

User Guide

AX32 DANTE I/O Card



NTP TECHNOLOGY

A DAN TECHNOLOGIES COMPANY

DAD
DIGITAL AUDIO DENMARK
By NTP Technology

IMPORTANT SAFETY INSTRUCTIONS

READ AND KEEP THESE INSTRUCTIONS



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.



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.



The garbage bin with a cross is intended to alert the user that the product may not be disposed of by regular garbage, but as electronic equipment.

WARNING – when using electric products, basic precautions should be followed, including the following:

Read all of the safety and installations instructions and explanation of graphic symbols before using the product.

1. Do not use this apparatus near water.
2. Clean only with dry cloth.
3. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
5. Do not defeat the safety purpose of the polarized or grounding-110 to 125V type plug according to UL 817 and CSA C22.2 no. 42. 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.
6. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
7. Only use attachments/accessories specified by the manufacturer.
8. 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.
9. Unplug this apparatus during lightning storms or when unused for long periods of time.
10. 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.

DANGER

Improper connection of the equipment-grounding can result in a risk of electric shock. Do not modify the plug provided with the product – if it will not fit the outlet have a proper outlet installed by a qualified electrician. Do not use an adapter which defeats the function of the equipment-grounding conductor. If you are in doubt as to whether the product is properly grounded, check with a qualified serviceman or electrician.

The product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This product is equipped with a power supply cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet which is properly installed and grounded in accordance with all local codes and ordinances.

WARNING

- This product, either alone or in combination with an amplifier and speakers or headphones, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
- The product should be located so that its location or position does not interfere with its proper ventilation.
- The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time. When unplugging the power supply, do not pull on the cord, but grasp it by the plug.
- Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

SERVICE

- Do not attempt to service the product beyond that described in the user maintenance instructions. All other servicing should be referred to qualified service personnel.
- The product should be serviced by qualified service personnel when:
 1. The power supply cord or plug has been damaged, or
 2. Objects have fallen, or liquid has spilled into the product, or
 3. The product has been exposed to rain, or
 4. The product does not appear to be operating normally or exhibits a marked change in performance,
or
 5. The product has been dropped, or the enclosure damaged.

WARNING – Hazardous moving parts inside the unit. Keep fingers and other body parts away.

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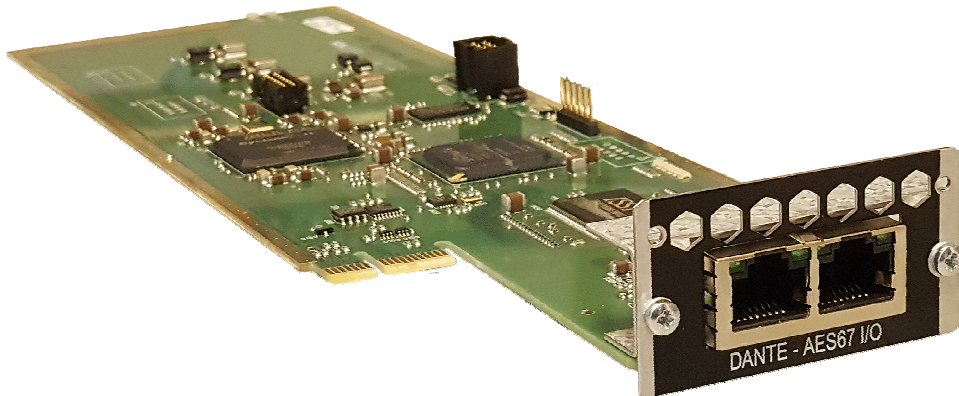
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General description.

This user guide gives an overall introduction to the operation of the AX32 with a DANTE I/O card installed. The functions of the card, once installed in the AX32, are managed via the DADman software.

In order for the DANTE card to work, the AX32 has to be installed with a software and firmware referred to as version 5.3.1 or later. This version covers DADman version 5.3.1, AX32 firmware version 2.2 and Brooklyn 2/Dante module firmware version 4.0. Please refer to the related release notes and installation guide for more details on the new features and how to upgrade AX32 units that are not supplied with version 5.3.1 or newer from the factory.

