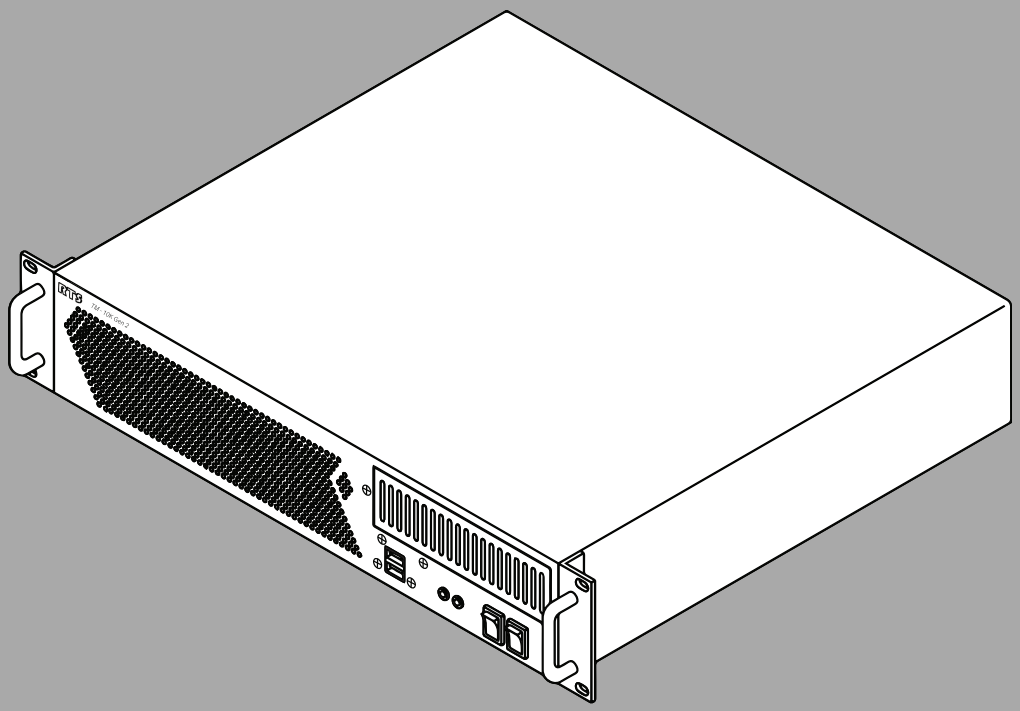
TM-10K Gen 2 High Capacity Trunkmaster

TM-10K Gen 2



en User Manual

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1 Safety

1.1 Copyright and Disclaimer

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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.

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

TM-10K Gen 2 Description

The TM-10K Gen 2 is the next generation in RTS Trunk Masters. The RTS Trunking System manages communications between separate intercom systems using intercom ports reserved and connected between the intercom systems. Keypanels or other data devices can communicate with various destinations in other intercom systems via the reserved intercom ports. (This is different from bus expansion, in which the bus system of two (2) or more frames interconnect to form one (1) system with decentralized hardware.)

The RTS Trunking System consists of a TM-10K Gen 2 that supports trunking data through Ethernet. Add a backup TM-10K Gen 2 to prevent downtime in the event of a failure of the main master control unit.

The TM-10K Gen 2 does not support serial RS-485 cards, parallel ports, RS-232 ports, or CD/DVD drives. The unit now supports updates via USB ports and has multiple video outputs.

Notice!

There are no compatibility issues between a first generation TM-10K and a TM-10K Gen 2 if the first generation TM-10K is running v10.1.0 or v10.2.0. However, if the first generation TM-10K has any intercoms connected serially, they will not be able to connect if the TM-10K Gen 2 goes active.

For a system to have active/standby compatibility, both trunk masters need to be connected via Ethernet and should be running the same version of application software.

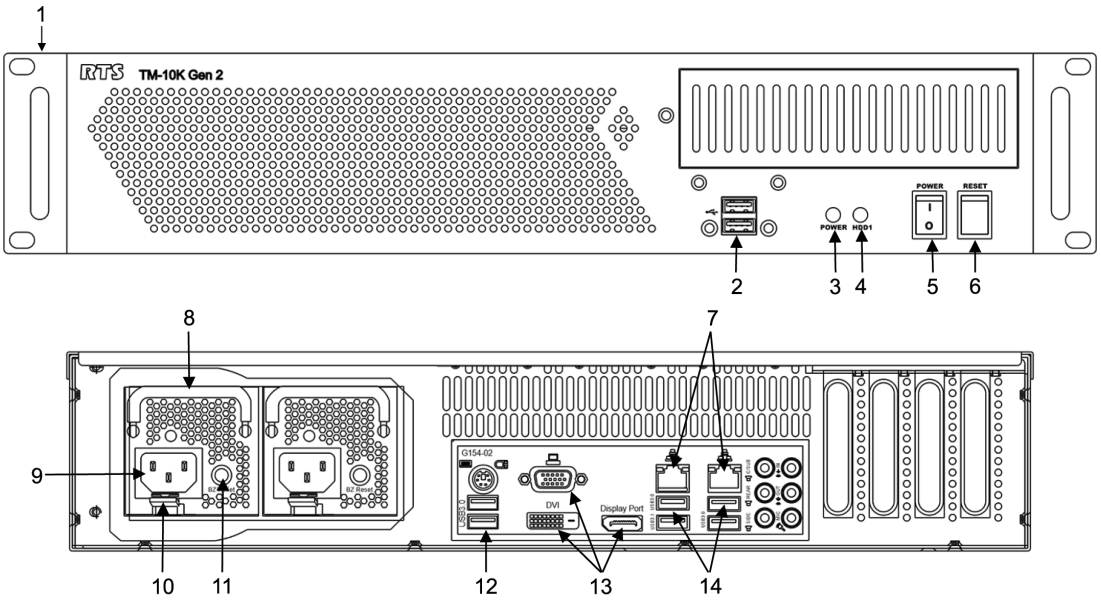
The TM-10K Gen 2 does not support the SWP-2000. If both trunk masters in an active/standby pair are running, a transfer of control can be performed by logging on to either trunk master:

- If logged on to the standby execute the command /tm/go-active
- If logged on to the active, execute the command /tm/go-standby

Features

- Supports configurations from 2 to 255 intercom systems with up to 10,000 assignable trunk lines.
- Includes dual AC power supplies for full redundancy in mission critical applications.
- Supports dual 100/1000 Mbps Ethernet connections for redundant or segregated network topologies.
- Supports geographically separated Trunk Masters for disaster recovery planning.
- Trunk data supported over Ethernet.

2.1 TM-10K Gen 2 Reference Diagram



Callout	Description
1	Rack ear
2	Front panel USB connectors
3	Power indicator LED
4	Disk drive activity indicator
5	Power switch (momentary toggle)
6	Reset switch (momentary toggle)
7	RJ-45 Ethernet (NIC 1 & 2) connector
8	Power supply handle
9	AC plug
10	Power supply clamp
11	Power indicator / Alarm override button
12	Back panel USB connectors
13	VGA, DVI, and DisplayPort connectors
14	Back panel USB connectors

3 Understanding Trunking

In a trunking system, the differential audio lines (not data) of one or more intercom ports connect between two separate intercom systems. The system administrator in each intercom system places restrictions on these ports to prohibit any key assignments. This reserves the ports for exclusive use as trunking lines. A data link is also established between each intercom system and the Trunk Master for exchange of system control signals, which is done over Ethernet. Once you make the connections, you can program a Trunk Master using Trunk Edit to recognize the individual intercom systems.

Once you have key assignments, keypanel operators can talk or listen to them as they would in their own intercom system. There is no apparent difference to keypanel operators, however what occurs in the system is slightly different. When a keypanel operator activates a key to talk to a destination located in another intercom system, the intercom system's master controller does not close any cross-points directly; rather, it forwards this request to the Trunk Master via its data connection. The Trunk Master then checks for an available trunk line. If a trunk line is available, it notifies the master controllers in the affected intercom systems to establish the communication path using this trunk line. If no trunk lines are available, the trunking system notifies the master controller in the caller's intercom system, which then sends a busy signal to the calling keypanel.

If more than two (2) intercom systems are connected, you must reserve and connect additional trunk lines between the systems. However, it is not always necessary to connect two (2) intercom systems directly as long as there is a path not more than one (1) system away to connect the two (2) systems. You can program the trunking system to permit cascaded trunking in which an established pathway through an intermediate intercom system connects the two (2) endpoints.

Notice!

The system and its software only support a single level of cascade. For example, suppose System A wants to talk to System C, but there are no available direct connections between System A and System C. System A can talk to System C by going through (cascading through) System B. However, it would be impossible for System A to talk to System D if it had to go through both System B and System C to do so, because that would require a two-stage cascade.

3.1 Cascade costs

Cascade Costs are numeric values associated with each intercom in the matrix system. When a cascade is created, the TM-10K Gen 2 selects the intercom with the lowest cost.

Cascaded trunks are used when no direct trunks are available to satisfy a request. The Trunk Master attempts to tie two trunks together to satisfy the request, forming a cascade through a third intercom.

EXAMPLE: In the default configuration, intercom 1 has a cascade cost of 10; intercom 2 has a cascade cost of 20, intercom 3 has a cascade cost of 30 etc. With these values, the Trunk Master selects the lowest-numbered intercom, which matches the operation of the TM-2000.

For more information, see *Assign a cascade cost, page 21*.

3.2 Alpha management

For each key assignment, two flags affect trunking behavior. If the AZedit scroll enable flag is set, then an AZedit session on a different intercom can program that assignment on a key. If the Trunk scroll enable flag is set, then a keypanel on a different intercom can scroll to that assignment and copy it to a key. For more information, see the AZedit Software User Manual. It is possible for an intercom to receive more remote alphas than it can store. If this occurs, some of its alpha lists may be missing completely.

Notice!
When intercom X connects to the Trunk Master, the Trunk Master forwards the entire scroll list for each intercom specifically in a common group with intercom X. For instance, if intercom X and intercom Y are members of intercom group 12, then intercom X and intercom Y exchange alphas. If intercom X receives alphas from too many other intercoms, it cannot store all the alphas.

4 Hardware details

Ethernet Adapters

The TM-10K Gen 2 supports the use of dual 10/100/1000 Mbps Ethernet links for redundant or segregated network topologies. Use the Ethernet links for active/standby communications and for communications with intercoms, Trunk Edit and Trunk Supervisor.

NIC Bonding

NIC Bonding occurs when two NICs connect to the same network and share a single IP address. The TM-10K Gen 2automatically designates one of the NICs as active. All traffic goes through the active NIC, until it fails, at which time the other NIC becomes the active NIC. Use this setup for increased reliability.

Video Adapters

The TM-10K Gen 2has support for three different display outputs: VGA, DVI, and DisplayPort. You can only use one output type at a time.

The display that is used is selected when the TM-10K Gen 2 boots up. If multiple display monitors are connected, the TM-10K Gen 2 uses the DisplayPort (if connected); otherwise, it uses DVI.

If the TM-10K Gen 2 powers on with no monitor, no video is available, even if you connect a monitor after the fact. Alternatively, once you boot the TM-10K Gen 2, you can disconnect the monitor; if you reconnect the monitor later, video is still available.

Notice!

You can use a display emulator in place of a monitor. A display emulator allows you to boot up the TM-10K Gen 2 without a monitor connected. If you need to use a monitor, disconnect the display emulator and connect the monitor.

AC Power Supplies

The TM-10K Gen 2 includes dual AC power supplies for full redundancy in mission critical applications.

Notice!

The TM-10K Gen 2 power scheme is designed to conform to IEC standards for industrial computing equipment. The power LED (red/green) is also a pushbutton. If the unit is powered on with only one supply powered, the TM-10K Gen 2 beeps loudly to warn of this condition; press the power LED button to cancel the audible alert.

An audible alarm sounds if one of the power supplies fail.

