



# DEK Series Solution Profile

## Mining and Aggregate Operations



**Break out from the four walls of your enterprise and monitor anywhere with the DXM Enclosure Kit Series.**

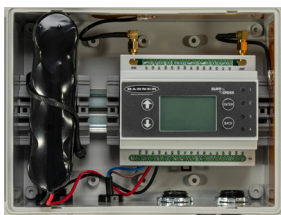
Build standalone monitoring systems with a kit that includes everything needed to deploy an end-to-end solution. This cellular-enabled offering from Banner Engineering arrives complete with a weatherproof enclosure, world class gateway controller, and an optimized solar-charging system with battery power supply.

Prepaid access to cloud software tools will capture critical data allowing you to acquire insights and make data-driven decisions about your operation. Monitor vibration, temperature, humidity, material levels, duty cycles, and pressure while creating alerts to prevent failures and costly downtime.



### Kit Features

- Cellular-enabled gateway controller with battery power supply and optimized solar-charging circuit
- Kit includes environmentally rated enclosure, solar panel, battery, antennas, mounting and cabling hardware
- Data inputs include analog and discrete signals with modbus, SDI-12, and wireless data communication
- Prepaid 90 day trial for Banner Cloud Data services and cellular service management with the Banner Cell Data web portal



DXM Enclosure Kit



5W Solar Panel

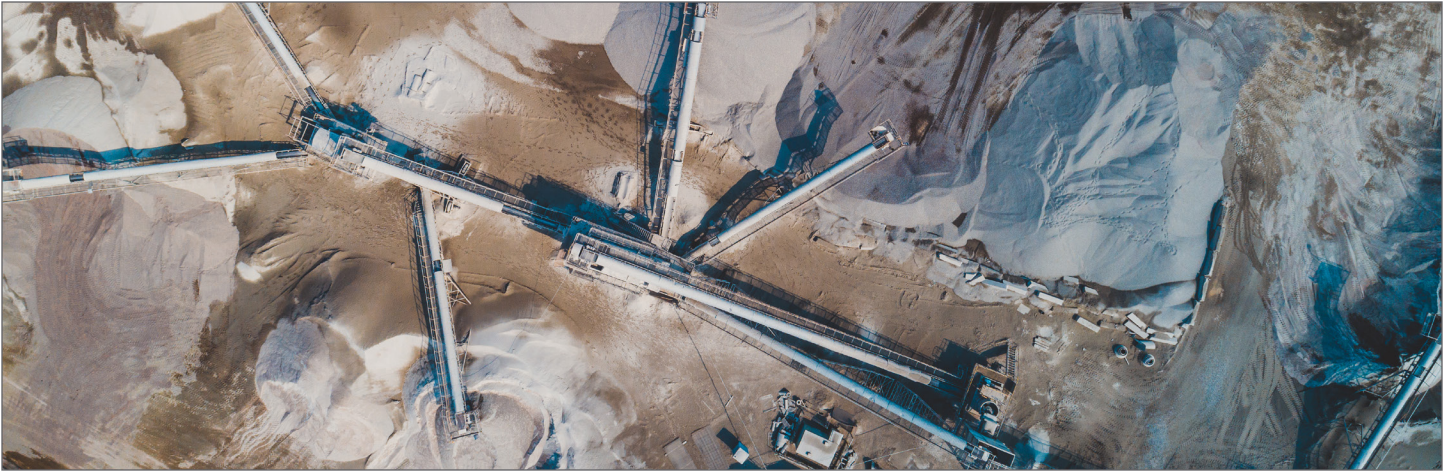


Banner Cloud Data Services



Banner Cell Data

Model	Description	Radio Frequency	Cell Carrier
DEK100-A1-V	DXM100-A1 VZW Controller, Enclosure with Glands, Solar Panel, and Battery	—	Verizon
DEK100-A1-A	DXM100-A1 ATT Controller, Enclosure with Glands, Solar Panel, and Battery	—	AT&T
DEK100-A2R1-V	DXM100-A1 VZW Controller, Enclosure with Glands, RF Module, Solar Panel, and Battery	900 MHz	Verizon
DEK100-A2R1-A	DXM100-A1 ATT Controller, Enclosure with Glands, RF Module, Solar Panel, and Battery	900 MHz	AT&T



# DEK Series Solution Profile

## Mining and Aggregate Operations

### Customer Industry

The mining industry pulls valuable resources from the earth providing material used within billions of products each year. The aggregate industry gathers and processes stone, gravel, and sand used in the construction and landscaping of our environment. Each of these industries offer unique challenges throughout their operations that could be resolved through the use of condition monitoring and analytics.

### Background

Operational understanding is critical, not only for site activities, but also for regulatory purposes. Actively monitoring and controlling operational systems can prevent failures that lead to downtime and lost productivity.

### Requirements

- Track and monitor operations for regulatory compliance reporting
  - Dewatering operations
  - Dust control
  - Operation hours
- Perform Condition Monitoring on conveying, pumping, and mobile equipment to maximize operational performance
- Connect to the instrumentation sensors of your crush, conveying, and process operations

### Challenges

- Remote locations of assets without available power and network communication
- Collection of data to common repository for analysis and visualization of trends is often difficult with independent systems
- Maintenance checks and repairs are costly without preemptive alerts

### Solution

The DXM Enclosure Kit (DEK) Series is well equipped to address the requirements of monitoring and control of aggregate and mine processing systems. The solution is the pivotal component that can collect data for operating and regulatory purposes. Gather information on your conveying and crushing systems as well as pumping and dust control operations. The data is then processed with the Banner Cloud Data Services web-based software where it can be visualized and alert notifications can be delivered.





# DEK Series Solution Profile

---

## Mining and Aggregate Operations

The DEK Series is designed to easily implement Banner solutions, as well as sensors and equipment from other manufacturers that assist you with creating the most comprehensive solution for your needs. Below are monitoring considerations within your industry and recommended Banner offerings that meet the requirements of your application.



### *Dewatering*

Monitor various aspects of the dewatering process such as the vibration, temperature, current draw, and pressure of pumping systems. Keep track of water levels in your local and remote retention ponds utilizing the BWA-PRESSURE-SENSOR-15L submersible pressure sensor. Totalizing and output flow can be recorded with a pulse counter on the gateway.

### *Dust Control*

Ensure local regulatory compliance for dust suppression by monitoring the cycle counts of vehicles entering the wash bays with photoeyes. Monitor the operation of the washing system through water pressure, vibration and temperature, and current draws on the pump and motor.



### *Conveyor/Crushing Operations*

Prevent conveyor downtime by monitoring the operational status of the conveyance system. Keep hard-to-reach motors and reducers at peak health with vibration, temperature, and current draw measurements and alarms. Increase the uptime of the hydraulic system in your crushing equipment through pressure monitoring.

### *Environmental Monitoring*

The DXM Controller can integrate SDI-12 and serial weather station inputs as either wired or wireless connections. Monitor ambient temp, humidity, or full weather station data such as windspeed, wind direction, and rainfall.

