SIMREX Corporation
DataMover™ ESS-II Spread Spectrum

UNLICENSED wireless DATA

1 Mbps/512 Kbps
902-928 MHz
Frequency Hopping
Spread Spectrum
Transceiver

Features

- High Speed – Up to 1 Mbps
- Long Range – Up to 30 miles[2]
- Secure – Multiple layers of cyber-security including:
  - AES-128 encryption (as specified by FIPS 140-2) optional
  - RADIUS authentication
- Ethernet and Serial interfaces allow migration of existing serial devices to IP networks
- Industrial Grade Performance – UL Class 1 Div 21 & Extended temperature range for extreme environments
- License free - Deploy immediately
- Plug and Play Connectivity – configuration requires minimal setup for Ethernet bridging

Applications

- Long range megabit-speed wireless Ethernet
- Gateway for serial/legacy networks and/or devices to IP network
- Video and/or Voice-over-IP
- Mobile network access for vehicle based operation

SIMREX..Global wireless solutions. Unlicensed Wireless Data

For almost 2 decades, SIMREX Corporation's wireless products have been providing wireless networking solutions with applications in SCADA, telemetry, telecommunications, mobile data and online transaction markets. SIMREX Corporation provides licensed and unlicensed solutions, installed worldwide.

Introducing the SIMREX DataMover ESS-II

The SIMREX DataMover ESS-II is a long-range, megabit-speed, industrial, wireless IP/Ethernet solution, with advanced cyber-security. It allows the connection of Ethernet and/or serial devices to an IP network. This includes mission-critical, revenue-generating data from fixed assets such as oil and gas wells, compressor stations, pipelines, fluid storage tanks and utility meters. It can also be used in vehicles to provide mobile network access.

SIMREX DataMover ESS-II is a hybrid radio that combines the higher speed capability of DTS (Digital Transmission System) with the robustness of Frequency Hopping. The radio operates in the license-free 902-928 MHz ISM band. It is capable of up to 30 mile range (line-ofsight)[2] and up to 1 Mbps over-the-air data rate communications.

Why Consider a DataMover ESS-II Solution?

- Longest range industrial product in its class. Providing lowest cost of ownership.
- Secure wireless operation with multiple layers of protection, including 900 MHz physical layer, RADIUS authentication and optional AES-128 data encryption with automatic key rotation.
- Reliable - Designed and built for low failure rates and reduced maintenance costs.
- Resilient - The protected Access Point (a chassis housing two radios in a warm standby configuration) increases the availability of mission-critical point-to-multipoint networks. Protected Remote stations can also be used to form protected point-to-point links.
- Flexible - The SIMREX DataMover ESS-II supports multiple users connecting to multiple applications via multiple protocols on the same DataMover ESS-II unit or the same network - simultaneously!
- Future proof - The SIMREX DataMover ESS-II adheres to open standards, allowing it to interface with a wide range of external devices enabling both new and old technologies to communicate.
- Comprehensive Network Management - Compatible with SIMREX D-View MS and any standard off-the-shelf SNMP management system.

DATAMOVER™ ESS-II Spread Spectrum Radio Specifications

General

- Data Rate: 1 Mbps/512 Kbps user configured air link

    1,200-115,200 bps serial ports

- Frequency Band: 902-928 MHz ISM band
- Spreading Mode: DTS/FHSS
- Range (512 kbps)2:
  - Typical Fixed Range: 12 miles
  - Maximum Fixed Range: 30 miles
  - Typical Mobile Range (parked): 3 miles
  - Typical Mobile Range (moving): 1 miles
- Range (1 Mbps)^2:
  - Typical Fixed Range: 8 miles
  - Maximum Fixed Range: 15 miles
- Available Configurations:
  - Access Point/Remote Dual Gateway - Serial and Ethernet
  - Remote Serial Gateway - Serial only
  - Remote Ethernet Bridge - Ethernet only

