MOTOROLA SOLUTIONS

MOTOTRBO™ PCR

Repeater Diagnostics and Control User Guide

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Document History

Version	Description	Date
MN003787A01-AA	Original release of the *Repeater Diagnostics and Control (RDAC) User Guide*	July 2017
MN003787A01-AB	Added front matter elements.	November 2017
MN003787A01-AC	Added Digital Backhaul features for P2.9.0 release.	March 2018
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MN003787A01-AE	Updated sections: ● MOTOTRBO Conventional Repeater Alarms on page 31 ● MTR3000 Base Radio and Repeater Alarms on page 36 ● MOTOTRBO SLR Series Repeater Alarms on page 57 ● Diagnostics View on page 98	October 2022
MN003787A01-AF	The title of the manual was changed to *MOTOTRBO Repeater Diagnostics and Control User Guide*. The following section was updated: ● Options Button on page 20 The following sections were added: ● Recovering an Application Feature on page 86 ● Database on page 22	December 2023
MN003787A01-AG	The following section was updated: ● Diagnostics View on page 98	August 2024

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About This Guide

This manual provides user information for the MOTOTRBO ™ Repeater Diagnostics and Control (RDAC) applications.

Related Information

Related Information	Purpose
Capacity Max Installation and Configuration Manual	Provides installation and configuration content to support a MOTOTRBO™ Capacity Max system.
Capacity Max System Operations, Troubleshooting, and Maintenance Guide	Provides basic operations, troubleshooting, and maintenance content to support a MOTOTRBO™ Capacity Max system.
Capacity Max System Release Upgrade Guide	Provides instructions for upgrading software in a MOTOTRBO™ Capacity Max system from one system release to the next system release.
Capacity Max Migration Guide	Provides instructions for using the Capacity Max Bridge to migrate from the MOTOTRBO™ Connect Plus trunked radio system to the Capacity Max commercial grade trunking system.
Capacity Max System Advisor Guide	Provides fault management, system, and call monitoring solutions for a Capacity Max system.
MOTOTRBO CPS 2.0, Tuner, AirTracer, and RDAC Applications Installation Guide	Provides installation, operations, and troubleshooting information for the CPS 2.0 and its tools. Distributed on the CPS 2.0 and tools CD.
Repeater Diagnostics and Control (RDAC) User Guide and *Online Help*	Explains the features of the MOTOTRBO™ RDAC, which is a standalone Windows application for system technicians who need to run diagnostics on the radio (repeater or base radio) that has the RDAC capability.
MOTOTRBO CPS Radio Management User Guide and *Online Help*	Provides information about the Customer Programming Software structure and features which allows technicians to manage all radio components, in addition with Radio Management which provides a centralized management of programming radios in-the-field.
MOTOTRBO Radio Management User Guide and *Online Help*	Provides information about the Radio Management (RM) which allows the user to manage an entire fleet of radios that are connected to the Radio Management Configuration Client (RMC).
MOTOTRBO RDAC Application Installation Guide	Provides installation, operations, and troubleshooting information for the RDAC application. Only for selected region. Distributed on the CPS 2.0 and tools CD.
MOTOTRBBO RDAC User Guide	Provides introduction, common tasks, and description on each feature in RDAC. Also available in online help version.

Related Information	Purpose
MOTOTRBO System Design Tools	Estimates the infrastructure and loading constraints on a MOTOTRBO™ system. The System Design Tools is a down-loadable program from Motorola Online.
MOTOTRBO Tuner Application Installation Guide	Provides installation, operations, and troubleshooting information for the Tuner application. Only for selected region. Distributed on the CPS 2.0 and tools CD.
MOTOTRBBO Tuner Online Help	Provides introduction, common tasks, and description on each feature in Tuner.
WAVE 5000 Solution System Planner for release 5.13	Provides guidance on when it is appropriate for a WAVE 5000™ deployment with a MOTOTRBO™ system.
Wave 7000 System Planner for release 17.3	Provides system operators' supporting the WAVE 7000™ server to collect and generate reports on statistical data on the MOTOTRBO™ system performance.
SmartPTT PLUS	Provides an explanation of the components of 3rd party supported solution for Control Rooms compatible with MOTOTRBO™ systems.
IMPRES Over Air Battery Management	Provides information about the functionality of the application managing batteries for radio fleets.
Radio Management Deployment Guide	Provides recommendations for deploying an RM system within a customer's network. It provides hardware recommendations for the various RM components based on customer requirements and the number of radios in the fleet. This guide is included with the RM Installation Suite DVD media.
Standards and Guidelines for Communication Sites Feature Guide	Provides standards and guidelines that should be followed when setting up a communications site. Also known as the R56 manual.
Radio Management System Planner	Provides information about Radio Management system components, installation, and troubleshooting of possible issues.

Chapter 1

RDAC Interface Overview

This section provides an introduction to the Repeater Diagnostics and Control (RDAC) graphical user interface (GUI) as well as the overview of the different interface elements available on the RDAC screen.

1.1 RDAC Screen Layout

Repeater Diagnostics and Control (RDAC) screen design is made to be simple, easy to access, and easy to understand.

The following table describes elements of the **MOTOTRBO RDAC** interface.

Table 1: RDAC–Elements of the User Interface

View	Description
Diagnostics Table	The top frame that displays a list of radios and diagnostics information in a table form. For more information, see Diagnostic Table View on page 87.
RSSI	The bottom frame that displays the additional diagnostics information for the currently selected radio in the **Diagnostics Table** view. For more information, see Diagnostics View on page 98.
Voting Details View	Displays a list of repeaters in current voting system, and voting information in a table. The application displays the digital voting status information, and controls the digital voting repeater in the Voting Details View. For more information, see Voting Details View on page 99.

1.2 RDAC Toolbars

Repeater Diagnostics and Control (RDAC) toolbars are located at the top of the Diagnostics Table view.

Table 2: Tool Bars

Toolbar	Keyboard Shortcut	Description
Systems	ALT+S	Launches a window that allows you to add systems and configure the system settings. For more information, see Systems Button on page 16.
Connect	ALT+C	Allows you to connect to a system in Remote Mode, or to the base radio/repeater in Local Mode. In Remote mode, clicking the Connect button displays a list of systems available for connection. In Local mode, clicking the Connect button connects to the local base radio/repeater. For more information, see Link Establishment on page 29.

Toolbar	Keyboard Shortcut	Description
Options	ALT+O	Launches a window to display and allow you to change application options. See the individual help topic for the features under Options toolbar. For more information, see Options Button on page 20.
RDAC Log	ALT+L	Launches a window to display the application log. For more information, see RDAC Log Button on page 23.
Repeater Log	ALT+R	Launches a window to display the additional diagnostics information for the currently selected radio in the Diagnostics Table View. For more information, see Repeater Log Button on page 25.
Control	ALT+N	Launches a window that allows you to perform control operations for the currently selected radio in the Diagnostics Table View. For more information, see Control Button on page 26.
Help	ALT+H	Displays a help icon and a drop-down for you to select **Contents and Index** or **About**. Selecting **Contents and Index** launches the help window, while selecting **About** launches the **About** window.
Status	N/A	This is a status bar at the bottom of the application that displays information on radio connection status, write/reset actions, and connection mode (remote mode or local mode). For more information, see Connection Mode Tab on page 16.

Chapter 2

RDAC Toolbar

Repeater Diagnostics and Control (RDAC) toolbars are the buttons located at the top of the Diagnostics Table View.

2.1 Systems Button

The **Systems** button launches the **Systems** window. The **Systems** window allows you to add systems and configure the system settings.

2.1.1 Connection Mode Tab

The **Connection Mode** tab allows you to choose between two types of connection modes available for the application.

The following table lists the fields and buttons available in the **Connection Mode** tab.

Table 3: Connection Mode Fields and Buttons

Fields and Buttons	Description
Remote Mode	Allows you to select the remote mode for the application. When **Remote Mode** is selected, all local mode features are disabled.
Local Mode	Allows you to select the local operating mode for the application. When **Local Mode** is selected, all remote mode features are disabled.
Add	Allows you to create a system and adds it to the list of systems. The systems are named as **Sys 1**, **Sys 2**, **Sys 3**, and so forth. A maximum of 16 systems are allowed to be added. For each system added, the Repeater Diagnostics and Control (RDAC) User Datagram Protocol (UDP) Port is automatically incremented, as it is required that each system uses a unique RDAC User Datagram Protocol (UDP) Port. This feature is supported in remote mode only.
Delete	Allows you to delete system if the system is no longer in use. After deletion, the system is no longer available for connection in remote mode.
Rename	Allows you to change the name of the system. Alternatively, you can select the system and press **F2** to rename it. A maximum of 32 characters is allowed. Names must contain at least one valid character. Valid characters are alphanumerics, spaces, and special characters. This feature is supported in Remote Mode only. It is disabled when in Local Mode.

2.1.2
System Settings Tab

The **System Settings** tab allows you to add systems and configure the system settings.

2.1.2.1
Remote Settings

Remote settings allow the user to configure a repeater remotely. This feature is supported in R\remote mode only.

The following table lists the fields and buttons available in the **Remote Settings** tab.

Table 4: System Type Fields

Fields	Description
System Type	Identifies the mode in which the selected system is running. Proper setting of this feature is necessary to connect to the system correctly. The available options are as follows: IP Site Connect Capacity Plus Linked Capacity Plus
Master IP Address	Displays the IP address of the Master radioand allows you to configure the IP address of the master radio. The format and range for the address are (000-255).(000-255).(000-255).(000-255). The default value is set to 0.0.0.0. The master Internet Protocol (IP) address does not need to be unique across all systems, but the combination of the master IP address and master User Datagram Protocol (UDP) port must be unique across systems.
Master UDP Port	Displays the master UDP port number of the master radio and allows you to configure the port number of the master radio. The maximum value is 65535. The minimum value is 1024. The default value is set to 50000. The master UDP port does not need to be unique across all systems, but the combination of the master IP address and master UDP port must be unique across systems.
RDAC ID	Displays the Repeater Diagnostics and Control (RDAC) peer ID and allows you to configure a unique RDAC peer ID used in Peer-to-Peer Protocol (P2P) messages to identify the application on the network. The maximum value is 16776415. The minimum value is 1. The default value is 1.
RDAC UDP Port	Displays the RDAC peer port number and allows you to configure a unique RDAC peer port number used in P2P messages to identify the application on the network. The maximum value is 65535. The minimum value is 1024. The default value is 50000.
Authentication Key	Displays the authentication key and allows you to select an authentication key for P2P messages. If the peer packet authentication is enabled, all P2P messages sent and received by the application are authenticated. Peer packet authentication is disabled if the value of this feature is set to 0.

Fields	Description
	This key is 20 bytes in lengthand is a shared authentication key that must be the same in all radios/peers including the RDAC PC belonging to the same IP system. For security reasons, after the authentication key is saved, its value is shown as Ø. The maximum value is FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF (Hex). The minimum value is 0000000000000000000000000000000000000000 (Hex).
Firewall Open Timer (sec)	Displays and allows you to select a firewall open message timer for P2P messages. This timer is used to keep the connection alive between the application and its peer by having a periodic message sent between them at an interval as defined here. The default value of this timer is six seconds. The maximum value is 60 sec. The minimum value is 5 sec.

2.1.2.2
Email Settings

The **Email Settings** allows you to set up a mailing list. The selected email addresses can be used to receive alarm notifications.

The following table lists the fields and buttons available in the **Email Settings**.

Table 5: Email Settings Fields and Buttons

Fields and Buttons	Description
To Email Address	Displays the selected email addresses that receive notification. A maximum of 10 email addresses per system is supported
Add	Allows you to add email addresses from the Email Address list to receive notification for the selected IP system.
Delete	Allows you to delete email addresses that no longer require the notification.

2.1.2.3
Select Notification Tab

The **Select Notification** tab allows you to select the available notifications to trigger the email notification when the events are detected.

The following table lists the features that you can select to be notified. For more information, see Diagnostic Table View on page 87 and Radio Alarms on page 31.

Table 6: Select Notification Check Box

Check box	Description
Repeater Connect	Allows you to choose whether to send email notification for a repeater connect event.
Repeater Disconnect	Allows you to choose whether to send email notification for a repeater disconnect event.

Check box	Description
MNIS Connect	Allows you to choose whether to send email notification for an MOTOTRBO Network Interface Service (MNIS) connect event.
MNIS Disconnect	Allows you to choose whether to send email notification for an MNIS disconnect event.
Fan Alarm	Allows you to choose whether to send an email notification for a fan alarm event.
Temp Alarm	Allows you to choose whether to send an email notification for a temperature (temp)alarm event.
TX Alarm	Allows you to choose whether to send an email notification for a TX alarm event.
RX Alarm	Allows you to choose whether to send an email notification for an RX alarm event.
PA Voltage Alarm	Allows you to choose whether to send an email notification for a Power Amplifier (PA) Voltage alarm event.
VSWR Alarm	Allows you to choose whether to send an email notification for a Voltage Standing Wave Ratio (VSWR) alarm event.
TX Power Alarm	Allows you to choose whether to send an email notification for a TX Power alarm event.
TX Gain Alarm	Allows you to choose whether to send an email notification for a TX Gain alarm event.
Backplane Supply Alarm	Allows you to choose whether to send an email notification for a Backplane Supply alarm event.
Software Update Management Alarm	Allows you to choose whether to send an email notification for a Software Update Management alarm event.
Ext. Circulator Temp Alarm	Allows you to choose whether to send an email notification for a Ext. Circulator Temp alarm event.
Power System Alarm	Allows you to choose whether to send an email notification for any Power System-related events. This feature is only available for MOTOTRBO SLR 5000 repeaters.
Frequency Reference Alarm	Allows you to choose whether to send an email notification for any Frequency Reference-related events. This feature is only available for MOTOTRBO SLR 5000 repeaters.
Forced Rest Failure Alarm	Allows you to choose whether to send an email notification for any Forced Rest Failure-related events.
Backhaul Status Alarm	Allows you to choose whether to send an email notification for any related Backhaul Status alarm event.

2.2
Options Button

The **Options** button launches the **Options** window. The **Options** window allows you to change application options such as language, types of notifications, Email SMTP configurations, diagnostics logging and database management.

2.2.1
General Tab

The **General** tab containing information about Repeater Diagnostics and Control (RDAC).

The following table lists the columns and buttons available from the **General** tab:

Table 7: General Tab Columns and Buttons

Columns and Buttons	Description
Select Language	Allows you to select a language from the list of languages populated from the registry.
Hide Messages	Allows you to enable or disable the warning messages.
Alarm Sound	Allows you to turn on or off the sound played when an alarm is detected and when the alarm is released.
Email Notification	Allows you to enable or disable the Email Notification feature. After enabling this feature, you must configure the settings in Email SMTP Tab on page 20 and Email Settings on page 18. Configuring the Email SMTP and Email Settings allows RDAC to send emails to the recepients set in the Email Settings when the selected notification is detected. This feature is disabled if the **System** list contains a system that is connected.

2.2.2
Email SMTP Tab

The **Email SMTP** tab contains general information about the Simple Mail Transfer Protocol (SMTP) server name.

The following table lists the columns and buttons available from the **Email SMTP** tab:

Table 8: Email SMTP Tab Columns and Buttons

NOTE:

- This feature is disabled if the Email Notification feature is disabled.
- This feature is disabled if the **System** list contains a system that is connected.

Columns and Buttons	Description
SMTP Server	Allows you to enter an SMTP server name. The maximum length for the server name is 255 Unicode Transformation Format (UTF)-8 characters. You must enter a valid domain name. The application

Columns and Buttons	Description
	does not validate the format of the server name other than the length of the name.
SMTP Server Port	Allows you to enter the SMTP server port. The default value is **25**. Maximum value is **32000**. Minimum value is **1**.
Use SSL	Allows you to use secure sockets layer (SSL) for outgoing SMTP mail.
Username	Allows you to enter a user name for SMTP server authentication. The maximum length is 255 UTF-8 characters.
Password	Allows you to enter a password for SMTP server authentication. The maximum length is 255 UTF-8 characters. The characters are hidden.
From Email Address	Allows you to enter the source email address. The maximum length of the address is 320 UTF-8 characters. The maximum length before the @ symbol is 64 characters. The maximum length after the @ symbol is 255 characters. The email address must contain at least one non-whitespace character before the @ symbol and at least one after the symbol, followed by a dash (–) and at least two other characters after the dash.
To Email Address	Allows you to enter an email address for the Email Notification feature. The maximum length of the address is 320 UTF-8 characters.
Email Address	Displays a list of email addresses for the Email Notification feature. A maximum of 50 email addresses per application is supported. Each email address in the list must be unique.
Add	Adds the text entered in **To Email Addresses** to the **Email Address** list.
Delete	Deletes the selected email address from the **Email Address** list. This feature is disabled if the **Email Address** list is empty.
Test	Sends a test email to validate the email connection. This feature is disabled if the **Email Address** list is empty.

2.2.3
Diagnostics Logging Tab

The **Diagnostics Logging** tab allows you to retrieve software alarm data from the repeater and store these data in a log format.

The logging information is important for developers to analyze the root cause of the reported alarm. You can set the interval for the Repeater Diagnostics and Control (RDAC) to retrieve software data alarms. For more information on how to set the RDAC to ertriece software alarm data, see Retrieving Software Alarm Data on page 96. You can also delete the software data alarm using the Clear Software Alarm Data feature. For more information on how to clear the software alarm data, see Clearing Software Alarm Data on page 96.

The following table lists the columns and buttons available from the **Diagnostics Logging** tab:

Table 9: Diagnostics Logging Tab Columns and Buttons

Columns and Buttons	Description
Enable Logging check box	Allows you to enable or disable the Diagnostics Logging feature. When you enable this feature, RDAC retrieve the active software alarm in the repeater and store the data in a log format. When you disable this feature, the Retrieve Software Alarm Data is disabled. You cannot retrieve the diagnostics log. For more information about the Retrieve Software Alarm Data, see Right-Click Menu in Diagnostics Table View on page 95.
Retrieval Interval (Min) spin edit	Allows you to set the interval for the RDAC to retrieve the software alarm data from the repeater. The range is 5–60 minutes. The default value is **30 minutes**.

