Digital Alert Systems

DASDEC™-III
Hardware/Installation Guide

Revision 1.2

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FCC Information

FCC Information

FCC ID: R8VG3DAS01

The DASDEC3 complies with Part 11 (47 CFR 11) of the FCC's rules for EAS encoders and decoders, including a Declaration of Conformity for Common Alerting Protocol (CAP) compliance, and are registered with the FCC under identification number: R8VG3DAS01.

This equipment has been tested and found to comply with the limits for a Class A 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/her own expense.

California Proposition 65 Statement

Proposition 65 is a California law officially known as the ***Safe Drinking Water and Toxic Enforcement Act of 1986*** requires businesses to warn consumers about significant exposure to chemicals known to cause cancer, congenital disabilities, or other reproductive harm. Therefore, if a commercial product contains a chemical listed under Proposition 65, the business must warn California consumers.

Businesses must provide a clear and reasonable warning before knowingly and intentionally exposing individuals in California to a listed chemical. However, a warning is not required if the anticipated exposure level will not pose a significant risk of cancer or is significantly below levels observed to cause birth defects or other reproductive harm.

Digital Alert Systems makes every effort to reduce or eliminate the use of hazardous substances. Products manufactured by Digital Alert Systems may contain chemicals such as lead and lead compounds listed by the state of California as causing cancer, birth defects, or other reproductive harm. Regardless, DAS products are designed and intended for commercial applications only and not for consumer sale or use. Therefore, exposure to hazardous chemicals in DAS products is considered "occupational exposure." Customers who purchase products for commercial applications in California, please refer to www.P65Warnings.ca.gov for more information.

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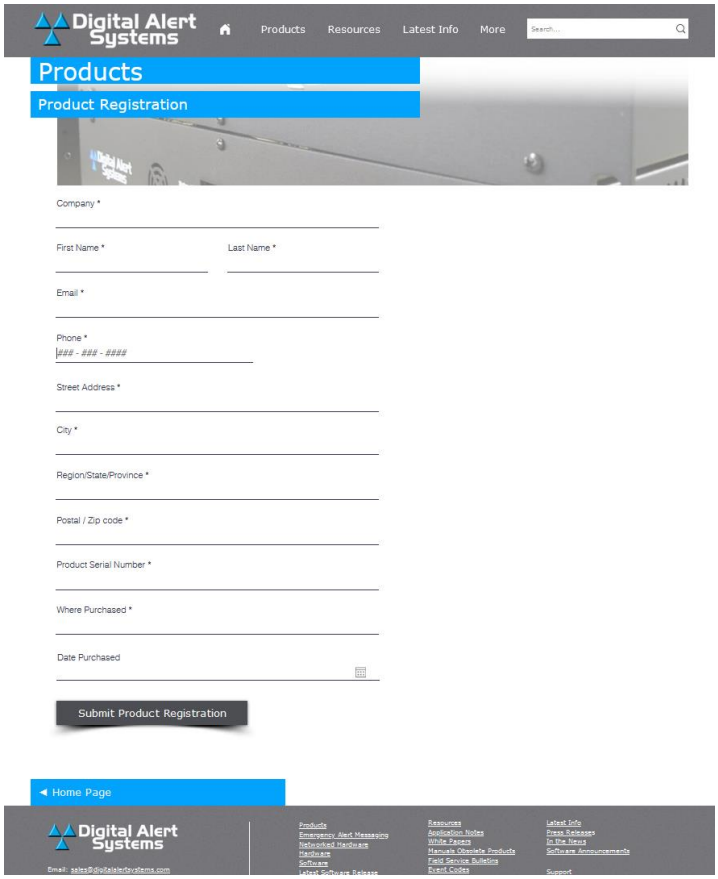
Register your DASDEC-III

Register your DASDEC-III to stay up to date with the latest software and news regarding your DASDEC-III and future changes. To register, fill out the form at www.digitalalertsystems.com/product-registration and submit.



Or, scan the QR code to the right or on the S/N label on the unit's rear panel to submit your information. You will be notified by email of the latest updates and enhancements that can be downloaded from our website.

