

SEL-3031 Serial Radio Transceiver

For Water and Wastewater Communications



Dual operation radio for instrumentation, monitoring, and control

- Point-to-multipoint (P2MP) operation allows you to gather SCADA information from remote locations. Low-latency, point-to-point (P2P) operation rapidly transfers critical control and protection commands.
- Optimized MIRRORING[®] communications increases speed and reliability for protection and control.
- SEL Hop-Sync[™] technology prevents radio frequency interference from co-located radios.
- The license-free 915 MHz industrial, scientific, and medical (ISM) band and a range of up to 32 km (20 mi) make implementation simpler.
- Three independent serial connections support simultaneous applications and protocols.





Key Features

The SEL-3031 Serial Radio Transceiver allows you to extend monitoring and control capability without installing additional wiring or using leased lines. Economical installation and operation reduce the cost and shorten the payback time of any project.

Dual Radio Operating Modes Provide Flexibility

Use P2MP radio operation to monitor and gather SCADA information from remote locations. Use P2P radio operation for low-latency transfer of critical control and protection commands.

P2MP Operation Supports Many Remote Radios

The SEL-3031 communicates with remote radios up to 32 km (20 mi) in any direction from the master radio location. Gather data and send control signals to tanks, booster stations, wells, reservoirs, and lift stations, as well as within treatment facilities, without running wire.

No Wiring or Leased Lines Improves Return on Investment

Economical radio installation reduces the amount of capital required and shortens the payback time on any project.

Low Latency Enables Fast Control

Using SEL MIRRORED BITS communications, the SEL-3031 transfers control commands with a typical latency of 5.5 milliseconds.

Strong Security Thwarts Attackers

An optional encryption card protects critical data and repels malicious attacks using session authentication and strong 256-bit Advanced Encryption Standard (AES) technology.

Tough Radio Operates in Extreme Conditions

Like all SEL devices, the SEL-3031 is designed, built, and tested for trouble-free operation in extreme temperature, electromagnetic interference, shock, and vibration conditions.

License-Free Operation Reduces Costs

The SEL-3031 uses the license-free 915 MHz ISM band, which reduces operating expenses and the time and cost of installation.

Applications



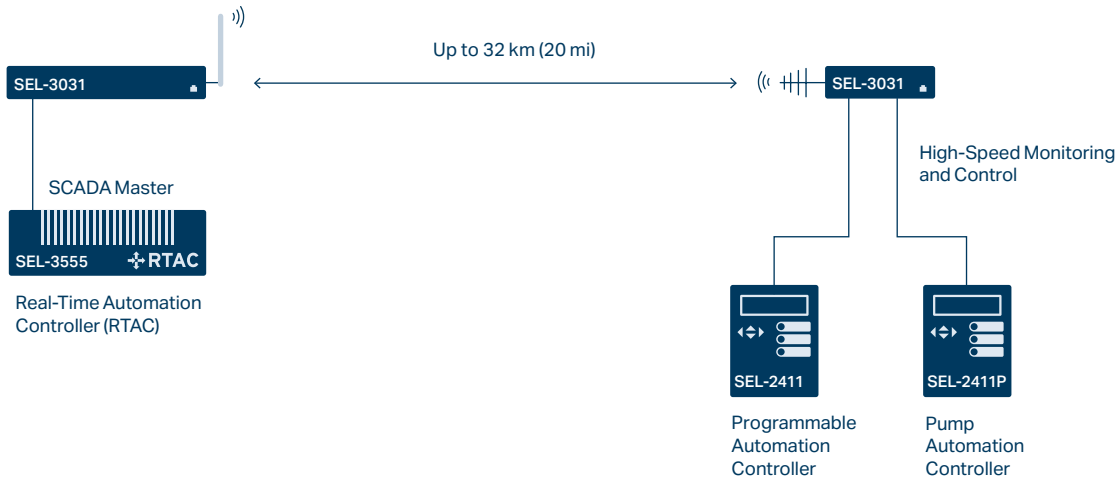
Water and Wastewater Applications

Communications for Control

- Support serial programmable logic controllers and programmable automation controllers
- EIA-232, EIA-485, and fiber-optic options
- Non-line-of-sight with repeater configurations

