RGW-7700

Radio Gateway

- Extremely low latency
- Supports ED-137
- Simplex and Duplex operation
- Easy to install

JOTRON
Performance for Life

RGW-7700 Radio gateway

Radio gateway application

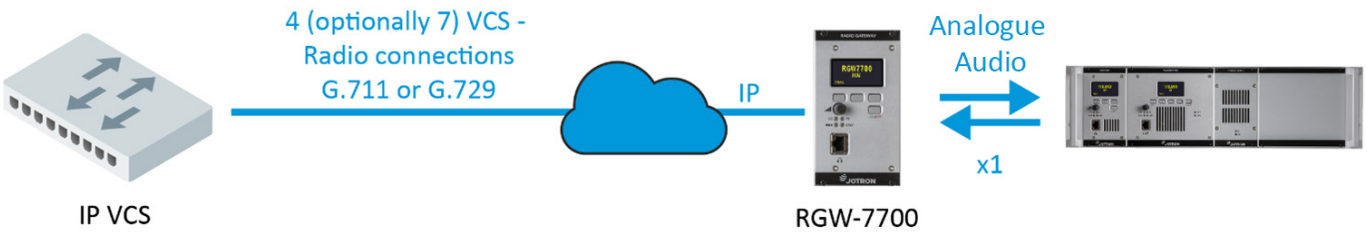
The RGW-7700 is a flexible unit that can be used in multiple configurations where it is necessary to connect an analogue radio to an IP based Voice Communication System (VCS), or an IP based radio to an analogue VCS. Two units can also be used back to back in a configuration where both systems are analogue, and the transport medium between is an IP network.

When used as a gateway from an ED-137 compliant VCS or a Remote Radio Control device, the RGW-7700 supports SIP connections using the ED-137 protocol, either as one TRX connection or using separate connections for TX and RX. The RGW-7700 supports separate connections from up to 4(7) independent Voice Control or Remote Radio Control Systems. The RGW-7700 supports both simplex and duplex operation, transferring audio and signalling in both directions simultaneously. When used as a gateway from an analogue VCS or Remote Control, the RGW-7700 is set up to use static Real Time Protocol (RTP) connections that streams voice and signalling to and from the radio or the other RGW-7700 that it controls.

The RGW-7700 introduces extremely low latency in the VoIP system, even when using the optional high compression audio codec. The latency can be as low as 8 ms, depending on the LAN topology and the configuration of the endpoints. The RGW-7700 can be used in any network, fixed LAN, LAN/WAN over a radio link, and over a satellite link with network latencies up to 1s. The RGW-7700 supports ED-137 compliant recording in both directions, and will seamlessly integrate into any recording system that supports this format, such as the Jotron Ricochet Record and Replay System. The RGW-7700 supports the optional RMM/MAM/CLD parameters defined in ED-137. In a system using offset delay compensation, these parameters are used to accurately determine the one-way network delay between the voice control system and the transmitter or receiver.

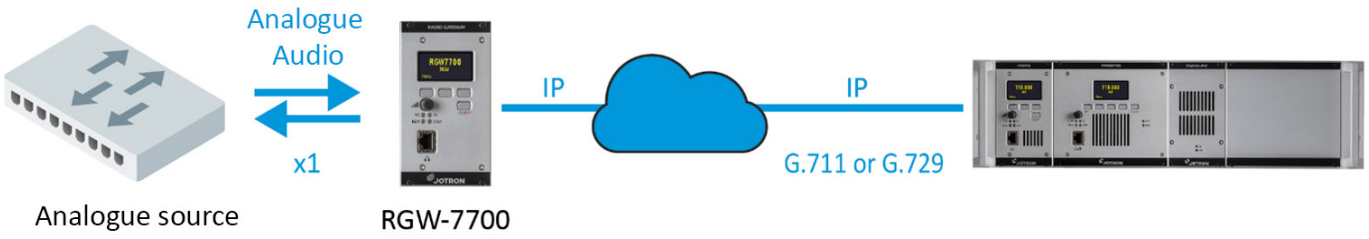
Analogue radio connected with IP based VCS/Remote Control(s)

When using one or more ED-137 compliant VCS, CWP or Remote Control(s), it is possible to connect a radio that has a standard E and M interface to the IP VCS using the RGW-7700 as an audio and signalling converter. The radio may be a HF, VHF, UHF or SHF radio from any vendor, as long as the radio uses an E and M (600 ohm) line interface for audio and signalling. In this application, the signalling from the VCS to the RGW-7700 follows the ED-137 specification, either using separate connections for TX and RX or connected as a TRX.



