

BRIGHTPATH[®]
FTTH made simple![™]



BRIGHTPATH™

Fiber-to-the-Home Solution from CommScope

Leverage Your Existing HFC Network

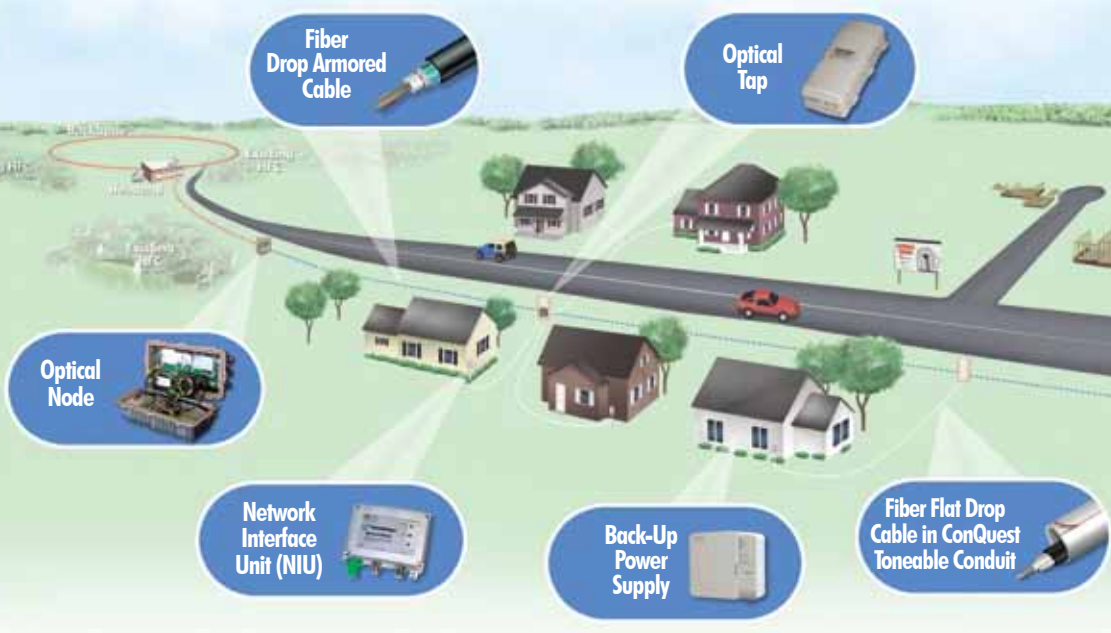
BrightPath™ is an innovative Fiber-to-the-Home (FTTH) distribution system designed to work seamlessly with existing Hybrid Fiber-Coax (HFC) networks. BrightPath is fully compatible with existing headend and subscriber equipment, allowing operators to cost-effectively deliver their current suite of analog, digital and interactive services all over fiber to the home.

Current Business Model Remains Intact

The BrightPath architecture is a unique, all optical distributed tap design that mirrors HFC in performance, design and cost. It allows an operator to deploy FTTH in selected areas as desired, yet maintains the same back office support, Cable Modem Termination System (CMTS), subscriber equipment and services. By incorporating a series of taps to manage bi-directional transmissions, signal levels can be optimized, enabling up to 32 subscribers to be served from a single fiber. Once installed, if business cases for advanced services are identified, the fiber infrastructure of BrightPath can be easily adopted to support wavelength services using known Wavelength Division Multiplexing (WDM) technologies.

Practical FTTH for Greenfields

The poor economics of traditional FTTH architectures have made deployment impractical based on high equipment costs along with installation and maintenance complexity. The BrightPath system can be deployed selectively to provide a competitive advantage, with lower up-front cost and maintenance relative to traditional Passive Optical Networks (PON). The system cost is also highly competitive with new build HFC, particularly in lower density applications.



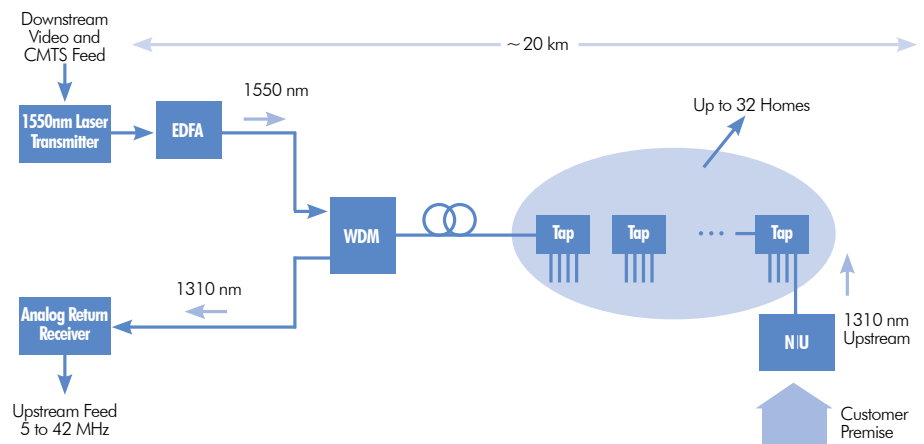
The BrightPath FTTH architecture is extremely flexible and intuitive since it is designed to mimic an operator's current HFC system. The primary version of the architecture is a Direct Feed from the Headend and is a completely passive optical network design. The Direct Feed solution is very effective at serving the majority of customers but may have some distance limitations. In cases where longer distances are required or where there is limited existing dark fiber, an optional node-based system can be implemented to extend the reach of the system or conserve dark fibers. Both of these systems are described in more detail below.

