

# NK-1 Network Management Appliance

The NK-1 Network Management Appliance is a single device designed to perform the functions of a Wireless Controller, a BakPak Appliance, or both. Because the Controller and BakPak functionality are packed into a single cloud-controlled unit, integrators can access, update, and manage a user's entire network from anywhere in the world without having to roll a truck.



Wireless Network Optimization

Cloud-Based Network Control

Simple Management Interface

Single Unit for Two Applications

# 3 Configuration Options

Configuration	Functionality	License Options	Optional Firmware upgrade (Additional license fees apply)
NK-1-CG1	Wireless Controller	3, 7, 15, and 30 WAPs	Network Patroller
NK-1-NP	Network Patroller	0, 15, 30, and Unlimited 3rd Party Devices*	Wireless Controller
NK-1-CP	Wireless Controller + Network Patroller	Same as above	N/A

\*All NK-1-NP models will support unlimited number of Pakedge devices

## NK-1-CG1 Wireless Controller

The NK-1-CG1's Wireless Controller functionality ensures fast, easy wireless network setup and optimized wireless networking. The Wireless Setup Wizard ensures complete setup of up to 30 devices in minutes. SectorMaxx increases wireless range, while TruStream improves overall wireless speeds. The SmartWav algorithm intelligently searches for sources of wireless interference and optimizes wireless settings for a network's unique environment.

## NK-1-NP BakPak Appliance

The NK-1-NP's BakPak Functionality enables sophisticated remote network management as well as self-healing - ensuring that any time a networked device goes down, it is automatically restored without user intervention. The BakPak Cloud Management System provides a complete overview of the network - including automatic network mapping and direct access to all connected devices - ensuring complete remote monitoring, management, and maintenance.

## NK-1-CP Integrated Wireless Controller/BakPak Appliance

The NK-1-CP boasts all the features and functionality of the NK-1-NP and NK-1-CG1 in a single, 1U device - saving valuable rack space and allowing complete network management from a single, easily upgradable unit.

# Introducing PakOS

An easier way to manage your NK-1



PakOS is an operating system for the Pakedge NK-1 management appliance. Manage and run all of your applications from a single intuitive user interface. Access and update network settings, user account details, or the Wireless Controller and Network Patroller applications

# NK-1 Specifications

## NK-1-CP

## NK-1-CG1

## NK-1-NP

### Interface

Total Network Interfaces		2	
Auto MDIX auto-sensing 10/100/1000 (Copper, RJ-45)		1	
Console Port (Copper, RJ-45)		1	
Console Port (Copper, RJ-45)		1	
USB Interfaces		1 (USB 3.0)	

### Dimensions

Height x Width x Depth		12 x 7.5 x 1.75 in (30.5 x 19 x 4.5 cm)	
Weight		6 lbs	
1U Rack Mountable		Yes	

### System Performance

Managed APs	Up to 30	Up to 30	-
WLANs	Depends on AP	Depends on AP	-

### Multimedia & Quality of Service

802.11e/WMM	Supported	Supported	-
Client Load Balancing	Supported (v2)	Supported (v2)	-
Client Capacity Limit	Supported (v2)	Supported (v2)	-
Suppressed SSIDs	Supported	Supported	-

### Environment

Power Input		110-240v AC	
Power Consumption		55w	
Operating Temp		0° - 40°C (32°-104° F)	
Operating Humidity		95% non-condensing	
Storage Temp		-20° - 80°C (-4°-176° F)	
Storage Humidity		95% non-condensing	

### Management

Configuration		Web user interface, CLI, SNMP v1, v2, v3	
AAA		RADIUS (v2)	
AP Provisioning	Auto-upgrade, Auto channel & power optimization, VLAN tagging, Spanning Tree, Heat Map (v2)	Auto-upgrade, Auto channel & power optimization, VLAN tagging, Spanning Tree, Heat Map (v2)	-
Centralized Management		Supported	
Centralized Reporting		Supported	
Site Survey	Rogue AP Detection	Rogue AP Detection	-

