YAMAHA

Boundary Microphone

RM-TT

Reference Manual

CONTENTS

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.
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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.

☐	**Web GUI "RM-TT Device Manager"**	This allows you to use a computer browser to configure and operate this unit.
☐	**RM Device Finder**	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.
☐	**ProVisionaire Design**	This is Windows application software for designing and managing an entire sound system made up of a combination of various devices.
☐	**ProVisionaire Kiosk**	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.
☐	**ProVisionaire Control PLUS**	This is Windows software for designing ProVisionaire Kiosk controllers.

Available manuals

This describes the manuals related to this product.

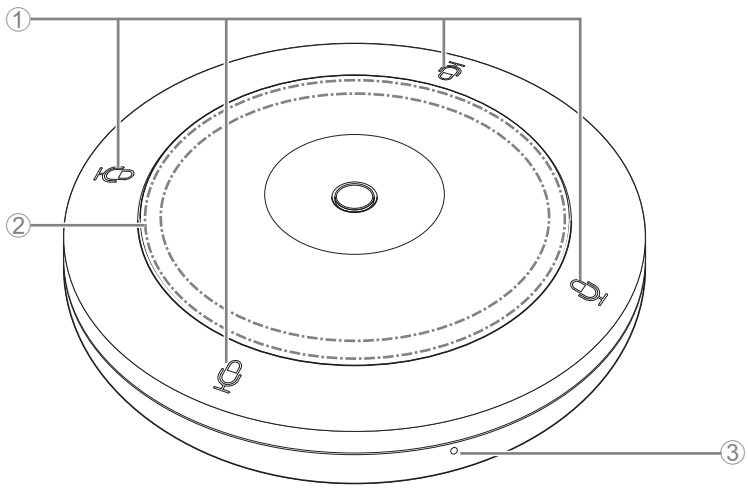
☐	**Installation Manual (included)**	This contains the precautions for using this unit safely as well as the installation procedure.
☑	**Reference Manual (this manual/PDF)**	This provides details on connecting and using this unit.
☐	**Web GUI Device Manager Operation Guide**	This provides details on the Web GUI Device Manager, which allows you use your computer to configure and operate this unit.
☐	**RM Series Remote Control Protocol Specifications**	This provides details on command information for acquiring and controlling information about this unit from external devices.
☐	**ProVisionaire Design User Guide**	This provides details on using ProVisionaire Design.
☐	**ProVisionaire Kiosk User Guide**	This provides details on using ProVisionaire Kiosk.
☐	**ProVisionaire Control PLUS User Guide**	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	Mic indicator	Unit status
In Toggle mode: Mic button touched	Lit green	Microphone on
In Toggle mode: Mic button touched	Lit red (Flashes every 2 seconds)	Microphone off
In Push to talk mode: Mic button touched continuously	Lit green	Microphone on while the button is touched
In Push to talk mode: Mic button released	Lit red (Flashes every 2 seconds)	Microphone off

NOTE: 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.

② Status indicator

Condition	Status indicator	Unit status
LAN cable plugged into Dante/PoE port	Flashes green	Starting up
–	Lit white	Standby (connected to RM-CR, but not in use)
In Toggle mode: Mic button touched	Lit green	Microphone on
In Toggle mode: Mic button touched	Lit red	Microphone off
In Push to talk mode: Mic button touched continuously	Lit green	Microphone on while the button is touched
In Push to talk mode: Mic button released	Lit red	Microphone off
Identify icon in Web GUI clicked	Flashes white	Responding (to Identify function)
Updating firmware	Flashes white quickly	Firmware being updated
Updating firmware	(After flashing white quickly) Flashes green quickly	Firmware updated successfully
–	Flashes red	Error occurring
–	Flashes red quickly	Severe error occurring

NOTE: • The lighting of the Status indicator varies according to the directivity of the microphone.

