

Hytera TETRA Interface for IP-224

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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.

OPENSSL PROJECT

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>). This product includes cryptographic software written by Eric Young (ey@cryptosoft.com). This product includes cryptographic software written by Tim Hudson (tjh@cryptosoft.com).

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1.0 Introduction

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

NOTE: For more information, see the IP-224 Technical Manual (P/N F.01U.218.562), the C-Soft Software Console Administrator's Guide (P/N F.01U.218.561), and the radio manufacturer's technical documentation.

2.0 Hardware Requirements

- IP-224 Ethernet Adapter Panel (P/N F.01U.306.547)
- IP-224 to Hytera TETRA Interface Cable (P/N F.01U.306.539)
- Hytera MT680 TETRA Radio

NOTE: See IP-224 Firmware Release Notes for the radio firmware revision tested.

3.0 Software Requirements

- C-Soft version 6.500 or later
- IP-224 version 2.300 or later
- IP-224 Advanced Interface Option (Export) or Advanced Interface Option (North American) Access Key
- Telex System Manager (TSM) 2.300 or later
- Windows 7 (32-bit or 64-bit)
- Windows 8.1
- Windows 10
- Hytera MT680 Customer Programming Software

4.0 Supported Features

Hytera 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	No

NOTE: The above list of features are supported when using the latest version of C-Soft. Hardware IP Consoles only support the following:

- Channel/Talkgroup Change
- ANI Decode
- Emergency Decode
- Status Message Decode
- Encryption On/Off
- Monitor On/Off
- Scan On/Off
- Talk Around On/Off

5.0 Cable Diagram

The IP-224 to Hytera TETRA Interface Cable allows the IP-224 to serially control a Hytera MT680 TETRA radio.

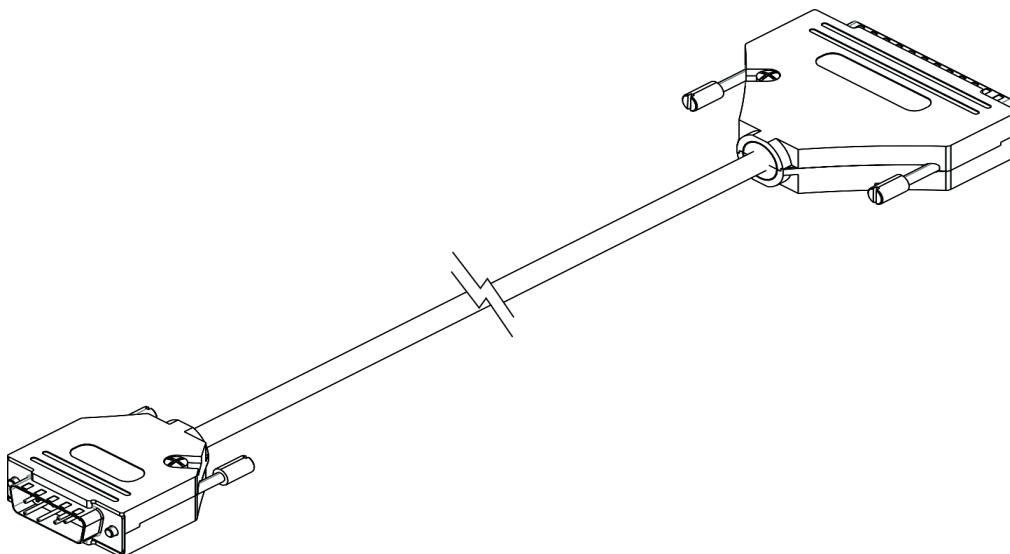


FIGURE 1. Hytera TETRA Serial Interface Cable

IP-224 to Hytera MT680 TETRA Radio Interface Cable			
Function	Hytera	IP-224	Function
UART_RX	PIN 20	PIN 17	RS-232/TTL TXD
UART_TX	PIN 22	PIN 36	RS-232/TTL RXD
GROUND	PIN 2	PIN 29	GROUND
GROUND	PIN 2	PIN 5	PTT RELAY COM CONTACT
Analog Input Ext_MIC	PIN 7	PIN 1	TX+ AUDIO
Analog output RX_AUDIO	PIN 8	PIN 20	RX+ AUDIO
PRGM/PTT	PIN 16	PIN 24	PTT RELAY N.O CONTACT
IO3	PIN 3	PIN 15	COR INPUT

6.0 Radio Programming Application Setup

The Hytera MT680 Customer Programming Software is used to configure the Hytera TETRA radio to interface properly with the IP-224.

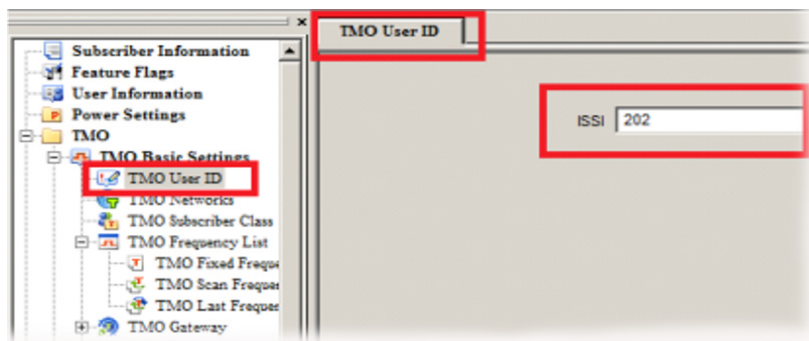
6.1 Trunked Mode Setup

Trunked mode allows the Hytera radio to communicate with other radios using a repeater.

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

TMO User ID

1. From the left navigation, select **TMO**.
The TMO Basic Settings appear.
2. From the TMO Basic Settings, select **TMO User ID**.
The TMO User ID window appears.

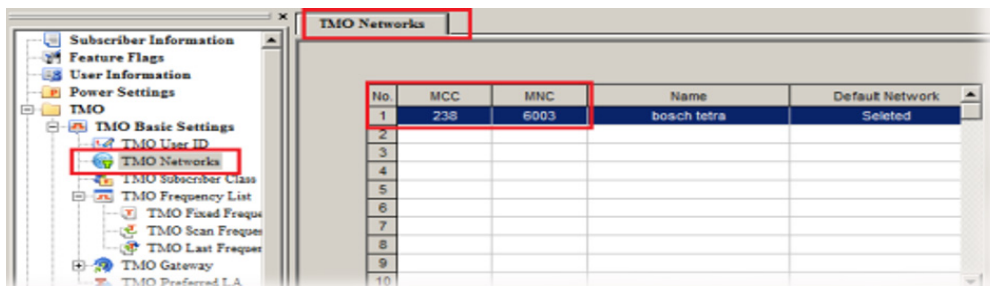


3. In the **ISSI** (Individual Short Subscriber Identifier) field, enter the **ISSI number**.

NOTE: The **TMO User ID** is a unique ID of the Hytera terminal in trunked mode.