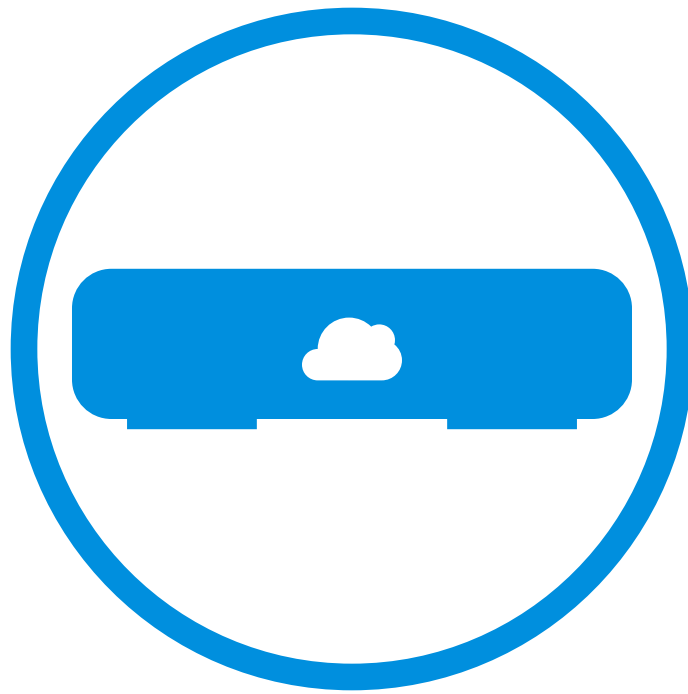
### Security

Standards	WEP, WPA, WPA2, IPv4, IPv6, PSK (v2), AES	WEP, WPA, WPA2, IPv4, IPv6, PSK (v2), AES	-
MAC Filtering	Supported	Supported	-
Guest Network	Supported	Supported	-

### Package Contents

NK-1, Console Cable, Rack Mounting Hardware, Power Cable and Quick Start Guide

# Network Patroller



# The BakPak Cloud Management System

What if...

You knew the moment something was wrong with your network?

Your network could heal itself?

Your network could self-configure?

You could change the way you interact with networks?

With BakPak, now you can.

# How Does BakPak Work?



# Features

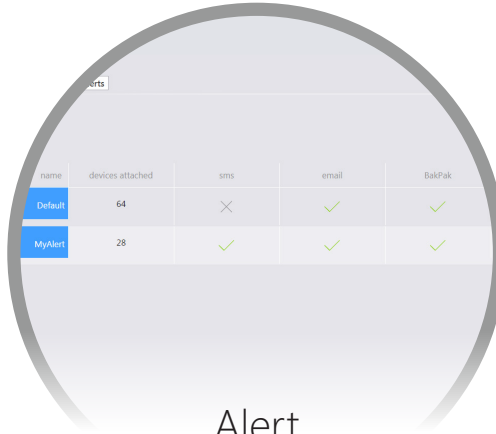
## Basic Tier Features

(Free with NK-1-NP)



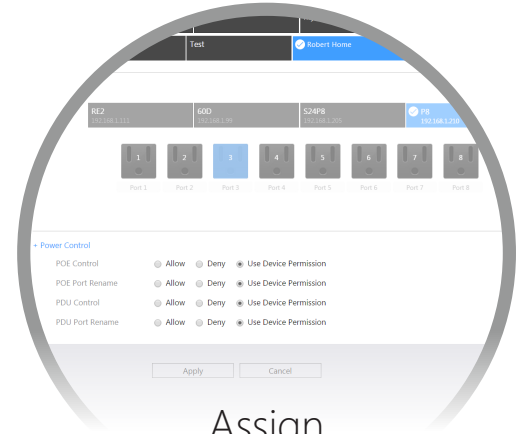
### Monitor

View the status of multiple networks, right down to the individual device on a specific network.



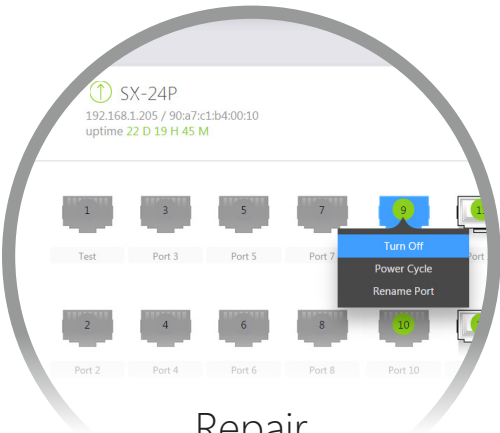
### Alert

Receive alerts, configurable on a per-device, by email, SMS or through the BakPak app. Device priority groups eliminate false and misleading alerts.



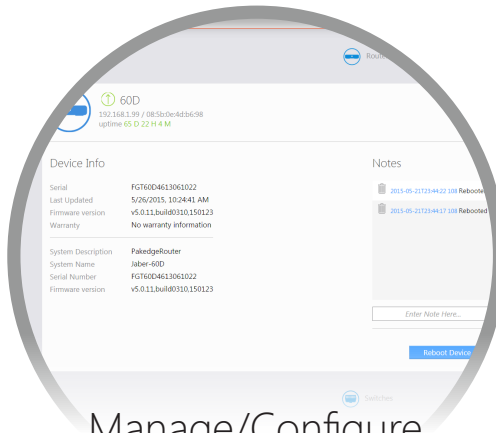
### Assign

Enable specific technicians to see alerts and manage networks, down to the device and port level.



