



THE ULTIMATE NDI® EXPERIENCE INTEGRATED.



USER GUIDE

December 2022

NDI

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Important Information

Legal Notice

To ensure account security, please change the password after your first login. You are recommended to set a strong password (no less than eight characters).

The contents of this document are subject to change without prior notice. Updates will be added to the new version of this manual. We will readily improve or update the products or procedures described in the manual. Best effort has been made to verify the integrity and correctness of the contents in this document, but no statement, information, or recommendation in this manual shall constitute formal guarantee of any kind, expressed or implied. We shall not be held responsible for any technical or typographical errors in this manual.

The product appearance shown in this manual is for reference only and may be different from the actual appearance of your device. Due to uncertainties such as physical environment, discrepancy may exist between the actual values and reference values provided in this manual.

Use of this document and the subsequent results shall be entirely on the user's own responsibility.

Regulatory Compliance

FCC Part 15

This equipment has been tested and found to comply with the limits for digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

LVD/EMC Directive

This product complies with the European Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC.



Welcome to BirdDog

Thank you for purchasing your BirdDog SDM module. If you have any questions regarding the device, please contact your authorized dealer.

Using This Manual

Your BirdDog SDM module is a sophisticated device, so please read this manual and retain for future reference.

Tip

When viewing the diagrams in this manual, use the zoom controls in your browser or PDF reader to reveal more detail.

First Step

Firmware Upgrade

Before you use your new SDM module, it's a good idea to upgrade to the latest firmware. We are always adding new features and improving the performance of our products, so installing the latest firmware will provide you with the best user experience.

To upgrade the firmware, please follow the **Firmware Upgrade Instructions** located in your firmware download folder and perform upgrade process.

The latest firmware files are available for download here: [Firmware Updates](#)

We're Invested In Your Success

We pride ourselves on being approachable and easily contactable. We'd love to hear from you.

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Welcome to the Future

What is NDI®?

Your new SDM module has been designed to support the cutting edge NDI® video transmission standard.

NDI® (Network Device Interface) is a high-quality, low-latency, frame-accurate standard that enables compatible devices to communicate, and deliver and receive high definition video over your existing Gigabit Ethernet network.

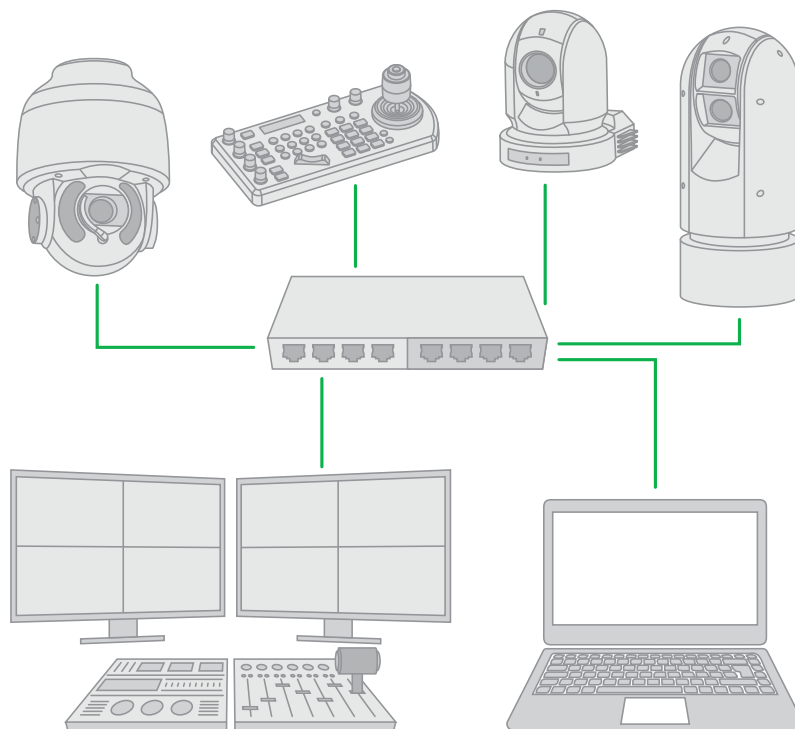
Operating bi-directionally, NDI® devices can be auto-detected, powered and controlled over the same Ethernet cable used to send the video and audio. If you have a Gigabit network, you have the potential for a streamlined, interconnected, video production environment.