The user guide focuses on operation of the specific functionality for the Dante card.

All screen examples are taken from the PC Windows 10 version of the DADman software. DADman 5.3.1 is also available for Mac OS X.

Accessing the DANTE I/O cards.

One or more Dante cards can be installed in the AX32. The cards can be installed in any of the available card slots and will be configured automatically by the software. In the DADman software, the cards will be identified by a number referring to the slot position in which the card is mounted. E.g. Card 3 is mounted in card slot 3.

DANTE I/O Card functionality.

The Dante I/O Card for AX32 is capable of interfacing 128 bi-directional channels of Dante or AES67 low latency real-time IP Ethernet audio. The card is mounted in the 8-slot modular card section. Up to 8 cards can be installed for a total capacity of 1,024 channels.

The Dante card has an onboard sample rate converter for both input and output signals enabling bridging between the clock synchronization of the AX32 and another Dante audio device. In the Connections and Indicators section the I/O for the card is shown.

The Dante card can interface 128 input and 128 output channels internally in the AX32 at 44.1/48 kHz. The number of channels scales downwards with the AX32 sample rate. So at 192 kHz sampling 32x32 channels are possible. This will also apply if the SRC is in operation and the Dante sample rate is e.g. 48 kHz converted to the AX32 sample rate of e.g. 96 kHz. In that case, 64x64 channels are possible.

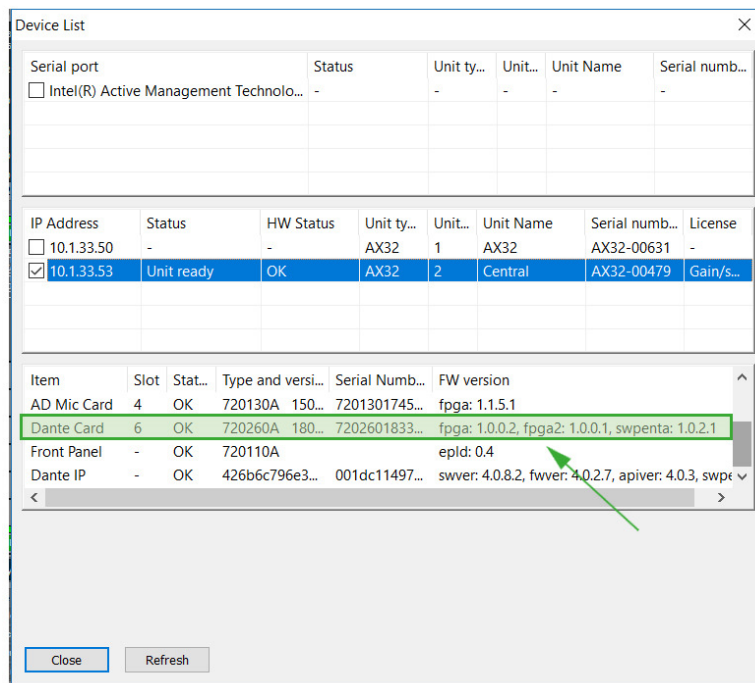
Key Features:

- Sample rates: 44,1, 48, 88,2, 96, 176,4 and 192 kHz
- 128 channels @ 48 kHz, 64 channels @ 96 kHz, 32 channels @ 192 kHz
- Up-to 128 bidirectional Dante flows
- Up-to 1,024 channels with more cards installed
- Dual Ethernet connectivity, switched or redundant
- Bi-directional sample rate conversion
- AES67 compatible with SAP
- Bridging between different networks

