TELEX
RADIO DISPATCH PRODUCTS

Application Guide

Sepura TETRA
Interface for IP-224

VOIProven

TELEX
Radio Dispatch

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Claims

No liability will be accepted for damages directly or indirectly arising from the use of our materials or from any other causes. Our liability shall be expressly limited to replacement or repair of defective materials.

Warning

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

Do not open the unit. No user serviceable parts are contained within. Bosch cannot be responsible for damage. If the unit is opened, the warranty can be voided.

Table of Contents

1.0 Introduction

The Sepura TETRA radio interface is designed as an add-on option in the Telex Radio Dispatch system. This application guide describes the Telex Radio Dispatch Sepura TETRA feature set and how to configure the interface for the IP-224 and C-Soft.

2.0 Hardware Requirements

- IP-224 Ethernet Adapter Panel (F.01U.306.547)
- IP-224 to Sepura Interface Cable (P/N F.01U.165.542)
- Sepura SRM2000/SRG3500 TETRA Radio

3.0 Software Requirements

- C-Soft version 6.500 or later
- IP-224 version 2.100 or later
- IP-224 TETRA Interface Access Key
- Telex System Manager (TSM) 2.000 or later
- Windows 7 (32-bit or 64-bit)
- Windows 8.1

4.0 Supported System Features

Sepura TETRA Supported Features					
Feature	**DMO Support**	**TMO Support**	**Feature**	**DMO Support**	**TMO Support**
Channel/Talkgroup Change	Yes	Yes	ANI Decode	Yes	Yes
Zone Change	No	No	Emergency Decode	Yes	Yes
			Status Message Decode	Yes	Yes
Group Call	Yes	Yes	Text Message Decode	No	No
Private Call	No	Yes	User Defined Scan List	No	Yes

5.0 Cable Diagram

The IP-224 to Sepura Interface Cable allows the IP-224 to serially control a Sepura TETRA radio.

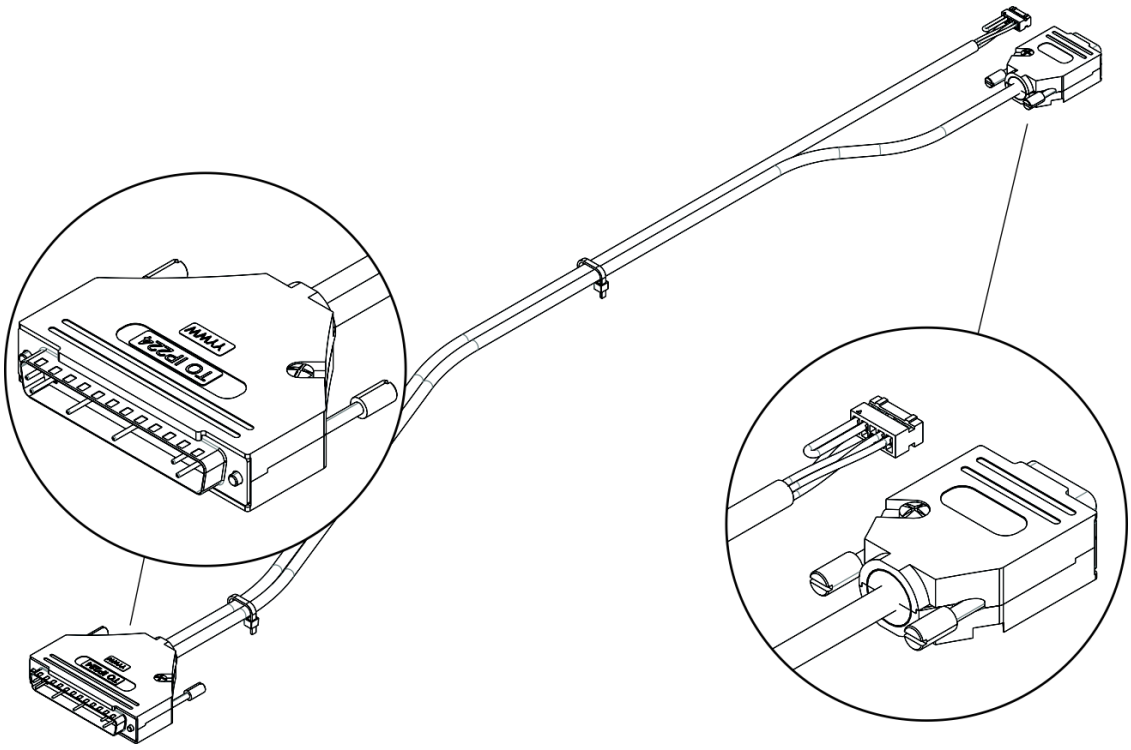


FIGURE 1. Sepura Serial Interface Cable

Sepura SRM2000/SRG3500 Radio Interface Cable to IP-224			
	Sepura	**IP-224**	**Function**
10 PIN CONNECTOR	PIN 2	PIN 5	PTT RELAY COM CONTRACT
	PIN 2	PIN 29	GROUND
	PIN 6	PIN 24	PTT RELAY N.O. CONTACT
	PIN 7	PIN 1	TX+ AUDIO
	PIN 9	PIN 20	RX+ AUDIO
	PIN 1		
	PIN 3		
15 PIN CONNECTOR	PIN 11	PIN 17	RS-232/TTL TXD
	PIN 10	PIN 36	RS-232/TTL RXD
	PIN 15	PIN 29	GROUND

NOTE: Pin 1 and Pin 3 of the 10-pin connector on the Sepura radio must be connected for the interface to function properly.

