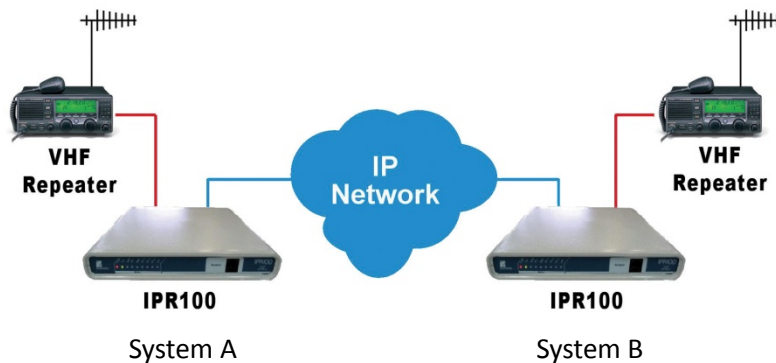


## FAQ

## How do I conduct a systems check on networked IPR100's?

### Troubleshoot an IPR100 using the Front Panel and Diagnostics Page

This note describes how to debug a system where there are 2 radios connected via an IP link using 2 IPR100 or IPR110+ units. The procedure is not exhaustive but shows how to get a basic system functioning.



For a system with revision 3.0 hardware the 'IP network' can be an Ethernet cable. If one unit has an even serial number and the other an odd serial number, with the units at the factory default settings, they will communicate when powered on. If you require a system with more than 2 IPR units, the IP addresses will need to be configured.

A full description of various diagnostic methods is provided below, followed by a summary checklist.

### The difference between an IPR100 and IPR110+

The IPR110+ has features that are not available on the IPR100 such as the ability to use more tone signaling schemes and being able to initiate SIP connections. However, at the basic level they work in the same manner and have the same diagnostic controls on the web page.



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#### Diagnostics from the Front Panel



The LED's on the front panel are the first indicators to use for checking a system. Once power and a network connection is established for both Systems, the LED's should be checked in the following order.

- **Power LED:** Indicates that power is applied to the device. If this LED is not on then there is no 12VDC power into the IPR100.
- **Run LED:** Flashes at a low rate during initialisation and then at a rate of about 5 flashes per second when operating normally.
- **ETH Link LED:** Indicates that the Ethernet interface has detected the switch or router. If this LED is not on, check that the Ethernet cable is plugged in and the network is working.
- **ETH RX LED:** Flashes when receiving Ethernet data packets. If only the 2 IPR100's are on the system the LED will flash occasionally, if there are many devices on the system the LED could appear to be permanently on. Note that the LED indicates that data has been received, not that the data was specifically for the IPR100
- **VoIP Link LED:** Indicates that a VoIP connection has been established between the IPR100's. If the LED is not on check that each IPR100 has the IP address of the other in the 'Remote IP Address' field on the VoIP / RTP configuration page. Also check that the Transmit and Receive port numbers match between the two units.
- **100M LED:** Indicates that the Ethernet interface is connected at 100Mbits/second. If this LED is not on and the other Ethernet LEDs are on, the Ethernet interface is operating at 10Mbits/second.
- **MUTE LED:** Indicates that an active signal is received on the Radio port Mute input. This signal is the output from the radio which may be referred to as the Mute, Busy, COR or COS. This indicates that the radio is receiving a signal. Unless the radio is receiving a signal, this LED should not be on.



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- **PTT LED:** Indicates that the PTT output on the Radio connector is active. When the LED is on the radio should be transmitting.
- **Serial LED:** Indicates data serial data is transmitted or received. The LED will flash while the IPR100 is starting up. Apart from that and unless the unit is being used to send RS232 data, it should be off.

### What if I am getting no transmission?

The system is set up so that the “Run” LEDs on both units are flashing at 5 flashes per second, the “Eth link” and “VoIP link” LED's are on and the radio in System A receives a signal but nothing is transmitted on the radio in System B. The sequence of tests which follow can be used to diagnose the problem.

#### Busy input

The first thing to check is that the “Mute” LED on the front panel of the IPR100 in System A is turned on when the radio is receiving. If the LED did not turn on or is permanently on, there is a hardware problem with the wiring. Check the FAQ Fact Sheet “How can I connect the IPR range of IP Gateways to my radio equipment?” ([Click here](#)) on our website.

