



## Fiber-to-the-home leaders and innovators for 2018

A BBC Staff Report

“Building a Fiber-Connected World” is the tagline of **BROADBAND COMMUNITIES** magazine, and each year the FTTH Top 100 list recognizes organizations that lead the way in this arena.

Fiber-to-the-home deployment in the United States is at an all-time high. In 2017, the number of U.S. households with access to fiber broadband increased by 4.4 million, and the increase for 2018 will likely be even higher. About 35 million households, or 28 percent of all U.S. households, now have fiber access. Everyone

is getting in the game of gigs, it seems – from AT&T, which is on track to pass 14 million homes with fiber by mid-2019, to tiny, rural towns connecting their hundred-odd premises.

It’s no wonder the industry is expanding and the number of companies competing for the Top 100 slots continues to grow. That’s great for the country as a whole, even if it makes life difficult for the editors who assemble this list.

The 2018 FTTH Top 100 list represents the whole fiber-to-the-home ecosystem. Optical fiber and fiber cables; passive equipment for connecting, protecting and managing fiber; and active equipment for sending and receiving signals over fiber are the most basic components of an FTTH network, along with software for planning, setting up and managing networks and for provisioning and billing fiber services. The list contains many companies that design, manufacture and distribute these essential products.

To put these pieces together requires firms that finance, plan, design, engineer, construct and install fiber optic networks, as well as those that make equipment for digging, pushing, pulling and attaching fiber. These, too, are represented on the list. Also included are a variety of organizations that advocate for better broadband or create conditions that make FTTH more profitable.

Finally, there wouldn’t be any fiber to the home if not for the employers – large and small,

### ORGANIZATIONS ADDED TO THE FTTH TOP 100 LIST IN 2018

Adams Telephone Co-Operative / CheckPoint Solutions	<a href="http://www.adams.net">www.adams.net</a> ; <a href="http://www.checkpointsolutions.net">www.checkpointsolutions.net</a>
Allo Communications	<a href="http://www.allocommunications.com">www.allocommunications.com</a>
Conexon	<a href="http://www.conexon.us">www.conexon.us</a>
FibNet	<a href="http://www.fibnet.net">www.fibnet.net</a>
Huntsville Utilities	<a href="http://www.hsvutil.org">www.hsvutil.org</a>
ONUG Communications	<a href="http://www.onugsolutions.com">www.onugsolutions.com</a>
Palmetto Engineering & Consulting / CrescentLink Solutions	<a href="http://www.palmettoeng.com">www.palmettoeng.com</a> ; <a href="http://www.crescentlink.com">www.crescentlink.com</a>
TDS Telecom	<a href="http://www.tdstelecom.com">www.tdstelecom.com</a>

## TOP 100 AT A GLANCE

<b>Network Planning, Systems Integration, Design, Engineering, Construction, Installation</b> .....	<b>34</b>
<b>Fiber and Fiber Cable</b> .....	<b>37</b>
<b>Network Testing, Monitoring and Management Services</b> .....	<b>37</b>
<b>Network Management Solutions</b> .....	<b>39</b>
<b>Fiber-to-the-Home Electronics</b> .....	<b>45</b>
<b>Test and Measurement Equipment</b> .....	<b>52</b>
<b>Passive Components for FTTH Networks</b> .....	<b>55</b>
<b>Optical LAN Solutions</b> .....	<b>61</b>
<b>Network Planning and Design Solutions</b> .....	<b>66</b>
<b>Distributors of Fiber Optic Products</b> .....	<b>68</b>
<b>FTTH Construction Equipment</b> .....	<b>72</b>
<b>Network Deployers and Service Providers</b> .....	<b>73</b>

private and public, incumbent and competitive – that invest in FTTH networks.

Companies newly added to the list represent a variety of ecosystem niches. In fact, several are creating entirely new niches. TDS Telecom and Adams Telephone Cooperative are incumbent telephone companies, and Adams is now leveraging its FTTH experience to help other small ILECs deploy fiber. Allo Communications and Huntsville Utilities are pioneering new types of public-private partnerships for deploying FTTH, Allo as a private-sector partner and Huntsville Utilities as a public-sector partner. Conexon is a consulting company that specializes in helping electric cooperatives build and operate FTTH networks. FibNet is an integrator that specializes in a new technology

it hopes will be a game-changer for deploying fiber in remote areas. ONUG Communications is a design and engineering firm that uses automated tools to optimize fiber network designs. Palmetto Engineering & Consulting, in addition to providing engineering and consulting services, is the developer of a widely used GIS system.

### SELECTION CRITERIA

In selecting the FTTH Top 100, the editors looked for organizations that advance the cause of fiber-based broadband by

- Deploying networks that are large or ambitious, have innovative business plans or are intended to transform local economies or improve communities' quality of life

- Supplying key hardware, software or services to deployers
- Introducing innovative technologies with game-changing potential, even if they have not yet been commercially deployed
- Providing key conditions for fiber builds, such as early-stage support or demand aggregation.

To be listed among the FTTH Top 100, an organization may be based anywhere in the world but must do business in North America. Except for broadband service providers, which are inherently local, we give preference to organizations that serve national rather than local markets. Overall size is unimportant, as is corporate form – in addition to for-profit companies, the list includes municipalities, a telephone cooperative and several nonprofits.

Although some organizations on the list focus entirely on fiber to the premises or other fiber-based broadband technologies, most deliver or support a mix of broadband technologies. For some, broadband represents only a small part of their business. In making these selections, the editors considered how important the organizations are to advancing fiber broadband rather than how important broadband is to them.

*The FTTH Top 100 list was researched by Marianne Cotter, Rachel Ellner and Cassandra Kania and overseen by editor-in-chief Masha Zager, with recommendations and advice from editor-at-large Steve Ross. To nominate a company for next year's FTTH Top 100, email [masha@bbcmag.com](mailto:masha@bbcmag.com).*

**“It’s fascinating to me that the role of the co-ops, municipalities and local utilities originated back in the 1930s to provide electric power to rural areas, and nearly 100 years later, they have assumed another critical mission: bringing high-speed broadband to underserved areas. This time, *broadband* is vital to rural America’s economic viability.”**

– Frank Gine, CEO, ETI Software Solutions

# FIBER-TO-THE-HOME TOP 100 LIST

COMPANY	WEBSITE	PHONE	KEY PRODUCTS AND SERVICES
3-GIS	<a href="http://www.3-GIS.com">www.3-GIS.com</a>	256-560-0744	Web-based tools and services for mapping, network design and management
ACRS	<a href="http://www.acrsokc.com">www.acrsokc.com</a>	405-843-9966	Broadband engineering and consulting, construction management
Adams Telephone Co-Operative / CheckPoint Solutions	<a href="http://www.adams.net">www.adams.net</a> ; <a href="http://www.checkpointsolutions.net">www.checkpointsolutions.net</a>	217-214-2774	Consulting services for FTTH deployers, including opportunity assessment software, support and systems automation
<b>ADTRAN</b>	<a href="http://www.adtran.com">www.adtran.com</a>	256-963-8000	FTTH, FTTN and FTTP solutions; software-defined access; subscriber experience; network modernization and management; system integration
Advanced Media Technologies	<a href="http://www.amt.com">www.amt.com</a>	954-427-5711; 888-293-5856	Fiber optic transmission equipment, headends, set-top boxes
<b>AFL</b>	<a href="http://www.AFLglobal.com">www.AFLglobal.com</a>	864-433-0333; 800-235-3423	Fiber optic cable and connectivity, outside-plant fiber, fusion splicers, test and inspection equipment, training, design, engineering, integration
Alianza	<a href="http://www.alianza.com">www.alianza.com</a>	801-802-6400	Cloud-based VoIP platform
Allo Communications	<a href="http://www.allocommunications.com">www.allocommunications.com</a>	308-633-5000	Internet access, metro Ethernet, phone and video services
Alpha Technologies	<a href="http://www.alpha.com">www.alpha.com</a>	800-322-5742; 360-647-2360	Power supplies; surge suppressors; enclosures and batteries; installation and construction services
Altice USA	<a href="http://www.alticeusa.com">www.alticeusa.com</a>		Internet, video and voice services
American Polywater Corporation	<a href="http://www.polywater.com">www.polywater.com</a>	800-328-9384	Cable-pulling lubes, cleaners and sealants
<b>Amphenol</b>	<a href="http://www.amphenol.com">www.amphenol.com</a>	203-265-8900	Electrical, electronic and fiber optic connectors; interconnect systems; coaxial and specialty cable
<b>AT&amp;T / AT&amp;T Connected Communities</b>	<a href="http://www.att.com/communities">www.att.com/communities</a>		High-speed internet, next-generation TV, voice, advanced mobile services
<b>Atlantic Engineering Group</b>	<a href="http://www.aeg.cc">www.aeg.cc</a>	706-654-2298	Turnkey outside-plant services for FTTH networks
Baller, Stokes & Lide	<a href="http://www.baller.com">www.baller.com</a>	202-833-5300	Legal services, public policy advocacy
Bechtel	<a href="http://www.bechtel.com">www.bechtel.com</a>	415-768-1234	Engineering, procurement, construction, project management
BHC RHODES	<a href="http://www.ibhc.com">www.ibhc.com</a>	913-663-1900	Planning, design and construction of FTTx projects
<b>Biarri Networks</b>	<a href="http://www.biarrinetworks.com">www.biarrinetworks.com</a>	877-730-1999	Software for fiber optic network design
Black & Veatch	<a href="http://www.bv.com/">www.bv.com/</a>	913-458-2000	Consulting, engineering, construction, operations, program management
Blandin Foundation	<a href="http://www.blandinfoundation.org">www.blandinfoundation.org</a>	877-882-2257	Grant making, community leadership development, public policy programs
C Spire / C Spire Fiber	<a href="http://www.cspire.com/home-services/">www.cspire.com/home-services/</a>	855-277-4734	Voice, video and internet access delivered over a fiber-to-the-home network
Calix	<a href="http://www.calix.com">www.calix.com</a>	707-766-3000; 877-766-3500	Fiber access solutions for residential and business services, network and services management software, value-added software as a service
CCG Consulting	<a href="http://www.ccgcomm.com/">www.ccgcomm.com/</a>	202-255-7689	Regulatory, engineering, marketing, strategy and planning services; raising money for broadband projects
<b>CenturyLink</b>	<a href="http://www.centurylink.com">www.centurylink.com</a>	318-388-9000	Data, voice, video, managed services, cloud and hosted IT solutions
Charles Industries	<a href="http://www.charlesindustries.com">www.charlesindustries.com</a>	847-806-6300	Fiber optic distribution enclosures and cabinets, fiber aggregation and demarcation interconnects and hubs, fiber cross-connects, fiber rack solutions
<b>Charter Communications / Spectrum Community Solutions</b>	<a href="http://www.charter.com">www.charter.com</a> ; <a href="http://www.charter.com/mdu">www.charter.com/mdu</a>		Internet, video, voice and managed Wi-Fi services
CHR Solutions	<a href="http://www.chrsolutions.com">www.chrsolutions.com</a>	713-351-5111	Engineering, network planning, managed NOC and managed IT services; communications billing software

**\* FEATURED COMPANIES APPEAR IN ORANGE \***

COMPANY	WEBSITE	PHONE	KEY PRODUCTS AND SERVICES
Cincinnati Bell	<a href="http://www.cincinnati-bell.com">www.cincinnati-bell.com</a> , <a href="http://www.cincinnati-bell.com/FiOptics">www.cincinnati-bell.com/FiOptics</a>	513-397-9900	Telephone, data, video, wireless and information technology solutions
City of Ammon, Idaho, Fiber Optic Department	<a href="http://ammonfiber.info">http://ammonfiber.info</a>	208-612-4054	Gigabit internet service
<b>Clearfield</b>	<a href="http://www.seeclearfield.com">www.seeclearfield.com</a>	763-476-6866; 800-422-2537	Fiber distribution and protection systems for inside plant, outside plant and access networks
<b>Comcast Cable / XFINITY Communities</b>	<a href="http://www.comcast.com">www.comcast.com</a> ; <a href="http://www.xfinity.com/xfinitycommunities">www.xfinity.com/xfinitycommunities</a>		Internet, video, voice and home security services
<b>CommScope</b>	<a href="http://www.commscope.com">www.commscope.com</a>	828-324-2200; 800-982-1708	Cable and connectivity products
Comsof / FiberPlanIT	<a href="http://www.comsof.com">www.comsof.com</a> ; <a href="http://www.fiberplanit.com">www.fiberplanit.com</a>	416-594-9777	Software for FTTH network planning and design
Conexon	<a href="http://www.conexon.us">www.conexon.us</a>	202-798-3884	Consulting, fiber design, construction management, fundraising, network operations
<b>Corning Optical Communications</b>	<a href="http://www.corning.com">www.corning.com</a>	828-901-5000	Optical fiber, optical fiber cable, fiber cabinets and splitters, fiber connectors, terminals, MDU products
<b>COS Systems</b>	<a href="http://www.cossystems.com">www.cossystems.com</a>	800-562-1730	Demand aggregation software, BSS/OSS for managing open-access fiber networks
Cox Communications	<a href="http://www.cox.com">www.cox.com</a>		High-speed internet, video, voice and smart-home services
CTC Technology & Energy	<a href="http://www.ctcnet.us">www.ctcnet.us</a>	301-933-1488	Fiber and wireless broadband network design, engineering, financial analysis, strategy, assessment, implementation
Danella Companies	<a href="http://www.danella.com">www.danella.com</a>	610-828-6200	FTTH network design, engineering, construction, testing
DASAN Zhone Solutions	<a href="http://www.dasanzhone.com">www.dasanzhone.com</a>	877-946-6320	Network access equipment, passive optical LAN, Ethernet switching, mobile backhaul, software-defined networks
Design Nine / WideOpen Networks	<a href="http://www.designnine.com">www.designnine.com</a> ; <a href="http://www.wideopennetworks.us">www.wideopennetworks.us</a>	540-951-4400	Planning and feasibility studies; business and financial planning; project management; network design, buildout and operations
Ditch Witch	<a href="http://www.ditchwitch.com">www.ditchwitch.com</a>	800-654-6481	Construction equipment for laying fiber
Dura-Line Corporation	<a href="http://www.duraline.com">www.duraline.com</a>	800-847-7661	Conduit, cable-in-conduit, microducts, accessories
Dycom Industries	<a href="http://www.dycomind.com">www.dycomind.com</a>	561-627-7171	Program and project management, engineering, construction, maintenance, installation services
EntryPoint Networks	<a href="http://www.entpnt.com">www.entpnt.com</a>	801-518-7333	Automated open-access platform
EPB Fiber Optics	<a href="http://www.epb.com">www.epb.com</a>	423-648-1372	Voice, video, data and smart-grid services provided over a fiber optic network
<b>ETI Software Solutions</b>	<a href="http://www.etisoftware.com">www.etisoftware.com</a>	770-242-3620; 800-332-1078	Software products for managing broadband service activation, billing, device management and analytics
EXFO	<a href="http://www.exfo.com">www.exfo.com</a>	418-683-0211; 800-663-3936	Test, monitoring and analytics solutions for the communications industry
Fiberdyne Labs	<a href="http://www.fiberdyne.com">www.fiberdyne.com</a>	315-895-8470	Optical passive devices, multiplexers, fiber optic cable assemblies, termination boxes, MPO cables and cassettes, FTTH drop cables
FibNet	<a href="http://www.fibnet.net">www.fibnet.net</a>	925-326-8605	Network design and installation; fiber optic cables and other networking products
Finley Engineering	<a href="http://www.finleyusa.com">www.finleyusa.com</a>	417-682-5531	Network design and engineering services
Fujitsu Network Communications	<a href="http://us.fujitsu.com/telecom">http://us.fujitsu.com/telecom</a>	888-362-7763	End-to-end multivendor network project integration; other professional services; network equipment and management software
<b>GigabitNow</b>	<a href="http://www.gigabitnow.com">www.gigabitnow.com</a>	866-748-8066	Planning, design, financing, construction, operation and support of gigabit fiber-to-the-home networks

# FIBER-TO-THE-HOME TOP 100 LIST

COMPANY	WEBSITE	PHONE	KEY PRODUCTS AND SERVICES
<b>GLDS</b>	<a href="http://www.glds.com">www.glds.com</a>	800-882-7950	Software for subscriber management, billing, provisioning and workforce management
Google Fiber	<a href="http://fiber.google.com">fiber.google.com</a>		Voice, video and gigabit internet services
Graybar	<a href="http://www.graybar.com">www.graybar.com</a>	800-GRAYBAR (472-9227)	PON electronics, fiber cabinets/enclosures, fiber optic cable, fiber splice closures and pedestals, DC power, fiber terminals
<b>Henkels &amp; McCoy Group</b>	<a href="http://www.henkelsgroup.com">www.henkelsgroup.com</a>	888-HENKELS (436-5357)	Planning, design, engineering, project management, construction, operations management and installation
Hotwire Communications	<a href="http://www.hotwirecommunications.com">www.hotwirecommunications.com</a>	800-409-4733	Data, voice and video services delivered over fiber-to-the-home networks
Huntsville Utilities	<a href="http://www.hsvutil.org">www.hsvutil.org</a>	256-535-1200	Citywide dark fiber infrastructure leased to service providers
InfiniSys Multifamily Technology	<a href="http://www.electronicarchitect.com">www.electronicarchitect.com</a>	386-236-1500	Telecommunications network design for multifamily buildings, technology amenity engineering
Institute for Local Self-Reliance	<a href="http://www.ilsr.org">www.ilsr.org</a> ; <a href="http://www.MuniNetworks.org">www.MuniNetworks.org</a>	612-276-3456	Broadband policy research and municipal broadband advocacy
Inteleconnect	<a href="http://www.inteleconnect.com">www.inteleconnect.com</a>	734-604-1563	Service provider negotiations, financial feasibility plans, fiber infrastructure design, consultation and situation analysis
iPhotonix	<a href="http://www.iphotonix.com">www.iphotonix.com</a>	214-575-9300	Optical network terminals, residential gateways
KGPCo	<a href="http://www.kgpco.com">www.kgpco.com</a>	800-755-1950	Equipment for wireline and wireless networks; inventory management, logistics, site development, sourcing, supply chain management
Ledcor Technical Services	<a href="http://www.ledcor.com">www.ledcor.com</a>	512-275-3500	Design, engineering, sales, construction and maintenance of wireless and wireline networks
Leviton Manufacturing	<a href="http://www.leviton.com">www.leviton.com</a>	800-323-8920	Premises wiring, outside plant, central-office solutions and home automation products
Magellan Advisors	<a href="http://www.magellan-advisors.com">www.magellan-advisors.com</a>	888-960-5299	Broadband and telecom planning, deployment and management services
<b>Mapcom Systems</b>	<a href="http://www.mapcom.com">www.mapcom.com</a>	804-743-1860	Software for visual operations, workforce management and service assurance
MasTec North America	<a href="http://www.mastec.com">www.mastec.com</a>	888-785-2171	FTTx deployment, outside-plant cabling, engineering, inside-plant construction and installation, splicing, testing, systems integration, maintenance
Michels Corporation	<a href="http://www.michels.us">www.michels.us</a>	920-583-3132	Fiber optic network construction, including outside-plant construction, structured cabling and fiber splicing and testing
Mid-State Consultants	<a href="http://www.mscon.com">www.mscon.com</a>	435-623-8601	Communications engineering services, facilities management software
<b>Multilink</b>	<a href="http://www.gomultilink.com">www.gomultilink.com</a>	440-366-6966	Fiber distribution and cable management solutions, connectors, splice enclosures and cabinets; MDU enclosures; raceway and pathway solutions
NBT Solutions / VETRO FiberMap	<a href="http://www.nbtsolutions.com">www.nbtsolutions.com</a> ; <a href="http://www.vetrofibermap.com">www.vetrofibermap.com</a>	207-221-6627	Fiber mapping software
NEO Connect	<a href="http://www.NEOconnect.us">www.NEOconnect.us</a>	970-309-3500	Consulting, feasibility studies, design and engineering services
Nokia / Nokia Networks	<a href="http://www.nokia.com">www.nokia.com</a>	908-582-3000	Wireline and wireless network equipment, software for network management, IoT technology, cloud solutions
<b>OFS</b>	<a href="http://www.ofsoptics.com">www.ofsoptics.com</a>	770-798-5555; 888-342-3743	Optical fiber, optical cable, fiber management and connectivity products, splicers, network design services
On Trac	<a href="http://www.ontracinc.net">www.ontracinc.net</a>	423-317-0009	FTTx consulting, design, installation and splicing services

