7800 Series PSU Overview

May 2024
78-0503-02

7800R Series AC Power Supplies

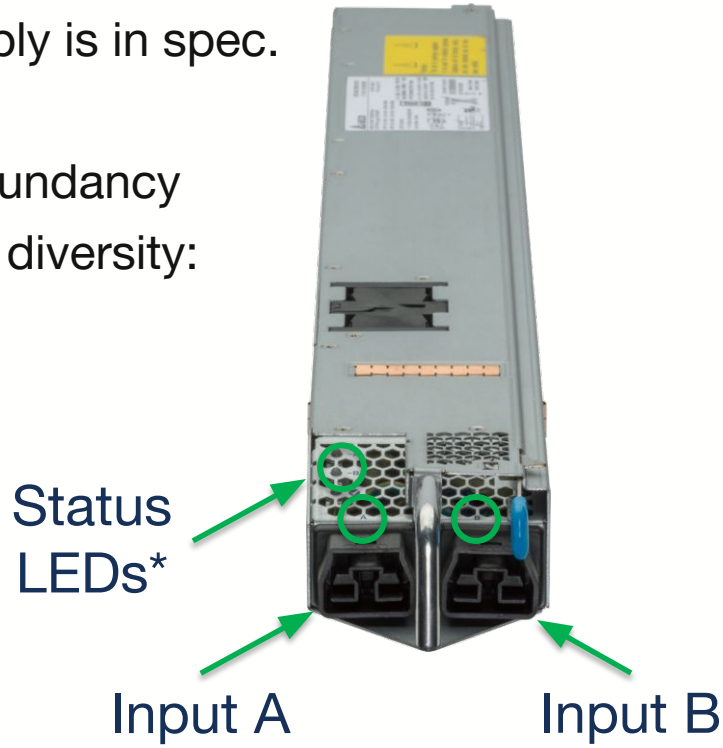
- Common power supply for all 7800R Series
- Over 94% Efficient with Hot-swap / load balancing
- Single power domain internal to switch
- PSU has Integrated redundancy
  - Dual AC inputs (200-240Vac, 16A max)
  - Allow for auto-transfer (ATS) switchover
- Single 20A Input for 3kW power output
  - Only single input required for 3kW
  - Second input provides resilience, not more power
  - Grid redundant with N supplies dual connected
  - PSU redundant with N+1, recommend N+2
  - SAF-D-GRID connector (smaller than C19) to C20

PWR-D1-3041-AC-BLUE

Dual Input AC Power Supply Overview

- Input A is always used by default while the supply is in spec.
- If Input A fails, hitless switch-over to input B
- No requirement for separate PSUs for Grid Redundancy
- Suggested connection plan to provide 1+1 grid diversity:

PSU#	PSU Connector	Grid Feed
First PSU	Primary(A)	GRID1
	Secondary(B)	GRID2
Second PSU	Primary(A)	GRID2
	Secondary(B)	GRID1
Third PSU	Primary(A)	GRID1
	Secondary(B)	GRID2
Fourth PSU	Primary(A)	GRID2
	Secondary(B)	GRID1
etc.		



* Status LEDs are lit whenever the chassis is energized - PSUs with no grid supply will draw power from the system to indicate status