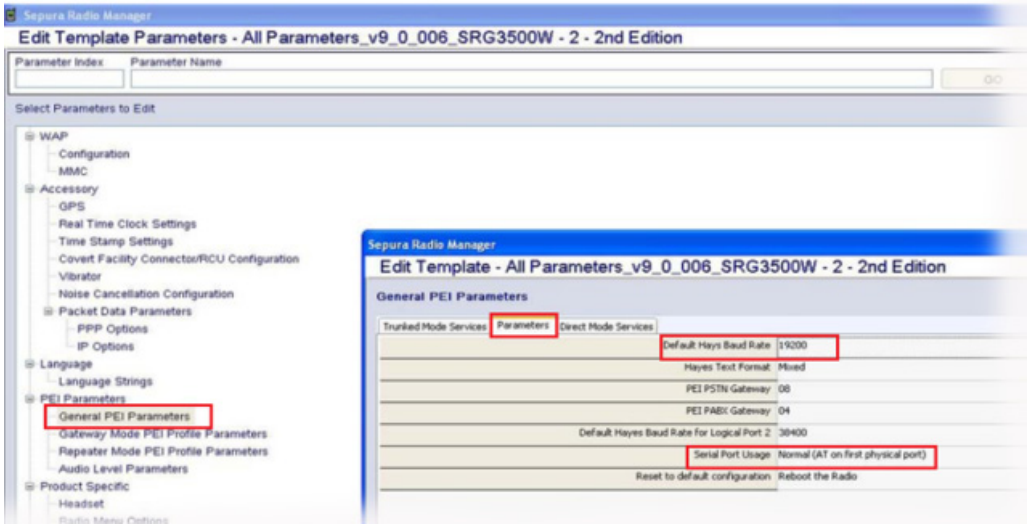
6.0 Radio Programming Application Setup

The Sepura Radio Manger is used to configure the Sepura TETRA radio to interface properly with the IP-224.

6.1 Serial Communications Setup

To **configure the Serial Communications**, do the following:

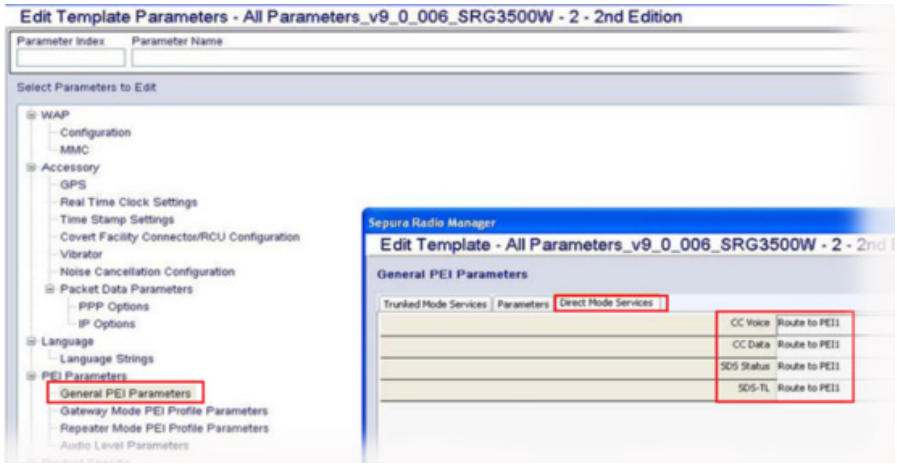
1. From the left navigation, select **PEI Parameters**.
   The PEI Parameters options appear.
2. From the PEI Parameters options, select **General PEI Parameters**.
   The General PEI Parameters window appears.
3. Click the **Parameters tab**.
   The Parameters window appears.



On the Parameters Page

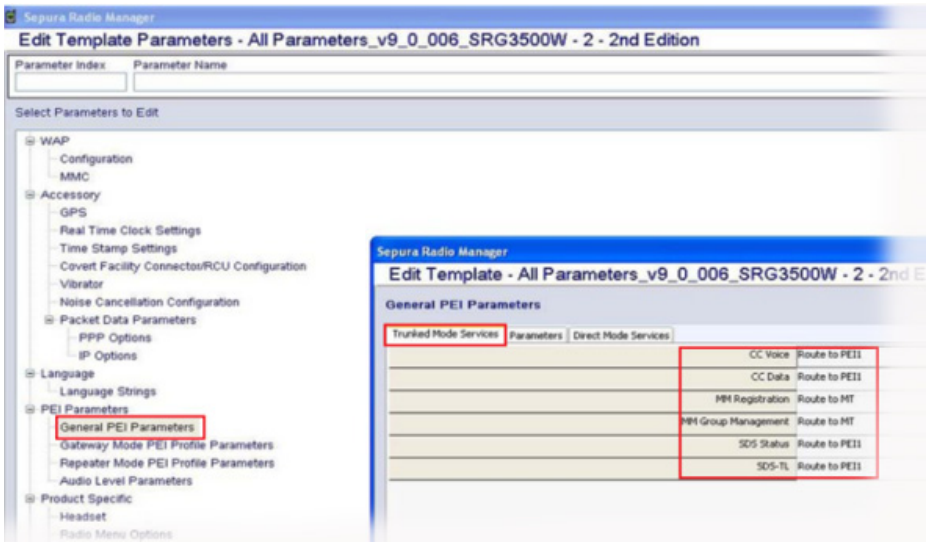
4. From the Default Hays Baud Rate drop down menu, **select 19200**.
5. From the Serial Port Usage drop down menu, select **Normal (AT on first physical port)**.
6. Click the **Direct Mode Services tab**.
   The Direct Mode Services page appears.

On the Direct Mode Services Page



7. From the CC Voice drop down menu, select **Route to PEI1**.
8. From the CC Data drop down menu, select **Route to PEI1**.
9. From the SDS Status drop down menu, select **Route to PEI1**.
10. From the SDS-TL drop down menu, select **Route to PEI1**.
11. Click the **Trunked Mode Service tab**.
    The Trunked Mode Services window appears.