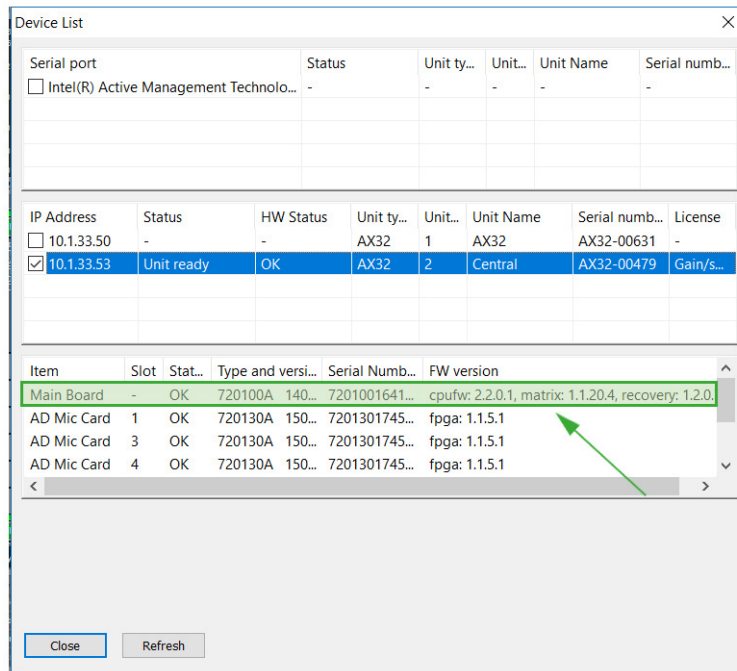
Operation

Inspecting the DANTE I/O Card and firmware versions.

The installed firmware version and unit configuration can be inspected in the device list as shown below. The AX32 Firmware version and the Dante module version can be seen by scrolling the list. Below, the Dante card installed in slot 6 is shown.

