

BK Technologies KNG Series 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

This application guide describes the Telex Radio Dispatch BK Technologies KNG Series 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 BK Technologies KNG Series Interface Cable, BK Technologies Option KAA0621

NOTE: Telex Radio Dispatch does not manufacture an interface cable. See the Cable Diagram section for details on creating one, or purchase from BK Technologies.
- BK Technologies KNG B or M Series Radio operating firmware 5.4.X and higher

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
- Telex System Manager (TSM) 2.300 or later
- Windows 8.1
- Windows 10
- BK Technologies Radio Editing Software (RES)

4.0 Supported Features

BK Technologies KNG Series Supported Features					
Feature	Analog Support	Digital Support	Feature	Analog Support	Digital Support
Channel/Talkgroup Change	Yes	Yes	Emergency Acknowledgement	No	No
Zone Change	Yes	Yes	Encryption On/Off	No	Yes
			GPS Read	No	No
Group Call	No	No	GPS Trigger On/Off	No	No
Private Call	No	No	Monitor On/Off	Yes	Yes
			Radio Call Alert	No	No
ANI Decode	Yes	Yes	Radio Check	No	No
Call Alert Decode	No	No	Radio Enable/Disable	No	Yes
Emergency Decode	Yes	Yes	Radio Select Call	No	No
Status Message Decode	No	No	Radio Remote Monitor	No	No
Text Message Decode	No	No	Radio Send Text Message	No	No
			Radio Status (Send Status Message)	No	No
Query Encryption	Yes	Yes	Radio Status Request	No	No
Query Monitor	Yes	Yes	Scan Add/Delete	No	No
Query Scan	Yes	Yes	Scan On/Off	*	*
Query Talk Around	Yes	Yes	Talk Around On/Off	Yes	Yes

* *Not fully supported. Please see Known Limitations section.*

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 Known Limitations

5.1 Scan On/Off

The BK Technologies KNG Series radio does not pass the correct serial channel information to the IP-224 while scan is active so the IP Console's channel will not be updated correctly.

NOTE: Verify the radio firmware version is at least 5.5.13 to avoid this issue.

6.0 Cable Diagram

By using the table below, customers will need to manufacture the IP-224 to BK Technologies KNG Series radio interface cable to serially control the BK Technologies BK Radio KNG Series radio.

TABLE 1. BK Technologies KNG Series to IP-224 Wire Connections

BK Technologies KNG Series		IP-224	
Pin Name	DB25 Pin	DB37 Pin	Pin Name
ACC_MIC	19	1	TX+ Audio
Ground	8	2	TX- Audio
ACC_PTT	12	24	PTT Relay N.O. Contact
OPT_1_Output	23	15	COR Input
ACC_R232_RXD	18	17	RS-232 TXD
ACC_R232_TXD	16	36	RS-232 RXD
Ground	8	29	Ground
ACC_Audio_Out	6	20	RX+ Audio
Ground	8	21	RX- Audio
Connect to Pin 21 of DB25	7	N/A	
Connect to Pin 7 of DB25	21		

