Keynet 3 - Single Site MPT1327 Solutions

Single Site, Modular Solution for Voice and Data Communications

● Minimum Hardware

● Maximum Features

● Lower Cost

● Proven

● Reliable

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ISO 9001
Registered

Contents

1   Introduction

The purpose of this document is to give an overview of Radio Systems Keynet 3 MPT1327 radio communications system.

Design terms of reference have been to focus costs solely upon components and functionality that will fulfill the majority of on site requirements with minimal redundant peripherals, whilst at the same time offering a clearly defined upgrade path to Radio Systems Keynet 2, wide area systems with no hardware redundancy.

At single site Keynet 3 level, the solution is modular and can therefore be easily scaled for initial preferred Grade of Service or loading and yet can have additional modules added, as loading demands increase.

The minimalist approach to hardware does not detract from full MPT1327 compliance and indeed, since all software is compiled by Radio Systems own in house development team, the areas of the MPT Standard that are prescribed for customisation permit bespoke software packaging. Radio Systems Commercial and technical philosophies work in parallel and each enquiry is judged on its merits and feasibility. This unique approach has made Keynet the system of choice where maximum functional potential and end user investment returns readily result.

2 Keynet 3 Component Parts

2.1 KF510 Base Station

The core of the Radio Systems in house infrastructure is the Key branded KF510 Base Station.

From a standard multifunctional hardware platform, the Radio Systems software suite has versions for PMR, MPT1327, voice, data, fast polling and telemetry applications.

Where Radio Systems supplies KF510 Base Stations configured for MPT1327 operation, the infrastructure is referred to as Keynet.

In excess of 1,000 KF510's are deployed in active systems in the UK and overseas with a reputation for MTBF often exceeding 5 years.

2.2 Power Supplies

The KF510 Base Station operates directly from a 12 volt DC supply. Radio Systems offer a range of power conversions, such that customer supplies in any industry standard dc or ac range can be accommodated.

Where maintained supplies to radio infrastructure are desirable and not available on site, Radio Systems offers a range of UPS options.

2.3 Antenna Configuration

The KF510 Base Station has separate transmit and receive antenna connections.

In a single unit deployment, two antenna working can be used or for economy, Radio Systems can supply a Duplexer that enables single antenna working.
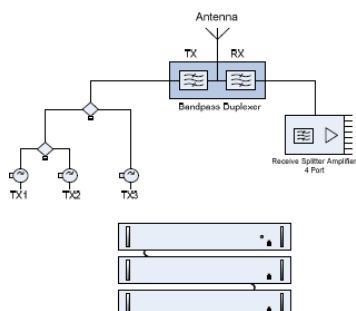
Where multiple KF510 or other Base Stations are deployed to a single site, inclusive of Keynet 3 configuration, Radio Systems is able to offer a variety of carefully calculated aerial combining options that again for economy, enable single antenna working that complies with local licensing and site sharing Standards

AerialCombining

KF510 Base Station

PS500 Power Supply

3 Keynet 3 Architecture

3.1 The Keynet 3 Site

Keynet III single site operation offers the ability to cascade a number of KF510 Base Stations (up to 24), which will operate in MPT1327 trunking mode without the necessity for an additional PC or Switch. A single site will consist of a Control Channel, which is enabled to revert to Traffic alone or a Control Channel with a number of additional Traffic Channels.

This provides a very cost effective, single site solution with minimum hardware and pricing inclusive of software.

- Minimum Hardware

- Maximum Features

- Lower Costs

3.2 Mobile Terminals

Radio Systems designs and manufactures the Key range of mobiles in a wide variety of formats with software suites customized to a whole range of end user applications. Generally the Key brand is recommended, however, where it is beneficial to a potential customer to use an alternative, Radio Systems is happy to recommend and supply the most effective solution.

In addition to its own Key range, Radio Systems is an authorised distributor for most radio communications manufacturers, with access to the widest range of quality equipment to provide optimum solutions.

Whatever the challenge, Radio Systems selects the best solution through unbiased in-house evaluation of quality, durability and ease of use to provide dependable, cost effective communications.

