



Applying modular scalable UPS technology to Tactical Field Applications

Designing power systems for military applications is generally a struggle to satisfy a multiplicity of requirements. There are seemingly contradictory pressures to:

- Design it to be reliable but still cost effective
- Design it to be smaller but keep the same or greater power rating
- Design it to be lighter weight but still rugged enough to meet shock and vibrate requirements
- Design it to be flexible enough to safely handle today's load but expandable for future growth.

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Joint Service Power Expo

May 2-4, 2017 · Virginia Beach, VA

Ultimate Power Source™ Rugged, Compact, Light Weight with N+1 Parallel Redundancy



Front View of Single
1U Module

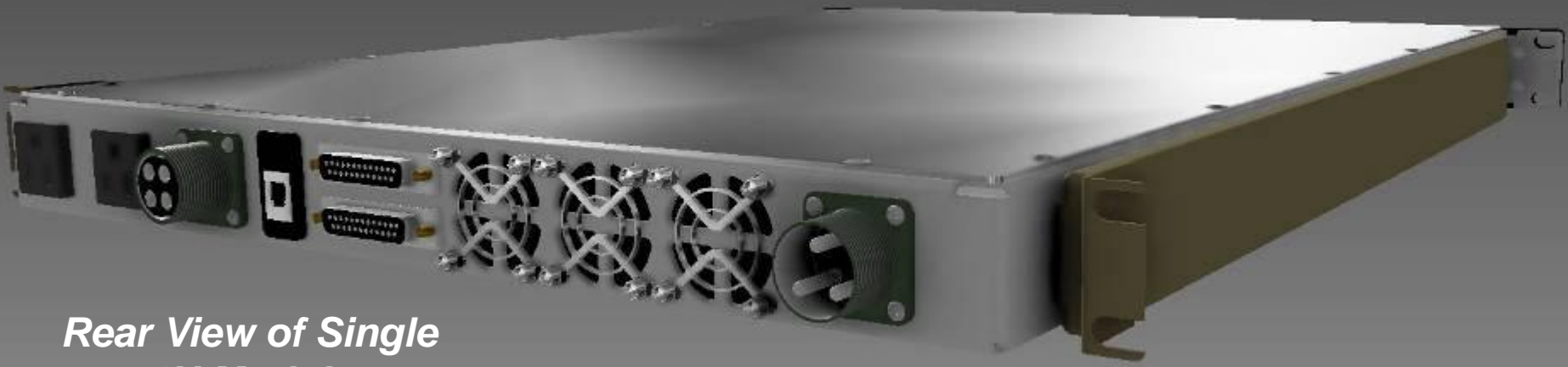
Output Power	AC Input Voltage Options	AC Output Voltage Options	DC Input Voltage Options	DC Output Options	Stand Alone Battery Run Time
2000 Watts, 2500 VA	80-140 Vrms or 150-265 Vrms @ 47-65 Hz	115 Vrms or 230 Vrms 50Hz or 60Hz	28 V nominal or 48 V nominal	up to 1250 Watts of DC total	10 Min. @2000 W 20 Min. @1000 W Lithium Iron Phosphate

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**Combine up to 32 Units for increased power!
1-phase or 3-phase AC output!**



*Rear View of Single
1U Module*

Battery Modules	Configuration	Overload Capabilities	Efficiency
Hot Swappable Battery Modules Light Weight Lithium	Parallelable (up to 32 Units) 1 or 3 Phase AC input or output	150% Power for 5 sec. 110% w/o degradation	95% Enhanced Power Conversion 90% Online



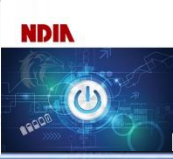
Features

- *2000 Watts, 2500 VA output power per module*
- *7-10 minute per battery module at 2000 W*
- *Built-in Power Distribution Unit (PDU)*
- *Field replaceable, hot swap battery modules*
- *High reliability & capacity lithium iron phosphate*
- *Full power operation from -20°C to +60°C*
- *Power factor correction at AC input*
- *True on-line double conversion*
- *Cold start with no AC or DC input connections*
- *Pure sinusoidal AC output voltage*
- *Handles both linear and non-linear loads*

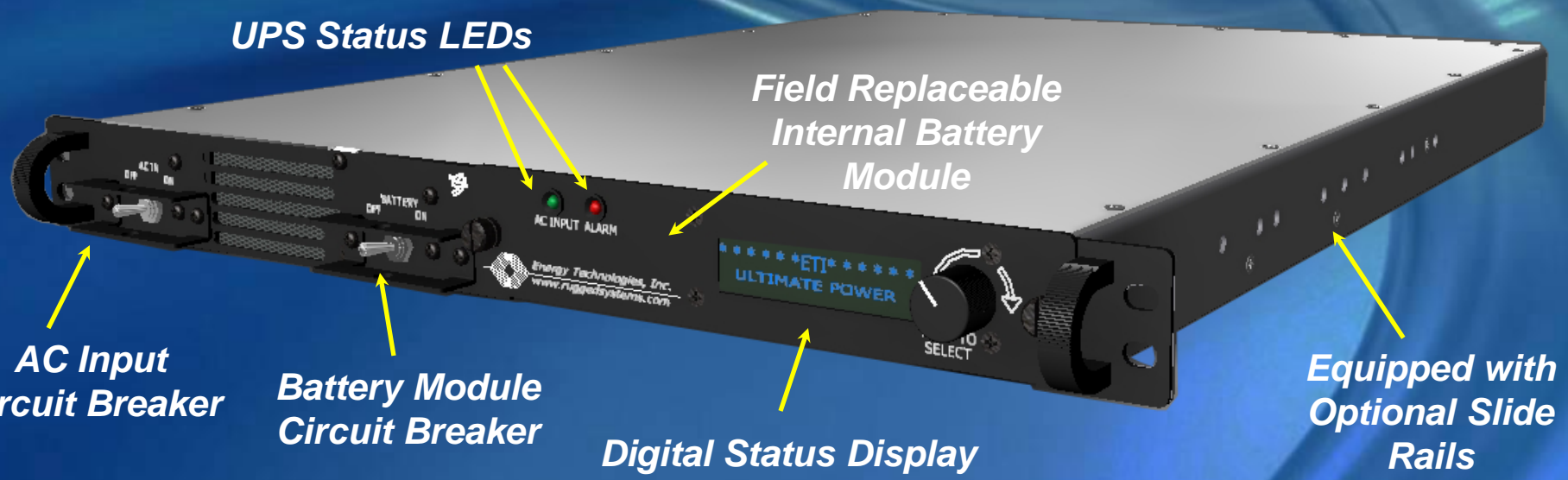


Features

- *N+1 redundancy: Increased reliability*
- *1-phase or 3-phase AC Input and/or output configurations*
- *Up to 32 units can be combined for increased power rating and reliability*
- *Available in Mil Spec or COTS versions*
- *1U high rack mount unit (1.73" x 19" x 23.0")*
- *Light weight: <40 lbs. including battery*
- *Meets mechanical shock and vibration standards*
- *Multiple output connector configurations*
- *User I/O and Configuration signal ports*



1U Rack Mounted UPS Front View



UPS Status LEDs

Field Replaceable
Internal Battery
Module

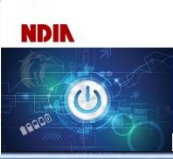
AC Input
Circuit Breaker

Battery Module
Circuit Breaker

Digital Status Display

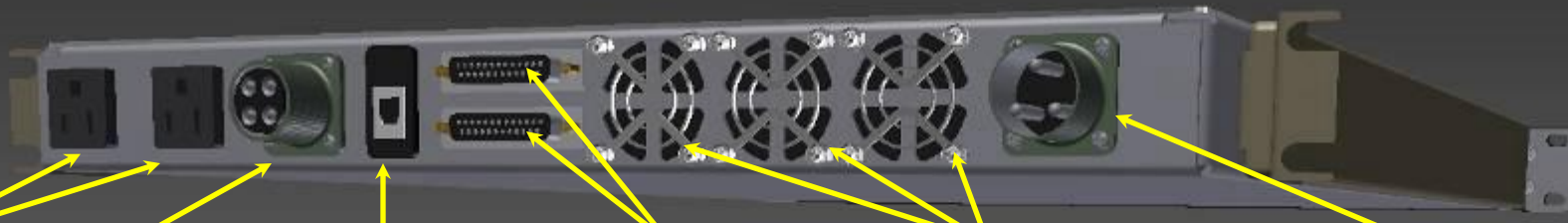
Equipped with
Optional Slide
Rails

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1U UPS with Several Output Connector Configurations



