




BLUE-BAND



WE BUILD SMART CITIES

FROM THE GROUND UP!

SMART PARKING MANAGEMENT SYSTEMS (SPMS) BROCHURE

BLUE-BAND LLC

WWW.BLUE-BAND.NET

Office: 877-577-7572 ext: 700


Mobile: 386-631-5830

COMMERCIAL AGENT




Stephanie D. Hoback, CBLC - Principal

 407-756-9083

 www.ecopartnering.com

 Stephanie.hoback@ecopartnering.com

 407-377-7540

 1708 Elaine Avenue

Altamonte Springs, FL 32701

blue-band.net | sales@blue-band.net | 877-577-7572 ext. 1 | 223 Hickman Dr., Sanford, FL 32771





REDUCE COST. INCREASE EFFICIENCY. FUEL SUCCESS.

Blue-Band creates next generation, Bluetooth V2X Transportation & Parking Technology solutions to help build Smart Cities that are highly sustainable, safe, and interactive. We have developed the first intelligent multi-use technology that enables smarter intersections, freeways, and parking in a single system. Thus, creating green, budget-friendly solutions for Smart City initiatives by combining Bluetooth, vehicle detection, and renewable state-of-the-art independent power system technologies. BLUE-BAND's green devices are powerful, advanced, and unique.

The autonomous vehicle movement is here, but is our infrastructure ready? Vehicles will be talking to vehicles, V2V, Vehicles to the infrastructure, V2I, then Vehicles will need to talk to everything, V2X. The importance of operational and functional technology is paramount and mission critical for data, communications, and safety.

Telemetry for autonomous vehicles starts in the roadway and with BLUE-BAND. Our Bluetooth V2X Transportation & Parking technology solutions with integrated asset maintenance will help shape the smart cities of tomorrow.

Fueled by real-time data, wireless connectivity, and intelligent analytics, an integrated technology solution can help drive new levels of efficiency, security, and profitability one "smart corridor" at a time.

Reduced travel times, increased gas savings, and safer roads are the goals of all transportation managers and *smart corridors* are the next step in the mission of providing the public with the best possible travel experience.

The BLUE-BAND Smart Parking Suite is the next-generation detection device revolutionizing the parking industry. This wireless, solar-powered solution delivers powerful analytics that enhance parking facility management, ultimately working to build smart, growing cities and communities that are highly sustainable, safer, and more interactive.

The BLUE-BAND Smart Parking Suite’s dual-detection system is capable of providing customized metrics that use raw data, including parking trends, time-based access control, traffic management, and much more. These dynamic metrics are captured in real-time and archived for increased flexibility and functionality, saving you time and money while evolving your city’s infrastructure.



15-minute installation



Bluetooth equipped



Wireless operation



Sustainably powered



Dual-detection system



Powerful analytics

TECHNOLOGY COMPARISON

System Capability	BLUE-BAND ARM	Inductive Loops	Radar	Video
Non Intrusive	●		●	●
No Occlusion	●	●		
Self-Powered	●			
Gate Control	●	●	●	●
Access Control	●			
Bluetooth	●			
Per-Vehicle Tracking	●			
Per-Space Management	●	●		
Low Maintenance	●		●	
Wireless	●			



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SMART PARKING MANAGEMENT SYSTEMS (SPMS)

Garage, Lots, On-street, Truck Stops



The Smart Parking Management Systems (SPMS) are a crucial part of a Smart City sustainable plan. When SPMS are properly deployed, they will significantly help reduce vehicle emissions in urban areas by assisting travelers to find parking spaces more efficiently, reducing the number of times circling looking for open spaces. As well as helping public and private agencies and manage supply or capacity.

CAPACITY TRACKING

Capacity tracking is critical. The BLUE-BAND parking system provides flexibility to Clients. The modular design allows capacity tracking by the facility, row, and even space. Give your parking guests the ability to go directly to open spaces and reduce congestion in your parking system. Data from detected vehicles combined with data collected from Bluetooth devices will produce trends in parking patron behavior.

METRICS & STATISTICS

Parking system managers will be able to utilize this data to enhance the parking facility. Planning efforts will be efficient and clean. Managers can apply the data metrics to determine: areas of over and/or underutilization, efficient flow control, and space demand. This information can even be used to determine ideal revenue-based parking spaces by monitoring per space usage trends.

