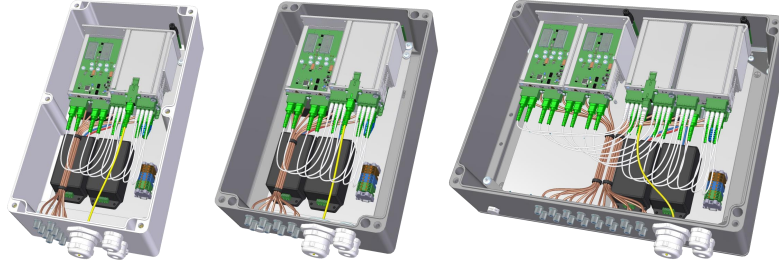


Optribution Alpha Outdoor Chassis



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

THE ART OF ENGINEERING

Product and Options

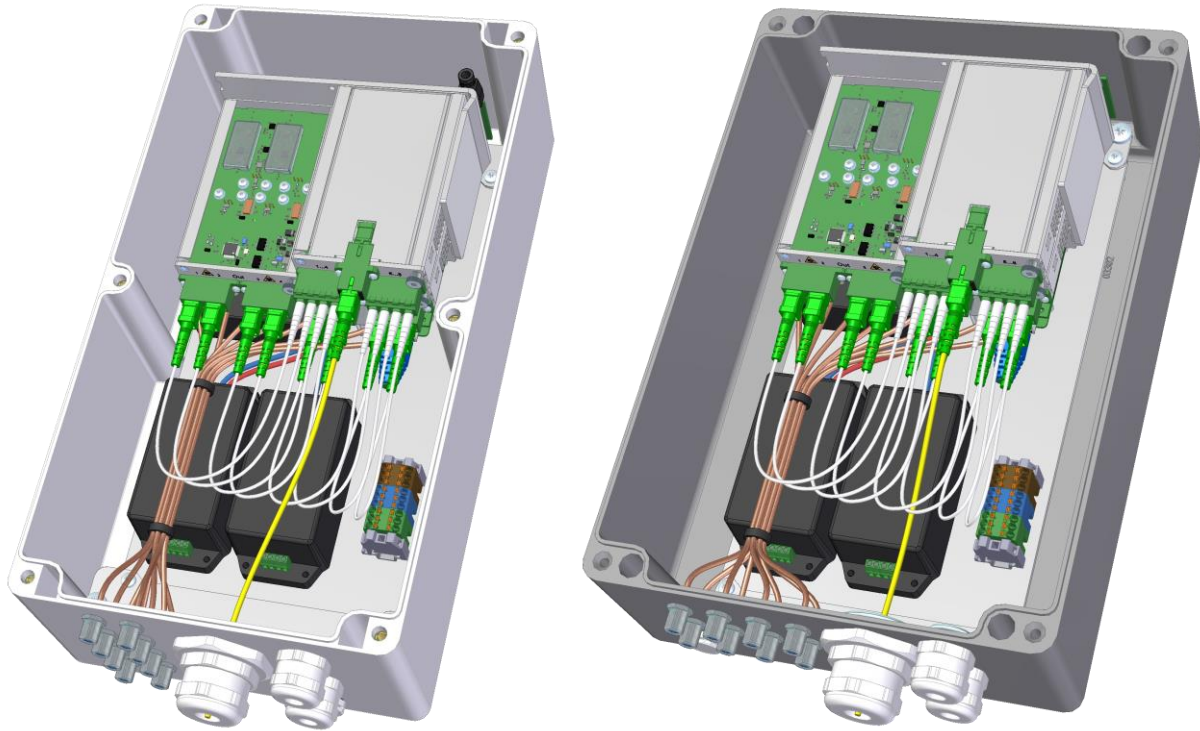
DEV 7185	Optribution Polycarbonate Outdoor Chassis Alpha; up to 8 Channels
DEV 7186	Optribution Aluminum Outdoor Chassis Alpha; up to 8 Channels
DEV 7187	Optribution Aluminum Outdoor Chassis Alpha; up to 16 Channels
Option 101	Alpha Optical Transmitter; 4*T _x ; 850...2450 MHz; SC/APC
Option 102	Alpha 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*R _x ; 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 156¹	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 158¹	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

Features

- 3 different Outdoor Chassis for up to 16 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
- SNMP Support (Option¹)
- DEV Web Interface (Option¹)
- Signal Recording (Option¹)
- Power Supply Redundancy Option
- Interoperability with the DEV Optribution Series

Note 1: DEV 7187 only

DEV 7185 **Optribution Polycarbonate Outdoor Chassis Alpha; up to 8 Channels**
DEV 7186 **Optribution Aluminum Outdoor Chassis Alpha; up to 8 Channels**



Both outdoor chassis can be equipped with up to two optical modules, i.e. up to 8 optical channels. The RF ports (with and without redundancy functionality) are installed below the optical modules. In addition, a slot located above the optical modules can be equipped with a CWDM de-/multiplexer.

