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Optribution Alpha 1 RU Indoor Chassis

The final products may vary from the above images depending on the options selected.

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Product and Options

DEV 7181	Intelligent Optribution Chassis Alpha; 1 RU
Option 101	Alpha Optical Transmitter; 4*Tx; 850…2450 MHz; SC/APC
Option 102	Alpha Optical CWDM Transmitter; CWDM Channels 1…4; 850…2450 MHz; SC/APC
Option 103	Alpha Optical CWDM Transmitter; CWDM Channels 5…8; 850…2450 MHz; SC/APC
Option 104	Alpha Optical CWDM Transmitter; CWDM Channels 9…12; 850…2450 MHz; SC/APC
Option 105	Alpha Optical CWDM Transmitter; CWDM Channels 13…16; 850…2450 MHz; SC/APC
Option 111	Alpha Optical Receiver; 4*Rx; 850…2450 MHz; SC/APC
Option 151	Alpha Input/Output; 4*RF Port; 75 Ohm, F (f)
Option 152	Alpha Input/Output; 4*RF Port; 50 Ohm, SMA (f)
Option 155	Alpha 1+1 Tx Redundancy; 4*RF Splitter; 75 Ohm, F (f)
Option 156	Alpha 1+1 Rx Redundancy; 4*RF Switch; 75 Ohm, F (f)
Option 157	Alpha 1+1 Tx Redundancy; 4*RF Splitter; 50 Ohm, SMA (f)
Option 158	Alpha 1+1 Rx Redundancy; 4*RF Switch; 50 Ohm, SMA (f)
Option 161	Alpha 1:4 CWDM De-/Multiplexer; CWDM Channels 1…4
Option 162	Alpha 1:8 CWDM De-/Multiplexer; CWDM Channels 1…8
Option 163	Alpha 1:16 CWDM De-/Multiplexer; CWDM Channels 1…16
Option 55	Change Ethernet to optical Ethernet Interface SC/APC
Option 56	Change Ethernet to optical Ethernet Interface SC/PC
Option 77	Signal Recording

Features

- 1 RU Chassis for up to 32 Optical Channels
- Optical Transmitter and Receiver Modules with four Channels each
- Different CWDM Transmitter Modules and De-/Multiplexer
- Variable Gain
- LNB Powering, switchable 13/18 V and 22 kHz Tone
- 1+1 Redundancy Options
- Local User Interface
- SNMP Support
- DEV Web Interface
- Signal Recording Option
- Power Supply Redundancy
- Interoperability with the DEV Optribution Series

DEV 7181 Intelligent Optribution Chassis Alpha; 1 RU

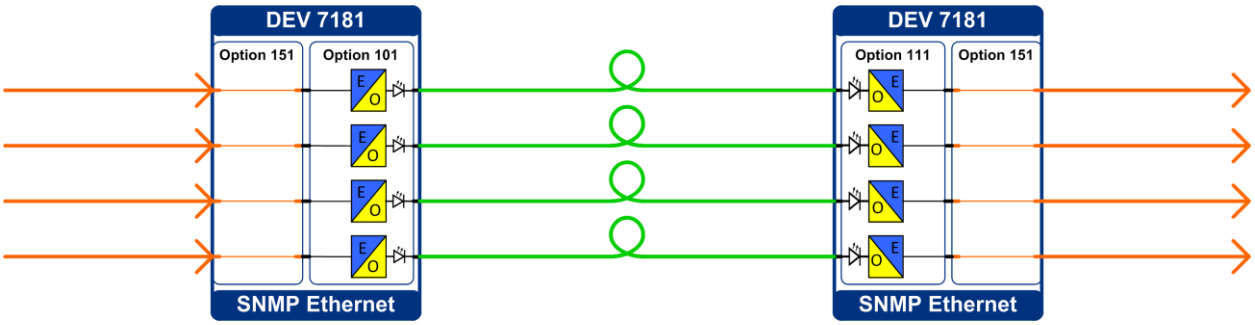
The 1 RU chassis can be equipped at the front side with up to eight optical modules, i.e. up to 32 optical channels. The RF ports (with and without redundancy functionality) installed at the rear side are assigned to the opposite optical module at the front side. In addition, the chassis is equipped with a redundant power supply, provides a local user interface, the DEV Web Interface, and SNMP support.		
Technical Data		
	Value	**Condition**
Capacity		
Slots for Optical Modules	8	
Local Operation		
Display	2.2" Full Color (18 Bits)	
Controls	Control Knob & Push Buttons	
Remote Communication		
Interface (Connector)	Ethernet (RJ-45)	
Remote Control & Surveillance	via Web Interface and via SNMP	
Redundant Power Supply		
Supply Voltage	100…240 V AC supplied by two different Lines	
Power Consumption	<200 VA	
General Specifications		
Size	19" (483 mm) Width, 1 RU (44 mm) Height, 18.5" (470 mm) Depth	Maximum Depth
Weight	~4.7 kg	Without Modules
Operating Temperature	-30…+60 °C (-22…+140 °F)	
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E	Except Temperature

