User Manual

K.M.E.

Dante Module

Index

1. General Information regarding the K.M.E. Dante Module

1.1 Stream Processing

With the K.M.E. Dante Module it is possible to receive eight audio streams in a Dante network. These streams are configurable with Audinates Dante Controller, through the K.M.E. Remote Control Access (see section 2: Remote Control Access) or directly over the menu of the DA428 / DA230 (see section 3: Device Access).

The first four streams are connected to the preamp of the device and can be used to drive the speaker outputs. Please note that an appropriate preset routing is needed. The internal inputs O(1), O(2), O(3) and O(4) must be routed to the outputs.
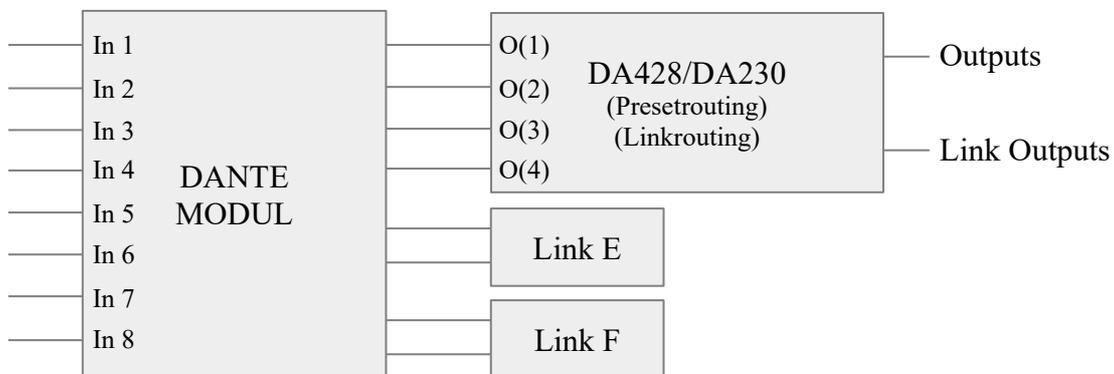
Figure 1: Basic Dante Routing Structure

In addition, these four inputs can be linked to link output A (DA428 and DA230) and link output B (only DA428) if set in the device settings.

The stream inputs five, six, seven and eight are directly connected to the link outputs E and F at the Dante Module, without DSP processing. These output signals (AES / EBU) can be used as digital input for another amplifier.

1.2 Recommended Setup Method

The most comfortable way for setting up a Dante network is the Dante Controller from Audinate. This software can scan the entire network for available Dante devices. So it is possible to configure all the devices and set up the desired routing. Please note, that version 3.6.2.4 or higher is needed for proper operation with AES67 enabled devices (like DA428 and DA230).

Another way to control and monitor the devices is to use the K.M.E. Remote Control or Device Access (as described in the sections below).

1.3 Hints about Switches in a Dante network

Please note, that using switches with EEE (Energy Efficient Ethernet (also called Green Ethernet or IEEE802.3az)) could lead to problems in a Dante network. Therefore, EEE should be deactivated or switches without EEE must be used.

A blacklist with unsupported switches is appended to these document (see dante-network-blacklisted-eee-switches-audinate.pdf).

2. Remote Control Access

2.1 Interface Structure

Using the Remote Control Access does not require additional firmware installation. The Dante Module works as an embedded webserver. This means that the module provides webpages, which will be used for loading and sending the settings. Therefore, only a webbrowser is needed for the operation with the advantage, that different devices (like PC, Tablet or Smartphone) can be used for the communication with the amplifiers.

Your Browser must support the following technologies: Javascript (must be activated), Ajax, SVG.

Basically, all latest browser releases are supporting these technologies. If your browser is deprecated, the Dante Module displays some error notes. For successful communication with the module you have to type the configured IP-Address into your browsers command line. Then, the Dante Module loads the device configuration (Device Config I).

The following status codes may occur at operation with the Remote Control Access:

Loading Settings / Sending Settings / Load / Send
Network communication in progress

OK! Done. / OK
The data transfer was successful.

Modified! - Use "Send Settings" to set the new values on device.
Some settings were modified by user input. You need to send them for updating the settings on your device.

Connection Error! / C. Err.
A network connection error occurred. The module could not set or receive the requested information. Please check your network connection.

Communication Error!

An internal error occurred. The module could not set or receive the requested information. Try to set the command again. If the problem remains, contact the K.M.E. Support.

Command failed: - Invalid value(s) at marked position(s)

This error occurs if you set invalid parameters. The wrong input is marked in red color until you have tried to set a new value.