ACCESS CONTROL SYSTEM (ACS)

The Access Control System (ACS) may be integrated with a parking space availability system

or as a stand-alone system. Upon entry, a barrier is in place which requires the parker to present their valid credentials before allowing access.

With BLUE-BAND's unique access control system a Bluetooth dongle or Bluetooth enabled device registered to the BLUE-BAND system provides simple and secure access management. The BLUE-BAND access control system can also be used to generate revenue for preferred parking guests. Registered preferred guests of the system will have access to reserved parking spaces. Violators would quickly be identified in real-time reducing the additional cost of on-site security enforcement.

GATE CONTROL

BLUE-BAND's parking system provides simple **gate control**. Installing the BLUE-BAND Detector along with the BLUE-BAND Gate Control Unit (GCU) equips any gate with wireless ingress and egress functionality. Open and close a gate via vehicle detection wirelessly with little to no effort.



Battery Backup • Data Collection • Signal Actuation
Remote Monitoring • Simple Configuration • Wireless

Wireless technology has dominated the industry as the preferred method for monitoring and reporting vehicular activity. Vehicle detection systems (VDS) are the primary contributor to efficiently managing traffic. A single device that configures, stores, and reports is essential in the long term success of any intelligent traffic system. The BLUE-BAND HUB completes all these tasks while removing the need for infrastructure with wireless communication to all of the BLUE-BAND ARM detectors.



The BLUE-BAND (HUB) is the industry's next generation traffic management tool. The HUB is a state-of-the-art wireless, traffic monitoring, and data storage device. The HUB is maintenance free utilizing a battery bank to provide protection and backup power against outages and power surge which increases reliability and further solidify our maintenance free design.

The combination of sleek design with new age data communications provides end users with unparalleled smart parking and traffic system management functionality. The HUB along with the detection system is capable of providing customized metrics that utilize the raw data sets of presence and identification while actuating a contact closure output.

Together these metrics enable functionality such as **parking trends, time-based access control, traffic management, and general system performance trends**. All of the system's dynamic metrics are captured in real time and stored for the system manager use. The flexibility provided by the BLUE-BAND HUB allows configuration of all associated detectors before deployment in the field reducing install time significantly. The embedded user interface allow the HUB to be configured with cell phones, tablets and with any operating system or browser. Because configuration can be accomplished before installing the detectors in the field integration time is significantly reduced.

System Capability	BLUE-BAND
Wireless (No Infrastructure)	●
Data Export	●
Integrated Battery Backup	●
Contact Closure	●
Weather Resistant	●
Embedded GUI	●
Integrated Asset Management	●
No Maintenance	●
Data Collection and Storage	●
Real Time Speed Reporting	●
Bluetooth ID Encryption	●
All Operating System Compatible	●
Integrated Ethernet Connectivity	●



FEATURES

- ◇ Frequency range: 2.4~2.5 GHz
- ◇ Ultra-violet resistant fiberglass radome
- ◇ Die casting mounting base with rugged structure design

2.4GHz Omni Directional Antenna

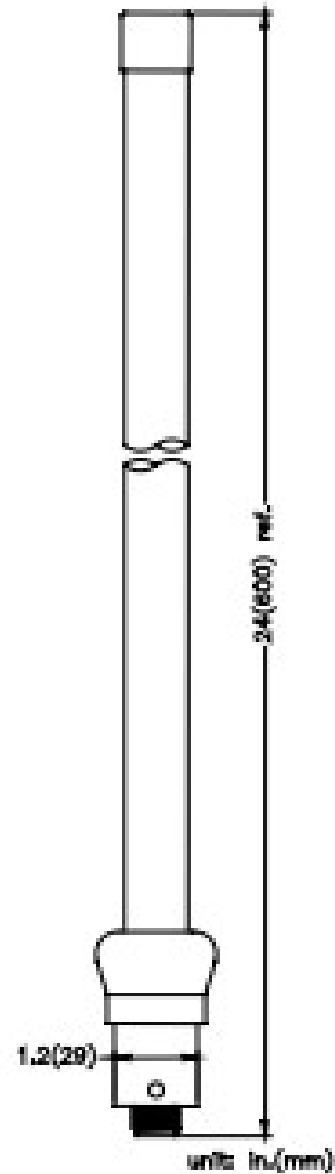
TECHNICAL DATA

Electrical Properties

Frequency Range	2400-2500 MHz
Impedance	50 ohms nominal
Gain	9 dBi
VSWR	≤2.0
Radiation	Omni
Polarization	Vertical

