to select slots 1-4 or slots 5-8 to assign the INPUT A/OUTPUT A connectors (referred to as PORT A) and the INPUT B/OUTPUT B connectors (referred to as PORT B).

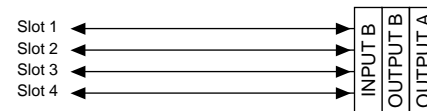
**If the PORT B SELECTOR is set to 5-8,** slots 1-4 are assigned to PORT A and slots 5-8 are assigned to PORT B for input and output signals.

**If the PORT B SELECTOR is set to 1-4,** only PORT B is available for input and output signals via slots 1-4. In reality, slot 1-4 input signals are routed to OUTPUT A, and the INPUT B signal is output to slots 5-8. If you wish to route slot 1-4 signals to both OUTPUT A and B, use this setting.

PORT B SELECTOR is set to “5-8”



PORT B SELECTOR is set to “1-4”



To connect the DIO8 to the DSP1D/DSP1D-EX, make one of the following settings, depending on your application.

### ● Using slots 1-8 of the DIO8 with a single DSP1D/DSP1D-EX

- 1) Connect the INPUT A and B connectors of the DIO8 to OUTPUT slot 1-6 of the DSP1D/DSP1D-EX.
- 2) Connect the OUTPUT A and B connectors of the DIO8 to INPUT slot 1-10 of the DSP1D/DSP1D-EX.
- 3) Set the PORT B SELECTOR to 5-8.

### ● Using slots 1-4 of the DIO8 with two DSP1D/DSP1D-EXs for Mirror mode operation

- 1) Connect the INPUT A connector of the DIO8 to the OUTPUT slot 1-6 connector of the first DSP1D/DSP1D-EX.
- 2) Connect the INPUT B connector of the DIO8 to the second DSP1D/DSP1D-EX OUTPUT slot connector with the same number as the first unit's slot you connected in Step 1).
- 3) Connect the OUTPUT A connector of the DIO8 to the INPUT connector for INPUT slot 1-10 of the first DSP1D/DSP1D-EX.
- 4) Connect the INPUT B connector to the second DSP1D/DSP1D-EX OUTPUT slot connector with the same number as the first unit's slot you connected in Step 3).
- 5) When you place the unit into Mirror mode from the CS1D, the PORT B SELECTOR changes its setting, depending on the operating status.

● **Using slots 1-4 input signals with two DSP1D/DSP1D-EXs simultaneously**

- 1) Connect the INPUT A connector of the DIO8 to OUTPUT slot 1-6 of the first DSP1D/DSP1D-EX.
- 2) Connect the INPUT B connector of the DIO8 to the second DSP1D/DSP1D-EX OUTPUT slot connector with the same ID number as the first unit's slot you connected in Step 1).
- 3) Connect the OUTPUT A connector of the DIO8 to the INPUT connector for INPUT slot 1-10 of the first DSP1D/DSP1D-EX.
- 4) Connect the INPUT B connector to the second DSP1D/DSP1D-EX OUTPUT slot connector.
- 5) Set the PORT B SELECTOR to 1-4.  
Slot 1-4 input signals will be output from OUTPUT A and B. However, the output signal will be the same as the signal input to INPUT B.

③ **POWER ON/OFF switch**

Use this switch to turn the power to the DIO8 on and off. When the power is turned on, the I/O UNIT ID indicator lights up.

④ **WORD CLOCK IN jack, ON/OFF switch**

The WORD CLOCK IN jack is used to provide word clock to the DIO8 from a clock generator or a connected external device. Use a BNC cable with an impedance of 75 Ω for connection.

The WORD CLOCK ON/OFF switch is used to terminate the word clock connection. Basically, if the DIO8 is the last device of the word clock chain, or if nothing is connected to the WORD CLOCK IN/OUT jacks, set this switch to ON.

⑤ **WORD CLOCK OUT jacks**

The WORD CLOCK OUT jacks are used to provide word clock from the DIO8 to the connected external device, such as digital MTR or DAT recorder. Use a BNC cable with an impedance of 75 Ω for connection.

**Caution:**

If you are using the MY8-AT card to handle ADAT format signals, synchronization may tend to be lost easily depending on the device that is connected. For the most reliable synchronization, we recommend that the word clock for digital audio devices being used together be taken from a connector other than the ADAT-format connector, such as this connector.

⑥ **COM port**

This connector is provided for future system expansion, but it is not operative in the current software version.

⑦ **OUTPUT connectors A (1-4)/(1-8), B (1-4/5-8)**

These connectors are used to output multi-channel digital audio signals to the DSP1D/DSP1D-EX. Depending on the setting of the PORT B SELECTOR, assignment between the OUTPUT A and B connectors and slots 1-8 varies. For more information, refer to ② PORT B SELECTOR. Be sure to use the included genuine Yamaha half-pitch 68-pin cable for connection. Optional genuine Yamaha cables in a variety of lengths are also available.

