

ThinkStation P500/P510, P700/P710, and P900/P910 Power Configurator

Version 1.6



1. Revision History

Revision	Date	Comments
V1.0		Initial release
V1.1		Update some minor errors
V1.2	5/20/2015	Add in NV M6000 card for RF2
V1.3	6/30/2015	Fix issue with P700 850W bar display
V1.4	2/21/2017	Updated to include P5/7/900 refreshes, P510/710/910 and associated refreshes.
V1.5	5/30/2017	Updated rules that were added to support 180W P5000 (for P5XX/P7XX) in latest power spec.
V1.6	6/12/2017	Updated title

2. Introduction

The introduction of the new P500, P700, and P900 ThinkStation platforms brings with it new design in power supply architecture. Traditionally, power supplies consisted of a set size (or can) that included all of the electronic and thermal components. Cabling would then route the power rails of various voltages and specs to components within the system such as the motherboard, disk drives, graphics cards, etc.

Instead of following the traditional power supply design point, the P500/P700/P900 power supplies were designed around a single output voltage that is fed to the motherboard using a card-like connector. Power is then regulated to the required voltages on the motherboard and fed to the various components within the system. Note that P510/710/910 use the same power supplies as their predecessor platforms (P500/P700/P900), so all of the same power rules associated with P500/700/900 also apply to their PX10 counterparts.

By following this design, multiple power supplies of different total wattages can be designed to work in the same chassis. This essentially allows the customer's configuration to dictate the level of power supply needed, resulting in a more cost effective solution for the customer.

This new design point also brings with it the need to put limitations on the hardware supported for each power supply version in order to not exceed the overall capability of the power supply. The purpose of this document is to outline the supported power supplies for each platform, and any hardware configuration restrictions that might be associated with each power supply.

IMPORTANT: If there is a desire to build a configuration that in any way violates these power guidelines for the platforms as defined, please contact the ThinkStation Technical Solutions Team (TSET) to have the configuration vetted properly before moving forward with the build/special bid.

3. Power Ratings for Key System Components

In order to fully understand the capabilities of the various power supplies supported by the P500/P510, P700/P710, and P900/P910 platforms, it's important to define the power ratings for the internal components of the system. The tables below list components supported by the platform (divided by component type) and the power rating associated with that component. This information is helpful for understanding the overall capabilities of each power supply.

Table 1: CPU Power Ratings

CPU Power	CPU Description (v3 Haswell)	CPU Description (v4 Broadwell)
160W	E5-2687W v3	E5-2687w v4
145W	E5-2699 v3, E5-2697 v3	E5-2699A v4, E5-2699 v4, E5-2697A v4, E5-2697 v4
140W	E5-1680 v3, E5-1660 v3, E5-1650 v3, E5-1630 v3, E5-1620 v3, E5-1607 v3, E5-1603 v3	E5-1680 v4, E5-1660 v4, E5-1650 v4, E5-1630 v4, E5-1620 v4, E5-1607 v4, E5-1603 v4
135W	E5-2698 v3, E5-2690v3, E5-2667 v3, E5-2643 v3, E5-2637 v3	E5-2698 v4, E5-2690 v4, E5-2667 v4, E5-2643 v4, E5-2637 v4
120W	E5-2695 v3, E5-2685 v3, E5-2683 v3, E5-2680 v3, E5-2670 v3	E5-2695 v4, E5-2683 v4, E5-2680 v4
105W	E5-2660 v3, E5-2650 v3, E5-2623 v3	E5-2660 v4, E5-2658 v4, E5-2650 v4
90W	E5-2640 v3	E5-2640 v4
85W	E5-2630 v3, E5-2620 v3, E5-2609 v3, E5-2603 v3	E5-2630 v4, E5-2623 v4, E5-2620 v4, E5-2609 v4, E5-2603 v4
75W		E5-2648L v4, E5-2628L v4, E5-2618L v4
65W	E5-2650L v3, E5-2630L v3	E5-2650L v4
55W		E5-2630L v4
50W		E5-2608L v4