Radio

- System Gain: 139 dB @ 512 Kbps; 134 dB @ 1 Mbps
- Carrier Power: 100mW to 1W (20 to 30 dBm)
- Output impedance: 50 Ohms
- Occupied Bandwidth: 600 kHz
- Modulation: CPFSK (Continuous Phase FSK)
- Receiver Sensitivity: -97 dBm @ 512 Kbps with 10-6 BER

    -92 dBm @ 1 Mbps with 10-6 BER

Physical Interface

- Ethernet: 10BaseT, RJ-45
- Serial: COM1: RS-232/V.24, DB-9F, DCE

    COM2: RS-232/V.24, DB-9M, DTE

- Antenna: TNC connector (female)
- LEDs: Lan, Com1, Com2, Power, Link

Protocols

- Wireless: CSMA/CA (Collision Avoidance)
- Ethernet: IEEE 802.3, Ethernet II, Spanning Tree (Bridging), IGMP
- TCP/IP: DHCP, ICMP, UDP, TCP, ARP, Multicast, SNTP, TFTP
- Serial: PPP, Encapsulation over IP (tunneling) for serial async multidrop protocols including Modbus, DNP.3, DF1, BSAP

- Optional: Allen-Bradley EtherNet/IP* - Modbus/TCP

* Allen-Bradley EtherNet/IP is a copyright of Rockwell Automation, Inc.

SIMREX Cyber Security Suite, Level 1

- Encryption: AES-128 with automatic key rotation. (optional)
- Authentication: 802.1x, RADIUS, EAP/TLS, PKI, PAP, CHAP
- Management: SSL, SSH, HTTPS

Management

- HTTP, HTTPS, SSH, TELNET, local console
- SNMPv1/v2/v3, MIB II, Enterprise MIB
- SYSLOG
- SIMREX D-View MS

Environmental

- Temperature: -30°C to +60°C (-22°F to +140°F)
- Humidity: 95% at 40°C (104°F) non-condensing

Electrical

- Input Power: 10.5-30 Vdc
- Current Consumption (nominal):

Mode	Power	13.8 Vdc	24 Vdc
Transmit	7 W	510 mA	290 mA
Receive	2.8 W	200 mA	120 mA

Mechanical

- Case: Die Cast Aluminum
- Dimensions: 3.15 H x 17.2 W x 11.2 D cm. (1.25 H x 6.75 W x 4.5 D in.)
- Weight: 908 g (2 lb.)
- Mounting options Flat surface mount brackets, DIN rail, 19" rack tray
- Protected Option:
  - Case: Steel (rack mountable 2U)
  - Dimensions: 8.9 H x 48.3 W x 35.6 D cm. (3.5 H x 19 W x 14 D in.)
  - Weight: 7.6 kg, (14.7 lbs) with transceivers

Agency Approvals

- FCC Part 15.247 (DTS)
- UL/CSA Class 1 Div. 21
- IC

1 The transceiver is not acceptable as a stand-alone unit for use in the hazardous locations described above. It must either be mounted within another piece of equipment, which is certified for hazardous locations, or installed within guidelines, or conditions of approval, as set forth by the approving agencies.

2 Typical fixed range calculation assumes a 6 dBi gain Omni on a 100 ft tower at the AP, a 10 dBi gain Yagi on a 25 ft mast at the remote with output power decreased to yield maximum allowable EIRP (36 dBm), a 10 dB fade margin, and a mix of agricultural and commercial terrain with line of sight.

Typical mobile range calculation assumes a 6 dBi gain Omni on a 100 ft tower at the AP, a 5 dBi gain Omni with 1 watt output power at 6 ft height, a10 dB fade margin, and 90% reliability with near line-of-sight in a mix of agricultural and commercial terrain. Maximum range achieved with a clear line-of-sight path, and fresnel zone clearance. Actual performance is dependent on many factors including antenna height, blocked paths and terrain.

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