1:1 Optical Link Specification

The link specifications apply for an optical link realized via an optical 1:1 connection of the single channels of the Alpha Optical Transmitter (Option 101) and of the Alpha Optical Receiver (Option 111).
For the RF connection, Alpha Input/Output RF Ports (Option 151 or Option 152) are applied on both sides of the optical link.

	Value	Condition
Frequency Range	850…2450 MHz	
Link Gain	0±3 dB	@ +25 °C / 77 °F
Variable Gain	-15…+13 dB ±0.5 dB; Step Size 0.5 dB	
Gain Stability vs. Temperature	<0.2 dB per 10 °C change	-30…+60 °C (-22…+140 °F)
Return Loss all Ports	>16 dB typ. >14 dB min.	
Flatness	±1.5 dB ±0.2 dB	850…2450 MHz @ +25 °C In any 36 MHz Window
Group Delay Distortion	<0.2 ns	In any 36 MHz Window
Nominal RF Input Level	-30 dBm	Aggregated Power
Input Power dynamic Range	-50…-20 dBm	Aggregated Power, Note 1
Damage RF Input Level	+10 dBm	Aggregated Power
Noise Figure	≤30 dB	
CNR	>30 dB	Notes 2, 3
Output IP3	>7 dBm	Notes 3, 4
OP1dB	>-10 dBm	Notes 3, 4
IM3	>40 dBc	@ 2 Tones, -28 dBm each
Transmission Distance	<3 km	
Optical Budget	1 dB	Note 5

