



Bringing versatility and reliability to your wireless network

Trio Data Radios



se.com

Life Is On

Schneider
Electric

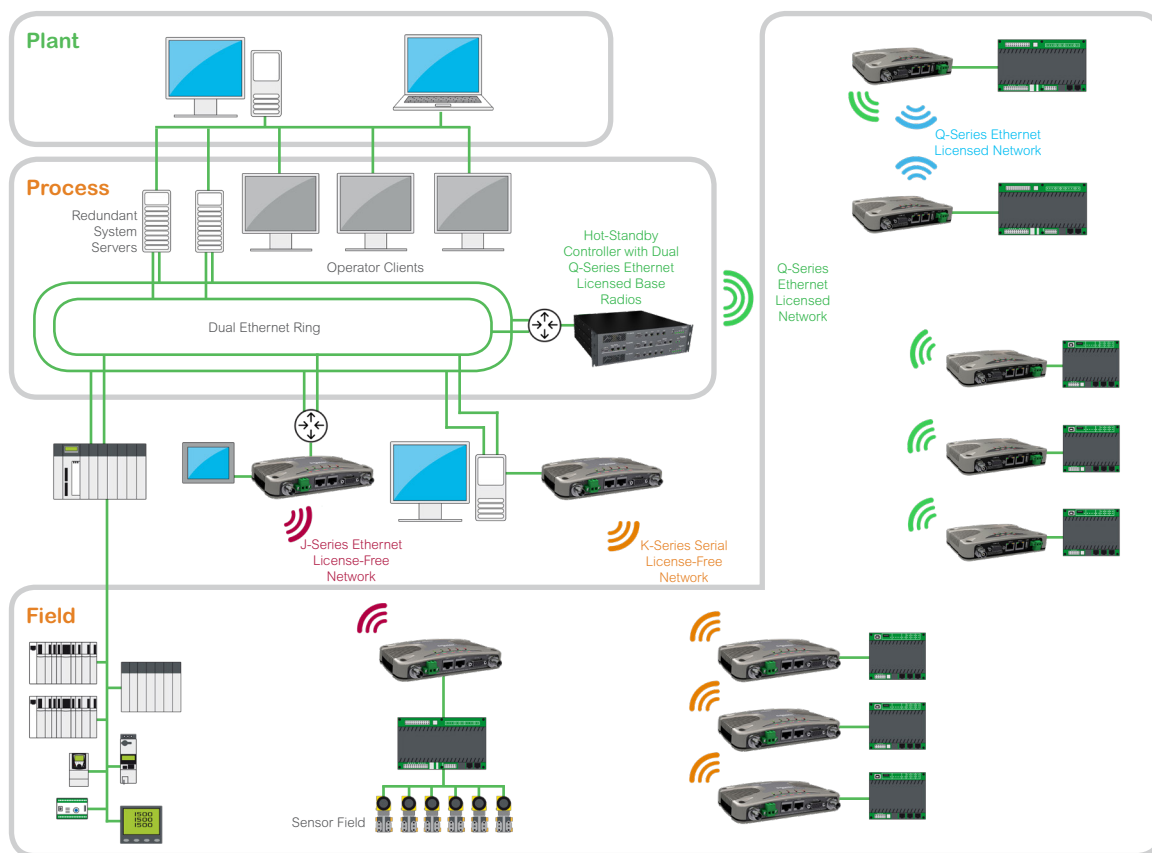
The right solution to enhance data integrity over wireless infrastructure



Wireless communication for industrial and utility assets

Establishing wireless communication is a crucial challenge for municipal water suppliers, oil and gas producers, electrical utilities, and other industries.

Monitoring and control infrastructure can be placed in geographically dispersed locations and are comprised of a diverse mix of equipment and system architectures, being subject to stringent environmental and protective regulations. With shrinking budgets and expanding systems, it's becoming increasingly crucial to minimize deployment and operational costs, while optimizing system performance and data availability. Trio™ licensed and license-free data radios offer cost-effective, versatile wireless solutions for SCADA and remote telemetry applications.



