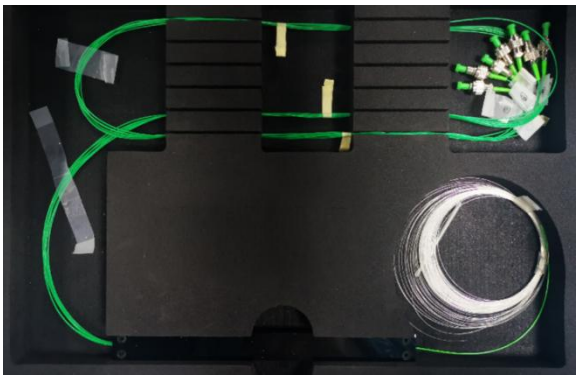
Multi-core fan-in and fan-out devices

1. Product introduction



Features

- Number of cores: 2, 3, 4, 7, 8
- Insertion Loss<1.5dB
- High data rates
- Various Package Dimensions Available
- Scalable manufacturing technique

Applications

- 2D bend sensing
- Next-generation optical amplifiers
- Active Optical Cables (AOC)
- Down hole sensing in oil exploration applications
- Photonic Integrated Circuits
- Pipeline monitoring
- Distributed sensing

The series of multi-core fiber fan-in and fan-out devices are designed and manufactured using a unique process. They have the advantages of low loss, low crosstalk and low loss difference between cores. They perfectly match the multi-core optical fiber developed by our company and are ideal for realizing fiber core multiplexing and solution. Multiplexed key components are widely used in data centers and optical fiber sensing fields. It can provide complete low-loss coupling solutions and customized services for different multi-core optical fibers.

2. Specifications

4 core Fan-in & Fan-out

Device Number	4-FAN-42	
Description	4 core FIFO	
Optical performance	Scope	Typical value
Average insertion loss@1550nm (dB)	<0.5	0.35
Maximum insertion loss(dB)	<0.5	0.35
Return loss(dB)	>45	50
Crosstalk(dB)	<-50dB	-55

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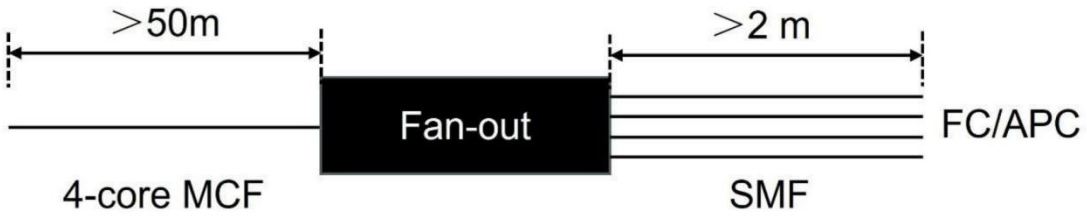
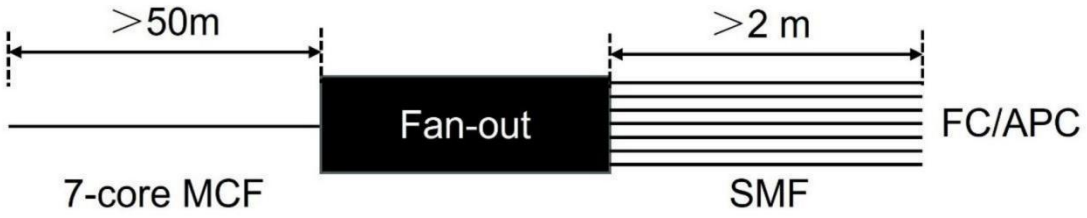
Geometric dimensions		
MCF Pigtail length(m)	>2m	2.1
SMF Pigtail length (m)	>2m	2.1
Package size		
Size (mm)	Φ3.0*25~30mm	
Working temperature (℃)	~40~+70	