⑧ **INPUT connectors A (1-4)/(1-8), B (1-4/5-8)**

These connectors are used to input multi-channel digital audio signals from the DSP1D/DSP1D-EX. Depending on the setting of the PORT B SELECTOR, assignment between the INPUT A and B connectors and slots 1-8 varies. For more information, refer to ② PORT B SELECTOR. Be sure to use the included genuine Yamaha half-pitch 68-pin cable for connection. Optional genuine Yamaha cables in a variety of lengths are also available.

**Note:**

The "(1-8)" function labelled at the INPUT A/OUTPUT A connectors is provided for future system expansion, but it is not operative in the current software version.

The following table shows optional Yamaha digital I/O cards and analog I/O cards that can be installed into the slots of digital IO unit DIO8.

Card	Format	Input	Output
MY8-TD	TASCAM	8 IN	8 OUT
MY8-AT	ADAT	8 IN	8 OUT
MY8-AE	AES/EBU	8 IN	8 OUT
MY8-AD	ANALOG IN	8 IN	—
MY4-AD	ANALOG IN	4 IN	—
MY4-DA	ANALOG OUT	—	4 OUT
AP8AD*	ANALOG IN	8 IN	—
AP8DA*	ANALOG OUT	—	8 OUT

\*: Manufactured by Apogee Corporation



It is not possible to install and use a total of five or more AP8AD/AP8DA cards. Also, if you are using AP8AD/AP8DA cards simultaneously with MY8-AD/MY4-AD/MY4-DA cards, there are restrictions on the number of cards, as described on the next page. Never exceed the allowable number of cards, since attempting to use a greater number of cards than allowed may damage the DIO8 due to excessive current. If you are not using AP8AD or AP8DA cards, or if you are using AP8AD or AP8DA cards simultaneously with an MY8-TD/MY8-AT/MY8-AE card, there is no limitation on the number of MY8-TD/MY8-AT/MY8-AE cards that can be used.

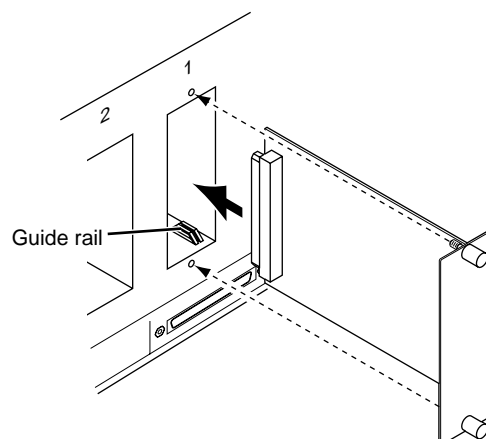
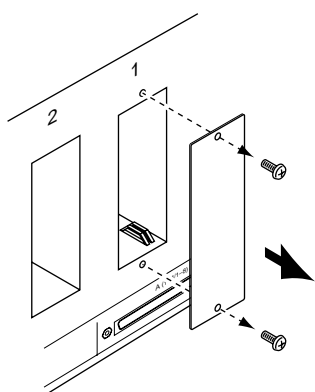
[AP8AD]+[AP8DA] cards used	[MY8-AD]+[MY4-AD]+ [MY4-DA] cards used	[MY8-TD]+[MY8-AT]+[MY8-AE] cards used
Total 0 cards	Up to a total of 8 cards	
Total 1 card	Up to 6 cards	Up to the number of vacant DIO8 slots
Total 2 cards	Up to 4 cards	Up to the number of vacant DIO8 slots
Total 3 cards	Up to 2 cards	Up to the number of vacant DIO8 slots
Total 4 card	Up to 1 card	Up to the number of vacant DIO8 slots
Total 5 or more cards cannot be used	—	—

## Installing an optional I/O card

### Important!

Before installing an optional I/O card, be sure to turn off the power to the DIO8 and remove the power cord from the DIO8. Otherwise, you may be in danger of electrical shock, and/or the unit or the card may be damaged.

1. Turn off the power to the DIO8 and remove the power cord from the DIO8.
2. Loosen two screws as shown below and remove the slot cover. Keep the cover in a safe place for future use.
3. Align the edge of the card with the guide rail inside the slot and insert the card into the slot. Push in the card until the connector on the card is securely plugged into the terminal inside the DIO8.



4. Fix the card by tightening the two screws.

### Caution:

Be sure to tighten the screws securely. Otherwise, the card may not be appropriately grounded.