TMO Networks

1. From the left navigation, select **TMO**.
The TMO Basic Settings appear.
2. From the TMO Basic Settings, select **TMO Networks**.
The TMO Networks window appears.



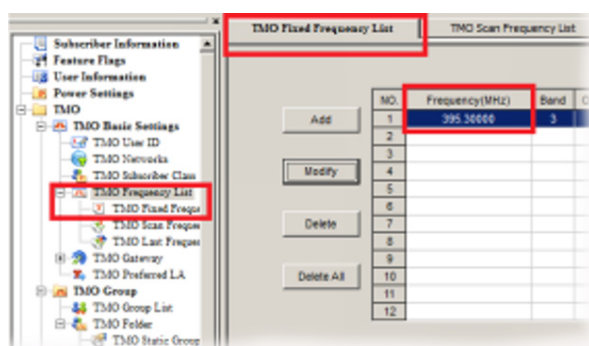
3. Click the **Add** button.
4. In the **MCC** (Mobile Country Code) column, enter the **MCC**.
The MCC is a 3-digit number determined by country and region.

- In the **MNC** (Mobile Network Code) column, enter the **MNC**.
The MNC is 2- to 4-digit number determined by the network carrier.

NOTE: The MCC and MNC numbers must match the TETRA network for the mobile radio to connect to the system and work in trunked mode.

TMO Frequency

- From the left navigation, select **TMO**.
The TMO Basic Settings appear.
- From the TMO Basic Settings, select **TMO Frequency List**.
The TMO Frequency List appears.
- From the TMO Frequency List, select **TMO Fixed Frequency List**.
The TMO Fixed Frequency List window appears.

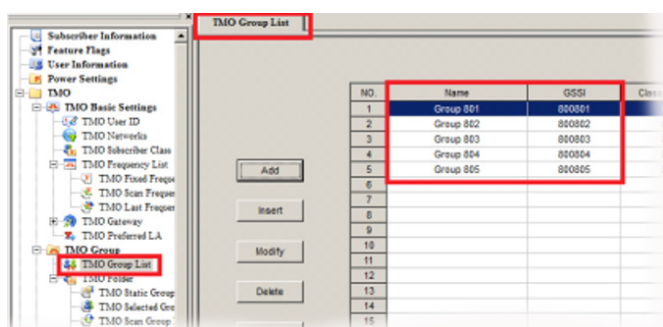


- Click the **Add** button.
- In the **Frequency (MHz)** column, enter the **frequency**.

NOTE: The frequency must match the TETRA network for the mobile radio to connect to the system.

TMO Group

- From left navigation, select **TMO Group**.
The TMO Group appears.
- From the TMO Group, select **TMO Group List**.
The TMO Group List window appears.

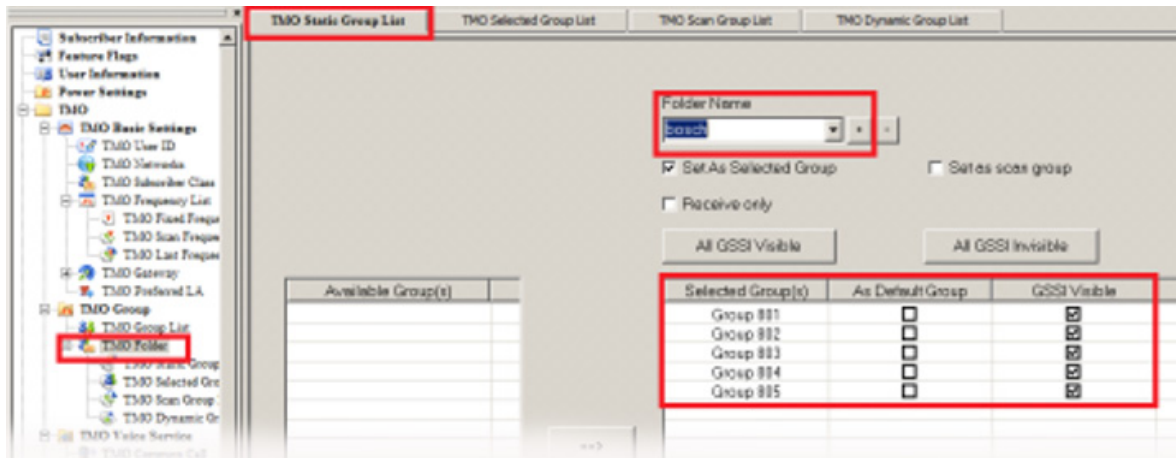


- Click the **Add** button.
- In the **Name** column, enter the **Group name**.
- In the **GSSI** (Group Short Subscriber Identity) column, enter the **GSSI number**.

NOTE: The Hytera terminal must have at least one group in the group list to affiliate and operate on the TETRA network. Each group needs a unique GSSI number.

TMO Folders

1. From the left navigation, select **TMO Group**.
The TMO Group appears.
2. From the TMO Group, select **TMO Folder**.
The TMO Static Group List window appears.



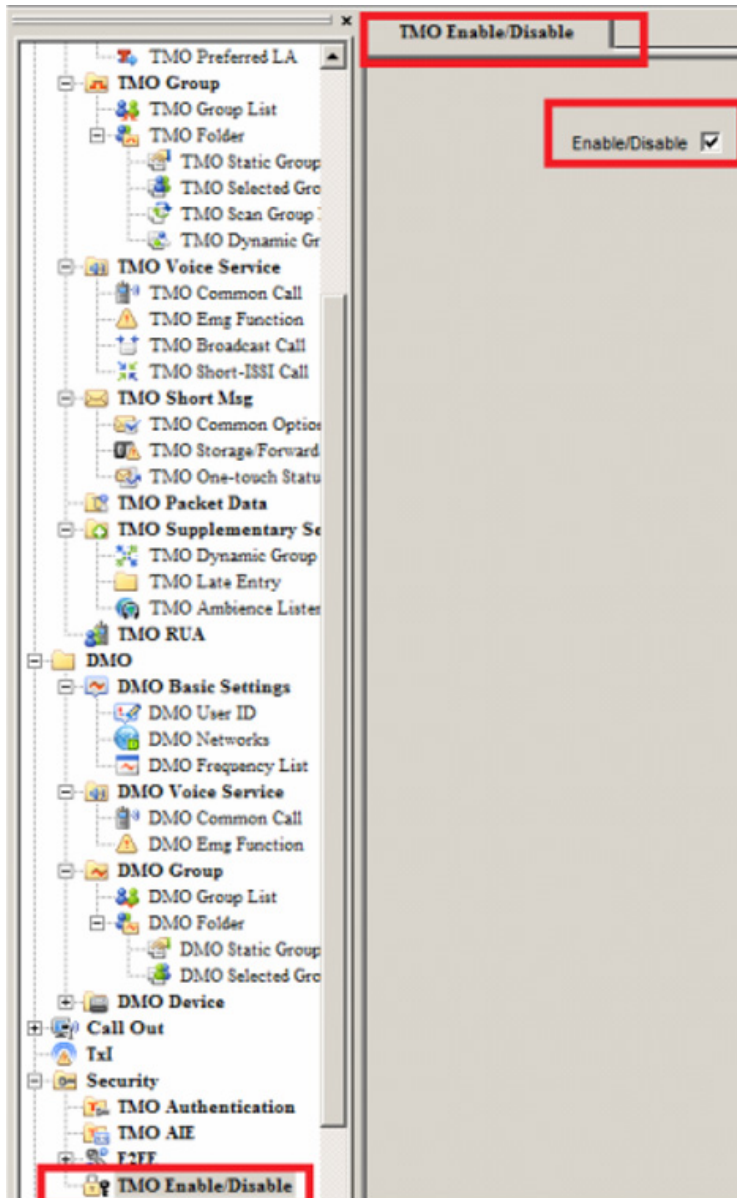
3. In the **Folder Name** field, enter the **name of the folder**
OR
use the drop down menu to select a **previously created folder**.