COMPANY	WEBSITE	PHONE	KEY PRODUCTS AND SERVICES
ONUG Communications	<a href="http://www.onugsolutions.com">www.onugsolutions.com</a>	919-876-5455	Outside-plant engineering, planning and design; project management, feasibility studies, consulting services, quality assurance, construction
Palmetto Engineering & Consulting / CrescentLink Solutions	<a href="http://www.palmettoeng.com">www.palmettoeng.com</a> ; <a href="http://www.crescentlink.com">www.crescentlink.com</a>	864-295-3180	Telecom engineering, consulting and installation; GIS software and services
<b>Pavlov Media</b>	<a href="http://www.pavlovmedia.com">www.pavlovmedia.com</a>	800-677-6812	Internet, video and voice services; managed services, including support for leasing offices
Power & Tel	<a href="http://www.ptsupply.com">www.ptsupply.com</a>	800-238-7514	Fiber optic products and cable, optical networking electronics, test gear, IPTV, home networking solutions
PPC Broadband	<a href="http://www.ppc-online.com">www.ppc-online.com</a>	315-431-7200; 800-800-6652	Armored polymer microduct and fiber cables for FTTH and MDU markets
<b>Preformed Line Products</b>	<a href="http://www.preformed.com">www.preformed.com</a>	440-461-5200	Fiber optic and copper splice closures, high-speed cross-connect devices, cable anchoring, control hardware systems
Prysmian Group	<a href="http://www.prysmiangroup.com">www.prysmiangroup.com</a>	803-951-4800; 800-713-5312	Optical fiber and telecommunications cables
Pulse Broadband	<a href="http://www.pulsebroadband.net">www.pulsebroadband.net</a>	703-467-1469	Broadband network feasibility studies, planning, design, construction management, provisioning, billing, customer care, video programming services, operations management
Rocket Fiber	<a href="http://www.rocketfiber.com">www.rocketfiber.com</a>	844-847-6253	Gigabit internet, managed services, voice, IPTV
SmartRG	<a href="http://www.smartrg.com">www.smartrg.com</a>	877-486-6210	Customer-premises equipment; open-services platform for managing networked in-home devices; tools for network optimization, insight and security
Smithville Communications / Smithville Telecom / Smithville Fiber	<a href="http://www.smithville.com">www.smithville.com</a>	812-876-2211; 800-742-4084	High-speed internet, IPTV, voice, managed services, cellular, home automation and security services, cloud services, IoT/big data support, videoconferencing, consulting services
Sonic	<a href="http://www.sonic.com">www.sonic.com</a>	855-757-6111	Internet access, voice, co-location, business networking
Superior Essex	<a href="http://www.SuperiorEssex.com">www.SuperiorEssex.com</a>	770-657-6000	Premises and outside-plant fiber and copper cable products, FTTH closures
TDS Telecom	<a href="http://www.tdstelecom.com">www.tdstelecom.com</a>	866-571-6662	Internet access, phone, video
The Broadband Group / TBG Network Services	<a href="http://www.broadbandgroup.com">www.broadbandgroup.com</a>	702-405-7000	Telecommunications master planning, network design and engineering, financial modeling, construction management
Ting	<a href="http://www.ting.com/internet">www.ting.com/internet</a>	855-846-4626	Gigabit Internet access
<b>TVC Communications / MaxCell</b>	<a href="http://www.tvcinc.com">www.tvcinc.com</a> ; <a href="http://www.maxcellinnerduct.com">www.maxcellinnerduct.com</a>	888-644-6075	Broadband electronics, connectivity products, outside-plant hardware, test equipment, fabric innerduct, conduit technology
Vantage Point Solutions	<a href="http://www.vantagepnt.com">www.vantagepnt.com</a>	605-995-1777	Broadband engineering and consulting services, including feasibility studies and network design, engineering, and deployment
Verizon Communications / Verizon Enhanced Communities	<a href="http://www.verizon.com">www.verizon.com</a> ; <a href="http://www.verizon.com/communities">www.verizon.com/communities</a>		Internet, video and digital voice services
Vermeer Corporation	<a href="http://www.vermeer.com">www.vermeer.com</a>	641-628-3141; 888-837-6337	Horizontal directional drilling equipment, utility and pedestrian trenchers and plows
VIAVI Solutions	<a href="http://www.viavisolutions.com">www.viavisolutions.com</a>	408-404-3600	Field and lab broadband test equipment, network monitoring systems, network performance monitoring, diagnostic services
<b>Walker and Associates</b>	<a href="http://www.walkerfirst.com">www.walkerfirst.com</a>	800-925-5371	Products and services for deploying communications networks
Zyxel Communications	<a href="http://www.zyxel.com/us">www.zyxel.com/us</a>	714-632-0882; 800-255-4101	FTTH/FTTN solutions, including gateways, customer-premises equipment, mesh Wi-Fi systems, and Ethernet switches

“Given the ongoing industry consolidation, communities without a local option for high-quality internet access will increasingly be stuck with a monopoly provider.”

– Christopher Mitchell, Director, Community Broadband Networks, Institute for Local Self-Reliance

## 3-GIS

www.3-gis.com  
256-560-0744

**Key Products:** Web-based tools and services for mapping, network design and management

**Summary:** 3-GIS Fiber Network Solutions is a browser-based, GIS fiber design and asset management system – a single-platform, single-database solution for fiber network design, construction output and tracking, and fiber asset maintenance/management. Built on Esri’s powerful ArcGIS Server platform, 3-GIS Fiber Network Solutions offers desktop and mobile tools for designing and documenting network assets during all phases of a network life cycle, including planning, design, construction and network management. Data can be stored in the cloud or on an organization’s server. Expanding the functionality of its asset tracking tools, the company recently introduced Web JS, which supports multiple network views and Google Street View. The web-based architecture allows designers, field crew, project management staff and other stakeholders to access accurate, real-time network information. 3-GIS Design Services provides consulting services to municipalities and network builders considering and deploying FTTH networks. Founded in 2006, 3-GIS is headquartered in Decatur, Alabama.



## ACRS

www.acrsokc.com  
405-843-9966

**Key Products:** Broadband engineering and consulting, construction management

**Summary:** Established in 1987, ACRS provides turnkey engineering and consulting to rural telcos, cable TV operators, wireless ISPs, competitive providers, electric co-ops, municipalities, Native American tribes and large carriers across the United States. Services include feasibility studies, financing acquisition, regulatory consulting (FCC licensing, CLEC and ETC filings and state corporation commission filings and testimony), detailed engineering, construction

management and acceptance testing. The company has extensive successful experience in acquiring RUS broadband loans and grants and competitive Connect America Fund awards for its clients. ACRS engineered the first full-motion distance learning network in the United States and the first FTTH system in Oklahoma. Recent projects include several FTTH networks for electric co-ops, including Northeast Rural Services (Bolt Fiber Optic) and Valley Electric Association, winner of a **BROADBAND COMMUNITIES** Cornerstone Award. ACRS is headquartered in Oklahoma City, Oklahoma, and has about 50 employees.

## Adams Telephone Co-Operative/ CheckPoint Solutions

www.adams.net; www.checkpointsolutions.net  
217-214-2774

**Key Products:** Consulting services for FTTH deployers, including opportunity assessment software, ongoing support and systems automation

**Summary:** Adams Telephone Co-Operative, a member-owned telco in Illinois, has deployed fiber for more than a decade. Today, more than two-thirds of the premises in its traditional service area have access to fiber broadband, and its Adams Fiber subsidiary is building fiber as a competitive provider in nearby towns. With more than 1,500 miles of fiber deployed and a set of well-developed processes and in-house software tools for deployment, Adams now serves 25 communities with fiber to the home. In 2016, after many inquiries, it formed a new subsidiary, CheckPoint Solutions, to share its expertise with other small companies that wanted to build FTTH in underserved communities and guide them through a software-developed automation process from beginning to end. CheckPoint already counts 12 other independent companies, including telephone and electric, as clients. It offers strategic advice and support that includes software-defined needs analysis, identification of growth opportunities, ROI analysis, risk management, demand measurement, customized reporting and more. Adams Telephone, founded in 1952 and based in Golden, Illinois, has 85 employees.



## ADTRAN

www.adtran.com  
256-963-8000

**Key Products:** Solutions for FTTH, FTTN and FTTdp architectures; mobile backhaul; software-defined access; subscriber experience; network modernization and management; system integration

**Summary:** ADTRAN is a top-three global supplier of next-generation broadband access solutions for residential, enterprise and mobile services markets served by cable MSOs, telecom service providers, municipalities, utilities and electric co-ops. The ADTRAN Total Access 5000 multiservice platform is the most widely deployed solution in North America, supporting hundreds of gigabit communities. Additionally, ADTRAN's next-generation 10 Gbps FTTH technologies allow operators to double the lives of their fiber optic distribution networks while lowering operational expenses by supporting both enterprise and residential customers. These solutions are complemented by a full suite of subscriber experience, network modernization and system integration services and a pool of next-generation alliance partners. ADTRAN is based in Huntsville, Alabama, and had 2017 sales of approximately \$667 million.



## Advanced Media Technologies

www.amt.com  
954-427-5711; 888-293-5856

**Key Products:** Fiber optic transmission equipment, cable modem termination systems, headends, IP and QAM set-top boxes

**Summary:** Advanced Media Technologies (AMT), a value-added reseller of high-performance broadband products, offers a complete line of DOCSIS, FTTH, IPTV and CATV products. AMT specializes in data solutions for private cable operators. It offers products from such leading manufacturers as Nokia, Amino, ARRIS, ATX Networks, Actiontec, Blonder Tongue, Casa Networks, Harmonic, Olson Technology, Imagine Communications and ZeeVee.

Customers include major cable companies in the United States and Latin America, telcos, private cable operators, and entertainment and multimedia content delivery companies around the world. Located in Deerfield Beach, Florida, AMT was originally founded as DX Communications in 2003. The company keeps an extensive inventory in its 32,000-square-foot warehouse and employs more than 70 people.

## AFL

www.AFLglobal.com  
864-433-0333; 800-235-3423

**Key Products:** Fiber optic cable and connectivity, outside-plant fiber and electrical conductor hardware, copper apparatus, fusion splicers, test and inspection equipment, training, design, engineering, integration

**Summary:** AFL products, services and engineering expertise help broadband providers create or improve their infrastructures and enable delivery of voice, video and high-speed data communications. AFL's product portfolio includes fiber optic cable and connectivity, outside-plant closures and terminals, demarcation devices, WDM/splitter modules, fusion splicers, test and inspection equipment, electrical conductor accessories and Light Brigade training and education. AFL plans, designs, builds and maintains communications networks, offering FTTx and MDU solutions for master-planned community networks serviced by telephone, cable TV and wireless providers; utilities/electric cooperatives; and industrial companies and enterprises. In 2016, AFL advanced its FTTx portfolio with the release of its MDU product set. The company continues to release and promote new cable technologies suitable for applications in metro and access networks, such as Wrapping Tube Cable with SpiderWeb Ribbon, an ultra-high-density fiber optic cable that offers fiber counts up to 3,456, and the LM-Series MicroCore cables for microducts, with fiber counts up to 432. Founded in 1984, AFL is headquartered in Spartanburg, South Carolina, and is a division of Fujikura Ltd. The company has more than 4,500 associates around the world and has operations in the United States, Canada, Mexico, Europe, Asia and Australia.



"There is a fundamental need for smart mapping tools in all facets of the FTTx life cycle. Fiber network mapping data can propel networks forward when operators are freed from old thinking and CAD drawings. Imagine a broadband network map that said, 'Ask me anything.'"

– Will Mitchell, Co-Founder and CEO, NBT/VETRO

# FIBER-TO-THE-HOME TOP 100 LIST

“Rural leaders know that to have strong economies, quality education and health care, and lifestyle options, broadband is necessary. After years of hard work, Minnesota is seeing the impact of partnerships among community leaders, state funders and community-minded providers. This winning combination is the way forward to connected communities that work for all.”

– Dr. Kathleen Annette, President and CEO, Blandin Foundation

## Alianza

[www.alianza.com](http://www.alianza.com)

801-802-6400

**Key Products:** Cloud-based VoIP platform

**Summary:** Though early fiber-to-the-home deployers were mainly telephone companies, many of today’s new entrants to the FTTH field have no history of providing voice services. For a broadband operator without telephone equipment or expertise, using a cloud-based system is the simplest, most economical way to add a voice offering – typically a high-margin service. Alianza’s Cloud Voice Platform, a web-scale voice over IP (VoIP) solution built for broadband providers, provides the functions required to deliver and support residential and business VoIP services. The platform does not require capital expenditure or equipment installation, and Alianza alleviates most operational and regulatory burdens associated with phone services. Since announcing a solution specifically for FTTH providers in February 2017, Alianza has made inroads with electric cooperatives, utilities and municipalities that deliver FTTH broadband to their communities. In the last year, Alianza has signed on more than 10 new FTTH ISPs to help them launch VoIP or replace outdated solutions and improve their phone services. The company has more than 60 ISP customers on the platform. Founded in 2009 and headquartered in Lindon, Utah, Alianza has more than 60 employees.



## Allo Communications

[www.allocommunications.com](http://www.allocommunications.com)

308-633-5000

**Key Products:** Internet access, metro Ethernet, phone and video services over fiber optic networks

**Summary:** Founded in 2003 and headquartered in Imperial, Nebraska, Allo Communications has built fiber broadband networks throughout Nebraska as a competitive service

provider. In addition to offering residential and business triple-play services, the company has a broad vision of fiber as a transformational technology. To that end, it has a policy of building out its fiber networks citywide, rather than in selected neighborhoods, and it works with communities to help them use their networks to expand business opportunities, create jobs and improve quality of life. Allo provides services in nine Nebraska communities and one community in Colorado, serving a total population of 375,000. Two current projects involve partnerships with city governments. In Lincoln, Nebraska, Allo leases the city’s conduits and is extending the conduit system into residential neighborhoods and building fiber to the home. In Fort Morgan, Colorado, Allo is leasing the city-owned fiber network to deliver broadband services. Allo was acquired in 2015 by Nelnet, a company based in Lincoln. Allo has 2017 revenues of \$25.7 million and more than 500 employees.



## Alpha Technologies

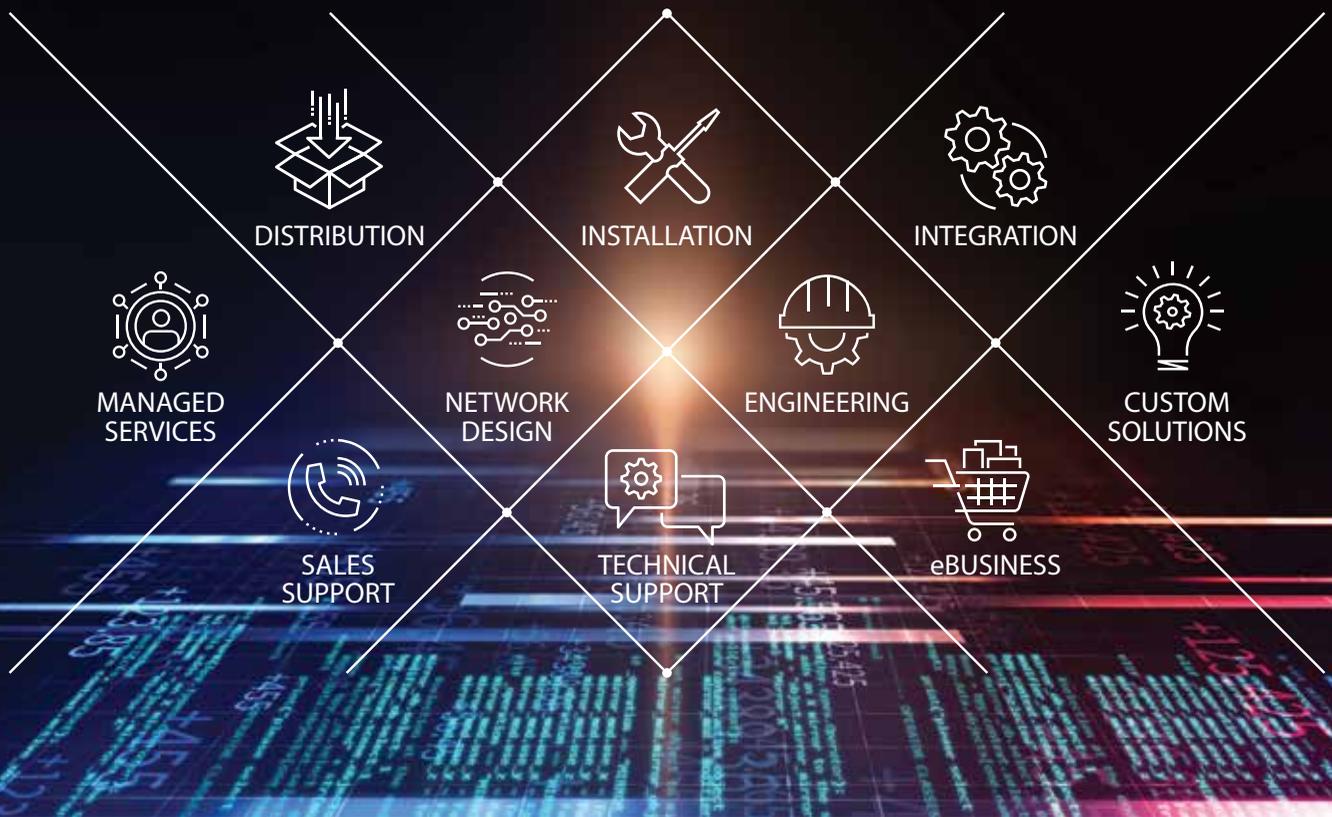
[www.alpha.com](http://www.alpha.com)

800-322-5742; 360-647-2360

**Key Products:** Standby, non-standby and uninterruptible power supplies; surge suppressors; enclosures and batteries; installation and construction services

**Summary:** Founded in 1976, Alpha Technologies is a major player in power systems for the broadband communications industry worldwide. Alpha products provide critical power conditioning and emergency backup for video, data and voice networks. Alpha’s installation and construction services include structure engineering, right-of-way and easement procurement, site preparation, equipment installation, system turnup and system testing. Customers in 50 countries include major cable television system operators, telecommunications service providers and full-service communications providers. Alpha Technologies’ portfolio of FTTH powering options includes the FlexPoint line of 12Vdc single-family solutions

Simplifying network deployments with expert installation, systems integration, and unsurpassed sourcing services



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# FIBER-TO-THE-HOME TOP 100 LIST

and the FlexNet line of 48Vdc multiple-dwelling-unit and small office-home office power supplies. In 2017, to streamline fiber management at headends, the company launched the Alpha Ultra High Density Fiber Panel, which combines ultra-high-density fiber capacity with connector access and a unique cable management system. Alpha, with more than 1,000 employees, has sales and service centers in the United States, Canada, Europe, the Middle East, China and Australia. It is a member of the Alpha Group, a global alliance of independent companies that share a common philosophy: to create powering solutions for communications, commercial, industrial and renewable energy markets.

## Altice USA

[www.alticeusa.com](http://www.alticeusa.com)

**Key Products:** Internet, video and voice services

**Summary:** Altice USA is one of the largest broadband communications and video services providers in the United States, delivering broadband, pay TV, voice services, Wi-Fi hotspot access, proprietary content and advertising services through its Optimum and Suddenlink brands. Altice USA continues to roll out enhanced data services to cable customers, with broadband speeds of up to 400 Mbps available to the great majority of Altice USA customers and gigabit

service available to 29 percent, representing 72 percent of the Suddenlink footprint as of the end of Q1 2018. In addition, the company is actively deploying an FTTH network, with construction underway to connect several hundred thousand homes in New York, New Jersey and Connecticut. The first commercialization of FTTH services is expected later this year. The newly launched Altice One is an all-in-one connectivity platform that provides ultra-high-definition video, high-speed broadband, whole-home Wi-Fi and voice services in one box. Headquartered in Long Island City, New York, and serving approximately 4.9 million customers across 21 states, Altice USA posted revenues of \$9.33 billion in 2017.

## American Polywater Corporation

[www.polywater.com](http://www.polywater.com)

800-328-9384

**Key Products:** Cable-pulling lubes, cleaners and sealants

**Summary:** In 1973, Nelson Jonnes, a Minnesota research chemist, invented a SCUBA-diving suit lubricant. It was well received, but his company really took off when it began selling the same technology to the telecom and power utility markets as a water-based cable-pulling lubricant. This lubricant revolutionized the industry, which until then had relied on mud, wax and grease. Today, American Polywater sells more

## NETWORK PLANNING, SYSTEMS INTEGRATION, DESIGN, ENGINEERING, CONSTRUCTION, INSTALLATION

(Excludes companies that provide these services only for networks they will own or manage.)

