

Preliminary Release

DA03

Integrated Smart Grid energy and power management System in a box

## Fact Sheet

### Introduction

Funded by the California Energy Commission, US Hybrid in working relation with the National Renewable Energy Laboratory (NREL) has designed, developed and is manufacturing an intelligent hybrid “DA03” Advanced Power Electronics Interface module capable of 4 quadrant operation with decoupled control of energy generation and storage with MPPT and UL1547 compliant operation.

### Technical Description

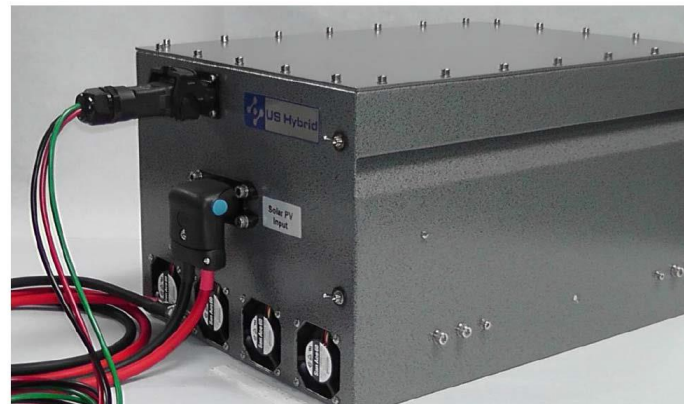
Designed specifically for smart grid application DA03 Solar Inverter, energy and power management system in a box “SIB” is UL1547 certified and optimized for direct connection to the grid via an internal high frequency (140kHz) isolation Transformer. DA03 solar converter system requires no additional control or interface to connect to a battery storage system and provide MPPT function with the option of feeding the grid or storing the energy in the batteries. The dc-ac converter system is capable of 4-quadrant operation of not only charging the batteries from grid but also provide full simultaneously active and reactive power management and process control. DA03 is compatible with a variety of distributed energy resources (DER) technologies.

### Grid Operation Features

The DA03 can feed the PV energy either to the grid or store in the energy storage device and is capable of bi-direction DC-AC operation to also charge the batteries from the grid at night time. The DA03 four quadrant operations also provides decouple control of active and reactive power generation independent of the solar power. DA03 improves the scalability and modularity of power electronic systems and components

### RIDE-THRU

DA03 innovative technology offers Low Voltage Ride Through (LVRT), Zero Voltage Ride Through (ZVRT) and High Voltage Ride Through (HVRT) capabilities. DA03 is capable of IEEE 1547 compliance Grid tie operation or standalone operation with excellent power quality, low ripple and fast transients meeting non-linear loads and motor drives.



