RTS

Innovating the Future of Global Communications

TM-10K Trunk Master
SWP-2000 Switch Over Panel
ICP-2000 Interconnect Panel

Technical Manual

TM-10K

ICP-2000

SWP-2000

PROPRIETARY NOTICE

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WARRANTY AND SERVICE INFORMATION

For warranty and service information, refer to the appropriate web site below:

RTS Intercoms ..... www.rtsintercoms.com/warranty
RTS Digital
RTSTW
AudioCom
RadioCom
Intercom Headsets.....www.telex.com

CUSTOMER SUPPORT

Technical questions should be directed to:

Customer Service Department
Bosch Security Systems, Inc.
www.telex.com

TECHNICAL QUESTIONS EMEA

Bosch Security Systems Technical Support EMEA
http://www.rtsintercoms.com/contact_main.php

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The manufacturer of the equipment described herein makes no expressed or implied warranty with respect to anything contained in this manual and shall not be held liable for any implied warranties of fitness for a particular application or for any indirect, special, or consequential damages. The information contained herein is subject to change without prior notice and shall not be construed as an expressed or implied commitment on the part of the manufacturer.

 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-SERVICABLE 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 APPRATUS TO RAIN OR MOISTURE.

WARNING: TO PREVENT INJURY, THIS APPARATUS MUST BE SECURELY ATTACHED TO THE FLOOR/WALL/RACK IN ACCORDANCE WITH THE INSTALLATION INSTRUCTIONS.

~	This product is AC only.
CE	

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 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 are 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 sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this 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.

Table of Contents

CHAPTER 1

Description and Specification

Introduction

This manual describes the installation and operation of the **TM-10K** (Trunk Master), **SWP-2000** (Switch-Over Panel), and **ICP-2000** (Interconnect Panel).

TM-10K Description

TM-10K 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 are interconnected to form one (1) system with decentralized hardware.)

The RTS Trunking System consists of a TM-10K which supports trunking data through Ethernet. In addition, the TM-10K supports legacy RS-485 data, which utilizes up to four (4) 8-port ACCES I/O RS-485 PCIe serial cards, in conjunction with ICP-2000 Interconnect Panels, depending on the number of intercom systems to be connected serially. A backup TM-10K may also be added to prevent downtime in the event of a failure of the main master control unit. The TM-10K replaces the TM-2000 Trunk Master and MTM-2000 Mini-Trunk Master.

TM-10K Reference View

Front Panel Features

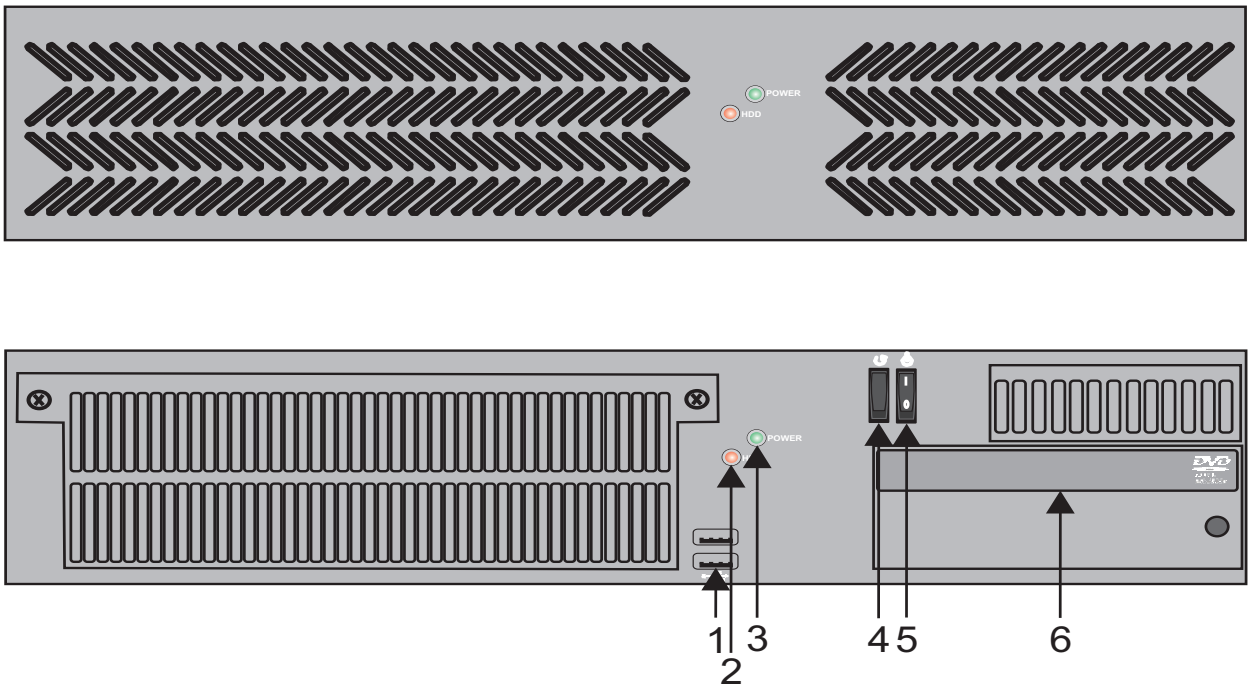


FIGURE 1. TM-10K front panel features (Drawing not to scale)

1. **USB connectors**
2. **Hard drive status indicator**
3. **Power status indicator**
4. **Reset switch**
5. **Power switch (front)**

   NOTE: Press and hold the power switch for five (5) seconds to turn off power.
6. **CD-ROM+DVD drive**

Rear Panel Features

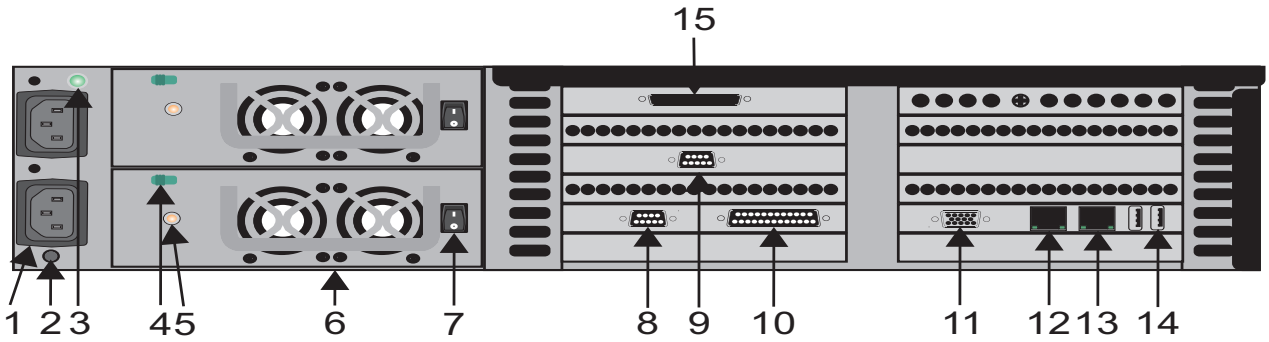


FIGURE 2. TM-10K rear panel features (Drawing not to scale)

1. **AC power connectors**
2. **Alarm Mute button**

IMPORTANT: An audible alarm sounds if one (1) of the power supplies fail. Press the **alarm mute button** once to turn off the alarm.

3. **AC power status indicator**
4. **Power supply release levers**
5. **Power supply status indicators**
6. **Power supply fans**
7. **Power switches (rear)**
8. **Serial (COM1) port connector** [1]
9. **Serial (COM2) port connector** [1]
10. **Parallel port connector** [1]
11. **VGA port connector**
12. **RJ-45 Ethernet (NIC2) connector**[1]
13. **RJ-45 Ethernet (NIC1) connector**[1]
14. **USB connectors**
15. **Card slots:** containing RS-485 PCIe serial card(s) using MDR connector [1]

1. *The exact location of cards and connector designations can vary from unit to unit. The diagram provided is for general feature locations only. Follow the designated labels found on your particular unit.*

ICP-2000 Description

The **ICP-2000** breakout panel converts the MDR connection provided from the TM-10K serial card to 9-pin D-Sub connectors. Each RS-485 serial card on the TM-10K has eight (8) ports provided on the MDR connector. The ICP-2000 breaks the eight (8) ports into individual 9-pin D-sub connections. There are two (2) connectors on the ICP-2000, which allow both a primary and a redundant TM-10K to be connected. The connectors are wired in parallel. It does not matter which connector the primary or redundant (if present) TM-10K is plugged into. The ICP-2000's connectors are labeled from left to right J1, J2, J3,....J8. The connector and port assignment is associated with the cable plugged into the ICP-2000. For example, if the cable plugged into the ICP-2000 has ports 1-8 on it, then J1 would be port 1, J2 would be port 2, etc. If the cable plugged into an ICP-2000 has ports 9-16 on it, then J1 would be port 9, J2 would be port 10, etc.

IMPORTANT: In systems using VDP panels, port 1 is reserved for the connection to the VDP controller and cannot be used for intercom communications.