Direct System

Link Budget (1550 nm)	up to 23 dB
Homes Passed per Feeder Fiber	32
Homes Passed per Distribution Fiber	32
Upstream Serving Group Size	32
Upstream Performance:	
CNR (23 dB Link)	30 dB (Typ)
Downstream Performance:	
CNR*	>48 dB
CSO**	<-58 dBc
CTB**	<-60 dBc

*50-552 MHz CW Analog, 552-864 MHz Digital, -4 dBm receive.
 **50-552 MHz CW Analog, 552-864 MHz Digital, 0 dBm receive.

A BrightPath service area within 20 km of the headend can be fed directly without the use of a node. A single fiber can be run from the headend to the service area where it can support up to 32 subscribers. This configuration is usually more cost effective since a node and its associated power supply are not required. However, more feeder fiber from the headend will be needed if there are more than 32 subscribers in the area.

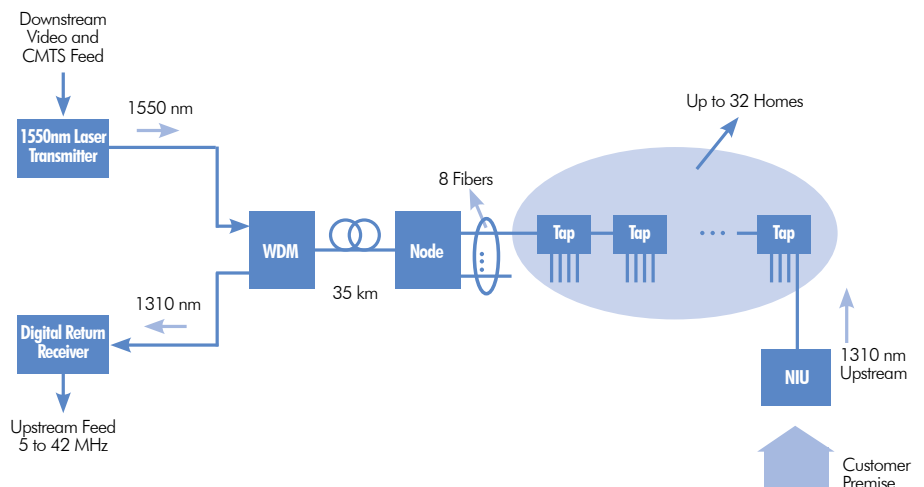


Node-Based System

Link Budget (Node to NIU, 1550 nm)	18 dB
Homes Passed per Node/Feeder Fiber	256
Homes Passed per Distribution Fiber	32
Upstream Serving Group Size	128
Upstream Performance:	
CNR (18 dB Link)	35 dB (Typ)
Downstream Performance:	
CNR*	>48 dB
CSO**	<-58 dBc
CTB**	<-60 dBc

*50-552 MHz CW Analog, 552-864 MHz Digital, -4 dBm receive.
 **50-552 MHz CW Analog, 552-864 MHz Digital, 0 dBm receive.

For service areas that are more than 20 km from the headend, the BrightPath system uses a node to extend the reach to a distance of up to 35 km. An optical amplifier (EDFA) in the node boosts the downstream signal, which is then split eight ways to serve eight distribution fibers. Each distribution fiber enables service to up to 32 customers, for a total node capacity of up to 256 customers. If feeder fiber is limited, the node solution can also be used in areas less than 20 km from the headend to conserve fiber.



The 2000 series tap is the “Next Generation” tap enclosure for the BrightPath system. The redesigned enclosure has expanded capabilities that provide cabling flexibility and facilitate simpler installations.

The BrightPath optical tap consists of a plastic enclosure, a mounting bracket, and an optical tap module. The tap module, spliced in-line with the distribution fiber, couples (“taps off”) some of the power from the distribution fiber, divides it and feeds it to the fiber drops connected to the tap. Tap ports are connectorized to facilitate a simple connect/disconnect of the customer drop cable. Similar to an RF tap in a Hybrid Fiber/Coax (HFC) plant, the tap is available in a number of different tap values and port counts. Selection of a particular tap value will determine the optical signal level that the Network Interface Unit (NIU) will receive.

The tap enclosure provides an environmentally sealed housing for the tap module. It contains a distribution and drop area, each with their own access doors. Each area has fiber management features for both the cable and the exposed fiber, and storage for fiber splice protection sleeves. The distribution side can accommodate management of up to 36 fibers, and can also accommodate a branch cable (and splicing) to facilitate service to an adjoining area or a business customer. The drop side can accommodate up to 8 fiber drops as well as the splicing of associated pigtailed. The access plate covers and protects the optical tap module, and provides the mounting platform for the bulkheads, which provide tap port access on the drop side of the enclosure.

The BrightPath taps accommodate a wide variety of fiber cables; including armored, all-dielectric, and flat-drop style cables. The family of BrightPath taps consists of 2, 4 and 8 port taps that can be installed in aerial or pedestal mount applications.