2.2 Device Settings

2.2.1 Device Config I

Under "Global Configuration" it is possible to reconfigure your network settings. Here you can change the functionality of the second network jack from switched to redundant mode. This means, that a second network could be connected, which will be used in case the primary network fails.

For both networks it is possible to manually configure IP-Address, Subnetmask, DNS-Server and Default Gateway. Please note that all participants in the network must be configured for the same subnet (see figure 2).

PC with Dante-Controller and Webbrowser for Remote Access	Network Connection	**DA428 / DA230 with Dante Modul**
IP-Address: 192.168.0.101 Subnetmask: 255.255.255.0		IP-Address: 192.168.0.102 Subnetmask: 255.255.255.0
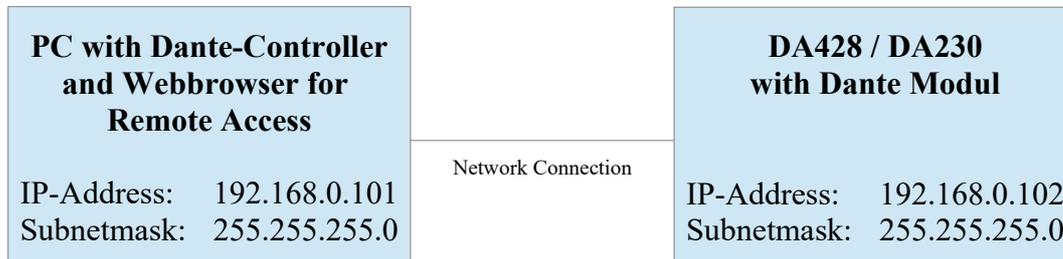
Figure 2: Example for a static network configuration

Alternatively, DHCP could be used for dynamic configuration if a DHCP server is available. Please keep in mind, that the Dante Module could not use the Device Name as DHCP hostname and the connection will be lost with erroneous configurations. In such a case you need to reconfigure the network configuration. This could be done on device under "Options" > "DANTE/NC" or with the Dante Controller software. If using DHCP to obtain an IP-Address, keep in mind, that the webpage could not reload its contents automatically. This is because the new IP-Address is not available before triggering the necessary reboot of the Dante Module.

With "LED Configuration" you are able to set the threshold values for the device LEDs.

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Signal LED Threshold means that values above will trigger the green LED. User LED Threshold means that values above will trigger the blue LED.

2.2.2 Device Config II

In this menu item you can pre-set the operating status of the device: If you choose „Always On", the device is always on. That means after applying the power supply connection the unit is automatically on and ready to play (the "lock function" can be active!). If you choose „Last State"- mode, the device will always start in the last state of operating after power cycle the unit. To reduce the power consumption e.g. in installations you can choose the „Audio Trigger"- mode. In this mode you can set a threshold value and a time value where the system automatically switched off when the threshold is not exceeded with an audio signal. After the pre-set time the unit is switched off. If the pre-set threshold value is exceeded during the unit is still on, the time value counts again - that means this function is a posttrigger-function. You can switch on the unit again by pressing the OK-button or playing an audio signal which has a higher input level as the pre-set threshold value. Trigger source for the pre-set time value is every input channel.

With "Channel Configuration" you could set input mode and link mode. In addition to the analog or digital inputs you could set up the Dante inputs O(1), O(2), O(3) and O(4) as source for the link outputs.