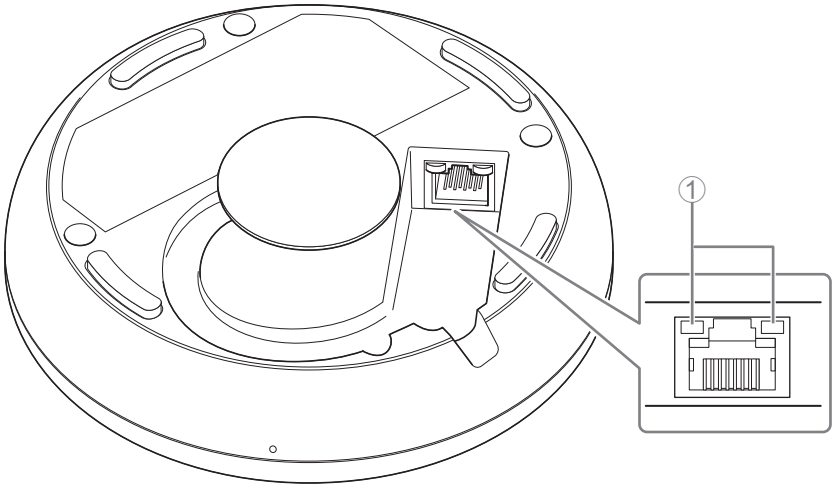
• Occurrences of errors and severe errors are recorded in the alert log. For details, refer to page 9.

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



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.

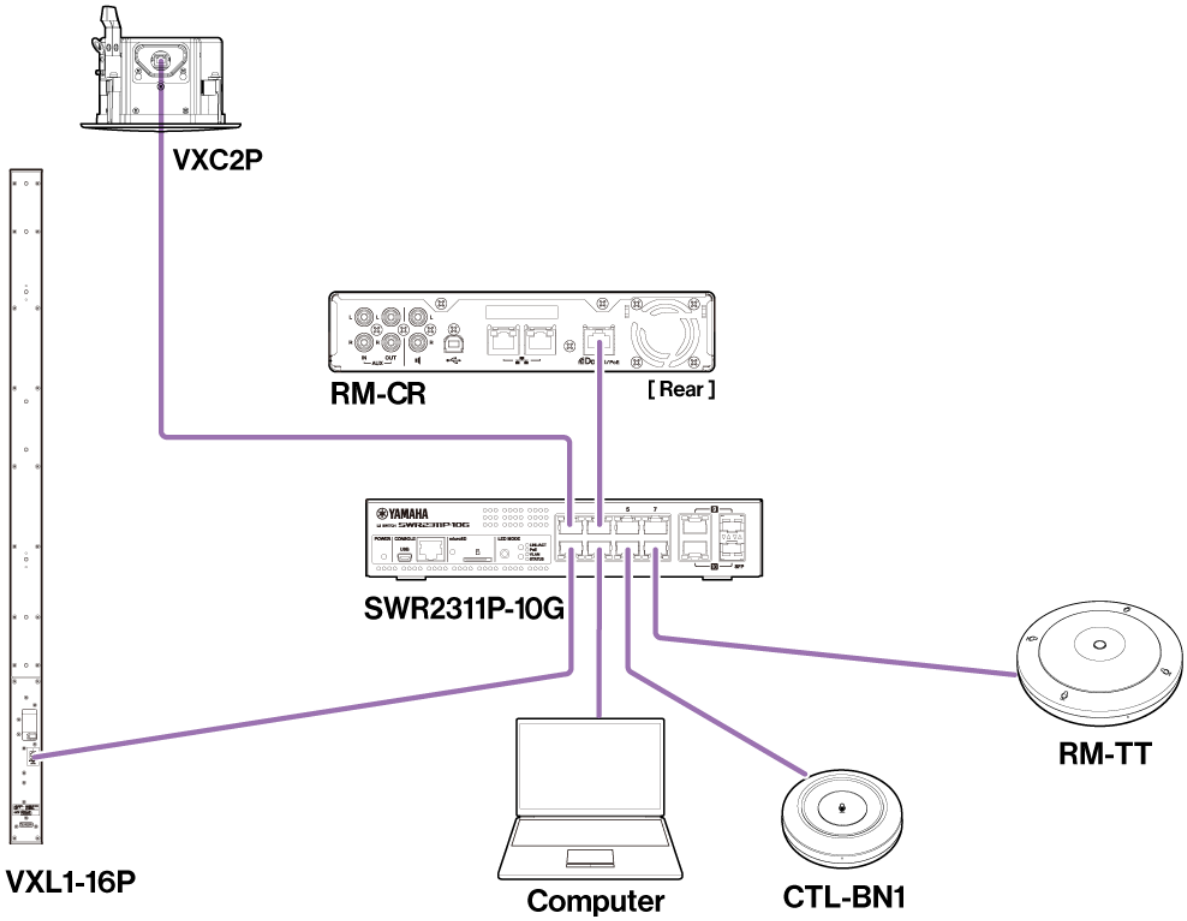
Prepare the following.

