

# New! Canary Adds DWDM Multiplexing Capability

Featuring:

- Mixed CWDM & DWDM Multiplexers
- 4 to 8 DWDM Expansion Channels
- Standalone / Rackable DWDM Multiplexers with Up to 16 Channels
- Active CWDM / DWDM Transceivers • 1000BASE-T • 1000BASE-SX • Other Protocols

Canary Communications builds on our experience with economical, simple to deploy, Coarse Wavelength Division Multiplexing systems by adding Dense Wavelength Division Multiplexing (DWDM) that enables up to sixteen additional data channels to be transported on top of existing CWDM data streams. Network access is easily increased to accommodate growth or expanded services.

Combined CWDM-*Plus*-DWDM versions mix DWDM channels with CWDM transport. This gives a user the flexibility to exactly specify the number of channels at the outset to maximize access at minimum cost when the number of CWDM channels is insufficient or, future planned and un-planned system growth is to be accommodated.

Single-Fiber Bi-Directional CWDM Multiplexers are typically limited to four channels. Canary Combined CWDM-*plus*-DWDM versions support three CWDM and up to eight DWDM channels.

DWDM *only*, Multiplexers are externally connected to one or two existing CWDM multiplexer ports for easy channel expansion. Alternatively, they can be deployed as dedicated DWDM channel devices.

Canary CWDM/DWDM products are designed to be compatible with other Optical WDM equipment deployed in installations without EDFA regeneration.

For legacy interfaces, *Active* 100 Mbps to 2.7 Gigabit Multi-Rate Transponders are available with SFP CWDM and DWDM transceivers.

Canary Communications is an industry leader in providing advanced and economical connectivity solutions for the evolving network.

Mixed CWDM & DWDM Single-Fiber Bi-directional Multiplexers



Three CWDM user- port & Four DWDM user-port clusters.

## ▪ Mixed CWDM + DWDM, Multiplexers:

Single-Fiber Bi-Directional Multiplexers with combined CWDM-*plus*- DWDM versions support three CWDM and up to eight DWDM channels for a total of eleven channels over a single, SMF-28 Fiber strand! Versions also available for duplex Fiber.

## ▪ CWDM Channel Capacity Doubled By Adding DWDM:

Drop one or two CWDM channels, externally connect/substitute groups of DWDM channels and gain up to sixteen new user connections. *Easy Expansion!*

## ▪ Multiple Channels Transmitted Over Single Fiber Pair:

Depending on equipment choices, potentially ten CWDM channels and up to sixteen DWDM channels can be supported - all over SMF-28 type single-mode fiber.

## ▪ Unparalleled Network Integration and Versatility:

Mixed CWDM and DWDM connections expand customer utilization of existing fiber installations and provide *exactly* the number of *multi-channel* links desired. Makes un-planned expansion easy. Supports un-amplified seventy-kilometer links.