NEMA 5-15

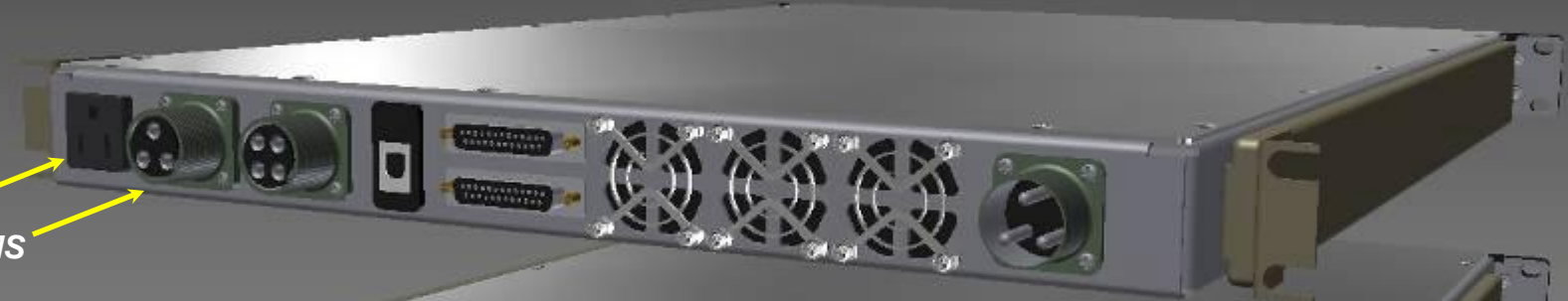
Aux Battery

I/O (RS232/TCP/IP)

Sync/Config Ports

Temp Controlled Fans

AC Input



NEMA 5-15 & MS



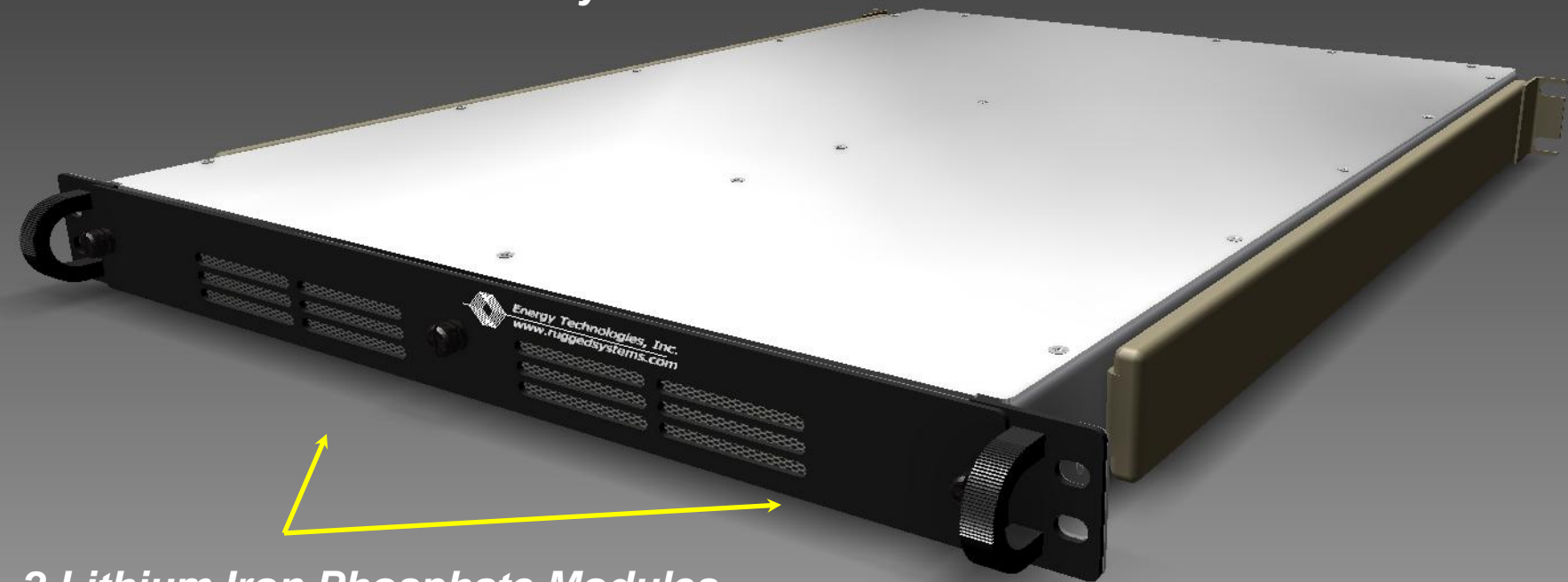
MS





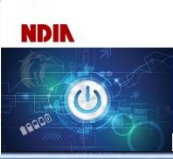
1U Battery Expansion Module (BEM)

- 2 internal Battery Modules
- Same Battery Modules used in the 1U UPS



Energy Technologies, Inc.
www.ruggedsystems.com

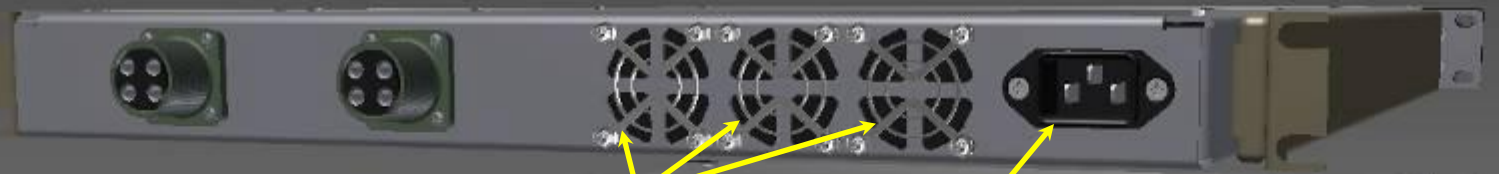
2 Lithium Iron Phosphate Modules



Connector Options for 1U BEM

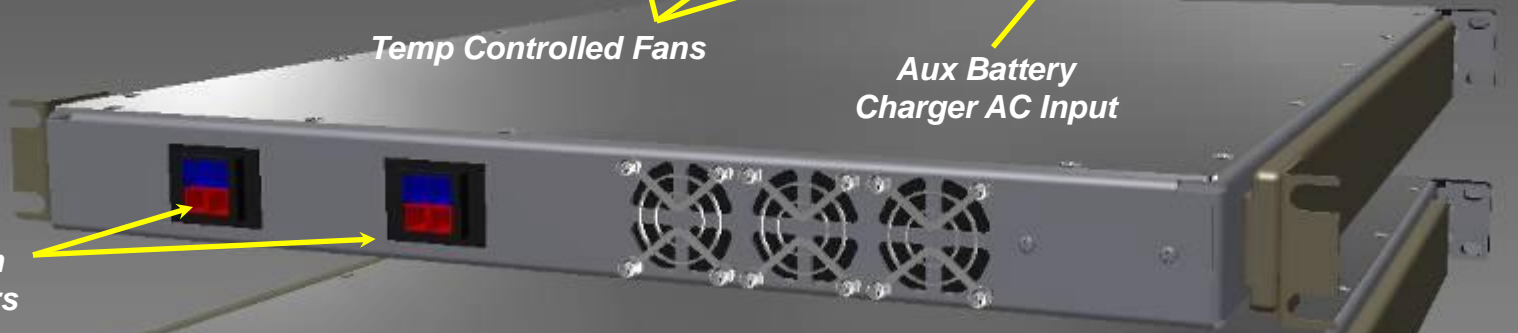


MS connectors. Dual connectors allow BEMs to be daisy chained for increased backup time