- Computer
- LAN cable

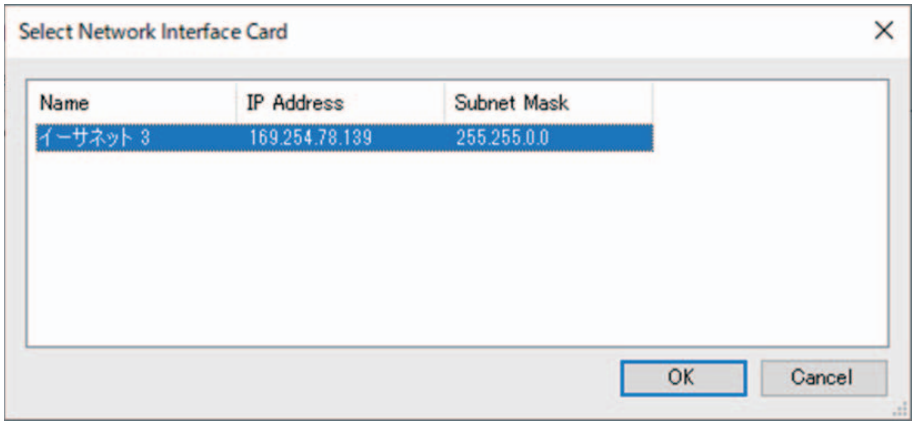
1. Download the application “RM Device Finder” from the Yamaha website (http://download.yamaha.com/), and then start it.

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.

