Cloud

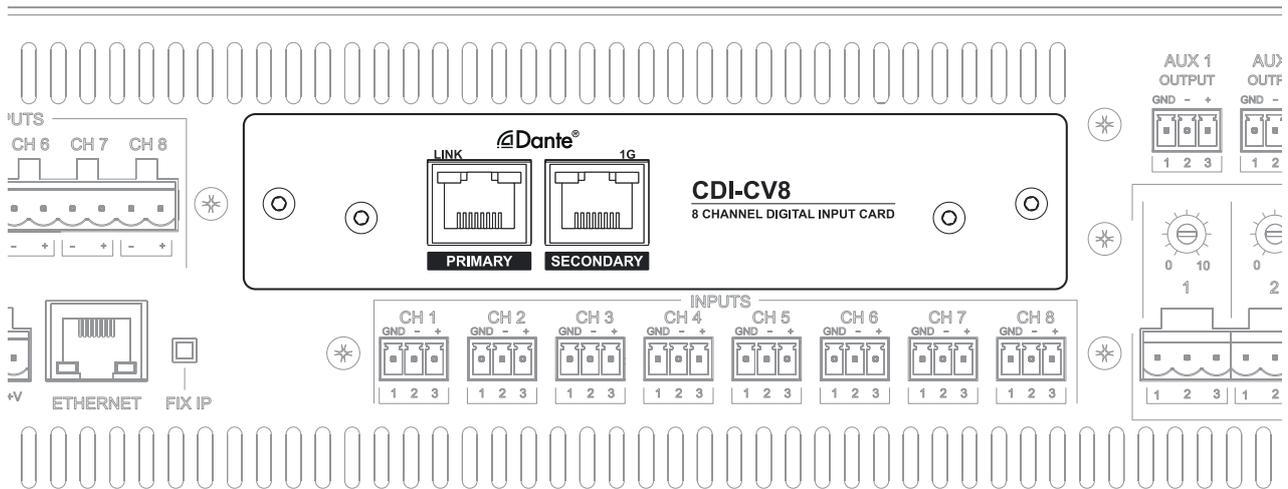# CDI-CV Auxiliary Digital Input Cards

Models CDI-CV2, CDI-CV4, CDI-CV8

Installation and Setup Guide

Contents

INTRODUCTION

The CDI-CV range of optional, retrofittable digital input cards is designed for use with the Cloud CV Series of digital power amplifiers. When fitted, a CDI-CV card allows the host amplifier to be connected to a Dante™ AoIP (Audio over Internet Protocol) network, and to derive some or all of its audio sources from the network instead of from its normal analogue inputs.

Three versions of the digital input card are available: the primary difference is the number of audio channels that the card can simultaneously source from the Dante stream to present to the amplifier as alternative audio inputs:

- CDI-CV2 – two Dante channels
- CDI-CV4 – four Dante channels
- CDI-CV8 – eight Dante channels

The three versions use the same size PCB and have similar faceplates. The CDI-CV2 and CDI-CV4 are almost identical in appearance, and have a single 100 Mb/s Ethernet port. The CDI-CV8 has two 1Gb/s Ethernet ports, which can be used either as a gigabit switch or operate as primary and secondary ports in a dual redundant network

The cards are compatible with the following amplifier models:

- CV2500 (2 channels)
- CV4250 (4 channels)
- CV8125 (8 channels)

The card is designed to fit the amplifier's rear panel expansion bay.

Scope of this Guide

This manual describes the mechanical and electrical installation of the card. It also explains its power requirements, and the additions to the amplifier's internal web server that will be available to the installer/user once installation is complete.

NOTE: A description of Audinate Dante Controller software and instructions for its use are beyond the scope of this Guide. It is assumed that the installer has a working knowledge of Dante Controller.

What's in the box

CDI-CV digital input card

Installation Guide (this document)

2qty M3 x 6 panhead screws (spare)

Amplifier/Dante card compatibility

All versions of the CDI-CV digital input card are mechanically and electrically compatible with all amplifiers in the Cloud CV Series.

In most sound contracting installations, fitting the CDI-CV card version with the same number of Dante channels as the number of amplifier channels will be the sensible option, as this will give the greatest flexibility. These combinations will be:

- a CDI-CV2 card in a CV2500 amplifier
- a CDI-CV4 card in a CV4250 amplifier
- a CDI-CV8 card in a CV8125 amplifier

However, if certain routing restrictions are acceptable, any card version may be used in any amplifier model; these options are discussed in the two following sections. The amplifiers' full input routing options, available via the browser GUI, or serial control via RS-232 or Ethernet, will continue to offer the same degree of flexibility as with the existing analogue inputs.