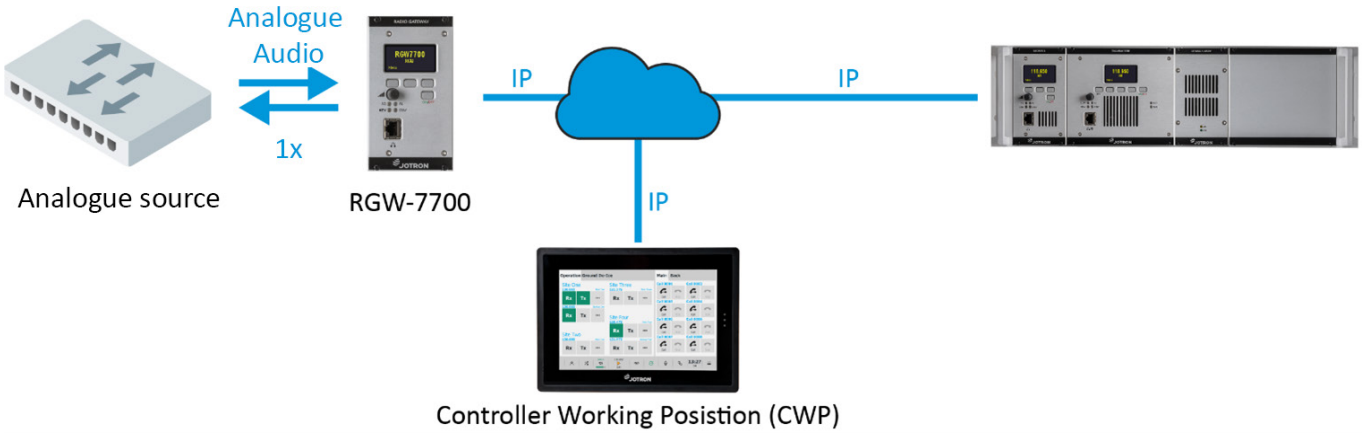
VoIP compliant radio connected to an analogue source

When using an analogue VCS, CWP or Remote Control, it is possible to connect the remote control to an IP radio. In this application, the signalling between the RGW-7700 and the radio follows the RTP part of the ED-137 standard (no SIP). The IP radio must support this format. For the Jotron 7000 series of AM and FM radios, this format is called ‘extended RTP’.



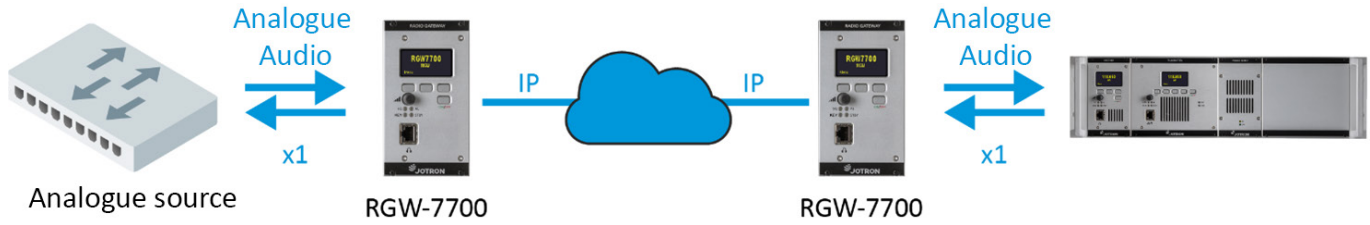
VoIP compliant radio connected to an analogue source, with one or more IP Voice Control Systems

In this application, it is possible to control the radio, using one or more ED-137 compliant CWPs in parallel with the IP input from the RGW-7700. This can be done since the RGW-7700 supports dynamic ED-137 SIP connections in addition to a static connection.



