

# HFE

## 1U 1600W & 2500W

### Hot Swap Front Ends

# NEW Product development

## HFE1600 Series 1.6kW /2.5kW in 1U

- Hot-swap front end.
  - High Efficiency 92%.
  - High Density, 1600W : 25.2 W/In3
  - 2500W: 28.9 W/In3
  - High Reliability and functionality.
  - PMBus Interface.
- Up to 8kW in 1U rack.  
Up to 10kW in 1U rack.



# HFE1600 & 2500



- ◆ 12V, 24 & 48V Outputs
- ◆ 1600W or 2500W Output Power
- ◆ 85 to 265VAC Wide Range Input
- ◆ 1U high 19" Rack Mount
- ◆ PMBus Option – Isolated from Output

# HFE Key Specifications

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- ◆ ORing FETs for hot swap, N+1 redundancy
- ◆ Active Power Factor Correction
- ◆ 90% or greater efficiency
- ◆ <1mA leakage current
- ◆ Temperature controlled fans for longer life
- ◆ Five 1600W or four 2500W per 19" rack
- ◆ 12V 0.5A Auxiliary Output

# HFE Controls and Signals

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- ◆ Programmable Output Voltage

12V: 9.6 to 13.2V

24V: 19.2 to 29V

48V: 38.4 to 58V

- ◆ Voltage Programming (apply external 0-5V)

- ◆ Resistive Programming (apply external 0-1k $\Omega$ )

- ◆ DC Good, AC Fail, Remote on/off (inhibit or enable)

