SMARTMOD SOLUTIONS

for Middle Mile Infrastructure

KEY FEATURES

- Modular turnkey power, cooling and infrastructure management solution
- Increased speed of deployment with prefabricated modules which are factory installed
- Lower total cost of ownership minimizing CapEx and OpEx
  - Right sized and scalable, deploy as needed
  - Installation and turn up in weeks and months due to standardization built in modular solution
  - High energy efficiency at varying loads utilization
  - Redundancy built at module level
  - Centralized common battery back-up for AC and DC loads, eliminating duplicate battery systems
  - Smart real time infrastructure management solution which allows remote monitoring and energy management
- Energy audits, preventive maintenance, 24 x 7 Energy Operations Center (EOC) services

Shelter Exterior

A fully integrated, energy-efficient power, cooling and network management platform for rapid remote deployment.

Description

SmartMod Solutions for Middle Mile Infrastructure provide a smart end to end solution with a single point of accountability backed up by an extensive relationship with ILEC/CLEC/IXC, and robust system engineering expertise, service and project management organization. Nationwide field service ensures seamless coordination and training for concurrent multi site installation and turn up, and robust global supply chain and inventory management reduce lead times and ensure high speed of deployment.

Electrical Room

SmartMod Solution Components:

- DC Power Systems
- Inverter Systems
- Service Entrance Power Transfer Switch
- Low Voltage Paralleling Switchgear
- Surge Protection
- Load Banks
- Batteries
- Thermal Management
- Engineered Shelter Solutions
- Colocation Cabinets
- Rack PDU's
- Infrastructure Management and Monitoring
- 24x7 Local Support
- Standards Compliance

Application

The SmartMod Solutions for Middle Mile Infrastructure are ideally suited for CLECs, IXCs and Cable MSO locations. Typically deployed as carrier hotels/POPs, colocation sites, mobile switching centers, etc., with optical transport gear to provide high speed connectivity to the internet back bone.

DC Power Systems

NetSure 721 Power System

The SmartMod solution employs the NetSure™ DC Power technology platform, utilizing high efficiency eSure™ rectifiers (96%) that deliver the most rigorous network-power applications, with an unparalleled breadth of intelligently engineered DC power, distribution, control and monitoring systems.

The modular NetSure 721 power system with 3500 watt or 2000 watt high efficiency rectifiers provides up to 4000 amps of current for -48 volt systems. The basic components of the power system include the ACU+ control unit, module mounting shelf assemblies which house the rectifiers and converters, and a modular distribution cabinet.

The NetSure 721 power system contains a powerful, microprocessor-based control system capable of monitoring and controlling up to 60 rectifiers and converters.

Inverter Systems

TSI Bravo High Density Inverter System

TSI™ Bravo High Density Inverter systems (75 kVA) are high density, modular, scalable and hot swappable with the 2500 VA Inverter as its building block. The system connects to DC and AC sources to produce an uninterrupted, reliable AC supply.

The inverter is designed to work from 200 VAC to 240 VAC and 48 VDC sources through AC/AC and DC/AC conversions. Unlike traditional inverters, the TSI features an AC to AC conversion that assures double filtering function. This results in an efficiency of 96% without any compromise in quality and stability of the output wave form. This off line operation mode is called “Enhanced Power Conversion” (EPC).

The TSI Distributed Static Transfer Switch Technology eliminates the single point of failure in a traditional inverter design. Unlike hard transfers between energy input sources, the TSI “soft switching” method is disturbance free.

Service Entrance Power Transfer Switch

The ASCO® 7000 Series Service Entrance Power Transfer Switch combines automatic power switching with a disconnect and overcurrent protective device on the utility source, utilizing the same reliable transfer switching mechanism and controller as the 7000 Series product platform. It also includes a utility circuit breaker as a disconnect device and links for connecting both neutral and ground conductors.

ASCO 7000 Series Power Transfer Switches

This service entrance power transfer switch is UL 891 listed and is available up to 600 V and 4000 A in standard, delayed, closed transition, soft load, and bypass isolation configurations. It meets all National Electrical Code requirements for installation at a facility's main utility service entrance and is generally installed at facilities that have a single utility feed and a single emergency power source.