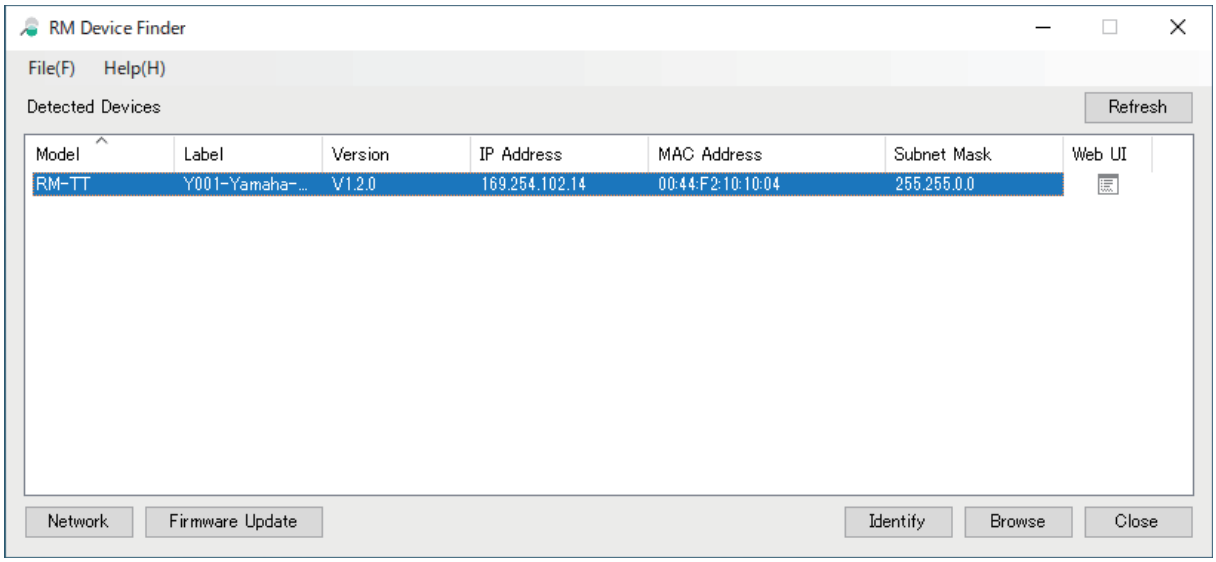


3. **Select a network in the [Select Network Interface Card] window, and then click [OK].**

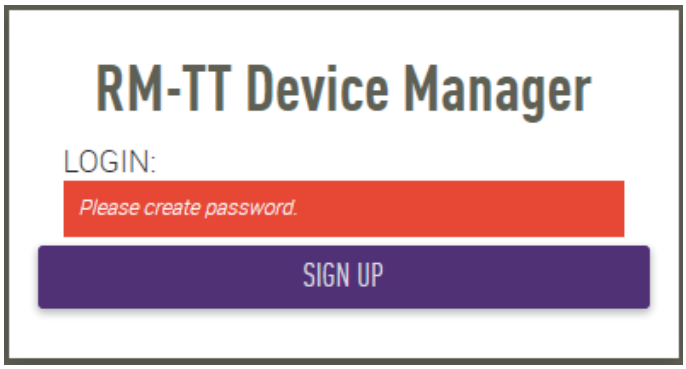


4. **Double-click this unit in the [Detected Devices] window. Alternatively, select this unit, and then click the [Browse] button.**

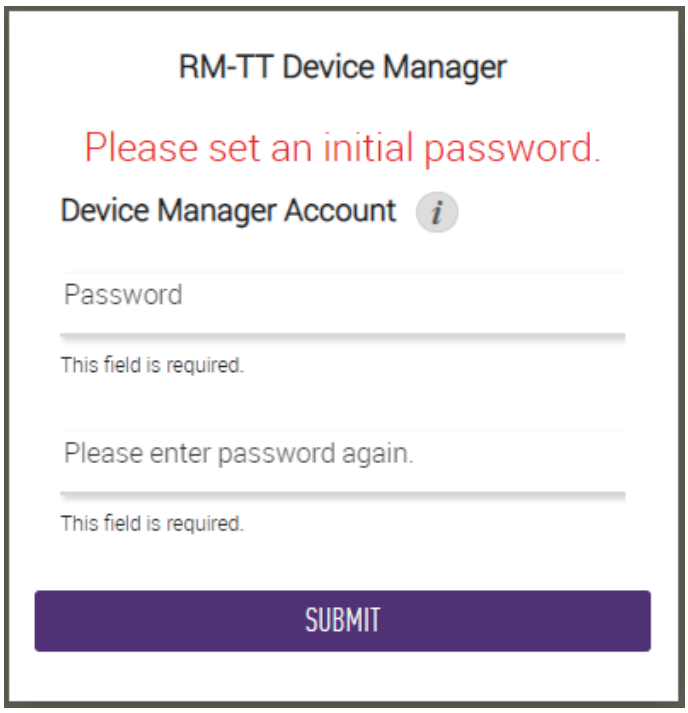
The first login window of RM-TT Device Manager appears.



