SHDSL.bis and Fiber

Up to 300Mbps

Ethernet

FlexDSL MiniFlex

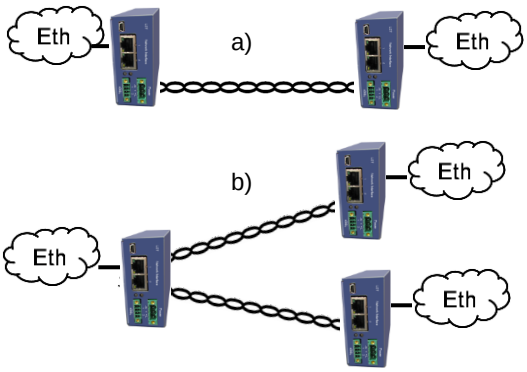
SHDSL.bis and Optical Mini DSLAM

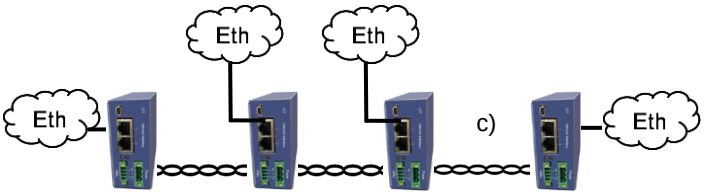
Features

- Up to 15.2Mbps Data Transmission per Copper Pair
- SHDSL and SHDSL.bis, TC-PAM16/32
- Additional TC-PAM4/8/64/128 Available
- 100 / 1000 Mbps Fiber Optical Tributary Interface
- Integrated Layer 2 Managed Ethernet Switch:
  - 4x Gigabit Ethernet Uplink (2x TP / 2x SFP)
  - 8x 10/100Mbps
- Rapid Spanning Tree, Ethernet Ring Protection, Link Aggregation, VLAN, QoS
- Transparent Transmission of Modbus RTU / ASCII, DNP3 and IEC 60870.5 Protocol
- Point-to-Point, Point-to-Multipoint & Ring Operation
- Console Port, Telnet, Web, SNMP Management
- 24/48VDC and/or 110/230VAC Redundant Powered, Low Power Consumption
- Included Primary Protection
- Repeater supported and available
- 19" & 2U Height or Robust DIN-Rail Metal Enclosure
- Industrial Temperature Range Available

The FlexDSL **MiniFlex** platform is a special part of the **Orion3** product family. Beside of having up to 10 dual **Orion3 SHDSL.bis Extended** line cards there is a feature-rich managed layer 2 Ethernet switch included. This switch has 8 auto-sensing front accessible 10/100Base-T ports as well as 2 gigabit Ethernet ports with fiber connectivity (SFP) and 2 gigabit Ethernet ports with copper connectivity (RJ-45). The inside backplane connects this switch to all Orion3 line cards through additional 10 Ethernet 10/100 Base-T ports.
The FlexDSL Orion3 SHDSL.bis Extended product family offers a broad range of products, which are based on the latest SHDSL.bis standards (ITU-T G.991.2 & ETS TS 101 524), while also being fully interoperable with all our existing SHDSL equipment (Orion1 & Orion2).
SHDSL.bis Extended allows symmetrical data transmission at speeds up to 15.2Mbps over a single pair of copper. In addition, the dual Orion3 line card also supports DSL channel bonding for 2 copper pairs in order to achieve speeds to 30.4Mbps! Using the link aggregation feature of the additional integrated switch, the FlexDSL MiniFlex can transmit up to 300Mbps over 20 copper pairs. This incredible speed makes Fiber installations in a lot of places needless.
In addition to SHDSL.bis, the **MiniFlex** platform supports subscriber access over Fiber Optic. The optical line card has built-in SFP jack for standard 100 or 1000 Mbps Ethernet module. The protocol is compatible with third-party switches, media converters, etc. Like all FlexDSL Orion products, the MiniFlex and its line cards are based on industrial components and are manufactured according to highest quality standards providing additional value due to the extended temperature range and higher reliability. The combination of comprehensive functions providing maximum flexibility together with the higher quality of the FlexDSL MiniFlex makes it the perfect choice for your access needs.

