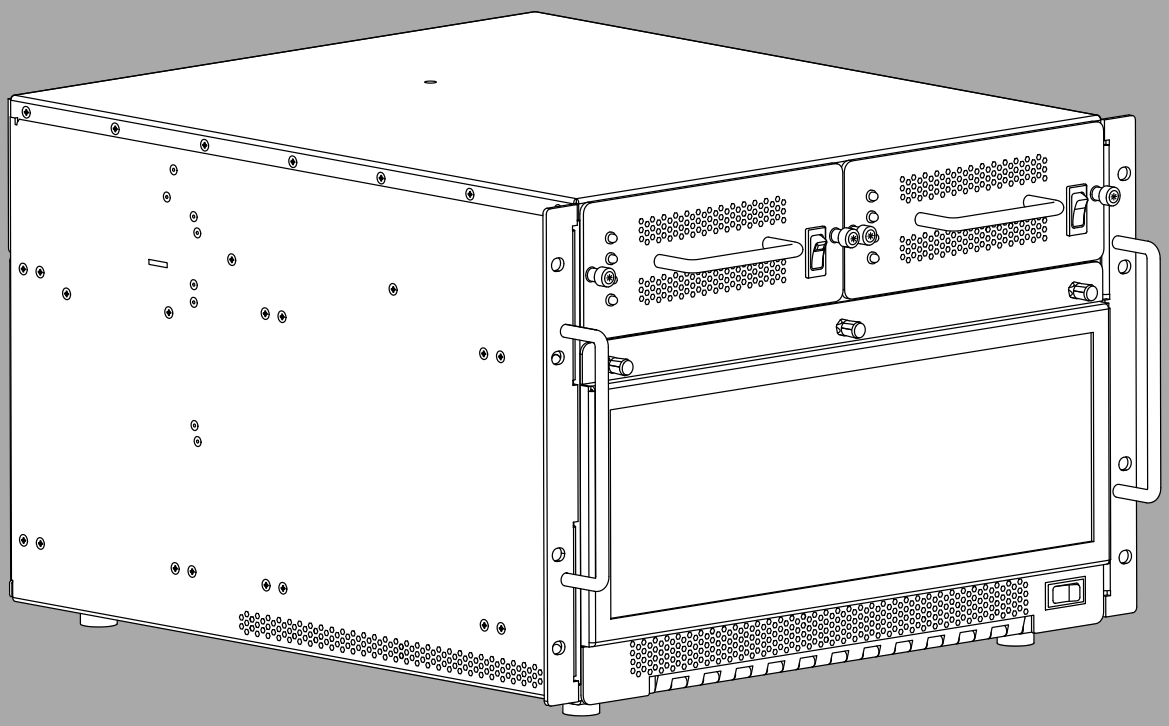
ADAM 2

ADAM 2 FRAME 110-220 V, ADAM 2 FRAME 110-220 V installed, ADAM 2 FRAME WITHOUT POWER SUPPLIES



en Technical Manual

Table of contents

1 Safety

1.1 Copyright and Disclaimer

1.2 Notices

		
The lightning flash and arrowhead within the triangle is a warning sign alerting you of dangerous voltage inside the product.	Caution: To reduce the risk of electric shock, do not remove cover. No user-serviceable parts inside. Refer servicing to qualified service personnel	The exclamation point within the triangle is a warning sign alerting you of important instructions accompanying the product.
See marking on bottom/back of product.		

Warning!
Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

Warning!
The main power plug must remain readily operable.

Caution!
To reduce the risk of electric shock, grounding of the center pin of this plug must be maintained.

Warning!
To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

∿	This product is AC only.

CE	CE Compliant and UL Certified
UL	

Warning!
This is a CLASS A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Notice!
Equipment is intended for installation in Restricted Access Area.

1.3 Important 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. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug the apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, 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.

2 Introduction

The RTS family of Digital Intercom Matrices is the most extensive, widely used, scalable and backwards compatible line of intercoms in the world today. The high-end ADAM 2 Matrix supports 8 to 880 users per system; 512 ports possible in just a seven RU (Rack Units) frame. Utilizing a patented TDM (Time Division Multiplex) technique, the ADAM 2 grows linearly as users are added. The system comes standard with redundant universal power supplies (100-240 VAC), and supports redundant controllers, allowing for automatic change-over in the event of failure.

ADAM 2 is available with a wide variety of Interface cards in the industry, including the MADI-16, OMI, AIO-16A, and RVON + interfaces. It also has the wide variety of cabling options, including RJ11, RJ45, DB9, jack fields, and many others.

With its second generation controller card, Ethernet connectivity is achieved between the ADAM 2 Intercom and AZedit. ADAM 2 can support 32 simultaneous AZedit sessions.

Features

- Supports all standards including VoIP, OMNEO, DANTE, Analog, SMPTE 2110, MADI, and more depending on cards populated in the frame.
- The new ADAM 2 is designed with quieter fans, universal power supplies that operate in all countries and is compatible with ALL current and legacy RTS keypanels and accessories. It comes standard with multi-level IFB, ISO, Party-Lines, Groups, and GPIs. It supports from 8 to 880 users.
- Supports real-time monitoring online and offline configuration and RTS UPL (User Programmable Language) for custom system configurations via pull-down menus.
- In addition to digital and VoIP cards, the analog dual-purpose ports support both keypanel and 4-wire audio.
- Integrated support for RTS Intelligent Trunking of 255 matrices (ADAM, ADAM-CS, ADAM-M, ADAM 2, Cronus, Zeus III, and ODIN).

Unpacking the components

- Unpack the contents of the shipping crates and carefully inspect for damage.
- Notify the freight carrier immediately if any damage is noted.
- Check off all items as noted in the packing lists.

Caution!

Use caution when lifting the system components.

A fully loaded ADAM 2 card frame weighs approximately 75 lbs (34 kg).

3 Mounting the central matrix components

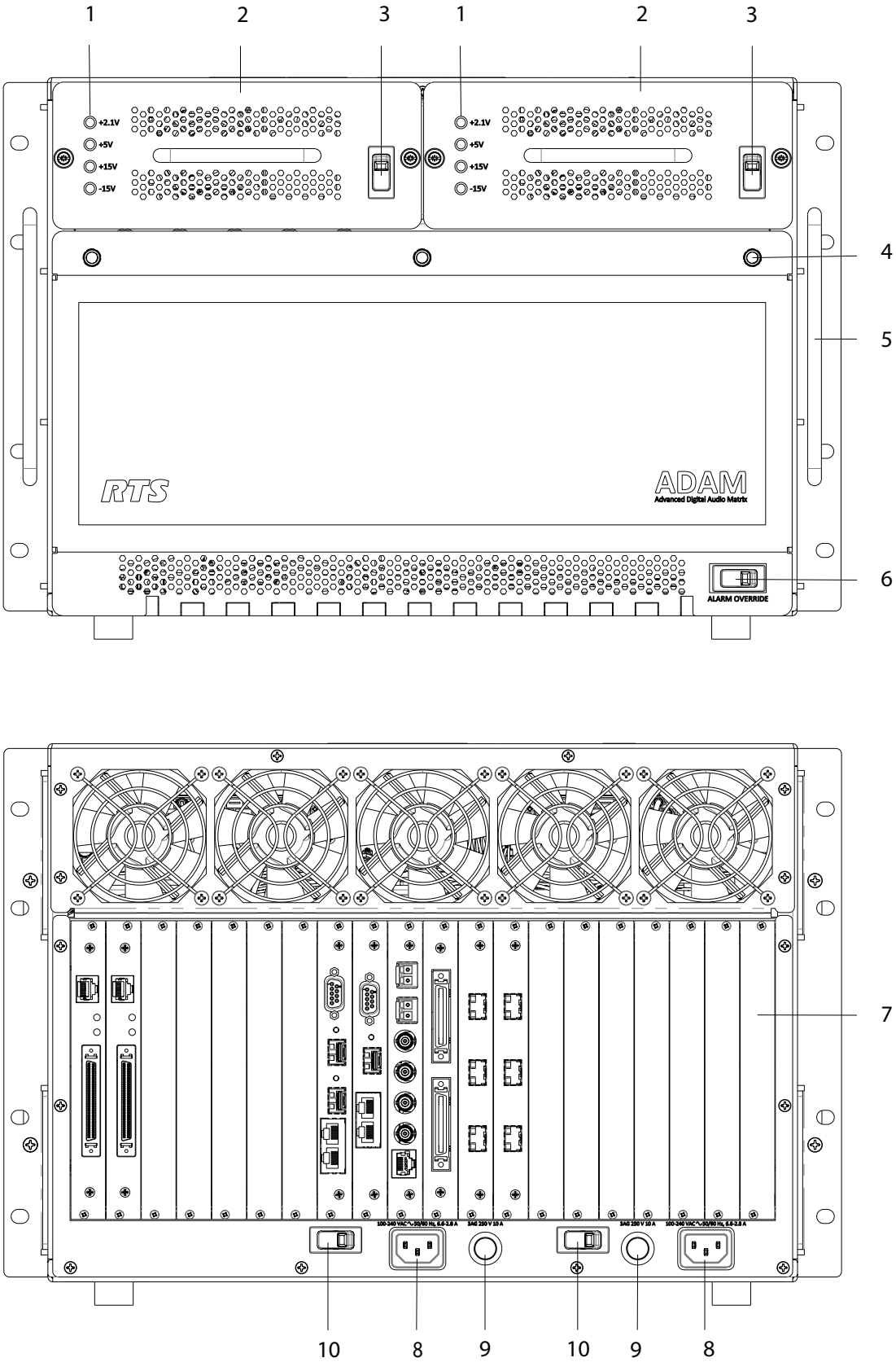
Bolt the frame into the front of the equipment rack. Make sure the ventilation holes on the front and back are unobstructed. The rack space behind the frame should be completely clear to allow for connections and card installation and removal (at least two feet).

Notice!
There is an LED fail indicator and reset switch located near the top-front of each front card. The LED indicators are only visible when the center of the card frame is at or above eye level.

Considerations

- Mount station breakout panels and translation panels in the back of the equipment rack to allow intercom station cabling to exit the frame at the top and bottom of the unit, as required.
- Mount optional UIO-256/GPIO-16 frames in the front of an equipment rack. Position a UIO-256/GPIO-16 to give visibility of the front panel LEDS, which provide visual indication for any active inputs and outputs.
- Mount PAPs (program assign panels) in the front of an equipment rack. To allow for viewing of the front panel indicators and easy activation of the front panel controls, position the PAP slightly below eye level when sitting or standing.

4 ADAM 2 Reference Drawing



1. Power supply rail LED indicators
2. Power supply sled
3. Power supply sled power switch
4. Thumb screw (x 3)
5. Chassis Handle (x 2)
6. Alarm Override switch
7. Card slots
8. AC power connector
9. AC Fuse
10. ADAM 2 power switch

5 ADAM 2 circuit cards

5.1 Front card access

To **access the front cards**, do the following:

1. Loosen the **thumb screws** securing the front glass door.
2. Swing the **door** down.

5.2 Card installation and removal

It is not necessary to turn off the power to the ADAM 2 frame before installing or removing cards in the frame. This permits continuous operation of the intercom system with no interruptions to unaffected ports in the event of a card failure.
Removal of a front or back audio card from the frame causes asterisks to appear on any keypanel connected to the card. When the card is reinserted into the frame, it takes a few minutes for the keypanel display to return to normal.
The card in slot 9 determines all system clock functions. The card in slot 8 serves as a backup to the card in slot 9.

Caution!
Never remove cards in slot 8 and 9 at the same time.
This causes the intercom system to stop working.

Notice!
Read all instructions before installation.
Damage to connector pins located on the back plane inside the ADAM 2 frame can occur by improper or hurried insertion of the circuit cards.