Accessories included:

- Power cord
- 7-pin terminal block
- Network crossover cable,
- Four rack mounting screws.
- A VGA Dongle is provided when optional DAS3-MPEG2 or MPEG-DASH are purchased.

Items NOT included:

- Wiring for audio and RF connections.
  Note: ADAPTERS MAY BE REQUIRED to connect the audio sources. For more information, refer to the sections regarding Program Audio and Monitor 4 Wiring – Analog/ AES Digital.

Getting Started – What's needed:

- A PC, laptop, or tablet and an RJ45 networking cable.
- A valid, unused IP address. Speak with your network administrator for a proper IP address.
- The county names for the areas where the equipment will be installed and/or transmitting.
- The radio frequencies for your Local Primary 1 (LP1) and Local Primary 2 (LP2). These can be obtained from the state EAS plan or the State Emergency Communications Coordinator (SECC) for your state. If applicable, you may also need the frequency for a NOAA radio station.

Introduction:

The DASDEC-III Emergency Alert System (EAS) Analog and Digital CAP/ Encoder/Decoder platforms are relatively easy to install and set up. This manual covers the installation and hardware connections of the DASDEC-III.

Hardware:

The DASDEC-III is a 2U rack-mounted EAS device that utilizes standard computer technology in a dedicated chassis with broadcast quality connectors. The PC motherboard uses industry-standard connectors for USB, PS/2, serial, VGA, HDMI, networking, and audio. In addition to the standard motherboard connections, the platforms feature broadcast-quality video, audio, antenna, contact closure, and power connectors. All external connectors are located in the rear of the unit. An LCD with a backlit tactile keypad, status/alert LEDs, and an internal speaker are located on the front of each unit.

Front Panel:

Front Panel view of the DASDEC-III

Front Panel Display:

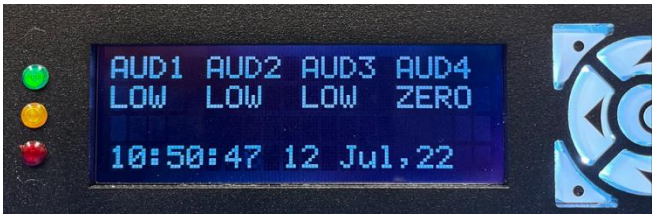
The backlit LCD displays information as “pages” with four lines of data. The fourth line always displays the currently set date and time. The pages may be cycled using the up and down arrows on the directional pad to the right of the display. The display automatically switches back to page one after a few seconds of inactivity.

Page One:

- Line 1 - the total number of active alerts.
- Line 2 –a crawl of one of those active alerts and whether the alert was decoded (**D**), originated (**O**), CAP (**C**), or forwarded (**F**).
- Line 3 –the time that the currently displayed alert will end.

Page Two:

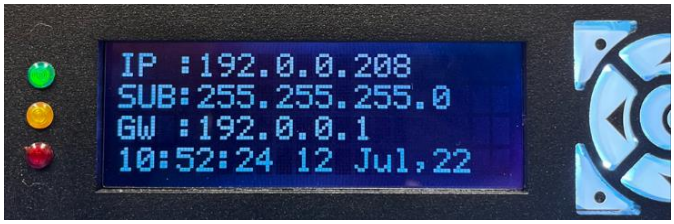
- Line 1 – audio sources 1 through 4. Press the down arrow again to display the IPAWS sources.
- Line 2: source status: HIGH, ELEVated, OK, LOW, or ZERO.



- For IPAWS sources: CONNected, POLLing, or OFF is displayed.

Page Three:

- Line 1 – device IP address.
- Line 2 – subnet mask.
- Line 3 – default gateway IP address.



Page Four:

- Line 1 – current software version.
- Line 2 – device name of the DASDEC-III.