Feature

- Aerial or UG (pedestal) mount
- Separate drop/distribution access
- Weather hardened/impact resistant enclosure
- Fiber routing/management
- Grommeted cable entry
- Integral cable retaining features
- Integral splice sleeve holders
- Branch cable
- Qualified to industry standards

Benefit

- Flexible deployment options
- Prevents accidental disruption of service
- Increases network reliability
- Protects bend radii, provides slack storage
- Allows use of multiple fiber cable types
- Prevents cable pullout/damage
- Enables field drop termination and branch splicing
- Facilitates service to business customers/adjoining areas
- Assure components reliability

Optical Performance

Wavelength Window	1270 to 1350nm 1510 to 1590nm
Port-to-Port Isolation	>55 dB
Tap to Out Isolation	>55 dB
Return Loss	>55 dB

Optical Interfaces

Input/Output Fiber	900 μm, no connector
Tap Port Fiber	900 μm, SC/APC connector

Enclosure Specification

Physical Access	Separated distribution & drop access doors. Inner access plate for tap module
Tap Module Access	
Drop	SC/APC bulkheads in drop access area
Distribution	Bare fibers passed through to distribution area
Sealing	
Cabling	Grommets for DA, DF, SLT cables
Environment	Door gasket, bell house design
Mounting	Universal aerial/pedestal bracket

General Specifications

Environmental

Operating Temperature	-40° to 176°F (-40 to +80°C)
Humidity	<95%

Mechanical

Dimension	
Tap Module	4.375" L x 2.00" W x 0.50" H (11.1cm L x 5.08cm W x 1.27cm H)
Enclosure	14.46" L x 7.62" W x 4.4" H (36.72cm L x 19.35cm W x 11.18cm H)
Weight	
Tap Module	0.30 lbs (0.136 kg)
Enclosure (w/o bracket)	3.0 lbs (1.36 kg)

Standards

Optical Tap Mod/Assembly	Telcordia GR-1221-CORE Telcordia GR-1209-CORE
SC/APC Connectors	Telcordia GR-326-CORE

Optical Tap Types

2-PORT

Value	Typical IL (dB)	Max IL (dB)	Typical Tap Loss (dB)	Max Tap Loss (dB)
17	0.47	0.87	16.42	17.02
15	0.57	0.97	14.96	15.56
14	0.71	1.11	13.41	14.01
12	0.96	1.36	11.65	12.25
10	1.39	1.79	9.79	10.39
8	2.12	2.52	7.97	8.57
7	3.26	3.66	6.42	7.02
5	5.48	5.88	4.96	5.56
4T	Terminated	Terminated	3.41	4.01

4-PORT

Value	Typical IL (dB)	Max IL (dB)	Typical Tap Loss (dB)	Max Tap Loss (dB)
17	0.71	1.11	16.62	17.22
15	0.96	1.36	14.86	15.46
13	1.39	1.79	13.00	13.60
11	2.12	2.52	11.18	11.78
10	3.26	3.66	9.63	10.23
9	5.48	5.88	8.17	8.77
7T	Terminated	Terminated	6.62	7.22

8-PORT

Value	Typical IL (dB)	Max IL (dB)	Typical Tap Loss (dB)	Max Tap Loss (dB)
17	1.39	1.78	16.31	17.51
15	2.12	2.52	14.49	15.69
14	3.26	3.66	12.94	14.14
12	5.48	5.88	11.48	12.68
11T	Terminated	Terminated	9.93	11.13

*Tap Loss values include connector.

BrightPath Fiber Optic Pigtaills

CommScope offers pigtaills that can be spliced to the Drop Armored or Flat Drop cable design to facilitate the connection to the NIUs and Taps within the BrightPath architecture. The part number for these pigtaills is BP-RFT-01RF09-8W-SCA-01. It consists of a 1m length of buffered fiber with a factory terminated pre-connectorized SC, APC connector on one end.

BRIGHTPATH[™]

Network Interface Unit (NIU)



The BrightPath Network Interface Unit (NIU) is the “Next Generation” subscriber electronics for the BrightPath System. Its new mechanical and electrical design provides greater component robustness, flexibility and improved upstream performance.

Installed at the customer’s location, the NIU provides the transition from the optical network to the RF network and provides the interface to the customer’s inside wiring. In the downstream direction, it contains an optical receiver to convert the signal back to its original RF format, and an RF amplifier to provide the designated RF signal level into the home. In addition, the NIU utilizes an AGC circuit to keep the RF output constant over the optical input range. The output RF connection is a standard female “F” connector, which can also be used for local powering from the home via a power inserter. A second “F” port is also available when a dedicated powering option is preferred. In the upstream direction, the NIU contains an optical transmitter to carry the RF signals, generated by cable modems and set-top boxes inside the customer’s location, back to the headend. With its new transmitter drive circuitry, the NIU provides higher upstream link performance for the same RF input level.

To prevent unwanted RF signals from entering the network, the reverse transmitter utilizes a threshold circuit that prevents it from being activated by signals that are below a pre-set level. If a signal coming from inside the residence is below that threshold, the transmitter will not be activated. To operate over a single fiber network, the NIU also contains a WDM filter, which multiplexes the 1310nm upstream and 1550nm downstream wavelengths. The NIU circuitry is mounted in a cast metal housing that protects the electronics from the outside environment and provides a high level of RFI shielding.



Feature

- 1 GHz RF spectrum
- Transparent return path
- Return transmission threshold
- Lower RF drive level
- RF-based AGC
- High RF output with up-tilt
- Die-cast aluminum housing
- “F” port powering

Benefit

- Extended RF Capacity
- Allows use of existing CPE
- Suppresses noise from the subscriber’s residence
- Enables higher link performance
- Constant RF output over optical input range
- Reduces need for in-home amplifier
- Protects electronics and provides excellent shielding
- Allows in-home powering over coax cabling

Network Interface Unit (NIU) Specifications

Receiver Specifications

Optical Specifications

Input Wavelength	1530 to 1560 nm
Optical Input Power	-5 to 0 dBm
Link Performance	
CNR*	>48 dB
CSO**	<-58 dBc
CTB**	<-60 dBc
LED Active	≥ -5 dBm

*50-552 MHz CW Analog, 552-864 MHz Digital, -4 dBm receive.