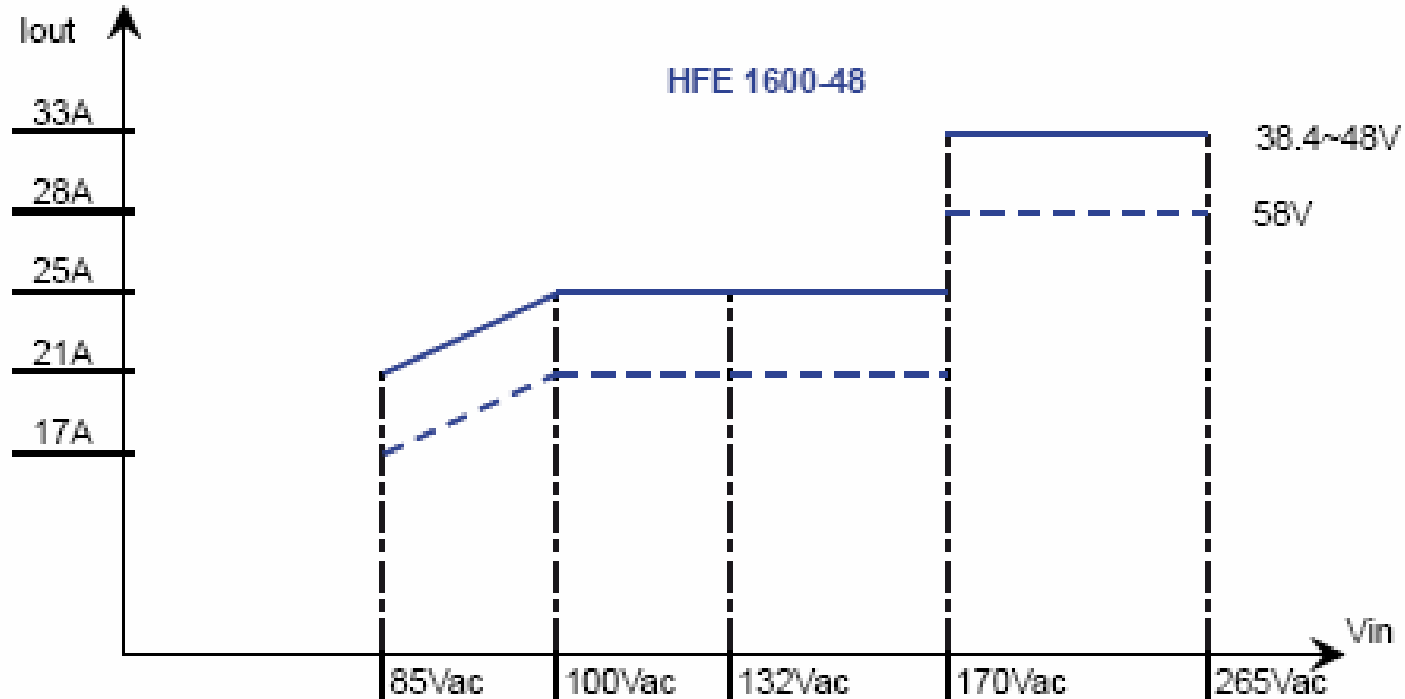
# HFE Protection & Certifications

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- ◆ Over temperature protection
  - Warning alarm 10°C before shutdown
- ◆ Tracking Over Voltage Protection (OVP) & DC Good
- ◆ HFE2500 Series
  - Programmable Overcurrent Protection (40 – 110%)
    - Apply external voltage. (Not applicable for HFE1600 Series)
- ◆ IEC/EN/UL 60950-1 Ed2. (UL listed)
  - Designed to meet IEC/EN/UL 61010-1
- ◆ Class B conducted, Class A radiated EMI

# HFE1600 Power Supply

- ◆ 1600W with 170 – 265VAC Input
- ◆ 1200W with 100 – 132VAC Input
  - De-rate 1% / 1V from 100V – 85VAC



# HFE2500 Power Supply

- ◆ 2500W with 170 – 265VAC Input
- ◆ 1500W with 100 – 132VAC Input
  - De-rate 1% / 1V from 100V – 85VAC

Maximum Output Current	Efficiency 100% load (230V)
12V 200A	91%
24V 105A	91%
48V 52.5A	92%

# 80 PLUS Certification

80 PLUS Certification	115V Internal Non-Redundant			230V Internal Redundant		
	% of Rated Load	20%	50%	100%	20%	50%
80 PLUS	80%	80%	80%	N/A		
80 PLUS Bronze	82%	85%	82%	81%	85%	81%
80 PLUS Silver	85%	88%	85%	85%	89%	85%
<b>80 PLUS Gold</b>	87%	90%	87%	<b>88%</b>	<b>92%</b>	<b>88%</b>
80 PLUS Platinum	90%	92%	89%	90%	94%	91%

