

A solid red circle.

FS FHD Series Data Sheet

Contents

1. Product Overview	3
2. Technology Basics	5
2.1 Dispersion	6
2.2 Attenuation	6
3. FHD Series DWDM Mux Demux	7
3.2 FHD-D82128EM3: 8CH C21-C28 DWDM Mux Demux	7
3.3 FHD-D82936EM: 8CH C29-C36 DWDM Mux Demux	8
3.4 FHD-D85360EM : 8CH C53-C60 DWDM Mux Demux	9
4. FHD Series CWDM Mux Demux	10
4.1 Overview	10
4.2 FHD-C82745EM: 8CH Low CWDM-band Mux Demux	10
4.3 FHD-C84761EM: 8CH High CWDM-band Mux Demux	12
5. Chassis	13
6. Application	14
6.1 DWDM Mux Demux	14
6.2 CWDM Mux Demux	14
7. Product Specification	15
7.1 FHD-D82128EM3	15
7.2 FHD-D82936EM	16
7.3 FHD-D85360EM	17
7.4 FHD-C82745EM	18
7.5 FHD-C84761EM	19
8. Ordering Information	20

1. Product Overview

The FS FHD Series Multiplexer/Demultiplexer is a high-density, cost-effective platform based on passive optical CWDM/DWDM filters. Featuring a modular cassette structure, this series supports rapid switching and expansion, offering flexible deployment and easy upgrades to facilitate smooth network evolution. The FHD Series Mux Demux can be deployed in mixed configurations with PLC, FAP, and MTP enclosures. It fully complies with ITU optical grid standards and achieves seamless interconnectivity with other FS product lines. Incorporating industry-leading components, this product delivers next-generation solutions for passive optical network requirements.

The FHD platform features a 1U high-density chassis design, supporting 4x 8CH CWDM/DWDM channels within a single 1U space. This achieves a 200% increase in module integration density, significantly saving data center rack space while supporting arbitrary data rates and multiple service types. By flexibly combining different modules, users can easily build various network topologies such as point-to-point, bus, or ring configurations, thereby meeting optical network deployment requirements across different scales and scenarios. The following products are included in the FHD series:



DWDM Mux Demux:

FHD-D82128EM3	8 Channels DWDM Mux Demux, 100GHz C21-C28, with Expansion, Monitor and 1310nm Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module
FHD-D82936EM	8 Channels DWDM Mux Demux, 100GHz C29-C36, with Monitor and Expansion Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module
FHD-D85360EM	8 Channels DWDM Mux Demux, 100GHz C53-C60, with Monitor and Expansion Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module

CWDM Mux Demux:

FHD-C82745EM	8 Channels CWDM Mux Demux, 1270-1450nm (Skip 1390, 1410nm), with Monitor and Expansion Port, 2.0dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module
FHD-C84761EM	8 Channels CWDM Mux Demux, 1470-1610nm, with Monitor and Expansion Port, 2.0dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module

1U 4-slot Chassis:

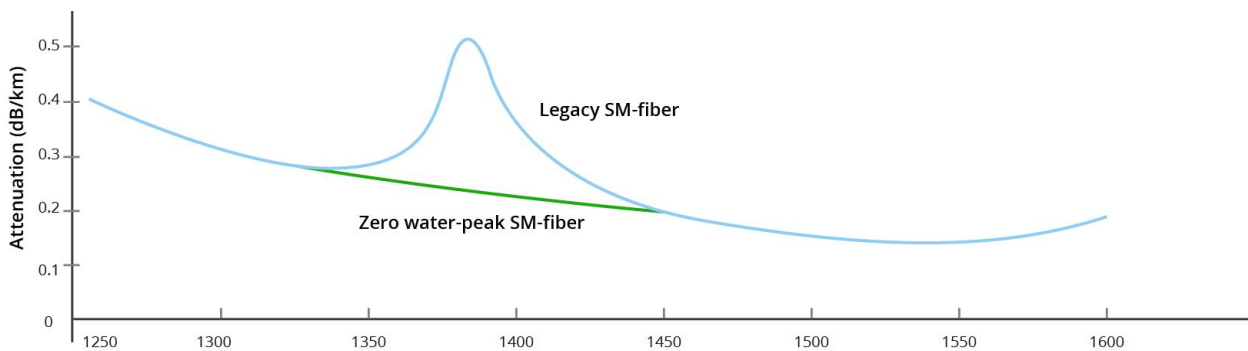
FHD-1U-CMP400	FHD® High Density 1U Rack Mount Modular Enclosure Unloaded, Rear Cable Managers, Holds up to 4 x FHD® Cassettes or Panels, 144 Fibers (LC)
----------------------	--

2. Technology Basics

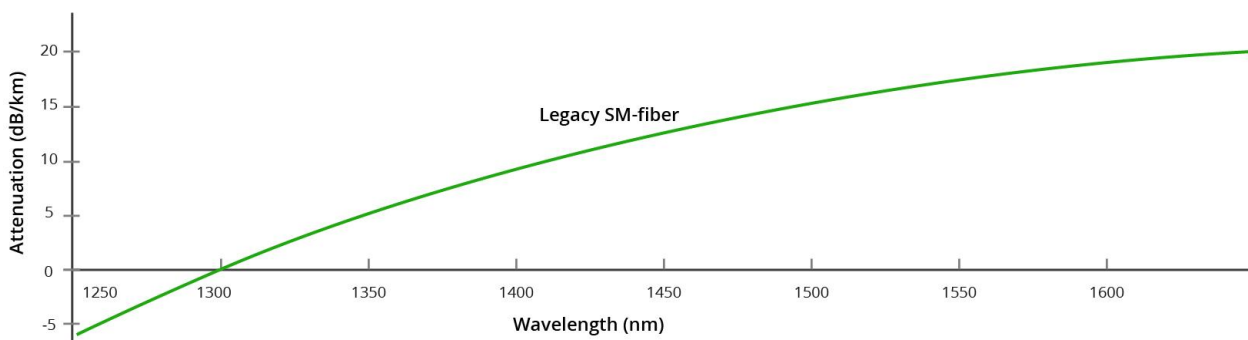
Generally, there are two main wavelength multiplexing technologies: DWDM and CWDM. Their respective spectral bands are illustrated in the following diagram.



