



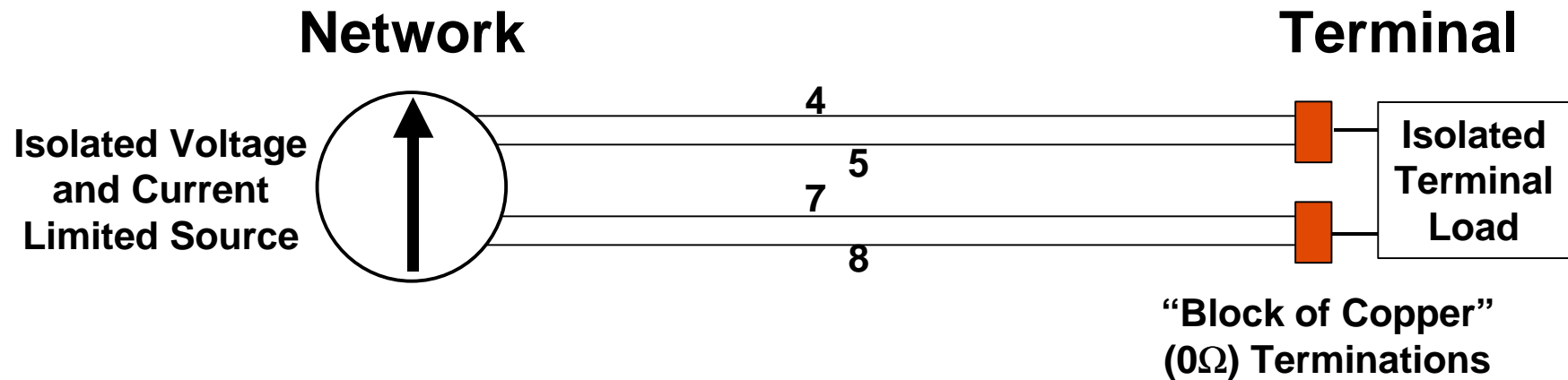
Further Powering System Considerations

Arlan Anderson

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Network Edge Technology

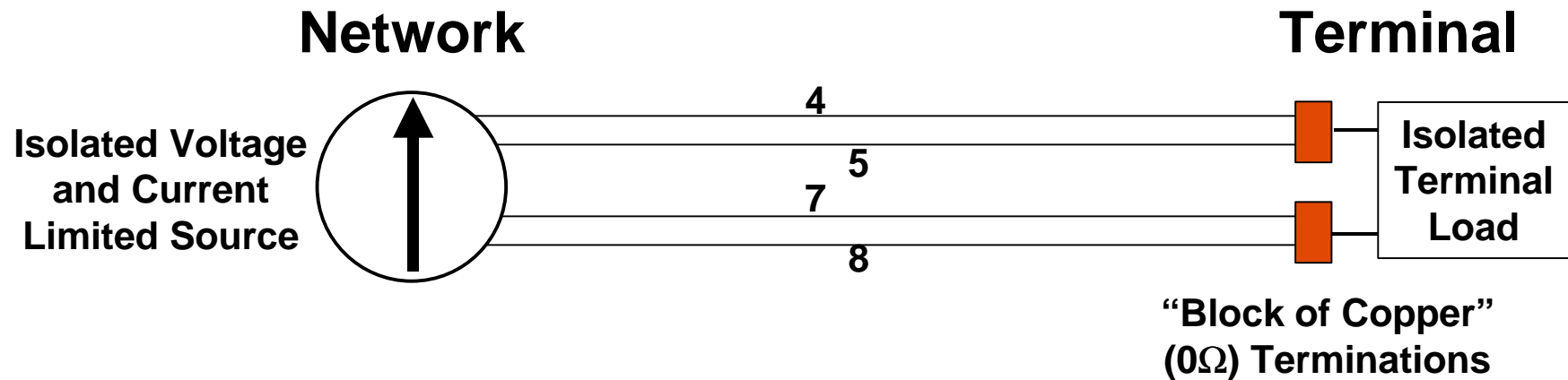
Pseudo-Phantom Power Feed



Using both idle pairs 4-5 and 7-8 to feed power.

- Reduce the IR losses in the cabling by one half;
- Minimizes interference to the 10/100 BASE-T signal transmission;
- Eliminates all impact to 10/100 BASE-T signal magnetics;
- Reduces amount of connector contact degradation;
- Would reduce hazards due to foreign system interconnects;
- It would enable moving the discovery mechanism from the signaling pairs to the powering pairs;
- It could support the 1000 BASE-T terminal powering requirement.

Pseudo-Phantom Power Feed (cont.)



Considerations for using the idle pairs to feed power:

- Use a balancing current feed to enable AC transmission balance, and future magnetics issues for 1000 BASE-T;
- Stay with IEC 60950:1991 Hipot isolation requirement;
- Focus on SELV safety requirements 60 VDC and 1.3 A Maximum;
- Define the safe operating area as: 48 VDC at 333 mA at $\pm 5\%$.

Power Source Discovery

Make the discovery mechanism a part of the power source:

- Eliminates any changes to PHY for 10/100 BASE-T application;
- Reduces possibility of interference with the 10/100 BASE-T transmission;
- Eliminates issues with “fool proofing” Link Integrity Test;
- Could make the discovery detector simpler and more robust by integrating it into the source power control circuitry;
- Could facilitate meeting our safety and hazards tolerance requirements by eliminating need for higher level logic interface to the power control.

Rationale

- **Simpler topology;**
- **Off the shelf technology;**
- **Should be a faster time to market;**
- **Less intrusion into the existing LAN interface;**
- **No new components requiring development;**
- **Less interference issues and potential for fixes;**
- **Should require minimal logic and processing;**
- **Facilitates mid-span power insertion.**

Power Source Attributes

As before the power source characteristics include:

- An isolated DC voltage source meeting all applicable worldwide regulatory safety requirements;**
- The power source to each loop must be independently current limited to a maximum rated output level.**
- All protection circuitry for the loop power feed must recover automatically without any operator intervention once the fault has been removed**
- The loop supply must be "smart," using a discovery mechanism to insure that power is only provided to authorized terminal devices;**
- The source must provide a maintenance capability to monitor and supply power only as long as the loop connection remains valid;**
- The source must limit the power to any non-authenticated terminal loads to protect against damage;**
- At the point of power insertion, appropriate terminations will be presented to the network side of the LAN connection.**

Terminal Power Attributes

As before the characteristics for the terminal are:

- A terminal, which is authorized for LAN powering, must support a unique discovery mechanism for its powering authentication;**
- A target for the absolute maximum peak power consumption at the terminal of 15 Watts;**
- A target of 10 Watts for the continuous nominal power load at the terminal;**
- At the point of power extraction, appropriate terminations will be presented to the terminal side of the LAN connection;**
- Under no circumstances will the terminal source current into the loop (i.e. back feed).**