**HF2500-48 Meet 80 Plus Gold !**

# HFE Rack



- ◆ HFE1600 Rack
  - 5 slots, 5 separate input feeds

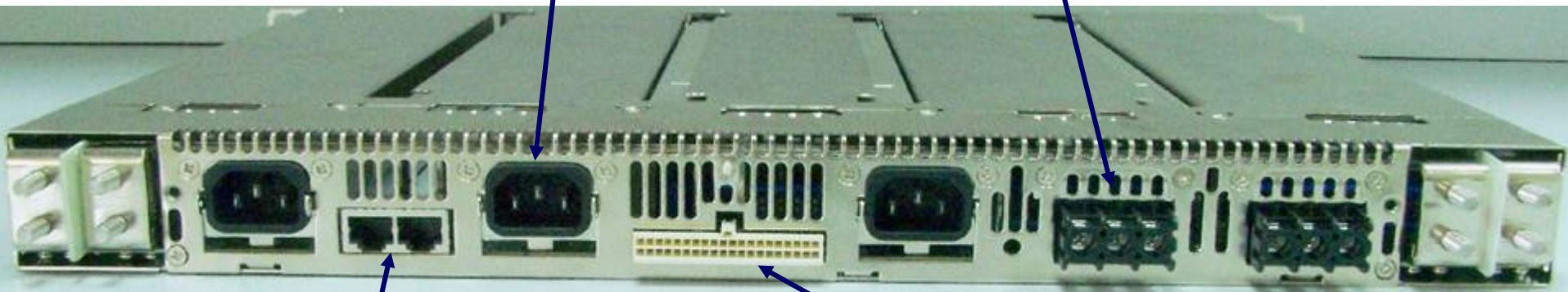
# HFE Rack



- ◆ HFE2500 Rack
  - 4 slots, 4 separate input feeds

# HFE Rack

**Individual IEC AC inputs, or Optional Terminal Blocks**



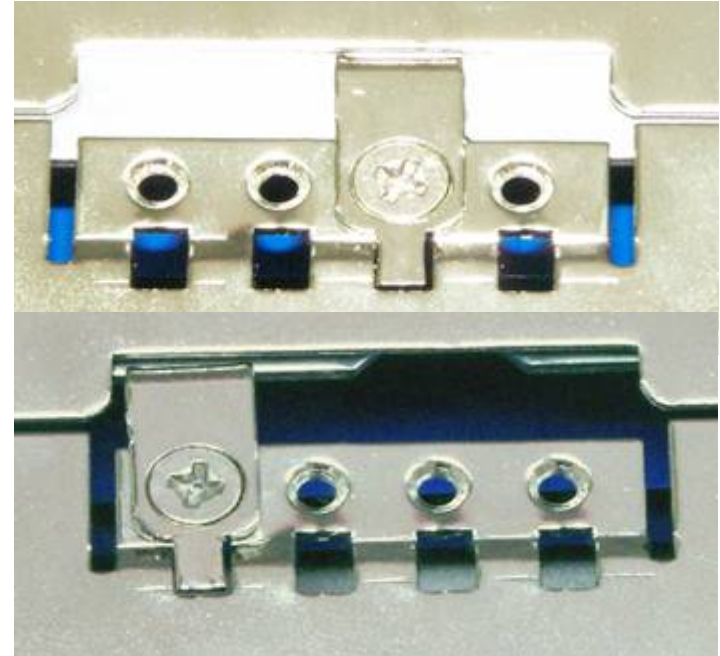
**PMBus communication interface**

**Control signals connector**

Can parallel up to ten 1600W units or eight 2500W units

# HFE Rack

## User Assignable Keying



**Output bus bars  
(200A maximum each side)**



# HFE Rack

## 2.3 Keying Option to define the Rack's Voltage

Keying Option can be installed to ensure that only the correct Power Supply can be inserted into the Rack. The Key Option consists of two parts: Power Supply Key (one per unit Fig 2.3a) and Rack Keys (5 per Rack Fig 2.3b). Power Supply Key and Rack Keys should be fixed (by Flat head screws M3x6) in position corresponding to Output Voltage.

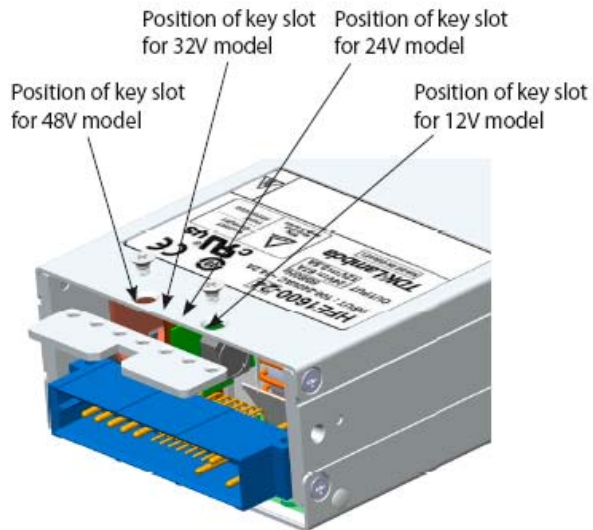


Fig 2.3a

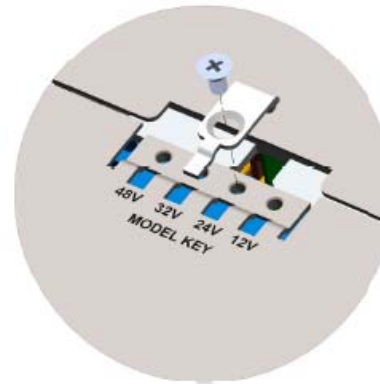


Fig 2.3b

## 1.3. Output Bus Bar Connections

The HFE1600-S1U has two Identical Output Bus Bar connections on both sides of Rear Panel. They are connected in parallel in the Rack. Each of them or both can be used for output connections.

