

Dugan-VN16 User Guide

Automatic Mixing Controller Card

For Avid Live Sound Systems: SC48, Mix Rack, and FOH Rack

Release Date November 2013

Version 1.0

Author Rob Wenig



Dan Dugan Sound Design



290 Napoleon St., San Francisco, CA 94124
Phone: (415) 821-9776 Fax: (415) 826-7699

Important Safety Instructions and Warnings

The Dugan-VN16's circuitry is made in the USA and meets applicable national safety standards.

Safety Instructions

1. Read these instructions.
 2. Keep these instructions.
 3. Heed all warnings.
 4. Follow all instructions.
 5. Do not use this apparatus near water.
 6. **WARNING!** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
 7. Clean only with dry cloth.
 8. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
 9. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
 10. Only use attachments/accessories specified by the manufacturer.
 11. Unplug this apparatus during lightning storms or when unused for long periods of time.
 12. **WARNING!** Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
 13. **WARNING!** No user serviceable parts inside.
-

FCC

1. **IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!** This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Dan Dugan Sound Design may void your authority, granted by the FCC, to use the product.
2. **IMPORTANT:** When connecting this product to accessories and/or another product use only high quality shielded cables. Failure to follow instructions could void your FCC authorization to use this product in the USA.
3. **NOTE:** This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations.

If this product is found to be the source of interference, which can be determined by turning the host unit OFF and ON, please try to eliminate the problem by using one of the following measures: Relocate either this product or the device that is being affected by the interference. Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/ s. In the case of radio or TV interference, relocate/ reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to co-axial type cable. If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Dan Dugan Sound Design.

The above statements apply ONLY to those products manufactured by Dan Dugan Sound Design.

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

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

This Class B digital apparatus complies with Canadian ICES-003.

Precautions

Failure to observe the following warnings may lead to fatality or serious injury from fire or electric shock.

1. Before installing the card, you must refer to the owner's manual of the host device or to the Avid website to verify that your host device supports this card, and to verify the number of cards that can be installed in combination with other Avid or third-party cards. Avid website: <http://www.avid.com/>
2. If one or more cards in a combination not endorsed by Avid are installed in an Avid device, electrical shock, fire, or malfunction may occur. Please note that the Dugan-VN16 can be used with the following models of Avid products that accept option I/O cards: FOH Rack, Mix Rack, and SC48.
3. Do not attempt to disassemble or modify the card. Do not apply excessive force to board connectors or other board components. Mishandling the board may lead to shock, fire hazard, or equipment failure.
4. To eliminate shock hazard, disconnect the power cable from the main unit before installing this card.

CAUTION: *Failure to observe the following precautions may lead to personal injury, or may result in damage to equipment or other property.*

5. Do not touch the board's metallic leads (pins) when handling the card. Pins are sharp and may cause hand cuts.
6. The card is electrostatic-sensitive. Before handling the card, you should briefly touch the main unit's metal casing with your bare hand to drain any static charge from your body.

CAUTION: *Dan Dugan Sound Design assumes no responsibility for data loss, equipment damage, or injury caused by inappropriate handling or usage.*

Warranty Statement

Dan Dugan Sound Design warrants that Dugan-VN16 hardware will be free from defects in components and workmanship for a period of 12 months from the date of invoice.

During the warranty period, Dan Dugan Sound Design will cover the cost of all parts and labor to remedy the defect, or replace products which prove to be defective.

Dan Dugan Sound Design is not obliged to honor this warranty if the hardware has failed to be maintained and operated as specified by Dan Dugan Sound Design, in the accompanying documentation, or other than in accordance with industry standards. Defects caused by unauthorized modifications, misuse, negligence, act of God or accident are not covered by this warranty.

Software is provided as a convenience, but due to the wide variety of computer systems, cannot be guaranteed to work. This Limited Warranty is exclusive and no other warranty is expressed or implied. Dan Dugan Sound Design does not warrant that Dan Dugan Sound Design software, or any third-party software, is error free.

Table of Contents

Chapter 1: Introduction	9
What's Included	9
Theory of Operation	10
Remote Control and Software	11
Chapter 2: Installation	13
SC48.....	13
FOH Rack.....	23
Mix Rack	28
Chapter 3: Configuration	33
Operating Modes	33
Standard	33
Shared	34
ADAT I/O.....	34
Linking.....	35
Inserting the Dugan-VN16.....	35
Connecting to a Computer or Network	38
Establishing Network Connections	38
Manually Add Unit	41
Using the Internally Stored Dugan Control Panel	41
Software Configuration for a Specific IP Address	42
Connecting when Windows Firewall is On	43

Chapter 4: The Dugan Control Panel	45
Top Pane	46
Select Units to Display	47
Setting Controls	47
Naming Units and Channels	48
Channel Pane	48
Level Indicator.....	49
Bypass	49
Channel Modes	49
Preset	50
Channel Groups.....	51
Channel Override	51
Meters	52
Weight	52
Master Pane	55
Unit Name.....	55
Indicators.....	56
Controls.....	56
Typical Operation	58
Chapter 5: Updates	61
Chapter 6: Specifications	63

Chapter 1: Introduction

The Dugan-VN16 is a 16-channel automatic mixing controller that is installed in the I/O card slots of the following Avid Live Sound Systems: FOH Rack, Mix Rack, and SC48.

The VN16 detects which mics are being used, and makes fast, transparent crossfades. This eliminates late upcuts, reduces system noise and feedback, and lets the engineer focus on balance and sound quality.

The Dugan-VN16 enhances a diverse group of live applications that require multiple mics:

- Conference reinforcement, video trucks
- Houses of worship
- Film and television dialogue, reality shows
- Theater
- Boardrooms, civic meetings, community TV
- Teleconferencing and distance learning

The Dugan-VN16 is operated from the Dugan Control Panel for Java (included). The Dugan Control Panel for iPad (sold separately) performs the same function on an iPad.

What's Included

The following is included in your package:

- One Dugan-VN16 automatic mixing controller card
- Two 40-pin ribbon cables, 20-in
- One 4-pin power Y-cable adapter
- Two rear mounting brackets (for FOH rack)
- One USB thumb drive, with software and user guide
- One product registration card

Theory of Operation

The Dugan-VN16 Automatic Mixing Controller uses a patented automatic mixing function that distributes the gain of one open microphone over the entire system, maintaining a natural one-mic ambience. It is essential to distinguish this behavior from the annoying fluctuation of levels and uneven ambience in a conventional gating system.

The system automatically manages any number of live mics in unpredictable dialogue situations. When one person speaks, that mic's gain fades up instantly, and the others down. When the speaker pauses, all mics fade to medium gains that sum to equal one mic at full gain. The result sounds like passing one mic around among the speakers. When several people talk at once, the gain is shared.

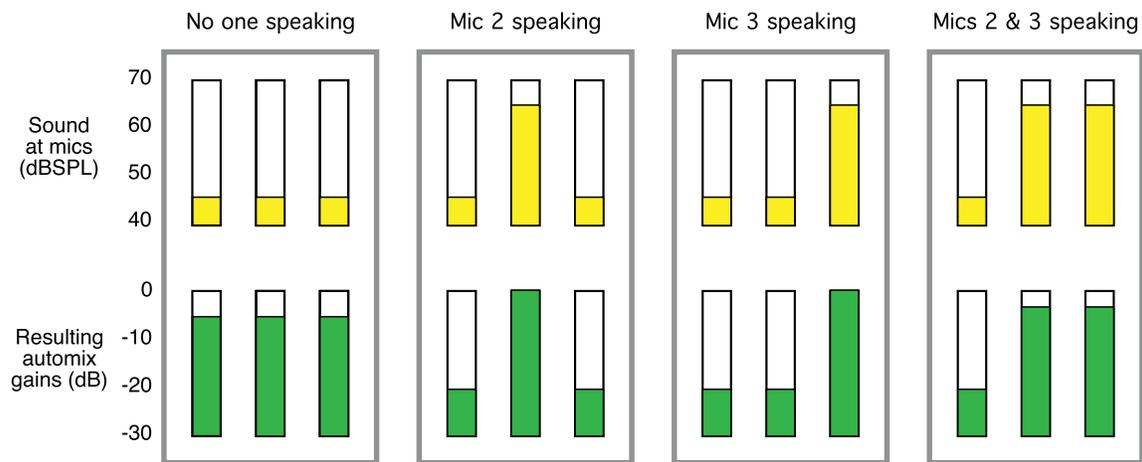


Figure 1-1 Four snapshots of a three-mic system

Figure 1-1 shows automatic mixing with a three-mic system.

- The first frame shows no one speaking; the sound levels at all mics are low. The system fades all channels to medium gains that sum to the equivalent of one mic at full gain.
- The second frame shows one person speaking. The system automatically fades his/her gain to full, while the other two inputs are turned down.
- The third frame shows a different person speaking. The system automatically fades his/her gain to full, while the other two inputs are turned down.
- The fourth frame shows two people speaking simultaneously. The system automatically shares the gain between them, while the other input is turned down.

Remote Control and Software

Two Java applets are included on a thumb drive or CD, or can be downloaded from www.dandugan.com/downloads:

- The Dugan Utility helps you connect to a network (see page 38). It is also used to update the firmware (see Chapter 5: *Updates*).
- The Dugan Control Panel offers expanded operational capabilities (see Chapter 4: *The Dugan Control Panel*).

The Dugan-VN16 can be controlled with:

- The Dugan Control Panel for Java (included)
- The Dugan Control Panel for iPad (sold separately)
- ASCII commands via Ethernet (contact Dan Dugan Sound Design for information)

Subscribe to the *duganusers* Yahoo! group to be notified when updates are available:

<http://tech.groups.yahoo.com/group/duganusers/>

Chapter 2: Installation

The Dugan-VN16 can be installed in the following Avid Live Sound Systems: FOH Rack, Mix Rack, and SC48. Follow the installation instructions in the appropriate section and then go on to Chapter 3: *Configuration*.

SC48

The Dugan-VN16 Card is installed in slot E on the back of the SC48, and is connected via ribbon cables to the existing Main I/O card.

This section explains each of the following tasks required to install a Dugan-VN16 card into an SC48:

- Open the Top Panel of the console.
- Remove the existing output option card located in slot D of the console.
- Remove either the slot E card slot cover, or remove the output card in slot E if you have an AO16 or IO16 output card installed, and remove the associated ribbon cable.
- Install the Dugan-VN16 card.
- Reinstall the output card installed in slot D and close the Top Panel.

NOTE: *To use the Dugan-VN16 card, you must be running VENUE software 3.0 or higher. Go to the Options > System page to check which version of VENUE software you are running. To find information on upgrading your software, go to www.avid.com. Upgrading your software to VENUE software 3.0 should be done prior to installing the card.*

To open the Top Panel of the SC48:

1. Shut down your system, and turn off power to the SC48.
2. Disconnect any power cables from the SC48, as well as any other audio cables that may get in your way.
3. Do one of the following:
 - If your console's Top Panel uses hex screws, use a 2-mm hex driver to remove the 26 screws that secure the Top Panel to the console chassis.
 - or -
 - If your console's Top Panel uses Torx screws, use a Torx driver to remove the 26 screws that secure the Top Panel to the console chassis.

NOTE: Use only a straight end driver, not a ball end driver, when removing or replacing the Top Panel hex screws.



Figure 2-1 Removing the 26 Top Panel screws

4. Hold the front edge of the Top Panel and carefully lift it upwards to a vertical position.

NOTE: If you sense any resistance when lifting the Top Panel upwards, do not force it. The Top Panel has slots that pivot on posts attached to the sides of the console chassis (Figure 2-2). Removing the Top Panel screws may cause the Top Panel to slide towards the front of the console so that the Top Panel slots are not correctly aligned with the posts. If this occurs, slide or push the Top Panel towards the rear of the console before lifting, making sure the posts are correctly aligned with the slots.