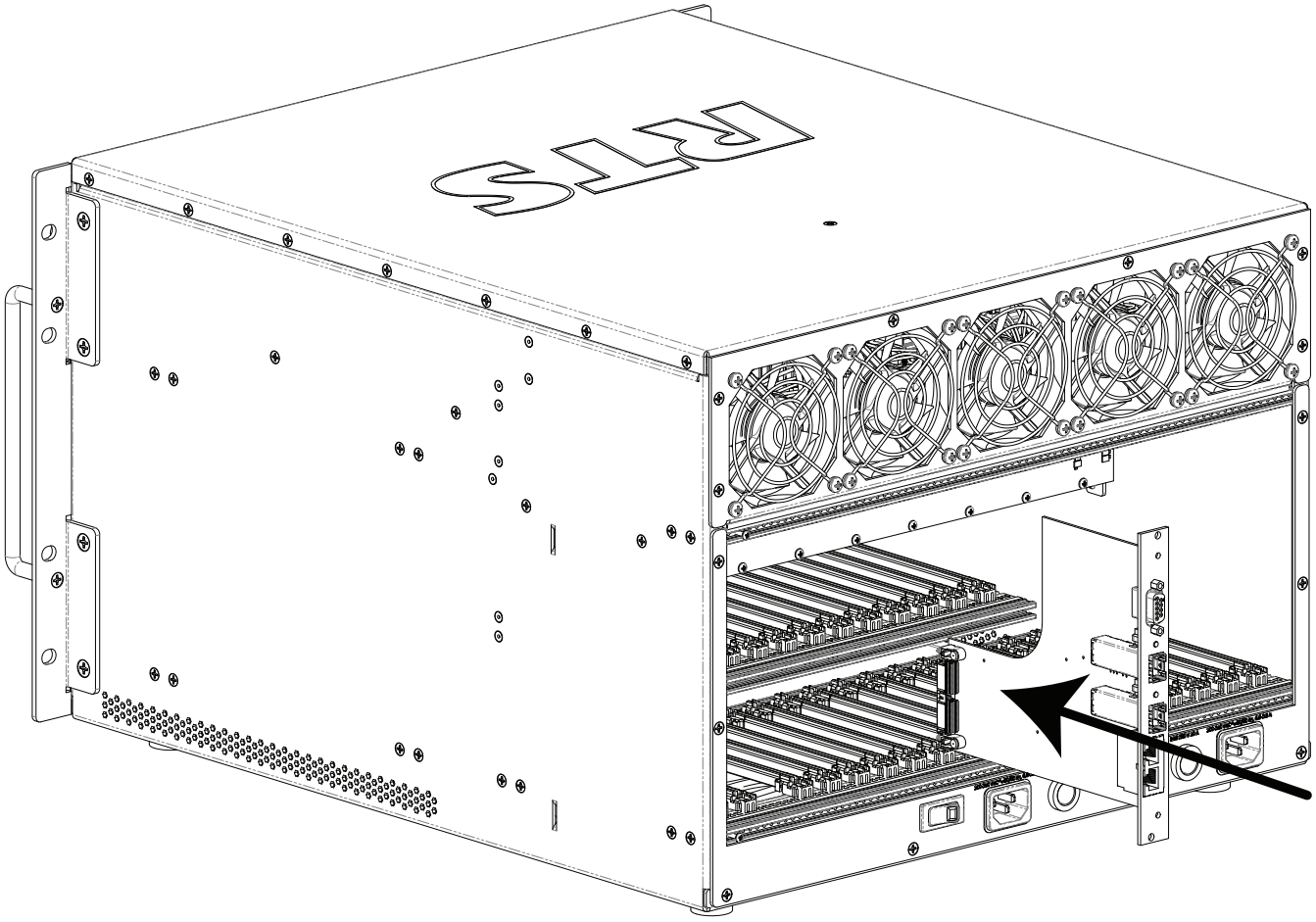


Figure 5.1: Back card installation

To **insert back cards**, do the following:

1. Orient the **card** so the side connector edge is toward the bottom.
2. Insert the **card edges** into the upper and lower guides in the back of the ADAM 2 frame.
3. Push the **card** in until the mounting plate is flush with the ADAM 2 frame.
4. Install **mounting screws (M2.5 x 10 mm)** in the top and bottom of the card plate to lock it in place.

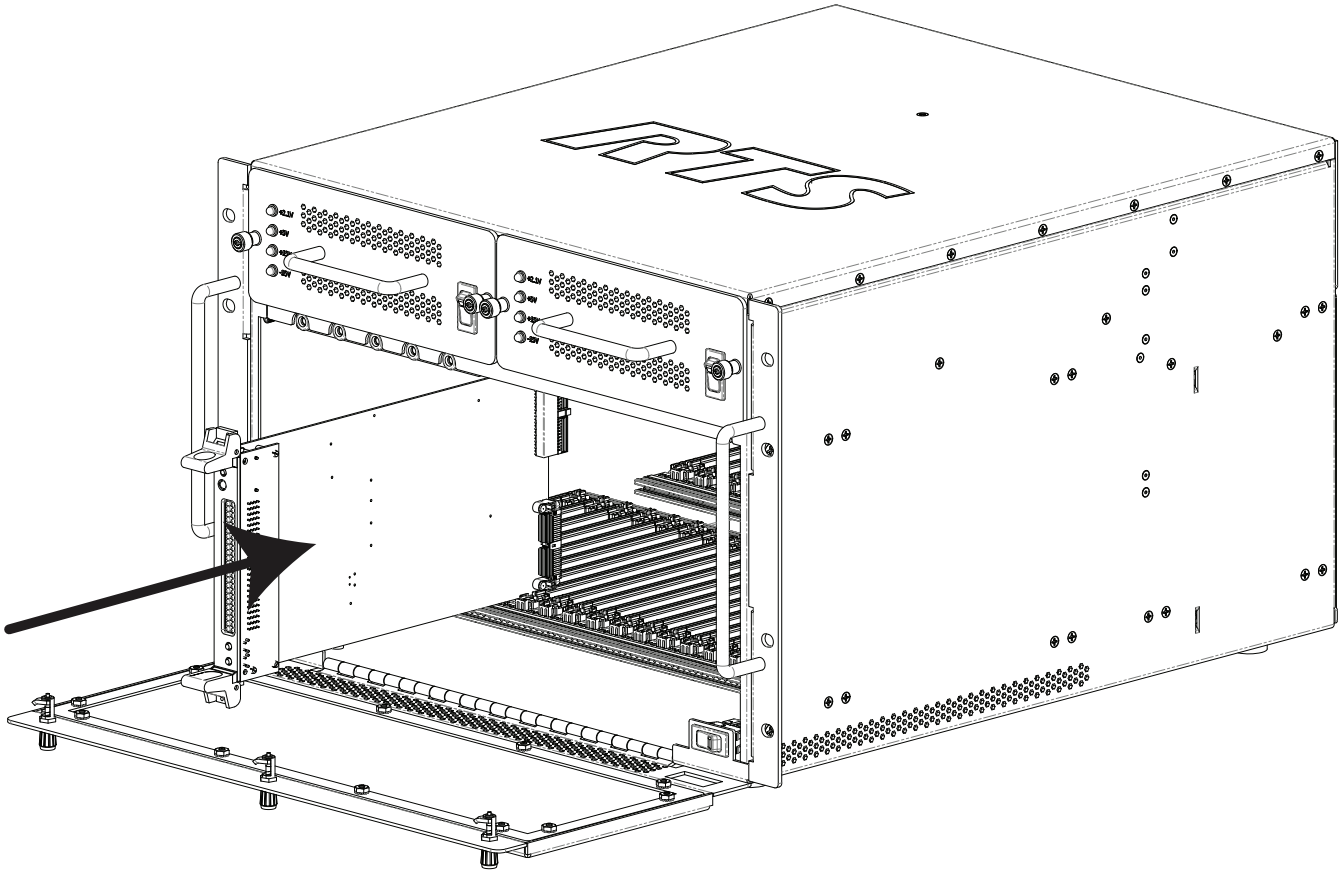


Figure 5.2: Front card installation

To **insert front cards**, do the following:

Notice!
Orient the front card so that the indicator LED and reset switch are at the top front.

1. Insert the **card edges** into the upper and lower card guides in the front of the ADAM 2 frame.
2. Push the **card** straight into the slot until you feel an initial resistance.
3. Apply **slightly more pressure** to engage the connector pins.
4. Press **firmly** to completely seat the connectors.
   The card mounting plate should be flush with the ADAM 2 frame.

Notice!
For mobile installations, use mounting screws (M2.5 x 10 mm) to secure the front cards.

To **remove the front card**, do the following:

1. Unscrew the **top** and **bottom screws**, if installed.
2. Simultaneously press **down** on the lower ejector lever and press up on the upper ejector lever.
3. Pull the front card straight out of the frame.

To **remove a back card**, do the following:

1. Unscrew the **top and bottom screws** on the back card.
   The screws do not completely come out.
2. Simultaneously press **down** on the lower ejector lever and press **up** on the upper ejector lever.
3. Remove the **back card** from the frame.

5.3 Unused back card slots

Use a card blank to cover the opening when there are unused back card slots to ensure proper air flow.

5.4 Master controller card DIP switches

All master controller card DIP switches are set to the factory default operation position. These settings are satisfactory for most applications. Optional settings are summarized in table below. Be sure the main and backup controller cards are set the same if changes are made to these settings.

DIP Switch 1	Debug Only! Must be in the OPEN position.
DIP Switch 2	Sets the baud rate for AZedit serial connection via J1. By default, AZedit is set for COM1 and 38,400 kbps (38.4k). The baud rate set in AZedit must match the baud rate setting of the Master Controllers in the frame. Default: Closed Open: 9,600 baud Closed: 38.4k baud
DIP Switch 3, 4, and 5	Reserved, keep in the OPEN position.
DIP Switch 6	Debug Only! Must be in the OPEN position.
DIP Switch 7	Determines the Master/Slave frame in a multi-frame system. Default: Closed Open: Slave Frame Closed: Master Frame
DIP Switch 8	Debug Only! Must be in the OPEN position

Tab. 5.1: MCII-e Factory set DIP Switch Settings

Caution!
DIP switches 1, 6, and 8 should always be left in the OPEN position. These are reserved for debugging and can have unintended consequences if not left in the OPEN position.

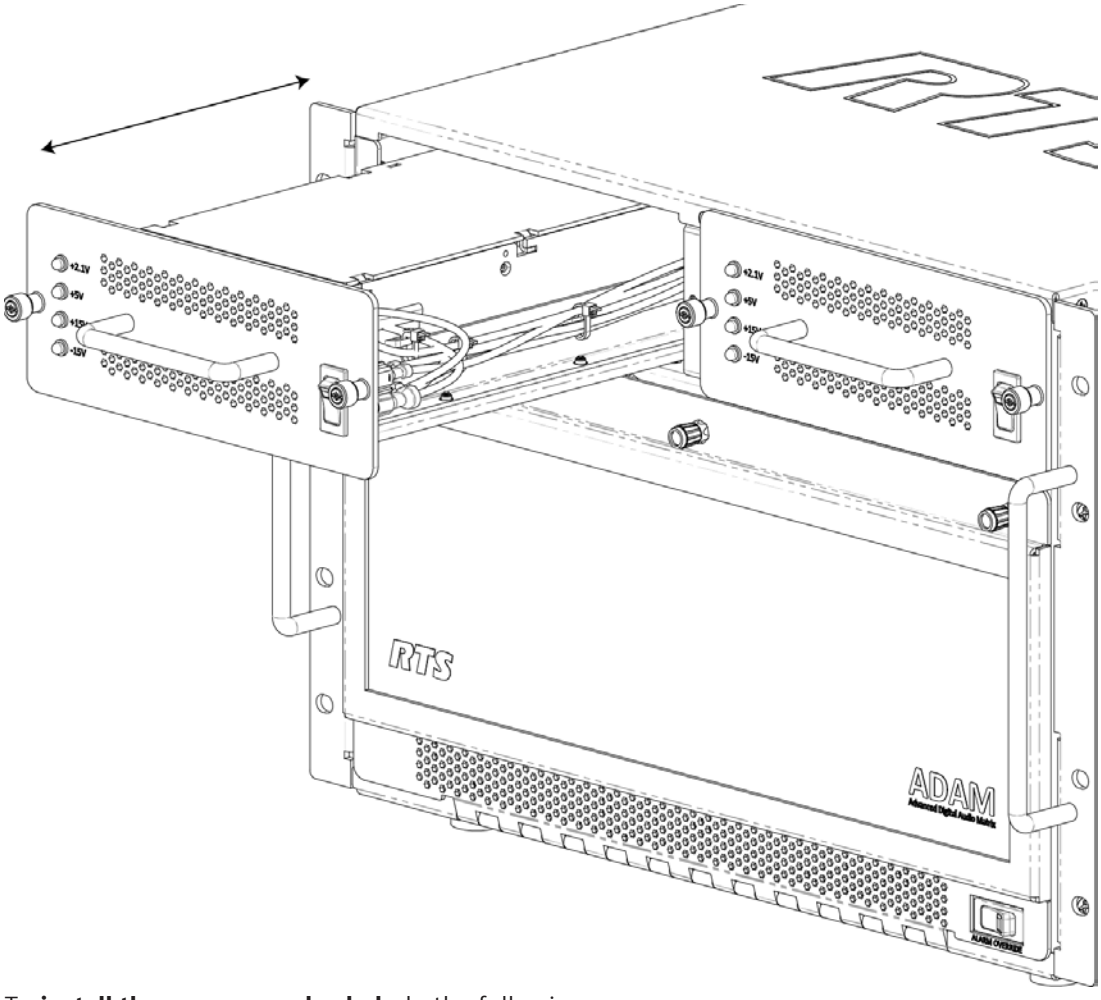
6 Power supply sled removal and installation