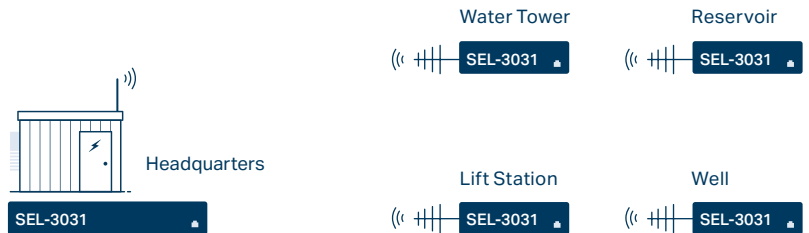
Remotely Monitor and Control

- Wells
- Water towers
- Lift stations
- Booster stations
- Water quality monitors
- Reservoirs



Multipoint Wireless Communication

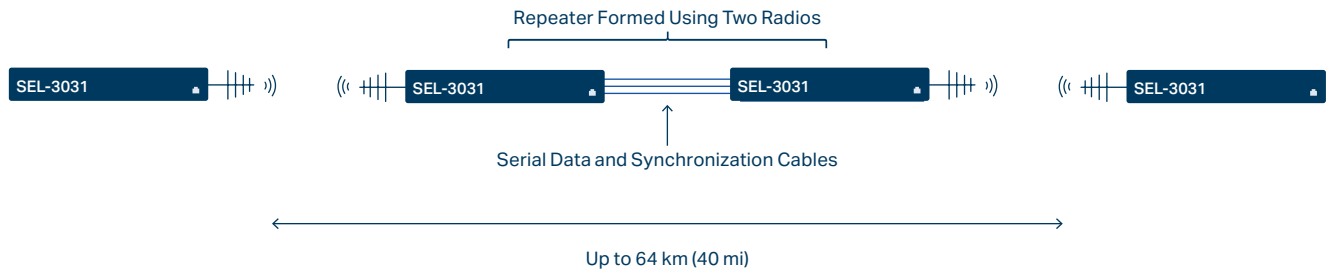
P2MP radio operations support SCADA monitoring and control between a master located at headquarters and multiple field locations in buildings, vaults, structures, rivers, and watershed areas.





Radio Links With Repeaters

- Non-line-of-sight radio path
- Longer distance applications
- Full-bandwidth repeater
- Predictable latency



You can connect SEL-3031 radios back-to-back to create a repeater. The repeater configuration can extend the length of a link or maintain radio contact when there is an obstacle between two substations.

Co-located Radios

A back-to-back repeater configuration is one example of co-located radios. There are several other important co-located radio configurations, and these can be difficult to design and install. The SEL-3031 has a special feature called SEL Hop-Sync technology to help mitigate installation difficulties.

Radio System Accessories

Custom Enclosures

SEL can provide one or more radios in enclosures with surge protectors, power supplies, and other devices.

External Power Supply

The SEL-9322 15 Vdc Power Supply is an ac-to-dc or dc-to-ac converter designed for harsh physical and electrical environments, including those found in electric substations. The SEL-9322 provides a nominal 15 Vdc at up to 1 A to power communications or instrumentation devices. The low-voltage output can be derived from higher-voltage dc battery sources or from higher-voltage ac sources. The three input options include: 9–30 Vdc, 24–48 Vdc, or 125–250 Vdc or 110–240 Vac.