Fundamentally, two key factors determine the maximum bridgeable distance of an optical signal in a fiber: attenuation and dispersion. Thus, both dispersion and attenuation limits must be considered.



The figure presents the wavelength-dependent dispersion of single-mode fiber, with values measured in picoseconds per nanometer-kilometer (ps/nm*km).



The figure illustrates the typical wavelength-dependent attenuation of single-mode fiber, measured in dB/km.

2.1 Dispersion

When these curves are incorporated into both CWDM and DWDM channels, it is clear that low-band CWDM channels suffer from more significant signal degradation owing to inherently higher fiber attenuation. In contrast, high-band CWDM and DWDM channels show lower attenuation but are subject to stronger dispersion effects.

2.2 Attenuation

Attenuation does not depend on bit rate; instead, it increases with fiber length as well as with the presence of connectors, splices, and optical filters. Dispersion, on the other hand, grows with distance and its influence intensifies as bit rate rises.

EDFA amplifiers can compensate for attenuation, but these devices are only operational in the 1550nm region where DWDM channels are placed, therefore, CWDM channels cannot use standard EDFA amplifiers. When amplifiers cannot be employed, alternative solutions include utilizing transceivers with high power budgets (between minimum transmitter power and receiver sensitivity) and implementing low-loss filters to mitigate attenuation effects.

Note:

- (1) The legacy G.652 fibers have water-peak attenuation, prompting many CWDM multiplexers/demultiplexers to exclude the most affected channels, typically reducing the low CWDM band to 8 channels. The newer G.652D single-mode fiber variant, now predominantly deployed, eliminates this water-peak attenuation.
- (2) Dispersion compensation can be achieved through specialized components, which can increase attenuation and usually require optical amplifiers to compensate for this additional loss. It should be noted that this approach is only viable for DWDM channels. Using spectrally "pure" lasers can reduce the effects of fiber dispersion. These typically have a higher price since they are more advanced.

To conclude:

- (1) CWDM solutions face attenuation and dispersion limitations, as they generally cannot employ optical amplifiers or dispersion compensation. Precise measurement of link characteristics (attenuation, dispersion) is essential to evaluate transceiver power budgets and dispersion limits, determining maximum channel count and achievable distance.
- (2) Unamplified DWDM solutions have the same limitation as CWDM solutions.
- (3) Amplified DWDM solutions can overcome attenuation and dispersion through compensation, but optical noise becomes the primary limiting factor.
- (4) Passive network designs permit straightforward additive calculations, while amplified networks necessitate sophisticated design tools.

Note:

Coherent 16QAM-based 400G channels can still run over a 100GHz spacing, but compared with lower-rate signals they need a broader spectrum allocation. As a result, when such 400G 16QAM traffic passes through conventional DWDM filters that lack support for wider passbands, its performance will be severely impaired.

3. FHD Series DWDM Mux Demux

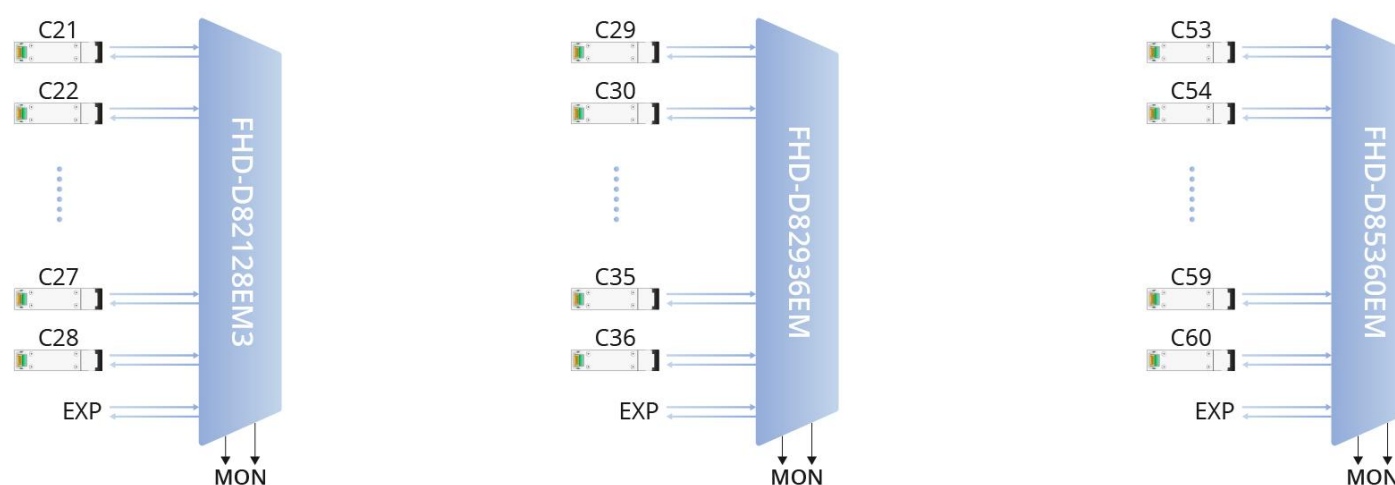
3.1 Overview

The DWDM spectrum is divided into multiple bands, among which the C-band (1530 nm–1565 nm) is the most extensively adopted, owing to its low fiber attenuation and full compatibility with conventional EDFA amplifiers. According to ITU-T Recommendation G.692.1, various channel grids are standardized, and the choice among them involves trade-offs among cost, modulation scheme, and symbol/bit rate.

The 100 GHz channel spacing remains the most prevalent in commercial systems, as the corresponding devices (such as optical transceivers and filters) are more cost-effective than those with 50 GHz spacing. Nevertheless, to support higher capacities, systems must adopt tighter channel spacing and often expand into the neighboring L-band (1565 nm–1625 nm) to accommodate more channels.

The FHD Series DWDM filters are designed for 100 GHz grid systems, offering a favorable balance between capacity and cost, making them well-suited for metro and access networks. This approach guarantees stable performance while supporting economical and scalable optical network deployment.