2.2.4
Database

The Database settings selection is used to back up and restore the RDAC database.

The following field and buttons are used to perform the backup function (see: Backing Up the RDAC Database on page 22):

Destination
Defines the name of a Windows folder, either on the local computer or the full path of a network share.

Browse Button
Allows the user to browse for a folder location on the computer or network.

Enable Password Check Box
Allows the user to enable the database backup password feature. When enabled, the Password field becomes visible and allows the user to add a password for the database backup.

Backup Button
Performs the backup function for the RM database to the specified destination. A confirmation message is displayed when selected.

The following field and buttons are used to perform the restore function (see: Restoring the RDAC Database on page 23):

Source
Defines the name of the Windows folder, either on the local computer or the full path of a network share.

Browse Button
Allows the user to browse for a source location on the computer or network.

Restore Button
Performs the restore function for the RM database from the source location.

2.2.4.1
Backing Up the RDAC Database

This procedure ensures that the RDAC configuration can be restored to its operation state in the event of a database error.

Procedure:

1. From the Options menu, select **Database** → **Database Backup** → **Browse**.

The **Browse For Folder** window opens, where you can select an existing folder location or create a new folder to store the backup.

2. Optional: Select the **Enable Password** checkbox and enter a password to password protect the backup file.
3. To initiate the backup operation, click **Backup**.

   In the **Destination** folder, a folder with the current date and time in its name is created. The folder contains the `rdac.bak` backup file.

2.2.4.2 Restoring the RDAC Database

Restoring the RDAC database allows an administrator to populate the database with a backup.

Procedure:

1. From the **Settings** menu, select **Database** → **Database Restore** → **Browse**.
2. Locate the **Source** folder that contains the RDAC database backup file – `rdac.bak`.
3. To initiate the restoring operation, click **Restore**.

   If a password was assigned to the backup file, a **Restore Password** window opens.
4. If the backup file was password protected, enter the password and click **OK**.

2.3 RDAC Log Button

The **RDAC** button launches the **RDAC Log** window. The **RDAC Log** window displays the application log information.

The fields for the **RDAC Log** window log are as follows:

Table 10: RDAC Log Top Row

Fields	Descriptions
Select Date Range	Allows you to filter out the log entries by date when this checkbox is enabled. When this checkbox is disabled, the table displays entire system range of the source data. For more information, see Selecting Date Range on page 25.
Log View	Allows you to switch between the default view or the voting view. If you select **Default**, the RDAC Log report is displayed. If you select **Voting**, the Voting Details Log is displayed.
Select System	Allows you to filter entries by system. When this checkbox is enabled, you are able to view only those entries associated with a particular system. When this checkbox is disabled, the table displays entire system range of the source data. The Select System field is enabled by default if the **System** tab is open when the **RDAC Log** window is launched.

Table 11: RDAC Log Data Grid View

Column	Description
System ID	Displays the system alias or "Local" for local connection. For events logged in IP Site mode, this field is prefixed with the string `IP`.
Date Time	Displays the time stamp of the personal computer (PC) clock time of the log event.
User Name	Displays the your Windows user name at the time of the log event.
Radio ID	Displays the repeater identification (ID) or the MOTOTRBO Network Interface Service (MNIS) associated with the logged event.
Site ID	Displays the site ID of the site that any connected radio is in. You can click the additional filter icon in this column header and select the option from the drop-down list to display rows of Site IDs that contain the selected option. This feature is available when **System Type** is set to Linked Capacity Plus. For more information about System Type, see Remote Settings on page 17
IP Address	Displays the internet protocol (IP) address of the repeater or MNIS associated with the logged event.
UDP Port	Displays you Datagram Protocol (UDP) port of the repeater or MNIS associated with the logged event.
Radio Name	Displays the radio name of the repeater associated with the logged event.
Event Type	Displays a description of the log entry. The log captures the following radio events: alarms connection disconnection read RSSI read repeater log clear repeater log write reset events for all the base radios/repeaters changes of channel types (only for digital and analog channel), knockdown, and state The log also captures the connect, disconnect, and status change events for the MNIS.
Response	Displays a description of the log event results.

Table 12: RDAC Log Bottom Row Buttons

Buttons	Description
Print	Allows you to print the currently displayed log.
Print Preview	Allows you to preview the log before printing.
Save As	Allows you to save the current log to a file in the `.htm`, `.html`, or `.csv` (comma-separated values) format at a desired location. A dialog box appears for you to choose a file to replace or specify a file name to save under.
E-mail	Allows you to email the current log.

Buttons	Description
Delete	Allows you to delete log entries before a specific date, for example if the log takies a long time to display.
Close	Allows you to close the currently open log browser window.

2.3.1
Selecting Date Range

This procedure shows you how to filter out the log entries by date.

Procedure:

1. Click the **Start Date** box.
2. Select a date from the calendar drop down list.

   Selecting a start date filters the row entries for the log list to be within the range from the start date to the current date.
3. Click the **End Date** box.
4. Select a date from the calendar drop down list.

   Selecting an end date filters the row entries for the log list to be within the range from the start date to the selected end date. The minimum value selectable for this box is the current start date. The maximum value is the current date.

2.4
Repeater Log Button

The **Repeater Log** button launches the **Repeater Log** window. The **Repeater Log** window displays additional diagnostics information for the currently selected radio in the Diagnostics Table view.

If the log read from the radio has no data, the Repeater Log list displays `Empty Log`. The Repeater Log list displays some extended alarm information that is not available in the Diagnostics Table View. For more information, see Radio Alarms on page 31.

This button is disabled when no radio is connected or when the currently selected radio row in the Diagnostics Table View is disabled. For more information, see Diagnostic Table View on page 87.

This button is disabled when the current selected peer is MNIS.

The following table lists the **Repeater Log** window:

Table 13: Repeater Log Table Grid View

Columns and buttons	Description
Name	Displays the alarm names of the radio highlighted in the Diagnostics Table View.
Type	Displays the alarm classification of the radio highlighted in the Diagnostics Table View. The type can be either **Major** or **Minor**. For more information, see Radio Alarms on page 31.
State	Displays the logged state of the alarms of the radio highlighted in the Diagnostics Table View. The type can be either **Detected** (an alarm is active) or **Released** (an alarm is inactive).
Time (sec)	Displays the time stamp for the alarm entry.

Columns and buttons	Description
Diagnostics Name	Displays the alarm-related diagnostics name. The available choices are as follows: Modem Temperature VSWR PA Output Power Transmit Frequency Transmit Power Control Voltage Modem Voltage RSSI Slot1 RSSI Slot2 Exciter Current Sense PA Current 1 PA Current 2 PA Current 3 PA Current 4 PA Temperature PA Voltage PSU Voltage DC Current External Battery Voltage Modem Current Software Update Management Alarm Diagnostics Name is not available for MOTOTRBO SLR 5000 repeaters.
Diagnostics Value	Displays the first of alarm-related diagnostics values. Diagnostics Value is not available for MOTOTRBO SLR 5000 repeaters.
Save Log button	Allows you to save the alarm log data displayed in the Repeater Log list for the currently selected radio in the Diagnostics Table View. A **Save** dialog box prompts you to save the log to the specified location in `.html` format. This button is enabled only when the Repeater Log list has data displayed.
Read Log	Allows you to read the alarm log data of the currently selected radio in the Diagnostics Table View into the Repeater Log list.
Clear Log	Allows you to clear the log within the currently selected radio in the Diagnostics Table View.

2.5
Control Button

The **Control** button launches the **Control** window. The **Control** window allows you to perform control operations for the currently selected radio in the Diagnostics Table View.

The control operations include changing the repeater current channel, transmit power, state, and knockdown settings.

The **Control** button is supported in remote mode only. This button is disabled during the following scenarious:

- When no radio is connected, or
- When the currently selected radio row in the Diagnostics Table View is disabled, or
- When the State value in the Diagnostics Table View is Locked., or
- When the currently selected peer is the MOTOTRBO Network Interface Service (MNIS).

The following table lists the options available in the **Control** window:

Table 14: Control – Table Grid View

Columns and Buttons	Description
Current Channel	Displays the current channel of the radio highlighted in the Diagnostics Table View and allows you to change the radio channels during runtime. The available options are all the available channels.
TX Power	Displays the current TX power of the radio highlighted in the Diagnostics Table View and allows you to change the radio power level during runtime. The available options are **High** and **Low**. If the radio is keyed up at the moment of the power change, the call is ended abruptly and the radio is dekeyed immediately. The new power level will take effect the next time the radio keys up. Use **High** when a stronger signal must extend transmission distances. Use **Low** when communicating in close proximity and to prevent transmissions into other geographical groups. A message is displayed when another repeater is selected, prompting you to write or discard changes. TX Power is not supported for satellite receiver.
State	Displays the state of the radio highlighted in the Diagnostics Table View and allows you to enable or disable it during runtime. The available options are **Enabled** or **Disabled**. When **Enabled**, the radio can transmit, receive, and repeat operations. When **Disabled**, the radio does not transmit, receive, or repeat in either analog or digital mode. Continuous Wave Identication (CWID) is not transmitted and the disabled LED is illuminated. A disabled radio can still allow some controls such as reset and channel change and can be enabled back. It still responds to General Programmable Input Output (GPIO) controls, such as channel steering and to alarms and diagnostics. If the radio was keyed up at the moment it was disabled, the call is ended abruptly and the radio is dekeyed immediately. For state changes that require a radio reset, you may not see the state change before the radio is reset and removed from the display. For definition of the radio states, see Radio States on page 83.
Knockdown	Displays the knockdown setting of the radio highlighted in the Diagnostics Table View and allows you to change the setting during runtime. The available options are **Knockdown** and **Repeat**. When you select **Knockdown**, the radio does not repeat but still can receive and transmit on wireline audio. When you select **Repeat**, the radio repeats normal functionality.

Columns and Buttons	Description
	Unlike the rest of the control operations where the radio is reset after changes, the radio does not reset during this operation. This column is disabled when the Channel Type field in the Diagnostic Table View on page 87 is Digital.
Reset	Allows you to reset the currently selected radio in the Diagnostics Table View. This is a firmware reset. The hardware does not power down during reset, only the software is reinitialized. The radio reset procedure takes approximately 8 to 10 seconds. During that time, the radio is unavailable for repeating and other control functions. Upon resetting the radio, the connection is lost.
Write	Allows you to write control changes to the currently selected radio in the Diagnostics Table View. You can modify either the **Current Channel**, or **TX Power**, and **State**, or **Knockdown** values in the Control View. Writing to a radio causes a reset. Upon resetting the radio, the connection is lost. This button is supported in remote mode only.
Reload	Allows you to cancel any user changes and refresh the radio information for the currently selected radio in the Diagnostics Table View.

Chapter 3

RDAC General Information

This section provides information about Repeater Diagnostics and Control (RDAC) such as link establishment, alarms, repeaters, voter behaviors, and other general information about RDAC.

3.1 Link Establishment

This section describes the behavior of Repeater Diagnostics and Control (RDAC) controls when connecting to or losing connection to a radio in local and remote modes. It also provides an overview of the hardware setup.

For detailed information on how to properly configure your system, see the *MOTOTRBO System Planner* and *Capacity Max System Planner*.

The following list provides the RDAC controls behavior in local mode and remote mode:

- When the application is connected to a radio, the radio is added to the Diagnostics Table View. For more information, see Diagnostic Table View on page 87.
- When the application loses connection to a radio, the radio is grayed out in the Diagnostics Table View. The **Control** button and the **Repeater Log** button are also grayed out. When the connection is re-established, the row color returns to the enabled color. This process is automatic in remote mode. In local mode, you must click the **Connect** button to re-establish or connect to a new radio.
- If the application is already connected to one or more radios, clicking the **Connect** button disconnects the application from those radios first, before attempting to reconnect to the new ones.
- In remote mode, if the application cannot connect to the Master within a specified time, you are prompted to retry, or edit the connection parameters.
- When a specific major alarm occurs in a radio, the radio resets immediately and the connection to the radio is lost. The radio is grayed out in the Diagnostics Table View.
- Upon a reset caused by user initiation (that is, when you click the **Write**, or **Reset** button in the **Control** dialog box), the application warns you that the radio is unavailable after reset for some time. In addition, the radio is disabled in the Diagnostics Table View.
- If an error occurs while connecting to or reading a radio in remote mode, the error is logged in to the RDAC Log. An error icon is displayed in the status bar until you views the RDAC Log or restarts the application.

The following figure shows the hardware setup in local mode.

Figure 1: Hardware Setup in Local Mode

The radio and PC are connected through a local universal serial bus (USB) interface.

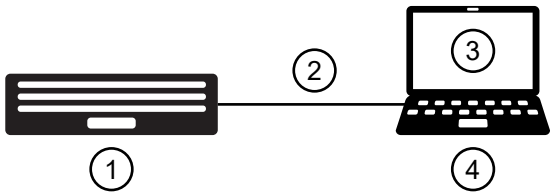


Table 15: Elements of the Hardware Setup in Local Mode

Number	Description
1	Radio
2	USB Cable
3	RDAC Local Application
4	Host PC

The following figure shows the hardware setup in remote mode.

Figure 2: Hardware Setup in Remote Mode

The radios and the host PC are connected through an IP-based user datagram protocol (UDP) connection. If a single radio is connected in the remote mode, the radio must be designated as a Master.

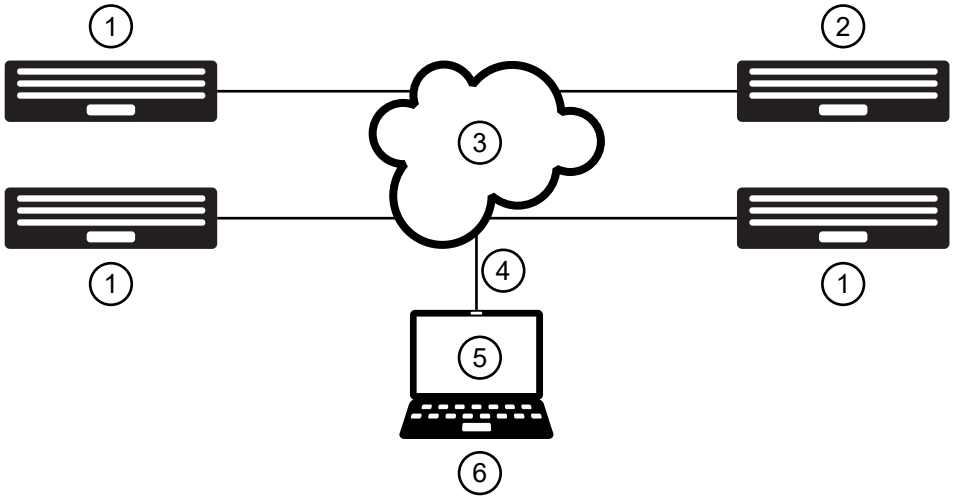


Table 16: Elements of Hardware Setup in Remote Mode

Number	Description
1	Radio
2	Master
3	Internet
4	IP/UDP
5	RDAC-IP Application
6	Host PC

3.2
Radio Alarms

The section provides lists of repeater alarms, the alarm classification, as well as the diagnosis and probable solution to resolve the issue.

3.2.1
MOTOTRBO Conventional Repeater Alarms

This section provides a list of MOTOTRBO Conventional repeater alarms, the alarm classification, and the diagnosis and probable solution to resolve the issue.

Table 17: Repeater Alarms for the Receiver Sub-System

NOTE: All alarms appear in the Diagnostics Table View and the Repeater Log.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
RX Alarm/ R1.4	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The receiver PLL has lost lock.	• Local Dealer: Replace receiver Field Replacement Unity (FRU). • Motorola Repair Depot: Repair or replace the receiver FRU.
Forced Rest Failure/R2.4A	Minor	Minor	Minor	Minor	The channel often rotates due to the forced rotation while other channels of the system are rotating due to call activity.	The proposed remedies are as follows: 1. Check if the RF interference exists. 2. Check if the hardware is damaged.

Table 18: Repeater Alarms for the Transmitter Sub-System

NOTE: All alarms appear in the Diagnostics Table View and the Repeater Log, except for the TX Power Alarm. The TX Power Alarm does not appear in Repeater Log.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
TX Alarm/ R1.4	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The exciter PLL has lost lock.	• Local Dealer: Replace exciter FRU. • Motorola Repair Depot: Repair/recalibrate or replace the exciter FRU.
PA Fan Alarm/ R1.4	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The PA fan has failed.	• Local Dealer: Replace the PA Fan unit. • Motorola Repair Depot: Replace the PA Fan unit.
Fan Alarm	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The main fan of the repeater has failed.	• Local Dealer: Replace the Fan unit. • Motorola Repair Depot: Replace the Fan unit.
TX Power Alarm (not applicable to 8 MB Repeater)	Minor (enabled)	Major (locked)	Minor (enabled)	Major (locked)	The actual transmit power of the repeater has fallen below 50% of the configured power.	• Local Dealer: Check the environment first. If the alarm persists, consult the *MOTOTRBO Detailed Service Manual* for troubleshooting or return the unit to Depot for service. • Motorola Repair Depot: Check the environment first. If the alarm persists, consult the *MOTOTRBO Detailed Service Manual* for troubleshooting.
TX Power Major Alarm (-3dB)/ R1.7 (32MB repeater only) RDAC applica-	Minor (enabled)	Major (locked)	Minor (enabled)	Minor (disabled)	The PA output power is more than 3dB below the set output power.	Local Dealer: Proposed remedies are as follows: 1. Verify that the "Exciter to PA" cable or "voltage supply to PA" cable is properly installed. 2. If no fault is found in remedy 1, replace the PA FRU. Motorola Repair Depot: Proposed remedies are as follows:

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
tion shows this alarm as Tx Power Major Alarm.						1. Verify that the "Exciter to PA" cable or "voltage supply to PA" cable is properly installed. 2. If no fault is found in remedy 1, repair, recalibrate, or replace the PA FRU.

Table 19: Repeater Alarms for the Power Sub-System

NOTE: All alarms appear in the Diagnostics Table View and the Repeater Log.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
AC Power Alarm/ R1.4	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station is not at fault. The AC power source has been interrupted and the station is operating on DC power.	Local Dealer: The alarm clears when the AC power source is brought back on line. **NOTE:** This alarm is masked if the station is set for **DC Operation Only** in the **General Settings** of the CPS.
Power Alarm	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station is not at fault. The Alternating Current (AC) power source has been interrupted and the station is operat-	No action is needed. The diagnosis is informational only.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
					ing on Direct Current (DC) power.	

