Tadiran GRX-4000 – Family of Radio Relays

Ultra-high capacity dual-band IP and multi-interface radio relay system for tactical communications

Elbit Systems™
Land and C4I

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The Tadiran GRX-4000 is the latest generation of the Dual Band (Band III+ and Band IV), Dual Mode (point to point or point to 2 points) high-capacity line-of-sight (HCLOS) broadband radio relay systems developed by Elbit Systems. Designed to meet present and future tactical communications requirements ,the software-defined radio relay systems supports the latest IP and legacy communication protocols (G703, EUROCOM and others). The Tadiran GRX-4000 is ECCM-capable, enabling interference-free communications. The radio relay systems are battle proven and in use with the US Navy, the Israel Defense Forces and other armed forces around the world.

High-Capacity – The Tadiran GRX-4000 is capable of multi-mode, high-speed data transmission. The GRX-4000 Indoor Unit a complete NATO Band III + (1350 to 2690MHz) frequency range radio has a data transmission capacity of up to 100Mbps. When connected to the NATO Band IV (4400 to 5000MHz) frequency range Outdoor Unit an additional simultaneous radio link is provided for an independent data transmission capacity of additional up to 100Mbps (two bands together provide total aggregate data transmission capacity up to 400Mbps). The radio also has an extremely high system gain ,supporting distances of more than 40Km at line-of-site conditions.

Point-to-MultiPoint configuration – The GRX-4000 has the ability to work in a Point-to-2Points configuration. This feature is available in both bands (Band III+ and Band IV) simultaneously.

Optional future upgrade: Point-to-4Points only in one band, Band III+ or Band IV.

Multi-interface – The Tadiran GRX-4000 incorporates a built-in sophisticated multiplexer supporting a wide variety of services ranging from traditional telephony to broadband multimedia for the very latest C4I applications. Its versatility allows the radio to multiplex IP data streams and serial trunk data at different rates simultaneously on the same link. The GRX-4000 includes a wide range of interfaces including Ethernet LAN / IP 100Base-TX ,G.703 E1 (2Mbps,) E2 (8Mbps)and E3 (34,368 Kbps), V11 as well as EUROCOM D/1. Partial data rates also are available.

Enhanced performance – The GRX-4000s' high sensitivity, combined with its robust modulation schemes, provides very high link availability. adjacent channels selectivity is provided by state-of-the-art, high-speed tunable filters, eliminating external interferences. Digital modulation with exceptional signal purity enables operation at congested radio relay nodes.

- Simultaneous Dual Band & Dual Mode operation
- High Capacity Built-in IP and TDM multiplexer
- High system gain
- Interference rejection
- Powerful adaptive digital equalizer
- Built-in forward error correction (FEC) and interleaving
- Built-in automatic power control
- Low probability of interception
- Adaptive frequency control
- Remote control facility
- Integrated MMI
- Built-in test equipment
- Single cable for signals, control and power for ODU connection

Key Features

Simultaneous Dual Band & Dual Mode operation
- **Dual Band (NATO Band III + & NATO Band IV)**
- **Dual Mode (Point to Point & Point to Multi-Point)**

High Capacity Built-in IP and TDM Multiplexer
- Up to 100Mbps rate for each frequency band sophisticated and versatile multiplexer
- Simultaneously multiplexes IP and serial trunk data
- Supports different link and trunk data rates
- Legacy protocols (G703, EUROCOM, and more)

High system gain
- Excellent sensitivity thresholds combined with robust modulation schemes
- High gain tactical antennas

Interference rejection
- Extremely low spurious level
- Close transmit / receive frequency duplex
- Highly linear receiver front-end with exceptional dynamic range

Powerful adaptive digital equalizer
- Rejection of narrowband interference
- Equalization of sever channel distortion

Built-in FEC and interleaving
- Eliminates high-power and long-time pulse jammers

Interleaver / deinterleaver
- Disperses the effect of burst errors
- Delivers white noise to the decoder, nullifying the channel memory

Built-in APC
- Output power continuously adjusted to minimum required level for error-free communications
- Low probability of interception
- Reduced potential interference (collocation)
- More efficient system-wide frequency management
- Less susceptible to ECM or environmental interference

Adaptive Frequency Control
- Negates CW jammers following detection of hostile ECM
- Frequency changed automatically when threat is detected or link performance is degraded

ACM- Adaptive Code/modulation
- Efficient traffic Data Rate and spectrum occupancy dependent on varying link conditions.

Emergency
- 138dB system gain during antenna alignment process

Remote Control Facility
- Controls and monitors all radio features
- Supports SYSCON network management requirements
- Contains an SNMP V-3 agent and the associated management information base

Integrated MMI
- Operated using a user-friendly keypad

Built-in Test Equipment
- Sophisticated online and offline check
- Testing and checking of all radio functions at ten preset frequencies
- No additional test equipment required

Single Cable
- For signals, control and power between indoor and outdoor unit (up to 600m) in Band IV.

Operational Benefits

- Simultaneous **Dual Band (NATO Band III+ & NATO Band IV) & Dual Mode (Point to Point & Point to Multi-Point)**
- Supports the latest IP communication protocols as well as legacy systems
- ECCM-capable, enabling interference-free communications
- High-rate (up to 100Mbps @ each frequency band) data transmission
- Supports distances of more than 40Km at line-of-site conditions
- Supports a wide variety of services
- Simultaneously multiplexes IP and serial trunk data at different rates on the same link
- Broad range of interfaces
- High link availability
- Adjacent channel selectivity
- Interference free operations in congested radio relay nodes

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Technical Specifications

Frequency Ranges	
GRX -4000/GRC-408E in Band III+	1350 to 2690 MHz
GRX -4000/GRC-408E in Band IV	4400 to 5000 MHz
Rx/Tx Duplex Separation	
Band III+:	80 MHz
Band IV:	300 MHz (Recommended)
Transmission rates	
:	1024/2048/4096/8448/34368 Kbps 52/104 Mbps
Channel spacing	
For rates up to 8448 Kbps:	125 kHz
For rates 34368/52M/104Mbps:	1 MHz
Baseband interfaces	
ETHERNET LAN:	10/100 Base-T
EUROCOM D/1:	up to 8448 Kbps
V11:	up to 8448 Kbps
G.703 (option): 1:	E1 (2 Mbps)
2:	n x E1 (nx 2 Mbps, n=2 to 4)
3:	E3 (34,368 Kbps)
Transmitter	
Modulation type:	16 QAM & QPSK &BPSK 64 QAM (GRC-408E/104M only)
System threshold	
Transmission Capacity (Kbps):	Threshold (dBm) for BER 10^{-5}
1024(BPSK):	≤-100 dBm
1024/2048/4096/8448/17000/34268(QPSK):	≤-83 dBm
4096/8448/17000/34368/52000/10000(16QAM):	≤-74 dBm
Memory functions	
Preset Frequencies:	5 Tx/Rx pairs
(the number of spare frequencies can be optionally increased) through the keypad or remote control	
SYSCON and remote control	
SNMPV3 via TCP/IP enhanced remote control channel	
Service channel	
Analog order wire:	Supports H-250 and H-350 handsets
Digital order wire:	according to V11 EUROCOM D/1 specifications or Balanced NRZ according to TRITAC specifications
MIL Enviromental Conditions	
Tempeture:	
Operating:	-32°C to + 55°C
Storage:	-40°C to + 70°C
Humidity:	94% (per MIL-STD-810E)
Mechanical stress:	MIL-STD-810E
Electromagnetic compatibility:	MIL-STD-461E

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