



Passive Optical Components

Service providers and MSOs, get more from your existing fiber infrastructure with integrated passive optical components

COMMScope®

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CHAPTER 1

APPLICATION OVERVIEW



Access the untapped potential in your fiber network with help from CommScope

With the rise of the cloud, the internet of things, smart city applications, and the anticipated arrival of 5G, the need for high-bandwidth, low-latency, future-ready networks is increasing rapidly. In addition, service providers and multisystem operators (MSOs) are challenged to provide significantly more symmetrical bandwidth and comparable performance for download as well as upload. User expectations are no less demanding: They expect always-on ubiquitous connectivity.

Fiber-optic cable is key to supporting today's bandwidth-intense applications. However, deploying new fiber is time-consuming and costly. How do you adapt your existing fiber infrastructure to support new services, add network capacity and guarantee the service performance your users expect? The short answer—passive optical components (POCs).

CommScope has developed and packaged passive optical components into several families of passive optical devices (PODs) that make it easy and fast for you to integrate them into your network. Adding PODs to an existing fiber infrastructure enables you to add capacity and deploy new network services quickly and efficiently. It is a proven strategy for increasing the performance of today's high-bandwidth fiber networks.

CommScope's POD-integrated solutions enable you to:

- Increase capacity on existing networks without adding fiber
- Reduce costs and improve optical performance
- Deploy faster and accelerate your return on investment
- Monitor network traffic
- Coexist services on a single fiber

Integrated POD solutions are just another way CommScope helps you maximize the potential of your most important asset while increasing your revenue.

Value of passive optical devices is quickly rising

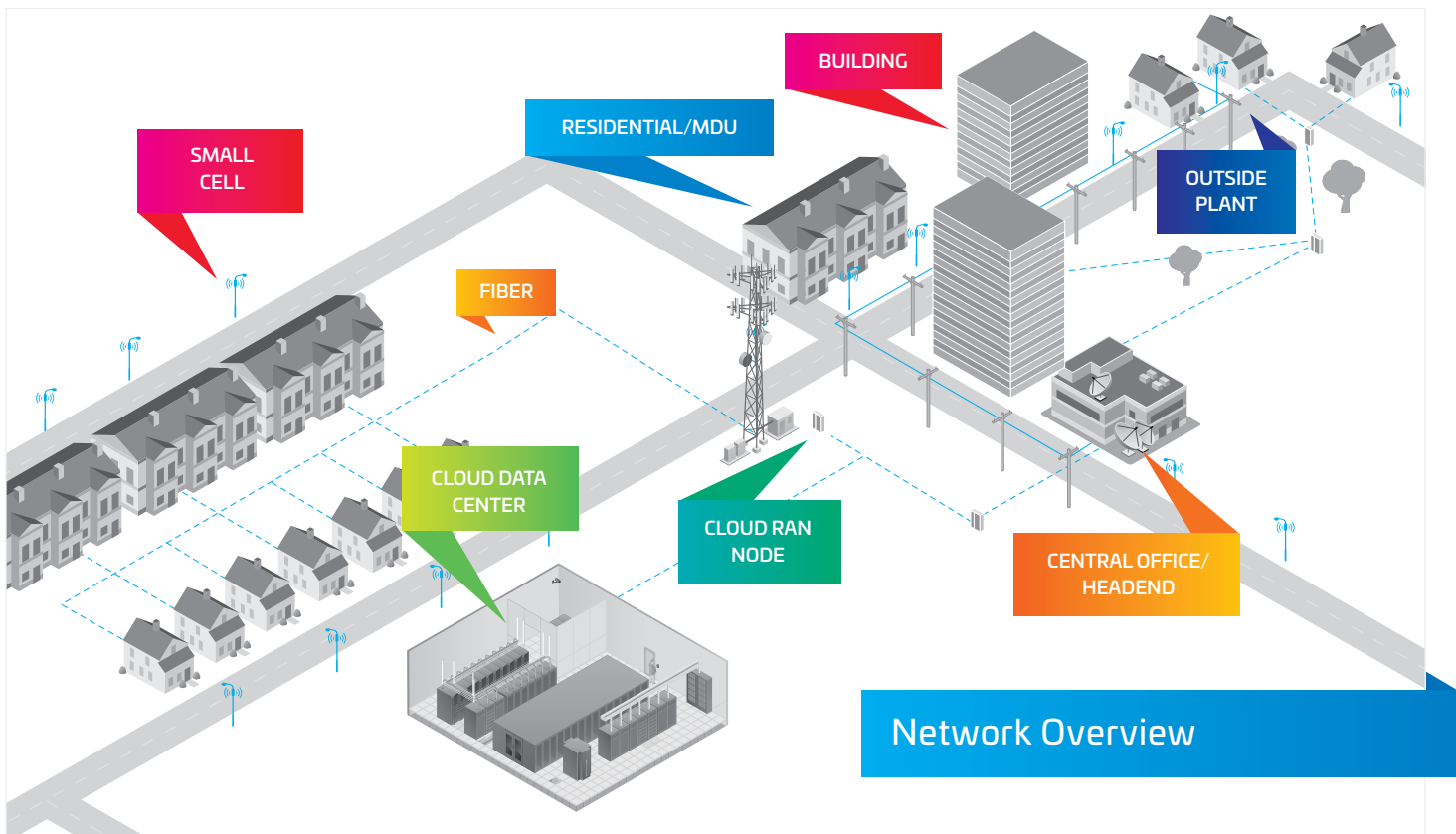
Developments in smart city applications, 5G and other new technologies have highlighted the value of passive optical devices across the fiber network—from the central office and backbone to the access network.

By 2020, global sales of PODs are expected to exceed \$45 billion¹.

PODs—including splitters, multiplexers and monitoring modules—are a compelling option as service providers and MSOs look to turn up services faster and recognize revenue sooner.

¹ Allied Market Research, April 2017





Integrated passive optical devices for your key applications

Applications

- **Wavelength division multiplexers (WDMs) and de-multiplexers** are used to combine multiple signals for transport on a single fiber (multiplexing) and to separate combined signals for distribution to multiple destinations (de-multiplexing). This increases the bandwidth available on your existing fiber.
- **Monitoring modules** offer non-intrusive monitoring and troubleshooting by monitoring network traffic proactively rather than relying on customers to report outages or other issues.
- **Optical splitters** divide the optical signal. In a traditional PON deployment, the optical splitter allows a single transceiver to serve multiple premises through a single fiber.
- **Coexistence modules** enable you to support multiple services on a single fiber. For example, you can offer XGS-PON and NGPON2 over the existing PON fiber infrastructure without changing the outside plant.