Three DWDM Mux/Demux filters are currently provided within the FHD Series.



3.2 FHD-D82128EM3: 8CH C21-C28 DWDM Mux Demux

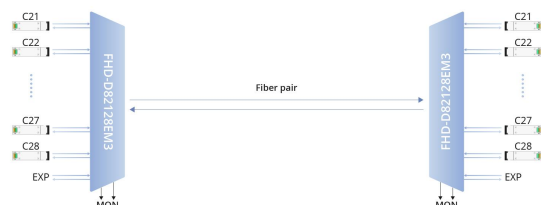
8 Channels DWDM Mux Demux, 100GHz C21-C28, with Monitor, Expansion and 1310nm Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module



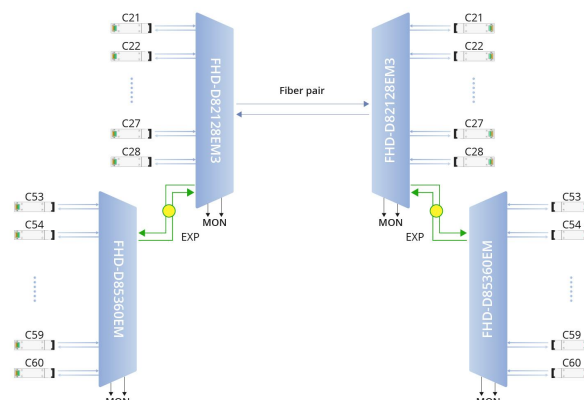
FHD-D82128EM3 wavelength and front plate

The monitor port extracts approximately 1% of both transmitted and received line signals, enabling real-time channel power monitoring through an attached Optical Channel Monitoring (OCM) device or optical spectrum analyzer.

Connecting two or more filters via expansion ports allows for an increase in the number of channels. Filters can be combined in any order, meaning they do not need to be connected in a continuous channel sequence.



Single DWDM Unit with Expansion Port



Multi-Unit DWDM System Interconnected via Expansion Port

3.3 FHD-D82936EM: 8CH C29-C36 DWDM Mux Demux

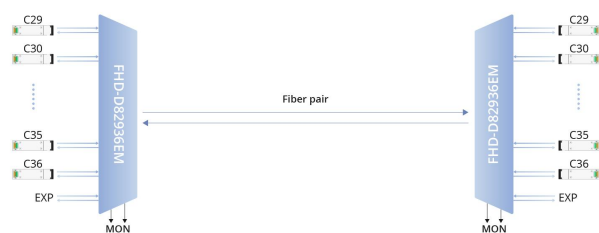
8 Channels DWDM Mux Demux, 100GHz C29-C36, with Monitor and Expansion Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module



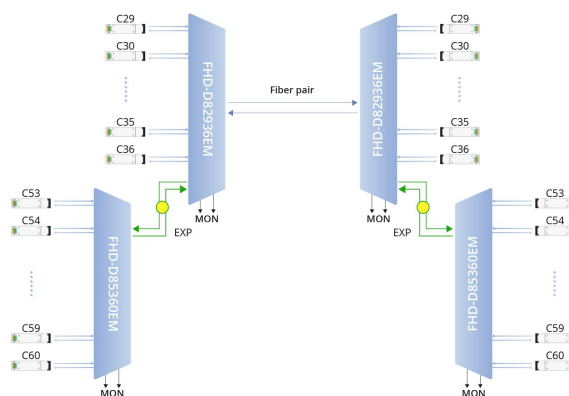
FHD-D82936EM wavelength and front plate

The monitor port extracts approximately 1% of both transmitted and received line signals, enabling real-time channel power monitoring through an attached Optical Channel Monitoring (OCM) device or optical spectrum analyzer.

Connecting two or more filters via expansion ports allows for an increase in the number of channels. Filters can be combined in any order, meaning they do not need to be connected in a continuous channel sequence.



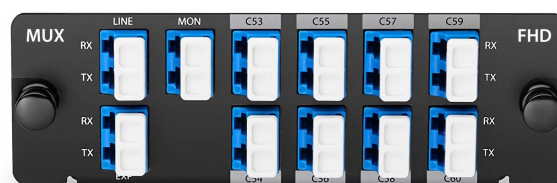
Single DWDM Unit with Expansion Port



Multi-Unit DWDM System Interconnected via Expansion Port

3.4 FHD-D85360EM : 8CH C53-C60 DWDM Mux Demux

8 Channels DWDM Mux Demux, 100GHz C53-C60, with Monitor and Expansion Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module



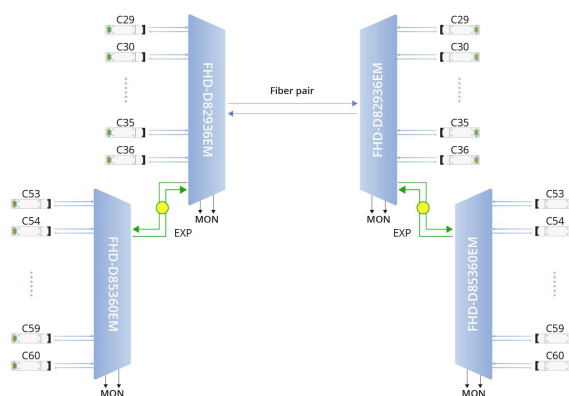
FHD-D85360EM wavelength and front plate

The monitor port extracts approximately 1% of both transmitted and received line signals, enabling real-time channel power monitoring through an attached Optical Channel Monitoring (OCM) device or optical spectrum analyzer.

Connecting two or more filters via expansion ports allows for an increase in the number of channels. Filters can be combined in any order, meaning they do not need to be connected in a continuous channel sequence.



Single DWDM Unit with Expansion Port



Multi-Unit DWDM System Interconnected via Expansion Port

4. FHD Series CWDM Mux Demux

4.1 Overview

The CWDM-band is partitioned into two distinct bands: a lower channel band (1270-1450nm) and an high channel band (1470-1610nm), with 20nm channel spacing as standardized in ITU-T G.694.2, exclusively supporting single-mode fiber transmission.