ICP-2000 Reference View

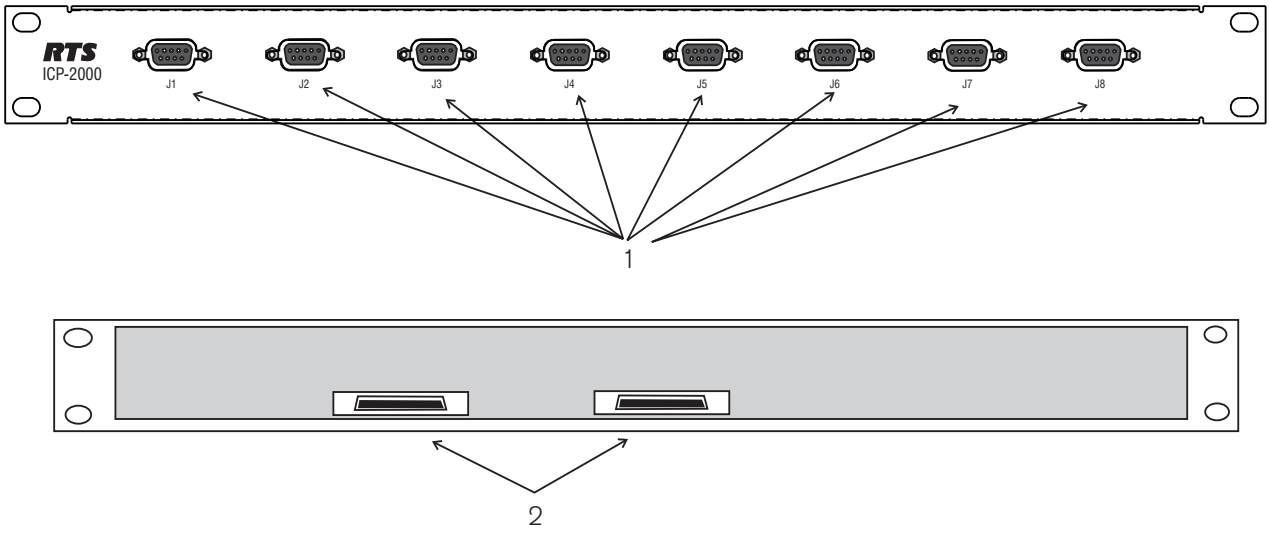


FIGURE 3. ICP-2000 Reference View

1. **9-pin female D-sub connector** - Each connector is dedicated to a RS-485 communications port carried on the MDR cable from the TM-10K.
2. **50-pin SCSI connector** - The adapter cable is included with the TM-10K unit.

SWP-2000 Description

The SWP-2000 switch-over panel provides common connections for Trunk Edit and Trunk Supervisor software packages via serial connections to a Windows-based PC. When used with redundant TM-10K Trunk Masters, the SWP-2000 monitors status and controls both TM-10K units.

SWP-2000 Reference View

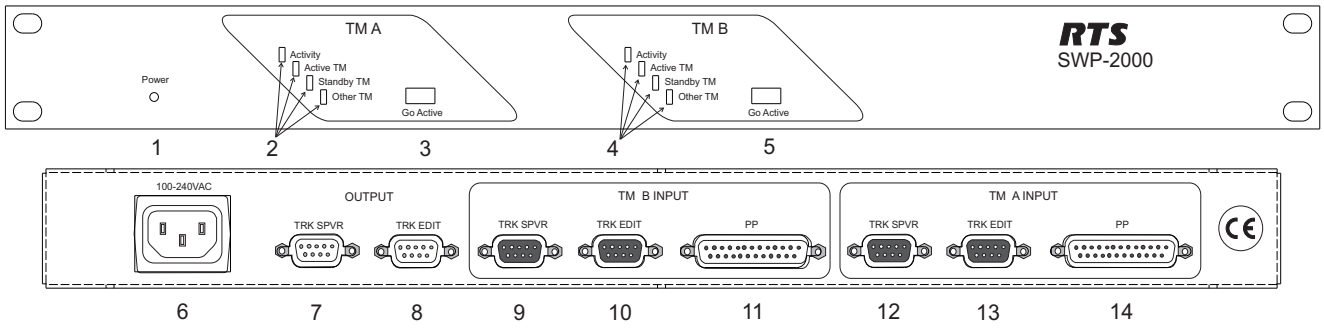


FIGURE 4. SWP-2000 Reference View

1. **Power LED -** Indicates the SWP-2000 has power.

2. **TM A Status LEDs -**

   Activity LED blinks about two (2x) times a second whenever the TM-10K associated with the TM A inputs is running and it blinks whenever the TM-10K is processing intercom requests.

   Active TM LED is green if the corresponding Trunk Master is active, otherwise the LED is off.

   Standby TM LED is green if the corresponding Trunk Master is standby, otherwise the LED is off.

   Other TM LED is green, if TM B is communicating, red if not communicating or blinks red if there is a communication error, and off if the system is not configured for a backup TM-10K.

3. **TM A Go Active Control Switch -** When two (2) Trunk Masters are connected to the SWP-2000, the *Go Active* control switch designates the TM-10K associated with the TM A inputs as the active Trunk Master. The TM-10K associated with TM B is designated as the standby Trunk Master.

4. **TM B Status LEDs -** *Activity* LED blinks about two (2x) times a second whenever the TM-10K associated with the TM B inputs is running and it blinks whenever the TM-10K is processing intercom requests.

   Active TM LED is green if the corresponding Trunk Master is active, otherwise the LED is off.

   Standby TM LED is green if the corresponding Trunk Master is standby, otherwise the LED is off.

   Other TM LED is green, if TM A is communicating, red if not communicating or blinks red if there is a communication error, and off if the system is not configured for a backup TM-10K.

5. **TM B Go Active Control Switch -** When two (2) Trunk Masters are connected to the SWP-2000, the *Go Active* control switch designates the TM-10K associated with the TM B inputs as the active Trunk Master. The TM-10K associated with TM A is designated as the standby Trunk Master.

6. **AC Power Connector -** The AC power connector cable connects directly into the wall.

7. **Trunk Supervisor Connector -** Provides a serial connection to the COM port of the PC running the Trunk Supervisor software. Trunk Supervisor can also connect via Ethernet.

8. **Trunk Edit Connector -** Provides a serial connection to the COM port of the PC running the Trunk Edit software. Trunk Edit can also connect via Ethernet.

9. **Trunk Master A Trunk Supervisor Connector -** Connects to COM port 2 of Trunk Master A.

10. **Trunk Master A Trunk Edit Connector -** Connects to COM port 1 of Trunk Master A.

11. **Trunk Master A Parallel Port -** Connects to the parallel port of Trunk Master A. Provides control from the SWP-2000 to the TM-10K and LED status monitoring of the TM-10K on the SWP-2000.

12. **Trunk Master B Trunk Supervisor Connector -** Connects to COM port 2 of Trunk Master B.

13. **Trunk Master B Trunk Edit Connector -** Connects to COM port 1 of Trunk Master B.

14. **Trunk Master B Parallel Port -** Connects to the parallel port of Trunk Master B. Provides control from the SWP-2000 to the TM-10K and LED status monitoring of the TM-10K on the SWP-2000.

Understanding Trunking

In a trunking system, the differential audio lines (not data) of one (1) or more intercom ports are connected between two (2) separate intercom systems. The system administrator in each intercom system places restrictions on these ports to prohibit them from being assigned to any keys. This reserves the ports for exclusive use as trunking lines. A data link is also connected from each intercom system to the Trunk Master for exchange of system control signals, which can be done over Ethernet or an RS-485 serial connection. The TM-10K supports up to 32 RS-485 ports. Once the connections are made, a Trunk Master is programmed, using Trunk Edit, to recognize the individual intercom systems.

After keys are assigned, 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, additional trunk lines must be reserved and connected between the systems. However, it is not always necessary for two (2) intercom systems to be directly connected as long as there is a path not more than one (1) system away to connect the two (2) systems. The trunking system can be programmed to permit cascaded trunking in which a pathway is established through an intermediate intercom system to connect two (2) endpoints.

NOTE: 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 to 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.

Cascade Costs

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

Cascades are used when no direct trunks are available to satisfy a request. The Trunk Master attempts to tie two (2) 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 intercoms, which matches the operation of the TM-2000. For more information, see "Assigning a Cascade Cost" on page 23.

Alpha Management

For each key assignment there are two (2) flags that 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 be sent more remote alphas than it can store. If this occurs, some of its alpha lists may be missing completely.

NOTE: When intercom *X* is connected to the Trunk Master, the Trunk Master forwards to it all the scroll lists for each intercom specifically in a common group with *X*. For instance, if *X* and *Y* are both members of intercom group 12, then *X* will be sent the alphas for intercom *Y*; and *Y* will be sent the alphas for intercom *X*. If intercom *X* receives the alphas from too many other intercoms, it will not be able to store all the alphas.

Specifications

TM-10K

Height ..... 3.5in (88.9mm) [2 RU]
Width 17in (431.8mm)
Depth 18.5in (469.9mm)
Weight ..... 28.65lb (13kg)[1]
Input Voltage 100–240VAC, 47–63Hz, 6-3A
Maximum Power Consumption 120VA

SWP-2000

Height ..... 1.75in (44mm) [1 RU]
Width 19.0in (483mm)
Depth 5.3in (133mm)
Weight 4.60lb (2.08kg)
Input Voltage 100–240VAC, 47–63Hz, 0.4A

ICP-2000

Height ..... 1.75in (44mm) [1 RU]
Width 19.0in (483mm)
Depth 1.0in (25.4mm)
Weight 0.85lb (0.40kg)

Environment

Operating Temperature ..... 0°C to 40°C (32°F to 104°F)
Operating Humidity ..... 5 to 90%, non-condensing
Storage Temperature ..... -20°C to 70°C (-4°F to 158°F)
Storage Humidity ..... 15 to 90%, non-condensing

Certification

CE, UL 60950-1

1. *The weight is based upon a unit with one (1) RS-485 PCIe card installed.*

CHAPTER 2

Installation

Power On Instructions

The TM-10K's redundant powering scheme is designed to conform to IEC standards for industrial computing equipment. Each of the power supplies, located on the rear panel of the unit, have an individual Power On/Off switch. In order to insure reliable start-up operation, AC power must be applied to the TM-10K with both power supply switches in the on position. For further details See "AC Power Supplies" on page 25.

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

1. Verify the power supply switches, located on the rear of the unit, are in the on position.
2. Plug the power supply into an AC power source, such as a power outlet or power strip.
   The rear LED indicator lights turn green.

Installing Software

Two (2) software packages are available to use with an external PC connected to the TM-10K: Trunk Edit and Trunk Supervisor. Trunk Edit is included with the TM-10K and provides the user with the ability to configure and monitor the TM-10K. Trunk Supervisor is available as an add-on software package at 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
- 64MB Memory
- 20MB Free Hard Disk space (not including swap file)

Trunk Edit works with a PC attached via Ethernet or serial COM port 1 of the TM-10K or via the TRK EDIT port of the SWP-2000.

Trunk Supervisor works with a PC attached via Ethernet or serial COM port 2 of the TM-10K or via the TRK SPVR port of the SWP-2000.

NOTE: Serial connection only: a minimum of two (2) serial ports are required to run both software packages at the same time on the same computer. Three (3) serial ports are required if an RT-2M is to be controlled by Trunk Supervisor. For TM-10K rear panel features, see Figure 2 on page 9.

