YAMAHA

Boundary Microphone

RM-TT

Reference Manual

CONTENTS

INTRODUCTION

Thank you for purchasing the Yamaha RM-TT boundary microphone. This document provides detailed information on the product functions and specifications as well as the Web GUI. 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).

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.

CONTROLS AND FUNCTIONS

Top panel/side panel
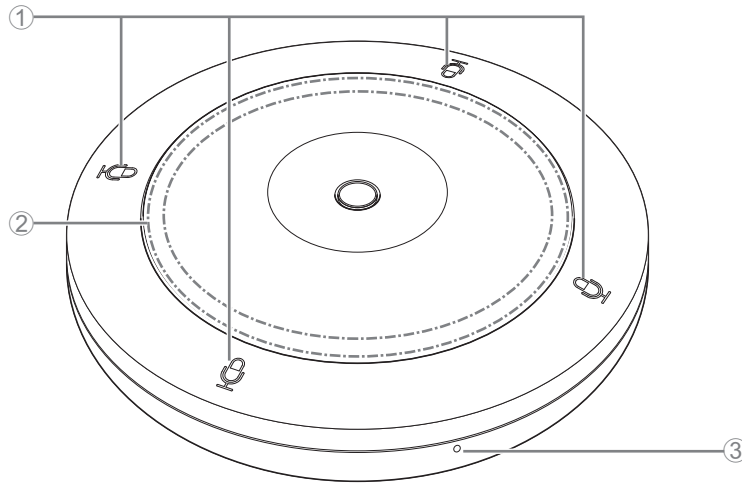
① 🎤 **Mic buttons/indicators**

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 to Toggle mode or Push to talk mode, refer to page 14.

② **Status indicator**

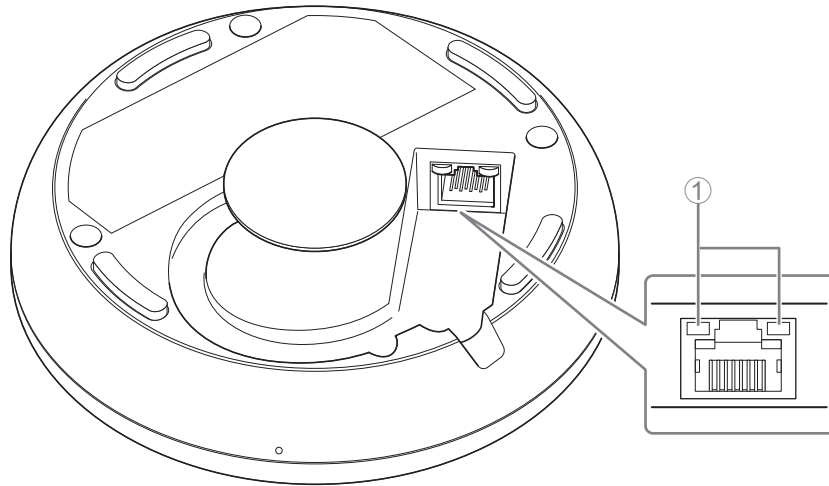| Condition	Status indicator	Unit status
In Toggle mode: Mic button touched	Lit green	Microphone on
In Toggle mode: Mic button touched	Lit red	Microphone off
In Push to talk mode: Mic button touched continuously	Lit green	Microphone on while the button is touched
In Push to talk mode: Mic button released	Lit red	Microphone off
LAN cable plugged into Dante/PoE port	Flashes green	Starting up
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 20.

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.

WEB GUI

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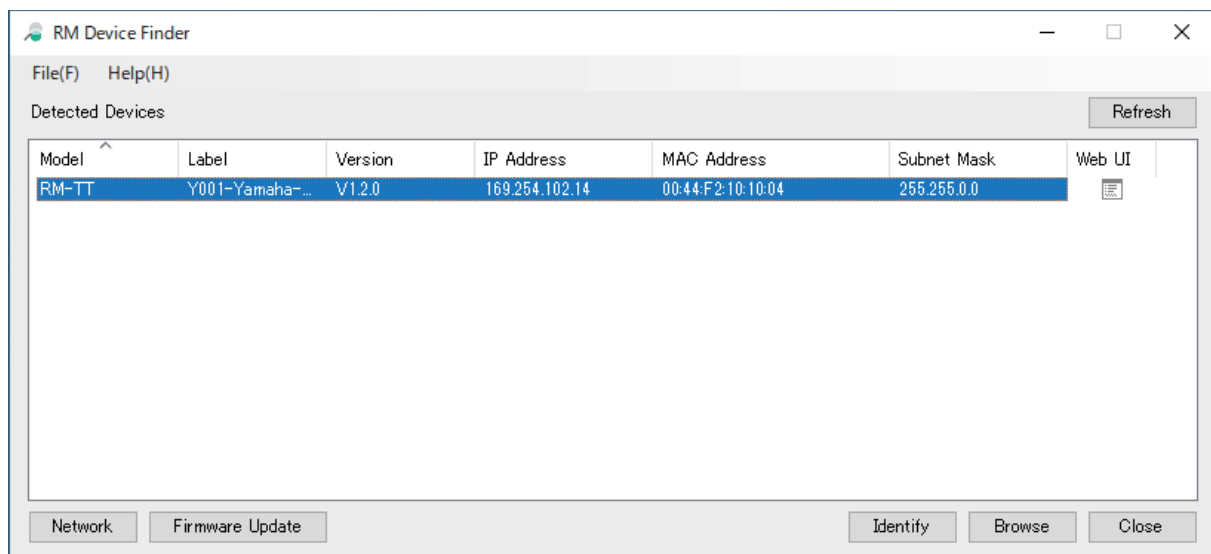
Starting RM-TT Device Manager

Prepare the following.
- Computer
- LAN cable

1. **Download the application "RM Device Finder" from the Yamaha website (U.S.A. and Canada: https://uc.yamaha.com/support/, Other countries: https://download.yamaha.com/), and then start it.**