### COMPANY NAME

3-GIS	<a href="http://www.3-gis.com">www.3-gis.com</a>
ACRS	<a href="http://www.acrsokc.com">www.acrsokc.com</a>
Adams Telephone Co-Operative /	
CheckPoint Solutions	<a href="http://www.checkpointsolutions.net">www.checkpointsolutions.net</a>
<b>AFL</b>	<a href="http://www.AFLglobal.com">www.AFLglobal.com</a>
Alpha Technologies	<a href="http://www.alpha.com">www.alpha.com</a>
<b>Atlantic Engineering Group</b>	<a href="http://www.aeg.cc">www.aeg.cc</a>
Bechtel	<a href="http://www.bechtel.com">www.bechtel.com</a>
BHC Rhodes	<a href="http://www.ibhc.com/">www.ibhc.com/</a>
<b>Biarrri Networks</b>	<a href="http://www.biarrinetworks.com">www.biarrinetworks.com</a>
Black & Veatch	<a href="http://www.bv.com">www.bv.com</a>
CCG Consulting	<a href="http://www.ccgcomm.com/">www.ccgcomm.com/</a>
CHR Solutions	<a href="http://www.chrsolutions.com">www.chrsolutions.com</a>
<b>Corning Optical Communications</b>	<a href="http://www.corning.com">www.corning.com</a>
Conexon	<a href="http://www.conexon.us">www.conexon.us</a>
CTC Technology & Energy	<a href="http://www.ctcnet.us">www.ctcnet.us</a>
Danella Companies	<a href="http://www.danella.com">www.danella.com</a>
Design Nine	<a href="http://www.designnine.com">www.designnine.com</a>
Dycom Industries	<a href="http://www.dycomind.com">www.dycomind.com</a>
FibNet	<a href="http://www.fibnet.net">www.fibnet.net</a>
Finley Engineering	<a href="http://www.finleyusa.com">www.finleyusa.com</a>

### COMPANY NAME

Fujitsu Network Communications	<a href="http://us.fujitsu.com/telecom">http://us.fujitsu.com/telecom</a>
<b>Henkels &amp; McCoy Group</b>	<a href="http://www.henkelsgroup.com">www.henkelsgroup.com</a>
InfniSys Multifamily Technology	<a href="http://www.electronicarchitect.com">www.electronicarchitect.com</a>
Inteleconnect	<a href="http://www.inteleconnect.com">www.inteleconnect.com</a>
KGPCo	<a href="http://www.kgpc.com">www.kgpc.com</a>
Ledcor Technical Services	<a href="http://www.ledcor.com">www.ledcor.com</a>
Magellan Advisors	<a href="http://www.magellan-advisors.com">www.magellan-advisors.com</a>
MasTec North America	<a href="http://www.mastec.com">www.mastec.com</a>
Michels Corporation	<a href="http://www.michels.us">www.michels.us</a>
Mid-State Consultants	<a href="http://www.mscon.com">www.mscon.com</a>
NEO Connect	<a href="http://www.NEOconnect.us">www.NEOconnect.us</a>
Nokia	<a href="http://www.nokia.com">www.nokia.com</a>
<b>OF5</b>	<a href="http://www.ofsoptics.com">www.ofsoptics.com</a>
On Trac	<a href="http://www.ontracinc.net">www.ontracinc.net</a>
ONUG Communications	<a href="http://www.onugsolutions.com">www.onugsolutions.com</a>
Palmetto Engineering & Consulting	<a href="http://www.palmettoeng.com">www.palmettoeng.com</a>
Pulse Broadband	<a href="http://www.pulsebroadband.net">www.pulsebroadband.net</a>
The Broadband Group / TBG Network Services	<a href="http://www.broadbandgroup.com">www.broadbandgroup.com</a>
Vantage Point Solutions	<a href="http://www.vantagepnt.com">www.vantagepnt.com</a>
<b>Walker and Associates</b>	<a href="http://www.walkerfirst.com">www.walkerfirst.com</a>

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**Biarrri Networks**  
N E T W O R K O P T I M I S A T I O N

[www.biarrinetworks.com](http://www.biarrinetworks.com)

“In student housing, managed internet/Wi-Fi is now a standard amenity, and within the next five years, we expect this may become the case across the luxury MDU world. The reason is simple: Residents desire always-on connectivity, and more recently, IoT has become an industry buzzword, which further increases the connectivity requirement.”

– Richard Holtz, CEO, InfiniSys

than 20 formulations of pulling lubes for every type of wire and cable imaginable – even special cable-blowing lubricants for air-assisted installation of fiber optic cables. It also sells cleaners and other specialty chemicals, worker protection products, cable-pulling software, training videos, adhesives and duct sealants. It even packages sealants to mouse-proof equipment cabinets and waterproof duct-within-duct systems. American Polywater is based in Stillwater, Minnesota, and sells its products in more than 50 countries.

## **Amphenol**

[www.amphenol.com](http://www.amphenol.com)  
203-265-8900

**Key Products:** Electrical, electronic and fiber optic connectors; interconnect systems; coaxial and specialty cable

**Summary:** With headquarters in Wallingford, Connecticut, Amphenol offers a wide range of coaxial cable, interconnect and passive products to serve the broadband market, from customer premises cables and interconnect devices to distribution cable and fiber optic components. The company's diverse interconnect products are deployed on a range of broadband equipment, from sophisticated headend equipment to digital set-top boxes, high-speed cable modems and satellite interface devices. The primary end markets for the company's products are communications and information processing markets, including cable television, cellular telephone, and data communication and information processing systems; aerospace and military electronics; and automotive, rail and other transportation and industrial applications. In 2017, Amphenol bought Telect, a company that designs and manufactures high-density fiber distribution solutions. Sales for 2017 were \$7 billion.

## **AT&T / AT&T Connected Communities**

[www.att.com/communities](http://www.att.com/communities)

**Key Products:** High-speed internet, next-generation TV, voice, advanced mobile services

**Summary:** AT&T is invested in being a global leader in the telecommunications, media and technology segment. In the last three years, it undertook a massive FTTH deployment

and now markets FTTH services to more than 8 million customer locations across 70 metropolitan areas. It plans to reach 14 million locations with fiber by mid-2019. For MDUs, it also offers a G.fast option. As the largest U.S. provider of pay TV, AT&T offers video entertainment through DIRECTV (satellite), U-verse (IPTV) and DIRECTV NOW (streaming) services. In the last year, AT&T started testing a new structure monitoring solution designed to improve roadway and railway safety as part of an IoT smart-cities solution. It also launched trials of its Project AirGig technology, which seeks to deliver speeds greater than 1 Gbps via a millimeter-wave signal guided by power lines. As part of a plan to virtualize access functions in the last-mile network, AT&T tested a 10 Gbps XGS-PON virtualized network in Atlanta and Dallas. AT&T revenue for 2017 was \$160.5 billion, and the company employs more than 200,000 people in the United States alone. AT&T Connected Communities works with multifamily and single-family builders, developers, management groups and homeowner associations to provide next-generation communications and entertainment services.

## **Atlantic Engineering Group**

[www.aeg.cc](http://www.aeg.cc)  
706-654-2298

**Key Products:** Turnkey outside-plant services for FTTH networks

**Summary:** Atlantic Engineering Group (AEG), a pioneer in fiber-to-the-home network deployment, helps lead the drive to combine FTTH and smart-grid technologies into a single business plan for municipalities, rural electric cooperatives and new entrants into the FTTH arena. The company, founded in 1996, specializes in the design and construction of fiber communications networks. This outside-plant specialist, headquartered in Buford, Georgia, deploys in-house personnel and on-site project managers globally. AEG performs project management, service planning, engineering, underground and aerial construction, splicing, premises installation, headend activation, testing and many other professional and technical services. It has completed or is currently working on design or build commissions for more than 100 networks,

including 48 FTTH projects that total 2.7 million premises passed. AEG is currently building FTTH networks for clients that include the cities of Newport, Tennessee; Muscatine, Iowa; Ocala, Florida; and Barbourville, Kentucky.

### **Baller Stokes & Lide**

www.baller.com  
202-833-5300

**Key Products:** Legal services, public policy advocacy

**Summary:** This telecom law firm has a long, consistent record of supporting the use of advanced broadband infrastructure to drive the development of economically strong local communities. The firm represents public and private entities on a broad range of communications matters, both nationally and in more than 35 states. It is best known for its work in opposing state barriers to local internet choice. The firm has worked on many leading public communications projects in the United States and was a consultant to Google on its Fiber for Communities initiative. As founder and president of the US Broadband Coalition, the firm's president, Jim Baller, played a leading role in forging a national consensus on the need for a national broadband strategy and on the framework for such a strategy. He is co-founder and president of the more than 500-member Coalition for Local Internet Choice, which works to preserve and protect the right of local governments to make the critical broadband infrastructure decisions that will affect their communities for decades to come. Founded in 1983, Baller Stokes & Lide is based in Washington, D.C. It has four full-time attorneys and a network of part-time local and regional counsel across the United States.



### **Bechtel**

www.bechtel.com  
415-768-1234

**Key Products:** Engineering, procurement, construction, project management

**Summary:** A global engineering, construction and project management company founded in 1898, Bechtel has completed more than 25,000 projects across 160 countries on all seven continents. For the Verizon Fios network, Bechtel engineered fiber routes and hub locations in the Western and Mid-Atlantic states. In addition, Bechtel was engaged by Google Fiber to build fiber to the premises and provide high-speed television and internet service. Bechtel's work for Google Fiber involves designing and installing more than 15,000 miles of fiber in cities across the Southeast, including Charlotte and Raleigh-Durham, North Carolina; Nashville, Tennessee; and Atlanta. The company has 53,000 employees and operates four global

## **FIBER AND FIBER CABLE**

These firms supply optical fiber for fiber access deployments.

### **COMPANY NAME**

### **WEB ADDRESS**

<b>AFL</b>	<a href="http://www.aflglobal.com">www.aflglobal.com</a>
Clearfield	<a href="http://www.seeclearfield.com">www.seeclearfield.com</a>
<b>CommScope</b>	<a href="http://www.commscope.com">www.commscope.com</a>
<b>Corning Optical Communications</b>	<a href="http://www.corning.com">www.corning.com</a>
Fiberdyne Labs	<a href="http://www.fiberdyne.com">www.fiberdyne.com</a>
FibNet	<a href="http://www.fibnet.net">www.fibnet.net</a>
<b>OFS</b>	<a href="http://www.ofsoptics.com">www.ofsoptics.com</a>
PPC Broadband	<a href="http://www.ppc-online.com">www.ppc-online.com</a>
Prismian	<a href="http://www.prysmian.com">www.prysmian.com</a>
Superior Essex	<a href="http://www.superioressex.com">www.superioressex.com</a>

businesses: infrastructure; nuclear, security and environmental; oil, gas and chemicals; and mining and metals.



### **BHC RHODES**

www.ibhc.com  
913-663-1900

**Key Products:** Planning, design and construction of FTTx projects

**Summary:** BHC RHODES provides civil engineering services to telecom firms that build and maintain fiber networks across the United States. It has designed and managed thousands of

## **NETWORK TESTING, MONITORING AND MANAGEMENT SERVICES**

### **COMPANY NAME**

### **WEB ADDRESS**

<b>AFL</b>	<a href="http://www.AFLglobal.com">www.AFLglobal.com</a>
<b>Atlantic Engineering Group</b>	<a href="http://www.aeg.cc">www.aeg.cc</a>
CHR Solutions	<a href="http://www.chrsolutions.com">www.chrsolutions.com</a>
Conexon	<a href="http://www.conexon.us">www.conexon.us</a>
Design Nine / WideOpen Networks	<a href="http://www.wideopennetworks.us">www.wideopennetworks.us</a>
<b>GigabitNow</b>	<a href="http://www.gigabitnow.com">www.gigabitnow.com</a>
Magellan Advisors	<a href="http://www.magellan-advisors.com">www.magellan-advisors.com</a>
Michels Corporation	<a href="http://www.michels.us">www.michels.us</a>
Nokia	<a href="http://www.nokia.com">www.nokia.com</a>
Pulse Broadband	<a href="http://www.pulsebroadbandinc.com">www.pulsebroadbandinc.com</a>
VIAMI Solutions	<a href="http://www.viavisolutions.com">www.viavisolutions.com</a>

# FIBER-TO-THE-HOME TOP 100 LIST

“There is no longer a limitation on who can enter the broadband industry. It is becoming a “first come, first serve” opportunity for any entity willing to undertake the opportunity and enter this industry. Our firm originally started engineering broadband networks for telecom companies. Today we have successfully helped more than a dozen different types of organizations find creative ways to finance, partner and build out broadband networks throughout the United States.”

– Mike Boehne, President and CEO, Finley Engineering

miles of telecom network infrastructure for clients that range from small communities and telcos to large international service providers. BHC RHODES’ FTTx services include feasibility studies, cost estimating and budgeting; planning, layout and network architecture; GIS and AutoCAD mapping; hut site development and construction; outside-plant design; site surveys; right-of-way permitting and asset management. Based in Overland Park, Kansas, with \$18 million in 2017 revenue, BHC RHODES has been in business for 25 years and has more than 135 employees.



## **Biarrri Networks**

[www.biarrinetworks.com](http://www.biarrinetworks.com)  
877-730-1999

**Key Products:** Software for fiber optic network design

**Summary:** Over almost a decade, Biarrri Networks has developed a simplified, web-based approach to fiber optic network planning and engineering. Its software platform, FOND, uses automation and optimization techniques, based on a patented algorithm, to remove much of the complexity of FTTx network planning and design. Conceived in 2008 as part of the Biarrri Group and formally established as a separate entity three years later, Biarrri Networks got its start developing software to design the 11-million-home Australian National Broadband Network and the 5-million-home Chorus New Zealand network. Over the last six years, Biarrri software has been used in the design of successful networks across Asia and Europe, and the company began operating in the United States in 2014. Biarrri’s U.S. clients include Tier-1 telecommunications providers, design and engineering firms such as ONUG Communications, infrastructure data firms such as QC Data, fiber overbuilders such as Allo Communications, municipalities, and public-private partnerships. Biarrri is headquartered in Windsor, Australia, and recently established

a U.S. head office in Denver. It also has field offices in New Jersey and San Francisco. Biarrri has 100 employees worldwide.



## **Black & Veatch**

[www.bv.com](http://www.bv.com)  
913-458-2000

**Key Products:** Consulting, engineering, construction, operations, program management

**Summary:** Founded in 1915 and based in Overland Park, Kansas, Black & Veatch is a global engineering, consulting and construction company that specializes in telecommunications, energy, water and government services. Employee-owned, Black & Veatch has approximately 10,000 professionals in more than 110 offices worldwide and has completed projects in more than 100 countries. Services include engineering, procurement, construction, design, management consulting, asset management, environmental consulting and security. Black & Veatch has deployed more than 30,000 miles of fiber for commercial carriers, cities and utilities. Revenue in 2017 was \$3.4 billion. In 2018, Black & Veatch’s telecommunications business was ranked No. 1 by Engineering News-Record for the seventh year.

## **Blandin Foundation**

[www.blandinfoundation.org](http://www.blandinfoundation.org)  
877-882-2257

**Key Products:** Grant making, community leadership development, public policy programs

**Summary:** Since 1941, the Blandin Foundation, a private foundation based in Grand Rapids, Minnesota, has been dedicated to strengthening rural Minnesota communities. Its Broadband Initiative, launched in 2003, helps communities educate citizens about the need for ultra-high-speed broadband

and plan and execute broadband projects. The foundation has published informational guides, sponsored conferences and educational events, and supported many feasibility studies for the development of robust, high-speed broadband networks. It has supported implementation of broadband applications in schools, health care facilities and other institutions and for home-based users and has promoted broadband adoption in rural communities. In 2018, Blandin will select eight rural Minnesota communities for two-year partnerships with the foundation to advance local broadband initiatives.

### C Spire / C Spire Fiber

[www.cspire.com/home-services](http://www.cspire.com/home-services)  
855-277-4734

**Key Products:** Voice, video and internet access delivered over a fiber-to-the-home network

**Summary:** C Spire is building an ultra-high-speed network in Mississippi to attract investment and economic growth and pave the way for improvements in health care, education, civic life and municipal services. Using a crowdsourcing model, the company started offering services in multiple cities in fall 2014. C Spire's FTTH deployment in Mississippi is supported by the fiber optic infrastructure it built to support its LTE network and business services. Recently, Madison County, Mississippi, signed a franchise agreement to bring C Spire Fiber to residents in some of its unincorporated areas, and C Spire's Business Solutions division announced it is building fiber optic infrastructure near 18 key business developments and industrial sites in DeSoto County, Mississippi. In the last year, C Spire launched C Spire TV, a streaming app that includes cloud DVR, eliminating the need for a set-top box. The company also began a smart-city technology trial involving smart lighting and vehicle traffic analytics applications in Ridgeland, Mississippi, and it is partnering with electric power company Entergy on an \$11 million fiber infrastructure project spanning more than 300 miles in 15 Mississippi counties. These and other projects are parts of a broader C Spire Tech Movement initiative designed to leverage the company's technology leadership and investments to help transform its service areas. Based in Ridgeland, Mississippi, C Spire is privately owned and employs 1,425 people.



### Calix

[www.calix.com](http://www.calix.com)  
707-766-3000; 877-766-3500

**Key Products:** Fiber access solutions for residential and business services, network and services management software, value-added software as a service

**Summary:** Calix, with more than 1,400 customers worldwide, serves more North American FTTx providers than all other

equipment vendors combined. It also serves several international markets with fiber and copper access solutions. In 2017, it completed a multiyear transformation from being mainly a wireline access systems provider to being mainly a software platform, cloud analytics, services and solutions provider. Calix's intelligent access solutions leverage its software solutions. Calix Cloud launched in early 2017, delivering Calix Marketing Cloud and Calix Support Cloud to more than 100 customers. EXOS, a carrier-class premises software platform that supports residential, business and mobile subscribers, is coupled to the GigaFamily premises devices. The AXOS platform, introduced in 2015, allows software functions in the access network to run independently of the underlying hardware. This brings SDN/NFV functionality to the access network. The number of applications using AXOS has expanded to approximately 1,000 modules. For instance, Calix introduced AXOS SMx in 2018 to give service providers the flexibility to deploy SDN networks with automated workflows that use existing back-office business systems. Calix has shipped 25 million ports of fiber and copper access lines to providers that have more than 100 million subscriber lines. Headquartered in Petaluma, California, Calix had 2017 revenue of \$510 million and spent almost \$128 million on research and development. It had 1,030 employees at the end of 2017.



## NETWORK MANAGEMENT SOLUTIONS

These companies provide OSS or software for network monitoring, optimization, provisioning, service management, subscriber management, billing and related functions.

<u>COMPANY NAME</u>	<u>WEB ADDRESS</u>
3-GIS	<a href="http://www.3-gis.com">www.3-gis.com</a>
<b>ADTRAN</b>	<a href="http://www.adtran.com">www.adtran.com</a>
Calix	<a href="http://www.calix.com">www.calix.com</a>
CHR Solutions	<a href="http://www.chrsolutions.com">www.chrsolutions.com</a>
<b>COS Systems</b>	<a href="http://www.cossystems.com">www.cossystems.com</a>
EntryPoint Networks	<a href="http://www.entpnt.com">www.entpnt.com</a>
<b>ETI Software Solutions</b>	<a href="http://www.etisoftware.com">www.etisoftware.com</a>
EXFO	<a href="http://www.exfo.com">www.exfo.com</a>
<b>GLDS</b>	<a href="http://www.glds.com">www.glds.com</a>
iPhotonix	<a href="http://www.iphotonix.com">www.iphotonix.com</a>
<b>Mapcom Systems</b>	<a href="http://www.mapcom.com">www.mapcom.com</a>
NBT Solutions / VETRO FiberMap	<a href="http://www.vetrofibermap.com">www.vetrofibermap.com</a>
Nokia	<a href="http://www.nokia.com">www.nokia.com</a>
Palmetto Engineering & Consulting / CrescentLink Solutions	<a href="http://www.crescentlink.com">www.crescentlink.com</a>
SmartRG	<a href="http://www.smartrg.com">www.smartrg.com</a>

“I believe more communities today, compared with a year ago, are realizing their best option is probably not to go head-to-head with private providers. Instead, they view broadband as a utility infrastructure and open it up to multiple providers. My gut feeling says that open-access networks will play an increasingly important role in the coming years.”

– Isak Finer, CMO, COS Systems

## CCG Consulting

[www.ccgcomm.com](http://www.ccgcomm.com)

202-255-7689

**Key Products:** Regulatory, engineering, marketing, strategy and planning services; raising money for broadband projects

**Summary:** In business since 1997, CCG is a full-service consultant for small communications carriers. The company specializes in launching new broadband ventures and making existing businesses more profitable. CCG offers a wide range of regulatory, engineering, strategy and planning, operations, budgeting and billing services. CCG helps clients design, upgrade and maximize fiber, coaxial, copper and wireless networks. CCG also offers direct operational assistance in areas such as number portability, new product development, cable programming, carrier disputes and billing audits. It is active in helping companies create workable public-private partnerships and secure funds for broadband projects – a specialty for which demand is growing. CCG continues to work on numerous feasibility studies for communities of all sizes and is helping several communities build and launch new broadband businesses.

## CenturyLink

[www.centurylink.com](http://www.centurylink.com)

318-388-9000

**Key Products:** Data, voice, video, managed security services, hosting, cloud and IT consulting services

**Summary:** A global communications and IT services company focused on connecting its customers to the power of the digital world, CenturyLink provides broadband, voice, video, advanced data and managed network services over a 450,000-route-mile U.S. fiber network and a 360,000-route-mile international transport network. CenturyLink launched its 1 Gbps FTTH service in Omaha, Nebraska, in 2013; it now passes more than 1.5 million homes with 1 Gbps service and continues to expand the service. CenturyLink also offers network and data systems management, big data analytics, managed security services, hosting, and cloud and IT consulting services. Last year's acquisition of Level

3 Communications expanded CenturyLink's presence significantly, boosting its U.S. route miles from 25,000 to 450,000. In 2018, CenturyLink announced that because of market changes, it will no longer expand its Prism TV service, though it continues to serve existing markets. CenturyLink recently deployed a field trial of ADTRAN's virtualized OLT 10G-PON solution, a disaggregated, software-defined access solution designed to create a more flexible, scalable, manageable access infrastructure. Headquartered in Monroe, Louisiana, CenturyLink is an S&P 500 company and is included on the Fortune 500 list of the largest U.S. corporations. With approximately 49,000 employees, CenturyLink posted operating revenue of \$17.5 billion in 2017.