7800R Series DC Power Supplies

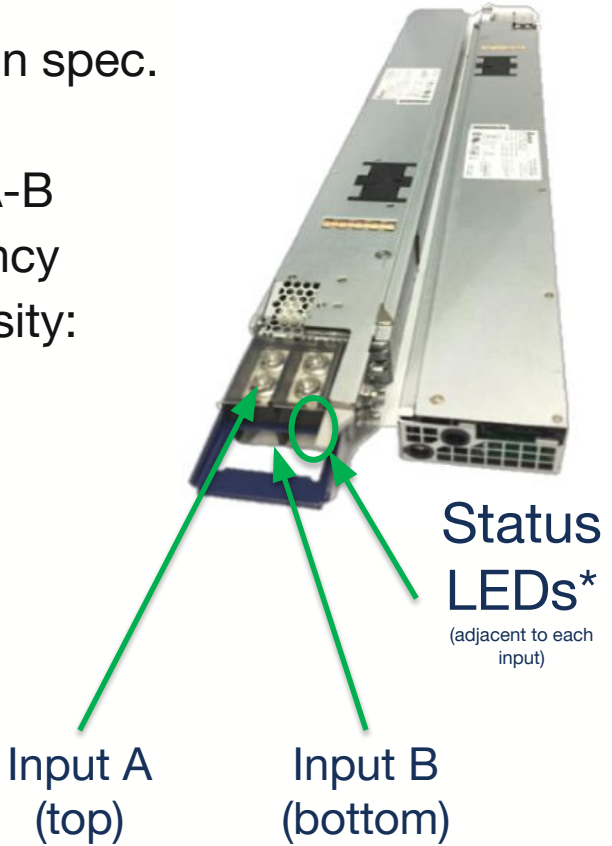
- Common power supply for all 7800R Series
- Over 94% Efficient with Hot-swap / load balancing
- Single power domain internal to switch
- PSU has Integrated redundancy
  - Dual DC inputs (-48 to -60Vdc, 70A max)
  - A/B redundant (Load sharing if both inputs are identical)
- Single 20A Input for 3kW power output
  - Only single input required for 3kW
  - Second input provides resilience, not more power
  - Grid redundant with N supplies dual connected
  - PSU redundant with N+1, recommend N+2
  - 2 x M6 studs per terminal

PWR-D2-3041-DC-BLUE

Dual Input DC Power Supply Overview

- Input A is always used by default while the supply is in spec.
- If Input A fails, hitless switch-over to input B
- If Input A and B are identical, load sharing between A-B
- No requirement for separate PSUs for Grid Redundancy
- Suggested connection plan to provide 1+1 grid diversity:

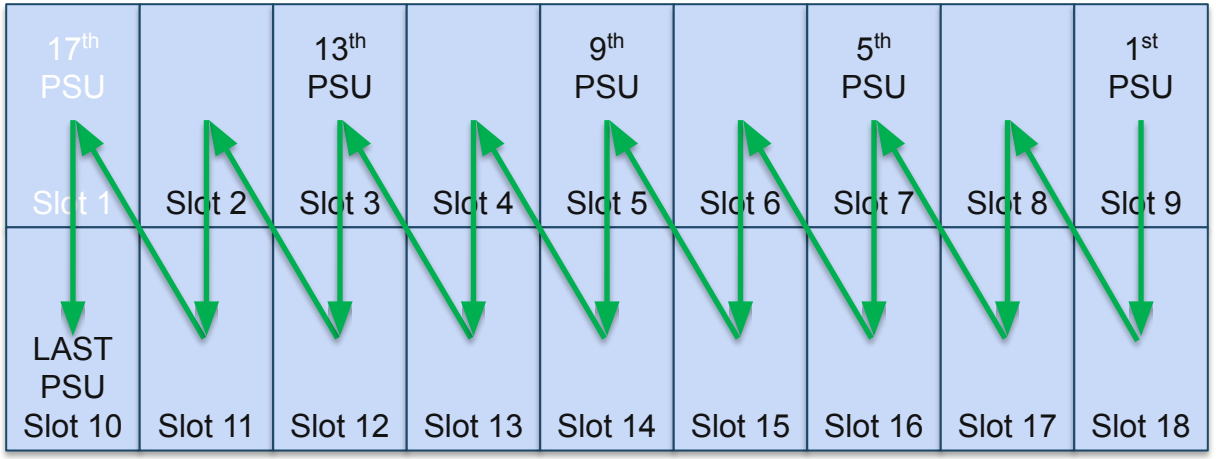
PSU#	PSU Connector	Grid Feed
First PSU	Primary(A)	GRID1
	Secondary(B)	GRID2
Second PSU	Primary(A)	GRID2
	Secondary(B)	GRID1
Third PSU	Primary(A)	GRID1
	Secondary(B)	GRID2
Fourth PSU	Primary(A)	GRID2
	Secondary(B)	GRID1
etc.		