With the introduction of NDI® 5, you can now securely share network sources between remote sites anywhere in the world – on a single network port. Even a smartphone can be a NDI® source.

Transitioning to NDI® can also occur gradually. Existing SDI or HDMI signals can easily be converted to an NDI® stream and piped where required on your network and converted back only at the necessary endpoints.

BirdDog has been on the NDI® journey since the very beginning, and your SDM module is just one of our products designed to take advantage of the features and potential of NDI®.

For more information on NDI®, please refer to this [page](#) on our website.





BirdDog SDM Overview

Built upon the Intel® SDM platform, the BirdDog SDM module easily installs inside an SDM compatible flat panel display providing integrated and scalable NDI® video from any compatible source. Power to the module is automatically provided by the host display.

The modules are controlled by BirdDog OS, which features built in Crestron control and RESTful API support for complete remote automation.

There are two BirdDog SDM modules to choose from – M1 and M2.

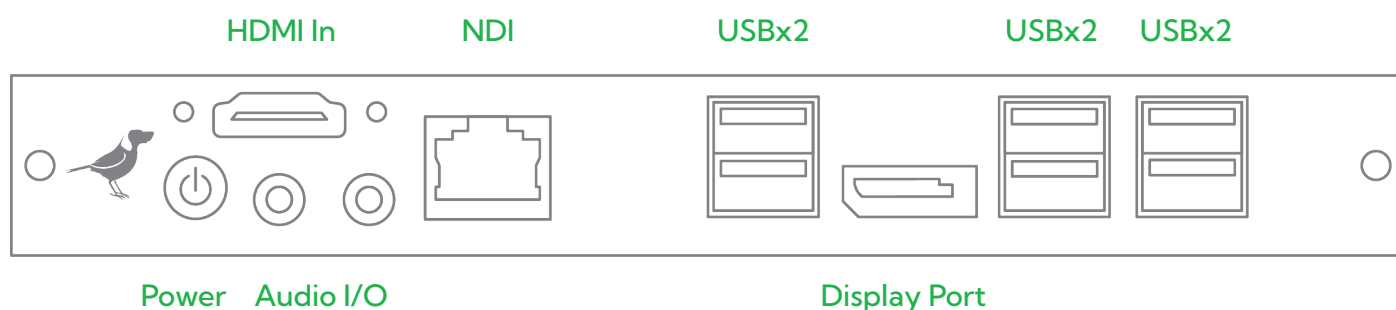
- M1 is a full NDI® Sender and Receiver based on the Intel SDM-L form factor.
- M2 is an NDI® Receiver built on the Intel SDM-S module. With support for resolutions all the way up to 4Kp60, there is also a RESTful API for programming completely automated spaces.

With the optional Dante activation licence, both the M1 and M2 have Dante audio support. The M1 can embed Dante audio to, and de-embed Dante audio from, the NDI® stream while the M2 features Dante embedding.

BirdDog Central

BirdDog [Central](#) is a natural partner for your SDM module. By teaming up Central with any NDI® source, including all BirdDog hardware capable of creating NDI® sources, you can easily direct your NDI® streams to your SDM enabled displays.

For complete Technical Specifications, please see this [webpage](#).



Supported Video Formats

- (4K) 2160p 25, 29.97, 30, 50, 59.94, 60
- (HD) 1080p 25, 29.97, 30, 50, 59.94, 60
- (HD) 1080i 50, 59.94, 60
- (HD) 720p 50, 59.94, 60



Card Installation



ESD (Electrostatic Discharge) Precautions

Electrostatic energy can be destructive to electronic components. The warranty may be void if equipment is damaged by ESD.