Card channel count less than amplifier channel count

Fitting a digital input card with fewer Dante channels than the amplifier will simply limit the number of separate audio streams that are available as amplifier inputs. For example, fitting a CDI-CV2 card (two Dante channels) in a CV4250 amplifier (four channels) will make either of the two Dante channels which have been assigned to the card in Dante Controller available to any of the four amplifier channels. A typical case would be where the two Dante channels are a stereo pair: the left channel may be routed to amplifier channels 1 and 3 and the right to 2 and 4. This principle applies to the other card/amplifier combinations where the amplifier has more channels than the Dante card.

Card channel count greater than amplifier channel count

Fitting a digital input card with more Dante channels than the amplifier will allow any of the Dante channels to be available to any of the amplifier channels, with the overriding restriction that the maximum number of individual audio outputs from the amplifier can only ever equal the number of amplifier channels. Thus, if a CDI-CV4 card is fitted in a CV2500 two-channel amplifier, any of the four Dante channels routed to the card may be routed to either of the two amplifier channels, using the amplifier's browser control pages. The CV amplifier's mono summing facility permits adjacent odd/even channels to be summed, so in this case, Dante channels 1 and 2 could be summed and routed as mono to amplifier Channel 1, and Dante channels 3 and 4 similarly to Channel 2, thus making full use of the card's capacity.

A special case is the use of the CDI-CV8 card's dual ports. Fitting a CDI-CV8 card in any CV Series amplifier will permit connection to a dual redundant network. Alternatively, the card may be configured so that it acts as a two port Ethernet switch, which may be useful to aid network distribution.

INSTALLATION

Mechanical fitting and internal connection

Fit the CDI-CV card within the CV Series amplifier according to the instructions below:

1. Disconnect the CV amplifier from the AC mains.

2. If the amplifier is installed in an equipment rack, disconnect all audio and control wiring (noting connections), remove the unit from the rack and place on a convenient flat surface.

3. Remove the top cover: there are 16qty M3 countersunk screws, eight on the top panel, 4 on each side. Orientate the unit with the rear panel towards you.

4. Remove the two M3 panhead screws securing the expansion port blanking plate, and remove the plate.

5. Insert the CDI-CV card through the empty slot (PCB first). The card has a short ribbon cable from the rear of the PCB. Plug its 20-way connector into the empty header CON28 (note it is labelled AUX INPUT) on the amplifier PCB immediately below the card.
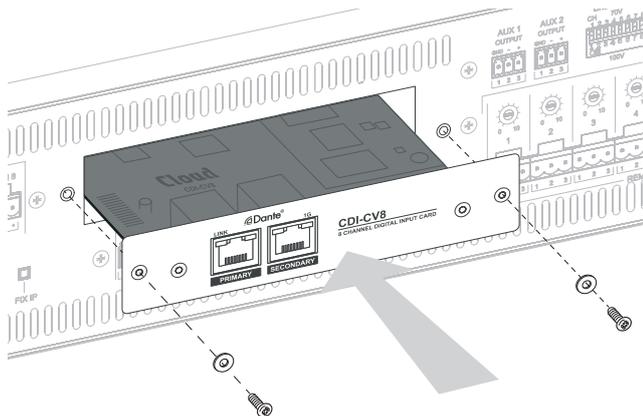
6. Secure the card in place with the two screws removed in Step 4. (Note these are the only fixings the card requires.)

7. Replace the top cover using the same screws (Step 3).

8. Reinstall the amplifier in the rack (if necessary), and reconnect.

Power considerations

CDI-CV cards are powered via PoE (Power over Ethernet); they do not derive their DC power from the host amplifier. This ensures the current available to the amplifier channels is uncompromised.

In most installations, the card's network port (either port in the case of the CDI-CV8) will be connected to a network switch, thus installers should ensure that this switch is PoE-capable and that PoE is enabled for the port in use (if per-port power activation is an option). For all versions, the card's power consumption is less than the 3.84 W rating applicable to Class 1 PoE, so Class 1-rated ports should cause no issues.

