

DIGITAL ELECTRICITY™ APPLICATION NOTE

INDUSTRIAL INTERNET OF THINGS (IIoT)

THE SCENARIO

Industry 4.0 is a driving force behind the Digital Transformation of the modern industrial world. Never have we seen such a revolution to develop an ecosystem to collect, monitor, and analyze data from industrial operations. Analysis of such data helps to increase efficiencies, reduce costs, and improve safety and security.

THE CHALLENGE

Ethernet IP protocols are driving fiber deeper in the network towards the edge and there is a clear migration of sensors and devices toward an Ethernet/IP platform. IIoT PoE switches and Industrial Edge Compute elements need to exist in “work cell areas” at the network edge to ensure Ultra Low Latency (uLL) for critical or potentially life-threatening applications. Access to reliable and resilient class 1 power at the industrial edge is costly due to licensed specialized contractor labor and takes valuable time to secure proper permitting. Backup power at the industrial edge with UPS or batteries is bulky, creates heat loading on the facility HVAC system and requires frequent battery maintenance. In addition, traditional class 1 circuits installed with rigid conduit and junction boxes lacks the adaptability to support fast and easy Moves, Adds and Changes (MACs) required in the modern manufacturing environment to support a constantly changing production scheduling landscape.

THE SOLUTION

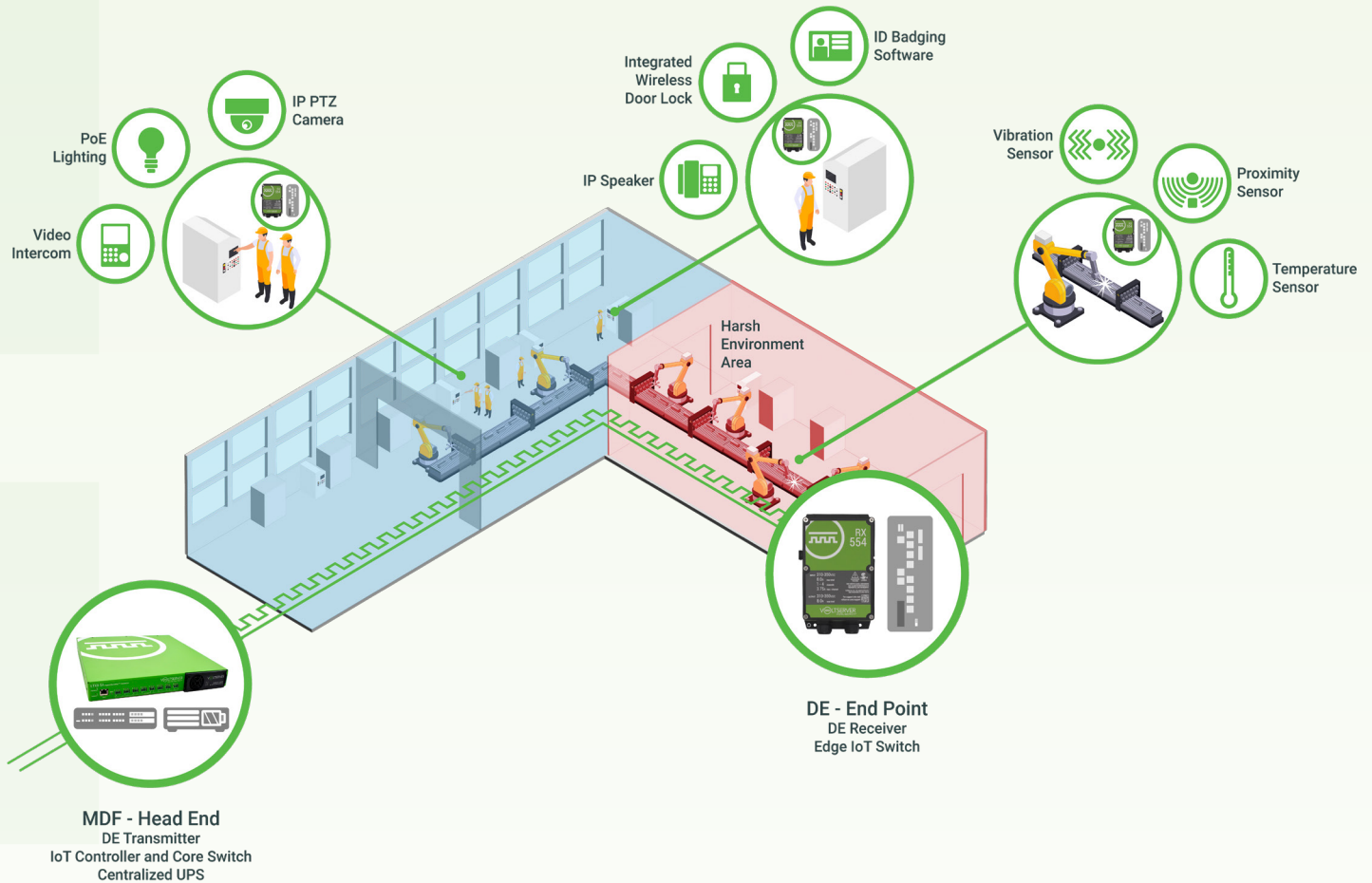
Digital Electricity (DE) from VoltServer is a Fault Managed Power Solution (FMPS) which is recognized by the IEC and UL as an efficient, flexible and cost-effective “Electrical Service Panel to Edge” powering solution offering an alternative to local venue powering.