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

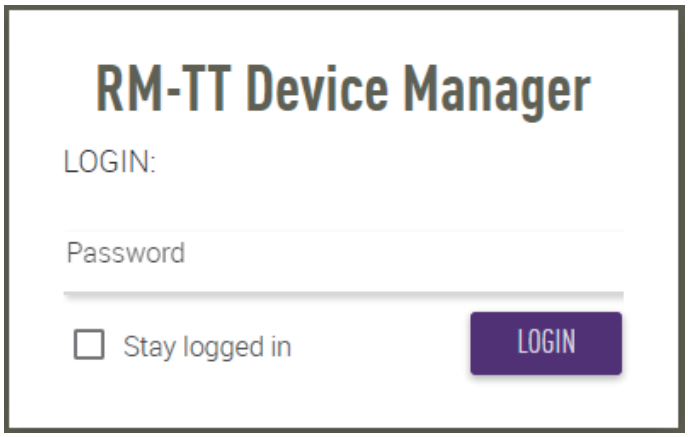


6. Specify a password in the password settings window, and then click the [SUBMIT] button.



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

The [HOME] window appears.



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.

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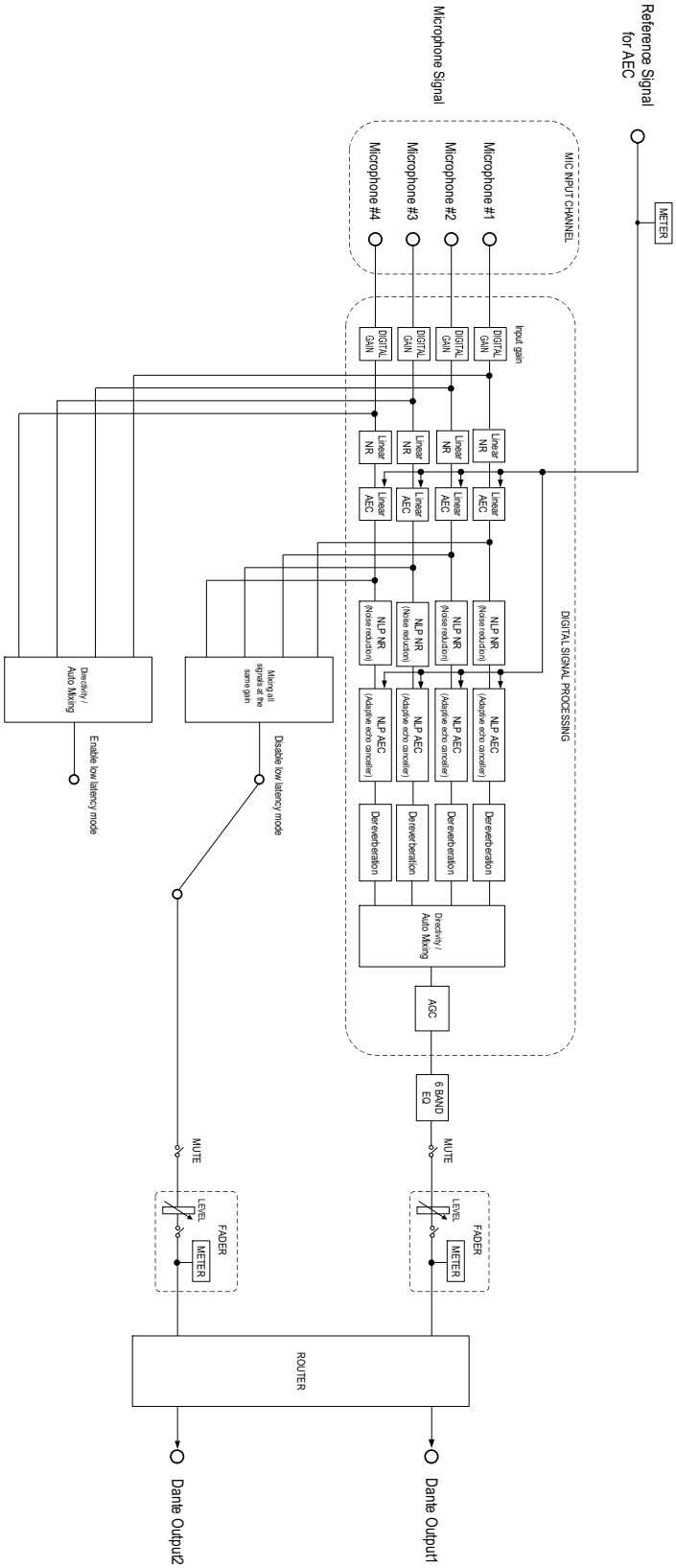
APPENDIX

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.