In excess of 15,000 Key branded mobiles are currently in active use in the UK in a wide variety of voice and data applications. This was the mobile that pioneered voice and data communications within the bus industry. Over 10,000 are fitted to buses and signs in the UK, to provide Real Time Passenger Information to the public, in line with central Government policies.
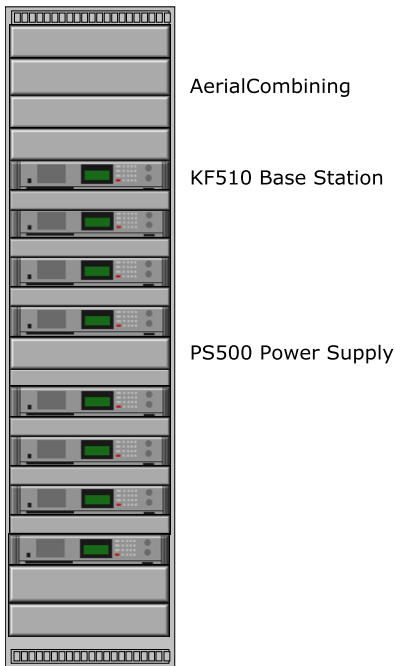
3.3 Computer Aided Despatchers

Whilst mobiles can be supplied with power supplies for use in offices and depots, there are occasions where enhanced fleet management facilities are required.

Although Keynet 3 is designed to keep costs down, Radio Systems own in house despatcher software packages can be configured to operate equally with either Keynet 3 or the more complex Keynet 2.

The PC software is offered in two formats voice plus MPT data or voice plus MPT data plus asset tracking.

Separate Operator manuals give full details but in either case packages are fully featured and permit user customisation.

3.4 Telephone Connect

Many systems require the addition of telephone connect units to enable that feature. In designing Keynet 3, it was recognised that whilst the feature was desirable, its inclusion could not allow costs to escalate and therefore, telephone connect has been included in the design without the need for more expensive external switching and interface units.

The Keynet III Base Station can operate as a single channel system with telephone connect, again using Control Channel revert.
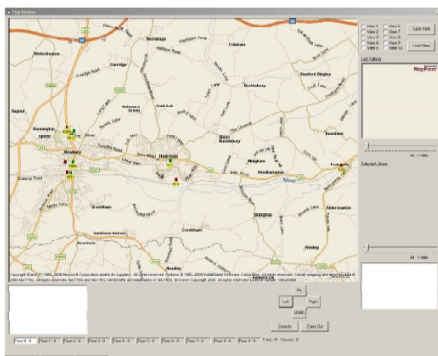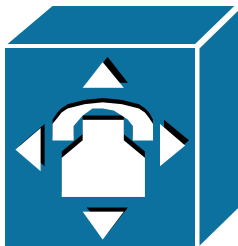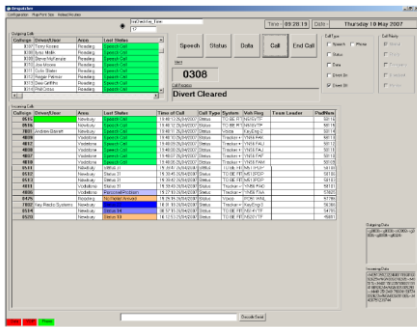
Multi Channel Keynet III offers the facility to add telephone lines to the Traffic Channels. Telephone lines can be added one per KF510 Base Station, as required

The Base Stations can connect to either PSTN (2 wire) or PABX (4 wire) lines, but not to a combination of both. When making a telephone call, the system will connect users to the next available telephone line.

The cost benefits of Keynet III are further enhanced here, where Telephone Connect can be provided at a small additional cost per enabled channel. The enabling element is either the initial supply or later retrofit of a Telephone Connect card. No complex Switch or configuration are required.

3.5 Vehicle and Asset Tracking

Keynet 3 provides an option to have a dedicated asset or vehicle tracking data port on the Control Channel KF510. Key branded mobiles fitted to vehicles and assets are configured to report to a Computer Aided Despatcher connected to the data port. The user interface is a mapping display screen with user configurable asset and vehicle icons.

