



## **LIGHTWORKS®**

### **iSentient Series**

### **Smart Emergency Lighting**

### **Applications**

Schools, Universities and  
Research Facilities

Hospitals, Medical  
and Healthcare

Nuclear Power  
Generation Facilities

Utilities

Telecommunications

Industrial and Chemical  
Processing Facilities

Law Enforcement

Fire Protection and Security

Military Services

Government  
Emergency Management

In any industry, unexpected power outages impact safety, impede recovery and increase risk scenarios for first responders and technicians. Dependable, resilient emergency lighting is essential to mitigating these unplanned power disruptions. BlackStarTech® Lightworks® iSentient Series Smart Emergency Lighting delivers essential emergency lighting that meets or exceeds emergency and regulatory facility lighting requirements. iSentient devices provide advanced LED lighting, state-of-the-art battery technology, self-diagnostic testing of battery health, and remote performance monitoring communications. With this suite of technology-enabled lights, you can remotely manage and maintain your smart emergency lighting across your facility, automate surveillances, minimize maintenance, and reduce lifecycle costs.

BlackStarTech utilizes Lithium Iron Phosphate (LiFePO<sub>4</sub>) batteries to power the iSentient Series. This advanced battery technology provides longer illumination durations of up to 24 hours in a two-headlamp configuration. The batteries are nearly 50% lighter, have twice the power density, and a much longer life than traditional lead acid batteries.

## Lightworks® iSentient Series Smart Emergency Lighting vs. Competitor's 2-Headlamp Emergency Lighting

iSentient Series	Typical Competitor
Up to 24-Hour LED run time (3x longer lasting)	8-Hour LED run time
Increased reliability using Lithium Iron Phosphate (LiFePO <sub>4</sub> ) batteries	Competition utilizes NiCad batteries, Lead Calcium, or Lead Acid batteries
15-year expected battery lifespan	4-8-year battery lifespan
Predictive self-diagnostics (available locally & through remote application)	Limited push-to-test switch and charge rate/power indicator
Remotely monitor health performance of all devices, with real-time communication updates	Time-intensive, manual field monitoring and maintenance of individual lighting devices
15,000 rechargeable battery cycles	4,000 rechargeable battery cycles
Fully charged in less than 24 hours	Fully charged in 24-48 hours
Lumens: 0.6 foot candles at 75 feet	Lumens: 0.1 foot candles incandescent and 0.19 foot candles LED
Cyber secure operation prevents hackers from impacting the device	Not available from known competitors

### LiFePO<sub>4</sub> Batteries: Superior and Safer Than Your Typical Industry Batteries

LiFePO<sub>4</sub> batteries are safe, reliable, and more environmentally friendly than lead acid batteries. While the battery management system (BMS) performs advanced self-diagnostics to protect the battery, the chemical make-up allows the battery to maintain a longer expected lifecycle of 15 years. This means fewer battery replacements, less downtime, and increased reliability.



Standard emergency lighting devices often use lead acid batteries which need to be replaced every 3 to 5 years. Additionally, they often require weekly and monthly manual validation checks, experience frequent failures, and can incur expensive repairs. As for the iSentient Series, they rely on LiFePO<sub>4</sub> batteries, providing significant maintenance cost savings due to the lifespan and little to no maintenance required as they can be monitored remotely. It's estimated that a customer could save up to \$150,000 in annual materials and maintenance costs when switching to the iSentient.

The internal BMS optimizes functionality and safety. The system monitors battery health including cell voltage, maximum charge and discharge current, overvoltage, overcurrent, temperature, cell balancing, short circuit, and more. The BMS takes protective actions to improve reliability and safety using notification alarms through data communications or by automatically disconnecting the battery. Temperature monitoring self-diagnostics eliminate the possibility of extreme temperatures from battery operation, thereby preventing thermal runaway.

## Regulatory Requirements

The iSentient Series Smart Emergency Lighting devices meet and exceed stringent code requirements across several industries. They are easily mounted to illuminate critical equipment, egress pathways, and work areas.