The "Link Matrix" illustrates the different link routing depending on the current link and input mode as well as the resulting signal (analog or digital) at the appropriate link output. Figure 3 displays an example, where the Dante inputs are connected to Link A and B on a DA428.
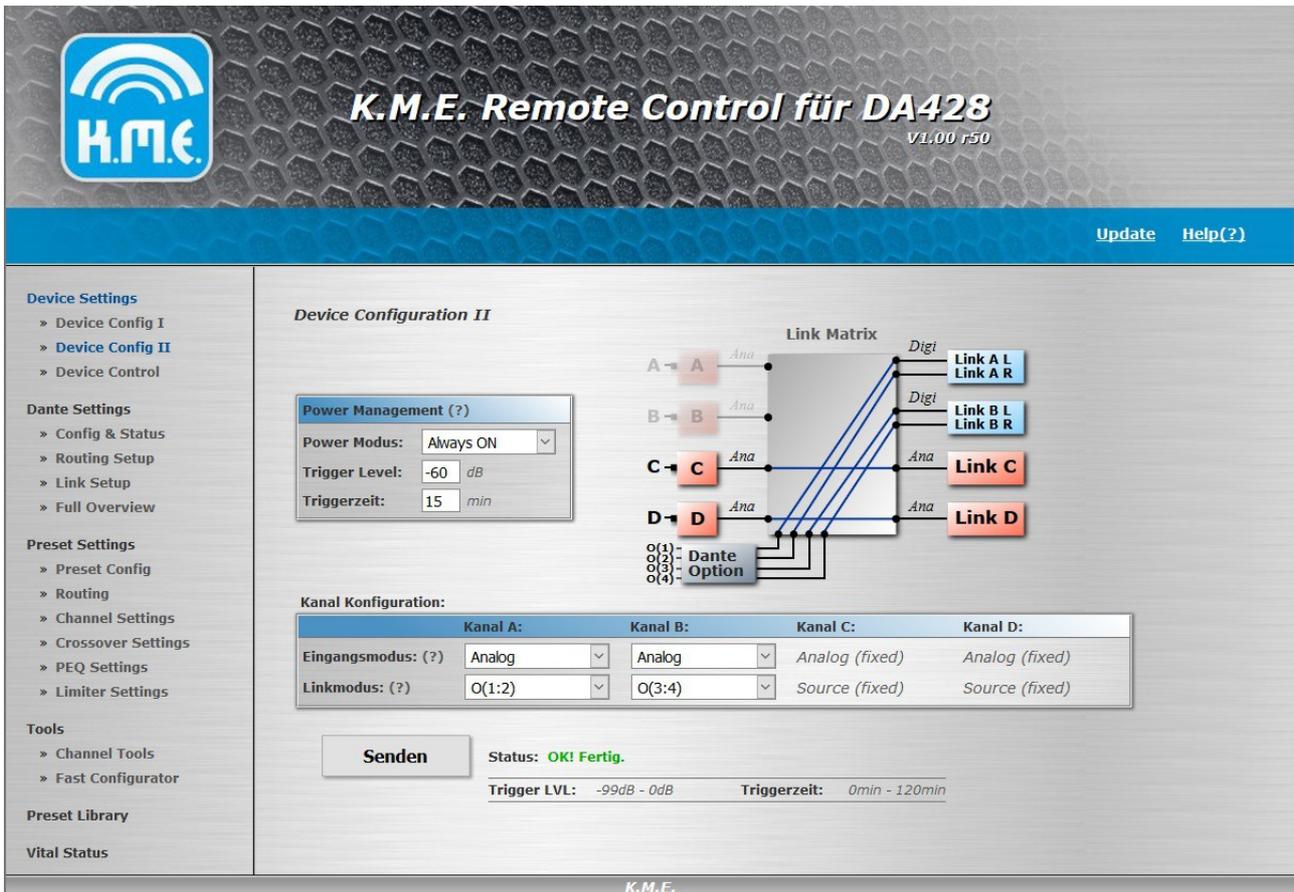
Figure 3: Device Config II with Link Mode Setup for Dante

2.2.3 Device Control

At "Device Control" you could see the current input and output levels. The browser refreshes the level meters every two seconds. A faster refresh cycle is not possible because of the underlying network technologies.

If you select "Use LED Thresholds", the level visualization considers the configured LED-Thresholds and the Limiter-Threshold with the following priority:

1. Value above Limiter-Threshold   => yellow level visualization
2. Value above User LED Threshold   => blue level visualization
3. Value above Signal LED Threshold   => green level visualization

In addition to the level meters you can see the global status. There you could get an information if the device enters the protect mode (e.g. as result of an overtemperature condition). With "Send Ping" you could trigger the device LEDs to blink in magenta. This feature could be very useful if you need to identify a device in a rack. With "Set Power Mode" you could switch the device power to standby.

2.3 Dante Settings

2.3.1 Config & Status

With Dante Config & Status it is possible to configure the Dante Module. Here you could set up Sample Rate, Encoding, Pullup, Preferred Master, AES67 and Latency. Please note, that the configuration for Sample Rate, Encoding and Pullup must match the settings of the selected Dante transmitter and the latency setting should fit the present network infrastructure.

Switching AES67 on or off triggers a reboot of the Dante Module. This will take around 20 seconds. Please wait till the browser signals "OK! Done.".

2.3.2 Routing Setup

The Dante Routing Setup shows the currently configured Dante transmitters and streams and their connection to the inputs O(1), O(2), O(3) and O(4). The visualization illustrates the signal flow from the Dante transmitter to the speaker outputs of the amplifier (including the selected preset routing).