On the Trunked Mode Services Page

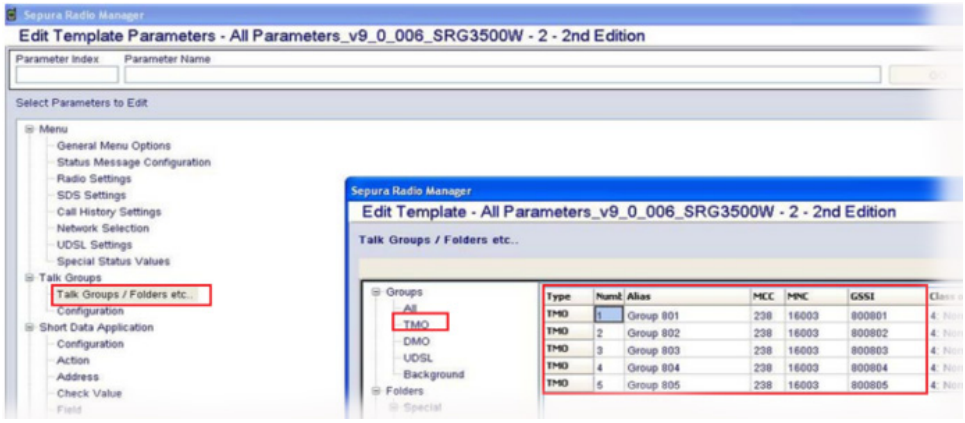


12. From the CC Voice drop down menu, select **Route to PEI1**.
13. From the CC Data drop down menu, select **Route to PEI1**.
14. From the MM Registration drop down menu, select **Route to MT**.
15. From the MM Group Management drop down menu, select **Route to MT**.
16. From the SDS Status drop down menu, select **Route to PEI1**.
17. From the SDS-TL drop down menu, select **Route to PEI1**.

6.2 Trunked Mode Setup

To **configure Trunked Mode**, do the following:

1. From the left navigation, select **Talk Groups**.
   The Talk Groups options appear.
2. From the Talk Groups options, select **Talk Group/Folders etc**.
   The Edit Template window appears.



3. From the left navigation of the Edit Template window, select **TMO**.

NOTE: The Sepura terminal needs TMO groups to affiliate and operate in Trunked Mode.

4. In **Alias** field, enter the **Name** of the group.
5. In **MCC** (Mobile Country Code) field, enter the **MCC number**.
   The MCC is a 3-digit number determined by country and region.
6. In **MNC** (Mobile Network Code) field, enter the **MNC number**.
   The MNC is 2- to 4-digit number determined by network carrier.

NOTE: The MMC and MNC must match the TETRA network for the Sepura terminal to connect to the TETRA system.

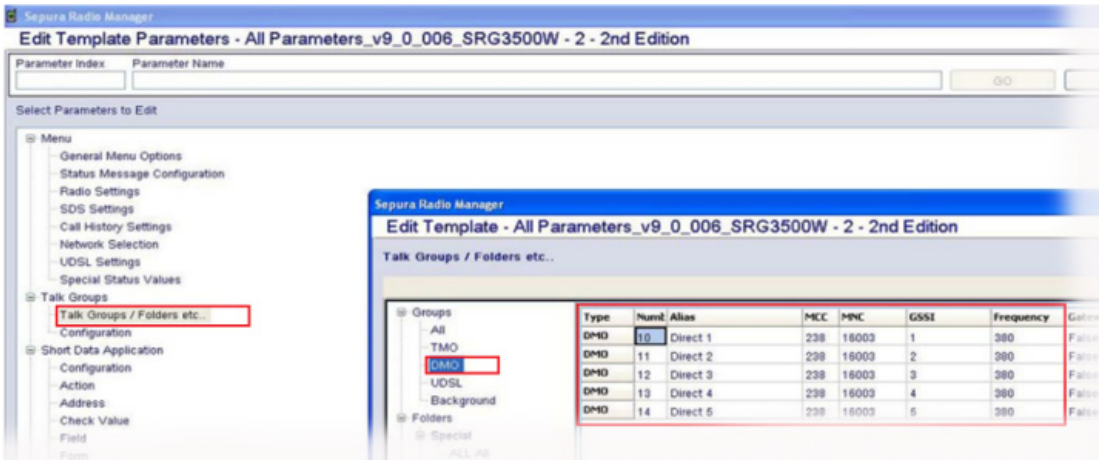
7. In the **GSSI** (Group Short Subscriber Identity) field, enter **GSSI number**.

NOTE: Each group requires a unique GSSI number.

6.3 Direct Mode Setup

To **configure Direct Mode**, do the following:

1. From the left navigation, select **Talk Groups**.
   The Talk Groups options appear.
2. From the Talk Groups options, select **Talk Group/Folders etc**.
   The Edit Template Window appears.



3. From the left navigation of the Edit Template window, select **DMO**.
4. In Alias field, enter the **Name** of the group.
5. In **MCC** (Mobile Country Code) field, enter the **MCC number**.
   The MCC is a 3-digit number determined by country and region.
6. In **MNC** (Mobile Network Code) field, enter the **MNC number**.
   The MNC is 2- to 4-digit number determined by network carrier.
7. In the **GSSI** (Group Short Subscriber Identity) field, enter **GSSI number**.

NOTE: Each group requires a unique GSSI number.

6.4 Emergency Setup

To **configure Emergency**, do the following:

1. From the left Navigation, select **Alarm**.
   The Alarm Options appear.
2. From the Alarm options, select **Trunked Mode**.
   The Trunked Mode window appears.