**Canary Communications**

## Port Descriptions

Rackable Multiplexer / De-multiplexers with <i>mixed CWDM-plus-DWDM Channels</i> (passive optics):			
Model	CWDM Channels $\lambda(s)$	DWDM Channels	Notes
• The following models are always deployed in SFA to SFB pairs (over Single-Fiber) •			
CR3C-436D1-SFA CR3C-456D1-SFB	3-Group (A) = 1470, 1510, 1590 nm 3-Group (B) = 1490, 1570, 1610 nm	4-Channels: 36, 37, 38, 39 4-Channels: 56, 57, 58, 59	Simplex SC – Single Fiber Network (span) Port Same
CR3C-431D1-SFA CR3C-451D1-SFB	3-Group (A) = 1470, 1510, 1590 nm 3-Group (B) = 1490, 1570, 1610 nm	4-Channels: 31, 32, 33, 34 4-Channels: 51, 52, 53, 54	Simplex SC – Single Fiber Network (span) Port Same
CR3C-432D1-SFA CR3C-452D1-SFB	3-Group (A) = 1470, 1510, 1590 nm 3-Group (B) = 1490, 1570, 1610 nm	3-Channels: 32, 33, 34 3-Channels: 52, 53, 54	Simplex SC – Single Fiber Network (span) Port Same
CR3C-732D1-SFA CR3C-752D1-SFB	3-Group (A) = 1470, 1510, 1590 nm 3-Group (B) = 1490, 1570, 1610 nm	7-Chan: 32, 33, 34, 36, 37, 38, 39 7-Chan: 52, 53, 54, 56, 57, 58, 59	Simplex SC – Single Fiber Network (span) Port Same
CR3C-831D1-SFA CR3C-851D1-SFB	3-Group (A) = 1470, 1510, 1590 nm 3-Group (B) = 1490, 1570, 1610 nm	8-Chan: 31, 32, 33, 34, 36, 37, 38, 39 8-Chan: 51, 52, 53, 54, 56, 57, 58, 59	Simplex SC – Single Fiber Network (span) Port Same
• The following models are always deployed as matched A-to-A or B-to-B pairs (over Duplex Fiber) •			
CR3C-436D1-A CR3C-456D1-B	3-Group (A) = 1470, 1510, 1590 nm 3-Group (B) = 1490, 1570, 1610 nm	4-Channels: 36, 37, 38, 39 4-Channels: 56, 57, 58, 59	Duplex SC – Network Multiplexer (span) Port Same
CR3C-431D1-A CR3C-451D1-B	3-Group (A) = 1470, 1510, 1590 nm 3-Group (B) = 1490, 1570, 1610 nm	4-Channels: 31, 32, 33, 34 4-Channels: 51, 52, 53, 54	Duplex SC – Network Multiplexer (span) Port Same
CR3C-332D1-A CR3C-352D1-B	3-Group (A) = 1470, 1510, 1590 nm 3-Group (B) = 1490, 1570, 1610 nm	3-Channels: 32, 33, 34 3-Channels: 52, 53, 54	Duplex SC – Network Multiplexer (span) Port Same

Rackable DWDM Multiplexer / De-multiplexers (passive optics):			
Model	CWDM Channels $\lambda(s)$	DWDM Channels	Notes
• The following DWDM-Only models are always deployed in matched (over Duplex Fiber) pairs e.g. CR-436D1 to CR-436D1 •			
CR-436D1 CR-456D1	Used with 1550 nm CWDM port * Same with 1530 nm CWDM port **	4-Channels: 36, 37, 38, 39 4-Channels: 56, 57, 58, 59	Duplex SC – Network Multiplexer (span) Port Same
CR-431D1 CR-451D1	Used with 1550 nm CWDM port * Same with 1530 nm CWDM port **	4-Channels: 31, 32, 33, 34 4-Channels: 51, 52, 53, 54	Duplex SC – Network Multiplexer (span) Port Same
CR-332D1 CR-352D1	Used with 1550 nm CWDM port * Same with 1530 nm CWDM port **	3-Channels: 32, 33, 34 3-Channels: 52, 53, 54	Duplex SC – Network Multiplexer (span) Port Same
CR-732D1 CR-752D1	Used with 1550 nm CWDM port * Same with 1530 nm CWDM port **	7-Chan: 32, 33, 34, 36, 37, 38, 39 7-Chan: 52, 53, 54, 56, 57, 58, 59	Duplex SC – Network Multiplexer (span) Port Same
CR-831D1 CR-851D1	Used with 1550 nm CWDM port * Same with 1530 nm CWDM port **	8-Chan: 31, 32, 33, 34, 36, 37, 38, 39 8-Chan: 51, 52, 53, 54, 56, 57, 58, 59	Duplex SC – Network Multiplexer (span) Port Same
* When used with existing CWDM Multiplexers & 1550 nm channel to expand number of user ports. ** When used with existing CWDM Multiplexers & 1530 nm channel to expand number of user ports.			