Mechanical Properties

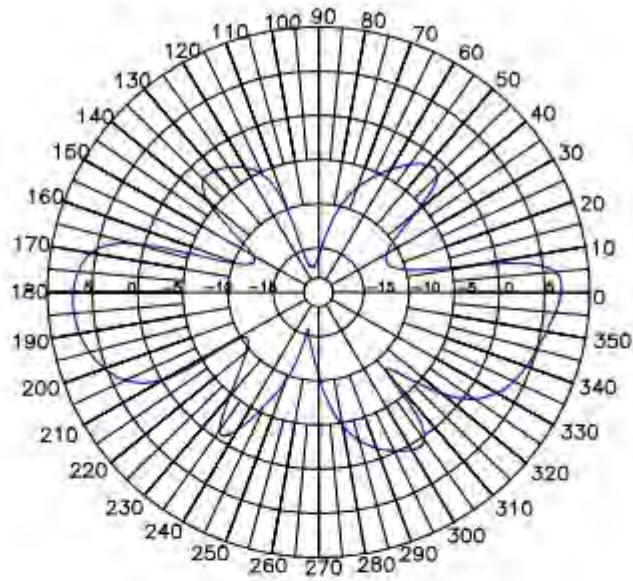
Antenna Height	24 in. (600 mm)
Connector	N (Female)
Radome	UV Resistant Fiberglass
Mounting Base	Zinc Alloy with Chrome Plated
Color	White, Grey, Black
Guided Pipe**	Aluminum Alloy
Bracket**	Aluminum Alloy



**Bracket not shown on the drawing.

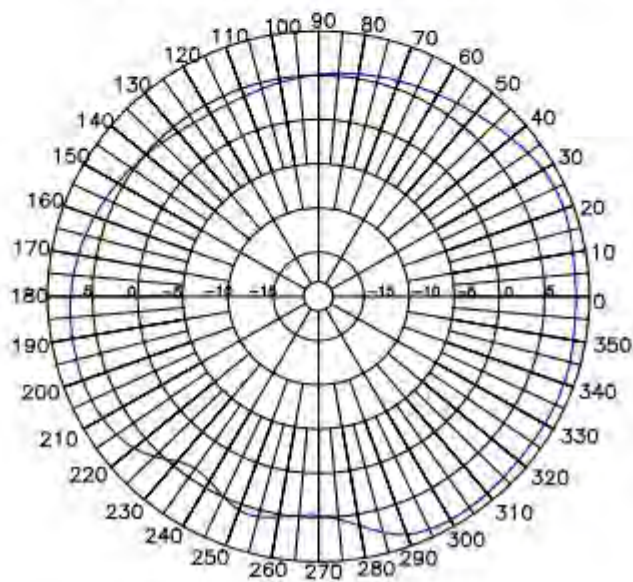
RADIATION PATTERN

E-Plane Field Pattern



Frequency: 2.45GHz

H-Plane Field Pattern



Frequency: 2.45GHz

DETECTOR / COMMERCIAL ARM (D-TX)

BLUE-BAND Detection Suite is a state of the art vehicle detection system. It is designed to accurately detect true presence, speed, volume, length, occupancy, origin, and destination of a vehicle.

FEATURES

- ◇ Battery & Solar
- ◇ Bi-State Smart Power System
- ◇ Mounts on or flush in pavement
- ◇ Works in all weather and lighting conditions.
- ◇ Per-lane and approach data collection
- ◇ Data collected in real-time and stored in local memory
- ◇ Per-Vehicle counts, length, speed, and occupancy reporting
- ◇ Web based application provides intuitive GUI to set all configuration parameters and display real time data.
- ◇ Built-in Bluetooth O&D data reporting
- ◇ Remote HUB storage
- ◇ Wireless communication
- ◇ Wireless linear mesh configurable
- ◇ Self-healing communication
- ◇ Remote Configuration and Monitoring
- ◇ Reports downloadable in Excel .csv format
- ◇ Outputs data in XML and JSON formats
- ◇ Auto GPS locates (Integrated Asset Management)
- ◇ Detects stopped vehicles (True Presence)