PowerQuest 5150 Controller

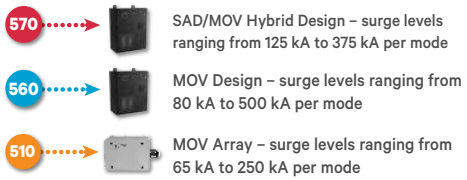
The PowerQuest controller monitors and controls the transfer switches, power, power factor, etc., and configures the sequence of powering critical loads during power source changes.

Low Voltage Paralleling Switchgear

ASCO 300 Series Power Control System

The ASCO Series 300 Power Control System is a standardized generator paralleling system for same size generator sets, offering smooth integration between generators and power transfer switches, plus sophisticated functionality normally found in custom designs.

Surge Protection



The 500 Series is a premium family of surge protection devices offering individually fused MOV (Metal Oxide Varistor) arrays. This "True Surge" tested design provides redundancy and high survivability to repetitive impulses.

Load Bank

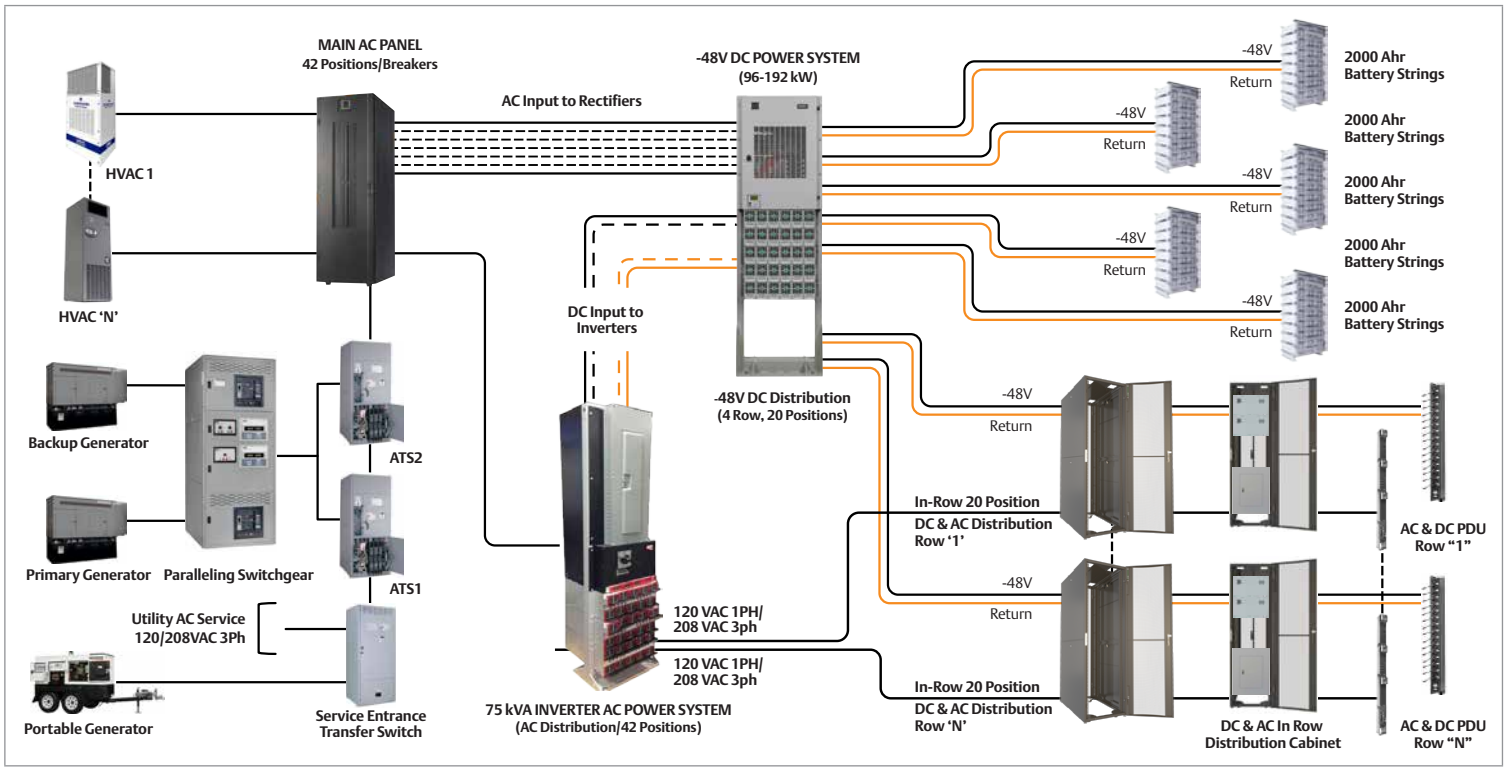
Spirit Load Bank

Vertiv™ Avtron load banks are designed to provide electrical loads for testing power sources such as generators and are used to reduce "wet stacking" problems in diesel engines of backup generating systems. Load banks are an essential part of preventive maintenance or frequent engine exerciser programs, providing practical means to test the system without interruption to the critical loads.