**ATTENTION:** Maximum allowable current for each pair of Output Bus Bars – 200A. Total Output Current: 400A



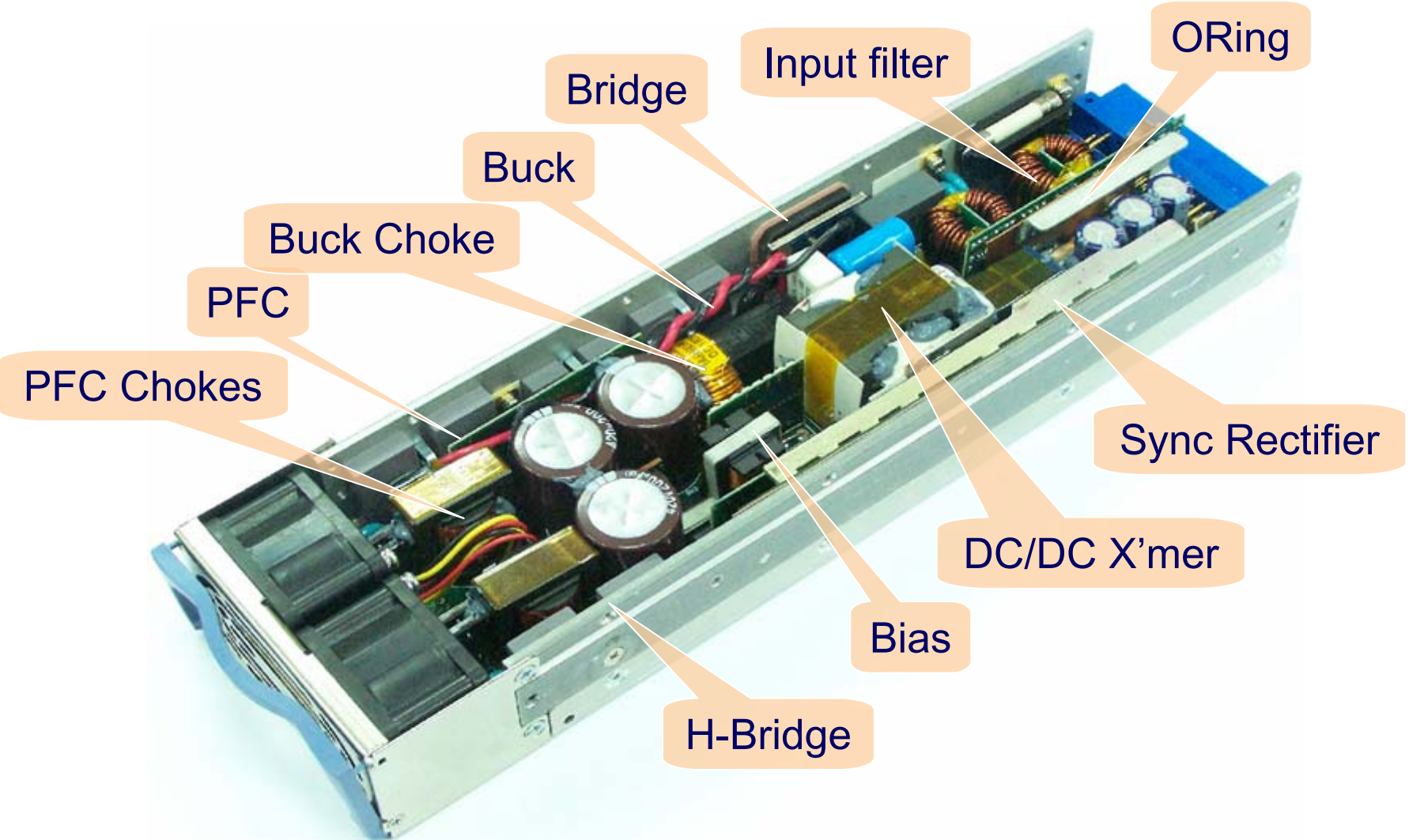
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MAXIMUM 200AMP

