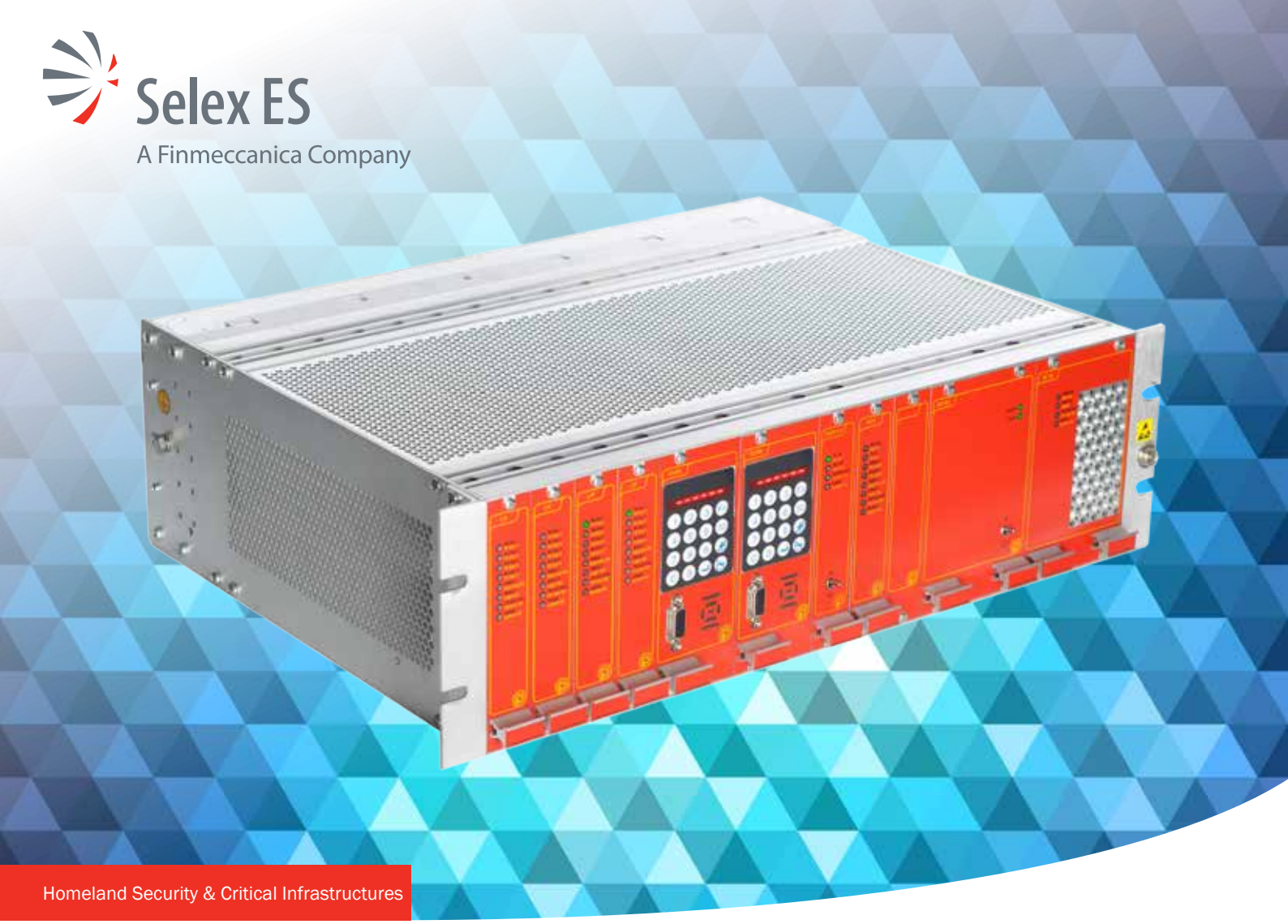
Selex ES
A Finmeccanica Company



Homeland Security & Critical Infrastructures

RGW4000 110W
RADIO GATEWAY

ECOS-D RGW4000 110W is a Selex ES modular voice and data Gateway with embedded Radio Base Station (RBS) functionalities, designed to meet and exceed the requirements of professional and land mobile radio systems.

Its high quality, combined with state of the art reliability and outstanding modularity makes the ECOS-D RGW4000 110W a digital based equipment, able to support analogue FM, digital DMR conventional Tier II and digital DMR trunking Tier III with all the power given by a SIP interface to make available all voice and data communications over LAN. The ECOS-D RGW4000 110W can be used in a real time dual mode Analog FM/Digital DMR conventional Tier II or in digital DMR trunking Tier III mode.