Specification	Recommended Condition
Detector Type	Magnetometer / Bluetooth
Vcc D-TX, Vcc HUB	4.5 VDC
D-TX Power Source	Battery, Solar
Dimensions	10" L x 5" W
Weight D-TX	Approx. 2.85 pounds
Weight Road Plate	Approx. 2 pounds
Weight Apron	Approx. 3 pounds
Speed Accuracy	Per vehicle: +/- 1mph to 3mph
Length Accuracy	Per Vehicle: +/- 1ft to 3ft
Volume Accuracy	Per Direction Typical: 98% to 99.9% Per Direction Minimum: 95% Per Lane Typical: 98 to 99.9% Per Lane Minimum: 95%
Bluetooth	2.1+EDR Long Range (Class 1)
HUB Range To D-TX	250ft + 450ft Ext. Antenna Optional
D-TX Range To D-TX	25ft
Temperature Rating	-40F° to 185F° (-40C° to 85C°)
Communication Type	Bluetooth: Linear Mesh Capable
Software	Embedded Software Access
Hardware Warranty	Standard Limited 2 year
Warranty Adder	1 year increments max 3 years

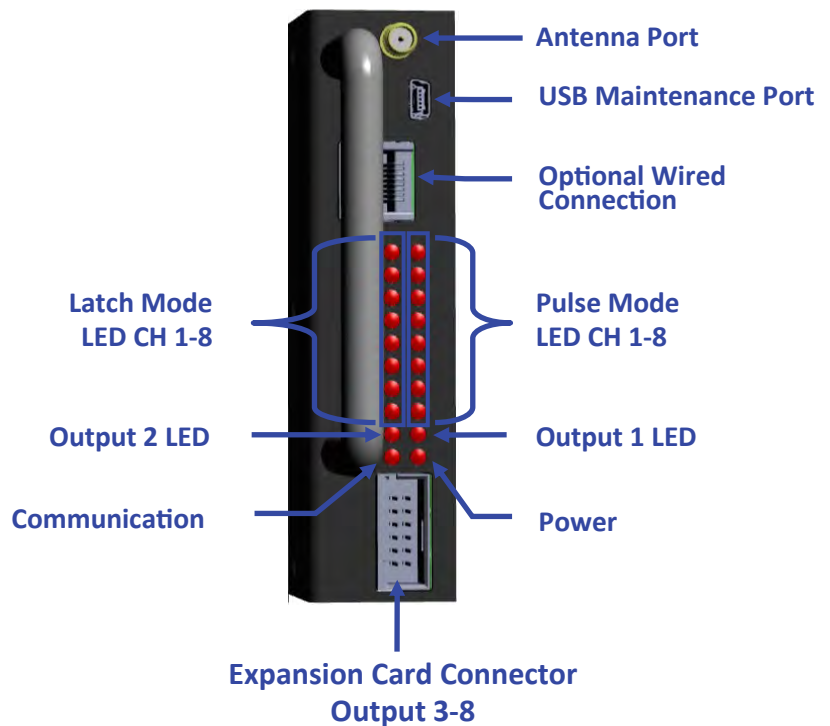


DETECTOR CARD



Specifications	
Input / Output Voltage	11-26 VDC
Operating Temperature	-40°F to 176°F (-40°C to -80° C)
Humidity	10-95% max non-condensing
Power Consumption	3mA per channel
Weight	0.3lbs
Interfaces	Wireless or Wired to HUB
Outputs Per Card	2
Modes	Pulse or Presence
Wireless Communication Type	Bluetooth

INDUSTRY STANDARD DIMENSIONS



*Optional based on configuration; ask representative for details



PRODUCT DESCRIPTION

Blue-Band BB-EPOXY-0001 material is a two component 100% solid hybrid polyurethane/polyurea based joint sealant. **BB-EPOXY-0001** is a self-leveling joint sealant designed to protect horizontal concrete expansion and control joints from spalling, chipping, and breakdown. This elastomer displays fast cure times and excellent adhesion to concrete. **BB-EPOXY-0001** can be applied at temperatures ranging 20° F to 180° F. This hybrid polyurethane/polyurea elastomer displays excellent chemical resistance, water insensitivity, and thermal stability at high and low temperatures. **BB-EPOXY-0001** may also be used under traditional floor coatings (such as epoxies, polyurea's and polyurethanes) or tiles to smooth the joints and provide protection from cracking and sinking caused by non-elastomeric joints sealants.