Encryption Protects Against Eavesdropping and Unauthorized Control

Order the radio with an SEL-3044 SEL Encryption Card to cryptographically secure your valuable data. The SEL-3044 features:

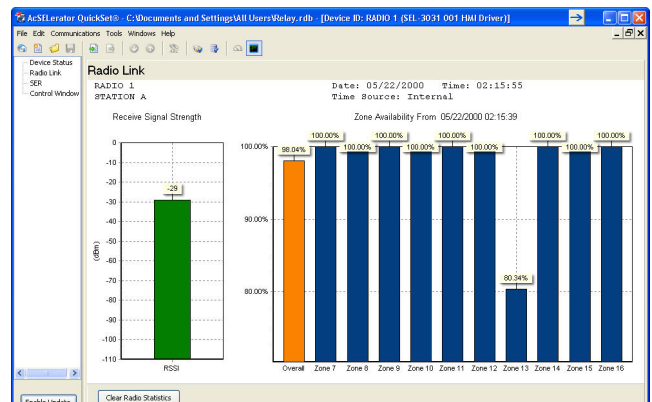
- 256-bit AES technology.
- Easy configuration with minimal settings.
- Verification of data encryption.
- Security against man-in-the-middle and replay cyber attacks.
- Fixed 9.6 kbps full-duplex throughput per port, or 19.2 kbps on Port 1 (disables Port 2).



ACSELERATOR QuickSet® SEL-5030 Software

QuickSet includes tools to help you manage settings and analyze the performance of the SEL-3031. With QuickSet, you can:

- Create, edit, store, transfer, and manage SEL-3031 settings.
- Obtain device data with the HMI.
- Easily understand performance with graphical displays of signal strength and zone availability.



Additional Accessories

Visit selinc.com/products/SEL-3031 or contact your SEL representative for more information.



Substation- and Plant-Grade Equipment

The SEL-3031 is designed, built, and tested with the same practices, processes, and standards that we use for our protective relays, information processors, and other products. This includes compliance with IEEE and IEC standards for electrostatic discharge, fast transients, radiated emissions, surge-withstand capability, dielectric strength, pulsed magnetic fields, and disturbances. Specifications and tests are per the IEEE C37.90-1989 and IEC 60255 protective relay standards.



SEL-3031 Specifications

General

Wireless	ISM band 902–928 MHz frequency-hopping spread spectrum P2P or P2MP operation Output power: 1 W (30 dBm) Adjustable power : 20–30 dBm Receiver sensitivity: –97 dBm, –104 dBm with ARQ on
Optional SEL Encryption Card	256-bit AES encryption Session authentication FIPS 140-2 Level 2 (historical—see certificate #1564)
Data	Send data via protocols, such as DNP3, Modbus, SEL MIRRORING communications, IEEE C37.118 synchrophasors, and SEL ASCII. IRIG-B time code on Port 2
Built-In Clock	Manually set or time-synchronize using IRIG-B.
Alarm Output	Integrate radio alarm contact with annunciators and alarm panels.
Distance	Communicates up to 32 km (20 mi) in line of sight; longer distances are possible with repeater configurations.
USB Management Port	Access local diagnostics, determine signal strength, create and modify settings, and determine packet quality.
Mounting and Power Supply Options	Wall mount: 9–30 Vdc at <5 W Rack mount: 24–48 Vdc, 110–240 Vac, or 125–250 Vdc
Certifications	FCC Part 15.247; ICES-001; RSS-210 FCC Part 15, Class A; ICES-003 for USA and Canada IFETEL for Mexico ANATEL for Brazil (part number starts with SEL-30311) ENACOM for Argentina UL, cUL: UL 508, CSA C22.2 No. 142

Operation-Related Specifications

P2P Operation (protection and control)	Three Serial Data Ports Standard interface: EIA-232 (DCE female 9-pin subminiature-D) Port 1 options: EIA-485 (female 9-pin subminiature-D), fiber-optic—SEL-2812 Fiber-Optic Transceiver With IRIG-B compatible (ST connectors) Speed: 9.6 or 19.2 kbps full duplex per port (unencrypted) Optional: 38.4 kbps full duplex on Port 1 (disables Port 2)
P2MP Operation (data gathering from multiple remote radios)	One Serial Data Port EIA-232, EIA-485, or serial fiber-optic port option Configurable port speeds: 9.6, 19.2, or 38.4 kbps; full duplex per port (unencrypted)

To learn more, visit selinc.com/products/SEL-3031.



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