CommScope's plug-and-play passive optical devices support network performance upgrades and provide standardized or customized configurations that can be integrated quickly and easily with CommScope's product portfolio.

Add fiber capacity easily and cost-effectively with integrated WDM (multiplexing/de-multiplexing)

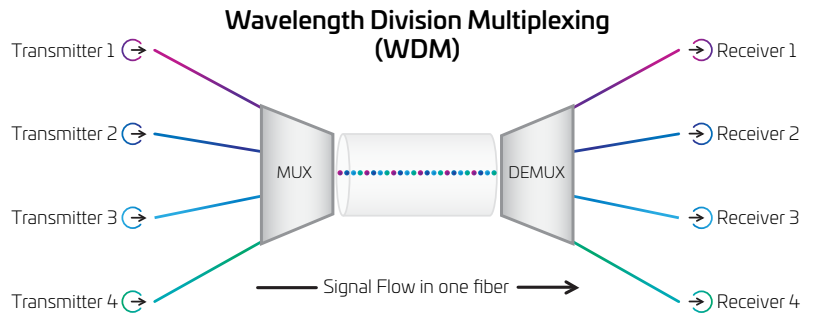
As data and bandwidth demands increase, network operators often look to add more fiber to increase their system's capacity. This is a costly and timely approach, which often prevents operators from meeting their required turn-up schedules.

CommScope's integrated WDM solutions can immediately address the added cost and time to deploy additional fiber and accelerate turn-up of new services.

Wavelength division multiplexing (WDM) enables different services to be transmitted at different wavelengths without the signals interfering with each other. It is analogous to a futuristic multi-lane highway in which each car has its own lane and can travel at its own speed without interference from traffic in the other lanes.

Using a "multiplexer" (mux), many different wavelengths can be combined and transmitted simultaneously on a single fiber. On the receiving end, the combined signal is "unscrambled" by a de-multiplexer (demux).

CommScope offers integrated POD solutions for inside-plant and outside-plant deployments that take advantage of the two main types of wavelength division multiplexing:

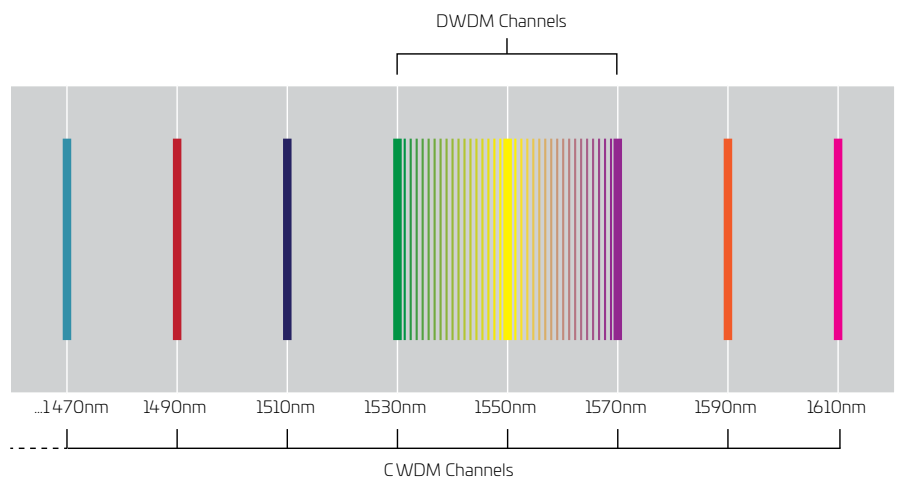


Multiplexing and de-multiplexing principle

CWDM Coarse wavelength division multiplexing	Typically 4, 8 or more channels	18 channels available (1271 nm to 1611 nm)	Channel spacing of 20 nm	No amplification possible over the transmission board
DWDM Dense wavelength division multiplexing	Typically 8-40 channels	96 channels available (1528.77 nm to 1606.6 nm)	Channel spacing of 0.8 nm	Dense spacing around 1550 nm allows amplification with EDFA (erbium-doped fiber amplifier)

CWDM and DWDM wavelengths in the C and L bands

DWDM channels are spaced much closer than CWDM channels



Integrated WDM solutions

CommScope's WDM solutions require neither power nor fiber installation permitting, making them quick and easy to install and maintain. Speed- and technology-agnostic, they work with service providers' existing equipment, enabling different services and technologies to be deployed on the same fiber. Because each wavelength exists as a separate and independent data pathway, customer traffic is secure.

CommScope's WDM products enable operators to:

- Support high-speed, high-capacity throughput with low latency
- Minimize CapEx and improve quality of service
- Utilize 100 percent of their fiber investment
- Deploy GPON, CPRI, and Ethernet in the same network
- Easily migrate from 1G to 100G and higher