Key mobile terminals are designed for a minimum cost AVL solution with the facility for either an internal GPS board or by directly interfacing to an external GPS receiver. Pricing includes user configurable polling software.

3.6 Frequency Bands

Keynet 3 is available in all the frequency bands published for the Key KF510 Base Station, encompassing VHF and UHF bands.

3.7 Coverage Enhancements

Even with the best planning for optimum siting, it is not always possible to achieve the desired operational coverage from a single Keynet 3 site, examples being within metal clad buildings or basements.

Rather than using multisite alternatives, Radio Systems can supply Enhancers that in effect boost signals both to and from difficult areas without the need for additional sites and switching.

3.8 Typical Keynet 3 System Overview

In considering all the above the following is a conceptual overview of a typical Keynet 3 system.

CE - Cell Enhancer
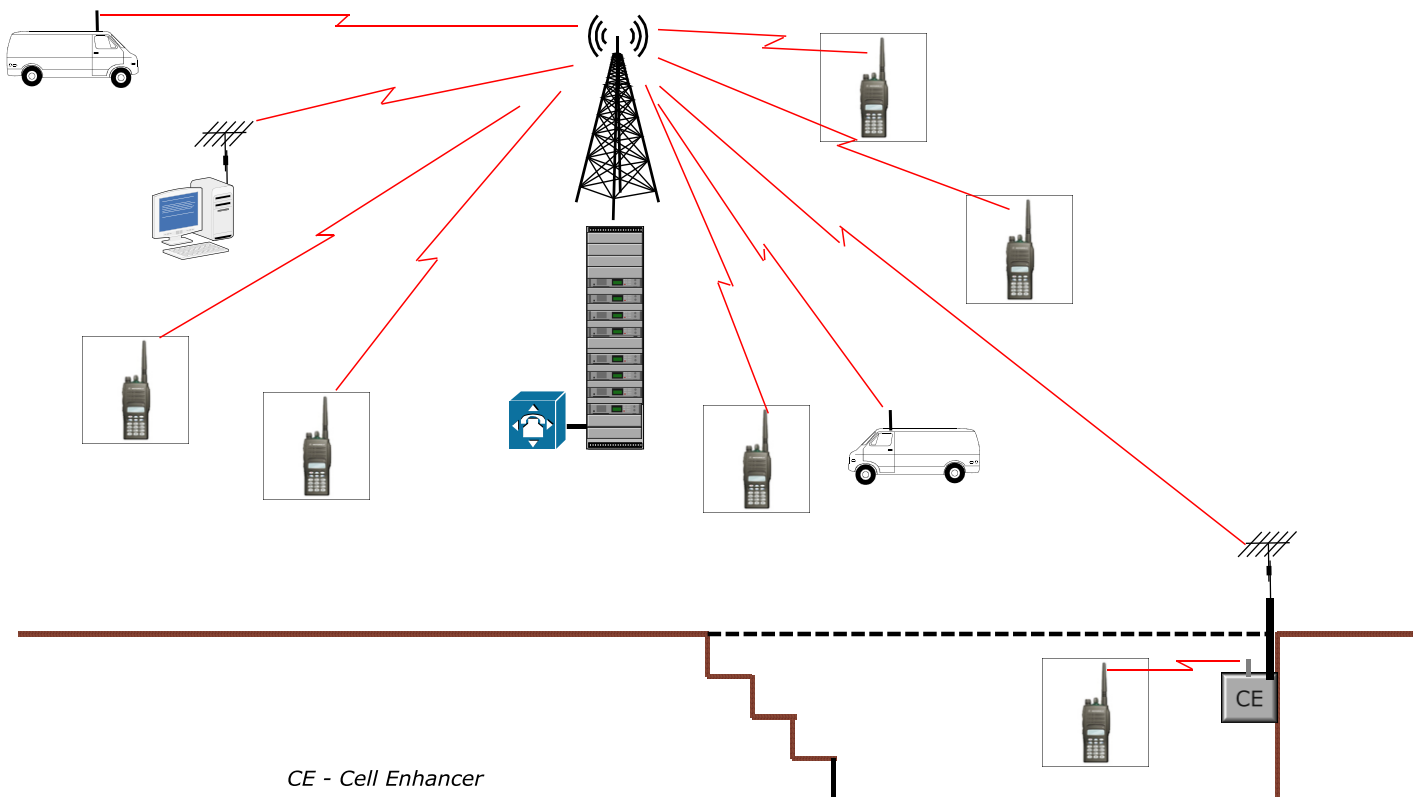
4 Upgrade Paths

4.1 Keynet 2

It is possible that expansion of a Keynet 3 system will be required at a later date. Since all hardware and software are Radio Systems in house developments, an upgrade path to Keynet 2 is provided with no equipment redundancy. Such upgrades allow for additional single site functionality or multi site architecture.

4.2 Single Site Upgrade

A single Keynet 3 site can be upgraded to Keynet 2 by adding a Site PC and Port Expander. The Site PC runs Keynet 2 software. Briefly, this upgrade permits the connection of additional line connected data devices, since it provides multiple serial data connections.

One such device can be a Network Manager PC, noted below, that permits more central management, monitoring and control of system function access rights.

The further addition of an AMUX Switch enables audio ports for off site connection. Voice despatchers can be line connected and no longer require a radio path to the single site. Radio Systems proprietary Data Gateway technology permits fast polling for line connected AVL (vehicle tracking) despatchers and where voice is also required at Control, dual screens, one with mapping are used.

4.3 Multisite Keynet 2 Systems