Technical Data					
		Value			Condition
Capacity					
Slots for Optical Modules		2			
Power Supply					
Supply Voltage		100...240 V AC			
Power Consumption		<60 VA			
General Specifications					
		DEV 7185	DEV 7186		
Size	Width	14.2" (360 mm)	13.0" (330 mm)	Without external Connectors	
	Height	7.9" (200 mm)	9.0" (230 mm)		
	Depth	5.9" (150 mm)	4.3" (110 mm)		
Weight		~3.1 kg	~4.7 kg	Without Modules	
Operating Temperature		-30...+60 °C (-22...+140 °F)			
Ingress Protection Rating		IP65			
Environmental Conditions		ETS 300019 Part 1-3 Class 3.1E		Except Temperature and Ingress Protection Rating	

DEV 7187 Optribution Aluminum Outdoor Chassis Alpha; up to 16 Channels



The DEV 7187 outdoor chassis can be equipped with up to four optical modules, i.e. up to 16 optical channels. The RF ports (with and without redundancy functionality) are installed below the optical modules. In addition, a slot located above the optical modules can be equipped with a CWDM de-/multiplexer. Optionally, the DEV 7187 can be equipped with a CPU for Monitoring and Control via Web Interface and via SNMP (Option 59).

Technical Data

	Value	Condition
Capacity		
Slots for Optical Modules	4	
Redundant Power Supply		
Supply Voltage	100...240 V AC	
Power Consumption	<60 VA	
General Specifications		
Size	15.7" (400 mm) Width, 12.2" (310 mm) Height, 4.3" (110 mm) Depth	Without external Connectors
Weight	~9.1 kg	Without Modules
Operating Temperature	-30...+60 °C (-22...+140 °F)	
Ingress Protection Rating	IP65	
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E	Except Temperature and Ingress Protection Rating

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	<0.4 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

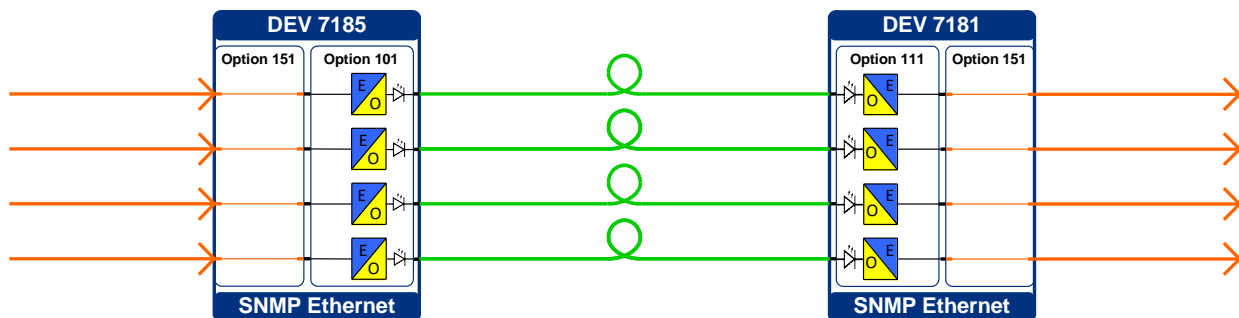
Note 1: minimum 10 dB CNR Margin within any 36 MHz window

Note 2: $P_{in} = -30$ dBm

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	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	-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	+13 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