7 core Fan-in & Fan-out

Device Number	7-FAN-42	
Description	7 core FIFO	
Optical performance	Scope	Typical value
Average insertion loss@1550nm (dB)	<0.75	0.6
Maximum insertion loss(dB)	<0.75	0.65
Return loss(dB)	>45	50
Crosstalk(dB)	<-50dB	-55
Geometric dimensions		
MCF Pigtail length(m)	>2m	2.1
SMF Pigtail length (m)	>2m	2.1
Package size		
Size (mm)	Φ4x100	
Working temperature (℃)	~40~+70	



8 core Fan-in & Fan-out

Device Number	8-FAN-42

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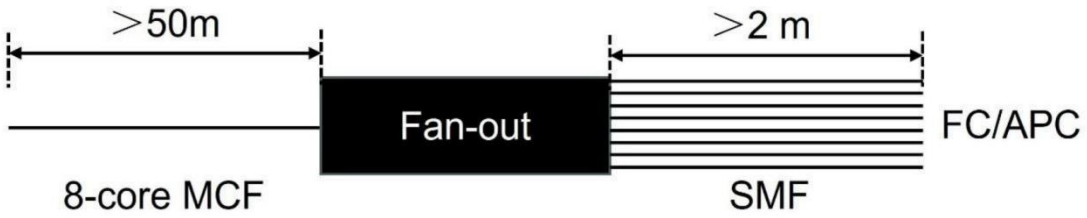
Description	8 core FIFO	
Optical performance	Scope	Typical value
Average insertion loss@1550nm (dB)	<1.2	0.9
Maximum insertion loss(dB)	<1.2	1.0
Return loss(dB)	>45	50
Crosstalk(dB)	<-50dB	-55
Geometric dimensions		
MCF Pigtail length(m)	>2m	2.1
SMF Pigtail length (m)	>2m	2.1
Package size		
Size (mm)	Φ4x100	
Working temperature (℃)	~40~+70	

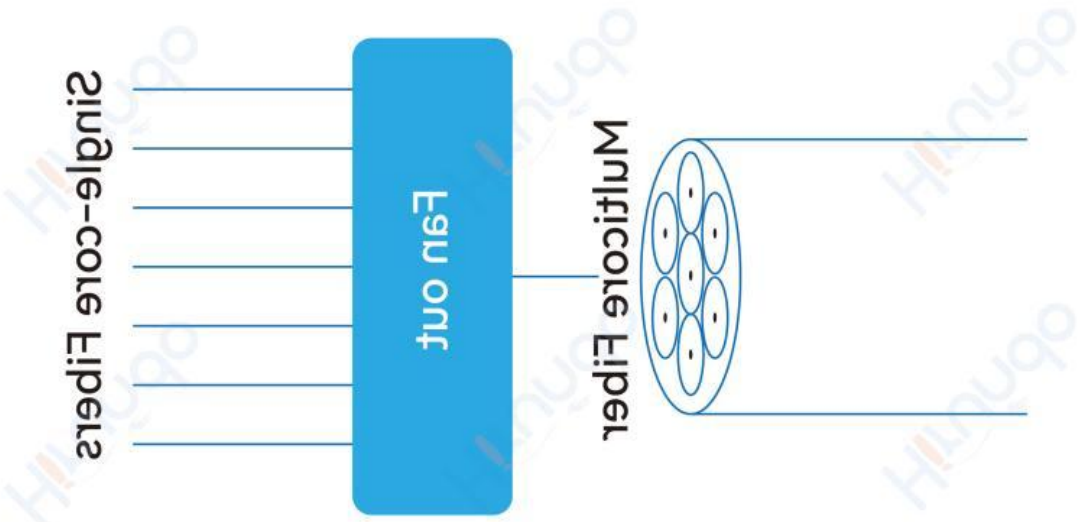


3. How Multi-core Fiber Fan out Works

Current optical communication network grows in a ratio of 20% to 60%, but single core fiber system has many limitations. Thus, breaking through the communication system capacity limit, Multi-core Fiber Fan-out gradually becomes the inevitable choice in the industry. Multi-core fiber (MCF) has multiple fiber cores in a common cladding area. Its fiber density can be increased by many times. To connect a single core fiber into a multi-core fiber, MCF fiber fan-out is needed. Multi-core fiber fan-out cable is designed to guide light from a 4/7/8 core fiber into 4/7/8 separate SMF28 fiber pigtail.