Temp Controlled Fans

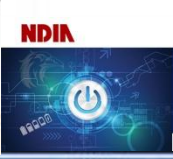
*Aux Battery
Charger AC Input*



*Anderson
Connectors*

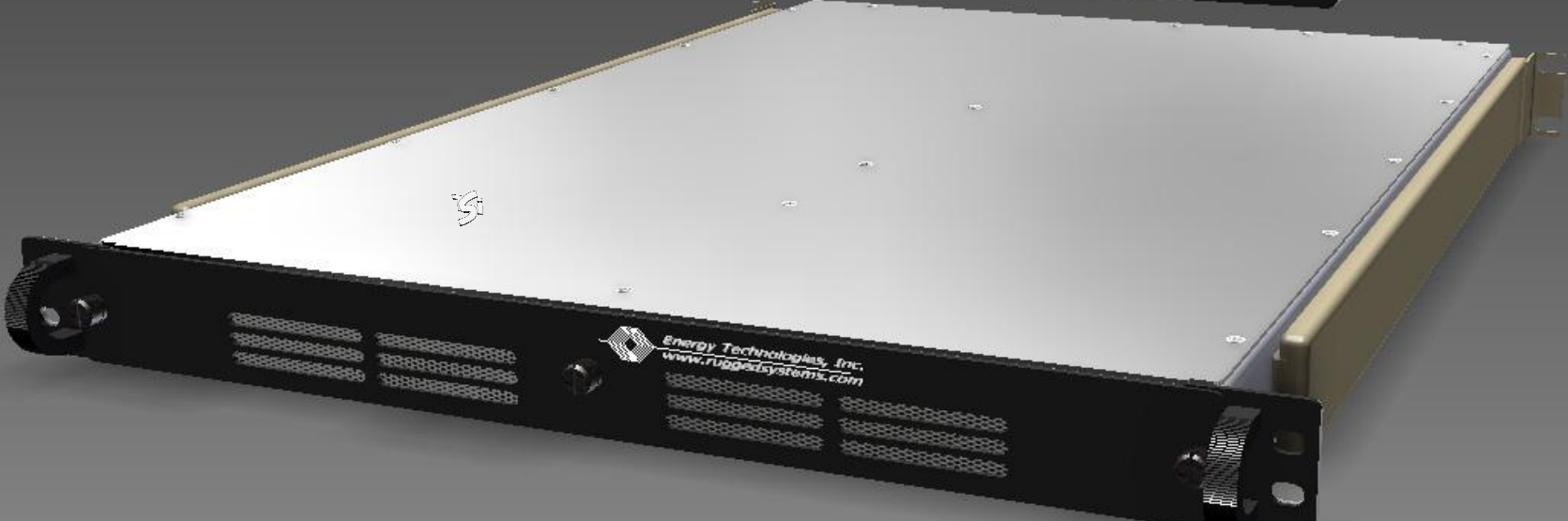


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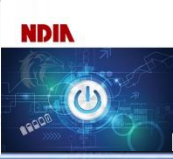


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Ultimate Power Source Mil Spec® Version 1U 2000 Watt Ultra Compact UPS with 1U Battery Extension Module (BEM) 30 Minutes @ 2000 W, 60 Minutes @ 1000 W



Ultimate Power Source

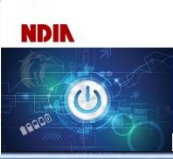


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**1U 2000 Watt Ultra Compact UPS with
(2) 1U Battery Extension Modules (BEM)
50 Minutes @ 2000 W, 100 Minutes @ 1000 W**



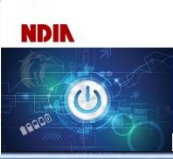
Ultimate Power Source



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**(2) 1U 2000 Watt Ultra Compact UPS with
1U Battery Extension Module (BEM)
20 Minutes @ 4000 W, 40 Minutes @ 2000 W**





Front Controlled 6 Load PDU with Status & Alarm Indicators

UPS 1 or 2
AC Input
Breakers

Emergency Power Off
(Press Both)



Battle
Short

Load
Control
Switches

Load Status
LEDs

Alarm
Status
LEDs

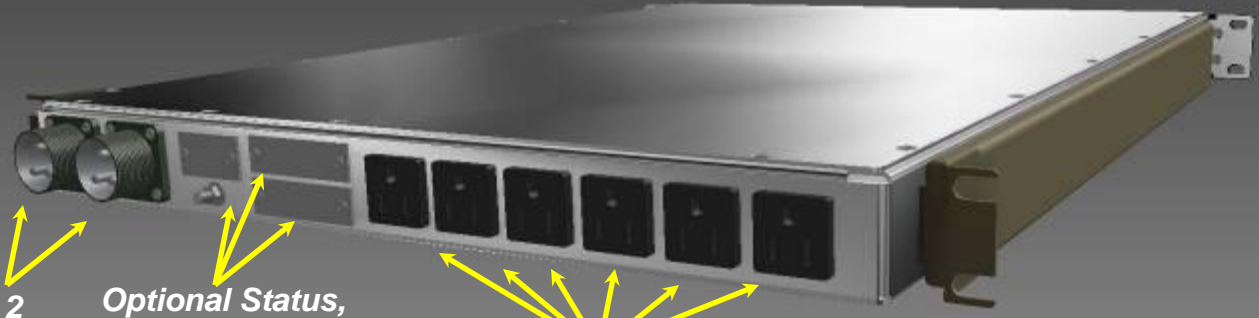
Alarm
Reset

Rear View with NEMA 5-15 Option

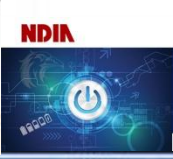
UPS 1 or 2
AC Inputs

Optional Status,
Safety Interlock
and Remote
Control Ports

Choice of
NEMA, IEC or MS
Connectors



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1U Power Distribution Unit (PDU) with 1U 2000 Watt Ultra Compact UPS and 1U Battery Extension Module (BEM)