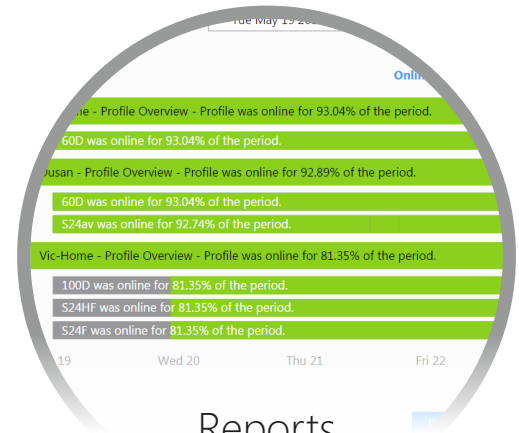
### Repair

Power cycle and "smart" reboot of individual devices as needed or on a scheduled basis.



### Manage/Configure

Configure devices, update firmware, and set schedules, all from one easy to use interface.



### Reports

View historical reports of device activities and key network metrics.



# Advanced Tier Features

(Subscription Required)



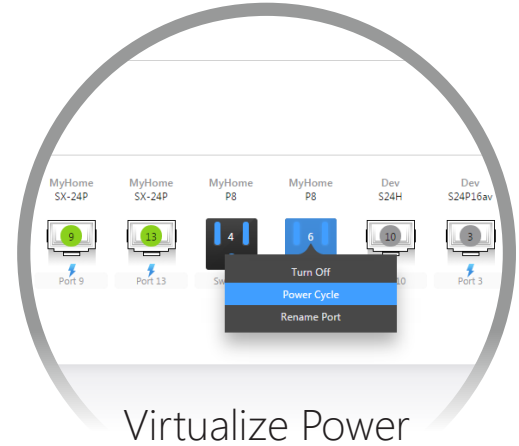
## Configuration Backup and Restore

Securely back up Pagedge device configurations to the cloud, where it can be restored to the device or to a new device when needed.



## Firmware Updates

Know when new firmware is available for your Pagedge device and update it directly from the cloud.

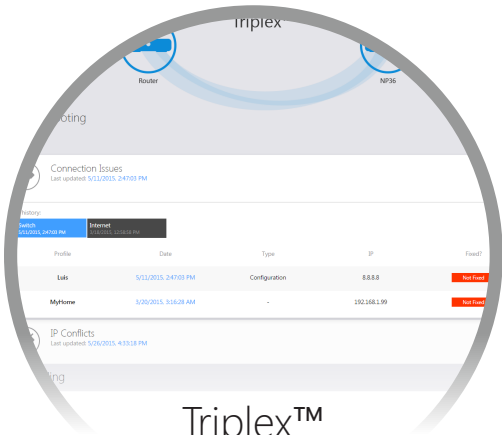


## Virtualize Power

Individual ports on compatible PoE switches and PDUs throughout the network can be grouped into custom virtual units and managed together.

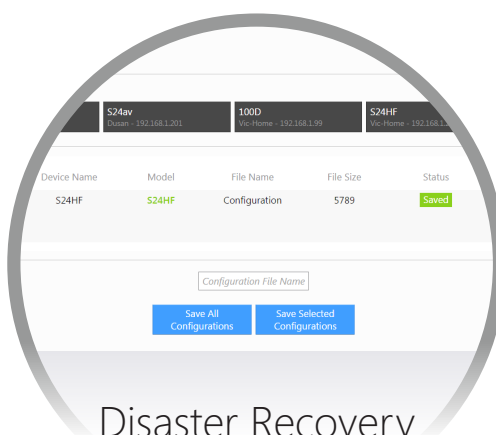
# Premier Tier Features

(Subscription Required)



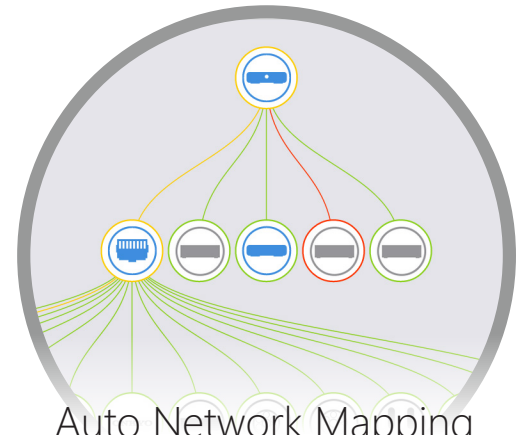
## Triplex™

A suite of AI algorithms and diagnostic tools restores connectivity autonomously and simplifies troubleshooting for maximum network performance and uptime.



## Disaster Recovery

Pagedge devices, across one or more networks, are placed into custom groups. Configurations can be restored to multiple replacement devices simultaneously, no matter where they are.



## Auto Network Mapping

AI algorithms automatically detect devices and what they are connected to. This enables their structure within the network to be automatically mapped and simplifies troubleshooting.