NOTE: The Hytera terminal must have a folder to serve as a container for the groups.

4. From the Available Group(s) panel, select **desired group or groups**.
5. Click the → **button**.
The selected group(s) will appear in Selected Group(s) panel.

TMO Enable/Disable

1. From the left navigation, select **Security**.
Security appears.
2. From Security, select **TMO Enable/Disable**.
The TMO Enable/Disable window appears.



3. Select the **Enable/Disable** check box.

NOTE: The Hytera terminal only works in trunked mode if the TMO Enable/Disable is enabled.

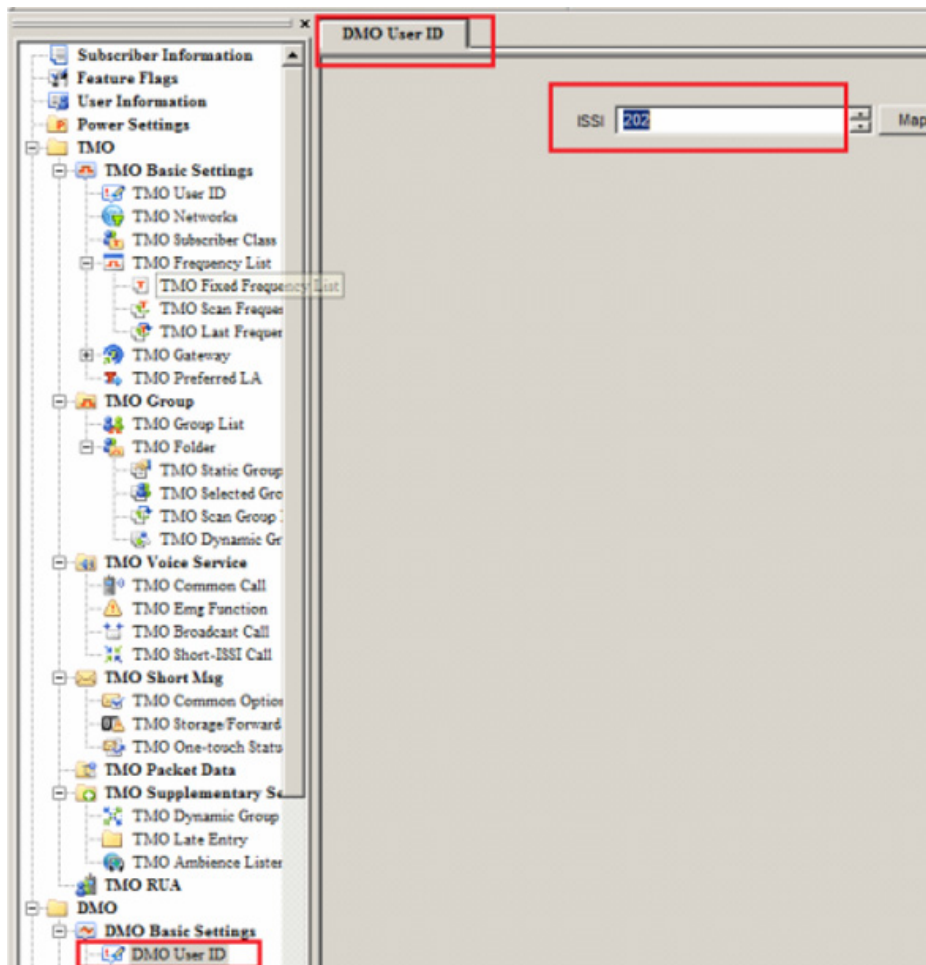
6.2 Direct Mode Setup

Direct Mode allows the Hytera radio to communicate with other radios directly when no repeater is available.

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

DMO User ID

1. From the left navigation, select **DMO**.
The DMO Basic Settings appear.
2. From the DMO Basic Settings, select **DMO User ID**.
The DMO User ID window appears.

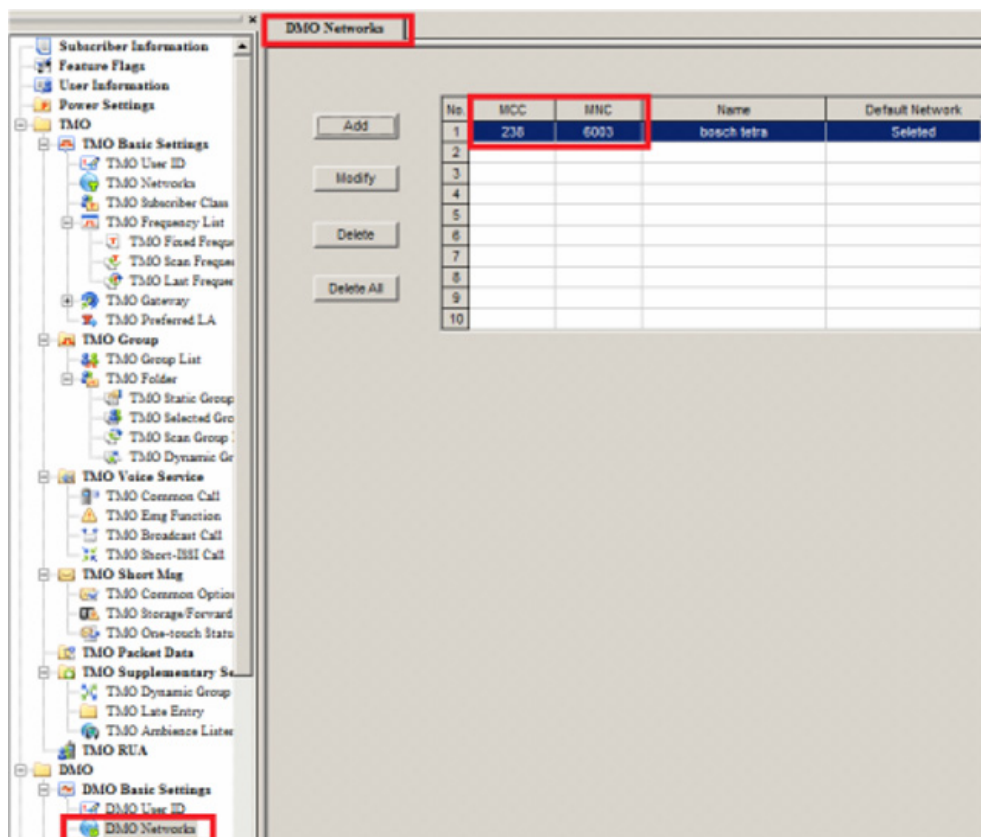


3. In the **ISSI** (Individual Short Subscriber Identifier) field, enter the **ISSI number**.

NOTE: The **DMO User ID** is the unique ID of the Hytera terminal in direct mode.