**50-552 MHz CW Analog, 552-864 MHz Digital, 0 dBm receive.

RF Specifications

Frequency Bandwidth	54 to 1002 MHz
RF Output Level	> 14 dB, AGC controlled
Tilt	3.5 dB (max)
Return Loss	> 14 dB
Impedance	75 Ω
RFI	> 100 dB

Transmitter Specifications

Optical Specifications

Output Wavelength	1310 nm (Nom)
Optical Output Power*	> 1.5 dBm
Link Performance**	
CNR	>37 dB
CSO	<-40 dBc
CTB	<-40 dBc

*50 dBmV RF input.

**50 dBmV RF input, 18 dB link budget.

RF Specifications

Frequency Bandwidth	5 to 42 MHz
RF Input Activation Level	30 dBmV (TYP)
RF Input Range	30 to 55 dBmV
Flatness	± 1.0 dB
Return Loss	> 16 dB

General Specifications

Environmental

Operating Temperature	-40 to 149°F (-40° to 65°C)
Humidity	95% non-condensing

Power

Power Consumption	< 2W @12 VDC
Powering	8-14.5 Vdc AC/DC converter with F connector Power Inserter
Surge Protection	6 KV (IEEE C62.41, B3 or A3)
LED Active	>7.5 Vdc

Mechanical

Optical Interface	SC/APC Female Connector
RF Connection	Female "F" Connector
Dimension	4.15" L x 3.53" W x 0.97" H (10.54 cm L x 8.96 cm W x .246cm H)
Weight	0.40 lbs (.18kg)

Standards and Certification

FCC	Part 15B
UL	



CLASS 1 LASER PRODUCT

BrightPath Fiber Optic Pigtails

CommScope offers pigtails that can be spliced to the Drop Armored or Flat Drop cable design to facilitate the connection to the NIUs and Taps within the BrightPath architecture. The part number for these pigtails is BP-RFT-01RF09-8W-SCA-01. It consists of a 1m length of buffered fiber with a factory terminated pre-connectorized SC, APC connector on one end.

Alpha® FlexPoint™ Back-Up Power Supply

Alpha extends its FlexPoint family with the addition of the 1230 series, a telecommunications grade optical network terminal power supply providing 30W of 12VDC primary and standby power for the BrightPath Network Interface Unit (NIU). The FlexPoint 1230 meets the telecommunications industry's most stringent requirements for uncontrolled environments while providing aesthetically pleasing solutions for sheltered environmentally uncontrolled residential installations. Onboard microprocessor based firmware is engineered to achieve maximum battery life, system reliability and emergency battery reserve for greater E911 service availability. Unlike other standby power supplies that discharge the battery to the low voltage disconnect point, the FlexPoint 1230 reserves 25 percent battery power, enabling activation for emergency telephone calls in extended power outage situations. Standby power is provided by one 12Ah battery model. User interfaces include visual status indicators, audible alarm and 24 hour silence button and an auxiliary 12VDC power input port supporting longer standby runtimes.



Features

- Telecommunications grade power system provides 30W of 12VDC primary and standby power for the BrightPath NIU
- Easy customer replaceable hot swappable 12Ah battery
- Emergency battery reserve for greater E911 availability
- Battery management system engineered to provide optimum service life and runtime
- Local visual and audible status indicators and remote alarm interface



FlexPoint 1230
Shown with Cover Removed
and Heater Option

(battery sold separately)

Alpha® FlexPoint™ Back-Up Power Supply Specifications

Input OPS

AC Input Voltage	120VAC or 240VAC
AC Input Frequency	50/60Hz
Surge Protection	ANSI/IEEE Std. C62.41 to Category A, B, or C requirements, using a "Ring Wave" or "Combination" waveform, at a level of 6kV

Output

Operational Output Power	30W max. continuous (ONT load + battery charge + heater*)
Output Voltage	12VDC Nominal (Battery voltage upon loss of AC)
Output Power Loading	Following GR-909 telephone lines in various states, e.g., ringing, off-hook, on-hook, data, and video operation requirements
Auxiliary Input Voltage	0.5 to 20.0VDC

Physical

Housing size	8.75"W x 7.75"H x 3.0"D (22.4cmW x 17.7cmH x 7.62cmD)
Weight	3 lbs. (1.4 kg)
Battery 7.2Ah	5.7 lbs. (2.6 kg)
Battery 12Ah	8.4 lbs. (3.8 kg)

Battery

Battery Type	Maintenance free, leak-proof, sealed VRLA (valve regulated lead acid)
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Visual Indicators

System	Green LED - Power is available at the output (AC, battery or auxiliary)
Battery	Green LED - Battery discharging to 25% SOC (main or auxiliary) Green Flash at 40% SOC (main battery) the indicator begins to flash
Replace Battery	Red LED - Battery not present or failed self test
Auxiliary Power Source	Green LED - Valid auxiliary power source connected

Audible Status Indicators

Loss of Input Power	Single, one second chirp
Low Battery	Single chirp every 15 seconds at 40% SOC
Replace Battery	Double chirp spaced 15 min. apart

Push Buttons

Silence Alarm	Suppresses the audible alarm for 24 hours
Battery Emergency Use	Accesses reserve battery capacity

Agency Compliance

System	FCC part 15 Class B, CSA-NRTL\ (CSA60950), CE, C-Tic, RoHS to EU 2002/95/EC, Seismic Zone 4 rated per GR-63
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Environment