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

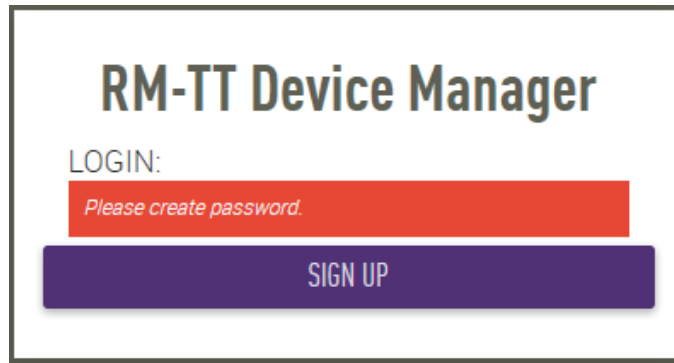*3.* **Select a network in the [Select Network Interface Card] window, and then click [OK].**
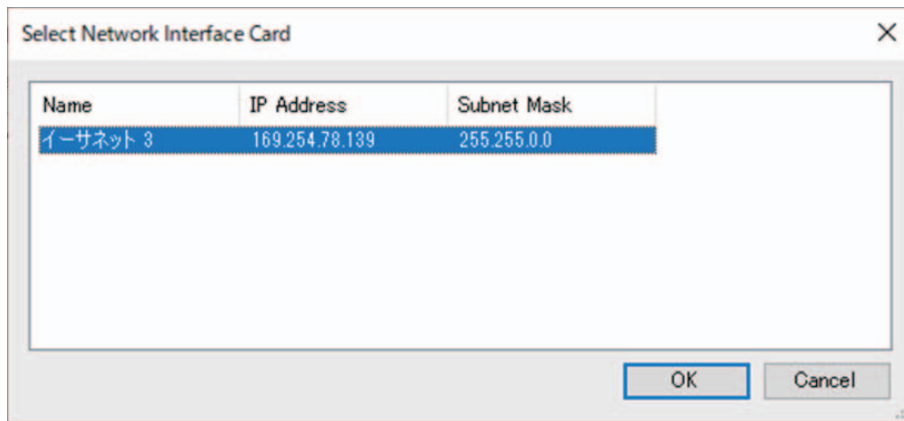
4. **Double-click this unit in the [Detected Devices] window. Alternatively, select this unit, and then click the [Browse] button.**
The first login window of RM-TT Device Manager appears.

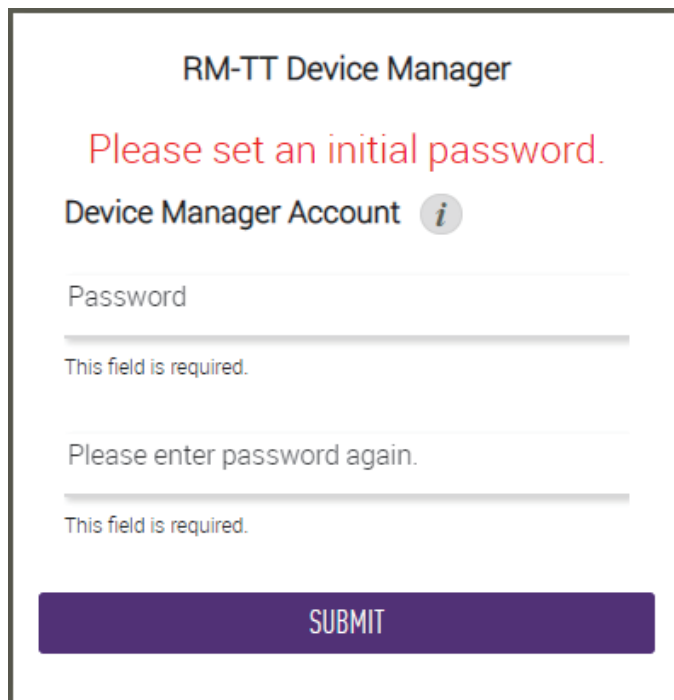**5.** Click the [SIGN UP] button in the first login window.

6. Specify a password in the password settings window, and then click the [SUBMIT] button.
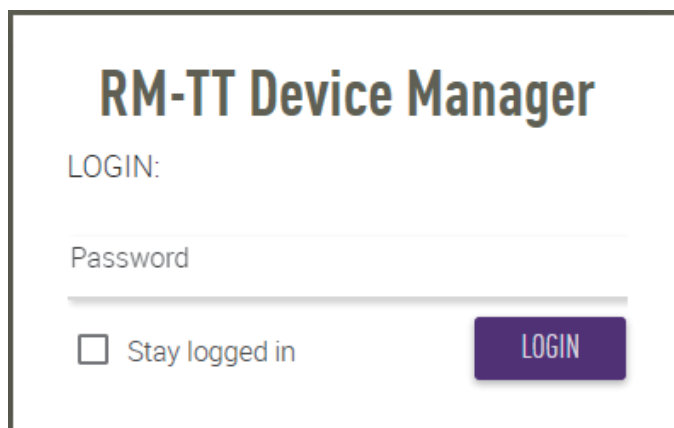
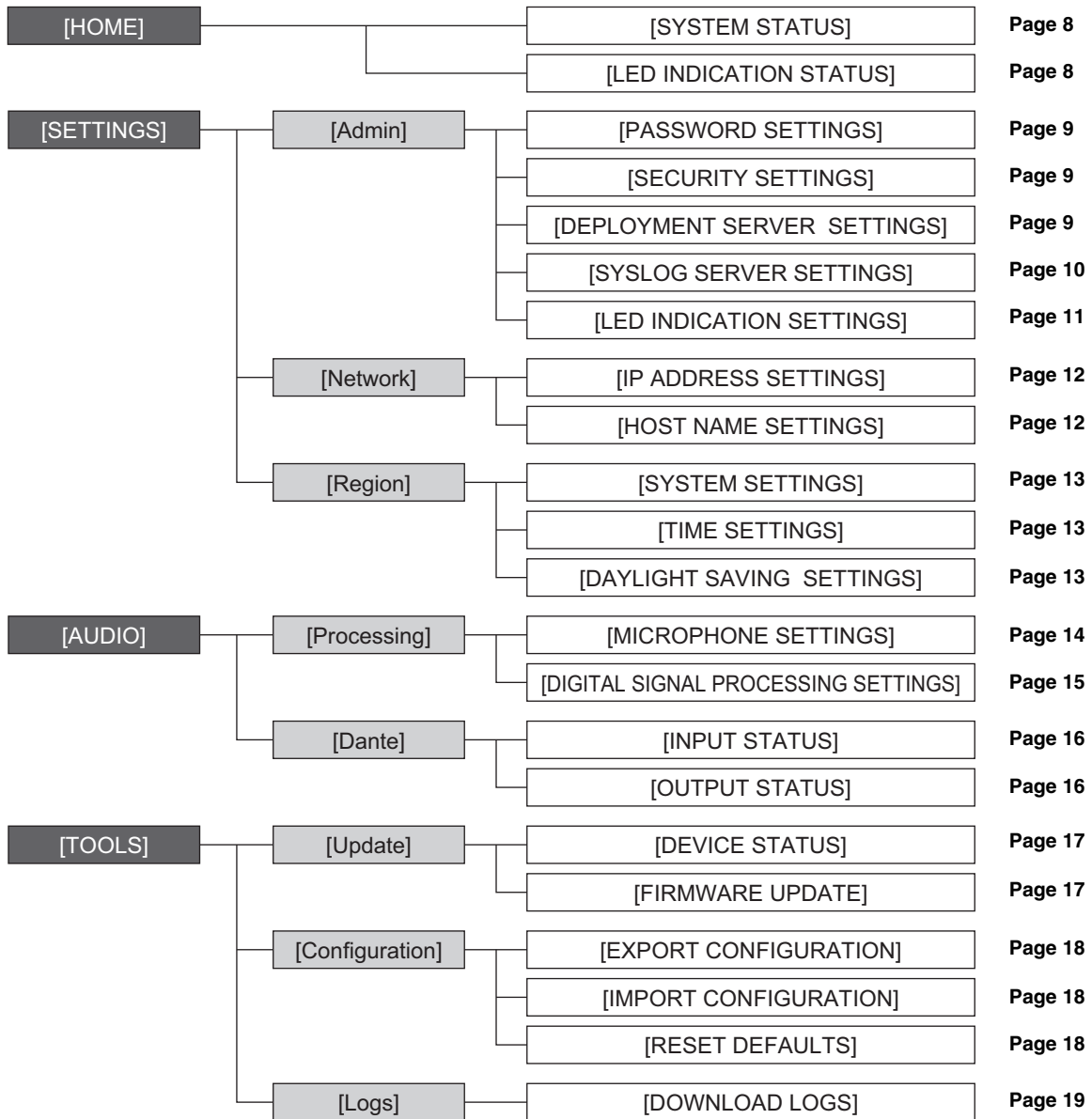**7.** Type the password into the login window, and then click the [LOGIN] button.