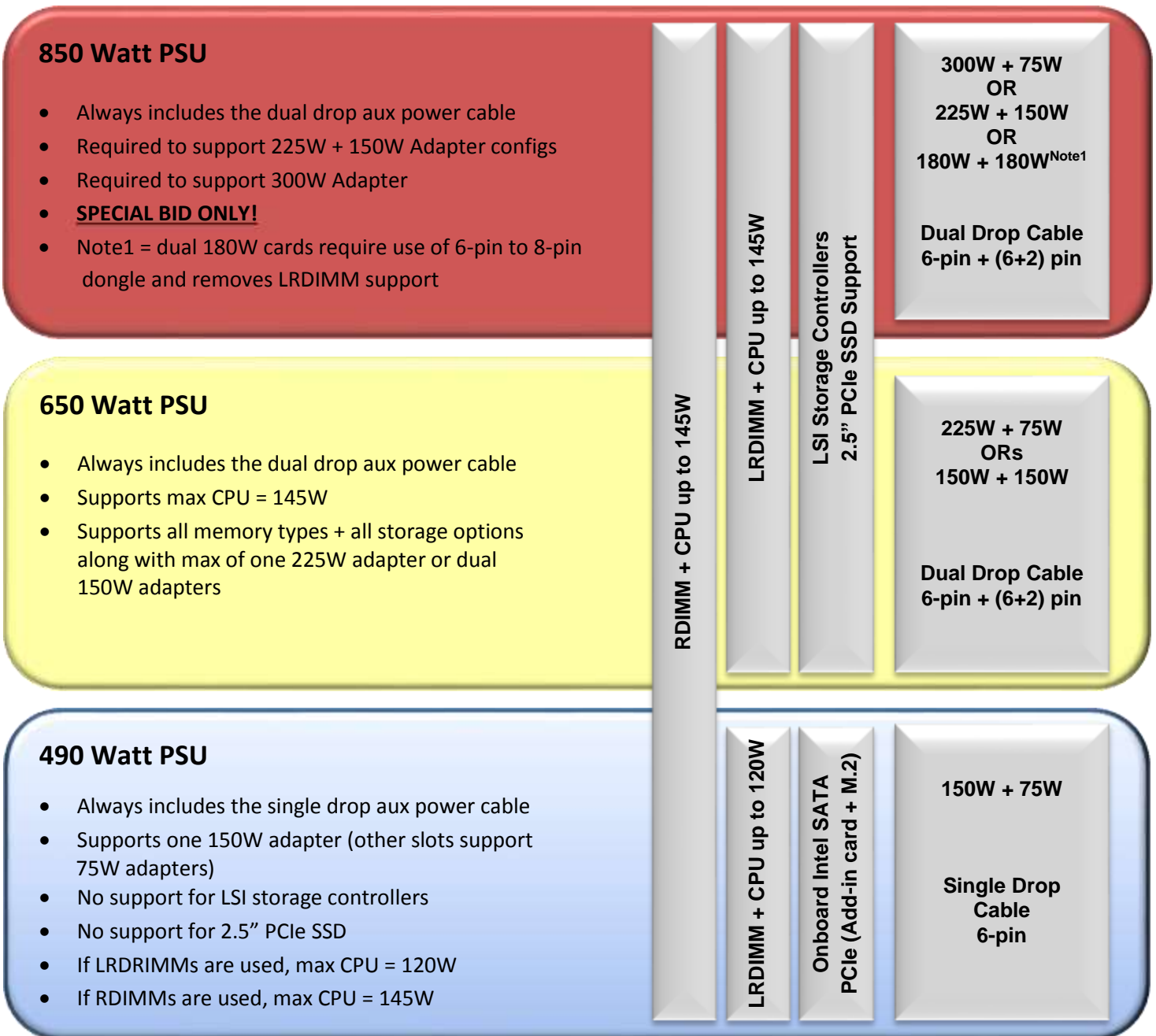
Table 2: Add-in Card Power Ratings

Max Power Rating	Card Name	Vendor	Card Type	Aux Power Connectors Required (if any)
300W	Xeon Phi 3120A	Intel	Co-Processor Card	6-pin + 8-pin (PCIe)
	Tesla K40c	Nvidia	Compute Adapter	6-pin + 8-pin (PCIe)
	M6000	Nvidia	Graphics Card	8-pin (PCIe)
	P6000		Graphics Card	8-pin (PCIe)
	M60		Compute/Grid Adapter	8-pin (CPU)
	GP100		Compute Adapter	
225W	K6000	Nvidia	Graphics Card	6-pin + 6-pin (PCIe)
	Grid K2		Remote Display Card	8-pin (PCIe)
	Tesla K20		Compute Adapter	6-pin + 6-pin (PCIe)
	P5000		Graphics Card	8-pin (PCIe)
150W	K5200, K5000 K4200, K4000 M5000, M4000	Nvidia	Graphics Card	6-pin (PCIe)
	W7000, WX7100	AMD	Graphics Card	6-pin (PCIe)
75W (or less)	K2200, K2000, K2000D K620, K600 K420, Q410 NVS510, NVS315, NVS310 M2000 P2000, P1000, P600, P400	Nvidia	Graphics Card	None
	W5100, W4100, W2100 FirePro 2270 WX3100, WX4100, WX5100	AMD	Graphics Card	None
	Teradici 2240 Teradici 2220	Teradici	Remote Display Adapter	None
	LSI 9364-8i (all versions)	LSI/Avago	Storage Controller	None
	Thunderbolt	Intel	Thunderbolt Controller	None
	Intel I210-T1 Intel I350-T2 Intel I350-T4	Intel	Ethernet Adapter	None
	Aquantia 5G NIC	Aquantia		
	IEEE 1394 (Firewire- 400)	Bitland	IEEE 1394 Controller	None
	USB3.1 Rear Adapter	Taisol	USB 3.1 card	
	SoundBlaster Z (SB1502)	Creative	Audio card	

*NOTE: Max power ratings listed do not necessarily reflect actual card TDP

4. P500/P510 Power Supply Configurations

P500/P510 has a total of 3 unique power supplies available in 490W, 650W, and 850W capacities.