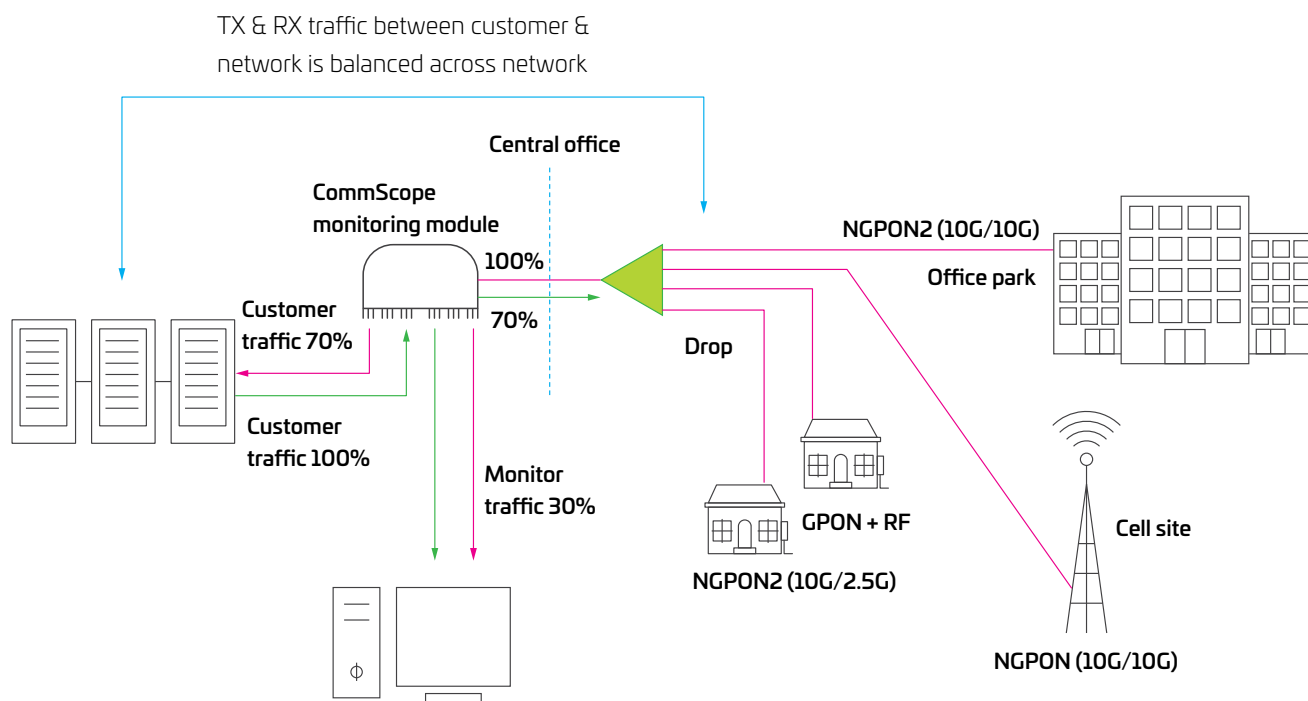
CommScope products and product locations for Mux/Demux applications

Integrated WDM solutions

Application Location	Products
BUILDING	FOSC, OCM6, FSASA2, LGX, NG4/FACT
RESIDENTIAL/MDU	FOSC, OCM6, FSASA2
CLOUD RAN NODE	FOSC, LGX, NG4/FACT
CENTRAL OFFICE/ HEADEND	LGX, NG4/FACT

Non-intrusive network monitoring

CommScope's integrated monitoring modules allow network operators to passively monitor and test their fiber-optic network signals. Integrating these capabilities into a passive optical device inserted in the network enables operators to identify physical layer issues and avoid costly downtime. The modules take a portion of the signal at a single point in the central office to monitor network traffic in real time



Example of monitoring module in network

CommScope's monitoring solutions enable:

- CPRI® (Common Public Radio Interface) monitoring of the signal between the remote radio head (RRH) and base band unit (BBU) in wireless deployments
- Passive mirroring for 100 percent of network traffic—including errors and non-standard network traffic—to enable detailed analysis, security, and monitoring
- Monitoring of singlemode and multimode fiber connections
- Non-intrusive monitoring and troubleshooting of network links
- Module operation without IP address or power for high reliability

Our integrated monitoring solutions feature:

- Multiple circuits per module or housing
- Support for singlemode and multimode applications
- LC APC and LC UPC connectors


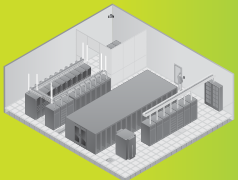
CommScope products and product locations for monitoring applications