To **remove the power supply sled**, do the following:

1. Turn the **power supply sled power switch off**.

Notice!
The power supply sleds can be removed while power is applied, it is recommended to turn the power supply sled off for the sled to be removed.

2. Loosen the **two captive thumb screws** on the front of the power sled.
3. Grasp the **handle**.
4. Pull the **power supply sled** from the frame.



To **install the power supply sled**, do the following:

1. Push the **power supply sled** firmly into the designated slot in the ADAM 2 frame.
2. Tighten the **captive thumb screws**.
3. Turn the **power supply sled power switch on**.

7 AC power connection

To **connect power to the ADAM 2 frame**, do the following:

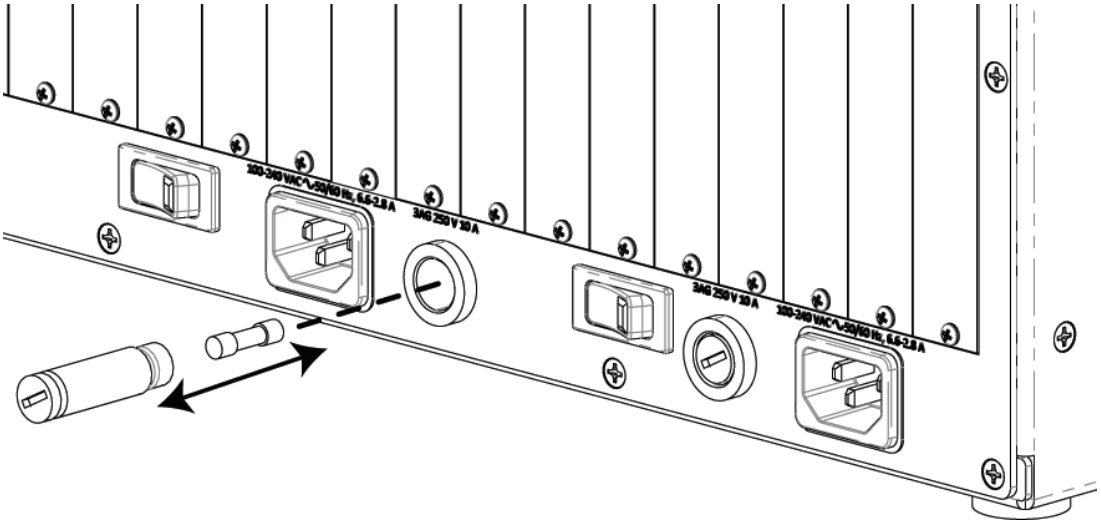
1. Place the ADAM 2 power switches on the back panel to the **off position**.
2. Place the power supply power switch on the front of each power supply sled to the **off position**.
3. Attach a **power cable** to each AC power connector on the back of the ADAM 2 frame.

Notice!
Connecting both AC inputs insures continued operation of the ADAM 2 frame in the event that one power supply fails. If desired, connect two separate AC power phases. This protects against a power supply failure and against a loss of power to one phase.

7.1 AC fuse replacement

To **replace the AC fuse**, do the following:

1. Place the **ADAM 2 power switches** on the back panel to the off position.
2. Place **the power supply power switch** on the front of each power supply to the off position.
3. Remove both **power cables** from the AC power connectors on the back of the ADAM 2 frame.
4. Using a flat head screwdriver, turn the **AC fuse cap** to remove the fuse.
   The cap is spring-loaded and pops out when the fuse cap is loosened.
5. Remove the **old AC fuse** from the fuse cap.



6. Insert the **new AC fuse in the fuse cap**.

Notice!
Required fuse:
Eaton Bussmann S500-10-R
5 x 20 mm 10 Amp 250 VAC fast blow

7. Using the flat head screwdriver, push and turn the **AC fuse cap** to secure it in place.

8 ADAM frame power-up

Notice!
Install at least two front cards in the frame before turning on the power to ensure proper power supply loading.

To **power on the ADAM 2 frame**, do the following:

1. Place the **ADAM 2 power switches** in the on position.

Notice!
The ADAM 2 power switch in the on position illuminates the power supply sled power switch LED.

2. Place the **alarm override switch** in the on position.
3. Place the **power supply sled power switch** in the on position.
   The four power supply rail LED indicators on the power sled front light, the fans start, and the alarm shuts off.

Notice!
The red LED fail indicators light on all circuit cards while the intercom system initializes. Allow 15 to 30 seconds for all indicators to turn off. If the red LED fail indicators do not turn off, use AZedit to configure the card slot properly.

9 Circuit card reset and fail indication

Each front card has a reset button located near the top of the card. Directly under the reset button is a red LED fail indicator. The LED indicator remains off during normal operation. If the LED fail indicator turns on, first attempt to resort normal operation by momentarily pressing the reset button. Allow 15 to 30 seconds for reset. If the LED fail indicator does not turn off after this time, replace the affected card.

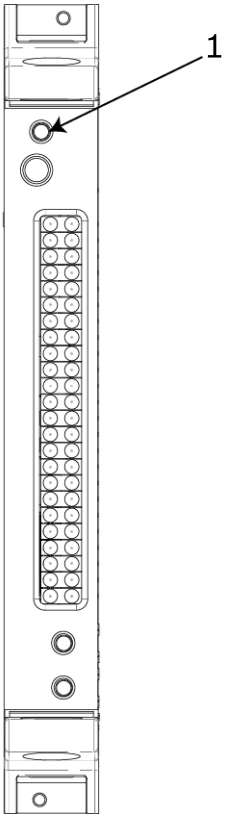


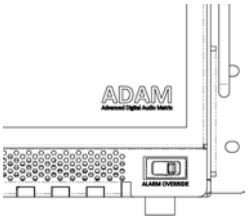
Figure 9.1: Reset Switch

10 Alarm operation

If there is a power supply sled fault during operation, the audible alarm sounds and one or more power rail LED indicator lights on the affected power sled turn off.

To **deactivate the alarm**, do the following:

1. Set the **alarm override switch** to the off position.



2. Turn off the **defective power supply sled**.
3. Repair or replace the **power supply sled**.

For information on replacing the power supply sled, refer to *Power supply sled removal and installation, page 15*.

Notice!

The alarm also sounds if a power sled is off and the alarm override switch is on. Either turn on the power supply sled or turn off the alarm override switch.

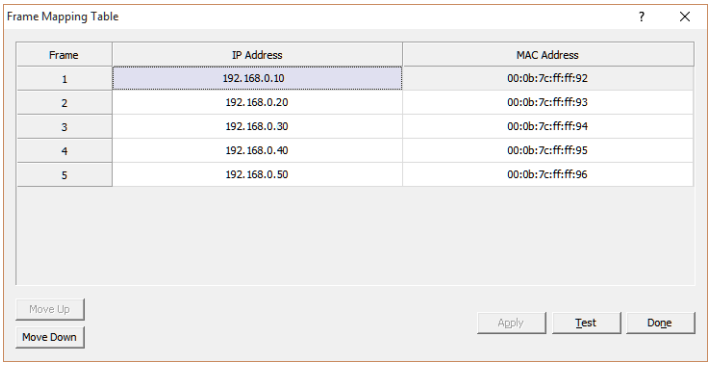
11 Frame mapping (multi-frame systems only)

Frame Mapping is used to assign the position of each frame in a multi-frame system intercom system. The frame order determines the port range assigned. For example, when mapping a 2-frame system, with each frame having 128 ports, the first frame is given ports 1 through 128. The second frame is assigned ports 129 through 256.

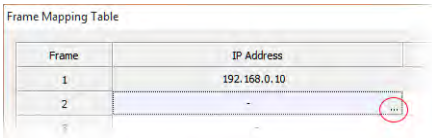
To order the frames in a system, a frame mapping table must be configured.

To **map frames from AZedit**, do the following:

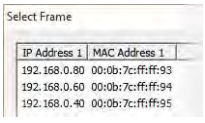
1. From the Options menu, select **Frame Mapping**.
   The Frame Mapping Table appears.



2. Click the **Browse icon** to select a frame to add to the table.
   The Select Frame screen appears.



3. Select the **IP address of the desired frame**.



4. Click the **OK button**.
   The Select Frame screen closes and the frame information is added to the frame mapping table.
5. Repeat **steps 3 and 4**, as necessary.
6. Click the **Test button** to validate the table.
   A valid or not valid message appears.
7. Click **OK**.
   The message closes.
8. Click **Apply**.
   The modifications are applied to the frame mapping table.
9. Click **Done**.
   The Frame Mapping Table closes.

12 Intercom port connections

General information

Typically, devices connect to individual intercom ports using Station Breakout Panels. Depending on the type of breakout panels used, individual intercom stations utilize either RJ-11 modular style intercom cables, RJ-45 connector type, or 9-pin D-sub cables.

The ADAM 2 frame supports a number of different technologies for port connections to devices. These can be either digital using the RVON+, OMI, and MADI cards or traditional analog connections using the AIO-16A card.

Each intercom port supplies two pins for audio input, two pins for audio output, and two pins for data. All audio connections are balanced, dry lines. All audio inputs and outputs are set for unity gain by default: whatever level applied at an input is the level supplied at the output. Input and output levels are adjustable for individual ports, if required. Make adjustments from either AZedit or the front panel of the connected device.

Various types of intercom stations can connect to the intercom ports, but other types of audio devices can also connect. For example, a program source can connect to the audio input for an intercom port, and in this case, the audio output pins are available for other functions.

The data wires for an intercom port send and receive control information between the connected device and the ADAM 2 AIO card. Keypanels, TIFs (Telephone Interface), and PAP-5032s all use data wires. The type of data transmitted includes key press information and display information. For example, key press information transmits on the data wires to the ADAM 2 frame. The AIO card talks to the Master Controller, the ADAM 2 frame then makes the necessary talk and listen connections so that a conversation can take place. It also sends data to the receiving device, for example, to display the caller's name at a keypanel, or to activate a telephone line at a TIF interface.

For the MCII-e DIP switch settings, please refer to *Master controller card DIP switches, page 14*.

12.1 Port allocation table

Use the Port Allocation Table to support I/O cards with more than 16 ports. It allows you to select which card types occupy which intercom slots and which ports are allocated to each card. Ports can be allocated in groups of four. Each group contains 16 ports.

Notice!

If you are running a single frame system, up to 880 ports are supported. If you are running a multi-frame Tribus system, you are limited to 256 ports per frame.

