

Smartoptics Support Statement

November 2019

Rev 04

This letter of support provides a mechanism for Dell EMC™ to offer the above designated Dell EMC solution support according to the conditions outlined in this document:

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Agreement

The following conditions/expectations exist:

- ♦ Any distance extension configuration that is beyond the specified scope of the Dell EMC Letter of Support or the Dell EMC Support Matrix requires a Dell EMC Request for Price Quote (RPQ) submission by the Dell EMC Sales team to Dell EMC Engineering.
- ♦ The configuration displayed in the “Supported configurations” section is supported using only the specified recommendations, revisions, and requirements as listed further.

Ordering information

Smartoptics is a Dell EMC Select partner. 32G and 16G optics and multiplexers for Connectrix switches or directors can be ordered directly from the Dell EMC Price Book.

Below are the SKUs available as of November 2019. Please note that SKUs are subject to change. Any questions around SKUs and ordering can be directed to DellEMCSelect@dell.com.

Please also note that the transceivers available in the Dell EMC Price Book are what can be ordered from Dell EMC and are a subset of what are supported. The entire list of supported transceivers and configurations can be found in the “Supported distance extension devices” section found later in this document.

| Connectrix B-Series Transceivers | |
|----------------------------------|--|
| 32G-IR-D210-BR | SEL-SFP28,32/16/8/Gbps,FC,D9210,7dB,10km |
| 32G-IR-D220-BR | SEL-SFP28,32/16/8/Gbps,FC,D9220,7dB,10km |
| 32G-IR-D230-BR | SEL-SFP28,32/16/8/Gbps,FC,D9230,7dB,10km |
| 32G-IR-D240-BR | SEL-SFP28,32/16/8/Gbps,FC,D9240,7dB,10km |
| 32G-IR-D250-BR | SEL-SFP28,32/16/8/Gbps,FC,D9250,7dB,10km |
| 32G-IR-D260-BR | SEL-SFP28,32/16/8/Gbps,FC,D9260,7dB,10km |
| 32G-IR-D270-BR | SEL-SFP28,32/16/8/Gbps,FC,D9270,7dB,10km |
| 32G-IR-D280-BR | SEL-SFP28,32/16/8/Gbps,FC,D9280,7dB,10km |
| 32G-IR-D290-BR | SEL-SFP28,32/16/8/Gbps,FC,D9290,7dB,10km |
| 32G-IR-D300-BR | SEL-SFP28,32/16/8/Gbps,FC,D9300,7dB,10km |
| 32G-IR-D310-BR | SEL-SFP28,32/16/8/Gbps,FC,D9310,7dB,10km |
| 32G-IR-D320-BR | SEL-SFP28,32/16/8/Gbps,FC,D9320,7dB,10km |
| 32G-IR-D330-BR | SEL-SFP28,32/16/8/Gbps,FC,D9330,7dB,10km |
| 32G-IR-D340-BR | SEL-SFP28,32/16/8/Gbps,FC,D9340,7dB,10km |
| 32G-IR-D350-BR | SEL-SFP28,32/16/8/Gbps,FC,D9350,7dB,10km |
| 32G-IR-D360-BR | SEL-SFP28,32/16/8/Gbps,FC,D9360,7dB,10km |

| <u>Connectrix B-Series Transceivers</u> | |
|---|------------------------------------|
| 16G-ER-D210-BR2 | SFP+,16/8/4Gbps,FC,D9210,13dB,40km |
| 16G-ER-D220-BR2 | SFP+,16/8/4Gbps,FC,D9220,13dB,40km |
| 16G-ER-D230-BR2 | SFP+,16/8/4Gbps,FC,D9230,13dB,40km |
| 16G-ER-D240-BR2 | SFP+,16/8/4Gbps,FC,D9240,13dB,40km |
| 16G-ER-D250-BR2 | SFP+,16/8/4Gbps,FC,D9250,13dB,40km |
| 16G-ER-D260-BR2 | SFP+, 16/8/4GbpsFC,D9260,13dB,40km |
| 16G-ER-D270-BR2 | SFP+,16/8/4Gbps,FC,D9270,13dB,40km |
| 16G-ER-D280-BR2 | SFP+,16/8/4Gbps,FC,D9280,13dB,40km |
| 16G-ER-D290-BR2 | SFP+,16/8/4Gbps,FC,D9290,13dB,40km |
| 16G-ER-D300-BR2 | SFP+,16/8/4Gbps,FC,D9300,13dB,40km |
| 16G-ER-D310-BR2 | SFP+,16/8/4Gbps,FC,D9310,13dB,40km |
| 16G-ER-D320-BR2 | SFP+,16/8/4Gbps,FC,D9320,13dB,40km |
| 16G-ER-D330-BR2 | SFP+,16/8/4Gbps,FC,D9330,13dB,40km |
| 16G-ER-D340-BR2 | SFP+,16/8/4Gbps,FC,D9340,13dB,40km |
| 16G-ER-D350-BR2 | SFP+,16/8/4Gbps,FC,D9350,13dB,40km |
| 16G-ER-D360-BR2 | SFP+,16/8/4Gbps,FC,D9360,13dB,40km |