Non-intrusive monitoring modules



CENTRAL OFFICE/
HEADEND

NG4/FACT



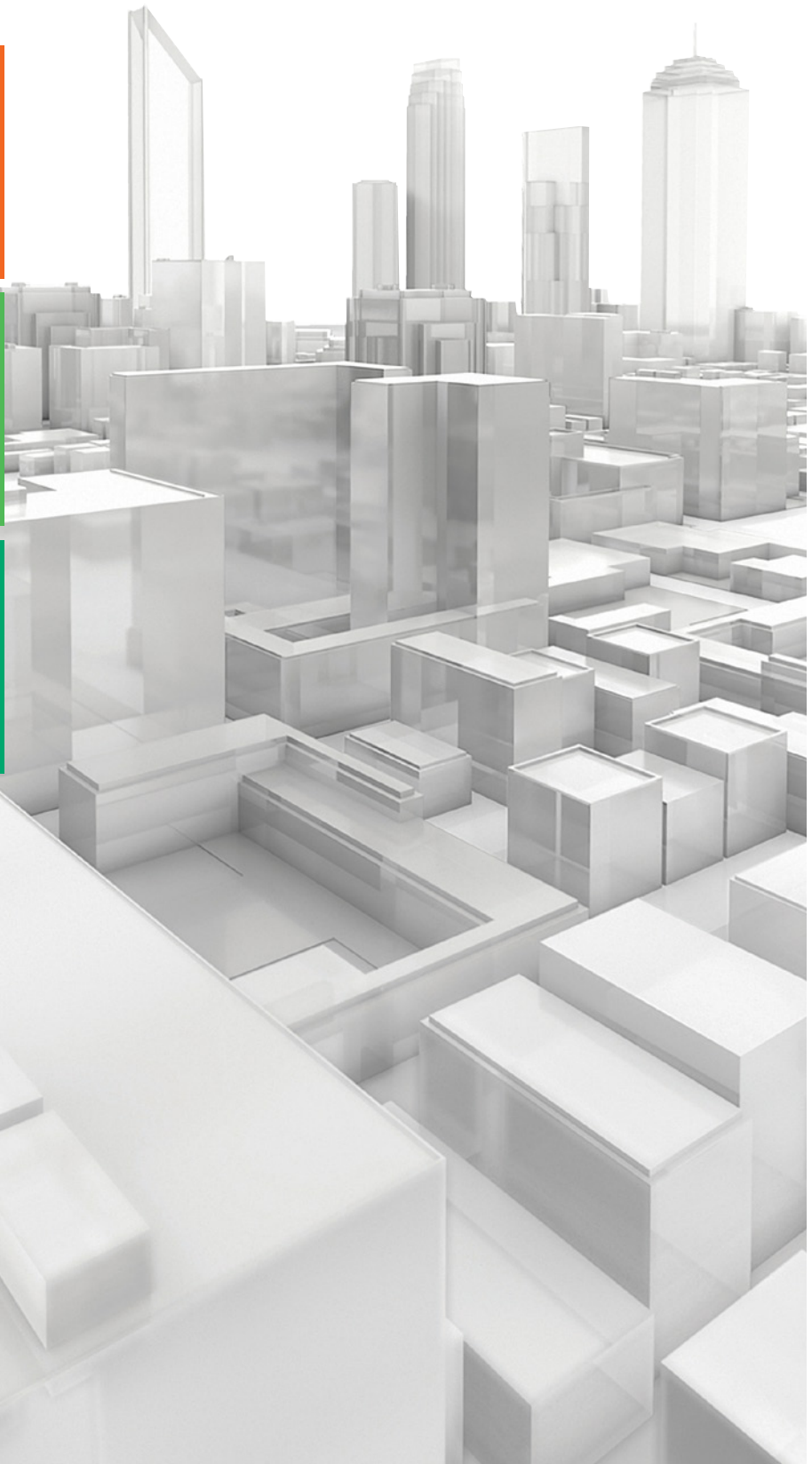
DATA CENTER

NG4/FACT



CLOUD RAN NODE

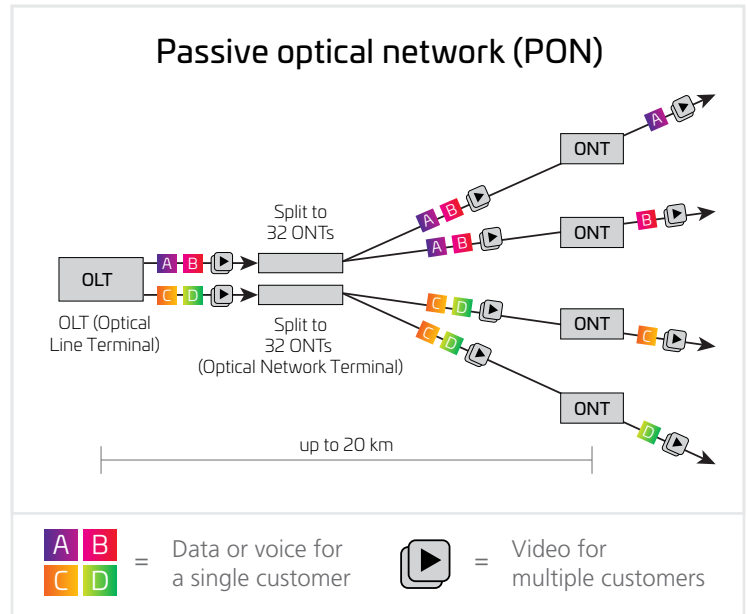
NG4/FACT



PON network deployment

Passive optical network (PON) architectures are being adopted at an increasing rate by network operators looking for a more economical solution to roll out new services and applications. By dividing the optical signal with passive optical splitters placed deeper in the network, a single transceiver can serve multiple premises using a single optical fiber. These splitters can be installed in the central office, in the field, or in the basement of a multidwelling unit for use in any FTTx network.

A **PON network** is a point-to-multipoint architecture that reduces the amount of fiber and central office equipment required when compared to point-to-point architectures.

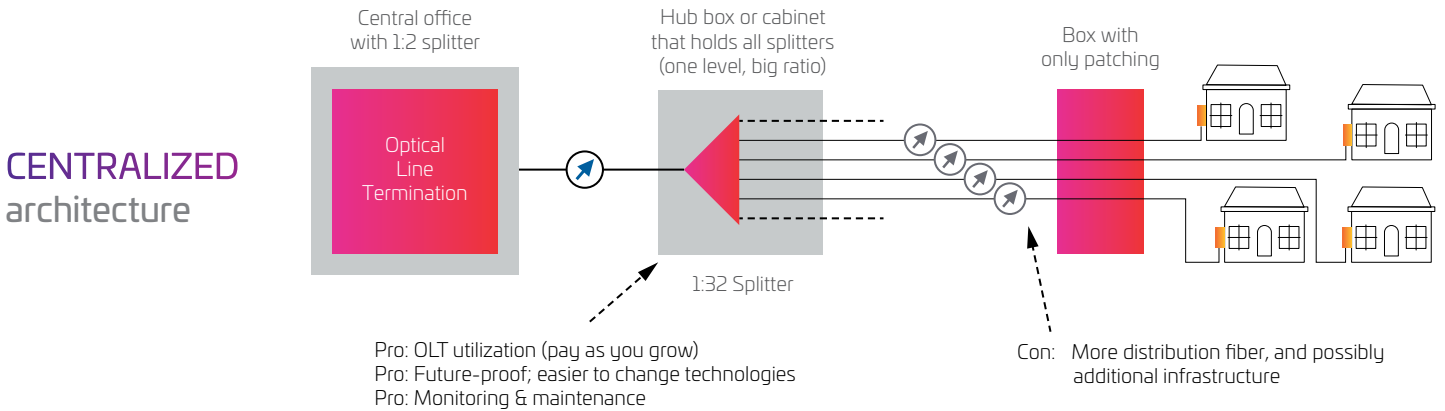


As completely passive components, splitters do not provide any switching capabilities; they simply split and distribute the signal to multiple optical network terminals (ONT). Each ONT selects the packets of data intended for it.

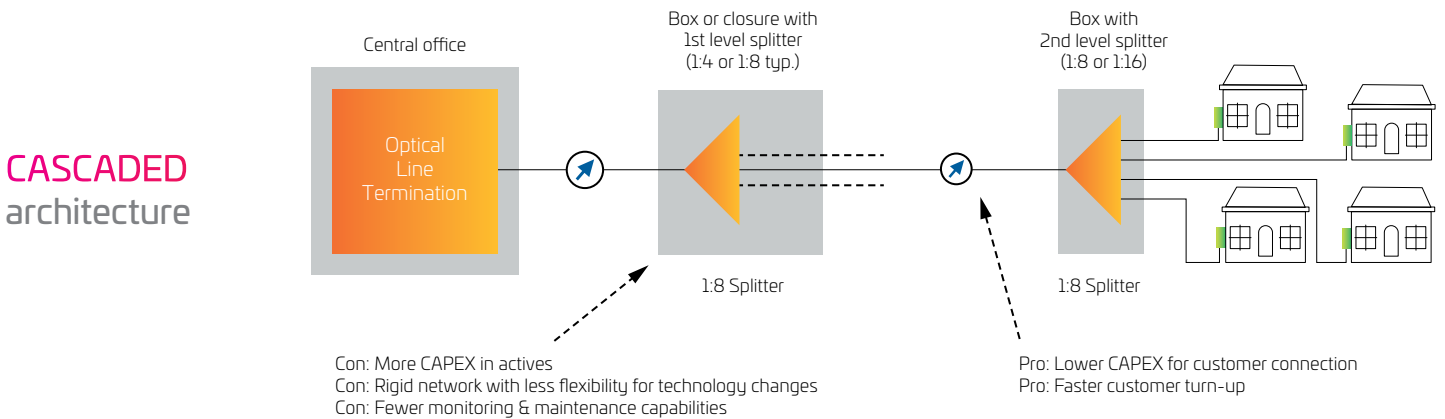
The optical splitter used in PON-based point-to-multipoint networks can be placed at different locations in the network. Various designs include a centralized split architecture or a distributed split (cascaded) architecture.