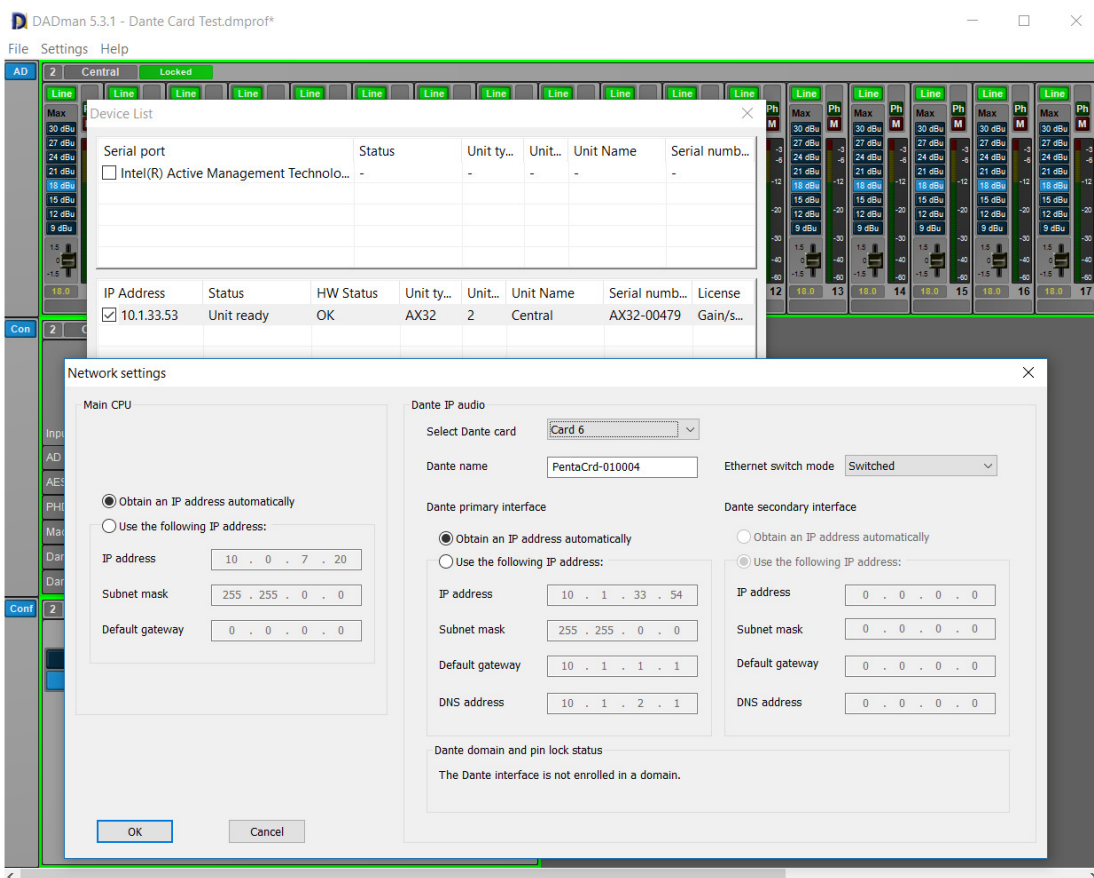


The version of the mainboard firmware can be seen in the top of the list as shown below.



Dante Card Network settings

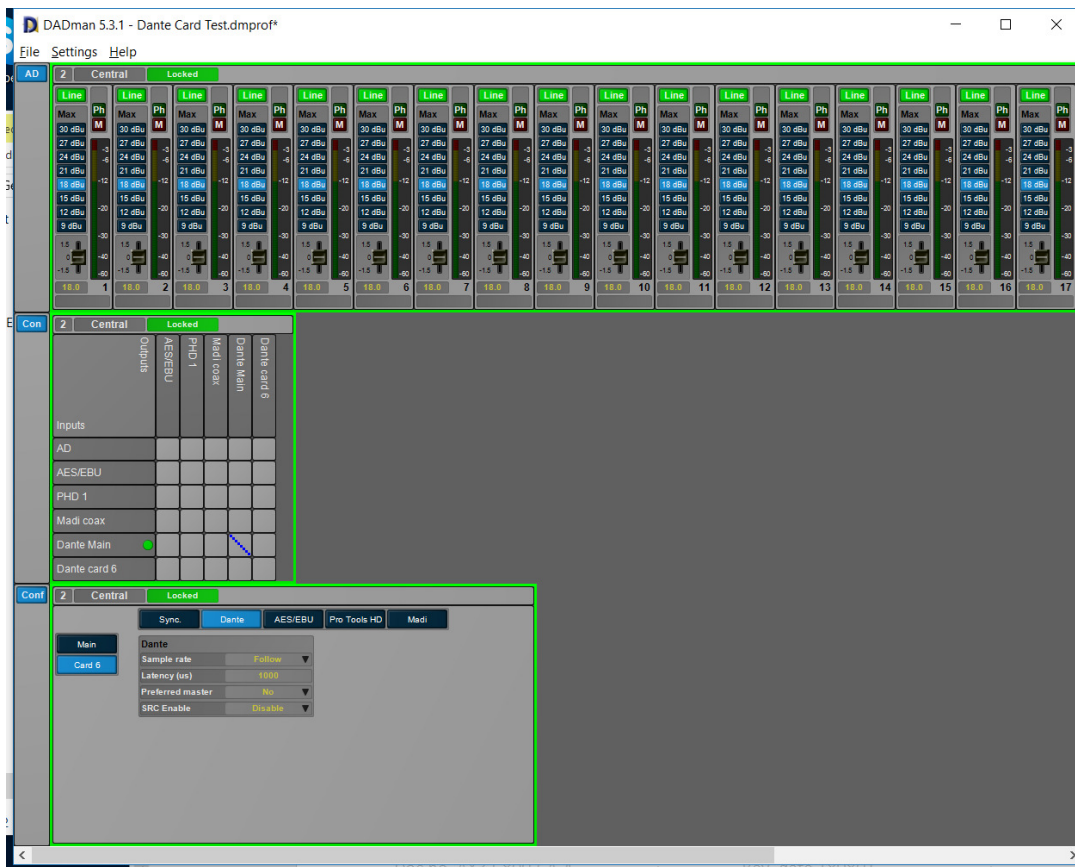
The DANTE I/O Cards can be configured network-wise, by selecting the AX32 in the device list. In the Network settings window, the Main Dante module and the Dante cards can be configured individually by selecting the Dante card in the list. The standard Dante network settings can be made. The Dante card and the Dante main module have an equal set of settings that can be made.