The [HOME] window appears.

This completes the startup.

Structure of RM-TT Device Manager

Refer to the page listed to the right for details on each item available in the various windows.

[HOME]		[SYSTEM STATUS]	**Page 8**
		[LED INDICATION STATUS]	**Page 8**
[SETTINGS]	[Admin]	[PASSWORD SETTINGS]	**Page 9**
		[SECURITY SETTINGS]	**Page 9**
		[DEPLOYMENT SERVER SETTINGS]	**Page 9**
		[SYSLOG SERVER SETTINGS]	**Page 10**
		[LED INDICATION SETTINGS]	**Page 11**
	[Network]	[IP ADDRESS SETTINGS]	**Page 12**
		[HOST NAME SETTINGS]	**Page 12**
	[Region]	[SYSTEM SETTINGS]	**Page 13**
		[TIME SETTINGS]	**Page 13**
		[DAYLIGHT SAVING SETTINGS]	**Page 13**
[AUDIO]	[Processing]	[MICROPHONE SETTINGS]	**Page 14**
		[DIGITAL SIGNAL PROCESSING SETTINGS]	**Page 15**
	[Dante]	[INPUT STATUS]	**Page 16**
		[OUTPUT STATUS]	**Page 16**
[TOOLS]	[Update]	[DEVICE STATUS]	**Page 17**
		[FIRMWARE UPDATE]	**Page 17**
	[Configuration]	[EXPORT CONFIGURATION]	**Page 18**
		[IMPORT CONFIGURATION]	**Page 18**
		[RESET DEFAULTS]	**Page 18**
	[Logs]	[DOWNLOAD LOGS]	**Page 19**