A separate brochure describes Keynet 2 in more detail but again briefly, to convert to a Keynet II multi site system, a minimum of an AMUX Switch and Site PC with Port Expander are required at the Central site. Keynet 2 supports a range of architectures and analogue or digital intersite connectivity, including IP. The physical medium can be landlines, microwaves, LAN or WAN.
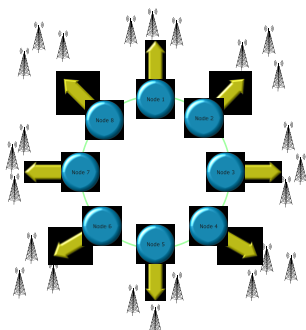
Top Level Design, Representational Bidirectional E1 Ring and Network Spurs to Satellite Sites

4.4 Management Terminal

If a Keynet 2 system requires managing, e.g. for validation, remote monitoring, alarms etc. then a Management Terminal and software are available.

5.   Radio Systems Services

The success and effectiveness of any project is reliant upon a whole range of skills and no matter how good the building blocks of a system might be, without those essential skills, projects can still fail to deliver.

The Radio Systems team is qualified, experienced and moreover understands all the critical steps necessary for a first class delivery.

- Requirements capture and documentation

- Site surveys and propagation studies

- Feasibility studies

- Project Management and Budget Control

- Risk analysis and mitigation

- Preferred component procurement

- In house software and hardware development

- Component manufacturing facilities in ISO9000 environments

- Quality Management and Control

- Factory assembly of systems

- Originating and implementing Factory Acceptance Test Documentation

- Production of Method Statements and Risk Assessments

- Site preparation

- Site installation

- Site commissioning

- Originating and implementing Site Acceptance Test Documentation

- As Built document pack production

- Escrow Agreements

- Warranty

- Maintenance and Support contracts
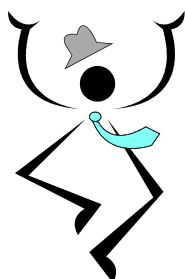
6.   Radio Systems Certification

Radio Systems adheres to all current UK and EU legislation, has been certified by NQA and is regularly audited for continued compliance.

ISO9001 Quality Certification

OHSAS18001 Health and Safety Certification

ISO14001 Environmental Certification

Compliant with Waste Electrical and Electronic Equipment Regulations 2006

7   Contacts

The Radio Systems team is always ready to adopt a no obligation consultative sale approach.

For initial discussions, contact details are as below.

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