Optimized design implementation

Commissioning costs associated with dedicated communication cables and leased lines are reduced by reducing the need for costly trenching work and wiring infrastructure. Further savings are realized with lowered ongoing operational costs.

Rapid deployment

Permanent or temporary systems are brought online in a fraction of the time of traditional, hardwired networks with easy-to-install and configure hardware components and effective software network management and diagnostic tools.

Reliability and high availability

Wireless means no more lost data due to damaged or improper cabling. Operational lifetime is extended and data integrity is enhanced over longer distances.

Providing value to a wide range of applications and customers

Trio Data Radios reduce installation and maintenance costs associated with the monitoring and control of your remote telemetry system while establishing data integrity over short and long-haul distances.

By combining the technical and economic advantages of wireless communication with a unique feature set, Trio data radios enable you to take ownership of your network by providing simple and rapid system configuration, consistent and dependable network performance, and long-term reliability and availability.

Network-Wide Management Tools

A powerful network management system is available for remote configuration and monitoring of the entire radio system from any network node and is a necessary tool in troubleshooting and preventative maintenance tasks.

Use With Confidence

Trio radios may be used in legacy installations and are field-proven compatible with industry-leading equipment brands.

Optimized Communication

Dedicated remotes, multitasking repeater and network bridging units, up to high endurance base radio and hot-standby controller models enable greater creativity in network design and functionality by accommodating a greater range of solutions.

Ease of Deployment

Trio radios are simple to install and can be pre-configured at the shop for rapid field installation or manually set up on-site with a laptop computer.

Quality Product

High reliability is enhanced with a mean time between failures (MTBF) specification of > 2 million hours and ISO 9001:2008 certification.



The flexibility and special feature set of Trio radios enable greater choice in network design and functionality by accommodating a greater range of solutions

Maximize ROI by optimizing network performance

Unique operational features set Trio radios apart from the competition by expanding network design possibilities to help maximize performance and minimize costs. Ethernet and serial interfaces, multi-antenna support, repeater and bridge modes extend networks far beyond the operational range of an individual radio and can bridge disparate data networks together. Network traffic is optimized with support for multiple, simultaneous protocols on one network, configurable stream identifier codes, and simultaneous data stream delivery.

TVIEW+™ is a network management and network-wide diagnostics application that supports multiple diagnostic hosts, integrated graphical spectrum analysis, and remote radio configuration. TVIEW+ software is ODBC-compliant and provides trending/logging of communication statistics and alarms.

Some of its unique features include:

- KwikStream™ high-speed single radio repeater mode
- LinkXtend™ dual antenna: network bridging technology that extends usable range
- ChannelShare™ integrated collision avoidance for unsolicited remote transmissions: allowing simultaneous polling, spontaneous alarm reporting, and multiple applications that share one radio channel, to make efficient use of available spectrum
- SmartPath™ technology for enhanced redundancy in network configuration
- MultiStream™ simultaneous data stream delivery: allowing multiple vendor devices and protocols to be transported on one radio network



Trio Data Radios for wireless communication solutions

Water & Wastewater

Telemetry and Remote SCADA

- Potable water
- Production
- Transmission
- Storage
- Treatment
- Consumption

Locations

- Reservoirs
- Wells
- Valves
- Pumping stations
- Pipelines
- Substations
- Kiosks

Applications

- Cathodic protection
- Leakage detection
- Equipment breakdown detection
- Water quality
- Customer premises metering
- Custody transfer
- Monitoring flow, level, pressure and temperature, etc.

