YAMAHA

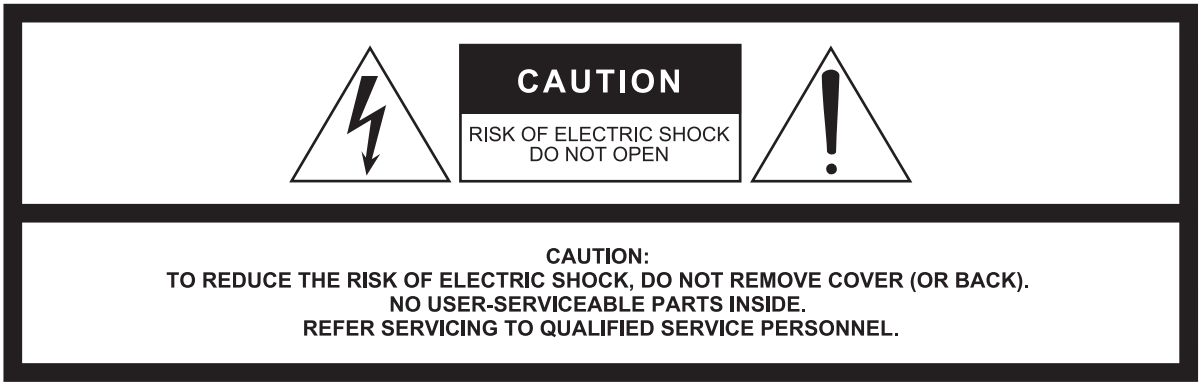
I/O RACK

RMio64-D

使用说明书

音频接口

ZH



The above warning is located on the top of the unit.
L'avertissement ci-dessus est situé sur le dessus de l'unité.

Explanation of Graphical Symbols
Explication des symboles

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.

L'éclair avec une flèche à l'intérieur d'un triangle équilatéral est destiné à attirer l'attention de l'utilisateur sur la présence d'une « tension dangereuse » non isolée à l'intérieur de l'appareil, pouvant être suffisamment élevée pour constituer un risque d'électrocution.

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 product.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est destiné à attirer l'attention de l'utilisateur sur la présence d'instructions importantes sur l'emploi ou la maintenance (réparation) de l'appareil dans la documentation fournie.

IMPORTANT SAFETY INSTRUCTIONS

1 **Read these instructions.**
2 **Keep these instructions.**
3 **Heed all warnings.**
4 **Follow all instructions.**
5 **Do not use this apparatus near water.**
6 **Clean only with dry cloth.**
7 **Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.**
8 **Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.**
9 **Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.**
10 **Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.**
11 **Only use attachments/accessories specified by the manufacturer.**
12 **Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.**

13 **Unplug this apparatus during lightning storms or when unused for long periods of time.**
14 **Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.**

WARNING
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

(UL60065_03)

PRÉCAUTIONS CONCERNANT LA SÉCURITÉ

1 **Lire ces instructions.**
2 **Conserver ces instructions.**
3 **Tenir compte de tous les avertissements.**
4 **Suivre toutes les instructions.**
5 **Ne pas utiliser ce produit à proximité d'eau.**
6 **Nettoyer uniquement avec un chiffon propre et sec.**
7 **Ne pas bloquer les orifices de ventilation. Installer l'appareil conformément aux instructions du fabricant.**
8 **Ne pas installer l'appareil à proximité d'une source de chaleur comme un radiateur, une bouche de chaleur, un poêle ou tout autre appareil (y compris un amplificateur) produisant de la chaleur.**
9 **Ne pas modifier le système de sécurité de la fiche polarisée ou de la fiche de terre. Une fiche polarisée dispose de deux broches dont une est plus large que l'autre. Une fiche de terre dispose de deux broches et d'une troisième pour le raccordement à la terre. Cette broche plus large ou cette troisième broche est destinée à assurer la sécurité de l'utilisateur. Si la fiche équipant l'appareil n'est pas compatible avec les prises de courant disponibles, faire remplacer les prises par un électricien.**
10 **Acheminer les cordons d'alimentation de sorte qu'ils ne soient pas piétinés ni coincés, en faisant tout spécialement attention aux fiches, prises de courant et au point de sortie de l'appareil.**
11 **Utiliser exclusivement les fixations et accessoires spécifiés par le fabricant.**
12 **Utiliser exclusivement le chariot, le stand, le trépied, le support ou la table recommandés par le fabricant ou vendus avec cet appareil. Si l'appareil est posé sur un chariot, déplacer le chariot avec précaution pour éviter tout risque de chute et de blessure.**

13 **Débrancher l'appareil en cas d'orage ou lorsqu'il doit rester hors service pendant une période prolongée.**
14 **Confier toute réparation à un personnel qualifié. Faire réparer l'appareil s'il a subi tout dommage, par exemple si la fiche ou le cordon d'alimentation est endommagé, si du liquide a coulé ou des objets sont tombés à l'intérieur de l'appareil, si l'appareil a été exposé à la pluie ou à de l'humidité, si l'appareil ne fonctionne pas normalement ou est tombé.**

AVERTISSEMENT
POUR RÉDUIRE LES RISQUES D'INCENDIE OU DE DÉCHARGE ÉLECTRIQUE, N'EXPOSEZ PAS CET APPAREIL À LA PLUIE OU À L'HUMIDITÉ.

(UL60065_03)

产品中有害物质的名称及含量

部件名称	有害物质					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr (VI)）	多溴联苯（PBB）	多溴二苯醚（PBDE）
外壳、框架	×	○	○	○	○	○
印刷线路板	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

此标识适用于在中华人民共和国销售的电子信息产品。

标识中间的数字为环保使用期限的年数。

保护环境

如果需要废弃设备时，请与本地相关机构联系，获取正确的废弃方法。请勿将设备随意丢弃或作为生活垃圾处理。

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包含附件

- 使用说明书
- AC电源线

注意事项

请在操作使用前，首先仔细阅读下述内容

请将本说明书存放在安全的地方，以便将来随时参阅。

⚠ 警告

为了避免因触电、短路、损伤、火灾或其它危险可能导致的严重受伤甚至死亡，请务必遵守下列基本注意事项。这些注意事项包括但不限于下列情况：

电源 / 电源线

- 请勿将电源线放在热源如加热器或散热器附近，不要过分弯折或损伤电源线，不要在其上加压重物，不要将其放在可能被踩踏引起绊倒或可能被碾压的地方。
- 只能使用本设备所规定的额定电压。所要求的电压被印在本设备的铭牌上。
- 只能使用附带的电源线 / 插头。
  如果您需要在购买时所在地区之外的其它地区使用本设备，附带的电源线可能不兼容。请咨询 Yamaha 经销商。
- 定期检查电插头，擦除插头上积起来的脏物或灰尘。
- 请务必连接到带有保护接地连接的适当电源插座。接地不当可能引起触电、设备的损坏甚至火灾。

请勿打开

- 本设备不含任何用户可自行修理的零件。请勿打开本设备或试图拆卸其内部零件或进行任何方式的改造。若出现异常，请立即停止使用，并请有资质的 Yamaha 维修人员进行检修。

关于潮湿的警告

- 请勿让本设备淋雨或在水附近及潮湿环境中使用，或将盛有液体的容器 （如花瓶、瓶子或玻璃杯）放在其上，否则可能会导致液体溅入任何开口。如果水等任何液体渗入设备，请立即切断电源并从 AC 电源插座拔下电源线。然后请有资质的 Yamaha 维修人员对设备进行检修。
- 切勿用湿手插拔电源线插头。

火警

- 请勿在设备上放置燃烧着的物体，比如蜡烛。燃烧的物体可能会倾倒并引发火灾。

当意识到任何异常情况时

- 当出现以下任何一种问题时，请立即关闭电源开关并从电源插座中拔出电源线插头。然后请 Yamaha 维修人员进行检修。
  - 电源线或插头出现磨损或损坏。
  - 散发出异常气味或冒烟。
  - 某些物体掉入设备中。
  - 使用设备过程中声音突然中断。
- 如果本设备跌落或损坏，请立即关闭电源开关，从电源插座中拔出电源线插头，并请有资质的 Yamaha 维修人员对设备进行检修。

