



K-Series

Professional Digital Data Radio Solutions
K-Series Product Overview

K-Series Spread Spectrum Data Radio

The advanced TRIO Datacom K-Series frequency hopping data radio sets the standard for professional high speed serial data communications in the license free 900MHz and 2.4GHz ISM bands.

With maximum range and virtually unlimited system coverage due to its unique **LinkXtend™** network bridging and **KwikStream™** high speed repeater capabilities, the industrial strength K-Series is ideally suited for the most demanding Point-to-Multipoint and Point-to-Point wireless SCADA and Telemetry applications.

The highly versatile K-Series also offers dual user ports with **MultiStream™** data routing and TRIO Datacom TVIEW+ network-wide diagnostics compatibility, as well as SmartPath™, a feature that identifies then rectifies a problem within the network with minimal interruption to the SCADA data flow.



Features

The TRIO Datacom K-Series combines class leading performance with unprecedented flexibility to allow cost effective implementation of even the most complex wireless SCADA and Telemetry solutions that may not have otherwise been achievable, and with unlimited expansion capability.

Some of the many outstanding features which make the K-Series so unique.

Outstanding and highly versatile operational capability

- Point to point and point to multi-point operation
- Configurable personality – master-remote-bridge-repeater
- **KwikStream™** high speed single radio repeater mode*
- Unlimited coverage networks
- No restriction on the number of radios in any system
- Unique 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 (refer to the SmartPath™ brochure for additional information)
- RSSI based synchronisation threshold to facilitate roaming (refer to SmartPath™)

* Up to 140km (90 miles) single repeater system range with 6dB antennas (at 900MHz)

A Radio and Modem that extends performance boundaries

- License free operation in the 900MHz and 2.4GHz ISM frequency bands
- 256kbps high speed over-air data rate (can be reduced to 128k, 64k or 32k for longer range)
- Robust, frequency hopping spread spectrum technology for superior interference immunity
- Ultra Long Range high performance receiver*
- 1 Watt (+30dBm) maximum allowable transmitter power (0.5Watt 2.4GHz version)
- Advanced error free data delivery with CRC plus selectable FEC and ARQ
- Multi-Access point synchronization mode for interference reduction with co-located access point radios
- High VSWR protection (900MHz only)

* Up to 70km (40 miles) maximum single hop line-of-sight range with 6dB antennas (at 900MHz)

Comprehensive and adaptable User Data interfacing, control and transmission

- Dual independent user configurable data ports
- Separate on-line system port avoids the need to interrupt user data for configuration access
- Selectable 300-230 kbps asynchronous RS-232 and RS-485 interfaces
- User selectable hardware handshaking or 3 wire data port interface
- Suitable for most industry standard data protocols. e.g.: MODBUS, DNP-3, IEC 870-5-101, etc.
- Low latency pseudo full duplex Point-Point mode (for sensitive protocols, e.g., SEL Mirrored Bits®)
- **MultiStream™** simultaneous data stream delivery allows for multiple vendor devices/protocols to be transported on the one radio network - compatible with Trio Datacom E-Series and M-Series
- Flexible data stream routing providing optimum radio channel efficiency

A Data Radio for the harshest environments and places

- Reliable operation in environmental extremes (-40°C to +70°C)
- Hazardous Environment Certification
CSA Class I, Division II (900MHz version)
ATEX II 3G Ex nA IIC T4 (2.4GHz version)
- FCC & ETSI (2.4GHz) certification – accepted in multiple regions
- Compact, rugged alloy housing
- Low power consumption with smart sleep mode operation
- 10-30Vdc power supply
- Dual industry standard TNC antenna connectors

Total command of the radio system with TVIEW+™ Network Management and Remote Diagnostics

- Remote and local fully transparent simultaneous Network Management and Diagnostics
- Network wide access from any radio modem
- Full SCADA style features such as database, trending and networking
- Full graphical Diagnostics presentation (HMI)
- User friendly Windows™ GUI configuration software
- Over-the-air reconfiguration
- Powerful system commissioning and troubleshooting tools
- Integrated graphical spectrum analysis
- Seamless integration with TRIO Datacom E-Series and M-Series diagnostics and remote configuration
- Local and over-the-air field upgradeable firmware

System Advantages

The TRIO Datacom K-Series puts an end to reduced transmission range and limited coverage previously associated with license free spread spectrum radio systems. Although conventional repeaters can be used to increase range and coverage, they incur a penalty of 50% or greater reduction in data throughput and an equivalent increase in data latency. Conventional repeaters also sacrifice antenna gain because only a single omni directional antenna can be used to access both the master radio as well as all the remote sites.

The K-Series now redefines the benchmark with a combination of its **KwikStream™** high speed, low latency repeater and its **LinkXtend™** dual antenna network bridge.

Point to Multipoint via KwikStream™ Repeater



The **KwikStream™** repeater is used in Point-to-Multipoint (PTMP) systems where one repeater with a single omni antenna is sufficient to provide coverage to all remote sites, but where the sheer number of remote sites, or the user data necessitate high data throughput with the lowest possible latency.

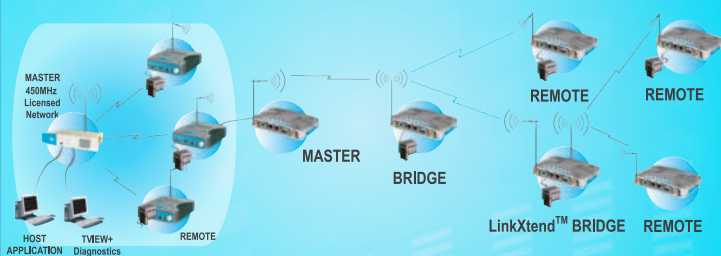
In situations where a repeater is needed to extend the range of a Point-to-Point (PTP) link, but where a single omni antenna at the repeater cannot provide the desired transmission range, Trio Datacom's **LinkXtend™** dual antenna bridge will allow the use of dual directional antennas with much higher gain.