DMO Networks

1. From the left navigation, select **DMO**.
The DMO Basic Settings appear.
2. From the DMO Basic Settings, select **DMO Networks**.
The DMO Networks window appears.

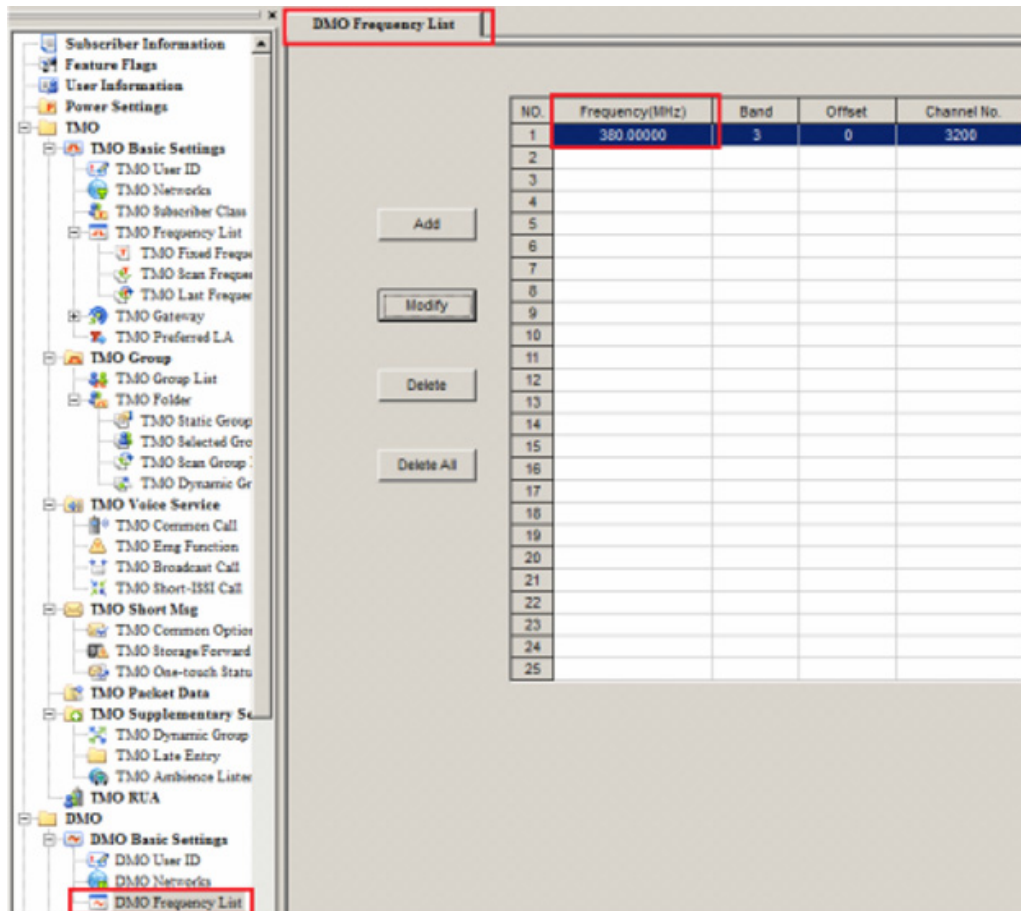


3. Click the **Add button**.
4. In the **MCC** (Mobile Country Code) column, enter the **MCC**.
The MCC is a 3-digit number determined by country and region.
5. In the **MNC** (Mobile Network Code) column, enter the **MNC**.
The MNC is 2- to 4-digit number determined by network carrier.

NOTE: The MCC and MNC number must match the other Hytera TETRA radios to work with them in direct mode.

DMO Frequency Lists

1. From the left navigation, select **DMO**.
The DMO Basic Settings appear.
2. From the DMO Basic Settings, select **DMO Frequency List**.
The DMO Frequency List window appears.

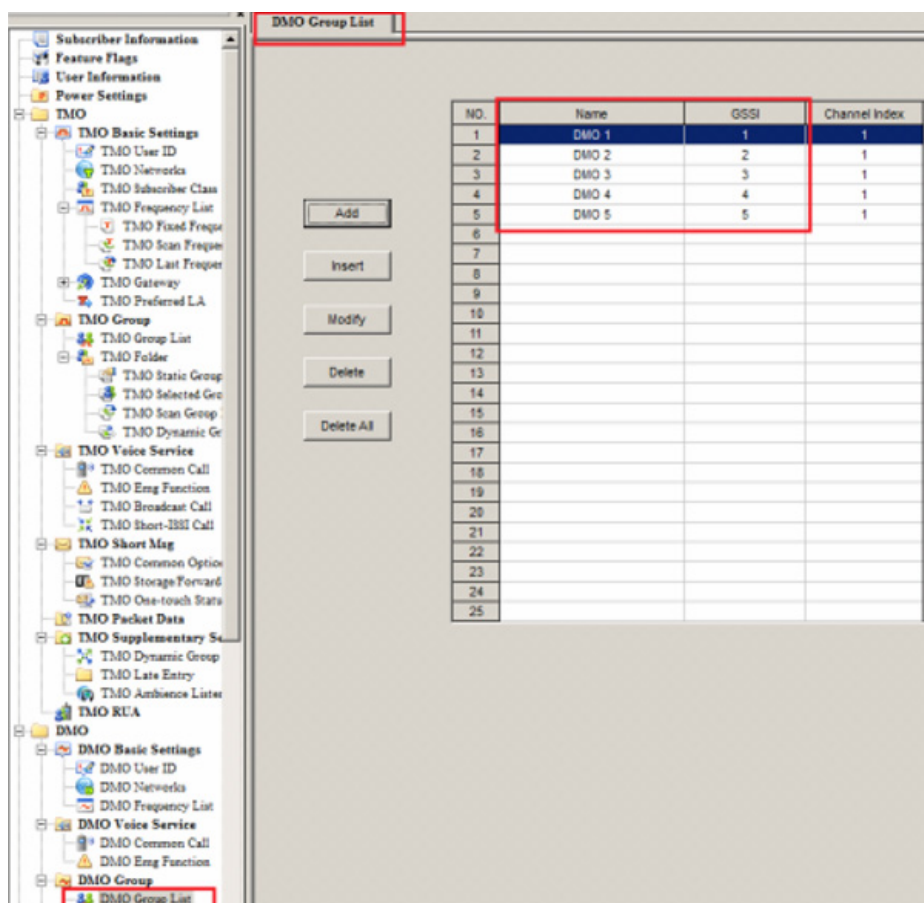


3. Click the **Add** button.
4. In the **Frequency (MHz)** column, enter the **frequency**.

NOTE: The frequency must match the other Hytera TETRA radios to work with them in direct mode.