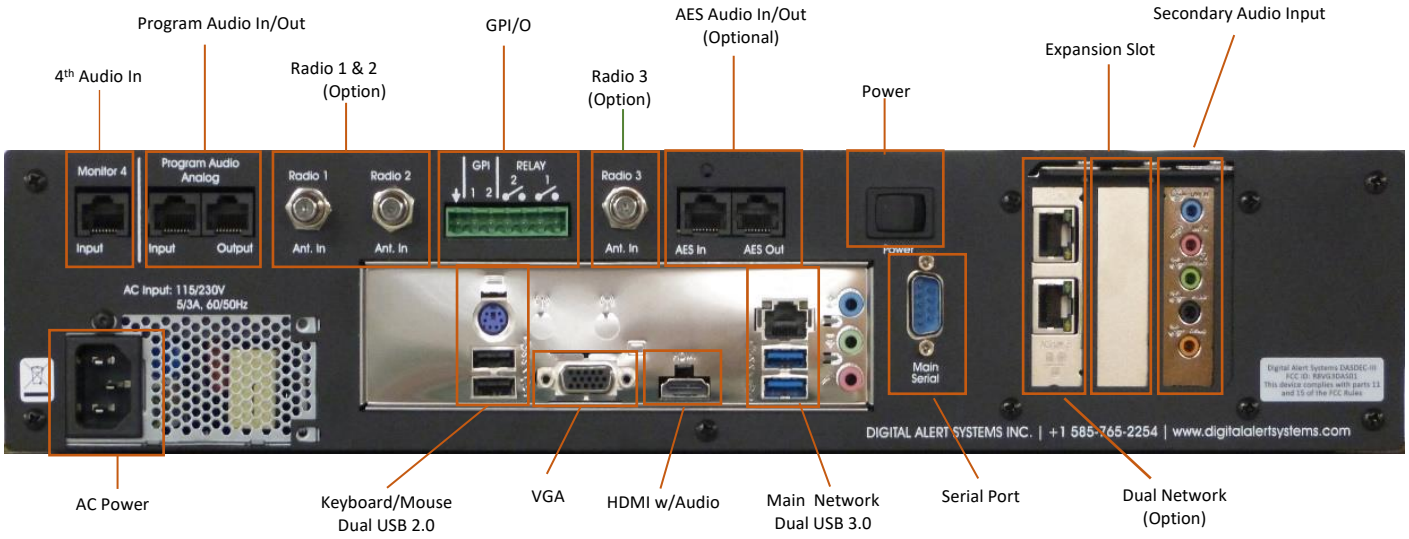
Status LEDs

Light Emitting Diodes (LEDs) display a variety of system status conditions.

System Status	Green LED	Yellow LED	Red LED
Initial Power on	Off	Off	Rapid Flash
System begins to boot	Slow Flash	Off	Off
System nears a ready state	Rapid Flash	Off	Off
System ready	On	Off	Off
Decoding an incoming alert	On	Off	Rapid Flash w/ Pauses
Sending an alert	On	Off	On
Awaiting Manual forward or acknowledgment	On	Slow Flash	Off
Alert being Held for GPI closure	On	Off	Rapid Flash
EAS device is non-operational (during restart/ upgrade)	Flash	Off	Off

Back Panel

All hardware connections are provided on the device's back panel.



Back Panel View of the DAS3-GX or DAS3-EX with DAS3-AES and EXP-2NICGIG options

The image above includes the Dual Port Gigabit Ethernet Expansion and AES Audio Options. Not all DASDEC-III devices will contain the same rear connectors.

The Expansion Slots are used for optional additional Network Interfaces and additional EAS Audio input hardware. Expansion hardware is only available with the DAS3-EX or the DAS3-GX.

Installation

The DASDEC-III frame mounts in an EIA-compliant equipment rack by means of four rack screws fastened through the front mounting ears.

For safe, long-term reliability:

- Ensure the ambient air temperature surrounding the EAS device is within the product's specified operating temperature range.
- Maintain adequate ventilation within the rack.
- Ensure that adequate space exists on all sides of the frame for sufficient airflow. It is recommended a 1RU space be maintained between equipment, to avoid the transfer of heat between devices.
- Ensure the location of the EAS device is accessible, dry, and free of dust.