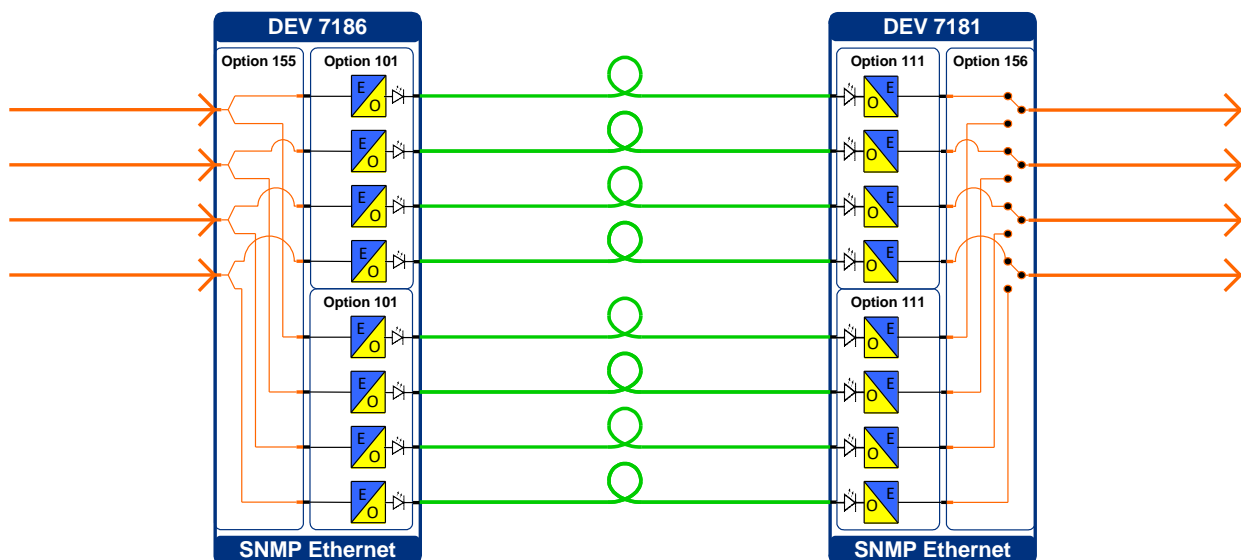
Note 1: minimum 10 dB CNR Margin within any 36 MHz window

Note 2: $P_{in} = -30$ dBm

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

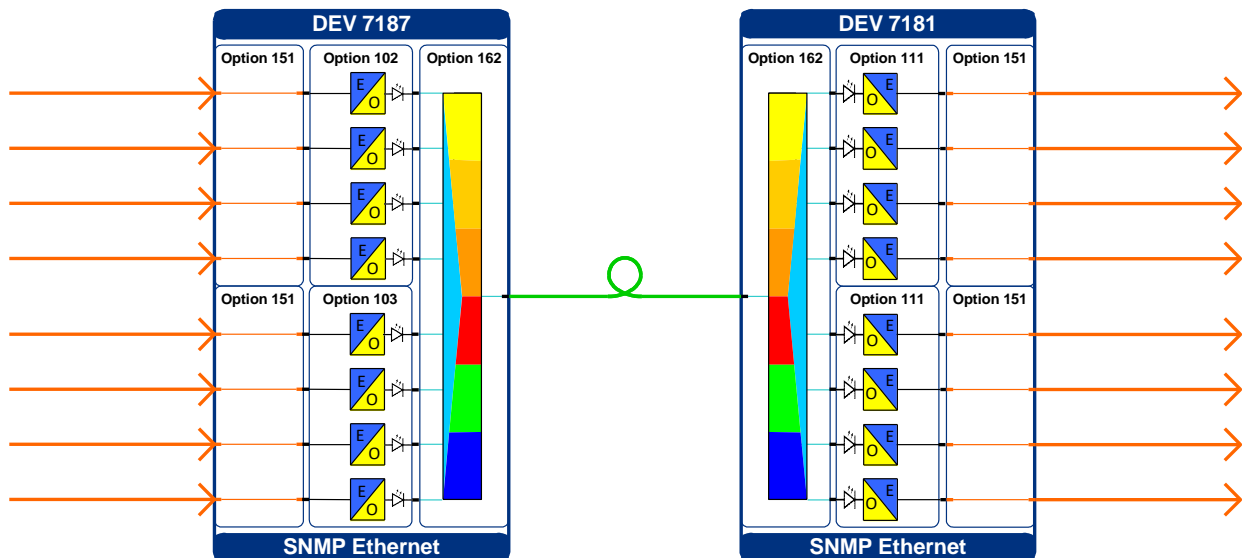
Note 1: minimum 10 dB CNR Margin within any 36 MHz window

