BLACKSTARTECH®

BEACON BROADBAND SERIES

Your Private Cellular LTE Network Solution for Facility and Portable Emergency Deployments

Wireless communications and Internet access are an essential part of everyone's life driving social well-being, economic prosperity, and essential lifesaving infrastructure. Failure of communication and broadband networks can be catastrophic, costly, and even deadly. While the most common cause of network failures are natural disasters and loss of power events, other interruptions can occur from equipment failures, accidents or deliberate cyber-attacks, which can bring down the network. A natural or manmade disaster can render networks inoperable for days, sometimes weeks. Regardless of what causes essential communication and broadband network failures, BlackStarTech has a standalone, IoT, affordable private LTE solution called Beacon Broadband Series that can be integrated as either a permanent facility installation or as a separate stand-alone rapidly deployable emergency response solution.

The Beacon Broadband Series provides a strategic broadband communication Long Term Evolution (LTE) network that can act as a primary or backup network for your facility, providing redundancy and infrastructure resiliency. Beacon On Demand Cellular (ODC) integrates with your existing facility's wireless communications systems including Wi-Fi, critical sensors, wired phone, 900 MHz radios and cameras. ODC works as an integrated expandable platform for all your facility broadband and communication requirements providing a distributed antenna architecture alternative standalone solution improving productivity, cost savings, security, and resiliency.

Applications

Telecommunications

Utilities

Nuclear Power Generation Facilities

Schools, Universities and Research Facilities

Hospitals, Medical and Healthcare

Government Emergency Management

Industrial and Chemical Processing Facilities

Law Enforcement

Fire Protection and Security

Military Services

FAST AND RELIABLE NETWORK CONNECTIONS

The Beacon Broadband Series enables LTE interconnectivity and reliable communications leveraging mobile edge computing (MEC).

## Rapidly Deployable, Battery Powered Resilient Communication System

In addition to the Beacon ODC, Emergency Response Cellular (ERC) provides a compact rapidly deployable, portable battery powered cellular communication system utilized by first responders for emergency response to natural disasters. With resilient, private LTE 4G and 5G networks capability, Beacon ERC delivers encrypted communication access zones up to 10 miles including integration to worldwide connectivity options such as contingent dark fiber and/or VSAT. Both ODC and ERC are the only cellular-based solutions that meet APCO25 requirements for emergency communication.

Beacon ODC and ERC integrate broadband Long Term Evolution (LTE) with your existing Wi-Fi and sensor technologies to form a complete, distributed, network and leading-edge integrated communication system. In fact, Beacon Broadband Series is much more secure than regular Wi-Fi because it incorporates several strands of encryption at multiple layers. Beacon operates completely independent of commercial cellular networks to support continued resilient facility communications while seamlessly interconnecting with any satellite-based system for global connectivity.