- Always wear a grounded anti-static wrist strap when handling cards.
- Always hold the card by the corners and avoid direct contact with any of the components.
- Never let the card come in contact with clothing. Clothing can generate high levels of electrostatic energy.

General Installation Procedure

Please consult the manual for your specific display for directions on module installation. However, the general procedure to install a Display option board, such as the SDM module, is as follows:

1. Turn off the display main power switch.
2. Remove the screws from the option board slot cover plate and remove the cover.
3. Align the SDM module to the rails of the slot and gently slide the module into place until it is firmly seated. Secure the module in place with the removed screws.
4. Turn on the display. The SDM module will show as an available input in the display OSD menu.



BirdUI

Connect one end of a CAT5e or CAT6 Ethernet cable to the NDI® port of the module and connect the other end to your switch or computer. Ensure that you are on the same subnet as the module, open a connected browser and type **192.168.100.100** into the address bar and press [Enter]. The read only SDM module Dashboard window should display. If it does not, please check your connections or consult your IT professional.

The BirdDog web user interface panel (BirdUI) allows you to configure module settings. While the BirdDog SDM has default settings that will usually provide an immediate 'plug and play' experience, you can fine tune the card to provide optimum performance for your particular application.

BirdUI Layout

The BirdUI is organized into the following panels:

1. Dashboard

Overall view of important information such as the network connection type and NDI® video stream format and resolution.

2. Network

General network settings such as DHCP IP Address details, timeout fallback address and camera network name, as well as NDI® specific network settings

3. System

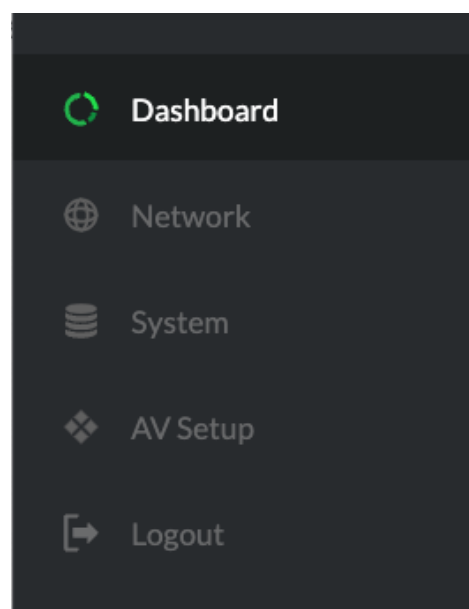
System admin functions such as updates, password change, designation of group access and system reboot.

4. AV Setup

Settings for NDI® decode / encode management and audio settings.

5. Logout

Click to logout from the BirdUI.





Dashboard

The Dashboard displays an overall view of important module settings.

1. System Info

Current computer system CPU utilization.

2. Device mode / Source Status

Displays the Encode or Decode mode of the unit and whether the selected source is available.

3. Network Bandwidth

Network bandwidth consumption of the current NDI® output stream(s).

4. Status

Operation mode and format of the selected NDI® source or output.

5. Stream Info

- Video Resolution.
- Video Frame Rate.