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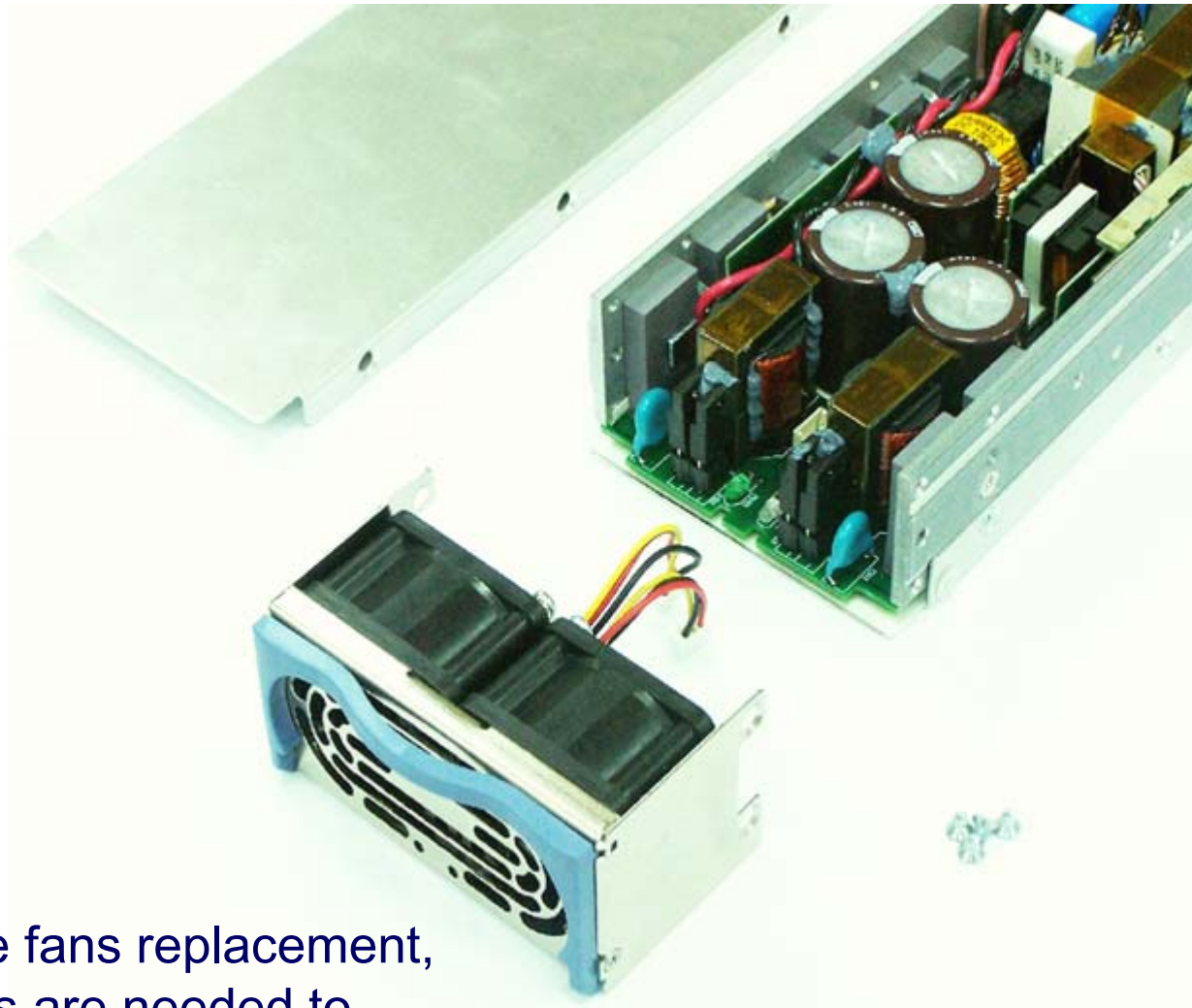
# HFE Mechanical



# HFE Technical – 1600W Mechanical Layout

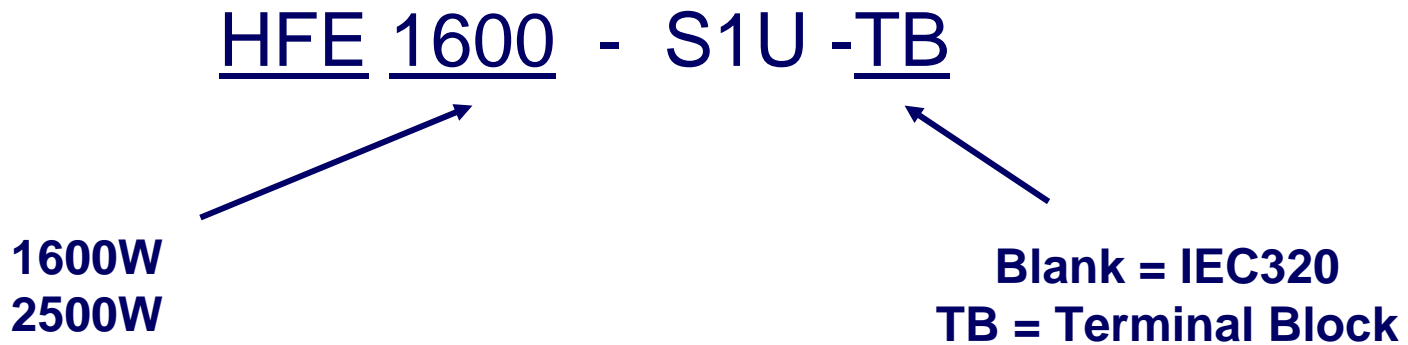
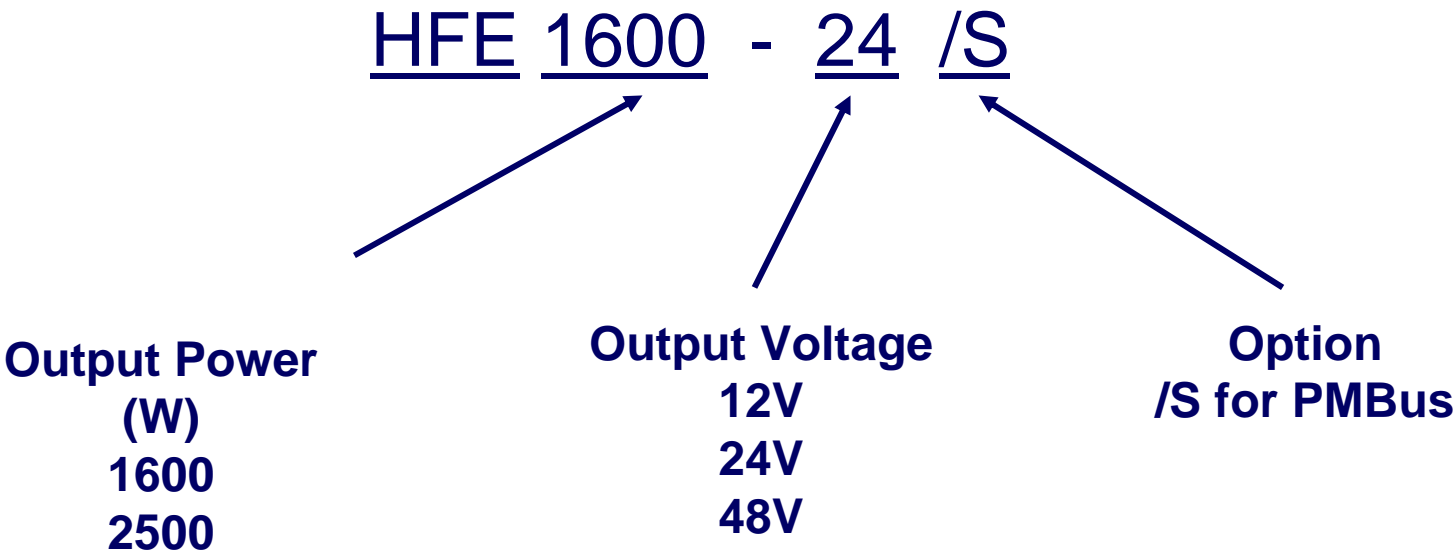