- **Nuclear Regulatory Commission (NRC) Appendix R Requirements**
- **OSHA regulation 1910.37(b)(1)**
- **National Fire Protection Association (NFPA) 101 Life Safety Code, Sections 7.8.1.3 and 7.9.2.1**
- **International Building Code (IBC) Section 1008**
- **UL 924 Compliant**



### **iSentient Series - Base Model # LWSS**

The long-lasting battery coupled with the latest cyber-compliant technologies sets a new standard for deploying smart emergency lighting solutions across your critical infrastructure and facilities. The iSentient Series minimizes maintenance through an embedded 24/7 self-diagnostic monitoring and battery health routine while establishing a platform for advanced remote monitoring, automation, and facility surveillance.



### **iSentient Flame Detector Series - Base Model # LWFF**

The iSentient Flame Detector Series adds another capability on top of the emergency lighting. This series includes a flame detector with a wide viewing angle that enables simple coverage of fire hazard areas across many fire hazard applications. The device detects wide range of hydrocarbon & non-hydrocarbon fires. Set-up and operation are simple. Wide area coverage and fast speed of response optimize safety.



### **iSentient Smoke Detector Series - Base Model # LWFS**

Building upon the iSentient Emergency Lighting platform, the iSentient Smoke Detector Series delivers 3-in-1 ionization smoke, fire, and carbon monoxide detection in a single installation. The iSentient Smoke Detector Series provides a smart way to protect businesses, factories, refineries, and other industrial sites.



### **iSentient Shot Detector Series - Base Model # LWSD**

Identify active shooter incidents in sensitive areas, such as college campuses and schools, corporate offices, industrial plants, hospitals, or research facilities with the iSentient Shot Detector Series. In addition to providing emergency lighting, the iSentient Shot Detector Series automatically detects gunshots and notifies internal and external personnel. If granted permission, any first responder can access the software and obtain live mapping of the shooting location and live video feeds of the incident. This device can enhance security with instant response, providing officials with live-time alerts, logged time stamps, and location mapping of the incident.



## OPTIONAL CONFIGURATION ENHANCEMENTS

iSentient Series Smart Emergency Lighting is designed to provide LED lighting to not only enhance facility emergency safety but also to augment other safety measures. Optional features are available for each iSentient device, providing optimal experiences to meet your facility's needs.

### HEADLAMPS

iSentient devices use 9 chip Cree LED headlamp with 60-degree beam angle, 6000k color temp, and provides 0.6 foot-candles at 75-feet. The headlamps support both local (attached) and remote headlamps. Each lighting device can have up to four headlamps with a combination of zero to four local or remote, while not exceeding greater than four total headlamps.

### CAMERAS

Optional dual cameras provide 200-degree viewing for security and monitoring. The iSentient Terminal Software Program, integrated in the iSentient devices, controls the cameras via computer or server system. Administrative, security, or operations personnel can control the cameras using a controlled IP address through the iSentient Terminal Software program.

### MOUNTING SHELF

While the iSentient can be completely portable, it is designed to be easily installed with a seismically qualified mounting shelf 60639 or is compatible with an existing seismic II/I mounting shelf, such as the Big Beam/Teledyne model 22 mounting shelf. Units are typically wall-mounted with AC power accessible from either side of the unit by rigid or flex conduit. Alternatively, an AC power cable with a cord grip entrance fitting can be installed to allow the device to be plugged into an available wall power outlet.

### MEDIA – SECURE DIGITAL AND SOLID-STATE DRIVE

Since iSentient devices are optically isolated, its unique cyber secure operation allows information to safely leave the device but prevents external information from impacting the device. The standard 8GB micro secure digital (SD) card for the Single Board Computer operating system provides ample storage space to hold your information. If more space is needed for video footage or historical data logs, the optional solid-state drive (SSD) offers 128GB of expanded storage. Each iSentient device will keep storing information on the SD Card until it reaches 80% capacity upon which time it will start over writing files. Note: The optional SSD can potentially be provided in larger capacities. Contact us for more information.

### LTE CONNECTIVITY

iSentient includes an option for Long Term Evolution (LTE) communications network functionality, which provides a quick and encrypted connection to securely monitor all iSentient devices. The LTE feature requires an LTE SIM card setup and configuration to connect to any global commercially licensed LTE carrier (e.g., AT&T, Verizon, or T-Mobile) or a private LTE network enabled by new Citizens Broadband Radio Service (CBRS) frequencies.