All the modes of operation of the ECOS-D RGW4000 110W support natively the flagship simulcast technology by Selex ES without any external ancillary. The ECOS-D RGW4000 110W can be used from stand-alone repeater to conventional simulcast to digital multi-site trunking with a configuration change only.

ECOS-D RGW4000 110W can be connected to build a system natively with IP, E1, 4W+E/M links.

ECOS·D
Digital Extended COmmunications System

DMR
DIGITAL MOBILE RADIO ASSOCIATION

MAIN FEATURES

- 3 RU device designed to be hosted in 19-inch rack
- Available in UHF Frequency bands at 12.5kHz/20kHz/25kHz programmable channel spacing
- RBS and Stand alone repeater mode of operation:
  - Conventional Analog FM only
  - Digital DMR Conventional Tier II only
  - Real Time Automatic dual-mode conventional analog FM/ Digital DMR Conventional Tier II with priority mode setting
  - Digital DMR Trunking Tier III (embedded trunking controller)
- Designed to natively support Simulcast technology:
  - Multi-site simulcast support: available for both conventional and trunking operations
  - Simulcast Master, Sub-Master, Slave mode within the same device (virtually no limits in the number of RBS per simulcast channel)
  - Reliable fall-back mode: Slave in-cabinet repeating and Backup Master automatic reconfiguration
  - Synchronization: GPS and/or Precise Time Protocol IEEE 1588v2 with fall-back
  - Voting: analog FM and digital DMR best in class voting
  - Auto Adaptive Technology (A2T): each RBS "adapts" itself to the time and frequency response of the backbone and automatically compensates time-variant differences
  - Multiple-link support: IP (SoIP – Simulcast over IP – technology), E1, 4W+E&M link interfaces
  - Redundant link management between RBSs (E1, 4W+E&M and IP)
- Dispatching and third party API
  - SIP based interface: AISIP (voice) and UDP/IP (data) for DMR Tier II/Tier III and Conventional Analog FM
  - Designed for PSTN link support: PBX SIP Trunk 2.0 interface
  - 4W+E&M for Conventional Analog FM
- Provides high levels of protection from access by unauthorised radio users, via the Unauthorised Access Protection procedure
- Embedded AMBE+2 vocoder for DMR Tier II clear or encrypted (ARC4) voice communications from a local microphone (embedded loudspeaker)
- DMR Data transmission ports (RS232/RS485/LAN), digital I/O and analog inputs available

MAINTENANCE

- Display and keypad for easy local maintenance and fault handling
- Modular structure for easy front and back cards replacement. In the event of failure, all modules are individually removable
- Digital I/O, Analog inputs, power supply, antenna connectors and backbone interfaces hosted on dedicated back-cards, easily removable from the back and insulated from voltage overload
- Remote Firmware upgrade over LAN with integrity control (embedded dual-flash memory for storage of two firmware)
- SNMPv2c Network Management System (each RBS is a SNMP agent) and MIB availability for integration with third-party NMS system

INTEROPERABILITY

- Interoperability (IOP) certificates with DMR major terminals vendors in Tier II and Tier III modes of operations (for further details, please visit the DMR Association website at: www.dmrassociation.org)

DMR
DIGITAL MOBILE RADIO ASSOCIATION

GENERAL SPECIFICATION

Mechanics	Dimensions 3 RU compatible with 19-inch rack mounts	
Weight	from 13 Kg (28.6 lbs)[3]	
Supported Modulations	FM/PM for analogue mode 4FSK/C4FM for digital mode with I&Q mo/ demodulator	
Frequency Generation	Synthesized	
Channel Spacing	12.5 kHz / 20 kHz / 25 kHz[1]	
Mode of Operation	Simplex / Half-Duplex / Duplex	
Digital Data gross bit Rate	9600 bps with 4FSK/C4FM digital modulation in 12.5 kHz channel	
Temperature Range	-30° - +60°C (-22°F - + 140°F)	
Power Supply	48 Vdc (galvanically insulated)	
Input Current (at 48 Vdc)	Transmission[2]	Standby[2]
	UHF: 7A	UHF: 0.9A
	800: 7A	800: 0.9A
	900: 7A	900: 0.9A
CTCSS (TX/RX split-tones)	Yes. 67 – 254.1Hz (with 0.1Hz step)	
DCSS (TX/RX split-tones)	Yes	
Backbone Interface	from 4xE1 G.703/G704 (cross connect and drop-insert functionality) from 4x4W+E/M 1xLAN port 10/100 Base T (SoIP Link, remote firmware upgrade and SNMP NMS)	
I/O ports	LAN, RS232, 4 digital inputs, 4 digital outputs, 2 analog inputs	