If you have a radio that does not have a busy output you will need to set up your IPR100 to use Voice Activity Detection (VAD). The section “Radios with no Busy Output” describes how to setup the VAD. The rest of the system can still be tested before the VAD is setup, continue through the sequence as if the busy input does not work.

#### PTT output

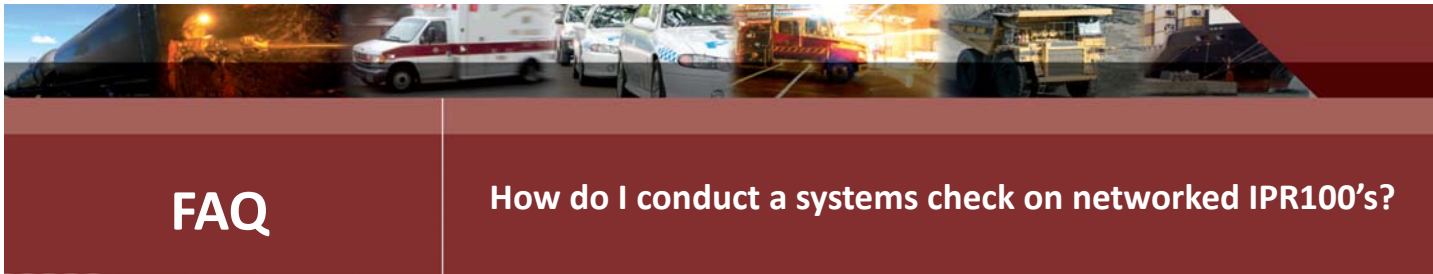
If the busy input worked correctly, check that the “PTT” LED on the IPR100 in System B is turned on. If the LED is turned on, check that the radio has transmitted and then check that the audio was sent from the radio to a receiver. If any of these functions did not happen, it is time to use the IPR100 diagnostics to help solve the problem.



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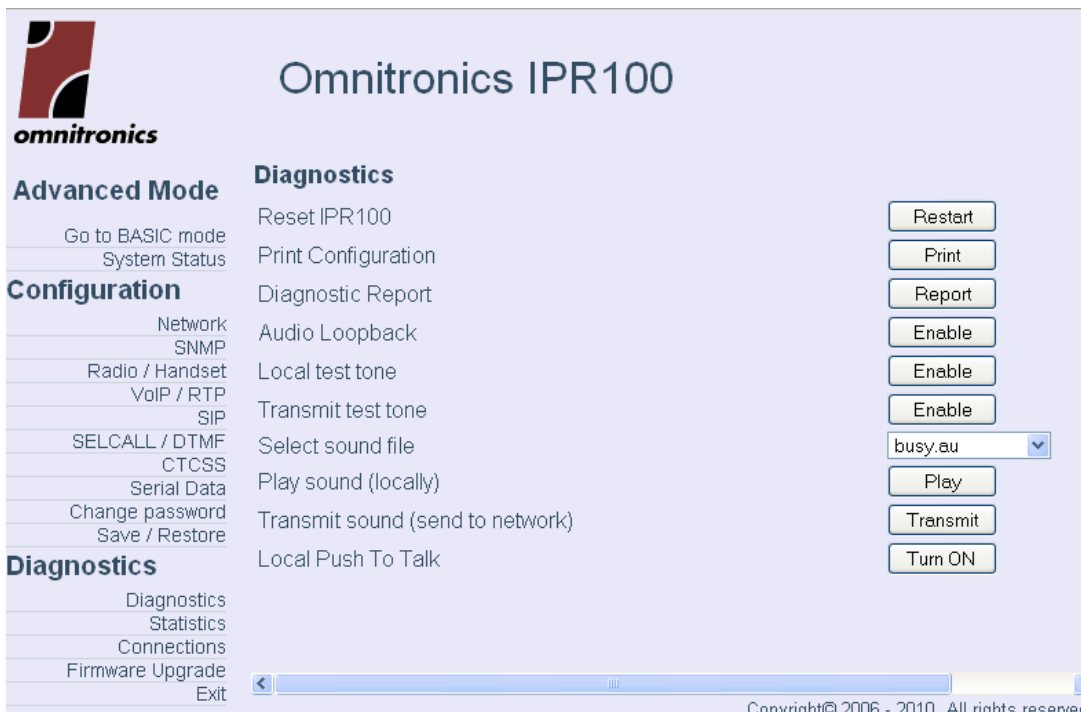


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### The Diagnostics Page

In your browser, enter the IP address of the IPR100. The Diagnostics functions are found from the System Status page by clicking on the Diagnostics page under the heading Diagnostics.



