

KENWOOD

DMR

Infrastructure Solutions for

Digital Mobile Radio (DMR) Systems



KA-160/450/500

KAIROS

Analog, DMR Tier II, S-Trunking, DMR Tier III

KENWOOD KAIROS repeaters are the perfect platforms for any application, from simple standalone sites to large nationwide systems. Ideal for utilities, energy, education and manufacturing organizations, KAIROS Conventional/Trunked simulcast is a great fit for organizations that require wide area communications with limited frequencies.



Features

Multi-Protocol

KAIROS repeaters support Analog, DMR Tier II, S-Trunking, and DMR Tier III. Automatically switches between analog and digital modulation, according to the type of incoming signal.

IP Multisite Multicast and Simulcast

Fully IP-based distributed network architecture supporting multisite, multi-protocol network solutions in multicast or simulcast mode of operation.

RF Linking

Provides RF backhaul among DMR Tier II sites where the IP backbone is not available, carrying analog and digital signals. IP, UHF, and VHF links can be mixed in a single network.

System Redundancy

Supports flexible redundancy design as either 1+1 (Main + Standby) or with backup Primary functionality (a Secondary station that automatically replaces the failed main Primary, restoring all network functions).

Powerful Remote Control

The remote control tool also ensures secure software upgrades, diagnoses IP backbone issues, and continuously assesses the health of the entire radio system. KAIROS also integrates directly with third party network management systems using the standard SNMP protocol.

Soft Diversity Reception

KAIROS soft diversity receiver technology allows for enhanced coverage and improved signal reception in RF fading conditions.

Light and Ruggedized

Compact and lightweight. Thanks to its environmental robustness, KAIROS can perform in harsh conditions with extremely low power consumption.

Reliable

KAIROS repeaters come with standard reliability features including power range control, reverse polarity protection, peak and transient handling, soft start, current limiting and RF power limiting capabilities.

KAIROS Specifications

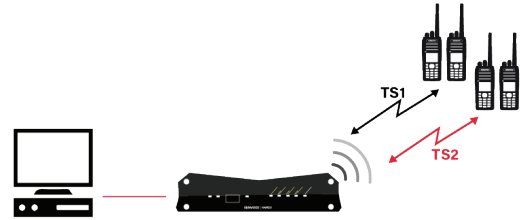
General			
Available Models	KA-160	KA-450	KA-500
Frequencies available	136-174 MHz	400-470 MHz	450-520 MHz
Protocols	Analog, DMR Tier II, S-Trunking and DMR Tier III (DMR available on KA-500 January 2020)		
Channelization	12.5 kHz/25 kHz (25 kHz not available in US)		
RF Output power	1-25 W / 100% duty cycle / selectable per channel (Higher RF output power available through standard external PA options in catalog)		
Synthesis step	50 Hz		
Frequency stability	0.5 p.p.m. (without GPS)		
Synchronization sources from	Internal, GPS/GLONASS, 2-wire, Digital RX, External, PTP based on IEEE1588 v2		
Operating temperature	-22°F to +140°F (-30°C to +60°C)		
Power supply (negative ground)	Minimum: 11 V	Typical: 13.8 V	Maximum: 15 V
Power consumption	TX: 60 W @25 W RF / RX: 5 W @Main+Div enabled		
Dimensions & weight	6.3 x 7.9 x 1.8 in. (160 x 200 x 45 mm) / 2.98 lbs. (1.35 kg)		
Audio lines	2 x (4-wire + E&M) - 1 x timeslot		
LAN port	Ethernet 10BT/100TX (auto MDI/MDI X) on an RJ45 socket		
Aux I/O	3xIO + 1xAnalog input		

Transmitter All Models	
Output power at connector	1/5/10/15/20/25 W
Connector	SMA
Available modulation	FM, PM, 4FSK, 2DFSK
Transmitting duty cycle	Continuous 100%
Adjacent Channel Noise	-75 dBc @ 25kHz / -65 dBc @ 12.5 kHz
FM distortion	< 1.5%
Noise	-56 dBp @ 25kHz / -50 dBp @ 12.5 kHz
Frequency Stability (without GPS)	0.5 ppm (without digital correction)