Table 20: Repeater Alarms for the Environmental Sub-System—External to Station

NOTE: All alarms appear in the Diagnostics Table View and the Repeater Log.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
Temp Alarm/ R1.4	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station has exceeded the temperature limit that allows maximum rated output power from the PA.	Local Dealer: The proposed remedies are as follows: **1.** If the Fan Alarm is present, Fan Alarm can cause the Temp Alarm to be issued as a secondary alarm. If applicable, correct the Fan Alarm first. See Fan Alarm. **2.** If the Fan Alarm is not present, power cycle/reset the station so that the firmware can provide an up-to-date status on the integrity of the fan. This action is needed since the polling rate of the fan is substantially less than the polling rate for temperature. **3.** If no fault is found in Remedy 1, verify that there is not a problem with the site temperature itself. The station clears the Temp Alarm and allow maximum rated out-

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
						put power when the temperature of the site is lowered. **4.** If no faults are found in Remedies 1 and 2, verify that the rack and cabinet installations of the station are in accordance with the product planner instructions. **5.** If no faults are found in Remedies 1, 2, 3, and 4; replace the PA FRU. Motorola Repair Depot: The proposed remedies are as follows: **1.** The presence of Fan Alarm can cause the Temp Alarm to be issued as a secondary alarm. If applicable, correct the Fan Alarm first, see Fan Alarm. **2.** Repair, replace, or recalibrate the PA FRU.
VSWR Alarm (not applicable to 8 MB Repeater)/R1.7	Minor (enabled)	Major (locked)	Minor (enabled)	Major (Disabled)	The VSWR of the equipment the station is coupled to, is greater than a 5:1. The station has rolled power back to protect the PA.	Local Dealer: The proposed remedies are as follows: **1.** Verify the operational load the station is coupled to is better than a 2:1 VSWR (minimally). The load should be better than a 1.5:1. **2.** Replace the PA FRU. Motorola Repair Depot: Replace/repair/recalibrate the PA FRU.

3.2.2

MTR3000 Base Radio and Repeater Alarms

This section provides a list of MOTOTRBO MTR3000 base radios and repeater alarms, the alarm class, as well as the diagnosis and probable solution to resolve the issue.

Table 21: Repeater Alarms for the Receiver Sub-System

NOTE:

- RX Alarm appears in both the Diagnostics Table View and the Repeater Log. Other alarms appear in the Repeater Log.
- Receiver EEPROM Corruption Type 1 to Type 3 alarms are applicable only to the MTR3000 PA that is important to note in MTR2000 upgrades.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
RX Alarm/ R1.0	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The receiver PLL has lost lock.	• Local Dealer: Replace receiver Field-Replaceable Unit (FRU). • Motorola Repair Depot: Repair or replace the receiver FRU.
Receiver EEPROM Corruption Type 1/R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The receiver EEPROM has incurred non-recoverable corruption in a semi-critical memory location.	• Local Dealer: Replace receiver FRU. • Motorola Repair Depot: Recalibrate the receiver FRU.
Receiver EEPROM Corruption Type 2/R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The receiver EEPROM has incurred a recoverable corruption in critical memory location or non-recoverable corruption in a non-critical area of memory.	No action is needed. The diagnosis is informational only.
Receiver EEPROM Corruption Type 3/R1.0	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The receiver EEPROM has incurred non-recoverable corruption in	• Local Dealer: Replace receiver FRU.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
					a critical memory location.	• Motorola Repair Depot: Recalibrate the receiver FRU.
RX Revision/ R.1.7	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The receiver hardware is incompatible with the currently loaded firmware version.	• Local Dealer: Replace receiver FRU with a hardware version that supports the currently loaded firmware version, or load a version of firmware that supports the currently installed receiver FRU. • Motorola Repair Depot: Replace receiver FRU with a hardware version that supports the currently loaded firmware version, or load a version of firmware that supports the currently installed receiver FRU.
Forced Rest Failure/R2.4A	Minor	Minor	Minor	Minor	The channel often rotates due to the forced rotation while other channels of the system are rotating due to call activity.	The proposed remedies are as follows: 1. Check if the RF interference exists. 2. Check if the hardware is damaged.

Table 22: Repeater Alarms for the Transmitter Sub-System (Part 1)

NOTE:
Alarms that appear on both the Diagnostics Table View and the Repeater Log are TX Alarm and Fan Alarm

Alarms that appear only on the Diagnostics Table View are TX Power Minor Alarm and TX Power Major Alarm.

Alarms that appear only on the Repeater Log are as follows:

- TX Power Minor Alarm -2dB and TX Power Minor Alarm -3dB (Counterpart to TX Power Minor Alarm)
- TX Power Major Alarm (-3dB) (Counterpart to TX Power Major Alarm)

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
TX Alarm/ R.1.0	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The exciter PLL has lost lock.	• Local Dealer: Replace exciter FRU. • Motorola Repair Depot: Repair/recalibrate or replace the exciter FRU.
Fan Alarm/ R.1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The PA fan has failed.	• Local Dealer: Replace the PA Fan. • Motorola Repair Depot: Replace the PA Fan. Replace the PA and Power Supply (PS) fans as a pair.
TX Power Minor Alarm	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (disabled) Does not switch to back-up.	The PA output power is between 2dB to 3dB below the set output power, or the output power is more than 3dB below the set output power with one or more of the following alarms already detected: • Fan Alarm	When this alarm is detected, check the Diagnostic Repeater Log to determine which failure has occurred: • TX Power Minor Alarm (-2dB) • TX Power Minor Alarm (-3dB)

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
					• Temp Alarm • PA Voltage Minor Alarm • PA Voltage Major Alarm • Voltage Standing Wave Ratio (VSWR) Minor Alarm • VSWR Major Alarm	
TX Power Major Alarm	Minor (enabled)	Major (locked)	Minor (disabled)	Major (locked)	The PA output power is more than 3dB below the set output power.	Local Dealer: Proposed remedies are as follows: **1.** Verify that the Exciter to PA cable is properly installed. **2.** Replace the PA FRU. Motorola Repair Depot: Proposed remedies are as follows: **1.** Verify that the Exciter to PA cable is properly installed. **2.** Repair/recalibrate or replace the PA FRU.
TX Power Minor Alarm (-2dB)/R.10	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (disabled) Does not switch to Back-up.	The PA output power is between 2dB to 3dB below the set output power of the station.	• Local Dealer: Replace PA FRU. • Motorola Repair Depot: Repair, recalibrate, or replace the PA FRU.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
TX Power Minor Alarm (-3dB)/R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (disabled) Does not switch to Backup.	The PA output power is more than 3dB below the set output power of the station, but at least one of the following "primary" alarms are also present: • Fan Alarm • Temperature (Temp) Alarm • PA Voltage Minor Alarm • PA Voltage Major Alarm • VSWR Minor Alarm • VSWR Major Alarm	• Local Dealer: Remedy the primary alarms (see appropriate remedy). • Motorola Repair Depot: Remedy the primary alarms (see appropriate remedy).
TX Power Major Alarm (-3dB)/R1.0 • In MTR3000 R1.0, this alarm type had alarm type of Major. In MTR3000 R1.7, the alarm type is set based on the system setup.	Minor (enabled)	Major (locked)	Minor (enabled)	Minor (disabled)	The PA output power is more than 3dB below the set output power.	Local Dealer: Proposed remedies are as follows: 1. Verify that the "Exciter to PA" cable or "voltage supply to PA" cable is properly installed. 2. Replace the PA FRU. Motorola Repair Depot: Proposed remedies are as follows: 1. Verify that the "Exciter to PA" cable or "voltage supply to

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
• RDAC application shows this alarm as "Power Unleveled Alarm"						PA" cable is properly installed. 2. Repair, recalibrate, or replace the PA FRU.

Table 23: Repeater Alarms for the Transmitter Sub-System (Part 2)

NOTE:
Radio Frequency (RF) Power Control Alarm appears on both the Diagnostics Table View and the Repeater Log.

TX Gain Alarm appears only on the Diagnostics Table View.

Alarms that appear only on the Repeater Log are as follows:

- Power Amplifier (PA) Gain Alarm (Counterpart to TX Gain Alarm)
- Exciter Final Amp Alarm (Counterpart to TX Gain Alarm)
- Exciter Driver Amp Alarm (Counterpart to TX Gain Alarm)

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
TX Gain Alarm	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The transmitter gain is low, which is indicative of a failed or failing amplifier stage.	When this alarm is detected, check the Diagnostic Repeater Log to determine which of the following failure has occurred: • PA Gain Alarm • Exciter Final Amp Alarm

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
						• Exciter Driver Amp Alarm
PA Gain Alarm/ R1.7 RDAC shows as Tx Gain Alarm.	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The PA power control loop is near saturation or in saturation.	Local Dealer: Proposed remedies are as follows: **1.** If an Exciter Final Amp Alarm and/or Exciter Driver Amp Alarm exist, then replace the Exciter FRU. **2.** Replace the PA FRU. Motorola Repair Depot: Proposed remedies are as follows: **1.** If an Exciter Final Amp Alarm and/or Exciter Driver Amp Alarm exist, then replace the Exciter FRU or troubleshoot or repair the Exciter's final/driver amplifier circuit. **2.** Repair (check PA final stage first) or replace the PA FRU.
Exciter Final Amp Alarm/ R1.7	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The current draw of the final stage of the excit-	• Local Dealer: Replace the Exciter FRU.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
RDAC shows as Tx Gain Alarm.					er is outside of specification.	• Motorola Repair Depot: Replace the Exciter FRU or troubleshoot/ repair the final amplifier circuit of the exciter.
Exciter Driver Amp Alarm/ R1.7 RDAC shows as Tx Gain Alarm.	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The current draw of the exciter's driver stage is outside of specification.	• Local Dealer: Replace the Exciter FRU. • Motorola Repair Depot: Replace the Exciter FRU or troubleshoot/ repair the final amplifier circuit of the exciter.
RF Power Control Alarm/R1.7	Minor (enabled)	Major (locked)	Minor (enabled)	Minor (Disabled)	The transmitter is delivering power in a dekeyed state or delivering more power in a keyed state than tolerancing allows.	• Local Dealer: Replace the PA FRU. • Motorola Repair Depot: Repair/recalibrate or replace the PA FRU.
OCXO Failure/ R2.0 This alarm is only applicable to 800/900 MHz stations.	Major (locked)	Major (locked)	Major (locked)	Major (locked)	A standard stability reference (1.5ppm) System Clock Module (SCM) is installed into a 800/900 MHz station.	Replace the SCM with a version (DLN6718) that provides a high stability reference (0.1 ppm).

Table 24: Repeater Alarms for the Transmitter Sub-System (Part 3)

NOTE:
Alarms that appear only on the Repeater Log are as follows:

- PA EEPROM Corruption Type 1 to Type 3
- PA Revision
- Exciter EEPROM Corruption Type 1 to Type 3
- Exciter Revision
- Reference Incompatibility
- Interoperability Between Exciter and PA

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
PA EEPROM Corruption Type 1/R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The PA EEPROM has incurred non-recoverable corruption in a semi-critical memory location. This alarm is only applicable to the MTR3000 PA which is important to note in the MTR2000 Upgrades.	• Local Dealer: Replace PA FRU. • Motorola Repair Depot: Recalibrate the PA FRU.
PA EEPROM Corruption Type 2/R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The PA EEPROM has incurred recoverable corruption in a critical memory location or non-recoverable corruption in a non-critical area of memory. This alarm is only applicable to the MTR3000 PA which is important to note in the MTR2000 Upgrades.	No action is needed. The diagnosis is informational only.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
PA EEPROM Corruption Type 3/R1.0	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The PA EEPROM has incurred non-recoverable corruption in a critical memory location. This alarm is only applicable to the MTR3000 PA which is important to note in the MTR2000 Upgrades.	• Local Dealer: Replace PA FRU. • Motorola Repair Depot: Recalibrate the PA FRU.
PA Revision/ R1.7	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The PA hardware is incompatible with the currently loaded firmware version.	• Local Dealer: Replace PA FRU with a hardware version that supports the currently loaded firmware version, or load a version of firmware that supports the currently installed PA FRU. • Motorola Repair Depot: Replace PA FRU with a hardware version that supports the currently loaded firmware version, or load a version of firmware that sup-

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
						ports the currently installed PA FRU.
Exciter EEPROM Corruption Type 1/R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The exciter EEPROM has incurred non-recoverable corruption in a semi-critical memory location.	• Local Dealer: Replace exciter FRU. • Motorola Repair Depot: Recalibrate the exciter FRU.
Exciter EEPROM Corruption Type 2/R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The exciter EEPROM has incurred recoverable corruption in a critical memory location or non-recoverable corruption in a non-critical area of memory.	No action is needed. The diagnosis is informational only.
Exciter EEPROM Corruption Type 3/R1.0	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The exciter EEPROM has incurred non-recoverable corruption in a critical memory location.	• Local Dealer: Replace exciter FRU. • Motorola Repair Depot: Recalibrate the exciter FRU.

Table 25: Repeater Alarms for the Transmitter Sub-System (Part 4)

NOTE:
Alarms that appear only on the Repeater Log are as follows:

- Exciter Revision
- Reference Incompatibility
- Interoperability Between Exciter and PA

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
Exciter Revision/ R1.7	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The exciter hardware is incompatible with the currently loaded firmware version.	• Local Dealer: Replace exciter FRU with a hardware version that supports the currently loaded firmware version, or load a version of firmware that supports the currently installed exciter FRU. • Motorola Repair Depot: Replace exciter FRU with a hardware version that supports the currently loaded firmware version, or load a version of firmware that supports the currently installed exciter FRU.
Interoperability Between Exciter and PA/ R1.0	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The PA and exciter do not have a compatible frequency range with each other.	Local Dealer: The proposed remedies are as follows: **1.** Verify that the correct PA or exciter is installed in the station. **2.** Verify that the backplane and PS cables to the PA are correctly installed. **3.** Replace the exciter or PA FRU. Motorola Repair Depot: The proposed remedies are as follows:

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
						1. Verify that the correct PA or exciter is installed in the station. 2. Verify that the backplane and PS cables to the PA are correctly installed. 3. Repair/recalibrate or replace the exciter or PA FRU.

Table 26: Repeater Alarms for the Power Sub-System

NOTE:
AC Power Alarm appears on both the Diagnostics Table View and the Repeater Log.

Alarms that appear only on the Diagnostics Table View are as follows:

- PA Voltage Minor Alarm
- PA Voltage Major Alarm
- Backplane Supply Alarm

Alarms that appear only on the Repeater Log are as follows:

- PA Voltage Alarm (High) and PA Voltage Alarm (Intermediate) (Counterpart to PA Voltage Minor Alarm)
- PA Voltage Alarm (Low) (Counterpart to PA Voltage Major Alarm)
- 8 Volt Supply Alarm and 10 Volt Supply Alarm (Counterpart to Backplane Supply Alarm)

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
AC Power Alarm/ R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station is not at fault. The AC power source has been interrupted and the station is operating on DC power.	Local Dealer: The alarm clears when the AC

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
						power source is brought back on line. **NOTE:** This alarm is masked if the station is set for **DC Operation Only** in the **General Settings** of the CPS.
PA Voltage Minor Alarm/ R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station is not at fault. This alarm occurs when the station is operating from a DC source with an output voltage that cannot sustain the maximum rated output power from the PA.	Local Dealer: When this alarm is detected, check the Diagnostic Repeater Log to determine whether the voltage is at an intermediate level PA Voltage alarm (Intermediate) or it is too high PA Voltage alarm (High).
PA Voltage Major Alarm/ R1.0	Minor (Enabled)	Minor (Enabled)	Minor (Enabled)	Minor (Enabled)	The station is not at fault. This alarm occurs when the station is operating from a DC source that has an output voltage which is too low to sustain any level of output power from the PA.	Local Dealer: The site batteries are near depletion and station shut down is imminent. Service personnel should be dispatched to the site to restore AC power or provide alternate power. This alarm clears when either the AC is restored or the DC voltage levels are restored to the working limits required by the station.
PA Voltage Alarm (High)/ R1,0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station is not at fault. This alarm occurs when the station is operating from a	Local Dealer: Proper operation of the battery charger / rectifier should be verified, or verify that the battery plant is designed to the specified

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
					DC source with an output voltage that is too high to sustain the maximum rated output power from the PA.	voltage operating limits of the station. This alarm clears when either the AC is restored or the DC voltage levels are restored to the working limits required by the station. **NOTE:** See the *MOTOTRBO Basic Service Manual* for more information on the maximum transmitter output power as a function of DC input voltage.
PA Voltage Alarm (Intermediate)	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station is not at fault. This alarm occurs when the station is operating from a DC source with an intermediate output voltage level that cannot sustain the maximum rated output power from the PA.	Local Dealer: The site batteries are within their normal discharge curve. This alarm clears when AC power is restored. **NOTE:** See the *MOTOTRBO Basic Service Manual* for more information on the maximum transmitter output power.
PA Voltage Alarm (Low)	Major (disabled)	Major (disabled)	Major (disabled)	Major (disabled)	The station is not at fault. This alarm occurs when the station is operating from a DC source that has an output voltage which is too low to sustain	Local Dealer: The site batteries are near depletion and station shutdown is imminent. Service personnel should be dispatched to the site to restore AC power or provide alternate power. This alarm clears when either the AC is restored or the DC voltage levels

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
					any level of output power from the PA.	are restored to the working limits required by the station.
Backplane Supply Alarm	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	One or both of the backplane linear regulators are delivering potentials outside of their specified range.	When this alarm is detected, check the Diagnostic Repeater Log to determine which of the following alarm failure has occurred:: ● 8 Volt Supply Alarm and/or ● 10 Volt Supply Alarm
8 Volt Supply Alarm/ R1.7 RDAC shows as Backplane Supply Alarm.	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The 8 volt backplane linear regulator is delivering a potential outside of its specified range.	The proposed remedies are as follows: **1.** Verify that the 8-V regulator is tightened to its specified torque value. **2.** Remove power from the station and remove the exciter/receiver/control board (core assembly) from the station. Next restore power to the station and verify if 8V DC is present at the regulator. If 8V DC is present, identify and repair/replace the fault core assembly FRU. **3.** Verify that the 8V regulator is receiving 14V DC. If not, check the backplane cable, backplane fuse, and Power Supply. **4.** Replace the 8V DC regulator.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
10 Volt Supply Alarm/ R1.7 RDAC shows as Backplane Supply Alarm.	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The 10 volt backplane linear regulator is delivering a potential outside of its specified range.	The proposed remedies are as follows: **1.** Verify that the 10-V regulator is tightened to its specified torque value. **2.** Remove power from the station and remove the exciter/receiver/control board (core assembly) from the station. Next restore power to the station and verify if 10V DC is present at the regulator. If 10V DC is present, identify and repair/replace the fault core assembly FRU. **3.** If no fault is found in Remedy 2, then verify that the 10-V regulator is receiving 14V DC. If not, check the backplane cable, backplane fuse, and Power Supply. **4.** If no fault is found in Remedy 3, then replace the 10V DC regulator.