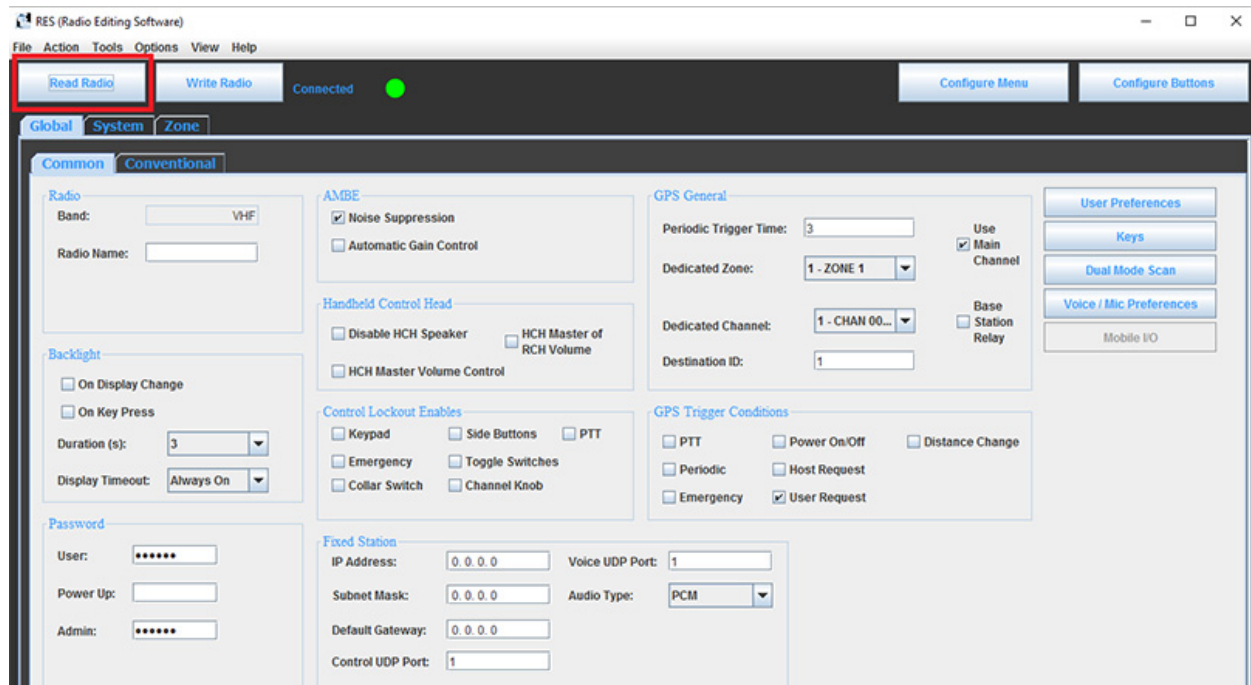
7.0 Radio Programming Application Setup

The Radio Editing Software (RES) is used to configure the BK Technologies KNG Series radio to interface properly with the IP-224.

7.1 Serial Communications Setup

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

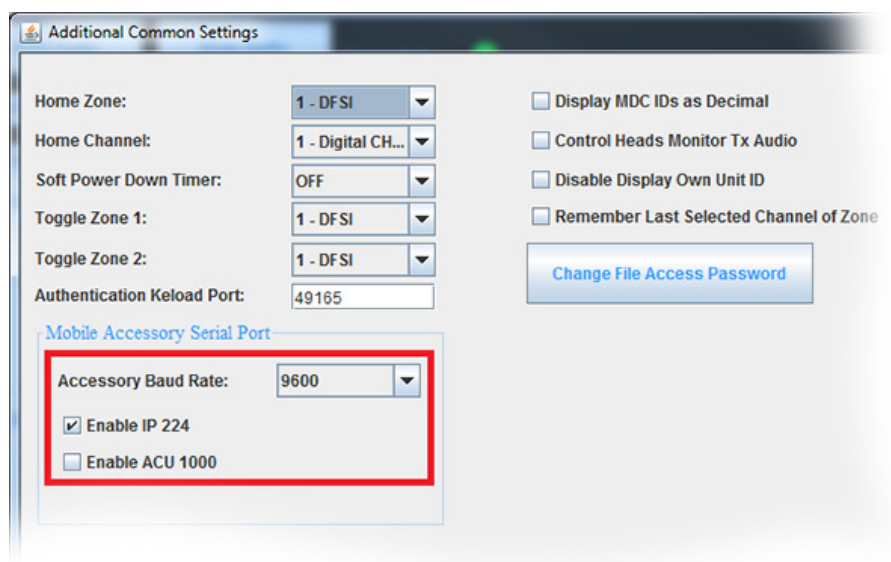
1. Using the USB programming cable, connect the **radio to the computer running the RES software**.
2. Turn on the **radio** and click the **Read Radio button** to read the current radio settings.