The **centralized approach** features single-stage splitters located within a central hub and deployed in a star or daisy chain topology. This architecture provides optimal flexibility for managing subscriber connections and connecting equipment. Another advantage is that it provides an easily accessible testing point.

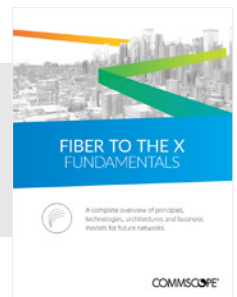


A **cascaded architecture** utilizes multiple splitters in series to achieve the overall desired split ratio. This approach reduces the amount of fiber in the distribution area by moving part of the splitting process to the access point where the subscriber drops are connected.



For more information about different types of architectures, download our FTTX Fundamentals eBook

download



CommScope's splitter products enable:

- Faster turn-up of new and existing PON networks
- Reliability and performance in outside plant environments
- Low insertion-loss (IL) specifications
- Generation of customer test reports and reliability certification

CommScope products and product locations for PON network build applications

Splitter modules



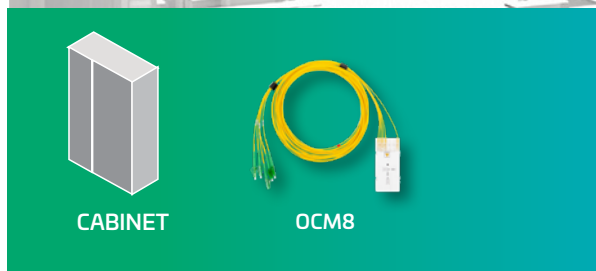
RESIDENTIAL/MDU OCCIP OCM8 FIST-OC-SC

This block features a blue background. On the left is an icon of a residential building. To its right are three product images: a black rectangular OCCIP module, a yellow coiled OCM8 fiber optic cable, and a black FIST-OC-SC fiber optic cable with a red connector.



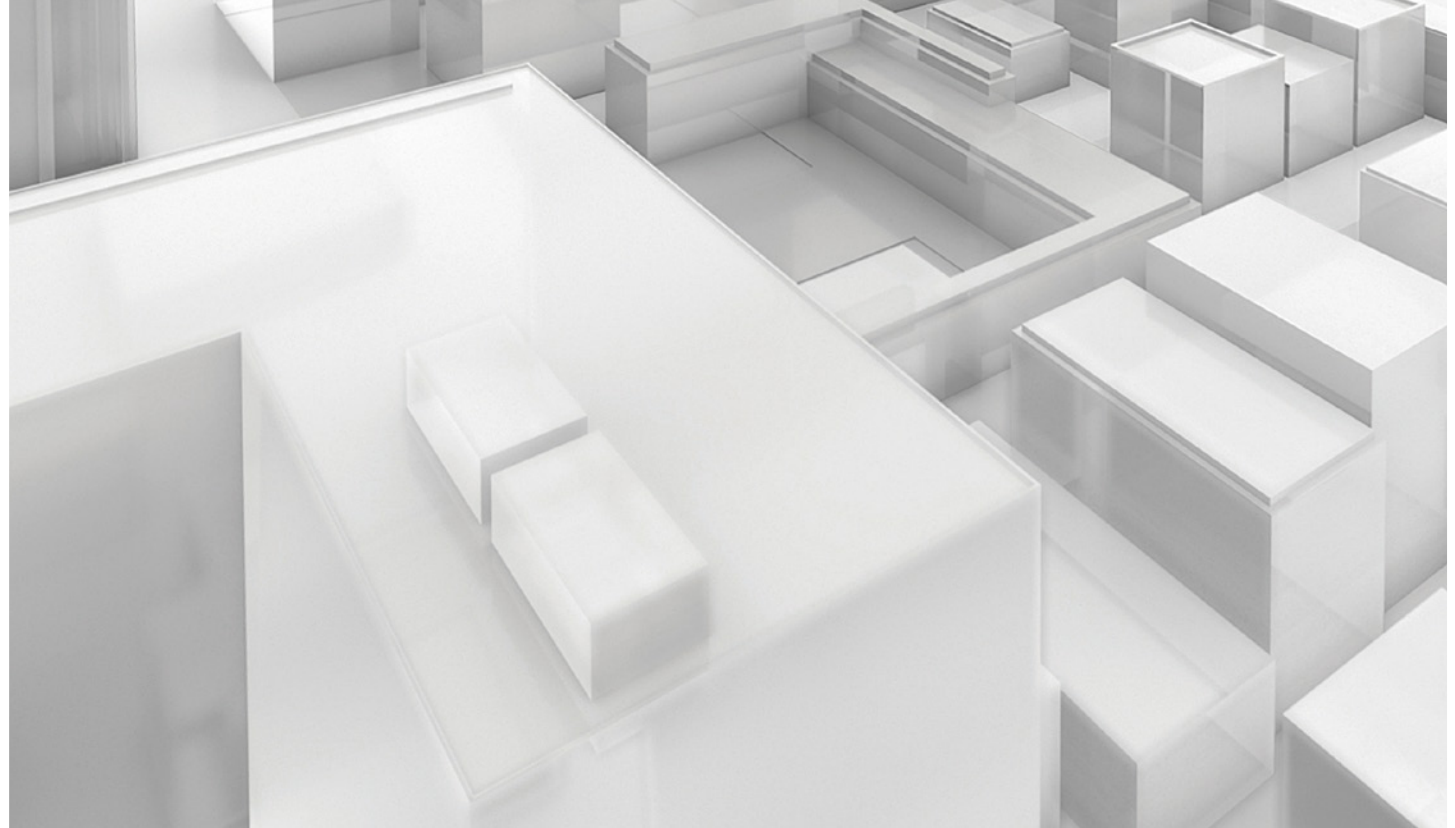
CENTRAL OFFICE/
HEADEND NG4/FACT

This block features an orange background. On the left is an icon of a central office building with satellite dishes. To its right is an image of a black NG4/FACT fiber optic cable with a red connector.



