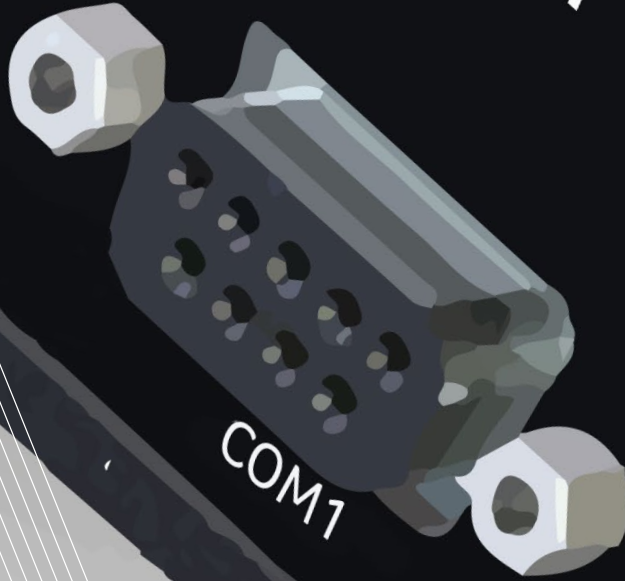
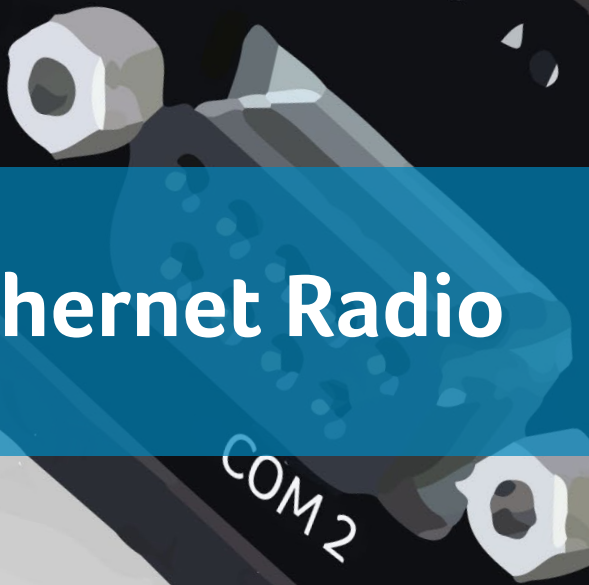


simocoXm



Simoco Xm Ethernet Radio



Simoco Xm Ethernet Radio



Xm is a best in class radio modem renowned for overall data throughput and reliability. The software defined radio is a native IP device allowing for both Ethernet and Serial communications.

Resilient Communications

The Simoco Xm Ethernet Radio provides resilient communications for mission critical applications for Utilities such as SCADA & Telemetry, SmartGrids & Smart Cities.