DMO Group

1. From the left navigation, select **DMO**.
The DMO Group appears.
2. From the DMO Group, select **DMO Group List**.
The DMO Group List window appears.

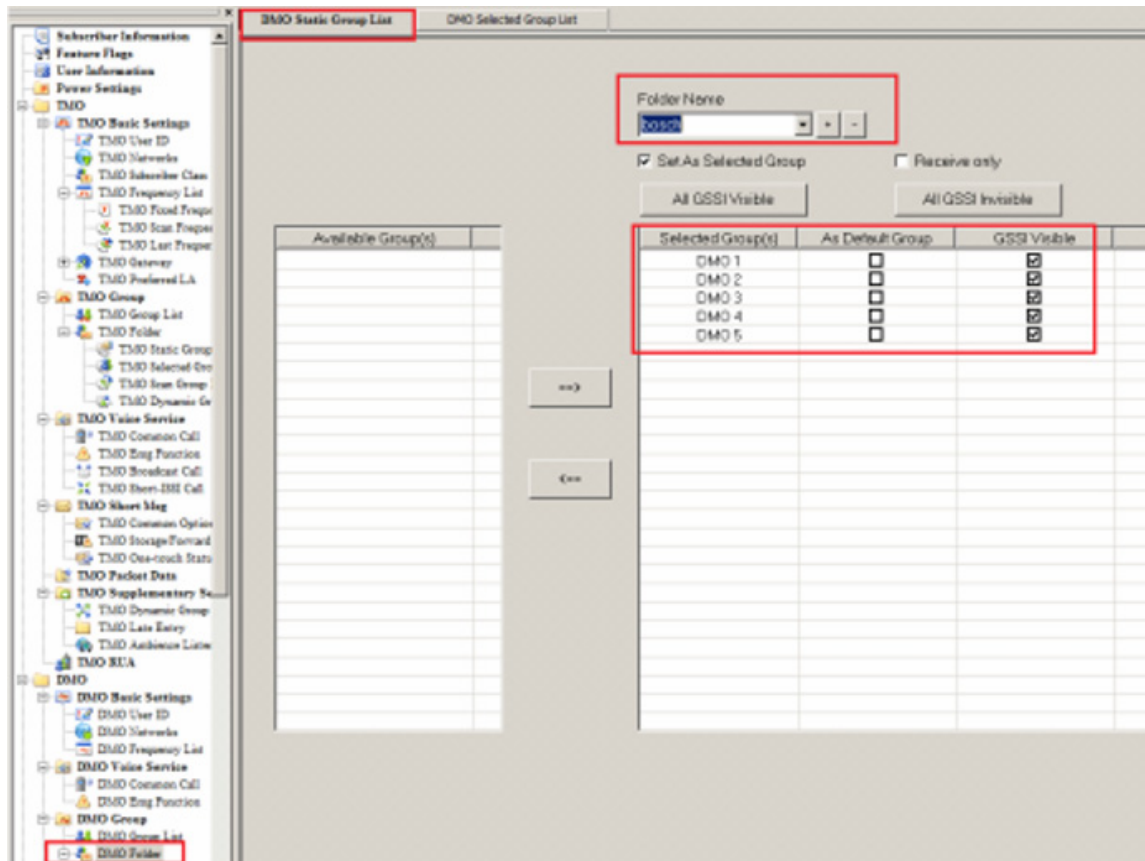


3. Click the **Add** button.
4. In the **Name** column, enter the **Group name**.
5. In the **GSSI** (Group Short Subscriber Identity) column, enter the **GSSI number**.

NOTE: The Hytera terminal must have at least one group in the group list. Each group needs a unique GSSI number.

DMO Folder

1. From the left navigation, select **DMO**.
The DMO Group appears.
2. From the DMO Group, select the **DMO Folder**.
The DMO Static Group List window appears.



3. In the **Folder Name** field, enter the **name of the folder**
OR
use the drop down menu to select a **previously created folder**.

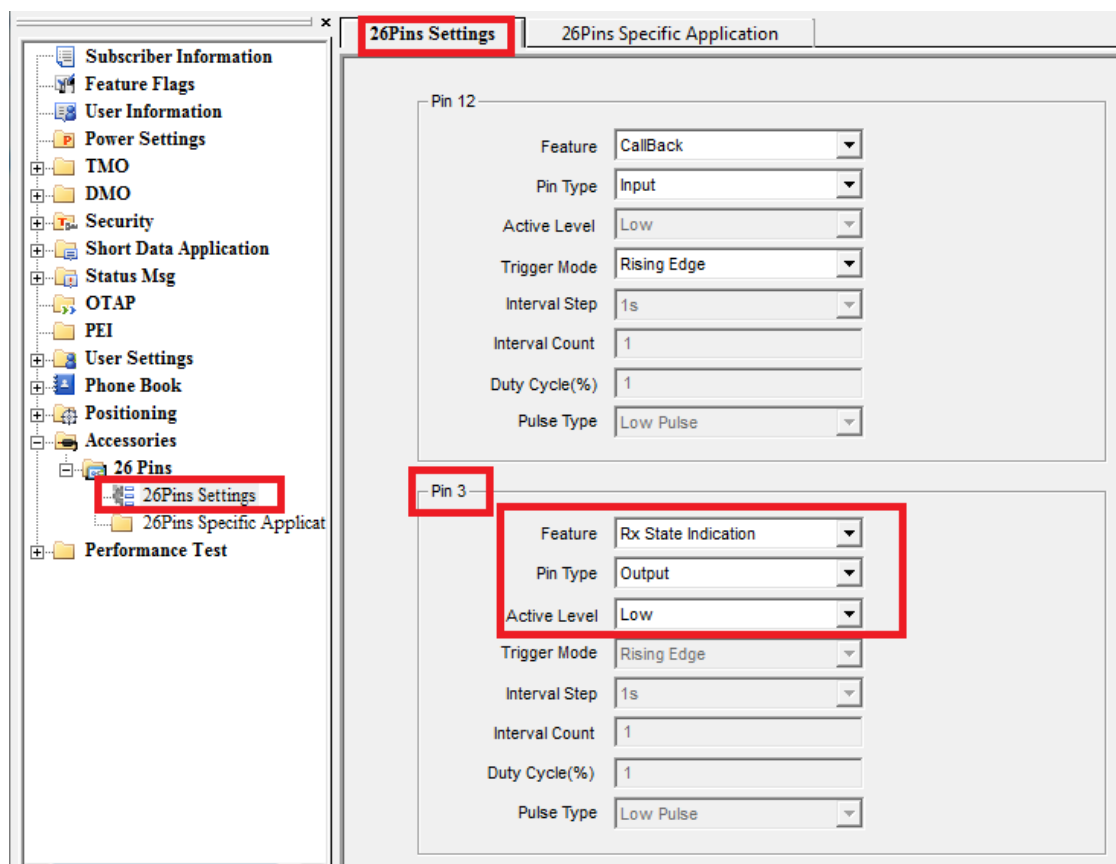
NOTE: The Hytera terminal must have a folder to serve as a container for the groups.

