Tekniam Remote Universal Communication System (RUCS)

White Paper

Introduction

The Remote Universal Communication System (RUCS) by Tekniam is a cutting-edge, rapidly deployable communication asset designed to bridge connectivity gaps in mission-critical scenarios. Originally developed to support emergency communications in rural and underserved areas, RUCS has evolved into a multi-functional system used by public safety agencies, military units, and specialized operational teams. This white paper outlines the various applications of RUCS across multiple sectors, demonstrating its adaptability, reliability, and essential role in modern communications.

Key Features

- **Rapid Deployment:** RUCS can be set up in minutes, ensuring immediate communication capabilities in remote or disaster-stricken locations.
- **Scalability:** The system can be configured to support small teams or scaled up for larger operations.
- **Interoperability:** Compatible with existing communication networks, including WiFi-6, radio VHF, UHF, satellite (Ka, Ku), and all modern cellular systems (3G, 4G, 5G).
- **Secure Communications:** Encrypted transmissions ensure the integrity and confidentiality of sensitive information.
- **Multi-Functionality:** RUCS supports voice, data, video, and situational tracking for comprehensive operational oversight.

Primary Use Cases

1. Emergency Response & Disaster Relief

RUCS was initially designed to support emergency responders in areas lacking traditional communication infrastructure. Its benefits in this field include:

- Providing first responders with real-time coordination tools during natural disasters.
- Enabling search and rescue teams to maintain connectivity in rugged terrains.
- Offering triage and medical teams the ability to communicate critical patient data.

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2. Military & Defense Operations

The armed forces require a robust and secure communication system for various mission profiles. RUCS is ideal for:

- Supporting small unit tactical operations where conventional communication is compromised.
- Ensuring secure data transmission in covert and high-risk environments.
- Facilitating logistics and supply chain coordination in remote deployments.

3. Public Safety & Law Enforcement

For police, fire departments, and other public safety agencies, RUCS enhances operational efficiency by:

- Allowing seamless communication between different units during major events or crises.
- Providing reliable connectivity in rural or urban dead zones.
- Enabling real-time data sharing for situational awareness and strategic decision-making, natural disasters, mass casualty events, training exercises, and active command posts.

4. Space & Aerospace Vision Applications

RUCS is gaining traction in space-related communication efforts. Its uses include:

- Supporting Space Command and private aerospace initiatives with extended-range communication capabilities.
- Integrating with high-power antennas to enhance mission coordination over vast distances.
- Enabling ground-to-space communication for space exploration projects.

5. Corporate & Infrastructure Resilience

Businesses and critical infrastructure operators require failover communication solutions. RUCS provides:

- Backup connectivity during cyberattacks or network outages.
- Secure channels for coordinating crisis response teams.
- Communication redundancy for financial institutions and key service providers.

6. Humanitarian Missions & Remote Communities

RUCS extends connectivity to underserved populations and humanitarian operations by:

- Providing NGOs with communication tools in conflict zones or disaster-affected regions.
- Establishing educational and medical communication networks in remote villages.
- Bridging the digital divide by offering voice and internet access where conventional networks are absent.

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7. Construction, Ranching, Mining, and Agriculture

RUCS provides essential communication solutions for industries operating in remote or expansive areas, such as:

- Ensuring seamless coordination across large construction sites where traditional networks are unreliable.
- Supporting ranchers and farmers in monitoring livestock, equipment, and environmental conditions.
- Enhancing communication for mining operations deep underground or in isolated regions.
- Providing a reliable network for precision agriculture and smart farming technologies.

8. Harbors, Ports, Industrial Complexes, and Green Cities

RUCS is an invaluable asset for large-scale infrastructure, ensuring continuous and secure communication in:

- Maritime operations, facilitating seamless coordination between ships, port authorities, and logistics teams.
- Industrial complexes requiring robust communication for safety, security, and operational efficiency.
- Green cities integrating smart technology for efficient resource management and real-time data monitoring.
- Ports managing large volumes of cargo and personnel with uninterrupted connectivity.

Conclusion

Tekniam's RUCS is a highly adaptable and mission-critical solution designed to meet the diverse communication needs of multiple sectors. From emergency response to military applications, public safety, aerospace, corporate resilience, humanitarian aid, harbors, ports, industrial complexes, and green cities, RUCS ensures connectivity in the most challenging environments. As technology and operational demands continue to evolve, RUCS remains a pioneering force in secure, rapid, and efficient communications.