Possible Application: Point-to-Point & Point-to-Multipoint





a) Ethernet Transmission Point-to-Point
b) Ethernet Transmission Point-to-Multipoint
c) Ethernet Add/Drop over a Long Copper Line

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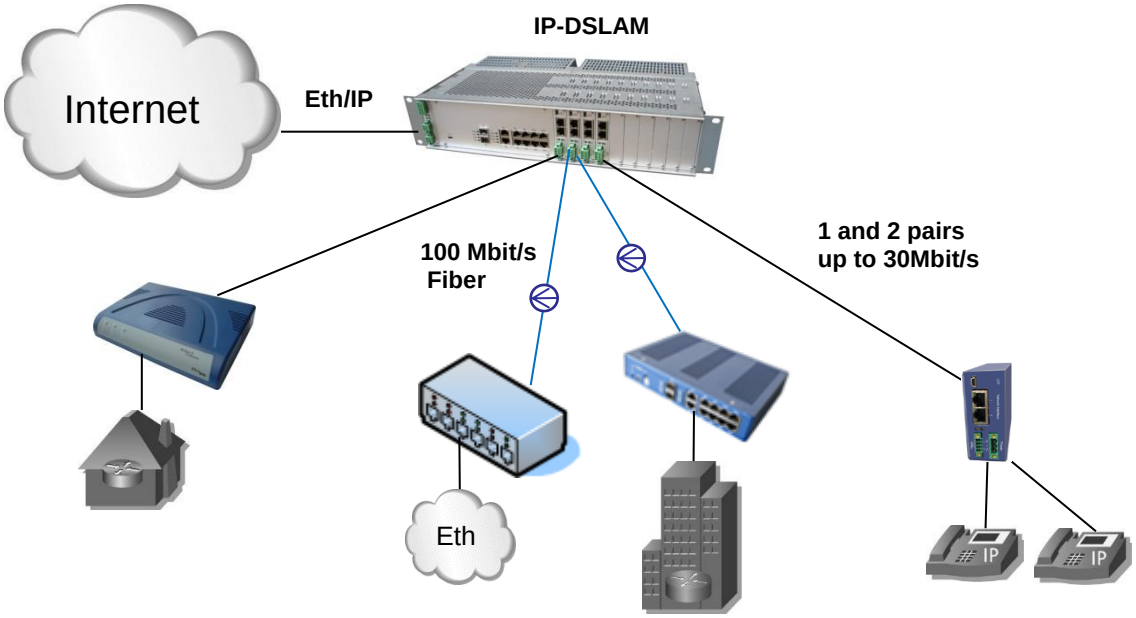
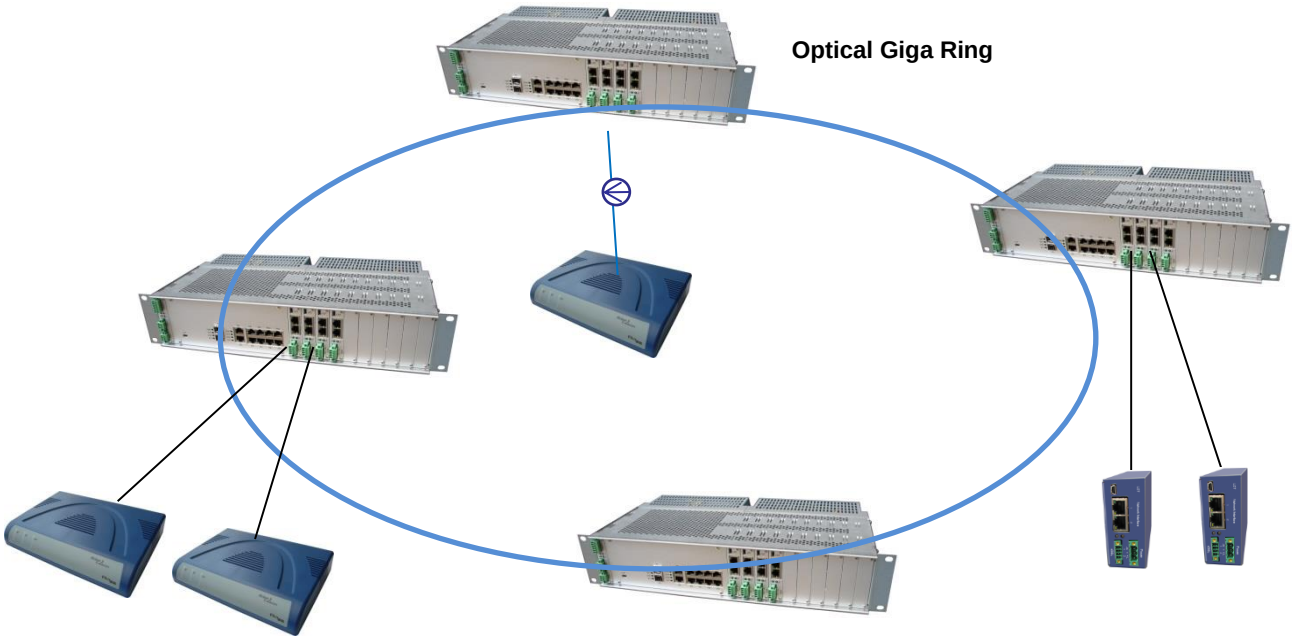
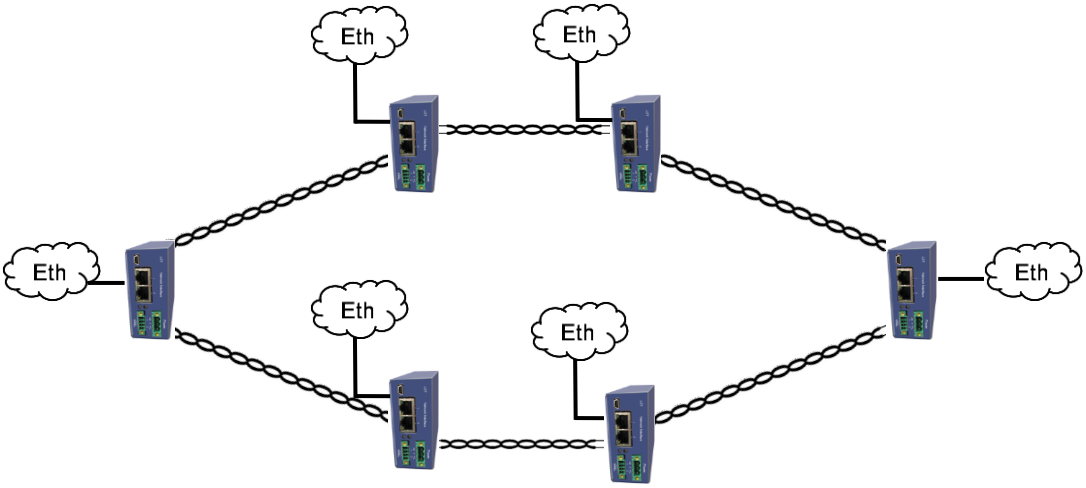
Possible Application: **Typical Internet Service Provider (ISP) Application**

