D Series
DANTE AV PTZ Camera
USER MANUAL

Part Two: Dante AV Use

VERSION: D-09232021

D412
D220

© 2021 Bolin Technology
DO NOT USE DANTE 
FIRMWARE UPGRADE
USING DANTE CONTROLLER FOR BOLIN DANTE AV DEVICES
DANTE AV – VIDEO ROUTING
AUDIO ROUTING
FIRMWARE UPGRADE
DO NOT USE DANTE UPDATE
PTZ CAMERA CONTROLLING

CONTENTS
PRIOR TO USE
EQUIPMENT TO PREPARE
DANTE CONTROLLER INSTALLING AND UPDATING
NETWORKS AND SWITCHES
DANTE AV CONNECTION BASIC SYSTEM DIAGRAM
USE FOR THE EXISTING DANTE AUDIO OVER IP SYSTEM

DANTE AV – VIDEO ROUTING
DISCOVERY AND AUTO-CONFIGURATION
USING DANTE CONTROLLER FOR BOLIN DANTE AV DEVICES

ROUTING FOR VIDEO DEVICES
NETWORK VIEW
ROUTING VIEW
DEVICE INFO
CLOCK STATUS
NETWORK STATUS

DEVICE VIEW
TRANSMIT TAB
STATUS TAB
LATENCY TAB
DEVICE CONFIG TAB
VIDEO CONFIG TAB
SERIAL CONFIG
NETWORK CONFIG TAB

FLOW INFORMATION
UNICAST / MULTICAST TRANSMIT FLOW CONFIGURATION

AUDIO ROUTING
CAMERA AUDIO

FIRMWARE UPGRADE
DANTE DEVICE FIRMWARE UPGRADE
MCU FIRMWARE UPGRADE

DO NOT USE DANTE UPDATE

PTZ CAMERA CONTROLLING

USE IR REMOTE CONTROLLER
USE IP PTZ CONTROL
USE BOLIN PTZ CAMERA CONTROLLER
CONTROLLER SETUP
USE BOLIN PTZ CONTROLLER FOR IP CONTROL
ADDING A VISCA-OVER-IP CAMERA TO KEYBOARD
CONTROL THE VISCA-OVER-IP CAMERA
USE BOLIN PTZ CONTROLLER FOR SERIAL PTZ CONTROL
Part Two: Dante AV Use

The following assumptions are made for this section of the manual that involve the usage of Bolin Dante AV devices.

- There is an existing operational (new designed) Dante Network that is ready for Dante AV PTZ camera and decoder installation
- Dante Controller has been properly configured for the existing Dante Network prior to Dante AV installation
- The operator/reader who is going to utilize the DanteAV devices has moderate understanding and installation expertise of the Dante Audio over IP system

If the above assumption applies to your application, please continue to the Prior to Use section.

If the above assumption does not apply to your application, please view the information below.

If you are interested in building a completely new Dante / Dante AV ecosystem
If you want knowledge on Dante / Dante AV ecosystem as a whole

Please visit Audinate’s website www.audinate.com or consult Dante certified technical team.
Prior To Use
Equipment to Prepare
To build up a typical Dante AV PTZ camera system, you will need to have the following equipment ready or have the following equipment already in the existing Dante system:

- Bolin Dante AV PTZ camera
- Bolin Dante AV Decoder or 3rd party Dante AV decoder
- Network switch within existing Dante network or independent network switch
- 4K TV display for PTZ camera local HDMI video output signal use if it is needed
- 4K TV display for Dante AV decoder HDMI video output signal use
- PC that has Dante Controller installed
- HDMI cables and CAT5e/6 network cables

Dante Controller Installing and Updating

Minimum System Requirements

General
Processor: 1GHz or better
Memory: 512Mbyte of RAM
Network: Standard wired Ethernet network interface (100Mbps or Gigabit) or wireless LAN (Wi-Fi) interface

Windows
Operating System: Windows 10
NOTE: Both UTF-8 and Unicode are supported EXCEPT for host or device names; the DNS standard does not support Unicode for these

macOS
Operating System: macOS 10.14, 10.15 and 11

Installing Dante Controller

Downloading Dante Controller
Dante Controller is available for download from Audinate’s website. To download a copy of Dante Controller:
Go to the Audinate website: www.audinate.com.

Installing Dante Controller on Windows
1. Ensure you are logged on to your PC as an administrator.
2. Navigate to and double-click the Dante Controller installer file.
3. Read the license agreement. If you agree to the terms, select the 'I agree' checkbox, and click Install. If you do not agree to the terms, click Close.
4. Confirm / acknowledge any Windows security prompts that are displayed.
5. Dante Controller will then be installed. Dante Controller will be added to the start menu, under 'Audinate'

Installing Dante Controller on macOS
1. Double-click the DanteController.dmg file. A drive icon will appear on your Desktop Finder window. Double click on this to open.
2. Double click the Dante Controller .pkg. This will run the installer.
3. Read the license text, and if you accept the terms of the agreement, click Agree. If you do not accept these terms, click Disagree to terminate the installation.

Note: Dante Updater will also be installed automatically.

Updating Dante Controller
Dante Controller can be updated directly from the application itself.
Always check and keep the Dante Controller version updated
Checking for Updates Manually
In Windows:
From the Help menu, select 'Check for Updates'.
In macOS:
From the Dante Controller application menu, select 'Check for Updates'.

Checking for Updates Automatically
Dante Controller can also check for updates automatically. If an update becomes available, you will be notified via a pop-up message. To activate automatic checking, in the update dialog, select the option to check for updates automatically.

Networks and Switches

Special network infrastructure is not required for Dante AV network
Since Dante is based upon universally accepted networking standards, Dante-enabled devices can be connected using inexpensive off-the-shelf Ethernet switches and cabling.

A dedicated network infrastructure is not required for Dante AV network
Dante-enabled devices can happily coexist with other equipment making use of the network, such as general-purpose PCs that is actively sending and receiving email and other data.

Selecting Cables
All Bolin Dante AV devices are designed to be used with gigabit transmission (1000BASE-T), so be sure to use a CAT5e or higher network cable (you can use CAT6 and CAT7 cables as necessary).

Selecting Network Switches
You will need a network switch that meets the following requirements to construct a Dante network.

1. Gigabit ports for inter-switch connections
   a. All the ports are capable of simultaneous gigabit transfer, determine whether the switching capacity is at least 1 Gbps x the number of ports x 2 (in and out)
2. Capable of switching off Energy Efficient Ethernet (EEE) and other power-saving features
   a. EEE (Energy Efficient Ethernet) is a technology that reduces switch power consumption during periods of low network traffic. It is also sometimes known as Green Ethernet and IEEE802.3az.
      Although power management should be negotiated automatically in switches that support EEE, it is a relatively new technology, and some switches do not perform the negotiation properly. This may cause EEE to be enabled in Dante networks when it is not appropriate, resulting in poor synchronization performance and occasional dropouts.
3. We recommend managed (intelligent) switches that can be configured and monitored.
   a. So that you can adjust the switch settings according to the system requirements and monitor the status of the switch. Simple systems can be operated using unmanaged switches (so long as they don’t use EEE), but you will need to use a managed switch to construct a more stable Dante network.
4. We recommend switches that support DiffServ (DSCP) Quality of Service (QoS) with strict priority and 4 queues.
   a. Quality of Service (QoS) is a feature of managed switches, which ensures that certain types of network packets (e.g., clock sync and audio packets) get preferential treatment and are "moved to the front of the line" ahead of other traffic.
   b. QoS is required when using Dante in networks that have 100Mbps devices and is optional in networks with Gigabit devices. We recommend that QoS be enabled in all Dante networks to ensure proper operation under all possible conditions.
   c. By configuring the QoS settings recommended by Dante on a network switch, you can give Dante clock synchronization top priority and give audio data the next highest priority over background data traffic. This will ensure good system performance when you need to transfer non-Dante data over the same network or when you transfer massive amounts of audio data
5. Packet control features such as VLANs and IGMP snooping.
   a. IGMP Snooping (highly recommended when using Dante AV)
6. When transferring data over long distances between switches, consider using switches that support fiber optical modules such as SFPs and GBICs.
7. If PoE power is needed, the switch should support POE++, IEEE802.3bt Type 4 Class 6 on each port.
Dante AV Connection Basic System Diagram