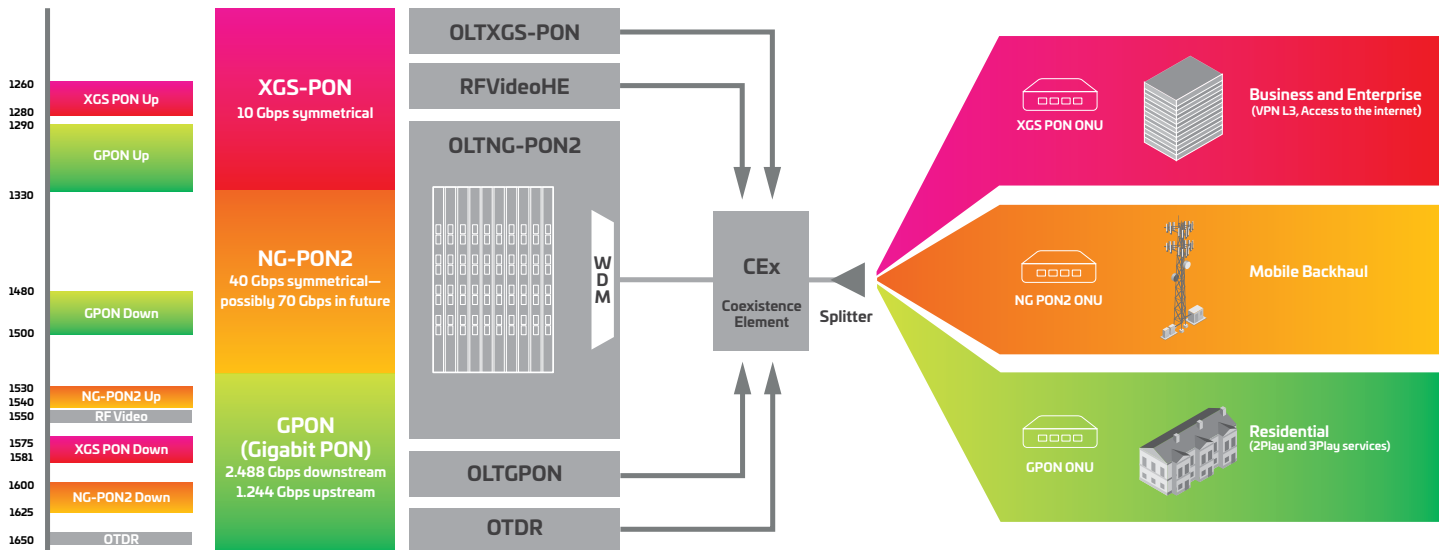
CABINET OCM8

This block features a teal background. On the left is an icon of a cabinet. To its right is an image of a yellow coiled OCM8 fiber optic cable with a red connector.



Upgrade existing PON networks with coexistence modules

Upgrading your existing PON network enables you to increase data speed and deliver additional services without having to replace your existing PON infrastructure. Additionally, CommScope’s passive optical devices support your migration to next-generation PON (XGS-PON or NG-PON2) services while controlling costs. Our portfolio of coexistence (CEx) modules are integrated into the network near the OLT (optical line terminal)—enabling existing PON services to coexist with XGS-PON, NG-PON2, RF video, OTDR (optical time domain reflectometer), as well as other current and future technologies.

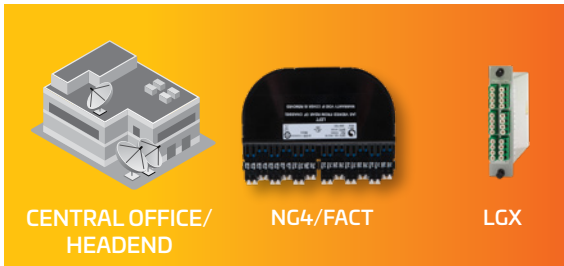


CommScope’s CEx products enable:

- Multiple PON services over existing OSP infrastructure
- Increased speed and performance over GPON systems
- Utilization of unused spectrum

CommScope products and product locations for PON upgrade applications

Co-existence modules






CHAPTER 2

PRODUCT INFORMATION



Inside plant— central office, headend, controlled environment

	NG4 Single High	NG4 Double High	NG4 Triple High
			
Location	CO/Headend	CO/Headend	CO/Headend
Indoor/Outdoor Rating	Indoor	Indoor	Indoor
Mounting	NG4 Chassis and FACT	NG4 Chassis	NG4 Chassis
Connectors	24 LC Max	24 LC Max	48 LC Max
Staggered Adapters	Yes	Yes	Yes
Application			
CWDM & DWDM*	Max 4 4ch circuits per module Max 2 8ch circuits per module Max 1 16ch circuits per module	Max 4 4ch circuits per module Max 2 8ch circuits per module Max 1 20ch circuits per module	Max 1 40ch circuits per module
CEx**	Max 8 3port circuits per module	Max 8 3port circuits per module	Max 16 3port circuits per module
Monitoring***	Max 4 circuits per module	Max 4 circuits per module	Max 8 circuits per module

* Circuit quantity is # of wavelengths, upgrade and common port - TX & RX Test ports, Express Ports available as options

** CEx circuit is number of inputs + 1 common - Available technologies/inputs - GPON, XGS PON, NGPON2 RF Video, OTDR

*** Monitoring circuit is Source TX & RX, Monitor TX & RX and Customer TX & RX for a total of 6 connectors per circuit

Mounting options

NG4 Chassis



CAPACITY:

- 24 - single high modules
- 12 - double high modules
- 8 - triple high modules

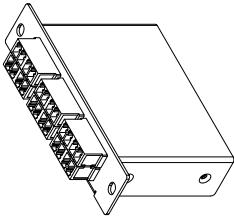
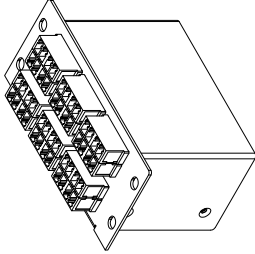
FACT NG4 Chassis



CAPACITY:

- One single high module per tray
- Two single high modules per element

Inside plant— central office, headend, controlled environment

	LGX Single Wide (OCM1)	LGX Double Wide (OCM2)
		
Location	CO/Headend	CO/Headend
Indoor/Outdoor Rating	Indoor	Indoor
Mounting	FPS-OCM/LGX Chassis	FPS-OCM/LGX Chassis
Connectors	24 LC Max	48 LC Max
Staggered Adapters	No	No
Application		
CWDM & DWDM*	Max 4 4ch circuits per module Max 2 8ch circuits per module Max 1 20ch circuits per module	Max 8 4ch circuits per module Max 4 8ch circuits per module Max 2 20ch circuits per module
CEx**	Max 8 3port circuits per module	Max 16 3port circuits per module
Monitoring***	Max 4 circuits per module	Max 8 circuits per module

* Circuit quantity is # of wavelengths, upgrade and common port - TX & RX Test ports, Express Ports available as options

** CEx circuit is number of inputs + 1 common - Available technologies/inputs - GPON, XGS PON, NGPON2 RF Video, OTDR

*** Monitoring circuit is Source TX & RX, Monitor TX & RX and Customer TX & RX for a total of 6 connectors per circuit

Mounting options

1RU Chassis

CK3903-000/FPS-OCM-K-F



CAPACITY:

3 - single wide modules

3RU Chassis

CC7806-000/FPS-OCM-I-F

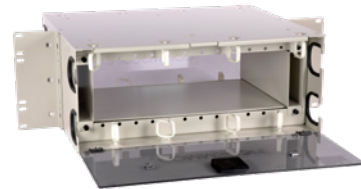


CAPACITY:

12 - single wide modules
6 - double wide modules

4RU Chassis


FBPS-LGX-4RU-PW



CAPACITY:

14 - single wide modules per side/28 total
7 - double wide modules per side/14 total

Outside plant—non-controlled environment

OCM6 modules	
	
Location	OSP
Indoor/Outdoor Rating	Outdoor
Mounting	OCSH-K Shelf BUDI
Connectors	LC
Application	
CWDM & DWDM*	Max 4 4ch circuits per module Max 1 8ch circuits per module
CEx**	Max 8 3port circuits per module

*Circuit quantity is # of wavelengths, upgrade and common port - TX & RX Test ports, Express Ports available as options

** CEx circuit is number of inputs + 1 common - Available technologies/inputs - GPON, XGS PON, NGPON2 RF Video, OTDR

Mounting options

1RU Shelf

EH3193-00/OCSE-K-OCM6/8



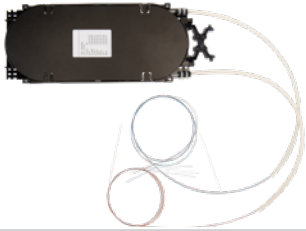

Shelf for central office and cabinet applications

BUDI with OCM6



Building distribution box (BUDI) for multi-dwelling units

Outside plant—non-controlled environment

	FOSC A Tray	FOSC D Tray
		
Location	OSP	OSP
Indoor/Outdoor Rating	Outdoor	Outdoor
Mounting	FOSC Enclosure	FOSC Enclosure
Connectors	N/A - 250 micron fiber for splicing	N/A - 250 micron fiber for splicing
Application		
CWDM & DWDM*	Max 4 4ch circuits per module Max 2 8ch circuits per module Max 1 12ch circuits per module Max 1 20ch circuits per module	Max 8 4ch circuits per module Max 4 8ch circuits per module Max 2 20ch circuits per module Max 1 48ch circuits per module

* Circuit quantity is # of wavelengths, upgrade and common port - TX & RX Test ports, Express Ports available as options

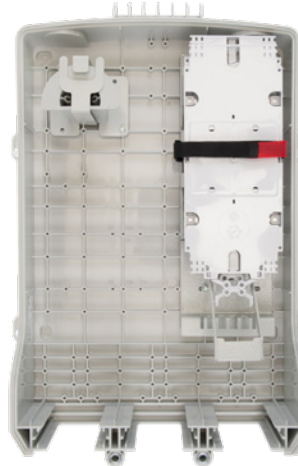
Mounting options

FOSC Enclosure




Outside plant enclosure

BUDI with FOSC tray



Multi-dwelling unit building distribution box

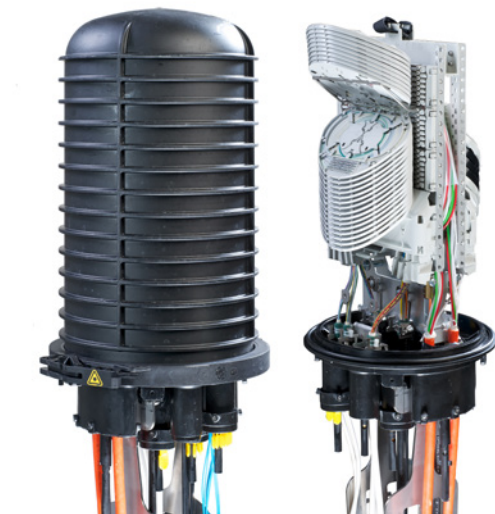
Outside plant—non-controlled environment

	FIST-FSASA2
	
Location	OSP
Indoor/Outdoor Rating	Outdoor
Mounting	FIST Organizers & Enclosures
Connectors	N/A - 250 micron fiber for splicing
Application	
CWDM & DWDM*	Max 2 4ch circuits per module Max 1 8ch circuits per module

* Circuit quantity is # of wavelengths, upgrade and common port - TX & RX Test ports, Express Ports available as options

Mounting options

FIST Enclosure




CHAPTER 3

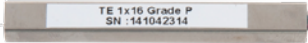
SPLITTER ORDERING INFORMATION



Splitters

- Field-installable holder or as a bare device
- Singlemode, wideband splitters
- Split ratios from 1:2 to 1:64
- PLC (planar technology)
- 250-micron fiber with 2.5-meter lead

Field-installable housing	Ratio	Splitter MID	Splitter description
	1x2	554944-000	OCC1P-10200-NNNQNF
	1x4	CC9545-000	OCC1P-10400-NNNQNF
	1x8	CC8542-000	OCC1P-10800-NNNQNF
	1x16	CC8544-000	OCC1P-11600-NNNQNF
	1x32	CC8312-000	OCC1P-13200-NNNQNF
	1x64	CC8313-000	OCC1P-16400-NNNQNF

Bare device housing	Ratio	Splitter MID	Splitter description
	1x2	733343-000	OCC1P-10200-NNNQQA
	1x4	A13551-000	OCC1P-10400-NNNQQA
	1x8	F08852-000	OCC1P-10800-NNNQQA
	1x16	E43774-000	OCC1P-11600-NNNQQA
	1x32	A11601-000	OCC1P-13200-NNNQQA
	1x64	CC8284-000	OCC1P-16400-NNNQQA

CommScope provides standardized solutions for PON network deployments. For other applications, we invite you to contact your CommScope representative who can help you configure the most appropriate POD for your requirements.