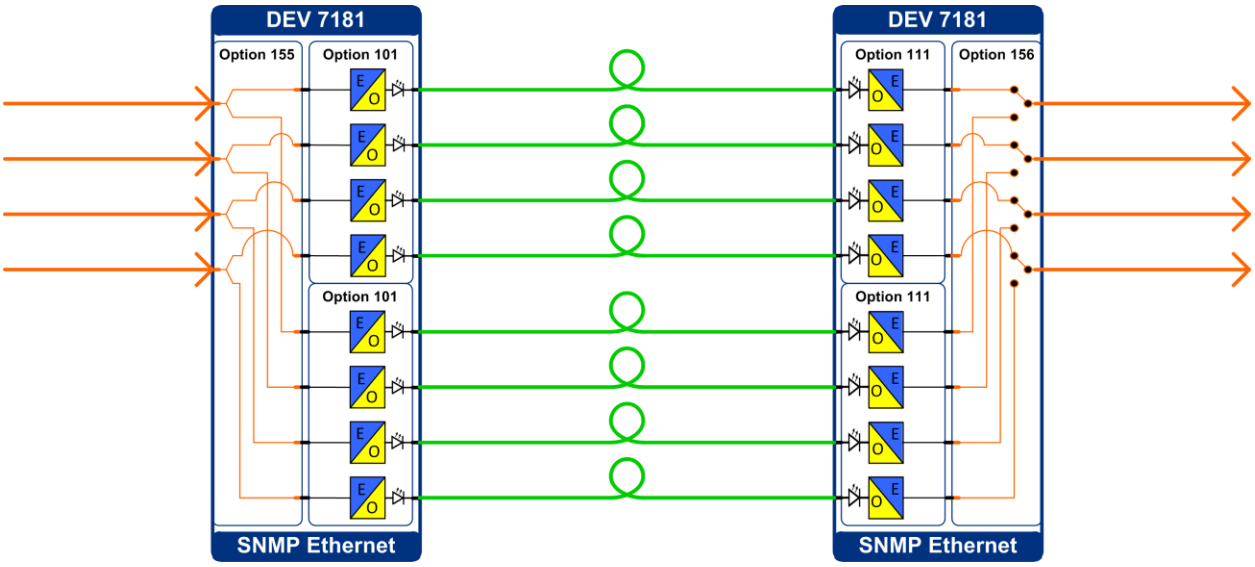
Note 1: minimum 10 dB CNR margin within any 36 MHz window
Note 2: P_{in} = -30 dBm, IM3 = 48 dBc
Note 3: with back-to-back fiber connection (2 m)
Note 4: variable gain set to +13 dB
Note 5: including 2 * SC/APC connector loss



1+1 Redundancy Optical Link Specification

The link specifications apply for an optical link realized via an optical 1+1 redundancy connection of the single channels of the Alpha Optical Transmitter (Option 101) connected to the Alpha 1+1 Tx Redundancy (Option 155) and of the Alpha Optical Receiver (Option 111) connected to the Alpha 1+1 Rx Redundancy (Option 156).		
	Value	**Condition**
Frequency Range	850…2450 MHz	
Link Gain	2±3 dB 0±3 dB	@ 50 Ohm @ 75 Ohm
Variable Gain	-15…+13 dB ±0.5 dB; Step Size 0.5 dB	
Gain Stability vs. Temperature	<0.2 dB per 10 °C change	-30…+60 °C (-22…+140 °F)
Return Loss all Ports	>16 dB typ. >14 dB min.	
Flatness	±2.0 dB ±0.2 dB	850…2450 MHz @ +25 °C In any 36 MHz Window
Group Delay Distortion	<0.2 ns	In any 36 MHz Window
Nominal RF Input Level	-30 dBm	Aggregated Power
Input Power dynamic Range	-50…-20 dBm	Aggregated Power, Note 1
Damage RF Input Level	+10 dBm	Aggregated Power
Noise Figure	≤34 dB	
CNR	>30 dB	Notes 2, 3
Output IP3	>7 dBm	Notes 3, 4
OP1dB	>-10 dBm	Notes 3, 4
IM3	>44 dBc	@ 2 Tones, -28 dBm each
Transmission Distance	<3 km	
Optical Budget	1 dB	Note 5

Note 1: minimum 10 dB CNR margin within any 36 MHz window
Note 2: P_{in} = -30 dBm, IM3 = 48 dBc
Note 3: with back-to-back fiber connection (2 m)
Note 4: variable gain set to +13 dB
Note 5: including 2 * SC/APC connector loss