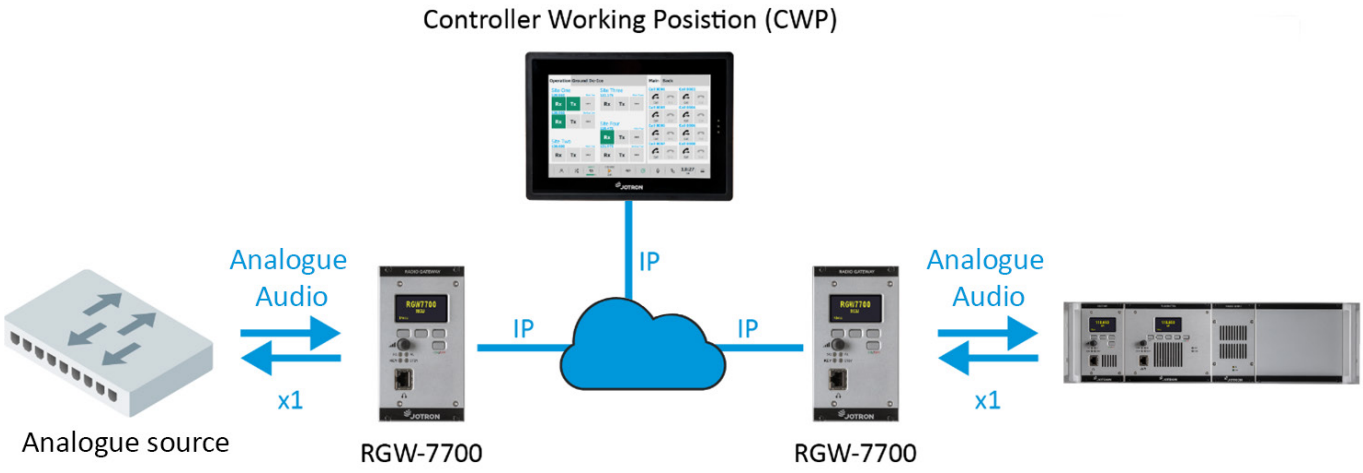
Analogue radio connected with an analogue source

When using an analogue VCS, CWP or Remote Control towards an analogue radio that uses an E and M (600-ohm) line interface. In this application, the two RGW-7700 communicates using the extended VoIP setup. The extended VoIP uses a static connection between the two RGW-7700 and contains the RTP information that is used by the ED-137 protocol. Thus both squelch, ptt, as well as RSSI and other important data is transferred along with the audio signal in the RTP header.



Analogue radio connected with an analogue source, in addition to one or more IP voice control systems

In this application, it is possible to control the RGW7700 closest to the radio using one, or more ED137 compliant CWPs in parallel with the RGW-7700 input. This can be done since the RGW-7700 supports dynamic ED-137 SIP connections in addition to the static connection.



Radio gateaway

Applicable standards

Voice over IP	EUROCAE ED-137 (RTP/SIP)
EMC	ETSI EN-301489 part 1/22, FCC rule 15B
Safety	EN-60950
Random vibration	ETSI EN 300019-2-2(V2.1.2), Method IEC 60068-2-6
Shock	ETSI EN 300019-2-2(V2.1.2), Method IEC 60068-2-27
Drop	ETSI EN 300019-2-2(V2.1.2)
GENERAL	
Audio frequency response	300-3400 Hz
Data ports	RS232, RS485, 100BaseT(Ethernet/LAN)
Remote protocols	UDP/IP: SNMP v.1., SNMP v.3., RTP, SIP, NTP TFTP, DHCP, RTSP
Codecs	G.711 A-law and u-law (standard), G.729A optional
Supported frame sizes	Minimum 5 ms, maximum 150 ms
Bandwidth @ 20 ms frames	G.711: ~100 kbit/s, G.729 (option): ~45 kbit/s
Bandwidth @ 100 ms frames	G.711: ~71 kbit/s, G.729 (option): ~15 kbit/s
Jitterbuffer	Adaptive (self-adjusting) or manual up to 500 ms (maximum allowed jitter)
Latency, analogue to VoIP	Typical 3 ms (G.711) + packet size. E.g. a packet size of 5 ms gives a total delay of 8 ms
Latency, VoIP to analogue	Typical 3 ms (G.711) + jitterbuffer. E.g. a jitterbuffer of 5 ms gives a total delay of 8 ms
IP network delay	Support up to 1000 ms network delay without loss of data
Security (remote control)	SNMP v3. DES, AES, AES192 and AES256 encryption. MD5 and SHA authentication
BITE monitoring	Monitoring of voltages, currents, line levels, IP network performance
Pre-set channels	99
Temperature range	Operating: -20°C to +55°C, storage: -40°C to +70°C
Humidity	95% @ +40°C (non-condensing)
AC operating voltage	85 to 264 VAC, 47-63 Hz
DC operating voltage	21.6 - 31.2 VDC negative ground, automatic switchover to DC on AC failure
Line input	600 Ω, -36 - +10 dBm, VOGAD, adjustable
Line output	600 Ω, -36 - +10 dBm adjustable
Heat dissipation	< 5 W
MTBF	Calculated: 10.1 years/unit (MIL-HDBK-217F), actual: > 20 years
MTTR	< 30 minutes at lowest replaceable unit
Dimensions	W: 71 mm (14 TE), D: 230 mm, H: 128 mm
Weight	1.7 kg