On the Alarm Priority Page

3. From the Alarm Call Priority (Trunked Mode) drop down menu, select **15**.

7.0 IP-224 Access Key Installation

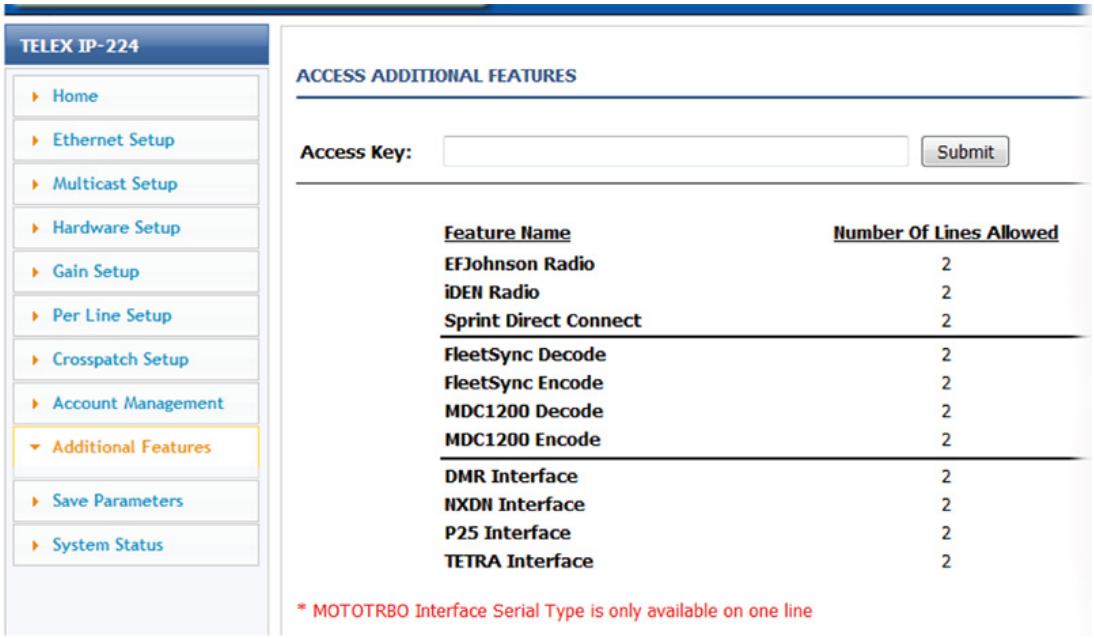
The Sepura TETRA radio interface requires an additional TETRA Interface option on the IP-224.

NOTE:

- The TETRA Interface Access Key must be purchased before you can activate the Sepura Serial Type. The TETRA Interface requires an access key to be generated specifically for each IP-224.
- If the TETRA Interface Access Key was purchased as a factory installation [TETRA-224 PI (factory installed)] it is activated by the factory prior to shipping.
- Activating the TETRA Interface via the IP-224 web interface is only required if this is a field installation [TETRA-224 FIELD (customer purchased option)].

To **activate the TETRA Interface**, do the following:

1. Open the **IP-224 webpage**.
2. From the left navigation, select **Additional Features**.
   The Additional Features page appears.

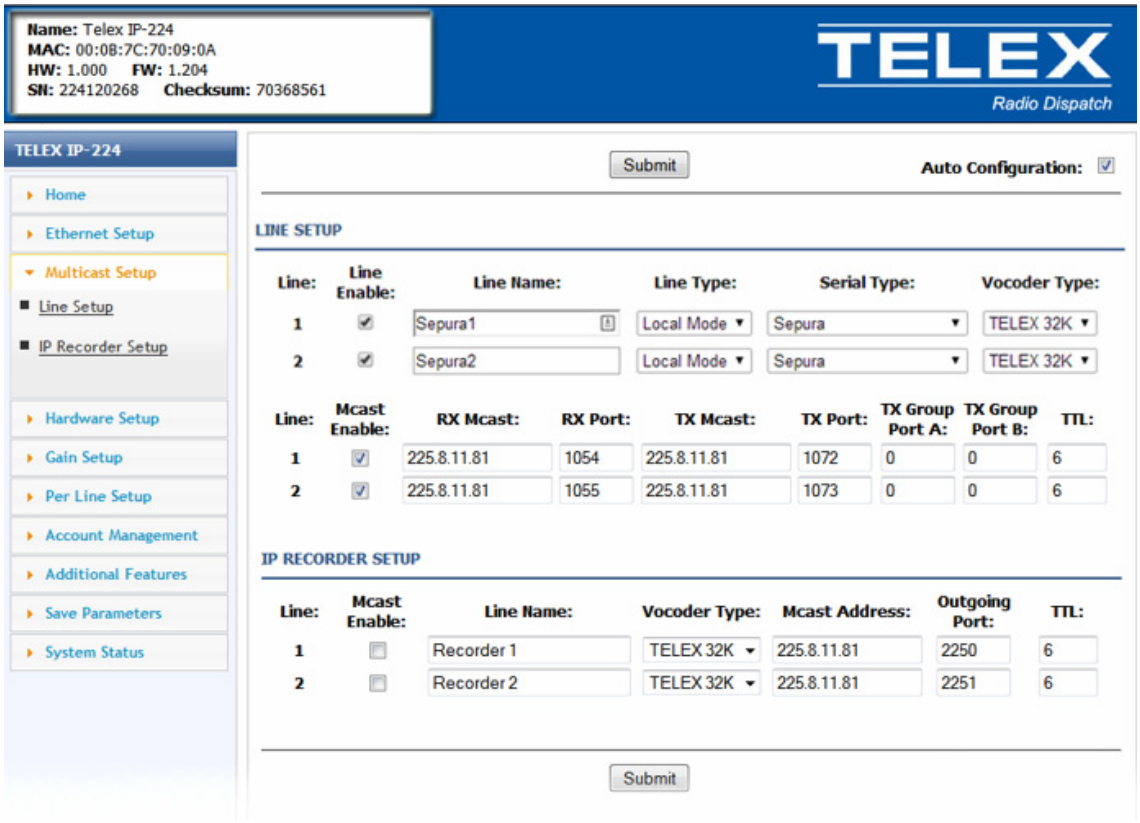


3. In the Access Key field, enter the **32-character access key**.
4. Click the **Submit button**.
   The changes are sent to the IP-224 in temporary storage.
5. From the left navigation, select **Save Parameters**.
   The Save Parameters page appears.
6. Click the **Save Parameters button**.
   Changes are now permanently saved to the IP-224 console.