Rack Units	Height	Depth	Width	Weight
2RU	3.50" (8.89 cm)	12.0" (30.48 cm)	19.0" (48.26 cm)	15 lbs (6.8 kg)

Radio Antennas

The EAS device can be equipped with two or three (optional) internal radio receivers and connect using

industry-standard F-type connectors for each receiver. If not equipped, each radio's F-type connector will be covered with a cap plug. Review your state's Emergency Alert System Plan for the appropriate monitoring assignments; these assignments will assist in determining the proper antenna for the frequencies that need to be monitored.

The EAS device's internal radios are designed to receive the following frequencies:

Band	Frequencies	Min. Input Level	Max. Input Level
FM	87.9 - 107.9 MHz	30-40 uV(-80 to -77 dBm)	1mV (-48 dBm)
NOAA	162.440 - 162.550 MHz	3-4 uV (-98 to -97 dBm)	<500 uv (-55 dBm)
AM	530 - 1700 KHz	2-3 uV (-102 to -98 dBm)	<500 uv (-55 dBm)

For proper reception, use a good quality, shielded RG6 coaxial cable and connectors. The quality of the incoming audio signal will affect the operation of the audio decoders, and the quality of the forwarded audio messages.

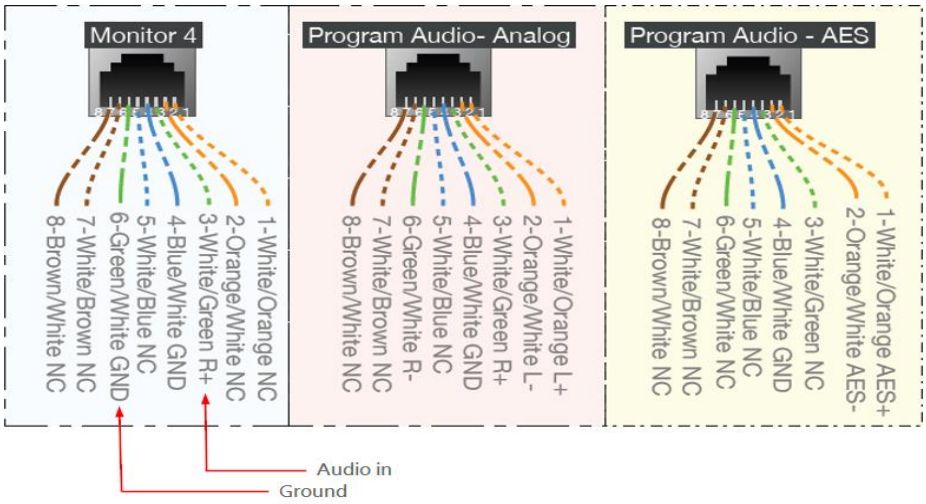
Audio Wiring

Overview

The DASDEC-III platform has two types of analog audio: EAS Monitored Audio and Program Audio. EAS Monitored Audio Inputs feed the internal EAS decoders for processing. Only signals with EAS information should be directed to these inputs. Program Audio connections are used for internal switching of program audio.

Program Audio and Monitor 4 Wiring – Analog/AES Digital (optional)

The DASDEC-III utilizes RJ45-style connectors for analog and digital audio. These balanced audio outputs deliver a continuous audio program stream that switches between the Program Audio inputs and EAS audio during an alert.
The following wiring diagram illustrates the connections using common T-568B cabling.



Connection diagrams for EAS Monitor Input 4 (DAS3-EX/GX), Analog and AES Program Audio

There are several sources for professionally terminated cables in various lengths and formats. One excellent source is Studio Hub (https://studiohub.com/adapters/)

AES Digital Audio Wiring

An optional AES audio input/output function is available for the DASDEC platform. This includes the capability for an AES digital audio output, along with a switching AES audio output when an AES audio input is connected. Refer to the diagram above for the cabling of the AES audio inputs and outputs.