4. From the **Available Group(s)** panel, select desired group or groups.
5. Click the → **button**.
The selected group(s) appear in Selected Group(s) window.

6.3 COR Setup

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

1. From the left navigation, select **Accessories**.
26 Pins appears.
2. From 26 Pins, select **26Pins Settings**.
The 26Pins Settings window appears.



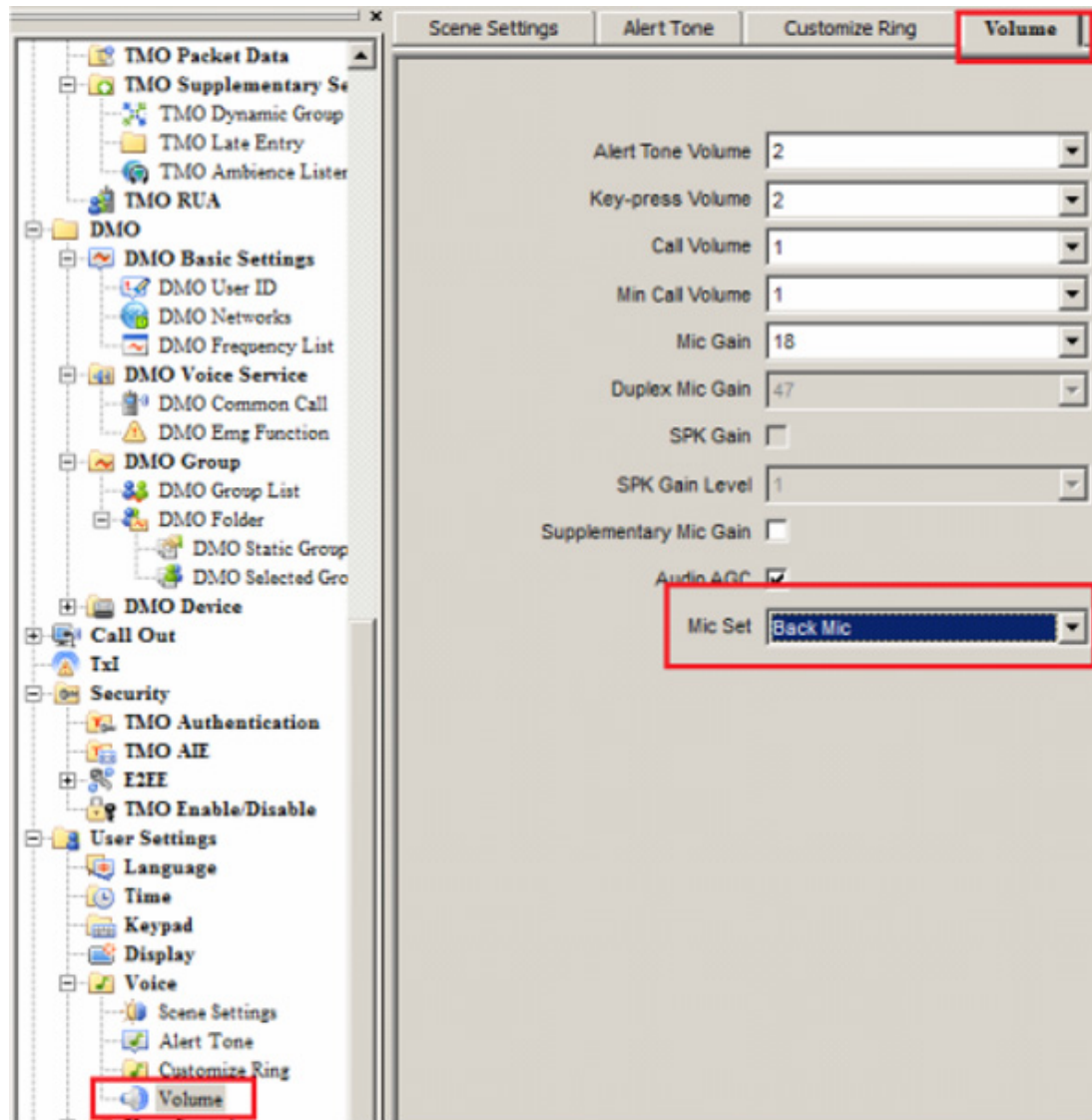
From Pin 3 Group Box

3. In the Feature drop down menu, select **RX State Indication**.
4. In the Pin Type drop down menu, select **Output**.
5. In the Active Level drop down menu, select **Low**.

6.4 Transmit Audio Setup

To configure **Transmit Audio**, do the following:

1. From the left navigation, select **User Settings**.
The Voice folder appears.
2. From the Voice folder, select **Volume**.
The Volume window appears.



3. In the Mic Set drop down menu, select **Back Mic**.

NOTE: For the terminal to use the mic on the back connector, the Mic Set drop down menu must be set to Back Mic. This allows the terminal to use audio from the IP-224 for transmitting.

7.0 IP-224 Access Key Installation

The Hytera TETRA radio interface requires an additional Advanced Interface Option (Export) or Advanced Interface Option (North American) on the IP-224.

NOTE:

- The Advanced Interface Option (Export) or Advanced Interface Option (North American) Access Key must be purchased before you can select the Hytera MT680 Serial Type. The Advanced Interface Option (Export) or Advanced Interface Option (North American) requires an access key to be generated specifically for each IP-224.
- If the Advanced Interface Option (Export) or Advanced Interface Option (North American) Access Key was purchased as a factory installation [(F.01U.347.906) IP-224 Radio Gateway Advanced Options Export or (F.01U.347.907) IP-224 Radio Gateway Advanced Options NA (factory installed)] the access key was activated by the factory prior to shipping.
- Activating the Advanced Interface Option (Export) or Advanced Interface Option (North American) via the IP-224 web interface is only required if this is a field installation [(F.01U.343.868) IP-224 Field Code Advanced Options Export or (F.01U.343.869) Field Code Advanced Options NA (customer purchased option)].

To activate the **Advanced Interface Option (Export)** or **Advanced Interface Option (North American)** Access Key, do the following:

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

TELEX IP-224

- Home
- Ethernet Setup
- Multicast Setup
- Hardware Setup
- Gain Setup
- Per Line Setup
- Crosspatch Setup
- Account Management
- Backup & Restore
- Firmware Upgrade
- Additional Features**
- Save Parameters
- System Status

SUCCESS: Features are now available. Save Parameters step still required.