8.0 IP-224 Setup

To **configure the IP-224**, do the following:

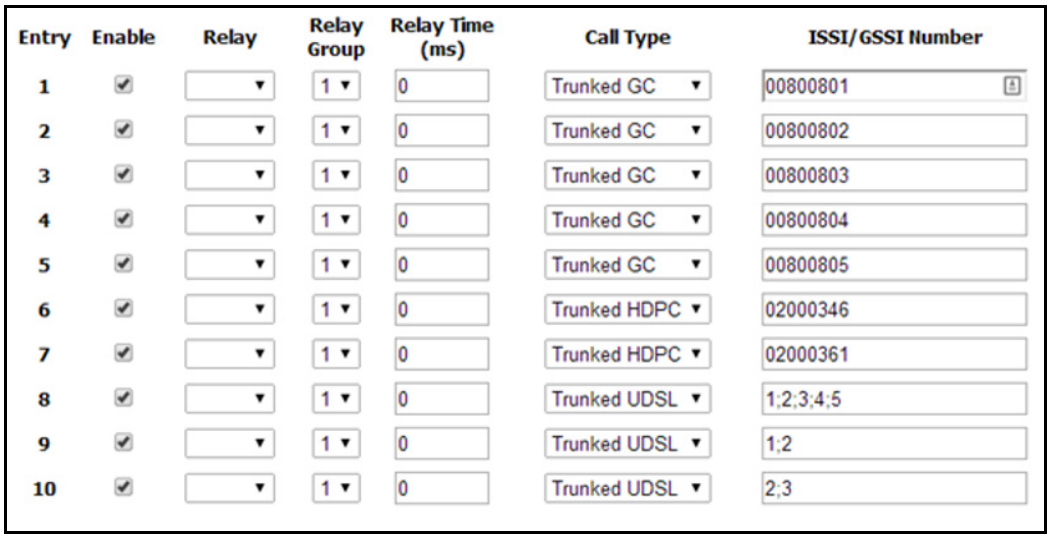
1. Open the **IP-224 web application**.
   The IP-224 Window appears.
2. From the left navigation, select **Multicast Setup**.
   The Multicast Setup window appears.



3. Select the **Auto Configuration** check box.

Under LINE SETUP

4. From the Serial Type drop down menu, select **Sepura**.
5. In the RX Mcast field, enter **Receive Multicast IP Address**.
6. In the RX Port field, enter the **Receive Multicast Port number**.
7. In the TX Mcast field, enter the **Transmit Multicast IP Address**.
8. In the TX Port field, enter the **Transmit Multicast Port number**.
9. Click the **Submit button**.
   The changes are sent to the IP-224 in temporary storage.
10. From the left navigation, select **Per Line Setup**.
    The Per Line Setup page appears.



Entry	Enable	Relay	Relay Group	Relay Time (ms)	Call Type	ISSI/GSSI Number
1	☑		1	0	Trunked GC	00800801
2	☑		1	0	Trunked GC	00800802
3	☑		1	0	Trunked GC	00800803
4	☑		1	0	Trunked GC	00800804
5	☑		1	0	Trunked GC	00800805
6	☑		1	0	Trunked HDPC	02000346
7	☑		1	0	Trunked HDPC	02000361
8	☑		1	0	Trunked UDSL	1;2;3;4;5
9	☑		1	0	Trunked UDSL	1;2
10	☑		1	0	Trunked UDSL	2;3

Under FUNCTION TONE SETUP

11. From the Call Type drop down menu, select the desired **Call Type**.
12. In the ISSI/GSSI Number field, enter **ISSI/GSSI number**.
13. Click the **Submit button**.
    The changes are sent to the IP-224 in temporary storage.
14. From the left navigation, select S**ave Parameters**.
    The Save Parameters page appears.
15. Click the **Save Parameters button**.
    Changes are now permanently saved to the IP-224 console.

NOTE: The ISSI/GSSI Number is an 8-digit number. This field only accepts numbers and is cleared if the user enters alpha characters and then clicks Submit.

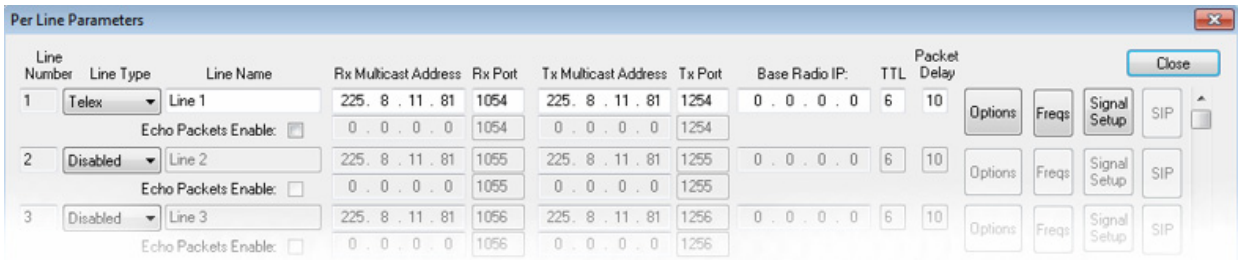
9.0 C-Soft Designer Setup

9.1 Configure Per Line Parameters

The Per Line Parameters window is used to configure C-Soft to IP-224 communications.

To **configure Per Line Parameters**, do the following:

1. Open **C-Soft Designer**.
2. From the Edit drop down menu, select **Setup Per Line Parameters**.
   The Per Line Parameters window appears.



3. In the Rx Multicast Address field, enter the **Receive Multicast IP Address** of the connected IP-224.
4. In the Rx Port field, enter the **Receive Multicast Port number** of the connected IP-224.
5. In the Tx Multicast Address field, enter the **Transmit Multicast IP Address** of the connected IP-224.
6. In the Tx Port field, enter the **Transmit Multicast Port number** of the connected IP-224.
7. In the Base Radio IP field, enter the **IP address** of the connected IP-224.
8. Click the **Close button**.

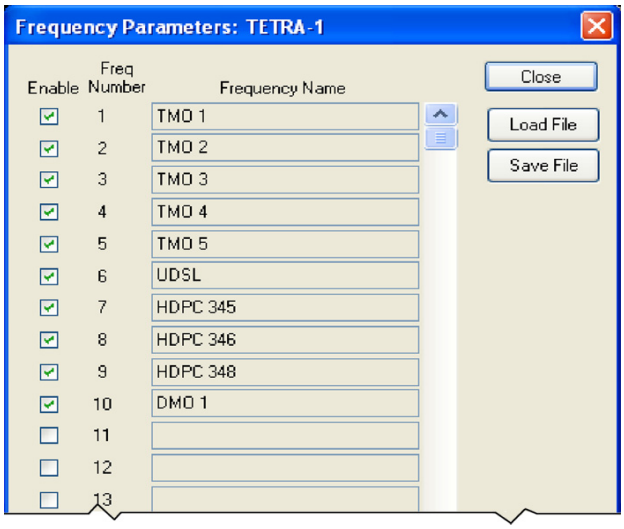
NOTE: The Multicast settings of the IP-224 and C-Soft must match for the interface to function properly. Verify that the RX and TX Multicast Addresses match, as well as the RX and TX Ports.