# BakPak Features

- Monitor
- Assign
- Manage
- Alert
- Report
- Repair

(Free)

(Subscription Required)

Basic

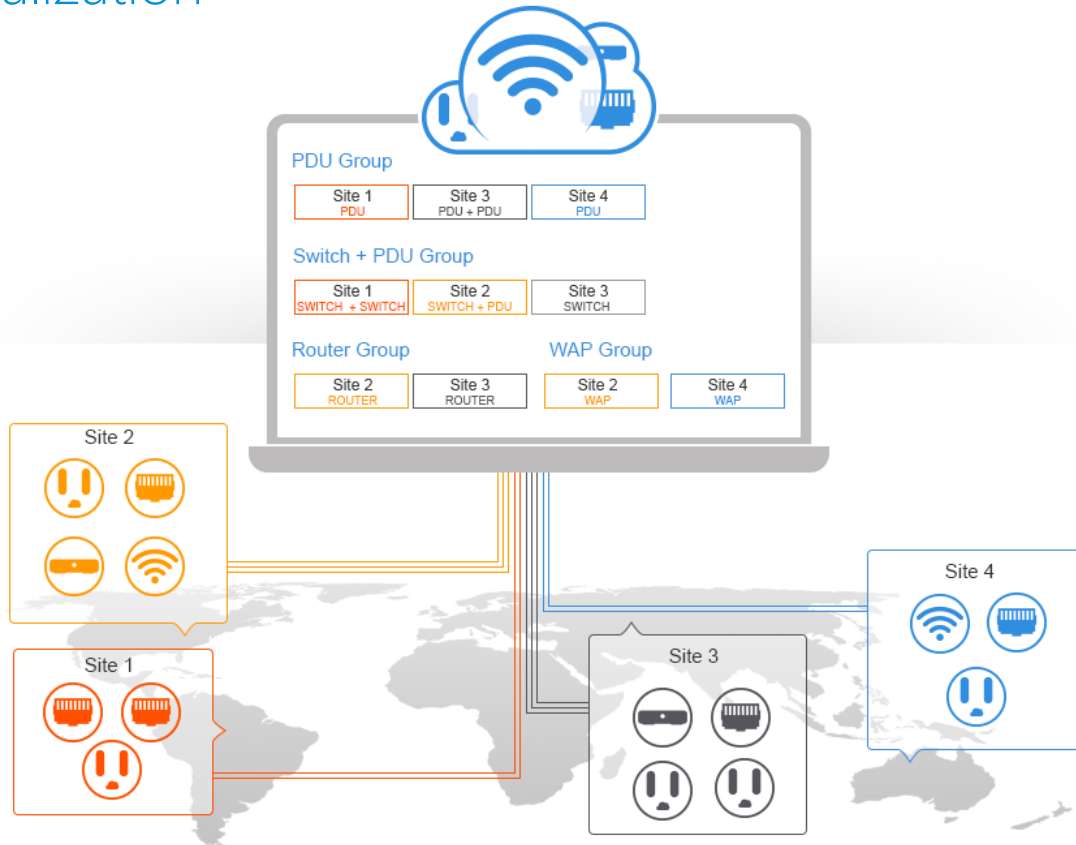
Advanced

Premier

Icon	Feature	Basic	Advanced	Premier
M	Network devices discovery across Pakedge Zones™ (VLANs)	✓	✓	✓
M	Network Map (Manual Creation)	✓	✓	✓
A	Deep customization of device priorities for alerts	✓	✓	✓
M	Monitor control systems & devices connected to them - Zigbee, Z-Wave, IoT devices	✓	✓	✓
A	Email & SMS alerts when devices are down	✓	✓	✓
MA	Access to Pakedge DDNS	✓	✓	✓
MA	Mapping devices to PDU and PoE Ports	✓	✓	✓
MA	Device Portal - Secure remote access to GUI for any compatible device	✓	✓	✓
MA	Lava Tunnel - Secure access to services on any device w/o VPN or port forwarding	✓	✓	✓
M	Street Map views of profiles	✓	✓	✓
R	Cloud based power control	✓	✓	✓
MA	Add non-managed device to profiles (unmanaged without IP)	✓	✓	✓
RP	Basic logging/device online & offline	✓	✓	✓
AS	Set up technicians and basic permissions	✓	✓	✓
M MA	New iOS & Android Applications	✓	✓	✓
MA	Virtualization across single sites only	✓	✓	✓
R	Self-healing on PoE switches and PDUs	✓	✓	✓
M	3rd Party PDU integration		✓	✓
RP	Reports/Logs: Weekly and historical data		✓	✓
MA	Virtualization across multiple sites for power devices only		✓	✓
AS	Advanced technician permissions		✓	✓
MA	Single device firmware updates and notifications via cloud		✓	✓
MA	Single device configuration backup and restore via cloud		✓	✓
R	Triplex™ - Detects/reports reasons for network connection issues			✓
MA	Grouped device firmware updates via cloud			✓
MA	Grouped device configuration backup/restore via cloud			✓
M	Automatic network mapping & topology change detection			✓
R	IP Conflicts detection - Able to identify/change duplicate IPs			✓
M	User Events – Users logged in/out, powered cycled ports			✓
M	Weather and ISP information			✓
M	Network speed test			✓

# Network Management Innovations

## Virtualization



BakPak's virtualization technology revolutionizes how networks are managed by integrating the different components together at the digital level. This approach decouples device intelligence from the physical unit and allows devices, whether on the same network but in different locations, or in different locations on different networks around the world, to be grouped together and operated in ways not possible before.