### Control System

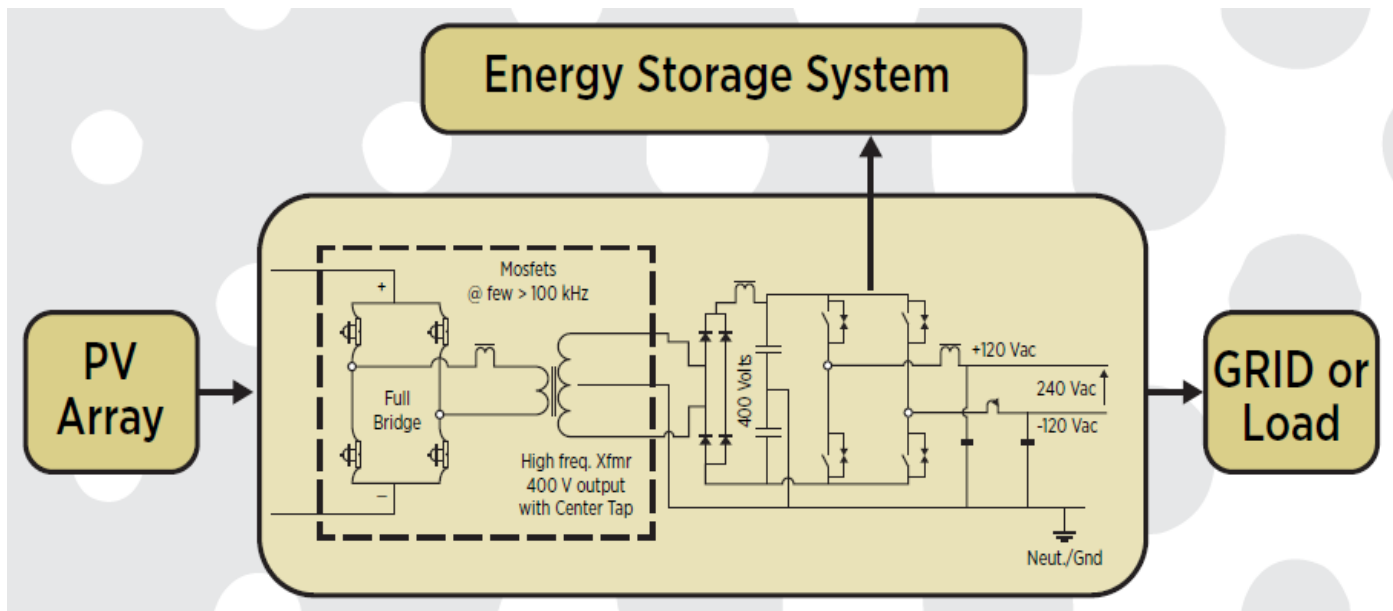
DA03 CONTROL system regulates voltage and power in real time. Like a conventional power plant, it supplies reactive power to the grid when it is needed, regulating system voltage and stabilizing weak grids by a simple integrated system of Volt-Amp- Reactive (VAR) control—unlike other systems that may require add-on capacitors or VAR compensators. DA03 also provides Energy Management System of the battery by controlling its state of charge depending on the predefined operation criteria or real time maximum power generation peak load shaving.