Use for the Existing Dante Audio Over IP System

Dante AV – Video Routing
Discovery and auto-configuration

When a Dante-enabled device is connected to an IP/Ethernet network, it will automatically:
1. Configure its IP address
2. Advertise itself to allow automatic discovery

Within seconds of a Dante-enabled device connecting to a network, Dante Controller will automatically discover and display the device, allowing you to configure channels and route media.

Automatic network configuration
A Dante-enabled device connected to a network will automatically setup its own network configuration, including its IP address.
If the network has a DHCP server, which may be the case for installed networks, it will receive its IP configuration using the standard DHCP protocol.
On a network without a DHCP server, which may be the case for temporary or smaller networks, the Dante-enabled device will automatically assign itself an address using link local protocols, in the same way PCs and printers often do.

Automatic discovery
A Dante-enabled device will advertise information about itself to other Dante devices and Dante Controller,
including:
• Device name
• Channel names
• Number of channels
• Sample rates and bit depths
This information can be seen when viewing a device on Dante Controller and allows Dante devices to determine compatibility with other devices, such as compatible sample rates to allow media to be routed.

Using Dante Controller for Bolin Dante AV Devices

This section of the manual is for connecting and utilizing Bolin Dante AV PTZ cameras, decoders, and very closely related devices only.

For Dante Controller full comprehensive guide and connectivity of other products, please refer to Audinate’s website for their Dante Controller software user guide.

Routing for Video Devices

Video (Dante AV) devices support three major channel types.

Audio Channels
Audio channels are represented in Dante Controller by the following icon:

Audio channels for Dante video devices are treated and managed identically to audio channels for audio-only Dante devices.

Video Channels
Video channels are represented by the following icon:

Video channels contain packetized video data streams and can be routed in the same way as audio channels. However, they typically use more bandwidth than audio channels, and require 1Gbps (or higher) switch ports.

Note:
IGMP snooping must be enabled on network switches that will be carrying Dante video on 1Gbps network infrastructure. Refer to your switch manufacturer’s documentation for information about enabling IGMP snooping.

Ancillary Channels
Ancillary channels are represented by the following icon:

Ancillary channels are ‘custom’ channels, defined by the device manufacturer, to carry additional data (not audio or video) between devices.

Using Bolin Dante AV devices, the Ancillary channels are USB, IR, RS-422
• USB is for remote peripheral controls of TX device
• IR for infrared control of TX device (not Bolin’s Dante AV PTZ Camera) from the RX end
• RS-422 port is for Visca RS-422 control of Bolin’s Dante AV PTZ camera from the RX end with compatible controller
Ancillary channels are typically low bandwidth (compared to audio and video channels). Some ancillary channel types cannot be added to multicast transmit flows.

Dante Controller presents two main types of view: Network View and Device View.
Network View

A typical Network view for a network that includes Bolin video devices (with four types of ancillary channels) is shown below.

Expanding the Routing View
In this example:

- The 'Video Rx' channel on the Bolin-Decoder-D10H receiver is subscribed to the 'Video Tx' channel on the Bolin-PTZ-Camera-D220 transmitter. This subscription would cause video from the Bolin-PTZ-Camera-D220 to be displayed on the front of housedisplay screen.
- The 'Left' and 'Right' audio channels on the Bolin-Decoder-D10H audio receiver are subscribed to the 'Left' and 'Right' Tx channels on the AVIO USB audio transmitter. These subscriptions would cause the left and right audio channels from the AVIO USB audio transmitter to be output via the HDMI of decoder.
- The 'Left' and 'Right' audio channels on the AVIO USB audio receiver are subscribed to the 'Left' and 'Right' Tx channels on the Bolin-PTZ-Camera-D220 audio transmitter. These subscriptions would cause the left and right audio channels from the Bolin-PTZ-Camera-D220 audio transmitter to be output via the USB of AVIO.
- The 'RS-422' ancillary channel on the Bolin-PTZ-Camera-D220 receiver is subscribed to the equivalent channels on the Bolin-Decoder-D10H transmitter. These subscriptions would enable serial control RS-422 on the transmitter (decoder) via the Serial control ports RS-422 on the receiver (camera).
- The 'RS-422' ancillary channel on the Bolin-Decoder-D10H receiver is subscribed to the equivalent channels on the Bolin-PTZ-Camera-D220 transmitter. These subscriptions would enable serial control RS-422 on the transmitter (camera) via the Serial control ports RS-422 on the receiver (decoder).
- The 'IR' ancillary channels on Bolin-PTZ-Camera-D220 receiver are subscribed to the equivalent channels on the Bolin-Decoder-D10H transmitter. These subscriptions would enable infrared control of the transmitter (decoder) via the control ports on the receiver (camera). This is only for the case when you use IR (TX/RX) jumper for camera IR control.
- It is not needed to use IR subscription when you use Bolin Dante AV camera and Bolin Dante AV decoder.

**Routing View**

When Dante Controller is started, it always displays the Routing Tab within the Network View. In this view the network is shown in the form of a grid. Devices with Tx channels are displayed along the top row of the grid, and those with Rx channels are displayed along the left-hand column of the grid. Initially a collapsed view is presented; individual channels cannot be seen. Initially a collapsed view is presented; individual channels cannot be seen.

**Note:**

- If a device name is shown in red, it means Dante Controller has automatically detected an error condition. Double-click the device name to see more information. Refer to Automatic Notification of Device Errors for further explanation.

**Note:**

- Bolin Dante AV camera and decoder has both Tx and Rx channels, it is shown along the top row of the grid and along the left-hand edge.

**Device Info**

The Device Info tab provides a network-wide overview of device configuration and operating information. The tabular view presents the following information, in columns from the left:

- **Device Name**: The device name currently associated with the device
- **Model Name**: The model name of the device
- **Product Version**: The product version assigned by the manufacturer (Bolin)
• **Dante Version:** The firmware version for hardware devices, or software version for Dante software applications.

• **Device Lock:** The lock state of the device. You can also click this field to open the device lock/unlock dialog.

• **Primary Address:** The IP address assigned to the primary interface. IP addresses are currently assigned via DHCP, or automatically self-assigned. Self-assigned addresses on the primary interface will be in the 169.254.*.* range.

• **Primary Link Speed:** The Ethernet link speed of the primary interface.

• **Secondary Address:** The IP address assigned to the secondary interface. Self-assigned addresses on the secondary interface will be in the 172.31.*.* range. 'N/A' indicates that the device does not support a secondary interface. 'Link down' indicates that the device supports a secondary Dante interface, but it is not currently connected.