To **suppress the audible alarm**, do the following:

- Press the **power LED button** to turn off the alarm.

For the location of the power LED button, see *TM-10K Gen 2 Reference Diagram, page 8*.

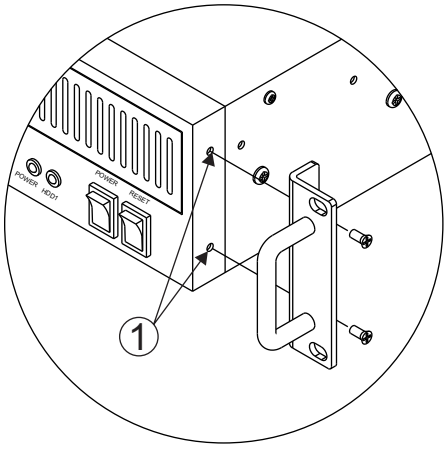
5 Installation

5.1 Rack mounting

Attach the rack ears to the TM-10K Gen 2

To attach the rack ears to the TM-10K Gen 2, do the following:

1. Remove **two chassis screws** from each side of the unit.



2. Using the screws you previously removed, attach a **rack ear** to each side of the unit.

Notice!
Install the TM-10K Gen 2 in an equipment rack. The unit does not have special ventilation requirements. We recommend using standard rear mount rack rails to support the unit in mobile installations.

5.2 Power On instructions

The TM-10K Gen 2 redundant powering scheme is designed to conform to IEC standards for industrial computing equipment.

For further details, see *Hardware details, page 11*.

To **power on the unit**, do the following:

1. Plug the **power supplies** into an AC power source, such as a power outlet or power strip. The rear LED indicator lights turn solid green or flashing green, depending on whether the trunk master turns itself on.

LED	Description
Solid Green	Computer on, power supply has power
Flashing Green	Computer off, power supply has power
Flashing Red	Power supply does not have power, only happens when the other power supply has power.

2. If necessary, briefly press the **power switch** on the front panel.
   Whether the unit turns on when power is applied depends on the BIOS settings.

5.3 Software and requirements

Two software packages are available to use with an external PC connected to the TM-10K Gen 2: Trunk Edit and Trunk Supervisor. The TM-10K Gen 2 includes Trunk Edit to provide the user with the ability to configure and monitor the TM-10K Gen 2. Trunk Supervisor is available as an add-on software package available for an additional cost. Trunk Supervisor is an advanced monitoring package for trunked systems.

Trunk Edit and/or Trunk Supervisor have the following minimum system requirements:

- Windows XP with Service Pack 3 or higher
- 64 MB Memory
- 20 MB Free Hard Disk space (not including swap file)
- Trunk Edit works with a PC attached via Ethernet.
- Trunk Supervisor works with a PC attached via Ethernet.

6 Trunk connections and setup

The TM-10K Gen 2 supports local and remote trunking. Local trunking consists of the Trunk Master and an intercom located on the same campus, possibly in different buildings, and possibly connected via fiber. Remote trunking occurs when there is a significant amount of delay (e.g. 50 ms or more) in the communications circuit between the Trunk Master and an intercom, such as when they are located in different cities.

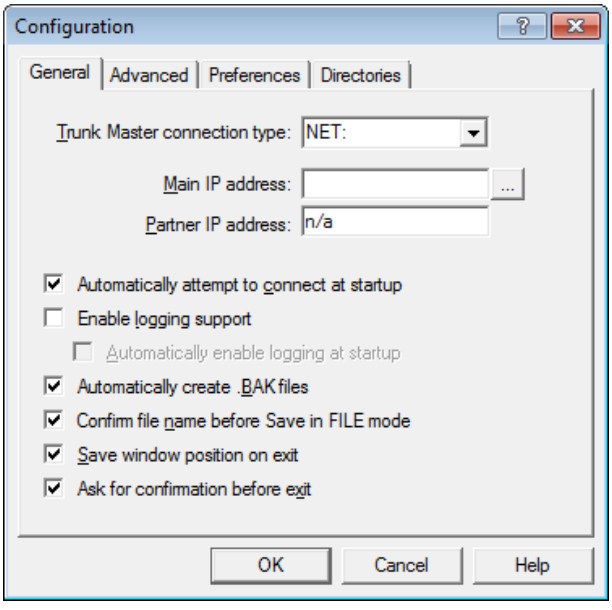
Notice!
When two Trunk Masters are not side by side, the maximum delay for the active/standby communication path should be no more than 400 milliseconds round trip.

The number of people communicating with other intercom systems and on the critical nature of their communication dictates the number of trunk lines to be set up. On the other hand, there may be additional expenses when running trunk lines on leased lines, for example, you may want to keep the number of lines to a minimum. You may be able to manage with fewer trunk lines than the number of potential users. For example, if two keypanels need to have access to another intercom system, but only one of those keypanels has a critical need, you may be able to use one trunk line. You can set the trunk priorities for the two users so the user with the critical need has a higher priority. In addition, the trunking system can create a communication path by cascading through a third intercom system if that system has trunk lines to the other two systems. If frequent busy signals occur during normal use, you may have to allocate more trunk lines. A busy signal normally indicated by an alphanumeric key assignment alternating with a double asterisk indication.

6.1 Connect Trunk Edit to a Trunk Master

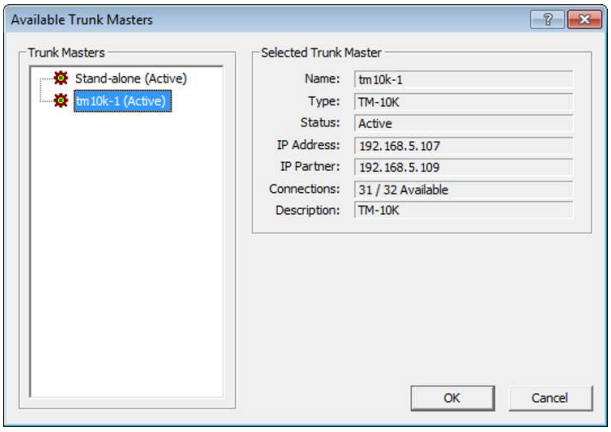
To **connect Trunk Edit to a Trunk Master**, do the following:

1. From the View menu in Trunk Edit, select **Configuration...**.
   The Configuration window appears.
2. On the General tab, select **Trunk Master connection type**.
   Available connections COM1:, COM2:, COM3:, COM4: and NET:.
   For a connection to a TM-10K Gen 2, select NET.



3. Select the **browse button** next to the Main IP address field.
   The Available Trunk Masters window appears.

Notice!
The browse function only works if the PC is on the same subnet as the TM-10K Gen 2. If they are on different subnets, you must manually enter the TM-10K Gen 2 IP address.



4. Select the **desired Trunk Master** from the Available Trunk Masters dialog.
   The selected Trunk Master details display.
5. Click **OK**.
   The Available Trunk Masters window closes.
6. Click **OK**.
7. Click the **Connect icon**.
   Trunk Edit connects to the TM-10K Gen 2.

6.2 Configure the Trunk Master to connect to an Intercom

To **connect an intercom to a Trunk Master**, do the following:

1. In the left navigation, click **Intercom**.
   The Intercom bar expands.
2. Click the **Setup icon**.
   A table displays setup information for each intercom system.
3. Enter a **unique four-character name** for each trunked intercom system under the Name 4 column of the setup table.
   (OPTIONAL) You can also enter unique six- and eight-character names under the Name 6 and Name 8 columns.
4. Right-click a **connection** from the Connection column.
   A popup menu appears.
5. Select the **Select connection type menu item.**
   A popup menu appears.
6. Select the **Network connection type**.

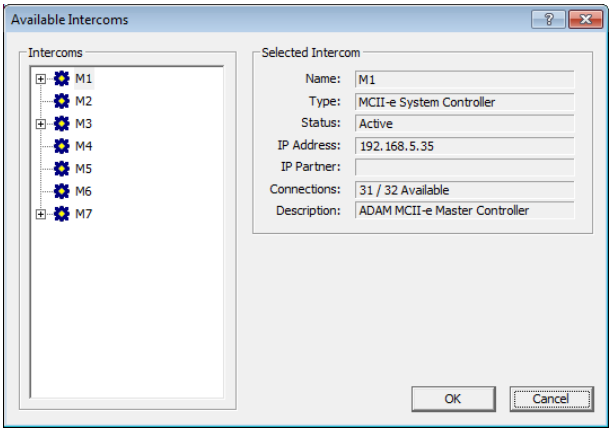
To **connect via a network connection (Ethernet)**, do the following:

1. From the Primary IP Address column, enter the **IP Address**.
   OR
   Right-click the **Primary IP Address**.
   A pop-up menu appears.

2. Select **Browse for intercom IP Address...**.
   A pop-up menu appears.

Notice!
The browse function only works if the PC is on the same subnet as the TM-10K Gen 2. If they are on different subnets, you must manually enter the TM-10K Gen 2 IP address.

3. In the Available Intercoms window, select the **intercom**.
   The Selected Intercom view displays the details for the intercom.



4. Click **OK**.

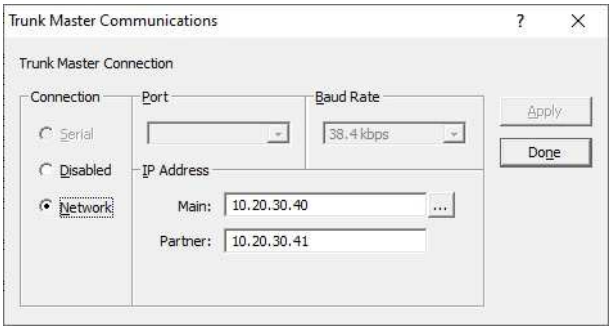
Notice!
If this is an ADAM intercom, then you also want to enter the IP Address for the standby controller.

5. If desired, set the **cascade cost** for the intercom.
6. Send changes to the Trunk Master.

6.3 Configure an Intercom to connect with a Trunk Master

Once you configure the Trunk Master to connect with the Intercom, you then have to configure the Intercom to connect with the Trunk Master.
To **configure the intercom to connect with the Trunk Master**, do the following:

1. Open **AZedit**.
2. From the Options menu, select **TM Communications**.
   The Trunk Master Communications screen appears.



3. In the Main: field, enter the **IP Address** of the main Trunk Master.
   OR
   Click the **browse button** and select the **Trunk Master** from the list.
4. In the Partner: field, enter the **IP Address** of the redundant Trunk Master, if applicable.
5. Click **Apply**.

6.4 Creating trunks

To **create trunks**, do the following:

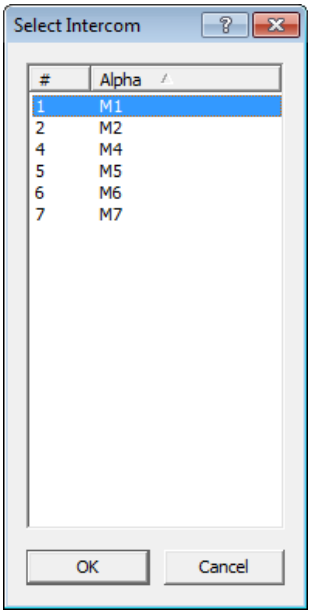
1. Identify the **correct wiring diagram** for your system.

For more information, see *System and wiring diagrams, page 37*.