* Status LEDs are lit whenever the chassis is energized - PSUs with no grid supply will draw power from the system to indicate status

Power Supply Installation for Maximum Efficiency

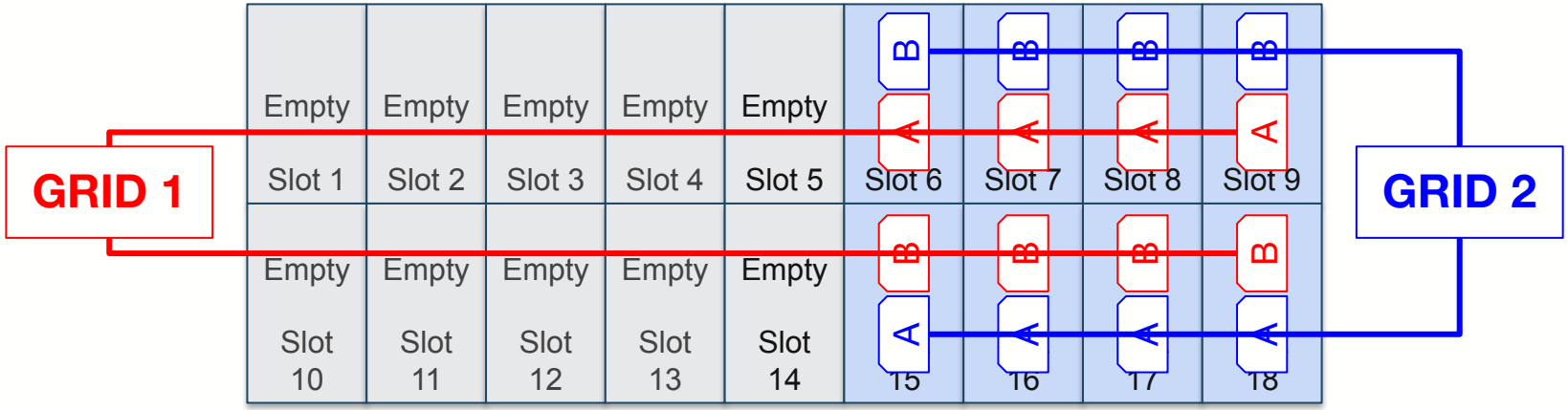
- To maximize power efficiency, PSUs should be installed in the order shown below
- Top right to bottom left principle applies to all systems
  - Example show 18 PSU bays across two rows (7812)
- Other combinations are allowed, but reduce system efficiency



Recommended Wiring for N+2 3kW PSUs (loadsharing grids)

System	PSU Slots	Max System Pwr
7804	8	24 kW
7808	12	36 kW
7812	18	54 kW
7816 / 7816L	24	72 kW

- N+2 Power is the **recommended** minimum configuration
- Dual-input PSUs provide integrated N+N grid redundancy
  - no additional PSUs are required for grid redundancy
- Additional PSUs provide coverage for PSU failure
- Example shows N+2 configuration for 18kW predicted max load (with loadsharing grids)



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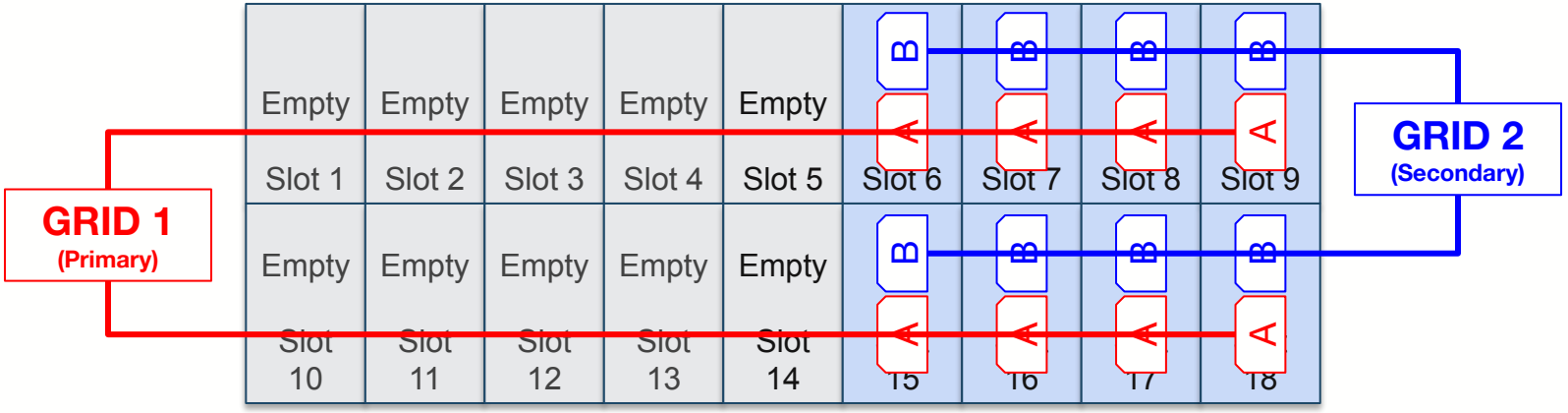
Recommended Wiring for N+2 3kW PSUs (active/standby grids)

