

MAXIMIZE FIBER
INFRASTRUCTURES

Our connectivity solutions,
maximize your fiber
infrastructures.

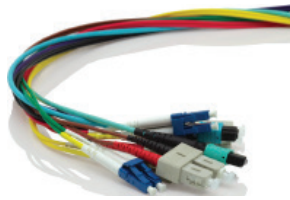



ProLabs
Unlock your connectivity

Transforming your existing fiber

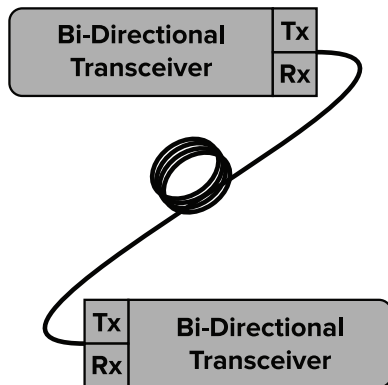
Maximizing existing optical fiber infrastructure is a challenge faced by network operators large and small. Network operators often face hard choices that balance ROI, timing, and planning for the future; each of which ultimately impacts customer satisfaction. Installing new optical fiber infrastructure is not only cost-prohibitive, but can require months of planning that may impact the ability to turn up new services.

ProLabs cost-effective Bi-Directional Transceiver and WDM solutions provide operators with solutions to maximize existing fiber infrastructure and avoid the time and expense of installing new optical fiber. ProLabs solutions offer operators opportunities to rapidly provision new services with the assurance of working with a trusted partner.



Single-Fiber Bidirectional Transceivers

The simplest and most cost effective solution, Single-Fiber Bidirectional Transceivers, essentially double the capacity of an existing fiber pair. Single-Fiber Bidirectional fiber transceivers send and receive signals over one single fiber strand as opposed to using both fibers of a traditional transceiver pair. Single-Fiber Transceivers provide welcome relief in all network segments, but due to the simple and cost-effective nature lends itself well to providing relief in campus environments and access networks. ProLabs offers an industry leading number of supported compatible platforms for our Single Fiber Bidirectional compatibles line.



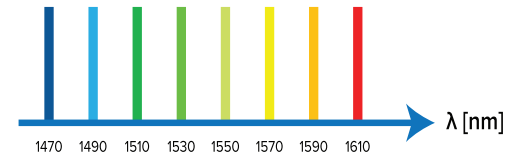
Single-Fiber Bidirectional Transceivers

Multiple Data Rates and form Factors: 1G SFP and 10G XFP/SFP+.

Variable Distance: 110km @ 1G speeds and SM Fiber and 60km @ 10G and SM Fiber.

Course Wavelength Division Multiplexer (CWDM) Solutions

CWDM solutions offer cost effective scalability in maximizing existing fiber infrastructure. CWDM passive multiplexers and CWDM transceivers offer operators the ability to quickly scale the capacity of existing optical fiber infrastructure. CWDM solutions are optimal in the metro, regional and access networks.



Standard CWDM

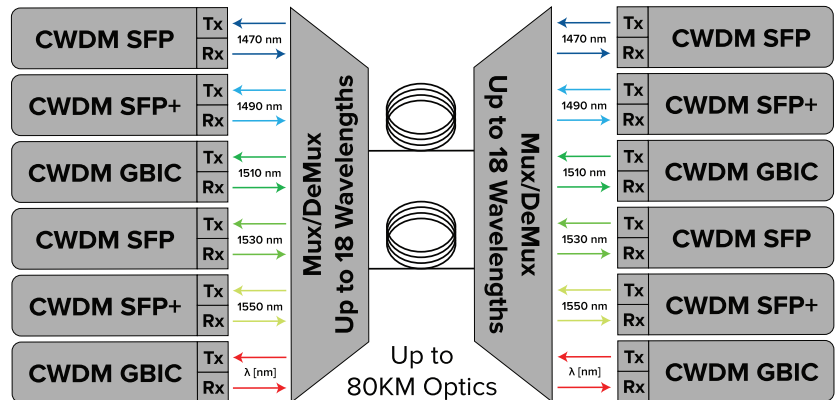
ProLabs offering of CWDM transceivers and passive CWDM offer operators the ability to quickly and inexpensively scale their fiber density, achieving up to 18x greater capacity over a fiber pair!

Multiple Data Rates and form Factors: 1G SFP, and 10G XENPAK/X2/XFP/SFP+.

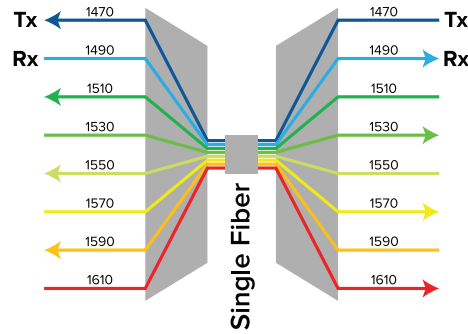
Variable Distance: 160km over 1G and SM fiber and 80km @ 10G over SM Fiber.

Single-Fiber CWDM Solution

Optical bidirectional transceivers extend the benefits of CWDM technology to a single fiber. By placing transmit and receive traffic on separate wavelengths on the same fiber, Single-Fiber CWDM solutions provide solutions for maximizing the capacity in situations where only a single fiber strand is available.



Single-Fiber Bidirectional Transceivers



Multiple Data Rates and form Factors: 1G SFP, and 10G XENPAK/X2/XFP/SFP+.
 Variable Distance: 160km over 1G and SM fiber and 80km @ 10G over SM Fiber.