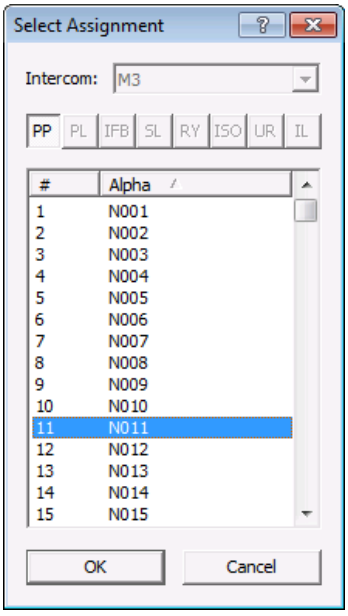
1. Connect **one or more intercom audio ports** between the intercom systems.
   Use these ports for trunking communication only.
2. From the Options menu in AZedit, select **Option|Preferences**.
   The Application Preferences window appears.
3. Click the **Advanced tab**.
   The Advanced page appears.
4. Select **Enable trunking support**.
5. Click **OK**.
   The preferences window closes.
6. Repeat **steps 3 through 6** for each intercom system to be trunked.
7. Click the **KP icon**.
   OR
   From the System menu, select **Keypanel Assignment**.
   The Keypanel/Ports window appears.
8. Select the **port** to set as a trunking port.
9. Clear all **Scroll Enable check boxes**.

Notice!
The Trunk Master controls the trunk port. You can use trunks for different functions at different times (i.e., connected to a party line; connected to an IFB). Never assign a trunk port as a regular key assignment. (The only reason to assign a trunk port as a key assignment would be for performing diagnostics.)

10. Send **changes** to the intercom.
11. Repeat steps **8 through 10** for each trunk port.
12. Select **Trunk** from the left navigation in Trunk Edit.
13. Click the **Definitions icon**.
    A table displaying trunk definitions appears. On initial set up, this table is empty.
14. Right-click a **trunk entry** from the Icom 1 column.
15. From the pop-up menu, select **Choose new assignment...**.
16. Select the **intercom system** desired for this end of the trunk line.



17. Right-click the **Port or Alpha entry** associated with the Icom 1 entry made.
18. From the pop-up menu, select **Choose new assignment...**.
19. Select the **port** from where the trunk connects.



20. Repeat **steps 14 through 19** for the other end of the trunk (Icom 2).

Notice!
If you want to allow this particular trunk line to cascade, then set the cascade flag. For more information, see *Cascade flag, page 20*.

21. Send changes to the Trunk Master.
22. In AZedit, assign **keypanel keys** as required to communicate with destinations in other intercom systems. Do this in each intercom system.

Notice!
This is similar to assigning keys in the local intercom system, except you need to select an intercom system first when making assignments. For more about key assignments, see the AZedit Software User Manual.

23. Send **changes** to the intercom.

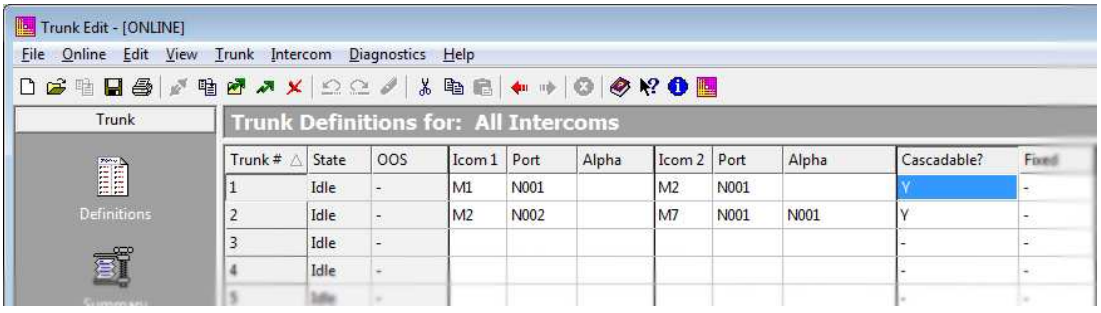
7 Cascades

7.1 Cascade flag

Setting a cascade flag in Trunk Edit identifies the trunk line is usable in a cascade.

To **set the Cascade flag**, do the following:

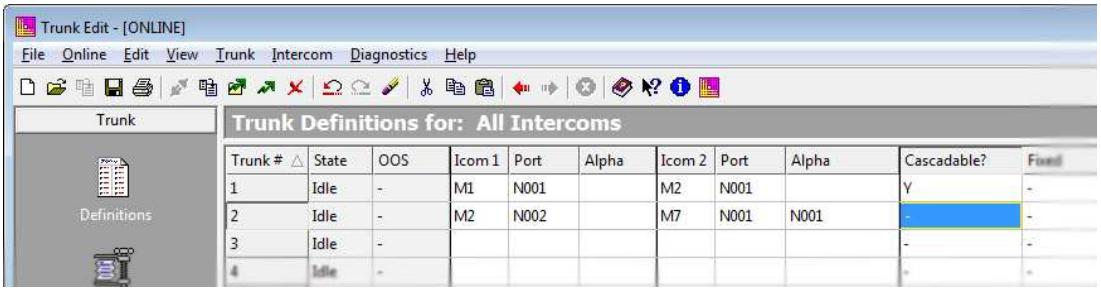
1. Select **Trunk** from the left navigation in Trunk Edit.
2. Click the **Definitions icon**.
   A table displaying trunk definitions appears. On initial set up, this table is empty.



3. Right-click a **trunk entry** from the Cascadable? Column.
   A pop-up menu appears.
4. Select **Set cascade flag**.
   The letter Y appears.
5. Send changes to the Trunk Master.

To **clear the Cascade flag**, do the following:

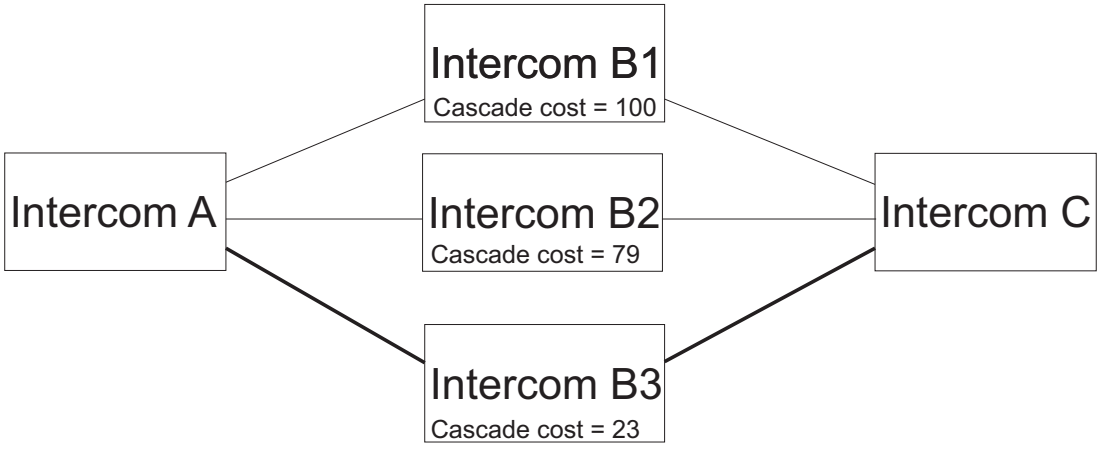
1. Select **Trunk** from the left navigation in Trunk Edit.
2. Click the **Definitions icon**.
   A table displaying trunk definitions appears.



3. Right-click the **trunk entry** from the Cascadable? Column.
   A pop-up menu appears.
4. Select **Clear cascade flag**.
   The letter Y is replaced by a dash (-).
5. Send changes to the Trunk Master.

7.2 Assign a cascade cost

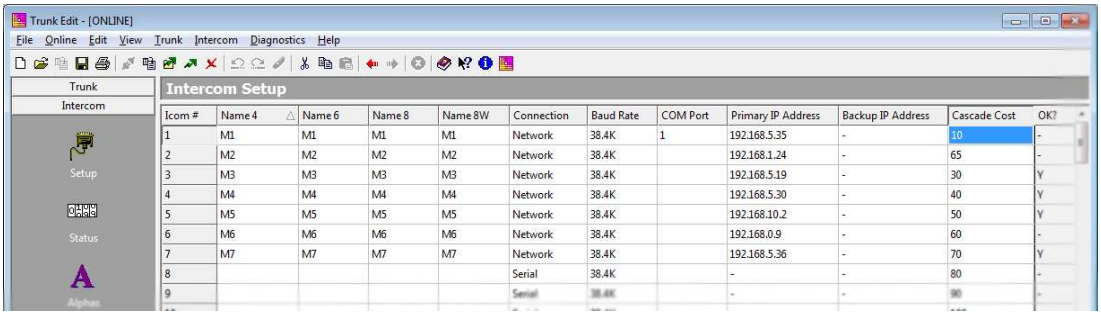
Cascade Costs are numeric values associated with each intercom in the matrix system. When a cascade is created, the TM-10K Gen 2 selects the intercom with the lowest cost.



There are no direct trunks between A and C, if a user in A wants to talk to a resource in C, create a cascade through B1, B2 or B3. B3 has the lowest cascade cost, a cascade will be created through this intercom, if possible; if not, the TM-10K Gen 2 tries to cascade through B2; if this is not possible, it will try to cascade through B1.

To **assign a cascade cost**, do the following:

1. Click **Intercom** from the left navigation pane in Trunk Edit.
2. Click the **Setup icon**.
   A table displays setup information for each intercom system.



Icom #	Name 4	Name 6	Name 8	Name 8W	Connection	Baud Rate	COM Port	Primary IP Address	Backup IP Address	Cascade Cost	OK?
1	M1	M1	M1	M1	Network	38.4K	1	192.168.5.35	-	10	-
2	M2	M2	M2	M2	Network	38.4K		192.168.1.24	-	65	-
3	M3	M3	M3	M3	Network	38.4K		192.168.5.19	-	30	Y
4	M4	M4	M4	M4	Network	38.4K		192.168.5.30	-	40	Y
5	M5	M5	M5	M5	Network	38.4K		192.168.10.2	-	50	Y
6	M6	M6	M6	M6	Network	38.4K		192.168.0.9	-	60	-
7	M7	M7	M7	M7	Network	38.4K		192.168.5.36	-	70	Y
8					Serial	38.4K		-	-	80	-
9					Serial	38.4K		-	-	90	-

Notice!
On the initial setup, this table is empty.

3. Enter a **new cascade value**.
4. Send changes to the Trunk Master.

8 Remote assignment gains

Currently, RTS intercoms allow the user to adjust listen levels for local point-to-point and party line assignments, for example, to adjust the individual component volumes when listening to a mix of sources. The Volume Adjust Across Trunking feature extends the capability to allow the user to adjust the listen volumes for remote assignments.
Remote volume adjustment requires the following minimum versions of firmware:

- MCII-e v3.6.0
- ODIN v1.3.0
- TM-10K v10.1.0
- AZedit v5.5.0
- TrunkEdit v1.9.0

8.1 Licensing

Volume Adjust across Trunking is a licensed feature. In order to update the TM-10K firmware to v10.1.0 (and the Platform OS to v1.10), a TM-10K license file is required. Installation of the firmware cannot be done without a valid license file.
If you do not intend to purchase support for remote volume adjustment, but you wish to upgrade the TM-10K to address any vulnerability concerns, a license file is available which allows installation of the new firmware without enabling remote volume adjustment.
Licensing is performed in the TM-10K. Remote volume adjustment does not require an ODIN or MCII-e license.
For more information, see *Upgrade the TM-10K Gen 2, page 22*.

8.2 Upgrade the TM-10K Gen 2

Upgrading an existing TM-10K Trunk Master requires 3 files:

tm-10k_v0_OS_v1.10.tgz	Updates the Platform OS from v1.00 to v1.10
tm-10k_v10.1.0.tar.xz	TM-10K application, v10.1.0
tm-10k.lic	License file

The license file is unique to the TM-10K hardware. (You may have a license file that is applicable to both computers if you have an active/standby pair.)
The TM-10K software can be upgraded via a USB thumb drive.

Upgrading via USB Thumb Drive

Notice!
Only use an unencrypted USB thumb drive formatted as NTFS or FAT32.

1. Copy the **3 files listed above to the root directory of the thumb drive**. There must be no other files of type .tgz or .xz in the root directory.
2. Log on as **root**.
3. If the TM-10K application is running, shut it down by entering the command: **/tm/stop_tm**.
4. Plug the USB thumb drive into one of the TM-10K USB slots.

