1394 - Cable Power Dist.

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Power Management Task Force

Sponsored by:

1394 Trade Association Architecture Working Group

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AR Review

- **Power Loss through a node**
  - **Current Limit & Trace Resistance**
- **Power Loss through a cable**
  - **Contact & Wire Resistance**
- **Maximum Number HOPS for Power Distribution**

Assumptions

- **Power Capacity reported in Self-Id is that which is available at the 1394 connector**
  - **Voltage and power loss from Current Limit, Trace Resistance, and Protection Diode must be accounted for in design of power provider**

Assumptions (cont'd)

- **Possible Power loss (380 milli-watts maximum) in a legacy Power Provider would not be accounted for by a Power "Manager"**

Eye-Chart Exercise

- **Current Dependency**
- **AWG Wire Resistance Specs.**
- **Cable Lengths**
- **1394-1995 Specified Contact Resistance**

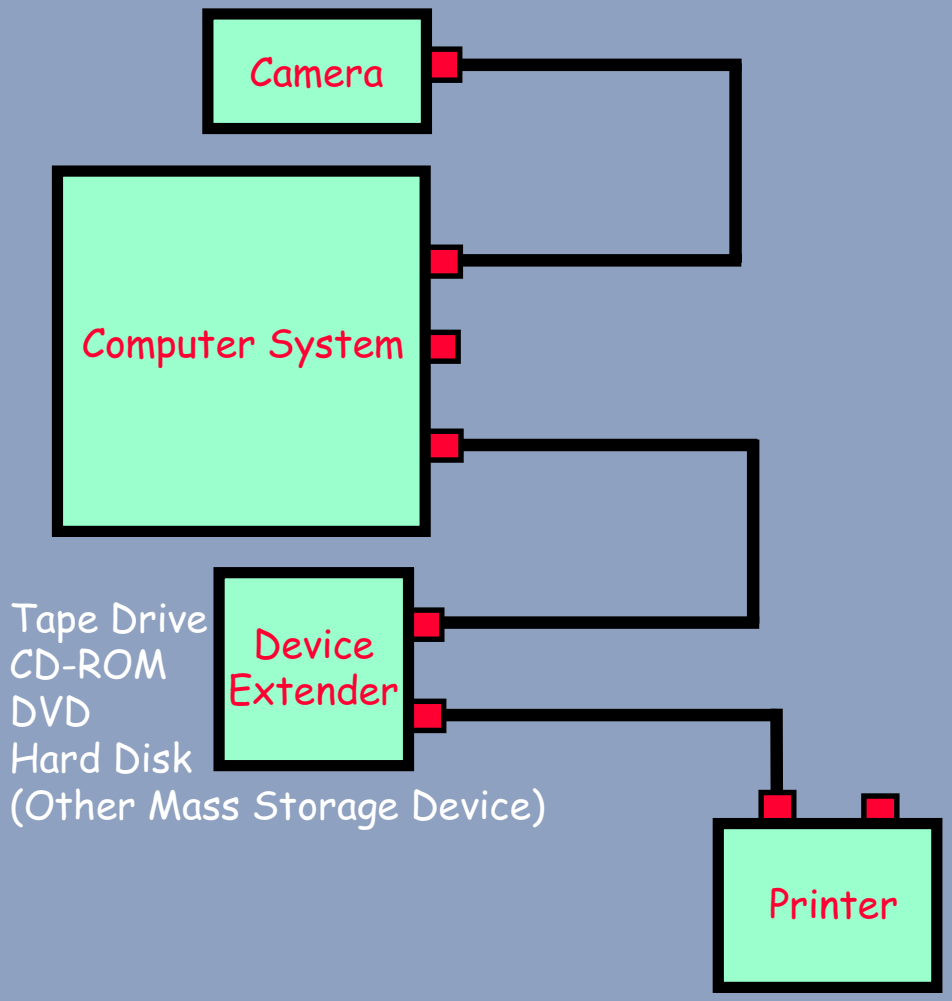
Eye-Chart Exercise

Volts	Watts	PWR_CLASS = 001_b	
20	15	MAX HOPS	
Length (meters)		(3 Watts)	(7.5 V)
4.5		6	10
10		4	7
15		3	5
25		2	3
50		0	1