Notice!

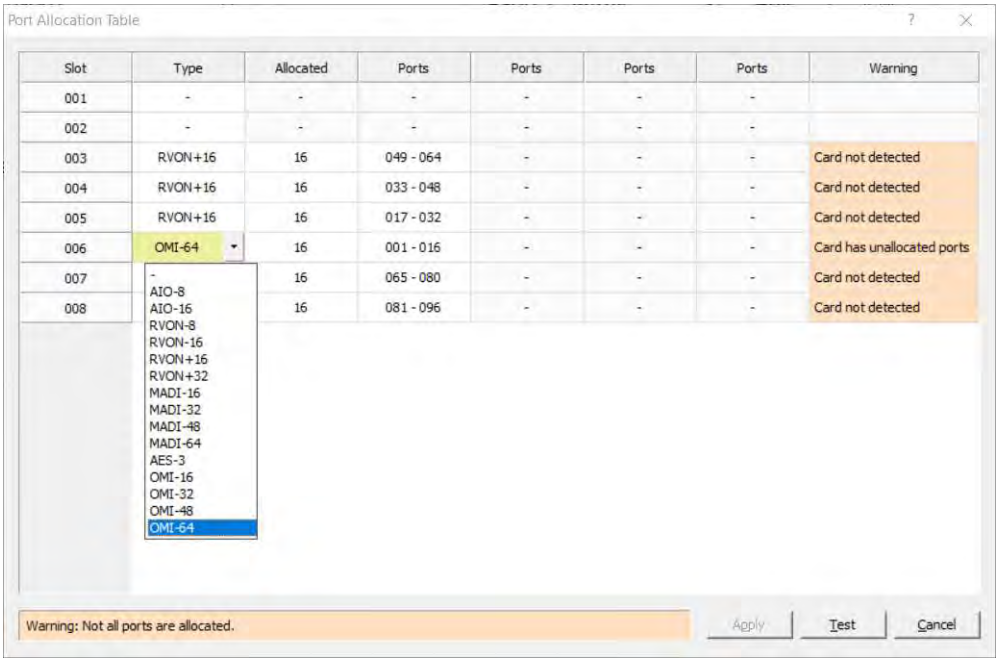
Check power limitations of each frame before building large intercom systems.

The Port Allocation Table requires the following minimum software and firmware versions:

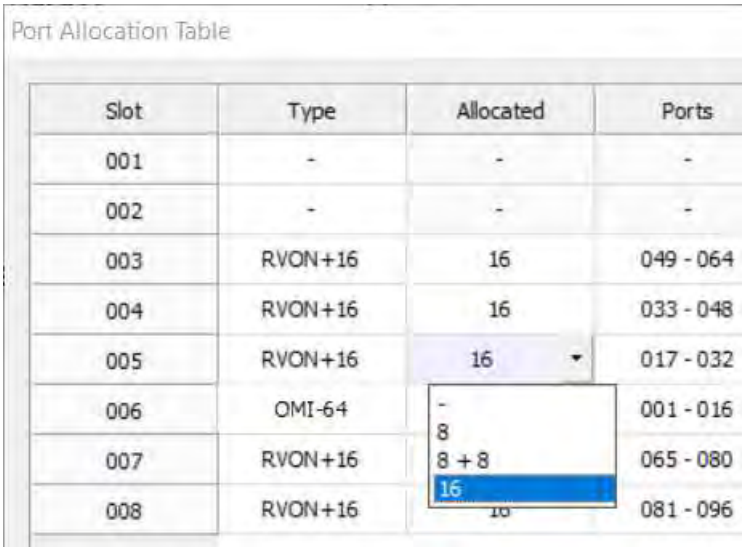
– AZedit V3.9.0 or later
– MCII-e V2.3.0 or later

To **configure the port allocation table in AZedit**, do the following:

1. From the Options menu, select **Port Allocation Table**.
   The Port Allocation Table screen appears.

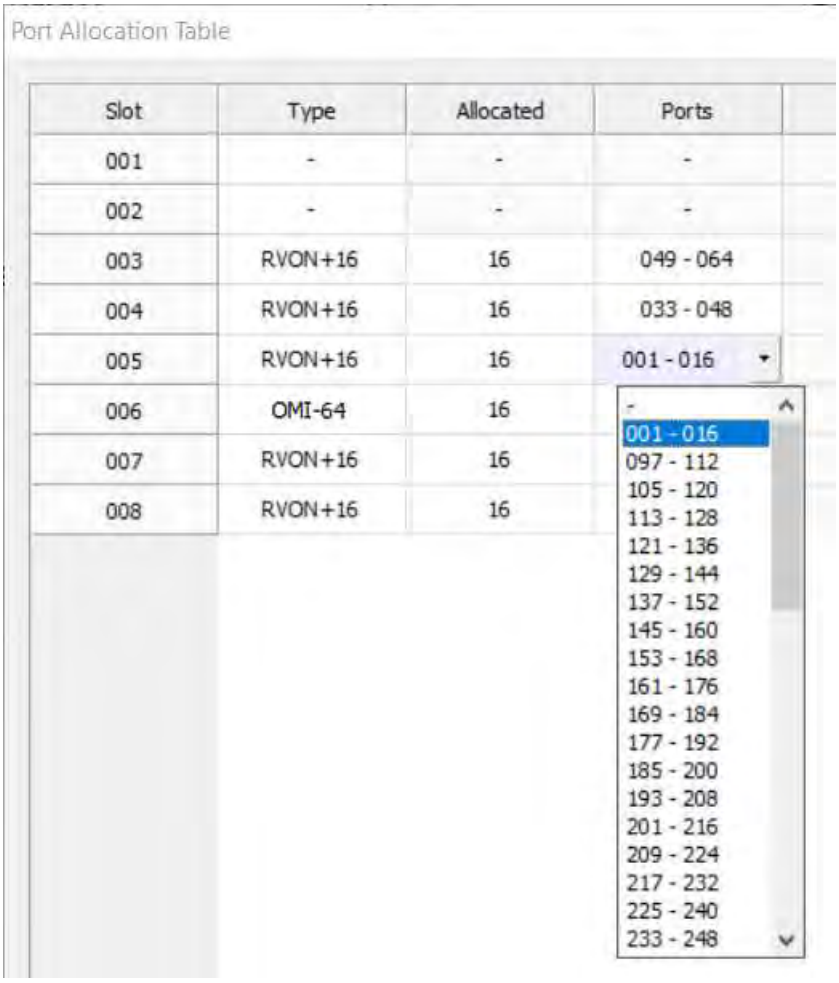


2. In the Type column, delete as many **card types** as necessary to fit the required frame population.
   Deleting the card type also deletes the quantity of allocated ports and the port numbers.
3. In the Type column, enter the **correct card types**.
4. In the Allocated column, enter the **quantity of ports**.



Notice!
The Allocated port count can be for 8, 8+8, 16, or 32/48/64 depending on the desired system architecture and the card types being fitted. When 8+8 or a port other than 16 is used, fill in additional port count columns.

1. In the ports column, enter the **port number**.



1. Using the Intercom Configuration Wizard, resize the **frame** to its actual frame size.
2. Click the **Test button**.
   The mapping is tested.

Notice!
A popup window appears if mapping fails. Check the column entries and correct, as necessary.

3. Click the **Apply button**.
   The mapping is applied to the frame.

13 KP Series keypanels

To **install the KP Series keypanel**, do the following:

1. Plug the **24 VDC power connector** of the power supply into the power connector on the back panel of the unit.
2. Connect an **RJ-12** or **RJ-45 (568B or USOC) cable** with RTS cabling to the J8 FRAME connector.
   OR
   Connect a **CAT-5e cable** to either J11 or J12 ETHERNET connector.

Notice!
If using the optional J13 fiber connector, connect a fiber connector to the OPTICAL fiber connector on the rear.
The KP Series panels can have both AIO and Ethernet connected simultaneously and the user can switch between connections using the menu.

3. Plug the **power supply power cord** into the wall outlet or power strip.

For configuration instructions, please refer to the KP-Series manuals, located at www.rtsintercoms.com.

14 Program source notes

- External audio program sources can be connected to intercom inputs, but all sources must be DC isolated.
- The audio output and data pins for the port are not used.
- Nominal input level is +8 dBu.

Notice!
Program inputs are assigned using a PAP (Program Assign Panel). PAP panels must be connected to specific ports of the intercom system. For installation information, please refer to *PAP-5032 program assign panel, page 33*.

15 TIF installation notes

Rear Panel DIP Switch (S201)

The rear panel DIP switch contains switches to configure the most often changes options. These include:

- Auto-answer on/off
- Ring signal on/off
- Password on/off
- Intercom port address
- Full duplex mode

Password Required

The Password Required option sets the unit so when a call is automatically answered, the user must enter a password via DTMF before the unit allows communications. The password numeric sequence and length are determined by the settings of the S203 internal DIP switch.

Intercom Port Address

Switches 4 to 7 determine the address of the unit. The port address is expressed in binary with switch 4 being the LSB (Least Significant Bit) and switch 7 being MSB (Most Significant Bit).

Connections

Intercom

Use either of the To Matrix connectors (but not both) to connect to an intercom port. The intercom port connection determines the address of the unit. An LED labeled DATA is located next to the Matrix connectors and serves as a basic indicator.

Telephone and Telephone Line

There are two telephone connections provided on the rear of the TIF system. Plug the telephone line into the jack labeled To Phone Line or use a standard telephone to plug into the Loop Thru jack.

Notice!

When the TIF seizes the telephone line, the telephone plugged into the Loop Thru jack disconnects.

Power Supply

To **power the TIF**, do the following:

1. Insert the **round connector** from the power supply into the power connector on the rear of the TIF.
2. Turn the **locking ring** on the connector to secure the connection.
3. Plug the **female end of the IEC type power cord** into the power supply.
4. Plug the **other end** into an appropriate power outlet.

For more comprehensive installation instructions, please reference the TIF Technical Manual found at www.rtsintercoms.com.

16 Device connections

Connections to ADAM 2 frame

ADAM 2 has a variety of configurations to meet different user requirements.

