# ExtendAir Licensed FCC

## Fast Ethernet/TDM Microwave Systems for Business Critical All-Outdoor Applications

ExtendAir is a first-of-its-kind line of entry-level, high performance, point-to-point radio systems for the 11, 18 and 23 GHz FCC Part 101 bands. Designed to deliver guaranteed Ethernet throughput and toll-quality voice in urban and suburban environments, ExtendAir "rc" series radios are rugged, all-outdoor systems delivering 100 Mbps full-duplex Ethernet throughput and optional native 4xT1/E1. ExtendAir is designed to meet the business critical performance, capital and operating requirements of enterprises, government organizations and service providers.

**Field-replaceable diplexer.** In an industry first for all-outdoor systems, the frequency sub-band is defined by an inexpensive field-replaceable diplexer. As a result, a single ExtendAir radio can be used to spare an entire 11, 18 or 23 GHz band, dramatically reducing the cost of sparing and shortening lead times.

**Multi-port flexibility.** In another industry first for entry-level all-outdoor systems, ExtendAir includes a 3x10/100BaseT option that provides users the flexibility to deploy back-to-back repeater sites or accept direct input from multiple IP devices such as surveillance cameras without the use of an external switch.

**Pay as you grow.** The future is hard to predict. With ExtendAir systems, you don't have to. All capacity enhancements and optional features are remotely upgradeable using a software license key.

**The native difference.** ExtendAir systems deliver true carrier-class capability, made possible by running Ethernet and optional TDM natively. That means rock-solid TDM performance regardless of IP traffic behavior. It also means that when T1/E1 ports are added, TDM throughput is traded bit-for-bit for Ethernet throughput and vice versa, so there's never a question about available user throughput for either transport. As a result, ExtendAir allows risk-free network migration for both private and operator networks, including 3G to LTE evolution at the network edge.

**Best-in-class data networking.** ExtendAir was designed to support complex IT environments, with support for Ethernet rate limiting, VLAN tagging (802.1Q) and QoS (802.1p) with four traffic classes and multiple filters.

**Toll-quality voice.** ExtendAir radios support native Ethernet and, optionally, native TDM traffic, with very low latency. So whether it's TDM voice or VoIP, ExtendAir won't get in the way of a good user experience.

**High security.** ExtendAir systems allow network managers to support the most stringent security requirements with optional FIPS 197-compliant AES 128-bit and 256-bit encryption for data traffic protection and support for both encrypted SNMP v3 and SSL/SSH to ensure management security.

| Primary Specifications | | ExtendAir rc11000 / rc11005 rc18000 / rc18005 rc23000 / rc23005 | ExtendAir rc11010 rc18010 rc23010 |
|---|---|---|---|
| Maximum Capacity | Ethernet (Aggregate) | 100 Mbps | |
| | TDM | – | 4xT1/E1 |
| Frequency (GHz) | | 11 GHz (10.7-11.7 GHz), 18 GHz (17.7-19.7 GHz) , 23 GHz (21.2-23.61 GHz) | |