Flexibility and Scalability

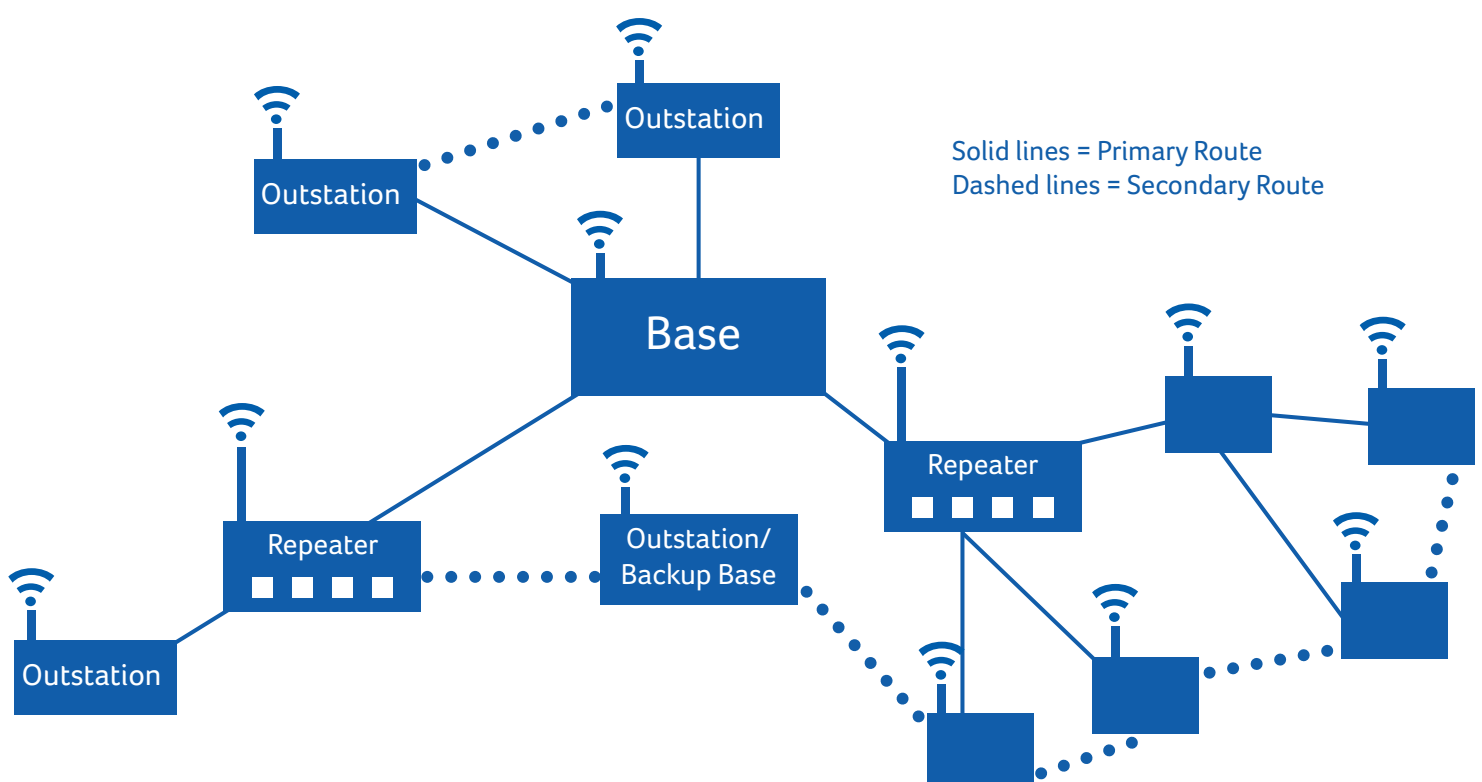
Within a Xm network every unit can serve as the central master, a repeater, a remote terminal or all of these simultaneously. These various configurations allow a variety of network topologies such as point-to-point, point-to-multipoint, and mesh, allowing for scalability and ease of deployment.

Connectivity

Combining both IP and serial connectivity, Xm modems are suitable for use with the latest SCADA technology, also providing a clear migration path from serial based infrastructure thanks to the modems inbuilt "migration solution software" which allows the phased replacement of legacy radio modems.

Benefits

- IP routing capability allows for Mesh networks and alternate routes
- Easy configuration through web browser
- Inbuilt migration solution for legacy serial networks
- Sophisticated anti-collision protocol on Radio channel - simultaneous report by exception and multi-master polling
- 166 kbps/50 kHz, 42 kbps/12.5kHz, 11kbps/6.25kHz



Features and Benefits

Native IP device

- **Router mode** - Xm works as a standard IP Router with 2 interfaces (Radio and Ethernet) and 2 COM port devices without any compromise. There is a sophisticated anti-collision protocol on Radio channel, where every single packet is acknowledged. Moreover, each unit can simultaneously work as a store-and-forward repeater.
- **Bridge mode** - Packets received on any interface are broadcast to the respective interfaces on all units. Packets received on COM are broadcast to both COM1 and COM2 at remote sites, allowing you to connect 2 RTU's to each remote unit.
- **IP specialities** ;
 - **Terminal Server**: encapsulates serial protocol to TCP (UDP) and vice versa, eliminating a transfer of TCP overhead over Radio channel, 5 independent sessions
 - **TCP proxy**: converts TCP to UDP, eliminates transfer of TCP overhead
 - **Subnets**: unlimited number of virtual Ethernet interfaces (IP aliases)
 - **VLAN**: unlimited number of VLANs assigned to Subnets
 - **ARP proxy**: any IP address simulating (for RTU's without routing capabilities within the same subnet)