Figure 2-2 Lifting the Top Panel to vertical

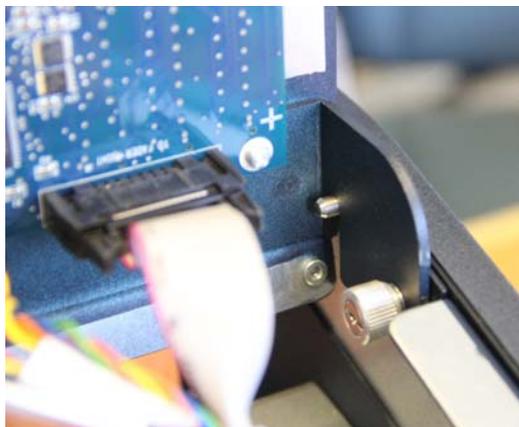


Figure 2-3 Correct alignment of Top Panel slot and pivot post

5. To lock the Top Panel in the vertical position, tighten the two interior captive thumbscrews located on the top left and top right sides of the console.



Figure 2-4 Tightening the top left captive thumbscrew

To remove the output card in slot D:

1. On the back panel of the SC48, locate the output card in slot D.

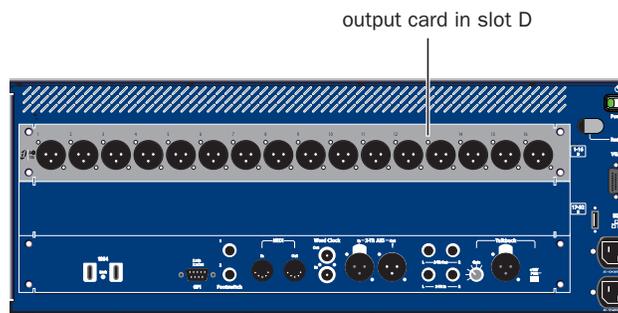


Figure 2-5 Left side of the SC48 back panel

2. Inside the console, locate the output option card and loosen the two captive thumbscrews that secure the card to the console chassis.

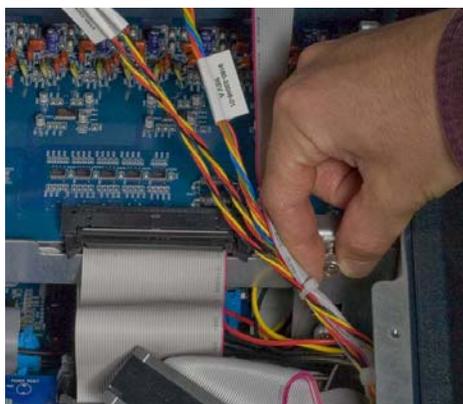


Figure 2-6 Loosening the output card captive thumbscrew

3. Disconnect the 50-pin ribbon cable from the port on the card by moving the tabs on each side of the connector outward. Leave the other end of the cable connected.

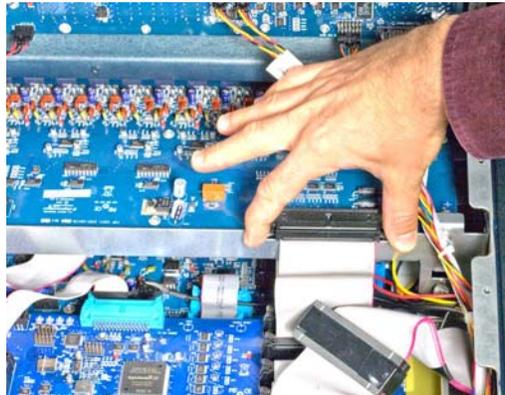


Figure 2-7 Disconnecting ribbon cable from the output card in slot D

4. On the back of the console, remove the four screws that secure the card to the console and gently slide the card out of the console. Set the card and the screws aside. You will reinstall the output card after you install the Dugan-VN16 card.

To remove the slot E cover or the output card in slot E:

1. Inside the console, locate the Hub 48 card and its five I/O card ports (Figure 2-8). Disconnect the ribbon cable connected to the back port (J1 Slot E on the Hub48 card). The other end of this cable is connected to either the slot E cover, or to an output card (if you installed an AO16 or IO16 card). This cable will be removed from the console entirely.

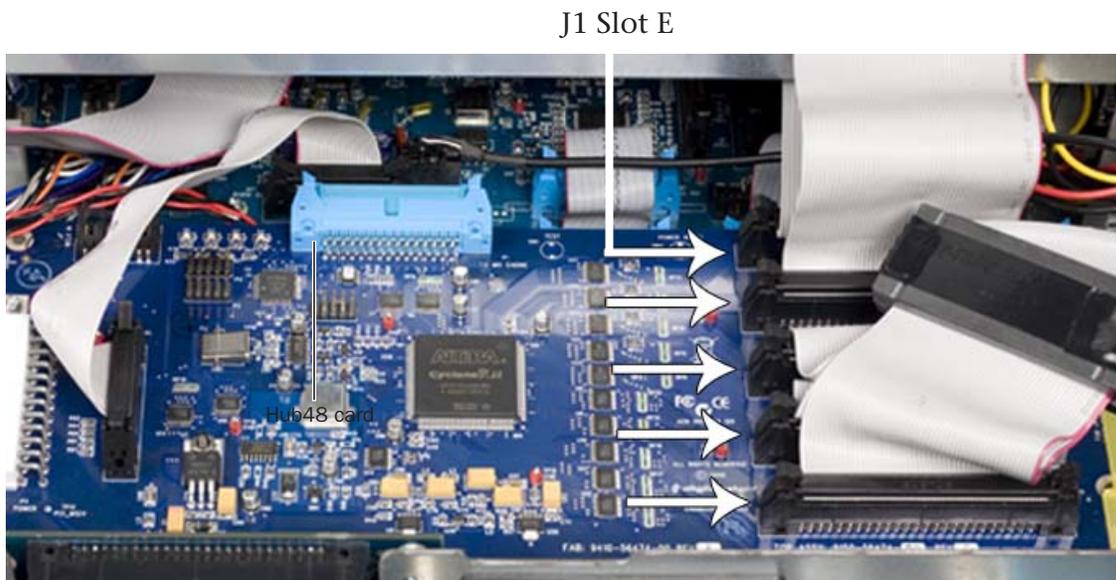


Figure 2-8 The Hub48 card and its five I/O card ports

2. On the back panel of the SC48, locate output slot E.

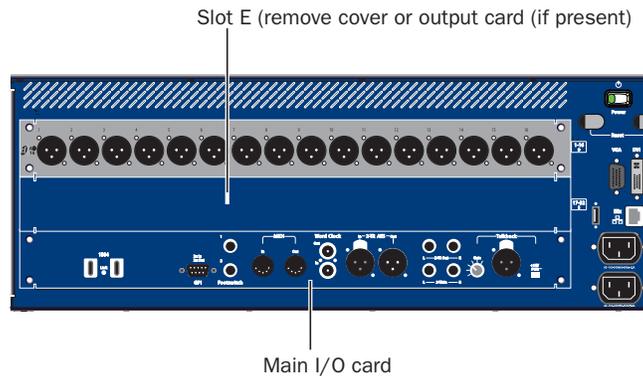


Figure 2-9 Left side of the SC48 back panel

3. Do one of the following depending on your configuration:
 - Remove the four screws holding the card slot cover in place. After removing the screws, you can use a flathead screwdriver to pry the cover away from the slot. Remove the ribbon cable that is attached to the slot cover.
 - or -
 - If you installed an additional output card in slot E, remove the four screws securing the card to the console and gently slide the card out of the console. Remove the attached ribbon cable along with the card.

Installing the Dugan-VN16 card:

1. Inside the console, locate the Main I/O card (under the now-removed output cards), and connect the two included ribbon cables to the ports J28 and J29 (Figure 2-10).

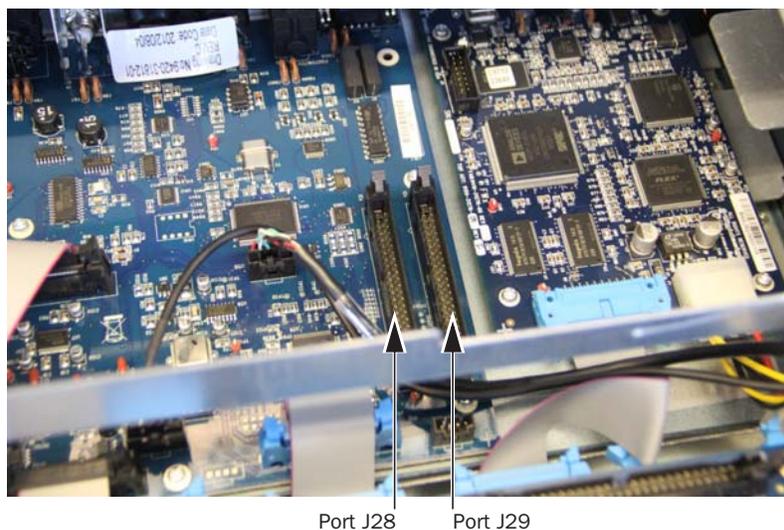


Figure 2-10 Main I/O card in SC48 and the ribbon cable ports

Make sure the keyed connector is oriented correctly in each socket. Secure each connection by moving the tabs on each side of the connector inward. Check to make sure the cables are connected securely.

NOTE: You will connect these cables to the Dugan-VN16 card, so make sure they are easily accessible after you slide the Dugan-VN16 card into the console.

2. Route the two ribbon cables that you connected to the Main I/O card next to the right-inner wall of the chassis. Position the cables as shown below in Figure 2-11 (so that the cable connected to port J28 is on top of the cable connected to port J29).

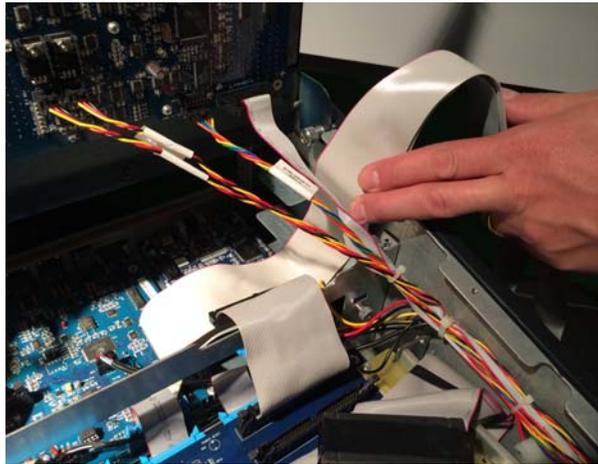


Figure 2-11 Routing the ribbon cables next to the chassis wall (viewed from right side of SC48)

3. Remove the Dugan-VN16 card from its packing material. Hold the card by its edges.

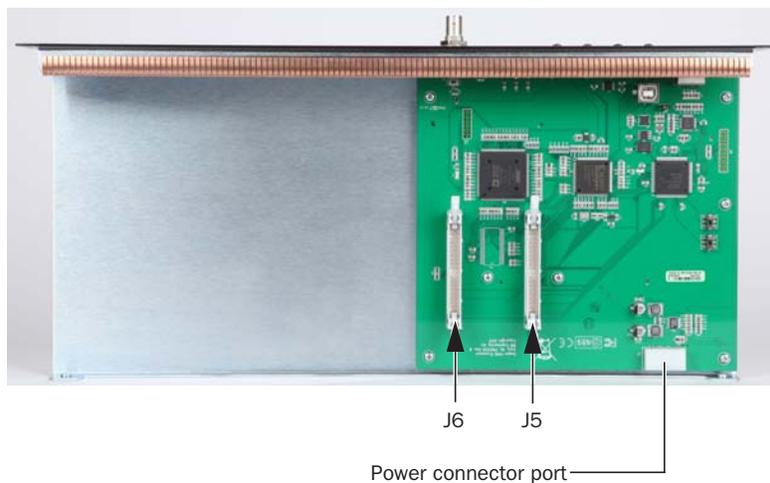


Figure 2-12 Dugan-VN16 card showing connectors

4. Slide the card into the slot, holding the two ribbon cables against the inner wall of the console (see Figure 2-13). Press firmly on both ends of the card so that it fits snugly in the slot, making sure the ribbon cables are not pinched between the card and the chassis.