Contact Information

For further inquiries or demonstrations, please contact Tekniam's sales and support team at [Tekniam.com] or mmurphy@tekinam.com

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PCL.C+

Case and Environmental

- Lockable, IP-67 weather-resistant ABS case
- Module Dimensions: 17x11x6 in (430x270x150)
- Unit Weight: approx. 15 lbs.
- Operational Temperature Range: -20C to 70C
- Operating Humidity Range: 5 to 95% (non-condensing)

Power Features

External:

- Any 120/240 vAC Power Source
- External Surge Arrestor to protect internal components

Internal:

- Converts 120 vAC to 5/24/48 vDC per equipment requirements

Connectivity

- Environmentally Hardened Industrial Router
- Built-In LTE/5G Cellular Modem
- Works with any Cellular Provider via External SIM Card Port
- Up-Link Connection Options:
  - Wired WAN
  - LEO/HEO Satellite Constellations
  - Point-to-Point Radio Backhaul Enabled
  - RJ-45 – IEEE 802.3 AF
  - 10/100/1000 Ethernet Switch

Options

Remote Power Module (PM)

- Self-Contained PM Allowing Connection to:
  - Solar Panel Input
  - Wind Generator Input
  - 120/240 vAC Portable Generator

DM

Environmental and Power

- System architecture and hardware based on USA made Single Board Computer (SBC) with custom OpenWRT Operating System
- Weatherproof enclosure with IP-67 rating
- Wind Survival: 140 km/h
- 0.5 amp - 48V DC power via POE
- Temperature Range: -20C to +70C
- Operating Humidity Range 5 to 95% (non-condensing)
- Lightning Resistant:
  - 5000 amp surge tolerant
  - IEC 61000-4-5

Connectivity

- User connectivity via 801.11 a/b/g/n 3x3 MIMO Wave 2 Access Point
- Network meshing via 801.11ac 2x2 MIMO
- High Power AI Routed Directional Radios

Intra-Module Meshing Features

- 2 - 5GHz High-power Meshing Radios
  - Tx Power up to 1w (30 dBm) – channel dependent
- 2x2 MIMO Flat Panel Directional Antennas (12 dB gain)
- Layer III Routing Protocols for all Meshed Connections
- 5 km range (may be more, depending on environment and locale)
- Ability to “daisy-chain” 10+ connections and maintain acceptable signal-to-loss ratio

Access Point Features

- 2.4 GHz High-power Access Point Radio
  - Tx Power up to 1w (30 dBm)
- Up to 250 Simultaneous Wi-Fi Connections
- 3x3 MIMO Wave 2 Protocols
- 3 - Omni-directional antennas (7 dB gain)
- 1000+ ft Radius coverage with full strength signal