Storage Temperature	-40 to 131°F (-40 to 55°C)
Operating Temperature	Without Heater -4 to 127°F (-20 to 55°C) With Heater -22 to 127°F (-30 to 55°C) <i>Note: Operating temperatures based on AX-LONGBAT-7.</i>
Humidity	0 to 95%
Elevation Operation Max.	10000ft (3000m) Derate at 2°C per 1,000 ft above 6,000 ft
Elevation Storage Max.	50000ft (15000m)

Interface

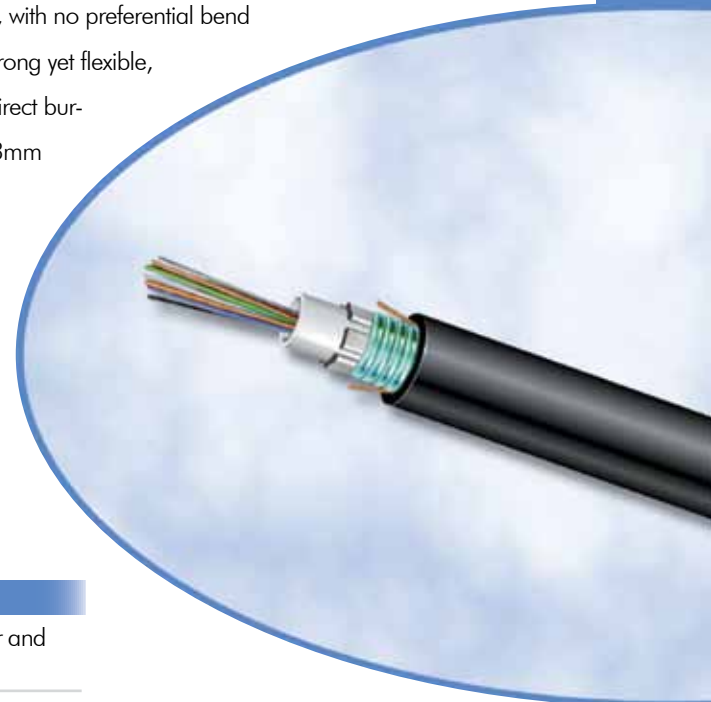
DC Output & Alarm	Removable Screw Terminal Plug accepts seven (2) 16AWG and (7) 24AWG wires
Auxiliary DC Input	3.5mm (OD), 1.3mm (Pin, positive) coaxial barrel connector
AC Input	IEC320/C6 Receptacle
Line Cord	NEMA 1-15 to IEC 320 C5 (Other cords avail. upon request)

Warranty

FlexPoint 1230	3 years repair or replace
Battery Available	3 year

Armored Construction

CommScope's Drop Armored cable design is an ideal armored solution for the distribution and drop portions of the BrightPath architecture. It is a small, lightweight central tube cable construction, with no preferential bend radius, designed for ease of handling and installation. Its corrugated steel armor is strong yet flexible, providing extra protection for the fiber itself. This robust drop cable design supports direct buried, conduit, and aerial applications. The Drop Armored cable contains a standard 3mm buffer tube, and is compatible with industry-standard hardware. It is also qualified to the ANSI/ICEA S-110-717-2003 Standard for Optical Fiber Drop Cable.



Feature


- Armored cable design
- Compact cable design
- Craft friendly design
- Versatile cable design
- Arid-Core moisture barrier
- MDPE jacket

Benefit

- Provides additional protection for the fiber and provides ease of locating
- Reduces cable weight
- Ease of midspan entry
- Suitable for direct buried, underground conduit, and aerial self-supporting applications
- Full water blocking protection for outside plant applications
- Jacket is rugged, durable, and easy to strip

Drop Armored Fiber Optic Cable Specifications

Physical Specifications

Product Type/ Fiber Count	Catalog Number	Subunits	Outer Diameter inch (mm)	Minimum Bend Radius Loaded inch (cm)	Unloaded inch (cm)	Maximum Tensile Load Short Term lbs (newtons)	Long Term lbs (newtons)	Weight lbs/kft (kg/km)
Armored 1-12 Fibers 	O- XXX -DA-8W-F ZZ NS/BP	1	0.32 (8.1)	6.4 (16.2)	3.2 (8.1)	300 (1335)	90 (400)	49 (73)

Variables in the Catalog Number:

XXX = Total Fiber Count (maximum of 12)

ZZ = Number of Fibers per Tube

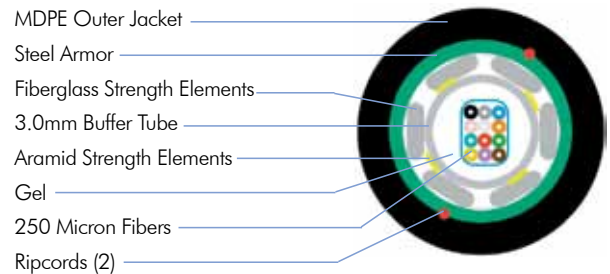
Fiber identification colors: 1/Blue, 2/Orange, 3/Green, 4/Brown, 5/Slate, 6/White, 7/Red, 8/Black, 9/Yellow, 10/Violet, 11/Rose, 12/Aqua

Mechanical Properties

Description	Specification	Test Method
Operating Temperature	-40° to 158°F (-40° to 70°C)	FOTP-3
Installation Temperature	-22° to 140°F (-30° to 60°C)	N/A
Storage Temperature	-40° to 158°F (-40° to 70°C)	N/A
Crush Resistance	125 lbf/in (22 N/mm)	FOTP-41
Impact Resistance	2.17 lbf-ft (2.94 N·m)	FOTP-25
Flexing	25 Cycles	FOTP-104
Twist Bend	Exceeds	FOTP-85

BrightPath™ Drop Armored Cable

(12 fiber version shown)



CommScope Outside Plant Fiber Optic cables are qualified to the ANSI/ICEA S-XXX-717-2002 Standard for Optical Fiber Drop Cable.

