



Boundary Microphone

# RM-TT

Reference Manual

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### Information

- The illustrations and images shown in this manual are for instructional purposes only.
- The company names and product names in this manual are trademarks or registered trademarks of their respective companies.
- We are continuously improving the software for our products. The latest version can be downloaded from the Yamaha website.
- This document is based on the latest specifications at the time of publication. The latest version can be downloaded from the Yamaha website.
- Reproduction of this manual in whole or in part without permission is prohibited.

# INTRODUCTION

Thank you for purchasing the Yamaha RM-TT ceiling microphone. This wired microphone, one of the devices that make up the ADECIA tabletop solution, can be set up on the table of a conference room.

For correct and safe use of this product, be sure to first read this manual carefully together with the RM-TT Installation Manual (included with the product).

## Available utility software

This utility software can be used to set up this unit according to its use and environment.

<input type="checkbox"/> <b>Web GUI “RM-TT Device Manager”</b>	This allows you to use a computer browser to configure and operate this unit.
<input type="checkbox"/> <b>RM Device Finder</b>	This is application software for controlling ADECIA devices on the network. It detects the ADECIA devices on the network and displays the Device Manager for each device.
<input type="checkbox"/> <b>ProVisionaire Design</b>	This is Windows application software for designing and managing an entire sound system made up of a combination of various devices.
<input type="checkbox"/> <b>ProVisionaire Kiosk</b>	This is software that allows you to control parameters for various devices from a single control panel. It runs on a Windows computer or iPad/iPhone.
<input type="checkbox"/> <b>ProVisionaire Control PLUS</b>	This is Windows software for designing ProVisionaire Kiosk controllers.

## Available manuals

This describes the manuals related to this product.

<input type="checkbox"/> <b>Installation Manual (included)</b>	This contains the precautions for using this unit safely as well as the installation procedure.
<input checked="" type="checkbox"/> <b>Reference Manual (this manual/PDF)</b>	This provides details on connecting and using this unit.
<input type="checkbox"/> <b>Web GUI Device Manager Operation Guide</b>	This provides details on the Web GUI Device Manager, which allows you use your computer to configure and operate this unit.
<input type="checkbox"/> <b>RM Series Remote Control Protocol Specifications</b>	This provides details on command information for acquiring and controlling information about this unit from external devices.
<input type="checkbox"/> <b>ProVisionaire Design User Guide</b>	This provides details on using ProVisionaire Design.
<input type="checkbox"/> <b>ProVisionaire Kiosk User Guide</b>	This provides details on using ProVisionaire Kiosk.
<input type="checkbox"/> <b>ProVisionaire Control PLUS User Guide</b>	This provides details on using ProVisionaire Control PLUS.

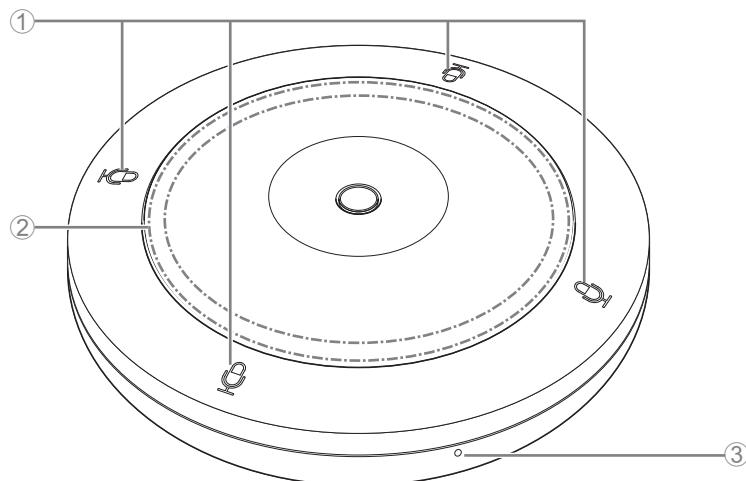
Software and manuals related to this product can be downloaded from the following website.

### ▼ Yamaha website (Downloads)

<https://download.yamaha.com/>

# CONTROLS AND FUNCTIONS

## Top panel/side panel



### ① Mic buttons/indicators

Condition		Indicator	Color/lighting status		Description
Toggle mode	Mic button touched		Green	Lit	Microphone unmuted
			Red	Lit (Flashes every 2 seconds)	Microphone muted
Push to talk mode	Mic button touched continuously		Green	Lit	Microphone unmuted while the button is touched
	Mic button released		Red	Lit (Flashes every 2 seconds)	Microphone muted

**NOTE:** The Mic button operates in Toggle mode or Push to talk mode.

In Toggle mode, pressing the button switches between muting and unmuting the microphone.