Today interconnectability and communication are as essential as electricity, natural gas, and water. But like any utility, it can go down. These unexpected communication outages often happen in conjunction with power outages. Imagine your facility has no power, and then all communication paths suddenly go down at your facility, leaving you unable to monitor essential parameters, reach personnel or contract security and first responders. This can make your site vulnerable and susceptible to threats. With the Beacon Broadband Series, your facility has a hardened communication solution under your direct control with capability to improve cost, minimize risks, and provide a resilient communication broadband architecture. Beacon can be configured to utilize modular battery power for permanent deployments or for rapid response. The ERC battery power cellular network provides a private network response in less than 10 minutes; therefore, if your network does drop, you can still use your internal network with Beacon and communicate with personnel.
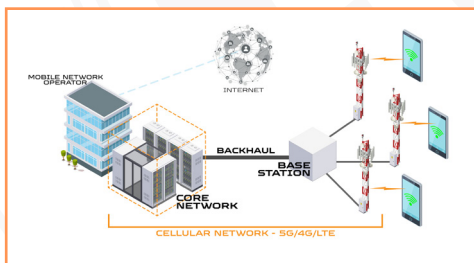
Cellular Core Networks are reliant upon a complex system of equipment, satellite links, backhaul lines, base stations and cell towers. Stable communication is highly reliant upon all these systems remaining in operation.
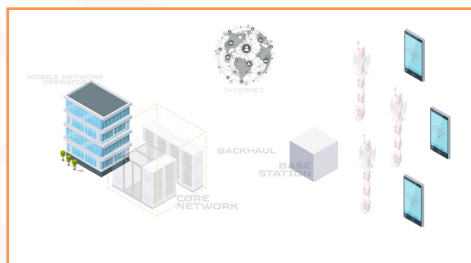
In the event of a catastrophic loss of power bringing the core network down, all communication between devices and the outside world (via the Internet) is lost. Connectivity cannot be restored until the major components of the Core Network are brought back online.
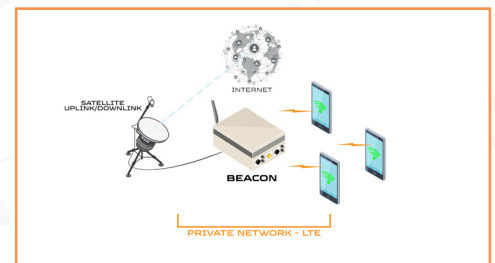
Beacon's Emergency Response Cellular (ERC) can be deployed rapidly to re-establish connectivity within minutes through a Private LTE Network. Worldwide communication (via the Internet) can be established through a mobile satellite link or dark fiber interconnectability.

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Today's U.S. Emergency Response vs BlackStarTech Beacon Solutions

Today's U.S. Emergency Response (FirstNet)	BlackStarTech Beacon Solutions
Deployable units owned and controlled by First Responder Entities	Portable battery powered system utilizing Distributed Mobile Architecture (MEC) for improved responsiveness
Currently no complete solutions offered	Nodes mesh on the network layer and create a "facility" network
Single points of failure still are an issue for deployment, response, and utilization	All network processing at the edge on COTS servers with all IP based network – Ethernet/TCP-IP
Fast response assets limited (90 CoWs) and expensive	Significantly less than the cost of conventional cellular on wheels (CoWs) systems
Solution is still dependent on commercial core networks with little effort being expended on hardening of critical assets or tools/techniques for rapid responsiveness	Rapid Response – System utilizes auto-acquire VSAT and can support calls worldwide in less than 10 minutes
Requires a commercial cellular (e.g. AT&T/Verizon Network) to be operational for deployment	Commercial cellular not needed, can be used by First Responders, State and Local Authorities, and Power Utilities

Eliminates Vulnerable Communication

Communication is critical to running your facility, yet telecommunication infrastructure is vulnerable and often rendered useless when disaster strikes. Beacon Broadband Series ODC and ERC solutions make certain your facility remains resilient with reliable communications or can be deployed to facilitate critical emergency response.

Beacon ODC and ERC are specifically designed to operate in the harshest environments including industrial settings, disaster and recovery areas, and extreme remote settings when nothing else is operational or available. With Beacon, first responders can communicate with each other and those requiring assistance via their cell phones to access resources, keeping your business functional in addition to potentially saving lives.

Operates in Full Stand-Alone Configuration

The Beacon Broadband Series is a completely self-contained communication system that requires no external connections to provide cellular and VoIP phone services. It contains all the components in a cellular network, including SMS and emergency broadcast capabilities. Beacon is a fully self-sufficient solution that integrates with dark fiber and VSAT interconnectability.

Rapidly Deployable

Beacon's rapid deployment solution is operational in less than 10 minutes and is field ready. It is light weight with low power consumption and requires minimal space. The Beacon's rugged design enables reliable operation with full "mobile" communication as it is can easily be carried by hand or mounted on a vehicle.

Compatible

The Beacon ODC and ERC solutions operate with standard cellular and VoIP type devices, running on highly tested commercial platforms, guaranteeing high reliability, easy acquisition, and low cost. It easily interoperates with 2-way radio systems for connection to any radio on a network. Both ODC and ERC also connect to legacy networks through a variety of media to ensure interconnections during normal operations and disaster scenarios. Satellite reach-back, microwave, Wi-Fi, WiMAX, IP/Ethernet, ISDN, and POTS network connections are supported for any facility for normal operations and emergent scenarios.