⚠ 注意

为了避免您或周围他人可能发生的人身伤害、设备或财产损失，请务必遵守下列基本注意事项。这些注意事项包括但不限于下列情况：

电源 / 电源线

- 当从设备或电源插座中拔出电源线插头时，请务必抓住插头而不是电源线。直接拽拉电源线可能会导致其损坏。
- 长时间不使用设备时，或者在雷电风暴期间，请从电源插座中拔出电源插头。

安放位置

- 请勿将本设备放在不稳定的地方，否则可能会导致突然翻倒。
- 请勿挡住通风口。本设备在正面 / 背面都有通风孔，用以防止设备内部温度过高。尤其要注意，不要侧面朝下或上下颠倒放置本设备。通风不畅可能导致过热，并可能损坏设备，甚至引起火灾。
- 请勿将本设备放置在可能会接触到腐蚀性气体或含有盐份的空气。否则可能会导致故障。
- 搬动设备之前，请务必拔出所有已连接的连接线。
- 设置设备时，请务必选择便于插拔的 AC 电源插座。如果出现问题或故障，请立即关闭电源开关，并将插头从电源插座中拔出。即使关闭了电源开关，仍然会有极少量的电流流向本产品。当您想要长时间不使用本产品时，请务必将电源线从壁式 AC 电源插座中拔出。
- 如果将本设备安装在 EIA 标准机架上，请仔细阅读第 7 页上的 “ 机架安装的预防措施 ” 章节。通风不畅可能导致过热，并可能损坏设备、造成故障，甚至引起火灾。

连接

- 将本设备连接到其它设备之前，请关闭所有设备的电源开关。在打开或关闭所有设备的电源开关之前，请将所有音量都调到最小。

保养维护

- 在对本设备进行清洁时，请务必将电源插头从 AC 电源插座中拔出。

小心操作

- 请避免在设备上的任何间隙或开口 （通风口等）插入或落进异物 （纸张、塑料、金属等）。如果发生这种情况，请立即关闭电源，然后将电源线从 AC 电源插座中拔出。然后请有资质的 Yamaha 维修人员对设备进行检修。
- 请勿将身体压在本设备上或在其上放置重物，操作按钮、开关或插口时要避免过分用力。

对由于不正当使用或擅自改造本设备所造成的损失、数据丢失或破坏， Yamaha 不负任何责任。

须知

为了避免损坏本产品、数据或其它财产，请遵照以下注意事项。

使用和保养

- 请勿在电视机、收音机、立体声设备、手机或其他电子设备附近使用本设备。这可能会在设备本身以及靠近设备的电视机或收音机中引起噪音。
- 为了避免操作面板发生变形、不稳定操作或损坏内部元件，请勿将本设备放在有大量灰尘、震动、极端寒冷或炎热 （如阳光直射、靠近加热器或烈日下的汽车里）的环境中。
- 请勿在设备上放乙烯或塑料或橡胶物体，否则可能使面板脱色。
- 清洁设备时，使用柔软的干布。请勿使用涂料稀释剂、溶剂、清洁液或浸了化学物质的抹布。
- 设备中可能会由于环境温度的快速变化而发生冷凝 — 例如，当设备从一个地方移动到另一个地方时，或者当打开或关闭空调时。发生冷凝时使用本设备会造成损坏。如果有理由相信可能发生了冷凝，请将本设备放置几个小时而不打开电源直到冷凝彻底消失。
- 当不使用本设备时，请务必关闭其电源。

信息

关于版权

- 除个人用途以外，严禁复制任何市场有售的音乐数据 （包括但不仅限于 MIDI 数据和 / 或音频数据）。

关于本说明书

- 本书中出现的插图和画面仅作说明介绍之用。
- Windows 是 Microsoft® Corporation 在美国和其它国家的注册商标。
- 本使用说明书中所使用的公司名和产品名都是各自所有者的商标或注册商标。
- 为便于您理解使用说明书的内容，本公司已经依据国家的相关标准尽可能的将其中的英文表述部分翻译成中文。但是，由于专业性、通用性及特殊性，仍有部分内容仅以原文形式予以记载。如您有任何问题，烦请随时与本公司客服联系 （热线：400-051-7700）。

本产品的型号、序列号、电源要求等规格可能标在铭牌上或铭牌附近，铭牌位于本机顶部。请将该序列号填写到下方的横线上，并妥善保存本说明书，以便在产品被盗时作为永久购买凭证使用。

型号名称 _____

序列号 _____

(rear_zh_01)

简介

感谢您购买Yamaha RMio64-D音频接口！
要全面应用RMio64-D的强大功能和出色性能、延长产品的可靠使用年限，操作前请认真阅读本说明书。

功能特点

RMio64-D是一台数字接口箱，可以在Dante网络和MADI兼容设备之间传输最多64路输入/64路输出数字信号。将Dante和MADI设备相连接，本产品即可在多种用途中应用，如广播、现场录音和后期制作。另外，本设备的控制方式已经与Yamaha Dante兼容设备全面实现了无缝整合。

- 支持Dante和MADI的冗余功能，从而提供极高的可靠性。
- MADI输入和输出中配置了采样率转换器 （SRC）。
- 信号可以从MADI光纤环出到同轴，或者是从同轴发送到光纤 （MADI Split）。
- 增强了与Steinberg Nuendo软件的结合使用能力，如通过Nuendo Syncstation得到高精度的同步时钟以及对信号的直接监听。

机架安装的预防措施

本机额定在0到40˚C环境温度的范围内操作。将本机同其它RMio机种及其它设备安装到EIA标准机柜时，内部温度可能会超过指定的上限，从而造成性能下降或故障。在机柜中安装本设备时，请始终按照下列要求操作，避免热积聚：

- 在机架中将本机与可产生大热量的功率放大器安装在一起时，请在RMio和设备之间保留1U以上的空间。也可敞开空余空间，或安装合适的通风面板尽量减少热量的聚积。
- 为了确保足够的空气流通，请将机架背面敞开并将其放置在离开墙壁或其它表面10cm以上的位置。如果已安装了风扇组件，封闭机柜后面可能会达到更好的冷却效果。有关详细说明，请参见机架和/或风扇组件的使用说明书。

固件升级

本产品能够升级固件，以利提高操作性、增加功能并排除可能的故障。以下两种类型的固件对应本设备使用。

- 设备的固件
- Dante模块固件

您必须单独升级每个类型的固件。有关固件升级的详情请参考下列网址：
http://www.yamahaproaudio.com/

有关本设备升级和设置的信息请参见官网提供的固件升级指南。

注

有必要根据Dante网络中使用的各设备的版本升级多台设备。有关详细说明，请参见官网上的参考手册。
http://www.yamahaproaudio.com/

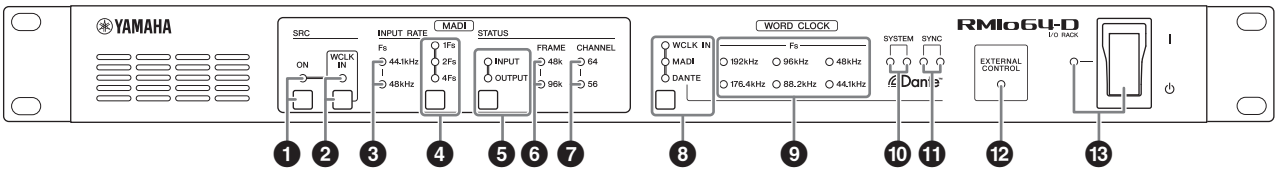
本说明书中的惯例

截图

本说明书中的截图实例来自Windows操作系统，Steinberg Nuendo软件的截图来自Nuendo 6.5版本。因此如果使用不同版本的Nuendo软件，实际画面可能有所不同。详情请参见Nuendo软件“帮助”菜单中的使用说明书 （PDF）。