The diagnostics page has many useful functions available but we will only use the functions that relate to PTT and sending audio to the radio.

### Turn on the PTT

If the busy signal into System A did not turn on the PTT in System B, we can work back from the radio in System B to find out why.

On the IPR100 that is connected to the radio in System B go to the Diagnostics page and turn on the PTT to the radio.



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### How do I conduct a systems check on networked IPR100's?

This is done by clicking on the “Local Push To Talk” button. Once this is done check that the “PTT” LED on the IPR100 front panel is on and that the radio is transmitting. If the radio is not transmitting, check that the 2 links on the IPR100 for the PTT output are in the correct positions and that the wiring to the radio is correct. To help with this check the FAQ Fact Sheet “How can I connect the IPR range of IP Gateways to my radio equipment?” (Click here) on our website.

#### Send Local Audio with the PTT

With the PTT working correctly, the audio to be transmitted can now be tested. There are two types of audio that can be used. There is a 1 kHz tone and there is a selection of sound files including voice.

To transmit a tone on the radio, turn on the local PTT then click on the “Local test tone” button. This will send a 1 kHz tone at the output level that is set on the IPR100 “Radio / Handset” page in the “Volume (output level)” drop down box. If the output gain is set to 0 the level will be -10dBm.



The screenshot displays the Omnitronics IPR100 web interface. The main heading is "Omnitronics IPR100". On the left, there is a navigation menu with sections: "Basic Mode" (containing "Go to ADVANCED mode" and "System Status"), "Configuration" (containing "Network", "Radio / Handset", "VoIP / RTP", "Change password", and "Save / Restore"), and "Diagnostics" (containing "Diagnostics", "Statistics", "Firmware Upgrade", and "Exit"). The "Radio/Handset" section is active, showing "Basic Settings". Under "Basic Settings", there are three fields: "Device Type and Linking:" with a dropdown menu set to "Radio and Handset/Console. Local audio linked"; "Expected audio input level:" with a dropdown menu set to "-10 dBm"; and "Volume (output level):" with a dropdown menu set to "Tx Gain 0 dB". At the bottom, there is a "Configuration Status" section indicating "Configuration Unchanged" and four buttons: "Save", "Restart", "Reset to Defaults", and "Undo".

To transmit sounds on the radio, first select the sound file from the “Select sound file” drop down box. These files include numerous system sounds as well as a voice file. The local PTT can now be turned on and the sound played to the radio by clicking on the “Play sound (locally)” button.



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### How do I conduct a systems check on networked IPR100's?

If no audio is transmitted on the radio verify that the IPR100 output levels are correct for the radio and check that the audio wiring is correct.

#### Send Remote Audio with local PTT

After the audio and PTT have been verified to work locally, the audio can be tested through the system. When the "VoIP Link" LED was checked it indicated that the system was connected from one end to the other. Sending audio from the remote end will test the quality and level of the voice through the system.

On the IPR100 in System B, turn on the local PTT. On the IPR100 in System A, an Audio file can be selected from the drop down box or a tone can be sent at the nominal system level. To send an audio file, select it then click on the "Transmit sound (send to network)" button. To send a 1kHz tone over the network, click on the "Transmit test tone" button. The audio in both cases should be transmitted the same as the local audio, if it is not then there are problems with the IP network.

#### Send Audio with a Busy From the Remote IPR100

Now that it has been established that the network will send audio across the system, the IPR100 in System A can have audio and a busy signal sent into the radio port. This should cause a PTT to be generated and audio to be output from the IPR100 of System B.

If you try and send tones from the audio input to the other IPR100's audio output, the Voice Activity Detection must be turned off since the tones are detected since it is not speech and the audio is not passed through the system. To turn the VAD off go to the "Radio / Handset" page in advanced mode and click on the "Voice Activity Detection" box to disable it.

If there is no PTT or the PTT is permanently on, the operation of the "Mute" LED should again be checked. If this is working correctly then check that the each IPR100 is set up so that the busy input will control the PTT output on the other unit. This is done in using the drop down boxes in "Advanced mode" on the "Radio / Handset" page. The default settings are that "Local PTT keying mode" is set to "Remote Busy/PTT" so that the PTT output is controlled by the other IPR100 and the "Remote PTT/Busy Control Mode" is set to "Local Busy/PTT" to allow the busy line to be the input which provides the signal for the other unit.