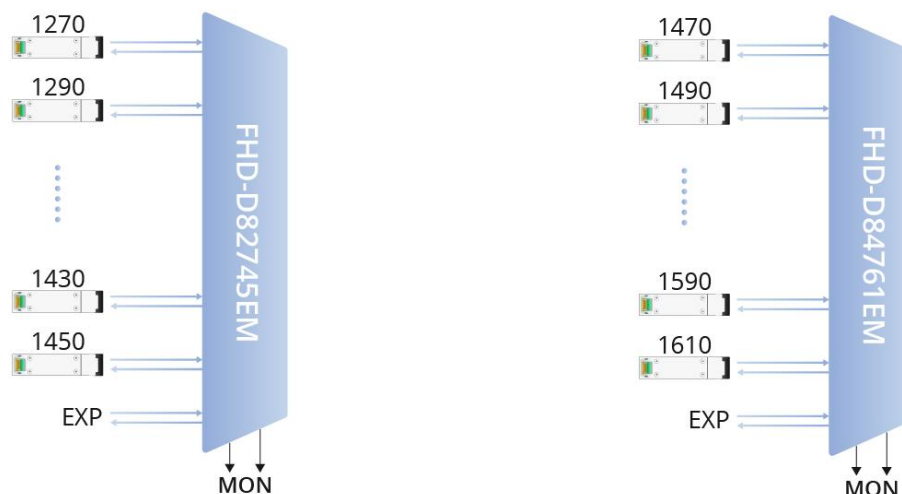
CWDM transmission over single-mode fiber is subject to increased intrinsic attenuation in the lower wavelength band, compounded by the water-peak effect prevalent in older fiber installations. These factors typically constrain the bridgeable distance for lower-band CWDM channels. FS CWDM filters strategically skip the two channels most impacted by water-peak absorption, resulting in an optimized 8-channel configuration for the lower band.

For long distances or scenarios with high link attenuation, coarse wavelength division multiplexing (CWDM) solutions may be limited to utilizing higher CWDM channel bands with inherently lower fiber attenuation. In such cases, dispersion may become a limiting factor.

Note:

The CWDM channel grid is fully compliant with the ITU-T G.694.1 standard, located at 1270nm, 1290nm, etc. with 20nm spacing. For historical reasons, CWDM channels are also referred to as "1270nm", "1290nm", etc. Regardless of the label or name, the actual wavelength always follows the ITU-T G.694.1 standard.

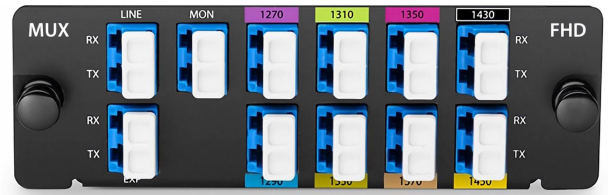
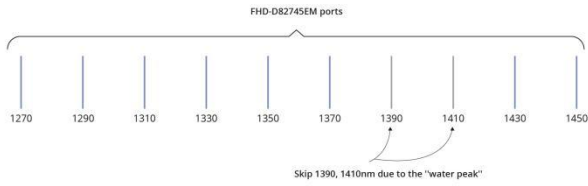
Two CWDM Mux/Demux filters are currently provided within the FHD Series.



4.2 FHD-C82745EM: 8CH Low CWDM-band Mux Demux

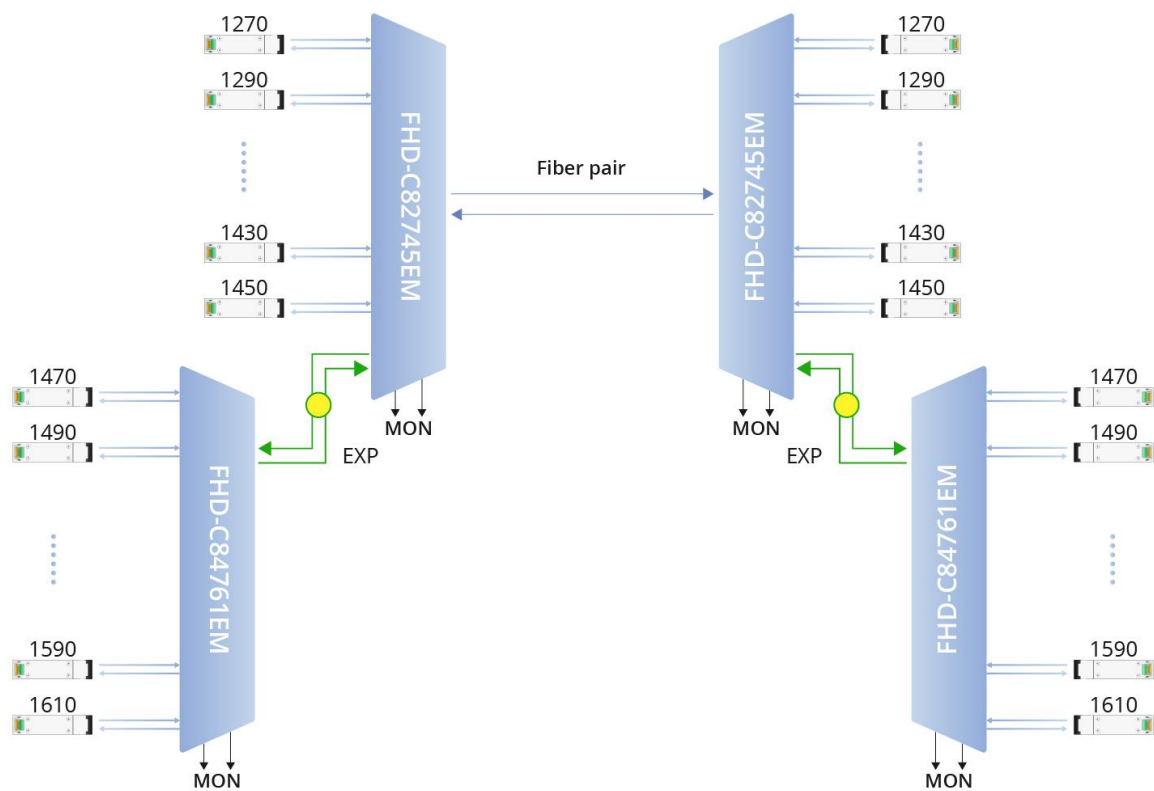
8 Channels CWDM Mux Demux, 1270-1450nm (Skip 1390, 1410nm), with Monitor and Expansion Port, 2.0dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module

As shown in the figure below, the two channels 1390nm and 1410nm are skipped since these are subject to the high water-peak attenuation that can be present in older fiber types.



