



IoT SOLUTIONS FOR MINING AND CONSTRUCTION

IoT Within Reach

The internet of things (IoT) is a steadily growing billion-dollar market largely driven by companies undergoing digitization for greater efficiency and transparency, as well as by 5G and emerging applications like smart cities. Satellite's inherent capabilities — such as its ability to reach remote areas, its ability to scale, to extend coverage for other providers — make it an essential part of a hybrid network needed to support an interoperable IoT system.

IoT and the Mining and Construction Market

Mining and construction operations are complex, remote, high-risk and cost intensive. Many companies have now expanded their use of sensors and mobile telemetry to continuously monitor operations, optimize productivity, and improve safety on site. By integrating sensors and data sources over satellite, monitoring of operations and assets can be done remotely, enabling real-time, informed decisions to be safely executed.

Market Snapshot

In the mining and construction industries IoT is a means to improve productivity, increase efficiencies, and improve safety of personnel. Other basic requirements and use cases such as vehicle telematics, real-time analysis of operations and employee tracking for safety and security are also driving IoT growth in this sector. **Integration of satellite communication terminals into heavy equipment at the point of sale will increasingly become a large driver of demand over the medium- or long-term through OEM agreements.**

IoT Application Summary

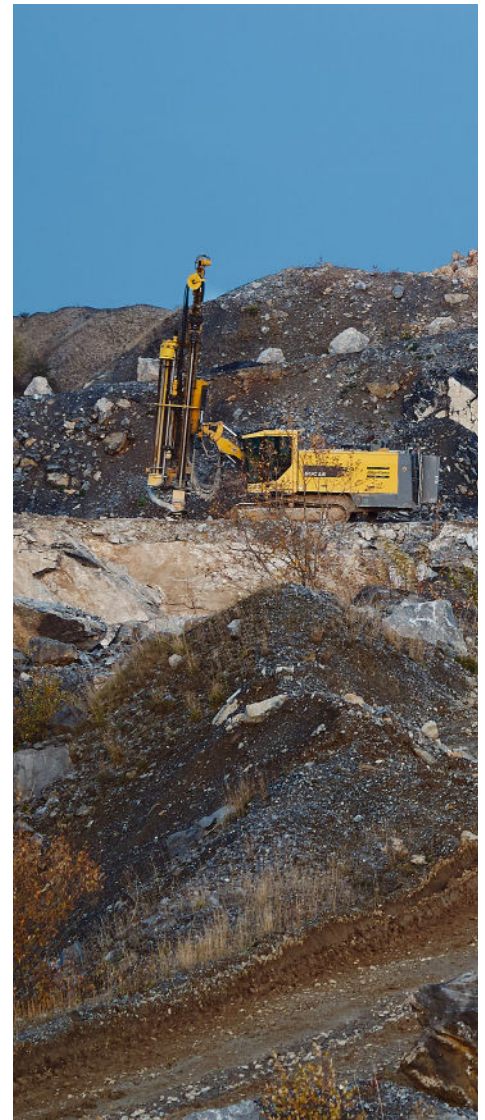
Asset tracking: Track engine hours, mileage report alerts, fuel consumption, and location

Site operations: Monitor safety, critical area monitoring, tracking progress, and security onsite

Drone beyond line of sight: Employ for inspection and survey

Key Mining and Construction IoT Use Cases

- **Predictive maintenance:** Mining and construction equipment with sensors can transmit its operational status and performance statistics over satellite to a central automation system. The automation system can then analyze this data, in conjunction with equipment suppliers, to predict required maintenance and prevent unplanned equipment failures. This enables mining and construction companies to reduce maintenance spending and prevent unexpected and potentially costly interruptions.
- **Fleet management and asset tracking:** Monitor, track, and report where assets — such as trucks, trailers, and heavy equipment — are operating. Site managers can oversee engine hours, idling, mileage alerts, fuel consumption, and location to ensure that all equipment and people are in the right place at the right time.
- **Environmental monitoring:** Weather stations and water, flood, and soil sensors help mine managers in preventing erosion, the formation of sinkholes, and the contamination of groundwater by chemicals from the mining process. Environmental monitoring with IoT sensors also aids the detection of harmful concentrations of minerals and heavy metals in the water table to prompt mitigating steps early on.
- **Site operations:** Proactively monitor critical structural components, load and terrain deformation to fulfill health, safety and environmental regulations.



IoT Within Reach With ST Engineering iDirect

At ST Engineering iDirect, our IoT Solutions serve all of these data requirement use cases. Our Evolution, Velocity and Dialog multi-service platforms are ideal for fixed and mobility applications that range from high to very high data rates (HDR) and that require highly reliable and complex network configurations.

However, we recognize that IoT requirements also exist in the low data rate (LDR) and medium data rate (MDR) market segments. Service providers that want to build a new IoT service offering for these markets, or that are new entrants into the IoT market in general, require a highly efficient, cost-effective solution and flexible business model.

That's why ST Engineering iDirect has launched our flexible IoT Services to supplement our highly successful platforms and to ease the entry of service providers into the IoT market. This new LDR and MDR offering provides customers with a complete connectivity solution that's built on a flexible service enablement platform paired with IoT-as-a-service options. With our scalable Evolution, Velocity, and Dialog platforms and our small form-factor IoT terminal, powered by hiSky, we can support flexible business models for immediate market access of fixed and mobile IoT environments while reducing the upfront capital investments and operational complexity usually required to launch an IoT platform and service.

At ST Engineering iDirect, our IoT Services are ideal for LDR (small data bursts of 30 Kbps or 1–2 MB per month usage) and MDR (continuous, on-demand throughput of 10–500 Kbps) applications. Our solutions utilize a family of compact, lightweight IoT terminals that feature a tightly integrated satellite modem and flat-panel antenna design in Ka-band or Ku-band variants.

Need more data than that? Our iQ and MDM series modems on our Evolution, Velocity, and Dialog multi-service platforms are ideal for fixed and mobility HDR IoT applications.