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## How do I conduct a systems check on networked IPR100's?

The screenshot shows the Omnitronics IPR100 web interface. The main heading is "Omnitronics IPR100". On the left is a navigation menu with sections: "Advanced Mode" (containing "Go to BASIC mode" and "System Status"), "Configuration" (containing "Network", "SNMP", "Radio / Handset", "VoIP / RTP", "SIP", "SELCALL / DTMF", "CTCSS", "Serial Data", "Change password", and "Save / Restore"), and "Diagnostics" (containing "Diagnostics", "Statistics", "Connections", "Firmware Upgrade", and "Exit"). The "Radio/Handset" section is active, showing "Basic Settings" and "Advanced Settings".

**Basic Settings**

- Device Type and Linking: Radio and Handset/Console. Local audio linked
- Expected audio input level: -10 dBm
- Volume (output level): Tx Gain 4 dB

**Advanced Settings**

- PTT/Busy Hold/Hang Time(milliseconds): 100
- Voice Activity Detection:
- VAD hold/hang time (milliseconds): 1000
- Local PTT keying mode: Remote Busy/PTT
- Remote PTT/Busy Control Mode: Local VAD
- Transmit without local BUSY/PTT signal:
- Disable PTT/Busy Timeout:
- PTT/Busy Locked On Timeout (seconds): 180

**Configuration Status**

Configuration Unchanged

Buttons: Save, Restart, Reset to Defaults, Undo

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If the PTT is generated on the IPR100 in System B but no audio is present then the audio level into the IPR100 in System A should be checked to see that it matches the level from the radio. The wiring should also be checked.

### Radios with no Busy Output

Some radios do not have a Busy output or the line will not work properly into the IPR100. This can be overcome by using the Voice Activity Detection software in the IPR100. The function is on by default in the IPR100 but the way that the PTT in the other unit is controlled must be changed. Also the audio must be allowed to pass through the system without a busy signal. On the IPR100 with the audio coming in, which is System A in our example, the change is made on the "Radio / Handset" page in advanced mode. On this page in the "Remote PTT/Busy Control Mode" drop down box, select "Local VAD" as the control mode. To allow the audio through the system without a busy signal, select 'Transmit without local BUSY/PTT signal' on the 'Radio / Handset' page in advanced mode.

### If it still does not work

Email [support@omnitronics.com.au](mailto:support@omnitronics.com.au), go to the website and use the inquiry section or contact your local office.



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### System Checklist

In summary, the system should be checked using the below checklist from start to finish.

Item to check	What happened	Possible solution
Front panel "Mute" LED	Turns on with busy input	Check PTT output turns on
	Is on permanently	Check wiring and voltage interface levels
	Does not come on	Check wiring and voltage interface levels
	The radio has no busy output	Use VAD
Front panel "PTT" LED	Remote Busy did not cause PTT	Check IP address and Port data. Use the diagnostics to verify PTT operation
		Check that units are set up for the remote busy to drive the PTT.
	Remote Busy causes PTT led to turn on but the radio does not transmit	Check wiring and interface voltage levels
	The PTT causes the radio to transmit but there is no audio	Check audio output from diagnostics page
Turn PTT on from the diagnostics page	PTT led turns on but the radio does not transmit	Check wiring and interface voltage levels
Turn PTT on and play sound locally from the diagnostics page	PTT causes radio to transmit but no audio is transmitted	Check transmit audio wiring and levels.
Turn Local PTT on and then use the transmit sound to network function on the remote IPR100	PTT causes radio to transmit but no audio is transmitted	Check that the IP addresses and Port numbers match.



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Item to check	What happened	Possible solution
Use the radio to generate a busy and send audio into the remote IPR100.	The busy generates a PTT which causes the radio to transmit but no audio is transmitted	Check received audio wiring and levels on the remote unit.
For a system that does not have a busy input from a radio use VAD to use speech audio on the remote unit to generate a PTT on the local unit	No PTT generated	Check VAD settings.
	No audio at radio	Check audio input wiring and levels. Audio must be speech not tones Check that 'Transmit without local BUSY/PTT signal' is enabled



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