• **Secondary Link Speed:** The Ethernet link speed of the secondary interface. Other values are possible (as per Secondary Address). Other values are possible.

**Note:** If no device information is displayed for a device, it can indicate a ConMon (Dante control and monitoring service) failure on the device. The device may need to be reset or restored.

### Clock Status

![Clock Status Table]

Dante AV uses Precision Time Protocol (PTP) across the network to achieve time alignment throughout the network. The page informs the user about Dante AV devices on the network and its clock status. This is important because it verifies if devices are in sync, which is needed to achieve the AV sync that Dante AV is well known for. This page also allows the user to select which device is preferred as the Leader clock. If no preferred Leader clock is selected, Dante controller will automatically decide on a device to be the Leader clock.

- **Device name:** the name/device ID of the devices at its current connected state
- **Sync:** if the device is in sync with the Leader clock or not.
  - Green means it is in sync
  - Red means it is NOT in sync
- **Clock Source:** Shows where the Leader clock source is from.
  - When it says Dante it means it is in sync with a device on the Dante network, or is the Leader clock, without any clock reference from outside the network
  - When it says External it means there is an external world clock source that devices are synced to
- **Preferred Leader:** users can select preferred device(s) to be the Leader clock. When only one device is checked, it is guaranteed to be the Leader clock. When multiple devices are checked, Dante Controller will pick one of the checked ones to be the Leader clock.

These are common settings most users will be utilizing with Bolin Dante AV devices. For common clock sync knowledge and more, please visit [www.audinate.com](http://www.audinate.com) for a full comprehensive breakdown of the clocking system and how it operates.

### Network Status

![Network Status Table]

The Network Status tab provides a range of network-related information across all devices on the network. This view includes subscription status, bandwidth, and latency information. It can be used to quickly identify any potential network traffic issues.
Device Name
The device name currently associated with the device.

Subscription Status
The icon in the Subscription Status column displays a summary of subscription states for the device. If any of the device's channels are not successfully subscribed, the relevant icon will be displayed here.

Primary Status
The Primary Status column indicates the link speed of the primary Dante network interface for the device.

Secondary Status
The Secondary Status column indicates the link speed and status of the secondary Dante network interface for the device (if applicable). 'N/A' indicates that the device does not have a secondary interface. 'Link Down' indicates that the device has a secondary interface, but it is not currently connected.

Bandwidth Columns
Use the bandwidth columns to see an approximation of transmit and receive traffic over individual device interfaces.

- Primary Tx B/W
  The Primary Tx B/W column displays an approximation of the current transmit bandwidth on the primary Dante network interface for the device.

- Secondary Tx B/W
  The Secondary Tx B/W column displays an approximation of the current transmit bandwidth on the secondary Dante network interface for the device.

- Primary Rx B/W
  The Primary Rx B/W column displays an approximation of the current receive bandwidth on the primary Dante network interface for the device.

- Secondary Rx B/W
  The Secondary Rx B/W column displays an approximation of the current receive bandwidth on the secondary Dante network interface for the device.

Latency Setting
Shows the current latency setting for the device.

Note:
For video (Dante AV) devices, the latency setting applies only to the audio channels.

Latency Errors
The Latency Errors column displays icons representing the recent latency performance of the device.

- A green light indicates that the device is subscribed, and there are no latency problems - i.e. all audio packets are arriving well within the device's latency setting.

- An amber light indicates that audio packets for one or more channels are arriving at or near the limit of the device's latency setting. You may need to increase the device's latency or reconfigure the network to prevent audio glitches due to packet loss from late-arriving audio packets.

- A red light indicates that one or more audio packets have arrived outside the device's latency setting. This will result in audio glitches. The device's latency setting should be increased, or the network reconfigured (for example, by reducing the number of network nodes in between the
transmitter and the receiver).

A grey light indicates that the device is not currently subscribed.

**Packet Errors**

A red light in the Packet Errors column indicates that one or more media packets have been corrupted in between the switch and the receiver. This is usually due to a faulty Ethernet cable.

Use the **Clear Counters** button in the Device View > Status tab to clear the packet errors history for a device.

**Device View**

The Device View is used to view and modify detailed information and settings for a specific device. Device view can be activated by double-clicking a device name in any of the Network View tabs (except Events), or by selecting Device View from the Device menu (Ctrl + D, or Command + D) in the Network View window. The Device View opens in a new window. Multiple device views can be open simultaneously.

The Device View displays some or all the following tabs, allowing you to see different information relating to a specific Dante device:

- **Receive**: Display and configure device’s receive (Rx) channels
- **Transmit**: Display and configure device’s transmit (Tx) channels including multicast
- **Status**: Device software, clock, and network status information
- **Latency**: View latency histograms (supported devices only)
- **Device Config**: Rename device, change sample rate, and set other attributes (as relevant to device type)
- **Video Config**: Display certain video configuration parameters and information of the Bolin PTZ camera and decoder
- **Serial Config**: Display important serial control settings and parameters
- **Network Config**: View and edit network configuration
Receive Tab

The Receive tab displays a list of all subscribed and dormant receive channels on the current device, plus subscription information for the subscribed channels. It also allows the creation of subscriptions from the Available Channels list.

Receive Tab with Bolin Dante AV camera

Receive Tab with Bolin Dante AV decoder

The tab is split into two panes: Receive Channels, and Available Channels.

Receive Channels

The Receive Channels pane contains three columns:

- **Channel**: Lists the receive channel names for the current device. These can be edited here to rename the channel.

- **Connected To**: Lists the Tx channel that the receive channel is currently subscribed to, plus the status of both primary and secondary subscriptions, using the following icons:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>🌟</td>
<td>Subscription is OK and media should be flowing</td>
</tr>
<tr>
<td>🔴</td>
<td>Subscription is unresolved - usually because the transmitting device has been removed from the network, or is switched off</td>
</tr>
<tr>
<td>🔴</td>
<td>No subscription, or a subscription error</td>
</tr>
<tr>
<td>→</td>
<td>Subscription is via unicast connection</td>
</tr>
<tr>
<td>←</td>
<td>Subscription is via multicast connection</td>
</tr>
</tbody>
</table>
Subscriptions can show several symbols in the Status column. Common status icon combinations and their meanings are as follows:

- **Unicast**: Unicast device successfully subscribed to a transmitter.
- **Redundant**: Redundant device successfully subscribed on both primary and secondary via unicast.
- **Redundant multicast**: Redundant device successfully subscribed on both primary and secondary via multicast.
- **Redundant primary only**: Redundant device successfully subscribed on primary only via unicast. This is typically seen when the secondary interface is not connected.

**Signal**: Supported devices will also show the following channel metering icons, indicating the presence of audio on subscribed channels:

- **Channel muted or less than -61dbFS**: Channel is either muted, or receiving audio at less than -61dbFS.
- **Channel receiving audio between -61dbFS and 0dbFS**: Channel is receiving audio between -61dbFS and 0dbFS.
- **Channel clipping**: Channel is clipping.