Aerial Construction

CommScope's Figure 8 Drop cable design is an ideal solution for the aerial portions of the BrightPath architecture. It is a small, robust cable construction designed for pole-to-pole installations that can support 350 foot spans in NESC heavy loading conditions. The cable can also be used for long pole-to-subscriber drops of up to 100 feet using traditional aerial plant installation techniques. This strong and light self-support cable is capable of long spans and drops, but care must be taken to consider attachment hardware, loading conditions and allowed clearances. CommScope recommends the use of SpanMaster® Sag and Tension software to qualify long installations prior to construction. The Figure 8 Drop cable is available with up to 6 fibers, contains a 2.5mm buffer tube, and is compatible with industry-standard hardware. This design is qualified to the ANSI/ICEA S-110-717-2002 Standard for Optical Fiber Drop Cable.



Feature


- Strong 0.109" Solid Steel Messenger
- Arid-Core® moisture barrier
- Incorporates both rigid and flexible strength elements
- Compact cable design

Benefit

- Cable exceeds application requirements in all loading conditions
- Full water blocking protection
- Provides optimal protection for the fiber
- Cost effective for OSP Drop applications

Self-Support Figure 8 Outdoor Drop Cable Specifications

Physical Specifications

Product Type/ Fiber Count	Catalog Number	Diameter Over Messenger in. (mm)	Diameter Over Fiber in. (mm)	Minimum Bend Radius		Weight in. (cm)
				Loaded	Unloaded	
Aerial 1-6 Fibers 	M- XXX -MN- XY - FZZ NS/ 25G/109	0.17 (4.3)	0.20 (5.1)	4.0 (10.2)	2.0 (5.1)	52 (78)

Variables in the Catalog Number:

XXX = Total Fiber Count (maximum of 6)

XY = Fiber Type and Grade

ZZ = Number of Fibers per Tube

Fiber identification colors: 1/Blue, 2/Orange, 3/Green, 4/Brown, 5/Slate, 6/White

Mechanical Properties

Description	Specification	Test Method
Operating Temperature	-40° to 158°F (-40° to 70°C)	FOTP-3
Installation Temperature	-22° to 140°F (-30° to 60°C)	N/A
Storage Temperature	-40° to 158°F (-40° to 70°C)	N/A
Crush Resistance	125 lbf/in (22 N/mm)	FOTP-41
Impact Resistance	2.17 lbf·ft (2.94 N·m)	FOTP-25
Flexing	25 Cycles	FOTP-104
Twist Bend	Exceeds	FOTP-85

CommScope Outside Plant Fiber Optic cables are qualified to the ANSI/ICEA S-XXX-717-2002 Standard for Optical Fiber Drop Cable.

BrightPath™ Self Support Figure 8 Outdoor Drop Cable

(6 fiber version shown)

Linear Low Density Polyethylene
Outer Jacket

0.109" Solid Steel Messenger

Flexible Strength Elements

Rigid Strength Elements

2.5mm Gel Filled Buffer Tube

250 micron Fibers



All-Dielectric Construction

CommScope's Flat Drop cable design is an ideal all-dielectric solution for the distribution and drop portions of the BrightPath architecture. It is a small, lightweight cable construction designed for ease of handling and installation. The costs associated with bonding and grounding is eliminated with the all-dielectric design and the dual ripcords simplify cable access and installation. This robust drop cable design, supports direct buried, conduit and aerial self-support applications. The Flat Drop cable is also compatible with industry-standard attachment hardware, and is qualified to the ANSI/ICEA S-110-717-2002 Standard for Optical Fiber Drop Cable. The design is also RUS/RDUP: RD Telecommunications Program listed.

Toneable Construction

CommScope's Toneable Flat Drop cable design is suited for the burial distribution and drop portions of the BrightPath architecture. The design incorporates a 24 AWG copper conductor to simplify the location of the cable after it is buried in the field. This allows for an easy, one step installation in ducts or open trenches since there is no need for the addition of a separate metallic component for detection in underground applications. The metallic portion is easily separated so the wire can be routed to the grounding point and does not affect the performance of the main cable. The Toneable Flat Drop cable is qualified to the ANSI/ICEA S-110-717-2002 Standard for Optical Fiber Drop Cable as well as RUS/RDUP: RD Telecommunications Program listed.



Feature

- All-Dielectric and Toneable versions available
- Compact cable design
- Craft friendly design
- Versatile cable designs
- Arid-Core® moisture barrier
- Dual ripcords

Benefit

- Flexibility for your installation needs
- Reduces cable weight
- Ease of midspan entry
- Suitable for direct buried, underground conduit, and aerial self-supporting applications
- Full water blocking protection for outside plant applications
- Simplifies cable access

Flat Drop Fiber Optic Cable Specifications

Physical Specifications

Fiber Count	Catalog Number (Description)	Cable Height in. (mm)	Cable Width in. (mm)	Minimum Bend Radius in. (cm)		Weight lbs/kft (kg/km)
				Loaded	Unloaded	
1 - 12 Fibers 	O- XXX -DF-8W-F ZZ NS	0.18 (4.5)	0.32 (8.2)	3.5 (9.0)	1.8 (4.5)	28.0 (41.8)
Toneable 1 - 12 Fibers 	O- XXX -DF-HY-F ZZ NS/ XY XXX /1X24AWG	0.18 (4.5)	0.42 (10.8)	3.5 (9.0)	1.8 (4.5)	31.4 (46.8)

