



## DC Power in the Evolving Network

Bringing Reliability to Evolving Networks through DC Power



The telecommunication network is evolving, and offering just one service – voice, data, or video – is no longer an option for providers who want to remain competitive. Whether the consumer chooses a traditional telephone company, a cable television operator, or even an Internet services provider, the trend is moving toward one entity delivering the complete package at one competitive price.

This push to drive fiber deeper towards the home with a variety of fiber-to-the-x (FTTx) architectures is also a catalyst for this changing telecom landscape. These new multiple service operators (MSOs) have many critical decisions to make in building or re-building their networks to add the missing elements of voice, data, and video services to offer the “triple play” bundles consumers demand.

ADC wants to ensure that every telecom service provider is aware of an easily-neglected consideration to evolving network architectures – power. Power, believe it or not, is a definite show-stopper because without it, the systems fail to operate. Power malfunctions can lead to equipment damage, fires, or even personal injuries. As service providers plan their networks of the future, cutting corners to save capital expenditures is a common occurrence – but power is not the place to cut those corners.

### **Powering for reliability**

DC power has always been used for telephony equipment, and it is evolving with today's evolving networks. With infrastructure already in place, powered by DC, most will make the logical choice to remain with DC power as they add data and video services to the network. DC power is the only way to provide the Telcordia's 99.999 percent (“five 9s”) uptime requirement for telephony communications. DC power also is constant and cleaner while enabling service providers to maintain a battery backup in the event of a main failure.

For data and video providers who are intent on adding voice services, such as voice-over-IP (VoIP), onto a single transmitted signal, switching to DC power is necessary.

The types of equipment required to support each service are worlds apart in terms of amperage. But the best overall choice is DC power for its reliability, protection, and distribution attributes.

Again, competition in today's bundled services market makes 99.999 reliability a critical differentiator. Customers likely have several choices when it comes to providers – and disappointed customers can be lost before a provider even realizes there was a problem. To gain and retain customers, providers must be able to turn up new services quickly and deliver equal reliability for voice, data, and video.

### **Conversion costs**

Several cable television companies are in the midst of national build-outs, or converged networks, that use routers to support voice, video, and data by collapsing all three into one signal for transport. The routers require high power levels and DC power is the best choice. Converting their power infrastructure from AC to DC is a definite cost consideration.

However, although DC requires more initial cost during installation and uses more real estate, the improvement to network reliability cannot be overstated. Capital expenditures must be weighed against the possibility of higher operational costs down the road. Truck rolls and technicians are a large part of operational costs so, simply put, upping the reliability lowers the number of service calls required.

There are other good reasons for converting headends, hubs, and nodes to DC power despite the conversion costs. Future services, including VoIP, video-on-demand (VOD), and IPTV, will up the ante in terms of a provider's ability to quickly add, turn up, and reliably maintain whatever service bundle each customer chooses. Problems relating to power in the new FTTx networks that offer “full suite” services will simply be unacceptable.

The impact of DC power is immediately apparent if one considers several attributes:

- DC power is conditioned power, enabling equipment to run more smoothly and efficiently.
- Systems can be configured for longer standby at hubs or nodes.
- Since equipment is direct-wired rather than plugged in, connections are unlikely to disconnect.
- Each piece of equipment can now be individually fused.
- There is A to B power redundancy to each individual piece of equipment.
- A DC power plant is easier to monitor.
- Cable management, a huge consideration in FTTX networks, is more cleanly managed.

### **Powering the FTTX network**

In today's FTTX architectures, fiber is being driven to the outer edges of the access network to deliver the bandwidth required by evolving new applications. Consumers are demanding much more capacity than just a few years ago – and will likely require even more in the future. Several providers are deploying fiber to the node, or curb, and connecting to existing architectures for delivery into the home or business.

This requires equipment at each node to convert optical signals running over the fiber to electrical signals for transport over the copper, and vice versa. To enable these conversions throughout the network, DC power will be required. Why DC? Again, ADC believes it is the most efficient and reliable means to provide power for delivering multiple services for the reasons stated above.

### **Making the conversion**

Power is never a no-brainer – not when it comes to doing the “heavy lifting” for the network. If the power fails, the network fails. If the network fails, customers look elsewhere for more reliable service. ADC, a company with many years of experience in powering networks, has a few tips for making the conversion to DC power.

Service providers should pay close attention to the standards and certifications that exist for power equipment. Power systems for communications are some of the most rigorously tested and standardized of any products. Also, providers should inquire about lead times in securing the products needed for their network's power requirements.

Cost is arguably the most important issue considered, particularly in designing today's new FTTX initiatives. Conversion costs should be viewed not only in terms of product cost, but also “real estate” costs, replacement costs, support costs, and even lost revenue in the event of failed or delayed delivery. Cutting costs is everyone's ultimate goal, but if reliability is sacrificed, any savings will quickly be wiped away.

Finally, service providers should be as demanding about their power equipment as their customers will be about the quality of their services. Both have the right to expect a lot – and failure to deliver on either will put the ball squarely in the competitor's court.

# WHITE PAPER



## **Web Site: [www.adc.com](http://www.adc.com)**

From North America, Call Toll Free: 1-800-366-3891 • Outside of North America: +1-952-938-8080  
Fax: +1-952-917-3237 • For a listing of ADC's global sales office locations, please refer to our web site.

ADC Telecommunications, Inc., P.O. Box 1101, Minneapolis, Minnesota USA 55440-1101  
Specifications published here are current as of the date of publication of this document. Because we are continuously improving our products, ADC reserves the right to change specifications without prior notice. At any time, you may verify product specifications by contacting our headquarters office in Minneapolis. ADC Telecommunications, Inc. views its patent portfolio as an important corporate asset and vigorously enforces its patents. Products or features contained herein may be covered by one or more U.S. or foreign patents. An Equal Opportunity Employer