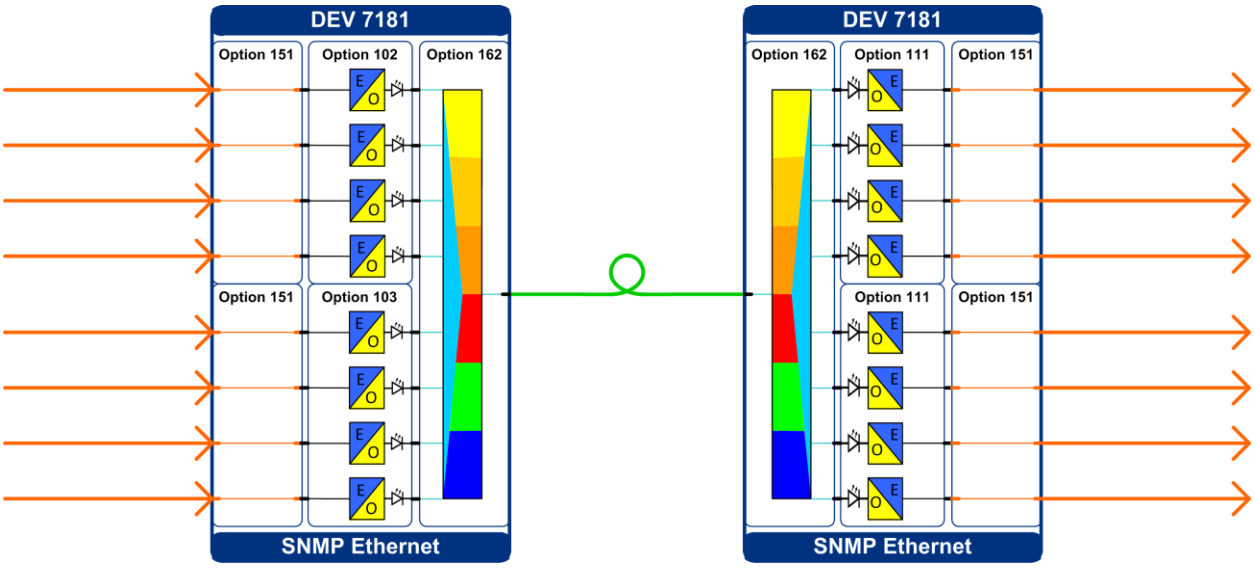


CWDM Optical Link Specification

The link specifications apply for an optical link realized via an optical 1:1 connection of the single channels of the Alpha Optical CWDM Transmitter (Option 102, Option 103, Option 104, or Option 105) and of the Alpha Optical Receiver (Option 111). For combining the optical signals at the transmitter side, and to split the optical signal at the receiver side, Alpha CWDM De-/Multiplexers (Option 161, Option 162, or Option 163) are used.
For the RF connection, Alpha Input/Output RF Ports (Option 151 or Option 152) are applied on both sides of the optical link.

	Value	**Condition**
Frequency Range	850…2450 MHz	
Link Gain	0±3 dB	@ +25 °C / 77 °F
Variable Gain	-15…+13 dB ±0.5 dB; Step Size 0.5 dB	
Gain Stability vs. Temperature	<0.3 dB per 10 °C change <0.1 dB per 10 °C change	-30…+50 °C (-22…+122 °F) -30…+40 °C (-22…+104 °F)
Return Loss all Ports	>16 dB typ. >14 dB min.	
Flatness	±1.5 dB ±0.2 dB	850…2450 MHz @ +25 °C In any 36 MHz Window
Group Delay Distortion	<0.2 ns	In any 36 MHz Window
Nominal RF Input Level	-30 dBm	Aggregated Power
Input Power dynamic Range	-50…-20 dBm	Aggregated Power, Note 1
Damage RF Input Level	+10 dBm	Aggregated Power
Noise Figure	≤30 dB	
CNR	>30 dB	Notes 2, 3
Output IP3	>7 dBm	Notes 3, 4
OP1dB	>-10 dBm	Notes 3, 4
IM3	>40 dBc	@ 2 Tones, -28 dBm each
Transmission Distance	<15 km	
Optical Budget	5 dB	Note 5

Note 1: minimum 10 dB CNR margin within any 36 MHz window
Note 2: P_{in} = -30 dBm, IM3 = 48 dBc
Note 3: with back-to-back fiber connection (2 m)
Note 4: variable gain set to +13 dB
Note 5: including 2 * SC/APC connector loss