3. Click the **Global tab**.
The Global page appears.
4. Click the **Common tab**.
The Common page appears.

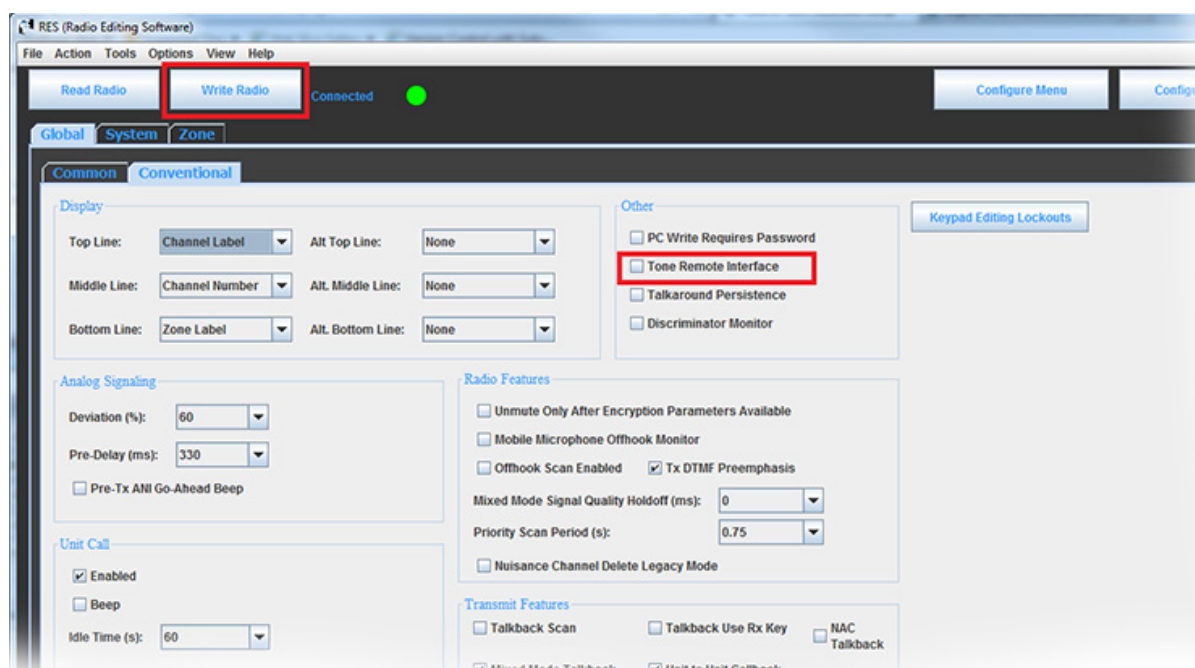
- Click the **User Preferences** button.

The Additional Common Settings window appears.



- From the Accessory Baud Rate drop down menu, select **9600**.
- Select the **Enable IP 224** check box.
- Clear the **Enable ACU 1000** check box.
- Close the **Additional Common Settings** window.
- Click the **Conventional** tab.

The Conventional page appears.



- Clear the **Tone Remote Interface** check box.
- When all necessary changes are complete, click the **Write Radio** button to write the current radio settings.

7.2 COR Setup

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

1. From the top navigation, select **Global- >Common**.

2. Click the **Mobile I/O** button.
The Mobile I/O Common Settings window appears.

3. From the Output 1 Mode drop down menu, select **Active Rx**.
4. Select the **Mobile** check box.
5. From the Output 1 Active Level drop down menu, select **Low**.

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 IP-224

Submit Auto Configuration: ☒

LINE SETUP

Line:	Line Enable:	Line Name:	Line Type:	Serial Type:	Vocoder Type:
1	☒	Generic_1	Local Mode	Telex Generic	TELEX 32K
2	☒	Generic_2	Local Mode	Telex Generic	TELEX 32K

Line:	Mcast Enable:	RX Mcast:	RX Port:	TX Mcast:	TX Port:	TX Group Port A:	TX Group Port B:	TTL:
1	☒	225.8.11.89	16054	225.8.11.89	16072	0	0	6
2	☒	225.8.11.89	16055	225.8.11.89	16073	0	0	6

IP RECORDER SETUP

Line:	Mcast Enable:	Line Name:	Vocoder Type:	Mcast Address:	Outgoing Port:	TTL:
1	☐	Recorder 1	TELEX 32K	225.8.11.87	62250	6
2	☐	Recorder 2	TELEX 32K	225.8.11.87	62251	6

Submit

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

Under LINE SETUP

4. From the Serial Type drop down menu, select **Telex Generic**.
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 **Hardware Setup**.