Table 27: Repeater Alarms for Codeplug Configuration

NOTE: Both alarms only appear in the Repeater Log.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
Incorrect Carrier Frequency/R1.0 This alarm is masked if the station is set for "DC Operations Only" in the General Settings of the CPS 2.0.	Major (locked)	Major (locked)	Major (locked)	Major (locked)	At least one personality (analog or digital channel) exists in the codeplug which has a frequency outside of the supported electronic bandwidth of the receiver, exciter, or PA.	Local Dealer: Correct the invalid personality with the Customer Programming Software (CPS) application. **NOTE:** Upon reading the codeplug, CPS sets the invalid personality automatically to a default value that falls within the valid limits of the hardware. The user must then set the defaulted personality to the required setting.
Incorrect Codeplug for MTR2000 PA/ R1.0	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The MTR3000 codeplug contains an unsupported MTR2000 PA.	Local Dealer: Correct the invalid MTR2000 sticker code with the Tuner application.

Table 28: Repeater Alarms for Environmental Sub-System—External to Station

NOTE:

- All alarms appear on both the Diagnostics Table View and the Repeater Log.
- Motorola Solutions defines the alarm classification. Customers cannot change the alarm classification.
- For MOTOTRBO repeaters, the system supports the Repeater Diagnostics and Control (RDAC) features for repeaters with the Tanapa number: PMUE2390A, PMUD2091A, PMUE3017A and PMUD2092A, except for the main fan failure alarm and AC power failure alarm. However, these two unsupported alarms are still listed in the RDAC screen with their states shown as "Released". These unsupported alarms are available when the repeaters are serviced with the service kit: PMLN5269.
- Satellite receiver only supports RX only alarms (RX Alarm and AC Power Alarm).

Alarm Name / Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
Temp Alarm /R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station has exceeded the temperature limit that allows maximum rated output power from the PA	Local Dealer: The proposed remedies are as follows: **1.** If the Fan Alarm is present, Fan Alarm can cause the Temp Alarm to be issued as a secondary alarm. If applicable, correct the Fan Alarm first. See Fan Alarm. **2.** If the Fan Alarm is not present, power cycle/reset the station so that the firmware can provide an up-to-date status on the integrity of the fan. This action is needed since the polling rate of the fan is substantially less than the polling rate for temperature. **3.** If no fault is found in Remedy 1, verify that there is not a problem with the site temperature itself. The station clears the Temp Alarm

Alarm Name / Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
						and allow maximum rated output power when the temperature of the site is lowered. **4.** If no faults are found in Remedies 1 and 2, verify that the rack and cabinet installations of the station are in accordance with the product planner instructions. **5.** If no faults are found in Remedies 1, 2, 3, and 4; replace the PA FRU. Motorola Repair Depot: The proposed remedies are as follows: **1.** The presence of Fan Alarm can cause the Temp Alarm to be issued as a secondary alarm. If applicable, correct the Fan Alarm first, see Fan Alarm. **2.** Repair, replace, or recalibrate the PA FRU.
VSWR Minor Alarm /R1.0	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (disabled) Does not switch to Backup.	The Voltage Standing Wave Ratio (VSWR), of the equipment the station is coupled to, is between a 3:1 to 5:1. The station has rolled power back to protect the PA.	Local Dealer: The proposed remedies are as follows: **1.** Verify the operational load the station is coupled to is better than a 2:1 VSWR (minimally). The load should be better than a 1.5:1. **2.** Replace the PA FRU. Motorola Repair Depot: Replace, repair, and recalibrate the PA FRU.

Alarm Name / Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
VSWR Major Alarm /R1.0	Minor (enabled)	Major (locked)	Minor (enabled)	Major (locked)	The VSWR of the equipment the station is coupled to, is greater than a 5:1. The station has rolled power back to protect the PA.	Local Dealer: The proposed remedies are as follows: 1. Verify the operational load the station is coupled to is better than a 2:1 VSWR (minimally). The load should be better than a 1.5:1. 2. Replace the PA FRU. Motorola Repair Depot: Replace/repair/recalibrate the PA FRU.
Power Unleveled	Major (disabled)	Major (disabled)	Major (disabled)	Major (disabled)	The PA output power is more than 3 dB below the set output power and no Fan, Temperature, Voltage, or VSWR alarms are active.	The proposed remedies are as follows: 1. Verify that Exciter Cable to PA is properly installed. 2. Verify that Voltage Supply cable to PA is properly installed. 3. Replace the PA FRU.
Ext. Circulator Temp Alarm	Minor (enabled)	Major (locked)	Minor (enabled)	Minor (Disabled)	A high VSWR is present at the external double circulator tray option.	Local Dealer: The proposed remedies are as follows: 1. Verify that the operational load (antenna port) the external circulator tray is coupled to is better than a 2:1 VSWR (minimally). The load should be better than a 1.5:1. 2. Replace the circulator load/temp sensor assembly of the external circulator tray.

3.2.3

MOTOTRBO SLR Series Repeater Alarms

This section provides a list of MOTOTRBO SLR Series repeater alarms, the alarm class, and the causes and possible solution to resolve the issue.

Table 29: Repeater Alarms for the Modem Sub-System

NOTE: All alarms (except Modern Module ID Alarm) appear in both the Diagnostics Table View and the Repeater Log. Modern Module ID alarm only appears in the Repeater Log.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
Reference Unlock (External Only).	Major (SLR5000/8000) This alarm class is configured in the Customer Programming Software (CPS) 2.0.	Frequency Reference Alarm	Proposed diagnosis are as follows: 1. The external reference is not connected or does not match what is programmed. Therefore, the reference cannot lock to the external reference. 2. The fault may be caused by the external reference rather than the station.	Connect the station to an operational reference at the programmed frequency and program the correct frequency of the applied reference. Alternatively, you can reprogram the station to use an internal reference.
Reference Unlock (Internal fall back)	Minor (SLR5000/8000) This alarm class is configured in the CPS 2.0.	Frequency Reference Alarm	Proposed diagnosis are as follows: 1. The external reference does not match what is programmed. Therefore, the reference cannot lock to the external reference but the station can run on the internal clock. 2. The fault is caused by the external reference rather than the station.	Proposed remedies are as follows: 1. Connect the station to an operational reference at the programmed frequency and program the correct frequency of applied reference. Alternatively, you can reprogram the station to use an internal reference. 2. Replace the modem because an internal reference has failed.
OCXO Unlock	Major (SLR5000/8000)	Frequency Reference Alarm	Proposed diagnosis are as follows: 1. The reference cannot lock to the internal oven-controlled crystal oscillator (OCXO) and cannot run on the in-	Replace the modem.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
			ternal Voltage Controlled, Temperature Compensated Crystal Oscillator (VCTCXO) due to the limitations in frequency tolerance. 2. Probable hardware failure.	
Modem Voltage	• Informational (SLR5000/8000) • Major (SLR1000)	Power System Alarm	Voltage to the modem is outside of the specified range. The modem cannot perform up to specifications.	Proposed remedies are as follows: 1. If the alternating current (AC) power alarm is set, dispatch service personnel to the site to restore the AC power or provide alternative power. This alarm clears when either the AC is restored or the Direct Current (DC) voltage levels are restored to the working limits required by the station. 2. If no AC power alarm is set, then Power Supply Unit (PSU) has failed. Dispatch service personnel to the site to replace the PSU Field-Replaceable Unit (FRU) or provide alternative power. This alarm clears when either the AC is restored or the DC voltage levels are restored to the working limits required by the station.
Modem Voltage Failure/ R1.0 (SLR 5000) / R2.6 (SLR 8000)	Major (SLR5000/8000)		The site batteries are near depletion and station shut down is imminent.	Proposed remedies are as follows: 1. If AC power alarm is set, dispatch service personnel to the site to restore AC power

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
				or provide alternate power. **2.** If AC power alarm is not set, dispatch service personnel to the site to replace PSU FRU or provide alternate power.
Modem Fan	Minor (SLR5000/8000)	Fan Alarm	The modem fan is malfunctioning.	Replace the modem fan.
Modem PA Temperature	User Defined (All)	Temperature (Temp) Alarm	Modem temperature is outside of the specified limits that allow rated power to be generated.	Proposed remedies are as follows: **1.** Replace the fan. **2.** If no fan alarm is active, verify that the site temperature is within limits. **3.** Verify that the air flow is not blocked on the repeater either at the intake or exhaust ports. **4.** Replace the modem FRU.
Modem PA Failure/ R1.0 (SLR 5000) / R2.6 (SLR 8000) For SLR 5000 and SLR 8000 this alarm class is configured in the Customer Programming Software (CPS) 2.0.	Major	None	Modem PA is failing or failed.	Proposed remedies are as follows: **1.** If any PA alarms are found, resolve the alarms. **2.** Replace the modem FRU.
Modem Module ID Failure Alarm/R1.0	Major (All)	None	The Item data in EEPROM is corrupted. The hardware identification (ID) data is not valid.	Replace the modem Field-Replaceable Unit (FRU).

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
(SLR 5000) / R2.6 (SLR 8000)				

Table 30: Repeater Alarms for the Power Amplifier (PA) Sub-System

NOTE:
Alarms that appear on both the Diagnostics Table View and the Repeater Log are as follows:

- PA Final Temp
- PA Voltage
- PA Fan
- PA Final Over Current
- PA Gain
- PA Power Control
- Power Roll-back Alarm-(-2dB)
- Power Roll-back Alarm-(-3dB)
- Power Unleveled
- Voltage Standing Wave Ratio (VSWR) Minor
- VSWR Major

Alarms that appear only on the Repeater Log are as follows:

- PA Module ID Failure
- PA Communication failure
- PA Program Failure
- Interoperability Between Modem and PA
- PA Hardware Version (HW Ver) Failure

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
AC Power Alarm/R1.0 (SLR 5000) / R2.6 (SLR 8000) For SLR 5000, this alarm class is configured	Minor (Enabled)	None	The station is not at fault. The AC power source has been interrupted and the station is operating on DC power.	Local Dealer: The alarm clears when the AC power source is brought back on line. **NOTE:** This alarm is masked if the station is set for **DC Operation Only** in the **General Settings** of the CPS.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
in the Customer Programming Software (CPS) 2.0.				
PA Module ID Failure/ R1.0 (SLR 5000) / R2.6 (SLR 8000)	Major (SLR5000/8000)	None	The Item data in EEPROM is corrupted. The hardware ID data is not valid.	Replace the PA FRU.
PA Communication Failure/ R1.0 (SLR 5000) / R2.6 (SLR 8000)	Major (SLR5000/8000)	None	Cannot communicate with the PA or recognize the response from the PA.	The proposed remedies are as follows: **1.** Ensure that a flex connection between the modem and PA is properly made. **2.** Replace the PA FRU.
PA Program Failure/R1.0 (SLR 5000) / R2.6 (SLR 8000)	Major (SLR5000/8000)	None	Cannot program with the PA	The proposed remedies are as follows: **1.** Ensure that a flex connection between the modem and PA is properly made. **2.** Replace the PA FRU.
Interoperability Between Modem and PA	Major (SLR5000/8000)	None	The PA and modem do not have a compatible frequency range/power model with each other.	The proposed remedies are as follows: **1.** Verify that the correct PA/Modem combination is installed in the repeater. **2.** Verify that the cables are connected correctly to the PA FRU. **3.** Replace the modem or PA FRU.
PA Final Temp	User Defined (SLR5000/8000)	Temp Alarm	PA Final temperature is outside the specified limits, which allows rated power to be generated.	The proposed remedies are as follows: **1.** Replace fan. **2.** Verify that the site temperature is within limits.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
				3. Verify that the air flow is not blocked on the repeater either at the intake or exhaust ports. 4. Replace the PA FRU.
PA Voltage Alarm (High) / R1.0 (SLR 5000) / R2.6 (SLR 8000)	Minor (enabled)	PA Voltage Minor Alarm	The station is not at fault. This alarm occurs when the station is operating from a DC source with an output voltage that is too high to sustain the maximum rated output power from the PA.	Local Dealer: Proper operation of the battery charger / rectifier should be verified, or verify that the battery plant is designed to the specified voltage operating limits of the station. This alarm clears when either the AC is restored or the DC voltage levels are restored to the working limits required by the station. **NOTE:** See the *MOTOTRBO Basic Service Manual* for more information on the maximum transmitter output power as a function of DC input voltage.
PA Voltage Major Alarm/R1.0 (SLR 5000) / R2.6 (SLR 8000)	Minor (Enabled) (SLR 5000/SLR 8000)	Power System Alarm	The station is not at fault. This alarm occurs when the station is operating from a DC source that has an output voltage which is too low to sustain any level of output power from the PA.	Local Dealer: The site batteries are near depletion and station shut down is imminent. Service personnel should be dispatched to the site to restore AC power or provide alternate power. This alarm clears when either the AC is restored or the DC voltage levels are restored to the working limits required by the station.
PA Voltage	Minor (SLR 5000/SLR 8000)	Power System Alarm	Voltage to the PA FRU is outside of the specified range. The PA does not perform up to specifications.	When the site batteries are near depletion and station shutdown is imminent, perform the following remedies:

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
				1. If the AC power alarm is set, dispatch service personnel to the site to restore the AC power or provide alternative power. This alarm clears when either the AC is restored or the DC voltage levels are restored to the working limits required by the station. 2. If no AC power alarm is set, then PSU has failed. Dispatch service personnel to the site to replace the PSU FRU or provide alternative power. This alarm clears when either the AC is restored or the DC voltage levels are restored to the working limits required by the station. 3. To ensure that the connections are installed correctly, check the supply connections to the PA FRU. If the PSU is not present or the Overvoltage Protector (OVP) or Layout versus schematic (LVS) is not available, perform the following actions: 1. Could be low voltage where the power source has failed or if batteries are discharged. 2. Could also be a high voltage where the power source is not functioning properly.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
PA Fan	User Defined (SLR5000/8000)	Fan Alarm	The PA fan is malfunctioning.	Replace the PA fan.
PA Final Over Current/R1.0 (SLR 5000) / R2.6 (SLR 8000)	Minor (SLR5000/8000)	TX Alarm	One or more PA final transistors exceeded the normal operating current.	Replace the PA FRU.
PA Gain	Informational (SLR5000/8000)	TX Alarm	The transmitter gain is low, which indicates a failed or failing amplifier stage.	Temperature alarms, fan alarms, voltage alarms can provide an indication to service the station or not. Determine if any other alarms are present by checking the diagnostic log.
PA HW Version Incorrect/ R2.6	Major (SLR5000/8000)	None	Incorrect PA hardware installed.	Replace PA.
PA Power Control	User Defined (SLR5000/8000)	TX Power Alarm	The following list is the possible diagnosis: ● The power is transmitted in a de-keyed state; or ● More power is transmitted in a keyed state than the tolerance level allows.	Replace the PA FRU.
Power Roll-back Alarm (–2 dB)	User Defined (SLR5000/8000)	TX Power Alarm	The PA output power is 2 dB to 3 dB below the set output power of the station and at least one of the following "primary" alarms is active: ● any Fan Alarms ● any Temp Alarms ● Modem Voltage Alarm ● VSWR Minor Alarm ● VSWR Major Alarm	The proposed remedies are as follows: **1.** Remedy the primary alarms if any. **2.** Replace the PA FRU.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
Power Roll-back Alarm (–3 dB)	User Defined (SLR5000/8000)	TX Power Alarm	The PA output power is more than 3dB below the set output power of the station but at least one of the following "primary" alarm is active: ● any Fan Alarms ● any Temp Alarms ● PA Voltage Alarm ● VSWR Alarm	The proposed remedies are as follows: **1.** Remedy the primary alarms if any. **2.** Replace the PA FRU.
Power Unleveled	User Defined (SLR5000/8000)	TX Power Alarm	The PA output power is more than 3 dB below the set output power and no Fan, Temperature, Voltage, or VSWR alarms are active.	The proposed remedies are as follows: **1.** Verify that Exciter Cable to PA is properly installed. **2.** Verify that Voltage Supply cable to PA is properly installed. **3.** Replace the PA FRU.
VSWR Minor Alarm/ R1.0 (SLR 5000) / R2.6 (SLR 8000)	User Defined (SLR5000/8000)	VSWR Alarm	The Voltage Standing Wave Ratio (VSWR) of the equipment that the station is connected to is between 3:1 and 5:1. The station rolled power back to protect the PA.	The proposed remedies are as follows: **1.** Verify that the operational load that the station is connected to is more than 2:1 VSWR (minimum). The load must be more than 1.5:1. **2.** Replace the PA FRU.
VSWR Major Alarm/ R1.0 (SLR 5000) / R2.6 (SLR 8000)	User Defined (SLR5000/8000)	VSWR Alarm	The VSWR of the equipment that the station is coupled to is greater than 5:1. The station rolled power back to protect the PA.	The proposed remedies are as follows: **1.** Verify that the operational load that the station is connected to is more than 2:1 VSWR (minimum). The load must be more than 1.5:1. **2.** Replace the PA FRU.