### PHOTOCONDUCTIVE PHOTOCELL

Photocells are a customized option with the iSentient Series and can be configured to customer specifications. For instance, if AC power to the iSentient device is lost, but there is still adequate daylight or another lighting source, having the Photocell means the lights will not turn on, saving battery life. Or the Photocell will turn on lights even if primary AC to the iSentient device remains in place but other facility lighting fails. The Photocell option can also be configured to an override switch, enabling or deactivating Photocell light detection.

## iSENTIENT INTERNAL CONTROL SYSTEM

The Internal Control System firmware code is developed and flashed on the SQUAD-7 cyber secure printed circuit board that is part of every iSentient unit to control and monitor each individual device.

The predictive software:

- Self-monitors, displaying local parameter performance on the device, including overvoltage, undervoltage, and high/low temperatures
- Performs self-testing to gauge overall health and longevity
- Optically isolated, parameter data can only be sent out through the communication software
- Automatically turns the LED head lamps on when AC Power goes out

### iSentient Internal Single Board Computer Communication Software

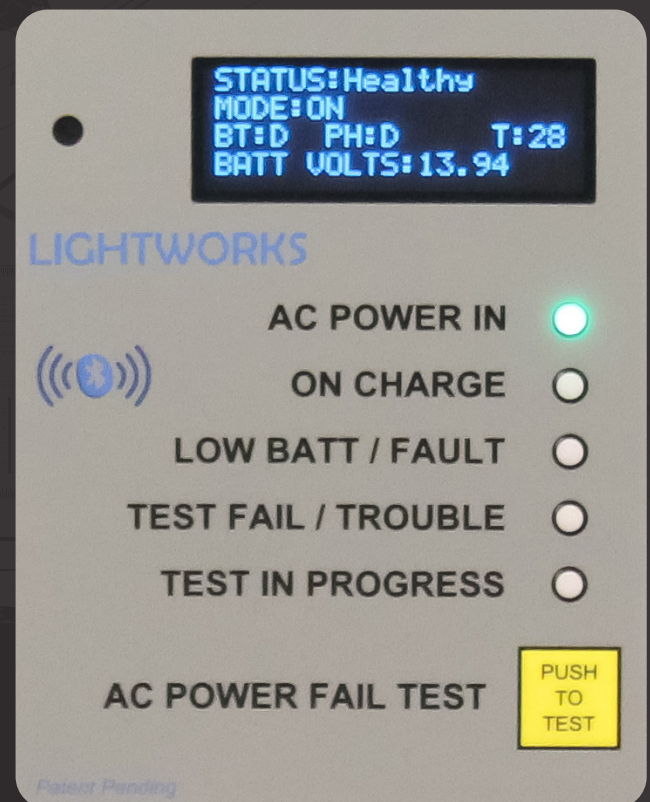
iSentient devices have various features that rely on the standard Internal Single Board Computer to communicate parameter status data from the optically isolated control system running on the printed circuit board. The Internal Single Board Computer collects data, such as recorded alarms, statuses, health diagnostics, and battery performance, from the iSentient's internal control system.

The Internal Single Board Computer can send recorded data through its standard Bluetooth connection or a selected network (standard Wi-Fi or with LTE option) to the iSentient Terminal Software Program. The Internal Single Board Computer requires a boot card device that is programmed into the iSentient device.

### iSentient Bluetooth Application

If an iSentient device is not able to access LTE or Wi-Fi, nor able to connect to a server, the data can be locally retrieved using the iSentient Bluetooth Application. This application can be licensed and used to manually capture the same data as the Terminal Software Program by retrieving the status information directly at the device.

The iSentient Bluetooth App installed on the end user's mobile device allows the user to collect and save component status health logs of the iSentient device as specified by user input. The Bluetooth App can pull a specified range of time and download entire component health logs stored on the component SD Card. The data captured is then transferred to the Terminal Software Program via Wi-Fi or LTE interface.





## iSentient Terminal Software Program

This software system allows you to easily integrate and monitor all your iSentient devices. The Terminal Software Program enables you to monitor multiple iSentient devices that can be connected through Wi-Fi or LTE, or manually through Bluetooth downloads.