控制器和功能

前面板



❶ MADI [SRC ON]指示灯
MADI [SRC ON]键

打开和关闭MADI SRC （采样率转换器）（打开时指示灯亮起）。

❷ MADI [SRC WCLK IN]指示灯
MADI [SRC WCLK IN]键

选择后面板上MADI[WCLK IN FOR SRC]接口使用的字时钟是否作为MADI SRC时钟使用。（使用时指示灯亮起。）

如果没有检测到可用的字时钟输入信号，该指示灯会闪烁。

❸ MADI [INPUT RATE Fs 44.1kHz]指示灯
MADI [INPUT RATE Fs 48kHz]指示灯

设备自动检测到MADI输入信号为44.1 kHz或48 kHz时这些指示灯会相应打开。如果没有检测到可用的MADI输入信号，这些指示灯都会熄灭。

❹ MADI [INPUT RATE 1Fs]指示灯
MADI [INPUT RATE 2Fs]指示灯
MADI [INPUT RATE 4Fs]指示灯
MADI [INPUT RATE] 1Fs/2Fs/4Fs键

结合着MADI输入采样率选择1Fs (1x)， 2Fs (2x)或4Fs (4x)。例如，对于192 kHz （4x 48 kHz）的MADI输入采样率，要确认MADI [INPUT RATE Fs 48kHz]指示灯为打开状态，然后选择[4Fs]。

注

如果选择[2Fs]，本设备会自动检测MADI输入信号的架构格式 （48 kHz/96 kHz）。

❺ MADI [STATUS INPUT]指示灯
MADI [STATUS OUTPUT]指示灯
MADI [STATUS] INPUT/OUTPUT键

选择要显示MADI输入信号还是MADI输出信号信息（架构格式/通道数量）。

注

您可以用该键锁定面板，防止误操作 （第14页）。

❻ MADI [STATUS FRAME 48k]指示灯
MADI [STATUS FRAME 96k]指示灯

显示MADI输入信号或输出信号的架构格式。在44.1 kHz和48 kHz时， [STATUS FRAME 48k]指示灯会亮起。在88.2 kHz和96 kHz时， [STATUS FRAME 96k]指示灯会亮起。如果没有检测到可用的MADI输入信号，这些指示灯都会熄灭。

注

如果没有检测到可用的MADI输入信号， MADI输出信号会设定到48 kHz/64通道。

❼ MADI [STATUS CHANNEL 64]指示灯
MADI [STATUS CHANNEL 56]指示灯

显示MADI输入信号或输出信号的通道数量 （64或56）。如果没有检测到可用的MADI输入信号，这些指示灯都会熄灭。

注

如果没有检测到可用的MADI输入信号， MADI输出信号会设定到48 kHz/64通道。

❽ WORD CLOCK [WCLK IN]指示灯
WORD CLOCK [MADI]指示灯
WORD CLOCK [DANTE]指示灯
WORD CLOCK WCLK IN/MADI/DANTE键

选择字时钟来源。

WCLK IN	使用从后面板上的[WORD CLOCK IN]接口输入的字时钟信号。如果没有检测到有效的字时钟信号时，该指示灯会闪烁。
MADI	使用MADI输入信号的字时钟。如果没有检测到有效的字时钟信号时，该指示灯会闪烁。
DANTE	使用来自Dante网络的字时钟。

❾ WORD CLOCK [Fs]指示灯

显示本设备使用的字时钟频率。如果字时钟没有同步，指示灯会闪烁。

❿ Dante [SYSTEM]指示灯

显示本机的操作状态。

绿 （指示灯亮起）	本设备工作正常。
绿 （指示灯闪烁）	固件升级正在进行中。
红 （指示灯亮起）	本设备的内存不能正常工作。
红 （指示灯闪烁）	本设备的CPU不能正常工作。

⓫ Dante [SYNC]指示灯

显示Dante网络和本机之间的同步状态。

绿 （指示灯亮起）	设备在Dante网络中以从机身份工作。
绿 （指示灯闪烁）	设备在Dante网络中以主机身份工作。
橙 （指示灯亮起）	Dante网络正在同步。
橙 （指示灯闪烁）	设备与Dante网络不同步。

⓬ [EXTERNAL CONTROL]指示灯

有些参数不能由RMio64-D设备进行设定。该参数需要由外部遥控设定。当RMio64-D设备不能成功设定参数时，该指示灯亮起。

有关可进行遥控操作的参数，详情请参见“遥控”（第16页）。

⓭ 电源指示灯 [I]/[⏻]（电源开关）

打开本机电源[I]，关闭本机电源[⏻]。
打开AC电源时，指示灯会亮起。

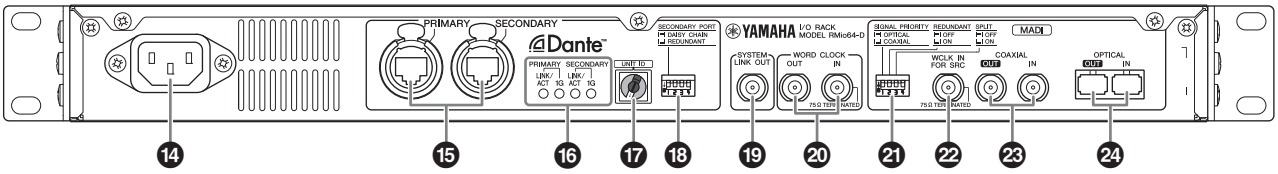
⚠ *注意*

即使电源开关关闭，设备电路中仍存在少量电流。确定长时间不使用本产品时，请务必将电源插头从AC电源插座中拔出。

注

频繁快速打开和关闭设备会造成其损坏。关闭电源后，等待至少6秒钟才能再次打开。

后面板



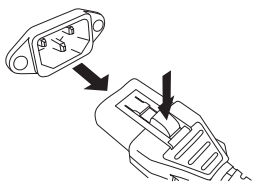
⓮ AC IN (交流电输入)接口

将电源线连接到这里。先将AC电源线连接到RMio设备，然后将电源线插头插入AC电源插座。
附带的AC电源线带有可锁紧的V-lock装置，可以防止电缆的意外脱落。
将电缆插头完全插入到底，直到牢固锁紧。

⚠ *注意*

连接或断开电源线时，请确保关闭设备电源。

断开电源线时请按下插头上的锁扣按钮。



⓯ Dante [PRIMARY]接口 Dante [SECONDARY]接口

这些是etherCON （RJ-45）接口，用于连接到Dante网络。

注

- 使用STP （屏蔽双绞）电缆可防电磁干扰。确保插头的金属部分和STP屏蔽线之间使用导电胶带或类似方式可靠连接，导电性能良好。
- 只能连接Dante兼容设备或GbE兼容设备 （包括计算机）。
- 可使用最长100米 （理论值）的电缆。

⑯ Dante [PRIMARY LINK/ACT]指示灯
Dante [PRIMARY 1G]指示灯
Dante [SECONDARY LINK/ACT]指示灯
Dante [SECONDARY 1G]指示灯

显示应用Dante网络的传输状态。

LINK/ACT	如果以太网线连接正确，它们会快速闪烁。
1G	当Dante网络以Giga-bit网络形式工作时，这些指示灯会亮起。

⑰ Dante [UNIT ID]旋转开关

设定该设备的ID。如果有多台需要ID设置的Yamaha Dante兼容设备已连接在同一网络中，就需要为每台设备设置不同的ID。确保在本机电源关闭状态下改变旋转开关的设置，否则ID设置将不会产生作用。

⑱ Dante DIP开关

用来改变本设备的设置。确保在本机电源关闭状态下改变DIP的设置，否则ID设置将不会产生作用。详情请参见“连接Dante兼容设备”（第11页）和“恢复出厂设置”（第18页）。

⑲ [SYSTEM LINK OUT]接口

BNC接口用于连接Steinberg Nuendo SyncStation的AES 2 IN接口。该连接可提供本机和Nuendo之间超精准的时钟同步。

不连接Nuendo SyncStation时， Dante输入信号的2个通道会以AES/EBU信号输出。将AES/EBU兼容设备连接到这个接口，可使Dante信号转换为AES/EBU信号，并输出。默认设置下， Dante通道1和2用于输出。可以通过遥控方式来更改输出通道。详情请参见“遥控”（第16页）。

⑳ [WORD CLOCK OUT]接口
[WORD CLOCK IN]接口

这些是BNC接口，用于发送和接收字时钟信号。

㉑ MADI DIP开关

用来改变本设备的设置。确保在本机电源关闭状态下改变DIP的设置，否则ID设置将不会产生作用。详情请参见“连接MADI兼容设备”（第12页）和“MADI Split”（第14页）。