5. Execute the command: **tm_update --usb**.
   This command updates the Platform OS to v1.10, and install the license file.

   If a valid license file is not present, this step fails. The installation is aborted, and the software is rolled back to the previous version.
6. Execute the command: **shutdown** -**h now**.
   This command shuts down and reboots the TM-10K. When it restarts, it will not find a valid TM-10K application to run.
7. Log on as **root**.
8. Execute the command: **tm_update --usb**.
   This command installs TM-10K application v10.1.0.

Notice!
This step will fail if the TM-10K Gen 2 is not updated to Platform OS v1.10 (step 5), or if the computer was not rebooted after updating the Platform OS (step 6).

9. Remove the **thumb drive**.
10. Execute the command: **shutdown** -**h now**.
    This shuts down and reboots the TM-10K. When it restarts, it automatically runs (the new version of) the application.

8.3 Configuration

Because the number of possible remote volume settings is immense and because the memory is limited (especially in the MCII-e), there are two parameters to determine resource usage:
– The maximum number of panels allowed to set remote volumes
– For each panel with remote volume adjust enabled, the maximum number of remote assignments for which it can set a (non-unity) listen volume.

To **configure Remote Assignment Gains**, do the following:
1. From the Options menu, select **Intercom Configuration**.
   The Intercom Configuration screen opens.
2. Click the **Options tab**.

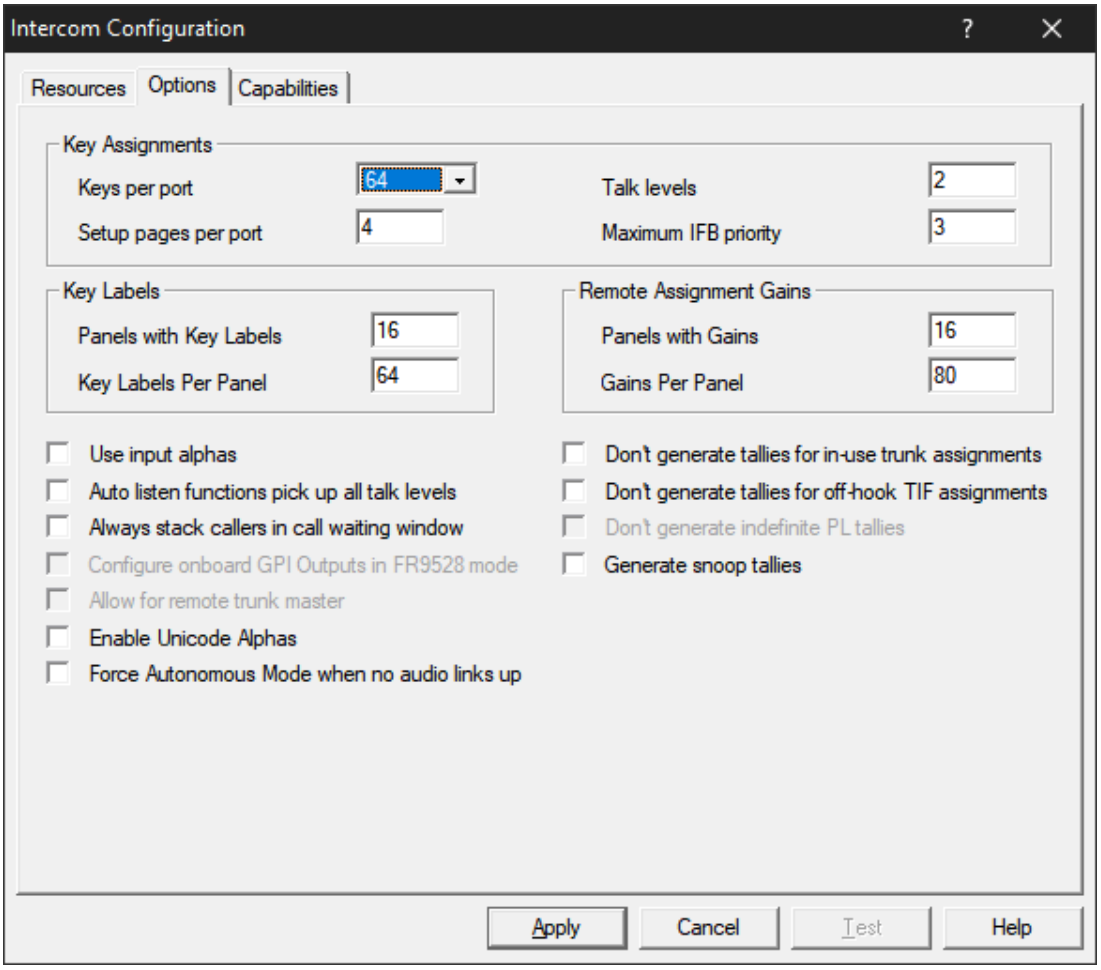


Figure 8.1: Intercom Configuration Screen - Options Page

3. In the Panels with Gains field, enter the **number of remote panels with gains allowed**. This value cannot exceed the number of ports in the system
4. In the Gains Per Panel field, enter the number of **remote assignments** that can have non-unity gains. Non-unity gains are stored in the matrix.
   The maximum number for this field is 128.

Notice!
You cannot adjust remote volumes for any port if either of these parameters are set to zero.

5. Click **Apply** to accept the changes and close the screen.

8.4 Operation

Before you can adjust the gain for a remote assignment, you must enable remote gain adjust for the port you want to adjust the gain.
To enable remote gain adjust, do the following:

1. In AZedit, select the **port** you want to enable Remote Assignment Gains.
2. Click the **Edit button**.
   The Keypanel Port screen opens.
3. Click the **Advanced tab**.
4. Select the **Remote Assignment Gains check box**.

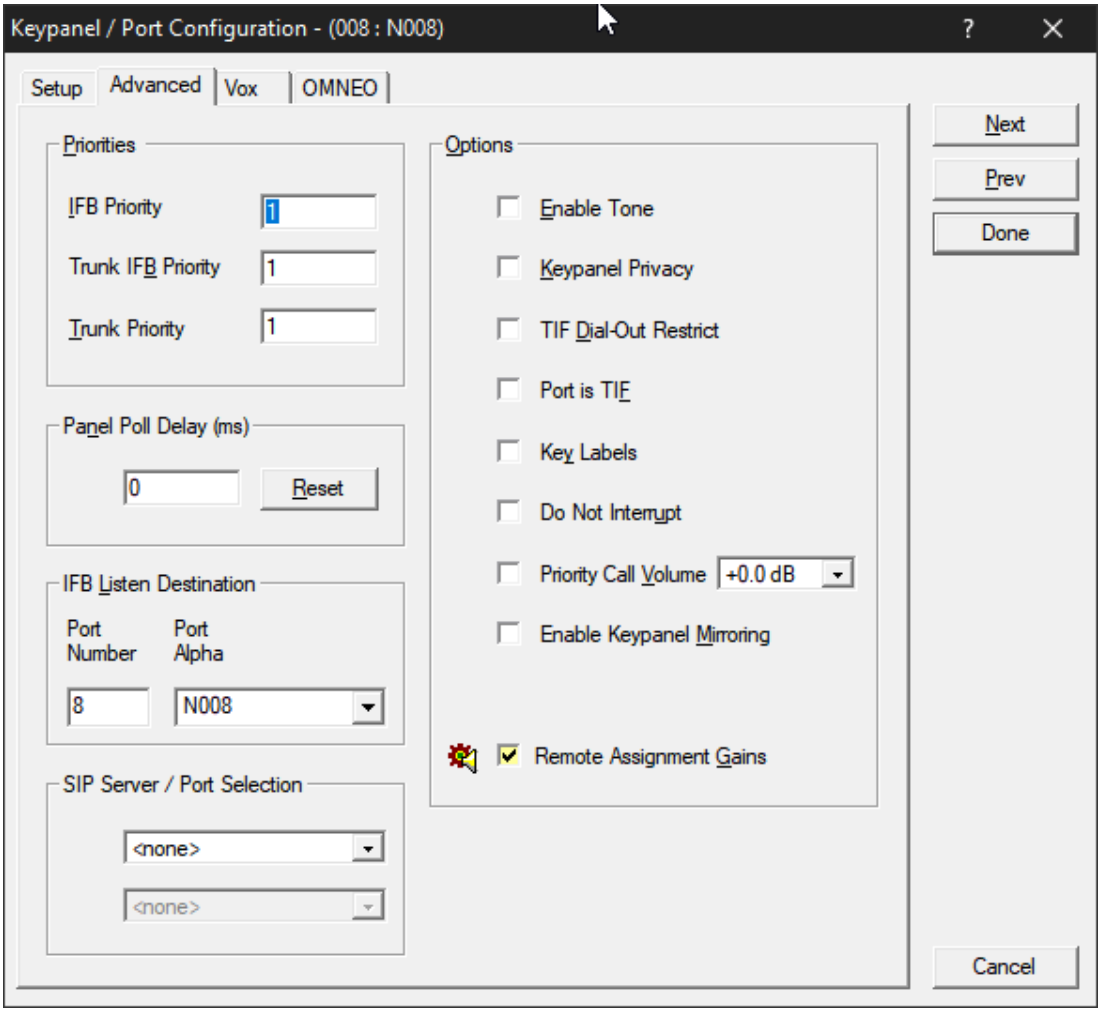


Figure 8.2: Keypanel / Port Configuration Screen - Advanced Page

AZedit warns you if you try to enable remote assignment gains for more ports than the configured maximum. For more information, see *Configuration, page 23*

Once you enable remote assignment gains for a port, you can adjust the gains for remote assignments several ways:

From the keypanel

You can adjust gains for remote assignments in the same that you adjust gains for local assignments.

For detailed keypanel gain adjustment, refer to the specific keypanel user manual. Find manuals on the RTS website at www.rtsintercoms.com.

From AZedit

You can adjust remote assignment gains in AZedit one of two ways:

- From the Remote Assignment Gains screen
  - Adjusts one or multiple assignments at the same time.
- From the Port Volumes screen
  - Adjusts only one assignment at a time.

Remote Assignment Gains Screen

To **adjust remote gains from the Remote Assignment Gains screen**, do the following:

1. From the System menu, select **Gains | Remote Assignment Gains**.
   The Remote Assignment Gains screen opens.

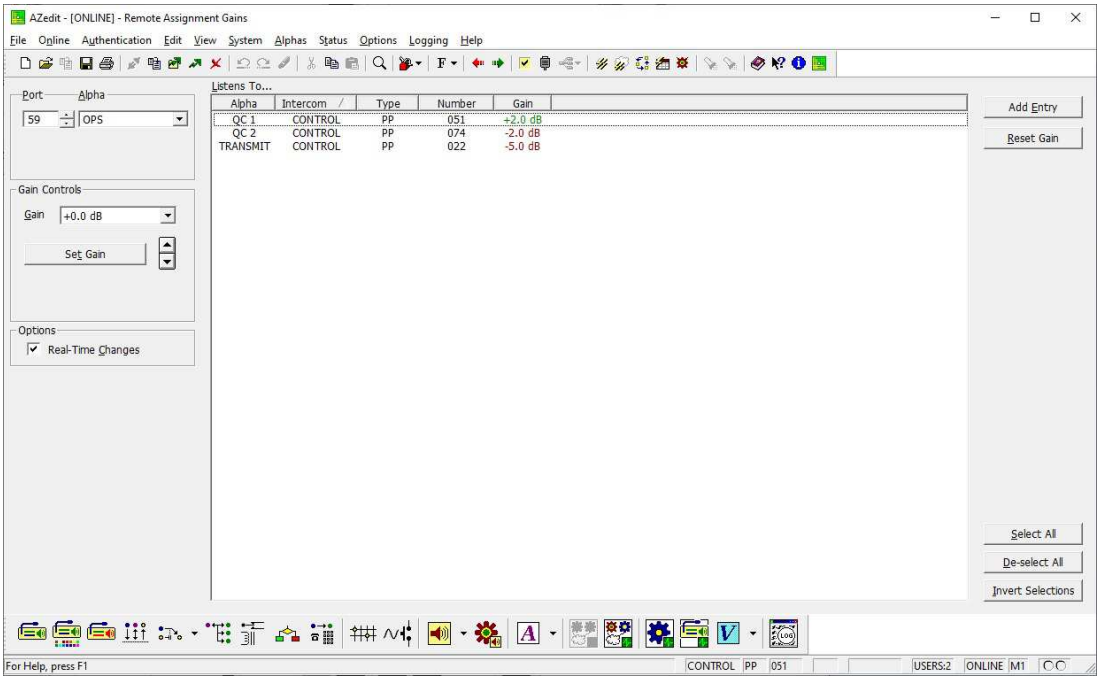


Figure 8.3: Remote Assignment Gains Screen

2. From the Port field, select a **port**.
   Only ports with remote assignment adjust enabled are selectable.
3. Click the **Add Entry button**.
   The Add Remote Assignment Gains screen appears.
4. Select the **ports** for which you want to adjust the gain.
   You can also drag assignments from the Grid control (View | Key Assignment Grid).
5. Using the Gain drop down menu or the scroll arrows, set the **listen volume** for the selected ports.