## Charles Industries

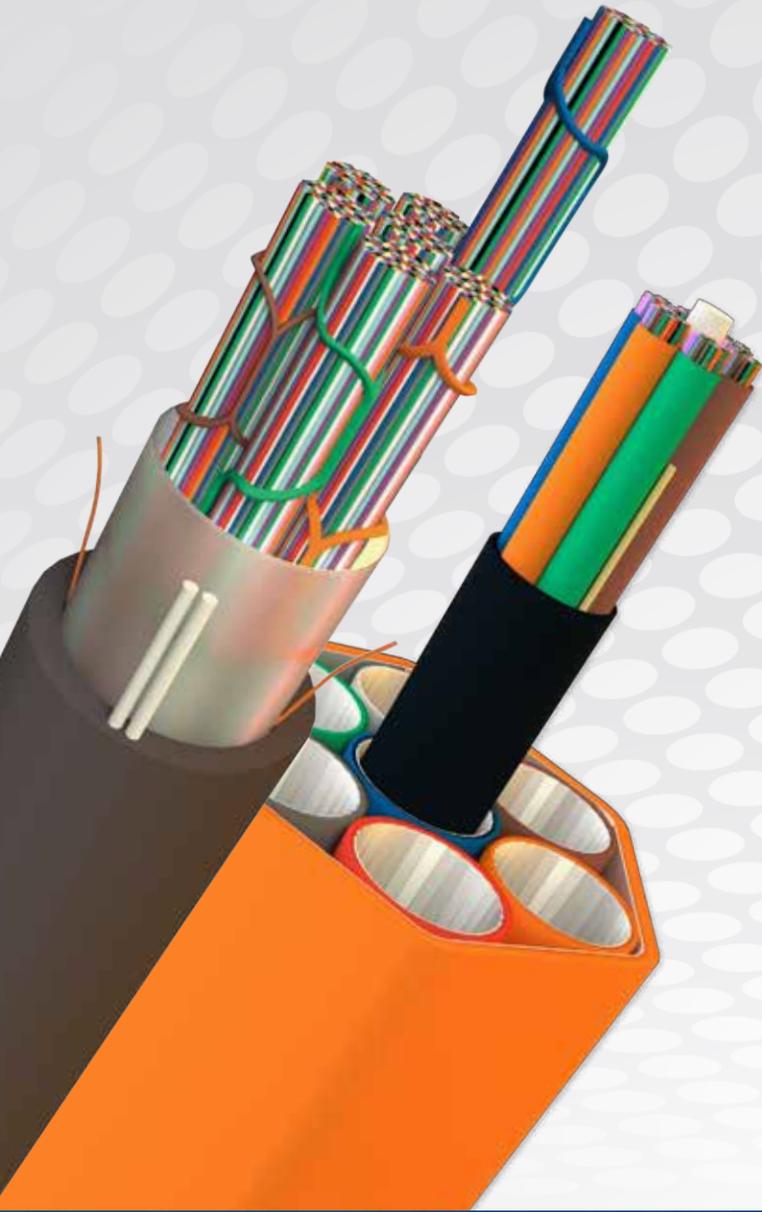
[www.charlesindustries.com](http://www.charlesindustries.com)

847-806-6300

**Key Products:** Fiber optic distribution enclosures and cabinets, fiber aggregation and demarcation interconnects and hubs, fiber cross-connects, fiber rack solutions

**Summary:** Celebrating its 50th anniversary in 2018, Charles Industries designs and manufactures buried distribution pedestals; indoor and outdoor power, battery and equipment cabinets; building terminals for both fiber and copper distribution; and below-grade handholes. The company serves telecommunications, wireless, broadband cable, municipal, utility and government service providers with end-to-end solutions tailored for rural and metro deployments. Charles focuses on creating solutions that lower the cost of deploying FTTP, shorten installation time frames and provide flexibility and reliability to fiber networks. Charles Fiber Pedestals, CUBE Cabinets, CFIT and CFBT Building Terminals, and TRUE Below-Grade Enclosures are compact and lightweight yet provide excellent technician access and user experience. In its fiber terminal portfolio, Charles recently introduced

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We're not exaggerating! Let us show you the different our cables can make for you.



[www.AFLglobal.com/DoMore](http://www.AFLglobal.com/DoMore)  
864.433.0333

new configurations that include more-compact profiles for indoor and outdoor applications. Smaller footprints allow terminal placement in space-constrained equipment rooms and outdoor walls for fiber distribution at MDUs, strip malls, business parks and other multi-tenant locations. Founded in 1968, Charter Industries is privately held and headquartered in Rolling Meadows, Illinois, with U.S.-based engineering and manufacturing facilities.

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## **Charter Communications / Spectrum Community Solutions**

[www.charter.com](http://www.charter.com); [www.charter.com/mdu](http://www.charter.com/mdu)

**Key Products:** Managed Wi-Fi services, internet, video and voice

**Summary:** With the acquisition of Time Warner Cable and Bright House Networks, Charter is now the second-largest cable company in the United States. It sells internet, video, voice and managed Wi-Fi offerings under the Spectrum brand to more than 26 million residential and business customers in 41 states. Headquartered in Stamford, Connecticut, the company has more than 94,800 employees, a network consisting of nearly 700,000 miles of physical infrastructure and annual revenue in excess of \$40 billion. In December 2017, Charter launched Spectrum Internet Gig service in markets that include New York City; Austin, Texas; Charlotte, North Carolina; Cincinnati; and Oahu. The service, which uses DOCSIS 3.1 technology, is now available to approximately 9 million premises across Charter's footprint, with additional launches scheduled for 2018. Charter is doubling minimum internet speeds to 200 Mbps in a number of markets at no additional cost. In addition, Charter is increasingly bringing fiber to sites for some new builds and multifamily properties. Spectrum Community Solutions works with property owners and managers to deliver advanced services that attract residents, increase property values and build resident loyalty. Charter announced in March 2017 that it plans to invest \$25 billion in broadband infrastructure and technology in the next four years.

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## **CHR Solutions**

[www.chrsolutions.com](http://www.chrsolutions.com)

713-351-5111

**Key Products:** Engineering and field services for communications networks and outside plant, network planning, managed NOC and managed IT services, communications billing software

**Summary:** CHR provides engineering, business and technology solutions to communications service providers. The company offers engineering, consulting and design solutions and services to ILEC, CLEC, power and municipal service providers. By the end of 2017, it had designed FTTx networks to pass more than 1 million premises. Services include preparing applications for loans and grants, broadband

planning, performing high-level and detailed designs of outside plant for FTTx networks, permitting, converting GIS/CAD files and implementing outside plant. CHR Engineering specializes in fiber design and has expertise in a variety of communications technologies, including xDSL, PON, active Ethernet, Carrier Ethernet, fixed wireless, microwave and Wi-Fi. CHR's B/OSS solution, Omnia360, has been adopted by a number of independent service providers. Powered by Microsoft Dynamics CRM, Omnia360 is a complete, out-of-the-box system available as a hosted cloud-based solution or as an on-site license subscription. The company is headquartered in Houston.

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## **Cincinnati Bell**

[www.cincinnati-bell.com](http://www.cincinnati-bell.com); [www.cincinnati-bell.com/Fioptics](http://www.cincinnati-bell.com/Fioptics)  
513-397-9900

**Key Products:** Telephone, data, video, wireless and information technology solutions

**Summary:** Households and businesses in Greater Cincinnati have access to Cincinnati Bell's integrated communications solutions, which include local, long-distance, data, internet, entertainment, wireless and information technology services. In addition, Cincinnati Bell offers complex information technology solutions, such as managed services and technology staffing. The company's fiber-based services, branded as Fioptics, include advanced high-speed data, digital television and telephone services and are available to 70 percent of its operating territory. In 2014, the company made gigabit internet speed available to Fioptics customers. It also sold its wireless spectrum licenses for \$194 million so it could focus its efforts on the efficient deployment of fiber. Last year, the company passed an additional 38,800 addresses with Fioptics. Earlier this year, Cincinnati Bell partnered with Fairborn, Ohio, to provide a public Wi-Fi network downtown as part of the city's economic development efforts and commitment to supporting small businesses. Cincinnati Bell's revenue in 2017 was \$1.28 billion.



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## **City of Ammon, Idaho, Fiber Optic Department**

<http://ammonfiber.info>

208-612-4054

**Key Products:** Gigabit internet service

**Summary:** Ammon began lighting its residential FTTH network in 2016. The project has been one of the most talked-about community fiber networks in the United States. Both its financing model and its technical model are innovative. Like other cities, Ammon first built out the backbone network by connecting anchor institutions and paid for the build largely

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Call 734.222.6061 or visit [pr.synergyfiber.com](http://pr.synergyfiber.com)

“We believe world-class broadband service requires fiber-to-the-home networks. Based on our many and varied experiences, we further believe it is possible to build fiber-to-the-home networks to every home and business in rural America. While we think world-class infrastructure should be a national priority, we understand that the indispensable ingredient is local initiative.”

– Jonathan Chambers, Partner, Conexon

through cost reduction and cost avoidance. When it came time to connect residences and small businesses, Ammon allowed property owners who wanted fiber services to opt into financing their connections. By joining a broadband improvement district, an owner can pay installation costs up front or amortize the costs in the form of a bond that creates a lien on the property. Ammon’s technical approach uses software-defined networking to make creating an open-access network simple and low cost. The Ammon fiber system currently has six service providers; the network is also open to researchers and application developers who want to test new technologies or services. Ammon is committed to using its network to promote economic development and technical innovation.

## Clearfield

[www.SeeClearfield.com](http://www.SeeClearfield.com)

763-476-6866; 800-422-2537

**Key Products:** Fiber distribution and protection systems for inside plant, outside plant and access networks

**Summary:** Headquartered in Minneapolis, Clearfield designs and manufactures fiber distribution and protection systems. Product lines include FieldSmart high-density fiber distribution systems for the inside plant, FieldSmart fiber scalability centers for the outside plant, a fiber delivery point series for access networks, and FieldShield, an optical fiber delivery and protection platform made of microduct and preconnectorized pushable fiber. All product lines integrate with the Clearview Cassette 12-fiber management system to deliver scalable deployment and craft-friendly operation. In the last year, Clearfield acquired a portfolio of Telcordia-certified outdoor powered cabinet products from Calix, providing customers with a single point of contact for cabinet solutions, both passive and powered. The acquisition allows Clearfield to reach service providers in the Tier 1 and Tier 2 markets. Clearfield also introduced the FieldSmart Fiber Distribution Hub, a 144-port cabinet that allows network planners to incrementally expand PON deployments, the YOURx-Aerial Terminal, and the FieldSmart Flex Box, which eases installation by interconnecting different types of media.

Clearfield, which has more than 200 employees, posted \$74 million in revenue for the year ending September 2017.



## Comcast Cable / XFINITY Communities

[www.comcast.com](http://www.comcast.com); [www.xfinity.com/xfinitycommunities](http://www.xfinity.com/xfinitycommunities)

**Key Products:** Internet, video, voice and home security services

**Summary:** The largest U.S. cable operator, Comcast delivers internet, phone and media services to residential customers under the XFINITY brand and to businesses under the Comcast Business brand. XFINITY Communities works with building and property owners, developers, leasing agents and homeowners associations to provide services to residents. In 2015, after building a national fiber backbone, Comcast launched Gigabit Pro, a symmetrical, 2 Gbps residential FTTH service. The company began rolling out the service in Atlanta in May 2015 and quickly extended it to many more markets. In 2016, Comcast began trials of gigabit residential service over its HFC network using DOCSIS 3.1 technology; this service is now available to residential and business customers in dozens of markets. Comcast also delivers FTTH-based gigabit residential service in greenfield MDUs. By the end of 2018, Comcast expects to make gigabit speeds available, via FTTH or coax, to almost every customer in its footprint. In November 2017, Comcast announced the expansion of its DOCSIS 3.1-based internet service to business customers in the western United States. Comcast’s Business Internet 1 Gig and Business Internet 500 speed tiers are now available to business customers in the western, central, mid-Atlantic and northeastern service areas. In June 2018, Comcast’s internet of things subsidiary, machineQ, collaborated with Neptune Technology Group on an IoT solution to accelerate smart-city projects for advanced water metering and infrastructure. Headquartered in Philadelphia, Comcast Cable is a division of Comcast Corporation, which also owns NBCUniversal. Comcast Cable reported 2017 revenue of \$52.5 billion.

## CommScope

www.commscope.com  
828-324-2200; 800-982-1708

**Key Products:** Cable and connectivity products

**Summary:** CommScope's solutions constitute an end-to-end FTTH portfolio, offering multiple fiber architectures. With a suite of data center, headend/central office, outside-plant and end-user solutions, CommScope provides carriers, electric co-ops and other operators with the technology and architecture to meet the needs of residential, MDU, commercial and cellular backhaul applications. Founded in Hickory, North Carolina, CommScope has been involved in the broadband and cable TV industry since 1976 and has played a role in nearly all the world's most advanced telecommunications networks. It is the largest supplier of subscriber-premises connectivity products and rugged conduit products. The acquisition of the Broadband Network Solutions business from TE Connectivity in 2015, following earlier acquisitions of Andrew Corporation and SYSTIMAX, made CommScope a leading communications infrastructure provider that offers end-to-end passive network equipment to meet the growing demand for network bandwidth. CommScope's Connectivity Solutions segment, which includes the company's fiber and copper cable connectivity offerings, reported \$2.81 billion of the company's overall \$4.56 billion in revenue for 2017.



## Comsof / FiberPlanIT

www.comsof.com; www.fiberplanit.com  
416-594-9777

**Key Products:** Software for FTTx network planning and design

**Summary:** Comsof was founded in 1998 as a spinoff of the Department of Information Technology of Ghent University in Belgium and has offices in Belgium and Toronto, Canada. Its flagship product, FiberPlanIT, is a software solution

for FTTx network planning. FiberPlanIT's automated and optimized design capabilities, based on GIS data, help network operators reduce planning and design time, avoid design errors and lower construction costs. Comsof provides the software on a license basis and offers consultancy services. FiberPlanIT has been used in more than 70 countries in 300 projects to plan networks serving more than 65 million homes.



## Conexon

www.conexon.us  
202-798-3884

**Key Products:** Consulting services, fiber design, construction management, fundraising, operations for rural electric cooperatives deploying fiber to the home

**Summary:** As the urban-rural digital divide continues to widen, rural residents throughout the United States have begun to look to electric cooperatives as potential internet service providers. Conexon was founded in 2015 to help electric cooperatives leverage their fiber infrastructures to provide broadband services to their members. Its services include performing feasibility studies, securing financing, managing construction, optimizing business performance, advocating for rural broadband and managing ISP operations for co-ops that prefer to outsource operations. Conexon has worked with nearly 100 electric co-ops and other utilities in more than 20 states on projects that have the potential to deliver fiber broadband services to millions of homes and businesses. More than two dozen of these co-ops are now actively deploying fiber to the home. Conexon has more than 30 employees and is headquartered in Kansas City, Missouri.



## FIBER-TO-THE-HOME ELECTRONICS

These companies provide FTTH electronic equipment for central offices or customer premises, or home networking equipment designed to work with FTTH.

### COMPANY NAME

**ADTRAN**  
Calix  
DASAN Zhone Solutions  
iPhotonix

### WEB ADDRESS

[www.adtran.com](http://www.adtran.com)  
[www.calix.com](http://www.calix.com)  
[www.dasanzhone.com](http://www.dasanzhone.com)  
[www.iphotonix.com](http://www.iphotonix.com)

### COMPANY NAME

Leviton Manufacturing  
Nokia  
SmartRG  
Zyxel Communications

### WEB ADDRESS

[www.leviton.com](http://www.leviton.com)  
[www.nokia.com](http://www.nokia.com)  
[www.smartrg.com](http://www.smartrg.com)  
[www.zyxel.com/us](http://www.zyxel.com/us)

# FIBER-TO-THE-HOME TOP 100 LIST

“The move to offer multiple last-mile solutions is generating a lot of interest – making fiber-based rural broadband projects feasible for virtually all interested parties.”

– Eric Freesmeier, President and CEO, Pulse Broadband

## Corning Optical Communications

www.corning.com  
828-901-5000

**Key Products:** Optical fiber, optical fiber cable, FTTH cabinets, splitters, terminals, connectors, cable assemblies, MDU products, other telecommunications hardware and equipment, engineering services, training

**Summary:** Corning is one of the world’s leading innovators in materials science. Nearly 50 years ago, the predecessor to British Telecom challenged Corning to develop a fiber that could transmit light with loss less than 20 db per kilometer. Corning responded in 1970 with the invention of the first commercial low-loss optical fiber. Corning also developed the first loose-tube cable design, the first plug-and-play solution for fiber to the home, and the first high-density, modular data center solution. Corning’s preconnectorized solutions introduced a new way to deploy FTTH networks, and its ultra-bendable ClearCurve product suite opened the way for cost-effective installation of fiber in MDUs and other challenging environments. Its SMF-28 Ultra Optical Fiber, designed for high performance across long-haul, metro, access and fiber-to-the-home network applications, combines low attenuation with improved macrobend performance. Corning’s new multiuse platform, a combination of multifiber and single-fiber connection points, makes it easier for operators to quickly deploy fiber-deep access networks, even in stadiums. In June 2018, Corning acquired 3M’s MDU-oriented optical, structured cabling, and international system integration business for \$900 million. Corning has a leading position in key passive optical segments and is the world’s largest fiber producer. Its optical communications business increased \$540 million last year to \$3.5 billion and has grown at twice the industry average over the last five years. The company expects to reach \$5 billion in fiber-related revenue by 2020.



## COS Systems

www.cossystems.com  
800-562-1730

**Key Products:** Demand aggregation software, BSS/OSS for managing open-access fiber networks

**Summary:** COS Systems’ cloud-hosted software helps network owners plan, deploy and manage modern broadband networks that deliver services from one or more providers. COS Service Zones is a demand aggregation tool that enables network builders to identify grassroots interest in better broadband, spread awareness of their projects and presell internet connections using a “fiberhood” approach. COS Business Engine is a BSS/OSS suite for managing and operating gigabit fiber networks. It enables network operators to easily market and sell services from multiple providers in an online marketplace. COS clients include private internet service providers and operators, public-private partnerships, municipalities, and utilities and cooperatives in North and South America, Europe, Africa and Asia. In the last year, COS Systems acquired nearly 30 new customers in the United States and several in Canada. It partnered with the Foresite Group to help U.S. communities build open-access gigabit networks and with NoaNet (Northwest Open Access Network) to deliver demand aggregation projects in Washington state. Privately held COS Systems is headquartered in Umea, Sweden, and has U.S. headquarters in New York City. With 18 employees, it posted revenue of \$2.5 million for 2017.



## Cox Communications

www.cox.com

**Key Products:** High-speed internet, advanced digital video, digital voice, smart home services

**Summary:** Cox Communications is the largest privately held telecom company in the United States. It serves 6 million residential and business customers with a variety of advanced digital video, high-speed internet, voice and smart home services over its broadband network. Cox was one of the first to launch residential gigabit internet speeds, now available to 60 percent of its customers nationwide and continuing to expand. A large portion of Cox’s greenfield gigabit deployments, both single-family and multifamily, use FTTH; upgrades of existing plant typically use “deeper fiber” HFC networks. Cox Communications joined with

US Ignite to help make Las Vegas, Phoenix and San Diego among the first “Smart Gigabit Communities” and teamed with the White House and HUD to bridge the digital divide for low-income families with school-age children through its Connect2Compete internet offer. Cox recently launched Cox2M, which provides custom, end-to-end IoT solutions to power smart businesses and smart cities. Cox Communications is a subsidiary of Cox Enterprises and headquartered in Atlanta.

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### CTC Technology & Energy

www.ctcnet.us  
301-933-1488

**Key Products:** Fiber and wireless broadband network design, engineering, financial analysis, strategy, assessment, implementation

**Summary:** CTC provides independent business and engineering consulting services to public sector and nonprofit clients. Its expertise includes fiber and wireless network feasibility analysis, strategic planning, business planning, financial analysis, market assessment, design, engineering, construction oversight, QA/QC, RFP/RFI preparation, grant applications and compliance, and negotiations on behalf of clients with private-sector partners. CTC currently provides broadband engineering and network financial planning services to the cities of Baltimore; Boston; Boulder, Colorado; Madison, Wisconsin; Palo Alto, California; Portland, Oregon; San Francisco; Seattle and Washington, D.C. CTC played a key role in helping negotiate broadband public-private partnerships on behalf of the city of Westminster, Maryland; the coalition comprising the cities of Urbana and Champaign and the University of Illinois; and rural Garrett County, Maryland. CTC has also provided strategic broadband guidance to Connecticut, Delaware, Kentucky, Massachusetts and New Mexico. Founded in 1983, CTC is headquartered in the Washington, D.C., area and has satellite offices in many other states.



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### Danella Companies

www.danella.com  
610-828-6200

**Key Products:** FTTH network design, engineering, construction, testing

**Summary:** Founded in 1972 and headquartered in Plymouth Meeting, Pennsylvania, Danella Companies has 17 divisions operating from 29 geographically diverse facilities in 12 states. Danella Construction performs approximately \$225 million in work per year and is a leading installation contractor for

all types of utilities, providing services for the power, gas distribution, water and communications industries. In 2017, Danella Companies had revenue of more than \$58.8 million in FTTH installations, with a large portion of this work in the Southeast. Danella continues to expand its FTTH services for Tier-1 service providers and municipalities.

