Two Pair Power Considerations

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Introduction

- **Four pairs energized used in cable studies**

- **Two pairs energized used in spec**

- **What are we leaving "on the table"?**

What can we get?

- When comparing 4-pair energized heat dissipation to 2-pair energized
  - Heat increase has a root 2 factor

- More Power
  2 pair power = 4 pair power * root(2)

- More Temp Range
  Temperature derating based on 4-pair, additional temp range when using 2-pair

We can get more power…

derating	4-pair	2-pair
5C	480 mA	679 mA
10C	600 mA	849 mA
15C	720 mA	1018 mA

We can get more temp range…

current	4-pair	2-pair
480mA	5 C	x C
600mA	10 C	2.7 C
720mA	15 C	6.2 C

Concerns and Possible Solutions

- **Some installations share two Ethernet ports in one wire (10/100 only) – eg Germany**
    - **Does not work for Gig**
    - **Preclude from PoE Plus**

- **Prevents 4-pair power**
    - **4-pair power with same heating effect acceptable**

- **ISO/TIA assumes 4-pairs are powered**
    - **Need to work with TIA/ISO**

- **Max current is 720mA in the ISO/TIA spec**
    - **Use root 2 factor to improve temperature range and max out at 720mA**

Summary

- We should take advantage of knowing 2-pair power
- We can get more power at higher temperatures

- Looking for "Birds of a Feather"