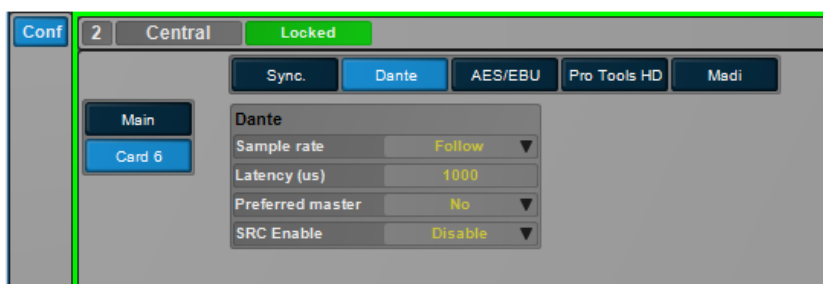
DADman basic user interface

In the DADman GUI, the following additions have been made in order to control and setup the Dante card.

- The connection window will have a row and column per installed Dante card each with 128 input and output channels.
- The configuration window has a window per card. When selecting the **Dante** tab, the relevant Dante card (**Card 6**) can be selected, or **main**, which is the Dante module installed on the mainboard if available.



Four parameters for the Dante card can be controlled and inspected: Sample rate, Latency, Preferred Master and SRC Enable as described below.



Sample rate:

- | | |
|--------|--|
| Follow | The Dante card is set to the sample rate of the AX32. |
| Free | The Dante card is not set to any sample rate by the AX32. Then, this has to be done in the Dante Controller. |

Preferred Master:

- | | |
|-----|---|
| Yes | The Dante card is set to be the preferred master of the Dante clock. The Dante network will be synchronized to the AX32 Dante card. |
| No | The Dante card is a slave to the clock of the Dante network. |

Latency:

- | | |
|---------|--|
| 'Value' | The value is the Dante network latency. This can be set from 250 to 21333 microseconds (21,333 milliseconds) |
|---------|--|

SRC Enable:

- | | |
|--------|--|
| On/Off | Enabling and disabling of the sample rate converter. |
|--------|--|



Note that Dante card settings done via AX32 are using Dante Con Mon messages in order to provide an easier configuration. If changes are made in Dante Controller this will be reflected in the DADman software.

The Dante card supports Dante Domain Manager (DDM). When the card is entered into a domain, the control of the Dante card is disabled from the DADman software. However, the actual status of the setting will be visible.

Synchronization Combinations

The Dante node can operate as a clock master, synchronizing the Dante network, or as a clock slave being synchronized from the Dante network. When the Sample Rate Converter (SRC) is not enabled, it means that the network and the AX32 has to be in sync, so when the Dante network is the sync master, the AX32 will have to slave to the network clock. In this scenario, also the sample rate has to be the same as the Dante Stream and the AX32 unit. If AX32 is the master the unit, it will provide the clock for the Dante network.

If SRC is enabled, there are two options with regard to functionality.

The Dante Network and the AX32 is synchronized and running on the same clock, but the sample frequency of the audio on the Dante network is different from the sample rate on the AX32.