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### DASAN Zhone Solutions

www.dasanzhone.com  
877-946-6320

**Key Products:** Network access equipment, passive optical LAN, Ethernet switching, mobile backhaul, software-defined networks

**Summary:** DASAN Zhone Solutions provides network access solutions for service provider and enterprise networks. The company offers a wide array of reliable, cost-effective networking technologies to a diverse customer base that includes more than 1,000 network operators. DASAN Zhone Solutions is headquartered in Oakland, California, with operations in more than 50 countries. In the last year, Japanese telecom operator KDDI began to offer a commercial, 10G, symmetrical internet service in Japan, utilizing DASAN Zhone Solutions equipment. In addition, Hotel VIA, a new boutique hotel in San Francisco, deployed DASAN Zhone Solutions' FiberLAN GPON solution to support guest amenities that range from customized thermostats to text messages greeting guests when they arrive in the city. With 639 employees, the company posted revenue of \$247 million in 2017.

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### Design Nine / WideOpen Networks

www.designnine.com; www.wideopennetworks.us  
540-951-4400

**Key Products:** Broadband planning and feasibility studies, network business and financial planning, broadband project management, broadband network design, network buildout, network operations

**Summary:** The broadband planning and network design firm Design Nine is well known for its expertise in – and commitment to – local transport networks and open-access networks. Open-access networks it has planned and designed include Bozeman Fiber in Montana; Palm Coast FiberNET in Florida; nDanville, Rockbridge and Wired Road in Virginia; FastRoads in New Hampshire; AccessEagan in Minnesota; and Charles City County in Virginia. Design Nine's services include fiber and wireless network design, grant-writing assistance, needs assessment, broadband network buildout assistance, financial modeling, business planning, legal and organizational design of community-owned broadband systems and project management. Design Nine's subsidiary, WideOpen Networks, manages community-owned and private-sector networks, providing network monitoring, service provisioning, service provider attraction, asset

“Fiber to the home is no longer ‘nice to have’; it’s a must-have if we’re to satisfy the insatiable appetite consumers and businesses have for internet service.”

– Ken Paker, Chief Technology Officer and Senior Vice President of Information & Network Technologies, TDS Telecom

management, billing and outside-plant management. Headquartered in Blacksburg, Virginia, Design Nine works on projects throughout North America. Current projects include network design, equipment specifications, pricing and financial modeling, network engineering and construction management, and network operations.

### Ditch Witch

[www.ditchwitch.com](http://www.ditchwitch.com)  
800-654-6481

**Key Products:** Construction equipment for laying fiber

**Summary:** The feasibility of FTTH often depends on digging efficiently through challenging terrain, congested roadways and manicured lawns. Ditch Witch, a Charles Machine Works company, is one of the companies deployers turn to in these situations. It specializes in the design and manufacture of high-quality underground construction equipment for broadband installations globally. Equipment includes trenchers, microtrenchers, vibratory plows, horizontal directional drills, mud recycling and fluid systems, drill pipe, HDD tooling, vacuum excavation systems and mini skid steers. Ditch Witch Financial Services offers a variety of financing and lease options. Ditch Witch microtrenchers are designed to improve productivity and reduce the cost per foot on fiber job sites. Last year, the Ditch Witch organization announced its partnership with Utilicor Technologies, a developer of keyhole coring and reinstatement technology, to offer the benefits of advanced keyhole technology and reinstatement to contractors, municipalities and utilities globally. The Ditch Witch factory is located in Perry, Oklahoma, and the company has more than 1,400 employees. Ditch Witch equipment is distributed through a worldwide dealer organization, which operates in more than 100 countries through more than 170 locations.



### Dura-Line Corporation

[www.duraline.com](http://www.duraline.com)  
800-847-7661

**Key Products:** Conduit, cable-in-conduit, microducts, accessories

**Summary:** Dura-Line develops and manufactures high-density polyethylene conduits for protecting fiber optic, electrical and coaxial cables. It supplies fiber optic conduit and related products to telecom, data, cable TV, power and other markets. Customers include leading U.S. and international telephone and cable providers. Dura-Line developed the first ducts for installing and protecting fiber optic cables in 1981, introduced a complete line of fiber optic microduct products in 2001, and followed up in 2003 with FuturePath, a bundled package of microducts that can be installed the same way as traditional conduit. FuturePath allows up to 24 pathways in a single conduit, and the new FuturePath Figure-8 (introduced in June 2018) allows seven microducts to be bundled into one conduit for aerial fiber. In May 2018, the company released new conduit and microducts made from a low-smoke, zero-halogen material and designed for use where smoke, toxic fumes and acidic gas pose risks to health or to electronic equipment, such as enclosed public areas and poorly ventilated tunnels, mass transit corridors, control rooms and confined spaces. Dura-Line, which is owned by Mexichem, is based in Knoxville, Tennessee, and has 1,500-plus employees worldwide.



### Dycom Industries

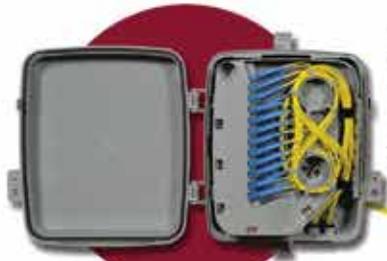
[www.dycomind.com](http://www.dycomind.com)  
561-627-7171

**Key Products:** Program and project management, engineering, construction, maintenance, installation services

**Summary:** Dycom provides specialty contracting services, including engineering, construction, program and project management, materials provisioning, installation, and maintenance services, to telecommunications, CATV and broadband providers throughout the United States. Dycom Industries subsidiaries provide services to construct, install, optimize and maintain communications facilities. The

# When it Comes to FTTX Fiber Enclosures, Charles Rises to the Occasion

## Charles MDU FTTX Solutions



CFIT-FLEX  
COMPACT  
UNIVERSAL  
ENCLOSURES  
(NEMA 4)

CFIT FIBER  
TRANSITION  
TERMINALS  
(NID)

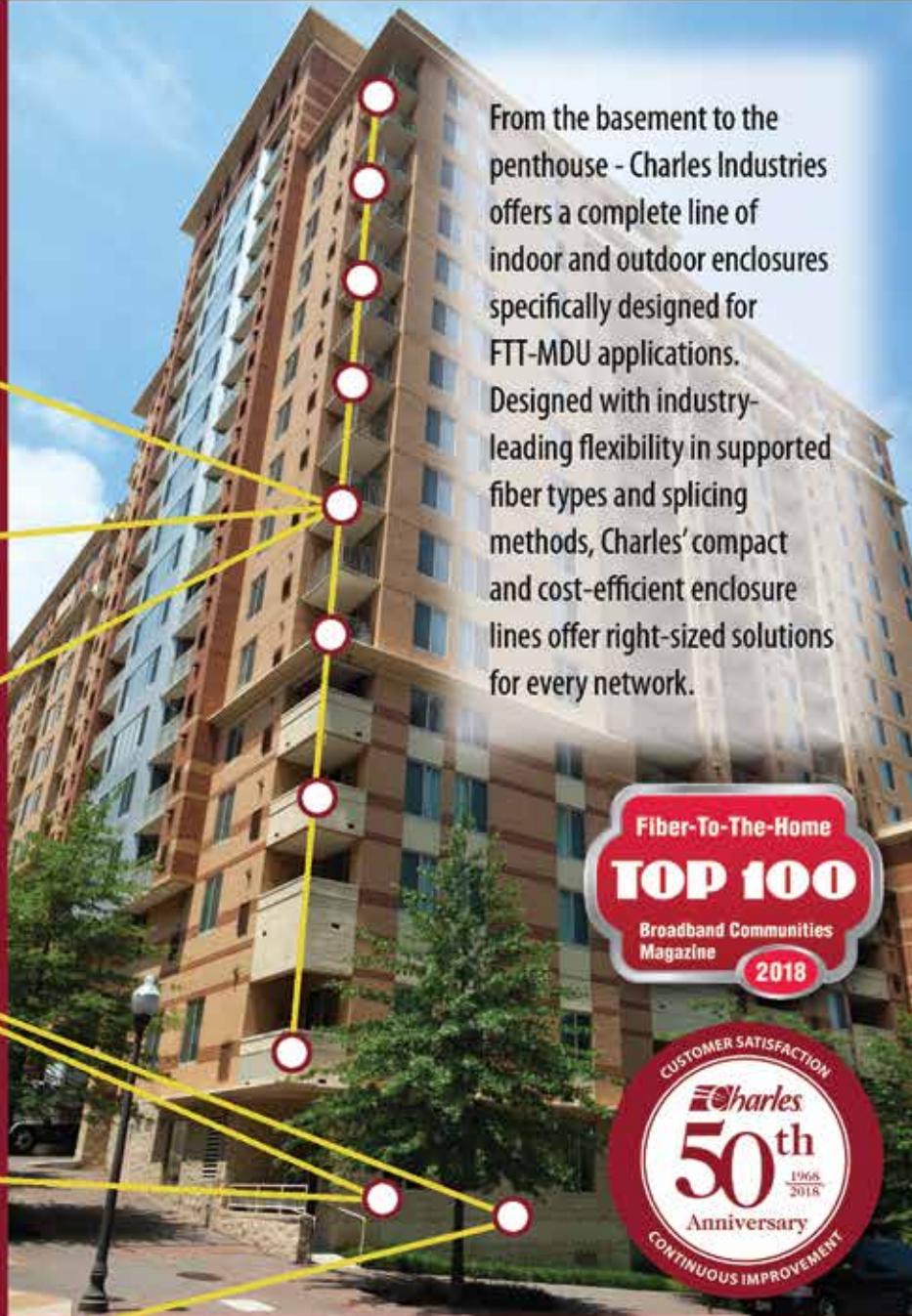


FIBER SPLITTERS,  
TRAYS, ADAPTERS,  
& ACCESSORIES

CFBT  
INDOOR  
TERMINALS  
& HUBS  
(NEMA 12)



CFIT  
OUTDOOR  
TERMINALS  
& HUBS  
(NEMA 4)



From the basement to the penthouse - Charles Industries offers a complete line of indoor and outdoor enclosures specifically designed for FTT-MDU applications. Designed with industry-leading flexibility in supported fiber types and splicing methods, Charles' compact and cost-efficient enclosure lines offer right-sized solutions for every network.

Fiber-To-The-Home  
**TOP 100**  
Broadband Communities  
Magazine  
2018

CUSTOMER SATISFACTION  
Charles  
**50<sup>th</sup>**  
Anniversary  
1968  
2018  
CONTINUOUS IMPROVEMENT

MADE IN THE  
**USA**

847-806-6300  
charlesindustries.com

**Charles**

INNOVATIVE ENCLOSED SOLUTIONS

company offers a full complement of turnkey services for wireline and wireless networks, including planning, site identification and acquisition, architectural and engineering services, design, project management, materials purchasing and distribution, infrastructure construction, tower construction, equipment and antenna installation, cable placement and splicing, central office EF&I, commission, integration, residential and commercial installations, customer acquisition, locating services and maintenance. Founded in 1969 and headquartered in Palm Beach Gardens, Florida, Dycor has more than 14,000 employees. It posted \$3.1 billion in revenue for FY 2017.



## EntryPoint Networks

[www.entpnt.com](http://www.entpnt.com)  
801-518-7333

**Key Products:** Automated open-access platform

**Summary:** EntryPoint Networks, founded in 2007, provides a municipal broadband network management platform for a cloud world. EP's platform is designed for municipalities interested in redefining the technology and business model for FTTH to enable competition, innovation, smart city control of the network and fast internet. EntryPoint's premise is that municipalities should own and control infrastructure as a utility, and private companies should deliver services from the cloud. Because EP's platform leverages software-defined networking, network automation and network virtualization, subscribers can switch ISPs in less than 40 seconds. EP's foundational implementation was in Ammon, Idaho. The Ammon model is now being replicated by a growing number of cities. Based in Salt Lake City, EP is privately held and has 10 employees. It has won numerous awards and two research grants from the U.S. Department of Energy.

## EPB Fiber Optics

[www.epb.com](http://www.epb.com)  
423-648-1372

**Key Products:** Voice, video, data and smart-grid services provided over a fiber optic network

**Summary:** EPB of Chattanooga's fiber-to-the-premises network is frequently cited as a municipal broadband success story. It delivers internet, voice and video services and serves as the backbone for Chattanooga's smart grid. This self-healing electric distribution system automatically reroutes power around storm damage and other disruptions to increase power reliability and reduce outage durations by more than 50 percent, which helps business and residential customers avoid \$55 to \$60 million in annual losses associated with

spoiled goods, productivity and other outage-related damages. The smart grid also improves operational efficiency and provides detailed usage information for electricity customers in tandem with the myEPB app. Launched in 2009, EPB Fiber Optics serves more than 97,000 homes and businesses. In 2010, EPB brought 1 Gbps speeds to Chattanooga, and in 2015, it announced NextNet, a 10 Gbps internet service available anywhere in the EPB service area. In collaboration with such organizations as the Company Lab and the Chattanooga Area Chamber of Commerce, the community launched a business accelerator, called GIGTANK, aimed at spurring innovation. Now in its eighth year, the program brings students and entrepreneurs from all over the world to Chattanooga to develop next-generation apps and disruptive business ideas using EPB's gigabit network.



## ETI Software Solutions

[www.etisoftware.com](http://www.etisoftware.com)  
770-242-3620; 800-332-1078

**Key Products:** Software for managing broadband service activation, billing, device management and analytics

**Summary:** ETI Software Solutions specializes in broadband billing, operational support and service assurance software. Its Vision360 software series is designed for FTTH network operators, including municipalities, utilities and electric co-ops. With Vision360, providers can opt for a turnkey billing and operational support software solution or choose to augment, rather than replace, enterprise billing and accounting platforms to support broadband services. Vision360 features seamless order entry and work order management, automated service provisioning, device inventory and device management, comprehensive network management tools and advanced visual analytics to help maximize revenue. In the last year, ETI announced its support for the MobiTV Connect Platform as well as Alianza's VoIP and unified communications SaaS solution. Newport Utilities in Tennessee selected Vision360 to support its greenfield FTTH network. Founded in 1992 and headquartered in Norcross, Georgia, ETI Software Solutions is 100-percent employee owned.





# BUILDING CONNECTIONS

Our mission at Henkels & McCoy Group is to create a better connected world. We are the builders of the world's strongest infrastructure networks, bringing reliable communications to people everywhere since 1923.

[www.henkelsgroup.com](http://www.henkelsgroup.com)



1-888-HENKELS  
[marketing@henkels.com](mailto:marketing@henkels.com)



# FIBER-TO-THE-HOME TOP 100 LIST

## EXFO

[www.exfo.com](http://www.exfo.com)

418-683-0211; 800-663-3936

**Key Products:** Test, monitoring and analytics solutions for the communications industry

**Summary:** EXFO, headquartered in Quebec, Canada, has pioneered network test, monitoring and analytics solutions for more than 30 years. EXFO solutions help communications service providers smoothly deploy, maintain and manage physical, hybrid, virtual, fixed and mobile networks. The company has deep expertise in lab and field testing and provides solutions that automate complex FTTH testing and workflows to boost efficiency and subscriber quality of experience. EXFO equipment, software and services help operators accelerate digital transformations related to fiber, 4G/LTE and 5G deployments and deliver superior network performance, service reliability and subscriber insights. In February, EXFO announced the purchase of Astellia, headquartered in Rennes, France, strengthening its offerings in the performance analysis of mobile networks and subscriber experience. EXFO's FTTH test portfolio includes fiber inspection solutions; OLTS, OTDR and iOLM, including CWDM and DWDM models; PON power meters; Ethernet protocol testers; and end-to-end monitoring solutions for the physical and service layers. The company has more than 2,000 employees in more than 25 countries and counts 95 percent of the world's top communications service providers as customers. In fiscal 2017 (ended August 31, 2017), EXFO reported revenue of \$243.3 million.



## Fiberdyne Labs

[www.fiberdyne.com](http://www.fiberdyne.com)

315-895-8470

**Key Products:** Optical passive devices, multiplexers, fiber optic cable assemblies, termination boxes, MPO cables and cassettes, FTTH drop cables

**Summary:** Fiberdyne Labs Inc., established in 1992, is a manufacturer of fiber optic products, including termination boxes, passive modules (WDM and fiber splitters), fiber jumpers, pigtails and MPO cables and cassettes. Recent product introductions include FTTH drop cables, thin-diameter patch cables, FTTA remote radio unit antenna cables, high-capacity light guide cross-connect modules in a variety of configurations and improved fiber tap products that use thin-film technology. Fiberdyne's improved 1RU termination box with splicing is new for 2018. The company also offers fiber characterization testing services nationwide. Headquartered in Frankfort, New York, Fiberdyne has 92 full-time employees.

## FibNet

[www.fibnet.net](http://www.fibnet.net)

925-326-8605

**Key Products:** Network design and installation; fiber optic cables and other networking products

**Summary:** Founded in 2017, with headquarters in Concord, California, FibNet is a broadband network solutions provider with a unique mission: delivering high-quality broadband networks to remote areas with challenging terrain. FibNet's focus is designing and deploying fiber optic networks based on a special armored cable that can be placed almost anywhere – directly on the ground, direct-buried in a shallow ditch, attached to trees, attached to sewage pipes, or submerged in water. This cable, similar to that used for undersea applications, can be installed by local residents with little training and no heavy equipment. FibNet's first projects were in Himalayan countries, where broadband enables new services that are transforming societies and economies. However, the cable and the deployment methods also hold promise for delivering fiber to remote regions of the United States in which fiber networks have been traditionally dismissed as too expensive.

## Finley Engineering

[www.finleyusa.com](http://www.finleyusa.com)

417-682-5531

**Key Products:** Network design and engineering services

**Summary:** Finley Engineering has 65 years of communications and electric power engineering experience and 30-plus years of experience with fiber communication and data projects. It works with organizations that provide fiber connections to improve quality of life and economic opportunities. Founded in 1953, Finley has more than 250 employees in 10 offices nationwide and is one of the largest communications network design companies in the United States. Specializing in end-to-end engineering consulting, Finley works with telecom providers, electric cooperatives, municipalities and counties to find the best broadband strategies to fit specific needs. Every project starts with a strategic discussion regarding broadband and includes all

## TEST AND MEASUREMENT EQUIPMENT

### COMPANY NAME

AFL  
Corning Optical Communications

EXFO

Nokia

Viavi Solutions

### WEB ADDRESS

[www.AFLglobal.com](http://www.AFLglobal.com)

[www.corning.com](http://www.corning.com)

[www.exfo.com](http://www.exfo.com)

[www.nokia.com](http://www.nokia.com)

[www.viavisolutions.com](http://www.viavisolutions.com)

stakeholders to gather critical information and perspectives. Once a project is underway, Finley provides construction observation and project management.



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### Fujitsu Network Communications

<http://us.fujitsu.com/telecom>

888-362-7763

**Key Products:** End-to-end multivendor network project integration; other professional services; network equipment and management software

**Summary:** Fujitsu Network Communications Inc., based in Richardson, Texas, builds middle-mile and last-mile fiber networks, partnering with states, municipalities and utilities. It works with customers or their consultants to plan, design, build, operate and maintain broadband networks. It delivers custom, end-to-end network integration by combining the best of wireline, wireless and software technology with multivendor services, using a vendor-agnostic approach to provide turnkey solutions for FTTH implementations. Fujitsu Network Communications has served as prime integrator for high-profile telecommunications and enterprise projects that include an ongoing FTTH deployment by Kit Carson Electric Cooperative in Taos, New Mexico, and middle-mile network connectivity for Horizon Telecom in southern and eastern Ohio. Fujitsu powered a 2,000-mile fiber network with broadband speeds up to 100 Gbps for Illinois Century Network, an open-access provider owned and operated by the state of Illinois. Last year, the company was design-build integrator for FairlawnGig, a municipal fiber network in Fairlawn, Ohio, and it operates and maintains the network. Fujitsu Network Communications is a subsidiary of Fujitsu Limited, a global information and communications technology company based in Japan that offers technology products, solutions and services in more than 100 countries. The company, which has approximately 140,000 employees, reported consolidated revenues of about \$36 billion for the fiscal year that ended March 31, 2018.

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### GigabitNow

[www.gigabitnow.com](http://www.gigabitnow.com)

866-748-8066

**Key Products:** Turnkey solutions for planning, design, financing, construction, operation and support of gigabit fiber-to-the-home networks; co-location and backup services

**Summary:** GigabitNow offers customized fiber internet solutions for small cities, communities, multitenant buildings and business. Established in 1994 and builder-operator of one of the oldest FTTH networks in the United States (Highlands

Fiber Network in Issaquah, Washington), GigabitNow most recently completed an overbuild and operates an FTTH network for the historic Sea Ranch community along the Northern California coast. The company consults with each community to develop the best solution to meet its needs, then guides the project from design through implementation. Once a network is constructed, GigabitNow performs network management, daily operations, end-user support and billing. GigabitNow, headquartered in Seattle, has 45 employees. It is a division of IsoFusion Inc., one of the largest privately held ISPs and co-location operators in western Washington.