# Fan Assembly/Replacement



For field service fans replacement, only four screws are needed to remove/replace the fan assembly.

# HFE Part Numbering



# KEY Segments & Applications

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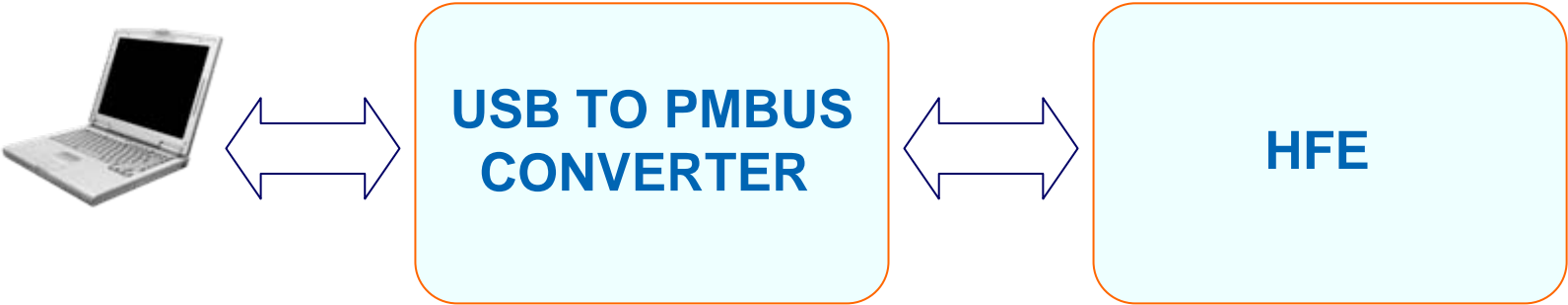
- ◆ Cellular Base stations
- ◆ Distributed Power
- ◆ Satelite Hubs
- ◆ RF Amplifier
- ◆ ATE Equipment
- ◆ Industrial
- ◆ High End Servers

# HFE1600/2500

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- HFE1600 development completed .
- NLI Pilot run Dec-2010 -Done ,  
Wuxi Pilot run by Mid-May-2011 , Mass Production Aug-2011
- HFE2500 is under final evaluation and prototype approval by TLJ QA.
- HFE2500 Series Schedule.
  - .HFE2500 Safety file update CB,TUV,UL by End/May-2011.
  - .Pilot run start Beg /June/2011.
  - .Pilot run shipping End/June/2011.
  - .Mass Production in Israel : End/Aug/2011.
  - .Mass Production In Wuxi : Mid-End/Dec/201

# HFE PMBus Set Up



# PMBus Driver

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What is a driver?