If a PoE network switch is unavailable, a Class 1 PoE injector may be employed. These are readily available from trade suppliers at low cost and will generally be supplied with a separate AC adaptor. The injector should be rated for 100Mb/s use in the case of the CDI-CV2 and CDI-CV4, and for 1000Mb/s in the case of the CDI-CV8.

Connect the injector between the network switch and the CDI-CV card as shown:
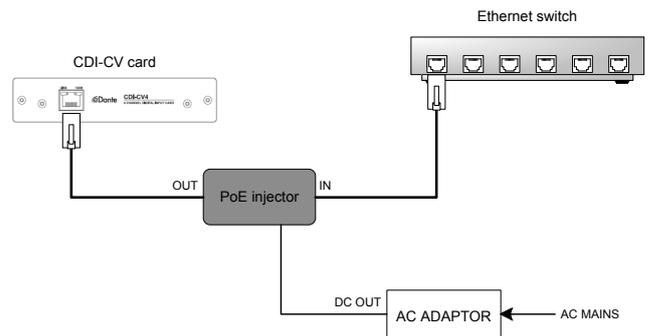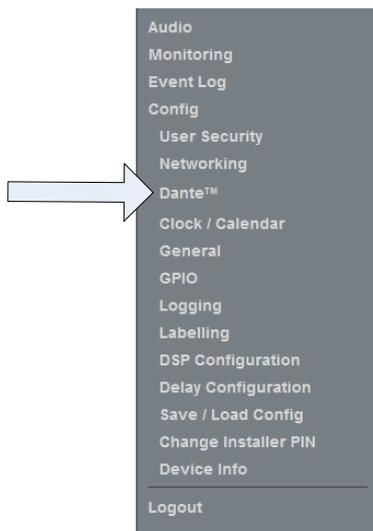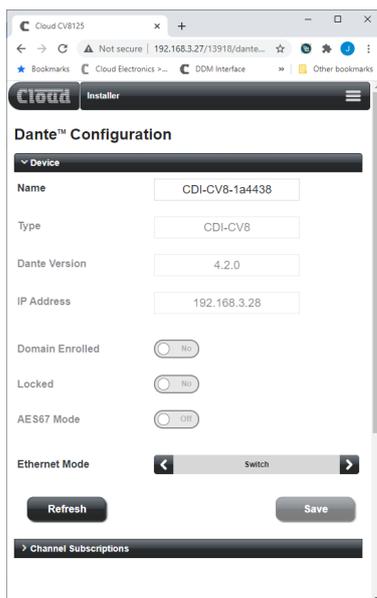
Amplifier configuration

Configuring the amplifier to use a digital input card is done via the browser GUI pages, or by serial control using either RS-232 or Ethernet. Once the CDI-CV card has been fitted and powered as described above, and the amplifier connected to the network and re-powered, the menu and Audio pages in the user GUI will be slightly different.

Dante Configuration page

It will be seen that a Dante™ page has been added to the list of Config options:

Audio
Monitoring
Event Log
Config
    User Security
    Networking
    Dante™
    Clock / Calendar
    General
    GPIO
    Logging
    Labelling
    DSP Configuration
    Delay Configuration
    Save / Load Config
    Change Installer PIN
    Device Info
Logout

Clicking Dante™ opens the Dante™ Configuration page:

The page has two tabs, `Device` (pictured above), and `Channel Subscriptions`.

Device tab

Most of the fields and controls on the `Device` tab are read-only, and are greyed-out. User-alterable controls and fields are:

- `Name` – this field will initially display the default name given to the card during manufacture. You can change this name to something more informative in the context of the installation if you wish. This name set in this field will be visible as the device's name in Dante Controller.

- `Ethernet Mode` (CDI-CV8 only) – this switch has two settings, `Switch` (the default) and `Redundant`, which define the operation of the CDI-CV8's SECONDARY port. The card has an internal Ethernet switch, and with `Ethernet Mode` set to `Switch`, the SECONDARY port acts simply as an additional network port, to which other devices (such as a Dante card in another CV Series amplifier) may be connected. Set the switch to `Redundant` if a dual redundant Ethernet network is being used for Dante (e.g., in a PA-VA life-safety installation), and connect the primary and secondary networks to the PRIMARY and SECONDARY ports on the card respectively

- `Refresh` – this button will reload the current card settings, discarding any changes that have been made in the GUI: it can be thought of as an "Undo" function.