Table 31: Repeater Alarms for the Chassis Sub-System

NOTE:
Alarms that appear only on the Repeater Log are as follows:

- Chassis Module ID Alarm
- Chassis HW Version Alarm

Alarm Name/Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
Chassis Module ID Failure Alarm/R1.0 (SLR 5000)/ R2.6 (SLR 8000)	Major (All)	None	The following list is the possible diagnosis: **1.** Flex cables are not connected properly. **2.** The EEPROM is corrupted. The hardware ID data is not valid.	The proposed remedies are as follows: **1.** Ensure that the flex is correctly connected to the modem **2.** Replace the chassis.
Chassis HW Version Incorrect Alarm/R2.6	Major (All)	None	Incorrect chassis hardware is installed.	Replace the chassis.

Table 32: Repeater Alarms for the Front Panel Board Sub-System

NOTE: All alarms appear only on the Repeater Log.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
Front Panel Board Module ID Failure Alarm/R1.0 (SLR 5000)/R2.6 (SLR 8000)	Major (All)	None	The following list is the possible diagnosis: **1.** Flex cables are not connected properly. **2.** The EEPROM is corrupted. The hardware ID data is not valid.	The proposed remedies are as follows: **1.** Ensure that the flex is correctly connected to the modem. **2.** Replace the Front Panel Board.
Front Panel Communications Failure/ R2.6 (SLR 8000)	Major (SLR8000)	None	Hardware failure when Communicate with Front Panel Board.	The proposed remedies are as follows: **1.** Ensure that the flex is correctly connected to the modem and the PSU. **2.** Replace the Front Panel Board.
Front Panel Program Fail	Major (SLR8000)	None	Indicative of a hardware failure.	The proposed remedies are as follows:

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
				1. Ensure that the flex is correctly connected to the modem and the PSU. 2. Replace the PSU.
Front Panel Hardware Version Incorrect/R2.6	Major (All)	None	Incorrect front panel hardware installed.	Replace front panel board.

Table 33: Repeater Alarms for the Power Supply Sub-System

NOTE:
Alarms that appear on both the Diagnostics Table View and the Repeater Log are as follows:

- Power Supply Unit (PSU) Over Temperature
- PSU Fan
- PSU Over Current
- Battery Revert
- Bad Battery
- Low Battery
- Battery Present

Alarms that appear only on Diagnostics Repeater Log are as follows:

- PSU Module ID Failure alarm
- PSU HW Version Failure
- PSU Communication Failure
- PSU Program Failure
- Power System alarm

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
PSU Over Temperature/R1.0 (SLR 5000)/R2.6 (SLR 8000) This alarm class is	Minor (SLR5000/8000)	Temp Alarm	Power supply temperature is outside of the specified limits, which allows rated power to be generated. Power supply shuts down until the temperature returns to a usable level.	The proposed remedies are as follows: 1. Replace fan. 2. Verify that the site temperature is within limits. 3. Verify that the air flow is not blocked on the

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
configured in the Customer Programming Software (CPS) 2.0.				repeater either at the intake or exhaust. 4. Replace the PSU FRU.
PSU Fan Failure / R1.0 (SLR 5000)/R2.6 (SLR 8000) This alarm class is configured in the Customer Programming Software (CPS) 2.0.	Minor (SLR5000/8000)	Fan Alarm	Malfunctioned power supply fan.	Replace the power supply fan.
PSU Over Voltage/ R1.0 (SLR 5000)/R2.6 (SLR 8000)	Informational (SLR5000/8000)	Power System Alarm	Power supply is at fault. Voltage sensed at the secondary voltage is too high.	Most likely a hardware issue. Replace the PSU. If possible, the alarm clears if the secondary voltage decreases within specifications.
PSU Over Current/ R1.0 (SLR 5000)/R2.6 (SLR 8000)	Minor (SLR5000/8000)	Power System Alarm	Power supply is at fault. Current sensed at the primary current is too high.	Most likely a hardware issue. Replace the PSU. If possible, the alarm clears if the primary current decreases within specifications.
Battery Revert	User Defined (SLR5000/8000)	Power System Alarm	The station is not at fault. The AC power source was interrupted and the station is operating on DC power.	The alarm clears when the AC power source is available again.
Bad Battery/R1.0 (SLR 5000)/R2.6 (SLR 8000) This alarm class is configured in the Cus-	Minor (SLR5000/8000)	Power System Alarm	The battery charger is unable to charge the battery.	Replace the battery.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
tomer Programming Software (CPS) 2.0.				
Low Battery/R1.0 (SLR 5000)/R2.6 (SLR 8000) This alarm class is configured in the Customer Programming Software (CPS) 2.0.	User Defined (SLR5000/8000)	Power System Alarm	Battery is nearing end of usefulness.	Replace the battery.
Battery Disconnected/ R1.0 (SLR 5000)/R2.6 (SLR 8000) This alarm class is configured in the Customer Programming Software (CPS) 2.0.	Minor (SLR5000/8000)	Power System Alarm	The battery is not connected properly. The alarm clears when the battery is connected.	Connect the battery properly.
PSU Module ID Failure Alarm/ R1.0 (SLR 5000)/R2.6 (SLR 8000)	Major (SLR5000/8000)	None	The Item data in EEPROM is corrupted. The hardware ID data is not valid.	Replace the PSU FRU.
PSU HW Version Incorrect/ R2.6 (SLR 5000)/R2.6	Major (SLR5000/8000)	None	Incorrect PSU hardware installed.	Replace the PSU FRU with the correct hardware version.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
(SLR 8000)				
PSU Communication Failure/ R1.0 (SLR 5000)/R2.6 (SLR 8000)	Major (SLR5000/8000)	None	Cannot communicate with the PSU or recognize the response from the PSU.	The proposed remedies are as follows: 1. Ensure that the flex connection between the modem and PSU is properly made. 2. Replace PSU.
PSU Program Failure/R2.6 (SLR 8000)	Major (SLR8000 only)	None	Indicative of a hardware failure.	The proposed remedies are as follows: 1. Ensure that the flex connection between the modem and PSU is properly made. 2. Replace PSU.
PSU Incompatible DC Supply/R.26 (SLR 8000)	Major (SLR8000 only)	Power System Alarm	Wrong battery type or incorrect DC voltage on supply.	Connect a correct battery type or adjust the DC supply voltage to the correct value.

Table 34: Repeater Alarms for the Receiver Sub-System

NOTE: All alarms appear on both the Diagnostics Table View and the Repeater Log.

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
RX Alarm/ R1.0 (SLR 5000)/R2.6 (SLR 8000)	Major (All)	RX Alarm	The receiver PLL has lost lock.	• Local Dealer:Replace receiver Field Replacement Unity (FRU). • Motorola Repair Depot: Repair or replace the receiver FRU.
RX Lock Detect	Major (All)	RX Alarm	Receiver first local oscillator out of lock, no RX functionality.	Could be hardware failure, excessive temperature at the RX local oscillator, or loss of the external reference signal. If Modem Temperature

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
				alarm is not set and reference unlock is not set, replace the modem. If temperature alarm is set, wait until it is within temperature and try again. If reference unlock alarm is set, address the external reference. If RX lock detect is still alarmed, replace the modem.
RSSI Indication Too Low/R1.00 (SLR 5000 and SLR 8000)	Informational (All)	RX Alarm	Receiver Signal Strength Indication (RSSI) is too low, possibly from hardware failure. It could be a fault in the antenna/feed or the station.	The proposed remedies are as follows: **1.** Ensure that the cable from the back wall is connected to the modem properly internal to the repeater. **2.** Replace the modem.
Forced Rest Failure/R1.0A (SLR 5000 and SLR 8000)	Minor (All)	RX Alarm	The channel often rotates due to the forced rotation while other channels of the system are rotating due to call activity.	The proposed remedies are as follows: **1.** Check if the RF interference exists. **2.** Check if the hardware is damaged.
Illegal Carrier/R2.6	User Defined (All)	Informational (SLR1000 only)	The receiver detected an interfering signal.	Check if the RF interference exists.

Table 35: Repeater Alarms for the Transmitter Sub-System

NOTE: All alarms appear in the Diagnostics Table View and the Repeater Log, except for the TX Power Alarm. The TX Power Alarm does not appear in Repeater Log.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
TX Alarm/ R1.0 (SLR 5000)/R2.6 (SLR 8000)	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The exciter PLL has lost lock.	• Local Dealer: Replace exciter FRU. • Motorola Repair Depot: Repair/recalibrate or replace the exciter FRU.
PA Fan Alarm/R1.4 (SLR 5000)/R2.6 (SLR 8000) For SLR 5000, this alarm class is configured in the Customer Programming Software (CPS) 2.0.	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The PA fan has failed.	• Local Dealer: Replace the PA Fan unit. • Motorola Repair Depot: Replace the PA Fan unit.
Fan Alarm	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The main fan of the repeater has failed.	• Local Dealer: Replace the Fan unit. • Motorola Repair Depot: Replace the Fan unit.
TX Power Alarm (not applicable to 8 MB Repeater)	Minor (enabled)	Major (locked)	Minor (enabled)	Major (locked)	The actual transmit power of the repeater has fallen below 50% of the configured power.	• Local Dealer: Check the environment first. If the alarm persists, consult the *MOTOTRBO Detailed Service Manual* for trouble-shooting or return the

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
						unit to Depot for service. ● Motorola Repair Depot: Check the environment first. If the alarm persists, consult the *MOTOTRBO Detailed Service Manual* for troubleshooting.
TX Power Minor Alarm (-2dB)/ R1.0 (SLR 5000)/R2.6 (SLR 8000) For SLR 5000 and SLR 8000 this alarm class is configured in the Customer Programming Software (CPS) 2.0.	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (disabled) Does not switch to Backup.	The PA output power is between 2dB to 3dB below the set output power of the station.	● Local Dealer: Replace PA FRU. ● Motorola Repair Depot: Repair, recalibrate, or replace the PA FRU.
TX Power Minor Alarm (-3dB)/ R1.0 (SLR 5000)/R2.6 (SLR 8000) For SLR 5000 and SLR 8000 this alarm	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (disabled) Does not switch to Backup.	The PA output power is more than 3dB below the set output power of the station, but at least one of the following "primary" alarms are also present: ● Fan Alarm	● Local Dealer: Remedy the primary alarms (see appropriate remedy). ● Motorola Repair Depot: Remedy the primary alarms (see appropriate remedy).

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
class is configured in the Customer Programming Software (CPS) 2.0.					• Temperature (Temp) Alarm • PA Voltage Minor Alarm • PA Voltage Major Alarm • VSWR Minor Alarm • VSWR Major Alarm	
TX Power Major Alarm (-3dB)// R1.0 (SLR 5000)/R2.6 (SLR 8000) For SLR5000 and SLR 8000, this alarm class is configured in the Customer Programming Software (CPS) 2.0.	Minor (enabled)	Major (locked)	Minor (enabled)	Minor (disabled)	The PA output power is more than 3dB below the set output power.	Local Dealer: Proposed remedies are as follows: **1.** Verify that the "Exciter to PA" cable or "voltage supply to PA" cable is properly installed. **2.** If no fault is found in remedy 1, replace the PA FRU. Motorola Repair Depot: Proposed remedies are as follows: **1.** Verify that the "Exciter to PA" cable or "voltage supply to PA" cable is properly installed. **2.** If no fault is found in remedy 1, repair, recalibrate, or replace the PA FRU.
PA Gain Alarm// R1.0 (SLR	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The PA power control loop is	Local Dealer: Proposed remedies are as follows:

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
5000)/R2.6 (SLR 8000) RDAC shows as Tx Gain Alarm.					near saturation or in saturation.	1. If an Exciter Final Amp Alarm and/or Exciter Driver Amp Alarm exist, then replace the Exciter FRU. 2. Replace the PA FRU. Motorola Repair Depot: Proposed remedies are as follows: 1. If an Exciter Final Amp Alarm and/or Exciter Driver Amp Alarm exist, then replace the Exciter FRU or troubleshoot or repair the Exciter's final/driver amplifier circuit. 2. Repair (check PA final stage first) or replace the PA FRU.
RF Power Control Alarm/R1.0 (SLR 5000)/R2.6 (SLR 8000) For SLR5000 and SLR 8000, this alarm class is configured in the Customer Programming Software (CPS) 2.0.	Minor (enabled)	Major (locked)	Minor (enabled)	Minor (Disabled)	The transmitter is delivering power in a de-keyed state or delivering more power in a keyed state than tolerancing allows.	• Local Dealer: Replace the PA FRU. • Motorola Repair Depot: Repair/recalibrate or replace the PA FRU.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
OCXO Failure/ R1.0 (SLR 5000)/R2.6 (SLR 8000) This alarm is only applicable to 800/900 MHz stations.	Major (locked)	Major (locked)	Major (locked)	Major (locked)	A standard stability reference (1.5ppm) System Clock Module (SCM) is installed into a 800/900 MHz station.	Replace the SCM with a version (DLN6718) that provides a high stability reference (0.1 ppm).
Interoperability Between Exciter and PA/ R1.0 (SLR 5000)/R2.6 (SLR 8000)	Major (locked)	Major (locked)	Major (locked)	Major (locked)	The PA and exciter do not have a compatible frequency range with each other.	Local Dealer: The proposed remedies are as follows: **1.** Verify that the correct PA or exciter is installed in the station. **2.** Verify that the backplane and PS cables to the PA are correctly installed. **3.** Replace the exciter or PA FRU. Motorola Repair Depot: The proposed remedies are as follows: **1.** Verify that the correct PA or exciter is installed in the station. **2.** Verify that the backplane and PS cables to the PA are correctly installed. **3.** Repair/recalibrate or replace the exciter or PA FRU.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
Reference Incompatibility/R1.0 (SLR 5000)/R2.6 (SLR 8000)	Major (locked)	Major (locked)	Major (locked)	Major (locked)	Reference PLL out of lock for desired external oscillator frequency setting.	Motorola Repair Depot: Connect station to an operational reference at the programmed frequency, program correct frequency of reference applied, or reprogram station to use internal reference.

Table 36: Modem Transmitter

NOTE:
Alarms that appear on both the Diagnostics Table View and the Repeater Log are as follows:

- TX Lock Detect
- Modem PA alarm

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
TX Lock Detect	Major (All)	TX Alarm	Transmitter frequency generation out of lock and the frequency is off.	Could be hardware failure or excessive temperature at the TX local oscillator. The proposed remedies are as follows: **1.** If Modem Temperature alarm is not set, replace the modem. **2.** If the temperature alarm is set, wait until it is within temperature and try again. **3.** If the TX lock detect is still alarmed, replace the modem.
Modem PA Alarm	User Defined (All)	TX Alarm	Modem PA is malfunctioning.	The proposed remedies are as follows: **1.** This alarm could be due to a PA FRU

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
				problem. If any PA alarms are active, address the alarms. 2. This alarm could be due to the modem PA over temperature. Address the Modem PA Temp Alarm (if present). 3. If Remedy 1 and Remedy 2 are not the issue, replace the modem FRU

Table 37: Repeater Alarms for the Wireline Card Sub-System

NOTE:
Alarms that appear on both the Diagnostics Table View and the Repeater Log are as follows:

- Wireline Board Module ID Alarm
- Wireline Hardware Version (HW Ver)

Alarm Name/ Initial Release	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
Wireline Board Module ID Failure Alarm/R2.6 (SLR 8000)	Major (SLR8000)	None	The following list is the possible diagnosis: 1. The flex cables are not connected correctly. 2. The Item data in EEPROM is corrupted. The hardware ID data is not valid. 3. The option is selected in CPS but not used in the station.	The proposed remedies are as follows: 1. Ensure that the flex cables are correctly connected. 2. Replace the wireline card. 3. If a wireline card is not required, correct the configuration in CPS to remove the wireline card.
Wireline Board Hardware Version/ R2.6 (SLR 8000)	Major (SLR8000)	None	Incorrect wireline board hardware installed.	Replace wireline board.

Table 38: Repeater Alarms for the Circulator Sub-System

NOTE: All alarms appear on both the Diagnostics Table View and the Repeater Log.

Alarm Name	Alarm Class	Name in Diagnostic View	Diagnosis	Probable Remedy
External Circulator Temp	Minor (SLR8000)	VSWR Alarm	Mistuned circulator or bad antenna VSWR.	The proposed remedies are as follows: **1.** Retune the circulator. **2.** Address the high antenna VSWR fault.

Table 39: Repeater Alarms for the Environmental Sub-System—External to Station

NOTE:

- All alarms appear in the Diagnostics Table View and the Repeater Log.
- The user can configure the following alarm class with Customer Programming Software (CPS) 2.0: Temp alarm, VSWR minor alarm, VSWR major alarm, PA Final Over Temperature alarm, Modem Fan Failure alarm, and Backhaul Chain alarm.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
Temp Alarm/ R1.0 (SLR 5000) / R2.6 (SLR 8000)	Minor (enabled)	Minor (enabled)	Minor (enabled)	Minor (enabled)	The station has exceeded the temperature limit that allows maximum rated output power from the PA.	Local Dealer: The proposed remedies are as follows: **1.** If the Fan Alarm is present, Fan Alarm can cause the Temp Alarm to be issued as a secondary alarm. If applicable, correct the Fan Alarm first. See Fan Alarm. **2.** If the Fan Alarm is not present, power cycle/reset the station so that the firmware can provide an up-to-date status on the integrity of the fan. This action is needed since the polling rate of the fan is substantially less than

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Back-up Repeater	with Back-up Repeater	Single Repeater	Multi Repeater		
						the polling rate for temperature. 3. If no fault is found in Remedy 1, verify that there is not a problem with the site temperature itself. The station clears the Temp Alarm and allow maximum rated output power when the temperature of the site is lowered. 4. If no faults are found in Remedies 1 and 2, verify that the rack and cabinet installations of the station are in accordance with the product planner instructions. 5. If no faults are found in Remedies 1, 2, 3, and 4; replace the PA FRU. Motorola Repair Depot: The proposed remedies are as follows: 1. The presence of Fan Alarm can cause the Temp Alarm to be issued as a secondary alarm. If applicable, correct the Fan Alarm first, see Fan Alarm. 2. Repair, replace, or recalibrate the PA FRU.
External reference clock internal fallback Unlock// R1.0 (SLR	Minor	Major	Minor	Major	External reference does not match what is programmed, reference	The proposed remedies are as follows: 1. Connect station to an operational reference at the programmed frequency,

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
5000) / R2.6 (SLR 8000)					cannot lock to external reference. However the station can run on internal clock.	program correct frequency of reference applied, or reprogram station to use internal reference. 2. Replace modem because the internal reference has failed.
PA Final Over Temperature/ R1.0 (SLR 5000) / R2.6 (SLR 8000)	Minor	Minor	Minor	Minor	PA final temperature is outside specified limits.	The proposed remedies are as follows: 1. If any fan alarm is present, replace fan. 2. If no fan alarm is present, verify that the site temperature is within limits. 3. If no fan alarm and site temperature is within limits, replace PA FRU.
Modem Fan Failure/R1.0 (SLR 5000) / R2.6 (SLR 8000)	Minor	Minor	Minor	Minor	The modem fan is failing or has failed.	Replace the modem fan.
Circ temperature/R2.6 (SLR 8000)	Minor	Minor	Minor	Minor	The circulator is mistuned or the VSWR antenna is bad.	Retune the circulator or replace the VSWR antenna.
Backhaul Chain alarm/ R2.9 (SLR 1000, SLR 5000, and SLR 8000) Alarm class is always major. RDAC refers to the alarm list query from the	Major	Major	Major	N/A	There is alarm triggered from the repeater in the Backhaul repeater chain.	Application should query full list through Backhaul Control command when receive Backhaul alarm broadcast.