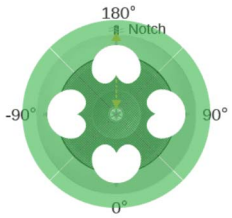
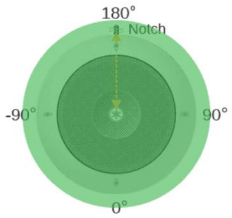
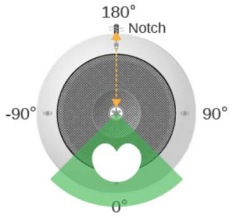
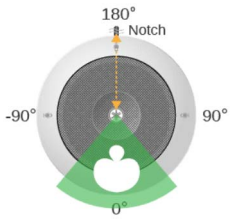
Display	Description	What to do
[0x010D0001] CPU temperature too high	CPU temperature has been too high.	Turn the power off, let the CPU cool down. Turn the power on again. If the temperature is still too high, check the installation environment and whether dirt or a foreign object could have clogged 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 its 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.

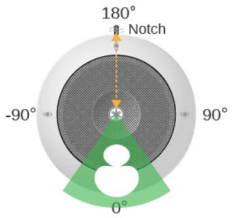
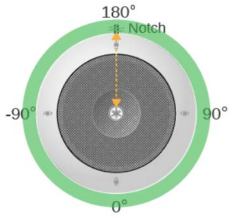
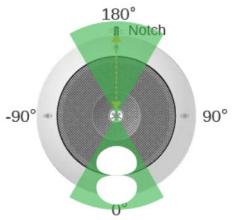
EXPLANATIONS

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

Auto voice tracking 	**Auto voice tracking:** With this setting, the microphone automatically focuses on the speaker’s voice. This is the default setting.
Omnidirectional 	**Omnidirectional:** 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.
Cardioid 	**Cardioid:** 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.
Supercardioid 	**Supercardioid:** This setting is the same as [Cardioid], but the polar pattern is narrower.

Hypercardioid 	**Hypercardioid:** This setting is the same as [Cardioid] and [Supercardioid], but the directivity is even narrower than [Supercardioid].
Toroid 	**Toroid:** 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.
Bidirectional 	**Bidirectional:** 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

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

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		• Mic • Status • Network port
Maximum number of connections to RM-CR		14 (maximum 16 when not using VXL1-16P)
Accessories		• Tabletop mounting adaptor : 1 • Mounting screw : 3 • Spacer : 3 • Installation Manual : 1

Network specifications

Dante/PoE port	• Dante audio/Dante control • Remote control • PoE • Cable requirements: CAT5e or higher, STP

Audio specifications

Frequency response	160 Hz – 16 kHz (–10 dB)
Sampling rate	48 kHz
Bit depth	24-bit
Latency	Default • 46 [ms] (with directivity other than toroid) • 50 [ms] (with toroid directivity) Low latency mode • 20 [ms] (with directivity other than toroid) • 23 [ms] (with toroid directivity)
Audio input/output (Dante)	1in×2out • In1 : AEC reference signal • Out1 : output of beam mix • Out2 : output of beam mix (simple processed)
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 dBA
Sensitivity	–12.8 dBFS/Pa
Dynamic range	100.5 dBA
Signal processing	• Auto voice tracking • Selectable polar pattern: Cardioid, Hypercardioid, Supercardioid, Omnidirectional, Bidirectional, Toroid • AEC, NR, Dereverberation, Auto Mixer, AGC, User PEQ, Output gain

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