Note 2: $P_{in} = -30$ dBm

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*T_x



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 > -50 dBm	Note 1
Threshold Repeatability	<±0.1 dB	
LNB Power		
Voltage and Tone Control	13 V, 18 V and 0 Hz, 22 kHz	Individually selectable per Channel, Note 1
LNB Power per Channel	max. 200 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

Note 1: DEV 7187 in combination with Option 59 only

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 > -50 dBm	Note 1
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 $^{\circ}\text{C}$ (-22...+140 $^{\circ}\text{F}$)	
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E	Except Temperature

Note 1: DEV 7187 in combination with Option 59 only

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

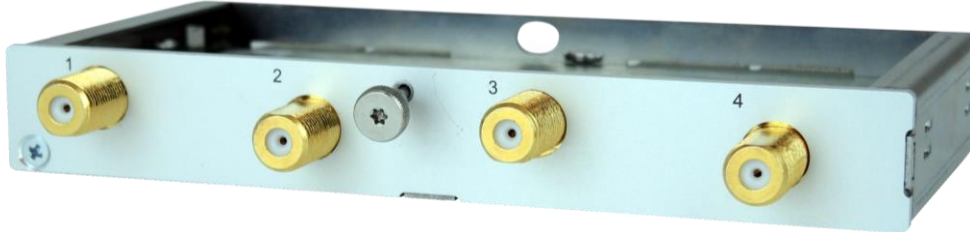


The Alpha Input/Output RF Ports provide direct RF access to the four channels of the related optical module.

	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 option is used for the RF connection to two optical receiver modules in 1+1 redundancy applications.

Note that the Alpha 1+1 Rx Redundancy option is available for a DEV 7187 in combination with Option 59 only.

	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. Note that the Alpha 1:16 CWDM De-/Multiplexer option is available for the DEV 7187 only.

	Value		Condition	
Optical Specifications				
Optical Connectors				
Common Port / Patch Cables	SC/APC / SC/APC			
De-/Mux Ports / Patch Cables	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		~0.2 kg	
Operating Temperature	-30...+50 °C (-22...+122 °F)			
Environmental Conditions	ETS 300019 Part 1-3 Class 3.1E		Except Temperature	

Option 16 - Redundant Power Supply

With Option 16, a second power supply is installed to provide power supply redundancy for the outdoor chassis.

Option 55 - Change Ethernet to optical Ethernet Interface

A DEV 7187 in combination with Option 59 equipped is enhanced with an optical Ethernet Interface.

■ Option 59 is mandatory for the application of Option 55 in a DEV 7187

Option 59 - CPU for Monitoring and Control via Web Interface and via SNMP

The DEV 7187 is enhanced with a CPU that enables monitoring and control via Web Interface and via SNMP.

■ Option 59 is mandatory for the Alpha 1+1 Rx Redundancy option in a DEV 7187

Option 77 - Signal Recording

With Option 77, the Web Interface of a DEV 7187 in combination with Option 59 additionally provides the Recording Window that permits the visualization and the external storage of transmitter and receiver signal data.

■ Option 59 is mandatory for the application of Option 77 in a DEV 7187

Option 89 - Pole Mount Assembly

	DEV 7185	DEV 7186	DEV 7187
Mounting for Pole Diameters	2.4...7.8" (60...200 mm)	6.6...10.0" (168...254 mm)	

Order Information

Product and Options

DEV 7185	Optribution Polycarbonate Outdoor Chassis Alpha; up to 8 Channels
DEV 7186	Optribution Aluminum Outdoor Chassis Alpha; up to 8 Channels
DEV 7187	Optribution Aluminum Outdoor Chassis Alpha; up to 16 Channels
Option 101	Alpha Optical Transmitter; 4*T _x ; 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 3...16; 850...2450 MHz; SC/APC
Option 111	Alpha Optical Receiver; 4*R _x ; 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 ¹	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 ¹	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 ²	Alpha 1:16 CWDM De-/Multiplexer; CWDM Channels 1...16
Option 16	Redundant Power Supply
Option 55 ¹	Change Ethernet to optical Ethernet Interface
Option 59 ²	CPU for Monitoring and Control via Web Interface and via SNMP
Option 77 ¹	Signal Recording
Option 89	Pole Mount Assembly

Note 1: DEV 7187 in combination with Option 59 only

Note 2: DEV 7187 only

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