Receiver All Models	
Maximum Sensitivity	-116 dBm @ 20 dBp SINAD -118 dBm @ 5% BER without diversity -121 dBm @ 5% BER with diversity
Operating Maximum input	-10 dBm
Maximum input without permanent damage	+10 dBm
Co-channel protection	8 dB @ 25kHz / 12 dB @ 12.5 kHz
Adjacent channel selectivity	73 dB @ 25kHz / 65 dB @ 12.5 kHz
Blocking protection	80 dB
Intermodulation protection	75 dB
Distortion	< 2% @ 1kHz

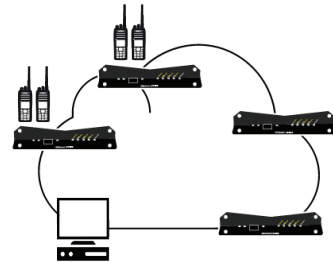
DMR Tier II Dual Timeslot Standalone Repeater

KAIROS repeaters support two talk paths in a single RF channel. KAIROS can be configured to connect to an analog or IP dispatch solution.



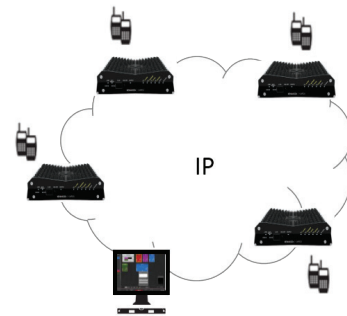
DMR Tier II IP Site Roaming

Multiple KAIROS base stations can be deployed across geographic sites and connected through an IP network to create a multisite conventional network.



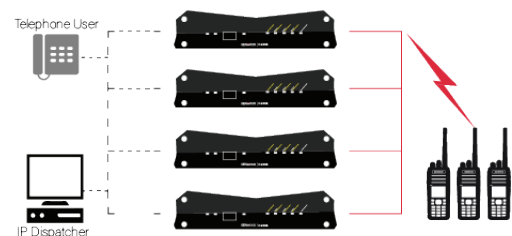
Analog/DMR Tier II Multisite and Simulcast System

Multiple KAIROS base stations can be deployed across geographic sites and connected through IP network to create multisite or simulcast systems. The multisite and simulcast controllers reside in the controllers as software. Controller redundancy is included in the base system.



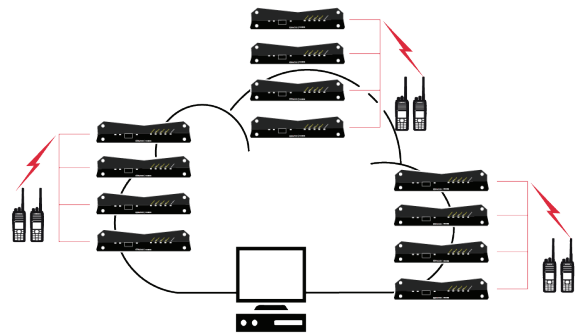
S-Trunking Single Site System

KAIROS repeaters are software-upgradeable to support single site S-Trunking functionality. S-Trunking is a DMR-based trunking solution that allows trunking operation on FB6 shared channels.



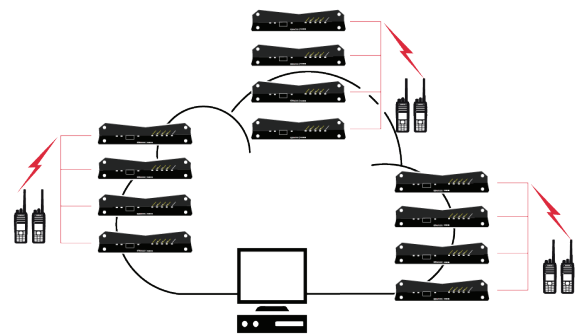
S-Trunking Multisite System

KAIROS S-Trunking can be configured as a multisite solution. This configuration is perfect for applications where exclusive channels are unavailable.



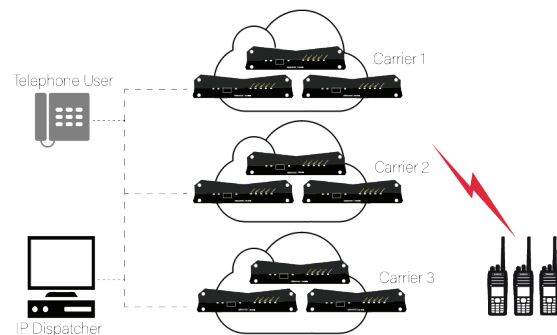
DMR Tier III Single and Multisite

KAIROS repeaters are software upgradeable to an open standard (ETSI) based DMR Tier III trunking system in single and multisite mode. DMR Tier III based trunking is the perfect solution for high density users who want to take advantage of the advanced Tier III features an open standard provides. The distributed architecture allows for single or multiple soft trunking controllers while managed by a Network Management System (NMS) controller and network.