6. System Details.

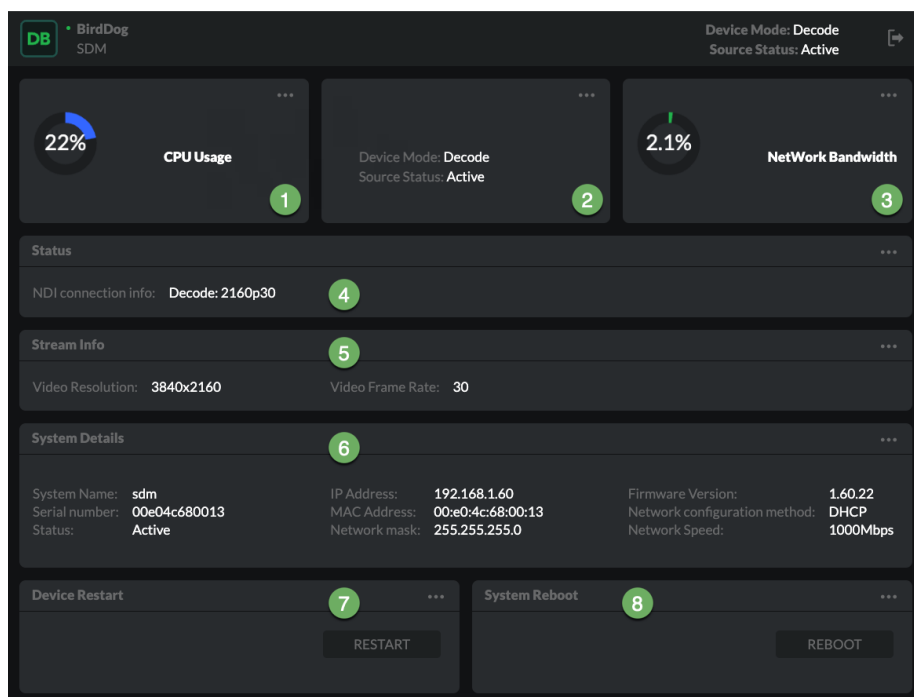
- SDM module name.
- Network details.
- Online status of the camera.
- MAC address and current firmware version of the camera.

7. Device Restart

Click this button to restart the NDI® video engine to ensure that any manual setting changes will be processed correctly.

8. System Reboot

Click this button to soft reboot the module, for example, after installing new firmware.





Login

To make any changes via the web browser interface BirdUI, you'll need log in. The BirdUI is secured by a user password. The default password is: **birddog** (one word, lower case). Refer to [Password Settings](#) to change the default password.

Network Details

Network Details			
Configuration method	☐ STATIC ☒ DHCP	DHCP Timeout	20
IP Address	192.168.1.60	DHCP fallback IP address	192.168.100.100
Subnet Mask	255.255.255.0	DHCP fallback subnet mask	255.255.255.0
Gateway Address	192.168.1.20	BirdDog name	screen2
APPLY			

Configuration Method

You can configure the SDM module to operate on the network with a dynamic (DHCP) IP address or a fixed address. For smaller networks, DHCP networking is generally suitable, however larger managed networks will often require that each device has a dedicated, *static* IP address.

DHCP

DHCP is set as the network configuration by default.

Static

To enable a static IP Address, change the Configuration Method to Static and add the Address, Mask and Gateway information. Particular attention should be paid to the Address and Mask fields, as incorrect information will result in the SDM module not being visible on the network and a factory reset will be required in order to recover the unit.

DHCP Timeout, Fallback IP Address, Fallback Subnet Mask

You can set the timeout period for the unit to be assigned a DHCP IP address. After this period, the device will default to the designated fallback IP address which by default is **192.168.100.100**.

BirdDog Name

You can name each SDM module with a meaningful name to make identification easier. Be sure to make the name unique, as no two devices on the network should have the same name. This name will appear on any NDI® receiver when it looks for video on the network. The name must not include any special characters and can be any combination of 'a-z, 0-9, and -'.

In this image, the SDM module has been named **screen2**. After renaming your SDM module, navigate back to the Dashboard and click REBOOT DEVICE. The device will re-initialize and you'll be good to go.

DHCP fallback subnet mask	255.255.255.0
BirdDog name	screen2



NDI Network Settings

NDI Network Settings	
Transmit preferred method	TCP
Multicast net prefix	239.255.0.0
Multicast net mask	255.255.0.0
Multicast TTL	1
Receive preferred method	TCP
NDI discovery server	OFF
NDI discovery server IP	192.168.1.122
APPLY	

The SDM module operates with the latest NDI® Libraries. There are several options to configure its behaviour in an NDI® network. Each configuration has its benefits, however it is recommended to utilise the default TCP transmit method unless you have reason to change.