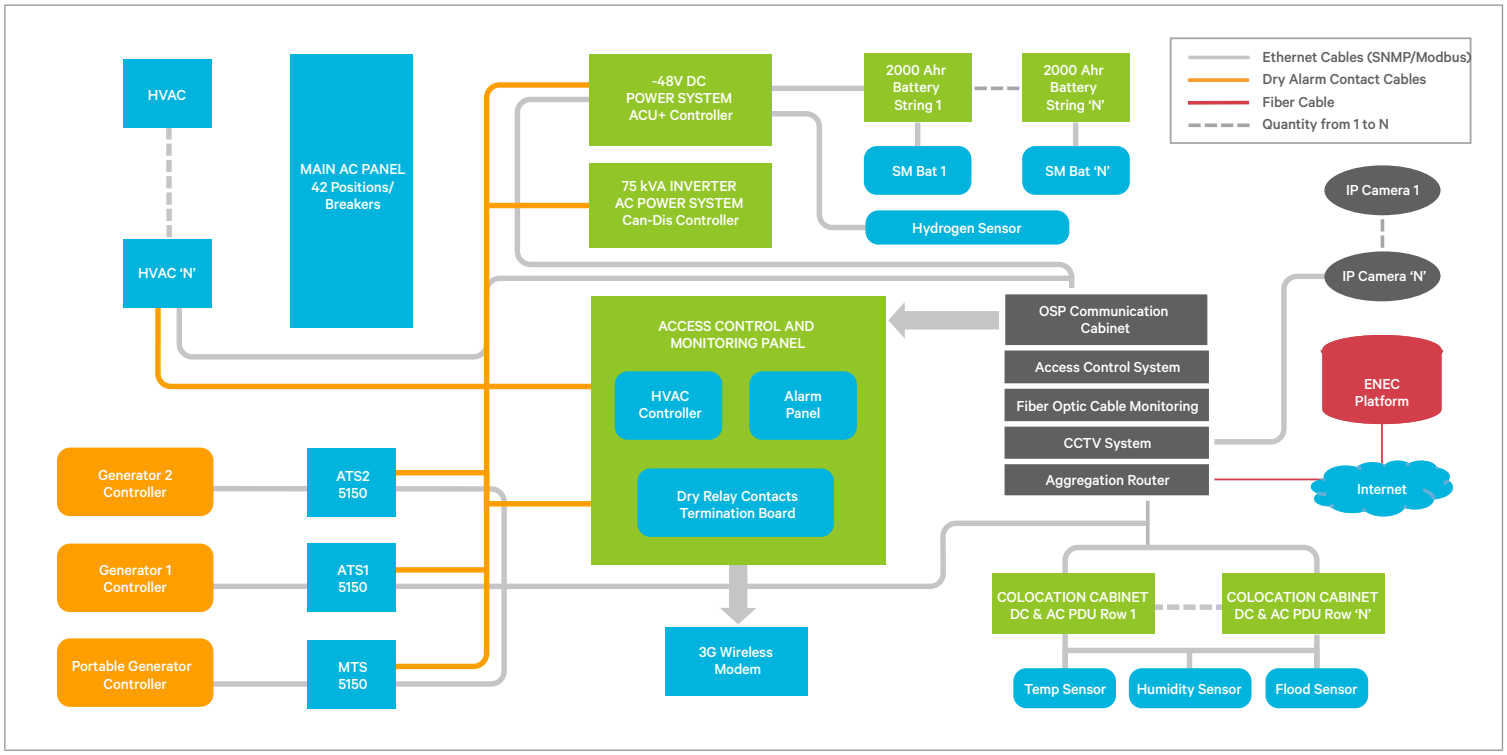
Batteries

High density batteries up to 2000 Ahr capacity with -48 VDC VRLA strings provide 2 hours of back up power. The 2V, 6V and 12V VRLA batteries feature easy maintenance, wide temperature range and long lifespan. Designed to avoid leakage and explosion, gas collecting and venting technology and fire retardant material ensures safety and reliability.

Electrical Room Block Diagram



ENEC Remote Monitoring Diagram



Thermal Management Options

Liebert Challenger 3000 with Liebert iCOM controls provides complete control of temperature, humidity and air filtration. Liebert iCOM controls enhance system performance, and allow Liebert Challenger 3000 systems to communicate and work as a team. This internal heat management solution offers an extremely compact footprint, ideal for facilities where space is at a premium.

Liebert Challenger 3000

Liebert Intellecool2

Liebert InteleCool2, external shelter cooling system, 5.25 to 17.5kW, is designed for year-round cooling of remote communications shelters. These small, rugged, lightweight, and self-contained precision system cooling units are easy to install and maintain, with a variety of options to deliver energy efficiency and redundancy.

Engineered Shelter Solutions

SmartMod shelter solutions with precast concrete and lightweight galvanized steel are built to withstand 150 mph wind loads, 1200 lbs/ft2 concentrated floor loads, and 250 lbs/ft2 equipment floor loads. The enclosures feature 2 hour fire resistant walls and bullet resistance UL752 level 4 and min R11 insulation. Available as 10'x12', 10'x14', 10'x16' and 12'x40' standard prefabricated building modules.

Colocation Cabinets