Rack Mounting

IMPORTANT: Install the TM-10K, ICP-2000, and SWP-2000 (if used) in an equipment rack. The units do not have special ventilation requirements. Standard rear mount rack rails to support the TM-10K are recommended for mobile applications. If a redundant system is being configured, it is recommended the SWP-2000 be installed between the two (2) TM-10K units. Mount one (1) or more ICP-2000 panels behind the TM-10K, at the back of the rack.

Trunking Connections and Setup

The TM-10K 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. Local and remote trunking is supported for both Ethernet and serial connections.

IMPORTANT: When two (2) Trunk Masters are not collocated the maximum delay for the active/standby communication path should be no more than 400 milliseconds round trip.

The number of trunk lines set up should be based on the number of people communicating with other intercom systems and on the critical nature of their communication. On the other hand, there may be additional expense involved with running trunk lines when using leased lines, for example, you may want to keep the number of lines to a minimum. You may be able to get by with fewer trunk lines than the number of potential users. For example: If two (2) keypanels need to have access to another intercom system, but only one (1) of those keypanels has a critical need, you may be able to get by with one (1) trunk line. You can set the trunk priorities for the two (2) users so the user with the critical need has a higher priority. Also, 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 (2) systems. If frequent busy signals are encountered during normal use, you may have to allocate more trunk lines. A busy signal is normally indicated by an alphanumeric key assignment alternating with a double asterisk indication.

Follow the labels as placed on the TM-10K for the specific locations of network cards and RS-485 serial cards/port numbers. The PCIe cards are sequenced as follows:

Slot 1: Ports 1–8	Slot 2: Ports 17– 24
Slot 3: Ports 25–32 COM2	Slot 4: Ports 9–16
Slot 5: COM1 + Parallel	Slot 6: SBC

NOTE: The PCIe cards are assigned ports in the order they are discovered. The discover sequence is as follows: Slot 1, Slot 4, Slot 2, and then Slot 3. This means if you only have cards in slots 2 and 3, then slot 2 has ports 1 through 8 and slot 3 has ports 9 through 16.

IMPORTANT: If using all four (4) PCIe slots, you must remove the COM2 face plate. Consequently, COM2 cannot be used with four (4) PCIe cards installed.

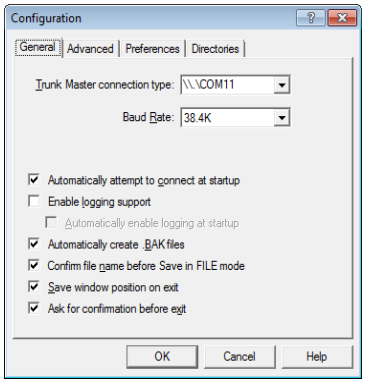
For more information, see “ACCES I/O RS-485 PCIe Card” on page 24.

Connecting Trunk Edit to a Trunk Master

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

1. From the View menu in Trunk Edit, select **Configuration...**.
   The Configuration window appears.
2. From the General tab, select the **Trunk Master connection type: drop down menu**.
   Available connection types: COM1:, COM2:, COM3:, COM4:, NET:.
3. From the Trunk Master connection type: drop down menu, select the **COM port**.
   Available connections COM1:, COM2:, COM3:, COM4:.

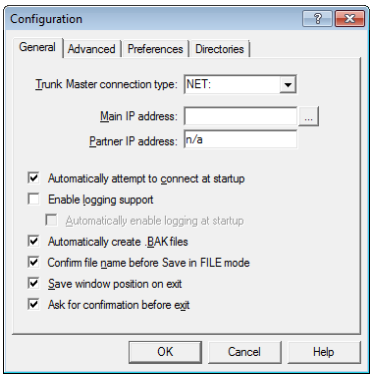
   NOTE: You can also type in the COM port name directly. If it is COM10 or higher you need to prefix the COM port name with \\.\, (e.g. \\.\COM11).



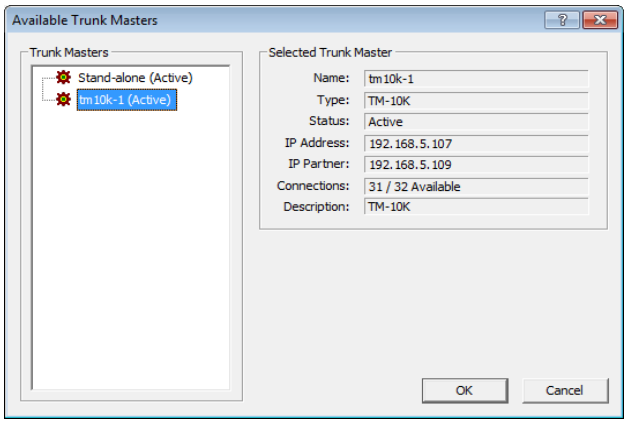
4. Select the **Baud Rate drop down menu.**
   Available baud rates 9600, 19.2K, and 38.4K.
5. For the TM-10K, select **9600** or **38.4K**.
6. Click the **OK** button.
   The Configuration window closes.
7. Click the Connect icon.
   Trunk Edit connects to the TM-10K.

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

1. From the View menu in Trunk Edit, select **Configuration...**.
   The Configuration window appears.
2. From the General tab, select the **Trunk Master connection type: drop down menu**.
   Available connection types: COM1:, COM2:, COM3:, COM4:, NET:.
3. From the Trunk Master connection type: drop down menu, select **NET:**.



4. From the Main IP address field, select the **browse button**. ...
   The Available Trunk Masters window appears.
5. From the Available Trunk Masters dialog, select the **Trunk Master**.
   The Selected Trunk Master details display.



6. Click the **OK** button.
   The Available Trunk Masters window closes.
7. Click the **OK** button.
   The Configuration window closes.
8. Click the Connect icon.
   Trunk Edit connects to the TM-10K.

Connecting an Intercom to a Trunk Master

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

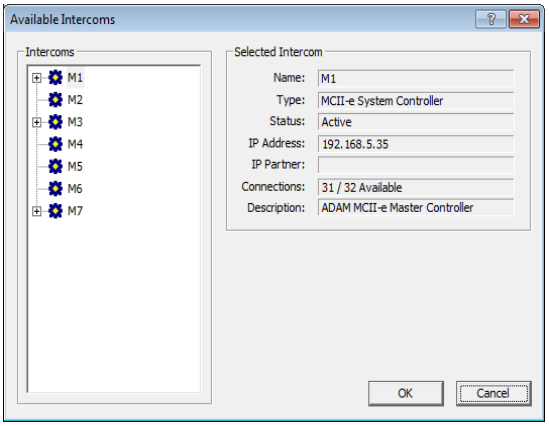
1. In the left navigation pane in Trunk Edit, click **Intercom**.
   The Intercom bar expands.
2. Click the **Setup** icon.
   A table displaying setup information for each intercom system is displayed.

   NOTE: On the initial setup, this table is empty.
3. For each trunked intercom system under the Name 4 column of the setup table, enter **a unique four (4) character name**.
   You can also enter unique six (6) and eight (8) character names under the Name 6 and Name 8 columns, but these are optional.
4. From the Connection column, right-click a **connection**.
   A pop-up menu appears.
5. From the pop-up menu, select **Select connection type**.
   A pop-up menu appears.
6. From the pop-up menu, select the **connection type**.
   Connection selections are Serial or Network.

7. To **connect via a serial connection**, do the following:
   a. From the Baud Rate column, right-click a **baud rate**.
      A pop-up menu appears.
   b. From the pop-up menu, select **Select baud rate**.
      A pop-up menu appears.
   c. From the pop-up menu, select **9600** or **38.4**.

      NOTE: For locally trunked systems (i.e. connected via cable only), select 38.4K. For remote trunked systems (eg. connected via RVON pass through data), select 9600.
   d. From the COM Port column, right-click the **RS-485 COM port** the TM-10K is to use.
      A pop-up menu appears.
   e. From the pop-up menus, select **Select COM port.**
      A pop-up menu appears.
   f. From the pop-up menu, select the **COM port**.
      The available COM ports are dependant on how many ACCES I/O RS-485 PCIe cards are installed.

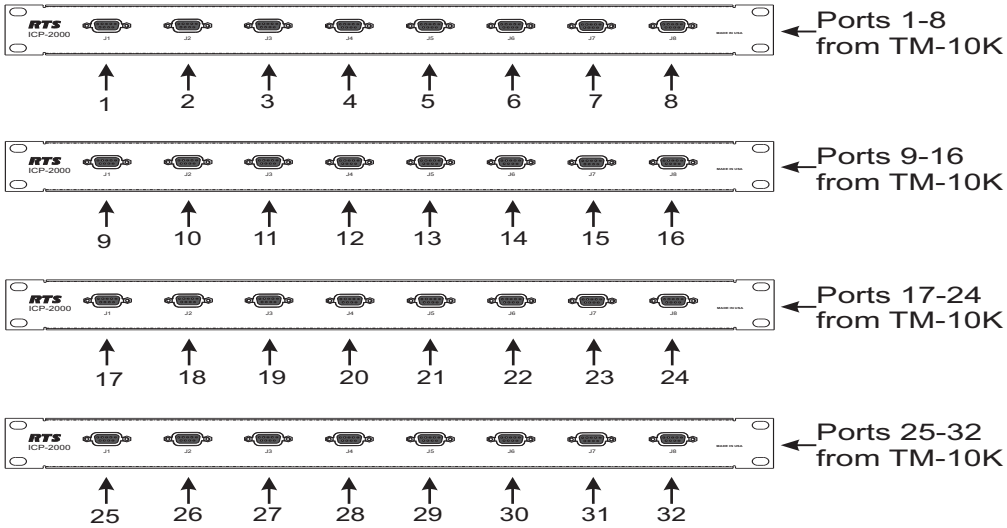
   To **connect via a network connection (Ethernet),** do the following:
   a. From the Primary IP Address column, enter the **IP Address**.
      OR
      Right-click the **Primary IP Address**.
      A pop-up menu appears.
   b. From the pop-up menu, select **Browse for intercom IP Address...**.
      A pop-up menu appears.
   c. In the Available Intercoms window, select the **intercom**.
      The Selected Intercom view displays the details for the intercom.



   d. Click the **OK** button.
      The IP Address appears in the Primary IP Address column.

