MIC-7

Multi-Interface Controller

by SureFire Radio

Introduction

- **Internal band decoder**
- **RS-232, CI-V, USB and Band Data interfaces**
- **Internal RS-232 and CI-V to USB interface**
- **Bi-directional band data port**
- **Dual port LAN interface**
- **Direct USB connection to Flex radios**
- **Two units may be interconnected for SO2R operation**
- **Automatic antenna lockout for antennas in use by other radio**
- **Completely configurable from front panel**
- **Anodized aluminum case with laser engraved panels**
- **Size: 1.4H x 6.7W x 7.6D (inches)**
- **Weight: 1.4 pounds**

The SureFire Radio MIC-7 Multi-Interface Controller is a complete band decoder, antenna switch controller and remote control gateway contained in a single package. The internal band decoder supports Icom, Kenwood, Yaesu, Elecraft and Flex radios. Most configuration is done from the front panel (excluding the LAN interface). At the heart of the MIC-7 is the Atmel atXMega64A3 microcontroller which features a high performance RISC architecture while consuming very little power and also allows the MIC-7 firmware to be upgraded in the field by the user. There MIC-7 provides eight outputs for antenna selection. Each output is a separate relay contact. The default configuration provides +12VDC to select antennas. Jumper selections allows the outputs to use any externally applied voltage. The MIC-7 provides seven separate interface connections as described below.

Power connection

Power may be applied to the MIC-7 with either the included power cable or via the FireLAN connection if another device on the bus, such as another MIC-7 or BF-100, already has a power connection. Power requirements are 12-15vdc at 200mA plus the current required by the relays in the antenna switch. If using the included power cable, attach the free ends to

your station power supply. The wire with the white strip is positive. The MIC-7 is protected against reverse polarity. The power jack is a common 2.1mm with center pin positive.

USB Port

The USB port in the MIC-7 utilizes the popular and reliable FT-232 chip from FTDI. The USB interface is powered by the USB connection separately from the main power to allow the COM port on your PC to remain active even when the MIC-7 is powered off. Firmware updating is also done using the USB port.

The MIC-7 USB port is normally connected to your PC for radio control from your logging software. Conversion to and from RS-232 or CI-V to USB is accomplished internally thus eliminating the need for an external interface. The USB port may also be connected directly to Flex SDR radios.

Band Data Port

The MIC-7 contains a bi-directional band data interface. When operating in band data mode the band data from the radio is applied to this port. Input levels may be between 3.3vdc and 12 vdc. Input impedance is 100K ohms so loading on the band data lines should not be an issue. When using the RS-232, CI-V or USB ports for radio control the MIC-7 will automatically output band data information on this port. Output levels are 0 and 5vdc.

Pinout connections for Band Date are shown below in Figure 1.

Radio RS-232 Port

The RS-232 port on the MIC-7 is the same gender as a standard PC serial port and in most cases the same cable used to connect a radio to a PC may be used between the radio and the MIC-7. All popular baud rates are supported.

One unique feature of the MIC-7 is the ability to send frequency data out the RS-232 port when using Icom radios (CI-V), Flex radio via USB or band data. This allows simple operation of accessories such as SteppIR controllers, automatic antenna tuners, auto tune amplifiers, etc.. In the case of band data the frequency data being sent will indicate the center of the band. The format of the data is in Kenwood format and is set to 9600 baud.

Pinouts for the RS-232 connections are shown below in Figure 1. Note that Kenwood radios may require the connection to pin 7 to enable data transmission.

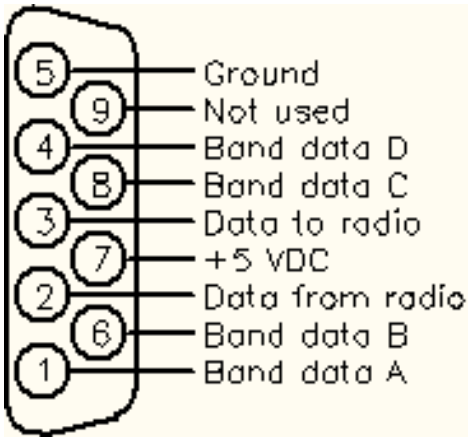

FIGURE 1
View looking into connector on MIC-7

CI-V Port

The CI-V port is used to connect to the Remote jack on Icom radios. This port will also output frequency data in Icom format when one of the other interfaces are used for radio control. Input impedance is 100K ohms so loading on the CI-V bus is negligible***. The MIC-7 will automatically acquire the proper CI-V address from the radio data*** and the baud rate for the CI-V port is configurable from the front panel.

Dual LAN Port

The MIC-7 contains a dual port LAN (Ethernet) interface. These are network ports and not two physical ports. Connect the LAN port to your router or switch using a standard straight-thru network cable. The IP address and port numbers are configurable by the user. After the IP address is initially set the rest of the LAN interface is configured using any web browser.

Port A of the LAN interface provides remote control of the MIC-7 from anywhere via network or internet using the MIC-7 control utility.