The following icons/buttons are used in RM-TT Device Manager.
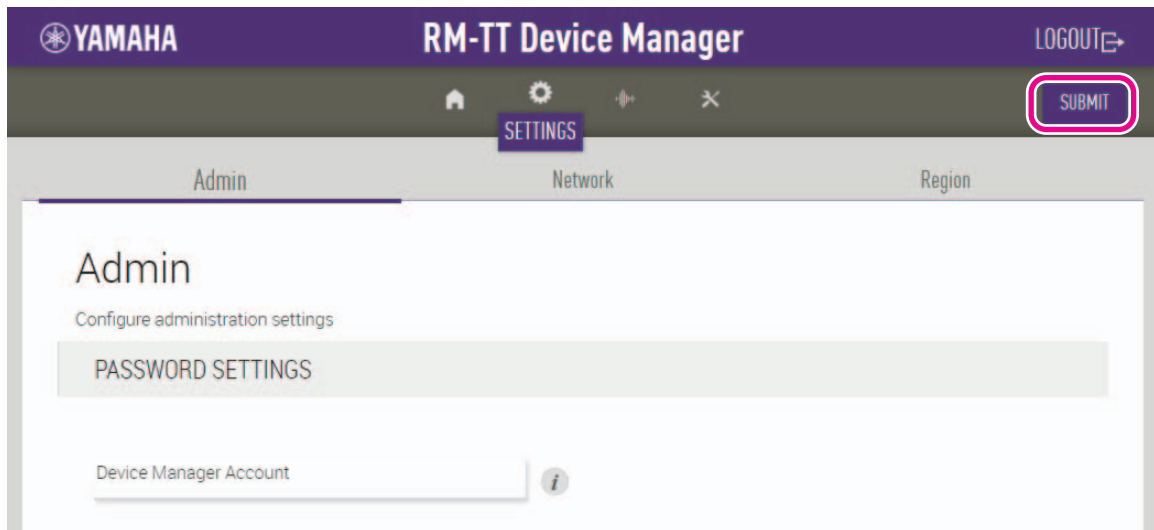
i   (Information icon): Move the pointer over this icon to see more information about the item.
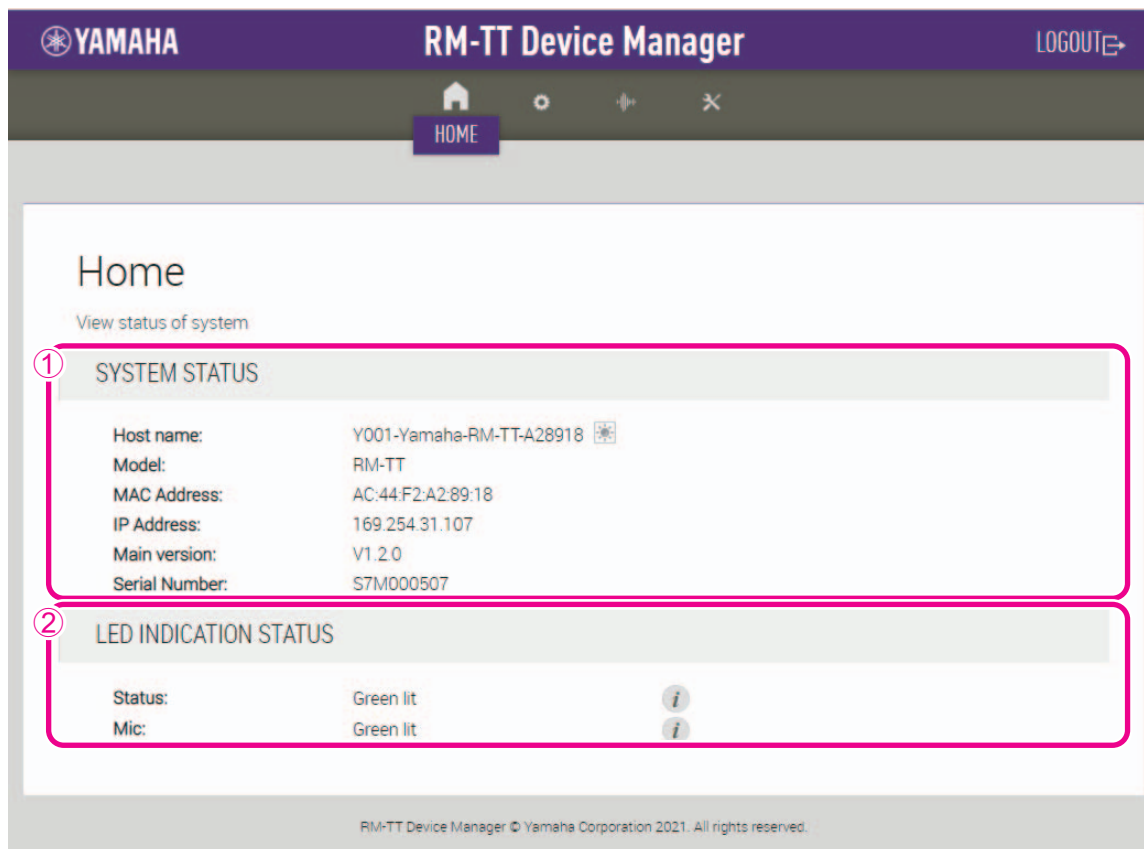
  (Identify button): Click to cause the indicator of the corresponding device to flash.

IMPORTANT: Be sure to click the [SUBMIT] button after changing settings in RM-TT Device Manager. The [SUBMIT] button always appears in the upper-right corner of the window.

Functions of RM-TT Device Manager
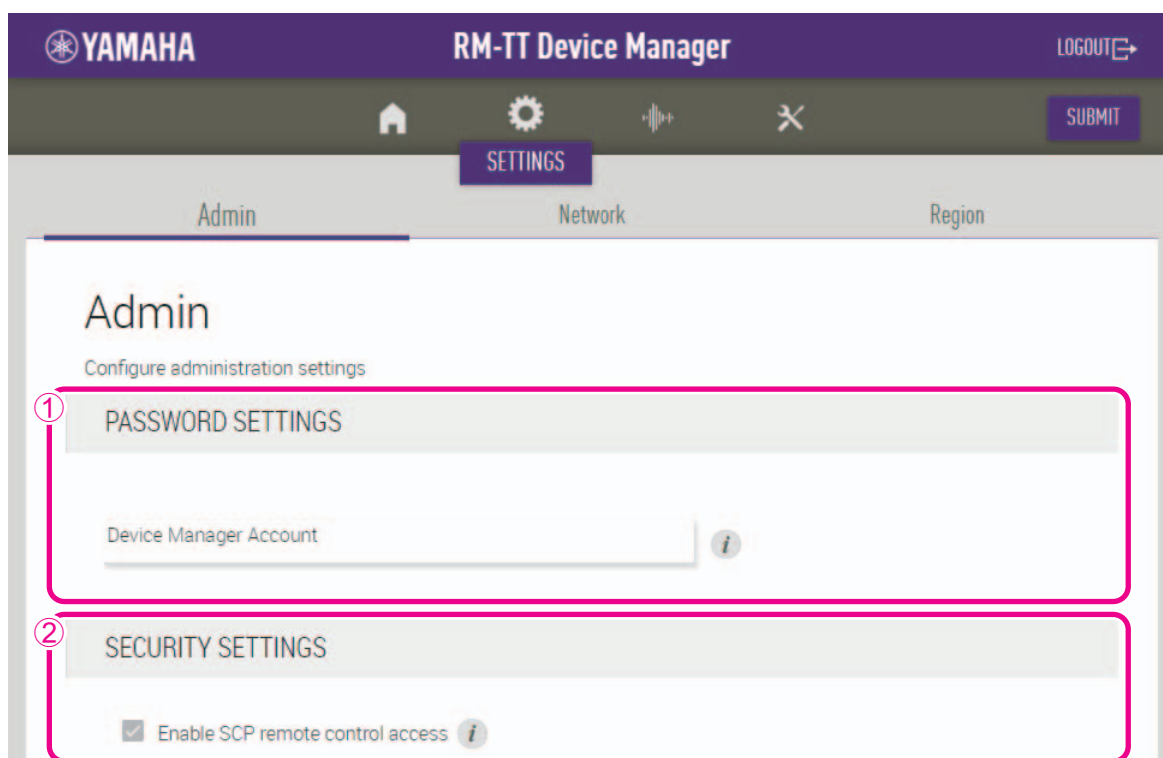
[HOME]

① **[SYSTEM STATUS]**

Allows you to check basic information on this unit.