### Terminal Software Capabilities:

- Display, record, and save all iSentient statuses, including the unit's state of health, battery health, and surveillance parameter data
- Control ancillary optional functions, such as flame detectors, cameras, etc., through the Single Board Computer
- Notify designated individuals when changes occur

The Terminal Software Program functions as a communicating and reporting interface with one or more network connected iSentient devices.



iSentient Series feature fire resistant enclosures that are weatherproof, seismically qualified and utilize internal electronic designs that meet or exceed all cyber security requirements.

## SOFTWARE LICENSING DETAILS

### iSentient Terminal Software Program

The iSentient Terminal Software Program can be licensed for a one-time fee, which covers all iSentient devices at your site. The Terminal Software Program enables use of Wi-Fi or LTE to retrieve the status of the device's state of health, battery health, and surveillance parameter data.

Software Model Number: LWSS-Terminal

### iSentient Bluetooth Application

The iSentient Bluetooth Application can be licensed for a one-time fee, which covers all iSentient devices at your site. The Bluetooth App leverages standard hardware on the device to facilitate manual performance monitoring of iSentient devices in areas without Wi-Fi access.

Software Model Number: LWSS-Bluetooth

## How To Order

Base Model Number	Local Head Lamps on the Device	Remote Head Lamps Associated with the Device	Cameras	Mounting Shelf	Solid State Drive (SSD) Additional Internal Storage	LTE Connectivity	Photoconductive Photocells
<b>LWSS</b> iSentient Series	<b>L0</b> = none <b>L1</b> = one <b>L2</b> = two <b>L3</b> = three <b>L4</b> = four	<b>R0</b> = none <b>R1</b> = one <b>R2</b> = two <b>R3</b> = three <b>R4</b> = four	<b>C</b> = with 2 cameras <b>0</b> = without cameras	<b>M</b> = with permanent mounting <b>0</b> = without permanent mounting	<b>D</b> = with 128GB SSD <b>0</b> = without SSD	<b>LTE</b> = with LTE Connectivity <b>000</b> = without LTE	<b>P</b> = with photoconductive photocells <b>0</b> = without photoconductive photocells
<b>LWSD</b> iSentient Shot Detector Series	Total Local + Remote is not to exceed 4.	Total Local + Remote is not to exceed 4.					
<b>LWFF</b> iSentient Flame Detector Series							
<b>LWFS</b> iSentient Smoke Detector Series							

Example model number: LWSS-L2R2-CMD-LTE-P denotes Lightworks iSentient Smart Emergency Lighting device with 2 Local Headlamps, 2 Remote Headlamps, Cameras (2), Mounting Shelf, SSD, LTE Connectivity and Photocell.

For more information on standard or customized products, contact us at 1-844-585-6439 and [info@blackstartech.com](mailto:info@blackstartech.com).

Specifications		iSentient Series	iSentient Shot Detector Series	iSentient Flame Detector Series	iSentient Smoke Detector Series
iSentient Device		Base Model # LWSS	Base Model # LWSD	Base Model # LWFF	Base Model # LWFS
	Dimensions (W x H X D)	16.5"x 16.5"x 9"			
	Weight	21 lbs	21 lbs	21 lbs	21 lbs
	Operational Temperature	0° - 140° F			
Enclosure Case					
	Nema Rating	4			
	Ingress Protection Rating	IP 65 guards against overhead water deluge			
	Unit Fire Protection	UL 94-V0 self-extinguishing resin			
	Pressure Equalize	2L/min equalization vent			
Battery					
	Voltage	12.8 VDC			
	Wattage	38ah			
	Battery Type	12.8 VDC LiFePO <sub>4</sub>			
	Battery Run Time 100% SOH 1/2/3/4 Heads	52 hrs / 24 hrs / 17 hrs / 13 hrs			
	Battery Run time 70% SOH 1/2/3/4 Heads	36 hrs / 18 hrs / 12 hrs / 9 hrs			
	Cell Certification	CE / RoHS / UN38.3 / UL 1642 / IEC 62133 / CB			
Charger					
	Size	14V 4 amp CC-CV battery charger			
	Charge Time 100% DOD	>0C 12 hrs / <0C 24 hrs			
Mount					
	Mount Type	Shelf 60639			
	Mount Dimensions (W x H X D)	15.25"x 9.61"x 9.13"			
Software					
	Bluetooth App (Licensing Fee Required)	Available			
	Terminal Software Program (Licensing Fee Required)	Available			
Lighting					
	Lighting Type	9 Chip Cree LED 60-degree beam angle			
	Lumens	910 lm 6000k color temp			
	Lamp Head Dimensions	4.5" diameter x 1.5" depth			
	Local Head Lamp Count (cannot exceed more than 4 remote/local lamps)	0 - 4	0 – 2	0 – 2	0 – 2
	Remote Head Lamp Count (cannot exceed more than 4 remote/local lamps)	0 - 4			