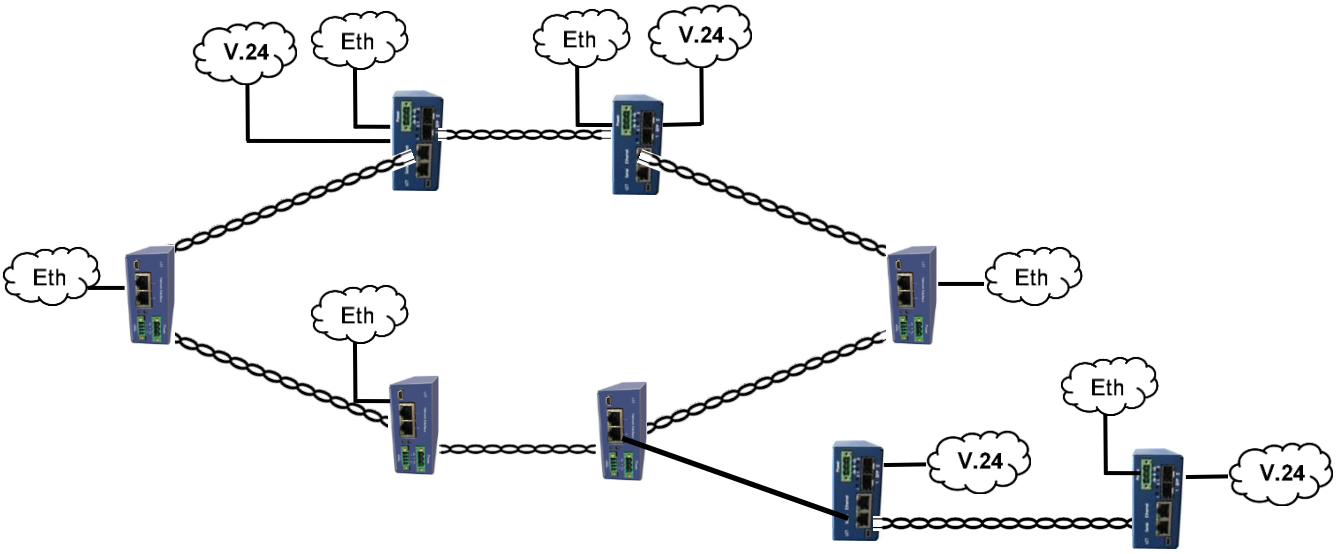


Possible Application: **Ring with the 19"MiniFlex Racks**



Possible Application: **Ring with the MiniFlex Dinrail Modems**





MiniFlex Rack with included Switch for 10 Linecards

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Model:	**MF-MR2N-SW-12Eth,V2**
Switch Interfaces:	8x Ethernet 10/100BaseT (Auto Sensing)
	2x Gigabit Ethernet 1000Base-T
	2x Gigabit Ethernet SFP
	1x USB 2.0 (Local Consol Port)
	10x Ethernet 10/100BaseT on Backplane to Line Card
Physical Interfaces:	SFP cage, RJ45 (Ethernet), Mini-B (USB)
Management:	Local Console Port, Telnet/SSH, Web, SNMP v1 and V2c
L2 Features:	**Spanning Tree and Ethernet Ring**
	IEEE 802.1D Spanning Tree Protocol (STP)
	IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
	IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
	Ethernet Ring Protection Mechanism, 50ms rapid In switching and
	VLAN
	4K IEEE 802.1q VLANs
	Port-based VLAN, MAC-Based VLAN, Private VLAN
	GVRP, Q-in-Q, VLAN Translation
	Link Aggregation
	Static Trunk, Dynamic Trunk, IEEE 802.3ad LACP, Load
	Multicast Features
	IGMP v1. v2, v3, IGMP Snooping, IGMP Groups
	Multicast VLAN
QoS:	**Quality of Service**
	8 Priority Queues/port
	WRR, Strict Priority
	WRR/WDDR+Strict Priority
	802.1p
	Port-Based CoS
	CoS based on MAC DA/SA
	Bandwidth Control per Port
	Access Control List
	MAC+Port Binding, VLAN+Port Binding
Security:	**Port Security**
	Trust Port, Port Blocking, Private VLAN, Port Powering Off
	MAC address learning limit per port
	DoS check, Management IP list
Alarm Interface:	Major and Minor Alarm Relays

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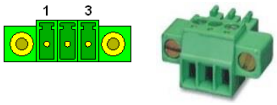
Model:	**MF-MR2N-SW-8Eth,V2**
Switch Interfaces:	6x Ethernet 10/100/1000BaseT (Auto Sensing)
	2x Ethernet 1000Base-X or 2500Base-X (SFP)
	1x USB 2.0 (Local Consol Port)
	10x Ethernet 10/100/1000BaseT on Backplane to Line Card
Physical Interfaces:	SFP cage, RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs, SNMPv1/v2c/v3, SD-Card support
Indication:	Major and Minor Alarm LEDs & Power Supply Detection LEDs
L2 Features:	IEEE-802.3, VLAN IEEE-802.1Q, QoS IEEE-802.1P
	STP IEEE 802.1D
Alarm Interface:	Major and Minor Alarm Relays

MiniFlex Rack without Switch for 10 Linecards

Model:	**MF-MR2N,V2**
Alarm Interface:	Major and Minor Alarm Relais

Power Supply for MiniFlex Rack



Model:	**MF-PS48, V1**
Input Voltage:	18 - 72 VDC, max. 90 Watts
Temperature:	-20 to +70°C
Connector:	3 Pin Phoenix Mini Combicon connector (Front access)