② **[LED INDICATION STATUS]**

Allows you to check the status of the indicators on this unit.

[SETTINGS]

[Admin]

① [PASSWORD SETTINGS]

Allows you to check/change the password for logging in to RM-TT Device Manager.

② [SECURITY SETTINGS]

Allows you to select whether to enable SCP remote control.

For details on SCP, refer to the RM Series Remote Control Protocol Specifications. The specifications can be downloaded from the Yamaha website.
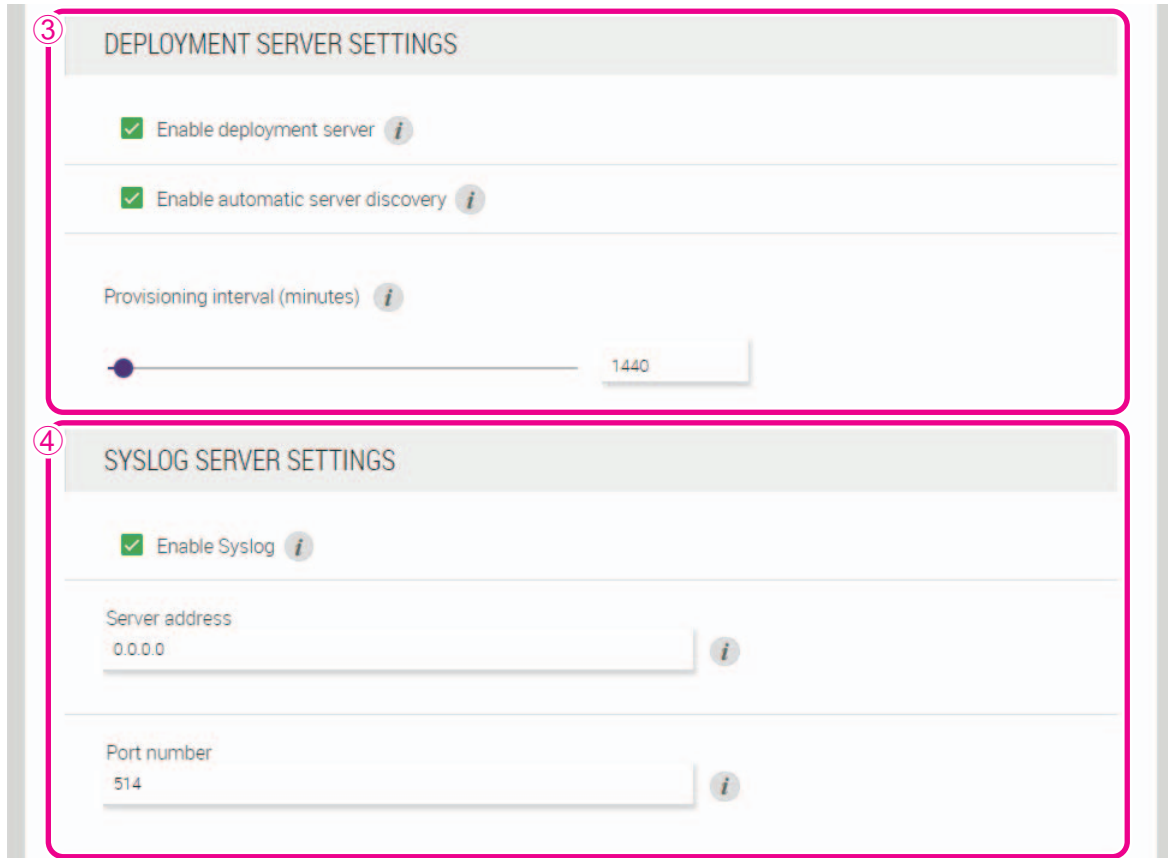
Yamaha website

U.S.A. and Canada:
https://uc.yamaha.com/support/

Other countries:
https://download.yamaha.com/

IMPORTANT: This must be enabled for this unit to link to the RM-CR signal processor.
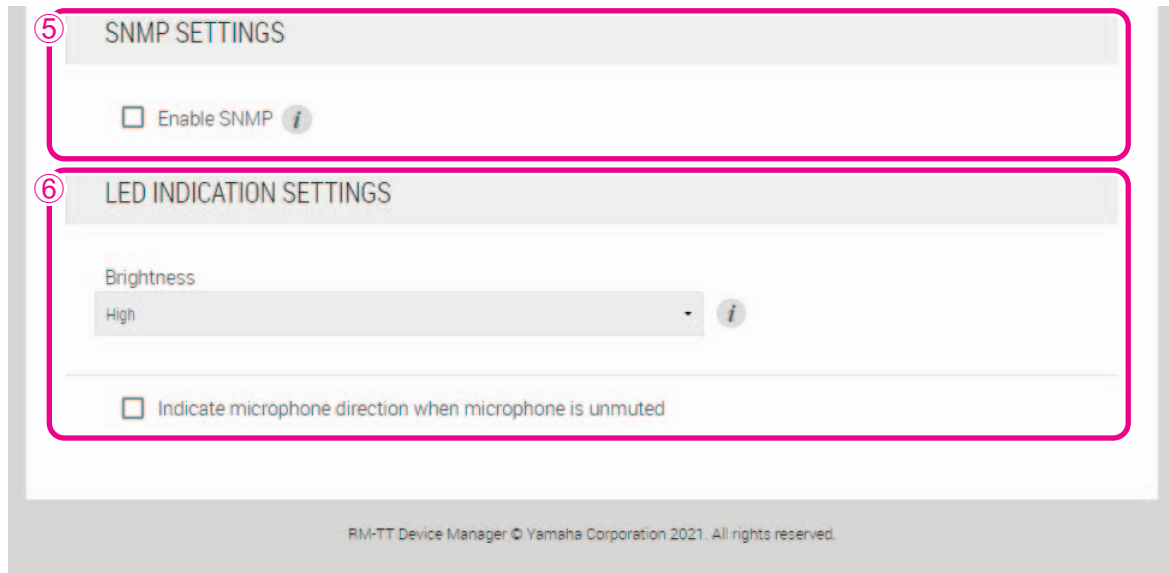
③ **[DEPLOYMENT SERVER SETTINGS]**
- Allows you to select whether to use a deployment server. If using a server, select whether to detect it automatically or configure it manually.
- Allows you to check/adjust the server provisioning interval.