16.1 Common cable assemblies

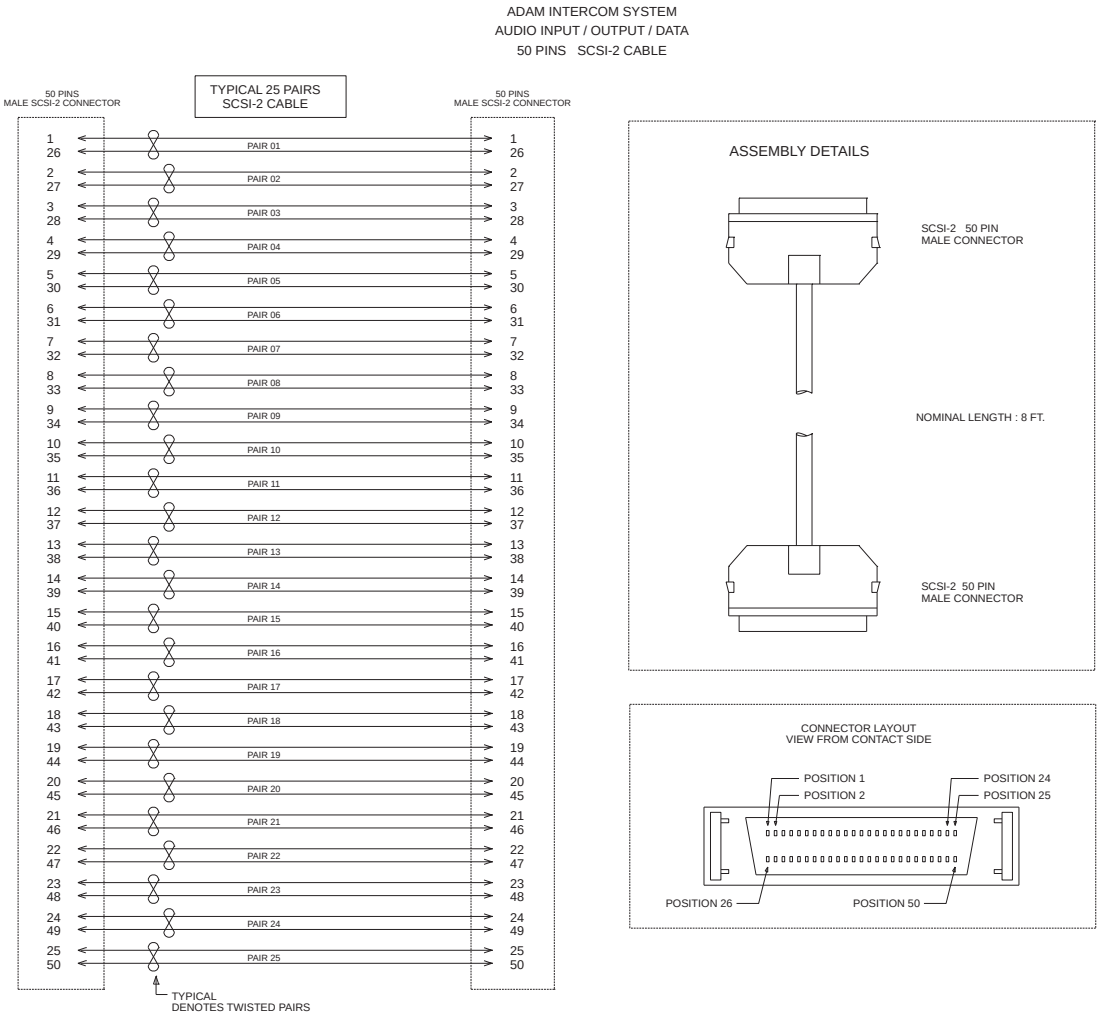


Figure 16.1: ADAM Intercom System Audio Input/Output/Data 50-pin SCSI-2 Cable

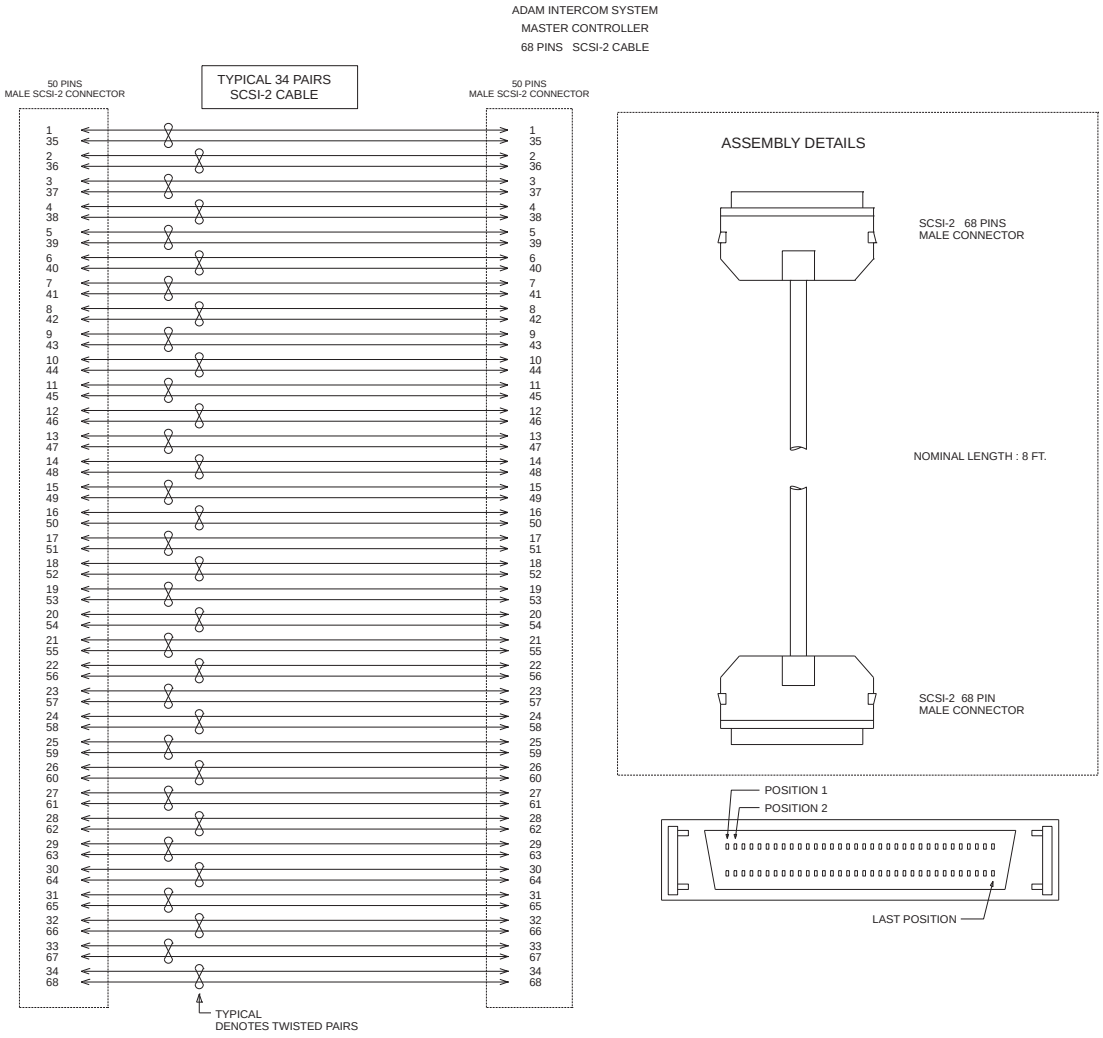


Figure 16.2: ADAM Intercom System Master Controller 68-pin SCSI-2 Cable

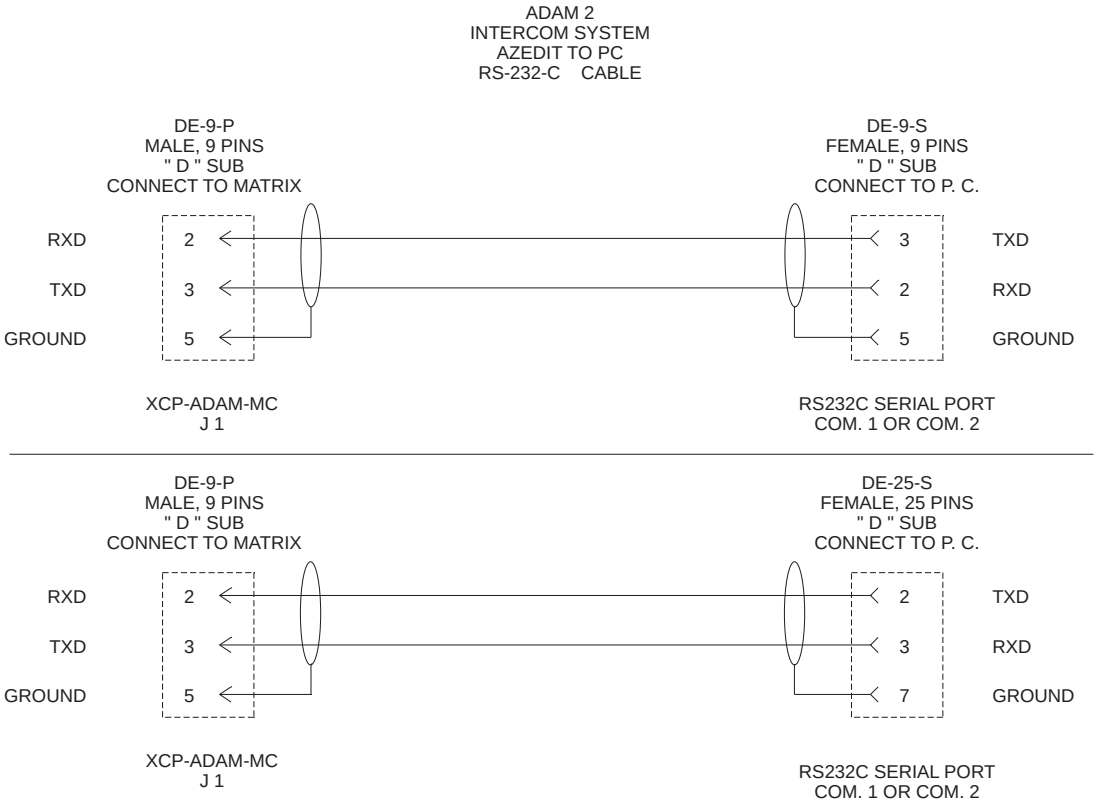


Figure 16.3: ADAM Intercom System AZedit to PC RS-232-C Cable

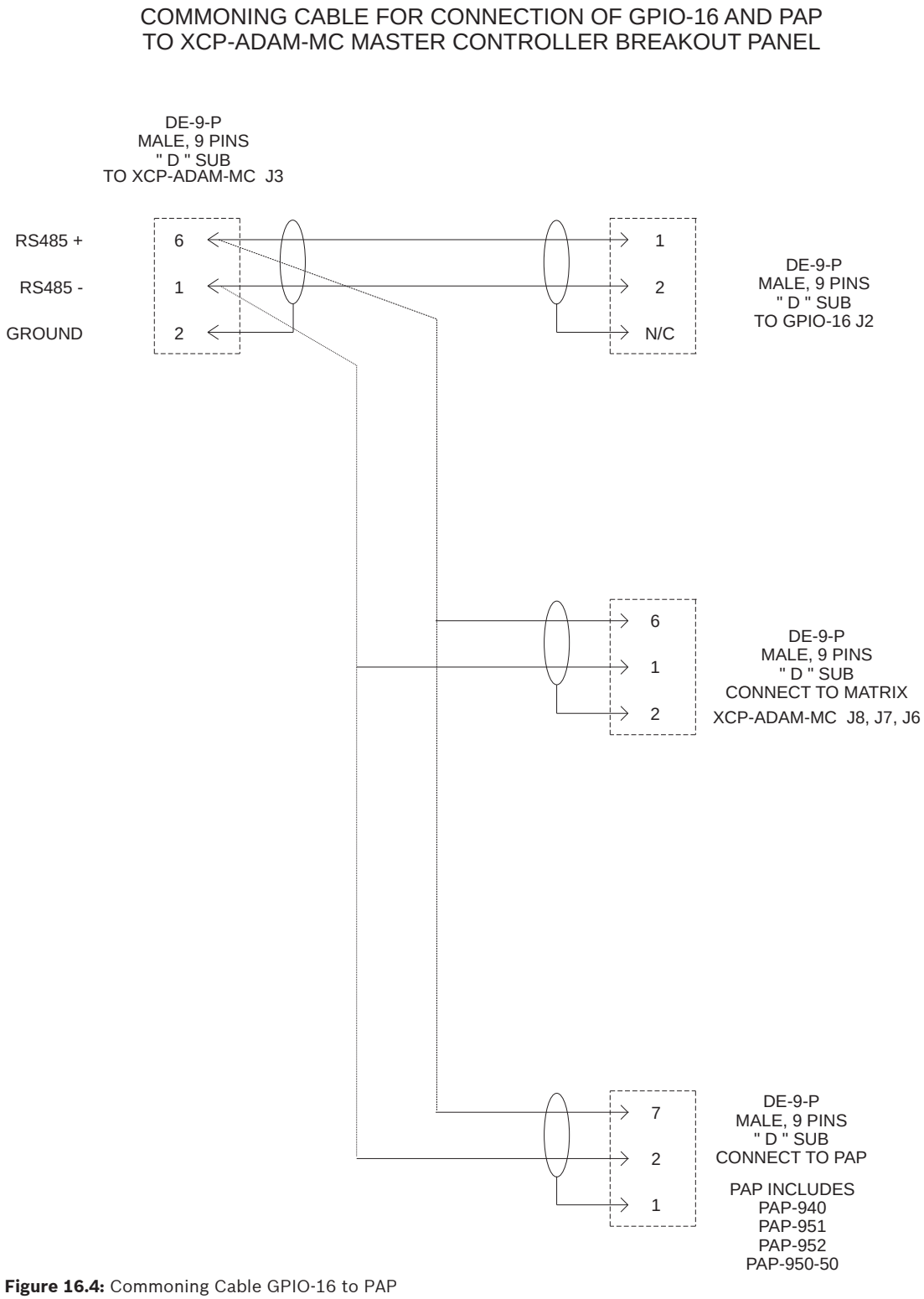


Figure 16.4: Commoning Cable GPIO-16 to PAP

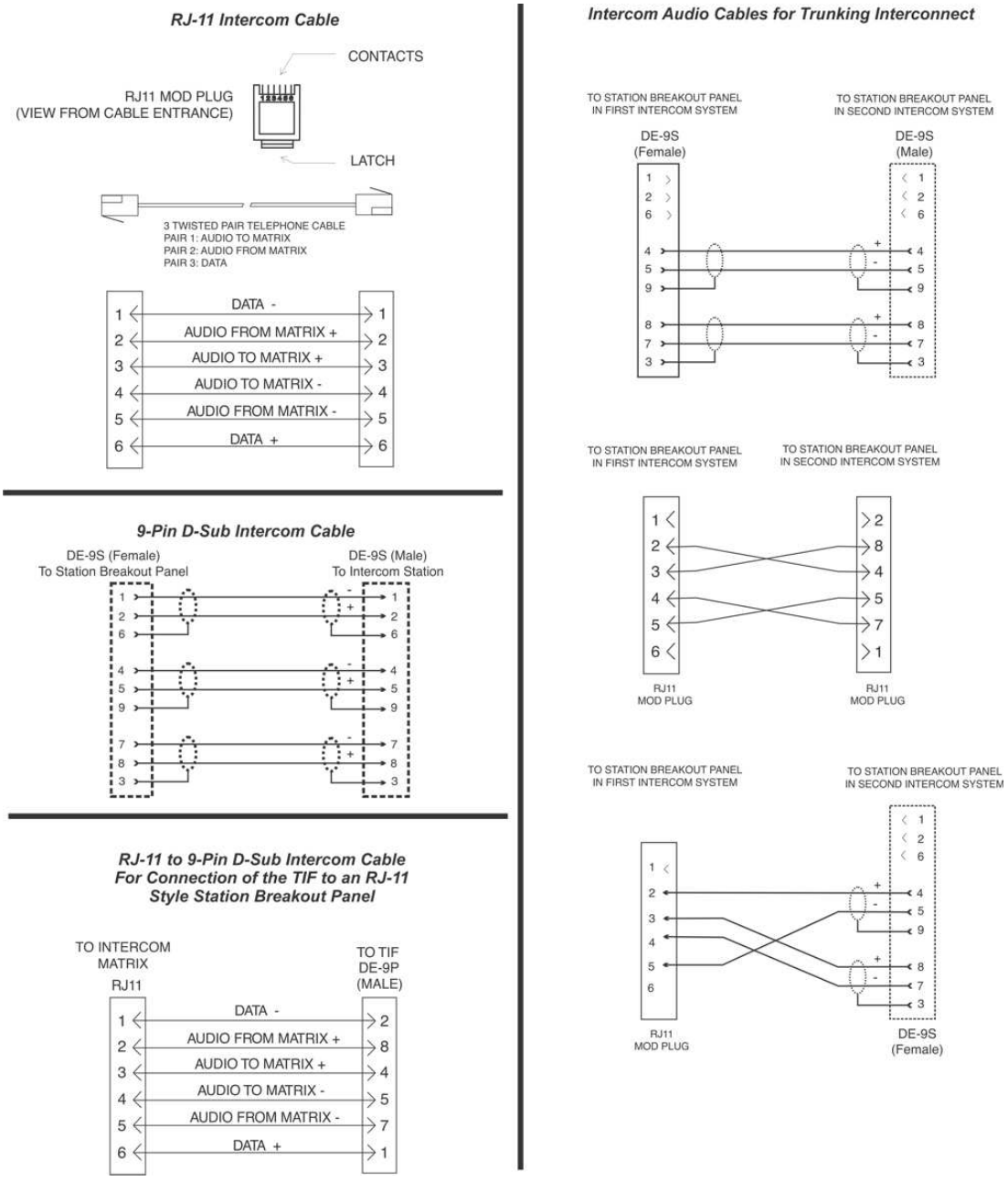


Figure 16.5: Intercom Station Cables

17 Configuration computer connection and check

Us an RS-232 cable to connect from J1 of the XCP-ADAM-MC Breakout Panel to a COM port of the configuration PC. For cable wiring details, please refer to *Device connections, page 27*. Download the AZedit software from www.rtsintercoms.com. Run the install program to install the software on the PC.

Notice!
The PC must have at least 2 MB of extended memory, preferably 4 MB.

If the link between the computer and intercom system is functioning properly, the current intercom system configuration should upload (even if nothing is programmed). ONLINE mode should appear at the lower right of the computer screen. If not, check the cable wiring and the connection between the computer and the intercom system.

Notice!
By default, the AZedit configuration program uses COM1 and 38,400 baud for communication between the computer and intercom system. COM2 and/or 9,600 baud, USB, Network connections are selectable as option in AZedit. When operating at 38.4 k baud, DIP switch number 1 must be set to the ON position on both the main and backup master controller cards in the frame. Please refer to *Master controller card DIP switches, page 14*.

18 PAP-5032 program assign panel

The PAP-5032 connects to J3 on the ADAM 2 system. The baud rate, as well as all UIO-256/ GPIO-16, and LCP-102 devices have a fixed 76.8 k baud.
For more information on the PAP-5032, see the PAP-5032 Technical Manual at www.rtsintercoms.com.
To **install the PAP-5032**, do the following:

1. Plug the **24 VDC power connector (A) of the power supply into the power connector** on the back panel of the unit.
2. Connect an **RJ-45 (568B or USOC) cable (B) with RTS cabling to the J8 FRAME connector** (AIO).
   OR
   Connect a **CAT-5e cable (C) to either J11 or J12 ETHERNET** connector (OMNEO CAT-5e).
   OR
   Connect a **fiber connector (D) to the OPTICAL fiber connector on the rear panel** (OMNEO Fiber).

Notice!
The PAP-5032 can have both an AIO and Ethernet connected simultaneously, and the user can switch between the connections using the menus.

3. Plug the **power supply power cord into the wall outlet or a power strip**.

18.1 Viewing the program source for an IFB

To **view the program source for an IFB**, do the following

- Press an **IFB destination key that has an IFB assignment** (i.e., is not blank).
  The IFB key's lower LED turns on solid red.

– If the specified IFB has a program has a program source, the lower LED for the key that has a program source assigned turns on solid red for as long as the IFB key is pressed. If the program source for that IFB does not appear on any of the source keys, the source displays in the scroll window, and the scroll window's lower LED turns on solid red.
– If the specified IFB key is pressed and does not have a program source, no indication is shown on the source keys.
– If an IFB destination key is pressed and the key does not have a program source, no indication is shown on the source keys.
– If an IFB destination key is pressed and the key does not have an assignment, the key press is ignored.
– If an IFB key is pressed and it does not have an output bus defined (in AZedit), the LED turns on solid green to indicate the program input for that IFB cannot be changed.

18.2 Viewing IFB program source feeds