Oil & Gas

Telemetry and Remote SCADA

- Extraction
- Production
- Processing
- Transmission
- Distribution
- Consumption

Locations

- Upstream and downstream
- Offshore and onshore
- Well heads
- In plants
- Along pipelines
- At valves
- Pumping stations
- Storage tanks

Applications

- Cathodic protection
- Metering
- Custody transfer
- Emergency shutdown (ESD)
- Water or gas injection
- Monitoring flow, level, pressure, and temperature, etc.

Electricity

Telemetry and Remote SCADA

- Generation
- Transmission
- Distribution
- Consumption

Locations

- Power plants
- Substations
- Kiosks
- Power lines
- Pole tops

Applications

- Substation switching
- Interconnection
- Protection/isolation
- Reclosers
- Relays
- Load shedding
- Fault indication
- Transformer monitoring
- Customer premises metering
- Custody transfer

Other Market Segments

Mining & minerals exploration

- Remote sensing
- Remote sensing
- Land and offshore

Petrochemical

- Production and transportation
- Security/Alarm Systems
- Emergency fire and intrusion monitoring

Public information message displays

- Public transport
- Traffic management
- Parking

Agriculture and environment

- Weather, pollution, and soil monitoring

Trio radios may be confidently used in legacy and new installations and are field-proven compatible with industry-leading equipment brands.

We will help answer
your system design and
configuration questions
and assist with
regulatory requirements



Network management system for troubleshooting and preventative maintenance



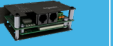
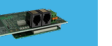







Which Trio radio model is right for my application?

Trio radios are broadly split into licensed and license-free frequency models with each further divided into Ethernet/serial and serial-only interfaced models.

The following chart may be used to determine the appropriate Trio radio to fit your needs. Further technical information is found in the specifications section.

Trio Radio Selection Chart

		License-free							
									
		JR900	JR240	KR900	KR240	KP900	KP240	KB900	KB240
Interface	Ethernet + Serial								
	Serial Only								
Frequency Band	900 MHz								
	2.4 GHz								
Radio Type	Remote / Repeater /AP								
Package	Board Only								
	Standalone								
Encryption	Encryption *								
Unique Features	KwikStream High Speed Repeater Mode								
	LinkXtend Dual Antenna Network Bridging								
	ChannelShare Collision Avoidance								
	SmartPath Enhanced Redundancy								
	Multistream Simultaneous Data Stream								
Accessories	Antennas, RF Cables, Lightning Protection								
Approvals	FCC/IC/ACA								
	CSA Class I Div 2 Hazardous Area								
	ETSI								
		Licensed							
									
		MR450	QRxxx	QPxxx	QBxxx	QHxxx			
Interface	Ethernet + Serial								
	Serial Only								
Frequency Band	135...175 MHz (VHF)								
	400...520 MHz (UHF)								
Radio Type	Half Duplex Radio								
	Full Duplex Radio								
	Hot-standby Radio								
Power Supply	10...16 Vdc								
	10...30 Vdc **								
Mounting/ Form Factor	DIN Rail Mounting								
	Standalone								
	19" Rack				1 RU	1 RU	3 RU		
Encryption	256-bit AES Encryption *								
Accessories	Antennas, RF Cables and Lightning Protection								
Approvals	FCC/IC/ACA								
	CSA Class I Div 2 Hazardous Area								
	ETSI								
	ACMA								

Trio radios are available in a range of hardware components that are optimized for your specific communication needs.

* Export restrictions may apply.