[contact us](#)

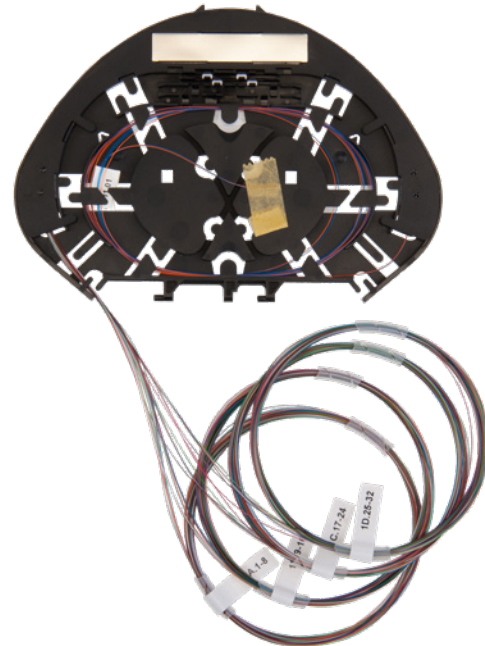
FIST-OC-SC

Optical component single circuit

CommScope's FIST-OC-SC splitter family offers a flexible platform for splicing and the addition of optical components in outside plant closures and customer premises wall boxes. The fibers are attached to the cassette to ensure failure-free installation and better protect splitter components from outside forces.

Features

- Tray height of 4 millimeters
- Split ratios up to 1:32
- On-tray splice capacity for the input fiber(s) for SMOUV and ANT splice protectors
- Output fibers can be easily rerouted to the other side
- A metal plate protects the fiber-optic splitter



Splitter size	Splitter MID	Splitter description
1x2	760241819	FIST-OC-SC-P112
1x4	760241820	FIST-OC-SC-P114
1x8	760241821	FIST-OC-SC-P118
1x16	760241822	FIST-OC-SC-P11G
1x32	760241823	FIST-OC-SC-P11W

OCM8

OCM8 features

- Three sizes (small, medium and large)
- Accommodates any symmetrical split ratio from 1:2 to 1:64
- High-performance 1.8-meter LSZH fiber-optic cables
- Factory assembled with LC Grade-B connectors
- Designed for high-density environments
- Simple integration into any central office, fiber distribution hub, or MDU BUDI box application
- Stackable and easily mounted into CommScope's OCSH-K-OCM6/8 shelf



PON build standard components

For cabinet

FIST-CAB5 application

Splitter size	MID	Splitter description
1x2	760242019	OCM8-SP112NLG-20DB
1x4	760242014	OCM8-SP114NLG-20DB
1x8	760242018	OCM8-SP118NLG-20DB
1x16	760242015	OCM8-SP11GNLG-20DB
1x32	760242017	OCM8-SP11WNLG-20DB
1x64	760242016	OCM8-SP11ZNLG-20DB
1x2	760241980	OCM8-SP112LLG-20DB
1x4	760241649	OCM8-SP114LLG-20DB
1x8	760241981	OCM8-SP118LLG-20DB
1x16	760241982	OCM8-SP11GLLG-20DB
1x32	760241983	OCM8-SP11WLLG-20DB
1x64	760241984	OCM8-SP11ZLLG-20DB

For optical distribution frame

FIST-GR3 application

Splitter size	MID	Splitter description
1x2	760242094	OCM8-SP112NLG-40DB
1x4	760242097	OCM8-SP114NLG-40DB
1x8	760242091	OCM8-SP118NLG-40DB
1x16	760242090	OCM8-SP11GNLG-40DB
1x32	760242089	OCM8-SP11WNLG-40DB
1x64	760242088	OCM8-SP11ZNLG-40DB
1x2	760242092	OCM8-SP112LLG-40DB
1x4	760242096	OCM8-SP114LLG-40DB
1x8	760241576	OCM8-SP118LLG-40DB
1x16	760242098	OCM8-SP11GLLG-40DB
1x32	760242095	OCM8-SP11WLLG-40DB
1x64	760242093	OCM8-SP11ZLLG-40DB

For multidwelling unit

FIST-BUDI application

Splitter size	MID	Splitter description
1x16	760242013	OCM8-SP11GNLG-61CB
1x16	760242012	OCM8-SP11GLLG-61CB
1x32	760238666	OCM8-SP11WNLG-72CB
1x32	760242011	OCM8-SP11WLLG-72CB

Module storage shelf OCSH-K-OCM6/8

The OCSH is a mechanical shelf assembly that accommodates the OCM6/8 splitter or xWDM modules in a rack or cabinet.

Features

- Typically used in 15-inch, ETSI or 19-inch active racks, or data racks
- Can be front mounted
- Occupies one height unit
- Front access to the modules
- Pigtails can exit the shelf left or right—maximum capacity is 340x1.8 mm patch cords
- Integrated fiber cord management
- Simple plug and play of modules

OCSH-K dimensions:

- Height 44 mm x width 481 mm x depth 281 mm

Splitter size	MID	Splitter description
Module housing type	EH3193-000	OCSH-K-OCM6/8
Small		
Medium*		
Medium**		
Large		

*Medium housing containing splitters ≥ 32 outputs

**Medium housing containing splitters ≤ 16 outputs





Unlocking the potential of every new day.

Your network can do more—be more—than you may realize. Faster speeds, lower latency, speedier installation, enhanced high-bandwidth performance. Sometimes all you need is an experienced partner with a different perspective. That's CommScope.

We know networks, from the macro to the micro. We know what it takes to help you compete today and prepare for tomorrow. We've been doing it for more than 40 years, with the world's most respected service providers and MSOs. With solutions like our passive optical devices, we're ready to power your present and empower your future.

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