

SAGEON

SAGEON[®] MICRO

3U Integrated Power Module

24 or 48VDC | 40 to 200A

Overview

SAGEON is intelligent power. SAGEON, the latest development in power systems, is simple to operate yet genius in delivering enhanced, built-in intelligence. SAGEON Power Systems minimize manual adjustments and measurements, while providing you with the information you need to manage power.

The SAGEON Micro Power Module delivers the unmatched capability of a full size SAGEON Power System in a compact and cost effective solution. Designed to deliver up to 200 amps of power for 24 volt or 48 volt systems, the Micro Power Module provides the flexibility to put power where it is needed. The Micro Power Module also offers the flexibility to configure the best solution for your needs with options including integrated battery disconnects and load distribution; all in space saving configurations from two through seven rack units.

The Micro Power Module consists of a power frame that includes the SAGEON Controller, mechanical mounting for up to seven SAGEON Micro Rectifiers, all inter-system cabling, and optional items including AC input breakers, battery disconnects, DC distribution breakers and fuses, and remote communications - all factory installed and tested. Installation cost and time are minimized because there is only one component to install. To complete your system simply connect your AC and DC cables, plug-in the SAGEON Micro Rectifiers, and you are ready to go.

In addition to the basic control functions, the Micro Power Module supports all of the advanced functionality available in a SAGEON Power System including; remote monitor and control, battery testing, individual cell monitoring, programmable battery recharge current, and site monitoring.

Features

- **High Density** - Compact design with rectifiers at up to 16.6 watts per cubic inch, minimizing space required for installation
- **Remote Access** - Remotely monitor and control the complete power system, reducing trips to site and increasing uptime
- **Battery Testing** - Automatic or on-demand battery testing, insures batteries are functioning properly under real-world load conditions
- **Battery Monitoring** - Continuous, individual cell level monitoring, providing 24 hour automated out-of-tolerance alarming and detailed identification by cell number
- **Programmable Battery Recharge Current** - Programmable recharge current limit eliminates overcharging of standby batteries, extending their useful service life
- **Wide Input Voltage Range** - Operating voltage range from 85 to 285 volts AC increases flexibility and insures unit functions under diverse conditions
- **Common Family** - The SAGEON Micro is part of the SAGEON Family of scalable DC Power Plants which all feature a common controller, monitor and control software, and remote communications modules; eliminating the learning curve



System Capability Guide

Controller (SCU)



The SAGEON Controller is a micro-processor based Power System Monitor and Control unit (PSMC) - the brains of the SAGEON Micro Power Module. The Controller continually monitors and controls all of the

Micro Power Module components for proper system operations to user configurable set points and generates local and remote alarms when system conditions are not meet; providing you with configuration flexibility and automated alerts. User configuration is accomplished through the keypad and display located on the front of the Controller, or through the PC based SageView® software tool included free with every system. The Controller is included standard in every system.

Battery Distribution



The SAGEON Battery Distribution Module (BDM) provides integrated battery landing points, battery disconnect breakers, and battery current transducers for up to four battery strings; all within

a space saving 1RU module. The BDM also contains reverse battery polarity protection and an optional low voltage battery disconnect (LVBD) with a user selectable disconnect set point. Combined with the SAGEON Controller, digitally controlled SAGEON Micro Rectifiers, and optional SAGEON Battery Monitor (SBM), the BDM's integrated battery current transducers enable the enhanced battery monitoring, discharge testing, and recharge current limiting features found in all of the SAGEON Family of DC Power Plants.

Rectifier



The SAGEON Micro 24V and 48V Series Rectifiers are high efficiency, high power density switched mode rectifiers - the heart of the SAGEON Micro Power Module. The rectifiers provide reliable AC to DC power

conversion through their wide operation temperature range of -40°F to 158°F, wide AC input range of 85-285VAC, fault tolerance to 440VAC, high degree of transient protection, and self protecting / fault tolerant design. Phase-to-Phase and Phase-to-Neutral AC connections are fully supported allowing you to easily connect to your existing service. Rectifier ventilation is front to rear via self regulating forced air fans, eliminating the need to waste revenue generating space above and below the unit for cooling. Rectifiers are "hot-swappable" and will continue to operate without service interruption should the SAGEON Controller ever fail or is removed from the system.



DC Breakers

The SAGEON DC Breaker Distribution module provides ten integrated DC load distribution breakers, load distribution terminal blocks, and ground return terminal blocks; all within a space saving 1RU module. Breakers are ordered separately and are available in 2A, 4A, 8A, and 16A. Breakers are installed at the factory when ordered with a system and can be field installed by removing two screws from the module's front cover and plugging in the new breakers.



DC Fuses

The SAGEON DC Fuse Distribution module provides ten integrated DC load distribution fuses, load distribution terminal blocks, and ground return terminal blocks; all within a space saving 1RU module. Fuses are ordered separately and are standard GMT type available in 0.5A through 15A sizes. Fuses can be field installed and replaced by plugging them into a socket on the module's front cover.

AC Breakers



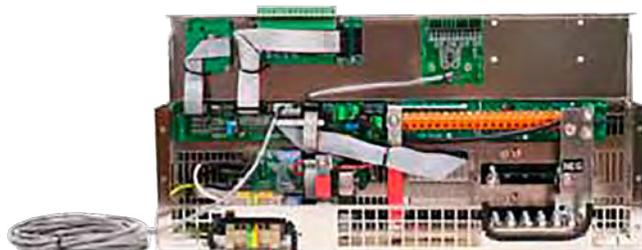
The SAGEON AC Breaker module provides integrated AC breaker protection for the SAGEON Micro Series Rectifiers for sites which require the installation convenience of a single AC feed, or simply require local AC

disconnects, the AC Breaker module provides 1RU and 3RU solutions and can be configured for one to three rectifiers per breaker. The AC Breaker module also provides single-pole and two-pole breaker options to suite the needs for line-to-neutral (Y-connected) and phase-to-phase (delta-connected) AC feeds.