Push to talk is a communication method that allows you to talk only while a button is pressed. Multiple devices cannot be used to talk at the same time.

For details on switching between the Toggle and Push to talk modes, refer to the RM-CR RM-CG RM-TT Web GUI Device Manager Operation Guide.

The setting can be changed via the following.

[AUDIO] → [Processing] → [MICROPHONE SETTINGS] → [Mute Button Behavior] in the Web GUI “RM-TT Device Manager”

## ② Status indicator

Category	Indicator	Color/lighting status		Description
Reset		Blue	Flashing	Waiting for resetting • Network-related settings • All settings
FW Update		White	Flashing quickly	Updating firmware
		Green	Flashing quickly	Firmware updated successfully
Notifications/alerts		White	Flashing	Responding (to Identify function)
		Red	Flashing quickly	Severe error occurring
		Red	Flashing	Error occurring
Mute		Green	Lit	Microphone unmuted
		Red	Lit	Microphone muted
Other		White	Lit	Not in use (connected to RM-CR)
		Green	Flashing	Starting up

**NOTE:**

- The lighting of the Status indicator varies according to the directivity of the microphone.
- Occurrences of errors and severe errors are recorded in the alert log. For details, refer to page 10.
- \*1 The setting is “White” by default, but can be changed via the following. (White / Green / Off)  
[SETTINGS] → [Admin] → [LED INDICATION SETTINGS] in the Web GUI “RM-CR Device Manager”  
Refer to the RM-CR RM-CG RM-TT Web GUI Device Manager Operation Guide.

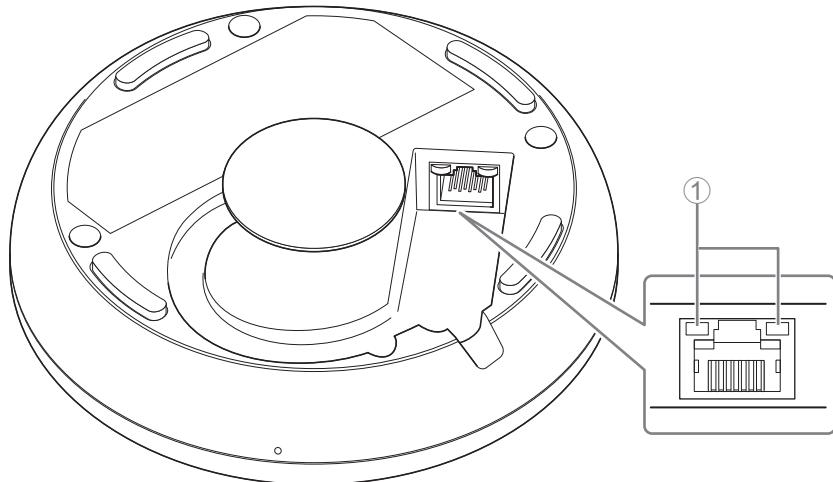
## ③ Reset button

Condition	Status indicator	Unit status
Reset button long-pressed for 4 seconds to less than 8 seconds, then released	Flashes blue twice per second (during long-pressing/resetting)	Network-related settings Waiting for resetting/Resetting
Reset button long-pressed for 8 seconds to less than 12 seconds, then released	Flashes blue three times per second (during long-pressing/resetting)	All settings Waiting for resetting/Resetting

**NOTE:** Use a fine-tipped object such as an ejector pin to press the Reset button.

## Bottom panel

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### ① Network port indicators (Dante/PoE port)

Network port indicator	Unit status
Left indicator lit green	Link up
Left indicator flashes green	Transferring data
Left indicator unlit	Link down
Right indicator lit green	Operating on word clock of peripheral device (leader)
Right indicator flashes green	Acting as word-clock leader
Right indicator flashes orange	Word clock unlocked

**NOTICE:**

- When disconnecting the LAN cable from the Dante/PoE port, wait at least five seconds before reconnecting the cable. Otherwise, damage or malfunctions may result.
- With a Dante network, do not use the EEE function\* of the network switch. Although mutual power consumption settings are automatically adjusted between switches that support the EEE function, some switches do not perform that properly. As a result, the switch's EEE function may be enabled inappropriately in the Dante network, possibly degrading clock synchronization performance and interrupting audio. Therefore, please note the following.
  - When using managed switches, turn off the EEE function on all ports used for Dante. Do not use a switch that does not allow the EEE function to be turned off.
  - When using unmanaged switches, do not use switches that support the EEE function. In such switches, the EEE function cannot be turned off.