| <u>Connectrix MDS Series Transceivers</u> | |
|---|------------------------------------|
| DS-16G-ER-D6061 | SFP+,16/8/4Gbps,FC,D9210,13dB,40km |
| DS-16G-ER-D5979 | SFP+,16/8/4Gbps,FC,D9220,13dB,40km |
| DS-16G-ER-D5898 | SFP+,16/8/4Gbps,FC,D9230,13dB,40km |
| DS-16G-ER-D5817 | SFP+,16/8/4Gbps,FC,D9240,13dB,40km |
| DS-16G-ER-D5736 | SFP+,16/8/4Gbps,FC,D9250,13dB,40km |
| DS-16G-ER-D5655 | SFP+, 16/8/4GbpsFC,D9260,13dB,40km |
| DS-16G-ER-D5575 | SFP+,16/8/4Gbps,FC,D9270,13dB,40km |
| DS-16G-ER-D5494 | SFP+,16/8/4Gbps,FC,D9280,13dB,40km |
| DS-16G-ER-D5413 | SFP+,16/8/4Gbps,FC,D9290,13dB,40km |
| DS-16G-ER-D5333 | SFP+,16/8/4Gbps,FC,D9300,13dB,40km |
| DS-16G-ER-D5252 | SFP+,16/8/4Gbps,FC,D9310,13dB,40km |
| DS-16G-ER-D5172 | SFP+,16/8/4Gbps,FC,D9320,13dB,40km |
| DS-16G-ER-D5092 | SFP+,16/8/4Gbps,FC,D9330,13dB,40km |
| DS-16G-ER-D5012 | SFP+,16/8/4Gbps,FC,D9340,13dB,40km |
| DS-16G-ER-D4932 | SFP+,16/8/4Gbps,FC,D9350,13dB,40km |
| DS-16G-ER-D4851 | SFP+,16/8/4Gbps,FC,D9360,13dB,40km |

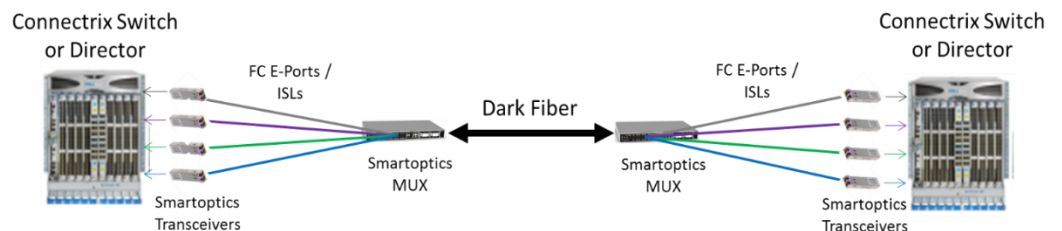
| Multiplexers | |
|------------------|---|
| DCP-M40-PAM4-ER | SEL 40Chan D921-960 OSC0-40km PAM4NRZCoh |
| M16-2136-C0000C1 | M-1601 16ch. exp port,D921-936,OSC,IL=6.6dB |
| M16-2136-D0030C1 | M-1601 16ch. exp port,D921-D936,OSC,Rx EDF |
| M16-2136-D003AC1 | M-1601 D921-D936,OSC,Rx EDFA,Rx DC 40km |
| M16-2136-D1A3TC1 | M-1601 D921-D936,Tx ED,Tx D40,Rx ED,Rx TD |
| M-3809-921928-M | M-3809 8 ch. M/Demux,D921-D928,IL=4.8dB |
| M-3809-929936-M | M-3809 8 ch. M/Demux,D929-D936,IL=4.8dB |
| M-3840-LL | M-3840 40 ch. M/Demux,D921-D960, IL=7.5dB |
| M-410 | DC power supply, M-series |
| M-420 | AC power supply, M-series |

Service and support

Dell EMC does not provide direct field support for Smartoptics hardware. The term support within this document means that Smartoptics hardware has been tested to work in the switches and directors mentioned below and can be installed in these products. Support of the Smartoptics hardware is therefore limited to basic troubleshooting and directing the customer to contact Smartoptics. There are Smartoptics support options available for purchase with the Smartoptics hardware in the Dell EMC Price Book.