Point to Point with LinkXtend™ Bridge



Point to Multipoint with LinkXtend™ Bridge



If more than one repeater is required for wide area PTMP coverage, then these radios are configured as bridges to optimize data throughput by ensuring that all radios in the system remain synchronized. They can be equipped with a single omni antenna or, where this does not achieve adequate coverage, configured as dual antenna **LinkXtend™** bridges equipped with one much higher gain directional antenna for uplink access, as well as an omni antenna for downlink communications with the remote sites.

Due to restrictions on maximum allowable signal levels in license free bands, the transmitter power for each of the two antenna ports can be individually adjusted in line with the two different antenna gains, to maximize the transmitted signal levels from both antennas.

The K-Series, allows networks carrying multiple simultaneous user applications, with totally separate protocols, to be extended literally without limit.

Any TRIO Datacom K-Series may be configured as a **KwikStream™** high speed low latency repeater or as a **LinkXtend™** network bridge.

K-Series

900MHz and 2.4GHz Spread Spectrum Radio

Radio

Frequency Range:

902-928MHz or 2.4-2.48335GHz
Region Specific Versions Available

Frequency Accuracy: ±2.5ppm (900MHz)
±3.0ppm (2.4GHz)

Aging: <= 1ppm/annum

Operational Modes: Half Duplex, Psuedo Full Duplex

Configuration: All configuration via Windows based software

Compliances:**900 MHz Version**

FCC PART 15
IC RSS210
ACA AS/NZS 4268

Hazardous Environment Certification CSA Class I, Division II

2.4GHz Version

FCC PART 15
IC RSS210
ACA AZ/NZS 4268
ETSI EN 60950
EN 50392
EN 300 328
EN 301 489

Hazardous Environment Certification ATEX II 3G nA IIC T4

Receiver

Selectivity: Better than 50 dB

Intermodulation: Better than 65 dB

Spurious Response: Better than 70 dB

Transmitter

900MHz: 0.01 - 1W (+30 dBm) 0.5 dB steps. User configurable with over-temperature and reverse power protection (VSWR)

2.4GHz: 0.01 - 500mW (+27 dBm) 0.5 dB steps. User configurable with over-temperature protection.

Modulation: 2 Level GFSK

Tx Keyup Time: <50uS

Tx Spurious: <= -50 dBc

Connections

User Data Ports: 2 in total - 1 x DB9 female port wired as DCE (modem) and 1 x RJ45

System Port: RJ45 for diagnostic, configuration and re-programming

Antenna: 2 x TNC female bulkhead. Separate connectors for LinkXtend™ or separate TX/RX antennas.

Power: 2 pin locking, mating connector supplied

LED Display: Multimode Indicators for Pwr, Tx, Rx, Sync, TxD and RxD data LEDs (for both port A and B)

Modem

Data Serial Port A: RS232 or RS485, RJ-45, 600-230,000 bps asynchronous

Data Serial Port B: RS232, DCE, DB-9 300-38,400 bps asynchronous

System Port: RS232, 19,200 bps asynchronous

Flow Control: Selectable hardware or 3 wire interface

RF Channel Data Rate: 32,000/64,000/128,000 or 256,000 bps

Bit Error Rate:
Max sensitivity < 1x10⁻⁶ @ -108 dBm

Encryption: 256-bit AES encryption*

ChanneShare™ Collision Avoidance: Trio Datacom's unique collision avoidance system

MultiStream™: Trio Datacom unique simultaneous delivery of multiple data streams (protocols)

Firmware: Local and over-the-air field upgradeable Flash memory

Diagnostics

Network wide operation from any remote terminal.

Non intrusive protocol - runs simultaneously with the application.

Over-the-air re-configuration of user parameters.

Storage of data error and channel occupancy statistics.

In-built Error Rate testing capabilities.

General

Temp Range: -40°C to +70°C

Power Supply: 10-30 Vdc (13.8 Vdc nominal)

Transmit Current: 900 MHz 500 mA nom @ 1W
2.4GHz 800 mA nom @0.5W

Receive Current:
900MHz <120mA nom
2.4GHz <100mA nom

Sleep Mode: Software Controlled & External

Dimensions: Rugged Diecast Enclosure 100 x 34 x 165mm (4.0 x 1.4 x 6.5 inches)

Mounting: Integrated Mounting Holes

Weight: 0.5kg (1.1lbs.)

Options

TVIEW+™ Configuration, Network Management and Diagnostic Windows GUI Software

Related Products

ER450 Remote Radio

MR450 Remote Radio

EB450 Base Station

EH450 Hot Standby Base Station

OM900 900MHz Remote OEM Module

OM240 2.4GHz Remote OEM Module

MSR/9 Port Stream Router Multiplexer

OM900 - OEM Version of K-Series

For more information please go to:
www.triodatacom.com



All TRIO Datacom Radios come with a industry leading 3 year Warranty

Local regulatory conditions may determine the performance and suitability of individual versions in different countries. It is the responsibility of the buyer to confirm these regulatory conditions. Performance data indicates typical values related to the described unit.

Information subject to change without notice.
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• Export restrictions may apply

Note: Not all product features are available in every mode of operation.

This device is an open type equipment that must be used within a suitable end-use system enclosure, the interior of which is accessible only through the use of a tool. The suitability of the enclosure is subject to investigation by the local Authority having jurisdiction at the time of installation.