\* EEE (Energy-Efficient Ethernet) function: Technology that reduces the power consumption of Ethernet devices during periods of low network traffic; also known as Green Ethernet or IEEE802.3az.

# AVAILABLE UTILITY SOFTWARE

## Starting up the Web GUI Device Manager

Use the Web GUI “RM-TT Device Manager” to check/change the settings of this unit.

**IMPORTANT:** Check/change the settings after the installation of this unit is finished. For details on installing this unit, refer to the RM-TT Installation Manual.

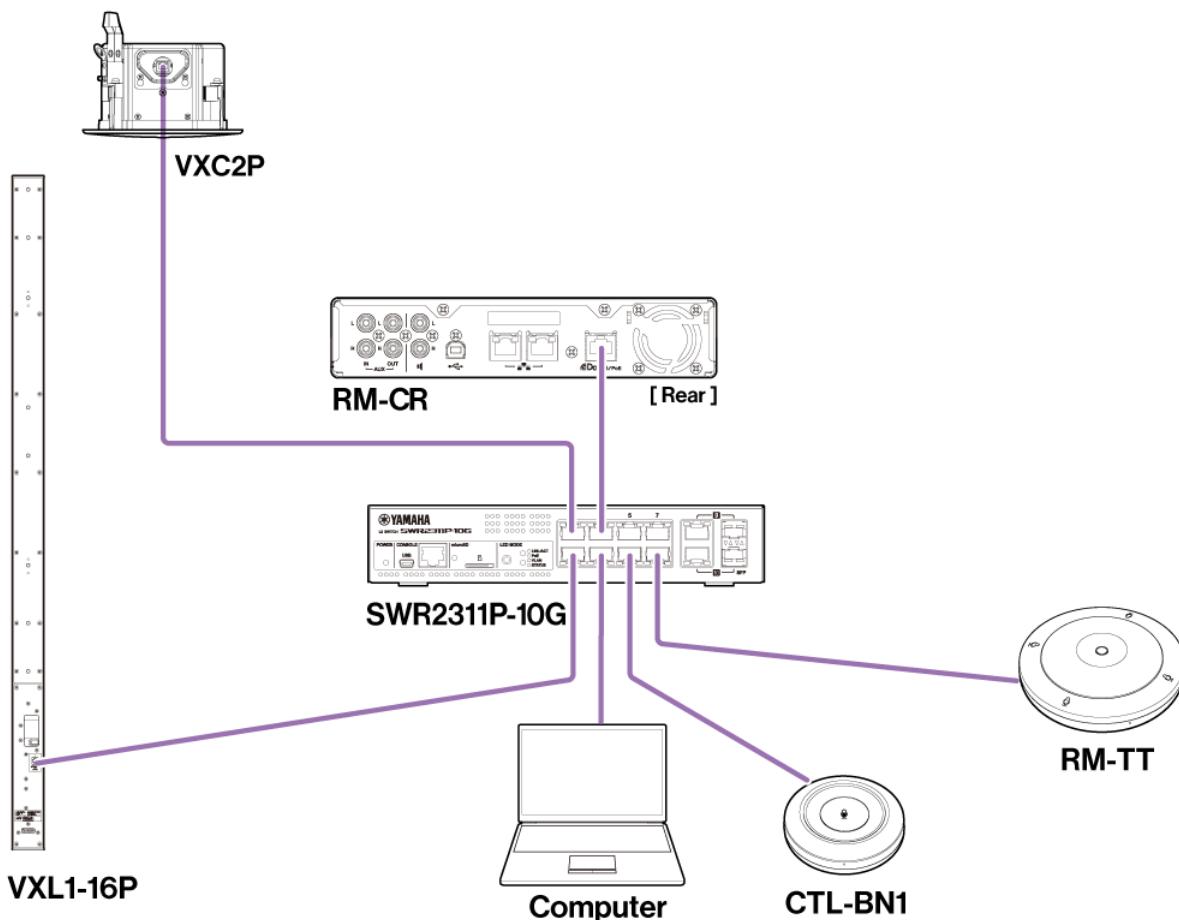
Prepare the following.