For video, ancillary and privately encoded audio channels, supported devices may also show variations of the following status icons in the **Signal** column:

- **Good signal**: The signal path (across the network) is good, and there are no external connectivity problems detected.
- **Good signal but Dante Controller cannot ascertain if there are any external connectivity problems**: The signal path is good, but Dante Controller cannot ascertain if there are any external connectivity problems.
- **Rx device does not support signal**: The signal path is good, but the Rx device does not support the signal (for example, because the signal is HDCP and the Rx device is not HDCP-enabled).
- **Indicates a signal problem such as an incompatible video codec, or the Dante subscription is unresolved**. Refer to the subscription status icon for further information.
- **Encryption enabled**: The signal path is good, and the signal is encrypted.

**Available Channels**

The Available Channels pane lists the devices and advertised channels available on the network. Devices that are greyed out indicate that this receiver cannot subscribe to those channels or devices. This is typically because of a mismatch in parameters (e.g. sample rate incompatibility etc.), or because a device cannot route media to itself.

For devices with many channels, you can click the Channel Groups button to group available channels into sets of 16.
**Transmit Tab**

The Transmit tab is used to inspect and modify the transmit configuration of a device.

Transmit Tab with Bolin Dante AV camera

Transmit Tab with Bolin Dante AV decoder

The Transmit Tab is arranged into two areas:

- **Transmit Channels**: The area on the left pane of the tab shows the Tx channels for the device. It allows you to edit channel names for transmit channels. Input to the table is filtered to prevent illegal characters from being used in channel names.

  Supported devices will also show the following channel metering icons in the **Signal** column, indicating the presence of audio on subscribed channels:

  - ![Icon] Channel is either muted, or receiving audio at less than -61dbFS
  - ![Icon] Channel is receiving audio between -61dbFS and 0dbFS
  - ![Icon] Channel is clipping

For video, ancillary and privately encoded audio channels, supported devices may also show the following status icons in the **Signal** column:

- ![Icon] Indicates there are no external connectivity problems with the Tx device
- ![Icon] Indicates there is an external connectivity problem with the Tx device
- ![Icon] Dante Controller cannot ascertain if there are any external connectivity problems with the Tx device
Multicast Transmit Flows: The area on the right pane of the tab shows the multicast transmit flows that have been configured on the device.

Multicast flows are listed in ID order, including the channels contained within the flow.

Note: Unicast flow details are displayed in the Flow Information dialog.

Changing Tx channel Names
To change a Tx channel name double click on the name and type in a new one. Tx channel names must be unique for the device.

Status Tab
The Status tab is used to obtain current information about a Dante device

Status Tab with Bolin Dante AV camera

Status Tab with Bolin Dante AV decoder
The tab is divided into sections. The information presented on this tab can be very useful when investigating networking or clocking issues in the system. The Refresh button can be used to update this information if required.

**Device Information**
This provides the following general information about the device:
- **Manufacturer**: The name of the device manufacturer.
- **Product Type**: The type of device.
- **Product Version**: The product version.
- **Software Version**: The version of the manufacturer software running on the device.
- **Firmware Version**: The version of the manufacturer firmware running on the device.

**Dante Information**
This provides Dante-specific information about the device:
- **Model**: The Dante device type.
- **Dante Firmware Version**: The version of the Dante firmware running on the device.
- **Hardware Version**: The version of the hardware firmware running on the device.
- **ROM/Boot version**: The version of the ROM or bootloader.

**Clock Synchronization**
This provides the following information about device clocking:
- **Mute Status**: 'Muted' indicates that the device is has been automatically muted (due to a clock synchronization problem, or because the external word clock is invalid). 'Unmuted' indicates that the device is not muted, and audio is flowing normally.
- **Sync Status**: 'Locked' indicates that the device is locked to the network PTP clock. 'Not Locked' indicates that the interface has not achieved lock with the network PTP clock.
- **External Word Clock**: 'No' indicates that the device has been configured to use the internal clock source. 'Yes' indicates that the device has been configured to accept an external word clock source. NOTE: If the Dante device is configured to accept an external word clock source, it is important to make sure that the host equipment has been configured to provide its word clock to the Dante device. Check your product manual for more information.
- **Preferred**: 'No' indicates that the card has not been set to preferred leader mode. 'Yes' indicates that the card is set to preferred leader mode.
- **Frequency Offset**: Indicates the offset from the network clock leader measured in parts-per-million.

**Primary Interface**
Provides the following information about the primary network interface:
- **IP address**: The IP address currently assigned to the interface
- **MAC address**: The Media Access Control address of the interface, associated with the Ethernet layer
- **Tx Utilization**: Shows the current total transmit bandwidth in use
- **Errors**: (on the same line as Tx utilization) shows the number of transmit Cyclic Redundancy Check (CRC) or packet errors detected since the device was last started
- **Rx Utilization**: Shows the current total receive bandwidth is use
- **Errors**: (on the same line as Rx utilization) shows the number of receive Cyclic Redundancy Check (CRC) or packet errors detected since the device was last started

**Note:**
The Rx Utilization includes not only network traffic destined for the Dante device, but any other multicast or broadcast traffic received at this network interface.

**Note:**
As a rule of thumb neither the Rx nor the Tx utilization should exceed about 85% of the link speed to guarantee good clock synchronization performance (links are full duplex).

The graphic also indicates the speed and connected state of the interface as follows:

- **Indicates that the link is operating at 1Gbps**
- **Indicates that the link is operating at 100Mbps**
- **Indicates that the link is not connected, or that there is an error. The IP address will read N/A, and Tx and Rx utilization will be 0 kbps.**

**Clear Counters:** Click this button to reset the packet errors history for the device.

**Latency Tab**
Status Tab with Bolin Dante AV camera

**Note:** For video (Dante AV) devices, latency settings made in Dante Controller apply only to the audio channels.

Status Tab with Bolin Dante AV decoder
Provides Latency information from the TX to the RX. It is measuring for the delay value due to network travel. The purpose of this tab is to help optimize resources and finding the best setting for your application in terms of latency. Data is transmitted throughout the network via packets, when not all packets arrive on time or at all, it can cause undesired results to the audio service. Common consequences involve distortion and temp loss of audio.

How to read the chart:

Bottom of the chart labels the latency range. Top of the chart labels the TX name. Left side of the table shows number of measurements.

Green bar: latency number falls within range and should not cause packet loss (usually no action needs to be done)
- Yellow bar: packet loss may incur because it is arriving right at the limit range (suggestion: increase receiver latency to compensate)
- Red bar: packet loss is occurring regularly (suggestion: increase latency setting on the receiver end or have the network administrator reconfigure the network)
- Settings: current latency setting of the respective device
- Peak: top number of latency data
- Average: average number of latency data
- Late: number of times packets that got dropped for arriving late (best if this number stays low or 0)
- Duration: data gathering time duration, leave on longer duration for best accuracy of overall numbers

Save: Will save the information in a PNG image
Clear: Will clear previous latency information.

**Device Config Tab**

This tab on the device view window allows you to configure device specific parameters.

**Device Config Tab with Bolin Dante AV camera**
Device Config Tab with Bolin Dante AV decoder

Configurable Parameters

Rename Device

Allows you to enter a new Dante 'friendly name' for the device. The text field displays the current name. To change the device name, enter a new name in the text field and press Enter.

Sample Rate

- Shows the current sample rate of the device, and allows you to change the operating sample rate of the Dante device. This may require the device to be rebooted to take effect. All sample rates supported by the device are shown in the drop-down menu.
- Shows the current pull-up/down setting for the device and allows you to change the pull-up/down setting. The pull-up/down setting can be used to adjust the sample rate of the device to synchronize audio with video that has undergone frame rate conversion. For example, to synchronize Dante audio with video that has been converted from 24 fps to 25 fps, set the sample rate pull-up/down for any relevant Dante audio devices to +4.1667%.
- Applies to audio channels only.