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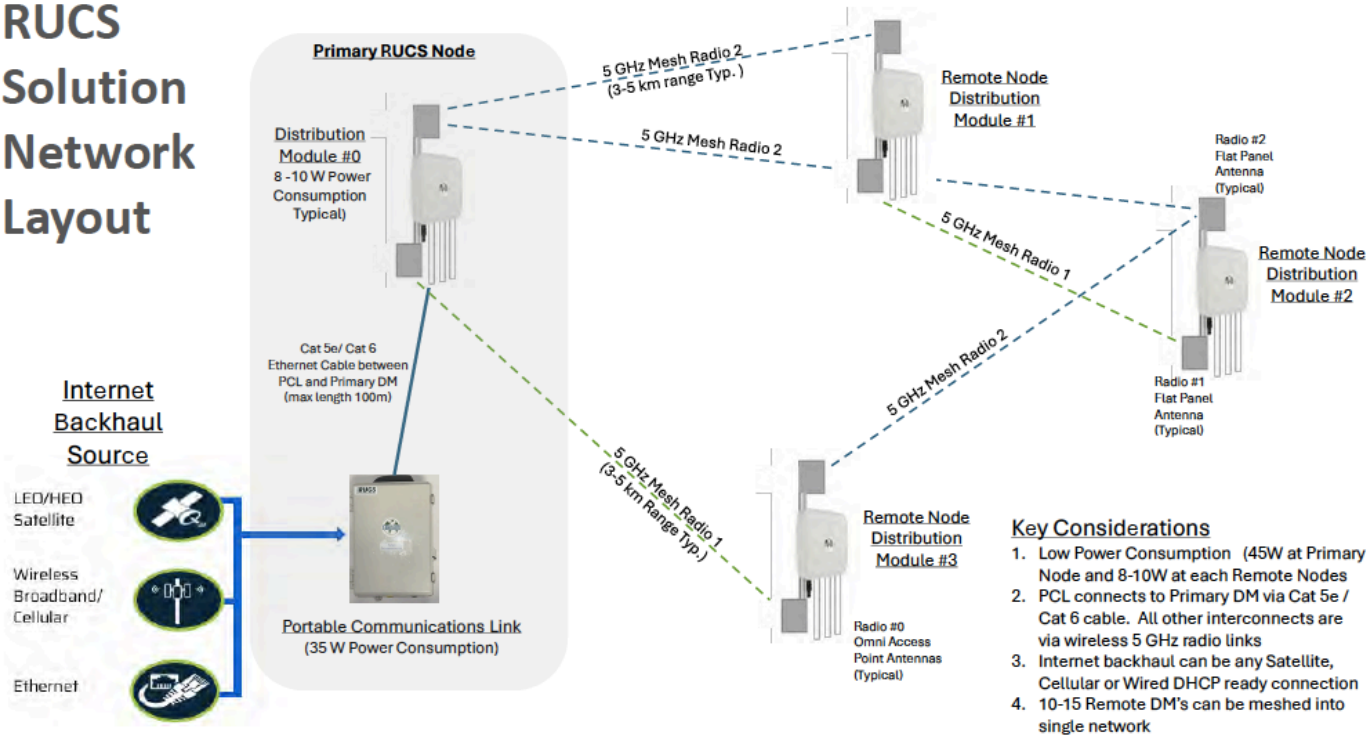
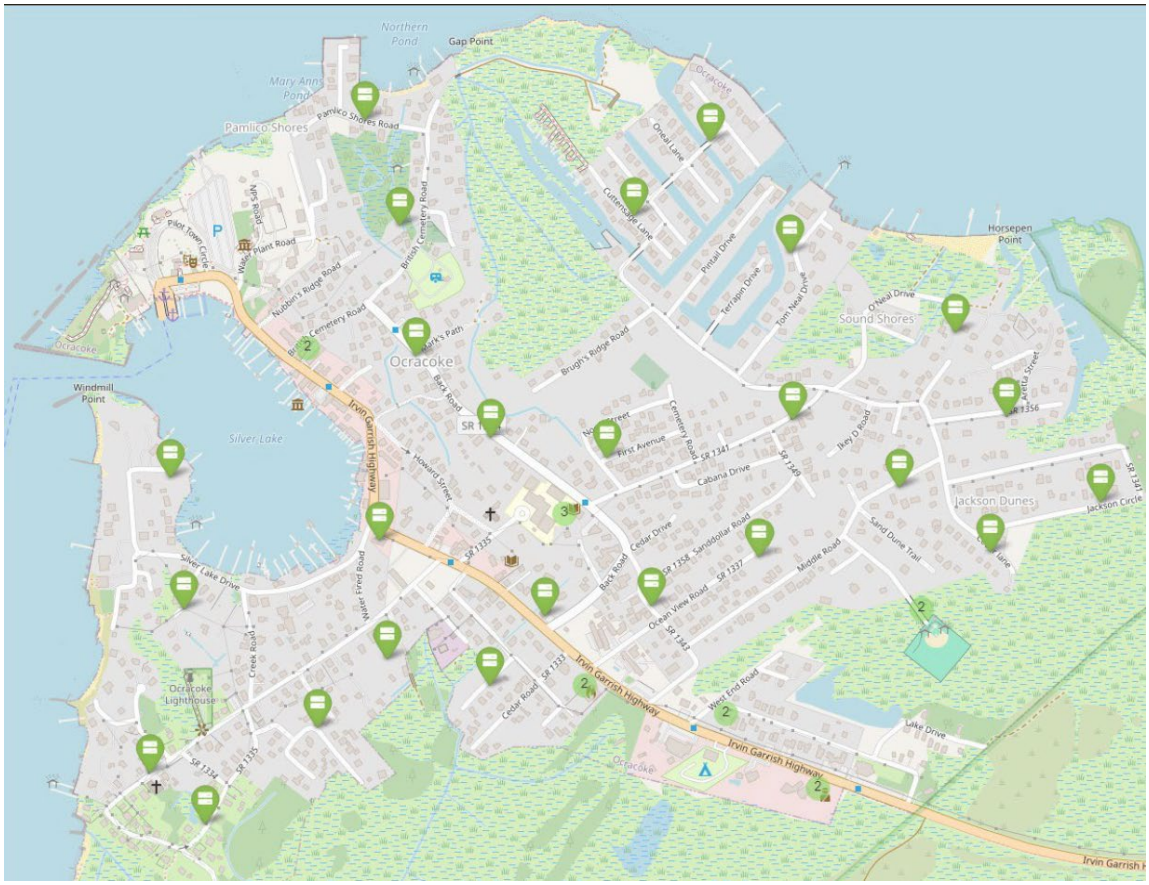
RUCS Solution Network Layout



Key Considerations

1. Low Power Consumption (45W at Primary Node and 8-10W at each Remote Nodes
2. PCL connects to Primary DM via Cat 5e / Cat 6 cable. All other interconnects are via wireless 5 GHz radio links
3. Internet backhaul can be any Satellite, Cellular or Wired DHCP ready connection
4. 10-15 Remote DM's can be meshed into single network



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Military Spec Kit

Tekniam

RUCS
Remote Universal Communication System

Qty: (1) Max RDK Case
Rolling & Lockable
TSA Compliant Case
33.75"L x 24"W x 19.5"H
Empty: 41.4 lbs / 18.8 kg (each)
Full Kit: 97 lbs / 44 kg

Max Rapid Deployment Kit w/ PCL.C+ & 2 DM's
(Custom Foam Lockable Hard Case)

This specification is subject to change without notice.
DRAWING SCALE: NONE Case Contents Version 1.10

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