



Features

- ✓ Utility Interoperability
- ✓ Legacy Asset Integration
- ✓ Vendor-Agnostic
- ✓ Load Following
- ✓ Load Shifting
- ✓ Load Leveling
- ✓ Peak Shaving
- ✓ Energy Storage Integration
- ✓ Islanding Capability
- ✓ Real-Time Data Visualization



Patented Forecasting Enables CleanSpark to Manage Power Flow and Create the Outcomes Our Customers Care About:



Economic Optimization: Cost Savings and Revenue Generation

Earn 12-18% Internal Rates of Return on your Power System. Whatever your location, utility, or rate structure, CleanSpark's mPulse™ software maximizes Return on Investment through using lowest cost power sources at all times while remaining flexible for future over the meter opportunities.



Vendor Agnostic Integration

Power systems are expensive, reduce first costs by at least 20%. Vendor competition for high-value components such as Solar PV, Energy Storage, and Backup Generators can significantly reduce first cost and boost your project's economics.



Reputable Ecosystem of Utility Proven Hardware

Utility proven substation field servers with a 10 year warranty drive CleanSpark's software and control suite at your site along with fleet scale data services ensure your system is accessible at all times.



Flexible, Scalable, and Intelligent

mPulse™ is a massively scalable hybrid-cloud solution that puts site-specific business value into the microgrid to enable highly resilient, disconnected, intelligent site functionality while backing that functionality with cloud-honed insights drawn from not only your microgrid's own history but industry standard modeling and AI-driven forecasts.



Cyber-Secure Energy Security

Designed from the ground up with NERC's Critical Infrastructure Protection (CIP) standards and the United States Department of Defense Risk Management Framework (RMF) in mind and built upon Microsoft's Azure's platform leveraging end-to-end encryption across all data-flows.

SPECIFICATIONS	
PROVEN SUBSTATION COMPUTE	SEL-3355, Complete Solid State Design
CONNECTIVITY	Enterprise Routing, 2x Ethernet, 2x Multicarrier 3G/4G/LTE
CPU	INTEL Core i7-312 Quad Core, Intel vPro™ Technology
RAM	2 x 8 GB DDR3 ECC 1,333MHz (Conformally Coated) *ECC: Error Correcting Code
CHIPSET	Intel CM236 Express Chipset
MASS STORAGE	2 x 256 GB Industrial SSD
VIDEO	Dual 8" Displays, Protected, Lockable
INPUT	Keyboard and Track Pad
USB	4 Rear Panel, 2 Front Panel USB 2.0
EXPANSION CARDS	2 PCIe
ETHERNET CONNECTED DEVICES	10
SFP FIBER CONNECTED DEVICES	2
SERIAL / LEGACY DEVICE / FLEXIBLE I/O	2 EIA-232 Ports, DB-9 Connectors, 300 to 114,200 bps; 5V Port Power, 500mA
ADDITIONAL CONNECTIONS	Software-selectable RS485
EXPANSION	SFP, PCIe
CONTACT	Form C Alarm Contact
WATCHDOG	Integrated Programmable Hardware
TIME-CODE INPUT/OUTPUT	IRIG-B Input on COM1
BIOS	AMI UEFI
TRUSTED PLATFORM MODULE	Infineon®
INTEL AMT	AMT 11.0
POWER SUPPLY	Dual, AC Primary with DC Failover when Connected within Energy Storage Device(s) or Optional UPS
OPERATING TEMPERATURE	-40° C - +75° C
WARRANTY	10 Years
MADE IN THE USA	California

CONNECTIVITY DETAILS	
USE CASE	Commercial and Industrial metering, substation network connectivity or serial telemetry requiring higher security
MANAGEMENT	HTTP, HTTPS, FTP, SFTP, SSL, SMTP, SNMP (v1/v2c/v3), SSH, Telnet and CLI for web management; Remote management via software tool (option); SMS management, Protocol analyser, Ability to capture PCAP files for use with Wireshark
SECURITY	RADIUS, TACACS+, SSL, SSLv2, SSLv3, FIPS 197, L2TP, (5 tunnels included - 50 max on WR41, 200 max on WR44.); IPsec with IKEv1, IKEv2, ISAKMP; DES, 3DES and AES up to 256-bit encryption; Simple Certificate Enrolment Protocol (SCEP) for X.509 certificates, Open VPN and PPTP; IPsec/PPP/L2TP VPN Server support; IP pass-through
ROUTER/FIREWALL	Bridging, NAT/NAT-Traversal, NAPT forwarding; PPP, PPPoE, GRE; IP Routing Protocols: PPP, GRE, RIP (v1 & v2), OSPF, SRI, BGP; IP Failover: VRRP, VRRP+™; VLAN support; STP (Spanning Tree Protocol); Stateful inspection firewall with scripting; Modbus over UDP/TCP; DHCP; Dynamic DNS client compatible with BIND9/No-IP/DynDNS; Automatic failover/fallback to second GSM network/Standby APN, Optional IPv6

