

PRELIMINARY INFORMATION



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INNOVATIVE ELECTRONIC SOLUTIONS



Featuring:

- Connection to both transceivers and radio handsets
- SELCAL and DTMF support over highly compressed links
- Voice Over IP protocol using Multicasting
- Voice Activity Detection (VAD) with silence suppression
- Multi-drop capability for operator handsets.

Target Markets

- ◆ Emergency services/public safety
- ◆ Power/Water utilities
- ◆ Telecommunications providers
- ◆ Transport industries
- ◆ Mining companies
- ◆ Local government

Features

- VoIP using Multicasting and supporting a number of Codecs
- 10/100 BaseT Ethernet port via RJ-45 connector
- Transceiver port provides 4-wire plus E&M signals and is directly compatible with Omnitronics 619 Audio Bridges
- Isolated PTT control using relay contacts
- Isolated COS input using an opto-coupler
- Voice Activity Detection with silence suppression
- Radio port levels can be attenuated through software
- Handset port is directly compatible with Omnitronics 960 Handsets and Consoles
- Built-in SELCAL and DTMF transceivers
- RS-232 port to support MPT radios
- Front panel activity and diagnostic indicators

- Software configurable via serial port and IP
- FLASH re-programmable over IP
- Static or dynamic IP address configuration
- Option to use AES encryption

Benefits

- Removes the need for expensive leased lines or radio links
- Supports SELCAL and DTMF signalling when using voice compression
- Interfaces to radios that do not provide a COS output
- Optimises use of IP bandwidth
- Plug compatible with Omnitronics handsets and consoles
- Software upgradable
- Secure communications

Modes of Operation

- Radio access for operators
- Back-to-back radio link

Overview

The IPR-100 is designed to provide Voice over IP extensions for analog radio equipment. Each device enables an analog two-way radio to be

remotely controlled over an IP link, either in a LAN or WAN environment. Working in pairs, two IPR-100 units can be used to create a back-to-back IP link between two radios. Alternatively, a pair of units can also be used to provide remote control and monitoring of a single radio from an operator's handset or console.

The IPR-100 has been specifically designed to transport signalling schemes such as SELCAL and DTMF over data networks. Analog signalling schemes will not pass directly through a data network when audio compression below 64kbps is used. Compression algorithms tend to degrade audio tones resulting in poor signal decoding at the end stations. The IPR-100 overcomes this problem by directly decoding analog SELCAL and DTMF and encoding them into data messages. Similarly, the reverse operation (analog encoding) is performed at the transmission end.

The radio port provides four-wire audio with E & M signalling on an RJ45 connector. The port is balanced with 600-Ohm transformer coupling. This provides isolation between the IPR-100 and the radio and virtually eliminates ground noise and induced signals. The E & M facilities also provide isolation and can be configured for relay control or opto (voltage) input/output. Links, accessible from the rear panel, also allow the PTT and COS signals to be configured to source or sink power.

The handset port provides a balanced, half-duplex, connection to a standard Omnitronics 960

Handset or Console. Multiple peripherals can be attached to the handset port allowing a number of operators to share a single radio.

The audio from both the radio and handset ports is digitised using a Codec using G.711 compression. However, an on-board DSP allows further compression down to 13kbps, using a GSM-compliant algorithm. The audio is then transported over IP using Multicasting.

The DSP also provides Voice Activity Detection (VAD) and silence suppression. Together, these features enable the product to make optimal use of the available IP bandwidth. With VAD and silence suppression audio packets are generated only whilst a person is actually talking. As soon as silence is detected, a message is sent to the other end to initiate comfort noise and the transmission of data packets is suspended. VAD is also useful when connecting to end equipment that does not provide a COS or Mute output. It performs a VOX function.

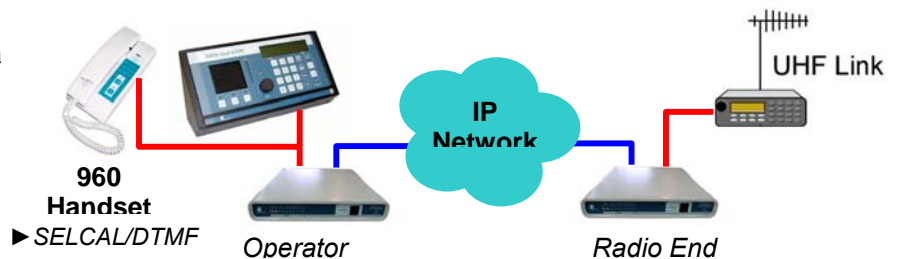
The IPR-100 can be re-configured within the LAN or WAN environment, via a dedicated graphical user interface. Each unit can be configured for mode of operation, compression level, audio adjustments and signalling parameters.

The device can be powered from a 12V DC plug pack.