Variables in the Catalog Number

XXX = Total Fiber Count (Maximum of 12)

XY = Fiber Type and Grade

ZZ = Number of Fibers per Tube

Fiber Identification Colors: 1/Blue, 2/Orange, 3/Green, 4/Brown, 5/Slate, 6/White, 7/Red, 8/Black, 9/Yellow, 10/Violet, 11/Rose, 12/Aqua

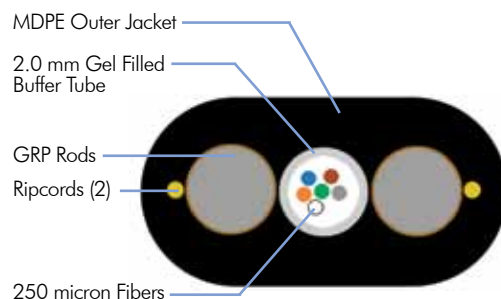
Custom sag and tension tables are available providing the recommended sag or tension. Please contact technical support.

Environmental & Mechanical

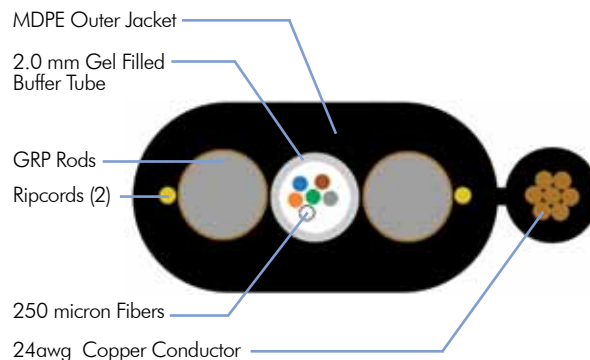
Test	Requirement	TIA/EIA Section	IEC 60794-1-2 Section
Strain	300 lbs (1335 N)	FOTP-33	5
Compression	57 lbf/in (10 N/mm)	FOTP-41	7
Flex	35 Cycles	FOTP-104	10
Impact	2.17 lb-ft (2.94N·m)	FOTP-25	8
Twist	10 Cycles	FOTP-85	11
Low High Bend	-40° to 140°F (-40° to +60°C)	FOTP-37	28
Temperature Cycle	-40° to 158°F (-40° to +70°C)	FOTP-3	22
Heat Age	-40° to 185°F (-40° to +85°C)	N/A	N/A
Water Penetration	24 Hours	FOTP-82	24
Cable Freeze	+25°F (-2°C)	FOTP-98	N/A
Drip	+158°F (+70°C)	FOTP-81	17

CommScope Outside Plant Fiber Optic Drop cables are qualified to the ANSI/ICEA S-110-717-2002 Standard for Optical Fiber Drop Cable RUS/RDUP: RD Telecommunications Program listed

All-Dielectric Flat Drop Cable



Toneable Flat Drop Cable



Optimized FTTH Infrastructure

ConQuest® Conduit - Providing Damage Prevention & Access to Underground Facilities

- Additional Cable Protection
- Cable Replacement Capabilities
- Empty, Toneable and Fiber-in-Conduit options

Interest in underground damage prevention is surging. Federal legislation and an array of state laws have heightened concern on protecting vital underground networks. Companies like yours spend billions to ensure continuity of service. Cable protection is even more critical in high-end FTTH underground networks. CommScope ConQuest products provide an ideal solution.

CommScope manufactures High Density Polyethylene (HDPE) conduit with factory pre-installed fiber optic cable or pull lines. Cable-in-Conduit (CIC) will provide added protection and reduce the cost of field installing cable. CommScope also offers toneable conduit, an HDPE conduit with an embedded 18 gauge copper clad steel tonewire. Toneable conduit is the ideal product to use with all-dielectric fiber optic cables. Factory pre-installed cables or pull lines are available in toneable conduit.

If installing the cable in the field is the only option, CommScope offers HDPE conduit empty or with factory pre-installed pull lines.



Feature

- HDPE
- UV Protected
- Continuous Lengths
- Internal Lubricant
- Locatable
- Pre-installed Cables

Benefit


- Provides superior protection and long term stability for underground networks
- Superior protection from cracking during storage or when used as a ground riser
- Installs faster than traditional PVC stick pipe and eliminates the need to inventory sweeps, bends & elbows. Installation by directional bore or plow methods
- Reduces down time by facilitating the replacement of damaged cable and allows cable operating systems to upgrade their services with minimal expense
- Toneable conduit allows the system owner to locate buried assets – detectable at extended distances and depths
- Eliminates the risk of damaged cables due to improper field installations saves time and labor costs associated with field installing cables

Pre-Installed with CommScope Fiber Drop Cables


Fiber-In-Conduit

All of CommScope's fiber cables can be pre-installed in conduit, including the Fiber Drop cables. Available in 1/2" or 3/4" and two different wall thicknesses - SDR 11 or SDR 13.5. For more information or specifications on Fiber Optic cables, please visit our website at www.commscope.com.