Each of the four Dante inputs can be configured separately. First choose a transmitter from the list of available transmitters. After that, a list of configurable streams is available under "TX-Channel". After selecting the desired stream, the web browser draws the configuration into the visualization. If the transmitter and the DA428 / DA230 are properly configured, the status of the selected input will change from "Selection incomplete" to "OK".

The color of the connection is green:

- the stream is properly configured and active

The color of the connection is orange:

- the recently configured transmitter is not available
- the connection establishment is active (after clicking "refresh" the stream should be active)

The color of the connection is red:

- the receiver configuration does not match the transmitter settings (e.g. sample rate)
- no stream is configured

Figure 4: Dante Routing Setup

Figure 4 illustrates four properly configured streams from the same transmitter routed to the inputs O(1), O(2), O(3) and O(4). The preset routing is set, that O(1) is connected to output A, O(2) is connected to output B, O(3) is connected to output C and O(4) is connected to output D. With this setup the configured streams are routed directly to the outputs.

2.3.3 Link Setup

The Dante Link Setup shows the currently configured Dante transmitters and streams and their connection to the link outputs E and F. The visualization illustrates the signal flow from the Dante transmitter.

Each of the four output signals can be configured separately. First choose a transmitter from the list of available transmitters. After that, a list of configurable streams is available under "TX-Channel". After selecting the desired stream, the webbrowser draws the configuration into the visualization. If the transmitter and the DA428 / DA230 are properly configured, the status of the selected input will change from "Selection incomplete" to "OK".

The color of the connection is green:

– the stream is properly configured and active

The color of the connection is orange:

– the recently configured transmitter is not available

– the connection establishment is active (after clicking "refresh" the stream should be active)

The color of the connection is red:

– the receiver configuration does not match the transmitter settings (e.g. sample rate)

– no stream is configured

2.3.4 Full Overview

The Full Overview visualizes the complete, currently configured, Dante communication with the DA428 / DA230. The page will be refreshed every two seconds.
The illustration includes the currently selected Dante transmitters und streams (see 2.3.2 and 2.3.3), the active preset routing (see 2.4.2) and the potential connection to link output A (DA428 / DA230) and B (DA428 only) (see 2.2.2)

Figure 5 illustrates a Dante setup with two different transmitters. The four streams from the first transmitter are routed to the inputs O(1), O(2), O(3) and O(4). By the configured preset routing, these inputs are directly connected to the outputs of the amplifier.
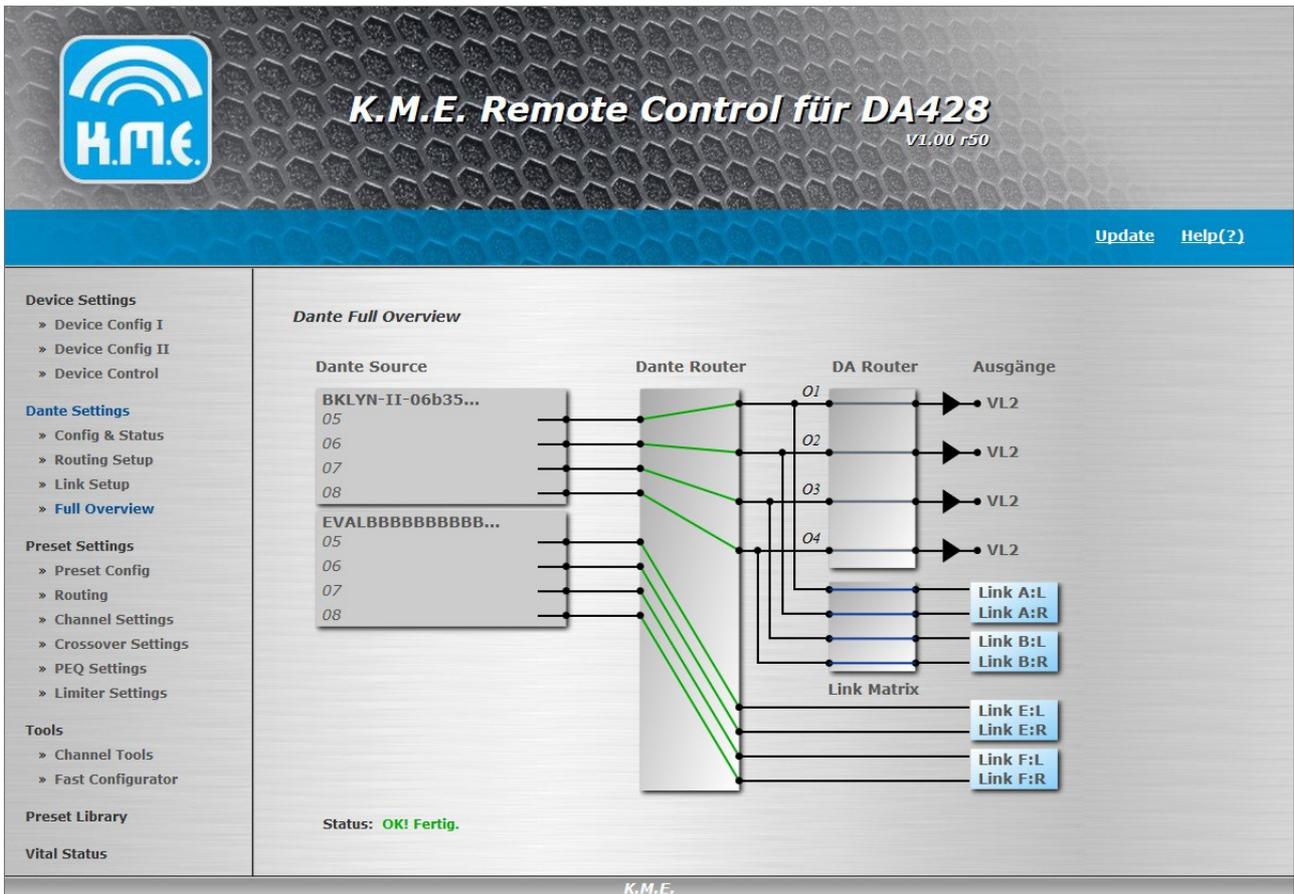
Figure 5: Dante Full Overview

