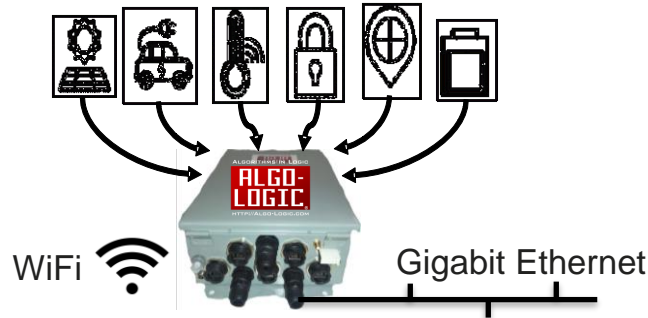


# Black Diamond: Data Acquisition System

(Industrial, Mobile, and Rackmount)

ALGORITHMS IN LOGIC

**ALGO-LOGIC**  
HTTP://ALGO-LOGIC.COM



## Black Diamond Industrial

### Description

The Black Diamond (BD) system is a high performance, intelligent Real-Time Data Acquisition System. It collects real-time data from a wide range of sources including analog sensors and network attached devices. Using logic in a Field Programmable Gate Array (FPGA) embedded within a System-on-Chip (SoC), BD captures and streams data to the Algo-KVS Cloud for real-time processing and to the Algo-Central Cloud for historical archiving and trend analysis.

The BD has three form factors that allow it to be used for industrial, mobile, and datacenter applications. Connectivity is not a problem, because it supports wired Gigabit Ethernet and wireless b/g/n WiFi and can be expanded to support 5G.

BD utilizes algorithms in logic to deterministically collect, filter, precision time-stamp, and archive data.

### Applications

- Real-time monitoring of critical sensor data
- Data collection for connected cities
- Energy monitoring, load balancing, and cost/price management
- Risk and failure analysis
- Manufacturing process control
- Oil and gas exploration / mining research
- Continuous structural monitoring
- Monitor or control fluid properties, material mechanical properties, and pressure, temperature, stress, strain, voltage and current

### Key Benefits

BD System:

- Records data from up to 15 precisely synchronized data acquisition channels
- Certified to collect data from a wide range of sensor types
- Operates without a fan for use in cleanrooms and outdoor/on-site locations
- Runs from DC, AC, battery, or solar power
- Accelerates algorithms in FPGA hardware
- Provides precision timestamp with GPS accuracy
- Provides real-time access to data from your PC, tablet, or smart phone

### Enclosure Configurations



Black Diamond Industrial

Black Diamond Mobile

Black Diamond Rackmount

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## Black Diamond System Specifications

Input range	Analog voltage range: 0-5V single-ended
ADC resolution	24 bit (17 to 18 ENOB)
Filter	Phase aligned and 10 <sup>th</sup> order Butterworth low-pass at 48Hz
Analog input channels	15
Local storage	500 GB SSD with optional flash storage device including failover
Data output	AlgoCentral, Key Value Store (KVS), and/or local user interface
Data retrieval	Retrieval from browser and network API
Available sensors	Acceleration, tilt, mass flow, optical, piezo, temperature, torque, chemical, electric current, electric potential, magnetic, moisture, humidity, fluid velocity, position, angle, strain, pressure, force, density, fluid level, proximity
Additional I/O controls	GPIO, & digital (additional analog customizations available on request)
Input impedance	1MΩ
Input Power	9 to 18V DC, 120/240V AC, or Power over Ethernet (PoE)
Communication	Gigabit Ethernet, b/g/n WiFi
Sensor connection interfaces	Shielded RJ-45
Time accuracy	GPS disciplined oscillator: 300 nanosecond resolution, sub microsecond accuracy
Form factors available	Hoffman enclosure, Pelican Case enclosure, or 1U Rack chassis
Heterogeneous computation	Field Programmable Gate Array (FPGA) with embedded ARM CPU
Local user interface	Client data browsing on laptop, tablet, or smart phone

## Black Diamond (BD) System Specifications