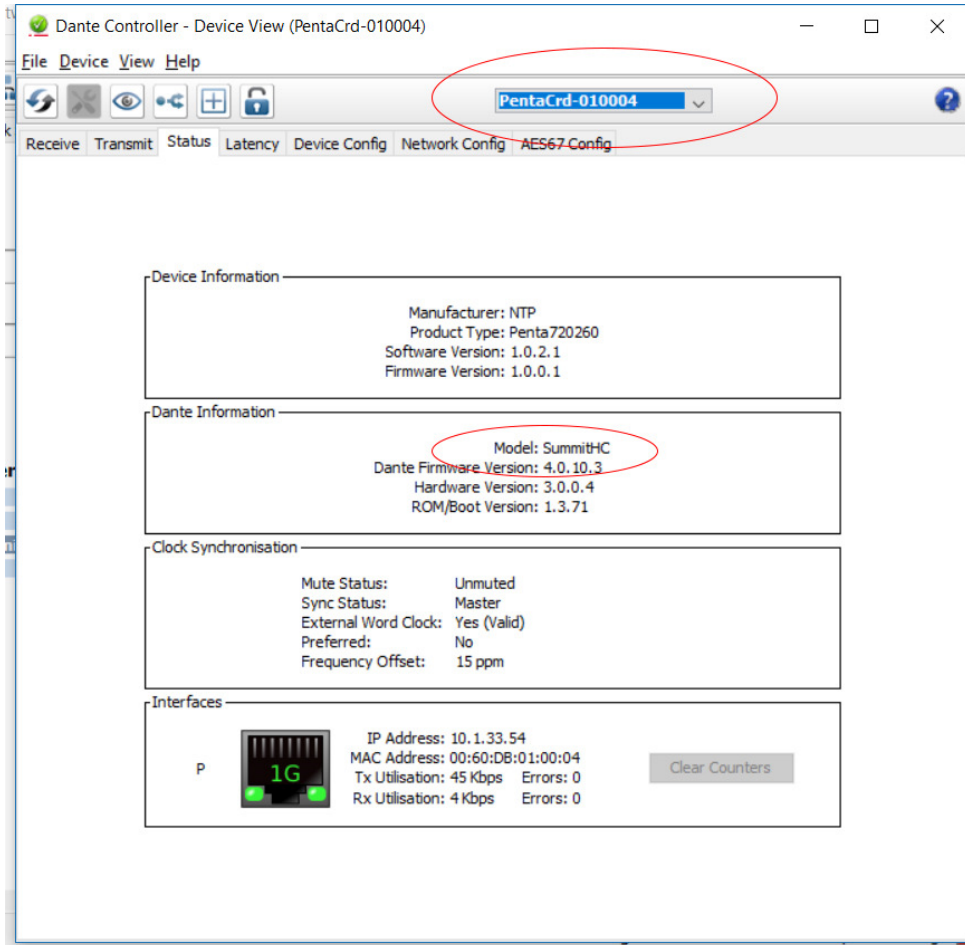
Dante Network and the AX32 are not synchronized and running on different clocks. The sample rate can be the same or different on the Dante network and on the AX32. In this case, the sample rate and clock sync setting of the Dante card will have to be done via the Dante controller.

Identification in Dante controller

The Dante card is managed and routed network-wise like a general Dante device. The card will appear with the model name SummitHC in the Dante controller. The Dante card has the name PentaCrd-‘MAC address’ (PentaCrd-010004) when delivered from the factory. If more cards are installed, they will each appear as a 128x128 Dante device. The name of the card can be changed in Dante controller.



Note that the name of the Dante card must be unique in order to work correctly on the network.



Connections and indicators.

The Dante card has two RJ45 connectors. They work in accordance with the general Dante functionality – either in a switched mode, or as two independent connectors for redundant operation. The mode is set on the network configuration page in the DADman software. On the rear panel, the two connectors are labelled 1 and 2.



Connector 2 is the Secondary interface

Connector 1 is the Primary interface

On the Dante card, there are a number of LED indicators. The basic rule is that the ones that light will have to be green when the card is booted and in correct operation. The LEDs have the following meaning.

- LED 1: Card Error (red)
- LED 2: Card OK (green)
- LED 3: FPGA boot OK (green)
- LED 5: Dante OK (green)
- LED 8: Dante Sync Err (red)
- LED 9: Dante clock master (flashing green) / Dante clock slave (green)
- LED 4, 6, 7: No function