④ **[SYSLOG SERVER SETTINGS]**

Allows you to select whether to use a Syslog server.

⑤ **[SNMP SETTINGS]**

Allows you to select whether to use SNMP.

SNMP is a protocol used to monitor and manage networks.

⑥ **[LED INDICATION SETTINGS]**

- Allows you to check/adjust the brightness of the front panel indicator.
- Allows you to select whether the lighting/flashing of the Status indicator varies according to the directivity of the microphone. This is available when the directivity of the microphone is set to [Cardioid], [Hypercardioid] or [Supercardioid].

[Network]

① **[IP ADDRESS SETTINGS]**
Allows you to select whether to use DHCP.

② **[HOST NAME SETTINGS]**
Allows you to select whether to specify the host name of this unit automatically or manually.

[Region]

① **[SYSTEM SETTINGS]**

Allows you to specify the time zone.
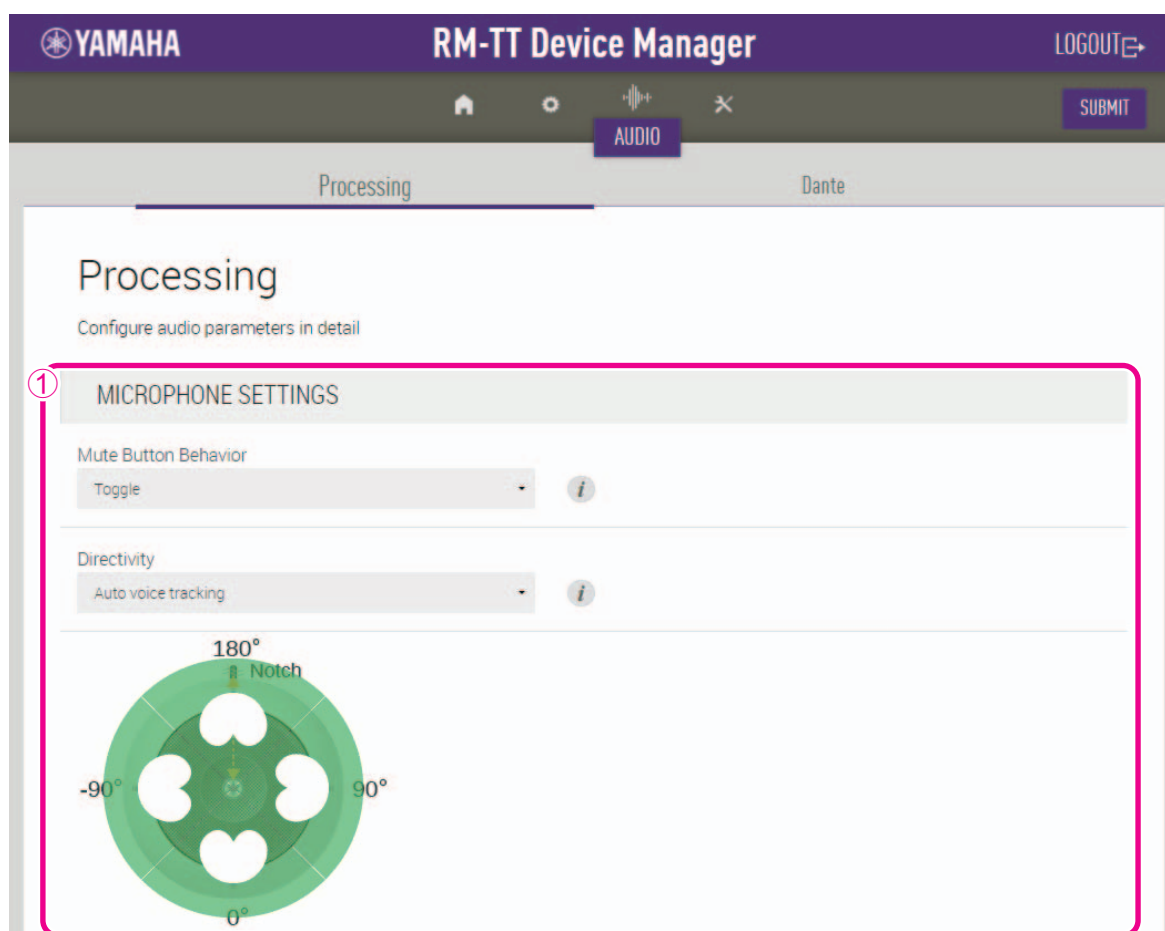
② **[TIME SETTINGS]**

Allows you to select whether to use NTP.

③ **[DAYLIGHT SAVING SETTINGS]**

Allows you to select whether to use daylight saving time with this unit.

[AUDIO]

[Processing]

① **[MICROPHONE SETTINGS]**

- Allows you to set the operation of the Mic button to one of the following.
  - [Toggle]: Turn on/off the microphone by touching the Mic button.
  - [Push to talk]: The microphone is on while the Mic button is touched.
  - [Disable]: The Mic button is deactivated.
- Allows you to set the directivity of the microphone to one of the following.
  - Auto voice tracking
  - Cardioid
  - Hypercardioid
  - Supercardioid
  - Non-directional
  - Bidirectional
  - Toroid

NOTE: When the directivity of the microphone is set to [Cardioid], [Hypercardioid] or [Supercardioid], you can check/change the automixer settings.

② **[DIGITAL SIGNAL PROCESSING SETTINGS]**

- Allows you to check/change settings for the following.
  - Input gain
  - Adaptive echo canceller
  - Noise reduction
  - Dereverberation
  - Auto gain control (type and speed)
- Click a button in the [Audio processing diagram] to open a window for checking/changing parameters for digital signal processing.

IMPORTANT: Parameter changes are immediately reflected in the acoustics of the unit.

[Dante]

① **[INPUT STATUS]**

    Allows you to check the Dante input status for each connected device.

② **[OUTPUT STATUS]**

    Allows you to check the Dante output status for each connected device.