5. Connect the power cord to the DIO8 and turn the power on.

## ■ Specifications

Sampling frequency (external sync)	39.69 kHz – 50.88 kHz
Power supply	USA and Canada : 120 V, 60 Hz
	Others : 230 V, 50 Hz
Power consumption	70W
Dimensions (W × H × D)	480 mm × 185.5 mm × 411.6 mm
Weight	15.5 kg
Operating temperature	10 – 35°C
Power cord length	1.5 m
Accessories	Connection cable (68-pin, D-sub, half-pitch) x 2, Length: 3m

## I/Os

I/O connectors	Level	Type
INPUT A, B	RS422	D-sub, half-pitch, 68-pin connector (female)
OUTPUT A, B	RS422	D-sub, half-pitch, 68-pin connector (female)
COM	RS232C	D-sub,9-pin connector (male)
WORD CLOCK IN	TTL/75 Ω (ON/OFF) *1	BNC connector
WORD CLOCK OUT (X4)	TTL/75 Ω	BNC connector

\*1 On the rear panel

## Slots

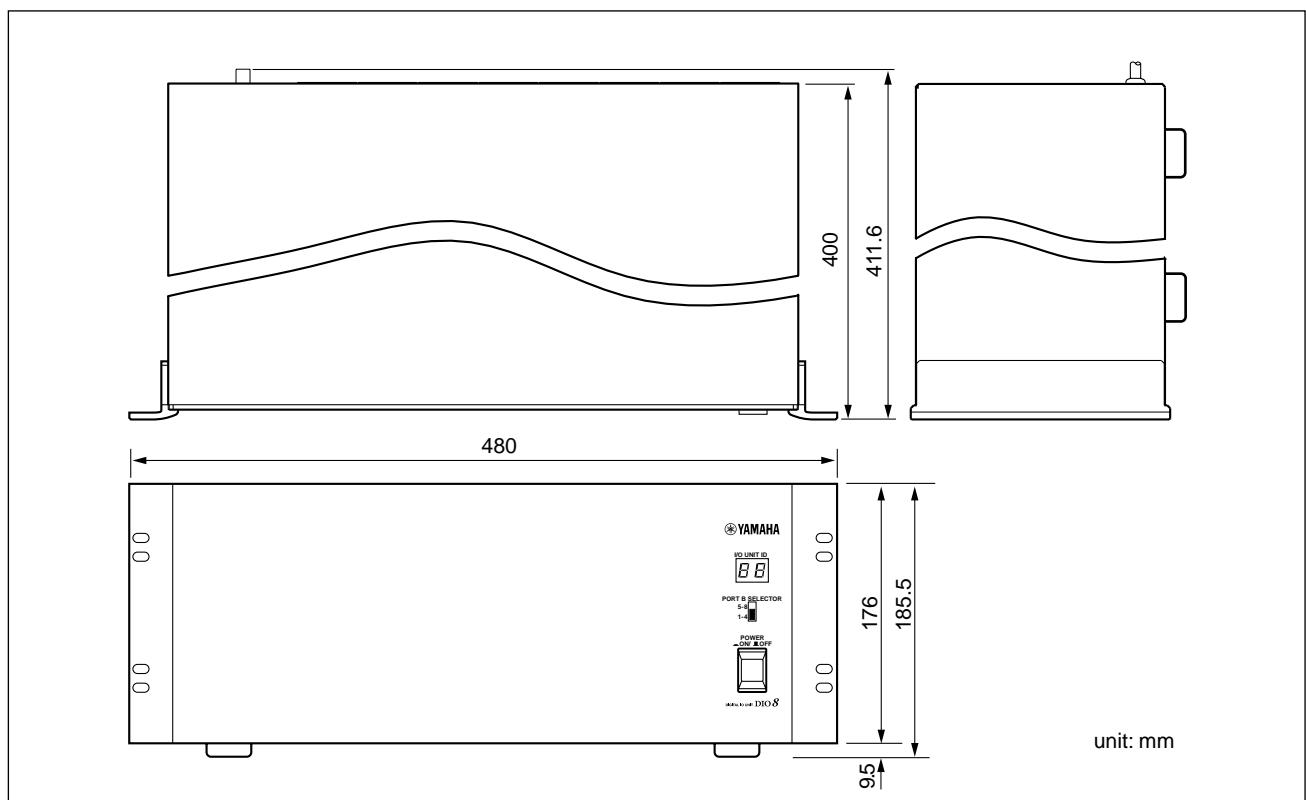
Eight slots (slots 1-8) are available on the DIO8 for installing digital I/O cards and analog I/O cards. Slot 1 supports a serial interface card (not released yet).

### ● Optional interface cards

Card	Format	Input	Output
MY8-TD	TASCAM	8 IN	8 OUT
MY8-AT	ADAT	8 IN	8 OUT
MY8-AE	AES/EBU	8 IN	8 OUT
MY8-AD	ANALOG IN	8 IN	—
MY4-AD	ANALOG IN	4 IN	—
MY4-DA	ANALOG OUT	—	4 OUT
AP8AD*	ANALOG IN	8 IN	—
AP8DA*	ANALOG OUT	—	8 OUT

\*: Manufactured by Apogee Corporation

## ■ Dimensions



unit: mm

- Specifications and appearance are subject to change without notice for improvement.
- For European Model  
Purchaser/User information specified in EN55103-1 and EN55103-2.  
Inrush Current: 10A  
Conformed Environment: E1, E2, E3 and E4.