   NOTE: If this is an ADAM intercom, then you also want to enter the IP Address for the standby controller.
8. If desired, **set the cascade cost** for this intercom. See “Assigning a Cascade Cost” on page 23.
9. Send **changes** to the Trunk Master.

IMPORTANT: On most systems, port 1 can be used for trunking. On special systems using VTR Delegate Panels (VDP), port 1 is reserved for communications with the VDP controller. Standard systems ship from the factory without VDP support, so port 1 can be used for trunking.



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" on page 40.
2. Connect **one (1) or more intercom audio ports** between the intercom systems.
   These ports are used for trunking communication only. See "System and Wiring Diagrams" on page 40.
3. From the Options menu in AZedit, select **Option|Preferences**.
   The Application Preferences window appears.
4. Click the **Advanced** tab.
   The Advanced page appears.
5. Select **Enable trunking support**.
6. Click the **OK** button.
   The preferences window closes.

   NOTE: Repeat steps 3–6 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.

   NOTE: A trunk port is under control of the Trunk Master. As such, it can be used for different functions at different times (e.g. connected to a party line; connected to an IFB). Normally, a trunk port would never be assigned as a regular key assignment, and should not be available. (The only reason to assign a trunk port as a key assignment would be for performing diagnostics.)

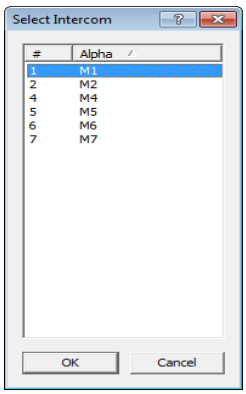
10. Send **changes** to the intercom.

    NOTE: Repeat steps 8-10 for each trunk port.

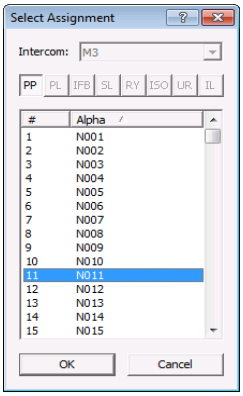
11. In Trunk Edit, in the left navigation pane, select **Trunk**.
The Trunk bar expands.
12. Click the **Definitions** icon.
A table displaying trunk definitions appears.

NOTE: On initial set up this table is empty.

13. From the Icom 1 column, right-click a **trunk entry**.
A pop-up menu appears.
14. From the pop-up menu, select **Choose new assignment...**.
The Select Intercom window appears.
15. Select the **intercom system** desired for this end of the trunk line.



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



19. Repeat steps 13-18 for the other end of the trunk (Icom 2).

NOTE:

- If this particular trunk line is to be cascadable, then set the cascade flag. For more information, see “Cascade Flag” on page 22.
- Repeat this procedure for each audio trunk line needed.

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

NOTE: 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 AZedit Software User Manual.

22. Send **changes** to the intercom.

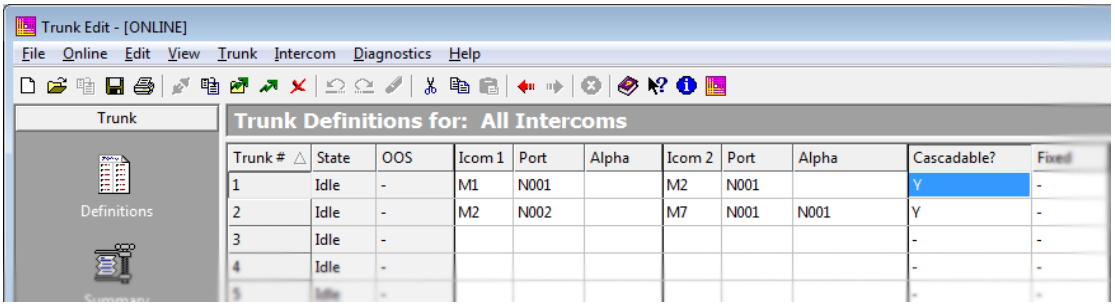
Trunk Edit Cascade

Cascade Flag

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

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

1. From the left navigation pane in Trunk Edit, select **Trunk**.
   The Trunk bar expands.
2. Click the **Definitions** icon.
   A table displaying trunk definitions appears.

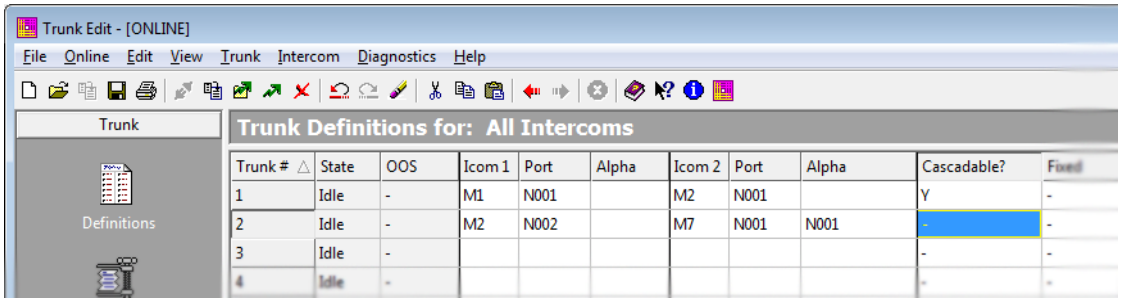


NOTE: On initial set up this table is empty.

3. From the Cascadable? column, right-click a **trunk entry**.
   A pop-up menu appears.
4. From the pop-up menu, select **Set cascade flag**.
   The letter Y appears.
5. Send **changes** to the Trunk Master.

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

1. From the left navigation pane in Trunk Edit, select **Trunk**.
   The Trunk bar expands.
2. Click the **Definitions** icon.
   A table displaying trunk definitions appears.

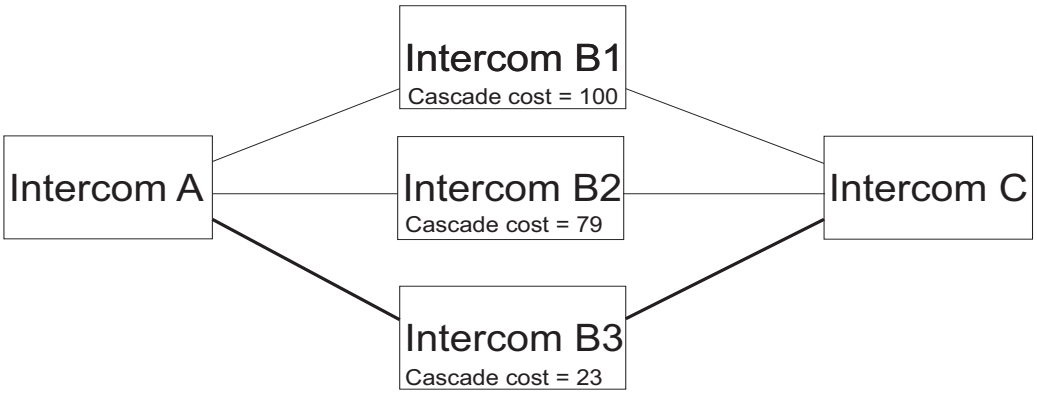


NOTE: On initial set up this table is empty.

3. From the Cascadable? column, right-click a **trunk entry**.
   A pop-up menu appears.
4. From the pop-up menu, select **Clear cascade flag**.
   The letter Y is replaced by a dash (-).
5. Send **changes** to the Trunk Master.

Assigning a Cascade Cost

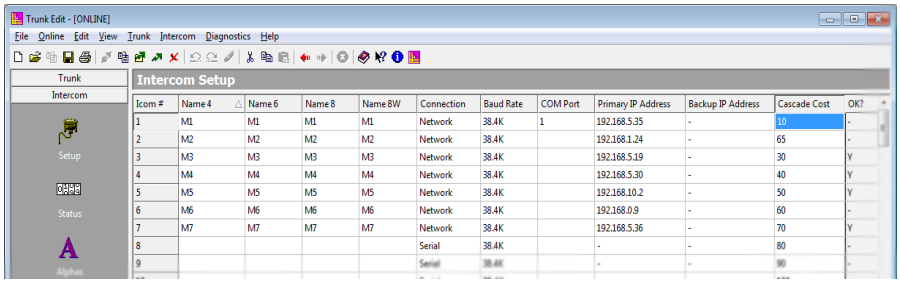
Cascade Costs are numeric values associated with each intercom in the matrix system. When a cascade is created, the TM-10K selects the intercom with the lowest cost.



There are no direct trunks between A and C, if a user in A wants to talk to a resource in C, a cascade has to be created, 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 will try 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. In the left navigation pane in Trunk Edit, click **Intercom**.
   The Intercom bar expands.
2. Click the **Setup** icon.
   A table displaying setup information for each intercom system is displayed.



NOTE: On the initial setup, this table is empty.

3. In the Cascade Cost column, enter a new **cascade value**.
4. Send **changes** to the Trunk Master.

Software Organization

The TM-10K consists of a custom PC running on Linux with real-time extensions. TM-10K software automatically starts when the computer is booted.

Hardware Details

Serial Ports

The TM-10K uses the standard COM1 and COM2 devices:

COM1.....Used for Trunk Edit

COM2.....Used for Trunk Supervisor

If a **VDP** (VTR Delegate Panel) controller is used, it must be connected to the first port on the first RS-485 card; otherwise, this port can be used for intercom communications. To enable VDP support, see “Site-specific Customization” on page 30.

Ethernet Adapters

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

NIC Bonding

NIC Bonding occurs when two (2) NICs are connected to the same network and share a single IP address. The TM-10K automatically designates one (1) 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. This can be used for increased reliability and/or higher bandwidth.

ACCES I/O RS-485 PCIe Card

The ACCES I/O RS-485 PCIe card is used for serial communications with intercoms. The TM-10K supports up to four (4) 8-port RS-485 PCIe cards. If the TM-10K has 1–3 RS-485 PCIe cards installed the two (2) serial ports (COM1 and COM2) and one (1) parallel port (LPT1) are available to use. In order to install four (4) RS-485 PCIe cards the second serial port (COM2) connector needs to be removed. For instructions on how to add additional RS-485 PCIe cards, see TM-10K 8-Port PCIe Card Kit Installation Instructions.