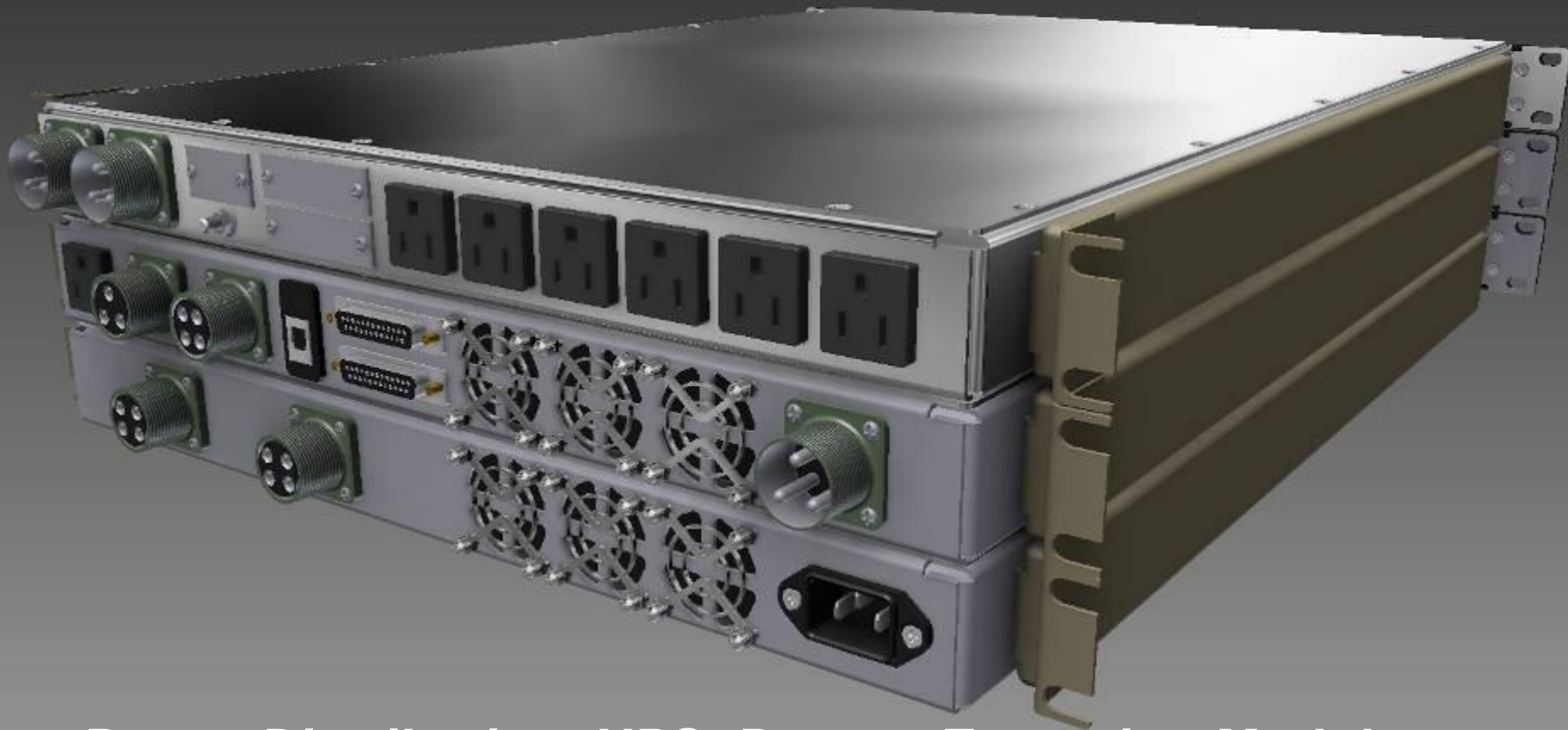
Ultimate Power Source



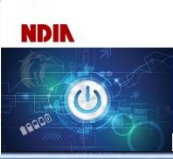
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PDU, UPS & BEM Rear View



*Power Distribution, UPS, Battery Extension Module
and Battery Charger in a 3U high configuration*

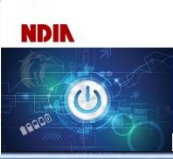


PDU, UPS & BEM in Rack



*PDU can be mounted Remotely
from UPS and BEM*

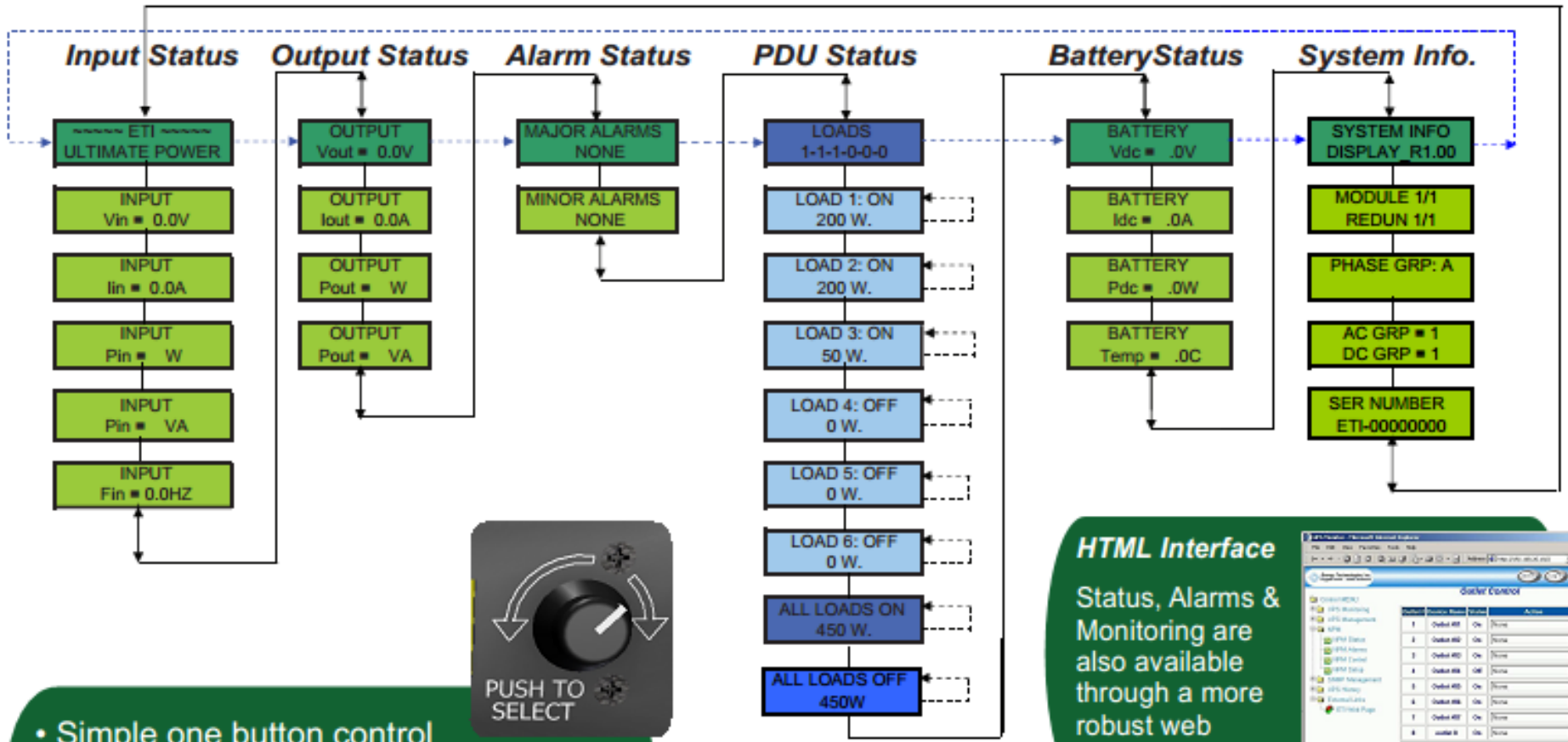




Integrated Software PDU Status & Control

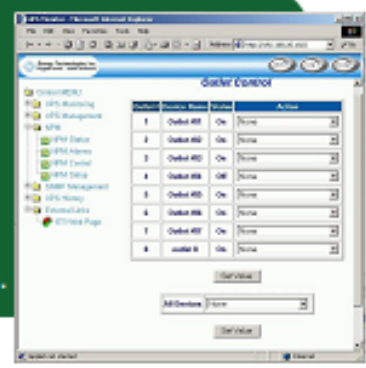
PUSH switch to select MAJOR menu items. -----

TURN switch to select MINOR menu items. _____



- Simple one button control
- Control features are access protected
- PDU built in for six(6) outputs

HTML Interface
Status, Alarms & Monitoring are also available through a more robust web browser interface.