Alarm Name/ Initial Release	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	Single Repeater	Multi Repeater		
Backhaul Control command.						

3.2.4
RAS Alarm

This section provides a list of MOTOTRBO Restricted Access to System (RAS) alarms, the alarm class, as well as the diagnosis and probable solution to resolve the issue.

The following table lists the repeater alarms for the sub-systems:

Table 40: Repeater Alarms for Software Sub-System

NOTE: The RAS CFS failure alarm appears in the Repeater Log.

Alarm Name	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	without Backup Repeater	with Backup Repeater		
RAS CFS Failure Alarm	Major (locked)	Major (locked)	Major (locked)	Major (locked)	When the whole system is configured in the RAS Enable Mode, which the Administrator configures in the Intermediary Security Panel—Authentication options in Restricted Access to System, the repeater falls into Repeater locked state, if this feature has not been purchased.	Probable remedies are as follows: 1. Reconfigure the intermediary to RAS Migration or RAS Disable Mode in Customer Programming Software (CPS) locally or remotely, then use CPS to un-

Alarm Name	Alarm Class (radio state) (Non-Capacity Plus System)		Alarm Class (radio state) (Capacity Plus System)		Possible Diagnosis	Probable Remedy
	without Backup Repeater	with Backup Repeater	without Backup Repeater	with Backup Repeater		
						lock the failed repeater. 2. Purchase the RAS feature for the failed repeater, then use CPS to unlock the failed repeater.

3.3

Radio States

This section provides information about the radio states.

Table 41: Radio States

For more information about radio alarm classification, refer to Radio Alarms on page 31

Working State	Description
Enabled	In this state, the radio can transmit, receive, and repeat.
Disabled	In this state, the radio cannot transmit, receive, or repeat, but the radio still responds to the General Programmable Input Output (GPIO) GPIO controls, such as channel steering and to alarms and diagnostics. The radio exits this state when the GPIO control indicates an enable event.
Locked	A radio enters this state when some major alarms occur on the radio. In this state, the radio does not transmit, receive, repeat, or respond to any controls except for diagnostics and state/alarm log retrieval. If for any reason the radio resets while in this state, it re-enters the Locked state. A technician can service the radio to exit this state by fixing the major alarm issue and rewriting the codeplug into the radio using the Customer Programming Software (CPS).

3.4
Voting Repeater

Voting repeater allows you to connect with the voting repeater on IP Site systems, Capacity Plus systems, and Linked Capacity Plus systems over an internet protocol (IP)-based user datagram protocol (UDP) connection.

This feature is supported in the IP connection mode only.

3.5
Satellite Receiver

Satellite receiver allows you to connect with the satellite receiver IP Site systems, Capacity Plus systems, and Linked Capacity systems over an IP-based UDP connection.

This feature is supported in the IP connection mode only.

3.6
Backhaul Status Repeater

Digital Repeater Backhaul is a backhaul solutions that use radio frequency (RF) to communicate between sites. This configuration is built upon the existing IP Site Connect (IPSC) system configuration.

The two types of backhaul repeaters are Drop repeater and Link repeater. Drop repeater is a traditional repeater that is connected to other repeaters at the same site through a local area network (LAN). Drop repeaters transmit calls that can be heard by subscribers and other Link repeaters at adjacent sites. The other repeaters at the site are Link repeaters.

Link repeater is a type of repeater that communicates only with other repeaters through the land mobile radio (LMR) channel. Link repeaters are also connected to other Drop and Link repeaters at the same site though a LAN.

3.7
Auto Connect Behavior

This section provides general information about Auto Connect behavior.

After launching, the Repeater Diagnostics and Control (RDAC) connects automatically to the system that it was connected to when it was closed for the last time. If the application was never connected to a system before, it does not connect to a system automatically. This feature is supported in IP connection mode only.

Chapter 4

Extended RDAC Feature

This section shows you ways to purchase and register the extended features. Features are not transferable from one PC to another.

Multiple systems are available for purchase. It enables monitoring and controlling multiple unique system simultaneously.

Contact the Network Administration if the PC is unable to communicate with the license server.

4.1 Purchasing an Application Feature

This procedure shows you how to purchase a Repeater Diagnostics and Control (RDAC) application feature.

Procedure:

1. Go to Motorola Solutions Online (MOL)
2. Purchase the extended RDAC feature.
3. Motorola Solutions provides EID.

   Keep the EID in a safe place because the EID is used to identify the purchased features and is necessary for enabling those features on the personal computer (PC).
4. Register this feature to enable the feature. For more information, refer to Registering an Application Feature on page 85.

4.2 Registering an Application Feature

This procedure shows you how to register a Repeater Diagnostics and Control (RDAC) application feature.

Procedure:

1. Click the **Help** → **Register Feature** in the RDAC application.

   During registration, an external Internet connection is required.
2. Enter the EID.

   After registration is complete, the selected feature is available in the application.
3. Selects the feature you want to download to the PC.

4.3

Recovering an Application Feature

This procedure allows the user to recover (re-download) all registered application licenses to the PC.

Procedure:

1. In the RDAC application, click **Help** → **Recover Features** .

   The **Recover Application Licenses Status** dialog box appears and provides the status of the recover operation. After the licenses recovering, the success message appears.

2. To exit the process, click **Close**.

Chapter 5

RDAC Features

Repeater Diagnostics and Control (RDAC) screen design is made to be simple, easy to access, and easy to understand. The RDAC interface contains Diagnostics Table View, Diagnostics View, and Voting Details View.

5.1 Diagnostic Table View

Diagnostics Table View is the top frame that displays a list of radios and diagnostics information in a table form.

The Diagnostic Table View is not editable. When local mode is selected, at most one radio row is displayed in this table. However, when remote mode is selected, multiple rows can be displayed in this table. For more information about local mode or remote mode, refer to Connection Mode Tab on page 16.

When the Repeater Diagnostics and Control (RDAC) is installed, only some columns are displayed by default. You can add more columns to the Diagnostics Table View. For more information, see Retrieving Software Alarm Data on page 96.

When a radio is disconnected from the application, its row in the table is greyed out. The icon is displayed when the application is attempting to re-connect to a radio. The icon is displayed when the connection to the radio is lost. For radio alarm classification, refer to Radio Alarms on page 31.

The columns display in the following order:

5.1.1 Status Column

The Status column displays the overall alarm status for all the connected radios.

The alarm can be in a detected, released, or locked state for some radio alarms. The alarm status is detected when any of the radio alarms is detected for the current row. Some alarms go into the locked state when the **State** value in this table is **Locked**. For more information about the radio states, refer to Radio States on page 83.

The image in the Status column also displays the status of the Network Interface Service. The status value is in a detected state when the connected Network Interface Service status is in faulty condition, and is in a released state when the MOTOTRBO Network Interface Service (MNIS) operation is fine.

Table 42: Status Value Description

Display	Description of the Status Value
	A major alarm message is detected in a connected radio, or the Network Interface Service is in a faulty condition.
	A minor alarm message is detected.
	The alarm is released in a connected radio, or the Network Interface Service is in good operational condition.
	The radio is in a Locked state.

Display	Description of the Status Value
	The alarm is not applicable.

Some extended alarm information is available only in the Repeater Log that is not available in the Diagnostics Table view. For more information, refer to Radio Alarms on page 31.

The MTR3000 base radio/repeater alarms go into the not applicable state when the connected radio is any platform other than the MTR3000 base radio/repeater.

5.1.1.1
Filtering Alarms

Some of the alarms are displayed by default but the user can choose the alarms to display or hide.

Procedure:

1. Right-click on the Status Table View header.
2. Check a header name to display the alarm or uncheck a header name to hide the alarm.

5.1.1.2
Displaying All Alarms

Procedure:

1. Right-click on the Status Table View header.
2. Select **Show All** option.

5.1.2
Site ID Column

The Site ID column displays the identification (ID) of the site that any connected radio is in. This feature is available when System Type is set to Linked Capacity Plus.

You can click on the additional filter icon in the Site ID column header and select the option from the dropdown list to show only rows that the Site ID column contains the selected option.

5.1.3
IP Column

The IP column displays the radio or the MOTOTRBO Network Interface Service (MNIS) Ethernet internet protocol (IP) address of any connected radio, including the Master if in remote mode.

When connected in local mode, only the IP address is displayed. This IP address is the Radio IP address that is preprogrammed in the Customer Programming Software (CPS).

5.1.4
IP Site UDP Port Column

The IP Site UDP Port column displays the port number of any connected radio or the MOTOTRBO Network Interface Service (MNIS), including the master if in remote mode.

When connected in local mode, only the IP address is displayed. This IP address is the radio IP address. Port number displays as **N/A**.

5.1.5
Radio ID Column

The Radio ID column displays the identity (ID) of any connected radio or the MOTOTRBO Network Interface Service (MNIS).

5.1.6
Radio Name Column

The Radio Name column displays the name of any connected radio.

5.1.7
Service Column

The Service column displays the Peer to Peer Protocol (P2P) peer service type of any connected radio. When connected in local mode, this column displays **N/A**.

The following table lists the functionality of each option.

Table 43: Service Column Description

Option	Functionality
Peer	One of the entities connected to the IP system.
Master	The radio is designated as the master.
MNIS	The connected peer is the MOTOTRBO Network Interface Service (MNIS).

5.1.8
Voting Type Column

The Voting Type column displays the voting type for any connected Voter or Satellite Receiver. This feature allows you to filter the Diagnostics Table View by voting type.

The following table lists the functionality of each option.

Table 44: Voting Type Column Description

NOTE:

- This feature is supported for voter and satellite receiver only.
- This feature is supported in IP connection mode only.

Option	Functionality
N/A	The voting type for the current repeater is not configured as voting enabled.
Voter	The voting type for the current repeater is configured as digital voter-enabled.
Satellite Receiver	The voting type for the current repeater is configured as digital satellite receiver-enabled.

5.1.9
Voter ID Column

The Voter ID column displays the voter identification (ID) of any connected voter or satellite receiver. This feature allows you to filter the Diagnostic Table View by the voter ID.

The following table lists the functionality of each control and button.

Table 45: Voter ID Column Description

NOTE:

- This feature is supported for voter and satellite receiver only.
- This feature is supported in IP connection mode only.

Control and Button	Functionality
Tree View	List all available voter ID for the current system. If current system not has any repeaters at the Diagnostics Table View, only **Select All** node is displayed.
Select All	Allows you to select all voter ID. This node is checked by default, and it is always the first node at the Tree View.
OK button	Commits the filter to filter the Diagnostics Table View and closes the dialog.
Cancel button	Cancels all user changes and closes the window.

5.1.10
Firmware Version Column

The Firmware Version column displays the firmware version of any connected radio. The range for the firmware version is defined as a variable length ASCII string.

5.1.11
Codeplug Version Column

The Codeplug Version column displays the codeplug version of any connected radio. Codeplug is the information stored in the radio to support radio software. Codeplug version identifies the version programmed in the radio.

5.1.12
Radio States Column

The Radio States column displays the state of any connected radio.

The following table lists the functionality of each state.

Table 46: Radio States

For more information about radio alarm classification, refer to Radio Alarms on page 31

Working State	Description
Enabled	In this state, the radio can transmit, receive, and repeat.

Working State	Description
Disabled	In this state, the radio cannot transmit, receive, or repeat, but the radio still responds to the General Programmable Input Output (GPIO) GPIO controls, such as channel steering and to alarms and diagnostics. The radio exits this state when the GPIO control indicates an enable event.
Locked	A radio enters this state when some major alarms occur on the radio. In this state, the radio does not transmit, receive, repeat, or respond to any controls except for diagnostics and state/alarm log retrieval. If for any reason the radio resets while in this state, it re-enters the Locked state. A technician can service the radio to exit this state by fixing the major alarm issue and rewriting the codeplug into the radio using the Customer Programming Software (CPS).

5.1.13
Knockdown Column

The Knockdown column displays the current knockdown setting of any connected radio.

The following table lists the functionality of each setting.

Table 47: Knockdown Column Description

Setting	Description
Knockdown	The radio does not repeat but still can receive and transmit on wire line audio.
Repeat	Normal repeat functionality.

5.1.14
Channel Name Column

The Channel Name column displays the current channel alias of any connected radio.

5.1.15
Channel Type Column

The Channel Type column displays the current channel signaling type of any connected radio.

The following table describes each channel type.

Table 48: Channel Type Column Description

Channel Type	Description
Analog	Repeater is set to an Analog channel.
Digital	Repeater is set to a Digital channel.
Mixed Mode	Repeater switches between Analog and Digital modes based on the call type received from the subscriber radios. The knock-down/repeat indication in this mode is for analog calls only and digital calls can always be repeated when the repeater is not in analog mode.
Capacity Plus Voice	Repeater is set to a Capacity Plus voice channel.

Channel Type	Description
Capacity Plus Data	Repeater is set to a Capacity Plus data channel.
Linked Capacity Plus Voice	Repeater is set to a Linked Capacity Plus voice channel.
Linked Capacity Plus Data	Repeater is set to a Linked Capacity Plus data channel.

5.1.16
IP Site Connect Column

The IP Site Connect column displays the slot allocation for remote mode of any connected radio.

The following table lists the description of each slot allocation.

Table 49: IP Site Connect Column Description

The cell displays **N/A** when Channel Type value is **Analog** for the current row.

Slot Allocation	Description
None	Indicates Single-site of the current channel or local mode.
Slot 1	Indicates Slot 1 of the current channel.
Slot 2	Indicates Slot 2 of the current channel.
Slot 1 & 2	Indicates Slot 1 and 2 of the current channel.

5.1.17
Alarm Columns

The Diagnostics Table View displays alarm status as image.

The following table lists the alarm statuses available in the Diagnostics Table View column. The table also lists the possible states for the alarms and the scenario when the alarm status is detected.

Table 50: Alarm Status and States

Alarm Status	States	Description
RX Alarm	Detected Released Locked	The alarm status is detected when a radio is in the Receive (RX) mode. The alarm goes into the locked state when the State value in the Diagnostics Table View is **Locked**.
TX Alarm	Detected Released Locked	The alarm status is detected when a radio is in the Transmit (TX) mode. The alarm goes into the locked state when the State value in the Diagnostics Table View is **Locked**.
Temperature (Temp) Alarm	Detected Released	The alarm status is detected when a radio is detected to be overheated.
Fan Alarm	Detected Released	The alarm status is detected when fan failure is detected in a radio.
Power Amplifier (PA) Voltage Alarm[1]	Detected Released	The alarm status is detected when PA voltage failure with high, intermediate-low, or low voltage is detected in a radio.

Alarm Status	States	Description
	Not Applicable	When this alarm is detected, check the Repeater Log to determine which failure has occurred. This alarm goes into the not applicable state when the connected radio is any platform other than the MTR3000 base radio/repeater.
Voltage Standing Wave Ratio (VSWR) Alarm [2]	Detected Released Not Applicable	The alarm status is detected when the VSWR ratio is higher than 5:1 or between 3:1 to 5:1 in a radio. It goes into the not applicable state when the connected radio is any platform other than the MTR3000 base radio/repeater.
TX Power Alarm	Detected Released Not Applicable	The alarm status is detected when the radio detects that the actual transmit power of the radio has fallen below 50% of the configured power.
TX Gain Alarm	Detected Released Not Applicable	The alarm status is detected when low transmitter gain is detected in a radio. This alarm goes into the not applicable state when the connected radio is any platform other than the MTR3000 base radio/repeater. **NOTE:** This alarm status is applicable for MTR3000 base radio/repeater only.
Backplane Supply Alarm	Detected Released Not Applicable	The alarm status is detected when the radio detects that one or both of the backplane linear regulators are delivering potentials outside of their specified range. This alarm goes into the not applicable state when the connected radio is any platform other than the MTR3000 base radio/repeater. **NOTE:** This alarm status is applicable for MTR3000 base radio/repeater only.
Software Update Management Alarm	Detected Released Locked Not Applicable	The alarm status is detected and the repeater goes into a locked state when the repeater's firmware is updated without Software Update Management license. When repeater is in a locked state, all alarms are greyed out.
External (Ext.) Circulator Temp Alarm	Detected Released Not Applicable	The alarm status is detected when the radio detects that a high VSWR is present at the external double circulator tray option. This alarm goes into the not applicable state when the connected radio is any platform other than the MTR3000 base radio/repeater. **NOTE:** This alarm status is applicable for MTR3000 base radio/repeater only.
Power System Alarm	Detected Released	This alarm status is only applicable for MOTOTRBO SLR 5000 repeaters.

[1] Displays the PA Voltage Major or PA Voltage Minor Alarm.
[2] Displays the VSWR Major and VSWR Minor Alarm.