Figure 2-13 Installing a card into slot E

5. Inside the console, adjust the position of the card and the ribbon cables as necessary, and tighten the two captive thumbscrews to secure the card to the inside of the console.
6. Connect the two ribbon cables from the Main I/O card to the Dugan-VN16 card as follows:
 - Connect the cable connected to port J28 on the Main I/O to port J5 on the Dugan-VN16 card.
 - and –
 - Connect the cable connected to port J29 on the Main I/O to port J6 on the Dugan-VN16 card.



Figure 2-14 Connecting ribbon cables to the Dugan-VN16 card

NOTE: *If you have to twist the cables to orient them correctly to connect to the Dugan-VN16 card, or the connectors do not line up properly, you are attempting to connect the cables to the wrong ports.*

7. Inside the console, locate an available power cable. An available power cable is located in a cable bundle running along the right-inside wall of the console. Power cables have yellow, brown, black, and red wires attached to a white connector.
8. Cut the cable tie that holds the power cable in the bundle, making sure not to cut any wires. Free the power cable from the bundle.
9. Rebundle the other cables and secure with them with the included cable tie.
10. Connect the power cable to the socket on the Dugan-VN16 card.

When the power cable is correctly connected, the yellow wire should be the first wire on the left. Check to make sure the cable is connected securely.



Figure 2-15 Connecting an available power cable to the Dugan-VN16 card

11. Secure the Dugan-VN16 card to the back of the console using the four screws you removed earlier.

To reinstall an output card in slot D and close the Top Panel:

1. Slide the output card gently into slot D, and secure it to the back of the console using the four screws you removed earlier.
2. Inside the console, reconnect the 50-pin ribbon cable to the card that you disconnected in step 3 on page 16.



Figure 2-16 Reconnecting the ribbon cable on the output card

3. Tighten the two captive thumbscrews to secure the card to the inside of the console.
4. Loosen the two interior captive thumbscrews holding the Top Panel upright, and gently lower the Top Panel into position.

NOTE: *The Top Panel has slots that pivot on posts attached to the sides of the console chassis. When lowering the Top Panel, the Top Panel slots may not stay correctly aligned with the posts. Gently slide or push the Top Panel towards the rear of the console while lowering, making sure the posts are correctly aligned with the slots. This way, the Top Panel screw holes align with console chassis screw holes.*

5. To secure the Top Panel to the console chassis, locate the Torx or hex screws that you removed originally and reinstall them.

To complete and confirm installation:

1. Reconnect the power cable and any other cables to the SC48.
2. Make sure that all amps or speakers connected to your console are muted or turned off, then power up the SC48.
3. The Dugan-VN16 card displays as a blank panel on the Options > Devices page.

NOTE: The Dugan-VN16 card appears as a blank panel and is not identified in the Patchbay, even when properly installed using VENUE software version 3.0. Visit the Avid website (www.avid.com) to check for upgrades to your VENUE software.

The Dugan-VN16 inputs and outputs are available in the **FOH** tab in Patchbay.

- Dugan-VN16 inputs and outputs 1–8 appear as **AES 1–8**.
- Dugan-VN16 inputs and outputs 9–16 appear as **Analog 9–16**.

Note that these patch points will appear as gray in Patchbay, however it is now possible to patch the Dugan-VN16 to the required channels.



Figure 2-17 Patchbay showing installed Dugan-VN16

See Chapter 3: *Configuration* for instructions on patching the Dugan-VN16 to your mic channels.

FOH Rack

The Dugan-VN16 card is installed in the FOH Rack I/O Expansion slot and connected with two ribbon cables to the I/O card already installed in the rack.

This section explains how to perform each of the following tasks required to install a Dugan-VN16 card into a FOH Rack:

- Prepare the FOH Rack
Shut down, disconnect cables, remove front and back face plates.
- Install the Dugan-VN16 Card
Install new brackets, install the Dugan-VN16 card, connect cables.
- Complete and confirm installation
Power up FOH Rack and verify installation.

To prepare the FOH for installation:

1. Shut down your sound system.
2. Disconnect all audio and power cables attached to the FOH Rack.
3. Remove the FOH Rack front panel faceplate by unscrewing its mounting screws (#1 Phillips).

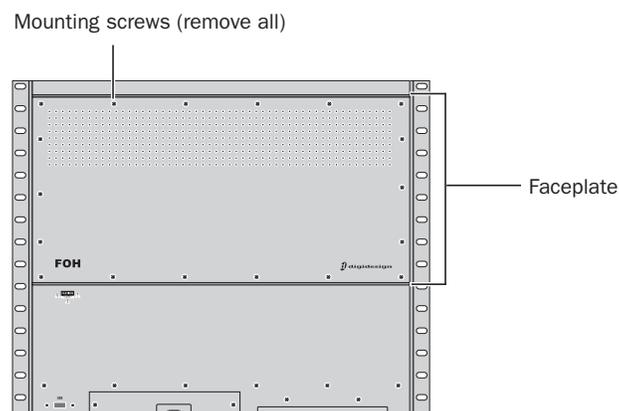


Figure 2-18 Front panel of the FOH Rack

4. On the back panel of the FOH Rack, remove the I/O card expansion slot cover by removing the four screws holding it in place. Keep the screws nearby to secure the Dugan-VN16 card to the FOH Rack later.

NOTE: *If you previously installed another output card in the expansion slot (i.e., the IOx card), you must remove this card before you can install and use the Dugan-VN16 card.*

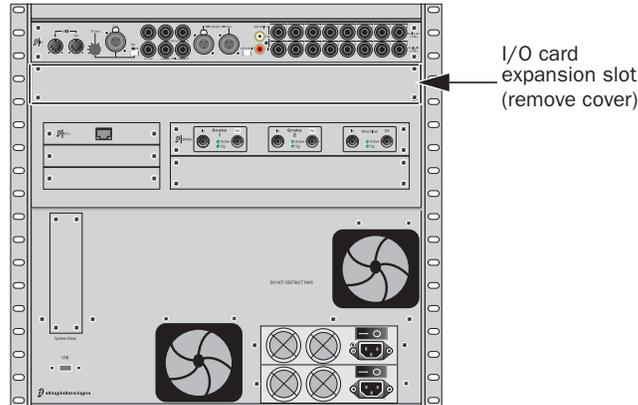


Figure 2-19 Back panel of the FOH Rack

To install the Dugan-VN16 card:

1. Remove the existing brackets from the I/O expansion slot. Keep the screws for the next step.



Figure 2-20 Bracket (one of two) included with the Dugan-VN16 card

2. Attach the Dugan-VN16 mounting brackets to the interior sides of the FOH Rack using a #1 Phillips screwdriver and the screws you saved.
3. Remove the Dugan-VN16 card from its packing material. Hold the card by its edges.

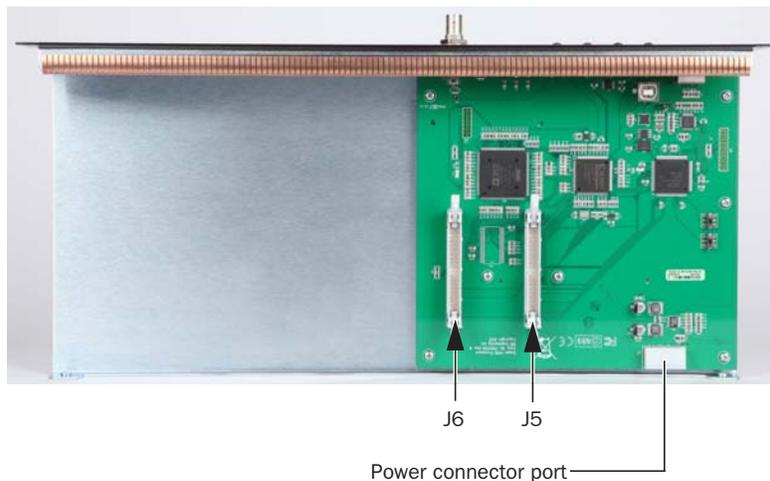


Figure 2-21 Dugan-VN16 card showing connectors

4. Gently slide the Dugan-VN16 card into the slot.



Figure 2-22 Installing the Dugan-VN16 card in the FOH Rack

5. When the card is seated in its slot, secure the card to the mounting brackets.



Figure 2-23 Securing a card to the mounting brackets

6. Secure the Dugan-VN16 card to the back panel of the FOH Rack using the four screws that held the slot cover.



Figure 2-24 Securing the Dugan-VN16 card to the back panel of the FOH Rack

7. When viewing the cards from the front of FOH Rack, attach the right-most connector of the top card to the left-most connector (J6) of the Dugan-VN16 card. Make sure the keyed connector is oriented correctly in each socket. Secure each connection by moving the tabs on each side of the connector inward. Check to make sure the cables are connected securely.
8. Attach another cable between the two connectors shown in Figure 2-25.

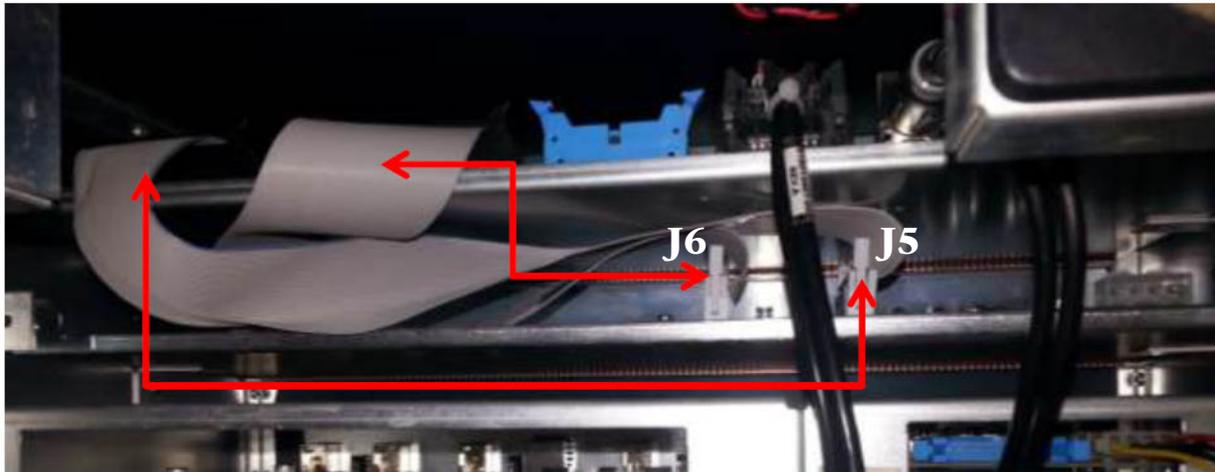


Figure 2-25 Ribbon cables connecting the Dugan-VN16 card to the I/O card

NOTE: To simplify connecting the ribbon cables, you may wish to disconnect the ribbon cable attached to the blue connector of the FOH IO card before attaching the cables to the Dugan-VN16. Remember to re-connect this cable after connecting to the Dugan-VN16.

9. Plug an available power connector from the FOH Rack into the power socket on the Dugan-VN16 card. Make sure it is connected securely.