To **view an IFB program source feed**, do the following

- Press a **program source key**.
  The lower LED for that key turns on solid red. Any IFB keys that have a program source assigned turn on solid red, for as long as the source key is held on.

18.3 Key assignment from the front panel

Notice!
The PAP-5032 must be connected to the Intercom system to assign keys from the front panel.

To **assign a key from the front panel**, do the following:

1. Press the **MENU key**.
2. Select **Key Assign**.
3. Press **SEL**.
4. Select **PGM Source** (P2P).
   OR
   Select **IFB**.
5. Press **SEL**.
6. Select the **source or IFB to assign to the key**.
7. Press **SEL**.
8. Press the **physical key** to make the assignment.

19 UIO-256/GPIO-16

Notice!
The maximum number of devices that can be connected when using a GPIO-16 are as follows:
Zeus, Zeus II, and ADAM CS - Four devices (64 relays)
ADAM 2, ODIN and Cronus - 16 devices (256 relays)

I/O Range	DIP Switch Settings							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1-16[a]	Open	Closed	Open	Open	Open	Open	Open	Closed
17-32	Open	Closed	Open	Closed	Open	Open	Open	Closed
33-48	Open	Closed	Open	Open	Closed	Open	Open	Closed
49-64	Open	Closed	Open	Closed	Closed	Open	Open	Closed

Tab. 19.2: UIO-256/GPIO-16 DIP switch settings for input/output range

a. Default

Relay Output Numbers [a]	Pin Numbers		
	NC Contact	**Common**	**NO Contact**
1/17/33/49	38	13	40
2/18/34/50	39	14	15
3/19/35/51	41	16	43
4/20/36/52	42	17	18
5/21/37/53	44	19	46
6/22/38/54	45	20	21
7/23/39/55	47	22	49
8/24/40/56	48	23	24
9/25/41/57	26	1	28
10/26/42/58	27	2	3
11/27/43/59	29	4	31
12/28/44/60	30	5	6
13/29/45/61	32	7	34
14/30/46/62	33	8	9
15/31/47/63	35	10	37
16/32/48/64	36	11	12

Tab. 19.3: UIO-256/GPIO-16 relay outputs connector (J5)

Dependent on UIO-256/GPIO-16 DIP switch SW1 settings for input/output range. The relay contacts are rated for 0.5 A at 120 VAC; 1 A @ 24 VDC; 0.3A @ 60 VDC.

Relay Output Numbers [a]	PIN Numbers	
	DC Control Input -	DC Control Input+ (50-30 VDC)
1/17/33/49	9	34
2/18/34/50	10	35
3/19/35/51	11	36
4/20/36/52	12	37
5/21/37/53	13	38
6/22/38/54	14	39
7/23/39/55	15	40
8/24/40/56	16	41
9/25/41/57	1	26
10/26/42/58	2	27
11/27/43/59	3	28
12/28/44/60	4	29
13/29/45/61	5	30
14/30/46/62	6	31
15/31/47/63	7	32
16/32/48/64	8	33

Tab. 19.4: UIO-256/GPIO-16 opto-isolated inputs connector (J7)

Dependent on UIO-256/GPIO-16 DIP Switch SW1 Settings for Input/Output Range.

Inputs sink 100mA max at a maximum input voltage of +18 VDC

For operation from an external DC voltage source, connect the external control voltage to the + pin, and connect the external common to the - pin.

The UIO265 also has an internal 18 VDC source that is available at pins 18 to 22. Ground is available at pins 24 and 25. To use the internal 18 VDC source, ground the - pin for the desired control input, then use an external switch to connect from the 18 VDC internal source to the + input pin.

19.1 Connecting a single UIO-256/GPIO-16

To **connect a single UIO-256/GPIO-16 frame**, do the following

1. Using an RS-485 data cable wired, connect a **single UIO-256/GPIO-16 to J3** of the Master Controller Breakout Panel.

Notice!
If a PAP is also used, it may be wired to the same connector. Alternatively, use a punch block or other connector system.

2. Set **SW-1 DIP switch** on the back of the UIO-256/GPIO-16 to select a range 1-16. The SW-2 DIP switches are not used, and their positions do not matter.
3. Connect **relay outputs to external devices** using the relay outputs connector, J5. The J5 connector pinout is shown in *UIO-256/GPIO-16, page 35*.
4. Connect the **input devices** using the opto-isolator connector, J7.

19.2 Connecting Additional UIO-256/GPIO-16

Up to 15 addition UIO-256-GPIO-16 frames may be connected in parallel bus configuration using the 15-pin ribbon cables provided.