BakPak virtualization means that any device and its individual ports can be grouped together with other devices to form an integrated custom unit and managed. For example, two PoE ports from a 24 port switch, four power outlets in an eight outlet Power Distribution Unit in another building and four ports in an eight port PoE switch in a network across the country can be grouped together and managed. There are no limits to how devices are grouped and the number of groups that can be created. Once formed, these groups can be managed as one unit and power cycled, set to user specified on/off power schedules, and self-healing enabled.

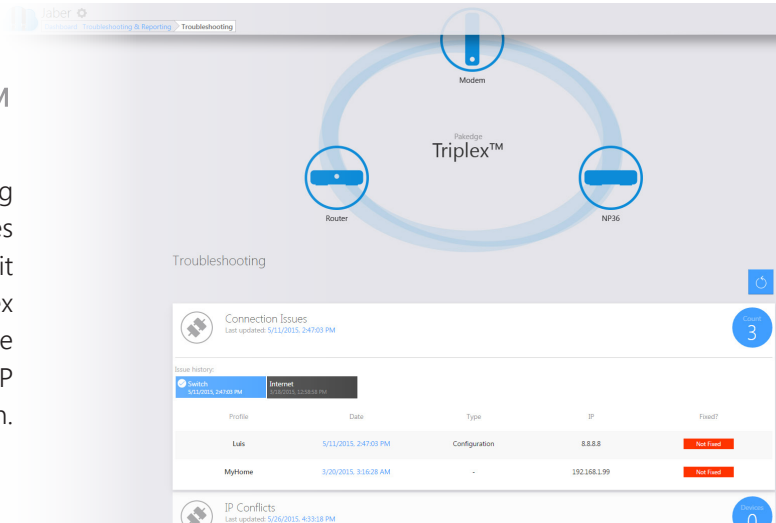
BakPak virtualization also enables compatible Pakedge devices - switches, routers, and wireless access points, to be grouped together for advanced management operations – including firmware management, configuration management, logging and reporting. For example, Pakedge SX-24P switches from different networks across the country can be virtualized and grouped together such that all of them can be updated to the latest firmware with one push of a button. In addition, a Pakedge SX-24P switch, a RE-2 router, and three WK-1 wireless access points within a single network can form another custom group, such that firmware updates, device configuration backups and restores from the cloud can be performed together. Further customization and management flexible is enabled by assigning management tasks for each group to different technicians.

# Artificial Intelligence

BakPak 3.0 was designed for today's complex networks. Its advanced capabilities is powered by our proprietary state of the art BakPak/Artificial Intelligence (B/AI) engine. It scans and learns the local network, then adapts its heuristic algorithms to continuously manage and optimize the system. B/AI resides on the network and operates continuously, even when connectivity to the cloud is lost.

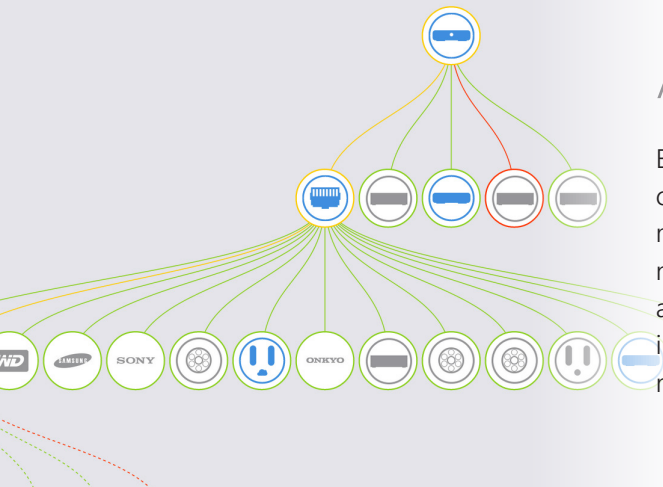
## Triplex™

Pakedge Triplex is a suite of intelligent diagnostic and self-healing algorithms. Whether one component, or the entire network goes down, Triplex automatically activates to identify the cause, repair it and reconnect. For example, if network connectivity is lost, Triplex kicks in and determines where the problem is – the modem, the router, or the NK-1-NP. Device connectivity issues, caused by IP conflicts or switch issues, are quickly identified for resolution.