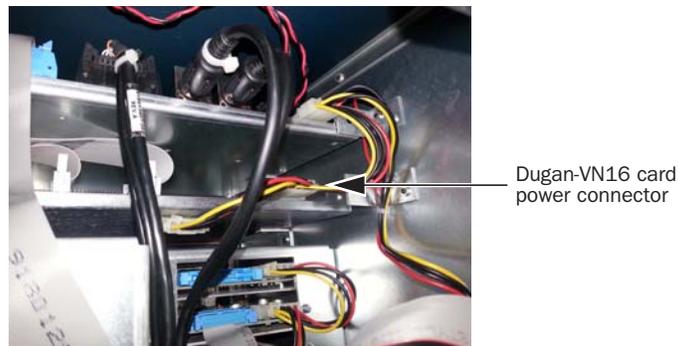


Figure 2-26 Dugan-VN16 card power connector

To complete and confirm installation:

1. Reattach the FOH Rack faceplate.
2. Reconnect the power, FOH Link, and any audio and MIDI cables to the FOH.
3. Turn on your FOH Rack.

NOTE: The Dugan-VN16 card appears as a blank panel and is not identified in the Patchbay, even when properly installed using VENUE software version 3.0. Visit the Avid website (www.avid.com) to check for upgrades to your VENUE software.

The Dugan-VN16 inputs and outputs are available in the **FOH** tab in Patchbay.

- Dugan-VN16 inputs and outputs 1–8 appear as **AES 1–8**.
- Dugan-VN16 inputs and outputs 9–16 appear as **Analog 9–16**.

Note that these patch points will appear as gray in Patchbay, however it is now possible to patch the Dugan-VN16 to the required channels.

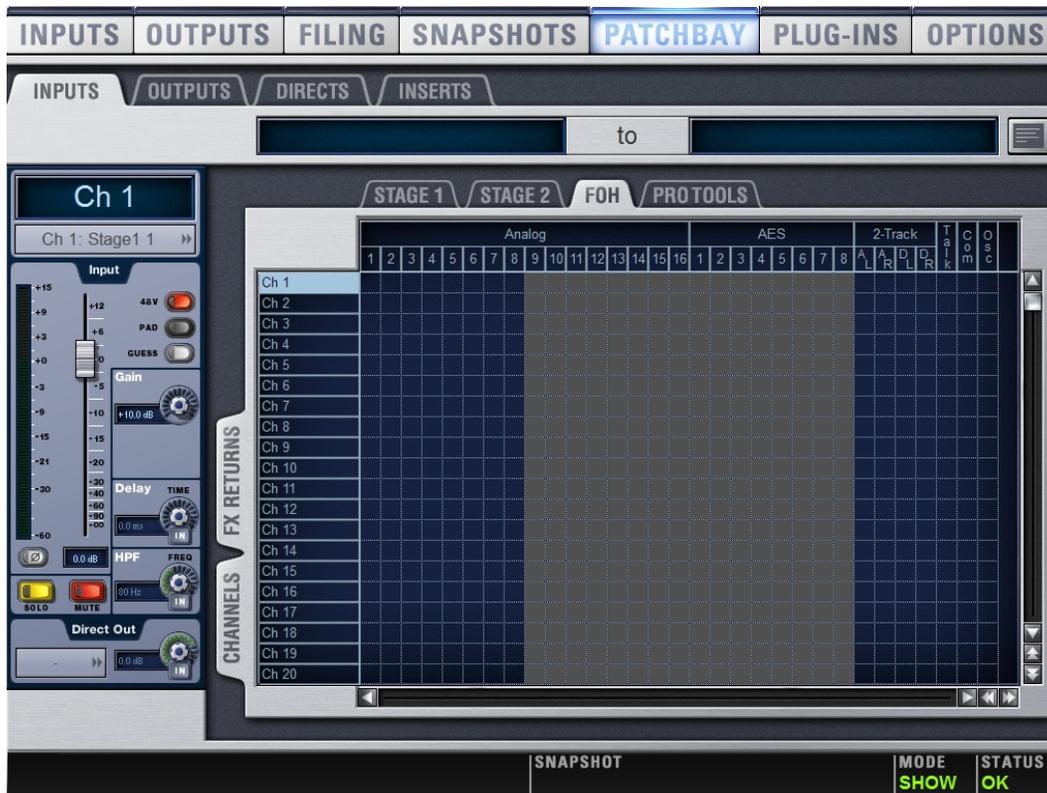


Figure 2-27 Patchbay showing installed Dugan-VN16

See Chapter 3: *Configuration* for instructions on patching the Dugan-VN16 to your mic channels.

Mix Rack

This section explains how to perform each of the following tasks required to install a Dugan-VN16 card into a Mix Rack:

- Prepare the Mix Rack
Shut down, disconnect cables, remove front and back face plates.
- Install the Dugan-VN16 Card
Install new brackets, install the Dugan-VN16 card, connect cables.
- Complete and confirm installation
Power up Mix Rack and verify installation.

To prepare the Mix Rack to install the Dugan-VN16:

1. Shut down the console, and turn off power to the Mix Rack.
2. Disconnect all cables from Mix Rack.
3. Remove the Mix Rack's front panel cover by unscrewing its mounting screws (#1 Phillips).

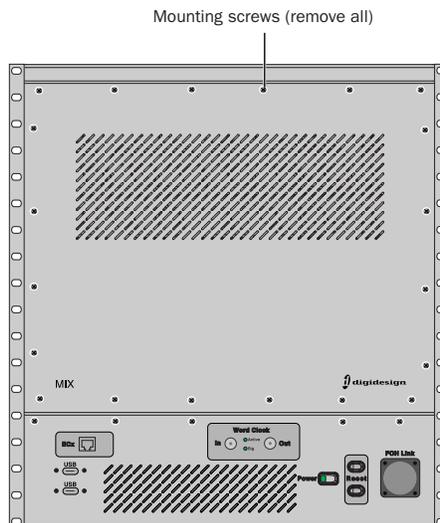


Figure 2-28 Mix Rack front panel

4. On Mix Rack's back panel, identify each input/output slot (A–E).

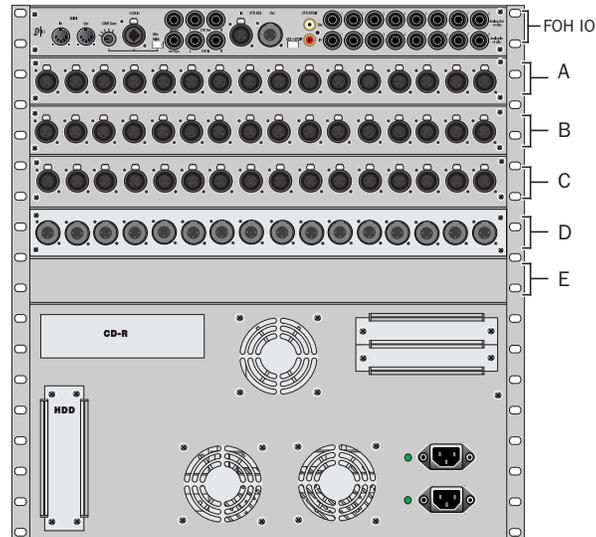


Figure 2-29 Mix Rack back panel slots A–E

Dugan-VN16 must be installed in slot E (the bottom expansion slot). This requires that you remove (or re-arrange) an output card that may have been previously installed in slot E. Your configuration may vary, depending on whether you have already added or replaced input or output cards.

NOTE: *This guide explains how to install the Dugan-VN16 card within a default, factory Mix Rack with three AI16 input cards and a single option output card.*

To install the Dugan-VN16 card in Mix Rack:

1. Remove the Dugan-VN16 card from its packing material, and gently slide it into slot E.



Figure 2-30 Sliding the Dugan-VN16 card into Slot E

2. When the card is seated in its slot, secure it to Mix Rack's chassis by tightening the two thumbscrews.



Figure 2-31 Securing the Dugan-VN16 card to its mounting brackets

3. Secure the card to the front panel of Mix Rack using the four mounting screws you removed earlier.

4. Attach an included ribbon cable to the left-most connector on the Dugan-VN16 card (J6). Attach the other end to the right-most connector on the FOH IO card.
5. Attach the right Dugan-VN16 connector (J5) to the left FOH IO connector (see Figure 2-32).



Figure 2-32 Dugan-VN16 ribbon cables connected to FOH IO card

6. From the back of the Mix Rack, locate an available power cable (or use the included power cable splitter) to attach the power cable to the Dugan-VN16 power socket (see Figure 2-33).



Figure 2-33 Power connector

To complete and confirm installation:

1. Reattach the Mix Rack faceplate.
2. Reconnect the power, FOH Link, and any audio and MIDI cables to the Mix Rack.
3. Turn on your Mix Rack.
4. The Dugan-VN16 card displays as a blank panel on the Options > Devices page.

NOTE: The Dugan-VN16 card appears as a blank panel and is not identified in the Patchbay, even when properly installed using VENUE software version 3.0. Visit the Avid website (www.avid.com) to check for upgrades to your VENUE software.

The Dugan-VN16 inputs and outputs are available in the **FOH** tab in Patchbay.

- Dugan-VN16 inputs and outputs 1–8 appear as **AES 1–8**.
- Dugan-VN16 inputs and outputs 9–16 appear as **Analog 9–16**.

Note that these patch points will appear as gray in Patchbay, however it is now possible to patch the Dugan-VN16 to the required channels.



Figure 2-34 Patchbay showing installed Dugan-VN16

See Chapter 3: *Configuration* for instructions on patching the Dugan-VN16 to your mic channels.

Chapter 3: Configuration

This chapter explains how to:

- Choose an operating mode
- Link multiple Dugan units
- Insert the Dugan into your mix
- Install software necessary to connect to a computer or network.

To begin configuring the Dugan-VN16 card:

1. Power on the Avid Live Sound System.
2. Press and hold the Dugan-VN16's **RESET** button for 3 seconds.
This restores its factory default settings.

Operating Modes

The Dugan-VN16's three operating modes are summarized in the table below.

	Automix Channels	ADAT I/O Channels	Linking
Standard	16	-	Yes
Shared	8	8	Yes
ADAT I/O	-	16	No

Table 3-1 Operating modes

Standard

Standard mode provides sixteen channels of Dugan automatic mixing that are patched using the **Inserts** tab of the Patchbay.

To set Standard mode:

- Set the rear panel **AUTOMIX-IO 16** switch to **AUTOMIX** (up).

Shared

Shared mode provides eight channels of Dugan automatic mixing and eight channels of general purpose ADAT I/O. The Dugan automatic mixing channels are patched using the **Inserts** tab of the Patchbay page (channels 9–16).

The eight ADAT I/O channels appear on the ADAT connector **AUDIO 1–8**. These channels are unrelated to Dugan mixing. They appear in the **FOH** tab of Patchbay as channels 1–8.

To set Shared mode:

1. Set the rear panel **AUTOMIX-IO 16** switch to **AUTOMIX** (up).
2. Toggle the **#ch** button in the Dugan Control Panel software to **8/8** (see **#ch** on page 57).

ADAT Synchronization

You must select a synchronization source to use Shared mode.

There are three ways to synchronize an ADAT input to the Dugan-VN16:

- Connect the word clock output of the VN16 to the audio source device.
- Connect the ADAT output of the VN16 to the ADAT input of the audio source device.
- Connect the word clock output of the audio source device to the word clock input on your Avid Live Sound System.

ADAT I/O

This mode provides sixteen ADAT I/O channels. ADAT connectors **AUDIO 1–8** and **AUDIO 9–16** serve as a general-purpose I/O interface that can be patched using the **FOH** tab in Patchbay (1–16). These channels provide additional Avid Live Sound System I/O, and do not perform automatic mixing. You must select a synchronization source to use this mode.

To set ADAT I/O mode:

- Set the rear panel **AUTOMIX / IO 16** switch to **IO 16** (down).