FHD-C82745EM channels and front plate

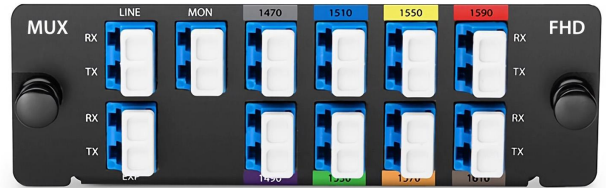
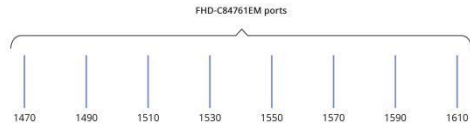
As shown in the figures below, the Expansion Port can be used to add on the high CWDM channel band for wavelength expansion.



Exemplified with FHD-C82745EM combined with 8CH CWDM high band filters

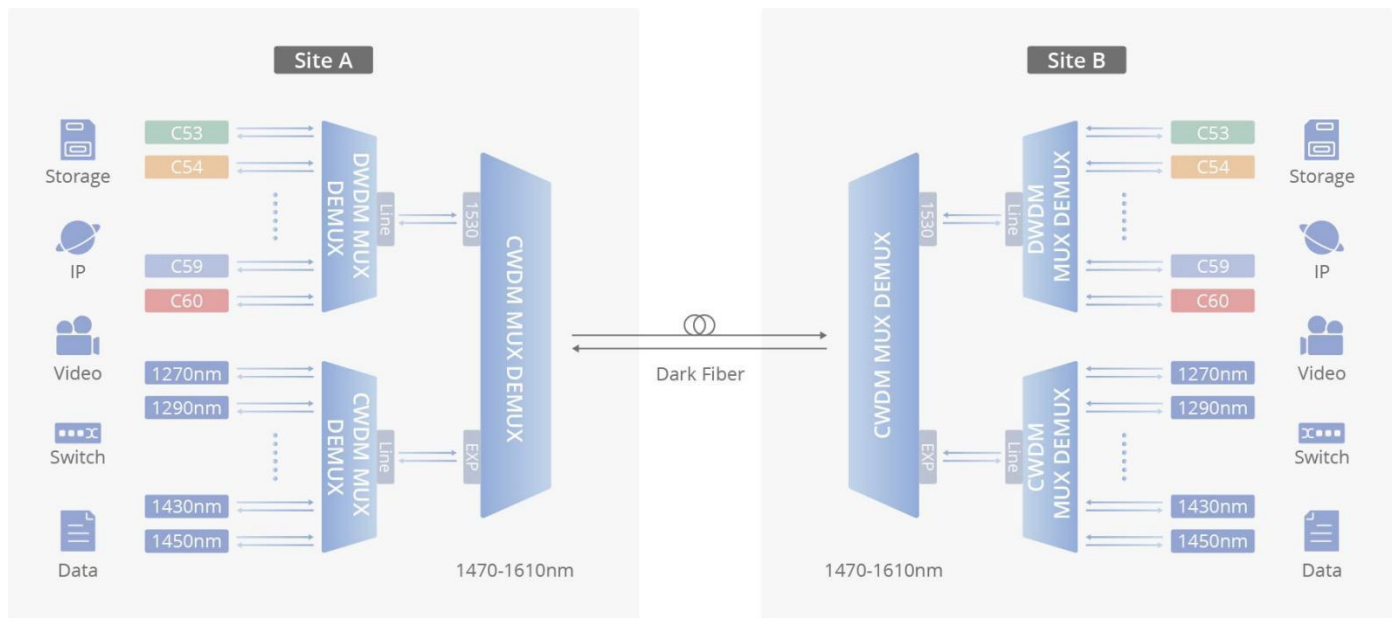
4.3 FHD-C84761EM: 8CH High CWDM-band Mux Demux

8 Channels CWDM Mux Demux, 1470-1610nm, with Monitor and Expansion Port, 2.0dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module



FHD-C84761EM channels and front plate

As shown in the figures below, by using the expansion port, 1530nm and 1550nm CWDM channels, it becomes possible to transmit multiple DWDM channels within a single CWDM channel, providing a solution that is both cost-effective and easily expandable.



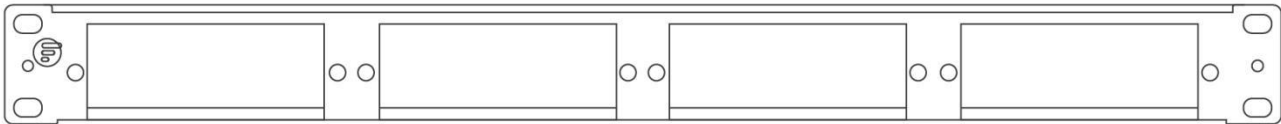
Exemplified with FHD-C84761EM combined with 8ch CWDM low band filters

5. Chassis

FHD® High Density 1U Rack Mount Modular Enclosure Unloaded, Rear Cable Managers, Holds up to 4 x FHD® Cassettes or Panels, 144 Fibers (LC)

FHD Fiber Optic Modular Enclosure could provide a flexible and modular system for managing fiber connections, and patching for all applications. This modular enclosure accommodates up to four FHD cassettes or panels within a one rack unit space.

The push-lock rivets allow fast deployment between enclosures and cassettes/panels. The one-piece structure provides full accessibility to the front and back of the enclosure, ensuring easy cable management.