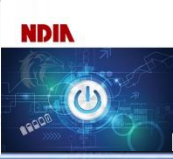


push on / push off

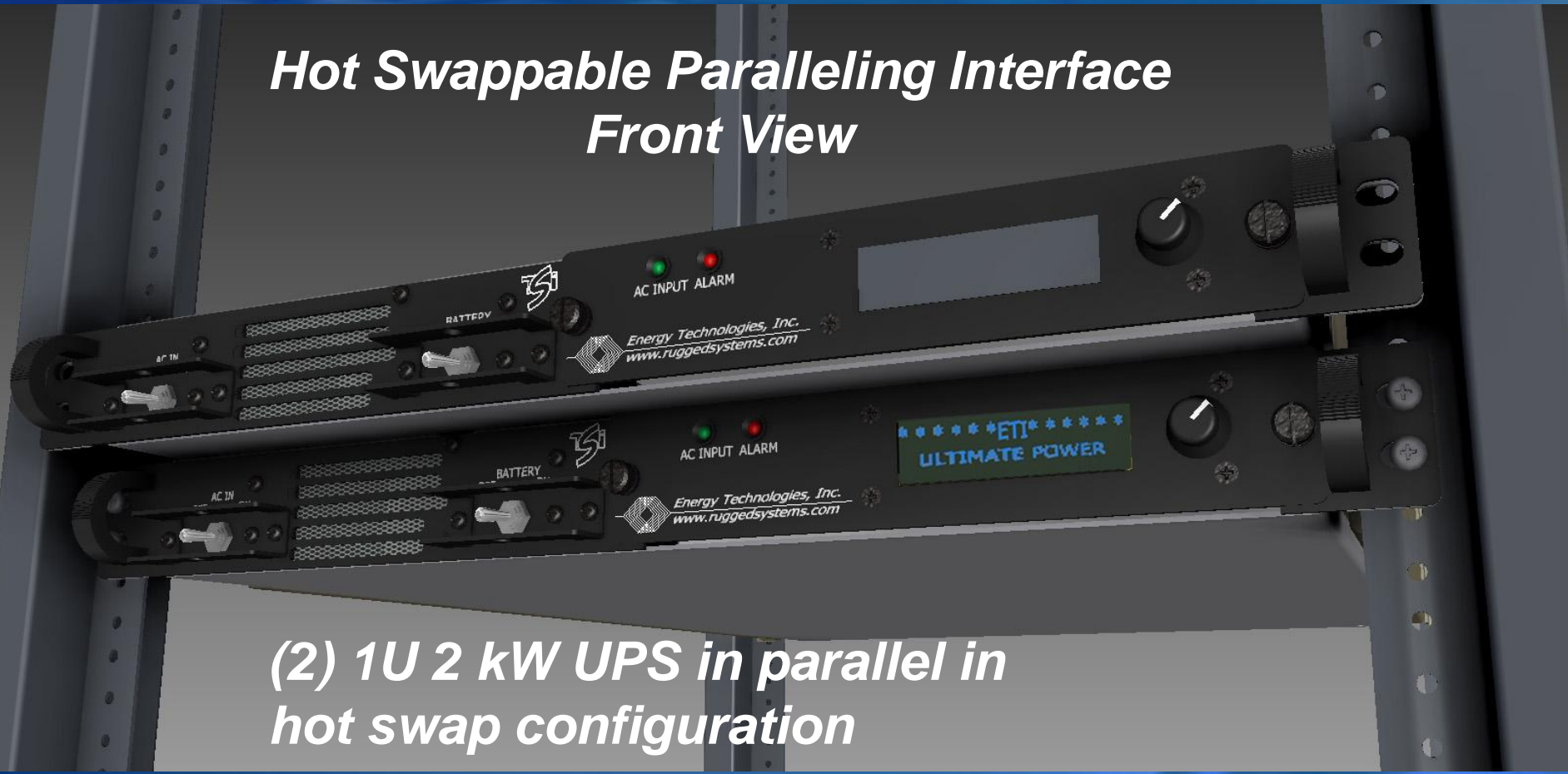


Internal Power Distribution Unit (PDU)

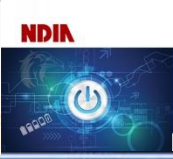
- True output isolation
- Individual output control
- PDU shutdown feature
- Individual load Status
- Start up configuration control
- All outlets are on in UPS by-pass mode
- Auto tracking in redundant configuration
- Password access required for control functions
- Load Level Status updates to main menu
- No Intelligent Interface required.



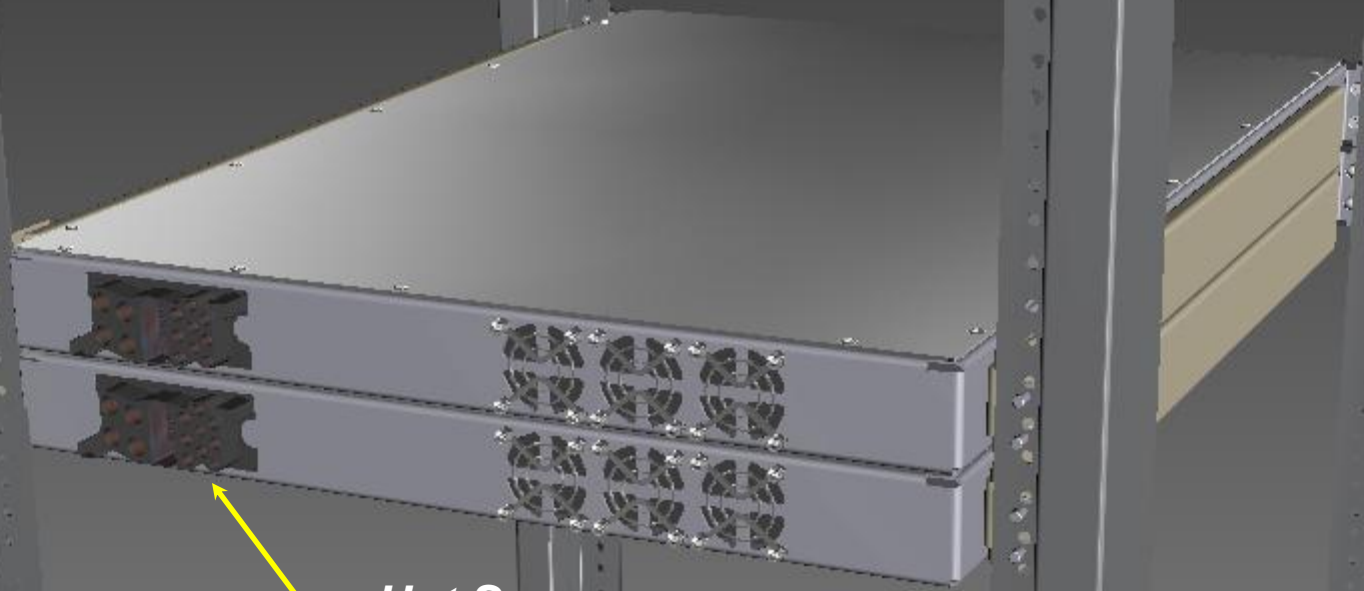
Hot Swappable Paralleling Interface Front View



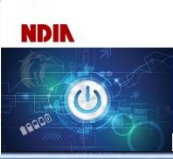
*(2) 1U 2 kW UPS in parallel in
hot swap configuration*



Hot Swappable Paralleling Interface Rear View (Backplane Cage not shown)



Hot Swap
Pin Protected
Connectors



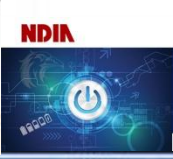
Hot Swappable Paralleling Interface Rear View (Backplane Cage not mounted)