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### GLDS

[www.glds.com](http://www.glds.com)

800-882-7950

**Key Products:** Software for broadband customer management, billing, provisioning and workforce management

**Summary:** Since 1980, GLDS has helped broadband service providers look big by providing reliable, full-featured billing and customer management software at affordable prices – including cloud-based services that operators can use with little server investment. Partnering with major equipment suppliers worldwide, GLDS supports FTTH, IPTV, OTT, DOCSIS, LTE, TVE, cloud services, wireless, satellite, mobile payments and legacy service delivery systems. Direct interfaces and open APIs allow GLDS applications to control voice, video, workforce management, VOD, high-speed data and more. GLDS adds new interfaces regularly. It has installed solutions for more than 800 small to midsize broadband service providers, including FTTH, cable, satellite and wireless operators that range in size from startups to providers with more than 400,000 customers. GLDS has offices in Wisconsin, Lithuania and Carlsbad, California, and operates in 49 U.S. states and 47 countries. Products include BroadHub for customer management and billing and SuperController for multiservice automated provisioning. WinForce tech, a mobile workforce management platform, empowers field techs with tools previously available only to office staff. MyBroadbandMarket offers a 24/365 customer shopping and self-subscription experience.

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### Google Fiber

[fiber.google.com](http://fiber.google.com)

**Key Products:** Voice, video and gigabit internet services

**Summary:** Since being founded by Google in 2010, Google Fiber has become a major competitive overbuilder that catalyzed FTTH deployments nationwide by introducing gigabit speeds at moderate prices in a growing number of cities across the United States. The total number of metropolitan areas in which Google Fiber is building networks now stands at 12. In one, Huntsville, Alabama, Google Fiber leases part of Huntsville Utilities' fiber network and builds only the final drops to customer premises. The company's October 2016

“There is so much happening today that stresses the need for good infrastructure planning: smart-city technology, rapid small-cell deployment, the internet of things, the reversal of net neutrality and privacy laws.”

– Diane Kruse, CEO, NEO Connect

acquisition of Webpass allows it to offer gigabit speeds to urban buildings using a hybrid fiber-wireless technology. Webpass service is currently available in Chicago; Denver; Miami; Oakland, California; San Diego; San Francisco and Seattle. In October 2015, Google Fiber was separated from Google when both became subsidiaries of the Alphabet umbrella company. Alphabet's Other Bets segment, of which Google Fiber is now a part, posted 2017 revenue of \$1.2 billion. Marking a significant change in strategy, in October 2016, Alphabet announced it would pause plans to roll out fiber in some cities where discussions had already begun or end discussions altogether. The company also announced a 9 percent staff cut in its national Google Fiber division. In 2017, the company announced that TV would not be included in its offerings in Louisville, Kentucky, and San Antonio.

## Graybar

[www.graybar.com](http://www.graybar.com)

800-GRAYBAR (472-9227)

**Key Products:** PON electronics, fiber cabinets/enclosures, fiber optic cable, fiber splice closures and pedestals, DC power, fiber terminals

**Summary:** Graybar specializes in supply-chain management services – getting the right parts to the right places at the right time so construction moves ahead and inventory doesn't pile up in warehouses. The company is a leading North American distributor of components, equipment and materials for telecommunications and other industries. FTTH and related solutions represent a significant portion of its broadband business. Independent telephone companies, competitive phone companies, municipalities, RUS plow contractors, wireless backhaul providers, central-office contractors and cable companies all depend on Graybar. Founded in 1869 as Gray and Barton, today Graybar sells thousands of items from leading manufacturers; its value-added services include kitting and integrated solutions. A Fortune 500 company with gross sales of \$6.6 billion in 2017, Graybar employs 8,500 people at 290 locations throughout the United States, Canada and Puerto Rico. It is one of North America's largest and oldest employee-owned companies.



## Henkels & McCoy Group Inc.

[www.henkelsgroup.com](http://www.henkelsgroup.com)

888-HENKELS (436-5357)

**Key Products:** Planning, design, engineering, project management, construction, operations management and installation of outside and inside plant for wireline and wireless networks

**Summary:** Founded in 1923, Henkels & McCoy Group Inc. (HMG) is a utility construction firm that provides critical infrastructure for the power, oil and gas pipeline, gas distribution, and communications markets in North America. It is the parent holding company of Henkels & McCoy Inc., HMI and H&M Shared Services. HMG has been an FTTH pioneer, performing feasibility studies, project management, construction management, implementation of outside plant and inside plant, and underground and aerial construction. It has regional, area and project offices across the United States, approximately 5,300 employees and more than 8,300 pieces of modern equipment, allowing the provision of end-to-end solutions.



## Hotwire Communications

[www.hotwirecommunications.com](http://www.hotwirecommunications.com)

800-409-4733

**Key Products:** Residential and commercial high-speed data, network management, Wi-Fi solutions, security, home automation, digital voice and HD IPTV video services delivered over FTTP networks

**Summary:** Hotwire Communications is one of the largest and oldest independent providers of fiber-to-the-premises communications solutions in the United States. It provides services to private residential communities, condominiums, apartments, hotels, multitenant commercial buildings, government buildings, student housing, and senior and assisted living facilities. Hotwire Communications operates in more than a dozen states and owns its fully redundant fiber network. As a competitive local exchange carrier and franchised cable operator, Hotwire Communications designs, builds and operates its telecommunications and in-home

entertainment services. Residential services include ultra-high-speed data, HD IPTV, VoIP and advanced home automation solutions. Fision Work, the company's business division, offers, in addition to these products, symmetrical metro Ethernet, co-location, hosted PBX, PRI and DAS solutions and other business services. Headquartered in Fort Lauderdale, Florida, Hotwire began delivering fiber to the home and IPTV in 2006. In 2014, it became the first residential gigabit internet provider in Florida. Recently, it provided a 10 Gbps symmetrical connection to the Fontainebleau Miami Beach – one of the fastest hotel connections in the world. It has been selected to operate the municipal network in Salisbury, North Carolina, and will supply FTTH services for part of Atlanta's massive redevelopment of Fort McPherson as a residential and commercial hub.



### Huntsville Utilities

[www.hsvutil.org](http://www.hsvutil.org)  
256-535-1200

**Key Products:** Citywide dark fiber infrastructure leased to service providers

**Summary:** Huntsville Utilities, owned by the city of Huntsville, Alabama, supplies electricity, gas and water to about 185,000 customers. In 2015, as the utility prepared to expand its legacy fiber facilities to meet growing needs for monitoring and automating its systems, it decided to install enough extra capacity to support a citywide FTTH network and lease this extra dark fiber to service providers. The open-access wholesale network will pass 105,000 premises by the end of 2019, making it one of the largest municipal FTTH networks in the United States. The Huntsville model has several unusual features; the most important is that the final drops to the premises are constructed and owned by service providers, not by the city. In February 2016, Google Fiber became the anchor tenant on the network, pledging to offer triple-play services to all Huntsville residents and small businesses. Google Fiber began connecting customers in 2017. The construction of the network was followed by a series of economic development wins for the city, which Huntsville's mayor calls a validation of the "Gig City" strategy. Facebook is investing \$750 million for a new data center, Toyota and Mazda have announced a \$1.6 billion production facility and Aerojet Rocketdyne announced it was headquartering its defense business unit in Huntsville and bringing about 800 jobs to the city.

### InfiniSys Multifamily Technology

[www.ElectronicArchitect.com](http://www.ElectronicArchitect.com)  
386-236-1500

**Key Products:** Telecommunications and broadband network design for MDU buildings; amenity selection; low-voltage and wireless system engineering; contract negotiation, project management and acquisition assessment

**Summary:** To differentiate their communities, MDU owners call on InfiniSys, a leader in multifamily electronic architecture. As an independent technology adviser and developer, InfiniSys creates comprehensive, standards-based amenity solutions that include internet and cellular connectivity, internet of things (IoT), entertainment, access control, video surveillance, digital signage and messaging, comfort and energy management, and leisure-space control systems for new and existing apartments, condominiums, student housing, senior housing, hotels, mixed-use developments and master-planned communities. The thousands of projects InfiniSys has undertaken since its inception in 1990 have garnered many awards for forward-thinking solutions and exceptional customer support. InfiniSys works with electronics and infrastructure manufacturers, software developers, and public and private service providers to create new products and service offerings, including IoT solutions. It developed and then successfully trademarked both the NetworkedApartment and SmartApartment brands. Based in Daytona Beach,

## PASSIVE COMPONENTS FOR FTTH NETWORKS (OUTSIDE PLANT AND INSIDE PLANT)

These companies provide fiber management solutions, enclosures, cabinets, connectors, ducts, conduits and related equipment for fiber access networks.

COMPANY NAME	WEB ADDRESS
<b>AFL</b>	<a href="http://www.aflglobal.com">www.aflglobal.com</a>
Alpha Technologies	<a href="http://www.alpha.com">www.alpha.com</a>
<b>Amphenol</b>	<a href="http://www.amphenol.com">www.amphenol.com</a>
Charles Industries	<a href="http://www.charlesindustries.com">www.charlesindustries.com</a>
Clearfield	<a href="http://www.seeclearfield.com">www.seeclearfield.com</a>
<b>CommScope</b>	<a href="http://www.commscope.com">www.commscope.com</a>
<b>Corning Optical Communications</b>	<a href="http://www.corning.com">www.corning.com</a>
Dura-Line	<a href="http://www.duraline.com">www.duraline.com</a>
Fiberdyne Labs	<a href="http://www.fiberdyne.com">www.fiberdyne.com</a>
Leviton Manufacturing	<a href="http://www.leviton.com">www.leviton.com</a>
MaxCell (TVC)	<a href="http://www.maxcellinnerduct.com/">www.maxcellinnerduct.com/</a>
<b>Multilink</b>	<a href="http://www.multilinkone.com">www.multilinkone.com</a>
<b>OFS</b>	<a href="http://www.ofsoptics.com">www.ofsoptics.com</a>
PPC Broadband	<a href="http://www.ppc-online.com">www.ppc-online.com</a>
<b>Preformed Line Products</b>	<a href="http://www.preformed.com">www.preformed.com</a>
Prysmian	<a href="http://www.prysmian.com">www.prysmian.com</a>
Superior Essex	<a href="http://www.SuperiorEssex.com/Comm">www.SuperiorEssex.com/Comm</a>

“It’s exciting to see FTTH beginning to be integrated into the business plans with smart city, electric utility grid efficiency, and even wireless overlays that make for systems with hybrid technologies. To me, it’s a sign that FTTH has finally become the accepted norm for wireline telecom architecture.”

– James Salter, Chairman, Atlantic Engineering Group

Florida, the firm represents developers and property owners in negotiations with service providers and low-voltage contractors and oversees projects for financial stakeholders.

### **Institute for Local Self-Reliance**

[www.ilsr.org](http://www.ilsr.org); [www.MuniNetworks.org](http://www.MuniNetworks.org)  
612-276-3456

**Key Products:** Broadband policy research and municipal broadband advocacy

**Summary:** Since 1974, the Institute for Local Self-Reliance (ILSR) has championed local self-reliance based on human-scaled institutions and widely distributed ownership. The nonprofit organization, which has offices in Maine, Minnesota and Washington, D.C., conducts research, advocacy and education that support local control of energy, recycling, financing, broadband and other initiatives. ILSR promotes the intelligent use of advanced technology to achieve locally determined goals. Its Community Broadband Networks Initiative is an important source of information and analysis about locally based fiber-to-the-home projects (those owned by municipalities, cooperatives and public-private partnerships). ILSR’s publications, including its MuniNetworks.org blog, toolkit and weekly podcast, have been instrumental in showing communities that controlling their broadband destinies is feasible and has the potential to improve local economies and quality of life.

### **Intelconnect**

[www.intelconnect.com](http://www.intelconnect.com)  
734-604-1563

**Key Products:** Service provider negotiations, financial feasibility plans, fiber infrastructure design, consultation and situation analysis

**Summary:** Founded in 1998, Intelconnect develops telecommunications strategies for municipalities, college and university campuses, mixed-use developments and small, medium and large businesses. The company designs and manages service provider–neutral networks (it designed, implemented and currently manages the St. Joe Valley Metronet in South Bend, Indiana); negotiates for in-building distributed antenna systems for such institutions as Clemson

University, Nemours Children’s Hospital and Lake Nona Medical City; and negotiates telecommunications service contracts to enable advanced internet, cable TV and telephone networks. Projects include the design and implementation of the statewide research and medical fiber network that connects the three research universities and seven major medical facilities in South Carolina. Other projects include Avalon for North American Properties in Alpharetta, Georgia, and the restructuring of Heather Gardens, an existing 2,400-unit, 55-plus community in Aurora, Colorado.

### **iPhotonix**

[www.iphotonix.com](http://www.iphotonix.com)  
214-575-9300

**Key Products:** Optical network terminals, residential gateways, network functions virtualization, cloud transformation

**Summary:** Based in Richardson, Texas, iPhotonix is a key player in the virtualization of optical access that is occurring worldwide. Its open, modular software platforms simplify network operation, enable multivendor hardware deployments and seamlessly connect physical and virtual network elements. In addition, the company develops and commercializes solutions to help service providers migrate to optical access networks in an easy, fast, affordable way. Its GPON and active Ethernet ONTs interoperate with a wide variety of central-office and customer-premises equipment, including RF video headends and set-top boxes, to provide FTTH services to all market segments. The iVolve optical network termination platform includes more than 50 models of ONTs and gateways, and the iPhotonix Virtual Network (iVN) platform enables communications service providers to create network managed services for a fraction of the cost and time it takes to deploy traditional managed services. Last year, iPhotonix’s iVolve ONT solutions were fully integrated with NeoNova’s ACS platform to support NeoNova’s network management service offerings and solutions, and Santa Rosa Telephone Cooperative implemented iPhotonix iVolve MoCA 2.0 ONTs into its home networking solution. The iPhotonix team has a rich history of innovation, R&D experience and delivery of reliable solutions from its origins at Siemens Telecom. The company’s solutions are tested and deployed by many communications service providers worldwide.

# MAXED OUT? MAXCELL.

Visit us at booth # 607 for MaxCell  
Samples and a MaxSpace Demo!



## New build or at capacity, MaxCell gives your network more space.

MaxCell's conduit maximization solutions allow operators to maximize their OSP and ISP network capacity while reducing total system cost.

MaxCell increases available conduit space and reduces pulling tension when installing cables.

MaxSpace is the no-dig service that safely removes rigid innerduct from around active fiber cables, maximizing your conduit and network.

**Max Out your network capacity, efficiency and budget with MaxCell.**



### Fits 300% More Cable

Traditional construction in a 4" conduit allows 3 cables to be placed. MaxCell triples the capacity, allowing up to 9 cables to be placed in the 4" conduit.



### Installs 2X As Fast

Actual Field Experience Report: Installers and Network Engineers can cut conduit installation time in half and increase cable installation speed.



### Cuts Total Project Costs

Independent surveys and field experience prove that MaxCell reduces material and labor costs by 50% and more.

**MaxCell**<sup>®</sup>  
FABRIC  
INNERDUCT

## Need your space?

Visit us online to learn how we can help!

[www.maxcell.us/maxedout/](http://www.maxcell.us/maxedout/)

NO MATTER WHERE YOU ARE IN THE PROJECT **MAXCELL FITS**

✉ info@maxcell.us  
☎ 1.888.387.3828  
🌐 www.maxcell.us

📍 MaxCell Innerduct  
600 Plum Creek Drive  
Wadsworth OH 44281



BEGINNING



MIDDLE



END

# FIBER-TO-THE-HOME TOP 100 LIST

## KGPCo

www.kgpcoco.com  
800-755-1950

**Key Products:** Equipment for wireline and wireless networks, cloud networks, SDN/NFV/IoT, data centers, and distributed antenna systems; inventory management, logistics, site development, sourcing, supply chain management

**Summary:** KGPCo aims to be the go-to partner for communications providers to build, optimize and transform their networks. It provides customized, scalable supply chain and network transformation solutions for the communications industry. The company combines a comprehensive suite of technical strategy and implementation services with a national logistics network and portfolio of technology partnerships. KGPCo recently launched the KGPCo Solution Innovation Center to evaluate, design and engineer cloud and virtualization solutions developed and operationalized in the live network environment. KGPCo, founded in 1973, is headquartered in Faribault, Minnesota.



## Ledcor Technical Services

www.ledcor.com  
512-275-3500

**Key Products:** Turnkey and multiservice communications solutions, including design, engineering, sales, construction and maintenance of wireless and wireline terrestrial networks, submarine networks, outside and inside plant, and FTTx

**Summary:** Ledcor, in business since 1947, is a diversified construction company that has built communications networks since 1979. It has built more than 50,000 miles of fiber across North America, including the United States' first full-standard GPON networks and Canada's first transcontinental fiber network. The company employs more than 6,000 people in 30 offices across North America; the communications division has more than 1,400 employees. Ledcor is engaged in a turnkey FTTx deployment for a Tier-1 Canadian telecommunications provider, connecting homes and businesses in communities across British Columbia and Alberta. To date, Ledcor has run fiber to approximately 520,000 homes and 60,000 MXUs. This program includes engineering, access agreements, construction, drops, sales and service delivery to end customers. Ledcor Technical Services' U.S. operations are headquartered in Austin, Texas.

## Leviton Manufacturing

www.leviton.com  
800-323-8920

**Key Products:** Premises wiring, outside plant, central-office solutions and home automation products

**Summary:** Leviton Manufacturing supplies secure, high-bandwidth fiber and copper connectivity solutions for enterprise, data center and service provider networks. Residential customers use Leviton's lighting controls, wiring devices and home automation products, which allow homeowners to create smart living environments that deliver energy savings, safety and convenience. The company has more than 20 years of experience developing solutions for high-speed networks and offers a full line of custom-configurable products along with layout and design support services for data centers. The company's online configurator allows users to customize enclosures, copper and fiber cable assemblies, copper patch cords and power distribution units to meet their network needs. Leviton's LightSpace enclosures, designed to meet the requirements of service providers large and small, are used in central-office, outside-plant and fiber-to-the-premises applications. Privately held and based in Melville, New York, Leviton has a portfolio of more than 25,000 products and 600 patents, employs more than 7,000 people and has sales in 80 countries.

## Magellan Advisors

www.magellan-advisors.com  
888-960-5299

**Key Products:** Broadband and telecom planning, deployment and management services

**Summary:** Headquartered in Denver, Magellan Advisors is a full-service consulting firm that offers services from project inception through implementation and into continuing operations. Magellan helps communities identify opportunities, value assets, and negotiate and forge public-private and public-public partnerships. Services offered include smart-city consulting, comprehensive community broadband planning, financial planning, funds sourcing, business modeling, design engineering, telecommunications master planning, deployment and project management services to governments, municipal utilities, electric cooperatives and private organizations. It also provides a suite of public-sector IT solutions to local, state and federal government markets. Magellan's projects have led to more than \$1 billion of investments in broadband networks that connect more than 1,000 schools, hospitals, libraries and government facilities and pass nearly 1 million homes and businesses with fiber and wireless broadband services. Magellan's portfolio includes more than 400 engagements for city, county, state, federal and private broadband projects. Clients range from national, regional and tribal governments to new master-planned communities, large cities and small, rural communities.





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“As an industry, we have to move away from the manual design processes of the past and embrace today’s technology, along with the massive amounts of data we are collecting, to remove the obstacles prohibiting our nation from fully deploying FTTx to every socioeconomic and rural group.”

– Danny Huffman, Owner, ONUG Communications

## Mapcom Systems

www.mapcom.com  
804-743-1860

**Key Products:** Software for visual operations, workforce management and service assurance

**Summary:** Mapcom Systems offers a visualization-based approach to FTTH operations and management. Its M4 Solutions Suite encompasses the FTTH life cycle from PON or active network design and feasibility analysis to day-to-day plant/facility assignment and network maintenance and management. It maps both outside and inside plant at physical and logical levels. Providers use the M4 Solutions Suite to model their networks and service areas, integrating and correlating data from billing, accounting, GPS tracking, element management, network monitoring and vehicle-tracking applications in a visual interface. Using the suite in conjunction with M4 Workforce and M4 Process Manager technology, staff can communicate via mobile devices to handle trouble tickets, service orders, field locates and permitting. This year, Mapcom Systems launched M4 SLA Vision, the newest addition to the M4 Solutions platform, which automates many of the reports and dashboards critical to meeting service-level agreements. Headquartered in Richmond, Virginia, with a staff of more than 100, Mapcom has worked since 1971 with independents, cooperatives, fiber communities and campus telecommunications providers across the United States, Canada, Central America, the Caribbean and Africa.

## MasTec North America

www.mastec.com  
888-785-2171

**Key Products:** FTTx deployment, outside-plant cabling, engineering, inside-plant construction and installation, joint trench systems, splicing, testing, systems integration, fulfillment, ongoing maintenance

**Summary:** MasTec’s engineering, design, construction and maintenance services support advanced fiber optic, copper, wireless and satellite networks. Its FTTH network experience includes underground and aerial fiber installation in urban, suburban and rural environments nationwide. It deployed Verizon Fios networks in Virginia, Pennsylvania, Maryland, Rhode Island, Florida, California and Texas; performed outside-plant construction for CenturyLink in

Florida and Georgia; and works with many small telephone companies. MasTec, headquartered in Coral Gables, Florida, can supply crews and equipment to its customers 24/7. By combining cutting-edge technology, innovative solutions, skilled professionals and a commitment to safety, the company ensures that its customers can meet their customers’ communications needs with reliability and quality.