Alarm Status	States	Description
	Locked Not Applicable	
Frequency Reference Alarm	Detected Released Locked Not Applicable	This alarm status is only applicable for MOTOTRBO SLR 5000 repeaters.
Forced Rest Failure Alarm	Detected Released	In a normal condition, the rest channel rotates due to call activity. A rest channel is force-rotated if the Rest Channel Time-out-Timer (Rest Channel TOT controls the duration of the repeater staying in its Rest Channel role) expired and no call has arrived on it during the average inter-call arrival time. When the reset channel is force-rotated, the "Preference Level" of a repeater is set to the lowest value, and rest channel can only be allocated to the repeater when all other higher preference channels are occupied. If the rest channel is force-rotated on a repeater excessively compared with other repeaters at the site, this alarm is flagged. This alarm is an indication of a receive issue on the repeater (may be due to interference or hardware). If the force rest failure alarm is generated due to interference, you can still start a call on this repeater when it is the rest channel and the interference has been removed. If any call is made successfully on this repeater, this alarm is cleared and the "Preference Level" of this repeater can be restored to the value configured in the Customer Programming Software (CPS). **NOTE:** This feature is only applicable for Linked Capacity Plus and Capacity Plus system only.
Backhaul Status alarm	Present	The Backhaul Status alarm indicates the status of the backhaul chain that is connected to the proxy repeater. If an alarm condition is present, you can view the **Backhaul Status** window. For more information, see Retrieving Software Alarm Data on page 96.

5.1.18
Voting Details Column

The Voting Details column is only displayed when you select a peer that has its Voting Type set to **Voter** or **Satellite Receiver**.

You can right-click on the data grid to launch the Voting Details View on page 99.

5.1.19

Right-Click Menu in Diagnostics Table View

In the Diagnostics Table View, there are available menus when you right click on any of the data grid.

The following table lists the functionality of each option.

Table 51: Right-Click Menu Description

Menu	Description
Voting Details...	The **Voting Details View** appears when this menu is selected. For more information, see Voting Details View on page 99. The Voting Details menu is only displayed when you select a peer that has its Voting Type set to **Voter** or **Satellite Receiver**.
Retrieve Software Alarm Data	Retrieve Software Alarm Data allows you to enable the Repeater Diagnostics and Control (RDAC) to retrieve the software alarm data from the repeater and store the data in a log file. This menu is only displayed when you enable the Enable Logging checkbox. For more information about Enable Logging checkbox, see Email SMTP Tab on page 20. For more information, refer to Retrieving Software Alarm Data on page 96.
Clear Software Alarm Data	Clear Software Alarm Data allows you to clear the software alarm data in the repeater. This menu is only displayed when you disable the Enable Logging checkbox. For more information about Enable Logging checkbox, see Email SMTP Tab on page 20. For more information, refer to Clearing Software Alarm Data on page 96.
Software Alarm Data Log Behavior	Stores the software alarm data in log format after you enable the Retrieve Software Alarm Data. This feature supports automatic and manual modes. In manual software alarm data log behavior mode, you can use the Retrieve Software Alarm Data and Clear Software Alarm Data. In automatic software alarm data log behavior mode, RDAC retrieves the software alarm data and store the data automatically at the configured intervals. The maximum size for each software alarm data log is 10 MB. The log is at the following path: `%ProgramData%\Motorola\MOTOTRBO RDAC\Software Alarm Logs\` **NOTE:** • The logging information is important for developers to analyze the root cause of the reported alarm. • This feature is supported in the IP connection mode and Local connection mode.
Backhaul Status	Displays the **Backhaul Status** window. This menu option is only available when there is backhaul chain connected to the proxy repeater.

5.1.20
Retrieving Software Alarm Data

You can retrieve the software alarm data from the repeater if you enable the Diagnostics Logging.

Procedure:

1. In the Diagnostics Table View, right-click any of the data grids.
2. From the drop-down menu, select **Retrieve Software Alarm Data**.

   After the process is complete, a message dialog box appears to indicate the operation results.

5.1.21
Clearing Software Alarm Data

You can clear the software alarm data from the repeater if you enable the Diagnostics Logging feature.

Procedure:

1. In the Diagnostics Table View, right-click any of the data grids.
2. From the drop-down menu, select **Clear Software Alarm Data**.

   After the process is complete, a message dialog box appears to indicate the operation results.

5.1.22
Displaying Backhaul Status Window

If the Backhaul Status alarm is present, you can view rhe **Backhaul Status** window.

Procedure:

1. In the Diagnostics Table View, right-click any of the data grids.
2. From the drop-down menu, select **Backhaul Status**.

   After the process is complete, a message dialog box appears to indicate the operation results.

5.1.23
Displaying Columns in Diagnostics Table View

When the Repeater Diagnostics and Control (RDAC) is installed, only some columns are displayed by default. You can add more columns to the Diagnostics Table View.

Procedure:

1. In the Diagnostics Table View, right-click on the table header.
2. From the drop-down menu, choose the columns to show.

5.2

Backhaul Status Window

Backhaul Status window displays the alarm conditions for all the backhaul repeaters that are connected to the proxy repeater.

Table 52: Backhaul Status–Columns and Buttons

Columns and Buttons	Description
Repeater ID	Displays the repeater identification (ID) of the backhaul repeater that is connected to the proxy repeater.
Status	Displays whether the backhaul repeater is present[3]
Role	Displays the type of backhaul repeater. Either the backhaul repeater is a drop repeater or a link repeater.
Power Supply alarm	Displays the status of the Power Supply (PS) alarm on the backhaul repeater.
Fan alarm	Displays the status of the Fan alarm on the backhaul repeater.
VSWR alarm	Displays the status of the Voltage Standing Wave Ratio (VSWR) on the backhaul repeater.
Over Temperature alarm	Displays the status of the Over Temperature alarm on the backhaul repeater.
Battery alarm	Displays the status of the Battery alarm on the backhaul repeater.
Power Rollback alarm	Displays the status of the Power Rollback alarm on the backhaul repeater.
Battery Revert alarm	Displays the status of the Battery Revert alarm on the backhaul repeater.
User Defined Alarm 1	Displays the status of the User Defined Alarm 1 on the backhaul repeater.
User Defined Alarm 2	Displays the status of the User Defined Alarm 2 on the backhaul repeater.
User Defined Alarm 3	Displays the status of the User Defined Alarm 3 on the backhaul repeater.
User Defined Alarm 4	Displays the status of the User Defined Alarm 4 on the backhaul repeater.
User Defined Alarm 5	Displays the status of the User Defined Alarm 5 on the backhaul repeater.
Refresh button	Updates all the parameters of the **Digital Backhaul Status** window.

[3] Connected to the proxy repeater.

5.3

Diagnostics View

This Diagnostics View are the bottom frame that displays the additional diagnostics information for the currently selected radio in the Diagnostics Table view.

Table 53: Diagnostics View–Fields and Buttons

NOTE:

- The RSSI View, RSSI, RSSI Slot 1, and RSSI Slot 2 are disabled if the currently selected radio row in the Diagnostics Table View is disabled.
- The RSSI View, RSSI, RSSI Slot 1, and RSSI Slot 2 are enabled when the Channel Type value in the Diagnostics Table View is **Digital**, or when the repeater is repeating the Digital call or in idle state in **Mixed Mode**.
- The Diagnostics Name, Diagnostics Value, and Query button are disabled when the currently selected repeater row in Diagnostics Table View is disabled.
- The Diagnostics Name, Diagnostics Value, and Query button are hidden when the currently selected peer is not a MOTOTRBO SLR 5000 repeater.

Fields and Buttons	Description
RSSI View	Displays the additional diagnostics information for the currently selected radio in the Diagnostics Table View. This button is disabled when the current selected peer is the MOTOTRBO Network Interface Service (MNIS).
RSSI	Displays the received signal strength indicator (RSSI) of the radio highlighted in the Diagnostics Table View after you click the Read RSSI button.
RSSI Slot 1	Displays the RSSI for Slot 1 of the radio highlighted in the Diagnostics Table View when the Read RSSI button is clicked.
RSSI Slot 2	Displays the RSSI for Slot 2 of the radio highlighted in the Diagnostics Table View when the Read RSSI button is clicked.
Read RSSI button	Allows you to read the RSSI of the radio highlighted in the Diagnostics Table View into the Slot 1 RSSI and Slot 2 RSSI boxes (if in digital mode) or the RSSI box (if in analog mode) when clicked.
Diagnostics Name	Displays and allows you to select one diagnostics name to query its value from the repeater. The available choices are as follows: • **External Battery Voltage** • External Battery Charging Current • External Battery Charging Voltage • AC Voltage • DC Current • Modem Temperature • Modem Current • Modem Voltage • Exciter Current Sense

Fields and Buttons	Description
	• Control Voltage • PA Current 1 • PA Current 2 • PA Current 3 • PA Current 4 • PA Temperature • Output Power • VSWR
Diagnostics Value	Displays the diagnostics value of the current selected repeater. NaN indicates that the functionality is not available in the queried hardware. **NOTE:** AC Voltage polling is not available for the SLR 5000 repeaters with the following Tanapa numbers: PMUD3327B, PMUE4392B, PMUE4522B.
Query button	Allows you to query the diagnostics value of the repeater into the Diagnostics Value.

5.4 Voting Details View

The Voting Details view displays a list of repeaters in the current voting system and voting information as a table. The Repeater and Diagnostics Control (RDAC) also displays the digital voting status information and controls the digital voting repeater in the Voting Details window.

Voting Details View is only supported for Voter or Satellite Receiver in the IP connection mode only. In the Single Site system, this view displays the Voter and all its receivers. In the IP Site system, this view displays the selected Voter and all its receivers. Only one Voter is displayed at a time. In the Capacity Plus system, this view displays all the Voters and receivers in the system. In the Linked Capacity Plus system, this view displays all the Voters and receiver of the same site only. If multiple sites are present in the system, only one site is shown at a time.

The columns display in the following order:

Table 54: Voting Details View–Columns

NOTE: Voting Type and Voting Filter are only supported for Voter and Satellite Receiver only.

Column	Description
Radio ID	Displays the repeater ID.
Radio Name	Displays the name of any connected repeater.
Voting Type	Displays the voting type for any connected Voter or Satellite Receiver. If voting is not enabled for the current repeater, "N/A" is displayed. If voting type for the current repeater is configured as Digital Voter-enabled, "Voter" is displayed. If voting type for the current repeater is configured as Digital Satellite Receiver-enabled, "Satellite Receiver" is displayed.

Column	Description
	For more information, see Voting Type Filter on page 105.
Voting Filter	Displays the voting type for any connected Voter or Satellite Receiver. For more information, see Voting Type Filter on page 105.
Update Rate	Displays the voting status update rate. The available options are as follows: **None** **Normal** **Diagnostic**
Slot 1 Voting Status	Displays the voting status information for the Satellite Receiver and the internal receiver[4] for Slot 1. For the Receiver, the available options are as follows: **N/A** **Disabled** **Synchronizing** **Idle** **Receiving** **Voted** For Voter, the available options are as follows: **N/A** **Idle** **Receiving** **Voted**
Slot 2 Voting Status	Displays the voting status information for the satellite receiver and the internal receiver for Slot 2. For the Receiver, the available options are as follows: **N/A** **Disabled** **Synchronizing** **Idle** **Receiving** **Voted** For Voter, the available options are as follows: **N/A** **Idle** **Receiving** **Voted**
Slot 1 Signal Quality	Displays the SQE for the satellite receiver and the internal receiver for Slot 1 Signal Quality Error (SQE). This slot only provides the signal quality values when the voting status of a receiver (satellite receiver or the internal receiver) is **Receiving** or **Voted**. The available values are as follows: Bad/Rejected

[4] The internal receiver is the receiver in the voting repeater.

Column	Description
	Poor Fair Good Excellent The internal receiver is the receiver in the voting repeater.
Slot 2 Signal Quality	Displays the SQE for the satellite receiver and the internal receiver for Slot 2 SQE. This slot only provides the signal quality values when the voting status of a receiver (satellite receiver or the internal receiver) is **Receiving** or **Voted**. The available values are as follows: Bad/Rejected Poor Fair Good Excellent
Force Vote	Displays the force voting status for Voting Repeater or Satellite Receiver. The available options are as follows: **Enabled** **Disabled**
Force Vote Control	Allows users to change the Force Vote status. The available options are as follows: **Enabled** **Disabled** Force Vote Control is enabled when the Remote Mode is enabled. When enabled, a message is displayed when another repeater is selected, prompting you to write or discard changes. This feature is disabled when the current selected repeater is disconnected. This feature is supported in the IP connection mode only.
Update Rate Control	Allows you to change the voting status update rate. This feature is applicable for Voter only and is only supported in the IP connection mode only. The available options are as follows: **None** **Normal** **Diagnostics** A message is displayed when another repeater is selected, prompting the user to write or discard changes Update Rate Control is disabled when the current selected repeater is a Satellite Receiver.
Log Digital Voting Status	Allows you to turn on or turn off Digital Voting Log for all repeaters. Log Digital Voting Status is supported for voting repeater and satellite receiver in IP connection mode only.
Write button	Allows you to write digital voting changes to the repeater. The Write button is only enabled when you have modified a value in the Force Voting Control or the Update Rate Control. Otherwise, the button is disabled.

Column	Description
	This button is only supported in the IP connection mode only.
RDAC Log button	Displays the Voting Details Log.

5.4.1

Voting Details Log

This feature allows user to open and display the voting log dialog for any selected Voter or Satellite Receiver.

The data grid view for the Voting Log is as follows:

Table 55: Voting Log

Fields and Buttons	Descriptions
Select Date Range	This feature allows the user to select a date range to filter out the log entries by date when enable. Disabling this feature causes the table to display rows in the entire date range of the source data. To select date range, see Selecting a Date Range on page 104.
Start Date	This feature allows the user to select a starting date for the date filter. The default value must be the current less one week. Selecting a start date shall filter the row entries for the display table to be within range of the start date value to the current date.
End Date	This feature allows the user to select an ending date for the date filter. The default value must be the current date. The minimum date range for the control shall be no less than the current value of the Start Date. The maximum range for the control shall be the current date. Selecting an end date shall filter the row entries for the display table to be within range of the start date value to the selected end date.
Log View (Voting)	Allows the user to switch between **Default** view and **Voting** view. If the user selects **Default**, the RDAC log report is displayed. If the user selects **Voting**, the Voting Log view is displayed.
Select System (Voting Details Log)	Allows the user to clear the system filter. Entries can be filtered by selecting a system to view only those entries associated with a particular system when enabled. Disabling this feature causes the table to display rows in the entire system range of the source data. This feature is enabled by default if a system tab is opened when the log dialog is launched. However, when no system tabs are opened, this feature is disabled.
System ID	Displays the system alias. For events logged in Remove mode, this field shall be prefixed with the string 'IP: '. This feature is not editable.
Date Time	Displays the timestamp of the PC clock time of the log event.
Radio ID	Displays the repeater ID of the repeater associated with the logged event. This feature is not editable.
Voter ID (Voting Details View)	This feature displays the Voter ID of any connected Voter or Satellite Receiver. This feature allows user to filter the current data view in the voting detail log. Refer to Voter ID (Voting Details View) on page 103 for functionality of each option.

Fields and Buttons	Descriptions
Voting Type (Voting Details View)	This feature displays the voting type for any connected Voter or Satellite Receiver. The available options are **N/A**,**Voter**,and **Satellite Receiver**. Refer to Voter ID (Voting Details View) on page 103 for functionality of each option.
Radio Name	Displays the radio name of the repeater associated with the logged event. This feature is not editable.
Event Type	Displays a description of the Log entry. This feature is not editable.
Response	Displays a description of the log event results. This feature is not editable.
Print	This button allows the user to print the currently displayed log. If the report fails to be printed or encounters any errors, an error is shown. Default Internet Explorer (IE) print functionality is used.
Print Preview	This button allows the user to preview the log before printing. Default Internet Explorer (IE) print preview window is used.
Save As	This button allows the user to save the current report to a file in the htm, html or CSV (comma-separated values) format at a desired location. A dialog box appears for the user to choose a file to replace or specify a file name to save under.
E-mail	This button allows the user to e-mail the current report. If the browser fails to launch the email client or encounters any other errors, an error is shown. The report and images are emailed as an attachment. Default email client shall be used to compose and send the email.
Delete	This button allows the user to delete log entries.
Close	This button allows the user to close the currently open log browser window.

NOTE:

- This feature is supported in the IP connection mode only.
- This feature is supported for Voter and Satellite Receiver only.

5.4.1.1

Voter ID (Voting Details View)

This feature displays the voter ID for any connected Voter or Satellite Receiver. This feature allows user to filter the current data view in the voting details log.

The following table describes the functionality of each Control and Button in the Voter ID filter.

Table 56: Voting Type--Buttons and Controls

Control and Button	Functionality
Tree View	List all available Voter IDs for the current system. If current system not has any repeaters at the Voting Details View on page 99, only Select All (below) node can be displayed
Select All	Let all Voter IDs can be selected. This node is checked by default, and it is always the first node at the Tree View.
OK button	Commits the filter to filter the Voting Details View on page 99 and closes the dialog.

Control and Button	Functionality
Cancel button	Cancels all user changes and closes the window.

NOTE:
- This feature is supported for Voter and Satellite Receiver only.
- This feature is supported in the IP connection mode only.

5.4.1.2

Voting Type (Voting Details View)

This feature displays the voting type for any connected Voter or Satellite Receiver.

The available options are **N/A**,**Voter**, and **Satellite Receiver**.

N/A
The voting type for the current repeater is not configured as voting enabled.

Voter
The voting type for the current repeater is configured as Digital Voter-enabled.

Satellite Receiver
The voting type for the current repeater is configured as Digital Voter-enabled.

The following table lists the functionality of each control and button in the Voting Type filter.

Table 57: Voting Type—Buttons and Controls

Control and Button	Functionality
Tree View	List all available Voting Types for the current system. If current system does not have any repeaters at the Voting Details View on page 99, only **Select All** node is displayed
Select All	Allows all Voting Types to be selected. This node is checked by default, and it is always the first node at the Tree View.
OK button	Commits the filter to filter the Voting Details View and closes the dialog.
Cancel button	Cancels all user changes and closes the window.