In addition, O(1), O(2), O(3) and O(4) are connected to the link outputs A and B (set in the link mode settings at Device Config II). The four streams from the second transmitter are routed to the link outputs E and F (located at the Dante Module).

2.4 Preset Settings

2.4.1 Preset Config

The "Preset Config" offers an overview of the current preset list. In addition, there is some information for each preset like preset type (User or Factory Preset) and lock state (which preset settings are locked on device). The lock state can be modified by setting different "Lock" parameters at the different preset pages.
The active preset is marked orange and can be changed by selecting another preset from the list.

All preset settings which are adjusted with the Remote Module are always related to the selected (active) preset!

2.4.2 Routing

Here you can set the routing for each speaker output channel. The Overview illustrates the current selection in dependence of the selected input mode.

2.4.3 Channel Settings

With "Channel Settings" you can set different channel related settings:

Channel Name: Name for each channel, max. 9 digits

Mute: Mute setting after loading the preset

Gain: Gain setting after loading the preset

Phase: 0° / 180°

System Delay: system related delay (e.g. between bass and top)

Delay: application related delay (e.g. delay line)

Mute Groups: independent / Group 1 (strong / weak) / Group 2 (strong / weak)

Here you can mute all single channels separately (independent) or in dependence of one or more channels. For example you can select channel A as master (=Group1 strong) and channel B as slave (=Group1 weak). After this settings you can mute channel A and channel B is muted automatically, too. If you want to mute only channel B you can do it, because it is independently switchable.

Level Groups: independent / Group 1 / Group 2

With this function you are able to set the channel gain separately (independent) or in dependence of one or more channels. For example you can set the channel A and B as group 1 (using a mono signal for the subs) and the channel C and D as group 2 (using a stereo signal for the top units). While using this settings you can change the volume for the subwoofer or for the top units by using only one encoder of each group. For using this function you have to link the single channels to the group 1 or group 2. If there is a volume difference in the pre-setting between the single channels (at the time of the linking), the difference still exists in the group. Both groups are identically functional.

2.4.4 Crossover Settings

These digital filters (crossover) limit the frequency range. The high pass filter can not be deactivated. When you need a full-range audio signal on the output you have to set the frequency to 35 Hz and choose a type of the high pass filter.

2.4.5 Parametric EQ

With this digital filter you can affect the frequency range by making adjustments of filter frequency (center frequency), the gain (boost resp. cut) and the Q-factor (bandwidth). For each channel there are Low Shelf, High Shelf and 8 parametric EQs available.

2.4.6 Limiter Settings

This dynamic processor is working when the audio signal exceeds the entered threshold-value. The two time constants attack and release time draw the speed of the gain regulation mechanism. With the post gain you can adjust your audio signal level. The Settings are dependent to the program material and the PA-System.