## Michels Corporation

www.michels.us  
920-583-3132

**Key Products:** Fiber optic network construction, including outside-plant construction, structured cabling and fiber splicing and testing

**Summary:** In 1983, Michels, based in Brownsville, Wisconsin, was one of the first companies to construct fiber lines. Today, it builds thousands of miles of fiber optic and broadband networks each year. Its communications personnel serve all sectors of the communications industry – local telephone companies, broadband and cable TV providers, schools and enterprises. The company’s construction design and management services include all phases of inside- and outside-plant engineering. Plowing, trenching, splicing, terminating, testing, constructing aerial lines, directional boring, rail plowing, installing cable, conducting site work and providing FTTx solutions are some of the services Michels offers. In addition, it assists clients with growth forecasting, verifying existing facilities, investigating potential migration strategies and estimating costs of numerous deployment options. For 2018, Michels ranked 38th on Engineering News-Record’s annual Top 400 Contractors list, its 13th consecutive year in the top 100 contractors. The firm has more than 5,000 employees in regional offices throughout the United States.

## Mid-State Consultants

www.mscon.com  
435-623-8601

**Key Products:** Communications engineering services, facilities management software

**Summary:** Mid-State Consultants offers a full range of communications engineering services for telephony, data and video networks as well as computerized mapping and

conversion and construction supervision. The company has experience working for a broad clientele, including local exchange carriers, RBOCs, interexchange carriers, competitive access providers, ISPs, cellular operators and CATV operators, and it has participated in many FTTH projects. Mid-State assists clients with growth forecasting, verification of existing facilities, investigation of potential migration strategies and cost estimates of numerous deployment options. The company's construction design and management services include all phases of inside- and outside-plant engineering. Mid-State's e-TICS facilities management software facilitates the assignment of inside and outside plant from end to end; for FTTH networks, it can assign fibers and splitter ports to specific locations. Mid-State Consultants is headquartered in Nephi, Utah, and has eight regional offices throughout the United States.

### Multilink

[www.gomultilink.com](http://www.gomultilink.com)

440-366-6966

**Key Products:** Fiber distribution and cable management solutions, connectors, splice enclosures and cabinets; MDU enclosures; raceway and pathway solutions

**Summary:** A manufacturer of telecommunications network components, Multilink, founded in 1983, focuses on fiber management solutions. Multilink's customers include independent telcos, RBOCs, utilities, local area network providers and CATV MSOs. Its products are designed to meet the needs of both legacy plant and new technology applications. The company's engineering staff works closely with customers to develop innovative designs and application-oriented products to provide cost-effective solutions. Recent product introductions include the Surelight H-IP, a fiber drop cable solution with a field-installable application that is an OptiTap-compatible connector. Based in Elyria, Ohio, Multilink is privately owned and has 200 employees.



### NBT Solutions / VETRO FiberMap

[www.nbtsolutions.com](http://www.nbtsolutions.com); [www.vetrofibermap.com](http://www.vetrofibermap.com)

207-221-6627

**Key Products:** Fiber mapping software

**Summary:** VETRO FiberMap, a cloud-based fiber management GIS mapping platform, is experiencing rapid adoption across the United States and globally. Launched in 2016, the platform is now used by more than 50 companies in 22 states and four countries. Designed and built to meet the needs of small and midsize fiber ISPs and community fiber networks, VETRO FiberMap helps such organizations

compete successfully with larger operators by providing efficiency and network map access. The software's open application programming interfaces allow for extensive integrations with outside applications. Network designers, builders and owner-operators leverage VETRO FiberMap as a core business platform to plan, design, build, manage, sell and operate FTTx networks. Customers include ISPs, rural ILECs and CLECs, WISPs, rural electric co-ops, design/engineering consultants and cable companies. VETRO FiberMap was launched by NBT Solutions, a privately owned software development firm based in Portland, Maine.



### NEO Connect

[www.NEOconnect.us](http://www.NEOconnect.us)

970-309-3500

**Key Products:** Consulting, feasibility studies, design and engineering services

**Summary:** NEO Connect works with local and state governments throughout the United States regarding all things broadband. NEO provides municipal advisory, funding, consulting, feasibility, and design and engineering services. NEO has become a leader in municipal broadband planning in Colorado, a hotbed for broadband initiatives. In addition to crafting the state's first comprehensive broadband plan, NEO provided planning, evaluation, management and/or implementation services for 45 of the state's 64 counties and for 52 cities and towns statewide. The majority of these projects were rural, grant-funded efforts aimed at enabling economic development, educational opportunities, public safety, and government accessibility; lowering costs; and improving services. NEO's team also assisted communities in Minnesota, California, Tennessee, the Virgin Islands and North Carolina. Notable projects include Colorado's Region 10 Middle Mile Project; Delta Montrose Electric Association's Gigabit Last Mile Project; and feasibility studies for El Dorado

## OPTICAL LAN SOLUTIONS

The following companies sell fiber-to-the-desk solutions for corporate or campus LANs.

### COMPANY NAME

### WEB ADDRESS

CommScope

[www.commscope.com](http://www.commscope.com)

Corning Optical Communications

[www.corning.com](http://www.corning.com)

DASAN Zhone Solutions

[www.dasanzhone.com](http://www.dasanzhone.com)

Nokia

[www.nokia.com](http://www.nokia.com)

# FIBER-TO-THE-HOME TOP 100 LIST

“Fiber to the premises is not considered a luxury anymore; it is becoming necessary for homes, businesses and communities to operate. It’s important that service providers are able to rely on a network’s ability to scale and increase bandwidth as the population demands. Our goal as an industry is not only to provide high-speed broadband services but also to provide a service that enriches the lives of our population.”

– Michael Fischer, Senior Vice President of Sales, Americas, DASAN Zhone Solutions

County, California; the cities of Greeley, Windsor, Arvada and Westminster; and the Jefferson County School District. Recently, NEO completed certification to work with local governments as a municipal adviser, allowing it to provide assistance in obtaining public financing for broadband projects on behalf of municipal clients.

## Nokia / Nokia Networks

www.nokia.com  
908-582-3000

**Key Products:** Wireline and wireless network equipment, software for network management, IoT technology, cloud solutions

**Summary:** Nokia, headquartered in Espoo, Finland, is a market leader in wireless and wireline networks. It has a global presence with operations in Europe, the Middle East and Africa, North America, Asia-Pacific and Latin America. A third of fixed-broadband subscribers worldwide are served by access networks that use Nokia technology, including EPON, GPON, xDSL, cable and G.fast. Many companies, including EPB Fiber Optics, China Mobile, SKB and Frontier Communications, have deployed Nokia’s NG-PON technology to deliver 10 Gbps services. Nokia Bell Labs (descendant of the original Bell Laboratories) showed that Nokia’s XGS-PON technology, part of the company’s NG-PON offering, could support ultra-low-latency fronthaul for 5G mobile traffic, thus paving the way for true integration of wireline and wireless networks. Nokia recently launched internet routing platforms, powered by its FP4 chips, that allow multi-terabit throughput. Nokia closed 2017 with net revenue of approximately \$27 billion on sales generated in about 130 countries. It had about 103,000 employees at the end of 2017, with an annual R&D budget of almost \$6 billion and R&D facilities in Europe, North America and Asia.



## OFS

www.ofsoptics.com  
770-798-5555; 888-342-3743

**Key Products:** Optical fiber; optical fiber cable; fusion splicers; fiber management and connectivity products for homes, businesses, data centers and MDUs; network design services

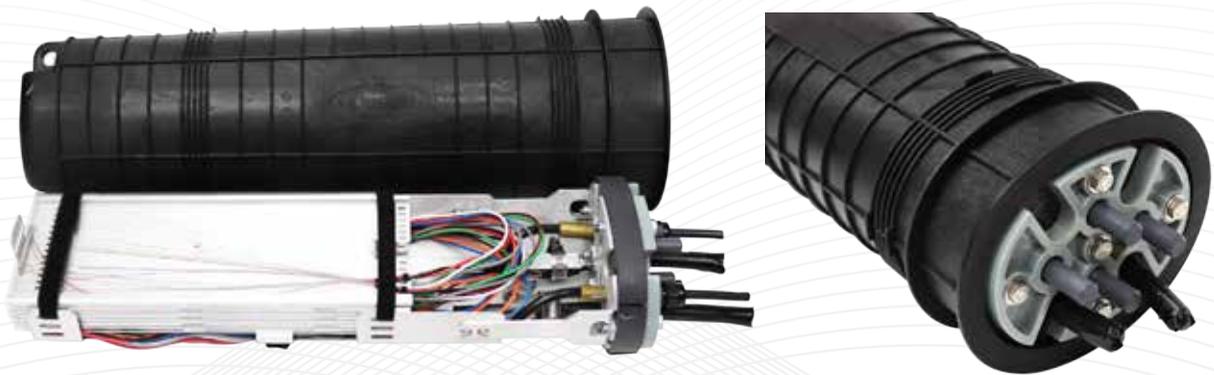
**Summary:** OFS’s heritage, which goes back to the original Bell Labs, includes pioneering research and development in fiber optics. Wholly owned by Furukawa Electric of Japan, OFS designs, manufactures and supplies optical fiber, fiber optic cable, specialty photonics and optical connectivity solutions, providing end-to-end fiber optic solutions for outside-plant and inside-plant networks. Products include EZ-Bend ultra-bend-insensitive optical cables and InvisiLight solutions for nearly invisible in-MDU and in-home fiber deployments; AllWave+ ZWP full-spectrum, zero-water-peak, bend-optimized fiber; gel-free Fortex loose tube, AccuRibbon ribbon and PowerGuide ADSS fiber cables; end-to-end fiber connectivity, optical splitter and fiber management solutions; fusion splicers and several MDU deployment solutions. The professional services group designs and builds FTTX networks for MDU and SFU applications. Recent product launches include Rollable Ribbon cables, assemblies and new connectivity solutions for MDU and SFU applications. Headquartered near Atlanta, OFS is a global provider with facilities in North America, Europe and Africa and sales offices around the world. Furukawa Electric reported revenue of about \$1.7 billion for its telecommunications group for the fiscal year ending March 2018.



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hubbellpowersystems.com



## On Trac

www.ontracinc.net  
423-317-0009

**Key Products:** FTTH splicing and installation, mainline fiber splicing, MDU network design and installation, structured cabling, consulting, project management, warehousing, back-office structure

**Summary:** Based in East Tennessee, On Trac provides telecommunications services and special projects to network operators nationwide. Its core services are FTTH splicing and installation. Additional services include consulting; project management; training, service and repair; materials management and warehousing; scheduling processes; and back-office structure. Clients include municipal network operators, cooperatives and privately owned operators, including Bristol Tennessee Essential Services, Dalton Utilities, GVTC, LUS Fiber, Google Fiber, C Spire and Longmont Power & Communications. To date, On Trac has connected more than 250,000 FTTH installations and performed outside-plant work that includes aerial drops, underground drops, mainline fiber splicing and bidirectional testing.



## ONUG Communications

www.onugsolutions.com  
919-876-5455

**Key Products:** Outside-plant engineering, planning and design; project management, feasibility studies, consulting services, quality assurance, construction

**Summary:** ONUG Communications, based in Raleigh, North Carolina, provides services for FTTH deployers that range from feasibility studies through planning, design, engineering and construction. Clients include AT&T, Google Fiber and other incumbent and competitive local exchange carriers, municipalities and utilities. Recently, ONUG began partnering with Biarri Networks, adding engineering expertise to Biarri's mathematical algorithms to produce cost-optimized network designs in a short time frame, thus saving capital expenditure and expediting deployment for clients. By using this automated design solution, ONUG planned and/or designed FTTH networks for more than 5 million households in 2017 alone.

## Palmetto Engineering & Consulting / CrescentLink Solutions

www.palmettoeng.com; www.crescentlink.com  
864-295-3180

**Key Products:** Telecom engineering, consulting and installation; GIS software and services

**Summary:** Founded in 2006 and based in Greenville, South Carolina, Palmetto Engineering & Consulting provides

engineering and consulting services to telecommunications operators, electric utilities and oil and gas companies, among others. It also provides GIS, data engineering and integration services. Since its 2014 merger with Little Rock, Arkansas-based CT&T, it offers right-of-way services. The telecom engineering group performs network planning, outside-plant design, central office equipment planning, specifications development, bidding assistance and acceptance testing, facilities management and project management. Palmetto's ISP engineers plan, design, provision and install equipment shelves and cards for communications circuits for telecom providers in all size categories. The company's CTS subsidiary specializes in installation and cutover of FTTH services. Palmetto's CrescentLink software, based on ArcGIS, was designed after years of working with clients on GIS projects and learning what they needed to plan, design, map and manage their fiber networks. It is now widely used by fiber deployers that include electric cooperatives, municipalities, telcos, universities and fiber overbuilders. Palmetto has a staff of 170.

## Pavlov Media

www.pavlovmedia.com  
800-677-6812

**Key Products:** Internet, video and voice services; managed services, including support for leasing offices

**Summary:** Pavlov Media is a leading network provider in the multiple-dwelling-unit space and the largest private provider of broadband services to off-campus student housing communities. It builds and runs networks in 44 states and Canada. With more than 175,000 residents using its network, Pavlov Media provides high-speed internet and cable television to hundreds of apartment, condo and student housing sites. Pavlov Media's national fiber network backbone enables the delivery of internet speeds up to 1,000 Mbps to residents. Other speed-enhancing innovations include WebSnap – a set of traffic management techniques that enable fast web page loading through superfast blasts of service – and a root domain name server hosted on Pavlov Media's network to improve latency. Pavlov Media launched its first fiber-to-the-unit service several years ago and now supplies FTTH to thousands of apartments. Founded in 1994, Pavlov Media is headquartered in Champaign, Illinois.

## Power & Tel

www.ptsupply.com  
800-238-7514

**Key Products:** Fiber optic and cable products, optical networking electronics, test gear, IPTV, home networking solutions

**Summary:** The distributor Power & Tel specializes in the procurement, sales and logistics of communications products. By cost-effectively and efficiently managing the supply chain, Power & Tel lets its customers – service providers, contractors and other entities large enough to maintain their



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### Better service.

Round-the-clock live support for you and your residents, plus dedicated community account representatives.

To learn more about how Xfinity Communities can provide better living at your property, visit [xfinity.com/xfinitycommunities](http://xfinity.com/xfinitycommunities).

Not available in all areas. Restrictions apply. NPA191069

# FIBER-TO-THE-HOME TOP 100 LIST

own communications networks – focus on building and maintaining fiber networks. The company also provides materials-management services that use state-of-the-art distribution technology to accommodate the industry’s rapidly changing supply needs. Last year, Power & Tel and Geneva-based ADB, a provider of end-to-end TV solutions, signed a master distribution agreement for the Americas. Founded in 1963 and privately owned, Power & Tel is headquartered in Memphis, Tennessee, and has locations in the United States, Canada, Mexico and Brazil.



## PPC Broadband

www.ppc-online.com  
315-431-7200; 800-800-6652

**Key Products:** Armored polymer microduct and fiber cables for the FTTH and MDU markets

**Summary:** PPC Broadband fiber optic cable, microduct and closure solutions are designed to enable cost-effective fiber deployment. The company’s Miniflex fiber cable can be pushed by hand more than 400 feet, pulled for 900 feet or blown 2,500 feet. The QuikPush family of preconnectorized pushable fiber solutions and all-dielectric, self-supporting (ADSS) cable are designed to speed up the last mile of FTTH and FTTC deployments. Preconnectorized QuikDrop cable is a small, ultra-tough, flexible fiber that is easy to ship and handle. In addition, PPC has closures to house fiber cable slack, ONUs, and RF electronics and passives that provide security for consumers and convenience for technicians. PPC Broadband has installed more than 100 million feet of fiber cable and microduct in more than 52 countries. PPC recently acquired

the Nebraska-based fiber provider Net-Tech Technology (NT2), which will add multiplexers and splitters to PPC’s fiber business unit. PPC Broadband is a wholly owned subsidiary of Belden Inc. and is headquartered in East Syracuse, New York, with manufacturing facilities in the United Kingdom, Mexico, Denmark, St. Kitts and China. Belden’s Broadcast Solutions segment, of which PPC Broadband is a part, generated revenues of \$725.1 million in 2017.

## Preformed Line Products

www.preformed.com  
440-461-5200

**Key Products:** Fiber optic and copper splice closures, high-speed cross-connect devices, cable anchoring, control hardware systems

**Summary:** Founded in 1947, Preformed Line Products (PLP) is an international designer and manufacturer of products and systems used to construct and maintain overhead and underground networks. Its communications segment serves telecommunications network operators, cable television and broadband service providers, corporations and enterprise networks, government departments and agencies and educational institutions. The company recently updated its flagship product line of COYOTE fiber optic closures to make the devices more durable, more versatile and easier to install. PLP serves telecommunications network operators, cable television and broadband service providers, power utilities, enterprise networks, government agencies and educational institutions. Headquartered in Cleveland, PLP has two domestic manufacturing facilities, 18 foreign subsidiaries and a global network of more than 3,000 employees. Net sales for 2017 were \$378 million.



## NETWORK PLANNING AND DESIGN SOLUTIONS

These companies provide software used to plan and design FTTH networks.

<u>COMPANY NAME</u>	<u>WEB ADDRESS</u>
3-GIS	www.3-gis.com
<b>Biarri Networks</b>	<b>www.biarrinetworks.com</b>
Comsof / FiberPlanIT	www.fiberplanit.com
<b>COS Systems</b>	<b>www.cossystems.com</b>
<b>ETI Software Solutions</b>	<b>www.etisoftware.com</b>
<b>Mapcom Systems</b>	<b>www.mapcom.com</b>
Mid-State Consultants	www.mscon.com
NBT Solutions / VETRO FiberMap	www.vetrofibermap.com
Palmetto Engineering / CrescentLink Solutions	www.crescentlink.com

## Prysmian Group

www.prysmiangroup.com  
803-951-4800; 800-713-5312

**Key Products:** Optical fiber and telecommunications cables

**Summary:** Created through the union of Prysmian and Draka, Prysmian Group is the world’s largest cable solutions provider with 21,000 employees, 82 plants and 17 R&D centers in 50 countries. With 140 years of history, Prysmian offers a wide range of products, services and technologies in high-tech markets, including optical fiber cable, composite fiber/power cable for wireless sites, FTTx solutions and premises/data cables. The company’s two compact solutions for FTTH are Mini FlexTube cables, optimized for mid-span access with SuperFlexible 1.3 mm tubes that can be removed without tools, and LT2.0 cables, which offer small, flexible, conventional buffer tubes with bend-insensitive fiber as a standard feature. Prysmian also offers ADSS and OPGW cables for FTTH and

middle-mile builders that have access to electrical utility poles or transmission infrastructure. In North America, the company has deployed 100 million miles of Prysmian Group fiber and opened two fiber optic manufacturing facilities in the United States, including the only co-located fiber and cable facility in the region. Last year, Prysmian Group North America announced a three-year, \$300 million agreement with Verizon to facilitate the deployment of its 5G and broadband networks and improve 4G LTE and other broadband capacity. In June 2018, Prysmian completed its acquisition of General Cable, a Kentucky-based manufacturer of aluminum, copper, and fiber optic wire and cable products. Prysmian's sales for 2017 reached more than \$7 billion.



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### **Pulse Broadband**

[www.pulsebroadband.net](http://www.pulsebroadband.net)  
703-467-1469

**Key Products:** Broadband network feasibility studies, FTTH and fixed wireless network planning, design, construction management, provisioning, billing, customer care, video programming services, operations management

**Summary:** Pulse Broadband, an NRTC company, was formed in 2008 to bring fiber broadband technology (including FTTH) to unserved and underserved areas. In 2016, it was acquired by the NRTC, a cooperative that serves more than 1,500 utilities in 48 states. Pulse is operated as an independent subsidiary, and NRTC is available to provide managed services to Pulse clients. Pulse Broadband specializes in rural broadband, helping electric and telephone cooperatives, municipalities and other organizations build and operate gigabit fiber backbone networks to enable next-generation, smart-grid information delivery along with high-speed broadband internet and telecommunications services. Pulse helps clients determine which broadband network architecture is most financially viable and then works to design networks, procure materials, manage construction and launch services. Pulse also offers professional services consulting for back-office and video programming functions, including billing, provisioning, customer sales and support, reporting and marketing. Over the past three years, Pulse has added more end-to-end broadband solutions to its FTTH core competence. Pulse's experience includes 24 projects, 25,550 miles of fiber/FTTH plant, 267,000 homes passed and \$727 million of rural infrastructure investment. Pulse has 115 employees and is headquartered in Mishawaka, Indiana, with additional offices in Herndon, Virginia, and St. Louis, Missouri.

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### **Rocket Fiber**

[www.rocketfiber.com](http://www.rocketfiber.com)  
844-847-6253

**Key Products:** Gigabit internet, managed services, voice, IPTV

**Summary:** Rocket Fiber was founded in 2014 and began rolling out FTTH services to residents and businesses in Detroit's central business district in late 2015. It currently has more than 40 miles of fiber optic cable in Detroit and has begun expanding east and west of the downtown area along the Detroit River and into midtown. One of the few U.S. providers to offer 10 Gbps residential service, its standard 1 Gbps service allows zero-buffering IPTV video and premium gaming performance. Rocket Fiber is unusual among private, for-profit ISPs in that it was formed with the explicit goal of contributing to local economic development. Its mission is to develop and implement critical technology infrastructure that will contribute to transforming Detroit into an attractive city for technology and other businesses. The company is at the forefront of Detroit's smart-city movement, leading the development of high-tech assets. It is a part of Detroit businessman Dan Gilbert's portfolio of companies, the best-known of which is the financial giant Quicken Loans.