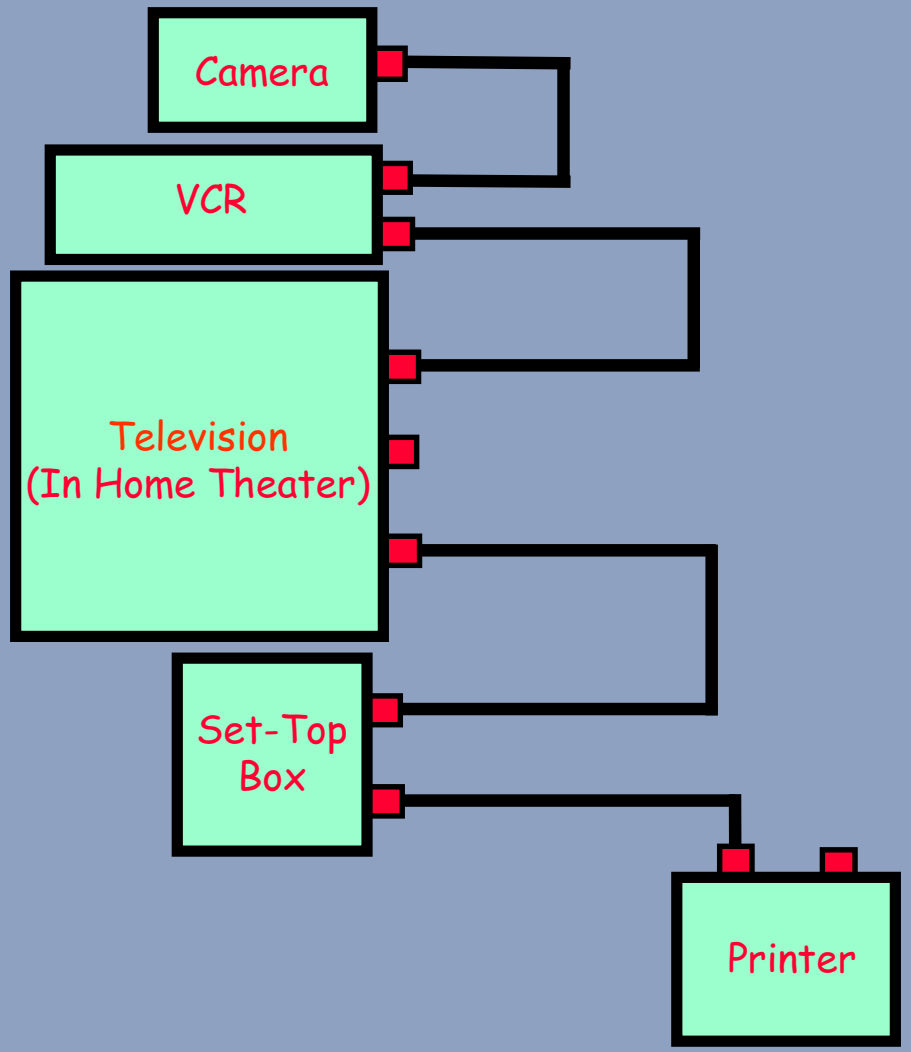
Volts	Watts	PWR_CLASS = 010_b	
20	30	MAX HOPS	
Length (meters)		(3 Watts)	(7.5 V)
4.5		15	10
10		11	7
15		8	5
25		5	3
50		2	1

Volts	Watts	PWR_CLASS = 011_b	
30	45	MAX HOPS	
Length (meters)		(3 Watts)	(7.5 V)
4.5		24	19
10		17	13
15		13	10
25		9	7
50		5	3