AC Power Supplies

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

IMPORTANT: The TM-10K's redundant powering scheme is designed to conform to IEC standards for industrial computing equipment. Each of the power supplies, located on the rear panel of the unit, have an individual Power On/Off (I/O) switch. In order to insure reliable start-up operation, AC power must always be applied to the TM-10K with both power supply switches in the on position.

Supplying power to the unit while both the power switches are in the off position may prevent the TM-10K power arbitration logic (located on the motherboard) from allowing the TM-10K to start. In this state, the LEDs on the rear power supplies remain in the ORANGE condition. If this condition is encountered, there are two ways to recover from this state:

- Make sure the power switch for both rear power supplies is switched to the ON position. Remove AC power from the TM-10K until the LEDs on each rear power supply are extinguished (usually 10 to 20 seconds). Then reapply AC power with both rear power supply switches in the ON position. The TM-10K should then start normally.
- Make sure the power switch for both rear power supplies is switched to the ON position. From the front panel, depress and hold the power switch (front) for 5 or more seconds. This resets the power arbitration logic on the server motherboard. Release the power switch (front) and then momentarily depress the button one more time. The TM-10K should then start normally.

These recovery actions should not be necessary if the user applies AC to the TM-10K with both power supply switches in the on position. RTS recommends that the TM-10K power supply switches always be left in the on state. This insures the units will properly recover automatically should a power failure occur during normal operation.

An audible alarm sounds if one (1) of the power supplies fail.

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

> Press the **alarm mute button** once to turn off the alarm. For the location of the alarm mute button, see Figure 2 on page 9.

TM-10K Software Installation Options

The operating system and TM-10K application software are installed on the TM-10K at the factory prior to shipment.

The TM-10K software consists of 2 components, which are distributed on separate CD's:

- The operating system is on the *TM-10K Operating System* CD.
- The TM-10K application software is on the *TM-10K Software and User Documentation* CD. For the remainder of this document this CD will be referred to as the TM-10K Software CD.

IMPORTANT: If you need to burn a CD/DVD to install the application software, ensure you use Joliet extensions when creating the CD/DVD.

Overview

The software installation procedure is provided in the event your TM-10K needs to have the operating system and/or software application reinstalled.

The installation procedure consists of 3 steps:

Step 1 "Installation of the Operating System" on page 27.

Step 2 "Site-specific Customization" on page 30.

Step 3 "TM-10K Trunk Master Software Installation" on page 37.

NOTE: A USB keyboard and a monitor with a VGA cable connected to the TM-10K is required to install the operating system.

Installation of the Operating System

To **install from the TM-10K Operating System CD**, do the following:

1. Reboot the **TM-10K** with the TM-10K Operating System CD in the CD-ROM drive.
   The BIOS runs a self-test. When the self-test is complete, the TM-10K Platform OS window appears.

NOTE:

- Wait for the TM-10K to boot off the CD.
- If you interrupt the boot process, press **Enter** to continue the boot process.

2. At the (none) login: prompt, enter the user name: **root** (no password needed).
3. Press **Enter** (↵).
   The system displays the root command prompt..

```
root:~ # _
```

4. At the command prompt, type **install_os**.
5. Press **Enter** (↵) to start the operating system installation.
   *A **WARNING** message appears.*

```
**WARNING**

This program will erase ALL data on the hard drive and then install the operation system.

Continue? (yes/no, default no) _
```

6. 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.

IMPORTANT: If y is typed by mistake the installation of the software will be aborted. Type **install_os** to start the installation process again.

7. Press **Enter** (↵).
The hard drive is reformatted and files are copied from the CD to the hard drive. The operating system installation takes approximately 11 minutes. The Installation Complete window appears.

> 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.

For more information, see “Site-specific Customization” on page 30.

For more information, see “Change the root Password” on page 36.

Boot off the Hard Drive

To **boot off the hard drive,** do the following:

1. At the command prompt, type **reboot -f**.
2. Press **Enter** (↵).
   The TM-10K restarts.
3. Remove the **CD** from the CD-ROM drive so the computer boots off the hard drive.
   The TM-10K window appears.

NOTE: If you end up at the TM-10K Platform OS window instead, press the space bar to interrupt the boot procedure.

4. The TM-10K boots from the hard drive.
   A login prompt appears.

```
tm10k-1 login: _
```

Site-specific Customization

Customize the TM-10K 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.

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

1. Log onto the **TM-10K** as the user: root.
   A root command prompt window appears.
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 17.*
6. In the New value field, enter a new **hostname**.

```
Hostname: tm10K-1

New value:
```

NOTE: If you do not want to make changes to the New value field, leave the New value field empty, and press **Enter** (↵) to continue.

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 4.*
    - *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)*
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:
```

NOTE:

- 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)*
27. Press **Enter** (↵).
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)
```

NOTE:

- 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 31.*
    - *If n is selected, the lan1 bonded with lan0 adapter window appears. For more information, see "NIC Bonding" on page 24.*

```
lan1 (MAC=00:18:7d:2a:70:56):
   Bonded with lan0 adapter: 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.*

NOTE: 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 58.*

```
Bond lan1 with lan0: y

New value:
```

42. In the New value field, enter **y** or **n** (use lowercase).
43. Press **Enter** (↵).
    - *If y is selected, the NICS are bonded. Skip to step 50.*
    - *If n is selected, the NICS are not bonded. The lan1 IP Address window appears..*

```
IP address: 192.168.5.107

New value:
```

44. In the New value field, enter a **new IP address**.
45. Press **Enter** (↵).qa
    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:

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: 192.168.5.107
    Prefix length: 8
    Default Gateway:

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, the Found 2 ethernet adapters window appears. Skip to step 66.*

```
IP address:

New value: 192.168.5.111
```

52. In the New value field, enter a **new IP address**.
53. Press **Enter** (↵).
    The Prefix length: window appears.

```
Prefix length: 8

New value:
```

54. In the New value field, enter a **new prefix length**.

55. Press **Enter** (↵).
The Default gateway: window appears.

```
Default gateway:

New value: 192.168.5.1
```

56. In the New value field, enter a **new default gateway**.
57. 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: 192.168.5.111
   Prefix length: 8
   Default Gateway: 192.168.5.1

Change these values? (y/n, default y)
```

58. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
59. 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 66.*
60. Press **Enter** (↵).
The Preferred gateway: window appears.

```
Preferred gateway: Fair-shared

Change these values? (y/n, default y)
```

61. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
62. 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 66.*

```
1 - Use 192.168.5.0 as the default gateway
2 - Use 192.168.5.1 as the default gateway
3 - Gateways are fair-shared

Selection: 3
New Value: 1
```

NOTE:

- Selection 1 Use 192.168.5.0 is the lan0 default gateway.
- Selection 2 Use 192.168.5.1 is the lan1 default gateway.

63. In the New value field, enter a **new preferred gateway selection**.
Selection choices are 1, 2, or 3.

64. Press **Enter** (↵).
The preferred gateway confirmation window appears.

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

65. In the Change these values? (y/n, default y) field, enter **y** or **n** (use lowercase).
66. Press **Enter** (↵).
    - *If y is selected, the preferred gateway selection screen appears. Return to step 62.*
    - *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. For more information, see “Useful Linux Tips” on page 49.

Change the root Password

NOTE: 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. Log onto the **TM-10K** as the user: root.
A root command prompt window appears.
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:~#
```

TM-10K Trunk Master Software Installation

The TM-10K application software can be installed from a CD or a USB drive.

IMPORTANT: If you need to burn a CD/DVD to install the application software, ensure you use Joliet extensions when creating the CD/DVD.

Installing from CD

To **install from the TM-10K Software CD**, do the following:

1. Insert the **TM-10K Software CD** into the CD-ROM drive.
2. Log onto the **TM-10K** as the user root.
   You are logged in and a root prompt appears.

   NOTE: A password may have been set for this user.
3. At the prompt, type **tm_update --cd**.
4. Press **Enter** (↵).
   The Copying firmware version... window appears.

```
Copying firmware version 10.0.0 to /tm...

Creating start-up script...

root:~#
```

5. Remove the **CD** from the CD-ROM drive.
6. At the prompt, type **/tm/run_tm** to start the TM-10K application software.
   OR
   Reboot the computer (see “Useful Linux Tips” on page 49).
7. Press **Enter** (↵).
   The Completing system initialization window appears. The TM-10K application software is running.

```
Completing system initialization

Stand-alone environment

Going active (no standby)

_
```

NOTE: If you choose to restart the computer, upon restart the software prompts whether or not to start the TM-10K application (it starts by default, with a 5-second time out).

Installing from USB Thumb Drive

The TM-10K application software can be saved to a USB thumb drive and installed on the TM-10K.

To **install the TM-10K Application Software from USB thumb drive**, do the following:

1. Copy the **TM-10K application software** to the root directory of a USB thumb drive.

   NOTE:

   - The TM-10K application software is packaged in a file with a ".tgz" extension.
   - The TM-10K supports USB thumb drives formatted as either FAT32 or NTFS.
   - The TM-10K does not support encrypted USB thumb drives.

2. Insert the **USB thumb drive with the TM-10K application software** into a USB port on the TM-10K.
3. Log onto the **TM-10K** as the user: root.
   You are logged in and a root prompt appears.

   NOTE: A password may have been set for this user.

4. At the prompt, type **tm_update --usb**.

   NOTE: Although the USB thumb drive may contain multiple directories and files, there can only be one file with a ".tgz" 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.

5. Press **Enter** (↵).
   Copying firmware version... window appears.

```
Copying firmware version 10.0.0 to /tm...

Creating start-up script...

root:~#
```

6. Remove the **USB thumb drive** from the USB port.
7. At the prompt, type **/tm/run_tm** to start the TM-10K application software.
   OR
   Reboot the **computer** (see "Useful Linux Tips" on page 49).
8. Press **Enter** (↵).
   The Completing system initialization window appears. The TM-10K application software is running.