Linking

Up to eight Dugan units can be linked into a single automatic mixing system. External Dugan controllers can be linked to the Dugan-VN16. The audio I/O for each must be configured and connected individually. Linking passes only control information between Dugans, not audio.

The Dugan-VN16 must be set to be the master and external Dugans the slaves.

1. Designate the Dugan-VN16 as the master by setting the **NORM-SLAVE** switch on the rear panel to **NORM** (up).
2. Designate external units as slaves by setting their **NORM-SLAVE** switches on the rear panel to **SLAVE** (down).
3. Use ADAT (Toslink) cables to link units in a ring network (see below).
Note that all **LINK IN** and **OUT** connectors are used to create the ring.

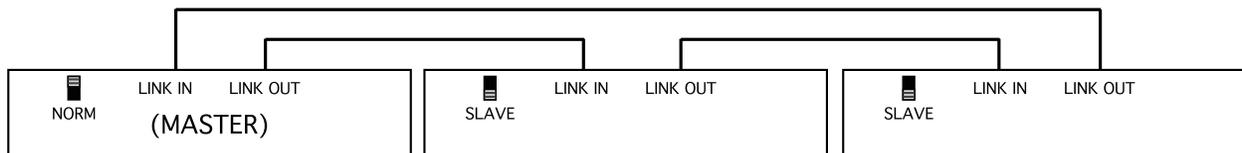


Figure 3-1 Linking multiple Dugans

Inserting the Dugan-VN16

Insert the Dugan-VN16 as a post-fader insert. Since Avid Live Sound Systems do not currently allow this, the following procedure routes the primary channels to secondary channels which are post-fader with respect to the primary channel:

1. Select **Post-Fader** for the Input Strip Fader Pickoff Point in the Pickoffs tab on the Options page (see figure below).

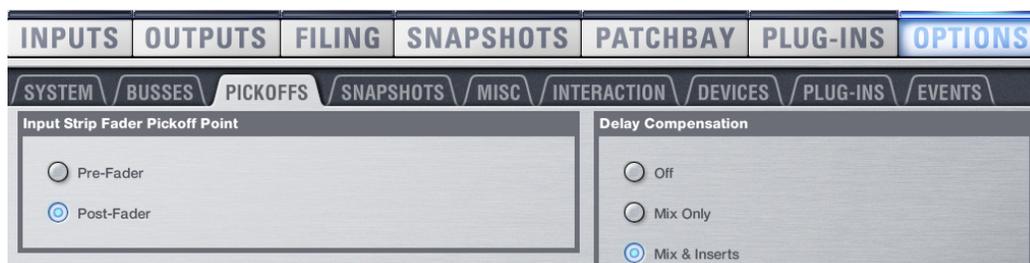


Figure 3-2

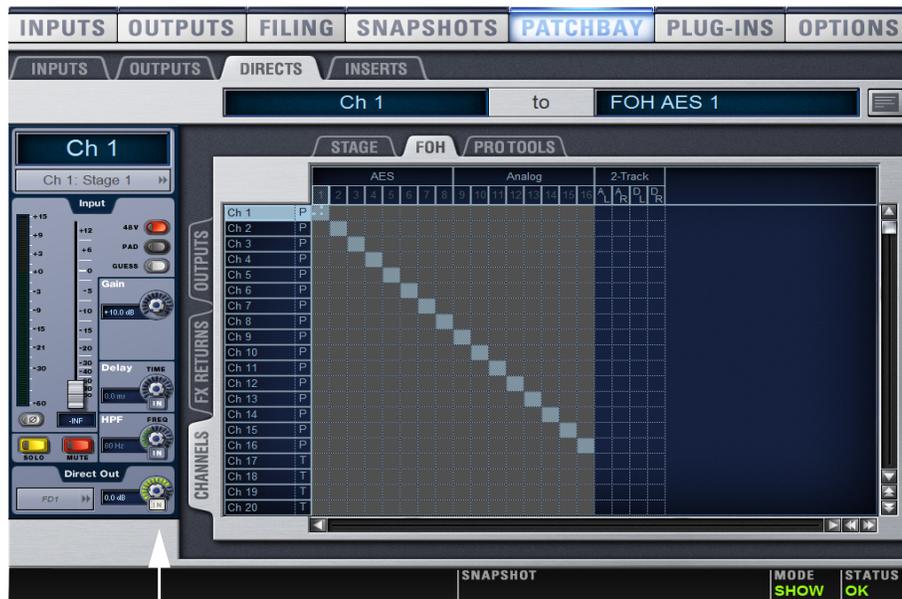
2. Display the Directs tab in the Patchbay.

3. To set each mic channel (primary input) that will be automixed to post-fader, click the letter to the right of the channel name and choose **Post-Fader** from the pop-up menu.



Figure 3-3 Setting the channel Post Fader

4. Set the gain for each primary input, but DO NOT assign the primary inputs to the mix bus (i.e., L/R/M).
5. Patch the post-fader direct output of each primary input channel to a channel on the Dugan-VN16.
6. Enable the direct output by clicking the **IN** switch below the knob on the screen.
7. Set the direct out level to unity (see below).



IN switch for Direct Out

Figure 3-4 Patching direct output of primary input channels to Dugan-VN16

NOTE: In VENUE software version 3, the Dugan-VN16 inputs and outputs 1–8 appear as AES 1–8, and the Dugan-VN16 inputs and outputs 9–16 appear as Analog 9–16 in the FOH tab of the Patchbay.

8. Patch the corresponding output for each Dugan-VN16 channel to a *secondary channel* on the Avid live sound system.

For example, if the primary input channels are from mic inputs 1–16, the secondary channels may be 17–32 (see below).

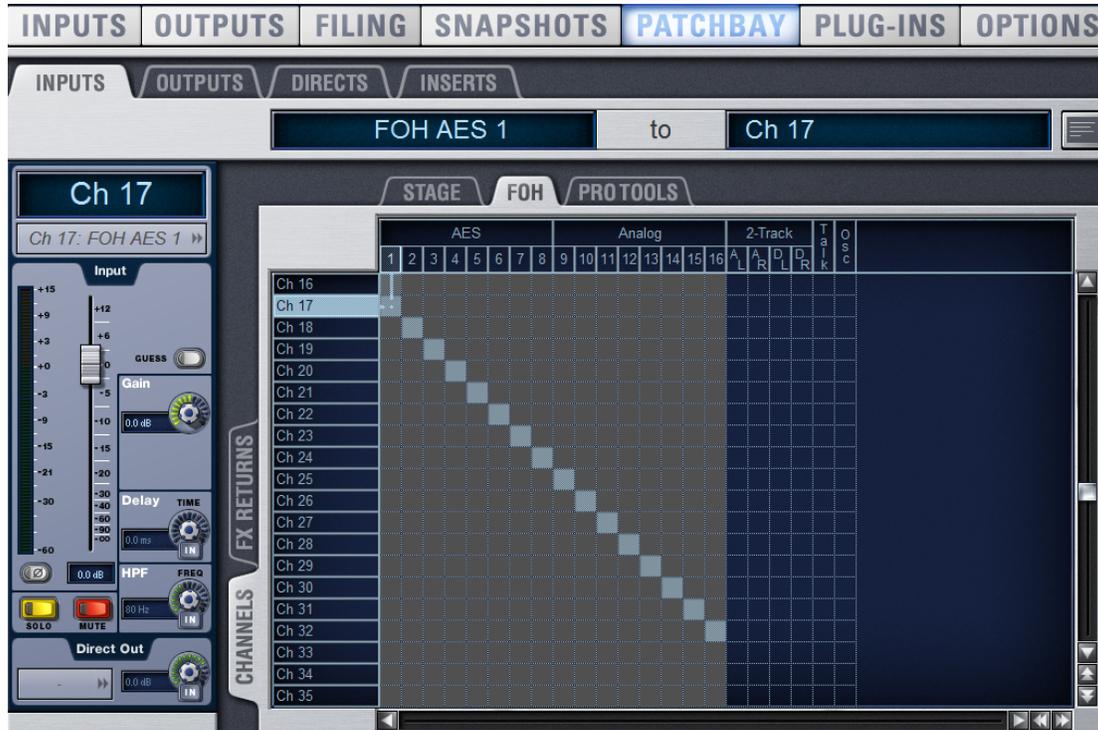


Figure 3-5 Patching the Dugan-VN16 output to the Avid live sound system

9. Assign the secondary channels to a mix bus (i.e., L/R/M).

All channels in an automix group (see page 51) must go to the same mix bus(es).

10. Set the input gain and fader position of the secondary channel for unity gain.

This channel should not change the signal level from the primary channel to the mix.

The primary channel is used for all operations (EQ, mute, and fader/VCA), while the secondary channel is left alone.

No further configuration is required to operate the Dugan-VN16. The nominal settings work fine out of the box, which comes in handy if you are pressed for time before an event. However, to take full advantage of the Dugan-VN16's advanced features, we recommend installing the Dugan Control Panel software.

Connecting to a Computer or Network

The Dugan software will work with the Mac, Windows, or any OS that can run Java. The computer must have the most current version of Java.

To connect to a computer or network, do the following:

- Windows users must turn the Windows firewall off. The Windows Firewall blocks port 9776 used by the Dugan software to communicate. If you must leave the Windows firewall on, either open this port or use the workaround described in *Connecting when Windows Firewall is On* on page 43.
- Turn off the computer's WiFi during this process because it sometimes interferes. You can turn it back on after the connection has been established.
- Complete your network connection with a computer before using the iPad app.

To obtain the latest Dugan software, download it from:

<http://www.dandugan.com/downloads>

- OR -

<http://tech.groups.yahoo.com/group/duganusers/files/>

If you do not have Internet access, copy the **Dugan Software** folder from the thumb drive or CD supplied with the Dugan-VN16 onto your computer.

Establishing Network Connections

Use the Dugan Utility to connect the Dugan-VN16 to a computer or network:

1. Attach a CAT5 cable to the rear panel **10/100BASE-T** connector.
Older PCs may require a crossover cable.
2. Launch **Dugan-Utility-yyyymmdd.jar**.

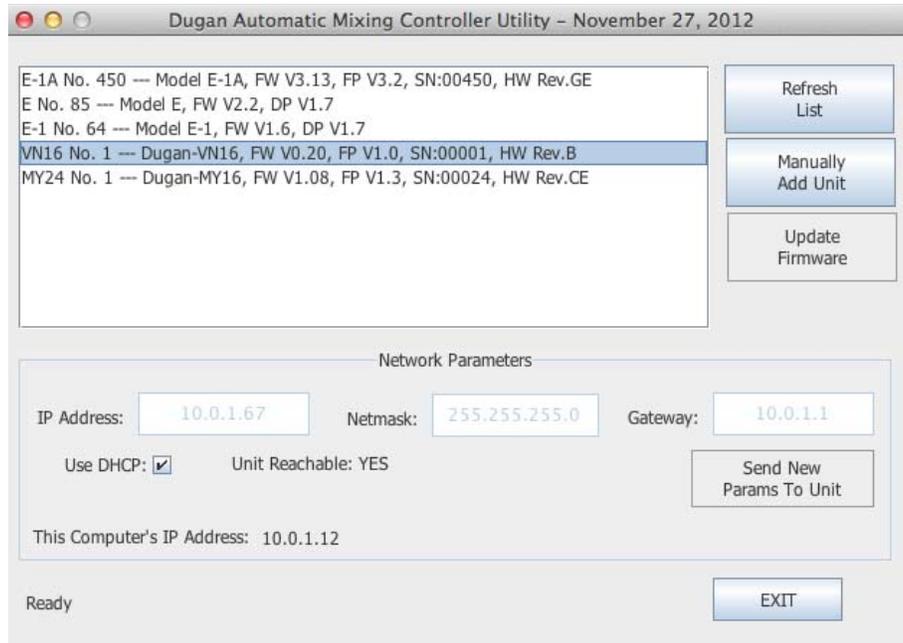


Figure 3-6 Dugan Utility

3. Wait a minute and if the list pane is blank, click **Refresh List**.
If the list pane remains blank, proceed to *Manually Add Unit* below.
If the list pane displays Dugan units, continue.
4. Click on the first unit in the list so it is highlighted.
The Network Parameters section displays information about that unit.
If **Unit Reachable** is **YES**, you are ready to use the Dugan Control Panel with that unit. If you have additional Dugan units to connect, select the next unit in the list and repeat this step. If you are finished with installation, proceed to Chapter 4: *Dugan Control Panel*.
If **Unit Reachable** is **NO**, proceed.
5. Select the **Use DHCP** parameter.
DHCP will be used to generate a compatible IP address for the card. After obtaining the address, we will turn DHCP off to retain this as a fixed address.
6. Click **Send New Params to Unit**.
If **Unit Reachable** is **YES**, do the following:
 - Deselect the **Use DHCP** checkbox.
 - Click **Send New Params to Unit**.
 - Click **Refresh List**.