Note

– To make Real-Time Changes, select the Real-Time Changes check box.
– Only non-unity entries are actually stored. Entries on this screen are do not disappear immediately just because the gain gets set to 0dB. The entries remain until you navigate away from the screen.

Port Volumes Screen

To **adjust remote assignment gains from the Port Volumes screen**, do the following:

1. Right-click an **assignment** on the Keypanel view.

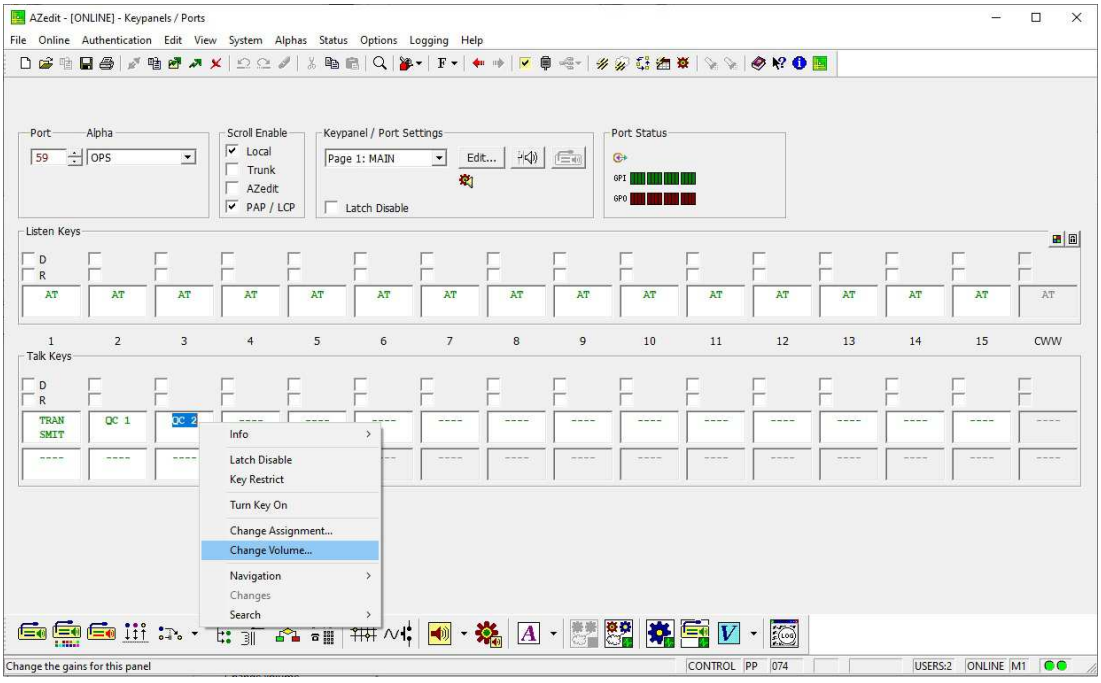


Figure 8.4: Keypanels / Ports Change Volume... popup menu

2. From the popup menu, select **Change Volume**....
   The Port Volumes screen opens.

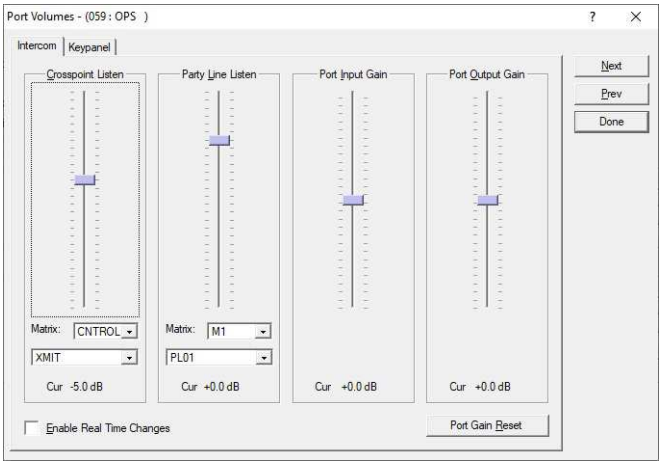


Figure 8.5: Port Volumes

3. Adjust the **assignment listen volume**, as needed.

Notice!
The Port Volumes screen exists in earlier versions of AZedit; however it now allows you to adjust the listen volumes for remote assignments (if enabled for the panel).

8.5 Compatibility

In a trunked environment, it is possible that some intercoms support volume adjustment of remote assignments, and others do not. In this case, trunking operation will continue to work; however, remote volume adjustment may not be available in some circumstances.

TM-10K Upgraded, Local Intercom not Upgraded
In this scenario, trunked operation is unchanged. Trunking will work normally, but remote volume adjustment (in the local intercom) will not be available.

Local Intercom Upgraded, TM-10K not Upgraded

This scenario is exactly like the previous scenario: Normal trunking operation, but no volume adjustment for remote assignments.

TM-10K and Local Intercom Upgrade, Remote Intercom not Upgraded

In this scenario, the intercom allows listen gains for remote assignments to be adjusted, at the keypanel and via AZedit. However, the actual behavior depends on the trunk allocation:

– If the trunk is forked in the local intercom (the one which has been upgraded), the remote gain setting will be applied.
– If the trunk is forked in the remote intercom (the one that does not support remote volume adjustment), the listen gain settings will not be applied, and all remote assignments will be heard at 0dB.

9 TM-10K Gen 2 update options

The operating system and TM-10K Gen 2 application software are installed on the unit at the factory prior to shipment.
The TM-10K Gen 2 ships with a bootable USB flash drive containing the OS (used to reinstall the operating system), the application software, and a license file.

Overview
In the event that you need to reinstall the operating system or the software application, use the following steps:

1. *Reinstall the operating system, page 43*
2. *Site-specific customization, page 29*
3. *Software update, page 35*

Notice!
A USB keyboard and a monitor with VGA, DisplayPort, or DVI cable connected to the TM-10K Gen 2 is required to install the operating system.

9.1 Site-specific customization

Customize the TM-10K Gen 2 with your site-specific parameters by running the site_cfg command. The site_cfg command can be run multiple times. Each time site_cfg is run, it loads the saved parameters, therefore you only need to enter information that has changed.

Notice!
The Trunk Master should be rebooted after running site_cfg, if any changes were made.

To **configure site-specific parameters**, do the following:

1. Log onto the TM-10K as the user: **root**.

Notice!
If the TM application is currently running, then you must first shut it down with **/tm/stop_tm**.

2. At the command prompt, type **site_cfg**.
3. Press **Enter**.
   The IP parameters window appears.

```
Hostname: tm10k-1
Domain: local
DNS1:
DNS2:
Change these values? (y/n, default y)
```

4. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
5. Press **Enter**.
   If y is selected, the IP parameters window appears.
   If n is selected, the Active/standby partner window appears. Skip to step 16.
6. In the New Value field, enter a **new hostname**.

```
Hostname: tm10k-1
New Value:
```

7. Press **Enter**.
   The Domain window appears.
8. In the New Value field, enter a **new domain**.

```
Domain: local
New value:
```

9. Press **Enter**.
   The DNS1 window appears.
10. In the New Value field, enter a **new DNS1 IP Address**.

```
DNS1:
New value:
```

11. Press **Enter**.
    The DNS2 window appears.
12. In the New Value field, enter a **new DNS2 IP Address**.

```
DNS2:
New value:
```

13. Press **Enter**.
    The IP parameters confirmation window appears.

```
Hostname: tm10k-1
Domain: local
DNS1:
DNS2:
Change these values? (y/n, default y)
```

14. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
15. Press **Enter**.
    If y is selected, the IP parameters window appears. Return to step 6.
    If n is selected, the Active/standby partner window appears.

```
Active/standby partner name: tm10k-2
Partner IP address #1: 192.168.5.107
Partner IP address #2:
Have VDP controller: n
Change these values? (y/n, default y)
```

16. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
17. Press **Enter**.
    If y is selected, the Have active/standby partner window appears.
    If n is selected, the Found 2 Ethernet adapters: window appears. Skip to step 29.

```
Have active/standby partner: n
New value:
```

18. In the New Value field, enter a **y** or **n** (use lowercase).
19. Press **Enter**.
    If y is selected, the Partner name window appears.
    If n is selected, an active/standby partner is not configured. (default) Skip to step 25.

20. In the New Value field, enter a **partner name**.

```
Partner name:
New value:
```

21. Press **Enter**.
    The Partner IP address #1 window appears.
22. In the **New value** field, enter a new IP Address.

```
Partner IP address #1:
New value:
```

23. Press **Enter**.
    The Partner IP address #2 window appears.
24. In the New Value field, enter a new **IP address**.

```
Partner IP address #2:
New value:
```

Notice!
If you only have one (1) Partner IP address, leave the Partner IP address#2 field blank. To clear the Partner IP address #2, enter 0.0.0.0.

25. Press **Enter**.
    The Have VDP controller window appears.

```
Have VDP controller: n
New value:
```

26. In the New Value field, enter a **y** or **n** (use lowercase).
    If **y** is selected, the VDP controller is enabled.
    If **n** is selected, the VDP controller is disabled. (default)

Notice!
The TM-10K Gen 2 does not support VDP since that requires an RS-485 connection. However, installation of the OS and application on an original TM-10K still supports RS-485 connections and a VDP controller.

27. Press **Enter**.
    The Active/Standby Partner Name window appears.

```
Active/standby partner name: tm10k-2
Partner IP address #1: 192.168.5.107
Partner IP address #2:
Have VDP Controller: n
Change these values? (y/n, default y)
```

28. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
29. Press **Enter**.
    If y is selected, the Have active/standby partner window appears. Return to step 17.
    If n is selected, the Found 2 Ethernet adapters: window appears.

```
Found 2 Ethernet adapters:
lan0 MAC address = 00:18:7d:2a:70:55
lan1 MAC address = 00:18:7d:2a:70:56
lan0 (MAC 00:18:7d:2a:70:55):
IP address: 192.168.5.107
Prefix length: 8
Default gateway: 192.168.5.0
Change these values? (y/n, default y)
```

Notice!
lan0 uses the RJ-45 Ethernet (NIC1) connector.
lan1 uses the RJ-45 Ethernet (NIC2) connector.

30. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
31. Press **Enter**.
    If y is selected, the lan0 IP address window appears.
    If n is selected, lan1 bonded with lan0 adapter window appears. Skip to step 39.
32. In the New Value field, enter a new **IP address**.

```
IP address: 192.168.5.107
New value:
```

33. Press **Enter**.
    The Prefix Length window appears.

```
Prefix length: 8
New value:
```

34. In the New Value field, enter a **new Prefix length**.
35. Press **Enter**.
    The Default gateway: window appears.

```
Default gateway:
New value: 192.168.5.0
```

36. In the New Value field, enter a **new Default gateway**.
37. Press **Enter**.
    The lan0 IP address confirmation window appears.

```
lan0 (MAC 00:18:7d:2a:70:55):
IP address: 192.168.5.107
Prefix length: 8
Default gateway: 192.168.5.0
Change these values? (y/n, default y)
```

38. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
39. Press **Enter**.
    If y is selected, the lan0 IP address window appears. Return to step 32.
    If n is selected, the lan1 bonded with lan0 adapter window appears.

```
lan1 (MAC 00:18:7d:2a:70:56):
Bonded with lan0: y
Change these values? (y/n, default y)
```

40. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
41. Press **Enter**.
    If y is selected, the Bond lan1 with lan0 window appears.

Notice!
If you entered **0.0.0.0** for the lan0 IP Address, then you are not prompted for bonding.
If **n** is selected with the following configuration; the adapters are not bonded, both adapters have IP Addresses, and both adapters have default gateways, the preferred gateway window appears. Skip to step 52. Otherwise, skip to step 57.

```
Bond lan1 with lan0: y
New value:
```

42. In the New Value field, enter a **y** or **n** (use lowercase).
43. Press **Enter**.
    If y is selected, the NICS are bonded. Skip to step 49.
    If n is selected, the NICS are not bonded. The lan1 IP Address window appears.
    If the two NICs are not bonded, they should be on different networks.

```
IP address: 10.33.201.5
New value:
```

44. In the New Value field, enter a new **IP address**.
45. Press **Enter**.
    The Prefix length: window appears.

```
Prefix length: 8
New value:
```

46. In the New Value field, enter a **new Prefix length**.
47. Press **Enter**.
    The Default gateway: window appears.

```
Default gateway:10.33.201.1
New value:
```

48. In the New Value field, enter a **new Default gateway**.
49. Press **Enter**.
    The lan1: Change these values? (y/n, default y) confirmation window appears.

```
lan1 (MAC 00:18:7d:2a:70:56):
Bonded with lan0 adapter: n
IP address: 10.33.201.5
Prefix length: 8
Default Gateway: 10.33.201.1
Change these values? (y/n, default y)
```

50. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
51. Press **Enter**.
    If y is selected, the Bond lan1 with lan0 window appears. Return to step 41.
    If n is selected with the following configuration; the adapters are not bonded, both adapters have IP Addresses, and both adapters have default gateways, the Preferred gateway: window appears. Otherwise, skip to step 57.

```
Preferred gateway: Fair-shared
Change these values? (y/n, default y)
```

52. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
53. Press **Enter**.
    If y is selected, the Preferred gateway selection window appears.
    If n is selected, the Found 2 Ethernet adapters window appears. Skip to step 57.
    If the two NICs are not bonded, they should be on different networks.

```
1 - Use lan0 192.168.5.0 as the default gateway
2 - Use lan1 10.33.201.1 as the default gateway
3 - Gateways are fair-shared
Selection: 3
New Value: 1
```

54. In the New Value field, enter a **new preferred gateway selection**.
    Selection choices are **1**, **2**, or **3**.
55. Press **Enter**.
    The Preferred gateway: confirmation window appears.

```
Preferred gateway: 192.168.5.0
Change these values? (y/n, default y)
```

56. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
57. Press **Enter**.
    If y is selected, the Preferred gateway: selection screen appears. Return to step 54.
    If n is selected, the Found 2 Ethernet adapters window appears.

```
Found 2 Ethernet adapters:
lan0 MAC = 00:18:7d:2a:70:55
lan1 MAC = 00:18:7d:2a:70:56
root:~ #
```

Ethernet adapter settings are displayed, start-up scripts are reconfigured and the site_cfg exits. If you change any of the site-specific configuration information, you should restart the computer.

9.1.1 Change the root password

Notice!
To log in remotely from another computer via SSH (Secure Shell), a password must be set for the root user.

To **change the password for root**, do the following:
1. Enter the command **reboot -f**.
2. Remove the **USB flash drive**.

To **boot from the USB flash drive**, do the following:
1. Log onto the TM-10K as the user: **root**.
2. At the command prompt, type **passwd**.
3. Press **Enter**.
   The Changing password for root window appears.

```
Changing password for root
Enter the new password (minimum of 5 characters)
Please use a combination of upper and lower case letters and numbers
New password: _
```

4. Enter a **new password**.
5. Press **Enter**.
   The Re-enter new password: window appears.

```
Re-enter new password: _
```

6. Re-enter the **new password**.
7. Press **Enter**.
   The password change is complete.

```
Passwd: password changed
root:~ #
```

9.2 Software update

The TM-10K Gen 2 application can be updated via USB thumb drive. The steps are the same as when initially installing the application.

To **perform an update**, do the following:
1. Log onto the TM-10K as the user: **root**.
   You are logged in and a root prompt appears.

Notice!
A password may have been set for the user: root.

2. At the root prompt, type **/tm/stop_tm** to shut down the TM-10K software.
   Several lines of output appear followed by another prompt.
3. Copy the TM-10K Gen 2 **application software** to the root directory of a USB thumb drive.
   - The TM-10K Gen 2 application software is packaged in a file with a .tar.xz extension.
   - If a license file has not been installed, then a valid license file named tm-10k.lic must be present in the root directory of the thumb drive.
   - The TM-10K Gen 2 supports USB thumb drives formatted as either FAT32 or NTFS.

– The TM-10K Gen 2 does not support encrypted USB thumb drives.

4. Insert the **USB thumb drive** with the TM-10K Gen 2 application software into a USB port on the TM-10K Gen 2 .
5. At the prompt, type **tm_update --usb**.

Notice!
Although the USB thumb drive may contain multiple directories and files, there can only be one file with a .tar.xz extension in the root directory. If there are multiple files with this extension in the root directory, tm_update prints out a diagnostic message, and exits without performing any updates.

6. Press **Enter**.
   The application software files are copied to the hard drive.
7. Remove the **USB thumb drive** from the USB port.
8. At the prompt, type **/tm/run_tm** to start the TM-10K Gen 2 application software.
   OR
   Reboot the **computer**.
9. Press **Enter**.
   The Completing system initialization window appears. The TM-10K Gen 2 application software is running.

Notice!
If you choose to restart the computer, upon restart the software prompts to start the TM-10K Gen 2 application (by default, there is a 5 second time out).