Preferred Transmit / Receive Method

TCP

TCP is the default transmission method for NDI®. It operates well within local networks with predictable latency and limited jitter. BirdDog recommends that TCP be used for typical applications, and using alternative transports only for specific reasons.

UDP

UDP is recommended for networks where there is extended latency. The nature of UDP allows dropped packets and doesn't establish handshaking dialogues to confirm each received packet – which can improve performance. UDP can have some consequences if there are other issues on the network, such as jitter or packet loss, as lost packets will not be re-sent.

Multicast

Multicast is especially useful for use cases that require a single source to be received on multiple receivers simultaneously. Using Multicast offloads the distribution of the NDI® A/V packets from the device to the network infrastructure. You should take care to ensure your network is specifically configured to support Multicast, as use on an ill-prepared network can create unintended network problems.

NDI Discovery

By default, NDI® utilizes mDNS (multicast Domain Name System) to create a zero configuration environment for network discovery. The primary benefits of using mDNS is that it requires little or no administration to set up. Unless the network is specifically configured to not allow mDNS, NDI® sources will be discovered.

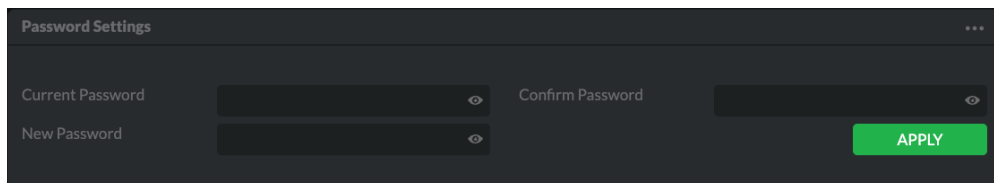
The NDI® Discovery Service is designed to allow you to replace the automatic discovery with a server that operates as an efficient centralized registry of NDI® sources resulting in much less bandwidth use. NDI® discovery server also helps with location of devices that reside on different subnets. The NDI® Discovery Server is available as part of the free [NDI Tools](#) in NDI version 5.5 (C:\Program Files\NDI\NDI 5 Tools\Discovery\NDI Discovery Service.exe).

1. If you are using a NDI® Discovery Server, click the ON button.
2. Enter the IP address of your NDI® Discovery Server.
3. Click the APPLY button to save your changes.



System

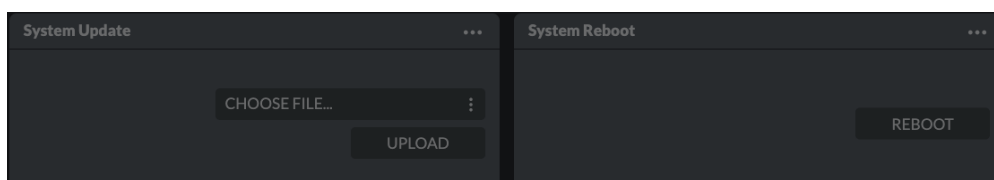
Password Settings



The WebUI is secured by a user password. The default password is **birddog** (one word, lower case). It is recommended to change this password to retain administration rights to prevent unauthorized changes since the WebUI grants full access to the configuration settings.

1. Enter the current password.
2. Enter the new password. Confirm the new password and click the Apply button.

System Update

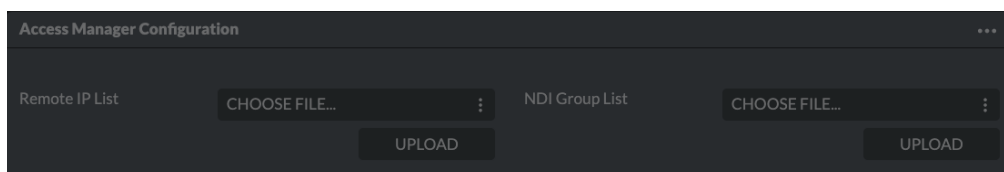


We are always adding new features and improving the performance of our products, so installing the latest firmware will provide you with the best user experience. To upgrade the firmware please follow the **Firmware Upgrade Instructions** located in your firmware download folder and perform upgrade process.

