

KAIROS DMR Tier 3

Release Note

Operating System: Linux 2.4.31 Version 01, Build 07

KAIROS Main Firmware Version 1.6.7.1_stable

KAIROS DSP Firmware Version 4.53

KAIROS PLD Firmware Version 4.13

KAIROS Manager Version 1.7.3

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Contents

1. RELEASE INFORMATION	- 1 -
1.1. Firmware Release Version	- 1 -
1.2. Overview	- 1 -
1.2.1. What's DMR Tier III.....	- 1 -
1.2.2. Features of KAIROS Tier III.....	- 1 -
1.3. Supported Network Model	- 2 -
1.3.1. Single Site Trunking.....	- 2 -
1.3.2. Multisite Trunking.....	- 2 -
1.3.3. Multisite Trunking with simulcast (Mixed site)	- 2 -
.....	- 2 -
1.4. Supported Features	- 3 -

1. Release Information

This document describes DMR Tier 3 that Radio Activity KAIROS supports.

1.1. Firmware Release Version

Operating System: Linux 2.4.31 Version 01, Build 07

KAIROS Main Firmware Version 1.6.7.1_stable

KAIROS DSP Firmware Version 4.53

KAIROS PLD Firmware Version 4.13

KAIROS Manager Version 1.7.3

1.2. Overview

1.2.1. What's DMR Tier III

In a TIER 3 "Trunked" radio system the number of channels is much lower than the number of potential users, but, the use of channels is optimized while minimizing waiting as the traffic channels are assigned only when needed.

The system consists of a certain number of channels called traffic channels (Payload / Traffic channel) and a channel dedicated to the management of the system: the Control Channel (TSCC). The Control Channel is always in transmission and it is controlled by the TIER 3 Controller (TSC - Trunking System Controller in the picture above) which is responsible for regulating the access of the networked terminals allocating the channels as appropriate.

1.2.2. Features of KAIROS Tier III

- KAIROS Tier 3 Trunking supports a larger Traffic Capacity with enhanced call function, security, and provides comfortable communication for easier user operation than the Tier 2 Conventional System.
- Multiple applications run on the reliable Linux OS in KAIROS.
- Since KAIROS can install Trunking Site Controller to itself as software, there is no need to separately prepare an industrial server for TSC.
- KAIROS can simplify the system configuration in the site, the number of equipment is small, power consumption is low, heat generation can be suppressed. It also improves reliability in case of failure.
- 16mil types of Unit ID and Group ID are possible.
- The KAIROS Tier 3 Network structure is based on the Distributed controller structure. This architecture reduces processing load on each cell, reduces the required IP bandwidth, and speeds up the communication channel allocation process.
- Combined with Simulcast, KAIROS Tier 3 can build Tier 3 Trunking in a very wide area.
- Migration from Tier 2 to Tier 3 is easy. KAIROS currently in use on Tier 2 can be changed to Tier 3.

1.3. Supported Network Model

1.3.1. Single Site Trunking



This is the most basic Tier 3 site which is suitable when traffic is high in a narrow area. When Traffic is high, it's available to increase the site's Payload Channel.

1.3.2. Single Tier3 Trunking with simulcast (Mixed site)



It is suitable when a Single Tier3 Trunking site coverage area needs to expand.

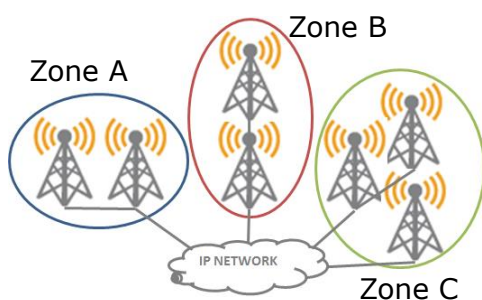
It seems Multisite but it works as Single Site Trunking for Tier3. When Traffic is high, it's available to increase the site's Payload Channel.