System	PSU Slots	Max System Pwr
7804	8	24 kW
7808	12	36 kW
7812	18	54 kW
7816 / 7816L	24	72 kW

- N+2 Power is the **recommended** minimum configuration
- Dual-input PSUs provide integrated N+N grid redundancy
  - no additional PSUs are required for grid redundancy
- Additional PSUs provide coverage for PSU failure
- Example shows N+2 configuration for 18kW predicted max load (with active-standby grids)



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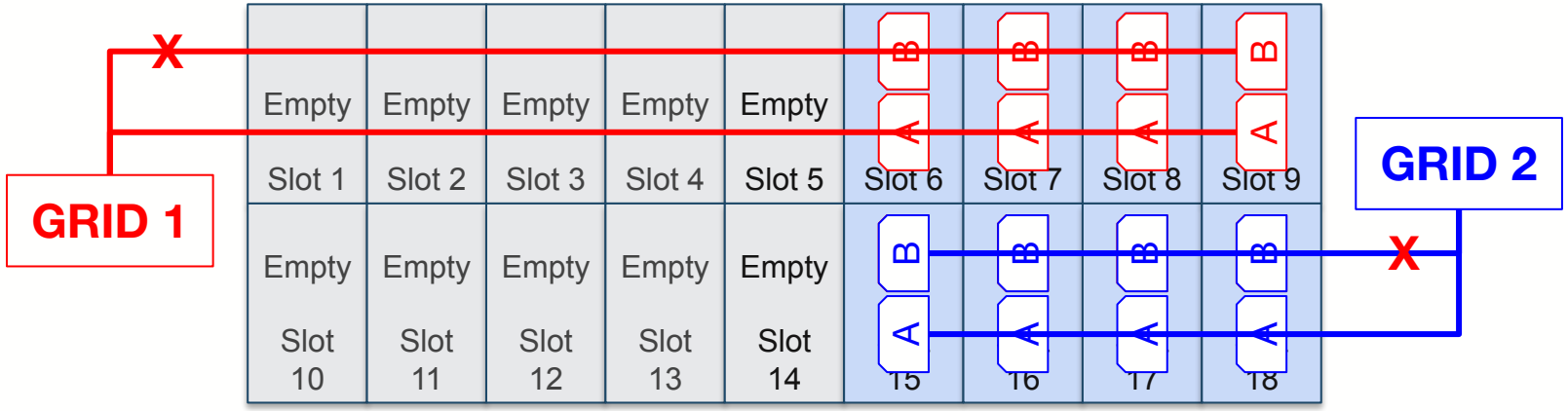
Common mistakes with N+2 3kW PSUs

Example target of 18kW + 2 x PSU redundancy

- Wiring the same grid to both A+B feeds does not provide redundancy
  - Unless there are redundant PDUs and the goal is to protect against a PDU or single circuit failure
- Result of wiring as below is N+N (12kW + 12kW) - when considering grid failure
  - Not N+2 (18kW + 2 x 3kW)
- Double wiring of each grid uses 2x cables, PDU ports and may require breaker oversizing