- `Save` – this button will remain greyed-out until `Name` or `Ethernet Mode` are altered. Click `Save` to upload the alterations to the CDI-CV card.

The other (non-alterable) data displayed in the Device tab are as follows:

- `Type` – confirms card version

- `Dante version` – confirms version of Dante software resident on card

- `IP Address` – this will normally be the last IP address used by the card. The way in which an IP address is assigned to a Dante device is determined in Dante Controller (in `Device View > Network Config`), so this address may change depending how the Dante system is configured.

The three indicators below confirm various aspects of the network status, as set up in Dante Controller:

- `Domain Enrolled` – the card is enrolled in a Dante Domain Manager domain.

- `Locked` – card settings and configuration have been locked in Dante Controller

- `AES67 Mode` – AES67 mode has been enabled in Dante Controller

Channel Subscriptions tab

This tab displays a list of the card's channels together with their network identifiers and a per-channel status display.

The first column lists the amplifier channel inputs, which are effectively also the decoded Dante audio channels. Two, four or eight channels will be listed, depending on card version. The default names listed will be `Opt In 1` to `Opt In n`, unless they have assigned new names in the GUI's `Config > Labelling` page, under the `Option Card` Inputs tab.

For each amplifier channel, the name of the Dante subscription routed to the channel in Dante Controller is displayed. This will be the name that has been given to the specific channel of the transmitting Dante device forming the audio source for the amplifier channel.

When the amplifier is connected to the Dante network, a ✅ symbol will appear alongside each subscription name when the card detects a valid subscription on the designated Dante channel. If the card is unable to detect a valid subscription for any reason, a ⚠️ symbol is displayed instead.

Audio pages

On the `Audio` page for each channel that to receive its input from the digital input card, set the `Rear Panel` switch to `No`. You will see that the `Input Routing` tab now has an additional function: the `Input Type` switch is active (was previously greyed-out). Each amplifier channel may now be independently selected to receive its input from either the digital input card (`Input Type` set to `Option Card`) or the normal analogue line inputs (`Input Type` set to `Line Input`).

If the amplifier is to derive its audio sources exclusively via the Dante network, set `Input Type` to `Option Card` for all channels.

With `Option Card` selected, the `Input Source` switch

allows you to choose any of the CDI-CV card's outputs (`Opt In 1` to `Opt In`) as the audio source for the channel, in exactly the same way as it allows selection of any of the analogue inputs (`Line In 1` to `Line In n`) when `Input Type` is set to `Line Input`. Note that `Opt In 1` to `Opt In n` are the default names, but these may be changed in `Config > Labelling, Option Card Inputs` tab.

It is also possible to select a channel on the digital input card to be the source for either of the Auxiliary Outputs in the same way.

Connecting to the Dante network

Observing the power requirements explained in the "power considerations" section (see page 4), connect the CDI-CV card to the Dante network with standard Ethernet cables. Cat 5e cable is recommended for use with the CDI-CV8 card due to the higher data rate the card can handle.

The two LEDs integral to the RJ45 socket(s) indicate network activity. On all card versions, the green LINK LEDs indicate network activity and will normally blink occasionally. On the single port on the CDI-CV2 and CDI-CV4 the orange **100M** LED will illuminate when a 100Mb/s data rate is detected on the network: on the CDI-CV8 the orange **1G** LEDs indicate a 1000Mb/s data rate.

Use Dante Controller to identify the CDI-CV card as a receiver on the network. It will display the name used in the `Name` field on the `Dante™ Configuration` page. Enable the desired per-channel audio routing in the normal way.

TECHNICAL SPECIFICATIONS

		CDI-CV2	CDI-CV4	CDI-CV8
Dante channels		2	4	8
Simultaneous receive flows		1 or 2		Up to 8
Sample rates		Dante: 48/44.1/88.2/96 kHz AES67: 48 kHz		
Encoding		16/24/32-bit PCM (default 24-bit PCM)		
Data rates		100 Mb/s		1 Gb/s
Connectors		1 x RJ45		2 x RJ45
Secondary port modes		(not applicable)		Switched (default); Redundant
LEDs		Network speed, Link status		
Power consumption		0.7 W	1.0 W	2.3 W
Software compatibility	Configuration	CV Series internal web browser		
	Routing	Audinate Dante Controller		
	Security and Domain management	Audinate DDM		

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