1.3.3. Multisite Trunking



Multisites can be installed when it is necessary to cover the Wide Area. Each site needs to connect with a stable IP network. When Traffic is high, it's available to increase the site's Payload Channel.

1.3.4. Multisite Trunking with simulcast (Mixed site)



It is suitable when a Multisite coverage area needs to expand. Within the simulcast zone, a Radio can roam between sites seamlessly like Tier2 Simulcast.

Each circle: Simulcast Zone

1.4. Supported Features

*M : Mandatory

ETSI TS 102 361-4 V1.9.2	IOP	Feature	KAIROS Tier3
System			
6.3.2		Network Model Tiny, Small, Large, Huge	✓
6.3.2		DMRLA 0 to 3 (Tiny), 0 to 5 (Small), 0 to 8 (Large), 0 to 10 (Huge)	✓
(TS 102 361-1) 5.1.1	M	channel timing aligned timing mode only	✓
4.7.2		Colour Code	✓
6.3.2		Multiple Control Channels	✓
5.3.1	M	Dedicated TSCC	✓
Channel Plan			
6.1.2		Fixed Channel Plan	✓
Trunking Type			
4.11.1	M	Message trunking	✓
4.11.2	M	Transmission trunking	✓
4.11.3		Quasi-Transmission trunking	✓
Call Type (Destination)			
4.6.2.1.1	M	Individual Call (OACSU)	✓
4.6.2.1.2	M	Individual Call (FOACSU)	✓
4.6.2.2	M	Talkgroup Call	✓
6.6.2.0	M	Broadcast Call	✓
6.6.1.7		All Call (every site)	✓
Call Type (Content)			
6.6.2	M	Voice Call	✓
6.6.6.1		Status Message	✓
6.6.6.2		Status Polling	✓
6.6.4	M	Unified Data Transport - UDT Short Data Message	✓
6.6.4		NMEA (IEC 61162-1) location - UDT Short Data Message	✓
6.6.5		Unified Data Transport - UDT Short Data Polling	✓
6.6.5		NMEA (IEC 61162-1) location - UDT Short Data Polling	✓
6.6.3		Packet Data Call	Apr/2019
Call Type (Emergency)			
6.6.2.0		Priority Call	✓

6.6.2.0		Emergency Call	✓
DMR Trunking Features			
6.4.7		Power Save	✓
6.4.8		Authentication	✓
n/a	M	Queue	✓
6.4.9		Stun/Revive	✓
6.4.10		Kill	✓
6.4.14		De-key	Apr/2019
6.4.15		Transmit Interrupt	Apr/2019
6.6.1.2		Call Cancellation	✓
6.6.2.2.0		Ambient Listening Service	✓
6.6.2.4		Late Entry	✓
6.6.6.3.1		Emergency Alarm	✓
6.7.1.4		Announce Local Time	TBD
Dialling			
Annex E.3.4.3		High Priority All Call (System Wide : ALLMSID)	✓
Annex E.3.4.3		Emergency All Call (System Wide : ALLMSID)	✓
Annex E.3.4.3		Normal All call (System Wide : ALLMSID)	✓
Annex E.3.5		Broadcast Call	✓
Annex E.3.5		Priority Call	✓
Annex E.3.5		Emergency Call	✓
Annex E.3.5		Status Delivery Call	✓
Annex E.3.5		UDT Short Data	✓
DMR Trunking MS basic behavior (not feature)			
6.2		Random Access	✓
6.4.1	M	Registration	✓
6.4.4.1.13		Talkgroup Subscription and Talkgroup Attachment	✓
6.4.6	M	De-registration	✓
6.4.5		Mass re-registration	✓
6.7.1.5		Mass Registration	✓
6.4.12		Unsolicited MS Radio Check	✓
6.4.13		Unified Data Transport - Supplementary Data Service	✓
6.5		Unified Data Transport	✓
6.7.1.1		Announce/Withdraw TSCC	TBD
6.7.1.6		Announce a logical physical channel relationship	TBD
6.7.1.7		Adjacent Site Information	✓