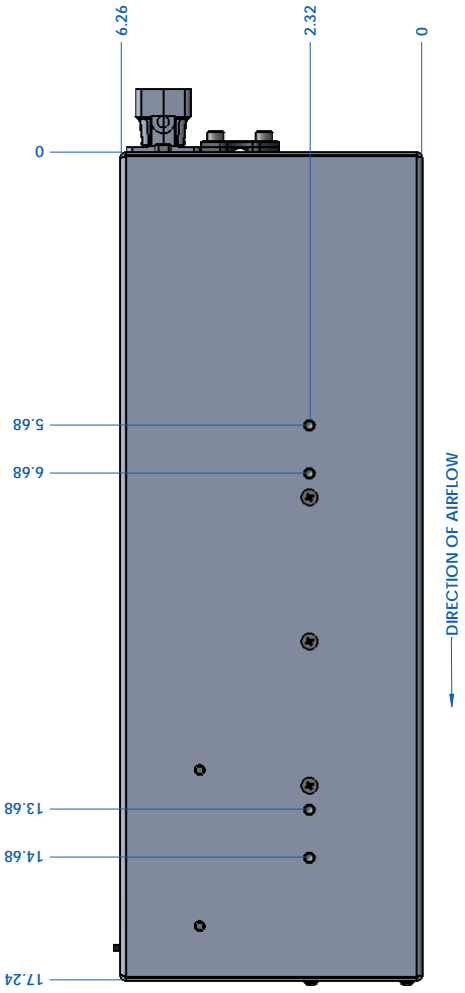
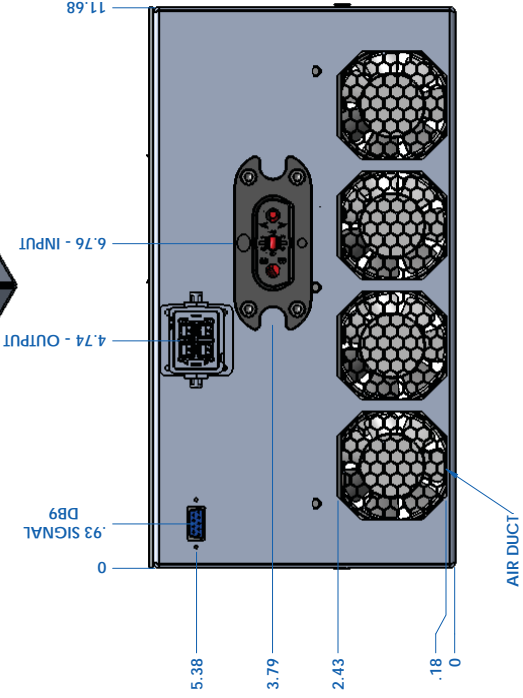
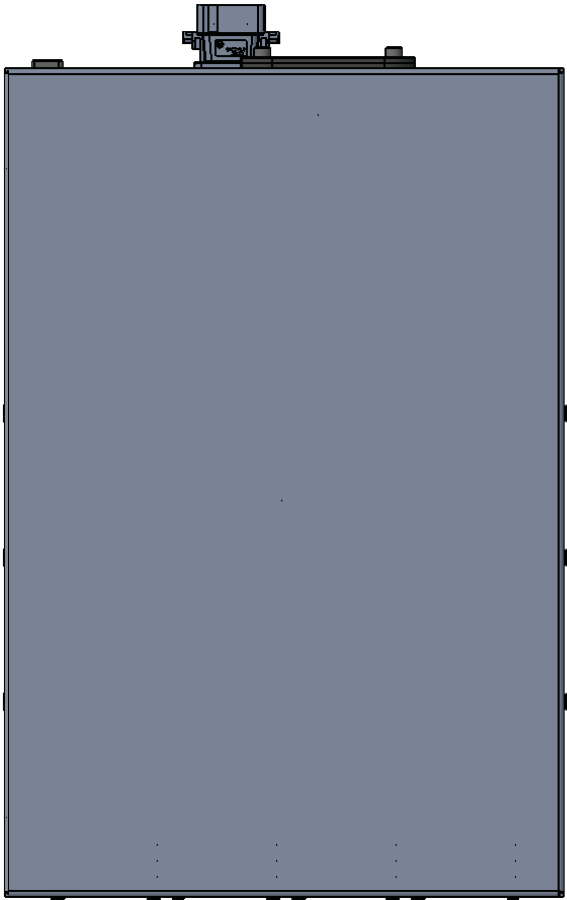
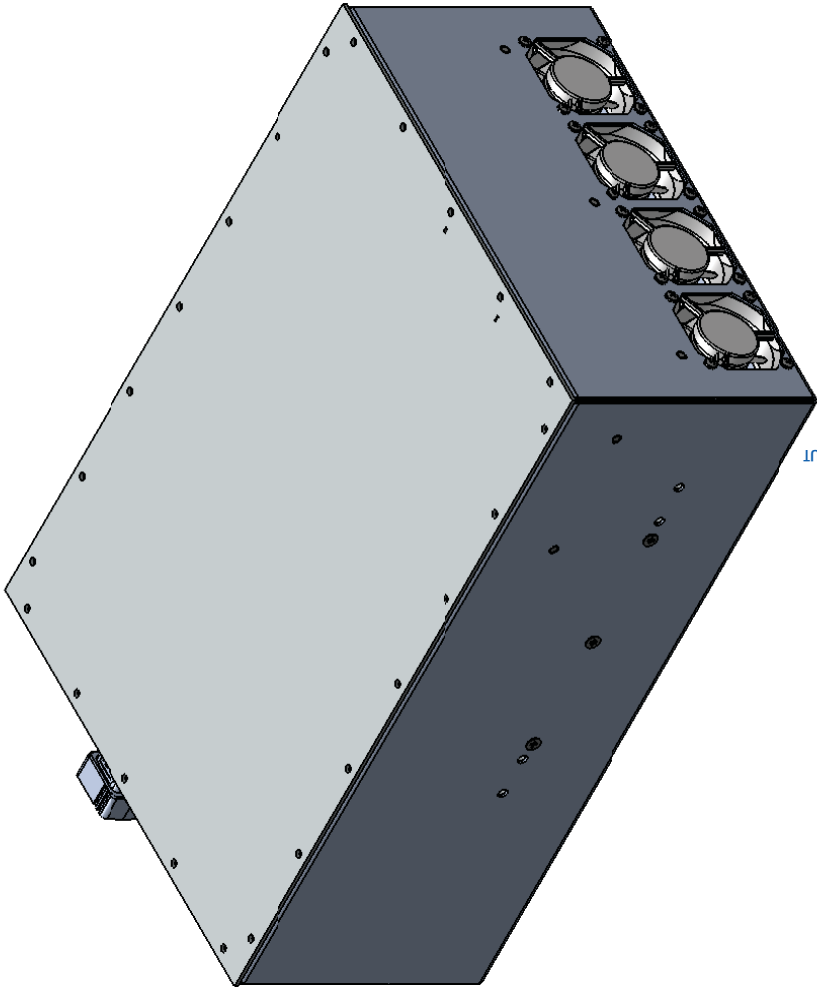
### iDrive Telematics data System