Terminal blocks accept wire sizes from 12 to 26 AWG. Multiple Breaker and Fuse modules can be selected when ordering; providing ten, twenty, thirty, or forty DC protected distribution points and eliminating the need to add an external distribution panel. For sites which already have DC distribution, the Micro Power module can be ordered without a DC distribution module and connections can be made to the "bulk distribution" connection points; which are standard in every system.

User Connections

The SAGEON Micro Power Module user connections are located on the rear of the module, providing ample space and safe access for installation, additions, and maintenance. Available (standard and optional) user connections include AC Feed terminal blocks, six ground return landings (one Bulk power, four Battery String, and one CO ground), one Bulk power landing, one Battery String landing per battery breaker, as well as temperature compensation, remote communications and alarm relay connections. Cable landings are 2-hole studs, 5/8" spaced. All installation hardware (except lugs) is included.



BDM/LDM Distribution

The SAGEON 3RU Battery Distribution Module/ Load Distribution Module (3RU BDM/LDM) combines all the features of the 1RU BDM while also providing breaker positions for high-current load breakers. The 3RU module provides up to four individual battery landing points, each with an integrated current transducer as well as an optional, low voltage battery disconnect (LVBD) with a user set table disconnect set point. Combined with the SAGEON Controller, SAGEON Micro Rectifiers and optional SAGEON Battery Monitor (SBM), the 3RU BDM's integrated current transducers enable the enhanced battery monitoring, discharge testing and recharge current limiting features found in all of the SAGEON Family of DC Power Plants. Up to 11 total DIN rail mounted breakers can be combined into this rack space saving package with load breaker values from 5 to 100 Amps.

SAGEON Site Monitor (SSM)

The SAGEON Site Monitor (SSM) is an auxiliary module for the SAGEON Family of Power Systems. The SSM provides additional I/O for the power plant enabling users to monitor the status of additional equipment through the SAGEON system. The SSM includes 12 digital inputs and 8 analog inputs for monitoring devices such as site security (door and window magnetic switches), AC Inverter status and alarms, Generator status (fuel level, oil pressure) and HVAC status & alarms. Also included are 4 voltage-free (dry) Form C control output relays. The control relays can be automatically activated in response to an event on any of the SSM digital/analog inputs (user configurable) or operated manually from a PC running SageView. Alarms are readable by the SageView software, your Network Management Software or SCADA system.

SAGEON Battery Monitor (SBM)

The SAGEON Battery Monitor (SMB) is an add-on module for the SAGEON Family of DC Power Systems. It is used to monitor individual cells of a battery during float or equalization operation, during a discharge or during a recharge. Each SBM is capable of monitoring up to 24 cells or monoblocks and up to 4 SBM units can be combined to monitor up to four battery strings of 24 cells or monoblocks each. Using the remote communications ability of the SAGEON Power System Controller, cell voltage data accumulated during a discharge can be transferred to a remote computer and saved. The cell voltages can be viewed in real time and the SageView software that is running on your PC displays the cell voltage data in various formats, providing you a snapshot of the health of your power system's batteries. In the event that a battery behaves less than ideal during a test or actual discharge, a number of pre programmed parameter levels are used to generate alarms which are triggered on the controller, the SageView software, your remotely connected PC, Network Management Software or SCADA system.



3 RU unit shown (rear view) with optional SBM, SSM and 4 Battery Temp Sensors

Environmental Specifications

Operating Temperature Range	-40°F (-40°C) to 158°F (70°C)
Full Power Temperature Range	-40°F (-40°C) to 122°F (50°C) (see rectifier data sheet for details)
Storage & Transport Temperature	-40°F (-40°C) to 158°F (70°C)
Humidity	0 to 100% RH including condensing
Altitude	13,100 ft. (4,000 m) (see rectifier data sheet for operation above 13,100 ft.)
Heat Dissipation	Dependant on system configuration, 424 BTU/Hr. Typical per 1,000W of output power
Cooling	Forced air, front to back, auto-regulating

Physical Specifications ¹

RU	Height	Width	Depth	Weight	Amps (max)	Example Layout
1	1.75 in (44 mm)	19 in (483 mm) (23 in mounting adapters available)	14.5 in (368 mm) overall; 1.25 in (32 mm) front and 13.25 in (336 mm) rear of mounting ears	14 lb (6 kg)	40	
2	3.5 in (89 mm)			20 lb (9 kg)	80	
3	5.25 in (133 mm)			29 lb (13 kg)	120	
4	7.0 in (178 mm)			37 lb (17 kg)	160	
5	8.75 in (222 mm)			46 lb (21 kg)	200	
6	10.5 in (267 mm)			55 lb (25 kg)	200	
7	12.25 in (311 mm)			64 lb (29 kg)	200	

¹Physical specifications for a typical, fully loaded system including rectifiers.

ABOUT GREEN CUBES TECHNOLOGY

Green Cubes Technology harnesses over 30 years of industry experience to ensure we design, develop and deliver solutions for the most challenging energy needs. We offer battery technology innovation, application design and performance management to drive productivity, scalability and sustainability.

Green Cubes provides complete power systems to the stationary power industry. With the addition of the Guardian and Aspiro Product lines offered under the UNIPOWER brand, these industry proven DC plant systems serve critical applications all around the world. Green Cubes offers complete power solutions including energy storage, power conversion, and seamless integration.

For more information, email contact@greencubes.com or visit greencubes.com