After updating, click the Reboot button to perform a system reboot.

The latest firmware files are available for download [here](#).

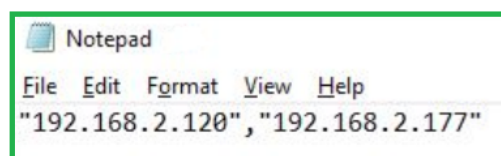
Access Manager Configuration



Remote IP List

By default, NDI® devices are visible to each other only when they're on the same VLAN. If you want visibility or control of a device on a different VLAN, you need to add it's address manually as a Remote IP.

1. Click the CHOOSE FILE button to load your Remote IP List in UTF-8 encoded string format.
2. Click the UPDATE button. Do not upload a blank list.

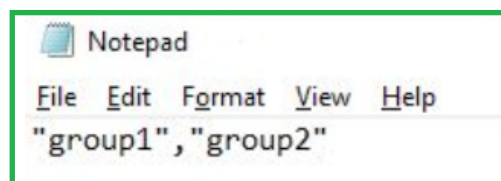




NDI Group List

Set the NDI group list. NDI® groups allow you to restrict communication to only devices that belong to the same NDI® group. NDI® Groups can be very useful in larger environments to control visibility and access amongst various groups.

1. Click the CHOOSE FILE button to load your NDI Group List in UTF-8 encoded string format.
2. Click the UPDATE button. Do not upload a blank list.



AV

Device Settings

Operation Mode

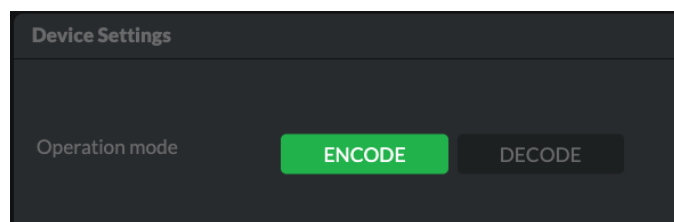
The SDM module can operate in either Encoder or Decoder mode.

Encode

Encodes the incoming HDMI signal to NDI®.

Decode

Decodes the NDI® input for display on the monitor.



The following settings apply to **Decode** mode.

Video Output

Output Mode

Select the required Output mode from the dropdown:

Decode NDI to original video format

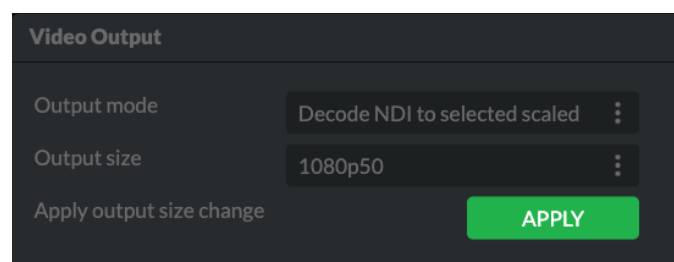
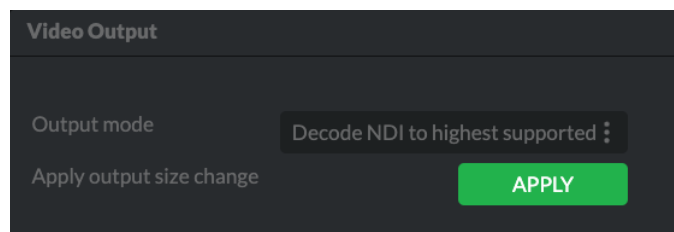
Decodes the NDI® video to the original format.

Decode NDI to highest supported

Decodes the NDI® video to the highest format supported by the SDM module (4Kp60).

Decode NDI to selected scaled

When selected, the Format dropdown is displayed. Select the format that you wish to scale the output video to.