Note:
Changing the sample rate pull-up/down for a device places that device in a dedicated clock domain. Dante devices can only transmit audio to, or receive audio from, other devices on the same clock domain. See Clock Status View for more information.

Encoding, Preferred Encoding

Shows the current preferred encoding setting and allows you to change the preferred encoding setting for the device.
Applies to audio channels only.

Note:
This setting does not guarantee that the device will always use the selected encoding: Both devices must support the selected encoding for it to be used.
Clocking

Unicast Delay Requests

Delay requests are messages sent by clock followers to the clock leader to establish the time it takes for data to traverse the network between the devices. By default, delay requests are multicast messages, and in networks with lots of devices, they can add up. Enabling 'Unicast Delay Requests' forces clock follower devices to send delay requests to the clock leader using unicast instead, which reduces multicast traffic.

**Note:**
Unicast Delay Requests does not have to be enabled on the clock leader, only on the clock followers.

**Important:** Some older Dante devices do not support Unicast Delay Requests. Before enabling the feature for your clock followers, check that your current clock leader supports the feature, by attempting to enable it for the device. If the clock leader device does not support unicast delay requests, do not enable it on your clock followers (it may prevent your devices from synchronizing). You can however choose an alternative clock leader that does support it, and then enable it for the clock followers that also support it.

Device Latency

Shows the current device latency setting and allows you to change the operating receive latency for the selected device. Select a value and click OK to apply the latency to all flows that the device is receiving. Applies to audio channels only.

**Note:**
The 150 µsec setting is unavailable for devices that include an internal network switch.

**Note:**
Device latency cannot be configured for Dante Via devices.

**Note:**
Devices enrolled in a Dante domain may support extra latency values.

**Warning:** Changing the latency value will cause disruption in the audio while the flows are reestablishing the new latency setting.

Reset Device

Allows you to remotely reboot the Dante interface, and to reapply factory settings (Factory Reset). Rebooting the Dante device may also require a reset of the host audio equipment containing the device. Factory Reset wipes the following device configuration settings:

- User-defined device name
- User-defined channel names
- Clock configuration (clock leader / external clock leader setting)
- Static IP addresses
- Redundancy configuration
- Sample rate setting (including pull-up/down)
- Latency setting
- Any existing audio routes

Supported devices allow you to 'Clear Config' instead of Factory Reset. Clear Config wipes the same configuration settings listed above, but allows you to optionally keep the IP settings (i.e., retain the Dante Redundancy settings, and any static IP addresses currently configured in the Network Config tab).
A reboot is required after clearing the configuration for the changes to take effect. Some devices will allow you to automatically reboot after clearing the configuration. If this option is not available, a manual reboot is required.

**Plugins**

Some devices may present additional 'plugin' tabs, defined by the device manufacturer, for configuration and display of additional device settings, such as video configuration and/or ancillary channel settings.

The contents of these tabs will vary based on the controls and information that the device manufacturer has chosen to expose.

**Video Config Tab**

Video Config Tab is an additional 'plugin' tabs defined by Bolin, for the camera and decoder, with additional video device settings.

**Video Config Tab with Bolin Dante AV camera**
The purpose of this tab is for the user to make certain convenient changes and obtain information from the Dante Controller regarding Bolin Dante AV devices.

WARNING: Changing settings using the Video Config tab will cause the screen to be disconnected and fade to black while the change takes place. The video should restore itself after the change has been applied without needing user intervention.

On the TX end (the camera end) the user can adjust the following:
- Video Resolution: For the Bolin PTZ camera, this option is set to Auto and cannot be changed since the Dante Controller software takes in the video resolution information of the camera itself. To change the resolution for the IP stream please change the resolution of the camera. Instructions on how to change video resolution on the Bolin Dante AV PTZ camera can be found in D Series PTZ camera – DANTE AV CAMERA D412 USER MANUAL-Part One-09232021
- Compression Profile: (Selection options: Broadcast, Ultra Low Latency)
  - Broadcast mode favors quality of image over latency
  - Ultra Low Latency favors keeping latency at the minimum over quality of image
Depending on application needs, the priority can be adjusted using the provided radio buttons

On the RX end (the decoder) the user can adjust the following:
- Color Space (Selection options: RGB 4:4:4, YCbCr 4:2:2, and YCbCr 4:4:4)
- Bit Depth (Selection options: 8 bit, 10 bit, 12 bit)

On Both TX and RX end the user can view the following information:
- Indicator light showing status, usually green or yellow.
  - Green indicating good established signal, yellow indicates concern.
  - If yellow, please check the information box in detail for why it is not green
- Status of the HDMI signal such as “valid non-HDCP signal”, if HDCP signal is important to the application please pay close attention to this information
- Direction: the way data flows to this device, the camera should be TX and the decoder should say RX
- Current settings: this section will show the current resolution, aspect ratio, color space and bit depth information that is actively being transmitted.

The information section will actively update itself with the most recent information. For example, if the color space is changed on the decoder end, the information area will refresh itself to reflect the change without needing to refresh the Dante Controller software.
Serial Config

Serial Config Tab is an additional 'plugin' tabs defined by Bolin, for the camera and decoder, with additional device settings.

Serial Config Tab with Bolin Dante AV camera

Serial Config are used to set various transmission detail to establish serial control. This is for the RS-422 port on the decoder (RX) to be able to send Visca RS-422 control from the keyboard controller to the camera (TX).

Baud Rate: This is the transmission rate of the serial communication channel.
- The most common is 9600, meaning the serial port can transfer a max of 9600 bits per second.
- All devices should have the same baud rate to appropriately communicate with each other.
- The image below shows the possible Baud Rate options

Data Bits: This setting changes the number of data bits in each character. (Selection options: 7 or 8)
- Most modern equipment uses 8 bits as it matches the size of a byte
- Older equipment may use other data bits such as 7

Parity: An error detection method for serial port transmission by adding extra data bit. (Selection options: None, Even, Odd)
- Default is set to None

Stop Bits: Stop bits lets the devices to know when the end of a character is. (Selection options: 1 or 2)
- Commonly used stop bit by most devices is 1
- Certain rare devices use stop bit of 2
- Both options are supplied for your convenience

Best practice is to have unified setting across all devices on the whole serial communication channel. Default setting are the following:
- Baud Rate: 9600
- Data Bits: 8
- Parity: None
- Stop Bits: 1

Note: Please click the SAVE button to store the setting.
Network Config Tab
Use the Network Config Tab to toggle supported devices between Redundant and Switched modes, and to specify static IP addresses for a device’s Ethernet ports.

Dante Redundancy / Switch Configuration
Depending on the manufacturer’s configuration of a device, it may be possible to toggle the device between Redundant and Switched modes, or to select a Switch Configuration.

Redundant
When a device is set to Redundant, the device will duplicate Dante media traffic to both Ethernet ports, allowing the implementation of a redundant network via the secondary port. Not all devices support redundancy.

Switched
When a device is set to Switched, the secondary Ethernet port will behave as a standard switch port, allowing daisy-chaining through the device.