Fault Managed Power Systems (FMPS) is an enabling technology that has the power to dramatically accelerate industry 4.0 digitization.

VoltServer, the pioneering creator of Digital Electricity™, has successfully deployed its patented technique across numerous systems and tens of thousands of loads using small gauge conductors without the need for conduit or separation. This revolutionary technology can be used to remotely power significant amounts of power at significant distances from a completely centralized head end or MDF location.

This makes it quick and easy to tap into centralized, industrial grade, resilient power extending enterprise networks to outdoor and harsh industrial environments. Further, cables carrying DE can be installed by telco technician labor in cable tray or raceway to power Industrial IoT switches directly in strategic edge zone locations effectively replacing traditional IDF closets with a new "IDF Anywhere" topology.

WHAT IS IDF ANYWHERE



WHY DIGITAL ELECTRICITY™

- **Simplicity:** Digital Electricity™ supports multiple services, devices, and vendors.
- **Cost:** Power and data can be delivered to IIoT zone switch locations in the same pathways by the same contractor, eliminating the parallel power infrastructure.
- **Flexibility:** The power distribution can be reconfigured by IT personnel as needed.
- **Resilience & Reliability:** A large battery plant or uninterruptible power supply (UPS) provides emergency fall back power for the remote industrial switches. Five 9's reliability can be provided with an N+1 power system design.

WHAT IS DIGITAL ELECTRICITY™ ?



Conventional Electricity



DE Transmitter

Structured Cable



DE Receiver



IoT switch

ENERGY PACKET



Discrete “packets” of electricity.
Each checked for safe transfer from transmitter to receiver.
500 safety checks per second.

SOLUTION 5S's:

- Significant Power: 600W/pair
- Significant Distance: 2km
- Skinny Conductors: 18-16AWG
- Speed to Deploy
- Safely



DELIVERING POWER:

- Where it is needed
- In the format it is needed
- With lower cost & higher resiliency

VoltServer is the leading provider of intelligent, premise-based power distribution solutions leveraging Digital Electricity™ from centralized source to distributed endpoint loads to improve the customer's essential business applications.

Patented and proven **Digital Electricity™** solutions deliver cost-effective, high-reliability power where and when you need.

Digital Electricity™ is a trademark of VoltServer, Inc.