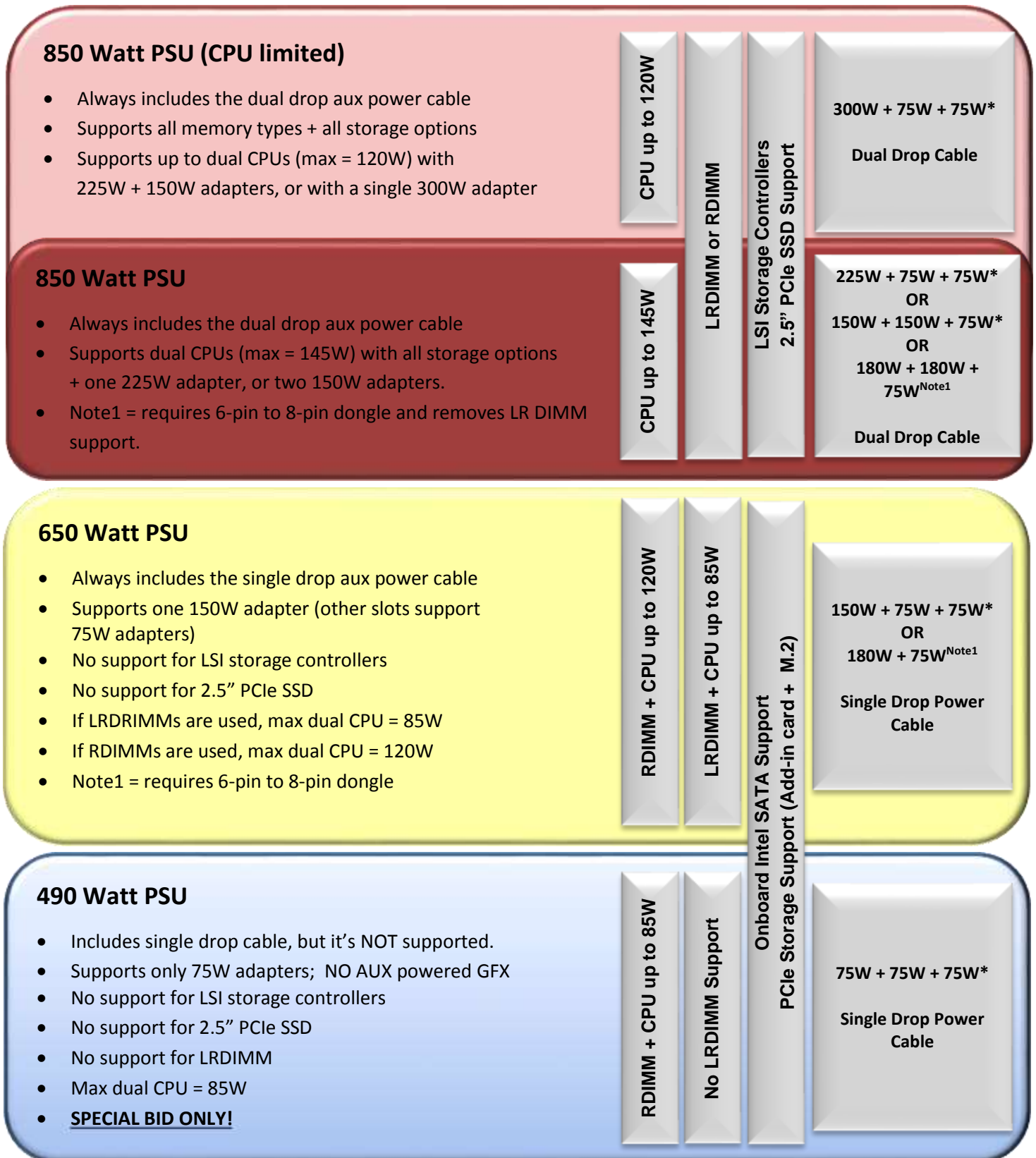


P500/P510 Power Supply Configuration Notes:

- Refer to Table 1 for CPU powers.
- Refer to Table 2 for power ratings for specific add-in cards and graphics cards.
- Single drop cable = 6 pin aux graphics cable
- Dual drop cable = 6 pin + 8-pin (6+2) aux graphics cable

5. P700/P710 Power Supply Configurations

P700/P710 also has 3 available power supply capacities in 490W, 650W, and 850W formats. These supplies are identical to the ones used in the P500/P510 platforms, but the hardware limitations differ.