- Computer
- LAN cable

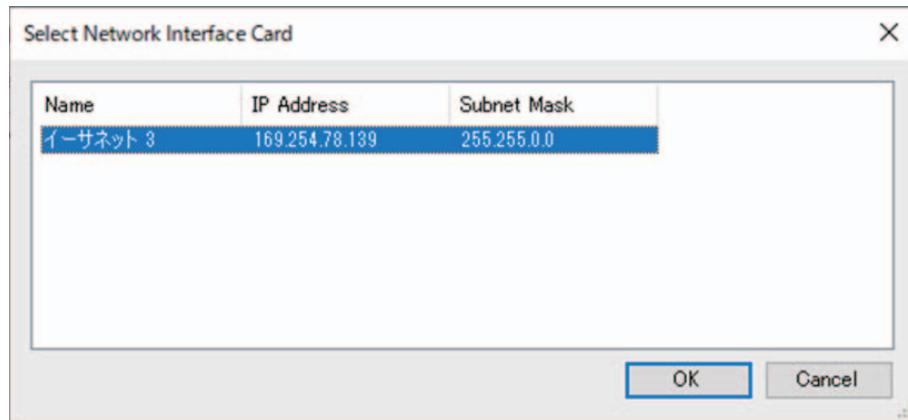
**1. Download the application “RM Device Finder” from the Yamaha website (<http://download.yamaha.com/>), and then start it.**

**NOTE:** For details on RM Device Finder, refer to the User Guide included with RM Device Finder.

**2. Using a LAN cable, connect the computer to the network switch where this unit is connected.**

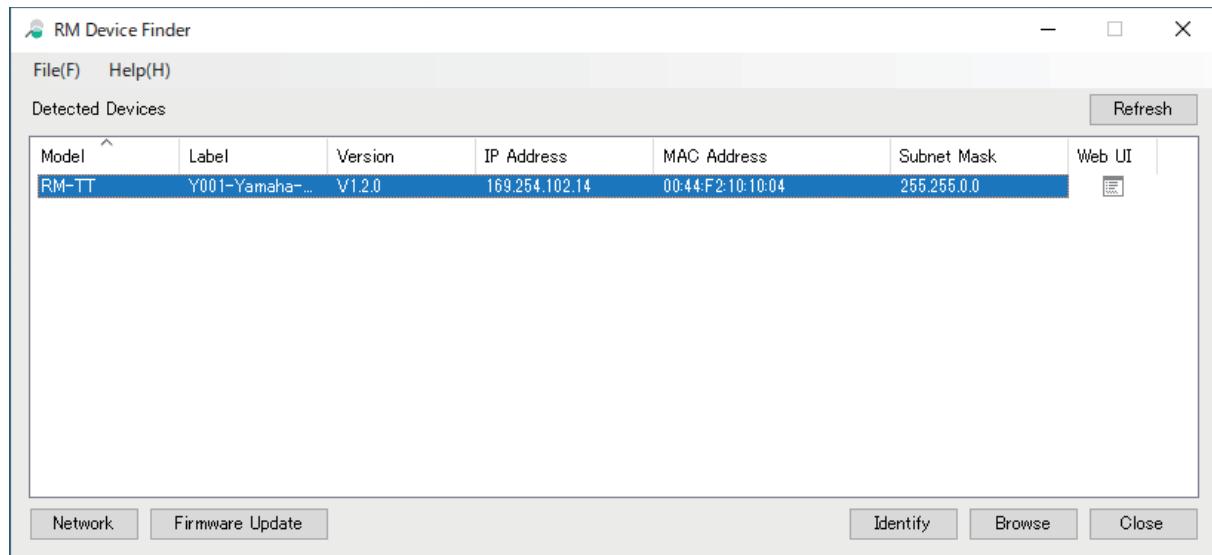


**3. Select a network in the [Select Network Interface Card] window, and then click [OK].**

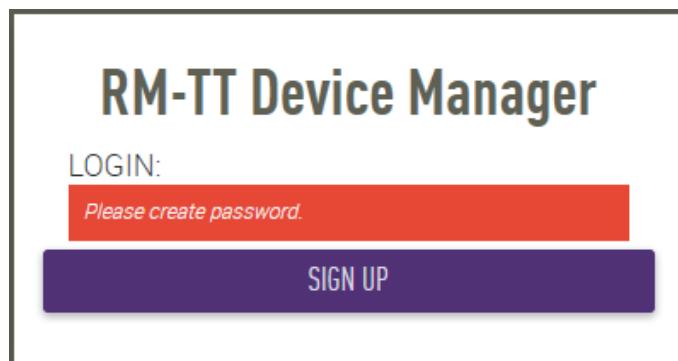


**4. Double-click this unit in the [Detected Devices] window. Alternatively, select this unit, and then click the [Browse] button.**