iDrive provides a broad set of intuitive tools for operation and maintenance of the solar plant reporting and diagnostic via cellular network or Wi-Fi. iDrive real time and historical operation data is accessible from anywhere on the network. It also can be used remotely with a secure Internet connection or a cellular line. To address the ever-growing service, diagnostics and security requirements in systems, user access control is integrated into the entire system and provides a record trail for all activity. A large set of energy production, unit health, prognostic and diagnostics and maintenance reports are available to enhance the operator’s ability to truly implement an optimum and reliable smart grid.

## DA03 Performance Specification

ITEM	DESCRIPTION	SPECIFICATION	ITEM	DESCRIPTION	SPECIFICATION
<b>DC INPUT</b>	Pmax DC (kW)	7.2kW	<b>Protection</b>	DC Input	OV, UV, OC
	Vin DC (Vdc)	80 V-150 V		Anti-islanding	OV, UV, OF, UF, PLL
	MPPT Range DC	95%		OT	YES
	Inom DC (A)	90Adc	<b>Mechanical</b>	Size H (mm)	10.5"
	Imax DC (A)	100 A		Width (mm)	12.5"
<b>AC Output</b>	Pnom AC (kW)	6.6kW	Length (mm)	17.25"	
	Vout AC (V)	110/220, 120/240V	<b>Environmental</b>	Weight (kg)	22kg
	Vgrid	211V - 264V		Protection type	IP 54
	Inom AC (A)	0-30A		Cooling	Forced air cooling
	Frequency	(59.3 Hz - 60.5 Hz)	Ambient Temp	- 40°C to 60°C	
	THD (%)	< 4%	Humidity	0 to 95 %	
	Efficiency	96%	<b>Standards</b>	UL 1547 Anti-Islanding	
	Response Time	¼ Cycle		IEEE 519 Power Quality	
<b>Topology</b>	Multi stage ZVS/ZCS DC-DC-AC HF Converter	UL 1741 Ground Fault Indicator			
<b>Telematics</b>	Wi-Fi and Cellular	IEC 60721-3-3 Class 3m3 Sine Vibration			
<b>User Interface</b>	CAN, RS232, Android Mobile Application	<b>Diagnostics</b>	CAN, RS232, iDrive		
<b>Reporting</b>	Operation status, Fault history, critical limits	<b>Metering</b>	DC input, Battery Energy, AC output		





NOTES: UNLESS OTHERWISE SPECIFIED.  
1. WEIGHT 22LBS.

US HYBRID	
NAME	F. ERICSON
DATE	01-06-10
DRAWN	F. ERICSON
CHECKED	
ENG APPR.	
MFG APPR.	
C.A.	
TITLE: CEC - SOLAR INVERTER OUTLINE & MOUNTING	
SIZE	DA030000D-
REV	-
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SCALE	1:2
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