All-Dielectric Flat Drop in Toneable Conduit

Cable Type/ Fiber Count	Catalog Number (Description)	Cable OD & Weight (kft)	Available Conduit OD	Available Wall Thickness	Weight (lb/kft)*	
					SDR 11	SDR 13.5
Flat Drop 1 - 12 Fibers 	O- XXX -DF-8W- FZZ NS Specify Conduit OD, Wall Thickness and Color	0.18" x 0.32" 28 lbs.	3/4"	SDR 11 or 13.5	185	165

Armored Drop Cable In Conduit

Cable Type/ Fiber Count	Catalog Number (Description)	Cable OD & Weight (kft)	Available Conduit OD	Available Wall Thickness	Weight (lb/kft)*	
					SDR 11	SDR 13.5
Armored Drop 1 - 12 Fibers 	O- XXX -DA-8W- FZZ NS/BP	0.32" 49 lbs.	1/2" 3/4"	SDR 11 or 13.5	135 180	120 160

Variables in the Catalog Number:

XXX = Total Fiber Count (maximum of 12)

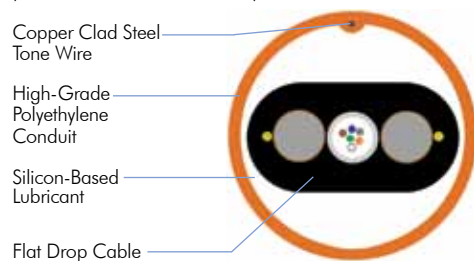
ZZ = Number of Fibers per Tube

Fiber identification colors: 1/Blue, 2/Orange, 3/Green, 4/Brown, 5/Slate, 6/White, 7/Red, 8/Black, 9/Yellow, 10/Violet, 11/Rose, 12/Aqua

*Other size conduits may be available upon request.
Weight does not include reel.

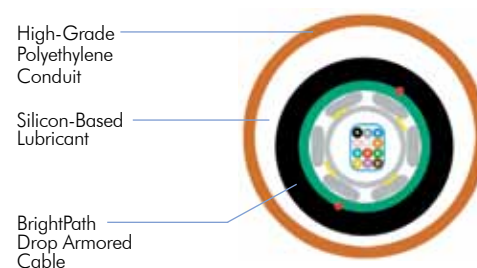
All-Dielectric Flat Drop Cable in ConQuest® Toneable Conduit

(6 Fiber Construction Shown)



Armored Drop Cable in ConQuest® Conduit

(6 Fiber Construction Shown)



Aurora's Node Solution

The typical node configuration, which supports the BrightPath FTTH architecture, consists of a highpower (+24 dBm) EDFA and an 8-way splitter to distribute the 1550nm downstream signal to 8 output fibers. A forward/return optical diplexer separates the eight downstream 1550nm signals from the eight upstream 1310nm signals. The eight upstream 1310nm signals are routed to eight upstream receivers, the outputs of which are combined into a single RF signal which is then digitized and transmitted upstream at 2.125 Gbps using Aurora's patented digital reverse technology transceiver. The typical configuration utilizes a "2-fer" Digital Transceiver (DT4230N) that supports 128 HP per each of two return paths.



Features

- Single-fiber FTTH network solution
- Services up to 8 optical outputs (up to 256 homes served per node)
- Digitized returns
- Enables low-cost Network Interface Units (NIUs)
- High reliability
- Provides extended dynamic range and distance
- High output EDFA – up to +24 dBm
- Supports alternate route switching
- Integrated element management provides full monitoring without the extra cost of a transponder
- Redundant powering options
- Environmentally hardened housing can be strand or pedestal mounted without external cooling

Physical

Dimensions	20"L x 10"D x 11.7"H (51cm x 25.5cm x 30cm)
Weight	38 lbs (17.1 kg)

Environmental

Operating Temperature Range	-40° to +65°C (-40° to 149°F)
Storage Temperature Range	-40° to +85°C (-40° to 185°F)
Humidity	5% to 95% non-condensing

Power Requirements

Operating Input Voltage Range	44 to 95 VRMS
Power Consumption	45 W (typ configuration)
Power Passing	15 ARMS
Power Supply Start-up Input Voltage	40-44 VRMS
Power Supply Turn Off Input Voltage	34-38 VRMS
Power Supply Efficiency	73% typical

Optical (typical configuration)

Forward Typical Values (1550nm)

Input	+5 to +15 dBm
Output	14 dBm at each of 8 outputs
Noise Figure at 5 dBm Input	< 6 dB

Reverse Typical Values (1310nm)

Input	-15 dBm nominal
Output	0 dBm using TR4040-PI SFP

The optical ports facility of the DT4230N or DT4030N can be populated with a variety of SFP (plug-in) transceivers depending on the network application. Please refer to the appropriate data sheets for the selected transceivers for detailed specifications.



Typical BrightPath Application Node Configuration

- 1 NH4000-H Housing
- 1 PS4001 Power Supply
- 2 AR4041 5–45 MHz Optical (Quad) Receiver modules
- 1 FA4524 High-output 1550nm Optical Amplifier
- 1 DT4230N Digital Transceiver
- 1 OP4138 Broadcast Splitter – 1310/1550 Diplexer
- 1 OP91M2S Single 1310/1550nm Combiner/Separator
- 1 PC4002 Power Chassis
- 1 FT4004V Fiber Tray
- 1 TR4040-PI 2.125 Gbps 1310nm Optical Transceiver SFP

A backup PS4001 Power Supply may be ordered separately. Also available are additional plug-in modules, including optical redundancy switches, which are described on separate data sheets. Please contact your Aurora Networks sales representative for information regarding specific equipment configuration options to meet your particular requirements.



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Contact your local
CommScope sales representative
for more information about
this innovative solution.