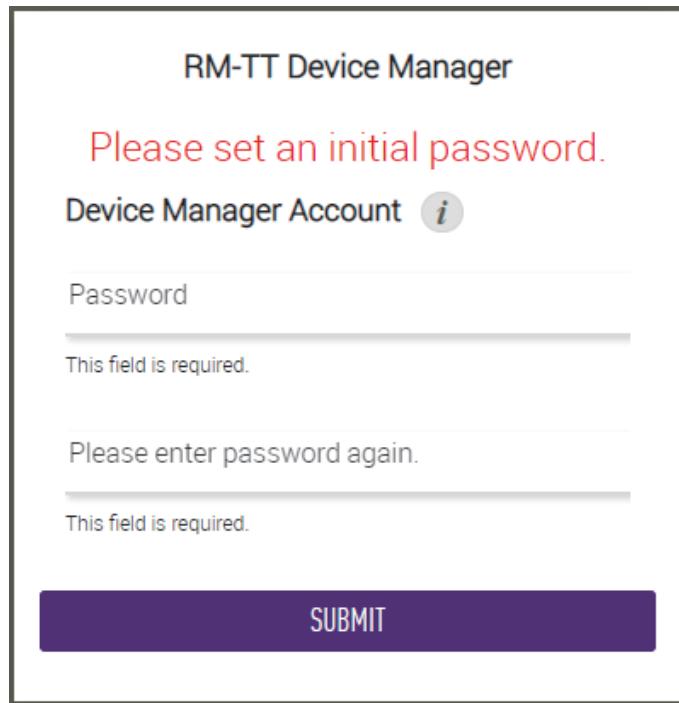
The first login window of RM-TT Device Manager appears.



**5. Click the [SIGN UP] button in the first login window.**



**6. Specify a password in the password settings window, and then click the [SUBMIT] button.**



RM-TT Device Manager

Please set an initial password.

Device Manager Account *i*

Password

This field is required.

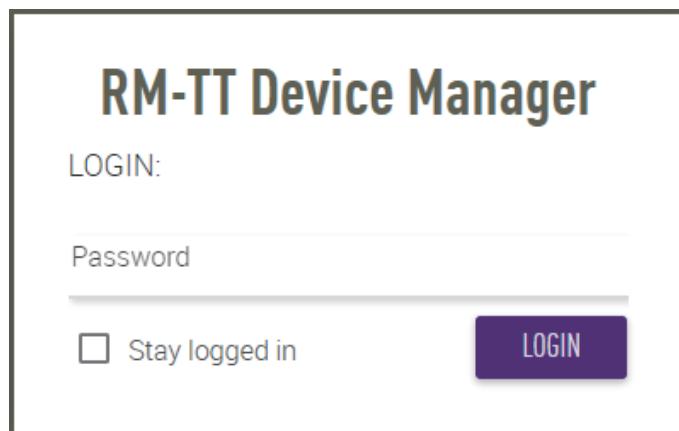
Please enter password again.

This field is required.

**SUBMIT**

**7. Type the password into the login window, and then click the [LOGIN] button.**

The [HOME] window appears.



**RM-TT Device Manager**

LOGIN:

Password

Stay logged in **LOGIN**

This completes the startup.