㉒ MADI [WCLK IN FOR SRC]接口

这是一个BNC接口，可用来为MADI SRC直接输入字时钟信号。

㉓ MADI [COAXIAL OUT]接口
MADI [COAXIAL IN]接口

这些是BNC接口，用于连接MADI兼容设备。

注

可使用最长100米 （理论值）的同轴线缆。

㉔ MADI [OPTICAL OUT]接口
MADI [OPTICAL IN]接口

这些是SC接口，用于连接MADI兼容设备。

注

- 请使用内芯直径50微米/外层直径125微米或内芯直径62.5微米/外层直径125微米的多模光纤。
- 光纤线缆最长可使用2,000米 （理论值）。
- 使用SC双工接口。
- 在接口上安装附带的橡胶保护盖，可防止接口不使用时灰尘积聚。

连接

本章将介绍下列连接。

连接Dante兼容设备 （第11页）

连接MADI兼容设备 （第12页）

连接AC电源 （第13页）

Dante音频路由 （第14页）

选择MADI输入采样率 （第14页）

关于Dante

Dante是由Audinate公司开发的一种网络音频协议。其设计为以多种采样率和比特率传输多通道音频信号，同时通过Giga-bit Ethernet （GbE）网络传输设备控制信号。

请访问Audinate官方网站获取更多详细信息。
http://www.audinate.com/

更多Dante的相关信息也发布在Yamaha Pro Audio网站上：
http://www.yamahaproaudio.com/

使用网络交换机的相关注意事项

在Dante网络中不要使用网络交换机的EEE功能 （*）。支持EEE功能的交换机，尽管可以自动调节两两之间的功耗设置，但仍有无法正确调节此类设置的交换机。设置不当时，在Dante网络中启用EEE功能，可能会导致不同步和断线。
因此我们建议如下。

- 如果使用可管理交换机，请禁用EEE功能。不要使用无法禁用EEE功能的交换机。
- 使用不可管理的交换机时，不要使用支持EEE功能交换机。此类交换机的EEE功能无法禁用。

* EEE （能效以太网）是一种能在低网络流量期间，降低交换机功耗的技术。也被称为绿色以太网和IEEE802.3az。

连接Dante兼容设备

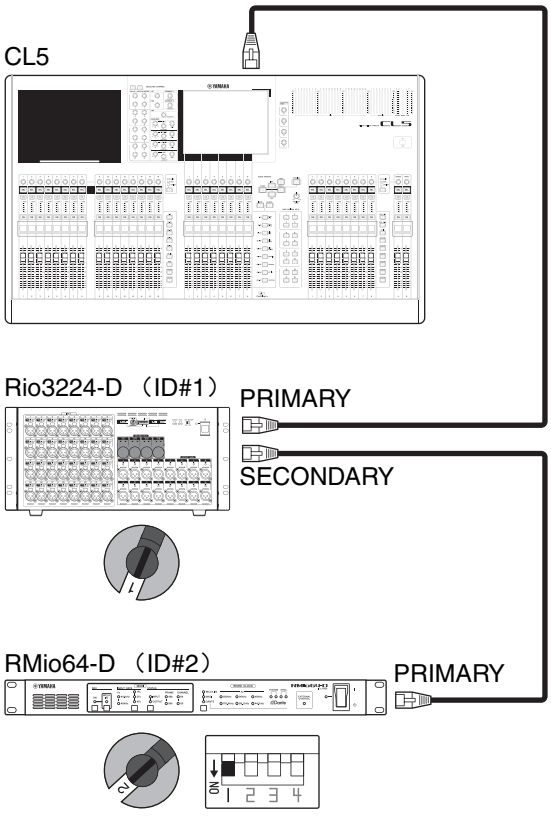
可以按照下列方式将RMio64-D连接到Dante网络。

菊型链网络

菊型链网络是一种接线结构，该结构中多台设备按顺序连接在一起。这种连接方式适用于应用少量设备的简单系统。
但如果连接的设备数量较多，您还需手动大幅度增加延迟值。如果菊型链网络中的连接被破坏，信号流会在该点中断并且没有信号会穿过该点传输。

■ 设置

- 关闭Dante DIP开关1 （上）。
- 如果有多台需要ID设置的Yamaha Dante兼容设备连接在同一网络中，要为每台设备设置不同的ID。确保在本机电源关闭状态下改变旋转开关的设置，否则ID设置将不会产生作用。



星型网络

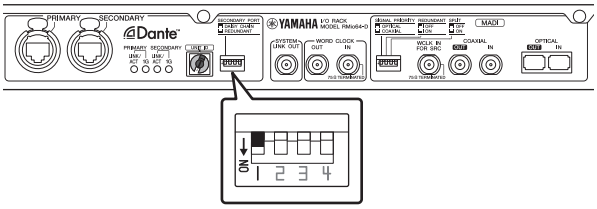
在星型网络中，每台设备都连接到兼容GbE的中央网络交换机。这种连接方式可以配置高带宽大规模的网络。

■ 设置

- 打开Dante DIP开关1 （下）。
- 如果有多台需要ID设置的Yamaha Dante兼容设备连接在同一网络中，要为每台设备设置不同的ID。确保在本机电源关闭状态下改变旋转开关的设置，否则ID设置将不会产生作用。

注

- 我们推荐使用具备多种可控和可监视网络能力的网络交换机 （如QoS）。
- 不要使用网络交换机的EEE功能。



星型网络 （冗余网络）

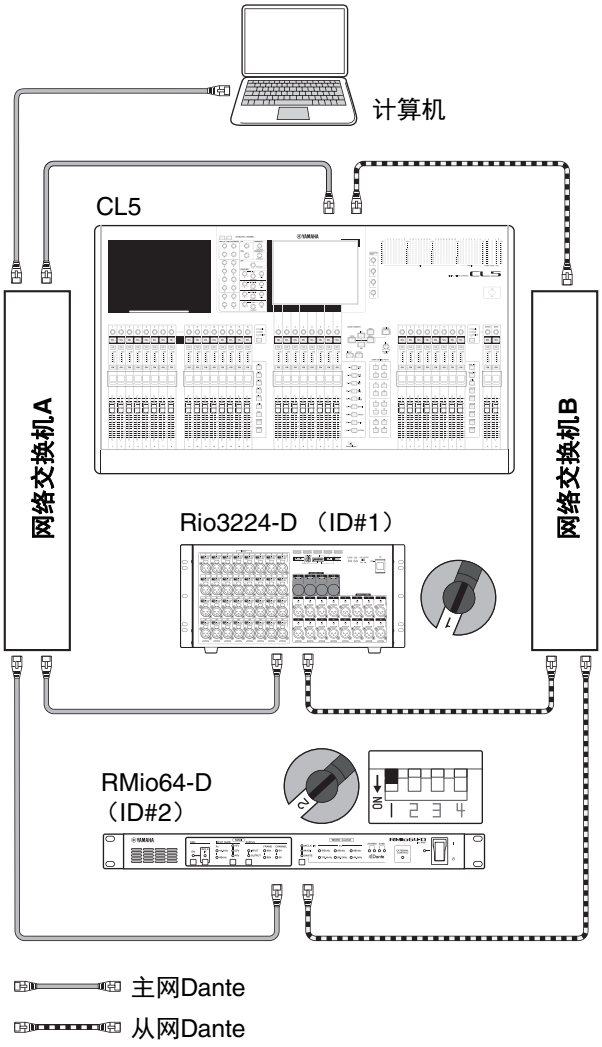
您可以设置为星形网络冗余，这样，即使网络中产生干扰也不会丢失音频。
冗余网络包括2个环路，主网(primary)和从网(secondary)。一般来说，网络工作在主网上。如果主网中断，从网会自动连接。

■ 设置

- 打开Dante DIP开关1 （下）。
- 如果有多台需要ID设置的Yamaha Dante兼容设备连接在同一网络中，要为每台设备设置不同的ID。确保在本机电源关闭状态下改变旋转开关的设置，否则ID设置将不会产生作用。