EAS Monitoring Inputs

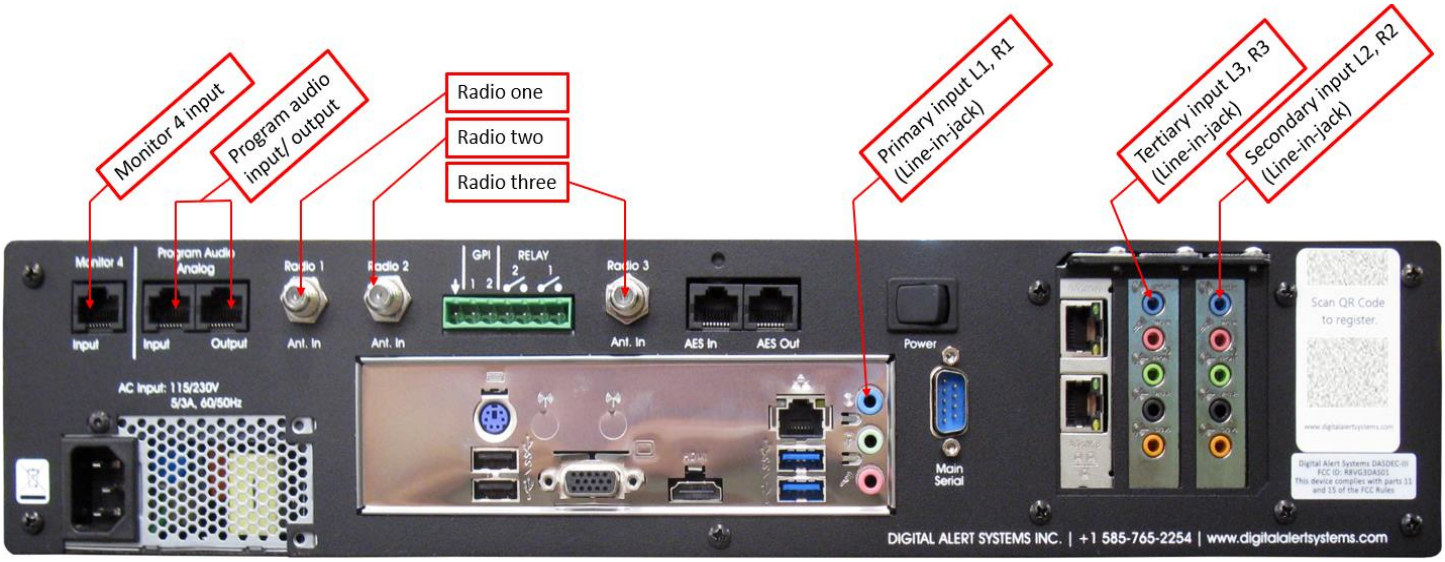
Radio signals for the DASDEC-III to decode EAS alerts can be received in two ways:

1. Via internal radios, connect to your site's antenna via a coaxial connection.
2. Via external radios that pass on audio to the DASDEC-III via a line-in-jack.

Four connection options are available.

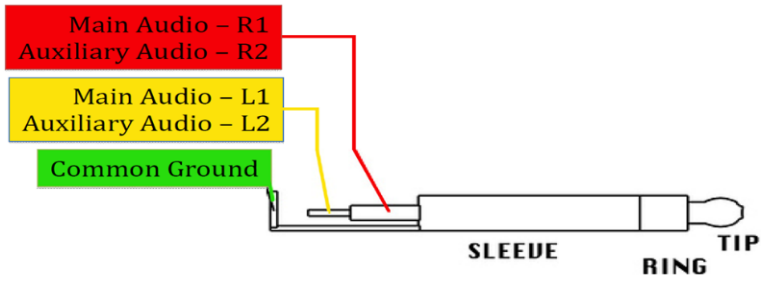
- A line-in-jack connection with external radios using a 3.5mm jack. and
- An additional sound card (EXP-EAS) with its 3.5mm jack.
- Radio tuners Radios 1, 2, and 3
- Monitor 4 input

See the back panel graphic on the next page for references to specific components.



Back Panel View shown with optional EXP-2NICGIG and EXP-EAS monitoring audio expansion

- Each audio line connector (3.5mm TRS) supports two EAS decoders. The left side of the input is decoded separately from the right side.
- The line-in-jack option uses a monoaural connection, meaning that one 1/8 mini plug will need to be wired to provide the audio of two sources provided from external radios.
- Refer to the diagram below:
    - The tip is left input, the ring is right input, and the sleeve is common ground.
    - Line-in-jack will utilize the blue 3.5 mm jack for main input 1 & 2 and if applicable the blue 3.5 mm jack on the sound card or aux input 3 & 4.