Easy to configure and maintain

- Basic IP knowledge is sufficient
- Web interface or CLI via SSH
- Service access via ETH, USB/ETH or Wifi Adapter
- Wizards - fast and simple setup
- All configuration parameters within one page
- Fast remote access - only the effective data is transferred over the air, html page downloaded from the local unit
- External flash disc - automatic configuration, SW keys and FW upgrade

Data speed & throughput

- 166 kbps/50 kHz, 42 kbps/12.5kHz, 11kbps/6.25kHz
- Optimisation - embedded optimisation triples throughput on the Radio channel
- Stream mode - transmitting starts immediately on the Radio channel, without waiting for the end of the received frame on COM means zero latency
- Auto-speed - receiver is automatically adjusted to the data rate of the incoming frame

SW feature keys

- Advanced features only when and where needed;
 - Router mode
 - 166/83 kbps
 - COM2, 10W
 - Backup routes
- Free Master-key trial - for 30 days in every Xm

Energy savings

- Sleep mode - 0.1 W, triggered by Digital input
- Save mode - 2 W, wake up by a received packet from Radio channel or by Digital input

Features and Benefits



Long range

- One radio hop over 50 km, Line of sight is not required
- Carrier output power 0.1 - 10W
- Exceptional data sensitivity:
 - 99dBm/83kbps/25kHz/BER 10e-6
 - 115dBm/10kbps/25kHz/BER 10e-6
- Any unit can work simultaneously as a repeater
- Unlimited number of repeaters on the way
- Any IP network can interconnect Xm units
- Backup routes
 - Tested alternative paths between two Xm units
 - Automatic switchover to backup gateway
 - Unlimited number of alternative paths
 - Alternative path priorities

SCADA protocols

- Modbus, IEC 60870-5-101, DNP3, Comli, DF1, Profibus, SLIP, Siemens 3964 (R), IEC104, DNP3/TCP, Modbus TCP and others
- SCADA serial protocol addresses are mapped to Xm addresses
- TCP (UDP) protocols can be handled transparently or using Terminal server or TCP proxy
- Each packet is transferred as an acknowledged unicast
- Sophisticated anti-collision protocol on Radio channel - simultaneous report by exception and multi-master polling
- Embedded Modbus RTU/Modbus TCP converter

Diagnostics & Network Management

- Statistic logs for interfaces and communication links
- Historical and on-line values displayed graphs
- 20 periods (e.g days) of history
- Watched values (RSS, Ucc, Temp, PWR, etc) also from neighbouring units
- SNMP including TRAP alarms
- HW Alarm input, HW Alarm output
- Monitoring - on-line analysis of communication over any of the interfaces


Security & Integrity

- Licensed radio bands
- FEC, interleaving, proprietary data compression
- CRC32 data integrity control on Radio channel
- Proprietary protocol on Radio channel with packet acknowledgement
- AES256 encryption
- Firewall: Layer 2 - MAC, Layer 3 - IP, Layer 4 - TCP/UDP
- Secured Management - https, ssh, access password
- SSL (own) certificate up to 2048 bits for https

Reliability

- Units tested in a climatic chamber as well as in real traffic
- Heavy-duty or industrial components
- Industrial rugged die-cast aluminium cse
- -40 to +70°C
- 2 years warranty

Others

- Removable sticker plate for your notes
- DIN rail, flat, vertical or 19" rack mounting
- Separated Rx and Tx antenna connectors*
- Integrated GPS*
- Hazardous locations:  II 3G Ex ic IIC T4 Gc
- Vibration and shock: EN 61373:1999