NDI Decode

1. If necessary, click the Refresh button to add newly discovered sources to the available sources list.
2. Click on the Available NDI Sources dropdown to select the source that you wish to decode and display on the monitor.
3. Click the Apply Source Change button. The source will then be displayed in the Current Source field along with the source IP address.

The following settings apply to **Encode** mode.

Encode Settings

A source connected to the HDMI in port can be encoded and output via NDI® or SRT. SRT is a WAN protocol that wraps a UDP stream.

Broadcast

Select NDI or SRT as the transmission protocol.

When SRT is selected, the following additional settings display:

Company

Select an API Token from the dropdown. Click the Add button to add a new API Token. Click the Trashcan button to remove a selected API Token.

Endpoint

Select the desired Cloud Endpoint.

SRT port

Enter the desired SRT streaming port number.



Glossary

Domain

A domain contains a group of computers that can be accessed and administered with a common set of rules. Domain can also refer to the IP address of a website on the Internet.

DNS

DNS (Domain Name System) is a system used by the Internet and private networks to translate domain names into IP addresses.

mDNS

mDNS (Multicast DNS) refers to the use of IP multicast with DNS to translate domain names into IP addresses and provide service discovery in a network that does not have access to a DNS server.

EDID

Extended Display Identification Data (EDID) is an AV industry standard which automatically communicates specification between devices, allowing your AV source to send the most compatible signal to your screen.

Ethernet

Ethernet, standardized as IEEE 802.3, refers to a series of technologies used to connect computers and other devices to a LAN (Local Area Network) or wide area network (WAN).

Firmware

Firmware is a class of software held in non-volatile memory that provides the low-level control for a device's hardware.

Gigabit Ethernet (GigE)

An Ethernet capable of transmitting frames at a rate of a gigabit per second. A Gigabit capable Ethernet network is recommended for NDI® production workflows.

IP

IP (Internet Protocol) is the communications protocol for the Internet, many wide area networks (WANs), and most local area networks (LANs) that defines the rules, formats, and address scheme for exchanging datagrams or packets between a source computer or device and a destination computer or device.

LAN

LAN (Local Area Network) is a network that connects computers and devices in a room, building, or group of buildings. A system of LANs can also be connected to form a WAN (Wide Area Network).

Mbps

Mbps (Megabits per second) is a unit of measurement for data transfer speed, with one megabit equal to one million bits. Network transmissions are commonly measured in Mbps.

NDI®

NDI® (Network Device Interface) is a standard allowing for transmission of video using standard LAN networking. NDI® comes in two flavours, NDI® and NDI®|HX. NDI® is a variable bit rate, I-Frame codec that reaches rates of around 140Mbps at 1080p60 and is visually lossless. NDI®|HX is a compressed, long-GOP, H.264 variant that achieves rates around 12Mbps at 1080p60. BirdDog uses NDI®.



PELCO

PELCO is a camera control protocol used with PTZ cameras. See also VISCA.

PoE

Power over Ethernet

Port

A port is a communications channel for data transmission to and from a computer on a network. Each port is identified by a 16-bit number between 0 and 65535, with each process, application, or service using a specific port (or multiple ports) for data transmission. Port can also refer to a hardware socket used to physically connect a device or device cable to your computer or network.

PTZ

Pan, tilt and zoom.

RJ45

A form of standard interface commonly used to connect computers onto Ethernet-based local area networks (LAN).

RS422, RS485, RS232

Physical layer, serial communication protocols.

Subnet

Subnet or subnetwork is a segmented piece of a larger network.

Tally

A system that indicates the on-air status of video signals usually by the use of a red illuminated lamp.

TCP

TCP (Transmission Control Protocol) is a network communications protocol.

UDP

UDP (User Datagram Protocol) is an alternative protocol to TCP that is used when reliable delivery of data packets is not required.

VISCA

VISCA is a camera control protocol used with PTZ cameras. See also PELCO.



WELCOME TO THE FUTURE.

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