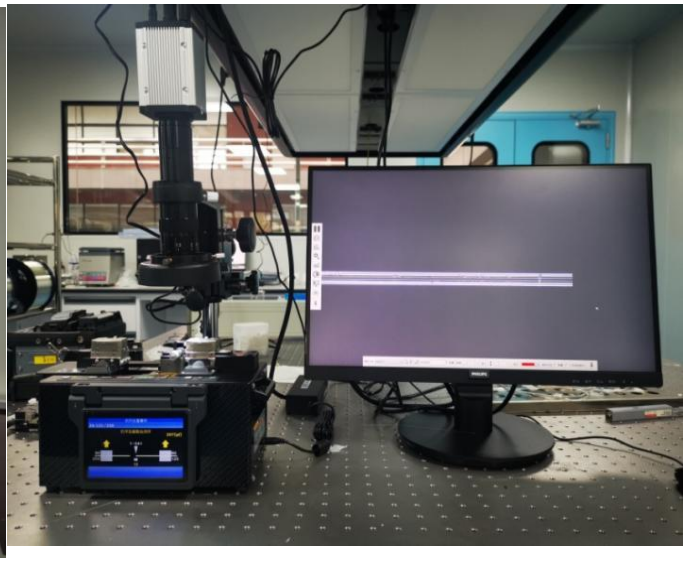
4. Technical introduction

Multi-core fiber fan-in and fan-out devices are prepared using fused tapering technology. Specially designed bridge fibers are inserted into the glass tube according to the arrangement of the multi-core fibers for adiabatic tapering. The tapering ratio is controlled according to the core spacing of the target multi-core fiber. . After the device is tapered, it is cut at a small angle and fused and packaged with the target multi-core optical fiber to obtain a multi-core optical fiber fan-in and fan-out device.



5. Production capacity introduction:

Hirundo has a full set of Fujikura's optical fiber device preparation related equipment, including CO2 laser fiber workstation (LZM100, Fujikura), polarization-maintaining fiber fusion splicer (100P+, Fujikura), large core diameter cutting knife (CT116, CT105, Fujikura), which can be Produce 500 pieces of multi-core optical fiber fan-in and fan-out devices.



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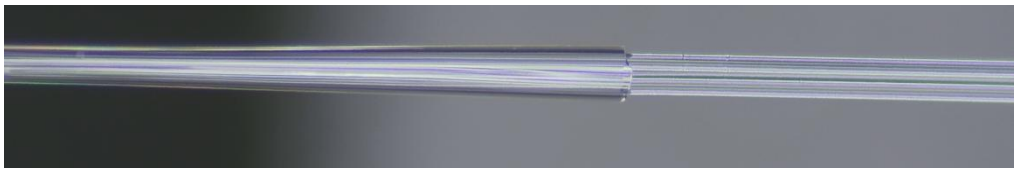
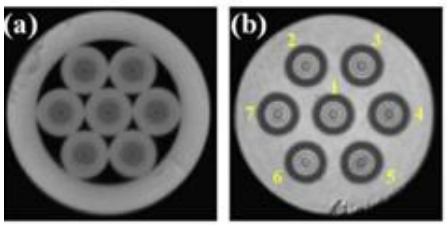
6. Application examples

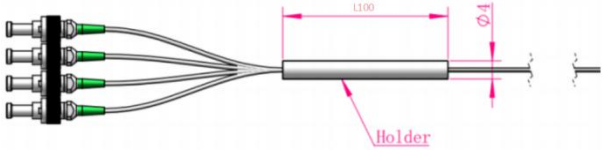




Seven-core optical fiber fan-in fan-out device end face and seven-core optical fiber