NOTE:
- This feature is supported for Voter and Satellite Receiver only.
- This feature is supported in the IP connection mode only.

5.4.1.3

Selecting a Date Range

This procedure shows you how to filter out the log entries by date.

Procedure:

1. Click the **Start Date** box.
2. Select a date from the calendar drop down list.

   Selecting a start date filters the row entries for the log list to be within the range from the start date to the current date.
3. Click the **End Date** box.

4. Select a date from the calendar drop down list.

   Selecting an end date filters the row entries for the log list to be within the range from the start date to the selected end date. The minimum value selectable for this box is the current start date. The maximum value is the current date.

5.4.2
Voting Type Filter

Voting Type filter lists all the available voting types for the current system. This filter only supports the Voter and Satellite Receiver only and available for the IP connection mode only.

Table 58: Voting Type Filter–Control and Button

Control and Button	Functionality
Select All	Allows all Voter Types to be selected. **Select All** is checked by default and is always the first selection in the filter. Only the **Select All** is displayed if the current system does not have any repeaters in the Diagnostics Table View or the Voting Details View. All other checkboxes is checked when the **Select All** is checked. All other node is unchecked when the **Select All** is unchecked. The **Select All** is checked if one of the Voter ID checkbox is checked. The **Select All** is unchecked if all the Voter ID checkboxes are un-checked.
OK button	Commits the filter to filter the Voting Details View and closes the filter. When click **OK** button, the Diagnostics Table View or the Voting Details View only show the repeaters that have the voter ID be checked.
Cancel button	Cancels all user changes and closes the filter.

5.4.3
Voting ID Filter

Voting ID filter lists all available Voter IDs for the current system. If the current system does not have any repeaters, only **Select All** is displayed. This filter is available for the IP connection mode only.

Table 59: Voting ID Filter–Control and Button

Control and Button	Functionality
Select All	Allows all Voter IDs to be selected. **Select All** is checked by default and is always the first selection in the filter. Only the **Select All** is displayed if the current system does not have any repeaters in the Diagnostics Table View or the Voting Details View. All other nodes are selected when the **Select All** is selected. All other nodes are cleared when the **Select All** is cleared. The **Select All** is selected if one of the Voter ID nodes is selected. The **Select All** is cleared if all the Voter ID nodes are cleared.
OK button	Commits the filter to filter the Voting Details View and closes the filter.

Control and Button	Functionality
	When you click **OK**, the Diagnostics Table View or the Voting Details View only show the repeaters that have the voter ID selected.
Cancel button	Cancels all user changes and closes the filter.

Chapter 6

Troubleshooting Section

The following topics are designed to help you identify and overcome possible problems or unexpected situations.

6.1 MOTOTRBO Driver Installation

After the radio is connected to the PC for the first time, you are prompted to install the MOTOTRBO driver. The following topics show you how to establish a connection between the radio and the PC for different operating systems:

- Installing the MOTOTRBO Driver on Microsoft® Windows® Vista Business/Home Premium and Microsoft Windows 7 Professional/Home Premium Operating System on page 107
- Installing the MOTOTRBO Driver on Microsoft Windows XP Home/Professional Operating System on page 108
- Installing the MOTOTRBO Driver on Microsoft Windows 2000 Professional Operating System on page 110

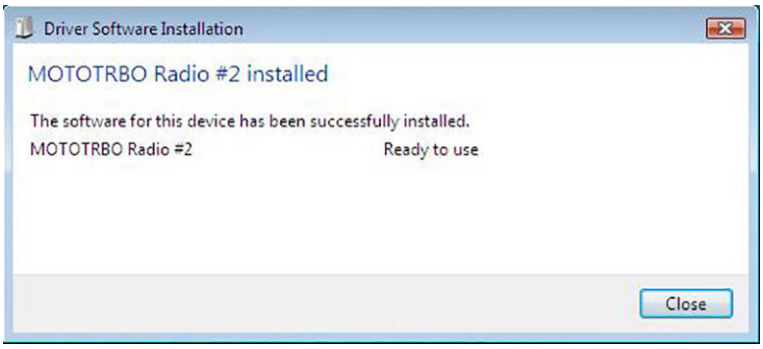
6.1.1 Installing the MOTOTRBO Driver on Microsoft® Windows® Vista Business/Home Premium and Microsoft Windows 7 Professional/Home Premium Operating System

Procedure:

1. Exit all the MOTOTRBO programs running on the computer.
2. Connect one end of the programming cable to the radio and the other end to the USB port of the PC. Power up the radio.

   The Driver Software Installation window appears automatically. The installation is complete.

   Figure 3: Succesful Radio Installation window for Microsoft® Windows® Vista Business/Home Premium and Microsoft Windows 7 Professional/Home Premium



3. Click **Close**.

6.1.2

Installing the MOTOTRBO Driver on Microsoft Windows XP Home/Professional Operating System

Procedure:

1. Exit all the MOTOTRBO programs running on the computer.
2. Connect one end of the programming cable to the radio and the other end to the USB port of the PC. Power up the radio.

   The **Found New Hardware Wizard** window appears automatically.

3. Select **No, not this time**. Click **Next**.

   Figure 4: Found New Hardware Wizard initial window - Microsoft Windows XP Home/ Professional

4. Select **Install the software automatically (Recommended)**. Click **Next**.

Figure 5: Radio Installation Type Choice window

If the computer cannot find the driver, the following screen appears.

Figure 6: Manufacturer's Installation Disk search window for Windows XP

5. Click **Browse...** to manually locate the driver.

   The default path for the driver is `C:\Program Files\Common Files\Motorola\MOTOTRBO Driver`. If the driver is installed in a different drive, the path may differ.

6. Click **OK** after the driver is located.
7. Click **Finish** to close the wizard after the installation completes.

   To complete the driver installation, refer to Setting Up the MOTOTRBO Local Area Network (LAN) on page 113.

6.1.3

Installing the MOTOTRBO Driver on Microsoft Windows 2000 Professional Operating System

Procedure:

1. Exit all the MOTOTRBO programs running on the computer.
2. Connect one end of the programming cable to the radio and the other end to the USB port of the PC. Power up the radio.

   The **Found New Hardware Wizard** window automatically appears.
3. Click **Next**.

   Figure 7: Found New Hardware Wizard initial window - Microsoft Windows 2000 Professional

4. Select **Search for a suitable driver for my device (recommended)**. Click **Next**.

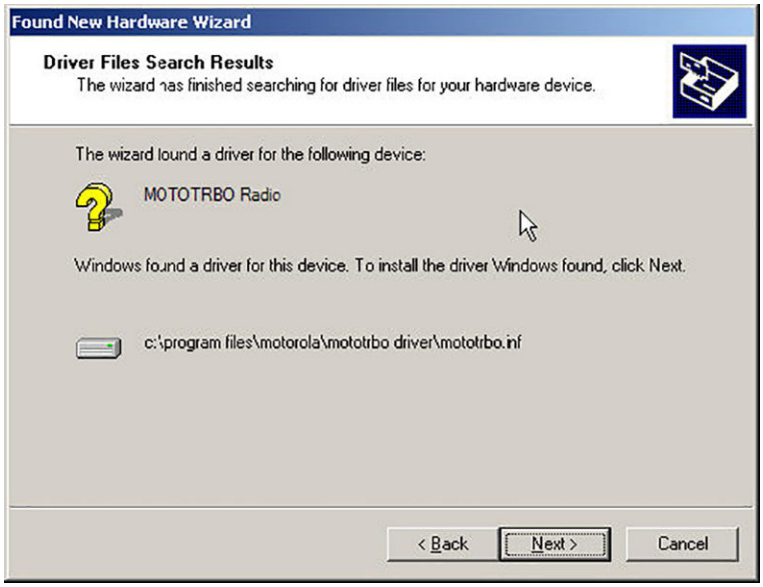
Figure 8: Install Hardware Device Drivers window

5. Check the **CD-ROM drives** and **Specify a location** check boxes. Click **Next**.

Figure 9: Locate Driver Files window

The following windows appears when a driver is found.

Figure 10: Driver Files Search Results window



6. Click **Next** to install the driver.

   If the computer cannot find the driver, the following screen appears.

   Figure 11: Manufacturer's Installation Disk search window for Windows 2000

7. Click **Browse...** to manually locate the driver.

   The default path for the driver is `C:\Program Files\Common Files\Motorola\MOTOTRBO Driver`. If the driver is installed in a different drive, the path may differ.

8. Click **OK** after the driver is located.
9. Click **Finish** to close the wizard after the installation completes.

   To complete the driver installation, refer to Setting Up the MOTOTRBO Local Area Network (LAN) on page 113.

6.2

Setting Up the MOTOTRBO Local Area Network (LAN)

This procedure shows you how to set up the MOTOTRBO LAN connection.

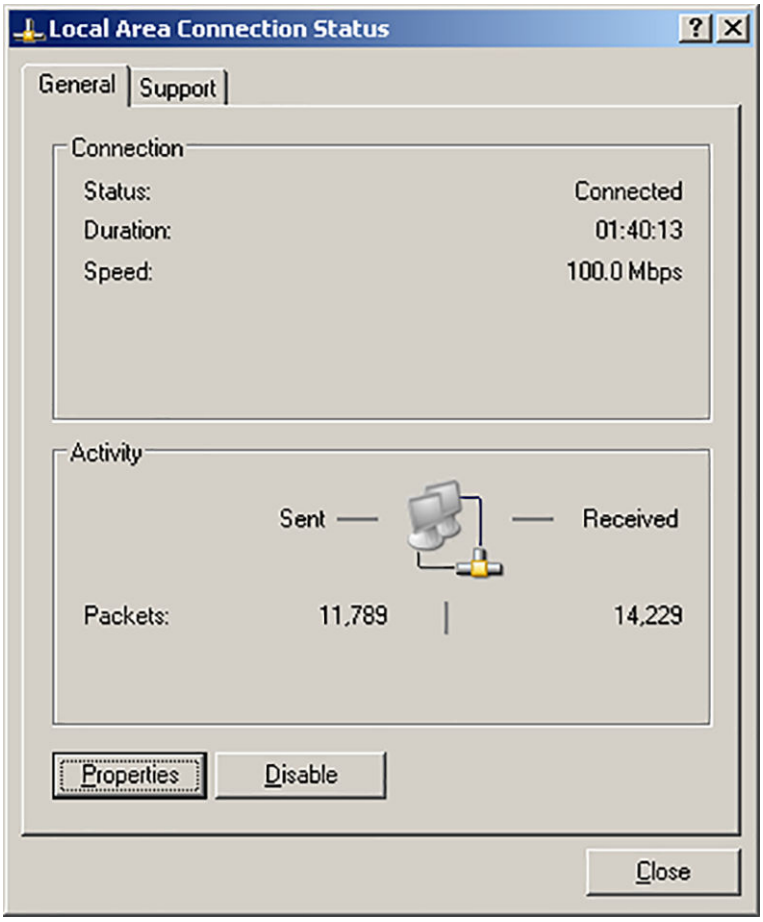
Procedure:

1. Click **Start** → **Settings** → **Network Connection**.

   Alternatively, click **Start** → **Settings** → **Control Panel** → **Network Connection** → **Open**.
2. Select **View** → **Details** at the menu bar.
3. Double-click the Network Connection named "Local Area Connection" that has the device name "MOTOTRBO Radio". The Local Area Connection box appears.

   If you have more than one active LAN connection on your machine, ensure that the right one is selected.

   Figure 12: Local Area Connection Status window

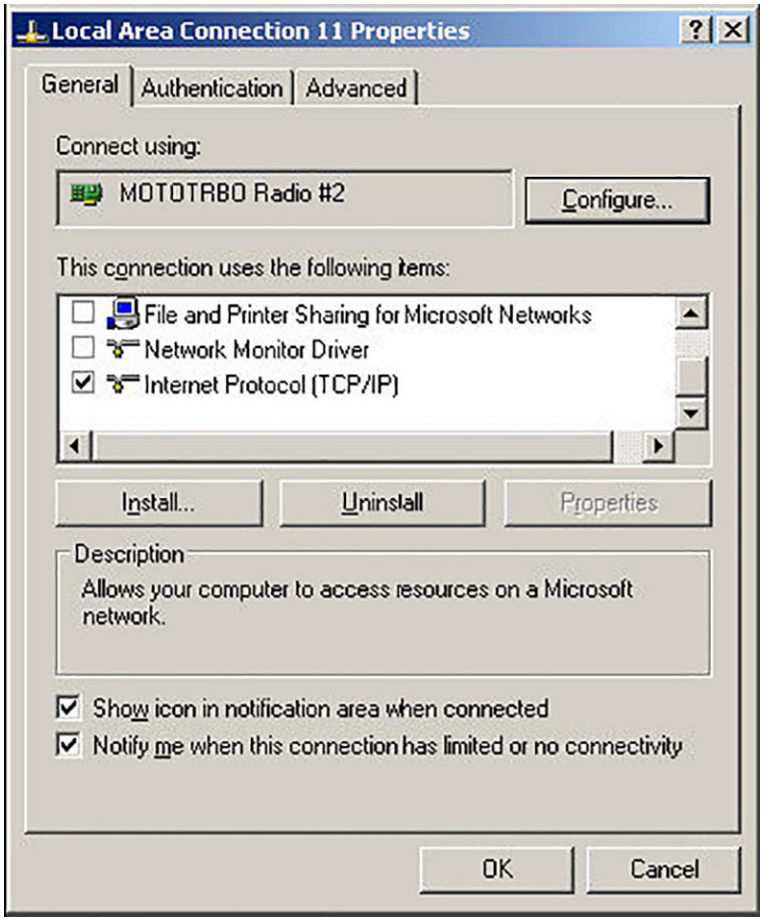


4. Click **Properties**.
5. Uncheck all the check boxes except for **Internet Protocol (TCP/IP)**.

   Motorola Solutions recommends to check the **Show icon in notification area when connected** and **Notify me when this connection has limited or no connectivity** check boxes.

The **Notify me when this connection has limited or no connectivity** check box is not be available on all machines.

Figure 13: Local Area Connection Properties window



6. Click **OK**.

   The setup for the MOTOTRBO Local Area Connection is complete.

6.3 Unable to Connect to the Remote System

If you are unable to connect to the Master radio or Peer radios, check the following system configuration by verifying the remote network connectivity or the remote system configuration.

6.3.1 Verifying Remote Network Connectivity

This procedure shows you how to check that the internet protocol (IP) address is correctly assigned and that the personal computer (PC) can communicate with the Master.

Prerequisites:

- To ensure that network policies allow bi-directional user datagram protocol (UDP) traffic, contact your network administrator.

- To check for any network policies that would restrict IP addresses or the media access control (MAC) addresses, contact your network administrator.
- For the purposes of verifying connectivity, ensure that the ping functionality is allowed on your network.

After the system is verified, the user can disable the ping functionality if required by your network policy.

Procedure:

1. Read the radio in the Customer Programming Software (CPS).
2. Verify in the **Network Settings** if the Master is configured to use a Dynamic Host Configuration Protocol (DHCP) or a Static IP address.

   If the DHCP field is unchecked, the Master is configured to use a Static IP address.

   To determine if you should use a DHCP or a Static IP configuration, check with your network administrator.
3. Go to the CPS **Device Information** screen and note down the MAC Address of the Master.
4. If the Master is configured to use a Static IP Address, refer to Verifying Remote Network Connectivity for Static IP Address on page 115. If the Master is configured to use a DHCP IP Address, refer to Verifying Remote Network Connectivity for DHCP IP Address on page 115.

6.3.1.1
Verifying Remote Network Connectivity for Static IP Address

If the Master is configured to use a Static IP Address, verify the remote network connectivity using these steps.

Procedure:

1. Ensure that the Master is connected via a CAT5 ethernet cable to the router.
2. Connect to your router with a PC. Through the router interface, find the MAC Address of the Master, check the IP address.
3. Verify that the static IP does not conflict with another device on the network.
4. Verify that the router is configured to forward traffic on the UDP port assigned to the Master.
5. Try to ping the Master IP Address from the PC. If the ping request times out, try resetting the router.

6.3.1.2
Verifying Remote Network Connectivity for DHCP IP Address

If the Master is configured to use a DHCP IP Address, verify the remote network connectivity using these steps.

Procedure:

1. Ensure the Master is connected to your router via a CAT5 ethernet cable and turned on.
2. Connect to your router with a PC. Through the router interface, find the MAC Address of the Master. Verify it has an IP Address assigned, and make a note of it.
3. Verify the router has been configured to forward traffic on the UDP port assigned to the Master.
4. Try to ping the Master IP Address from the PC. If the ping request times out, try resetting the router.
5. If you are able to ping the Master IP address but are still unable to connect to the system or peers in the system, continue on. If you are not able to communicate with the Master, please contact your network administrator.

6.3.2

Verifying Remote System Configuration

This procedure shows you how to verify the remote system configuration.

Procedure:

1. Read all the system radios in the Customer Programming Software (CPS).
2. Verify that the following fields are the same across all peers and match the Master radio where applicable.

Table 60: Fields in CPS

Field	Action Summary
Master IP and Master UDP Port	Each peer must have the correct Master IP (this field is distinct from Radio IP) and Master UDP Port assigned to join the system.
Authentication Key	This field should match the value in the Master and for each peer. (for example, if this field is turned off in the Master, the same field must be turned off in all peers).
Peer Firewall Open Timer (sec)	This field is used to ensure that the connection between peers is kept open through a firewall. Depending on your system, this field value may need to be decreased to keep the firewall open for peers to connect.

3. Open Connection Mode Tab on page 16.
4. Check whether the following fields matches the values set through the CPS for the peers:

   Master IP and Master UDP Port
   Authentication Key
   Peer Firewall Open Timer (sec)
5. Check that each peer in the system has a unique Radio ID assigned.
6. Check in the Connection Mode Tab on page 16 to ensure that the RDAC ID does not conflict with any Radio ID values of peers in the System.
7. If more than one peer is connected to the same router, and another peer is outside the router, that router must support hairpinning. Verify with your network administrator that the router in question supports this feature.
8. Ensure that any updated system configuration values are written to the radios, and the radios are re-connected to the system. Attempt to re-connect to the system in the RDAC application.
9. If the user is still unable to connect to the system, contact Motorola Solutions Customer Support.