1. Connect **the J3 output of the ADAM MC to the UIO-256/GPIO-16 via J2 on the UIO-256/GPIO-16**.
2. Connect **J2 output of the first UIO-256/GPIO-16 to the J2 input of the second UIO-256/GPIO-16**.
3. Connect the **J2 output of the second UIO-256/GPIO-16 to the J2 input of the third**.
4. Repeat as necessary
5. Set **SW1 DIP switches on each UIO-256/GPIO-16** to select a unique panel number.
6. Connect to **the opto-isolator outputs and relay inputs** as for the first UIO-256/GPIO-16.

19.3 Programming the UIO-256/GPIO-16

Each opto-isolator input is assignable in the GPI Assignments table of AZedit. The GPI Assignment table allows you to simulate a key on a keypanel at a particular intercom port, regardless of whether or not there is an actual keypanel connected to that port.
If an input has been assigned to a key, it is then necessary to define a device to be activated by that key. This is accomplished in the keypanel edit screen for the port the digital input was assigned to.
The UIO-256/GPIO-16 relay outputs are programmed using the GPI Output Edit screen in AZedit.

20 DSI-2008

The DSI-2008 Dual Digital Hybrid interfaces two 2-wire intercom lines to two 4-wire intercom lines. Unlike earlier analog hybrids, the DSI-2008 features advanced digital signal processing to achieve automatic nulling of the 4-wire lines. In addition, each hybrid features convenient peak-reading level meters to quickly match the levels between the lines being interfaced. The result is an easy and accurate setup. With the DSI-2008, there is no need for test tones, nulling adjustments, and ducking adjustments.

20.1 4-wire audio connections

- Use standard 9-pin or RJ-12 keypanel cables
- Connect from one port of your intercom system to J2A or J3 A (System A connection) on the back of the DSI-2008
- Connect from another port to J2B or J3B (System B connection)
- On the DSI-2008 front panel, set the 4W LEVEL REF SEL switches to the +8dB position

20.2 Audio connections for other 4-wire communications systems

1. Construct **9-pin or RJ-11 cables to connect from your 4-wire system to the DSI-2008**. For the System A hybrid, use either J2A or J3A; for the System B hybrid, use either J2B or J3B.

DB-9 Pin Connection

Connection Type: 9-pin male D-sub

Pin 1	No connection
Pin 2	No connection
Pin 3	No connection
Pin 4	Balanced Audio + output (to 4-wire system)
Pin 5	Balanced Audio - output (to 4-wire system)
Pin 6	No connection
Pin 7	Balanced Audio - input (from 4-wire system)
Pin 8	Balanced Audio + input (from 4-wire system)
Pin 9	No connection

RJ-12 Connection

Connection Type: RJ-12 plug

Pin 1	No connection
Pin 2	Balanced Audio + input (from 4-wire system)
Pin 3	Balanced Audio - output (to 4-wire system)
Pin 4	Balanced Audio - input (from 4-wire system)
Pin 5	Balanced Audio + output (to 4-wire system)
Pin 6	No connection

1. On DSI-2008 front panel, set **the 4W LEVEL REF SEL switches to the position that most closely matches the audio input and output levels of your 4-wire system**. If you do not know the levels, select +4 dB.

20.3 4-wire call signal connections

Notice!
These connections require the call signal option. Part number 9002705500

Call signal connections
Use the **GPI** (General Purpose Interface) connector to interface the call signals. The pin-out of the connector is the same for the following:
ADAM GPI Connector: XCP-ADAM-MC, J11
Zeus GPI Connector: J27

Notice!
If an intercom is equipped with a UIO-256/GPIO-16 frame, this connection can be used.

As an alternative to using the GPI, use external components to send and receive call signals.

20.4 Call signal connections for other 4-wire communications systems

4-wire Call Send and Call Enable/Inhibit
The DSI-2008 accepts a switch-contact input from the 4-wire system and then generates a call signal output to the 2-wire system. The DSI-2008 also accepts an option switch contact input to enable or inhibit call signaling between the 4-wire and 2-wire systems.

4-Wire Call Receive
The DSI-2008 receives call signals from the 2-wire system, and then converts this to relay contact closure for use as a 4-wire call receive indication. The DSI-2008 also provides +5 VDC, which is connected to the relay contacts to generate a DC output signal instead of a contact closure.
The DSI-2008 power indicator flashes whenever a call signal is received from either 2-wire line. This is used as an incoming call indication for the 4-wire system, if desired, and the level display should provide an indication of which line is calling.

21 SSA-324

General Description

The SSA-324 is a System-to-System Adapter (or interface). It interconnects the voice signals between different types of intercom systems. In addition, it can optionally interconnect intercom systems. In addition, it can optionally interconnect Calls or tally signals between systems. Each SSA-324 includes two, 2-wire to 4-wire converters. The 4-wire interface can deliver and accept high-level signals such as those from the McCurdy intercom system. An SSA-324 carries two voice channels when used as dual 2-wire to 4-wire interfaces, and one voice channel when functioning as a 2-wire to 2-wire interface.

21.1 Installation

Mechanical Installation

The SSA-324 installs three different ways:

- A single unit mounted in half rack space using an optional Model MCP2 Kit for rack mounting a single unit.
- Two SSA-324 power supplies mounted side-by-side using the optional MCP1 Kit for rack mounting two units, side-by-side.
- Free standing using the optional MCP8 Kit for adding side channels for non-rack mounting portable use.

Electrical Installation

The connection for the headset on the front panel is used to setup the interface. All other connection are on the rear panel.

On the rear panel, the 2-wire connection on System A is at J101, while on System B it is a J102. These are XLR-3-31 (female) type connectors. System A and B 4-wire connections are both at TB1 and J103. J103 also contains connections to the options car, when installed. Low voltage alternating current power is applied to J104 (16 volts, AC).

	RTS Unbalanced	Audiocom Balanced[a]	Clear-Com Unbalanced[b]
CH1	2	2, 3	3
CH2	3	-	-
Com	1	1	1

a. S101 and/or S102 set to IN position for balance operation.

b. If option board is installed and Clear-Com call light operation is required, move jumper W103 (System A) and/or jumper W203 (System B) on the motherboard to the 2, 3 position. Jumper J103-7, 20 for System A, and/or J103-12/25 for System B.

TB1 4-wire connections

	System A TB1	System B TB2
Audio In Hi	1	5
Audio In Lo	2	6
Audio Out Hi	3	8
Audio Out Lo	4	8

J104 Power Input

Earth	1
16VAC	2
16VAC	3

J103 I/O

1	Earth
2	4-wire Audio In Hi, System A
15	4-wire Audio In Lo, System A
3	4-wire Audio Out Hi, System A
16	4-wire Audio Out Lo, System A
4	4-wire Audio In Hi, System B
17	4-wire Audio In Lo, System B
5	4-wire Audio Out Hi, System B
18	4-wire Audio Out Lo, System B
6	Call Send GND (A)
19	Call Send Hi (A)
7	DC Call Sig En GND (A)
20	DC Call En Hi (A)
8	Relay Contact NO (A)
9	Relay Contact COM (A)
21	Relay Contact NC (A)
22	Relay Contact NO (B)
23	Relay Contact COM (B)
10	Relay Contact NC (B)
11	Call Send GND (B)
24	Call Send Hi (B)
12	DC Call Sig En GND (B)
25	DC Call En Hi (B)

Front Panel Dyn. Mic Headset Connector

1	Mic Lo
2	Mic Hi
3	Headphone Com
4	Headphone Hi

Motherboard Test Signal Jumper

Place jumper on W2 for tone test signal, W3 for voice test signal. Test signal used with headset and front penal nulling adjustments to null return 2-wire signal.

21.2 Operation

Controls and Connections

Front Panel Switches	
	– Channel Select switch, CH1 out / CH2 in, System A – Press momentary switch for nulling System A, 2-wire – Channel Select switch, CH1 out / CH2 in, System B – Press momentary switch for nulling System B, 2-wire
Connectors	
	– XLR-4-31 Female 4-pin headset connector (DYN MIC HEADSET)
Controls	
	– Monitor headphone level (VOLUME)
Indicator	
	– Indicator (Power) green LED
Controls	
	– LEVEL TO RTS, System A – LEVEL FROM RTS, System A – DUCK Level, System A – Inductive (LOW) null, System A – Resistive (MEDium) null, System A – Capacitive (High) null, System A – LEVEL TO RTS, System B – LEVEL FROM RTS, System B – DUCK Level, System B – Inductive (LOW) null, System A – Resistive (MEDium) null, System A – Capacitive (High) null, System A

Rear Panel

Switches	
	Unbalanced (Out) Balanced (In) / Two-wire, System A
	Unbalanced (Out) Balanced (In) / Two-wire, System B

Operation Nulling

Preset Controls as follows:

Function	Pot Position
To/From RTS	Set to midway
Duck Level	Set to CW (Clockwise)
Low	Set to midway
Med	Set to midway
HI	Set to CCW (Counter-clockwise)
Volume	10 O'clock

Press Test Switch

– If test signal tone, adjust Med for null, then Hi, then Low. If test signal voice, say "ahhhhh" into microphone, adjust Med for null, then Hi, then Low.
– Release Test Switch

Level Setting

– Have Talkers 1 and 2 on 4-wire system, Talkers 3 and 4 on 2-wire system. Adjust To/From RTS Controls so that all Talkers can hear each other at about the same level regardless of which system they are on.

Duck Setting

– Adjust Duck Level only if full duplex operation is not possible because of feedback. Adjust Duck Level carefully from CW towards CWW. Only a very small amount of ducking should be used.

22 Power Supply

22.1 Voltage Adjustment

Power supplies do not have current sensing capabilities, which means the power supplies do not automatically adjust the DC output based on the number of cards installed in the chassis. When setting up a brand new chassis or after adding or removing cards from the chassis, the power supply outputs need to be adjusted.

Notice!
Adjust one power supply sled at a time. The power supply not being adjusted should remain turned off until the adjustment is complete.

To **measure the power supply outputs**, do the following:

1. Turn on the power supply that needs adjustment.
2. Open the **ADAM 2 front door**.
3. Measure the **voltage** using a multi-meter with a standard banana plug between the GND test point and the test point corresponding to each **power supply DC voltage rail**.
   The test points for the DC voltage rails are located in the top left corner.

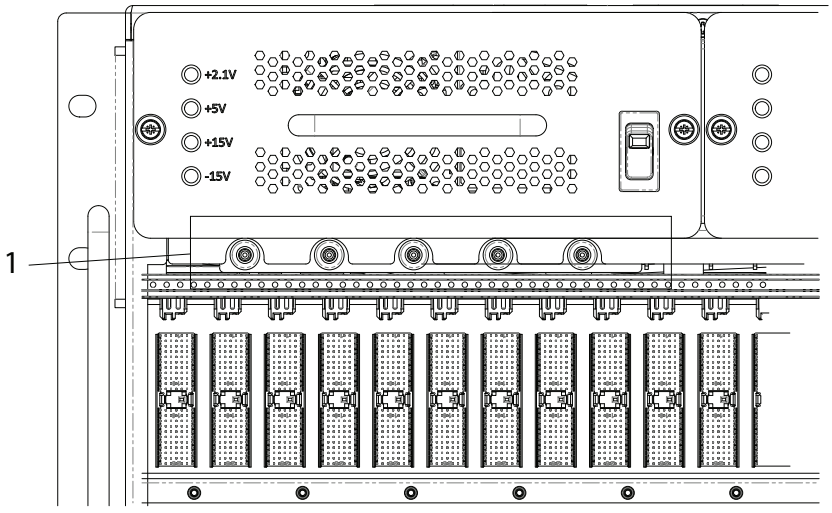


Figure 22.1: Location of test points for DC voltages

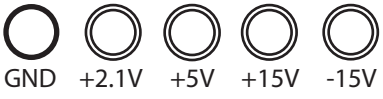


Figure 22.2: Power supply test point legend

The power supply DC voltages should be:

+2.1 V rail	+2.25 to +2.30 VDC
+5 V rail	+4.90 to +5.20 VDC
+15 V rail	+14.85 to +15.15 VDC
-15 V rail	-14.85 to -15.15 VDC

If the voltage is outside of the range, the voltage pot needs adjustment.