** 19" Rack Radios QP/QB/QH minimum supply voltage is 11 Vdc. Refer to datasheet for specific details

License-Free Data Radios: Feature Overview

License-free J and K-Series Data Radios

Common Features

- Configurable operational profiles: access point, remote, bridge, repeater
- KwikStream high-speed single radio repeater mode
- Dual antenna LinkXtend technology increases usable range
- Repeater and bridge units support locally connected user devices
- ChannelShare collision avoidance for unsolicited remote transmissions allowing simultaneous polling and spontaneous reporting
- SmartPath technology for enhanced redundancy in network configuration
- License-free operation in the 900 MHz and 2.4 GHz ISM frequency bands
- Robust frequency-hopping spread spectrum technology for superior interference immunity
- One watt (+30 dBm) maximum allowable transmitter power (500 mW with 2.4 GHz version)
- High VSWR protection (900 MHz version only)
- Compatible with Trio TVIEW+ diagnostics for stand-alone network management
- Spectrum analyzer and channel lockout facilities
- 256-bit AES data encryption (export restrictions may apply)
- Operates in environmental extremes: -40...+70 °C (-40...+158 °F)
- 10...30 Vdc power supply
- Dual industry-standard TNC antenna connectors

J-Series Ethernet and Serial Data Radio

JR900 | JR240



- 900 MHz version: 512 kbps high-speed over-air data rate or 256 k, 128 k, or 64 k for longer range; 2.4 GHz version: 256 k/128 k/64 k
- Dual independent Ethernet ports (Auto MDI/MIDX)
- Optimized Ethernet connectivity with smart peer-to-peer repeating, broadcast filtering, and data compression
- Legacy RS-232 serial support via embedded terminal servers (UDP/TCP) and Modbus™/TCP gateway
- SNMP V1/V2c access to radio diagnostics including trap generation for radio alarms
- HTTPS, Telnet, SSH, and serial-based configuration and management interface
- Compact, rugged alloy housing with DIN-rail mounting option

K-Series Serial Data Radio

KR900 | KR240



Common features:

- 256 kbps high-speed over-air data rate (can be reduced to 128 k, 64 k, or 32 k for longer range)
- Advanced accurate data delivery with CRC plus selectable FEC and ARQ
- Suitable for industry-standard data protocols. e.g., Modbus, DNP3, IEC 870-5-101, etc.
- MultiStream simultaneous data stream delivery allows for multiple vendor devices/protocols to be transported on the one radio network — compatible with Trio E-Series and M-Series
- Flexible data stream routing providing optimum radio channel efficiency

KB900 | KB240 (board only)



KP900 | KP240 (enclosure)



- Dual, independent, user-configurable data ports
- Selectable 300...230 kbps asynchronous RS-232 and RS-485 interfaces
- Mounting options for DIN-rail and solar

Licensed Ethernet & Serial Data Radios: Feature Overview



Trio Q-Series Data Radios

Trio Q Data Radios are advanced, high-speed licensed digital data radios, providing both Ethernet and serial communications for complex and demanding applications in Point-to-Point and Point-to-Multipoint (Multiple Address Radio) Telemetry and remote SCADA systems.

Features such as ChannelShare and web-based user configuration, together with powerful remote diagnostics and Network Management, make Trio Q Data Radios the complete licensed radio solution that works with leading host systems and remote equipment.

Combining both Ethernet and serial connectivity, Trio Q Data Radios are suitable for use with the latest SCADA technology and for providing a smooth transition from serial-based infrastructure to IP/Ethernet.

Ideal for deployment at remote sites, the QR Half Duplex Radio supports Simplex or Half duplex operation. Where base stations or hot-standby radios are required, please refer to the QB (Full Duplex Base), QP (Half Duplex Hot-standby) and QH (Full Duplex Hot-standby) radios.

QR450 | QB450 | QP450 | QH450

Common features:

Radio

- VHF Frequency Band Operation: 135...175 MHz
- UHF Frequency Band Operation: 400...450 MHz and 450...518 MHz
- 12.5 kHz and 25 kHz channel operation in one radio model
- User configurable transmitter output power up to 10 Watts
- Coverage of common international frequency bands
- Designed to meet international FCC & ETSI radio regulatory requirements
- VSWR and over temperature protection
- Operation over full -40...+70 °C (-40...+158 °F) ambient temperature range
- Automatic frequency offset compensation for years of service/calibration free operation