Specifications		iSentient Series	iSentient Shot Detector Series	iSentient Flame Detector Series	iSentient Smoke Detector Series
Cameras					
	Number Count Available	0 – 2			
	Resolution	1920X1080			
	Lens Size	1/2.7 inch			
	Power Consumption	150mA			
	Power	5V			
	Operating Temperature	-10 ~ +50°C			
	Pixel	1080P			
	Dimensions	15*15*19mm			
Connectivity					
	Bluetooth Capability	Yes			
	Wi-Fi	Yes			
	LTE Connectivity	Available			
Storage					
	Secure Digital (SD) Card	8 GB			
	Solid State Drive (SSD)	128 GB SSD			
Qualifications					
	EMC/RFI	NRC Regulatory Guide 1.180R1, EPRI TR-102323 R4, MIL-STD-461, & IEC-6100-4 EMC Part 4 Testing			
	UL	UL-924 10th Edition and UL-746C Crush & Impact Testing; UL 924 10th Edition Design, Flammability and Environmental Testing			
	Seismic	IEEE 344-1975 and IEEE 323-1974 testing			
	UN-DOT	Pending			
Shot Detector					
	Shot Detector Measuring Range Small arms fire (22LR/9mm)		Indoor: Typical 2500 ft3 -25000ft3 depending on configuration of room  Outdoor: within 60ft from front of sensor with FOV 120-150 degrees depending on environmental conditions (wind/rain)		
	Shot Detector Measuring Accuracy		>95% based on environmental and room configuration form factors		
	Shot Detector Frequency		~1-2 secs		
	Shot Detector Microphone Type		Patented acoustic and concussion sensor operating from room atmosphere		

Specifications		iSentient Series	iSentient Shot Detector Series	iSentient Flame Detector Series	iSentient Smoke Detector Series
Smoke Detector with +135°F (+57°C) Heat and Carbon Monoxide Sensors					
	Dimensions				6.75 in. x 2.25 in. (17.1 cm x 6.4 cm)
	Power Up Time				22 seconds maximum
	Operating Temperature Range				+32°F to +100°F (0°C to +38°C)
	Electrical Current Alarm				20 mA minimum at 8.5 VDC; 35 mA maximum at 32 VDC
	Voltage (Standby)				8.5 VDC to 32.0 VDC
Flame Detector					
	Dimensions			125 x 80 x57 mm	
	Weight			465 g	
	Response Time			<10 Seconds	
	Temperature Range			Hazardous Area: -25 °C to +70 °C Safe Area: -40°C to +70 °C	
	Spectral Range			2.7 – 5.0 Microns	
	Maximum Range			35 Meters (115 ft) 0.09 m2 (1 sq.ft.) Heptane pan fire	
	Field of View			90° x 90°	
	Input Power			10-28 VDC	
	Current (Normal)			25 mA @ 24 VDC	
	Current (Alarm)			35 mA @ 24 VDC	
Photocell					
		Optional	Optional	Optional	Optional

For more information on standard or customized products, contact us at 1-844-585-6439 and [info@blackstartech.com](mailto:info@blackstartech.com).



## LIGHTWORKS® iSentient Series Smart Emergency Lighting. A device for any application.





# **BLACKSTARTECH<sup>®</sup>**

Resilient Solutions for Targeted Power, Lighting and Communications.  
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