Switch Configuration
Certain devices support specialist switching and/or redundancy configurations for the Ethernet ports. For these devices, the top pane of the Network Config tab will be titled 'Switch Configuration'. Please refer to the manufacturer’s technical documentation for information on the supported switching configurations for the device.

Addresses
Dante devices obtain IP addresses automatically by default, and in most circumstances there is no need to change the Addresses settings. However, static IP addresses can be assigned if necessary.
To assign a static IP address:
1. Select 'manually configure an IP Address' for the appropriate Ethernet port.
2. Enter the IP Address and Netmask.
3. Click Apply.

The DNS Server and Gateway settings are optional - the device will use network defaults if they are not
specified.

Click **Revert** to revert to the previous settings.

**Note:**
Assigning static IP addresses requires a device reboot.

**Flow Information**

The Flow Information dialog displays any audio, video, or ancillary flows to and from the device. To open the Flow Information dialog, open the Device View for the device and select View > View Flow Information.

It shows the number of transmitting flows and receiving flows of the device in question. It lists Unicast number, Multicast number, and Total number. This is necessary information, because there is a limit to the number of flows for transmitters and receivers. For example, Bolin decoder D10H is only meant to receive one video flow. Knowing this information can help troubleshoot certain concerns when routing errors or warnings occur.

Bolin Dante AV PTZ camera has 1 video, so when a second decoder tries to request HDMI routing from the same camera it caused a subscription error, with the status of no more flows from TX. If there is an easy method to resolve this concern it will be noted in the information box when hovering over the failed subscription. In this case, it suggests unsubscribing receivers or switching to multicast instead.

**Unicast / Multicast Transmit Flow Configuration**

**Information regarding Unicast**
- 1 to 1 transmission, data sent is unique
- The data will have to be completely duplicated if want to unicast to multiple recipients
- Dante AV default is unicast

**Information regarding Multicast**
- Created immediate via user intervention with the Dante Controller software
- When utilized correctly can help optimize network bandwidth
- When unmanaged it is like broadcast, where data is transmitted to every recipient, which greatly impacts the network negatively. As such, we recommend using IGMP snooping, so the data is delivered only to the intended recipients
  - **Note:** There should be only one IGMP querier for each VLAN
  - **Note:** All switch should have IGMP snooping

**When to use Unicast and when to use Multicast**

Unicast is recommended when application requires the following:
- video needs to be transmitted beyond a router
- when only one transmitting and receiving end point is needed

Multicast is recommended when application requires the following:
- when video needs to be transmitted to multiple receivers
- to fix fan out errors

**How to change from Unicast to Multicast**

1. Open device view of the transmitter device
2. Click the 'Create a new multicast flow' button in Device View to open the Create Multicast Flow dialog.
3. Check the items to include in the multicast and then click Create on the bottom left.

4. Make the proper subscriptions. (Note: multicast must be enabled first before subscriptions can be successfully made.)
Audio Routing

Camera Audio

Bolin Dante AV PTZ camera has audio input via Mic/Line-in port that is on the back panel of the camera.

- Audio input signal can be embedded with the camera local HDMI output.
- Audio input signal can be embedded with the camera Dante AV IP video streaming.
- As an audio TX endpoint within Dante AV network, the camera Mic/Line-in audio signal can be independently routed to any Audio RX endpoints.

- The 'Left' and 'Right' audio channels on the AVIO USB audio receiver are subscribed to the 'Left' and 'Right' Tx channels on the Bolin-PTZ-Camera-D220 audio transmitter. These subscriptions would cause the left and right audio channels from the Bolin-PTZ-Camera-D220 audio transmitter to be output via the USB of AVIO.
Firmware Upgrade
Dante AV Module Firmware Upgrade

Dante Device Firmware is the operating software for Dante AV module that’s developed by Audinate. For Bolin Dante AV devices, there’s Bolin customized version that’s been optimized for Bolin camera and decoder. It is released by Bolin, so please visit Bolin website www.bolintechnology.com to download Dante Device Firmware.

Important information:

For Bolin Dante AV PTZ camera, there are two firmware to upgrade:
1. Product Version: shown as Bolin D412-PV-1.3.1.dnt
2. Dante AV version: shown as DanteAV TX-ROM-V 1.3.81.dnt
Use “Dante Firmware Update Manager” to upgrade Product Version (No.1) first, then upgrade Dante AV version (No.2).

For Bolin Dante AV Encoder/Decoder, there is only one firmware to upgrade:
1. Product Version: shown as Bolin D10H-PV-1.3.2.dnt
Use “Dante Firmware Update Manager” to upgrade Product Version.

Install “Dante Firmware Update Manager” on your PC/laptop prior to starting the DanteAV firmware upgrade. Download Dante Firmware Update Manager from www.bolintechnology.com

1. Running “Dante Firmware Update Manager” and click Next button.

2. Select Update Dante Firmware.

3. Click Browse…button to select the DanteAV firmware file, for example for Dante AV Camera, and then go to next;
4. Firmware Update Manager will auto search the DanteAV device, it takes around 10 seconds, then will list all the devices on the network that the software deems to be compatible with the uploaded file.

5. Please select the device consistent with the firmware file been selected and click **Start** button to continue the upgrade operation.

**NOTE:**
For Bolin Dante AV PTZ camera, there are two firmware to upgrade:
1. Product Version: shown as Bolin D412-PV-1.3.1.dnt
2. Dante AV version: shown as DanteAV TX-ROM-V 1.3.81.dnt
Use “**Dante Firmware Update Manager**” to upgrade Product Version (No.1) first, then upgrade Dante AV version (No.2).

For Bolin Dante AV Encoder/Decoder, there is only one firmware to upgrade:
1. Product Version: shown as Bolin D10H-PV-1.3.2.dnt
Use “**Dante Firmware Update Manager**” to upgrade Product Version.

If no device is detected, please disable any antivirus and try again.
6. Firmware Update Manager will displaying **Get file**, after around one minute, it will change to displaying **Flashing**, now firmware upgrade is in processing.

7. Please don’t do any operation during the upgrade process, which takes approximately 5 mins. It will pop-up the Upgrade done window if the upgrade is successful, and the status will change to displaying Update Done, like below picture.
8. Restart the DanteAV Camera once and now it is running the new firmware.

Do Not Use Dante Updater

Bolin Dante AV devices including camera and encoder/decoder does not need to upgrade firmware via Dante Updater.

You will see the following firmware upgrade guide in Audinate Dante Controller User Guide and in the Dante Controller interface. Skip and do not use it for Bolin device firmware upgrade.

“Dante Updater is a desktop application that allows you to update the Dante firmware and software on Dante hardware devices. It is installed automatically when you install Dante Controller.

The application is linked to an online database containing firmware update files for products from multiple manufacturers. When the application is connected to a Dante network, it scans the network and identifies the firmware versions for each discovered Dante device.

If newer firmware for any device is available in the online database, you can update the device using the online file, or download the firmware file to your local machine for offline use. If firmware is found for multiple devices in your network, you can choose to update all devices simultaneously. You can always easily control which devices get updated.”

MCU Firmware Upgrade

MCU (Micro Control Unit) is the microcomputer control system built in the camera, it conducts following processing:

1. Imaging parameter setting and adjustment (ex. image exposure, color, white balance, WDR, etc.)
2. Video signal processing (ex. video input/output, video format, frame rate, scaling, etc.)
3. Control signal and protocol management (ex. serial control, IP control, Visca/Visca-Over-IP, Tally, etc.)
4. Moving parts/motor driver and movement operation (ex. zooming, Pan/Tilt speed, etc.)
5. Other signal processing and power management (ex. OSD menu, Firmware upgrade, power distribution, etc.)