Ethernet

- Transport of Ethernet/IP based protocols (including UDP, TCP, DHCP, ARP, ICMP, STP, IGMP, SNMP & TFTP)
- Layer-2 Ethernet Bridge Mode & Layer-3 IP Router mode
- Advanced data payload / RoHC (RFC-3095) Ethernet/IP/TCP and UDP compression
- Network Address Translation for static NAT port forwarding
- VLAN 802.1Q capable
- Quality of Service (QoS) with eight priority lanes, Min-Max bandwidth limiters and flexible user defined matches
- SNMP access to radio diagnostics parameters (including alarm generation via traps)
- Legacy RS-232 serial support via embedded terminal servers (UDP/TCP) and Modbus/TCP gateway
- Embedded TCP to UDP gateway with Unicast/Multicast support
- Configuration via embedded HTTP, HTTPS web interface and/or Telnet/SSH/Serial console
- Local and (one to N) broadcast firmware upgrades

Modem

- Dynamic Speed Selection: QoS/RSSI based automatic speed selection (or fixed mode)
- RF Data Rates: Up to 32 kbps in a 12.5 kHz Channel & 56kbps in a 25 kHz ETSI Channel
- ChannelShare: Advanced dynamic supervisory collision avoidance system
- Compatible with the Trio E-Series and Trio M-Series Data radios (UHF only)

Security

- Support for 256-bit AES encryption
- Multi-User password-protected HTTP and HTTPS configuration/diagnostics management interface
- Multi-User Password-protected Telnet, SSH and Serial console interface

Diagnostics and configuration

- Compatible with the Trio TVIEW+ Diagnostics Network Management Software
- Embedded error rate testing facilities
- Diagnostics parameters available for Tx Power, RSSI, DC Supply Volts, Frequency Offset, Temperature and VSWR
- Embedded event and performance logs including time-stamped data statistics and channel occupancy
- Manual Configuration via embedded HTTP, HTTPS web interface & or Telnet/SSH/Serial console with optional TFTP
- Automatic configuration load via USB
- Automatic configuration save via TFTP/SCP server

Licensed Ethernet & Serial Data Radios: Feature Overview

Approvals

- Europe (ETSI): ETSI EN300 113, EN 301 489, EN 60950
- FCC (North America): FCC Part 15, Part 90
- Industry Canada: IC RS119, ICES-001
- Australia: ACMA AS4295-1995 (Data)
- Hazardous: CSA Class I, Division II, Groups (A,B,C,D) for Hazardous Locations ANSI/UL equivalent (QR450 Remote Only)

Trio Q Data Radios

Half duplex radio QR150 | QR450

- Simplex or Half duplex operation
- 10...30 Vdc supply voltage
- Rugged die-cast housing
- QR150: 115 x 56 x 164 mm (4.52 x 2.20 x 6.45 in.)
- QR450: 115 x 34 x 164 mm (4.52 x 1.33 x 6.45 in.)
- DIN Rail Mounting Kit Option
- Digital Inputs & Outputs (QR150 only)

Full duplex radio QB450 (Base)

- Full Duplex operation (100% duty cycle)
- 19" 1RU rack mount
- 11...30 Vdc supply voltage
- Digital Inputs & Outputs

Half duplex hot-standby radio QP450

- Simplex or Half duplex operation
- Duplicated redundant transceiver configuration
- Automatic change over upon alarm
- 19" 1RU rack mount
- 11...30 Vdc supply voltage
- Digital Inputs & Outputs

Full duplex hot-standby radio QH450

- Full Duplex operation (100% duty cycle)
- Ethernet link monitoring and shared IP address provides smart Ethernet redundancy
- Remote monitoring, control and changeover of duplicated base/ repeater stations
- Hot-swappable modular 19" 3RU rack mount transceiver configuration
- Automatic change-over upon alarm
- Digital Inputs & Outputs
- 11...30 Vdc supply voltage



Licensed Serial Data Radios: Feature Overview



Trio M Data Radio

The Trio MR450 professional compact digital data radio provides cost effective and dependable serial communications in Point-to-Point and Point-to-Multipoint (Multiple Address Radio) Telemetry and remote SCADA systems, particularly in demanding water and electricity utility applications.