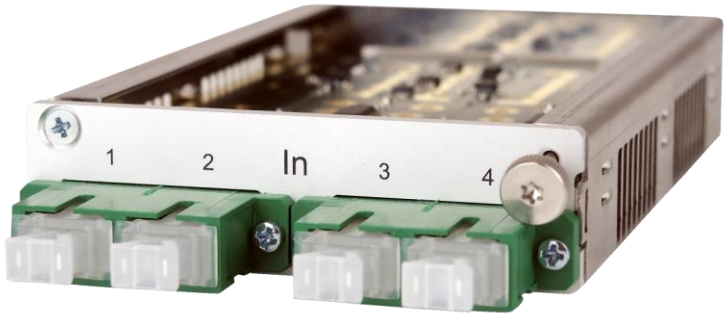
Option 101 - Alpha Optical Transmitter; 4*Tx

The Alpha Optical Transmitter provides 4 optical output channels.		
	Value	**Condition**
Optical Specifications		
Optical Output Channels	4	
Fiber Type	Single Mode 9/125 µm	
Optical Connectors	SC/APC	
Laser Class (according to IEC 60 825-1)	Class 1M (low Risk to Eyes, no Risk to Skin)	
Wavelength	1310 nm nominal	
Optical Output Power	0.5 mW / -3 dBm	
RF Sensing		
Adjustable Threshold Level	-15 dBm > Threshold Level > -55 dBm	
Threshold Repeatability	<±0.1 dB	
LNB Power		
Voltage and Tone Control	13 V, 18 V and 0 Hz, 22 kHz	Individually selectable per Channel
LNB Power per Channel	max. 380 mA	
General Specifications		
Power Consumption Module	12 V; ~250 mA	Without LNB Power
Size	2.75" (70 mm) Width (one slot)	
Weight	~0.2 kg	
Operating Temperature	-30…+60 °C (-22…+140 °F)	
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E	Except Temperature

Option 102 - Alpha Optical CWDM Transmitter; CWDM Channels 1…4
Option 103 - Alpha Optical CWDM Transmitter; CWDM Channels 5…8
Option 104 - Alpha Optical CWDM Transmitter; CWDM Channels 9…12
Option 105 - Alpha Optical CWDM Transmitter; CWDM Channels 13…16

The Alpha Optical CWDM Transmitters provide the same specifications as the standard Alpha Optical Transmitter (Option 101), except the CWDM wavelengths:				
	Value			
Optical Specifications	**Option 102**	**Option 103**	**Option 104**	**Option 105**
CWDM Wavelengths	Channels 1…4: 1510 nm ±10 nm 1530 nm ±10 nm 1550 nm ±10 nm 1570 nm ±10 nm	Channels 5…8: 1470 nm ±10 nm 1490 nm ±10 nm 1590 nm ±10 nm 1610 nm ±10 nm	Channels 9…12: 1310 nm ±10 nm 1330 nm ±10 nm 1350 nm ±10 nm 1370 nm ±10 nm	Channels 13…16: 1270 nm ±10 nm 1290 nm ±10 nm 1430 nm ±10 nm 1450 nm ±10 nm