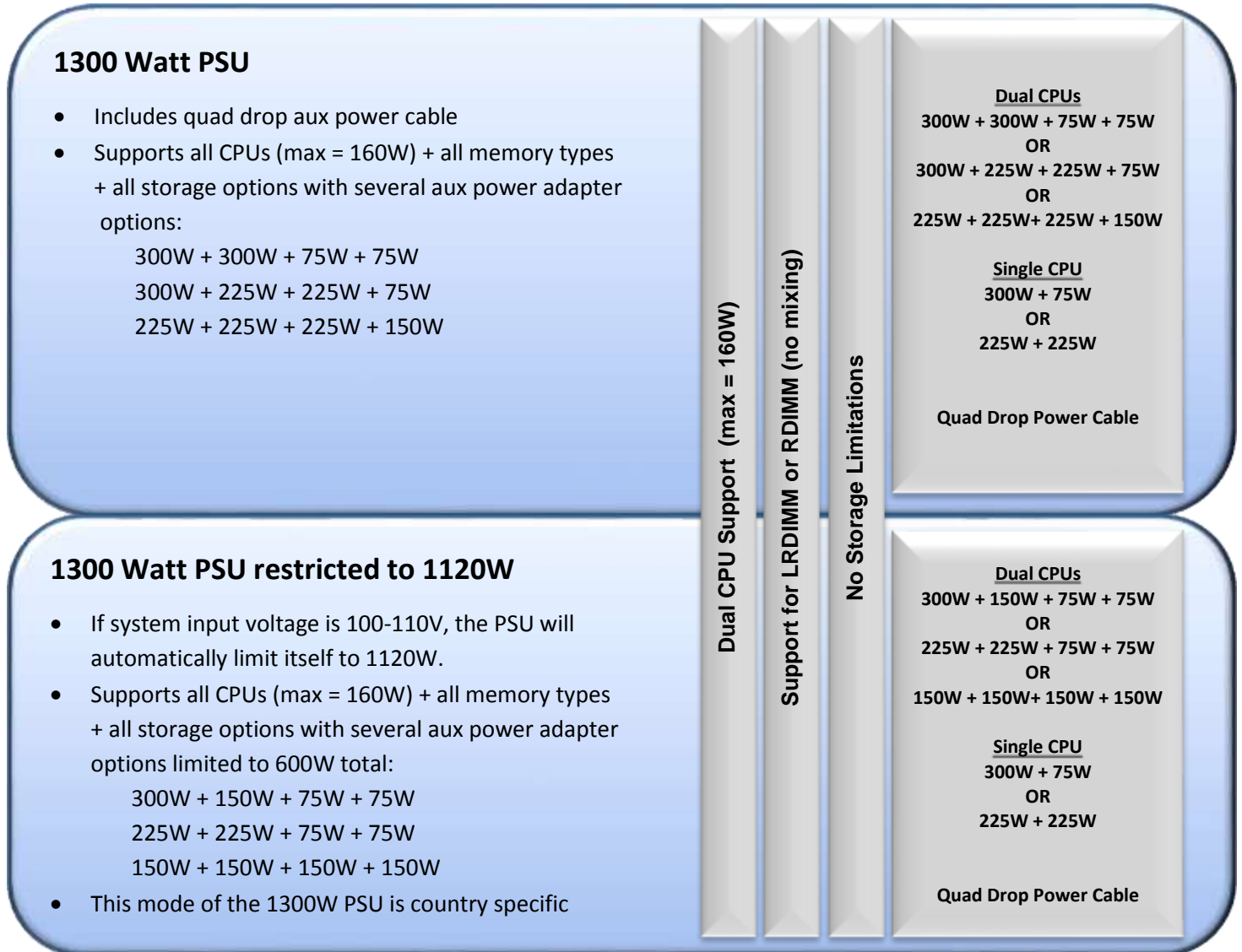


P700/P710 Power Supply Configuration Notes:

- * Third PCIe x16 slot requires dual CPUs to be installed.
- Refer to Table 1 for CPU powers
- Refer to Table 2 for power ratings for specific graphics cards and add-in cards
- Single drop cable = 6 pin aux graphics cable
- Dual drop cable = 6 pin + 8-pin (6+2) aux graphics cable
- In P700/P710 systems with the 490W PSU (Special Bid Only), the single drop aux graphics cable will be installed in the chassis, but it is not officially supported with this power supply. In order to use a graphics card (of up to 150W) with this PSU, one of the x16 PCIe slots must remain empty.

6. P900 Power Supply Configuration

P900/P910 has a single 1300W power supply that is designed to support a fully loaded system. The power supply for P900/P910 is unique to the platform and cannot be used in the P500, P700, P510, or P710 platforms.



P900/P910 Power Supply Configuration Notes:

- To utilize the third and fourth PCIe x16 slots, dual CPUs must be installed
- Quad drop power cable consists of four connectors:
 - 6-pin + 8-pin (6+2) for use in the upper PCIe x16 slots
 - Dual 8-pin (6+2) for use in the lower PCIe x16 slots
- 1300W PSU is mechanically unique to the P900/P910 chassis and cannot be used in other platforms.
- PSU will automatically operate in 1120W (restricted) mode if the system line input is 100-110V. For other supported system line input voltages, the PSU will operate at the full 1300W.

- For supported PCIe card configurations that require more power drops than what the default cabling will provide, special splitter cables (that convert a single 8-pin to dual 6-pin connectors) will be derived and installed that will allow all cards to be connected and powered correctly.