PRIMARY APPLICATIONS

BB-EPOXY-0001 was designed to protect against the abuse to concrete joints caused by heavy load transfers from such items as forklifts, steel-wheeled carts and trash dumpsters. Some typical uses include:

- ◇ Concrete Control/ Expansion Joints
- ◇ Concrete Spall Repairs
- ◇ Cold Storage Facilities
- ◇ Merchandise Distribution Centers
- ◇ Home Improvement Stores
- ◇ Bridge Headers
- ◇ Warehouse Floors
- ◇ D.O.T. Road Sensor
- ◇ D.O.T. Pothole Road Repair
- ◇ U.S.D.A and F.D.A Acceptable

Typical Physical Properties

		2:1
Tensile Strength (PSI)	ASTM D412	2950
Elongation (%)	ASTM D412	350
100% Modulus	ASTM D412	1620
Tear Strength (PLI)	ASTM D412	500
Hardness (Shore A)	ASTM D2240	95A
Flexibility (1/8" Mandrel)	ASTM D1737	Pass
Flashpoint (°F)	ASTM	>200
	Pensky-Martin	
Taber Abrasion (mg loss) CS18 Wheel 1kg per 1000 cycles	ASTM D4060	25

*Optional based on configuration; ask representative for details



Typical Physical Properties (Continued)

			2:1
Viscosity	B Side	CPS	1200
Viscosity	A Side	CPS	400

Typical Processing Properties

Gel Time	Minutes	2
Tack Free Time	Minutes	5
Open to Industrial Traffic	Minutes	15

APPLICATION EQUIPMENT

This material may be applied using a plural component pump (2:1 or by volume), or by plural component cartridges. This proportioning unit must be capable of supplying the correct pressure and heat for the required hose length on a consistent basis. This characteristic is mandatory to apply this elastomer in a consistent, efficient manner. The applicators for the plural component cartridges can be manual, pneumatic, or battery operated.

AVAILABLE COLORS

- ◇ Black
- ◇ Custom tinting on request

INSTALLATION RECOMMENDATIONS

BB-EPOXY-0001 adheres well to sound concrete substrates. All surfaces should be free of moisture, loose particles and debris. Any moisture present in the joint should be eliminated prior to installation. Using a diamond blade saw, saw the joint vertically to 90° angles to a minimum depth of 1 inch. The joint should be widened slightly to ensure adhesion to freshly opened concrete. Care should be taken not to adversely affect adhesion by “burnishing” the sides of the joint with a grinder. After sawing or grinding, care should be taken that minimal amounts of dust and debris are left over in the joint. The joint should be vacuumed using a common “shop-vac” to remove as much dust and debris as possible or high pressure air depending on the site location. BB-EPOXY-0001 should be placed in the joint full depth, overfilled, and allowed to cure for a minimum of ten minutes before shaving level with the concrete. Spalls/Blowouts: Remove all existing material from the spall or blowout. Any moisture present in the spall should be eliminated prior to installation. Using a diamond blade saw, saw the joint vertically to 90° angles to a minimum depth of 1 inch. The spall should be widened slightly to ensure adhesion to freshly opened concrete. Care should be taken not to adversely affect adhesion by “burnishing” the sides of the joint with a grinder. After sawing or grinding, care should be taken that minimal amounts of dust and debris are left over in the spall.



APPLICATION NOTES

It is very important to maintain constant pressures while installing BB-EPOXY-0001 with a plural component pump. A variation in pressures can result in loss of properties, poor color retention and bubbling. Hose heat is not required at ambient temperatures. Low temperatures may require the use of hose heat to improve flow ability.

REPAIRS AND MAINTENANCE

Repairs to divots caused by unforeseeable abuse can be repaired very easily. The damaged area should be removed to sound BB-EPOXY-0001 and concrete. It may be necessary to remove BB-EPOXY-0001 with a pocketknife or pneumatic saw and should include removal of all damaged materials to the fresh concrete. The damaged area should be squared to 90° and solvent wiped with acetone. BB-EPOXY0001 should be placed in the damaged area.