Easy to configure and use, yet highly versatile, the MR450 has advanced features such as ChannelShare, MultiStream, single channel simplex store and forward repeating, compatibility with all leading industrial data protocols such as DNP-3, Modbus, IEC870-5-101, etc., and powerful remote diagnostics.

Full -30...+60 °C operational capability and a specialized low power sleep mode option make the MR450 ideally suited to solar-powered gas flow metering applications in the harshest environments The MR450 is supported by the Trio Radio range of full duplex base and repeater stations, including a redundant hot-standby version.

Radio

- UHF Frequency Band Operation: 395...450 MHz and 450...520 MHz
- 12.5 kHz and 25 kHz channel operation in one radio model
- User configurable transmitter output power up to 5 Watts
- Coverage of common international frequency bands
- Designed to meet international FCC & ACMA radio regulatory requirements
- Over temperature protection
- Operation over full -30...+60 °C (-22...+140 °F) ambient temperature range
- Automatic frequency error compensation for years of service/calibration free operation

Modem

- Advanced technology DSP based GMSK digital data modem
- Up to 9,600 bps true over-the-air data rates
- Selectable 300...38.4 kbps asynchronous RS-232 interface
- Multistream simultaneous data streams allows for multiple vendor devices to be present on the one radio network
- Compatible with industry standard data protocols. E.g.: Modbus, DNP-3, IEC 870, etc
- Internal repeater operation – single radio store and forward Channelshare unique integrated collision avoidance technology permits simultaneous polling and spontaneous alarm reporting operation in the same system

Diagnostic

- Complete configuration of user parameters by both local connection and remotely over-the-air, provides maximum versatility and ease of adaptation to changing needs
- A separate system port allows live configuration and diagnostics without the need to take the data radio 'off air'. This results in a constant 'in service' time
- Flash memory resident firmware that can be field upgraded offers insurance against obsolescence (makes these units 'future ready')
- TVIEW+ transparent non-intrusive Network Management and Remote

Diagnostics option promotes reduced maintenance costs by allowing scheduled maintenance to avoid unexpected system down time. Exceptional network management tools including: packet rate testing of any unit, channel occupancy statistics, data statistics etc.

Approvals

- Europe (ETSI): ETSI EN300 113-2 V1.4.1, EN 301 489, EN 60950
- FCC (North America): FCC Part 15, Part 90
- Industry Canada: IC RS119, ICES-001
- Australia: ACMA AS4295-1995 (Data)
- Hazardous: CSA Class I, Division II, Groups (A,B,C,D) for Hazardous Locations ANSI/UL equivalent

Half duplex radio MR450 (Remote)

- 395...520 MHz operation
- 0.1...5 watt transmitter output power
- Simplex or half duplex operation with any Tx-Rx splits
- One model suitable for 12.5 and 25 KHz channel spacing
- User configurable 300...38,400 bps RS-232 port
- DIN Rail mounting kit option
- Rugged die-cast alloy chassis

Life Is On



se.com

Schneider Electric

Process Automation SCADA & Telemetry
415 Legget Drive, Suite 101, Kanata, Ontario K2K 3R1
Canada
Direct Worldwide: +1 (613) 591-1943
Email: telemetrysolutions@se.com
Fax: +1 (613) 591-1022
Toll Free within North America: +1 (888) 267-2232
www.se.com

© 2019 Schneider Electric. All Rights Reserved. Schneider Electric, Life is On Schneider Electric, Channelshare, KwikStream, LinkXtend, Modbus, MultiStream, SmartPath, Trio and TVIEW+ are trademarks and the property of Schneider Electric SE, its subsidiaries and affiliated companies. All other trademarks are the property of their respective owners. March 2019
• TBULM01012-20