9.2 Configure Frequencies

To **configure frequencies**, do the following:

1. From the Per Line Parameters window, select the **Freqs button** for the TETRA Radio line. 

The Frequency Parameters window appears.



2. Select the **Enable check box** for each frequency.
3. In the Frequency Name field for each frequency, enter a **name** to be associated with the IP-224's function tone allocation.

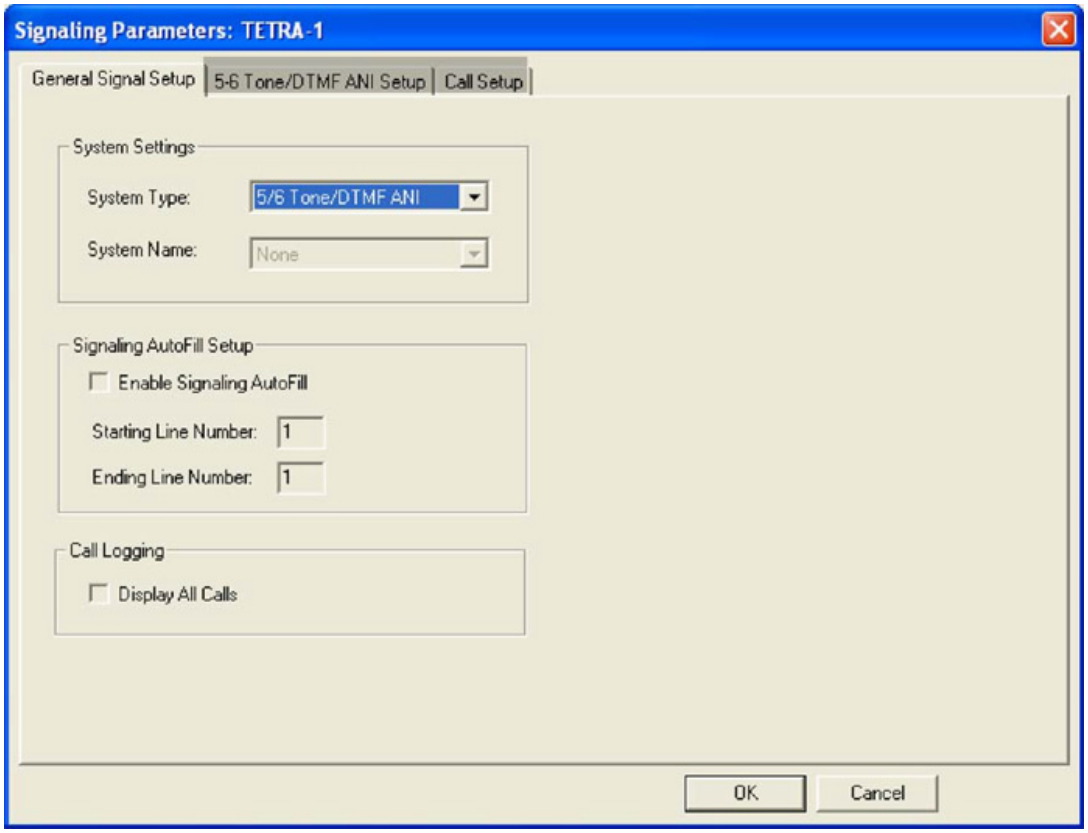
NOTE: The console operator is able to select the various call types defined within the IP-224 Per Line Setup.

4. Click the **Close button**.

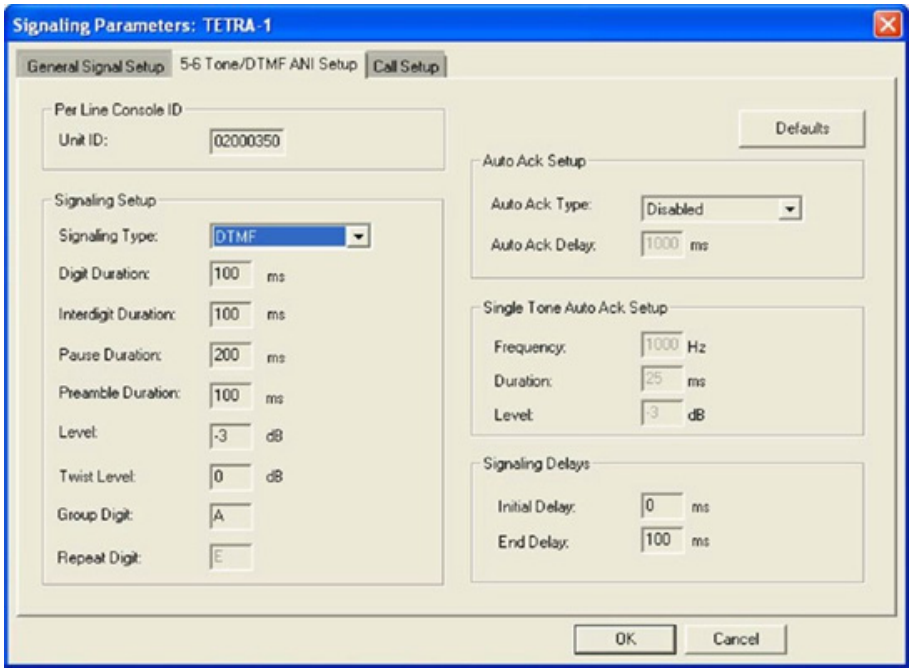
NOTE: The C-Soft frequency list has a maximum of 1000 entries, so all 1000 IP-224 function tones/calls can be addressed.