Configuration diagram

The following diagram shows an example of a typical Connectrix / Smartoptics deployment:



The configuration above depicts a single path dark fiber configuration. Although not always possible, it is highly recommended that the customer build out a highly available environment with redundancy consisting of:

- Minimum of two Fibre Channel switches or directors per location
- Minimum of two E_ports/ISLs per location
- Minimum of two Smartoptics muxes per location with redundant dark fiber paths

Supported configurations

This section outlines the supported Fibre Channel configurations. 10GE, 40GE, and 100GE configurations are also supported by Smartoptics but are outside the scope of this document.

Supported distance extension devices

The supported configurations consist of the following two categories:

1. Transceivers
 - Brocade Supported Transceivers

Use these transceivers with Connectrix B-Series switches and directors:

| Transceiver | Supported Switches and Directors | Supported Fabric OS Versions |
|-----------------|--|------------------------------|
| 8G-ZR-Dxxx-BR1 | DS-6505B, DS-6510B, DS-6520B, ED-DCX8510-8B, ED-DCX8510-4B | FOS 8.0.2d or higher |
| 16G-ER-Dxxx-BR2 | DS-6505B, DS-6510B, DS-6520B, ED-DCX8510-8B, ED-DCX8510-4B, DS-6610B, DS-6620B, DS-6630B, ED-DCX6-4B (FC32-48 blade), ED-DCX6-8B (FC32-48 blade) | FOS 8.0.2d or higher |
| 8G-ER-Dxxx-BR1 | DS-300B, DS-5300B, ED-DCX-B, ED-DCX-4S-B, DS-6505B, DS-6510B, DS-6520B, ED-DCX8510-8B, ED-DCX8510-4B | FOS 7.4.2c or higher |
| 16G-ER-Dxxx-BR1 | DS-6505B, DS-6510B, DS-6520B, DS-6630B, ED-DCX8510-8B, ED-DCX8510-4B | FOS 7.4.2c or higher |
| 32G-IR-Dxxx-BR | DS-6610B, DS-6620B, DS-6630B, ED-DCX6-4B (FC32-48 blade), ED-DCX6-8B (FC32-48 blade) | FOS 8.2.1c or higher |

2. Multiplexers/Line system

These devices fall into the following two categories:

- DCP-M40-PAM4-ER

This is an active DWDM line system. The product has 40 ports where the corresponding DWDM wavelengths will be connected. The DCP-M40-ER supports all protocols supported by the M-series (see below), but in addition it also has support port for high-speed protocols such as 32G FC and 100G PAM4. The DCP-M-series comes in two different flavors with the main difference being the reach (distance) of the product. The product provides monitoring capabilities of the optical signals it transports. Please see: <https://www.smartoptics.com/products/m-series/> for further details.

- M1601-Series

This is an active DWDM line system. It has 16 ports where the corresponding DWDM wavelengths will be connected. The M-series comes in different flavors, with different functionality. The main difference is the reach (distance) of the product. The M-1601 also contains monitoring of the optical signals, which eases troubleshooting. Please see: <https://www.smartoptics.com/products/m-series/> for further details.

- M-3809 and M-3840

Passive multiplexers will not extend the optical reach supported by the optics nor will it be possible to monitor the optical signal that passes through the product. Please see: <https://www.smartoptics.com/products/multiplexers-oadms/> for further details.

Recommendations and restrictions

For every single Fibre Channel E_port / ISL, two SFPs are used at the local and remote Fibre Channel switch. It is mandatory that the SFPs on both local and remote switch – associated to the same E_port / ISL are identical in wavelength (i.e., same SFP part number and nano-meter spectrum/nm on both ends).

Smartoptics SFPs and multiplexers do not participate in extending bb-credits for Fibre Channel flow control. The bb-credits used for Fibre Channel flow control will be sourced from the Fibre Channel switch E_ports attached to Smartoptics SFPs/MUX devices. Verify that the physical distance and latency at the customer sites do not exceed the credit amounts/capabilities of the Fibre Channel switches. Fibre Channel switch bb-credit provisioning of the E_port may be required depending on the distance between sites.

If auto-negotiation fails, Fibre Channel link speeds may need to be hard-set across Fibre Channel switched E_ports attached to Smartoptics SFPs/MUX devices.

Consult Dell EMC, Smartoptics, or Fibre Channel switch vendor documentation for assistance and further configuration guidance.

WAN protection

Although not recommended, an unprotected environment can pass Fibre Channel traffic. Dell EMC will support an unprotected distance solution; however the customer should understand the implications and risks of a non-HA configuration. (There would be no fault to Dell EMC if related issues were to occur.).

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