```
Completing system initialization

Stand-alone environment

Going active (no standby)

_
```

   NOTE: If you choose to restart the computer, upon restart the software will prompt whether or not to start the TM-10K application (it starts by default, with a 5-second time out).

Updating the TM-10K Software

The TM-10K application can be updated via CD or USB thumb drive. The steps are exactly 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.

   NOTE: A password may have been set for this user.
2. At the root prompt, type **/tm/stop_tm all** to shut down the TM-10K software.
   Several lines of output appear followed by another prompt.

Return to **"Installing from CD" on page 37**, or **"Installing from USB Thumb Drive" on page 38** and follow the steps to install the TM-10K application.

Reinstalling the Operating System

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

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

1. Insert the **Platform OS CD** into the CD-ROM drive.
2. Boot from the **Platform OS CD**.
3. Log onto the **TM-10K** as the user: root.
   A root command prompt appears.
4. At the command prompt, type **install_os --keep-site**.
   Several lines of output appear followed by another prompt.

   NOTE: 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, see "Site-specific Customization" on page 30. The TM-10K application, and its local configuration file are not saved.

Return to **"Installation of the Operating System" on page 27**, and follow the steps to install the TM-10K Platform OS.

System and Wiring Diagrams

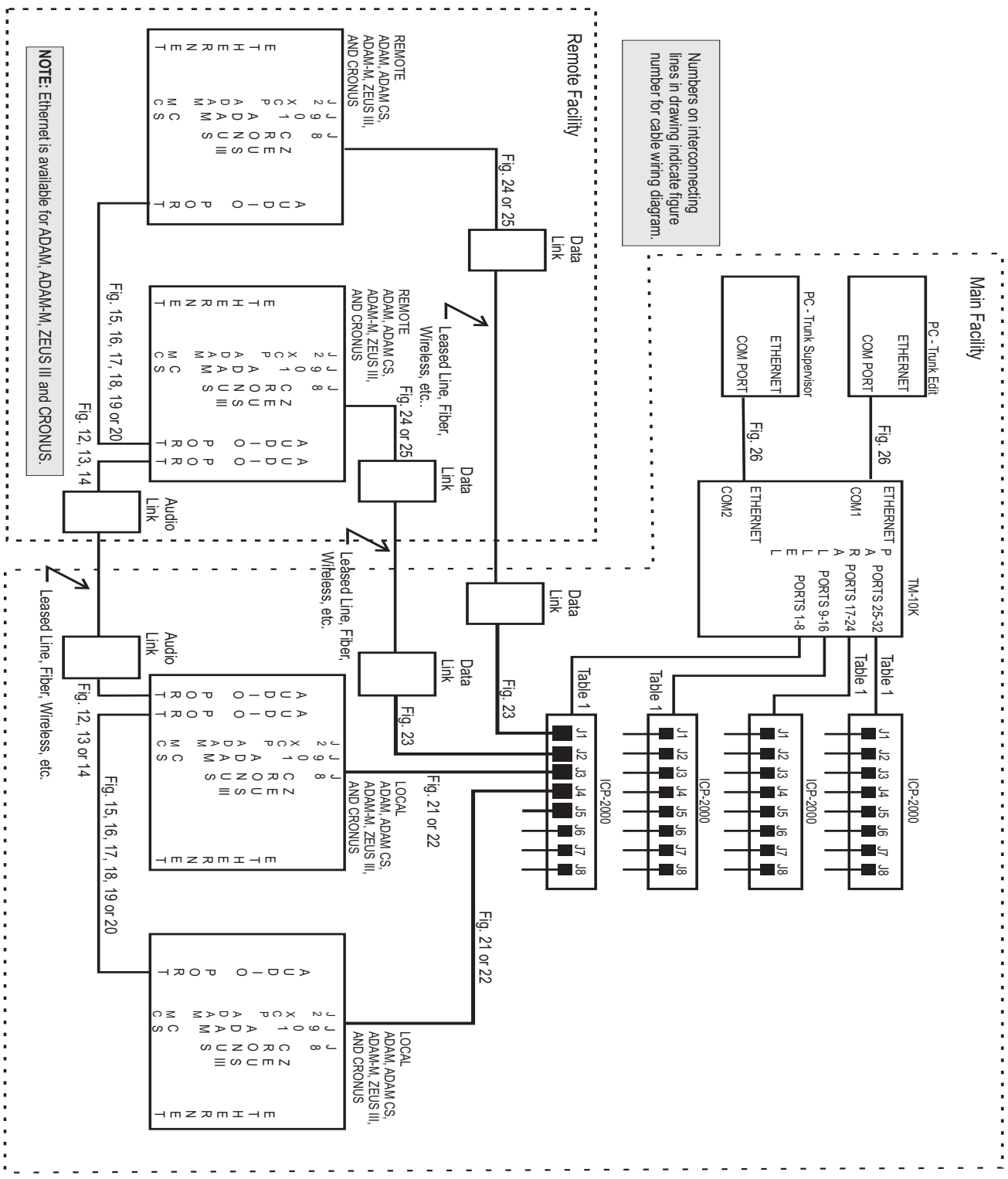


FIGURE 5. Example of a non-redundant TM-10K system.

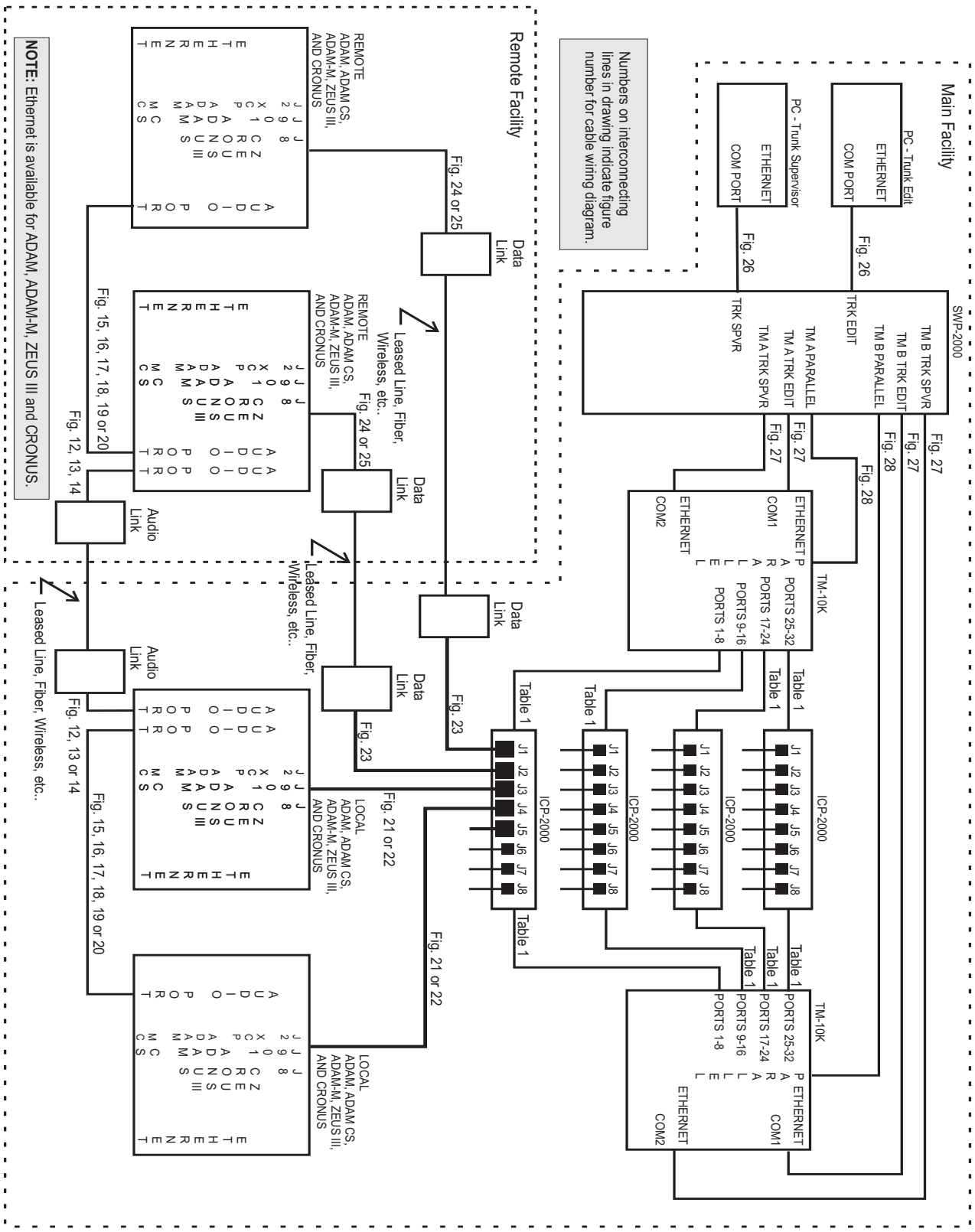


FIGURE 6. Example of a redundant TM-10K system.

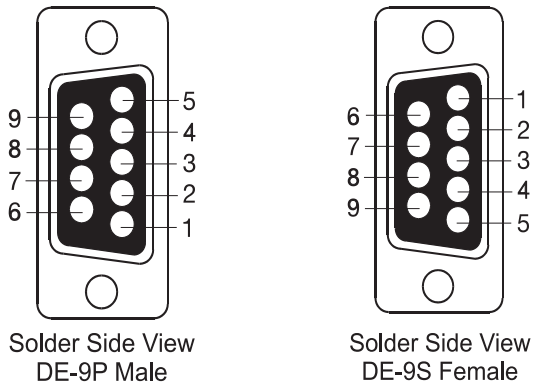


FIGURE 7. 9-pin D-sub connector pinouts.

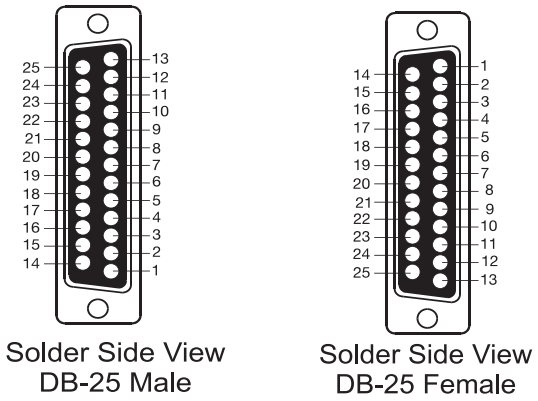


FIGURE 8. 25-pin D-sub connector pinout.

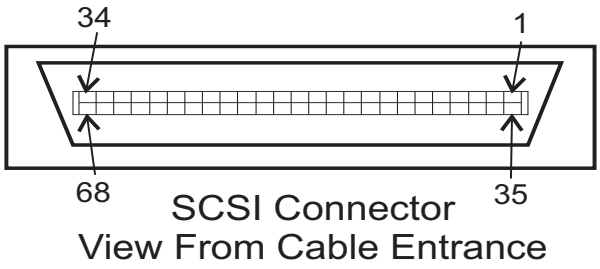


FIGURE 9. 68-pin SCSI connector pinout.

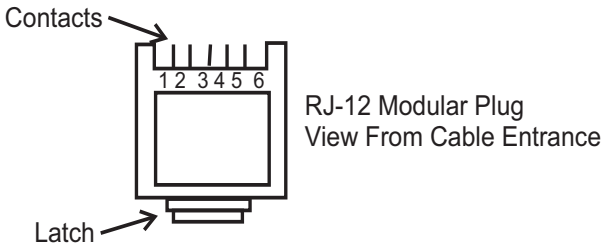


FIGURE 10. RJ-12 connector pinout.

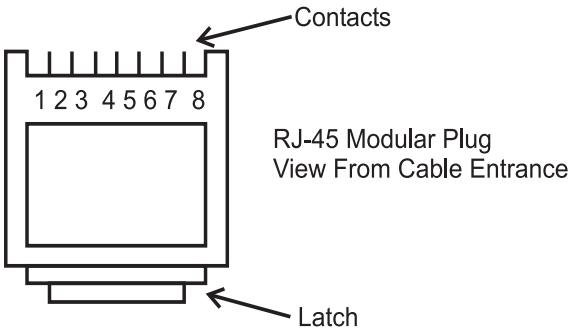


FIGURE 11. RJ-45 Connector pinout.

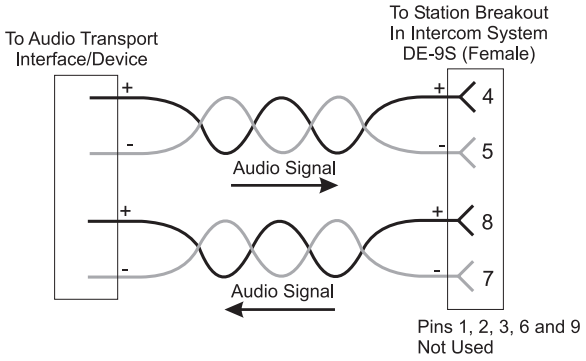