9.3 Signal Setup

1. From the Per Line Parameters Setup window, click **Signal Setup**.
   The General Signal Setup page appears in the Signaling Parameters window.
2. From the System Type drop down menu, select **5/6 Tone/DTMF ANI**.



3. From the Signaling Parameters window, click the **5-6 Tone/DTMF ANI Setup tab**. *The 5-6 Tone/DTMF ANI Setup tab appears.*



4. In the Unit ID field, enter the **8-digit unit ID** of the TETRA terminal connected to the associated IP-224.
5. From the Signaling Type drop down menu, select **DTMF**.
6. In the Digit Duration field, enter **100ms**.
7. In the Interdigit Duration field, enter **100ms**.
8. In the Pause Duration field, enter **200ms**.
9. In the Preamble Duration field, enter **100ms**.
10. In the Level field, enter **-3dB**.
11. In the Twist Level field, enter **0dB**.
12. In the Group Digit field, enter **A**.
13. From the Auto Ack Type drop down menu, select **Disabled**.
14. In the Initial Delay field, enter **0ms** (required).
15. In the End Delay field, enter **100ms.**
16. Click the **OK button**.

9.4 Call Setup

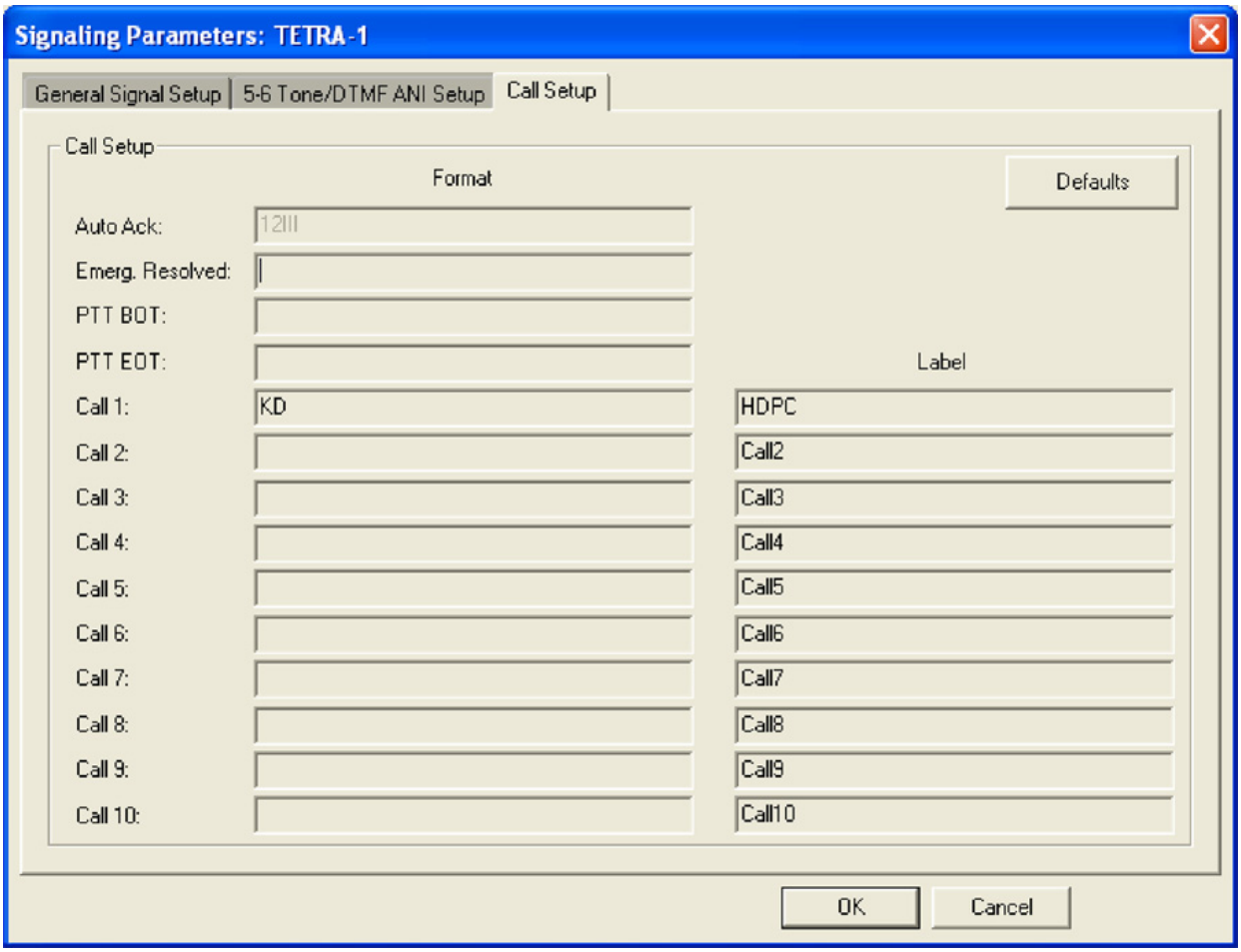
The **Call Setup** page is used to define a call button to make a Half-Duplex Private Call (HDPC) on the TETRA radio line. The button appears in the Call History, Manual Call List, and Call List windows when the appropriate line is selected.

To **setup a call button for HDPC**, do the following:

1. From the Signaling Parameters window, click the **Call Setup tab**.
   The Call Setup window appears.
2. In the Call 1 Format field, enter **KD**.

NOTE: When this button is activated, the *K* loads the contents of the currently selected User ID and the *D* creates the HDPC.