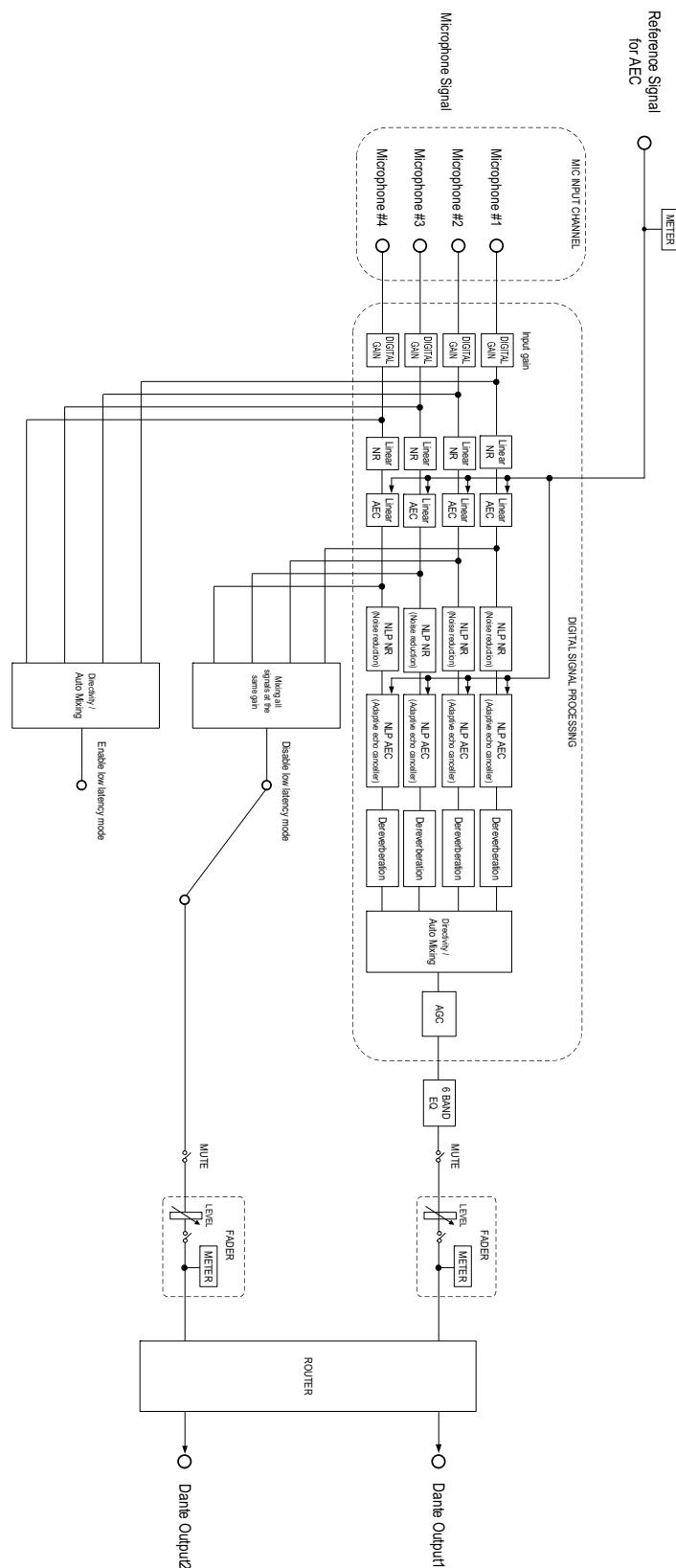
**NOTE:** For details on using RM-TT Device Manager, refer to the separate RM-CR RM-CG RM-TT Web GUI Device Manager Operation Guide.

The latest software and manuals can be downloaded from the following website.

▼ Yamaha website (Downloads)  
<https://download.yamaha.com/>

# APPENDIX

## Block diagram



## Alert log list

This provides details on the main alert log messages contained in the log files. The log file can be downloaded via [TOOLS]→[Logs].

Display	Description	What to do
[0x010B0020] important mic CH* broken	Important mic CH* broken.	Please contact your Yamaha dealer.
[0x000a0000] Dante hardware error	Dante has not started up correctly.	Turn the power off, then turn the power on after waiting at least six seconds. If this does not solve the problem, please initialize the memory. Should this also fails, contact your Yamaha dealer.
[0x01070003] Firmware update failed, because of *	Failure of firmware update has occurred.	Check firmware file on the firmware update pages of Web GUI.
[0x01070004] Firmware update failed, because of internal error		Turn the power off, then turn the power on after waiting at least six seconds. If this does not solve the problem, please contact your Yamaha dealer.
[0x01050009] Web UI internal failure	Internal failure has occurred in Web GUI.	Turn the power off, then turn the power on after waiting at least six seconds. If this does not solve the problem, please initialize settings. Should this also fails, contact your Yamaha dealer.
[0x01010007] failed to start audio proc	The device audio has not started up correctly.	Turn the power off, then turn on after waiting at least six seconds. If this does not solve the problem, please initialize the memory. Should this also fails, contact your Yamaha dealer.
[0x00010000] System error	The device has not started up correctly.	
[0x00010001] Power unstable	The device is not supplying power normally.	Connect to a PoE compatible switch. If this does not solve the problem, please turn the power off, then turn on after waiting at least six seconds. Should this also fail, contact your Yamaha dealer.
[0x01060001] Syslog setting error	Failed to update syslog transfer servers.	Turn the power off, then turn the power on after waiting at least six seconds. If this does not solve the problem, please initialize settings.
[0x01060003] logging error	Failed to restart logging.	
[0x010B0044] Automatic audio tuning failed, because of internal error.	Automatic audio tuning has failed, because internal error has occurred.	Turn the power off, then turn the power on after waiting at least six seconds. Please try again. If this does not solve the problem, contact your Yamaha dealer.
[0x000a0001] Dante started in fail safe mode	Dante has started in failsafe mode.	Execute Failsafe Recovery using Audinate's firmware update tool.
[0x000a0002] Unable to configure Dante, because the Dante device is locked.	Dante is currently limited to control settings, because the device is locked.	Unlock device lock using Dante Controller or check Dante Domain Manager settings.
[0x010C0001] Resume data lost	The settings saved in internal memory has been lost.	Initialize the memory. If this dose not solve the problem, contact your Yamaha dealer.
[0x010C0002] Saving setting data failed	The device has not started up correctly.	Turn the power off, then turn the power on after waiting at least six seconds. If this does not solve the problem, please initialize the memory. Contact your Yamaha dealer if problem still exists.