Internet

2+ MILES COVERAGE

Beacon

INTEGRATED SOFTWARE CORE LTE NETWORK
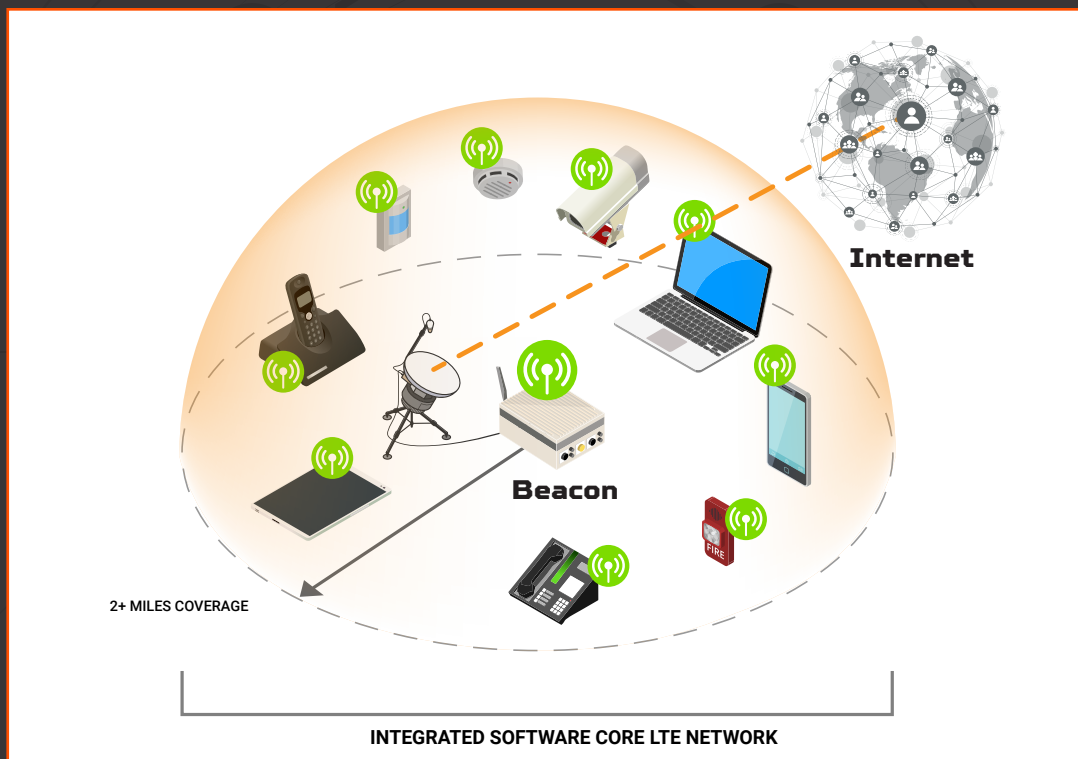
The Beacon's coverage includes any communication device (cell phones, computers, security cameras, etc.) within a two mile radius and can bring you back online within minutes. Worldwide communication can be established with mobile satellite links to the internet.

SWARM NETWORKING: INTELLIGENT COMMUNICATION

Each ODC and ERC radio provides cellular, SIP, High Speed Data and SMS communication. When several ODC nodes or ERCs are networked together, they deliver the most advanced networking capabilities imaginable—they swarm!

Moving Mesh Networks

Each node operates whether stationary or in motion. When users move, the ERC Swarm nodes also move. The network topology can dynamically shift and change as necessary, responding to the needs of your team.

Dynamic

Stationary or Swarm networks are self-healing, self-routing, and self-networking. Both ODC and ERC Swarm nodes automatically recognize each other. When one is removed from service, surrounding units 'swarm' to take over its users and coverage area. Alternately, if a new node is added, it automatically integrates with the combined network.