Synchronization

RBS Main Clock	OCXO (Oven Controlled Crystal Oscillator) 50 ppb temperature stability with programmable zero-offset compensation
Simulcast Synchronization	from Built-in GPS (1+1 option available on request) from incoming IP GMC/BC/OC PTP IEEE 1588V2 from incoming E1 stream (2.048 MHz) from 4W Out of Band tone (3400 Hz)

Tier II conventional / Analog FM Conventional

Configuration Mode	Stand-Alone Repeater
Simulcast Configuration wide coverage Virtual repeater	Radio Base Station: Macro-cell Master/ Sub-Master/ Slave

Tier III trunking

Configuration Mode	Radio Base Station with Embedded Trunking Controller: Control Channel RBS/Traffic Channel RBS
Simulcast Configuration wide coverage Virtual repeater	Radio Base Station Macro-cell Master with Embedded Trunking Controller /Macro-cell Master for Traffic Channel/Sub-Master/Slave

TRANSMITTER

Frequency in MHz	UHF	800	900
	450-526	806-894	896-941
Output Impedance	50 Ohms		
Output Power	Programmable from 10W up to 110W (0.1dB step)		
Maximum Deviation (RSD) 12.5/20/25 kHz	± 2.5/± 4 /± 5 kHz		
Adjacent Channel Power	<-60 dB@12.5 kHz / -70 dB@25 kHz		
Intermodulation Attenuation	>40dB		
Spurious and Harmonic Emissions	UHF: <-36dBm < 1GHz		<-30dBm > 1GHz
	800/900: <-36dBm < 1GHz		<-26dBm > 1GHz
Audio Response	+1, -3dB; 300-3000 Hz		
Audio Distortion	< 3% @ 1000Hz; 60% RSD		
S/N	>45dB (12.5 kHz) >50dB (25 kHz)		
Frequency Stability	± 0.05 ppm		

RECEIVER

Frequency in MHz	UHF	800	900
	450-526	806-894	896-941
RF Input Impedance	50 Ohms		
Analog Sensitivity	PM modulation: < -119 dBm @ 12 dB SINAD psofo		
Digital sensitivity	C4FM: < -120 dBm @ BER = $5x10^{-2}$ 4FSK: < -120 dBm @ BER = $5x10^{-2}$		
Adjacent Channel Selectivity 12.5/20/25 kHz	>60 dB/ 70 dB/ 70 dB (ETSI)		
Intermodulation Rejection 12.5/20/25 kHz	>70 dB (ETSI)		
Spurious and Image Response Rejection	>70 dB (ETSI)		
Audio Response	+1, -3dB; 300-3000 Hz		
Audio Distortion	<3% @ 1000Hz; 60% RSD		
S/N	>45dB (12.5 kHz) >50dB (25 kHz)		
Line Output	-10dBm		

EMISSION DESIGNATORS

Analog FM/PM	8K50F3E/8K50G3E, 11K0F3E/11K0G3E; 14K0F3E/14K0G3E , 16K0F3E/16K0G3E
Digital 4FSK	7K60FXD/7K60FXE
Digital C4FM	8K10F1D/8K10F1E

COMPLIANCIES

FCC	CFR Title 47 - Part 90 - Part 15B
CE	R&TTE Directive 1999/5/EC
Safety	EN 60950-1, EN 50385, EN 62311
EMC	EN 301 489-1, EN 301 489-3, EN 301-489-5

Not all variants and features might be available in all countries or in all geographic areas.

RGW4000 (IP links ordering guide*)			RGW4000J-**A**-**B**-A0C1-4W0-E100-S2-V2-**L**		
A	00000	No Radio (gateway features only)	B	0	No receiver
	U2110	110W UHF (450 - 526 MHz)		W	Single receiver
	U4110	110W 800 (806-894 MHz)		D	Receiver Diversity
	U5110	110W 900 (896-941 MHz)	L	G0	No GPS receiver
	U2000	Receive Only UHF (450 - 526 MHz)		G1	Single GPS receiver
	U4000	Receive Only 800 (806-894 MHz)		G2	Dual GPS Receiver
	U5000	Receive Only 900 (896-941 MHz)			

Specifications subject to change without notice

[1] According with the national regulations where RGW is used [2] Value is to be intended for a fully equipped RGW configuration [3] Depending on RGW equipment

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