Fully Adjustable for
Rack Configurations

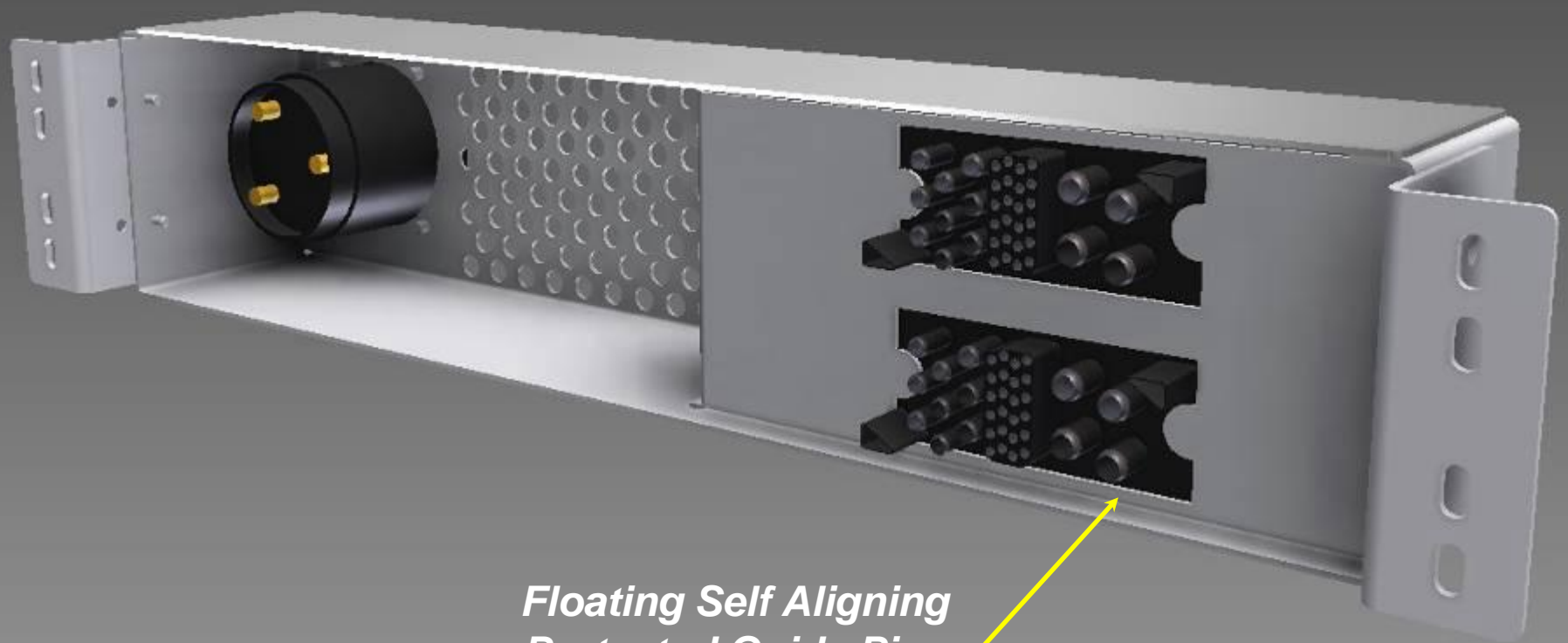


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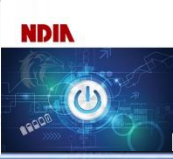


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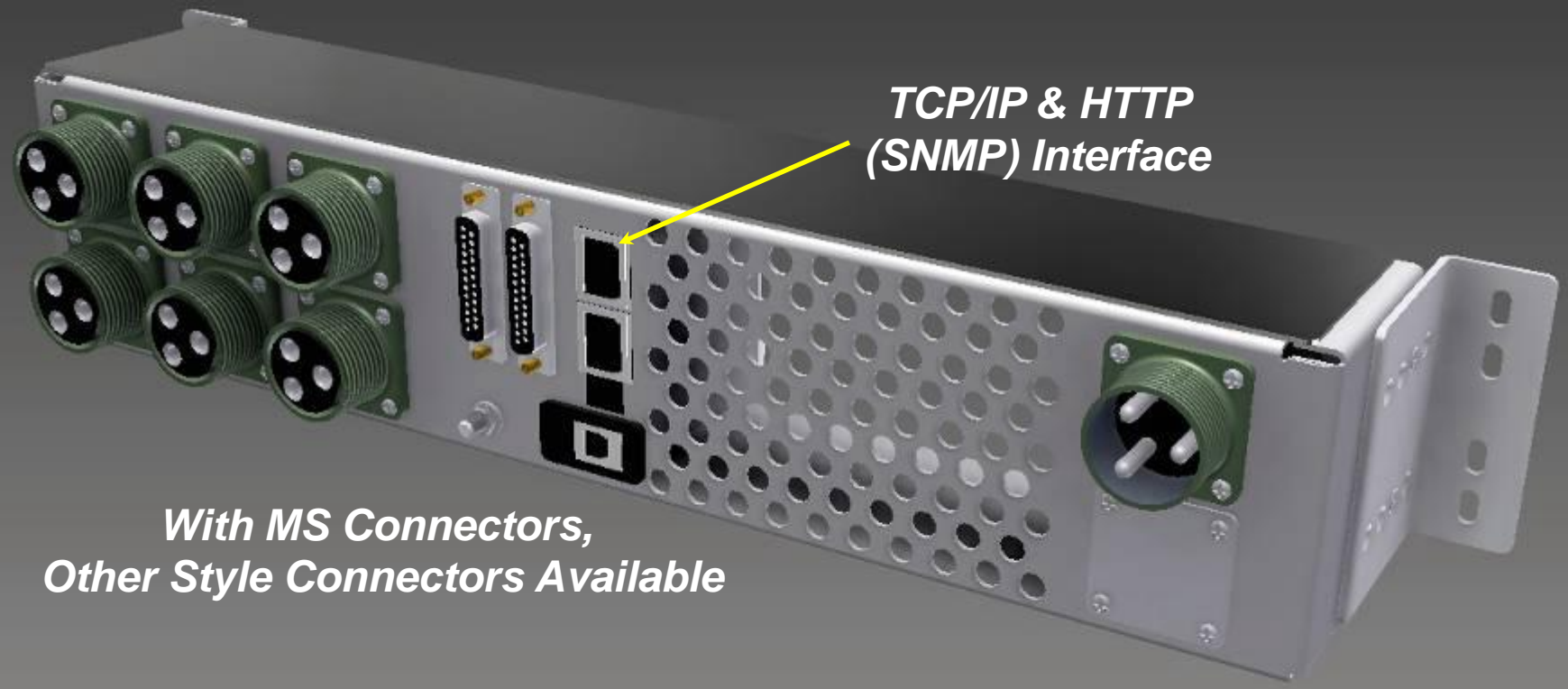
2U Hot Swappable Paralleling Interface Backplane Cage Inside View



*Floating Self Aligning
Protected Guide Pins*



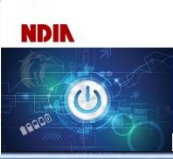
2U Hot Swappable Paralleling Interface Backplane Cage Rear View