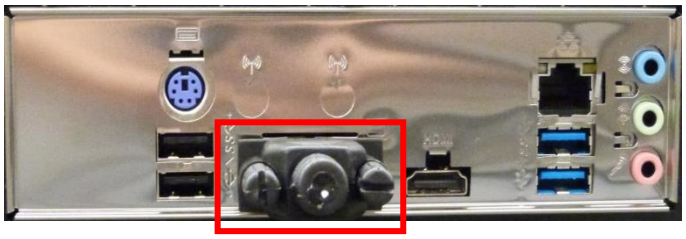


Video Wiring

HDMI-Video Output is a standard on the DAS3-GX model and optional for all other DASDEC-III units. When enabled, full-screen emergency alert details and accompanying audio is present during alert forwarding and/or alert origination via the HDMI connector on the back panel.

MPEG Encoder

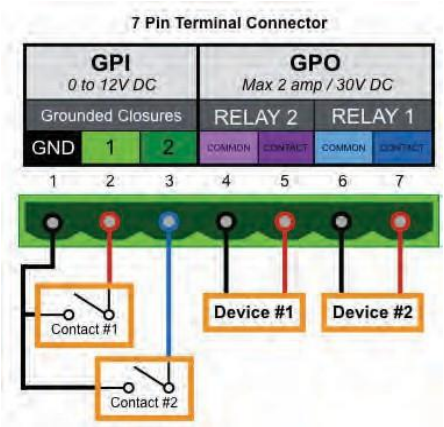
The optional MPEG Encoder requires installing a “dongle” (shipped in the accessory kit) that must be placed on the VGA port. The system must have this installed during a cold start for the system to properly recognize that the port is active.



Back Panel View showing placement of MPEG “dongle”

General Purpose Input/Output (GPIO)

The EAS platform comes standard with two General Purpose Input (GPI) contact closures and two General Purpose Output (GPO) relays. The connector is located on the back panel, a 7-pin pluggable terminal connector is provided.



GPIO Terminal Connector

GPO relay outputs are programmable. Triggering can be filtered against specific alert FIPS Groups and EAS Group codes. Events that can trigger a GPO relay include:

- Remain closed during EAS audio playout
- Momentarily closed at start of EAS audio playout
- Momentarily closed at start of an alert that has been decoded but not forwarded,
- Remain closed if an alert is held or delayed pending a GPI action.

The EAS device comes with two General Purpose Input (GPI) contact closures. They can be programmed to trigger a variety of actions, such as:

- Issue a Required Weekly test
- Trigger origination of an alert header/attention signal, pausing for voice dub of the audio message, followed by trigger of the EOM audio
- Review of audio portion of an active alert
- Active alert acknowledgment
- Forwarding of a monthly test with original audio
- Re-enabling of active alert forwarding capability

Additional Expansion GPIO Options

For installations that require additional GPIs and GPOs, there are several options available that will expand the standard capabilities. An internal GPIO card may be installed in the PCI expansion slot to enable eight additional GPIs and eight additional GPOs. If the PCI expansion slot is unavailable, several network-connected GPIO devices, such as the R190A Remote LAN Hub Controller / Net GPIO, are options. The DASDEC platform can mix and match any combination of internal and network-connected GPIO devices.