10 System and wiring diagrams

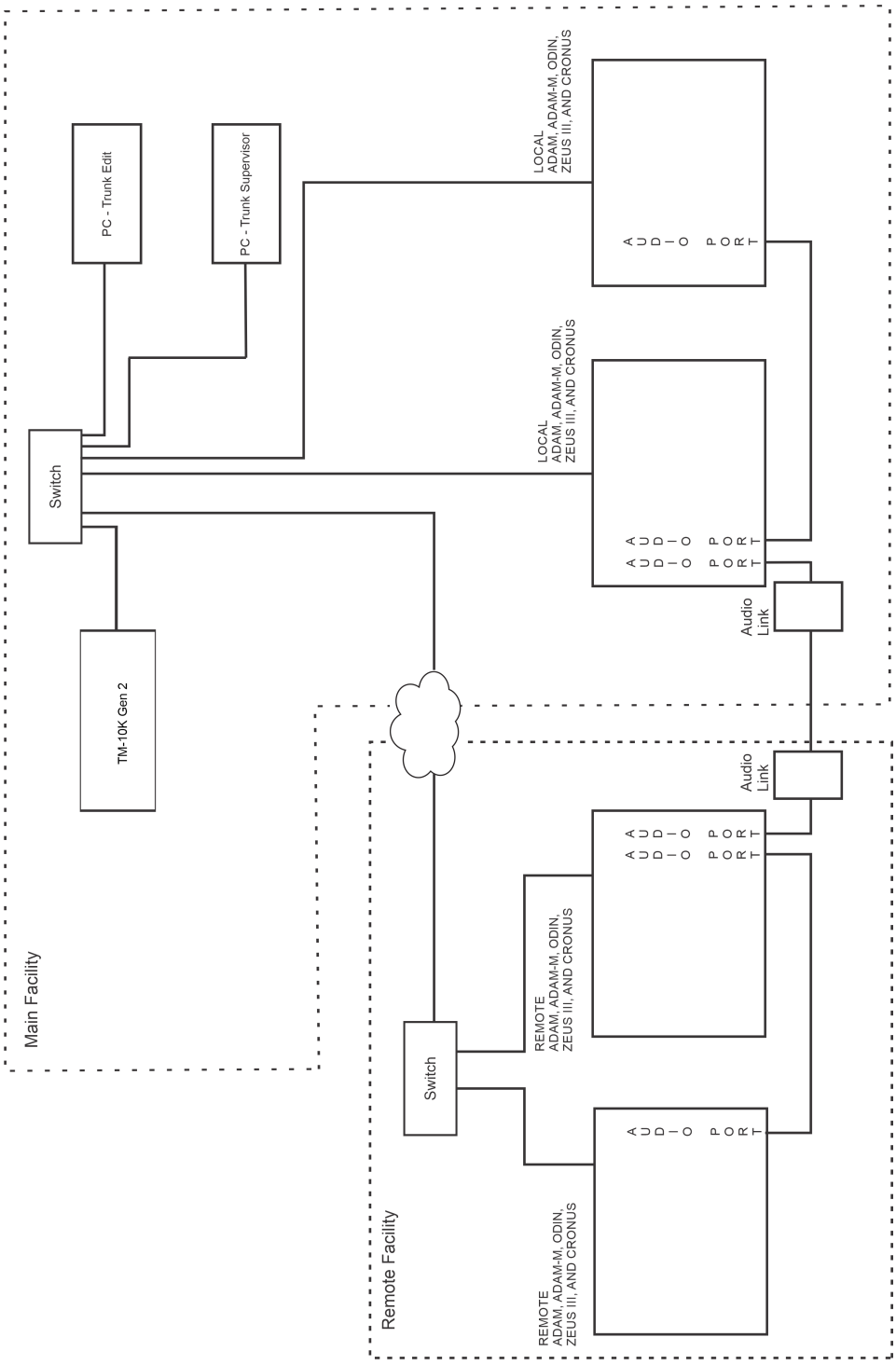


Figure 10.1: Example of a non-redundant TM-10K Gen 2 system

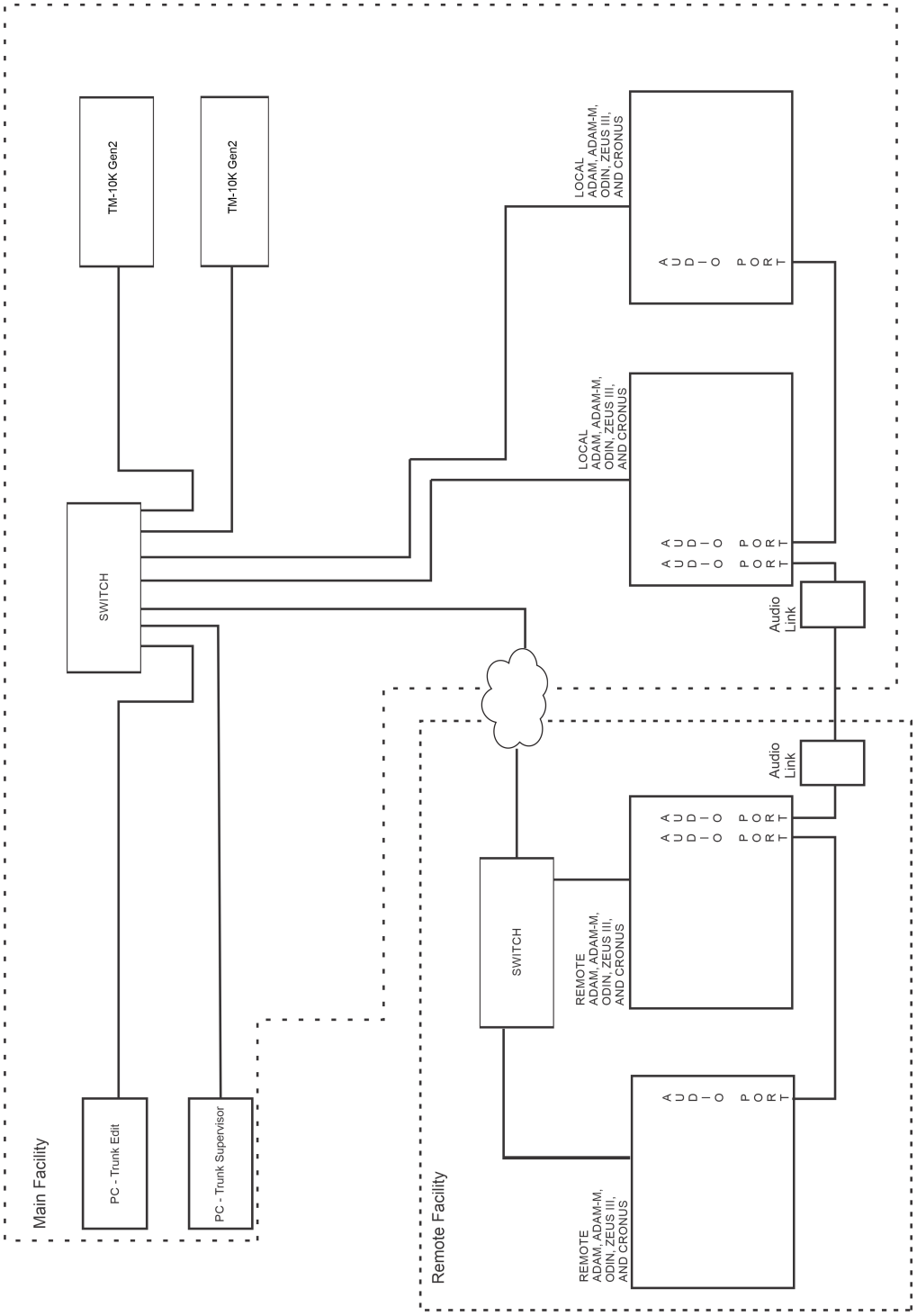


Figure 10.2: Example of a redundant TM-10K Gen 2 system

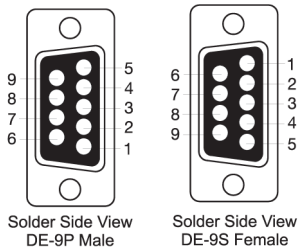


Figure 10.3: 9-pin D-sub connector pinouts

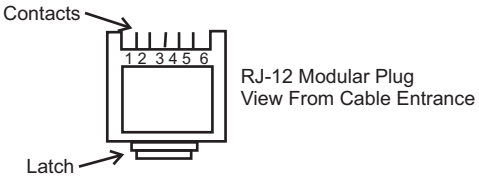


Figure 10.4: RJ-12 connector pinout

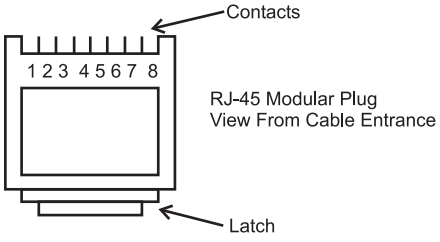


Figure 10.5: RJ-45 connector pinout

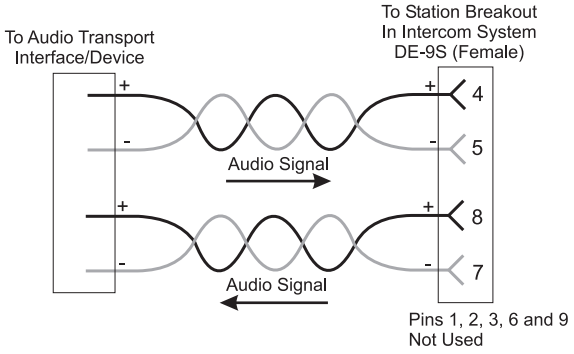


Figure 10.6: Unspecified device to DE-9S audio cable

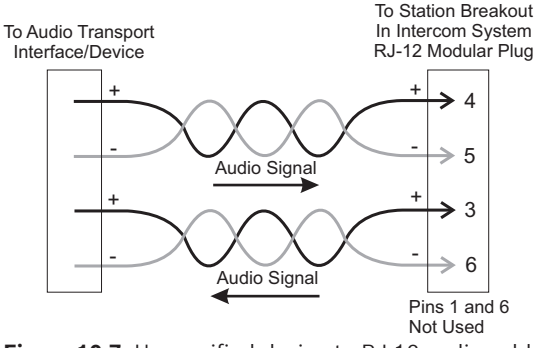


Figure 10.7: Unspecified device to RJ-12 audio cable

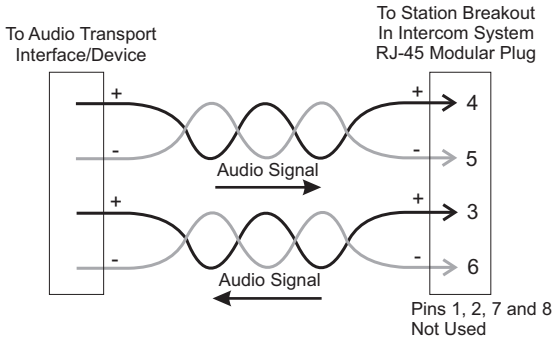


Figure 10.8: Unspecified device to RJ-45 audio cable

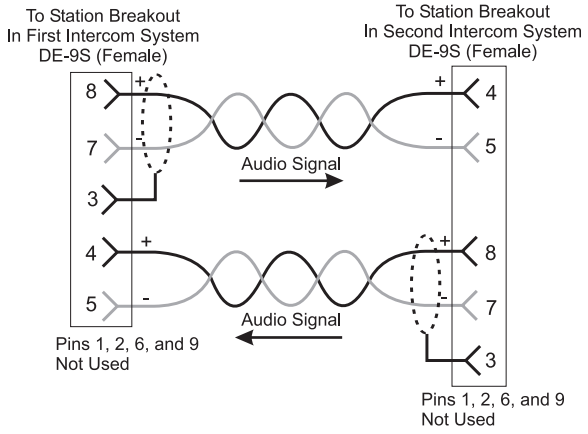


Figure 10.9: DE-9S to DE-9S audio cable

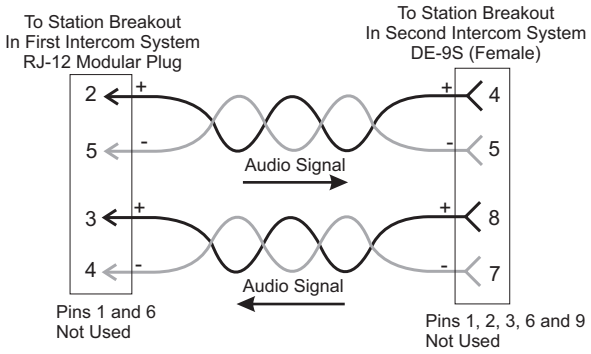


Figure 10.10: RJ-12 to DE-9S audio cable

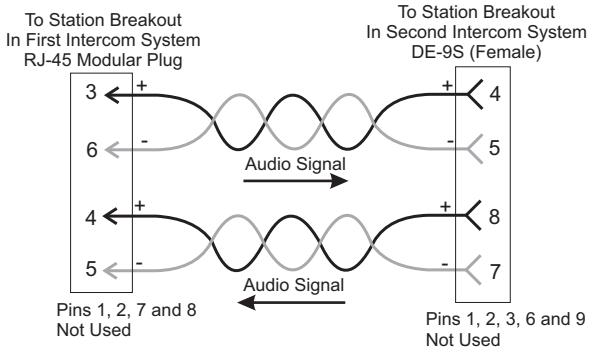


Figure 10.11: RJ-45 to DE-9S audio cable

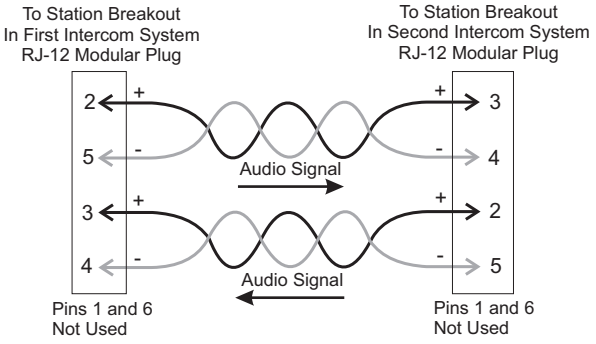


Figure 10.12: RJ-12 to RJ-12 audio cable

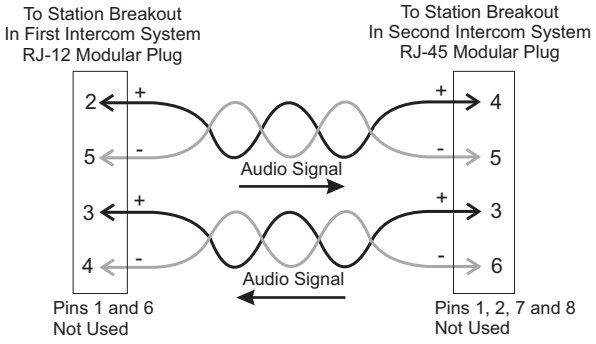


Figure 10.13: RJ-12 to RJ-45 audio cable

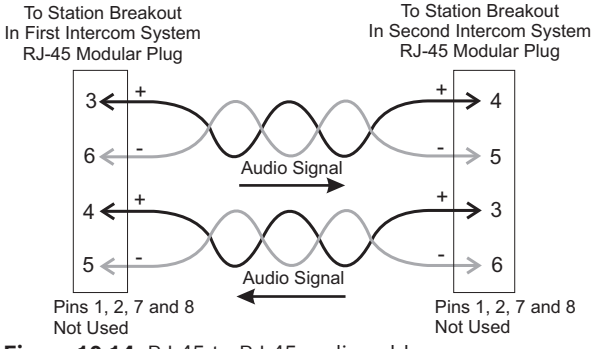


Figure 10.14: RJ-45 to RJ-45 audio cable

10.1 Recommended cables

- For cables using RJ-12 and RJ-45 connections, use CAT-5 network cable.
- For audio cables, use Belden 8723 or similar type with two (2) twisted pairs with shield/ drain wires.

11 Maintenance

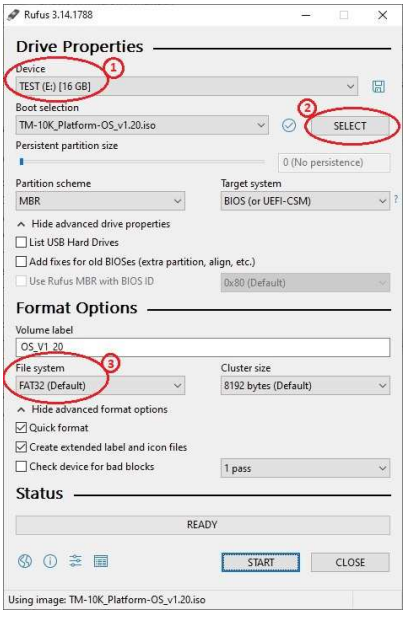
11.1 Create a bootable USB thumb drive

The TM-10K Gen 2 Platform OS is distributed as a bootable file system image (an .iso file) which can be used to create a bootable USB thumb drive. You cannot copy the file to the USB drive; instead, you must use an appropriate tool to create the bootable USB drive. You can use any bootable USB creation utility; however, the recommended utility is Rufus (https://rufus.ie/en/).