CLEAN-UP DISPOSAL

Cured product may be disposed of without restriction. The uncured isocyanate and resin portions should be mixed together and disposed of in a normal manner. "Drip-free" containers should be disposed of in accordance with local, state and federal laws.

SAFETY AND HANDLING

Refer to MSDS Sheets

SHELF LIFE AND STORAGE

Six months in factory delivered unopened drums or plural component cartridges. Keep away from extreme heat, cold, direct sunlight, and moisture. It is recommended to keep the material at a stable storage temperature between 60°F and 80°F as much as possible. The components used in the BB-EPOXY-0001 have been specially formulated to withstand a certain amount of low temperature applications. However, it is recommended to warm the material to a minimum of 60°F before application if the material is cold. This is to help with flow and proper mixing.

PACKAGING

BB-EPOXY-0001 is available in 450ml cartridges for easy mixing and installation.

SHIPPING INFORMATION

BB-EPOXY-0001 can ship standard ground or via commercial truck lines as a non-regulated/nonhazardous liquid resin.

LIMITATIONS

BB-EPOXY-0001 is an aromatic polyurethane. While the physical properties may not be affected, the elastomer could yellow and chalk with exposure to UV or Hg vapor light. It is highly recommended to use a dark color for any applications requiring color stability. If color stability is mandatory, contact the manufacturer for recommendations. The chemical resistance chart should be consulted prior to any application. BB-EPOXY-0001 was designed to protect the edges of concrete control and expansion joints. BB-EPOXY0001 will pull away from the joint edges if too much slab movement is encountered. This characteristic allows for early replacement and to alert the property owners that movement is present.

APPLICATION NOTES

WARRANTY

The technical data and any other printed information furnished by Blue-Band LLC. is true and accurate to the best of our knowledge. BB-EPOXY-0001 conforms to in-house quality control procedures and should be considered free of defects. Due to the wide range of applications of this product, it is impossible to assume responsibility for any errors in regard to application, coverage, workmanship, over-spray or injuries resulting from the use of BB-EPOXY-0001. Blue-Band, Inc. makes no warranty, expressed or implied, or it products and shall not be liable for indirect or consequential damage in any event.

ADHESION RESULTS

ASTM D-4541 Elcometer

Concrete (No Primer) >400 psi=> Concrete

Chemical Resistance			
CHEMICAL	RESULT (25° C)	CHEMICAL	RESULT (25° C)
Acetic Acid (100%)	RC	NaCl / h2o (10%)	R
Brake Fluid (DOT3)	RC	Potassium Hydroxide (10%)	R
Clorox® (10%) H2O	C, Dis	Sodium Hydroxide (10%)	R
Diesel Fuel	R	Sodium Bicarbonate	R
Gasoline	R	Sugar / H2O (10%)	R
Hydrochloric Acid (10%)	R	Sulfuric Acid (10%)	R, Dis
Hydraulic Fluid (Oil)	R, Dis	Sulfuric Acid (>22%)	NR
Mineral Spirits	R	Vinegar / H2o (5%)	R
Motor Oil	R, Dis	Water	R
Muriatic Acid (10%)	R	Xylene	C

RESULT LEGEND

- R Recommended (Little or no visible damage)
- RC Recommended Condition (Some effect, swelling, discoloration)
- C Conditional (Crackling wash down within 1 hour of spillage to avoid effects)
- NR Not recommended
- Dis Discoloration



ADDITIONAL RESULTS

In certain cases, it may be recommended by the manufacturer to utilize a different formulation speed or hardness depending upon the specific needs of the application. The BB-EPOXY-0001 series offers several different hardness readings from 45 (Shore A) to 75 (Shore D). The physical properties, gel times and reaction times vary with the formulation. The BB-EPOXY-0001 formulations are available in 2:1 and 1:1 volume ratios. Call the manufacturer for specific technical information.

COVERAGE CALCULATIONS

Coverage Rate=ft./gal: Does not include overfilling.