Supports Diverse Emergency Response Scenarios

Swarm Networks deliver numerous applications: search and rescue missions where rescuers can communicate with victims, Cellular Emergency Broadcast, and continuity of operations for your facility, or critical government and business functions.

Within a complex facility, traditional 5G/4G/LTE Networks allow communication between key teams. During an emergency, it is critical that communication is reliable between control facilities, first responders, security and field personnel, to mitigate the situation.

In the event of a catastrophic loss of power bringing the Core Network down, this critical communication lifeline can be lost.

Beacon's Emergency Response Cellular (ERC) Private LTE Network does not rely on the Core Network. Even if the Core Network is down, the Beacon ERC can provide secure and reliable emergency communication for your site within minutes.

The Beacon Broadband Series Brings Savings, Reliability, and Security

BlackStarTech Beacon provides a variety of solutions for a modular integrated communication system that can be permanently installed to augment facility communication or be configured into a rapidly deployable response system.

Beacon's ODC and ERC technologies are more resilient and less costly than the Distributed Antenna Systems (DAS). DAS is more costly, and multiple units are required; whereas you only need one Beacon, and our technology is far superior and cost effective. Beacon is more secure and provides better coverage. Beacon is simplistic yet modern, and more seamless to deploy than a standard DAS. Integrated facility installation solutions combining cellular with existing radio, Wi-Fi, and sensor technologies form Beacon's complete and distributed network.

Cutting Edge Technology

The FirstNet deployment vision previously attempted by competition was not a complete communication solution and has limited fast response assets. Other current solutions are dependent on commercial core networks with little efforts being expended on hardening critical assets, tools, or techniques for rapid responsiveness. With the Beacon, it can be deployed in as little as 10 minutes, giving you the ability to connect with your internal network harmoniously.

Beacon employs Broadband LTE in multiple configurations and channels including new CBRS band. It also expands to various available cellular frequencies, integrates to conduct voice, radio, sensor, data, and video applications, and is a completely functional 4G/5G private network. The network is implemented in software and a completely IP-based architecture to enable installation on private enterprise networks. You cannot get such cutting-edge, dependable technology from DAS.

Critical operations and communications require a solution that works on a complete standalone basis. Resiliency is key. Both power and communication solutions must be matched to deliver when needed. BlackStarTech delivers both reliable communications in the Beacon Broadband Series and emergency power supply solutions to protect your facility from being vulnerable.

Regulations

The Beacon Broadband Series meets public safety requirements. Both ODC and ERC are the only cellular-based emergency solutions that meet APCO25 requirements for emergency communication system use with the following attributes:

- Priority access and group call, allowing commanders easy communication to personnel
- Highly reliable and self-contained, with no center or hub
- Global coverage. ODC covers as large or small of an area as desired
- Secure phone capable, providing Type 1 and Non-Type 1 secure connections
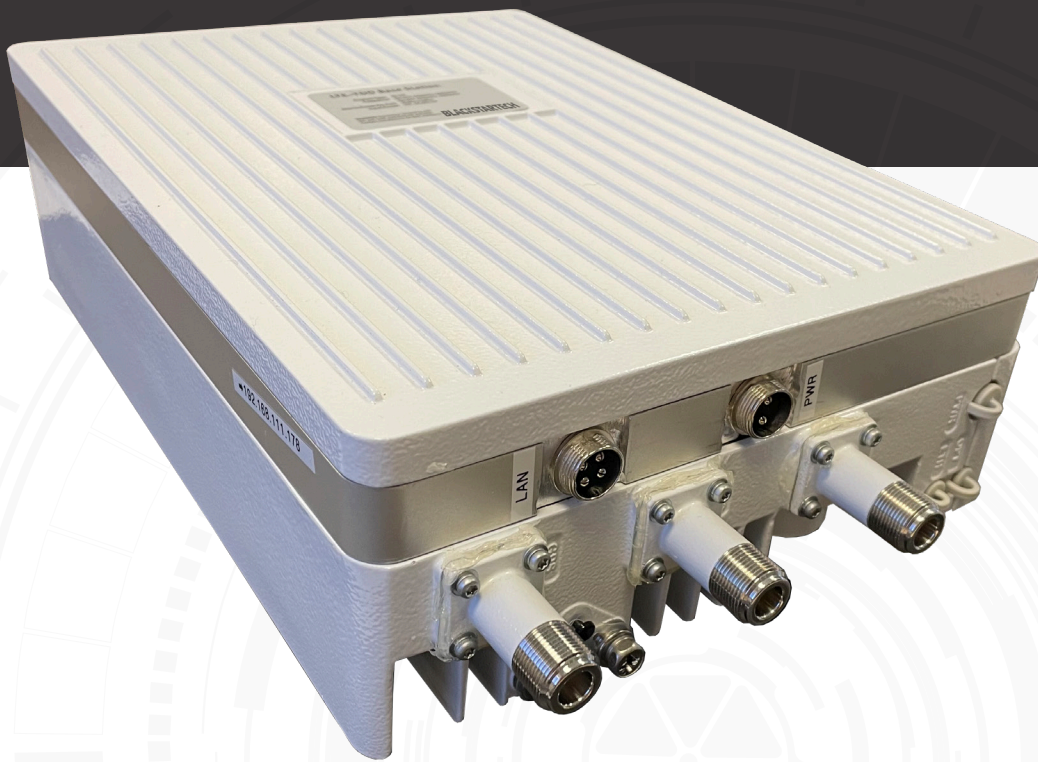
Beacon Broadband Series EZ 4G/5G LTE Node

BlackStarTech offers two products in the Beacon series, the Beacon Broadband Series EZ 4G LTE Node (model # Beacon-EZ-4G-001) and Beacon Broadband Series EZ 5G LTE Node (model # Beacon-EZ-5G-001) depending on your needs.

BlackStarTech delivers a rapidly deployable private LTE network, with multi-access edge base computing, and hardened response. With its integrateable facility installation solution that combines cellular with existing radio, Wi-Fi, and various sensor technologies, Beacon forms a complete distributed network. Field deployments are operational in under 10 minutes. This gives you the ability to interconnect for routing traffic over any commercial or Internet-based network, and can include EMP protection options and hardening solutions. Beacon Broadband Series is reliable, secure, and dynamic. It's your solution for network failures.

Specifications

		Beacon Broadband Series EZ 4G LTE Node	Beacon Broadband Series EZ 5G LTE Node
		Model #Beacon-EZ-4G-001	Model #Beacon-EZ-5G-001
Unit			
	Dimensions (W x H X D)	12 x 9 x 5 (in) 300 x 228 x 120 (mm)	
	Weight	< 5.5kg	
	Layer 7 Backbone	Ethernet/Microwave Link	
Performance			
	Working Frequency	Band 48 (CBRS band), Band 42 and 43	
	Working Bandwidth	5MHz/10MHz/15MHz/20MHz TDD DL ≈ 90Mbps - UL ≈ 30Mbps @ 20MHz 96 active users (3-Sectors: 288 active users) Up to ≈1.8 miles radius coverage Ethernet Connection	
	Mobility	≤ 75 m/h	
	Receiver Sensitivity	-105dBm	
	Output Power (TOC)	2W (1W x 1W MIMO)	
	Synchronization Mode	GPS, IEEE1588	
Power			
	Power Supply	48V DC	
	Power Consumption	55W@100% RF load LTE	
Reliability			
	MTTR	1 Hour	
	Availability	99.9997%	
	Downtime Duration	<1.481min/year	
EMC			
	MTBF	≥ 350000 hours	
Environment			
	Ground	≤5 Ω Earth resistance can be less than 10Ω in lightning-less area with less than 20 lightning storms a year	
	Temperature	Outdoor: -45°C to +55°C	
	Heat Dissipation	Natural Cooling	
Warranty			
		1 Year Manufacturer's Warranty	

For more information on standard or customized products,
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