*Optional

Technical Specifications

General Specification

Frequency Bands	135-154; 154-174; 215-240; 300-320; 320-340; 340-360; 368-400; 400-432; 432-470; 470-512; 928-960 MHz						
Channel spacing	6.25 / 12.5 / 25 / 50 kHz						
Frequency stability	+/- 1.0 ppm						
Modulation	Linear: 16DEQAM, D8PSK, $\pi/4$ DQPSK, DPSK Exponential (FM): 4CPFSK, 2CPFSK						
RF Data rate - CE (kbps)	Bandwidth	Linear				Exponential	
		16DEQAM	D8PSK	$\pi/4$ DQPSK	DPSK	4CPFSK	2CPFSK
	50 kHz	138	104	69.4	34.7	41.6	20.8
	25 kHz	83.3	62.4	41.6	20.8	20.8	10.4
	12.5 kHz	41.6	31.2	20.8	10.4	10.4	5.2
RF Data rate - FCC (kbps)	Bandwidth	Linear				Exponential	
		16DEQAM	D8PSK	$\pi/4$ DQPSK	DPSK	4CPFSK	2CPFSK
	50 kHz	138	104	69.4	34.7	41.6	20.8
	25 kHz	69.4	52.0	34.7	-	20.8	-
	12.5 kHz	34.7	26.0	17.3	-	10.4	-
RF Data rate - Unlimited (kbps)	Bandwidth	Linear				Exponential	
		16DEQAM	D8PSK	$\pi/4$ DQPSK	DPSK	4CPFSK	2CPFSK
	50 kHz	166	125	83.3	41.6	41.6	20.8

Interfaces

Ethernet	10/100 Base-T Auto MDI/MDIX	RJ45
COM1	RS232 300-115 200 bps	DB9F
COM2	RS232/RS485 SW configurable 300-115 200 bps	DB9F
USB	USB 1.1	Host A
Antenna	50 Ohms	TNC female

Environmental

IP Code	IP40
Temperature	-40 to +70°C / -40 to +158 °F
Humidity	5 to 95% non-condensing

Electrical

Primary Power	10 to 30 VDC, negative GND
Rx	5 W @ 13.8 V; 4.8 W @ 24 V; (Radio part < 2 W)
Tx	5W RF: 33.1 W @ 13.8 V; 31.2 W @ 24V 10W RF: 41.4 W @ 13.8 V; 38.4 W @ 24V
Sleep mode	0.1 W
Save mode	2W

Transmitter

RF Output Power (Carrier and Modulated)	Linear: Programmable 0.5 - 2W Exponential (FM): Programmable 0.1 - 10W
Duty Cycle	Continuous
Rx to Tx Time	< 1.5 ms
Intermodulation Attenuation	> 40 dB
Spurious Emissions (Conducted)	< -36dBm
Spurious Emissions (Radiated)	< -36dBm
Adjacent channel power	< -60dBc
Transient adjacent channel power	< -60dBc

Receiver

Sensitivity	-90dBm to -122dBm (depending on bandwidth, modulation, FEC level, BER level and regulatory method & mask)
Anti-aliasing Selectivity	50kHz @ -3dB BW
Tx to Rx Time	< 1.5 ms
Maximum Receiver Input Power	20 dBm (100 mW)
Rx Spurious Emissions (Conducted)	< -57dBm
Radiated Spurious Emissions	< -57 dBm
Blocking or Desensitization	-21 dB to 7dB
Spurious response rejection	> 70dB

Mechanical

Casing	Rugged die-cast aluminium
Dimensions	150 W x 118 D x 50 H mm (5.90 x 4.65 x 1.97 in)
Weight	1.1kg (2.4lbs)

Diagnostics and Management

Radio Link Testing	Yes (ping with RSS, Data Quality, Homogeneity)
Watched Values	Device-Ucc, Temp, PWR, VSWR, HW Alarm Input. Radio channel-RSScom, DQcom, TXLost[%] User interfaces-ETH[Rx/Tx], COM1[Rx/Tx], COM2[Rx/Tx]
Statistics	For Rx/Tx Packets on User interfaces (ETH, COM1, COM2) and for User data and Radio protocol (Repeats, Lost, ACK etc.) on Radio channel
Graphs	For Watched values and Statistics

Certifications

CE, FCC, ATEX, IECEx

SW

Operating modes	Bridge/Router
User Protocols on COM	Modbus, IEC60870-5-101, DNP3, UNI, Comli, DF1, RP570, Profibus
User Protocols on Ethernet	Modbus TCP, IEC60870-5-104, DNP3 TCP, Comli TCP, Terminal server
Multi master applications	Yes
Report by exceptions	Yes
Collision Avoidance Capability	Yes
Repeaters	Store-and-forward; Every unit; Unlimited number

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See Simoco Product Catalogue for a full list of specifications. All specifications are subject to change without prior notice. Simoco does not accept liability for any error or omission in this document.

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