Port B of the LAN interface is connected directly to the radio data stream and allows for full control of your radio from any location. If your radio control software does not offer networking, such as setting an IP address and port number, there is a virtual COM port utility available which allows setting the IP address and port number and assigning them to a standard COM port.

FireLAN Port

The FireLAN port is used to connect to other SureFire Radio devices. Connecting the MIC-7 via FireLAN to the BF-100 BandPass Filter unit provides automatic filter selection for the current band on the radio. The FireLAN bus may also be connected to another MIC-7 for SO2R operation to provide automatic antenna lockout when an antenna is in use by the other radio. This port also provides power in addition to data so only a single connection to a power source is required, eliminating the need for multiple power cables and making for a cleaner installation. A 30" cable is supplied to connect to other devices.

Relay Outputs

The MIC-7 has eight relay outputs for selecting antennas. The default settings provide +12 vdc on each active output with the "C" connection being ground. These outputs are made to the screw terminals at the rear of the unit.

Configuring the MIC-7

All configuration except for the LAN is done from the front panel. Enter Configuration Mode by simultaneously pressing NEXT and PREV. After entering Configuration mode use NEXT and PREV to step through the menu options. The descriptions of the menu options are below.

Radio Configuration

Access the Setup Radio menu by entering Configuration Mode and then pressing NEXT once and then press AUTO at the Setup Radio screen.

The first option is the Radio Number. Select the desired radio number by pressing NEXT or PREV and then pressing AUTO to accept the current setting.

Next selection is the Radio Type. Use NEXT and PREV to select the desired radio type and then press AUTO.

Now use NEXT and PREV to select the proper baud rate for the radio. The USB port will be also be set to this baud rate. Press AUTO to accept the displayed baud rate.

The next option is Radio Polling. When disabled the MIC-7 will not ask the radio for data and your logging or control software must periodically ask the radio for data. Normal operation is to have polling enable. Only disable polling if you are getting erroneous data when using the MIC-7 with radio control software. Enable or disable polling using NEXT and PREV and then press AUTO.

If you are using an Icom radio the MIC-7 will now ask you to turn the VFO knob to acquire the CI-V address. Note that you much have CI-V Transceive enabled on the radio.

You are now finished setting up the radio interface.

Auto Band Change

This option allows the MIC-7 to return to automatic antenna selection mode when changing bands. For most users the option should be enabled. If you wish to change this option, press AUTO at the Auto Band Change screen and use NEXT and PREV to enable or disable this option. Press AUTO to accept your choice.

Control via USB

Normally the MIC-7 USB port is used for radio control and the LAN port is used to control the MIC-7. If you wish to control the MIC-7 via USB set this option to Enabled. When enabled there will not be and radio data present on the USB port. Disable this option to allow radio control via the USB port.

Restore Defaults

This option will restore the MIC-7 to factory default settings. To reset the MIC-7 to factory defaults press AUTO at the Restore Defaults screen. Use NEXT to select YES to restore default settings or NO to cancel. Press AUTO after you have made your selection.

Reset IP Address

This option is used to reset the IP address of the LAN interface to 0.0.0.0. Use this option if you accidentally set the IP address to one outside of your local network and are unable to connect to it. Press AUTO at the Reset IP Address screen and then use NEXT or PREV to select YES to reset the IP address or NO to cancel. Press AUTO when done It will take several seconds to reset the address.

Default Antenna Selection

The last thing to compete the setup of the MIC-7 is to set the default antenna for each band. This is a simple process and is done at the main operating screen. First place the radio on the desired band and then use NEXT and PREV to select the desired antenna. After the antenna is selected press AUTO for longer than 3 seconds. Do this for each band to complete the configuration.

LAN Configuration

Configuring the MIC-7 LAN interface is a two step process. The first step is to connect the MIC-7 to your local network and then run the IPSetup utility. The MIC-7 should be shown in the utility as SBL2E. If it isn't showing click on the Search Again button. After it appears in the list you now enter the desired IP address. Be sure the address you enter is compatible with your local network. Next set the Network Mask. For almost all users this should be set to 255.255.255.0. Lastly set the Baudrate to 9600. No entries are required for Gateway and DNS. Now click the Set button. After a few seconds click on the Search Again button and the MIC-7 should show up showing the new IP address. Now click on the Launch Webpage button. When the web page comes up you can set the two port numbers for the LAN interface. These are in the second section of the page under Incoming TCP settings. The defaults are 23 and 24 but it is highly recommended you change these to numbers between 5000 and 60000. No other settings on the page should be changed. Click on the Submit New Settings button at the bottom of the page. Next click on the Serial link at the top of the page. Be sure the baud rate for both ports is set to 9600. No other changes should be made on the Serial page. Click on Submit New Settings to save the baud rate. The LAN configuration is now complete.

Operating the MIC-7

The MIC-7 is a very simple device to operate. For most users it will be a set and forget device. If you wish to use an antenna other than the default one use NEXT and PREV to select the desired antenna. Press AUTO to return to the default antenna. The default antenna will automatically be selected when changing bands if the Auto Band Change option is enabled.