## Specifications — ExtendAir Licensed FCC

| | | | | |
|---|---|---|---|---|
| **System** | | | | |
| Models | | rc11000, rc18000, rc23000: 1x10/100BaseT PoE<br>rc11005, rc18005, rc23005: 1x10/100BaseT PoE + 2x10/100BaseT<br>rc11010, rc18010, rc23010: 1x10/100BaseT PoE + 4xT1/E1 | | |
| **Frequency Bands FCC Part 101** | | 10.70–11.70 GHz | 17.70–19.70 GHz | 21.2–23.61 GHz |
| **TR Spacing (MHz)** | | 490 / 500 | 1560 | 1200 |
| **Channel Bandwidth (MHz)** | | 5, 10, 30 | 5, 10, 20, 30 | 5, 10, 20, 30 |
| **Antenna Interface** | | WR-75 | WR-42 | WR-42 |
| **Output Power (dBm)** | | | | |
| | **QPSK** | 25 | 23 | 21 |
| | **16QAM** | 23 | 21 | 19 |
| | **64QAM** | 21 | 20 | 17 |
| **Receiver Threshold (BER=$10^{-6}$) over temperature (dBm)[1]** | | | | |
| **QPSK** | **5 MHz** | - | -90 | -90 |
| | **10 MHz** | - | -87 | -87 |
| | **20 MHz** | - | -84 | -84 |
| | **30 MHz** | - | -82 | -82 |
| **16QAM** | **5 MHz** | - | -84 | -84 |
| | **10 MHz** | - | -81 | -81 |
| | **20 MHz** | - | -78 | -78 |
| | **30 MHz** | -77 | -76 | -76 |
| **64QAM** | **5 MHz** | -79 | - | - |
| | **10 MHz** | -76 | -75 | -75 |
| | **20 MHz** | - | -72 | -72 |
| | **30 MHz** | -71 | -70 | -70 |
| **Throughput (Mbps) (Max system layer 1/Max Ethernet + TDM layer 2)[2]** | | | | |
| **QPSK** | **5 MHz** | - | 9 / 7 | 9 / 7 |
| | **10 MHz** | - | 19 / 15 | 19 / 15 |
| | **20 MHz** | - | 37 / 30 | 37 / 30 |
| | **30 MHz** | - | 56 / 45 | 56 / 45 |
| **16 QAM** | **5 MHz** | - | 19 / 14 | 19 / 14 |
| | **10 MHz** | - | 38 / 30 | 38 / 30 |
| | **20 MHz** | - | 75 /60 | 75 / 60 |
| | **30 MHz** | 108/90 | 108 / 90 | 108 / 90 |
| **64 QAM** | **5 MHz** | 28 / 22 | - | - |
| | **10 MHz** | 57 / 46 | 57 / 46 | 57 / 46 |
| | **20 MHz** | - | 108 / 91 | 108 / 91 |
| | **30 MHz** | 108 / 108 | 108 / 108 | 108 / 108 |
| **Emissions Designators** | **5 MHz** | 5M00W7D | 5M00W7D | 5M00W7D |
| | **10 MHz** | 10M0W7D | 10M0W7D | 10M0W7D |
| | **20 MHz** | - | 20M0W7D | 20M0W7D |
| | **30 MHz** | 30M0W7D | 30M0W7D | 30M0W7D |
| **Maximum RSL** | | 0 dBm no damage | | |
| **QPSK** | | -25 dBm error-free | | |
| **64QAM** | | -30 dBm error-free | | |
| **Output Power (min power)** | | 0 dBm | | |
| **Power Control Step Size** | | 0.5 dB | | |
| **Error Floor** | | $10^{-12}$ | | |
| **FEC** | | Reed Solomon T=8 | | |
| **TDM latency** | | <1ms typical | | |
| **Ethernet latency** | | <250 µs typical | | |
| **Data Security** | | NIST FIPS 197-compliant 128-bit AES and 256-bit AES[3] or 96-bit proprietary encryption | | |
| **Spectrum Analyzer[4]** | | Embedded | | |

[1] Due to FCC Part 101 spectral efficiency and channel requirements, not all combinations of channel bandwidth and modulations are supported.

[2] Maximum layer 1 throughput as measured with 64-byte packets and maximum layer 2 Ethernet + TDM throughput as measured with 1536-byte packets. In both cases throughput includes source address, destination address and CRC overhead. Base configurations start at 25 Mbps full-duplex with 50 and 100 Mbps upgrades available.

[3] Software license key option.

[4] Software upgrade required.