3. In the Call 1 Label field, enter **HDPC**.
4. Click the **OK button.**

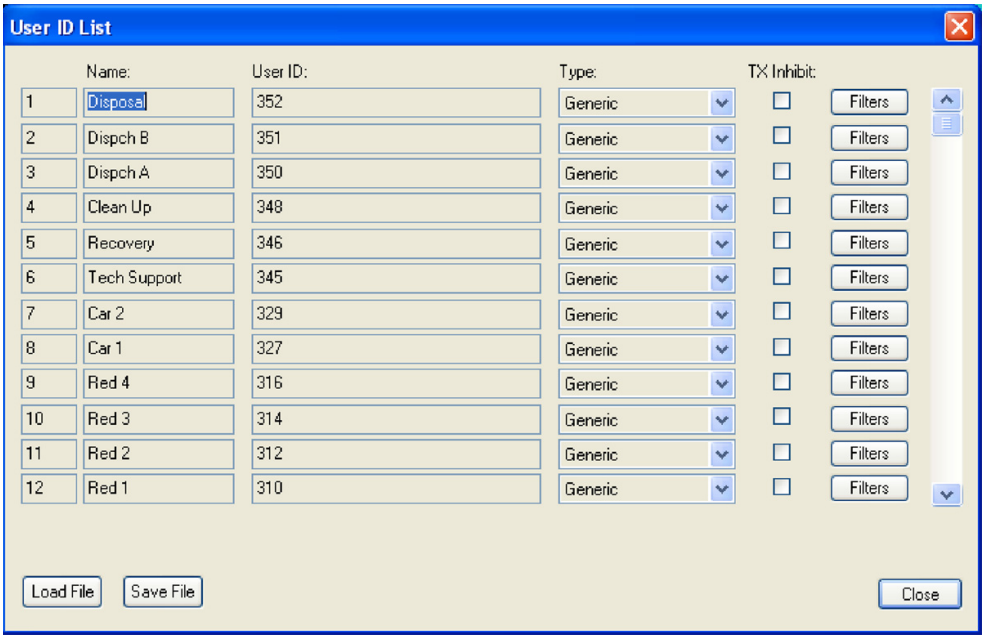


9.5 User ID List

The **User ID List** is used to translate IDs and aliases for ANI display and call history logging, in addition to forming the console's call directory.

To **configure a TETRA User ID List**, do the following:

1. From the Edit drop down menu, select **Edit User ID List**.
   The User ID List window appears.



2. In the Name field, enter a **Name** for the User ID.
3. In the User ID, enter the **ID number**.
4. In the Type drop down menu, select **Generic**.
5. Click the **Close button**.

NOTE:

- The User ID List can contain up to *6,000 entries*.

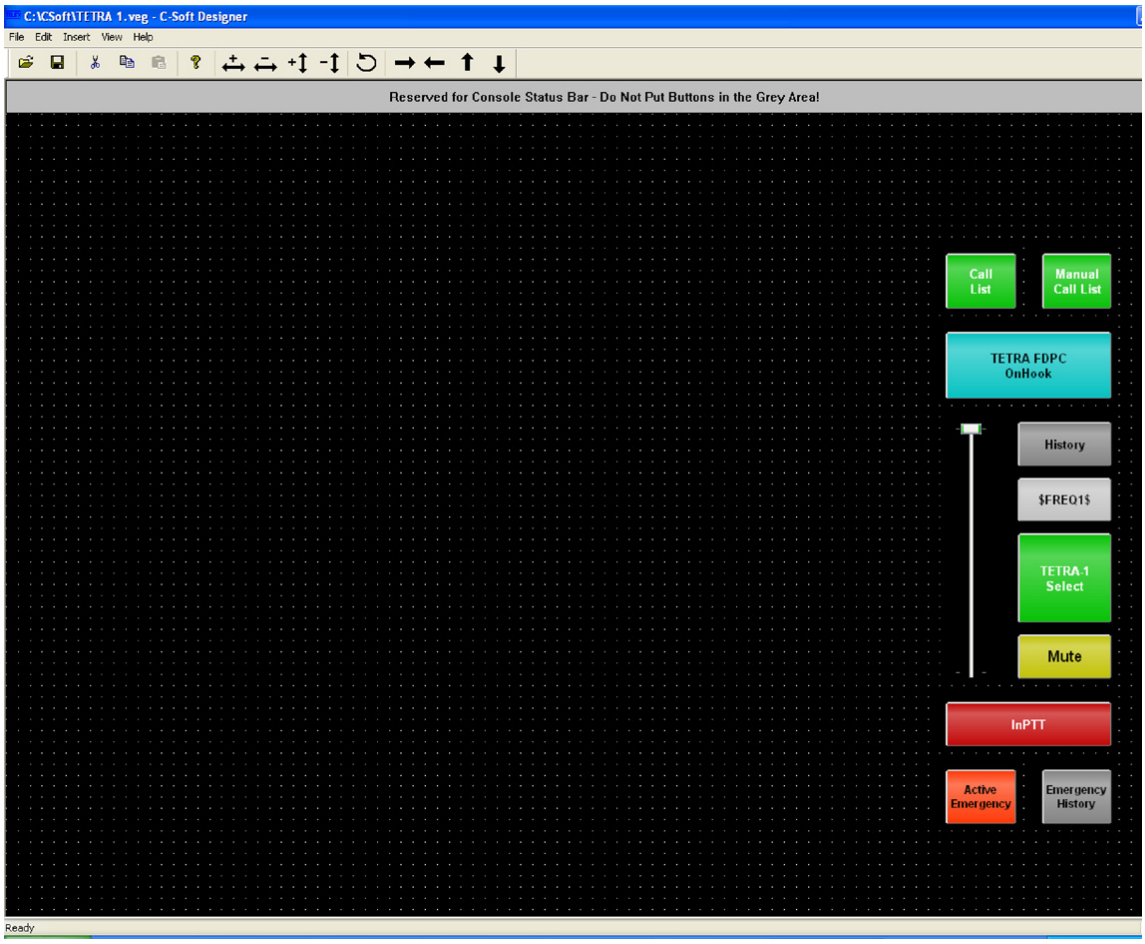
9.6 Console Design Overview

The console operator requires relevant buttons associated with the TETRA radio line to use TETRA radio functions.

The console example contains per line user interface elements, such as Select, Mute, Call History, Frequency Change, Individual PTT, and Volume Control.

The console operator should use the Call List to make calls. If a user is not contained in the User ID List, the console operator can use the Manual Call List.

Active Emergency and Emergency History buttons, used to access the emergency windows, have also been added so the console operator can manage emergency calls.



Notes:

Suggestions or comments:

Contact technical support with suggestions or comments concerning this application note.

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