JOINT WIDTH (Inches)					
Inches	1/8 inch	1/4 inch	1/2 inch	3/4 inch	1 inch
1/8	1230	615	3308	205	154
1/4	615	308	154	102	77
1/2	308	154	77	51	38
3/4	205	103	51	34	25
1	154	77	38	25	19
1 1/2	103	51	25	17	12
2	77	38	19	12	9
3	52	25	12	8	6

NOTICE

The information describing the physical properties of samples made from these chemicals is offered in good faith and should be used only as guide for design requirements. Results may vary due to different equipment and conditions. Blue-Band, Inc. makes **no warranty expressed or implied** of its products and shall not be liable for indirect or consequential damages in any event.



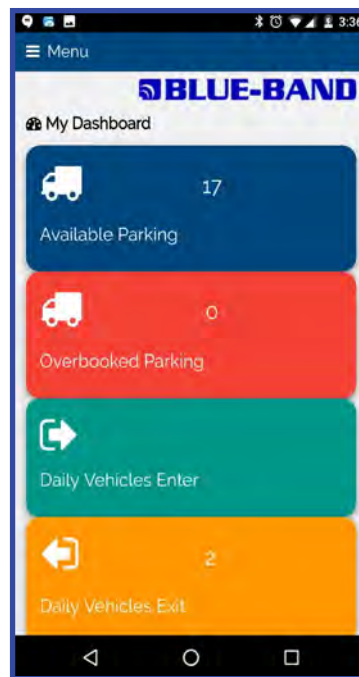
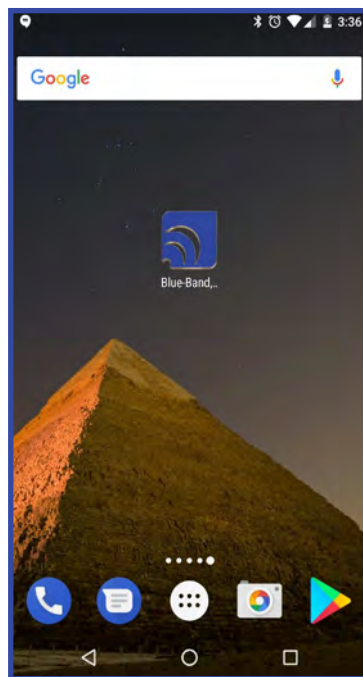
BLUE-PARK LITE SOFTWARE (BPLS)

Local Server - Facility Smart Parking Management System (FSPMS) Option 1

BPLS is ideal for agencies that want a simple, cost-effective system for Facility Management. Blue-Band defines Facility Management as monitoring the total space availability count based on ingress/egress of garages and surface lots.

Blue-Band understands the need for flexibility of a Smart Parking Management System. The Blue-Park Lite Software was created to provide that flexibility and remove the one size fits all approach. The light version can track a facility vehicle counts as customers exit and enter a facility and allows users to utilize their Google Chrome mobile browser to view easy to read parking availability on their mobile device.

MOBILE LITE app (GOOGLE CHROME BROWSER)