Optical Add / Drop Multiplexers for Standard DWDM Channels (passive optics): (Pending)			
Model	Description	Connectors	Standard $\lambda$ Groups
AD1-DXX-S1 * AD1-D36-S1 AD1-D56-S1	1-DWDM Channel, (1) $\lambda$ Add / Dropped DWDM Channel Number 36 DWDM Channel Number 56	(1) SC Client, (2) SC Network Same Same	DXX = DWDM Channel Number From 100 GHz Grid Same Same
AD2-DXX-S1 * AD2-D36-S1 AD2-D56-S1	2-Chan, East/West (1) $\lambda$ Add / Dropped (Two) DWDM Channels – Number 36 (Two) DWDM Channels – Number 56	(2) SC Client, (2) SC Network Same Same	DXX = DWDM Channel Number From 100 GHz Grid Same Same
AD2-DXXX-S1* AD2-D3656-S1	2-Channels (2) $\lambda$ s Add / Dropped (Two) DWDM Channels – 36 + 56	(2) SC Client, (2) SC Network Same	DXXYY = DWDM Chan. Numbers From 100 GHz Grid Same
* Additional models with more DWDM channels to be announced when available or as special order.			

## Mechanical Specifications

### CWDM/DWDM Multiplexer Chassis

#### Mechanical:

- Length: 7.50" (19.05 cm)
- Width: 17.36" (44.09 cm)
- Height: 1.67" (4.24 cm)
- Single Unit Weight: 5.0 lb (2.3 Kg)
- Shipping Weight: 7.0 lb (3.2 Kg)

### Optical Add/Drop Multiplexers (OADMs)

#### Mechanical:

- Length: 7.50" (19.05 cm)
- Width: 7.00" (17.78 cm)
- Height: 1.00" (2.54 cm)
- Single Unit Weight: 3.0 lb (1.4 Kg)
- Shipping Weight: 4.5 lb (2.1 Kg)

#### Environmental:

- Operating Temp.: 0 to 50 °C
- Storage Temp.: -10 to 66 °C
- Relative Humidity: 5% to 95%, non-condensing



#### Available CWDM/DWDM Channels:

##### CWDM Channels:

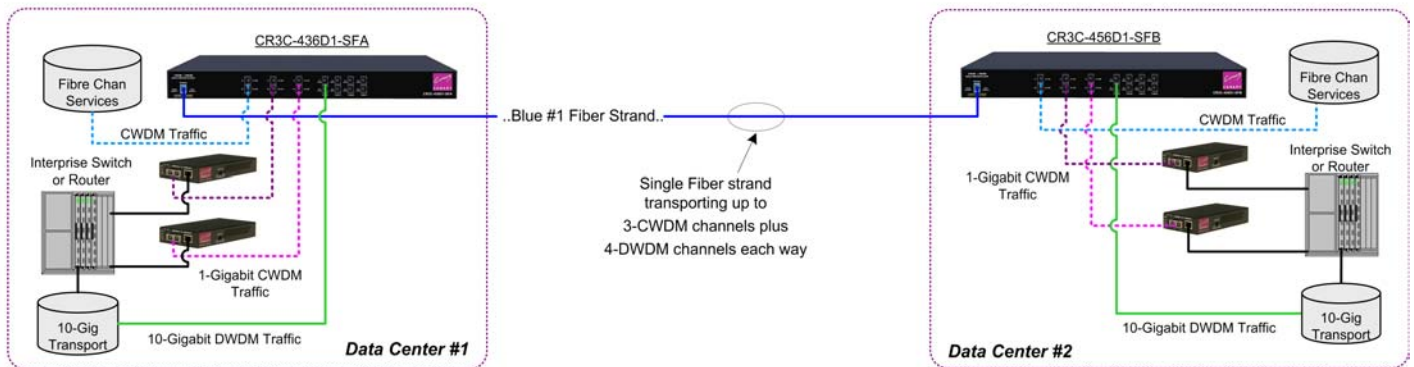
Group (A) Wavelengths ( $\lambda_s$ ) = 1470, 1510, 1550\*, 1590 nm  
 Group (B) Wavelengths ( $\lambda_s$ ) = 1490, 1530\*, 1570, 1610 nm  
 Group (E) Wavelengths ( $\lambda_s$ ) = Group (A) + Group (B)

##### DWDM Channels (100GHz Grid):

Channels 31 through 39 (Compatible with 1550 nm)  
 Channels 51 through 59 (Compatible with 1530 nm)

\* 1550 nm and 1530 nm wavelengths are dropped from SFA & SFB models with mixed CWDM and DWDM capability.

### CWDM plus DWDM Optical Service Layer Installation



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