High Density CWDM Solution

Innovations in packaging of passive fiber optic components into a high-density package and integrating bi-directional CWDM transceivers presents operators the opportunity to increase the capacity on a single fiber of up to 18x or 36x on a fiber pair!

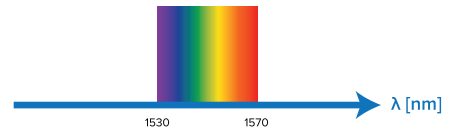
1G SFP.
 Variable Distance: 40KM to 80KM.

Dense Wavelength Division Multiplexer (DWDM) Solutions

DWDM possess key features that make it ideal for long haul and high capacity networks. DWDM signals can be amplified to extend the transmission beyond the DWDM transceiver specifications. In addition, DWDM also pack over 100 channels on to a single fiber pair. DWDM transceivers and passive DWDM multiplexers work much like CWDM transceivers and passive multiplexers in the network. DWDM solutions maximize fiber infrastructure over both a single fiber and a fiber pair.

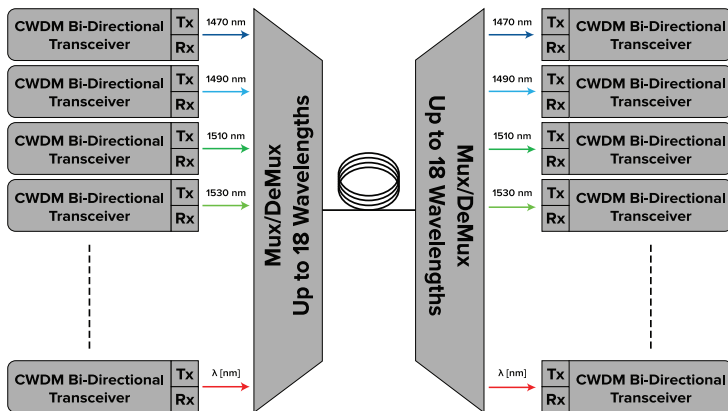
CWDM Basics

CWDM uses wavelengths from 1270nm to 1610nm. CWDM can use up to 18 wavelengths in low water peak fibers (fibers without the attenuation peak around 1383nm). CWDM grid at 10Gbps is limited to 8 wavelengths for longer reaches, more wavelengths available for 10-40Km.

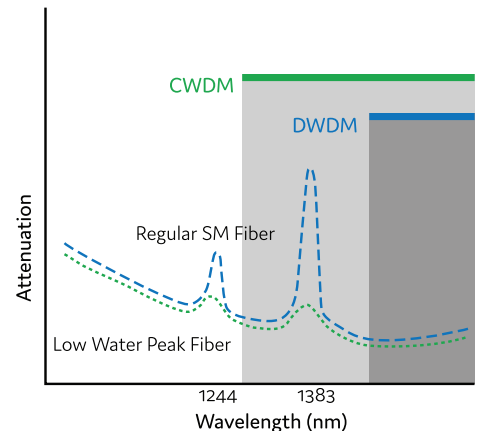


CWDM Wavelength ITU Channel Reference.

TU Channel	CWDM Wavelength	CWDM Band
27	1270	O
29	1290	O
31	1310	O
33	1330	O
35	1350	O
37	1370	E*
39	1390	E*
41	1410	E*
43	1430	E*
45	1450	S
47	1470	S
49	1490	S
51	1510	S
53	1530	C
55	1550	C
57	1570	L
59	1590	L
61	1610	L



High Density CWDM Solution



CWDM/DWDM Wavelength Attenuation

DWDM Wavelength ITU Channel Reference
 ~ 100 GHz Spacing.

ITU Channel Number	Wavelength, nm	Freq., THz
11	1568.11	191.1
12	1567.95	191.2
13	1567.13	191.3
14	1566.31	191.4
15	1565.50	191.5
16	1564.68	191.6
17	1563.86	191.7
18	1563.05	191.8
19	1562.23	191.9
20	1561.42	192.0
21	1560.61	192.1
22	1559.79	192.2
23	1558.98	192.3
24	1558.17	192.4
25	1557.36	192.5
26	1556.55	192.6
27	1555.75	192.7
28	1554.94	192.8
29	1554.13	192.9
30	1553.33	193.0
31	1552.52	193.1
32	1551.72	193.2
33	1550.92	193.3
34	1550.12	193.4
35	1549.32	193.5

High Density CWDM Solution

DDWM uses wavelengths from 1530nm to 1610nm. Channels are separated by 0.8nm (100GHz) or 0.4nm (50GHz). Over 100 channels are possible over the c-brand (1530nm - 1565nm) and L-Band (1565nm - 1625nm).

ITU Channel Number	Wavelength, nm	Freq., THz
36	1548.51	193.6
37	1547.72	193.7
38	1546.92	193.8
39	1546.12	193.9
40	1545.32	194.0
41	1544.53	194.1
42	1543.73	194.2
43	1542.94	194.3
44	1542.14	194.4
45	1541.35	194.5
46	1540.56	194.6
47	1539.77	194.7
48	1538.98	194.8
49	1538.19	194.9
50	1537.40	195.0
51	1536.61	195.1
52	1535.82	195.2
53	1535.04	195.3
54	1534.25	195.4
55	1533.47	195.5
56	1532.68	195.6
57	1531.90	195.7
58	1531.12	195.8
59	1530.33	195.9
60	1529.55	196.0
61	1528.77	196.1

ProLabs, Your Trusted Partner

ProLabs is the perfect partner to engage in with discussions of fiber conservation and fiber exhaust. We have worked with customers across the country to do more with less, both from an economic and fiber perspective, to maximize their existing optical fiber infrastructure.

Visit www.prolabs.com for more connectivity solutions.