7. Highlight the unit in the list pane again.

If **Unit Reachable** is **YES**, this unit is ready to use with the Dugan Control Panel. If you have additional Dugan units to connect, select the next unit in the list and repeat Step 4. If you are finished with installation, proceed to Chapter 4: *Dugan Control Panel*.

If **Unit Reachable** is **NO**, proceed to the next step.

8. Press and hold the rear panel **NETWORK RESET** button for 3 seconds.

This resets the following network parameters to their factory default value.

IP Address	192.168.1.xx*
Netmask	255.255.255.0
Gateway	192.168.1.254
DHCP	off

*xx = last two digits of serial number, unless 00, then use 100

9. Click **Refresh List**.

10. Click on the first unit in the list so it is highlighted.

If **Unit Reachable** is **YES**, you are ready to use the Dugan Control Panel with that unit. If you have additional Dugan units to connect, select the next unit in the list and repeat Step 4. If you are finished with installation, proceed to Chapter 4: *Dugan Control Panel*.

If **Unit Reachable** is **NO**, proceed to the next step.

11. Copy **This Computer's IP Address** to the **IP Address** field, and increase the value in the last (fourth) group by one.

For example, if **This Computer's IP Address** is 192.168.1.101, set **IP Address** to 192.168.1.102.

12. Click **Send New Params to Unit**.

13. Highlight the unit in the list pane again.

If **Unit Reachable** is **YES**, this unit is ready to use with the Dugan Control Panel. If you have additional Dugan units to connect, select the next unit in the list and repeat Step 4. If you are finished with installation, proceed to Chapter 4: *Dugan Control Panel*.

If **Unit Reachable** is **NO**, see *Using the Internally Stored Dugan Control Panel* on page 41.

Manually Add Unit

If the Dugan unit does not appear in the Dugan Utility list pane, you can manually add the unit:

1. Hold down the rear panel **NETWORK RESET** button for three seconds.
This generates an IP address.
2. Click **Manually Add Unit**.
3. Enter the generated IP address: 192.168.1.xx
xx = last two digits of serial number, unless they are 00, in which case enter 100.
4. Click OK to exit the dialog.
5. Click **Refresh List**.
If the list pane is still blank, see *Using the Internally Stored Dugan Control Panel* below.
If the unit appears in the list, go to step 4 on page 39.

Using the Internally Stored Dugan Control Panel

Normally, the Dugan Control Panel is run from the **Dugan-Control-Panel-vxxx.jar** file. However, if for any reason you do not have that file or an Internet connection, you can run the Dugan Control Panel from a copy stored in the unit (see Chapter 5: *Updates*).

 iPad

It is not currently possible to run the internally stored Dugan Control Panel from an iPad.

To run the internally stored Dugan Control Panel:

1. Launch your browser.
2. Enter the IP Address of the unit.
3. If you do not know its IP Address, press and hold the rear panel **NETWORK RESET** button for 3 seconds.
The IP Address will be set to 192.168.1.xx (xx = last two digits of the unit's serial number, unless 00, then use 100).
4. Enter this IP address in your browser's address bar.
5. If the Top Pane of the Dugan-VN16 control panel is empty, open a separate browser tab for each unit you wish to operate, and enter its IP Address. Switch units by clicking different tabs.

If this does not work, consult the *duganusers* Yahoo group (<http://tech.groups.yahoo.com/group/duganusers>) or contact Dan Dugan Sound Design.

Software Configuration for a Specific IP Address

This section explains to users with IT expertise how to set a specific IP address for any Dugan unit on the network.

1. Launch **Dugan-Utility-yyyyymmdd.jar**.

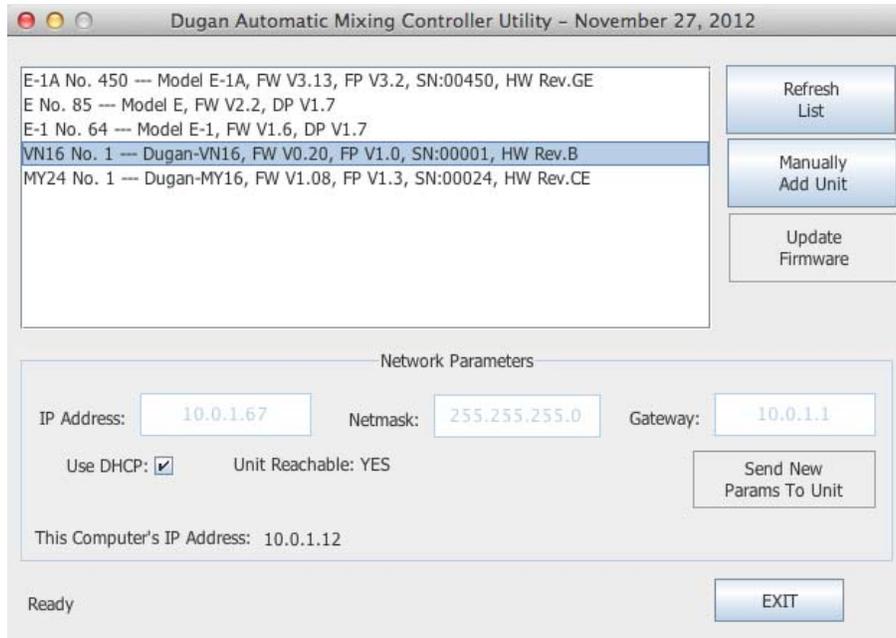


Figure 3-7 Dugan Utility

2. Wait a minute and if the list pane is blank, click **Refresh List**.
If the list pane remains blank, skip back to *Manually Add Unit* above.
If the list pane displays Dugan units, continue.
3. Click on the first unit in the list so it is highlighted.
The Network Parameters section displays information about that unit.
4. If **Use DHCP** is selected, deselect it.
5. Enter the desired IP address into the **IP Address** field.
6. Click **Send New Params to Unit**.
The Dugan-VN16 will reboot.

Connecting when Windows Firewall is On

The Windows Firewall blocks access to port 9776 that is used by the Dugan software. If you must leave the Windows Firewall on, you can operate the Dugan Control Panel in a browser window with one connected unit per tab.

- 1.** Enter the Dugan-VN16's IP address directly in the browser's address field.
The browser uses the Dugan Control Panel that is stored in the Dugan-VN16's hardware, not the version that you may have downloaded to your computer.
The unit may not show up in the Top Pane but the control panel will still work.
- 2.** If you have multiple Dugan units, create a browser tab for each one and enter its IP Address.
- 3.** Switch tabs to control different units.

Chapter 4: The Dugan Control Panel

The Dugan Control Panel has both Java and iPad versions. This chapter discusses the Java version and notes the iPad app's few differences.

The Dugan Control Panel is not required to operate the Dugan-VN16. If you use it to configure your unit, those settings will persist each time you restart the VN16, whether or not the Dugan Control Panel is running.

The Dugan Control Panel has three panes. The controls displayed in these panes depend on which Dugan device is selected in the Top Pane. This chapter assumes the Dugan-VN16 is selected.

The Dugan Control Panel is divided into three panes:

Top Pane	icons for all connected Dugan units
Channel Pane	man, auto, mute, preset, override, group, weight, bypass , and channel name controls
Master Pane	OVERRIDE, PRESET, MUTE , meters, system, #ch , and reset controls



Figure 4-1 Dugan Control Panel

Top Pane

The Top Pane displays all connected Dugan units. The selected unit is enclosed by a yellow rectangle. Click on another unit to select it and deselect the previous unit.



Figure 4-2 Top Pane

If all connected units do not appear in the Top Pane, see *Establishing Network Connections* on page 38.

To display a unit's IP address, hover the mouse over the unit's name.

iPad

To display a unit's IP address, touch and hold the unit's name.

Select Units to Display

The Dugan-VN16 is set up by default to find all available units connected to the network automatically. Some facilities have multiple studios on the same network that operate independently. In that case, you may want to restrict the units shown in the Top Pane to those in your studio. To do this:

1. Hover the mouse cursor over the names of the units that you want to display, and note their IP addresses.
2. Ctrl-click on the + sign at the right of the Top Pane.
The + sign turns red.
3. Quit and relaunch the Dugan Control Panel.
It opens with **Auto Detect Disabled** in the Top Pane
4. Click on the red + sign, and enter the IP address of the first unit you want to add.
5. Repeat step 4 until your units all appear in the Top Pane.

Manually added units must also be removed manually. To remove manually added units from the Top Pane, shift-click on the + sign. A dialog appears to confirm that they have been removed.

To restore automatic detection, Ctrl-click on the + sign, which turns white.

Setting Controls

Controls can be adjusted five ways:

- Enter a dB value in the numeric field.
- Drag in the numeric field (not on iPad).

When a slider is present:

- Drag the slider up or down.
- Click in the slider track to raise or lower the value by 0.5 dB.
- Ctrl-click anywhere on the slider to reset its value to 0 (touch and hold on iPad).

Naming Units and Channels

Connected units are displayed in the top pane in alphabetical order. To display them in your own order, use names with number prefixes.

To name a unit and its channels:

1. Select a unit in the top pane.
2. Select the yellow text in the right pane (under the Dugan logo) and type a name.
3. Press the Enter key on the keyboard to set the name.
4. To name a channel, select the yellow text and type a name.
5. Press the Enter key on the keyboard to set the name.

Channel naming is cleared by pressing **reset** (see page 56).

Channel Pane

The Channel Pane contains the controls and indicators for each channel. Channels are always in one of three modes: **man**, **auto**, or **mute**. The active channel mode illuminates. All transitions are made with a smooth, rapid fade. Select a channel mode by pressing the individual mode buttons or the Master **PRESET** button.

Figure 4-3 shows a typical system: channels 1–4 in **auto** with ambient noise, and channels 5–8 in **mute**.



Figure 4-3 Channel Pane

Level Indicator

Each channel has a **level** LED that lights green when the audio level is adequate for automatic mixing. It should remain green when no one is talking.

- If the **level** indicator blinks, raise the Avid mixer's input gain.
- If the **level** LED lights red, lower the Avid mixer's input gain until it stays green at all times.

Bypass

When **bypass** is active, the signal passes through without automixing. That channel appears inactive, with all lights extinguished.

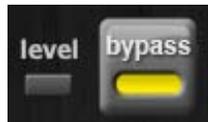


Figure 4-4 bypass button lit

To deactivate **bypass**, you can:

- Click **bypass** again;
- - OR -
- Click any of the three channel mode buttons.

Channel Modes

Changing channel modes initiates a half-second fade to the new mode. Like radio buttons, you can only choose one mode at a time.



Figure 4-5 Channel modes

Man

In **man** mode there is no automixing, and the signal passes through at unity gain.