TCP/IP & HTTP
(SNMP) Interface

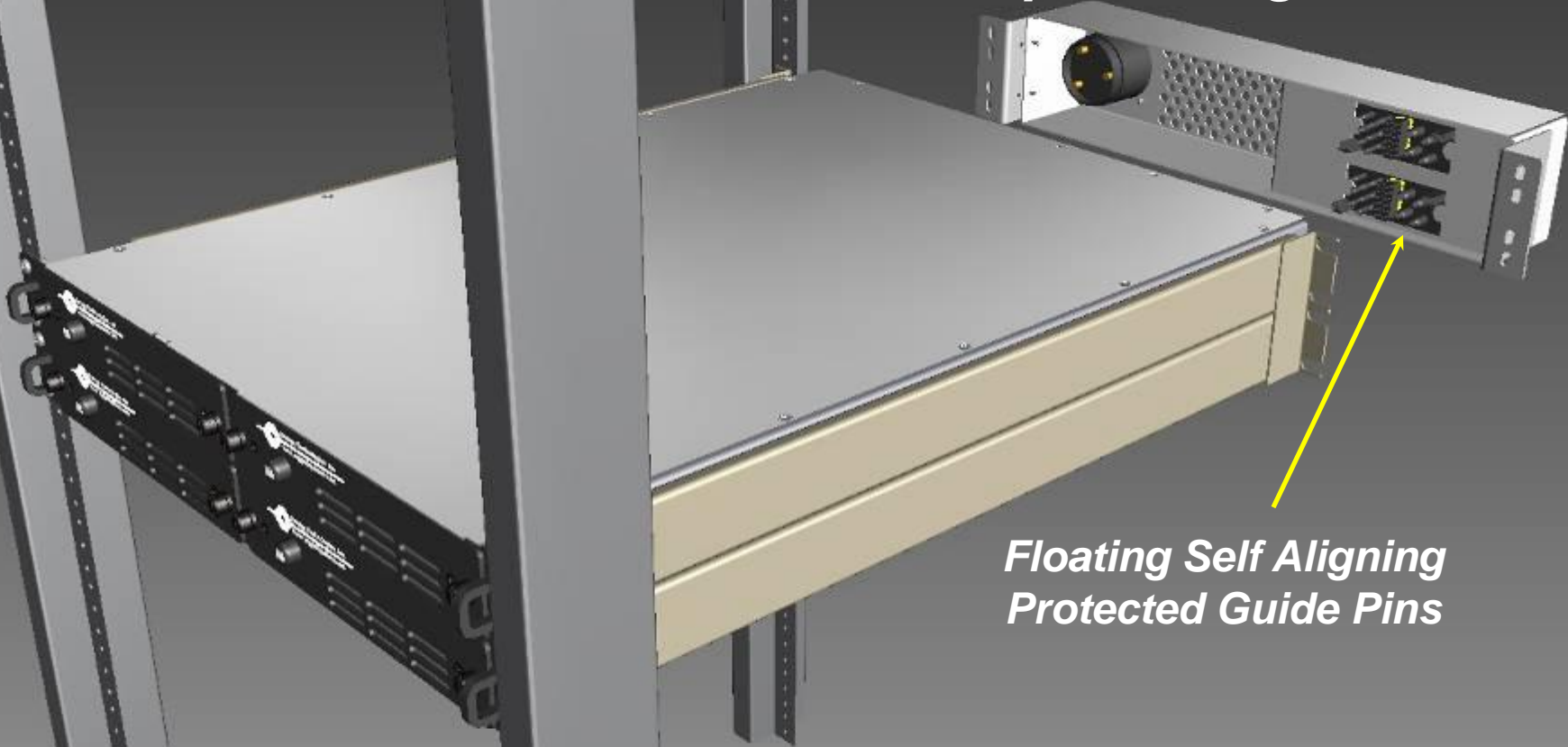
With MS Connectors,
Other Style Connectors Available

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Hot Swappable Paralleling Interface Backplane Cage



Floating Self Aligning
Protected Guide Pins

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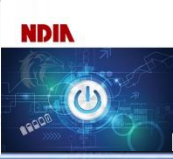
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2U Hot Swappable Paralleling Interface Fully Assembled in Rack Rear View

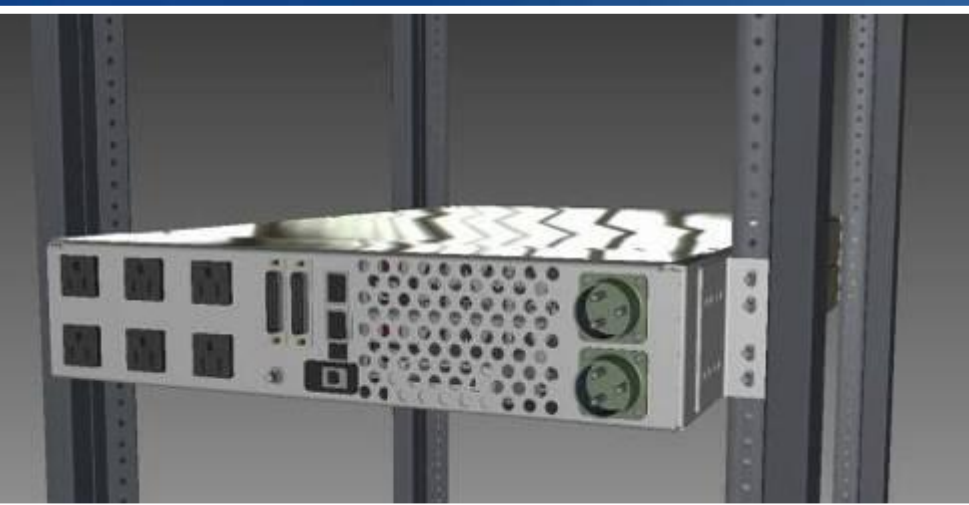
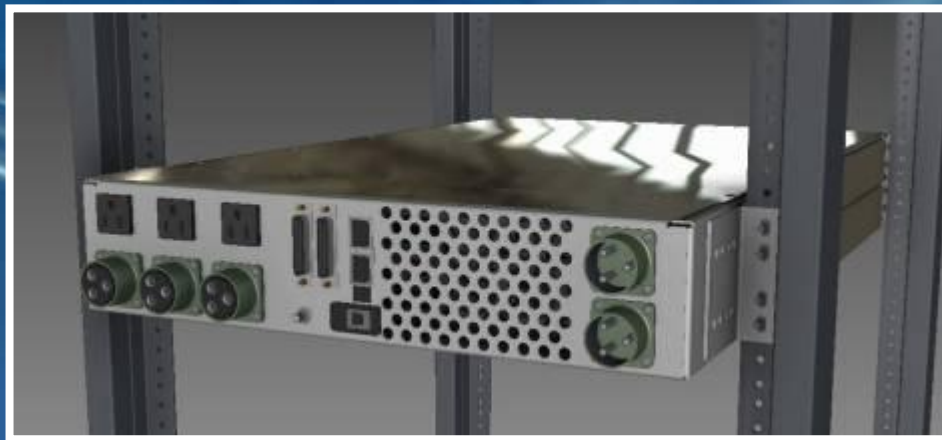


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Multiple Output connector configurations available to fit your application (2U Configurations)



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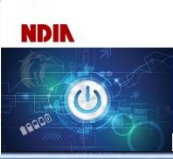
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Multiple Output connector configurations available to fit your application (3U Configurations)



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12 kW, 3 Phase UPS, Field Replaceable Modules



Power Distribution Management (PDM)

2 2kW paralleled per phase

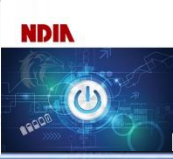
Allows Easy Field Replacement



12 kW, 3 Phase UPS Rear View



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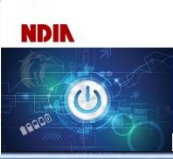
2 kW with Extended Battery (Shipboard Compliant) Dual Source Input

Digital Performance
Monitoring Display



20 min Battery Backup

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2 kW with Extended Battery (Shipboard Compliant) Rear View

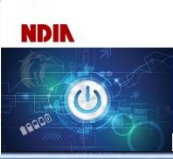
Multiple Output connector configurations available