[TOOLS]

[Update]
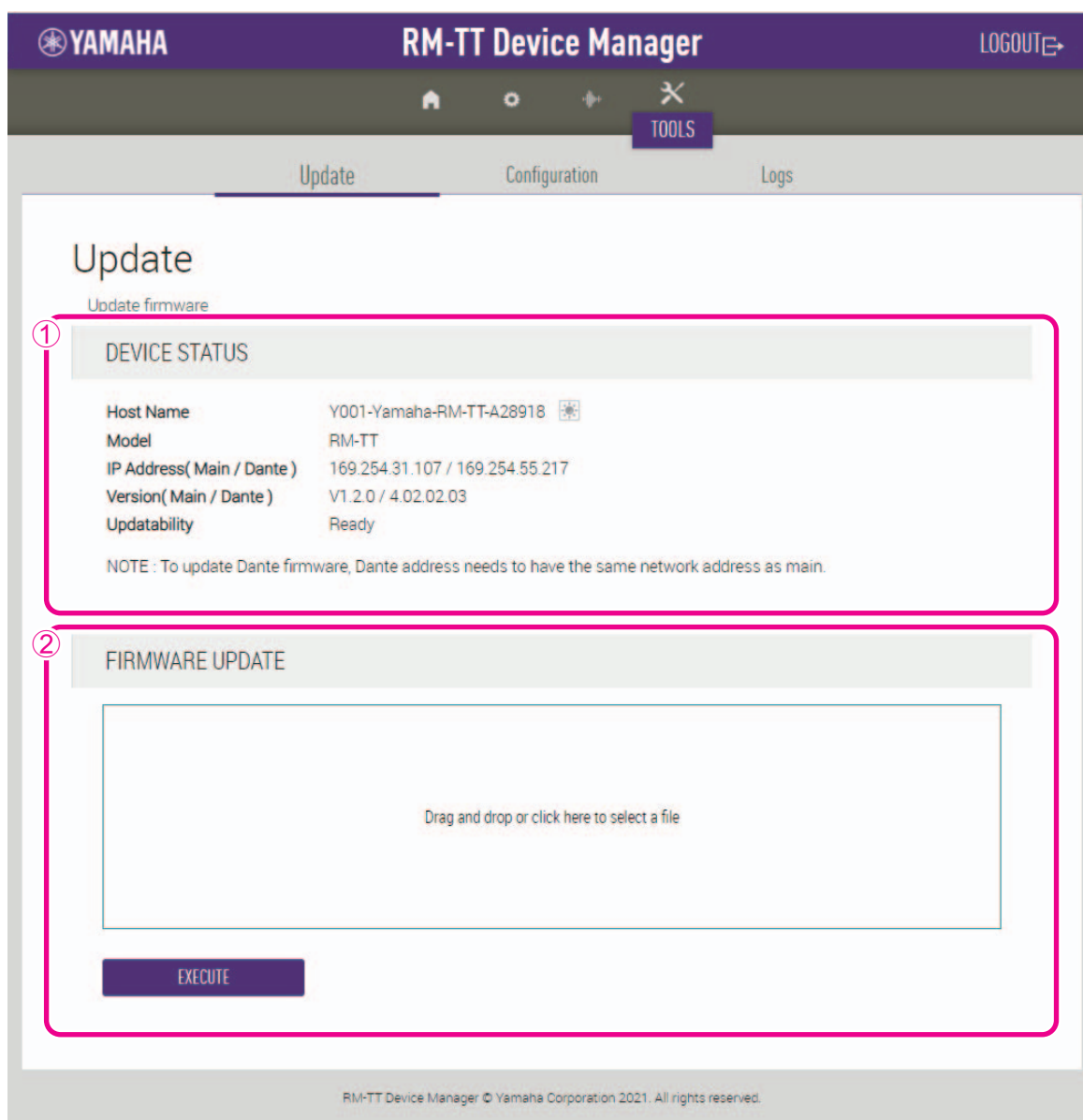
① **[DEVICE STATUS]**

Allows you to check the versions of the firmware and Dante of this unit. The firmware and Dante of this unit can be updated when [Ready] appears below [Updatability].

IMPORTANT: In order to update Dante, the network portion of this unit's IP address and the network portion of Dante's IP address must be the same.

② **[FIRMWARE UPDATE]**

Allows you to update the firmware and Dante collectively or individually by dragging and dropping the update file(s) into the box, then clicking the [EXECUTE] button.

The files for the latest firmware can be downloaded from the Yamaha website.

Yamaha website

U.S.A. and Canada:
https://uc.yamaha.com/support/

Other countries:
https://download.yamaha.com/
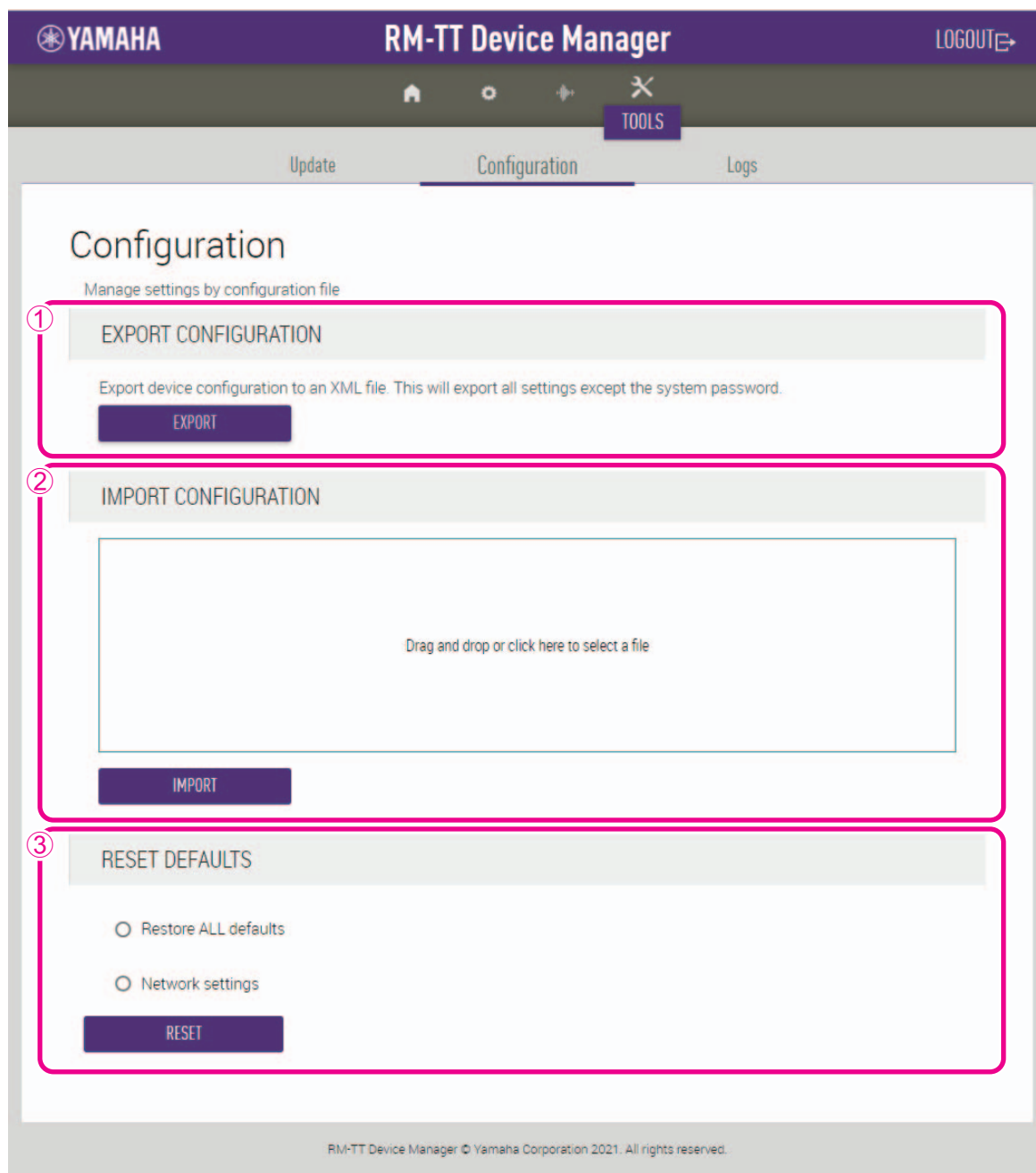
[Configuration]