7. Structure Examples

4C MCF Single Fan out -FC/APC



4C MCF Fan out pairs- FC/APC

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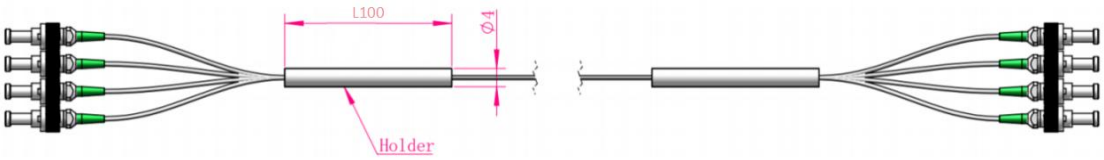
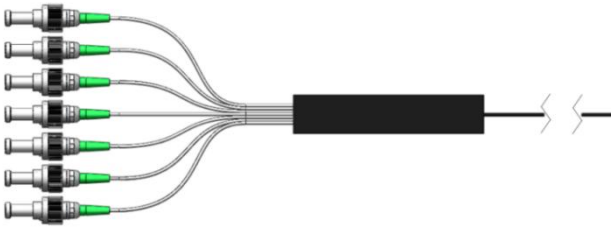
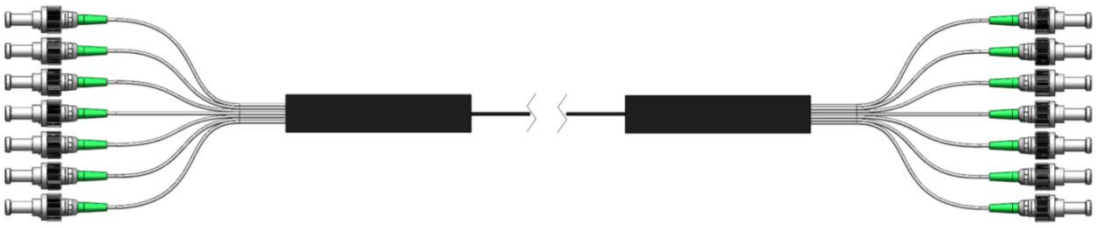


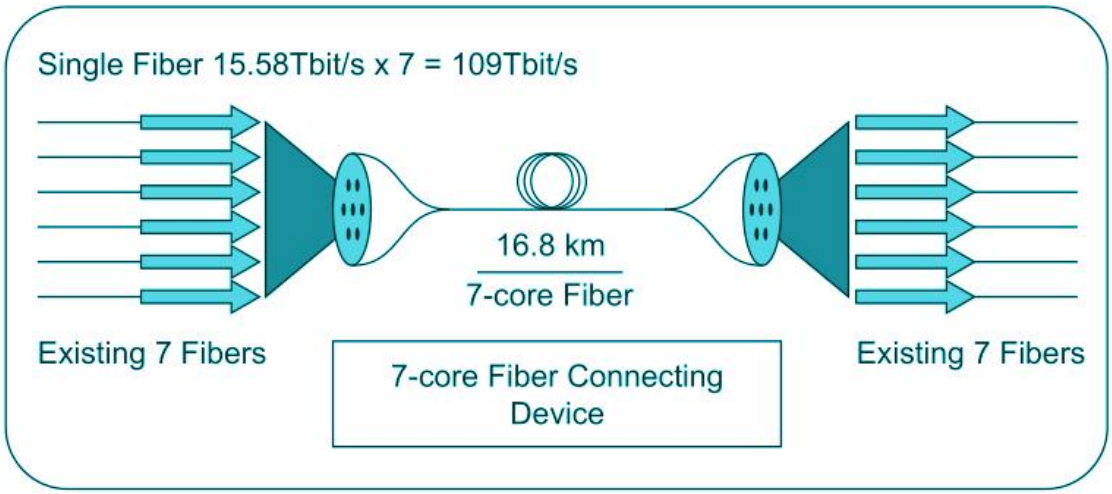
7C MCF Single Fan outs -FC/APC



7C MCF Fan out pairs -FC/APC



8. MCF Transmission System



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