Man and **bypass** modes perform similar functions, but we recommend using **man** during live mixing to prevent clicks.

Auto

This is the normal Dugan automixing mode.

Mute

The channel is muted when **mute** is active.

Preset

Use the preset function to store your favorite channel mode settings, which may be restored by pressing the Master **PRESET** button. When the unit powers up, the channels default to their preset modes; all other settings are retained.

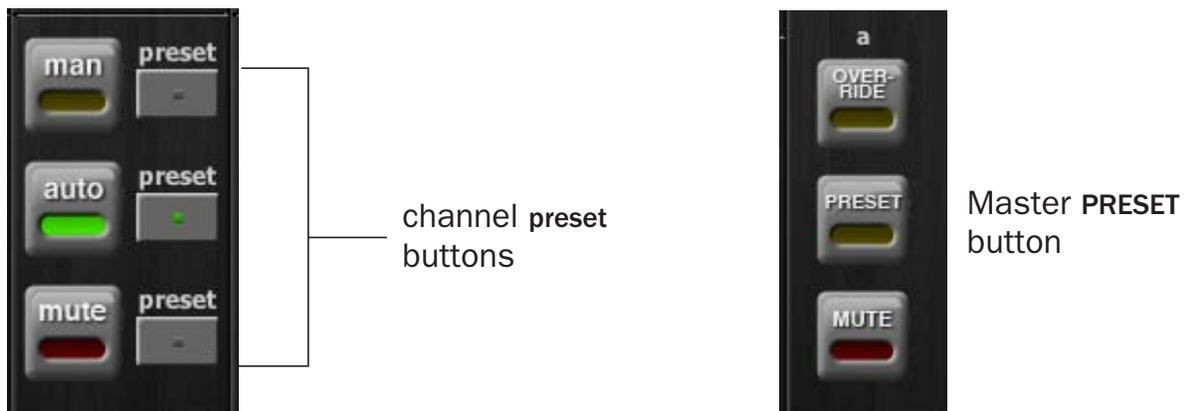


Figure 4-6 Channel **preset** (left) and Master **PRESET** (right) buttons

To set channel presets:

1. Click the channel **preset** button next to the desired channel mode button.
2. For all unused channels, click the **preset** button next to the **mute** button.

The preset indicators should mirror your normal working combination of input modes. The normal condition can then be restored by pressing the Master **PRESET** button.

Channel Groups

Each channel can be assigned to one group: a, b, or c. Each group functions as a separate, independent automatic mixer that can span multiple linked Dugans.

Applications where groups are helpful include:

- **Separate Rooms:** Assign the mics in each room to different groups so they function as separate automatic mixers.
- **Stereo Panning:** Assign the mics panned left, right, and center to groups a, b, and c, respectively, to maintain a stable stereo ambience.

To assign a channel to a group, click the **group** button until the desired group letter appears. The channel strip background is tinted green (**group b**) or blue (**group c**); **group a** is not tinted (Figure 4-7). A set of **OVERRIDE**, **PRESET**, and **MUTE** buttons appears in the Master Pane for each group.



Figure 4-7 Channel groups

NOTE: The Dugan algorithm requires unity-gain summing of all channels in a group to the same bus, otherwise you will hear shifting ambience levels. Iso splits should be taken pre-Dugan.

Channel Override

Override can be used to quickly mute all mics except one (the host or chairperson). However, any number of mics can be included in the override group.

To assign channels to an override group, activate the **override** button on each channel.

Clicking the Master **OVERRIDE** button puts channels with their **override** buttons lit into **man** mode. All other channels are muted. Click the **OVERRIDE** button again to restore normal automixing operation.

Meters

The meters have three display modes.

	Meter Displays	Meter Color
auto mix gain	action of the Dugan Speech System	green
input	input level	yellow
output	output level	blue

Table 4-1 Meter modes

The default meter display is **auto mix gain**. This is the most useful choice during normal operation; the input and output meters are only used when setting or checking levels.

Click on the Master **meters** button to toggle through the three meter display modes.

Weight

The **weight** controls set the side-chain levels for each channel into the control system. This establishes the relative sensitivity of the automatic mix for the channels in use. *They do not change the mix levels.* When the **weight** controls are balanced, each mic has an equal opportunity to take over the system: when one person talks into one mic, he/she gets all the **auto mix gain** and the others get turned down.

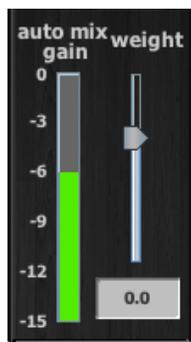


Figure 4-8 Weight controls

The **weight** controls should be used to balance the channel **auto mix gain** indicators when no one is talking. If a board preamp trimmer is turned down, that channel's **weight** control can be turned up to re-balance the automixing, and vice-versa. Weights can be changed by dragging the sliders or by entering dB values in the windows below the sliders. Ctrl-click the **weight** slider to reset its value to 0.

iPad

Touch and hold the **weight** slider to reset its value to 0.

It is important to understand that the Speech System works by detecting the *ratios* of the levels between channels, not their absolute levels. *The weight control is not a gate threshold!*

The following example explains how **weight** works (see Figure 4-9).

Raising the **weight** control for one channel:

- increases that channel's **auto mix gain** display during ambience and decreases it slightly for the others;
- makes it more difficult for others to speak when someone speaks into the channel with the higher **weight** setting.

It is important to understand that this does not set that mic's *level* in the mix when that person speaks alone, but only its *sensitivity* during automatic mixing compared to other channels.

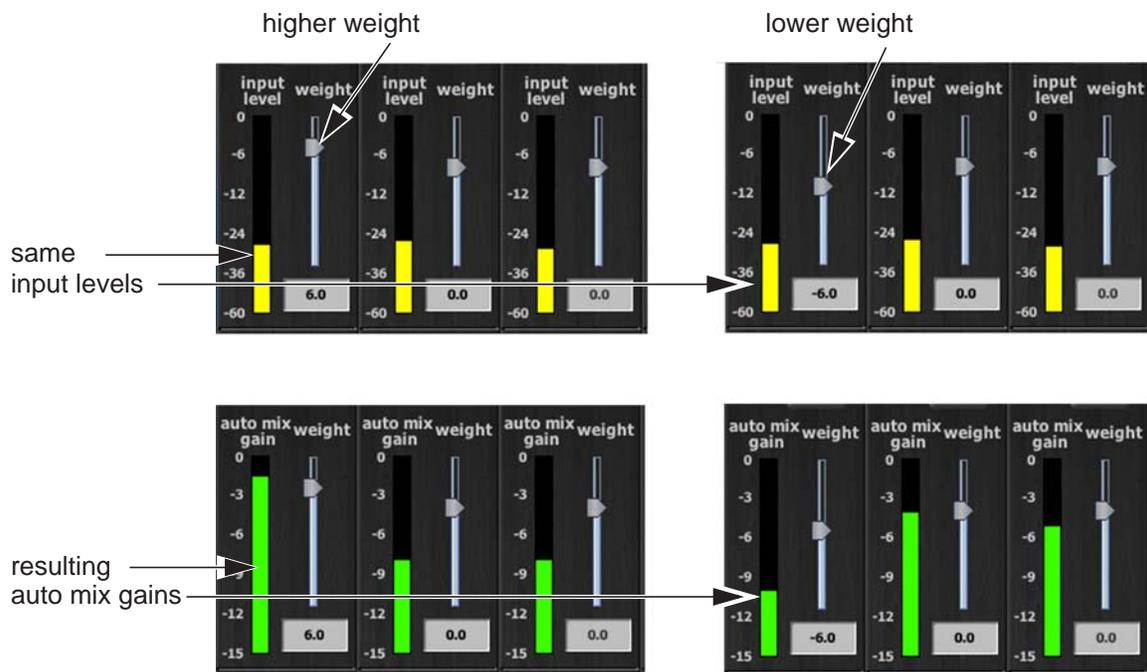


Figure 4-9 Changing one channel's weight control

Lowering the **weight** control for one channel:

- decreases the **auto mix gain** display during ambience for that channel and increases it slightly for the others;
- makes it more difficult for that channel's talker to be heard over the others.

For optimal performance, balance the **weight** controls so the channel gains display approximately equally when no one is talking. If there is ongoing noise near one mic (e.g., computer fan or air vent), suppress it by reducing that channel's **weight**. Of course, you will hear that noise increase when that talker speaks.

Figure 4-10 shows eight- and four-mic systems with appropriate **auto mix gain** displays when no one is talking.

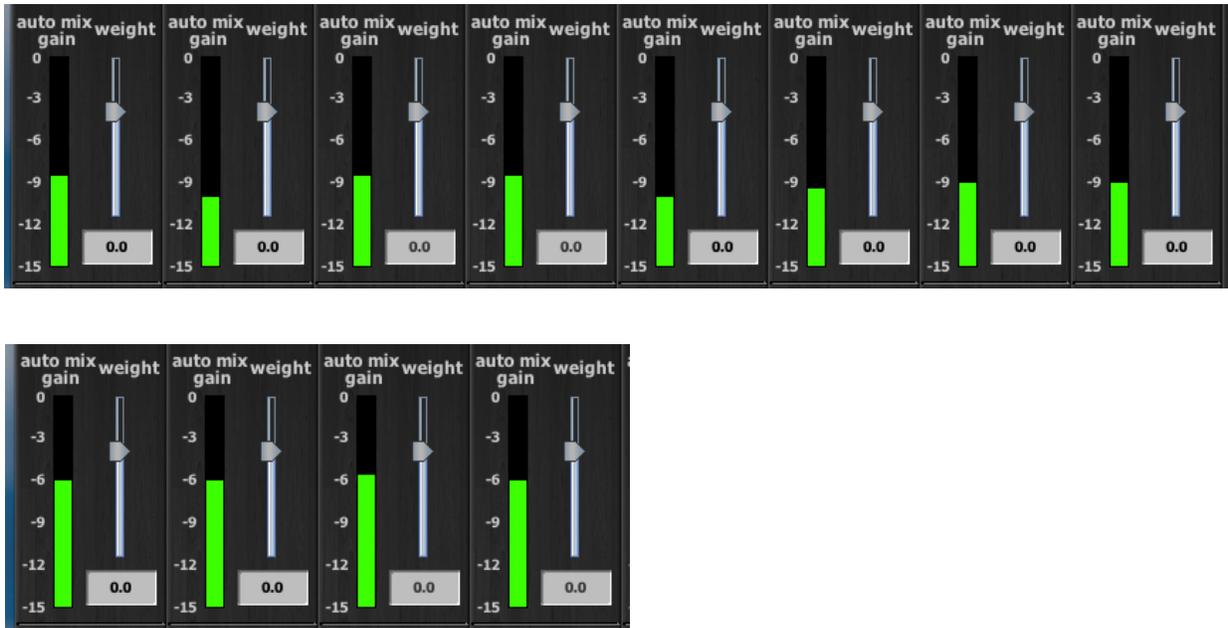


Figure 4-10 Multiple mic ambience: **auto mix gain** hovers around -9 dB for eight mics, -6 dB for four mics

Master Pane

The content of the Master Pane changes to reflect the Dugan device selected. This section documents the Dugan-VN16's controls and indicators.

The selected unit's firmware and Control Panel (Java or iPad) versions are shown below the Dugan logo.