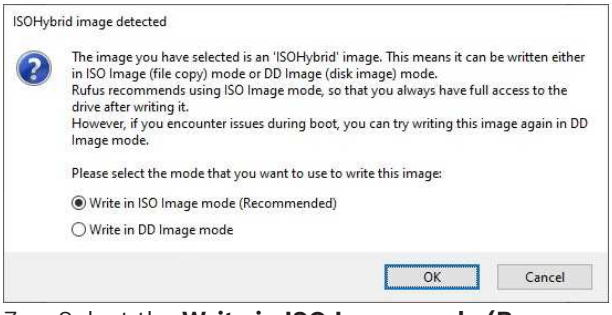
For illustration purposes, the following instructions use the Rufus utility.

To **create a bootable USB thumb drive**, do the following:

1. Insert a **USB thumb drive** and run Rufus.
   The following screen appears.



2. Select the **USB thumb drive** from the Device drop down menu.
   If you only have one USB drive attached, it will be preselected.
3. Click **SELECT**.
4. Browse to and select the **Platform OS .iso image**.
5. Select **FAT32** from the File System drop down menu. (NTFS also works, but FAT32 is recommended.) Leave the remaining options at their defaults.
6. Click **START**.
   A warning message appears.



7. Select the **Write in ISO Image mode (Recommended) radio button**.
8. Click **OK**.
   A warning message appears.

9. Click **OK** to start the operation.
   The USB drive will be reformatted and any data on the drive will be lost.

Once the utility finishes programming the flash drive, you can add additional files such as the TM-10K license file and application software to the flash drive.

11.2 Boot from the USB Flash Drive

To **boot from the USB flash drive**, do the following:

1. Plug the **bootable USB flash drive** into one of the USB slots on the TM-10K Gen 2 .
2. Power on the TM-10K Gen 2 .
3. Press **DEL** on the keyboard to enter the BIOS configuration menu.
4. Under Boot Override in the Save & Exit menu, select the **USB drive** (you must select the device, not partition 1 on the device) to boot from the thumb drive.

11.3 Reinstall the operating system

Notice!
This program reads the site parameters from the disk before proceeding (and aborts the installation if it cannot read them); then, after installing the operating system, it restores the site parameters. The site_cfg command should be used to verify the parameters. For more information, refer to *Site-specific customization, page 29*. The TM-10K Gen 2 application, and its local configuration file are not saved.

If the operating system and application are to be reinstalled on a computer that has previously been configured, you can preserve the license file and the site-specific configuration.

To **reinstall the operating system**, do the following:

1. Insert the **Platform OS USB** into the USB drive.
   For information on how to create a bootable USB thumb drive, see *Create a bootable USB thumb drive, page 42*.
2. Boot from the **Platform OS USB drive**.
   The TM-10K Gen 2 Platform OS window appears. For more information, see *Boot from the USB Flash Drive, page 43*.

3. Log onto the TM-10K as the user: **root**.
4. Press **Enter**.
   The system displays the root command prompt.
5. At the command prompt, type **install_os --keep-site- -keep-lic**.
6. Press **Enter**.
   A warning appears that says all data on the computer will be erased, and prompts whether to continue.

```
**WARNING**
This program will erase ALL data on the hard drive and then install the operation system.
Continue? (yes/no, default no)
```

7. Type **yes** (spell out the word yes in lowercase) to continue with the installation.
   OR
   Type **no** to cancel the installation without affecting the hard drive.

Notice!
If y is typed by mistake the installation of the software is aborted. Return to step 5 to restart the installation process again.

8. Press **Enter**.
   The hard drive is reformatted and files are copied from the USB drive to the hard drive. The installation is complete.

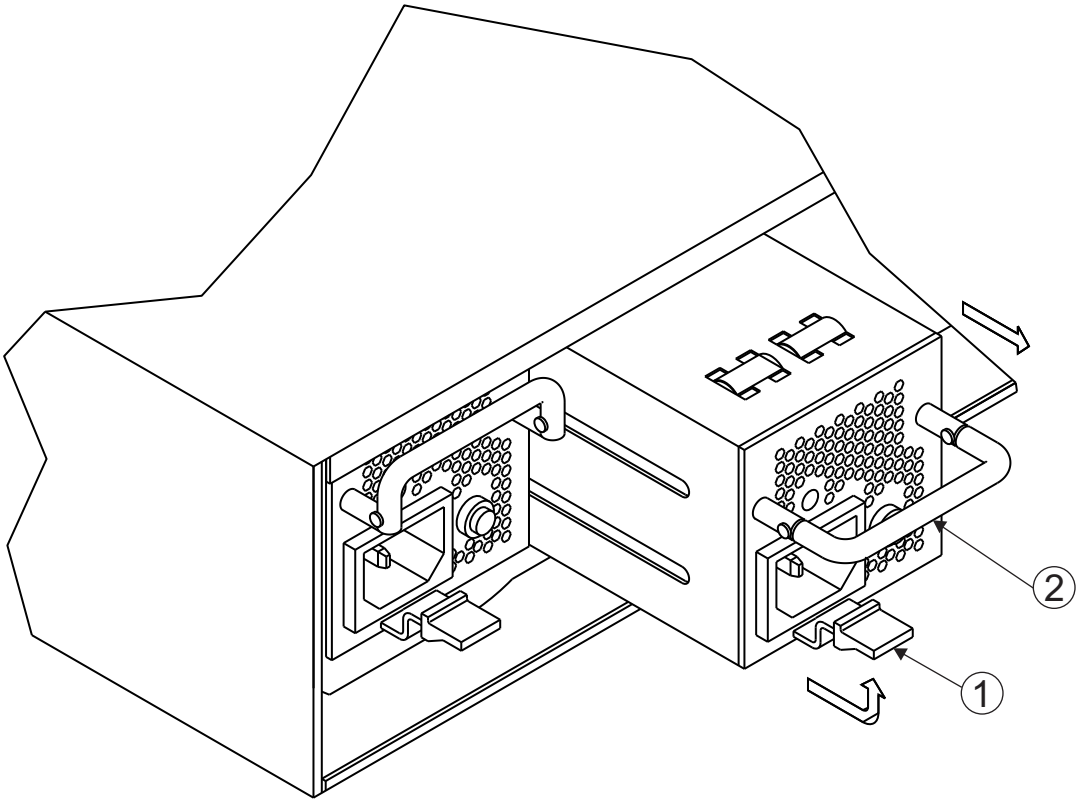
```
Installation complete.
Reboot the computer from the hard drive. You can then log in as root and run the command
site_cfg
to configure site specific information for this computer. (You can run this command multiple
times, if necessary.)
Currently there is no password for root. You can use the passwd command to set a
password. If you wish to enable remote logins via ssh, you must first set a password for root.
```

To perform site-specific customizations, see *Site-specific customization, page 29*.
To set a password for root, see *Change the root password, page 35*.

11.4 Replace a power supply

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

1. Lift up the **spring latch (1)** that holds the power supply in place.
2. Use the handle (2) to pull the **power supply** from the chassis.



To **replace a power supply**, do the following:

1. Align the **sidetracks** on the sides of the power supply with the chassis sidetracks.

Notice!
To avoid pinching fingers, place the power supply handle in the up position before sliding the power supply into the chassis.

2. Gently push the **power supply** into place, taking care to click the clip into place.

12 Technical data

Power

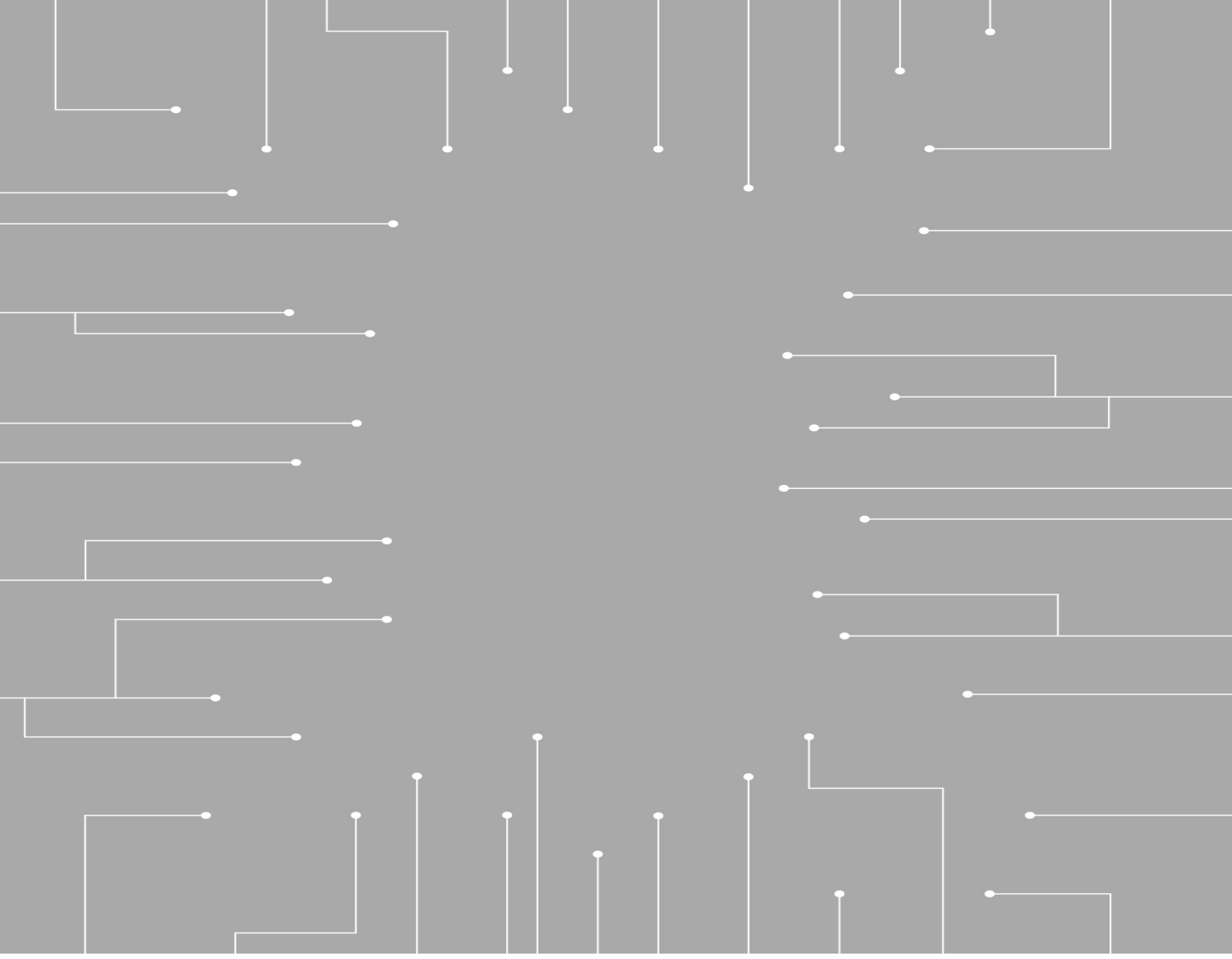
	TM-10K GEN 2 High Capacity Trunkmaster Gen 2 TM-10K
Input voltage (VAC)	100 VAC - 240 VAC
Input current (A)	1.0 / 0.5 A
Power frequency	60 / 50 Hz

Mechanical

Dimension (H x W x D) (in)	3.5 in. x 19.0 in. x 15.1 in. 2 RU Rackspace
Dimension (H x W x D) (mm)	88.90 mm x 482.60 mm x 383.54 mm 2 RU Rackspace
Weight (lb)	35.60 lb
Weight (kg)	16.15 kg

Environmental

Operating temperature (°F)	32 °F – 122 °F
Operating temperature (°C)	0 °C – 50 °C
Operating relative humidity, non-condensing (%)	5% – 90%
Storage temperature (°F)	-4 °F – 176 °F
Storage temperature (°C)	-20 °C – 80 °C
Storage relative humidity (%)	5% – 90%



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