ACCESS ADDITIONAL FEATURES

Access Key:

Feature Name	State
Advanced Interface Option (North American)	Enabled
Serial Type	Available
EFJ 5300/VMx00	Yes
Hytera MD782	Yes
Hytera MT680	Yes
Icom	Yes
iDEN	Yes
Kenwood 5x10	Yes
Kenwood NEXEDGE	Yes
Kenwood NX-5x00	Yes
Kenwood x150	Yes
Kenwood x180	Yes
Kenwood x80	Yes
Kenwood x90	Yes
MOTOTRBO Interface*	Yes
MTRBi	Yes
PowerTrunk	Yes
Sepura	Yes
Serial Over IP	Yes
Sprint Direct Connect	Yes
Tait TM91xx/TM94xx	Yes
Tait TM93xx	Yes
Telex Generic	Yes

** MOTOTRBO Interface is only available on one line with the Advanced Interface Option (North American)*

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 web page appears.
2. From the left navigation, select **Multicast Setup**.

TELEX
Radio Dispatch

Name: Telex IP-224
MAC: 00:08:7C:70:09:0A
HW: 1.000 FW: 1.204
SN: 224120268 Checksum: 70368561

TELEX IP-224

- Home
- Ethernet Setup
- Multicast Setup
 - Line Setup
 - IP Recorder Setup
- Hardware Setup
- Gain Setup
- Per Line Setup
- Account Management
- Additional Features
- Save Parameters
- System Status

Submit Auto Configuration: ☒

LINE SETUP

Line:	Line Enable:	Line Name:	Line Type:	Serial Type:	Vocoder Type:
1	<input checked="" type="checkbox"/>	Hytera 1	Local Mode	Hytera MT680	TELEX 32K
2	<input checked="" type="checkbox"/>	Hytera 2	Local Mode	Hytera MT680	TELEX 32K

Line:	Mcast Enable:	RX Mcast:	RX Port:	TX Mcast:	TX Port:	TX Group Port A:	TX Group Port B:	TTL:
1	<input checked="" type="checkbox"/>	225.8.11.81	1054	225.8.11.81	1072	0	0	6
2	<input checked="" type="checkbox"/>	225.8.11.81	1055	225.8.11.81	1073	0	0	6

IP RECORDER SETUP

Line:	Mcast Enable:	Line Name:	Vocoder Type:	Mcast Address:	Outgoing Port:	TTL:
1	<input type="checkbox"/>	Recorder 1	TELEX 32K	225.8.11.81	2250	6
2	<input type="checkbox"/>	Recorder 2	TELEX 32K	225.8.11.81	2251	6

Submit

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

Under LINE SETUP

4. From the Serial Type drop down menu, select **Hytera MT680**.
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 window appears.

Entry	Enable	Relay	Relay Group	Relay Time (ms)	Call Type	ISSI/GSSI Number
1	<input checked="" type="checkbox"/>	<input type="text"/>	1 ▾	0 <input type="text"/>	Trunked GC ▾	00800801 <input type="text"/>
2	<input checked="" type="checkbox"/>	<input type="text"/>	1 ▾	0 <input type="text"/>	Trunked GC ▾	00800802 <input type="text"/>
3	<input checked="" type="checkbox"/>	<input type="text"/>	1 ▾	0 <input type="text"/>	Trunked GC ▾	00800803 <input type="text"/>
4	<input checked="" type="checkbox"/>	<input type="text"/>	1 ▾	0 <input type="text"/>	Trunked GC ▾	00800804 <input type="text"/>
5	<input checked="" type="checkbox"/>	<input type="text"/>	1 ▾	0 <input type="text"/>	Trunked GC ▾	00800805 <input type="text"/>
6	<input checked="" type="checkbox"/>	<input type="text"/>	1 ▾	0 <input type="text"/>	Trunked HDPC ▾	02000346 <input type="text"/>
7	<input checked="" type="checkbox"/>	<input type="text"/>	1 ▾	0 <input type="text"/>	Trunked HDPC ▾	02000361 <input type="text"/>

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 the 8 digit **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 **Save Parameters**.
The Save Parameters page appears.
15. Click the **Save Parameters button**.
Changes are now permanently saved to the IP-224 console.

NOTE: The Hytera radio is currently unable to support Trunked UDSL.

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 menu, select **Setup Per Line Parameters**.

The Per Line Parameters window appears.

Line Number	Line Type	Line Name	RX Multicast Address	Rx Port	TX Multicast Address	TX Port	Base Radio IP	TTL	Packet Delay	Options	Freqs	Signal Setup	SIP
1	Telex	TETRA-1	234 . 8 . 11 . 8	1120	234 . 8 . 11 . 8	1222	172 . 19 . 20 . 201	6	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
2	Telex	Ken.UHF	234 . 8 . 11 . 8	1121	225 . 8 . 11 . 8	1223	172 . 19 . 20 . 201	6	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
3	Telex	IDen-1	234 . 8 . 11 . 8	1124	234 . 8 . 11 . 8	1226	172 . 19 . 20 . 203	6	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
4	Phone	IDen Phone	225 . 8 . 11 . 60	1057	225 . 8 . 11 . 60	1078	10 . 6 . 100 . 224	6	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
5	Phone	Telephone	225 . 8 . 11 . 60	1058	225 . 8 . 11 . 60	1073	10 . 6 . 100 . 224	6	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
6	Disabled	Remote UHF	225 . 8 . 11 . 81	1059	225 . 8 . 11 . 81	1077	10 . 6 . 100 . 225	6	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
7	Disabled	Remote TETRA	225 . 8 . 11 . 81	1060	225 . 8 . 11 . 81	1078	10 . 6 . 100 . 225	6	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
8	Phone	TETRA FDPC	225 . 8 . 11 . 81	1061	225 . 8 . 11 . 81	1111	172 . 19 . 20 . 201	5	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
9	Disabled	Line 9	225 . 8 . 11 . 81	1062	225 . 8 . 11 . 81	1112	0 . 0 . 0 . 0	1	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						
10	Disabled	Line 10	225 . 8 . 11 . 81	1063	225 . 8 . 11 . 81	1113	0 . 0 . 0 . 0	1	6	Options	Freqs	Signal Setup	SIP
		Echo Packets Enable:	<input type="checkbox"/>	0 . 0 . 0 . 0	1054	0 . 0 . 0 . 0	1072						

AutoFill

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.

Enable	Freq Number	Frequency Name
<input checked="" type="checkbox"/>	1	TMO 1
<input checked="" type="checkbox"/>	2	TMO 2
<input checked="" type="checkbox"/>	3	TMO 3
<input checked="" type="checkbox"/>	4	TMO 4
<input checked="" type="checkbox"/>	5	TMO 5
<input checked="" type="checkbox"/>	6	UDSL
<input checked="" type="checkbox"/>	7	HDPC 345
<input checked="" type="checkbox"/>	8	HDPC 346
<input checked="" type="checkbox"/>	9	HDPC 348
<input checked="" type="checkbox"/>	10	DMO 1
<input type="checkbox"/>	11	
<input type="checkbox"/>	12	
<input type="checkbox"/>	13	

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**.