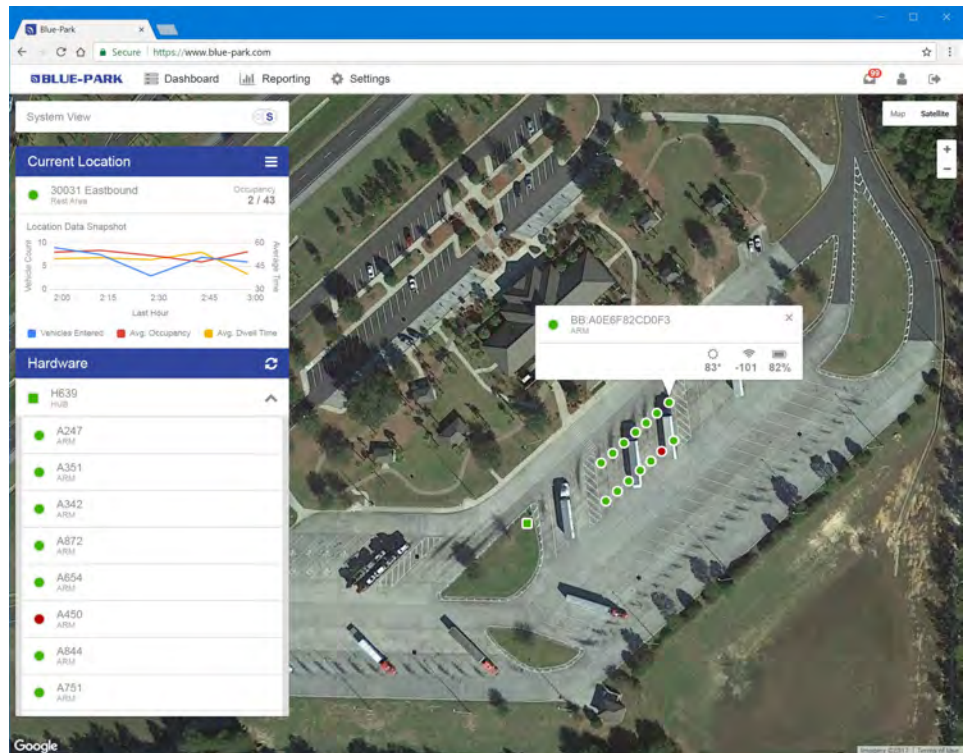


BLUE-PARK ENTERPRISE SOFTWARE (BPES)

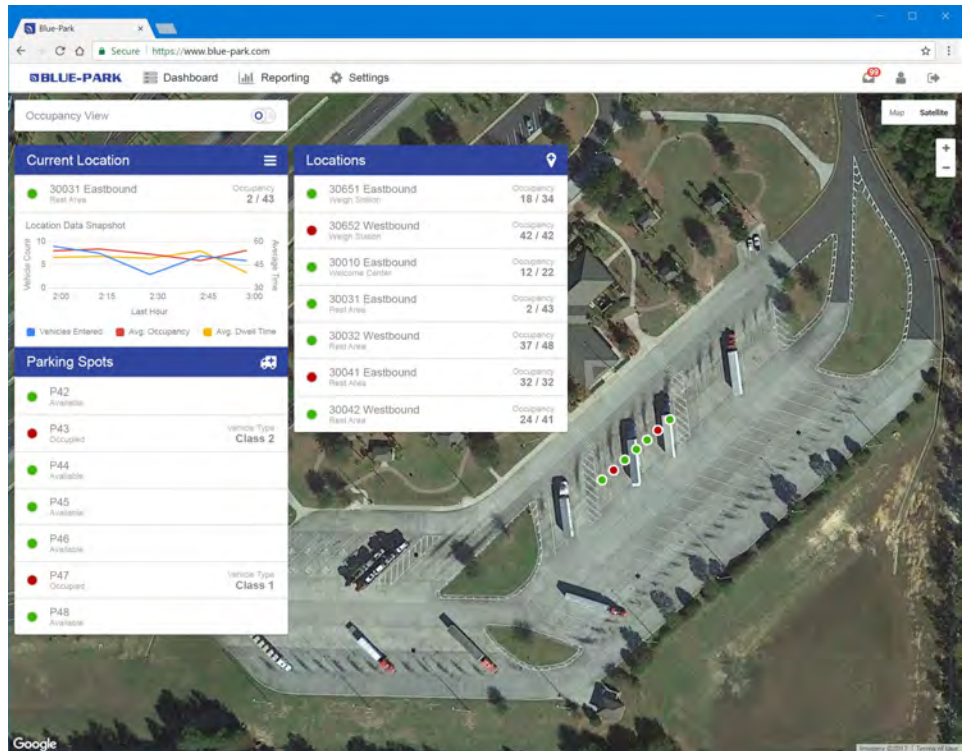
Blue-Band defines “Enterprise Management” as monitoring the total space availability count based on ingress/egress of garages and surface lots as well as the ability to monitor per space occupancy of garages, surface lots and on-street spaces citywide.

The Blue-Park Enterprise Software is possibly the most robust parking software in the market today. It is an evolving software that is modular, features and applications are added specifically for our end users’ projects. The Blue-Park Enterprise Software extends its capabilities to truck parking with enforcement on size classification while providing facility and per space availability information. The Blue-Park Enterprise Software tracks occupancy of a utilized space making metering digitally with the options to add a payment and user profile module possible. The Blue-Park Enterprise Software edition creates a platform that is the basis for any vehicle and parking tracking application with the flexibility to be modified for new future endeavors.

ENTERPRISE DASHBOARD Health & System Overview



ENTERPRISE DASHBOARD
Location / Device View



ENTERPRISE DASHBOARD
Per Space View