FIGURE 12. Unspecified device to DE-9S audio cable.

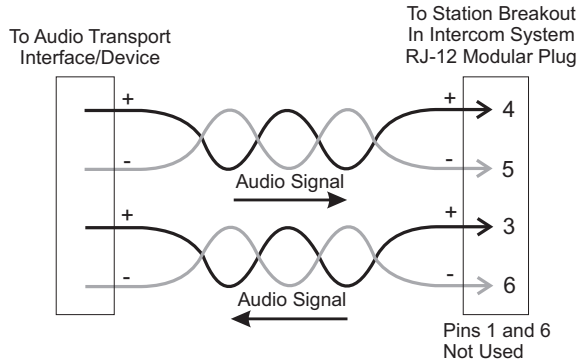


FIGURE 13. Unspecified device to RJ-12 audio cable.

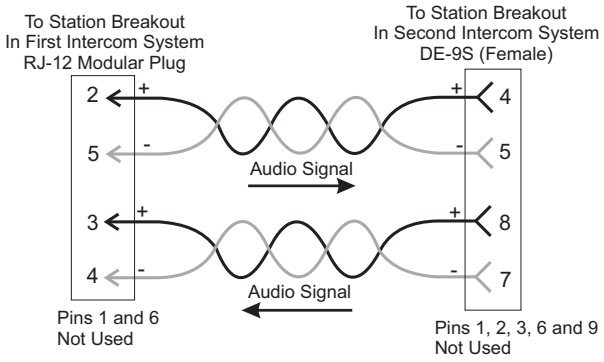


FIGURE 16. RJ-12 to DE-9S audio cable.

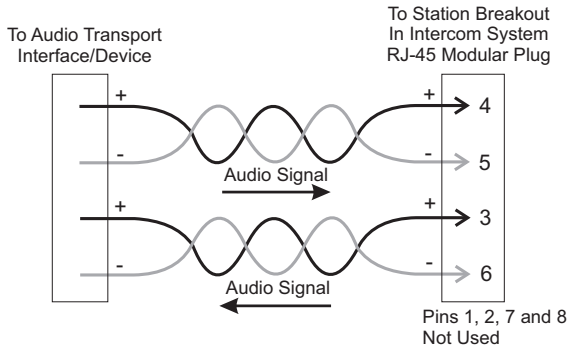


FIGURE 14. Unspecified device to RJ-45 audio cable.

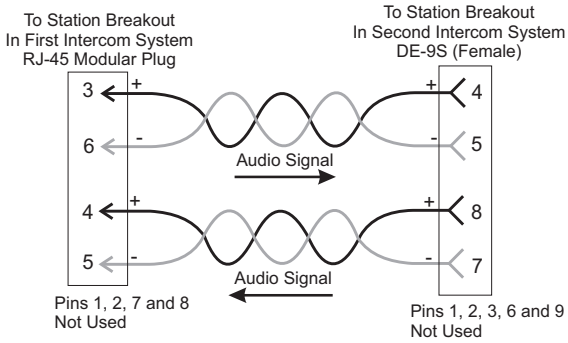


FIGURE 17. RJ-45 to DE-9S audio cable.

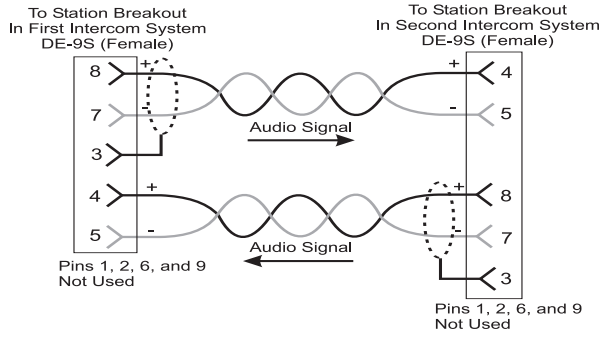


FIGURE 15. DE-9S to DE-9S audio cable.

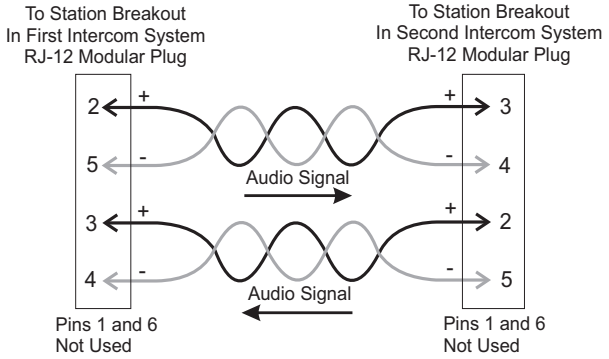


FIGURE 18. RJ-12 to RJ-12 audio cable.

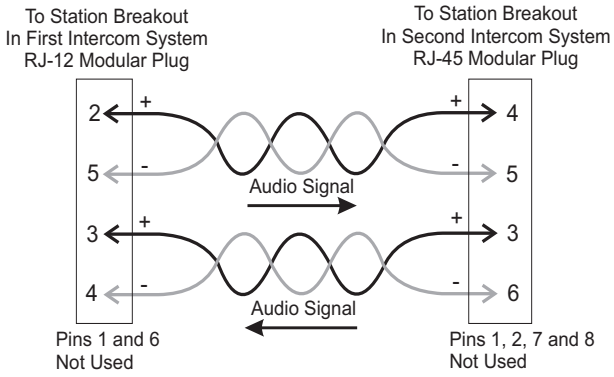


FIGURE 19. RJ-12 to RJ-45 audio cable.

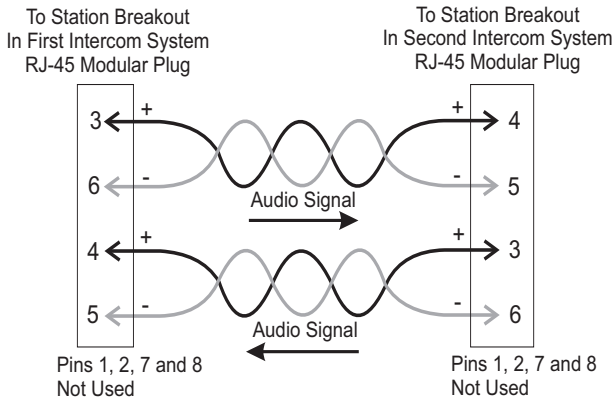


FIGURE 20. RJ-45 to RJ-45 audio cable.

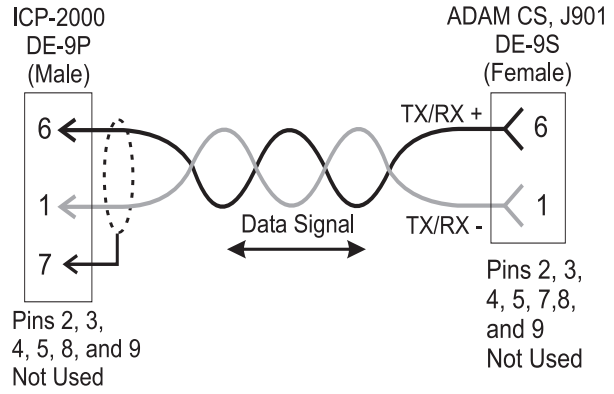


FIGURE 21. ICP-2000 to ADAM-CS RS-485 data cable.

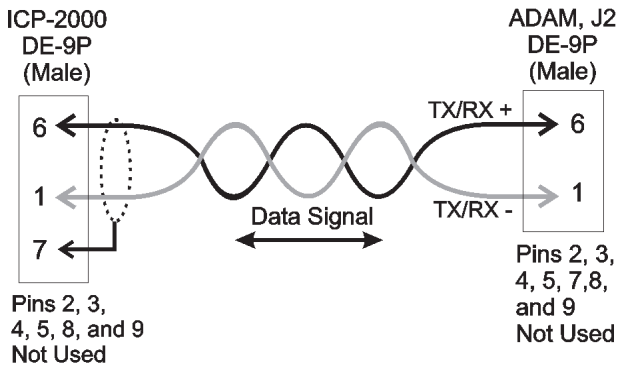


FIGURE 22. ICP-2000 to ADAM RS-485 data cable.

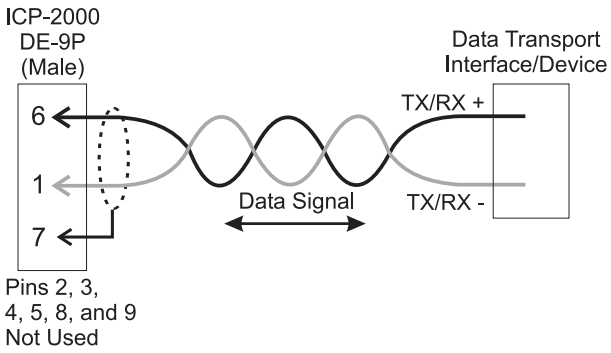


FIGURE 23. ICP-2000 to unspecified device RS-485 data cable.

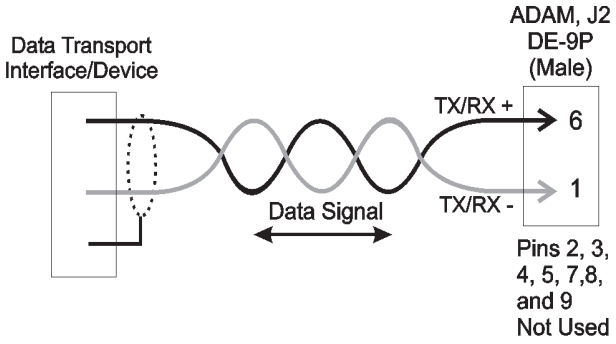


FIGURE 24. ADAM to unspecified device RS-485 data cable.

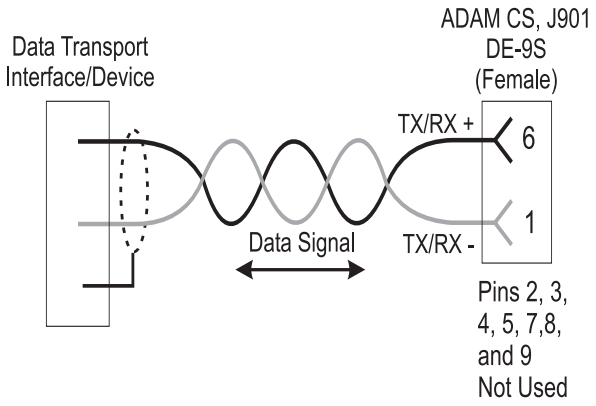


FIGURE 25. ADAM-CS to unspecified device RS-485 data cable.

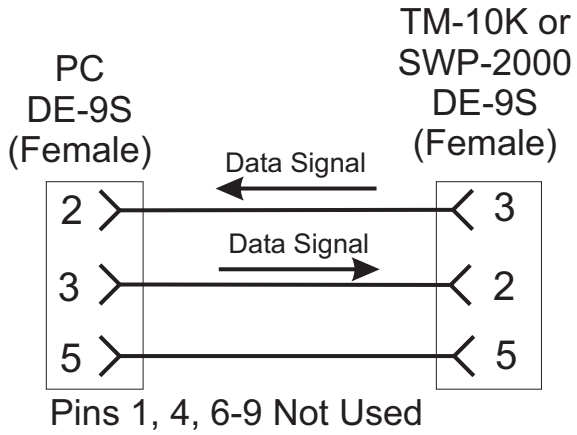


FIGURE 26. PC (Trunk Edit/Trunk Supervisor) to TM-10K or SWP-2000 RS-232 data cable.

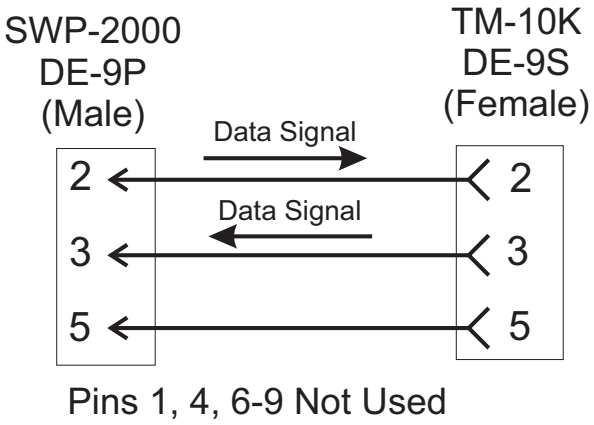


FIGURE 27. SWP-2000.

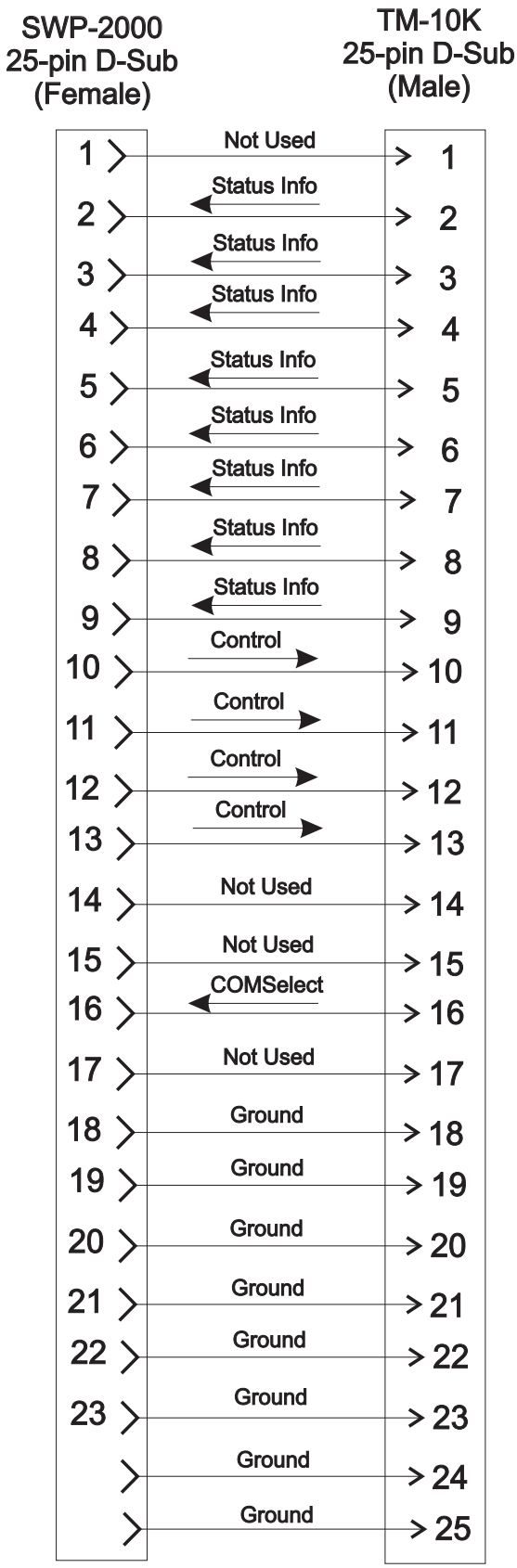


FIGURE 28. TM-10K to SWP-2000 parallel port status and control cable.

TABLE 1. TM-10K Pin-out

P1:	68-pin VHDCI 0.8mm SCSI III male molded hood with thumb screws (TM-10K)	
P2:	50-pin SCSI II male molded hood with latches (ICP-2000)	
Wire:	High Impedance SCSI spec. 30AWG, AL FOIL, braid shield, UL20276	
Length:	1M	
P1-2	: P2-2	Port A TXRX+
P1-3	: P2-3	Port A TXRX-
P1-6	: P2-8	Port B TXRX+
P1-7	: P2-9	Port B TXRX-
P1-10	: P2-14	Port C TXRX+
P1-11	: P2-15	Port C TXRX-
P1-14	: P2-20	Port D TXRX+
P1-15	: P2-21	Port D TXRX-
P1-18	: P2-27	Port E TXRX+
P1-19	: P2-28	Port E TXRX-
P1-22	: P2-33	Port F TXRX+
P1-23	: P2-34	Port F TXRX-
P1-26	: P2-39	Port G TXRX+
P1-27	: P2-40	Port G TXRX-
P1-30	: P2-45	Port H TXRX+
P131	: P2-46	Port H TXRX-