注

- 我们推荐使用具备多种可控和可监视网络能力的网络交换机 （如QoS）。
- 不要使用网络交换机的EEE功能。



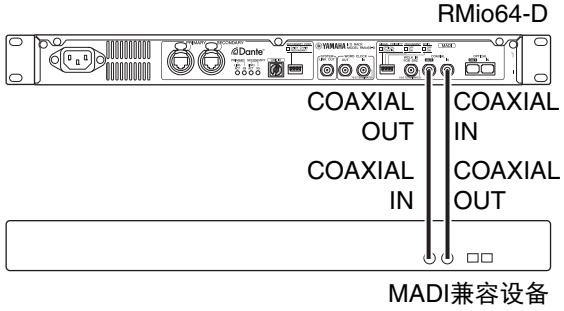
连接MADI兼容设备

可以将RMio64-D通过75Ω同轴 （BNC）或光纤 （SC）线缆连接到MADI兼容设备。

使用75Ω同轴线缆

注

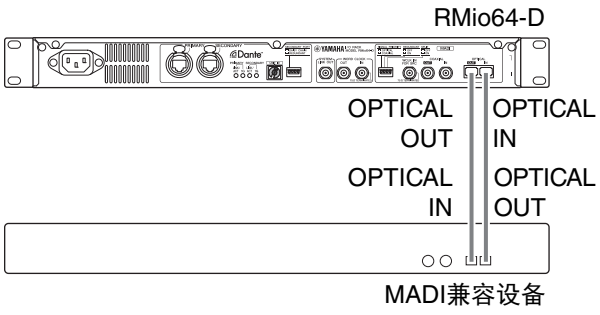
可使用最长100米 （理论值）的同轴线缆。



使用光纤线缆

注

光纤线缆最长可使用2,000米 （理论值）。



冗余连接 （仅输入）

您可以使用一个既有75Ω同轴线缆又有光纤线缆的冗余连接，这样，即使连接中发生干扰，也不会丢失输入信号。

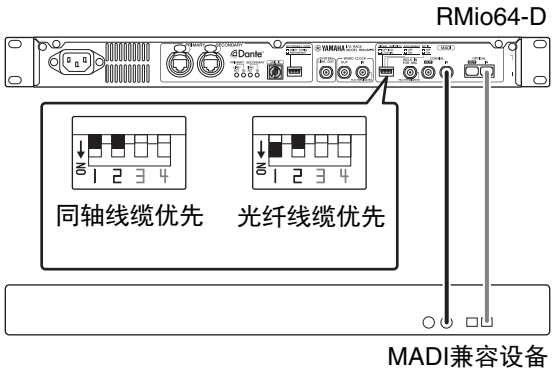
另外，来自Dante网络的输入信号，无论是否进行MADI冗余设置，都可从MADI [COAXIAL OUT]和MADI [OPTICAL OUT]两种接口输出。

■ 设置

- 要设置冗余连接，可以打开MADI DIP开关2 （下）。
- 如要赋予同轴线缆优先权，请打开MADI DIP开关1 （下）。
- 如要赋予光纤线缆优先权，请关闭MADI DIP开关1 （上）。

注

确保在本机电源关闭状态下改变DIP的设置，否则ID设置将不会产生作用。



连接AC电源

1. **关闭本机电源。**
2. **将附带的AC电源线插头连接到本机后面板上的AC IN接口上。**
3. **将AC电源线的另一端插头连接到市电插座。**

注

- 拔除AC电源线时，以反向顺序操作。
- 断开电源线时请按下插头上的锁扣。

⚠ 警告

- **RMio64-D设计使用于正确的接地连接。为防止触电和设备损坏，请使用包装中附带的AC电源线，以创建安全的接地连接。如果不知道如何正确接地连接，请联络本书后附列表中的Yamaha服务中心。**
- **确保本机只使用包装内附带的电源线。使用其它电源线可能造成异常发热和触电。**

⚠ 注意

- **连接或断开电源线时，请确保关闭设备电源。**
- **即使电源开关关闭，设备电路中仍存在少量电流。确定长时间不使用本产品时，请务必将电源插头从交流电源插座拔出。**

电源的打开和关闭

打开音频系统的交流电源时，请始终最后打开功率放大器，以避免损坏扬声器。同样，关闭电源时，请首先关闭功率放大器。

Dante的网络设置和音频路由

使用Dante网络，就能够以任意方式路由多台Dante设备的输入和输出信号。需要设定哪个通道的信号被发送到哪个输入口。在RMio64-D上， MADI与Dante网络进行连接时的路由是固定的。因此，路由中的任何更改都要在Dante网络中执行。使用Dante Controller软件配置Dante网络的音频路由。
可从下列网站下载Dante Controller。
http://www.yamahaproaudio.com/

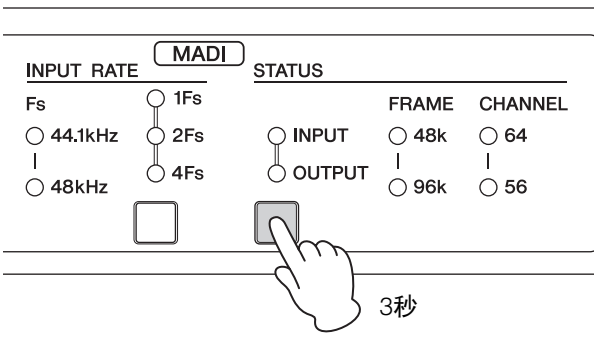
有关Dante Controller的详情，请参见Dante Controller软件的使用说明书 （可从相同网址下载）。

选择MADI输入采样率

用前面板上的MADI [INPUT RATE] 1Fs/2Fs/4Fs键选择MADI输入采样率。
例如，对于192 kHz （4x 48 kHz）的MADI输入采样率，要确认MADI [INPUT RATE Fs 48kHz]指示灯为打开状态，然后选择[4Fs]。如果检测到可用的MADI输入信号，这些指示灯都会熄灭。

面板锁定

您可以锁定面板，防止意外的更改和操作。启用锁定功能后，前面板上的所有控制器都无法操作。要启用锁定功能，可按下并按住MADI [STATUS] INPUT/OUTPUT键至少3秒钟。所有前面板指示灯 （除了电源指示灯）都会闪烁，标识所有控制器已锁死。要解除锁定，可以按下并按住MADI [STATUS] INPUT/OUTPUT键至少3秒钟。

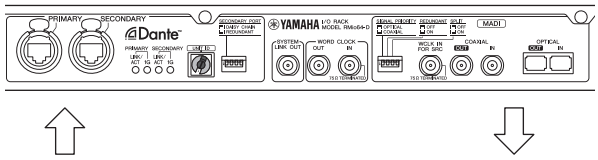


注
即使前面板被锁定，您还是可以用遥控设备更改设置。有关遥控兼容设备的最新信息，请参见Yamaha专业音频网站。
http://www.yamahaproaudio.com/

信号流

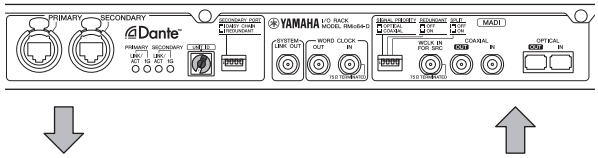
Dante到MADI

Dante输入信号会从MADI [COAXIAL OUT]接口和[OPTICAL OUT]接口进行输出。



MADI到Dante

MADI输入信号会从Dante [PRIMARY]和[SECONDARY]接口输出。

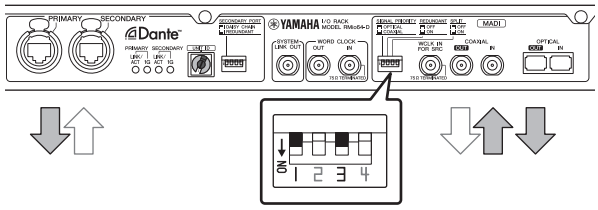


MADI Split

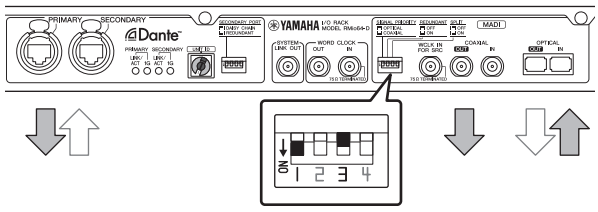
通过同轴和光纤接口输入的信号可以经过其它接口循环返回。信号也可发送到Dante网络。