## Auto Mapping

B/AI algorithms automatically detect devices and determine what they are connected to. This enables their structure within the network to be automatically mapped. When devices are removed or new devices added, the updated network topography is remapped. More importantly, all available information about the auto-mapped connections are known by B/AI – hierarchy, port information, device information, and utilized for autonomous real time management, maintenance, optimization and operation of the network.

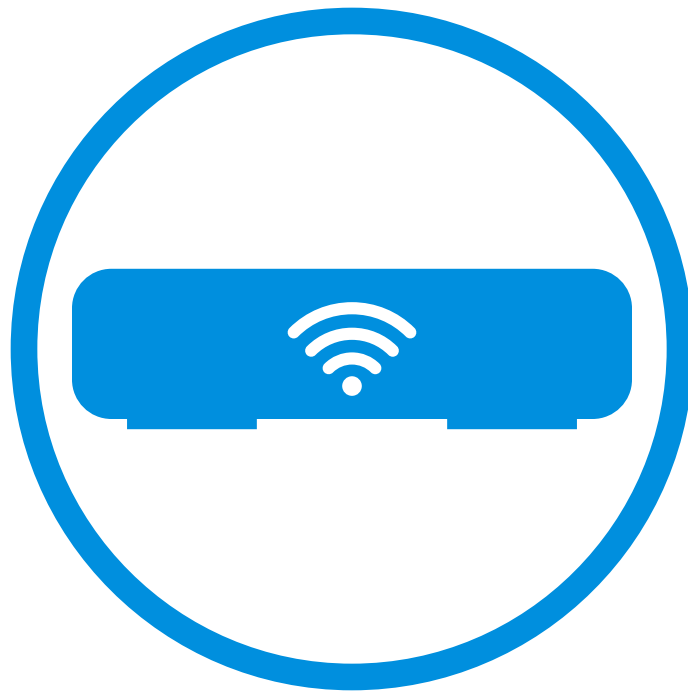


## Smart Alerts

B/AI takes simple alerts and notifications to the next level. Devices are put into one of five monitoring priority profiles to ensure that laptop computers, wireless phones, and IOT units, that come on and off frequently are characterized accurately. This ensures no false alerts. When BakPak detects multiple disconnected units, it compares priority profiles, network hierarchy, and device specific measurements (temperature, current, voltage, etc.) to determine what is really offline.



# Wireless Controller

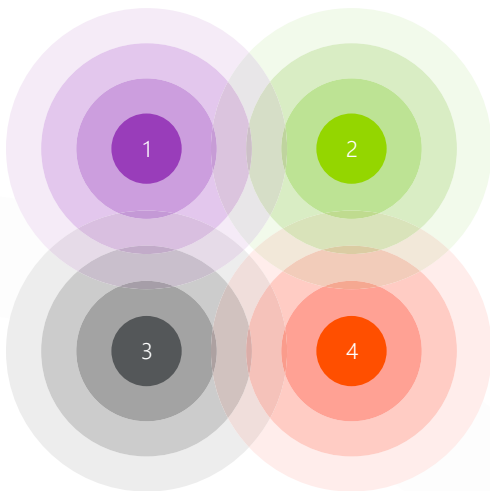


# NK-1-CG1 Wireless Controller

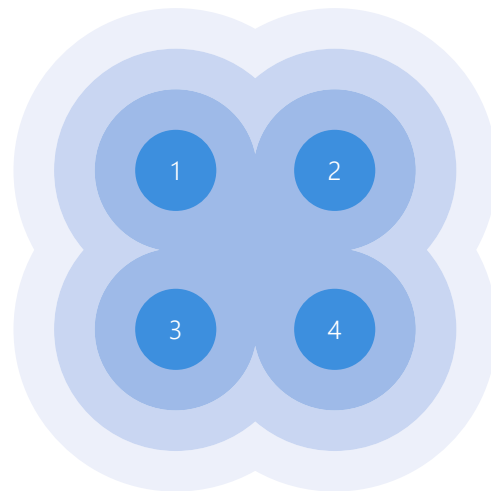
## True Wireless Harmony

In a network without a wireless controller, the wireless access points are unaware of each other and act independently - resulting in sub-optimal network performance, coverage gaps, and unreliable connectivity. AP settings may not be applied consistently throughout the network - leading to incompatible policy application and enforcement, and potential problems with rogue access points and devices.

The NK-1-CG1 eliminates these problems by working in conjunction with up to 30 Pakedge Wireless Access Points. The NK-1-CG1 Wireless Controller serves as the command, coordination, and control center of a wireless network with multiple access points. It provides seamless, scalable, reliable wireless network access by managing each access point and optimizing wireless coverage with a suite of performance enhancing technologies.