To **adjust the voltage pot**, do the following

1. Turn off the **power supply** that needs adjustment.
2. Remove the **power supply sled** that needs adjustment to access the adjustable voltage pots.

3. Using a flathead screwdriver, turn the **voltage pot clockwise** to increase the voltage.
   OR
   Turn the **voltage pot counterclockwise** to decrease the voltage.
   The voltage is adjusted accordingly.

Notice!
There are four adjustment pots on the power supply sled. The wiring and wiring harnesses are hidden from the voltage adjustment line drawing for pot placement clarity.

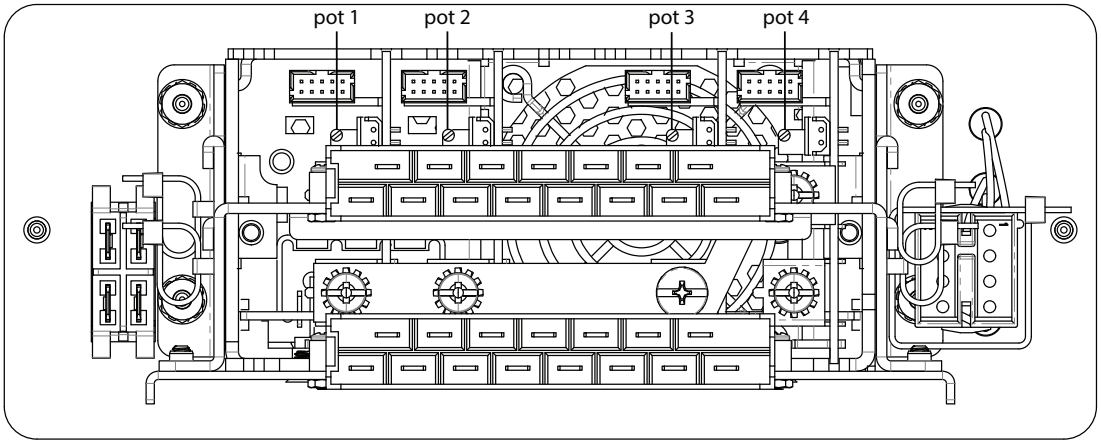


Figure 22.3: Voltage adjustment pots on the rear side of the power supply sled

Pot	Power Supply Rail
1	+2.1V
2	+5V
3	+15V
4	-15V

Tab. 22.5: Voltage adjustment pot legend

4. Replace the **power supply sled** in the unit.
5. Turn on the adjusted **power supply**.
6. Measure the power outputs to verify the DC voltages are within range.
7. Repeat **step 1** through **step 6** until the power supply has the correct adjustment.

Notice!
Once the DC output of the individual power supplies is adjusted, turn on both power supplies. Measure the power supply outputs again to ensure that the voltages are within the range.

Notice!
While both power supplies are turned on, ensure the output of the 2.1V rail does not exceed the absolute maximum of 2.4 VDC. If the output is too high, adjust the voltage pot for each power supply as outlined above. In this specific case, it is acceptable to lower the 2.1V rail output of the individual power supply to 2.20 VDC.

22.2 Fuse Replacement

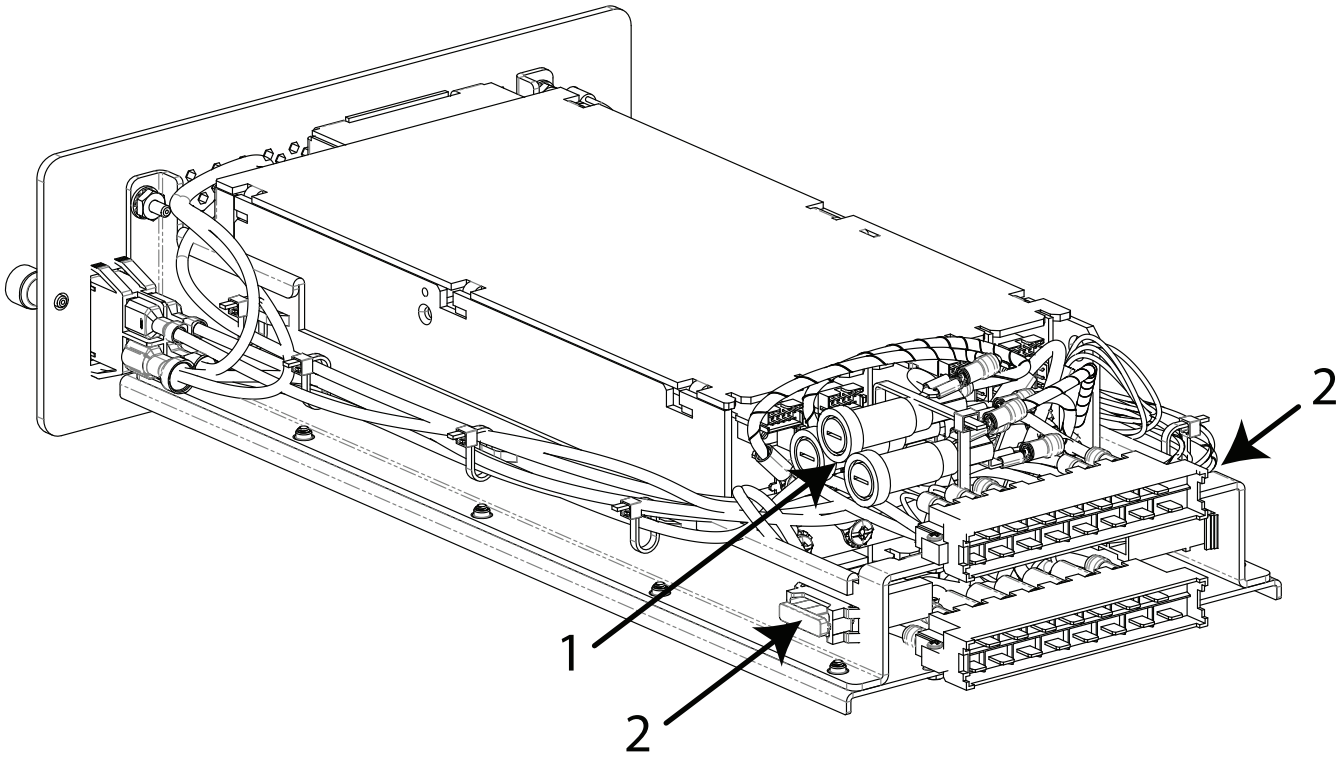


Figure 22.4: Fuse Location

1	Location of 3, 8, and 12A fuses
2	Location of each 25A fuse

Caution!
Use only approved replacement fuses:
3A - Littelfuse 0312003.HXP
8A - Littelfuse 0312008.HXP
12A - Littelfuse 0312012.HXP
25A - Littelfuse 0287025.PXCN or Eaton BK/ATC-25

Wire Color	Fuse Voltage	Fuse Value
White/Blue	+2.1 V	3 Amp cartridge type
White/Red	+15 V	12 Amp cartridge type
Red	+5 V	25 Amp (automotive blade type)
Red	+5 V	25 Amp (automotive blade type)
White/Orange	-15 V	8 Amp cartridge type

Tab. 22.6: Fuse Identification and Specification

Notice!
If the ADAM 2 does not power up properly, verify the fuses are working. If needed, contact Bosch Security Systems, LLC technical support to replace the fuse for proper functionality.

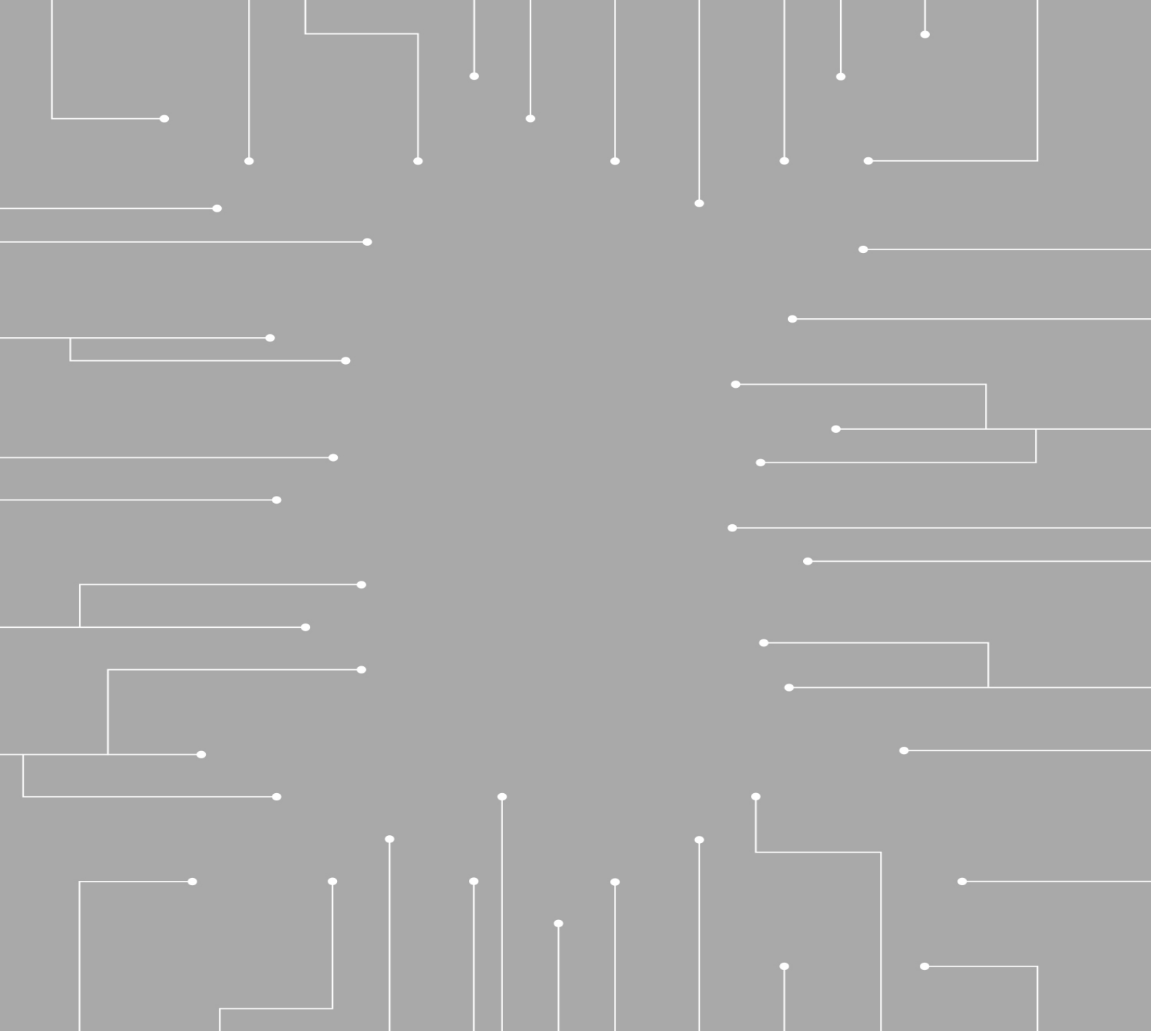
23 Technical data

Matrix Size	8 to 880 ports
	17 AIO slots
	2 MC slots
	1 Blank slot
Matrix Type	
	Digital Audio
	TDM Bus
Signal Format	
	44.1 kHz, 24-bit
Redundancy	
	Power/Controller
Matrix Frame Dimensions	
	12.25 in. (31.12 cm) H x 19 in. (48.26 cm) W x 20 in. (50.8 cm) D
Power	
	100-240 VAC, 50/60 Hz, 700 VA
Approvals	
	CE Compliant and UL Certified
Temperature	
Operating	32° F to 122° F (0° C to 50° C)
Storage	-4° F 158° F (-20° C to 70° C)
Ventilation	
	Minimum 6" clearance to fan area, unobstructed

Caution!
Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids shall be placed on the apparatus.

Caution!
The ADAM2 is to be connected to a mains socket outlet with a protective earth.

For more information on ADAM 2 frame accessory specifications, please refer to www.rtsintercoms.com.



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