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### **SmartRG**

[www.smartrg.com](http://www.smartrg.com)  
877-486-6210

**Key Products:** Carrier-grade customer-premises equipment; open-services platform for managing networked in-home devices; service provider tools for network optimization, insight and security

**Summary:** Service providers increasingly must view and manage equipment inside customer premises, and SmartRG provides hardware and software for them to do that cost-effectively. Headquartered in Vancouver, Washington, SmartRG was spun off from the former ClearAccess when Cisco acquired the software assets of ClearAccess in 2012. One of SmartRG's flagship products, Smart/OS, uses the emerging technologies of software-defined networking and network functions virtualization to support next-generation FTTH gateways and other in-home networking products. In October 2017, SmartRG introduced a new gigabit broadband access gateway. Poised to take advantage of the connected-city and internet of things market trends, SmartRG has more than 600 service provider customers – including many fiber-to-the-home providers – with a total of more than 15 million broadband subscribers. Privately held SmartRG has annual revenues of more than \$20 million.

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### **Smithville Communications / Smithville Telecom / Smithville Fiber**

[www.smithville.com](http://www.smithville.com)  
812-876-2211; 800-742-4084

**Key Products:** High-speed internet, IPTV, voice, managed

# FIBER-TO-THE-HOME TOP 100 LIST

“Consumers want giga-fast broadband and beyond, from the access side all the way down to every device in their smart homes, without any bandwidth bottlenecks. So combining advancements in fiber access technologies, such as PON, XGS-PON and NG-PON2, with innovations in home Wi-Fi, such as intelligent mesh and 802.11ax, into an integrated solution is essential to help service providers exceed their subscriber expectations.”

– Brian Feng, Senior Vice President, Zyxel North America

services, cellular, home automation and security services, internet of things/big data support, videoconferencing, consulting services

**Summary:** Privately owned Smithville Communications, with 204 employees, is Indiana’s largest independent telecom company. Smithville expanded its fiber network in 2018, building a new network for enterprise-level capacity and partnering with Purdue University to bring high-capacity fiber to a rural area that is home to the Purdue Research Park, a \$2 billion federal research lab. Smithville’s GigaCity project continues to advance in the city of Jasper, and the company expanded its fiber operations in the tourist mecca of Nashville, Indiana, and the rural town of Ellettsville. These expansions are not grant funded; they are either self-funded or funded through public-private partnerships. Smithville recently standardized its residential service options to the best speed available in any location with no data caps, and it actively promotes streaming TV as its main television service offering. It continues to upgrade all its legacy copper areas with fiber to the cabinet to upgrade speeds and capacity in rural areas.



## DISTRIBUTORS OF FIBER OPTIC PRODUCTS

<u>COMPANY NAME</u>	<u>WEB ADDRESS</u>
Advanced Media Technologies	<a href="http://www.amt.com">www.amt.com</a>
Graybar	<a href="http://www.graybar.com">www.graybar.com</a>
KGPCo	<a href="http://www.kgpc.com">www.kgpc.com</a>
Power & Tel	<a href="http://www.ptsupply.com">www.ptsupply.com</a>
<b>TVC Communications</b>	<a href="http://www.tvcinc.com">www.tvcinc.com</a>
<b>Walker and Associates</b>	<a href="http://www.walkerfirst.com">www.walkerfirst.com</a>

### Sonic

[www.sonic.com](http://www.sonic.com)  
855-757-6111

**Key Products:** Gigabit fiber-to-the-premises, fiber-to-the-node and DSL internet access; voice service; co-location; business networking

**Summary:** Based in Santa Rosa, California, Sonic is the largest independent internet service provider in Northern California and has delivered internet and phone service to homes and businesses for more than 24 years. Founded on the belief that access to fast, reliable, affordable internet should be available to all, Sonic is committed to building out a wholly owned gigabit fiber network while supporting the local communities it serves. In December 2017, Sonic launched the biggest expansion of its gigabit fiber service in its history, bringing its offerings to the Bay Area cities of Berkeley, Albany, and parts of Oakland, El Cerrito and Kensington. Businesses such as Russian River Brewing, Awayco and Digilock depend on Sonic for fast, affordable internet and award-winning customer service. The company adheres to policies that benefit its customers and has been awarded a perfect score for its privacy policy from the Electronic Frontier Foundation year after year.



### Superior Essex

[www.SuperiorEssex.com](http://www.SuperiorEssex.com)  
770-657-6000

**Key Products:** Premises and outside-plant fiber and copper cable products, FTTH enclosures

**Summary:** Superior Essex designs, manufactures and supplies a large selection of premises and outside-plant fiber optic and copper wire and cable products. The company supplies many of the largest telecommunications service providers, and its cable products are installed in thousands of enterprises around the world. It recently introduced a line of cables for distributed antenna systems; FTTH enclosures, including

fiber distribution hubs; and redesigned families of fiber dome closures. Superior Essex has a codevelopment and marketing alliance with Legrand to create a suite of structured cabling systems, nCompass. The company recently launched PowerWise Category 5e cable, a 22-gauge communications data cable specifically designed for internet-connected devices that utilize Power over Ethernet. Also introduced recently is EnduraLite indoor/outdoor loose-tube optical fiber cable. Superior Essex is headquartered in Atlanta and has more than 3,000 employees. Its state-of-the-art product development center is in Kennesaw, Georgia, and it has manufacturing facilities in Brownwood, Texas; Tarboro, North Carolina; and Hoisington, Kansas.

### TDS Telecom

[www.tdstelecom.com](http://www.tdstelecom.com)

866-571-6662

**Key Products:** Internet access, phone, TV services

**Summary:** TDS Telecom is the seventh-largest local exchange telephone company in the United States with 1.2 million connections to high-speed internet, phone and TV services in nearly 900 rural, suburban and metropolitan communities. TDS also operates TDS Broadband Service

LLC, a cable company that includes BendBroadband. For residential customers, TDS deploys up to 1 gigabit internet access, IPTV service, cable TV options and traditional wireline services. For businesses, TDS offers advanced communications solutions, including hosted VoIP, high-speed internet, fiber optics, data networking and hosted managed services. TDS Telecom began building FTTH in greenfield developments more than a decade ago, and today it offers FTTH in 75 communities. In 2017, it acquired the municipal fiber network in Sun Prairie, Wisconsin, and has upgraded and expanded it over the last year. It is also partnering with other Wisconsin municipalities to build fiber optic networks. In February 2018, the company announced it had earmarked \$60 million to fund new fiber expansions inside and outside its wireline footprint throughout the rest of the year. TDS Telecom, headquartered in Madison, Wisconsin, employs more than 2,800 people and is a wholly owned subsidiary of Telephone and Data Systems Inc. Its operating revenues for 2017 were \$1.14 billion.



Virtually invisible solutions  
bring fiber into your home.

InvisiLight® ILU and MDU Optical Fiber Cabling  
and Connectivity Solutions for your Home.

Learn more today!  
[www.foptics.com](http://www.foptics.com)

“The broadband industry in 2018 is at a critical pivot point, and the traditional modes of building networks are clearly not delivering reliably. The explosion in consumer demand and the unquestionable economic benefits of globally competitive internet access for all communities are now as undeniable as the sun rising. The challenge is for the industry to innovate and evolve to meet that demand efficiently.”

– Paul Sulisz, Senior Vice President, Americas, Biarri Networks

## The Broadband Group / TBG Network Services

[www.broadbandgroup.com](http://www.broadbandgroup.com)  
702-405-7000

**Key Products:** Telecommunications master planning, network design and engineering, financial modeling, construction management

**Summary:** The Broadband Group (TBG), a technology and telecommunications consulting firm, develops business plans, network specifications, engineering designs, financial models and deployment strategies for utilities, master-planned communities, municipalities and service providers that seek to facilitate or deliver next-generation broadband services. TBG's wholly owned subsidiary, TBG Network Services (TBGNS), oversees construction management. In Huntsville, Alabama, TBGNS manages the Huntsville Utilities buildout of its 966-mile, citywide fiber network, which leases excess dark fiber to its anchor tenant, Google Fiber. Current TBG projects include leading the fiber business plan development and deployment strategies for Ontario, California; Long Beach, California; and City Utilities/SpringNet in Springfield, Missouri. Large-scale master-planned communities around the United States call on TBG to create technology master plans that position wired and wireless connectivity as differentiated amenities. Based in Las Vegas, with additional offices in Huntsville, Alabama, TBG was founded in 1997.

## Ting

[www.ting.com/internet](http://www.ting.com/internet)  
855-846-4389

**Key Products:** Gigabit internet access

**Summary:** Ting, a subsidiary of Tucows – a domain-management service company that ventured into the MVNO business in 2012 – launched its FTTH business with a bang in December 2014 when it acquired Blue Ridge InternetWorks, a competitive fiber provider in Charlottesville, Virginia. Ting expanded its network across Charlottesville and continues to expand to small markets in new areas, often by partnering with municipalities. Ting currently provides fiber services in Charlottesville, Virginia; Westminster, Maryland; Holly

Springs, North Carolina; and the Greater Sandpoint area of Idaho. The company is building new networks in Centennial, Colorado (where it is accepting sign-ups), and Fuquay-Varina, North Carolina. Recently, Ting announced Ting TV, its upcoming HD TV offering that comes with DVR and an app for viewing on tablets and smartphones. Tucows is headquartered in Toronto, Canada. With 400 employees, it reported \$330 million in revenue in 2017.



## TVC Communications / MaxCell

[www.tvcinc.com](http://www.tvcinc.com); [www.maxcellinnerduct.com](http://www.maxcellinnerduct.com)  
888-644-6075

**Key Products:** Broadband electronics, connectivity products, outside-plant hardware, test equipment, fabric innerduct, conduit technology

**Summary:** TVC Communications, a division of WESCO Distribution Inc., is a value-added distributor that stocks and same-day ships FTTH products and facilitates planning, launching and turning on fiber networks in broadband, telephony and utility markets. TVC provides services for FTTx networks that include designing systems, project planning and custom cutting of fiber optic cable and can develop any customized solutions a project requires. The company's brands include MaxCell, a flexible, multicelled fabric innerduct system designed for the network construction industry. Compared with rigid innerduct, the MaxCell solution enables network owners and builders to increase cable density by as much as 300 percent. This increases space, reduces costs and allows overlay without breaking new ground. MaxSpace is a no-dig conduit space recovery solution designed to safely remove rigid innerduct from around active fiber cables with little to no load on the cable and no interruption of service. Last year, the company introduced MaxCell Edge, the 5G version of MaxCell, whose patented fabric design reduces cable pulling tension by up to 20 percent.



# High-density fiber connectivity for today's central office

## FACT Optical Distribution Frame (ODF) Platform



Today's broadband networks are converging and driving higher fiber counts in the central office and head end. In response, CommScope has developed the FACT ODF. Designed for unmatched flexibility and full-front access, the FACT ODF allows service providers to manage high-density fiber connections, while maintaining optimal cable management, accessibility and protection as their network grows and evolves.

- Compact and lightweight frame features high-density, plug-and-play elements
- Innovative snap-on design requires no tools and can cut installation time by 50%
- Flexible termination, splicing, patching and storage capabilities
- Supports various different types of cable and fiber types: loose tube, patch cords, breakout assemblies, and intrafacility cables
- Complete moves, adds and changes with easily identifiable fibers along easy-to-follow cable paths
- Supports any-to-any demands of today's leaf and spine architectures



Learn more at [commscope.com/FACT](https://commscope.com/FACT)

# FIBER-TO-THE-HOME TOP 100 LIST

## Vantage Point Solutions

www.vantagepnt.com  
605-995-1777

**Key Products:** Broadband engineering and consulting services, including feasibility studies and network design, engineering, and deployment

**Summary:** Vantage Point Solutions (VPS) believes that better broadband means better lives. Based in Mitchell, South Dakota, VPS provides engineering and consulting services to wireless and wireline broadband providers to help them deliver on that promise. Vantage Point's professional engineering capabilities, financial and technical expertise and extensive regulatory knowledge enable it to design advanced, economically viable solutions customized for each client. With more than 250 employees and hundreds of clients across the country and internationally, VPS has great depth and breadth of expertise, which allow it to help clients at nearly every step of broadband network development and operation, from concept to cutover and beyond. Services include feasibility studies; network design, engineering, and deployment; regulatory advice; financial and business analysis; municipal code review and development; and network maintenance and security.

## Verizon Communications / Verizon Enhanced Communities

www.verizon.com; www.verizon.com/communities

**Key Products:** Internet, video and digital voice services

**Summary:** Verizon delivers broadband and other communications services to consumer, business, government and wholesale customers. Headquartered in Basking Ridge, New Jersey, and the largest FTTH provider in the United

States, it provides converged communications, information and entertainment services in the United States and integrated business solutions in more than 150 countries. In 2017, revenue for Fios, Verizon's FTTH network, grew to \$11.7 billion; at the end of 2017, Fios had 5.9 million internet subscribers and 4.6 million video subscribers. Verizon continues to add new Fios customers in its existing footprint, including in Boston, where it launched Fios in 2016. Fios Gigabit Connection, the company's flagship broadband service, offers download speeds up to 940 Mbps and upload speeds up to 880 Mbps, and Fios Multi-Room DVR (formerly Quantum TV) offers the ability to record up to 12 shows at the same time and up to 200 hours of HD recording capacity. It includes the Fios TV app and a hands-free, voice control option with an Alexa-enabled device. Verizon Enhanced Communities works with property owners, property managers and businesses to serve multifamily residential, multitenant commercial and mixed-use communities with high-bandwidth internet, TV and phone services. A Dow 30 company with almost \$126 billion in 2016 revenues, Verizon employs 155,000 people worldwide.



## Vermeer Corporation

www.vermeer.com  
641-628-3141; 888-837-6337

**Key Products:** Horizontal directional drilling equipment; utility and pedestrian trenchers and plows

## NETWORK DEPLOYERS AND SERVICE PROVIDERS

### COMPANY NAME

Adams Telephone Co-Operative  
Allo Communications  
Altice USA

### AT&T / AT&T

### Connected Communities

C Spire / C Spire Fiber

### CenturyLink

### Charter Communications /

### Spectrum Community Solutions

Cincinnati Bell

City of Ammon, Idaho, Fiber Optic Department

### Comcast Cable /

### XFINITY Communities

### WEB ADDRESS

www.adams.net  
www.allocommunications.com  
www.alticeusa.com

www.att.com/communities

www.cspire.com/home-services/

www.centurylink.com

www.charter.com;

www.charter.com/mdu

www.cincinnati.com,

www.cincinnati.com/Fioptics

http://ammonfiber.info

www.comcast.com; www.xfinity.com/

xfinitycommunities

### COMPANY NAME

Cox Communications  
EPB Fiber Optics  
Google Fiber

Hotwire Communications

Huntsville Utilities

### Pavlov Media

Rocket Fiber

Smithville Communications /

Smithville Telecom / Smithville Fiber

Sonic

TDS Telecom

Ting

Verizon Communications /

Verizon Enhanced Communities

### WEB ADDRESS

www.cox.com  
www.epb.com  
fiber.google.com

www.hotwirecommunications.com

www.hsvutil.org

www.pavlovmedia.com

www.rocketfiber.com

www.smithville.com

www.sonic.com

www.tdstelecom.com

www.ting.com/internet

www.verizon.com;

www.verizon.com/communities

**Summary:** Headquartered in Pella, Iowa, and selling worldwide, Vermeer manufactures underground installation equipment. Its involvement in fiber optic installation began in 1991 with the launch of its Navigator horizontal directional-drill product line. Vermeer HDD products can install communications lines underground without excavating or trenching, minimizing environmental disruption and helping reduce labor costs in fiber deployments. In 2010, Vermeer introduced a microtrenching system that allows installation of fiber lines into a roadway in one quick, efficient pass. Recent introductions include the S3 generation of directional drills, whose speed, simplicity and quietness are trademarks of the product line, and the tiny SPX25 remote-controlled vibratory plow, which is used for installing small pipes and cables at depths up to 12 inches and for boring underneath driveways and sidewalks using an optional attachment. Privately owned, Vermeer was founded in 1948.

**VIAMI Solutions**

www.viavisolutions.com  
408-404-3600

**Key Products:** Field and lab broadband test equipment, network monitoring systems, network performance monitoring, diagnostic services

**FTTH CONSTRUCTION EQUIPMENT**

These companies provide equipment for trenching, boring, microtrenching and other construction tasks.

**COMPANY NAME**

Ditch Witch  
Vermeer

**WEB ADDRESS**

www.ditchwitch.com  
www.vermeer.com

**Summary:** Formed in 2015 when JDSU split into two companies, VIAVI Solutions has nearly 100 years of experience in network testing and assurance. VIAVI provides testing, assurance and optimization solutions for broadband communications service providers, cable operators, mobile service providers, network equipment manufacturers, contractors and enterprises. The company's network optimization and communications test tools for fiber, wireless, virtual and wireline networks are designed to optimize connectivity, quality of experience and profitability. VIAVI offers installation and service measurement for all gigabit internet technologies, including GPON, DOCSIS

## WideOpen Delivers Open Access Networks





**We plan your Gigabit network**

- Network business and financial plans
- Financial models and pro formas
- Take rate analyses and cash flow projections
- Funding strategies and financing development
- Network architecture and specs for fiber and wireless

**We build your Gigabit network**

- Construction management
- Vendor selection for fiber and wireless equipment
- Contractor selection and procurement management
- Service provider selection and negotiation

**We operate your Gigabit network**

- 24/7/365 network operations center
- Service provider management
- Marketing and public awareness
- Equipment and fiber asset management



**WIDEOPEN NETWORKS**  
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# FIBER-TO-THE-HOME TOP 100 LIST

“With next-generation PON technologies such as NG-PON2 delivering 10 gigabit speeds and beyond to each customer premises, service providers will focus on optimizing their network performance and efficiency while monetizing their FTTH network investments through the exploding smart-home opportunity.”

– Carl Meyerhoefer, Senior Director of Solutions Marketing, Calix

3.1, HFC, G.fast and Wi-Fi. The company claims numerous firsts in this category, such as the industry’s first 400 Gb test platform, and it works with the world’s top broadband service providers. This spring, VIAVI purchased Cobham’s test and measurement business, expanding its position in 5G testing. It also opened a new research center in Budapest. For fiscal 2017, which ended July 1, 2017, VIAVI reported net revenue of \$811 million. VIAVI is based in Milpitas, California.

## Walker and Associates

www.walkerfirst.com  
800-925-5371

**Key Products:** Products and services for deploying communications networks

**Summary:** Walker and Associates is a national distributor of networking products for broadband providers, including wireline, wireless, and CATV, and has supported government and enterprise network operators for nearly 50 years. The company sources products from more than 300 suppliers, facilitating carriers’ delivery of high-speed internet, video, data and voice services to residential, business and mobile users. Walker supports technology solutions such as switching, routing, Wi-Fi, microwave, NFV, Carrier Ethernet, VoIP, WDM, ROADM, packet optical networking, SDN, GPON, active Ethernet, fixed wireless, DSL and more. Walker’s certified product engineering, kitting, testing, installation, systems integration and managed services simplify network deployment, and the company helps network designers make product selection decisions for optimum network performance, scale and operating cost. Products include fiber and copper connectivity, power systems, indoor and outdoor enclosures, and outside-plant products. Walker also offers marketing, sales, logistical and technical support services for manufacturers, reaching 10 telecommunications submarkets and more than

1,200 domestic customers. In the past year, keeping pace with the markets it serves, Walker invested in additional technical resources and tripled its NFV lab capacity. To meet customer requirements for bulk fiber, the company increased its fiber cable supply yard and its capacity for custom-cut cable requests. Based in Welcome, North Carolina, with 155 employees, Walker is ISO 9001/2015 quality certified and is a certified women-owned corporation.



## Zyxel Communications

www.zyxel.com/us  
714-632-0882; 800-255-4101

**Key Products:** FTTH/FTTN solutions, including GPON, XGS-PON and NG-PON2 gateways; G.fast CPE; mesh Wi-Fi systems; Ethernet switches

**Summary:** Zyxel, a pioneer in IP technology for more than 29 years, provides a portfolio of multiservice LTE, fiber and DSL broadband gateways; home connectivity solutions; smart home devices; enterprise-class Ethernet switches; and security and Wi-Fi equipment for small to midsize businesses. Recent Zyxel solutions for FTTH and FTTN include mesh Wi-Fi systems for whole-home Wi-Fi, XGS-PON and NG-PON2 residential gateways with built-in 802.11ax Wi-Fi and 10G Ethernet ports, and G.fast customer-premises equipment. Zyxel’s network solutions are integrated, interoperable and based on open standards. Zyxel’s worldwide headquarters is in Hsinchu, Taiwan. With 90 employees, Zyxel offers logistical, sales and technical support in the North American market through a team of local professionals. ❖

To nominate an organization for next year’s FTTH Top 100 list,  
email [masha@bbcmag.com](mailto:masha@bbcmag.com).