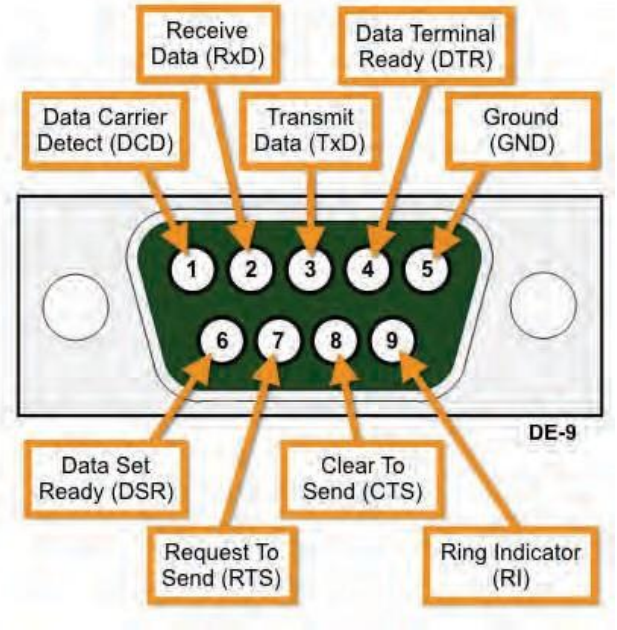
Serial Port Wiring

Each EAS device has one RS-232 serial port on the back panel. The serial ports connect to and drive a variety of external video character generators and BetaBrite LED signs. The software supports a wide variety of serial protocols, including the most commonly used protocols in legacy EAS equipment, such as TFT Standard and Sage Generic.

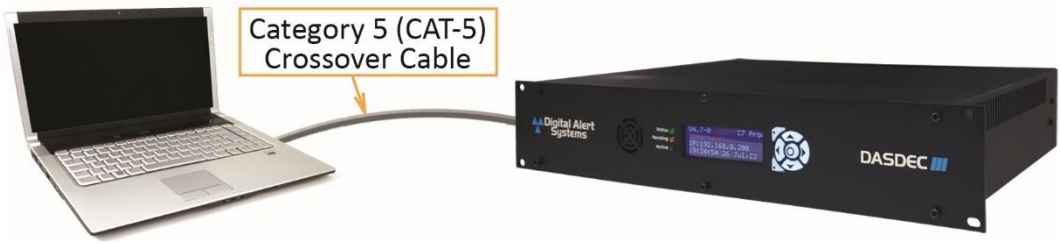
An optional USB/serial port expander can provide up to four additional RS-232 serial ports. This option is useful when additional character generators and LED signs are needed.

Each serial port has the same pin-out, as shown below.

Serial Port Conns (Chassis Side)



Direct Connection

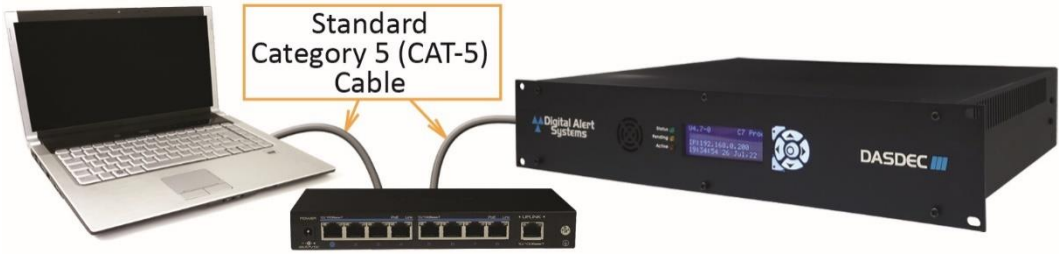


Direct Connection

1. Connect one end of the factory-supplied CAT-5 network crossover cable to the Main Network Interface port at the back of the EAS device and the other end to the network interface port of a standalone PC or laptop computer. Once the EAS platform is powered up and completely booted, it can be accessed via a web browser launched from the directly connected, customer-supplied standalone computer.

Attention
It is advised that you contact a network administrator before starting the following procedure, as a valid IP address and subnet mask settings are required to complete this initial setup. Working knowledge of how to change the network settings of the standalone computer is also necessary.

Hub/Switch Connection



Hub/Switch Connected

The primary difference between this type of connection and the direct connection method is the inclusion of additional networking hardware.

1. Connect a standard CAT-5 network cable to the Main Network Interface port at the back of the EAS device and the other end into the open port of a routing hub or other network switching device.
2. Once the EAS device is powered up, booted, and operational, it should be accessible via a web browser running on any remote computer on the local area network routed to see the address 192.168.0.200.