■ 设置

- 要使用MADI Split功能，请打开MADI DIP 开关3 （下）。
- 要从MADI[COAXIAL IN]接口将输入信号循环返回到MADI [OPTICAL OUT]接口，可以打开MADI DIP开关1 （下）。



- 要将输入信号从MADI [OPTICAL IN]接口循环返回到MADI [COAXIAL OUT]接口，请关闭MADI DIP开关1 （上）。



注
确保在本机电源关闭状态下改变DIP的设置，否则ID设置将不会产生作用。

字时钟

关于字时钟

- 您可以将时钟源设定为外部字时钟设备、 MADI输入信号或Dante网络。
- 您可以将字时钟通过本机[WORD CLOCK OUT]接口发送到一台外接设备。
- 将[SYSTEM LINK OUT]接口连接到Steinberg Nuendo SyncStation的AES 2 IN接口，可实现与Nuendo的高精度字时钟同步。

选择字时钟源

用前面板上的WORD CLOCK [WCLK IN]/[MADI]/[DANTE]键选择字时钟源。
本机时钟会与选定的字时钟源同步。

WCLK IN	使用从后面板上的[WORD CLOCK IN]接口输入的字时钟信号。如果没有检测到有效的字时钟信号时，该指示灯会闪烁。
MADI	使用MADI输入信号的字时钟。如果没有检测到有效的字时钟信号时，该指示灯会闪烁。
DANTE	使用来自Dante网络的字时钟。

注

- 如果选择[WCLK IN]或[MADI]，该设备会自动被指定为"Preferred Master" （首选主机），同时Dante网络中会设置为"Enable Sync To External" （允许同步到外部）。
- 如果选择[WCLK IN]或[MADI]，当设备在Dante网络中充当从机运行时，向设备输入相同时钟的设备就成为主机。您可用Dante Controller （可从下列网址下载）软件检查哪个设备是当前时钟主机。
  http://www.yamahaproaudio.com/
- 如果来自选定字时钟源的字时钟信号被截断，本机会切换到自己的内部时钟。内部时钟会按照截断之前的前一个字时钟值运行。

MADI SRC （采样率转换器）

通过MADI SRC，您可以连接与RMio64-D设备有着不同字时钟的MADI兼容设备。

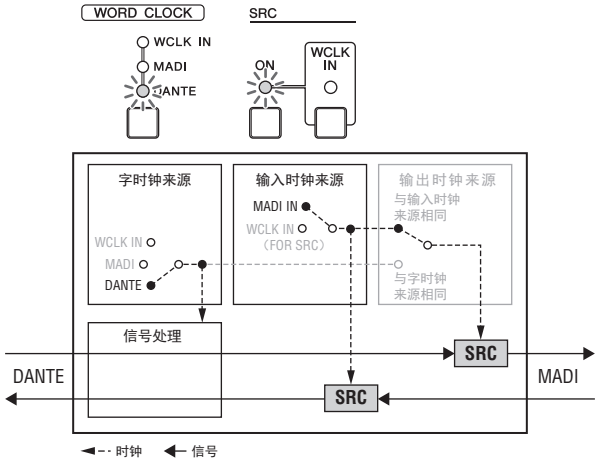
- 无需更改双方设备的字时钟，就可以连接以不同字时钟运行的Dante网络和MADI兼容设备。
- 能够以MADI输入信号不同的字时钟输出MADI信号。

设置实例

注

下列框图中的输出时钟来源只能通过遥控进行控制。

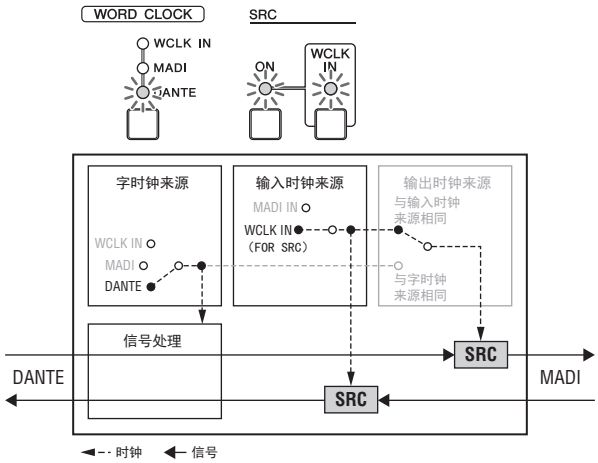
在MADI侧使用MADI信号的内部字时钟，将设备同步到Dante网络：



在MADI兼容设备上使用外部字时钟，将设备同步到Dante网络：

注

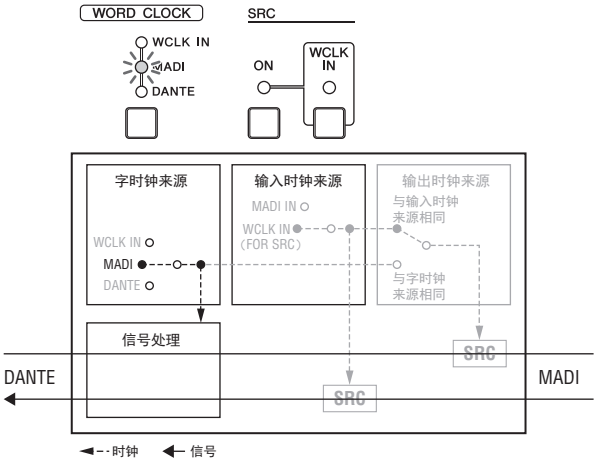
必须将供给MADI兼容设备的相同外部时钟输入到设备的[WCLK IN FOR SRC]。



将设备同步到MADI输入信号

注

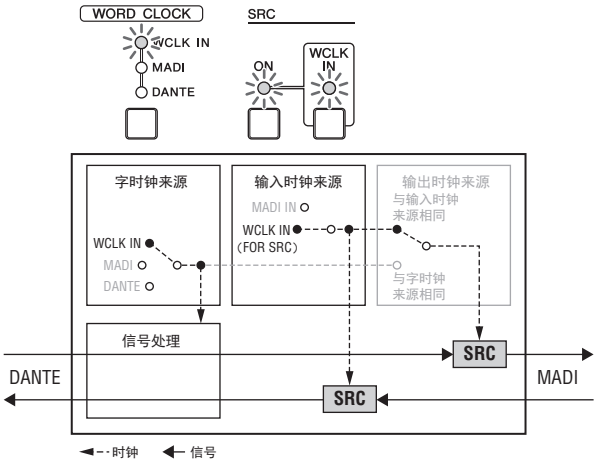
如果设备在Dante网络中以字时钟从机运行，将相同MADI时钟输入到该机的设备就是时钟主机。您可用Dante Controller （可从下列网址下载）软件检查哪个设备是当前时钟主机。
http://www.yamahaproaudio.com/



在MADI兼容设备上使用外部时钟，并让该设备同步于不同的外部时钟：

注

- 必须将供给MADI兼容设备的相同外部时钟输入到设备的[WCLK IN FOR SRC]。
- 如果设备在Dante网络中以字时钟从机运行，将相同外部时钟输入到该机的设备就是时钟主机。您可用Dante Controller （可从下列网址下载）软件检查哪个设备是当前时钟主机。
  http://www.yamahaproaudio.com/



显示MADI输入和输出信号

MADI输入或输出信号的架构格式和通道数量会显示在MADI [STATUS]区域。
用MADI [STATUS] INPUT/OUTPUT键可以在输入信号画面和输出信号画面之间切换。

遥控

您可以从RMio64-D遥控控制器配置一些无法在本机面板进行配置的项目，如MADI SRC输入/输出控制器的独立设置，以及将MADI输出信号设定为不同于MADI输入信号的格式。