Option 111 - Alpha Optical Receiver; 4*Rx

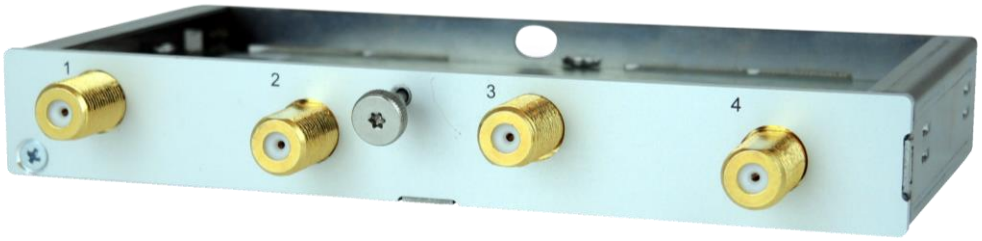


The Alpha Optical Receiver provides 4 optical input channels.		
	Value	**Condition**
Optical Specifications		
Optical Input Channels	4	
Fiber Type	Single Mode 9/125 µm	
Optical Connectors	SC/APC	
Wavelength Range	1270…1610 nm	
RF Sensing		
Adjustable Threshold Level	-15 dBm > Threshold Level > -55 dBm	
Threshold Repeatability	<±0.1 dB	
General Specifications		
Power Consumption Module	12 V; ~180 mA	
Size	2.75" (70 mm) Width (one slot)	
Weight	~0.2 kg	
Operating Temperature	-30…+60 °C (-22…+140 °F)	
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E	Except Temperature

Option 151 - Alpha Input/Output; 4*RF Port; 75 Ohm, F (f)
Option 152 - Alpha Input/Output; 4*RF Port; 50 Ohm, SMA (f)

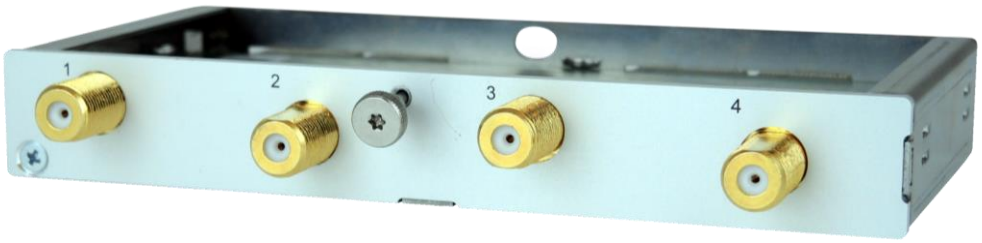
The Alpha Input/Output RF Ports provide direct RF access to the four channels of the related optical module.			
	Value		**Condition**
RF Specifications			
Input or Output Ports	4		
	Option 151	**Option 152**	
Impedance, Connectors	75 Ohm, F (f)	50 Ohm, SMA (f)	
DC blocked	No		
General Specifications			
Size	2.75" (70 mm) Width (one slot)		
Weight	~0.1 kg		

Option 155 - Alpha 1+1 Tx Redundancy; 4*RF Splitter; 75 Ohm, F (f)
Option 157 - Alpha 1+1 Tx Redundancy; 4*RF Splitter; 50 Ohm, SMA (f)



The Alpha 1+1 Tx Redundancy options are used for the RF connection to two optical transmitter modules in 1+1 redundancy applications.			
	Value		**Condition**
RF Specifications			
Input Ports	4		
	Option 155	**Option 157**	
Impedance, Connectors	75 Ohm, F (f)	50 Ohm, SMA (f)	
DC blocked	No		
General Specifications			
Size	5.55" (141 mm) Width (two slots)		
Weight	~0.2 kg		

Option 156 - Alpha 1+1 Rx Redundancy; 4*RF Switch; 75 Ohm, F (f)
Option 158 - Alpha 1+1 Rx Redundancy; 4*RF Switch; 50 Ohm, SMA (f)



The Alpha 1+1 Rx Redundancy options are used for the RF connection to two optical receiver modules in 1+1 redundancy applications.			
	Value		**Condition**
RF Specifications			
Output Ports	4		
	Option 156	**Option 158**	
Impedance, Connectors	75 Ohm, F (f)	50 Ohm, SMA (f)	
DC blocked	Yes		
General Specifications			
Size	5.55" (141 mm) Width (two slots)		
Weight	~0.2 kg		

Option 161 - Alpha 1:4 CWDM De-/Multiplexer; CWDM Channels 1…4
Option 162 - Alpha 1:8 CWDM De-/Multiplexer; CWDM Channels 1…8
Option 163 - Alpha 1:16 CWDM De-/Multiplexer; CWDM Channels 1…16