Display	Description	What to do
[0x010D0001] CPU temperature too high	CPU temperature has been too high.	Turn the power off, let the CPU cool down. Turn the power on again. If the temperature is still too high, check the installation environment and whether dirt or a foreign object could have clogged the cooling fan, and clean the fan if necessary.
[0x00070003] Too many devices on the network	Too many devices are connected to the network.	Reduce the number of devices connected to the network.
[0x01100010] Configuration import failed, because of file download failure (*)	Configuration import has failed, because of file download failure.	Check network, server address settings, existence of configuration file at server.
[0x01100011] Configuration import failed, because of file format error (*)	Configuration import has failed, because of file format error.	Check contents and format of configuration file.
[0x01100012] Configuration import transfer failed, because of wrong filename or peripheral disconnected (*)	Configuration import transfer has failed, because of wrong filename or peripheral disconnected.	Check file name and connection status of peripheral device.
[0x01100013] Configuration import failed, because the system is busy (*)	Configuration import has failed, because of system busy.	Check device status and try again. If it is still not working, please update firmware or reset all of the settings.
[0x01100014] Configuration import failed, because of internal error (*)	Configuration import has failed, because of internal error.	Try again. If it's not working again, please update firmware or reset all of settings.
[0x01090001] Schedule data lost	The schedule data saved in internal memory has been lost.	If this occurs often, contact your Yamaha dealer.
[0x01080001] Peripheral communication error	A peripheral device within the system was not found on the network.	Power-on all peripheral devices in the system, and make sure that they are correctly connected to the network.
[0x01010005] Factory reset failed	Factory reset has failed.	—
[0x01010006] * reset failed	Partial reset has failed.	
[0x01050002] Web UI login failure by *	Web GUI login failure has occurred by (IP address).	Check password.
[0x01090004] Scheduling event failed, because of *	Scheduling event has failed.	Check the number of scheduled events.
[0x010B0040] Audio processing restarted	Audio processing failure has occurred, then restarted.	If this occurs often, contact your Yamaha dealer.
[0x01010013] SNMP error	SNMP operation has failed to start.	Turn the device off, then on again after waiting at least six seconds. If this does not solve the problem, initialize the memory. Contact your Yamaha dealer if the problem persists.
[0x010f0004] IEEE802.1X restart failed	Failed to start the IEEE802.1X operation.	Turn the unit off, then on again after waiting at least six seconds. Contact your Yamaha dealer if the problem persists.

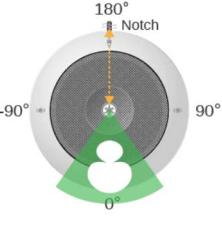
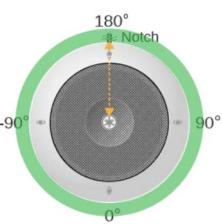
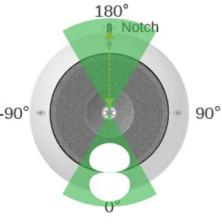
# EXPLANATIONS

## Microphone directivity settings

The directivity of the RM-TT microphone can be set to one of the following. The directivity setting can be specified via [AUDIO]→[MICROPHONE SETTINGS]→[Directivity] in the Web GUI “RM-TT Device Manager”.

- Auto voice tracking
- Omnidirectional
- Cardioid
- Supercardioid
- Hypercardioid
- Toroid
- Bidirectional

<b>Auto voice tracking</b> 	<b>Auto voice tracking:</b> With this setting, the microphone automatically focuses on the speaker's voice. This is the default setting.
<b>Omnidirectional</b> 	<b>Omnidirectional:</b> With this setting, all microphone elements are kept active at all times, allowing it to pick up multiple voices simultaneously. This setting is suitable for use in quiet, reverb-free environments.
<b>Cardioid</b> 	<b>Cardioid:</b> With this setting, voice pickup can be focused in a specific direction. Up to four directions can be selected. This setting is suitable for use when the speaker is always in the same position relative to the microphone. With [Cardioid], an automixing method must be selected.
<b>Supercardioid</b> 	<b>Supercardioid:</b> This setting is the same as [Cardioid], but the polar pattern is narrower.

<b>Hypercardioid</b> 	<b>Hypercardioid:</b> This setting is the same as [Cardioid] and [Supercardioid], but the directivity is even narrower than [Supercardioid].
<b>Toroid</b> 	<b>Toroid:</b> With this setting, the focus is on the sound in the same horizontal plane as the microphone. This setting is suitable for use in environments where there is a noise source above the microphone.
<b>Bidirectional</b> 	<b>Bidirectional:</b> With this setting, the focus is on two speaker positions that are opposite each other (180°). This setting is suitable for use when the speakers are facing each other.