注

有关遥控兼容设备的最新信息，请参见Yamaha专业音频网站。
http://www.yamahaproaudio.com/

遥控参数

参数	说明
SRC ON/OFF	打开/关闭MADI SRC功能。
SRC INPUT CLOCK SOURCE	用于选择MADI SRC时钟源：从WCLK IN FOR SRC接口输入的MADI输入信号或字时钟。
SRC OUTPUT CLOCK SOURCE	用于选择MADI SRC时钟输出信号：输入信号或本机主时钟。
INPUT RATE	显示当MADI输入信号被自动检测为44.1 kHz或48 kHz时的频率。 用于选择与MADI输入采样率结合使用的1Fs、 2Fs或4Fs。
STATUS INPUT	显示MADI输入信号的状态。
STATUS OUTPUT	显示MADI输出信号的状态。您也可以更改MADI输出信号的架构格式和通道数量。
BNC AES/EBU OUT	用于选择Dante输入通道从[SYSTEM LINK OUT]接口输出为AES/EBU信号。
CLOCK	用于选择当作主时钟使用的信号源。
PANEL LOCK	锁定面板，防止本机控制器的意外操作。默认设置被关闭。

从NUAGE Workgroup Manager进行控制

当RMio64-D在NUAGE Workgroup中运行时，您可以遥控配置RMio64-D，并使用直接监听功能。

直接监听

当RMio64-D在NUAGE Workgroup中运行时，可以使用直接监听功能。直接监听功能可以让您将RMio64-D输出到Steinberg Nuendo的信号，直接作为MADI输出信号进行监听。这与NUAGE I/O的使用方式相同。
与Nuendo推子相平衡的音频轨信号和路由到OUTPUT BUS的MADI信号的直接监听，都可以通过直接监听功能来实现。
如果RMio64-D被路由Nuendo的输入端口，可以用Nuendo中音轨上监听按钮打开或关闭或直接监听。

注
要使用直接监听功能，必须在Nuendo的[设备设置]菜单中启用[直接监听]项。

RMio64-D设置

如果Dante网络中有多台AIC128-D卡，指定Nuendo中使用的AIC128-D设备。
要打开Nuendo中的RMio64-D设置窗口，可以单击“Devices”，然后点击“RMio64-D Setup”。

❶ Dante Interface （Dante接口）
选择Nuendo中使用的AIC128-D。

❷ Identify （鉴别）
点击这里时，已选定AIC128-D的指示灯会闪烁几秒钟。该功能适用于鉴别已选定的AIC128-D。

❸ Reload （重载入）
点击这里时， Dante接口会更新到最新状态。

疑难解答

以下是过去常见问题的简要一览表。如果出现类似问题并需要帮助，请先查看该表。

调音台不能识别RMio64-D

- Dante [Unit ID]是否设置了与处于同一网络中的Yamaha品牌Dante兼容设备所不同的ID？
- 网络交换机工作是否正常?
  重启网络可能解决问题。
- 线缆是否出现了问题？
  更换电缆可能解决问题。

音频中断或失真

- 是否选择了正确的MADI输入频率？（第14页）
- 如果[MADI]或[WCLK IN]被选定为字时钟来源，请将其改为[DANTE]。请牢记，如果该方法能够有效解决问题， Dante网络的时钟和设备将不会同步。如果要将[MADI]或[WCLK IN]选择为字时钟来源，本设备必须设置为Dante网络的字时钟主机。有关详细说明，请参见下列网址中的Dante Controller软件的使用指南。
  http://www.yamahaproaudio.com/

升级

如何升级固件？

升级固件的计算机硬件要求是什么?

升级本机的详细信息，请参见各产品的固件升级指南和下列网址。
http://www.yamahaproaudio.com/

无法升级

禁用所有防病毒软件和计算机防火墙可能解决问题。

有关详细说明，请参见官网上的固件升级指南。
http://www.yamahaproaudio.com/

我应该升级什么设备?

根据各设备的版本，有必要升级多个设备。有关详细说明，请参见官网上的参考手册。
http://www.yamahaproaudio.com/

路由/跳线

调音台无法接收来自RMio64-D的输入信号

- 通过Dante Controller设置的Dante网络跳线是否正确?
- 调音台中的跳线设置是否设置为使用Dante Controller?
- 调音台中的字时钟设置是否设定为对应的Dante网络?

如何配置Dante的输入和输出信号?

使用Dante Controller软件配置Dante网络的音频路由（跳线）。有关详细说明，请参见官网上的Dante Controller User Guide。
http://www.yamahaproaudio.com/

是否能够将来自2台RMio64-D设备的信号输入调音台的一个通道?

和输出通道不同，每个输入通道只能有一个输入信号。

是否能用另一台调音台接收来自RMio64-D的输入信号?

可以用Dante Controller软件进行配置。有关详细说明，请参见官网上的Dante Controller User Guide。
http://www.yamahaproaudio.com/

遥控

我想从调音台更改RMio64-D的设置。

我想知道什么设备能够遥控设置RMio64-D。

有关RMio64-D遥控的详细说明，请参见以下网址。
http://www.yamahaproaudio.com/

其它问题

什么是Dante网络的延迟?

延迟值可以通过Dante Controller软件或其它调音台进行设定。详情请参见各产品的说明书。

诸如"firmware mismatch" （固件不匹配）等内部出错信息会出现在连接到RMio64-D的设备上。

确保每个设备都是可兼容的版本。有关详细说明，请参见网站上的固件兼容信息。
http://www.yamahaproaudio.com/

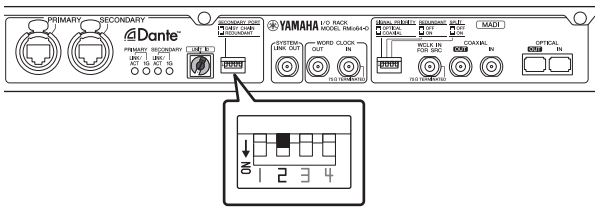
恢复出厂设置

执行下列步骤可以恢复出厂设置。

1. **关闭本机电源。**

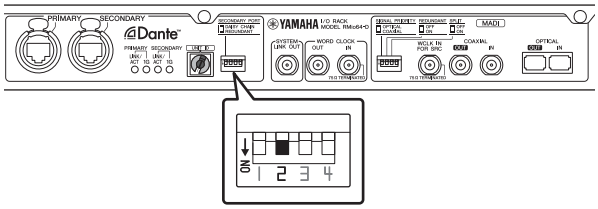
2. **打开Dante DIP开关2 （下），然后打开本机电源。**

前面板上的所有指示灯 （除了电源指示灯）开始闪烁，表示所有参数已经被恢复为出厂设置。



3. **关闭本机电源。**

4. **关闭Dante DIP开关2 （上）。**



5. **再次打开本机电源。**

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技术规格

一般规格

采样率	内部	44.1kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±50ppm
		48kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±50ppm
		88.2kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±50ppm
		96kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±50ppm
		176.4kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±50ppm
		192kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±50ppm
	外部	44.1kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±200ppm
		48kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±200ppm
		88.2kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±200ppm
		96kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±200ppm
		176.4kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±200ppm
		192kHz	+4.1667%/+0.1%/-0.1%/-4.0% ±200ppm
MADI 通道和格式	fs=44.1kHz/48kHz：		MADI 单 fs 44.1/48k架构， 56/64通道
	fs=88.2kHz/96kHz：		MADI 双 fs 44.1/48k架构， 28/32通道
			MADI 双 fs 88.2/96k架构， 28/32通道
	fs=176.4kHz/192kHz：		MADI 四 fs 44.1/48k架构， 14/16通道
SRC	SRC锁定范围：		38.59kHz – 216kHz
	采样率比例限制：		6:1
外形尺寸 （宽x高x深）和净重	480 x 44 x 374 mm、 4.7 kg		
电源要求（瓦）	25W		
电源要求（伏和赫兹）	美国/加拿大：		120V 60Hz
	日本：		100V 50/60Hz
	中国：		110 – 240V 50/60Hz
	韩国：		220V 60Hz
	其它：		110 – 240V 50/60Hz
温度范围	运行温度范围：		0 – 40 °C
	储藏温度范围：		-20 – 60 °C
包含附件	使用说明书， AC电源线		