Without NK-1-CG1



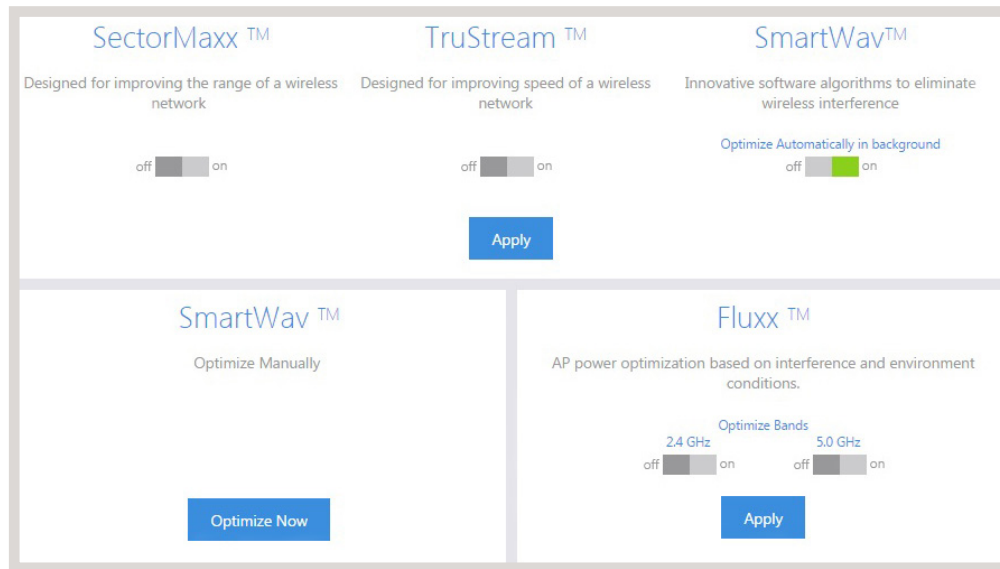
With NK-1-CG1

### Unified, Seamless Coverage

The NK-1-CG1 utilizes adaptive wireless technologies to allow a unified team of access points to work in conjunction with one another, creating a more seamless wireless environment with fewer dead zones between APs. Pakedge SmartWav™ technology mitigates interference, enabling higher effective ranges with greater throughput and alleviates connectivity issues that occur when wireless signals overlap. With fewer handoffs, users will enjoy a wireless experience with fewer dropped connections.



# Key Features



## Optimized Wireless

The NK-1-CG1 continuously scans the local environment to adapt and optimize wireless performance, using TruStream™, SectorMaxx™, SmartWav™ and Fluxx™ technologies. This enhances speed and coverage while mitigating interference across the entire site.

## Simple Management

Configure and manage up to 30 APs from any device on the network, all on one page. Setup, manage and maintain the network in minutes.

## Fast Synchronized Deployment

Automatic detection and configuration of APs, site surveys, a GUI wizard, heat maps, and visualization tools make deploying expanding a network simple.

## Enhanced Security

The ability to establish, push, and manage security settings across the network, integrated individual device blocking, guest access and Wi-Fi broadcast scheduling prevents security holes and provides a unified, secure wireless network.

## Centralized Reporting

Quickly and easily obtain information about any access point or client device on the network, including device and system logging. The NK-1-CG1 Integrates with the Packedge Cloud Management System for visibility and management using any device, anywhere, anytime.





# Advanced Features



## Firmware Update Via Cloud

Quick, easy cloud-based firmware updates for all APs on the network.