MCU software (Firmware) upgrade may include:
1. Performance improvement
2. Feature and functionalities added and adjustment
3. Bug fixing
4. Feature and performance customization

Follow the steps to make the FW upgrade:

1. Prepare a USB flash drive (Formatted as FAT32)
2. Download the latest version firmware from website
3. Load the xxx.bin file onto the flash drive, and must rename the file "HD20.bin"
4. With the camera powered off, insert the flash drive to the USB port on the back panel of the camera.
5. Apply power to the camera.
6. The Status indicator light on the front panel will turn to red for a few seconds while the upgrade takes place. Once the upgrade is finished, the light will turn back to green, and the camera will proceed through a normal boot cycle.
7. Check the FW version data on the OSD System screen.

NOTE:
The firmware upgrade process is intended to be performed under the supervision of a BOLIN-Authorized repair technician. For assistance with this, please contact your authorized BOLIN Technology dealer, installer, or integrator. BOLIN Technology Technical Support can also be reached for assistance with this process.
PTZ Camera Controlling

Within Dante AV network, Bolin Dante AV PTZ camera can be controlled by:
- IR remote control via Dante network
- Serial control via Dante network
- IP control via Dante network

Use IR Remote Controller

How to use IR remote controller to directly control the PTZ camera, please refer to the user guide Part One
1. At the place where the camera is mounted, use IR remote controller to directly control the PTZ camera.
2. When Bolin Dante AV decoder is used, the decoder has camera IR receiver built in. At the remote site where the decoder is connected to the displayer, use IR remote controller to control the PTZ camera via decoder.

How to use IR remote controller to remotely control the PTZ camera via Dante AV decoder:
1. Use the IR remote controller to control the PTZ camera directly aiming to the camera.
2. Go to camera OSD setting, set the IR-RECEIVE to OFF.
3. Dante Controller serial RS422 routing check.
   - The 'RS-422' ancillary channel on the Bolin-PTZ-Camera-D220 receiver is subscribed to the equivalent channels on the Bolin-Decoder-D10H transmitter.
     These subscriptions would enable serial control RS-422 on the transmitter (decoder) via the Serial control ports RS-422 on the receiver (camera).
   - The 'RS-422' ancillary channel on the Bolin-Decoder-D10H receiver is subscribed to the equivalent channels on the Bolin-PTZ-Camera-D220 transmitter.
     These subscriptions would enable serial control RS-422 on the transmitter (camera) via the Serial control ports RS-422 on the receiver (decoder).
   - It is not needed to use IR subscription when you use Bolin Dante AV camera and Bolin Dante AV decoder.
4. Aim IR remote controller to decoder, you can control the Dante AV PTZ camera remotely.

5. When use IR remote controller via decoder, following features with IR control are not functional:
   - Fn + Scan
   - Fn + Left Limit
   - Fn + Right limit
   - Fn + F.Default
   - Fn + STATUS
   - Fn + Resolution
   - WB.R plus + - adjustment
   - WB.B plus + - adjustment
   - PT.S plus + - adjustment
   - Zoom S. plus + - adjustment
   - Preset S. plus + - adjustment
   - WDR plus + - adjustment
* Please turn on the IR Receive in OSD, then use the IR controller directly to face the camera if you want to use above features.

3. When Non-Bolin Dante AV decoder is used, you may need external IR TX/RX on both encoder and decoder side to transfer IR control signal. At the remote site where the decoder is connected to the display, use IR remote controller to control the PTZ camera via decoder. (Refer to Dante AV decoder user guide)
Use IP PTZ Control
Within Dante AV network, it supports Visca Over IP protocol via Dante network.

VISCA over IP Control
With VISCA over IP function, you can control the camera using VISCA protocol on an IP controller via Dante AV Network.

- Bolin Dante AV PTZ camera supports Visca Over IP control protocol.
- The IP controller must support Visca Over IP control protocol. For how to configure Visca Over IP setting on the PTZ controller, please refer to the controller user guide
- Within Dante Controller configuration, there is no specific Visca Over IP Config Tab for configuration.
  - Once the PTZ controller has Visca Over IP properly configured, it will automatically recognize the PTZ camera and pass control to the camera via the Dante AV network.

The communication specifications of VISCA over IP are followings:
- Interface: RJ-45 100/1000M
- Interface protocol: IPv4
- Transport protocol: UDP
- IP address: DHCP by default (Specific by camera maker)
- Port: 52381 by default (Specific by camera/controller maker, refer to camera/controller user guide)

VISCA over IP Network Configuration
The default IP configuration of the camera:
- IP Address: By default, the device is set to DHCP. IP addresses are assigned via DHCP
- Or automatically self-assigned. Self-assigned addresses on the primary interface will be in the 169.254.** range.
• VISCA over IP control port: **52381**.

Use Network Config Tab within Device View to re-assign the camera IP address if necessary.

The following Visca Over IP setup information is based on Bolin PTZ keyboard controller KBD-1010-RNV:

**Controlling via VISCA over IP**

With Dante AV PTZ camera connected and set to work with Dante AV network:

• Connect and config the VISCA over IP compatible controller to the same network
• **The IP port on your controller must be set to 52381 to communicate with the camera.**
• The IP controller should be able to recognize the Dante AV camera automatically.

**Use Bolin PTZ Camera Controller**

Model Number: KBD-1010-RNV

Here to include the guidance of how to use Bolin KBD-1010-RNV controller to control Dante AV camera:

• Via Visca Over IP protocol over Dante Network
• Via serial port Visca protocol over Dante Network

**NOTE:**

• *Here to show how to use Bolin PTZ keyboard controller KBD1010-RNV to control the Dante AV PTZ camera.*

• **For non-Bolin PTZ controller, how to use serial port to control the camera, please refer to the camera user guide Part One or decoder user guide Part One.**

• **For complete information of how to control the Bolin PTZ camera and how to use Bolin PTZ controller, please refer to camera and controller user guide.**

**Controller Setup:**

Knob function:

**P/T Speed Dial:**
- Rotate: Move Cursor
- Click: Select
- Long Press: Invert L/R (pan axis)

**Zoom Speed Dial:**
- Rotate: Select Value
- Click: Save

**Setup button**

The Setup button opens the setup menu on the LCD screen:

Default Password: 0000
The password can be changed under Setup > Keyboard Setting > Password Setting
Opens Menu on LCD screen
Use Bolin PTZ Controller for IP Control

Connect the KBD-1010-RNV keyboard controller to the Dante AV network switch from the IP port on the back of the controller. Use POE to power up the controller. (12VDC power adapter included can also be used.)

IP Configuration

The controller IP address must be within the same subnet as Dante AV camera.

The IP address can be set to either STATIC or DHCP.

- If setting the IP address to DHCP, move the cursor to the Type field, and rotate the Zoom Speed dial to change the value to DHCP. Click the Zoom Speed dial to save.
- If setting the IP address to a STATIC address, ensure that the Type field shows STATIC, and then rotate the P/T Speed dial to move the cursor between the IP address octets. Move the cursor to each octet and use the alphanumeric keypad to enter its value. Rotate the P/T Speed dial to move to the next octet and repeat until all IP address octets are set to the desired values.
- Click the Zoom Speed dial to save.
- Edit the Subnet Mask and Gateway as necessary to communicate on your network.
- Click the Zoom Speed dial to save.
- Exit this menu.
Configure Visca over IP

When all Visca-Over-IP cameras in the system are from the same brand, use the following Visca-Over-IP configuration for the controller. The Visca-Over-IP configuration data will be applied to all Visca-Over-IP cameras in the system.