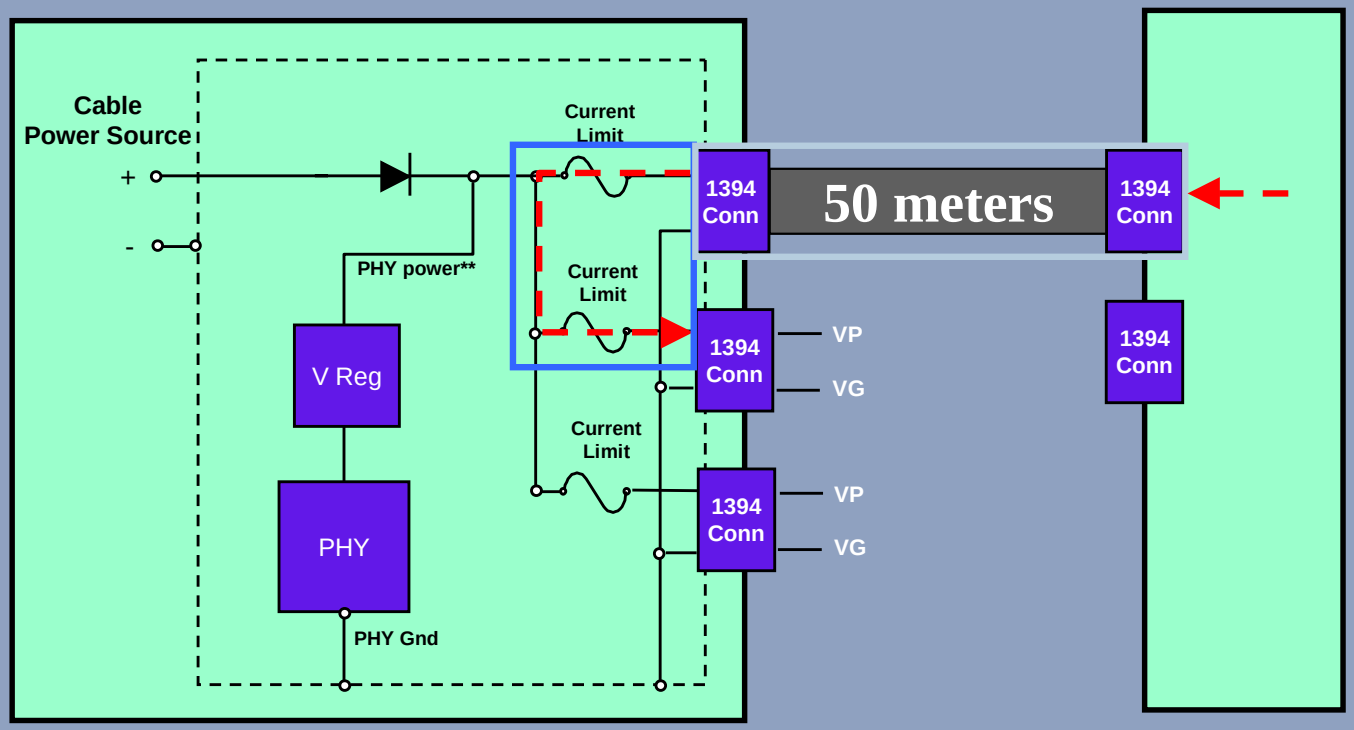
"Typical?" PC System Interconnect?



"Typical?" CE System Interconnect?



“System” Measurement Model



“System” Measurement Model

Resistance Calculations

Trace	4 inches at 5mΩ/inch	0.020 Ω
Current Limiters	2 devices at 0.210 Ω each	0.420
	Total	0.440 Ω

Cable	50m at 53.1 mΩ/m	2.655 Ω
Connectors	2 pairs 0.030 Ω each	0.060
	Total	2.715 Ω

Power Loss Calculations

	Resistance (Ω)	Current (A)	Power (W)
Board	0.440	1.5	0.99
Cable/Conn.	2.715	1.5	6.11
Total	3.155		7.10