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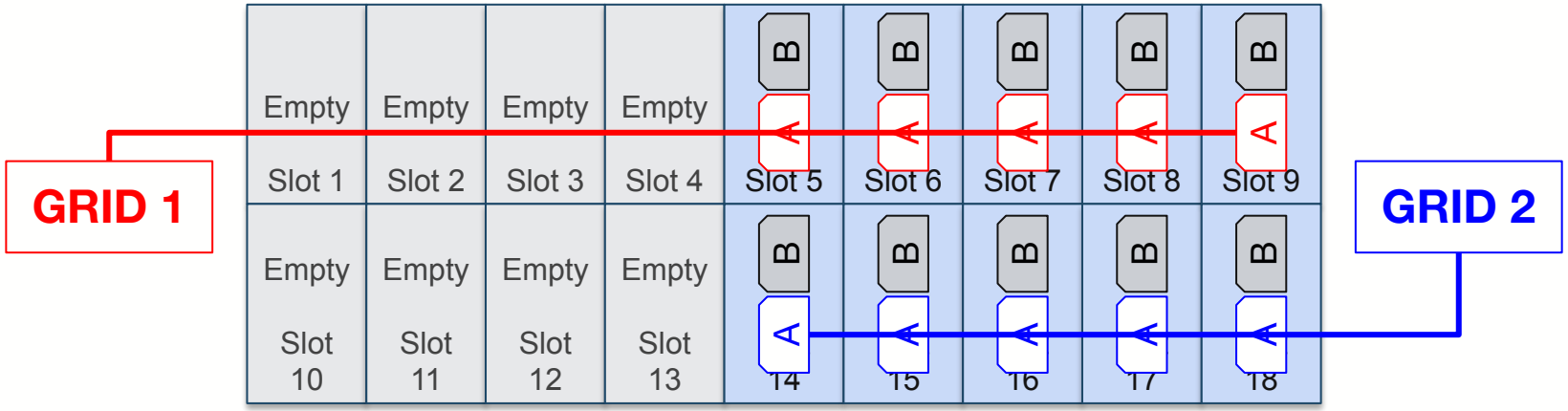
Recommended Wiring for N+N 3kW PSUs

System	PSU Slots	Max System Pwr
7804	8	24 kW
7808	12	36 kW
7812	18	54 kW
7816 / 7816L	24	72 kW

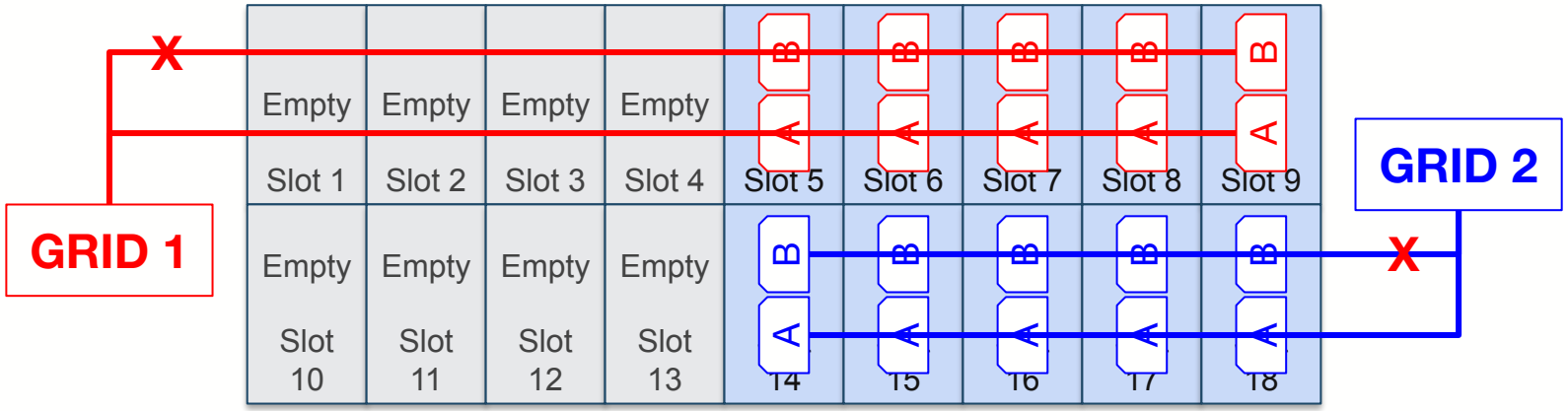
- N+N Power is supported where system load ≤ half of total system power capacity
- In N+N configuration, half of the PSUs should be connected to each grid
- With N+N redundancy it is not necessary to use the B-feed on each PSU
- Example below shows N+N configuration for 15kW with load-sharing grid redundancy



Common mistakes with N+N 3kW PSUs

Example target of 15kW + 15kW redundancy

- Wiring both A and B feed to the same grid
  - PSU A and B feeds are for switchover, not load sharing
  - Extra connections require 2x cables and PDU sockets, may require breaker oversizing.
  - No value unless there are 2 independent PDUs for each Grid to protect against PDU failure



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