DMR Tier III Simulcast System

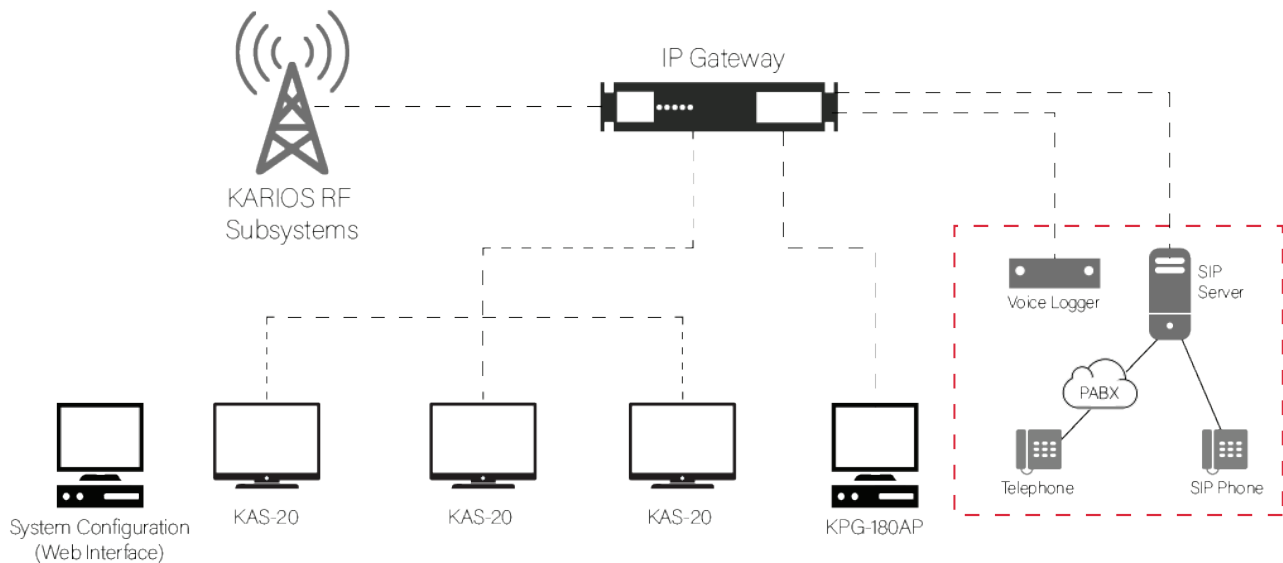
Multiple KAIROS DMR Tier III single site systems can be connected together over an IP network to create a Simulcast DMR Tier III trunking system. Distributed software controller can be deployed for redundancy.



Dispatch Solutions

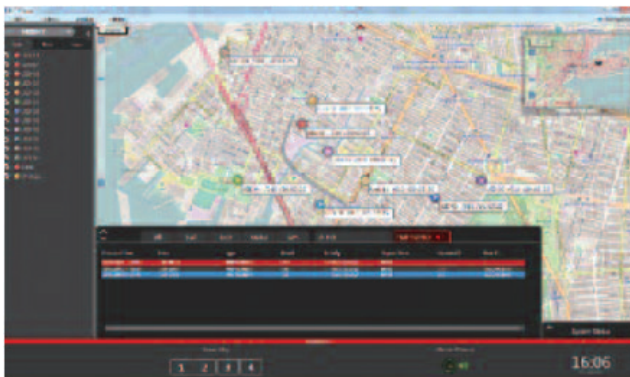
IP Gateway

The IP Gateway is used to interface console solutions, logging recorders, OTAP, a SIP server (April 2020), and other third party products to KAIROS DMR systems.



KAS-20 Dispatch Console

The KAS-20 Software provides AVL and Dispatch capability compatible with KENWOOD KAIROS DMR systems. With the capability to run under Windows and Windows Server operating systems, it provides a cost effective package for AVL and dispatch for business, supporting both the DMR digital protocols. The graphical user interface and map display are intuitive to the user, allowing seamless operation for the control of multiple subscriber units on a network or the ability to work with multiple clients with the server configuration.



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