A driver is a piece of software used by your computer to communicate with a particular peripheral. There are drivers for printers, the video, sound, modems, etc

# HFE Driver

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- ◆ **Startup and Periodical status monitoring**
- ◆ GUI Application shall check connection for all possible PS addresses at application startup and by user request.
- ◆ GUI Application shall check PS Status for each connected PS every 1 minute and at startup
- ◆ GUI Application shall alarm user about PS errors for all visible PSs

# HFE Driver

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## **Real time PS data monitoring**

GUI Application shall display :

1. Output Voltage
2. Output current
3. Power Supply temperature

GUI Application shall display/indicate PS Status and errors:

1. Over Temperature
2. Temperature Alarm
3. Fan Fail
4. Over Voltage
5. Programmed Voltage more then allowed
6. AC Fail
7. DC Fail
8. Command Error

# HFE Driver

## PS information display

GUI Application shall display

1. PMBUS Revision
2. PS Address
3. PS Model
4. PS Location
5. PS Serial number
6. PS Manufacturing date
7. PS Manufacturing Revision
8. PS Output voltage
9. PS Maximum allowed voltage
10. Conversion Coefficients
11. PS Manufacturing name

Comment: PS data's order shall be

1. PS Manufacturing name
2. PS Model
3. Serial number
4. Location
5. Manufacturing date
6. Manufacturing Revision
7. Address
8. PMBUS Revision

# HFE Driver

Lambda: GUI 2010.09.01

Measurements | Supply | Group Command

Address  
Model  
Voltage(V)  
Current(A)  
Temperature(°C)

Select Supply  
1111

Address  
Model  
Voltage(V)  
Current(A)  
Temperature(°C)