Number of Rack Spaces

1U

Dimensions (HxWxD)

1.73"x19.00"x7.67" (44.0x482.6x194.8mm)

Fiber Count

Up to 144 Fibers (LC) or 1,152 Fibers (MTP®-24)

Application

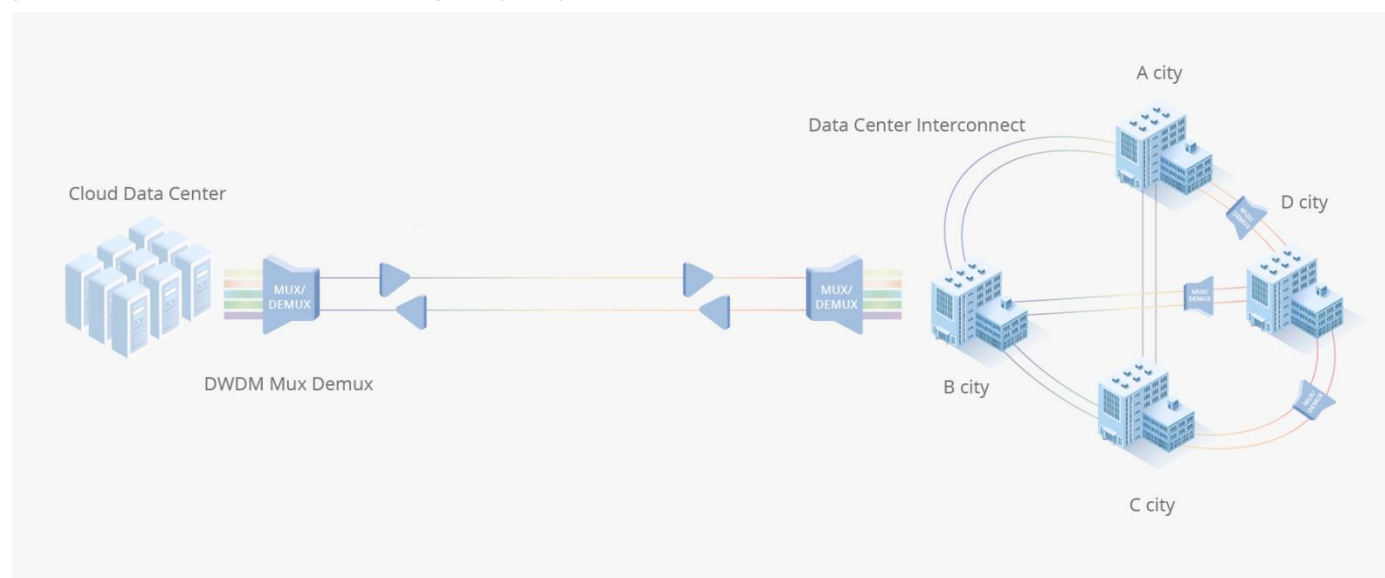
Accepts FHD® Adapter Panels/Cassettes

6. Application

The FS FHD Series encompasses both DWDM and CWDM Mux Demux. While the DWDM Mux Demux is primarily deployed in long-haul, high-capacity fiber channel networks such as OTN, DCI, and WAN, the CWDM Mux Demux is better suited for small- to medium-scale fiber infrastructures.

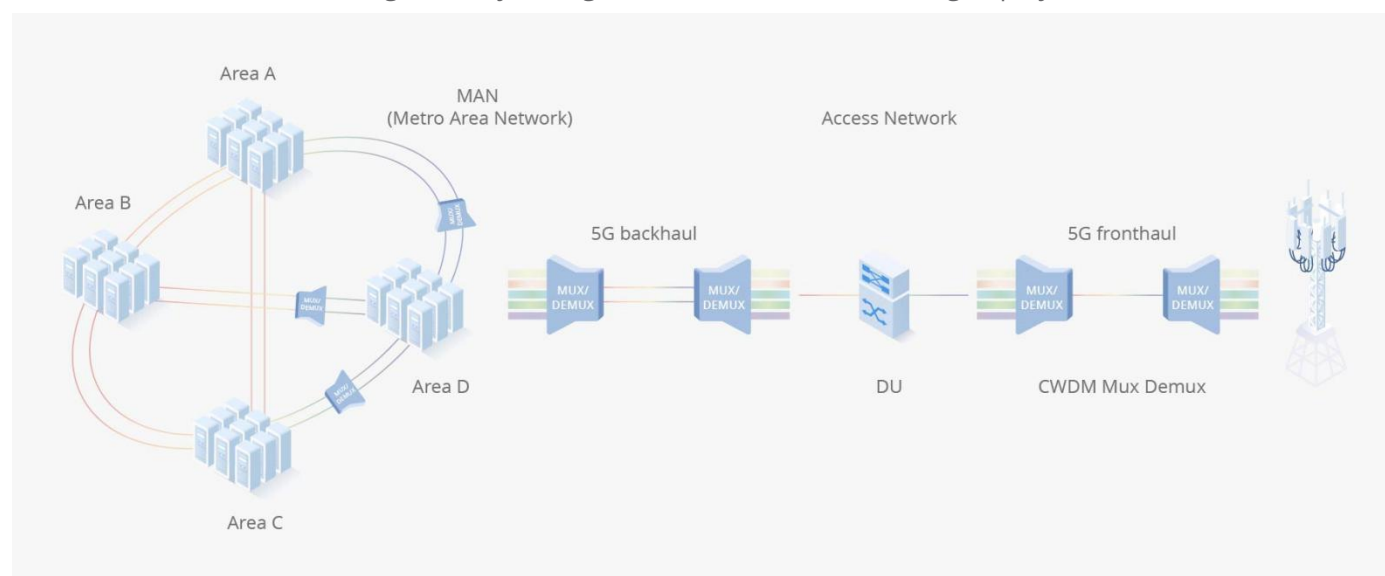
6.1 DWDM Mux Demux

FHD Series DWDM Mux Demux interconnect seamlessly with transponder, muxponder, and third-party WDM products, to form cost-effective high-capacity DWDM tailored solutions.



6.2 CWDM Mux Demux

FHD Series CWDM Mux Demux is suitable for ISPs, carriers, enterprises and other scenarios. Through CWDM technology, multiple wavelengths are multiplexed on a single fiber to achieve high-speed, high-capacity data transmission between sites, significantly saving fiber resources and reducing deployment costs.