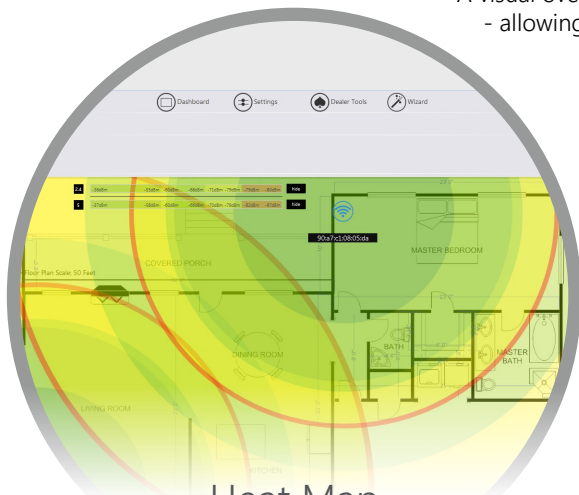
## Intuitive Setup Wizard

Fast setup for up to 30 APs within minutes



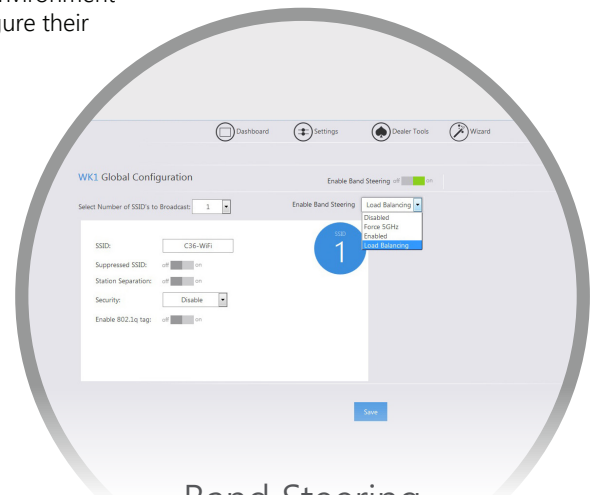
## Site Survey

A visual overview of the wireless environment - allowing users to better configure their network.



## Heat Map

Heat Map functionality shows a real-world view of wireless coverage based on actual blueprints



## Band Steering

Automatically moves connected devices from the 2.4 GHz band to the more open 5GHz band for a more stable connection





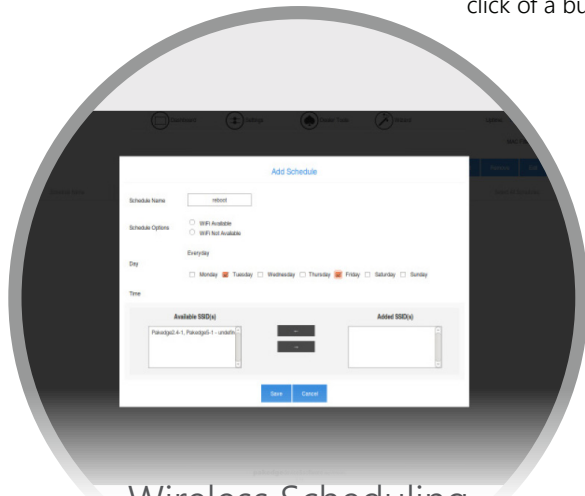
### Device Blocking

Block individual devices from the network on a per-device basis.



### One Step Backup and Restore

Back configurations and settings up with the click of a button - allowing easy maintenance and replacements.



### Wireless Scheduling

Schedule Wireless access based on dates and times - enhancing security.



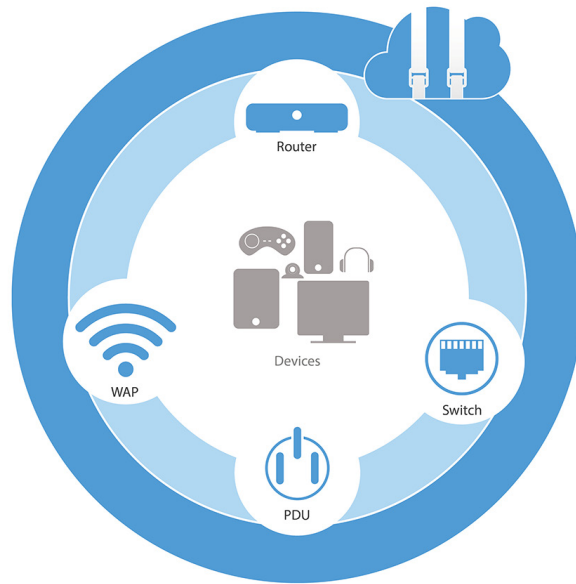
### MAC Filtering

Create whitelists and blacklists based on a device's MAC address - giving users complete control over the devices allowed on the network.



### Centralized Guest Maintenance

Manage your guest networks from a single location.



## Connect+ Certified

The Pakedge Connect+ Platform is a carefully integrated system of switches, routers, wireless, power management and software technologies, designed specifically to work with each other to deliver seamless, scalable, and reliable multimedia networking performance. When unified with the BakPak Cloud Management System, the functionality of the Pakedge Connect+ Platform is extended with cloud-enabled services such as monitoring and management of all connected devices anywhere, any time, and from any device.

## Why Pakedge?

- Purpose-built for A/V and smart networking applications
- Enterprise-level performance
- Seamless, scalable, and reliable
- End-to-end network system solutions
- Free lifetime technical support
- Free lifetime firmware updates and functionality support

## Warranty

Pakedge Device & Software offers a 3-year limited warranty. Pakedge Device & Software will repair or replace products that do not perform as specified within 3 years of the date of purchase due to a defect in materials, workmanship, or functionality.



2012, 2013, 2014



2013, 2014, 2015



2015



2015

## About Pakedge Device & Software


Pakedge is an industry leading manufacturer of high performance end-to-end networking platforms for residential and commercial A/V applications. Recognized by industry peers and winner of the prestigious CEPro Brand Leader award for Networking in 2013, 2014 and 2015, Pakedge specializes in integrating high performance engineering innovations, operational simplicity, and systems engineering to develop technology that enables customers to unleash the power of their network.


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