Payload Header:
- A set of data carried with Visca-Over-IP protocol for camera compatibility identification. Some Visca-Over-IP cameras don’t have it.
- The camera maker that has Payload Header: SONY, BOLIN. For the cameras from these brands, Set it ON
- For the cameras from other makers, Set it OFF. Or consult the camera provider.

Port: The control port for Visca over IP.
- By default, is 52381.
- Camera brands SONY, BOLIN uses port 52381.
- Please consult your camera provider for port information.

Adding a Visca-Over-IP Camera to Keyboard

Within the controller Setup menu, go to CAM SETTING

Use this for adding Visca-Over-IP camera manually from Local Area Network (LAN)

Selecting VISCAIP (VISCA over IP) as the protocol and clicking the P/T Speed dial will cause the VISCAIP configuration menu to appear

- Rotate the P/T Speed dial to move the cursor between the IP address octets. Move the cursor to each octet and use the alphanumeric keypad to enter its value. Rotate the P/T Speed dial to move to the next octet and repeat until all IP address octets are set to the desired values.
- Click the Zoom Speed dial to save Payload Header: A set of data carried with Visca-Over-IP protocol for camera compatibility identification. Some cameras don’t have it.
- Camera brands that have the Payload Header: SONY, BOLIN camera. Set it ON.
- For the cameras from other brands, Set it OFF. Or consult the camera provider.

Port: The control port for Visca over IP.
- By default, is 52381.
- BOLIN uses port 52381.
- Please consult your camera provider for port information.
- Exit this menu

Repeat this process for each camera that you wish to control with the KBD-1010-RNV keyboard.

Scanning Dante AV network for available VISCA over IP cameras

- Press the Search button to bring up the Auto Search menu
- Move the cursor to VISCA-IP
- Select Yes to start the search
- A list of discovered cameras will appear showing the cameras that have been discovered. Scroll through the discovered cameras using the Zoom Speed dial
- To add a camera to be controlled by the KBD-1010-RNV, press the ADD button
- With the cursor on CAM ID, Assign the camera to a CAM ID by rotating the Zoom Speed dial
- Click the Zoom Speed dial to save
- Move the cursor to the Title, and use the alphanumeric keypad to give the camera a title
- Click the Zoom Speed dial to save

Repeat this process for each discovered camera that you wish to add to the KBD-1010-RNV.

**Control the Visca-Over-IP Camera**

Once the controller and the cameras are set for Visca-Over-IP use, on the controller:

- Press the camera ID then press the CAM button, the camera config info will be shown on the LED display with OK shown at the right upper corner meaning the Visca Over IP control is connected, and the communication is in place correctly.
- The camera is ready to be controlled.
- Use Joystick to control the camera

"CAM: 3 VISCAIP OK
TITLE: ABCDE001
192.168.001.26
L/R: OFF U/D: OFF

1. Press the camera ID
2. Press button CAM
3. Joystick to control"
Use Bolin PTZ Controller for Serial PTZ Control

There are two ways of wiring the serial controller to use serial control to control Dante AV camera:

1. At the local location where the camera is, directly connect to the camera’s serial port.
2. At the remote site where the decoder is, connect to the decoder serial port and control the camera over Dante AV network.

For serial control, make the following camera setting accordingly before the wire connection:

- Setup DIP switch on the back panel of the camera
- Set RS422 control method on Bottom Dip Switch.
- Set Baud Rate on Bottom Dip Switch to the same as Baud Rate setting on the keyboard you are using. Set the Baud Rate to 9600 is recommended.
- Set specific camera address that you want to control the camera for on Bottom Dip Switch.
  1. If you want to have the camera address to be automatically assigned by VISCA controller, set camera Dip Switch address to 0. The camera ID address 001 should be taken if there is one camera in the system.
  2. Usually set the camera ID address 001 if there is only one camera in the system.
- Reboot the camera after the Bottom Dip Switch has been set up correctly.

If there are more than 1 camera in the system to be controlled,

- RS422 Daisy Chain wiring should be made. How to make RS422 Daisy Chain connection, please refer to camera and controller user guide.
- Daisy Chain connection up to 7 cameras
- Visca Over IP is recommended to use for controlling more than one camera in Dante AV network.
Local RS422 Connection to the Camera

1. Use the included (Premade) Ethernet cable or T-568B Standard Ethernet cable direct connect between the controller and the camera.

2. Or you can use CAT5/6 T-568B Standard Ethernet cable direct connect between the camera and the controller to make RS422 connection by following the pin definition below:

NOTE:
Other ways of making the RS422 connection, please refer to camera and controller user guide.
At the remote site where the decoder is, connect the KBD-1010-RNV keyboard controller to the Dante AV decoder RS-422 serial port (RJ45) to control the camera over Dante AV network. Use POE to power up the controller. (12VDC power adapter that’s included with the keyboard can be used.)

1. Use the included (Premade) Ethernet cable or T-568B Standard Ethernet cable direct connect between the controller and the decoder.

2. Or you can use CAT5/6 T-568B Standard Ethernet cable direct connect between the decoder and the controller to make RS422 connection by following the pin definition below:
Use serial control over Dante AV network, you need to setup Serial Config and run routing check within Dante Controller.

- Set up Serial Config Tab within Dante Controller

**Dante Controller serial RS422 routing check.**

- The 'RS-422' ancillary channel on the Bolin-PTZ-Camera-D220 receiver is subscribed to the equivalent channels on the Bolin-Decoder-D10H transmitter. These subscriptions would enable serial control RS-422 on the transmitter (decoder) via the Serial control ports RS-422 on the receiver (camera).
- The 'RS-422' ancillary channel on the Bolin-Decoder-D10H receiver is subscribed to the equivalent channels on the Bolin-PTZ-Camera-D220 transmitter. These subscriptions would enable serial control RS-422 on the transmitter (camera) via the Serial control ports RS-422 on the receiver (decoder).
- It is not needed to use IR subscription when you use Bolin Dante AV camera and Bolin Dante AV decoder.
**Manually adding serial control cameras**

On the controller, press the Setup button to go into menu:

1. Go to CAMERA SETTING
2. With the cursor on the Camera Selection, use the Zoom Speed dial to select which camera slot to assign a camera.
3. If the camera has Visca address set to 0 or 1, set the CAM ID to 001.
4. Set the camera Title if desired.
5. Set Protocol:
   a. Each camera can be configured to be controlled using any of the following protocols:
      - VISCA
      - PELCO-D
      - PELCO-P
      - ONVIF
      - VISCAIP (VISCA over IP)
      - CGI*
   Select VISCA, the Baud Rate Setting screen will appear. Use the Zoom Speed dial to set the baud rate.
6. Click the Zoom Speed dial to save, and then exit this menu.

**Control the Camera via Serial RS422**

Once the controller and cameras are set for serial control, on the controller side:

- Press the camera ID then press the CAM button, the camera config info will be shown on the LED display with OK, indicating successful connection. The camera is ready to be controlled.
- Use Joystick to control the camera