| Specifications (Cont.) | | ExtendAir Licensed FCC | | |
|---|---|---|---|---|
| **Management** | | In-band management<br>Out-of-band management (x005 models only) | | |
| **Security** | | SSL/SSH and secure, encrypted SNMPv3 | | |
| **HTTP** | | Embedded web server GUI (Internet Explorer, Firefox, Safari, Chrome) | | |
| **CLI/Telnet** | | via 10/100BaseT | | |
| **SNMP** | | v1, v2c, and secure v3 | | |
| **MIB support** | | MIB I, MIB II, Exalt MIB | | |
| **Installation and Management Manual** | | Embedded in radio, accessible via HTTP GUI | | |
| **Compliance** | | SNMP v1, v2c, v3 | | |
| | | FCC Part 101 | | |
| | | IC RSS-210; SRSP-305.9 | | |
| **Physical** | | | | |
| **Dimensions (H x W x D)** | | 9.4" x 9.4" x 5.25"<br>23.9 cm x 23.9 cm x 13.3 cm | | |
| **Operating Temperature** | | -40 to +65 °C; -40 to +149 °F | | |
| **Full Spec Temperature** | | -40 to +60 °C; -40 to +140 °F | | |
| **Weight** | | 3.6 kg / 8.2 lbs. | | |
| **Environmental** | | NEMA 4 / IP66 | | |
| **Altitude** | | 4600m / 15,000 ft. | | |
| **Humidity** | | 100% condensing | | |
| **Antenna Mount Options**[5] | | 11 GHz | 18 GHz | 23 GHz |
| **Gain/3dB Beamwidth** | **1 ft / 0.3 m** | - | - | 35.1 / 2.7 degrees |
| | **2 ft / 0.6 m** | 33.4 dB / 3.4 degrees | 38.6 dB / 2 degrees | 40.2 / 1.7 degrees |
| **Interfaces** | | | | |
| **RF Diplexers**[6] | | 11 GHz TR 490 / 500 MHz; Hi/Lo | 18 GHz TR 1560 MHz; Hi/Lo | 23 GHz TR 1200 MHz; Hi/Lo |
| | | Band 1: 10.70–10.90 GHz / 11.20–11.40 GHz | Band 1: 17.70–18.14 GHz / 19.26–19.70 GHz | Band 1: 21.20–21.62 GHz / 22.40–22.82 GHz |
| | | Band 2: 10.85–11.05 GHz / 11.35–11.55 GHz | | Band 2: 21.59–22.01 GHz / 22.79–23.21 GHz |
| | | Band 3: 11.00–11.20 GHz / 11.50–11.70 GHz | | Band 3: 21.98–22.40 GHz / 23.18–23.60 GHz |
| **Ethernet** | | RJ48C/RJ45 Female (x1 or x3)[7] | | |
| **Interface Speed** | | 10/100BaseT (PoE or PoE + ETH1 + ETH2) | | |
| **Duplex** | | Half, Full, Auto-MDIX | | |
| **Compliance** | | 802.3 | | |
| **VLAN** | | 802.1q, transparent, trunk, and management only | | |
| **QoS**[4] | | 4 QoS traffic classes; filters on: port, IEEE802.1p, IPv4 TOS or DiffServ, IPv6 traffic class, 802.1Q VLAN ID, SA/DA MAC | | |
| **Ethernet Rate Limiting** | | Configurable per port via software | | |
| **Maximum Packet Size** | | 2048 bytes | | |
| **T1/E1 (xx010 models only)** | | T1 (x4) | E1 (x4) | |
| | | RJ48C/RJ45 Female (x2) | | |
| **Impedance** | | 100 ohms, balanced | 120 ohms, balanced | |
| **Line Code** | | AMI, B8ZS, selectable per channel | HDB3 | |
| **Data Rate** | | 1.544 Mbps | 2.048 Mbps | |
| **Compliance** | | ANSI T1.102-1987; ITU-T; G.823; GR-499-CORE | CEPT-1; G.703; ITU-T-G.703 | |
| **Loopback Modes** | | Remote Internal; Remote External; Local Line | | |
| **DC Power** | | <40W | | |
| **AC/PoE Power Adapter** | | | | |
| **Input** | | 100–240VAC, 0.5A | | |
| **Output** | | 72W, 48VDC | | |
| **Warranty** | | Two years[8] | | |

[5] Remote mount option requires flexible waveguide. Consult Exalt for more information.
[6] Field replaceable. Refer to warranty terms and conditions.
[7] xx010 TDM models include a single PoE 10/100BaseT port. xx005 models include one PoE 10/100BaseT port and two additional 10/100BaseT ports.
[8] Terms and conditions apply. Consult your Exalt sales representative for details.