Dual Source
AC Option
Available

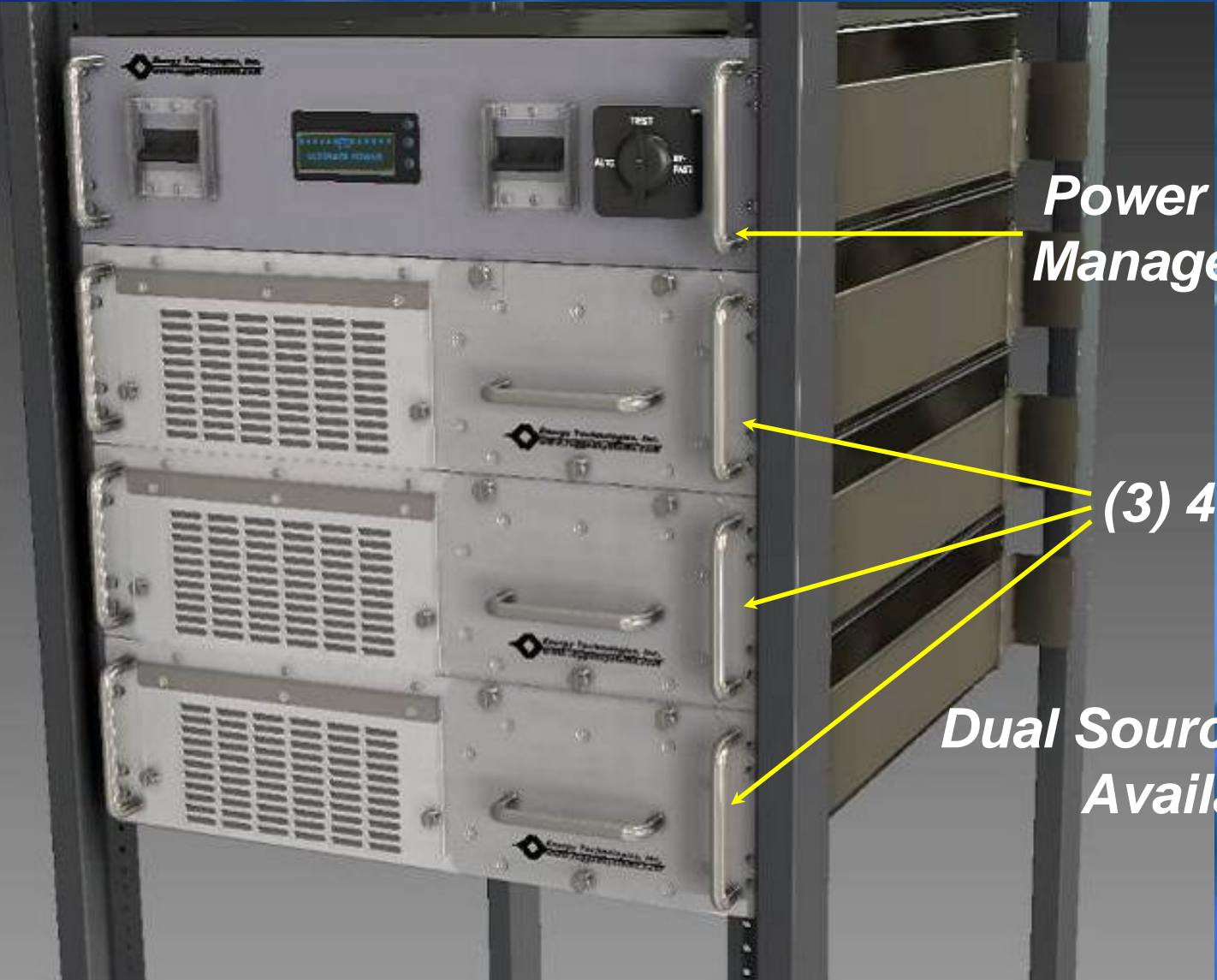
TCP/IP & HTML (SNMP) Interface

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12 kW with 1 Phase or 3 Phase Configuration, Front View

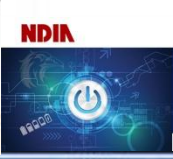


Power Distribution Management (PDM)

(3) 4 kW UPS

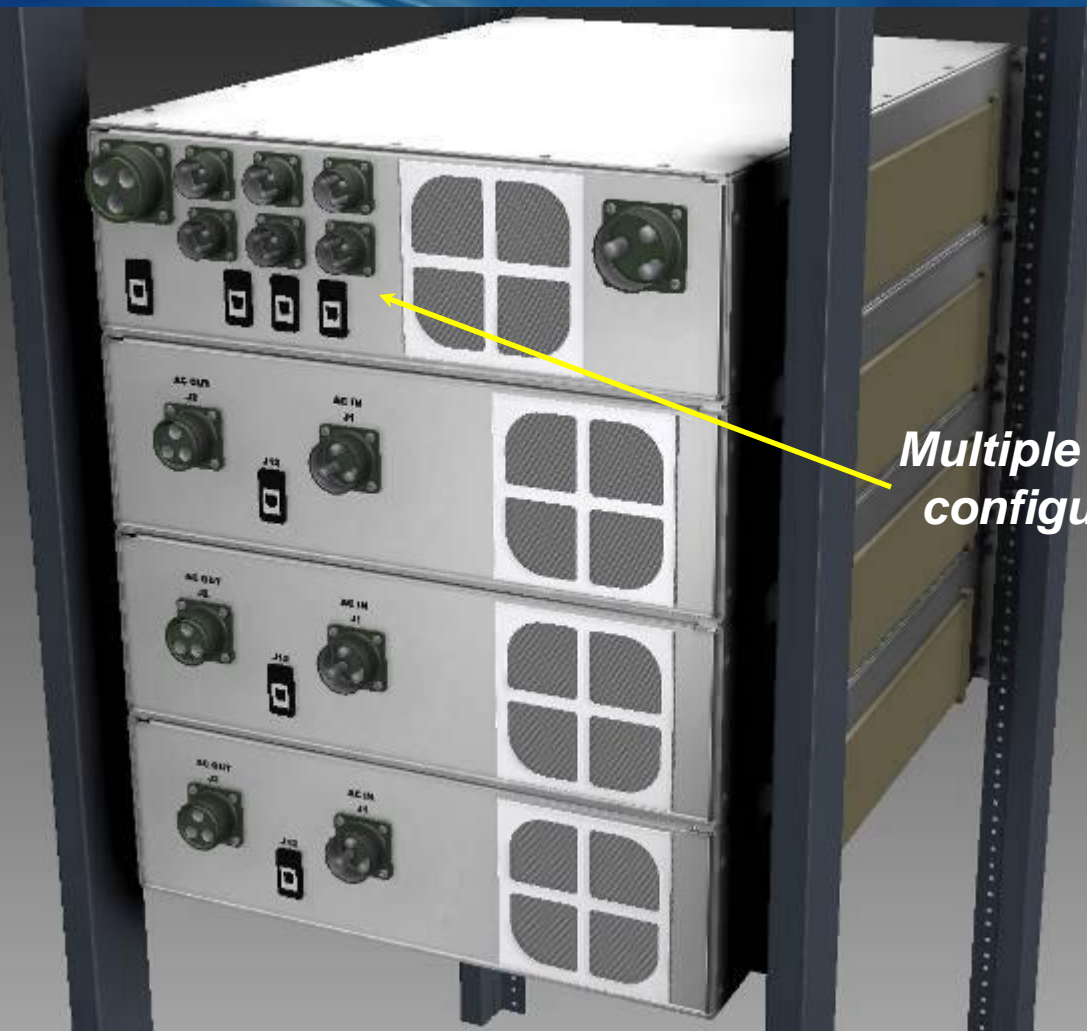
Dual Source Option Available

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12 kW with 1 Phase or 3 Phase Configuration Rear View



Multiple Output connector configurations available

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Tactical Case with 4 kW total UPS power
20 Minutes of Battery Backup @ 4 kW
40 Minutes of Battery Backup @ 2 kW
In a 3U high configuration





**Rear view of 3U Tactical Case with
(2) 1U 2000 Watt Ultra Compact UPS with
1U Battery Extension Module (BEM)
20 Minutes @ 4000 W, 40 Minutes @ 2000 W**



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***Rear view of 3U Tactical Case with
Hot Swap Rear Cage, NEMA Connectors
(2) 1U 2000 Watt Ultra Compact UPS
1U Battery Extension Module (BEM)***





***Rear view of 3U Tactical Case with
Hot Swap Rear Cage, MS Connectors
(2) 1U 2000 Watt Ultra Compact UPS
1U Battery Extension Module (BEM)***



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***Tactical, Shock Isolated Rack Case with:
1U UPS, 2 kW, 10-30 Min Backup
1U Workstation or Server and
1U Key Board, Touchpad and Display***





Contact Energy Technologies, Inc.

Go to www.UltimatePowerSource.com

for more information or:

Tim Lowe PhD, VP of Sales

tdlowe@ruggedsystems.com

Chip Calderhead, Senior Inside Sales

calderhead@ruggedsystems.com

Voice: 419.522.4444

Fax: 419.522.4466