① **[EXPORT CONFIGURATION]**

Allows you to export the settings of this unit by clicking the [EXPORT] button.

② **[IMPORT CONFIGURATION]**

Allows you to import settings into this unit by dragging and dropping the settings file into the box, then clicking the [IMPORT] button.

NOTE: Create the settings file to be imported by editing the one exported in ①.

③ **[RESET DEFAULTS]**

Allows you to reset the settings of this unit by clicking the [RESET] button.

IMPORTANT: Be sure to check what is to be reset before doing it.

[Logs]
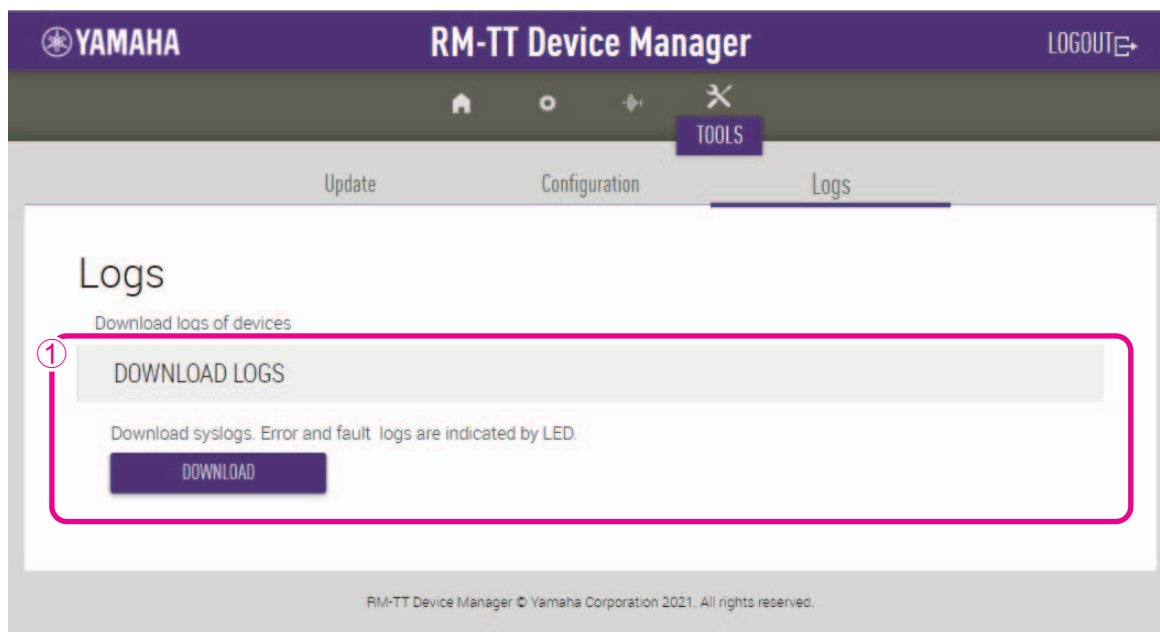
① **[DOWNLOAD LOGS]**

Allows you to download logs by clicking the [DOWNLOAD] button.

NOTE: Be sure to read alert log list on the following pages for explanations on the displayed alert log and the recommended solutions.

Alert log list

Display	Description	What to do
important mic CH* broken	Important mic CH* broken.	Please contact your Yamaha dealer.
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.
Firmware update failed, because of *	Failure of firmware update has occurred.	Check firmware file on the firmware update pages of Web GUI.
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.
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.
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.
System error	The device has not started up correctly.	
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.
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.
logging error	Failed to restart logging.	
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.
Dante started in fail safe mode	Dante has started in failsafe mode.	Execute Failsafe Recovery using Audinate's firmware update tool.
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.
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.
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.
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.

Display	Description	What to do
Too many devices on the network	Too many devices are connected to the network.	Reduce the number of devices connected to the network.
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.
Configuration import failed, because of file format error (*)	Configuration import has failed, because of file format error.	Check contents and format of configuration file.
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.
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.
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.
Schedule data lost	The schedule data saved in internal memory has been lost.	If this occurs often, contact your Yamaha dealer.
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.
Factory reset failed	Factory reset has failed.	–
* reset failed	Partial reset has failed.	
Web UI login failure by *	Web GUI login failure has occurred by (IP address).	Check password.
Scheduling event failed, because of *	Scheduling event has failed.	Check the number of scheduled events.
Audio processing restarted	Audio processing failure has occurred, then restarted.	If this occurs often, contact your Yamaha dealer.
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.

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 (this document) : 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	46 [ms] (with directivity other than toroid) 50 [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