The Alpha CWDM De-/Multiplexer provide four, eight, or sixteen optical ports for CWDM applications.				
	Value		**Condition**	
Optical Specifications				
Optical Connectors Common Port / Patch Cables De-/Mux Ports / Patch Cables	 SC/APC / SC/APC SC/APC / LC/APC			
	Option 161	**Option 162**	**Option 163**	
Number of De-/Mux Ports	4	8	16	
CWDM Wavelengths	Channels 1…4: 1510 nm ±10 nm 1530 nm ±10 nm 1550 nm ±10 nm 1570 nm ±10 nm	Channels 1…8: 1510 nm ±10 nm 1530 nm ±10 nm 1550 nm ±10 nm 1570 nm ±10 nm 1470 nm ±10 nm 1490 nm ±10 nm 1590 nm ±10 nm 1610 nm ±10 nm	Channels 1…16: 1510 nm ±10 nm 1530 nm ±10 nm 1550 nm ±10 nm 1570 nm ±10 nm 1470 nm ±10 nm 1490 nm ±10 nm 1590 nm ±10 nm 1610 nm ±10 nm 1310 nm ±10 nm 1330 nm ±10 nm 1350 nm ±10 nm 1370 nm ±10 nm 1270 nm ±10 nm 1290 nm ±10 nm 1430 nm ±10 nm 1450 nm ±10 nm	
General Specifications				
Size	2.75" (70 mm) Width (one slot)		5.55" (141 mm) Width (two slots)	
Weight	~0.1 kg			
Operating Temperature	-30…+50 °C (-22…+122 °F)			
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E		Except Temperature	

Option 55 - Change Ethernet to optical Ethernet Interface SC/APC
Option 56 - Change Ethernet to optical Ethernet Interface SC/PC

With applied Option 55 (or Option 56), the DEV 7181 provides a 100Base FX Ethernet interface with SC/APC (or SC/PC) connectors (instead of the standard 100Base-TX Ethernet interface with RJ-45 connector) for the optical transmission of Ethernet signals.

Option 77 - Signal Recording

With applied Option 77, the Web Interface additionally provides the Recording Window that permits the visualization and the external storage of transmitter and receiver signal data.

Order Information

Product and Options

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Option 102	Alpha Optical CWDM Transmitter; CWDM Channels 1…4; 850…2450 MHz; SC/APC
Option 103	Alpha Optical CWDM Transmitter; CWDM Channels 5…8; 850…2450 MHz; SC/APC
Option 104	Alpha Optical CWDM Transmitter; CWDM Channels 9…12; 850…2450 MHz; SC/APC
Option 105	Alpha Optical CWDM Transmitter; CWDM Channels 3…16; 850…2450 MHz; SC/APC
Option 111	Alpha Optical Receiver; 4*Rx; 850…2450 MHz; SC/APC
Option 151	Alpha Input/Output; 4*RF Port; 75 Ohm, F (f)
Option 152	Alpha Input/Output; 4*RF Port; 50 Ohm, SMA (f)
Option 155	Alpha 1+1 Tx Redundancy; 4*RF Splitter; 75 Ohm, F (f)
Option 156	Alpha 1+1 Rx Redundancy; 4*RF Switch; 75 Ohm, F (f)
Option 157	Alpha 1+1 Tx Redundancy; 4*RF Splitter; 50 Ohm, SMA (f)
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Option 163	Alpha 1:16 CWDM De-/Multiplexer; CWDM Channels 1…16
Option 55	Change Ethernet to optical Ethernet Interface SC/APC
Option 56	Change Ethernet to optical Ethernet Interface SC/PC
Option 77	Signal Recording

Contact

DEV Systemtechnik GmbH
Grüner Weg 4A
61169 Friedberg
GERMANY
Phone: +49 6031 6975 100
Fax: +49 6031 6975 114
info@dev-systemtechnik.com
www.dev-systemtechnik.com

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