The screenshot shows a software window titled "Signaling Parameters: TETRA-1" with a standard Windows-style title bar (blue with a close button). The window contains three tabs: "General Signal Setup", "5-6 Tone/DTMF ANI Setup", and "Call Setup". The "General Signal Setup" tab is active. It is divided into three sections: "System Settings", "Signaling AutoFill Setup", and "Call Logging". In the "System Settings" section, "System Type" is set to "5/6 Tone/DTMF ANI" and "System Name" is set to "None". In the "Signaling AutoFill Setup" section, the "Enable Signaling AutoFill" checkbox is unchecked, and both "Starting Line Number" and "Ending Line Number" are set to "1". In the "Call Logging" section, the "Display All Calls" checkbox is unchecked. At the bottom right of the window are "OK" and "Cancel" buttons.

Signaling Parameters: TETRA-1

General Signal Setup | 5-6 Tone/DTMF ANI Setup | Call Setup

System Settings

System Type: 5/6 Tone/DTMF ANI

System Name: None

Signaling AutoFill Setup

☐ Enable Signaling AutoFill

Starting Line Number: 1

Ending Line Number: 1

Call Logging

☐ Display All Calls

OK Cancel

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

The screenshot shows the 'Signaling Parameters: TETRA-1' window with the '5-6 Tone/DTMF ANI Setup' tab selected. The window contains several configuration sections:

- General Signal Setup:** Includes 'Per Line Console ID' and 'Unit ID' (02000350).
- Signaling Setup:** Includes 'Signaling Type' (DTMF), 'Digit Duration' (100 ms), 'Interdigit Duration' (100 ms), 'Pause Duration' (200 ms), 'Preamble Duration' (100 ms), 'Level' (-3 dB), 'Twist Level' (0 dB), 'Group Digit' (A), and 'Repeat Digit' (E).
- Auto Ack Setup:** Includes 'Auto Ack Type' (Disabled) and 'Auto Ack Delay' (1000 ms).
- Single Tone Auto Ack Setup:** Includes 'Frequency' (1000 Hz), 'Duration' (25 ms), and 'Level' (-3 dB).
- Signaling Delays:** Includes 'Initial Delay' (0 ms) and 'End Delay' (100 ms).

Buttons for 'Defaults', 'OK', and 'Cancel' are also visible.

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.

Signaling Parameters: TETRA-1

General Signal Setup | 5-6 Tone/DTMF ANI Setup | **Call Setup**

Call Setup

Format

Auto Ack: 12111

Emerg. Resolved:

PTT BOT:

PTT EOT:

Call 1: KD

Call 2:

Call 3:

Call 4:

Call 5:

Call 6:

Call 7:

Call 8:

Call 9:

Call 10:

Label

HDPC

Call2

Call3

Call4

Call5

Call6

Call7

Call8

Call9

Call10

OK Cancel

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.

	Name:	User ID:	Type:	TX Inhibit:	
1	Disposal	352	Generic	<input type="checkbox"/>	Filters
2	Dispch B	351	Generic	<input type="checkbox"/>	Filters
3	Dispch A	350	Generic	<input type="checkbox"/>	Filters
4	Clean Up	348	Generic	<input type="checkbox"/>	Filters
5	Recovery	346	Generic	<input type="checkbox"/>	Filters
6	Tech Support	345	Generic	<input type="checkbox"/>	Filters
7	Car 2	329	Generic	<input type="checkbox"/>	Filters
8	Car 1	327	Generic	<input type="checkbox"/>	Filters
9	Red 4	316	Generic	<input type="checkbox"/>	Filters
10	Red 3	314	Generic	<input type="checkbox"/>	Filters
11	Red 2	312	Generic	<input type="checkbox"/>	Filters
12	Red 1	310	Generic	<input type="checkbox"/>	Filters

Load File Save File Close

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 *6000 entries*.

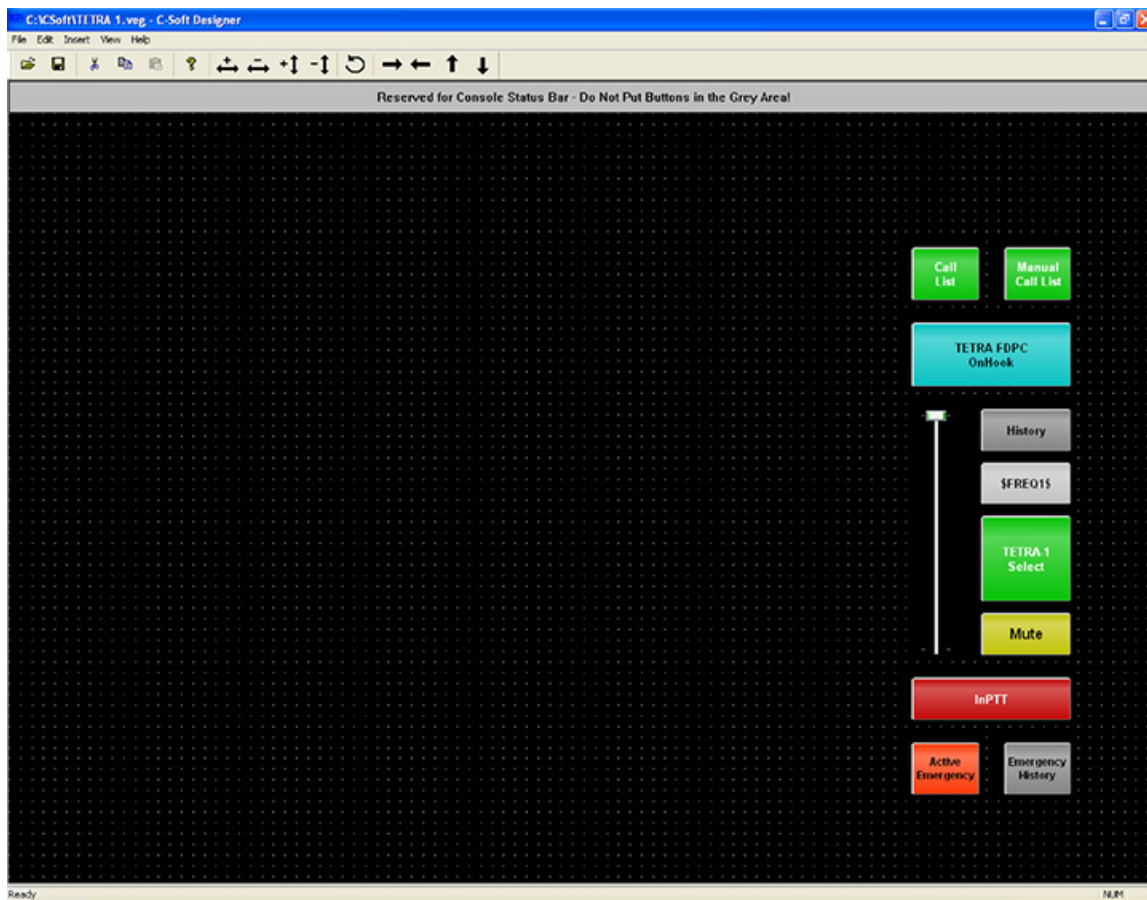
9.6 Console Design Overview

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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