Specifications

DASDEC-III Specifications	DAS3-EL	DAS3-EX	DAS3-GX	DAS3-CX
Monitoring Audio Inputs: monaural EAS monitoring inputs	Two (2)	Four (4)	Four (4)	Four (4)
Internal Monitoring Receivers – Integrated Dual Tri-Band receivers (AM/ FM/WX) Tunable frequencies: AM 520 to 1720 kHz | FM 76 to 108 MHz | WX 162.4 to 162.55 MHz Connector: "F" type - 50Ω	DAS3-2RADIO Optional	DAS3-3RADIO Optional	DAS3-3RADIO Standard	DAS3-3RADIO Standard
Monitoring Audio Expansion **EXP-EAS-E** adds two (2) additional monaural inputs (6 total)	N/A	Optional	Optional	Optional
Program Audio				
Analog Input / Output – Balanced 600Ω stereo audio input - fail-safe bypass relay. Connector: RJ-45 in/out using StudioHub™ wiring standard |MAY REQUIRE ADAPTORS - SOLD SEPARATELY[1]				
Digital Input– DAS3-AES Balanced 110Ω AES/EBU digital audio input Connector: RJ-45 in/out using StudioHub wiring standard MAY REQUIRE ADAPTORS - SOLD SEPARATELY[1]	Optional	Optional	Standard	Optional
Digital Output – DAS3-AES Balanced 110Ω AES/EBU digital audio synced to incoming rate, or 48 kHz without reference Connector: RJ-45 in/out using StudioHub wiring standard MAY REQUIRE ADAPTORS - SOLD SEPARATELY[1]	Optional	Optional	Standard	Optional
Auxiliary Audio Output – Un-balanced lo-Z audio | Connector: 1/8" mini-plug	N/A	Standard	Standard	Standard
LAN Interface – TCP/IP Ethernet: One (1) 10/100/1G BASE-T | Default Address: 192.168.0.200 |Connector: RJ45 |Green link & amber data indicators				
Network Expansion				
USB-1NICGIG External single port adaptor USB-RJ45 Connector: USB-RJ45	Optional	Optional	Optional	Optional
EXP-2NICGIG Internal dual 10/100/1000 BASE-T IP addressing: static (ports 1-4) or DHCP (ports 1 & 2) Connector: RJ45	Optional	Optional	Standard	Standard
Video Output - Full-screen Slate Video Output License VGA: Maximum resolution: 1920 x 1200 @60Hz | Connector: DB-15 HDMI 1.4: Max. resolution: 4096x 2160 @30Hz|Connector: Type A HDMI output includes embedded alert audio	Optional	Optional	Standard	Standard
General Purpose Inputs/Outputs (GPIOs) Two (2) software-defined inputs Two (2) software-defined outputs rated 2A @30VDC Connector: 7-pin detachable terminal strip				
Serial Port – One (1) RS232 data 9 pin "D" connector | Optional **USB/4RS232** adds four additional RS-232 ports (5 max.)				
USB ports: Two (2) USB V2.0/1.1 | Connector: type A sockets Two (2) USB V3.1 | Connector: type A sockets				
Local Control Ports – Keyboard/Mouse | Connector: PS-2 type socket				
Front Panel Display – LCD matrix display: Four rows of 20 characters Status lamps – Green, Yellow, Red	Monochrome backlit	Color backlit		
Expansion Port – Triple EXpansion slots for the following options: **EXP-EAS-E** – Two (2) monitoring audio inputs (6 total) **EXP-GPIO-E** – Eight (8) additional GPIs and GPOs (10 total) using external breakout box and cabling **EXP-2NICGIG** – Dual gigabit network expansion (3 total)	N/A	Two expansion ports available	EXP-2NICGIG Included One expansion port available	
Power (90 - 264 VAC) max. 85% RH non-condensing	16W	20W	21W	22W
Dimensions / Weight – 19" W x 12" D x 3.5" H (48.2cm W x 30.4cm D x 8.9cm H) 2RU EIA rackmount / 15 lbs. (6.8 Kgs)				
Environmental - Ambient temperature range of 0 to +50 degrees C. Relative humidity of up to 95% (non-condensing)				