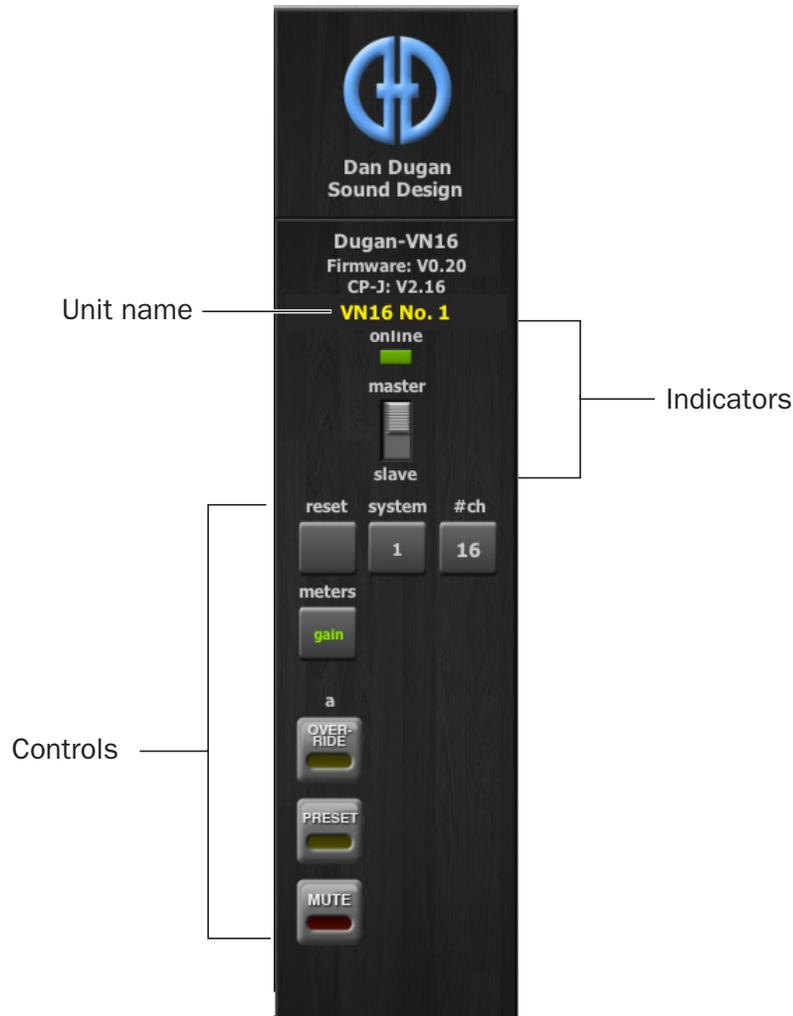


Figure 4-11 Master Pane indicators and controls

Unit Name

The Master Pane includes the unit name in yellow. You can edit this field to assign your own name which persists through power cycles and pressing the **reset** button in the Master Pane. A default name is restored after pressing the **NETWORK RESET** switch on the back panel.

Indicators

The Master Pane includes two indicators that do not change any function.

Online

This indicator lights to show the unit is online.

Master-slave

This indicates whether this unit is set to **NORM (master)** or **SLAVE** mode on the rear panel switch.

- A single Dugan-VN16 must be set to **master**.
- If multiple Dugans are linked, set only one to **master** and the others to **slave**.
- If external Dugan automatic mixing controllers are linked with one or more Dugan-VN16s, one of the Dugan-VN16s must be set to **master**.

Controls

The Master controls, located on the far right, include **reset**, **system**, **#ch**, **meters**, **OVERRIDE**, **PRESET**, and **MUTE**. A set of buttons appears for each active group.

Reset

Click the **reset** button to restore the Dugan-VN16 to factory default settings. This is the same as pressing the rear panel **RESET** button. This sets

- channel modes and presets to **auto**
- **override** buttons to inactive
- weights to 0 dB
- groups to **a**
- **bypass** buttons to inactive
- channel names to defaults
- meters mode to **gain**.

System

When multiple Dugan *units* are linked, groups **a**, **b**, and **c** span linked units and operate as independent automatic mixers.

It is possible to have multiple *systems* of linked units on your network. These units will all appear in the Top Pane. The Dugan-VN16 allows 16 systems in a network.

In the rare instance that requires multiple systems:

1. Select the first unit to include in the system by clicking it in the Top Pane.
2. Click the **system** button and select a unique number for that system.
3. Repeat for each unit in that physically linked system, making sure to use the same number for each unit in the system.
4. Repeat steps 1–3 for each system.

#ch

This button selects between the normal 16-channel mode (**16**) and Shared mode (**8/8**). Shared mode provides eight Dugan automatic mixing channels and eight ADAT I/O channels.

Meters

Click on the Master **meters** button to toggle through the three meter display modes.

	Meter Displays	Meter Color
auto mix gain	action of the Dugan Speech System	green
input	input level	yellow
output	output level	blue

Table 4-2 Meter modes

Group Master Controls

Group master buttons appear in the Master Pane for each group in use.

Override

Activating the Master **OVERRIDE** mode button has the following effect on individual channels:

- Channel **override** button active: puts the channel in **man** mode with full gain (no automixing);
- OR -
- Channel **override** button inactive: mutes the channel.

Select channel(s) to include in the override group by activating their **override** button(s).

Remove channel(s) from the override group by deactivating their **override** button(s).

Preset

Pressing the Master **PRESET** button sets the channel modes (**man**, **auto**, **mute**) to those shown on each channel's **preset** buttons. Use these settings to store your favorite channel mode settings. When the unit powers up, the channels default to their preset modes.

Mute

Press the **MUTE** mode button to mute a group. Press it again to unmute the group.

Typical Operation

This section creates a setup that will work for most applications.

1. Activate the **auto** mode buttons for all live mic channels.
The figure below shows channels 1–4 in **auto** mode.
2. Activate the **mute** buttons for all unused channels.
The figure below shows channels 5–8 in **mute** mode.



Figure 4-12 Typical operation

- 3.** Activate the **preset** button next to the active mode button on each channel.
This causes that mode to be selected when the system restarts.
- 4.** Initially, set the mixer's faders to unity gain.
- 5.** Speak into each mic normally at the desired distance from the mic. Increase the mixer's input gain to just below clipping for best automatic mixing performance.
The input gain before the Dugan-VN16 should be high enough keep the **level** LED lit green during silences.
If the input gain controls are set too low, the inputs drop below the minimum operating level, and the smooth ambience is disrupted.
- 6.** Adjust each live mic channel's **weight** setting until the fluctuating ambient noise registers approximately equally on all **auto mix gain** meters.
Note that raising one channel's **weight** setting causes its **auto mix gain** to rise and the others to fall. With balanced **weight** settings, all mics have equal access to the system gain.
- 7.** During the event, adjust the faders to refine your mix.
There is usually no need to adjust the Dugan-VN16's controls during the event.
Since the Dugan Speech System manages gain, there is no need to mute live mic channels (on the mixer or Dugan-VN16) unless there is disturbing noise.

NOTE: *If channel clipping occurs, turn down its input gain on the console, and increase the channel's weight setting on the Dugan to re-establish the ambient noise balance.*

Chapter 5: Updates

Updates for the Dugan-VN16 can be downloaded.

iPad

To update the firmware in your Dugan unit, iPad users must connect a computer and run the Dugan Utility.

To update the Dugan Control Panel for iPad, connect to the Apple App Store.

To update your device's software and firmware:

1. Connect to the Internet and download **Dugan-Software-yyyymmdd.zip** from:
<http://www.dandugan.com/downloads/>

- OR -

<http://tech.groups.yahoo.com/group/duganusers/files/>

After the download is complete, the Internet connection is no longer necessary.

2. Unzip the software package.

It contains the **Dugan-Control-Panel-vxxx.jar** and **Dugan-Utility-yyyymmdd.jar**. The Dugan Utility contains the latest versions of both the firmware and the safety copy of the Dugan Control Panel that loads automatically into the unit.

To revert to a previous version, use the older version of the Dugan Utility.

3. Connect the computer to the Dugan units you wish to update.
4. Launch **Dugan-Utility-yyyymmdd.jar**.

The Dugan Utility window appears.

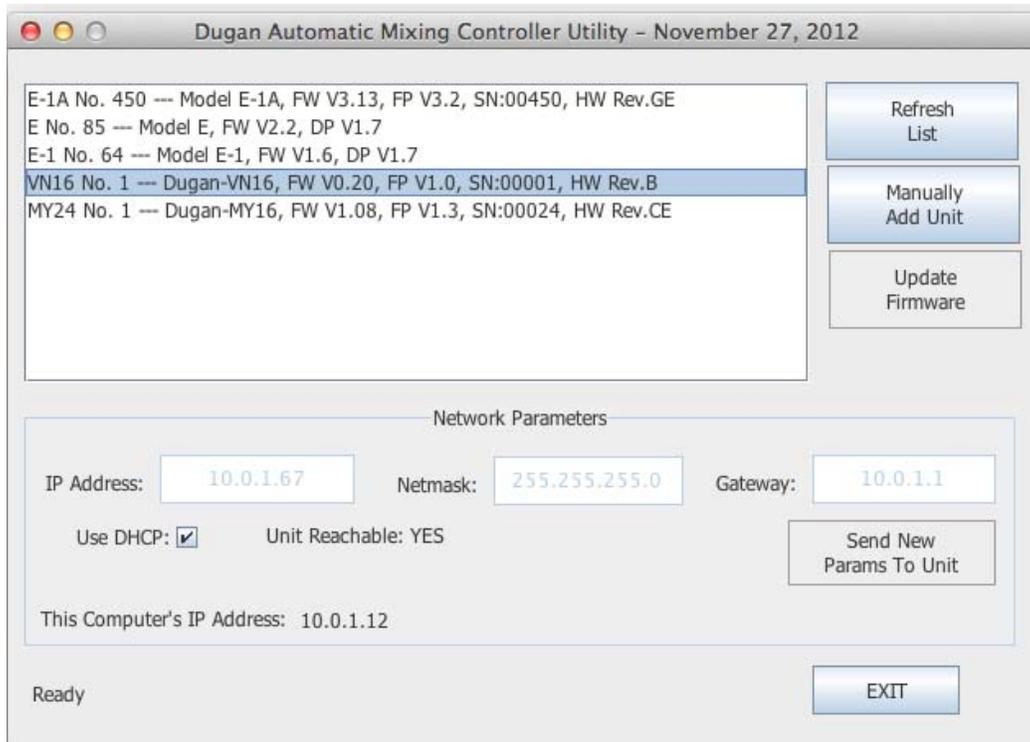


Figure 5-1 Dugan Utility

If you do not see the Dugan unit(s) on your network in the list, see *Establishing Network Connections* on page 38.

5. Select the unit to update from the list.
6. Make sure **Use DHCP** is *NOT* selected for that unit.

Under certain network conditions, DHCP is not compatible with the firmware update process.

7. Click on **Send New Params To Unit**.
8. Click **Update Firmware**.

The unit reboots after the update completes.

If there is a problem, Ctrl-click the **Update Firmware** button to force another firmware update.

9. Repeat steps 5 through 8 for each unit you wish to update.

NOTE: To force an update when the **Update Firmware** button is not blue, Ctrl-click the button.

Chapter 6: Specifications

Compatible Avid Live Sound Systems	SC48, FOH Rack, and Mix Rack
Operating Modes	
Standard	16 channels of Dugan mixing ADAT connectors link multiple Dugan units
Shared	8 channels of Dugan mixing and 8 channels of general purpose ADAT I/O
IO 16	16 channels of general purpose ADAT I/O
Audio	
Digital I/O	ADAT optical, 24 bit, 48 kHz (Shared and IO 16 modes only)
Gain	Unity
Audio Latency	2 ms
Linking	7 external Dugan units may be linked with one Dugan-VN16 in an optical ring network
Connectors	
10/100 BASE T	RJ-45
Word Clock Output	BNC
Linking and Digital I/O	ADAT optical
Physical	
Dimensions	H = 4.4 cm (1.75 in) W = 43.2 cm (17 in) D = 21.6 cm (8.5 in)
Weight	1.43 kg (1 lb 2.5 oz) 2.75 kg (6 lb) in shipping box