HARDWARE COMPLIANCE AND TESTING	
RELEVANT TESTING STANDARDS	
IEEE 1613-2009	Standard Environmental and Testing Requirements
IEEE C37.90	Standard for Surge Withstand Capability Tests
IEC 60255	Measuring Relays and Protection
47 CFR 15B, Class A	Radiated Emissions Limits
IEC 61850-3:2013	Communication networks and systems for power utility automation
IEC 61010-1:2016	Safety requirements for electrical equipment for measurement, control, and laboratory use

ELECTROMAGNETIC COMPATIBILITY AND EMISSIONS	
Communications Equipment in Utility Substations:	IEC 61850-3:2013; IEEE 1613-2009 (Severity Level: Class 1)
Industrial Environment:	IEC 61000-6-2:2005; IEC 61000-6-4:2006
Electrical Equipment for Measurement, Control, and Laboratory Use:	IEC 61010-1:2013; UL 61010-1:2016; C22.2 No. 61010-1:12; IEC 61010-2-201:2013; UL 61010-2-201:2017; C22.2 No. 61010-2-201:14
Measuring Relays and Protection Equipment:	IEC 60255-26:2013; IEC 60255-27:2013
Conducted and Radiated Emissions:	CISPR 11:2009 + A1:2010 CISPR 22:2008; CISPR 32:2015; IEC 61000-6-4:2006; IEC 61850-3:2013; FCC 15.107:2014; FCC 15.109:2014 (Severity Level: Class A)
Harmonic Current:	IEC 61000-3-2:2014 (Severity Level: Class A)
Voltage Flicker:	IEC 61000-3-3:2013
Conducted RF:	IEC 61000-4-6:2013 (Severity Level: 10 Vrms)
Electrostatic Discharge:	IEC 61000-4-2:2008; IEEE C37.90.3-2001
Fast Transient/Burst:	IEC 61000-4-4:2012 (Severity Level: Class A)
Magnetic Field:	IEC 61000-4-8:2009 Severity Level:
Power Supply:	IEC 61000-4-11:2004; IEC 61000-4-17:1999+A1:2001+A2:2008 IEC 61000-4-29:2000
Radiated Radio Frequency:	IEC 61000-4-3:2006+A1:2007
Surge Withstand Capability:	IEC 61000-4-18:2006+A1:2010; IEEE C37.90.1-2012
Surge Immunity:	IEC 61000-4-5:2005

ENVIRONMENTAL	
Change of Temperature:	IEC 60068-2-14:2009
Cold, Operational:	IEC 60068-2-1:2007
Cold, Storage:	IEC 60068-2-1:2007
Damp Heat, Cyclic:	IEC 60068-2-30:2005
Damp Heat, Steady:	IEC 60068-2-78:2012
Dry Heat, Operational:	IEC 60255-1:2009
Dry Heat, Storage:	IEC 60255-1:2009 IEC 61850-3:2013
Free Fall:	IEEE 1613-2009
Vibration:	IEC 60255-21-1:1988
Enclosure Protection:	IEC 60529:2001 + CRGD:2003

SAFETY AND COMPLIANCE	
Enclosure Protection:	IEC 60529:2001 + CRGD:2003 (IP30, IP67 Available)
Dielectric Strength:	IEC 60255-27:2013
Impulse	IEEE C37.90-2005
UL	All Components Recognized
CE Mark	CE marking is a certification mark that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area (EEA)
RoHS Compliant	RoHS stands for Restriction of Hazardous Substances. RoHS, also known as Directive 2002/95/EC, originated in the European Union and restricts the use of specific hazardous materials found in electrical and electronic products.