7. Product Specification

7.1 FHD-D82128EM3

Parameter	Value
Wavelength	8CH C21-C28
Operating Wavelength	1520-1570nm
Channel Spacing	100GHz (0.8nm)
Channel Passband	±0.11nm
Insertion Loss	≤ 3.1dB, 2.4dB Typical
Adjacent Channel Isolation	≥30dB
Non-adjacent Channel Isolation	≥40dB
Passband Ripple	≤0.5dB
Directivity	≥45dB
Return Loss	≥45dB
Polarization Dependent Loss	≤0.3dB
Polarization Mode Dispersion	≤0.1ps
Max Optical Power	≤ 500mW (27dBm)
Connector Type	LC/UPC
Dimensions (HxWxD)	1.38"x4.29"x4.64" (35x109x118mm)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 85°C (-40 to 185°F)

7.2 FHD-D82936EM

Parameter	Value
Wavelength	8CH C29-C36
Operating Wavelength	1520-1570nm
Channel Spacing	100GHz (0.8nm)
Channel Passband	±0.11nm
Insertion Loss	≤ 2.8dB, 2.4dB Typical
Adjacent Channel Isolation	≥30dB
Non-adjacent Channel Isolation	≥40dB
Passband Ripple	≤0.5dB
Directivity	≥45dB
Return Loss	≥45dB
Polarization Dependent Loss	≤0.3dB
Polarization Mode Dispersion	≤0.1ps
Max Optical Power	≤ 500mW (27dBm)
Connector Type	LC/UPC
Dimensions (HxWxD)	1.38"x4.29"x4.64" (35x109x118mm)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 85°C (-40 to 185°F)

7.3 FHD-D85360EM

Parameter	Value
Wavelength	8CH C53-C60
Operating Wavelength	1520-1570nm
Channel Spacing	100GHz (0.8nm)
Channel Passband	±0.11nm
Insertion Loss	≤ 2.8dB, 2.4dB Typical
Adjacent Channel Isolation	≥30dB
Non-adjacent Channel Isolation	≥40dB
Passband Ripple	≤0.5dB
Directivity	≥45dB
Return Loss	≥45dB
Polarization Dependent Loss	≤0.3dB
Polarization Mode Dispersion	≤0.1ps
Max Optical Power	≤ 500mW (27dBm)
Connector Type	LC/UPC
Dimensions (HxWxD)	1.38"x4.29"x4.64" (35x109x118mm)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 85°C (-40 to 185°F)

7.4 FHD-C82745EM

Parameter	Value
Wavelength	8 Channels 1270-1450nm (Skip 1390, 1410nm)
Channel Passband	±6.5nm
Insertion Loss	≤ 2.4dB, 2.0dB Typical
Adjacent Channel Isolation	≥30dB
Non-adjacent Channel Isolation	≥40dB
Passband Ripple	≤0.5dB
Directivity	≥50dB
Return Loss	≥45dB
Polarization Dependent Loss	≤0.3dB
Polarization Mode Dispersion	≤0.1ps
Max Optical Power	≤ 500mW (27dBm)
Connector Type	LC/UPC
Dimensions (HxWxD)	1.38"x4.29"x4.64" (35x109x118mm)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 85°C (-40 to 185°F)

7.5 FHD-C84761EM

Parameter	Value
Wavelength	8 Channels 1470-1610nm
Channel Passband	±6.5nm
Insertion Loss	≤ 2.4dB, 2.0dB Typical
Adjacent Channel Isolation	≥30dB
Non-adjacent Channel Isolation	≥40dB
Passband Ripple	≤0.5dB
Directivity	≥50dB
Return Loss	≥45dB
Polarization Dependent Loss	≤0.3dB
Polarization Mode Dispersion	≤0.1ps
Max Optical Power	≤ 500mW (27dBm)
Connector Type	LC/UPC
Dimensions (HxWxD)	1.38"x4.29"x4.64" (35x109x118mm)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 85°C (-40 to 185°F)

8. Ordering Information

Mux Demux & OADM		
FHD Series Mux Demux	FHD-D82128EM3	8 Channels DWDM Mux Demux, 100GHz C21-C28, with EXP & Mon and 1310nm Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD® Plug-in Module#126899
	FHD-D82936EM	8 Channels DWDM Mux Demux, 100GHz C29-C36, with Monitor and Expansion Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD Plug-in Module#126900
	FHD-D85360EM	8 Channels DWDM Mux Demux, 100GHz C53-C60, with Monitor and Expansion Port, 2.4dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD Plug-in Module, CWDM/DWDM Hybrid Solution#126901
	FHD-C84761EM	8 Channels CWDM Mux Demux, 1470-1610nm, with Monitor and Expansion Port, 2.0dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD Plug-in Module#126902
	FHD-C82745EM	8 Channels CWDM Mux Demux, 1270-1450nm (Skip 1390, 1410nm), with Monitor and Expansion Port, 2.0dB Typical IL, LC/UPC, Dual Fiber, High Density, FHD Plug-in Module#126903
Custom Mux Demux	MUX-DWDM	Customized Dual and Single Fiber DWDM Mux Demux#322911
	MUX-CWDM	Customized Dual and Single Fiber CWDM Mux Demux#70410
	MUX-CCWDM	Customized Dual and Single Fiber Compact CWDM Mux Demux#73961
OADM	DOADM-DF	Customized Dual Fiber DWDM OADM#70427
	COADM-DF	Customized Dual Fiber CWDM OADM#70425
Chassis	FHD-1U-CMP400	FHD® High Density 1U Rack Mount Modular Enclosure Unloaded, Rear Cable Managers, Holds up to 4 x FHD® Cassettes or Panels, 144 Fibers (LC)#704198

TRANSPONDERS & MUXPONDERS

10G	FMT4DL-OEO25GSFP28	FMT4DL-OEO25GSFP28, 4 Channels 25G WDM Transponder (Converter) for FMT Managed Chassis, 8 SFP28/SFP+ Slots#92056
	FMT4DL-OEO10GSFP	FMT4DL-OEO10GSFP, 4 Channels WDM Transponder (Converter) for FMT Managed Chassis, 8 SFP/SFP+ Slots#30515
	FMT04-CH1U	FMT04-CH1U, 4 Slots 1U Managed Chassis Unloaded Platform, Redundant AC PSUs, Support SNMP V1 Network Management#39214
Chassis	FMT-CH	FMT-CH, Customized 4/8/16 Slots 1U/2U/4U Managed Chassis Unloaded Platform, Redundant AC/DC PSUs, Support SNMP Network Management#70413