P1-33	: P2-1, P2-7, P2-13, P2-19, P2-4, P2-10, P2-16, P2-22 GND	
P1-67	: P2-26, P2-32, P2-38, P2-44, P2-29, P2-35, P2-41, P2-47 GND	

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.
- For individual RS-232 or RS-485 data cables, use Belden 8451 or similar type with single twisted pair with shield/drain wire. DO NOT EXCEED 50 FEET RUN WITH RS-232 CABLES! RS-232 cables can be purchased pre-made from a computer dealer. Use a DB-9 straight through cable and standard DB-25 parallel cable, for SWP-2000 to TM-10K connections. Do not exceed 10 feet run length with DB-25 parallel printer cable.
- Use a DB-9 “Null Modem” cable for PC to TM-10K/SWP-2000 connection.
- For TM-10K to ICP-2000, use the supplied cables.

APPENDIX A

Useful Linux Tips

On the computer console, Shift+Page Up and Shift+Page Down can be used to scroll through the last six (6) or so pages of text. Each keystroke scrolls forward or back by half of a screen.

The TM-10K is configured with three (3) virtual consoles. Normally, everything is done on the first virtual console. However, Alt+F2 can be used to switch to a second virtual console (the first time you do this, another login prompt appears); Alt+F3 can be used to switch to a third virtual console; Alt+F1 can be used to switch back to the first virtual console. This can be useful if you are logged in and doing something, and need to look information up without disturbing you first session.

The computer can be rebooted by typing Ctrl+Alt+DEL. You do not have to be logged in to do this. Alternatively, if you are logged in as root, you can enter the command “shutdown -r now”. To halt the computer, rather than reboot it, type the command “shutdown -h now”. The operating system and TM-10K software are stopped and the TM-10K is powered off.

If you are logged in, you can log out by typing the command *exit*, or by pressing Ctrl+D.

If the computer is restarted without shutting it down properly (i.e., there is a power failure), the computer automatically runs fsck (file system check, similar to DOS’s chkdsk). However, this normally only takes a few seconds, since a journaling file system is used.

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