1111  
1600/12  
12.1  
0.0  
30.3

Maximum Voltage Settings (V)  
9.0v 12.0 13.0v

Program Allowed Voltage Settings (V)  
9.0v 11.5 13.0v

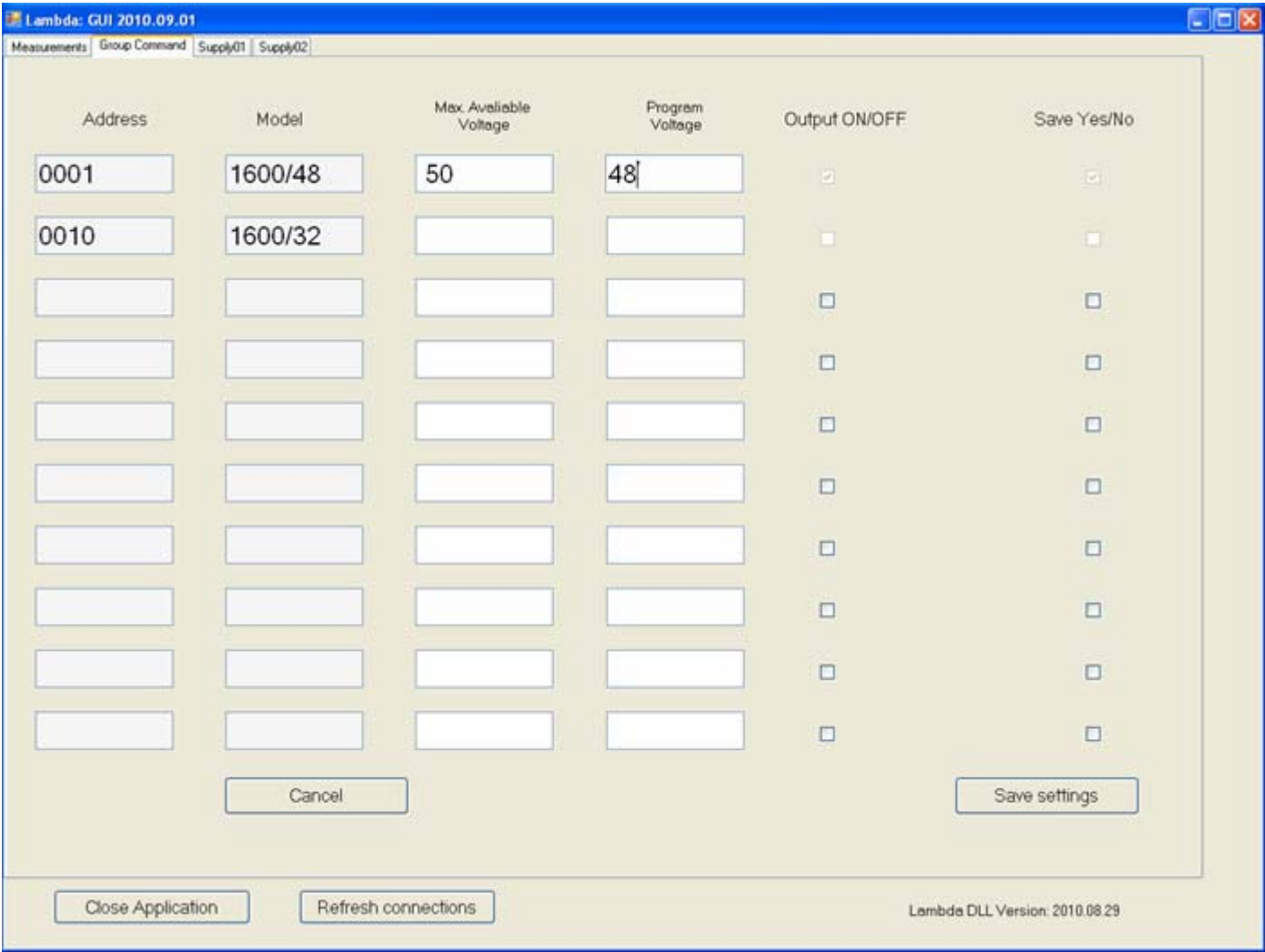
Alarms  
Clear Alarms

Cancel Filter ON/OFF  
Save Output ON/OFF

Close Application Refresh connections

Lambda DLL Version: 2010.09.21

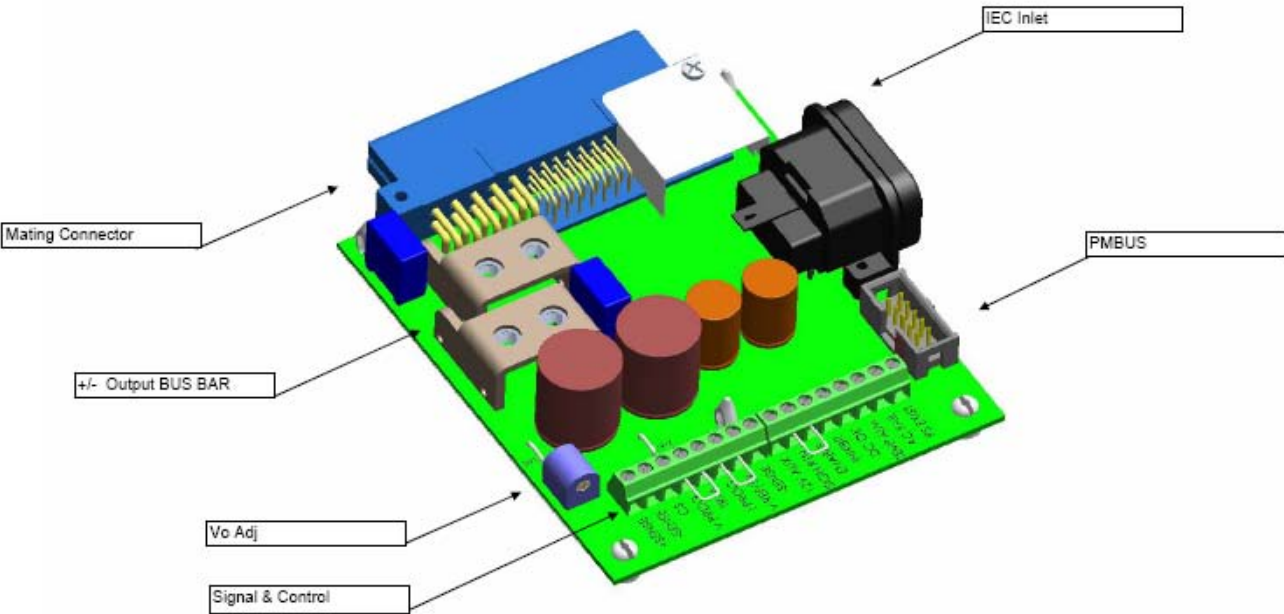
# Group Command :Settings Screen simultaneously for selected PSs



# HFE1600 EVALUATION BOARD

HFE1600- KIT mating connector & PCB for evaluation purposes

Nemic P/N :HFE1600 Series EVALUATION BOARD



# HFE1600 EVALUATION BOARD

HFE1600-KIT Mating connector & PCB evaluation purposes

Nemic P/N:HFE1600 Evaluation board



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Thank You