Applications

Remote Radio Access

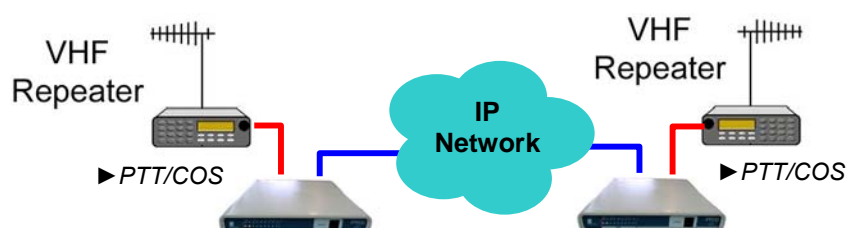
An operator can control and monitor a remote transceiver across a Local Area Network or a Wide Area Network. The transmit and receive audio, along with the PTT and Busy/COS signals, are transported over the link transparently, using VoIP Multicasting techniques. SELCAL and DTMF are also transported reliably, regardless of the level of compression that is employed.



Multiple Omnitronics handsets and consoles can be multi-dropped to allow shared access to the transceiver by a number of operators.

UHF/VHF Link Replacement

Two radios can be connected back-to-back over an IP link. This can typically be used to interconnect two repeater sites over a Wide Area Network. PTT and COS signals are transported over the link as data messages. The IPR-100 will provide a

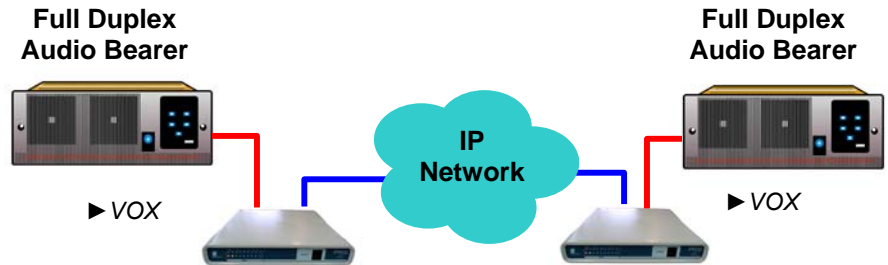


configurable PTT output to the radio. It will also accept a configurable COS input from the radio. An active COS signal from the radio will enable the transmission of voice packets over the IP network and generate a PTT output at the opposite end.

Full duplex operation is supported.

Leased Line Replacement

Two audio devices, such as 4-wire audio bearers, can be connected back-to-back over an IP link. Since the communications equipment will not provide a COS output, a VOX function is implemented in the IPR-100 using the VAD feature. When a voice signal is detected at the radio port of the IPR-100, an internal COS signal is generated and transmitted to the destination IPR-100. This will also enable the transmission of voice packets over the IP network. A hang period is automatically applied to the VOX algorithm.



Full duplex operation is supported.

Specifications

Power	
Voltage	12Vdc (11.5V to 13.8Vdc)
Current	200mA
Radio Port	
Connector	8-way US modular
Configuration	Four wire, transformer coupled
Input Impedance	600 ohms
Output Impedance	600 ohms
Input Levels	-27dBm to +4dBm (-10dBm nominal)
Output Levels	-27dBm to +4dBm (-10dBm nominal)
Software level attenuation	0 to -18dB in 3dB steps
Frequency Response	300 to 3000 Hz (within 1 dB)
E-Input Lead	Opto coupled @ 5 to 50Vdc. Link configurable for voltage, contact, switched ground or switched power.
M-Output Lead	Relay contacts limited to 30W (30Vdc or 1A). Link configurable for voltage, contact, switched ground or switched power.
Handset/Console Port	
Connector	6-way US modular
Configuration	Two wire, balanced half-duplex
Input Impedance	50K ohms
Output Impedance	500 ohms
Input Level Range	-27dBm to +4dBm (-10dBm nominal)
PTT Input	Contact to 0Vdc
Busy Output	+12Vdc
RS-232 Port	
Connector	DB9 Female (DCE)
Standard Data Rate	19200 baud
Network Interface	
Connector	8-way RJ45
Interface	10 BASE-T or 100 BASE-TX Ethernet with autodetect
Protocol	Multicast RTP
Vocoders	G.711, G.723 ADPCM, GSM (13Kbps)
Front Panel Indicators	
System	Power OK, CPU RUN, VoIP Link OK
RS-232	Activity
Radio Port	PTT output active, COS input active
Ethernet	10Mbps/100Mbps, Link Active, Activity
Physicals & Environmental	
Weight	0.7 kg
Dimensions	220mm(W) x 35mm(H) x 230mm(D)
Operating Temperature	0 to 60 degrees C.

Note. Specifications are subject to change without notice.