OPTICAL LINE SYSTEM

Amplifiers	FMT20PA-EDFA	FMT20PA-EDFA, 20dB Gain C-band DWDM EDFA Pre-amplifier for FMT Managed Chassis, 13dBm Output#72284
	FMT26PA-EDFA	FMT26PA-EDFA, 26dB Gain C-band DWDM EDFA Pre-amplifier for FMT Managed Chassis, 16dBm Output#36524
	FMT17BA-EDFA	FMT17BA-EDFA, 17dB Gain C-band DWDM EDFA Booster Amplifier for FMT Managed Chassis, 17dBm Output#72283
	FMT26PA-51EDFA	FMT26PA-51EDFA, 26dB Gain Extended C-Band DWDM EDFA Pre-amplifier for FMT Managed Chassis, 20dBm Output#248135
	FMT17BA-51EDFA	FMT17BA-51EDFA, 17dB Gain Extended C-Band DWDM EDFA Booster Amplifier for FMT Managed Chassis, 20dBm Output#248133
	FMT-EDFA	Customized C-band DWDM EDFA Amplifier for DWDM Solution#322907
	FMT-ARRAY-OA	Customized Multiports DWDM Array EDFA Amplifier#322909

OPTICAL LINE SYSTEM

Dispersion Compensation	FMT40-DCM	FMT40-DCM, C-Band 40km DCF-based Passive Dispersion Compensation Module for FMT Managed Chassis#65781
	FMT80-DCM	FMT80-DCM, C-Band 80km DCF-based Passive Dispersion Compensation Module for FMT Managed Chassis#65779
Line Protection	FS-DCM	Customized C-Band DCF-based Dispersion Compensation Module for FMT Managed Chassis#65783
	FMT-OLP2	FMT-OLP2, 1+1 Optical Line Protection Switch for FMT Managed Chassis#66010
	FMT-OLP	FMT-OLP, 1:1 Optical Line Protection Switch for FMT Managed Chassis#192620

WDMTRANSCEIVERS

100G/200G CFP2	CFP2-DCO-200G-M	C14 1566.31nm CFP2-DCO 100G/200G DWDM C-band Tunable 96Chs ITU CH13-CH60 50GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#120128
25G SFP28	DW-SFP25G10-17	Cisco C17 DWDM-SFP25G-63.86 Compatible SFP28 25G DWDM 1563.86nm 100GHz 10km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#87000
	CW-SFP25G30-27	Cisco CWDM-SFP25G-1270-30 Compatible SFP28 25G CWDM 1270nm 30km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#100112
	CW-SFP25G10-27	Cisco CWDM-SFP25G-1270-10 Compatible SFP28 25G CWDM 1270nm 10km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#76003
	LW-SFP25G40-86	Cisco LWDM-SFP25G-86.66 Compatible SFP28 25G LWDM 1286.66nm 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#93786
10G SFP+	DW-SFP10G80-21-I	Cisco C21 DWDM-SFP10G-60.61-I Compatible SFP+ 10G DWDM 1560.61nm 100GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#113562
	DW-SFP10G40-21-I	Cisco C21 DWDM-SFP10G-60.61-I Compatible SFP+ 10G DWDM 1560.61nm 100GHz 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#113511
	CW-SFP10G80-47	Cisco CWDM-SFP10G-1470 Compatible SFP+ 10G CWDM 1470nm 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#19367
1GSFP	CW-SFP10G40-27-I	Cisco CWDM-SFP10G-1270-I Compatible SFP+ 10G CWDM 1270nm 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#112392
	DWDM-SFP1G-EZX	Cisco C17 DWDM-SFP-6386 Compatible SFP 1000BASE-DWDM 1563.86nm 100GHz 100km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#54150
	DWDM-SFP1G-ZX	Cisco C17 DWDM-SFP-6386-80 Compatible SFP 1000BASE-DWDM 1563.86nm 100GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#47697
	CWDM-SFP1G-ZX	Cisco CWDM-SFP-1270 Compatible SFP 1000BASE-CWDM 1270nm 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#33234
	DWDM-SFP1G-ZX	Cisco C17 DWDM-SFP-6386-80 Compatible SFP 1000BASE-DWDM 1563.86nm 100GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#47697
	CWDM-SFP1G-ZX	Cisco CWDM-SFP-1270 Compatible SFP 1000BASE-CWDM 1270nm 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#33234

*Standard products are listed above. Customized specifications are available upon request.



Delaware, United States

Address: Delaware: 380 Centerpoint Blvd, New Castle, DE 19720, United States
Email: US@fs.com
Tel: +1 (888) 468-9910

Germany

Address: Röntgenstraße 18, 85757 Karlsfeld, Germany
Email: DE@fs.com
Tel: +49 (0) 8131 377 3008

Australia

Address: 57-59 Edison Rd, Dandenong South, VIC 3175, Australia
Email: AU@fs.com
Tel: +61 3 5909 9990

Japan

Address: JS Progress Building 5F, 4-1-23, Heiwajima, Ota Ku, Tokyo, 143-0006, Japan
Email: JP@fs.com
Tel: +81-3-6897-9438

California, United States

Address: California: 15241 Don Julian Rd, City of Industry, CA 91745, United States
Email: US@fs.com
Tel: +1 (888) 468-9910

United Kingdom

Address: Unit 8, Urban Express Park, Union Way, Aston, Birmingham B6 7FH, United Kingdom
Email: UK@fs.com
Tel: +44 (0) 121 726 4775

Singapore

Address: 7002 ANG MO KIO AVENUE 5 #05-02 Singapore 569914
Email: SG@fs.com
Tel: +65 31381992



FS has several offices around the world. Addresses, phone numbers are listed on the FS Website at https://www.fs.com/contact_us.html. FS and FS logo are trademarks or registered trademarks of FS in the U.S. and other countries.