## Updating the firmware

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There are multiple ways to update the firmware.

### Using RM Device Finder

RM Device Finder is application software for detecting and controlling ADECIA devices on the network. It can also be used to update the firmware of each device.

For operating procedures, refer to the RM Device Finder User Guide included with RM Device Finder.

### Using the Web GUI “RM-TT Device Manager”

Firmware can be updated via [TOOLS]→[Update]→[FIRMWARE UPDATE] in the Web GUI “RM-TT Device Manager”.

For operating procedures, refer to the RM-CR RM-CG RM-TT Web GUI Device Manager Operation Guide.

### Using the Web GUI “RM-CR Device Manager”

By using the Web GUI “RM-CR Device Manager”, it is possible to update the firmware of peripheral devices, such as RM-CG and RM-TT, at the same time as the firmware of RM-CR.

Firmware can be updated via [TOOLS]→[Update]→[FIRMWARE UPDATE] in the Web GUI “RM-CR Device Manager”.

For operating procedures, refer to the RM-CR RM-CG RM-TT Web GUI Device Manager Operation Guide.

The latest utility software, firmware files and manuals can be downloaded from the following website.

#### ▼ Yamaha website (Downloads)

<https://download.yamaha.com/>

## Initializing

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There are two ways to initialize an RM-TT: using the reset button on the unit and using the Web GUI “RM-TT Device Manager”.

For details on using the reset button on the unit, refer to “CONTROLS AND FUNCTIONS” in this manual.

Alternatively, it can be initialized via [TOOLS]→[Configuration]→[RESET DEFAULTS] in the Web GUI “RM-TT Device Manager”. For operating procedures, refer to the RM-CR RM-CG RM-TT Web GUI Device Manager Operation Guide.

# MAIN SPECIFICATIONS

## General specifications

Dimensions	W 140.0 mm × D 140.0 mm × H 40.0 mm (excluding protrusions)	
Weight	310 g	
Power requirements	PoE (IEEE802.3af), DC48 V	
Maximum power consumption	4.5 W	
In operation	Temperature	0 °C – 40 °C
	Humidity	30% – 90% (no condensation)
Storage	Temperature	–20 °C – 60 °C
	Humidity	20% – 90% (no condensation)
Indicators	<ul style="list-style-type: none"> <li>Mic</li> <li>Status</li> <li>Network port</li> </ul>	
Maximum number of connections to RM-CR	14 (maximum 16 when not using VXL1-16P) / 16 (ADECIA V3.0 or later)	
Accessories	<ul style="list-style-type: none"> <li>Tabletop mounting adaptor : 1</li> <li>Mounting screw : 3</li> <li>Spacer : 3</li> <li>Installation Manual : 1</li> </ul>	

## Network specifications

Dante/PoE port	<ul style="list-style-type: none"> <li>Dante audio/Dante control</li> <li>Remote control</li> <li>PoE</li> <li>Cable requirements: CAT5e or higher, STP</li> </ul>
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## Audio specifications

Frequency response	160 Hz – 16 kHz (–10 dB)
Sampling rate	48 kHz
Bit depth	24-bit
Latency	<p>Default</p> <ul style="list-style-type: none"> <li>46 [ms] (with directivity other than toroid)</li> <li>50 [ms] (with toroid directivity)</li> </ul> <p>Low latency mode</p> <ul style="list-style-type: none"> <li>20 [ms] (with directivity other than toroid)</li> <li>23 [ms] (with toroid directivity)</li> </ul>
Audio input/output (Dante)	<p>1inx2out</p> <ul style="list-style-type: none"> <li>In1 : AEC reference signal</li> <li>Out1 : output of beam mix</li> <li>Out2 : output of beam mix (simple processed)</li> </ul>
Maximum input level of SPL (0 dBFs)	106.8 dB SPL
Self noise	6.3 dBA SPL
SNR (Ref. 94 dB SPL at 1 kHz)	87.7 dB
Sensitivity	–12.8 dBFS/Pa
Dynamic range	100.5 dBA
Signal processing	<ul style="list-style-type: none"> <li>Auto voice tracking</li> <li>Selectable polar pattern: Cardioid, Hypercardioid, Supercardioid, Omnidirectional, Bidirectional, Toroid</li> <li>AEC, NR, Dereverberation, Auto Mixer, AGC, User PEQ, Output gain</li> </ul>