These advanced enclosure systems safeguard networking equipment. The DCF optimized 19" or 23" rack system integrates equipment, modular power distribution units and wiring management. The rack cabinets are available in 42 U or 48 U heights; widths of 600 mm or 800 mm; and depths of 1100 mm or 1200 mm and can handle static load capacity up to 1,363 kg (3,000 lbs). Each rack cabinet is lockable including split, locking side panels, split locking perforated rear doors, single perforated locking front door, low profile casters and leveling feet.

To customize your solution and request more information, email EnergySystems@VertivCo.com.

Rack PDU's

Whatever the level of criticality – basic distribution, remote monitoring, or control at the receptacle level – a Vertiv™ rack PDU solution can fit your -application needs.

- Liebert® MPH™, MPX™-Adaptive Rack PDU with metered outlets, zero RU rear mount distribution units
- NetSure™ RDB plug and play, 8.6 kW max capacity zero RU rear mount distribution units
- Integrated third party - Servertech -48 VDC metered , 14 kW max capacity 2 RU mounted distribution units

Infrastructure Management & Monitoring

24x7 infrastructure management and network monitoring software, systems and services to provide continuous oversight of access network

- VNEC (Vertiv Network Energy Center) Remote Supervision for communication networks – Energy Operations Centers are an integrated approach to managing the energy and health of entire networks.
- Battery Monitoring – Alber technology to extend battery life, reduce maintenance cost and increase safety.
- Emergency power – ASCO® PowerQuest SCADA control system

24x7 Local Support

Nationwide, encompassing engineering, installation, project management and total on-site operations management, preventive maintenance and energy-consumption monitoring.

Standards Compliance

COT's equipment complying with NEBS (MIL-STD-810 equivalent), GR487 Telcordia,Telecom Industry Association (TIA), International Building Code (IBC), National Electric Code (NEC), Electronics Industry Association (EIA), Underwriters Laboratories (UL).

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