The screenshot displays the 'Hardware Setup' configuration page. On the left is a navigation menu with options: Audio/Analog Setup, Digital I/O Setup, Display Setup, Serial Protocol Setup, Gain Setup, Per Line Setup, Crosspatch Setup, Account Management, Additional Features, Save Parameters, and System Status. The main content area is divided into four sections:

- AUDIO/ANALOG SETUP**: Contains settings for Line 1 and Line 2. Functions include 2-Wire/4-Wire Audio (set to 4-Wire), RX Audio Single-Ended/Balanced (Single-Ended), RX Audio Impedance (600 Ohms), TX Audio Single-Ended/Balanced (Single-Ended), and TX Audio Impedance (200 Ohms).
- DIGITAL I/O SETUP**: Contains settings for Line 1 and Line 2. Functions include I/O Pullup/Pulldown/Float (set to Pullup) and I/O Voltage (set to 5VDC I/O).
- DISPLAY SETUP**: Contains Contrast (set to 6) and Menu Enable (checked).
- SERIAL PROTOCOL SETUP**: Contains settings for Line 1 and Line 2. Functions include Serial Mode (set to RS-232) and Baud Rate (set to 9600,N,8,2). This section is highlighted with a red box.

Under Serial Protocol Setup

11. From the Serial Mode drop down menu, select **RS-232**.
12. From the Baud Rate drop down menu, select **9600,N,8,2**.
13. Click the **Submit** button.

The changes are sent to the IP-224 in temporary storage.

14. From the left navigation, select **Per Line Setup**.

The Per Line Setup window appears.

FUNCTION TONE SETUP

Jump to Entry: << < 1 to 10 > >>

Boot Up Frequency: 1

Entry	Enable	Relay	Relay Group	Relay Time (ms)	Digital Output	CTCSS Freq	CTCSS Default	System	Chan
1	☒		1	0	0	0	☐	1	1
2	☒		1	0	0	0	☐	1	2
3	☒		1	0	0	0	☐	1	3
4	☒		1	0	0	0	☐	1	4
5	☒		1	0	0	0	☐	1	5
6	☒		1	0	0	0	☐	1	6
7	☒		1	0	0	0	☐	1	7
8	☒		1	0	0	0	☐	1	8
9	☒		1	0	0	0	☐	2	1
10	☒		1	0	0	0	☐	2	2

Under Function Tone Setup

15. In the System Column field, enter the desired **radio system/zone**.

16. In the Chan Column field, enter the desired **radio channel**.

17. Click the **Submit** button.

The changes are sent to the IP-224 in temporary storage.

18. In the left navigation, select **Save Parameters**.

The Save Parameters page appears.

19. Click the **Save Parameters** button.

Changes are now saved permanently to the IP-224 console.

9.0 C-Soft Designer Setup

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	Fire Department	225.8.11.81	1054	225.8.11.81	1254	0.0.0.0	2	10	Options	Freqs	Signal Setup	SIP
2	Telex	Sidney Police	225.8.11.81	1055	225.8.11.81	1255	0.0.0.0	2	10	Options	Freqs	Signal Setup	SIP
3	Telex	Newport Police	225.8.11.81	1056	225.8.11.81	1256	0.0.0.0	2	10	Options	Freqs	Signal Setup	SIP
4	Telex	iDen Line	225.8.11.81	1057	225.8.11.81	1257	0.0.0.0	2	10	Options	Freqs	Signal Setup	SIP
5	Telex	16kb Vocoder	225.8.11.81	1058	225.8.11.81	1258	0.0.0.0	2	10	Options	Freqs	Signal Setup	SIP
6	Telex	Supervisor Line	225.8.11.81	1059	225.8.11.81	1259	0.0.0.0	2	10	Options	Freqs	Signal Setup	SIP
7	Disabled	Line 7	225.8.11.81	1060	225.8.11.81	1260	0.0.0.0	6	10	Options	Freqs	Signal Setup	SIP
8	Disabled	Line 8	225.8.11.81	1061	225.8.11.81	1261	0.0.0.0	6	10	Options	Freqs	Signal Setup	SIP
9	Disabled	Line 9	225.8.11.81	1062	225.8.11.81	1262	0.0.0.0	6	10	Options	Freqs	Signal Setup	SIP
10	Disabled	Line 10	225.8.11.81	1063	225.8.11.81	1263	0.0.0.0	6	10	Options	Freqs	Signal Setup	SIP

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

Notes:

Suggestions or comments:

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

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