To make the adjustment easier, the Remote Control offers a tool for calculating the output power. The first step is to set the impedance of the connected speakers. Then you can set "Threshold" and "Gain" to affect the desired output.

Another approach is to select the option "Generate Threshold". After that, set the impedance and the maximum speaker output (AES) of your speakers. Then, the Remote Module calculates the appropriate Limiter Threshold. Please take into account that the result may be rounded to a valid value for the preset (in that case, there is a recalculation of the desired output).

2.5 Tools

2.5.1 Channel Tools

With "Channel Tools" the Remote Control offers channel copy and reset functionality. It is freely selectable which channel should be copied to another (or to all others). In addition, the user can select the settings which should be affected by the copy or reset process.

The Overview illustrates the current copy selection (blue settings will be copied to the orange settings).

2.5.2 Fast Configurator

The Fast Configuration is the easiest way to speed up the preset creation. First you could choose one of the "Routing Setups". Routing Setups are predefinded Setups, suited for the most common applications. Basically, the Routing Setup will set an appropriate input routing and the Mute & Level groups. In addition, you could import channel settings from the K.M.E. speaker library with the Fast Configurator.

Before generating the preset, choose a preset from the preset list which should be overwritten and enter the desired preset name. By clicking "Send Preset", the Fast Configurator generates a User Preset for the configured Routing Setup and imported channels. The new preset will be set active after generation.

Additionally, this feature can be used to do fast changes to an existing user preset.

For example: if you want to change the top unit of a SAT-Preset (DA428)(leaving the subs unchanged)

1. Set Routing Setup (User)
2. Select the User-Preset (with "Send to"), which you want to change
3. Import the new top units for channel 3 and 4
   (select "import" for channel 3 and 4 and choose your speakers,
   leave channel 1 and 2 deselected)
4. Send Preset

The option "Convert routing for Dante input" is selected per default. This means, that the Routing Setups will use the Dante inputs O(1), O(2), O(3) and O(4) instead of the device inputs A, B, C and D.

2.6 Preset Library

The preset library includes all K.M.E. Factory Presets sorted by applications. After choosing an application and an appropriate preset, you could send the preset (before sending choose a preset from the preset list which should be overwritten). The new preset will be set active after sending.

For Versio presets there is an option "Create as Factory Preset". This means, that you can send this preset as User Preset, too. So its possible to edit the entire preset after sending.

The option "Convert routing for Dante input" is selected per default. This means, that the Presets will use the Dante inputs O(1), O(2), O(3) and O(4) instead of the device inputs A, B, C and D.

2.7 Vital Status

"Vital Status" shows a summary of the most important status parameters. There are level information, monitoring for voltage and temperature and other necessary information like operation time or firmware version numbers.

3. Device Access

Analog to the Remote Control Access all settings can be adjusted directly on the DA428 / DA230. The Dante configuration is located in the menu under: "Options > Dante/NC". All parameters can be set with the active encoders (encoder LED on). Pressing "OK" saves the appropriate configuration. Please note that the network configuration in the menu may use leading zeros for visualization. Do not use leading zeros at typing the IP-address into the browser command line (e.g. type 192.168.0.1 instead of 192.168.000.001). Reconfiguring the network settings requires a reboot after configuration.

4. Update Manual

The Firmware Update Manager from Audinate is required to update the Dante Module. The associated manual and installation file are attached to this document. For updating the Dante module, the following steps must be executed:

1. Start the Firmware Update Manager

2. Choose the network interface, which is connected to the Dante network and click „next"

3. Choose „Update Dante Firmware"

4. Click "Browse" and select the distributed update file
   (do **not** set "Override Device Matching" unless K.M.E. told you),
   Click „next"

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5. Now the Update Manager searches for K.M.E. Dante devices and displays a list of all found amplifiers. Select the modules, which should be part of the update or choose "Select All" for updating the entire list.

6. Click "Start" to initiate the update process.
   Please wait till the Update Manager displays that the update is finished.

7. Restart the upgraded devices or use the "Reboot" functionality from Audinates Dante Controller Software.

In addition, there may be updates for the integrated preset library (file extension .cfs), which must be processed separately. To apply such a update, please load an arbitrary website of the Dante module (using the Remote Control Access via the web browser). Then click "Update" at the top right position of the page. Now you could choose the appropriate update file. After that, click "Send Update" to initiate the update process. Please wait until the website signals that the update is finished.