*本使用说明书的内容为印刷时最新的技术规格。请至 Steinberg/Yamaha 网站下载最新版本的使用说明书。

数字I/O特性

端口	格式	数据长度	标准	接口
PRIMARY/SECONDARY	Dante	24位	1000Base-T	etherCON x 2

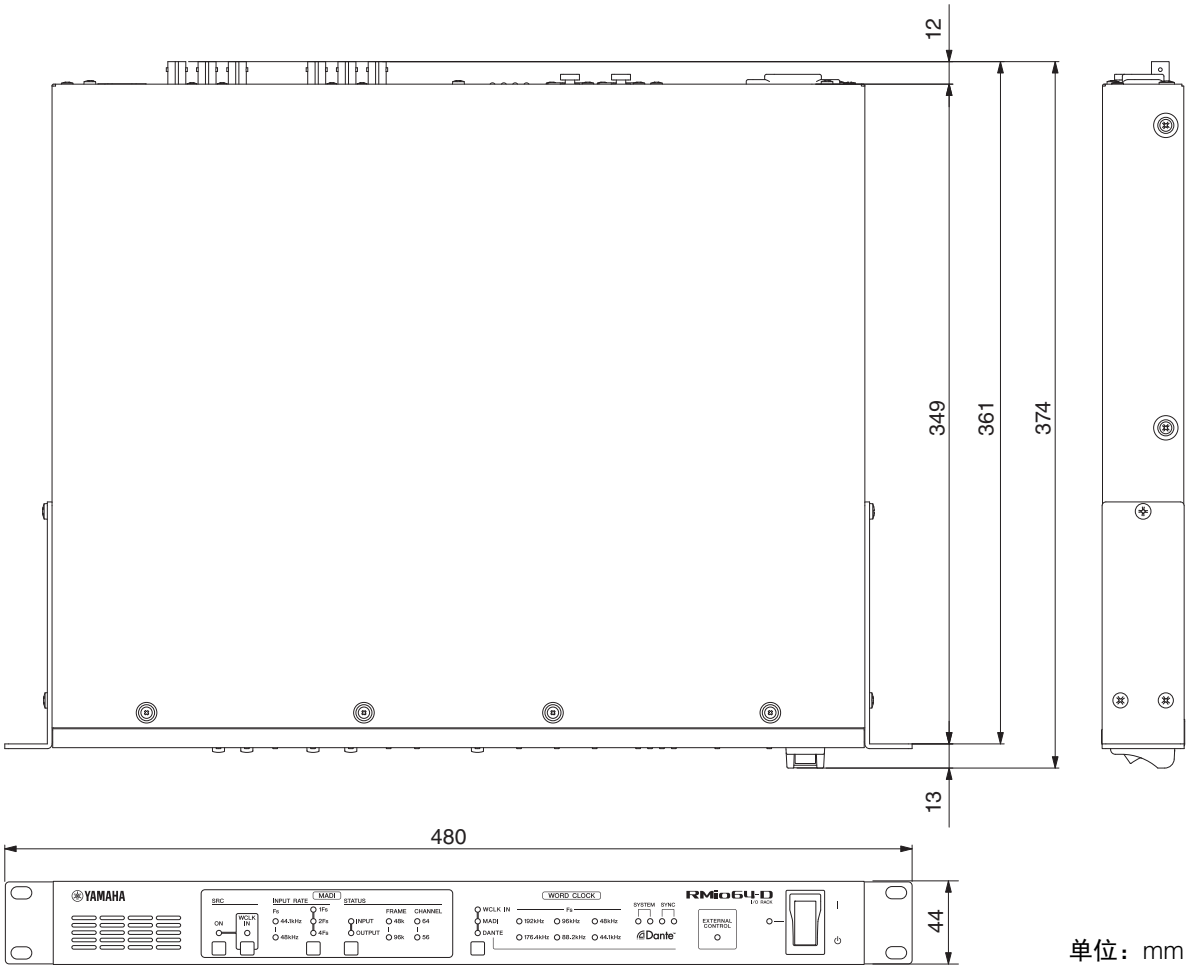
端口	格式	数据长度	标准	接口
MADI IN 1 – 64	AES10-2008（MADI）	24位	ECL	BNC接口
			-31 – -14dBm	SC接口
MADI OUT 1 – 64			ECL	BNC接口
			-20 – -14dBm	SC接口

控制I/O特性

端口		标准	接口
WORD CLOCK	IN	TTL/75Ω终端	BNC接口
	IN FOR SRC	TTL/75Ω终端	BNC接口
	OUT	TTL/75Ω	BNC接口
SYSTEM LINK OUT		1.0±0.2Vp-p/75Ω*	BNC接口

*AES-3id

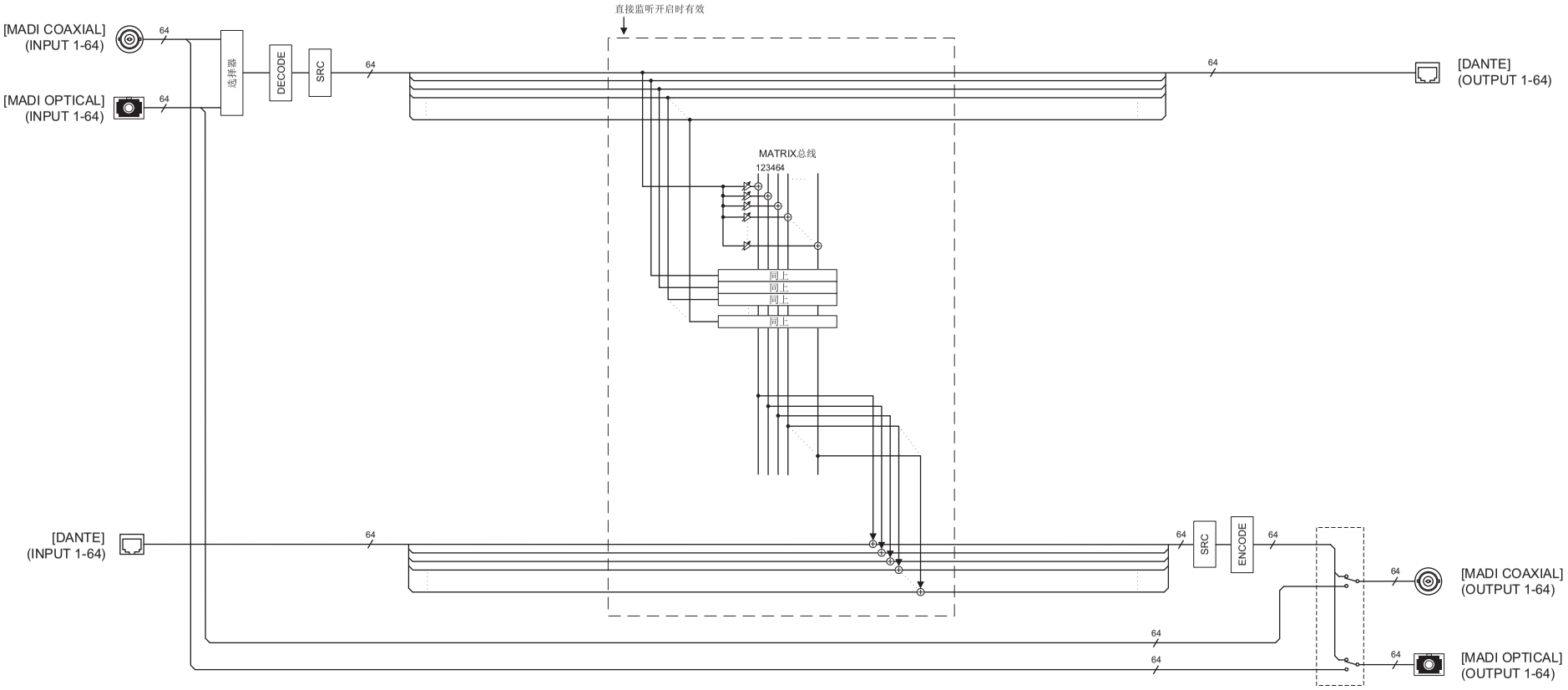
外形尺寸



单位：mm

电路图

[MADI INPUT] (1-64)
（支持64ch@44.1/48kHz，支持32ch@88.2/96kHz，支持16ch@176.4/192kHz）



[MADI OUTPUT] (1-64)
（支持64ch@44.1/48kHz，支持32ch@88.2/96kHz，支持16ch@176.4/192kHz）

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Version 2, June 1991

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