Model:	**MF-PS110/230, V1**
Input Voltage:	90 - 264 VAC, 47 - 63 Hz, max. 90 Watts
Temperature:	-20 to +70°C
Connector:	IEC 60320 Appliance Inlet C14 (Back access)

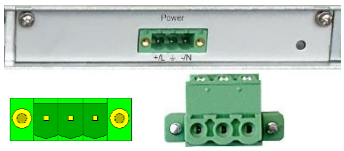
MiniFlex FlatRack with included Switch for 5 Linecards

Model:	**MF-FR05N-SW-2Eth,V1**
Modes:	MDI / MDI-X auto crossover, Auto Negotiation, Full/Half Duplex
Interfaces:	1x Ethernet 1000Base-X or 2500Base-X (SFP) on the back panel
	1x Ethernet 10/100/1000BaseT on the back panel
	7x Ethernet 10/100/1000BaseT on Backplane to the Line Cards
Physical Interfaces:	SFP cage, RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs, SNMPv1/v2c/v3, SD-Card support
Indication:	Major and Minor Alarm LEDs & Power Supply Detection LEDs
L2 Features:	IEEE-802.3, VLAN IEEE-802.1Q, QoS IEEE-802.1P
	STP IEEE 802.1D
Size:	483x293x24mm (WxLxH)

MiniFlex FlatRack without Switch for 5 Linecards

Model:	**MF-FR05N,V1**
Size:	483x293x24mm (WxLxH)

Power Supply for MiniFlex FlatRack



Model:	**MF-PS48-FR05N,V1**
Input Voltage:	18 - 72 VDC, max. 40 Watts
Temperature:	-20 to +60°C (at full load)
Connector:	3 Pin Phoenix Combicon connector (Back access)

Model:	**MF-PS230-FR05N,V1**
Input Voltage:	170 - 264 VAC, 47 - 63 Hz, max. 60 Watts
Temperature:	-20 to +60°C
Connector:	3 Pin Phoenix Combicon connector (Back access)

Model:	**MF-PS120-FR05N,V1**
Input Voltage:	85 - 132 VAC, 47 - 63 Hz, max. 60 Watts
Temperature:	-20 to +60°C
Connector:	3 Pin Phoenix Combicon connector (Back access)

MiniFlex MiniRack 2U for 4 Linecards

Model:	**MF-MR-RAIL-2U4S,V2**
Input Voltage:	18 - 72 VDC, max. 20 Watts, Dual Input, Fuse 2AT
Temperature:	-20 to +70°C
Connector:	3 Pin Phoenix Mini Combicon connector (Front access)
Alarm Interface:	Major and Minor Alarm Relais
Connector:	6 Pin Phoenix Mini Combicon connector (Front access)
Size:	110x181x88mm (WxLxH)

MiniFlex MiniRack Wallmount Kit

Model:	**MF-MR-RAIL-WALLMOUNT,V1**

MiniFlex Dual Unit for 2 Linecards

Model:	**MF-DU-RAIL-2U2S-24V, V2** **MF-DU-RAIL-2U2S-230V, V2**
Input Voltage DC:	18 - 72 VDC, max. 20 Watts without PoE
Input Voltage AC:	85-264VAC, 120-370VDC, max 20 Watts without PoE
Temperature:	-40 to +70°C
Connector:	3 Pin Phoenix Mini Combicon connector (Bottom access)
Alarm Interface:	Major and Minor Alarm Relais
Connector:	6 Pin Phoenix Mini Combicon connector (Bottom access)
Size:	50x180x87mm (WxLxH)

MiniFlex SHDSL.bis Line Card

Model:	**MF-PAM-SR2L-2Eth, V1**
DSL Version:	SHDSL / SHDSL.bis / Extended
Modulation:	TC-PAM4 / TC-PAM8 / TC-PAM16 / TC-PAM32 / TC-PAM64 /TC-PAM128
Data Rate:	128kbps - 30.464Mbps, 2x 15.232Mbps
Copper Pairs:	2 with Modes Master / Slave / Auto / Multipoint / Multipair
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch 2x Ethernet 10/100BaseT on the front panel 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	Phoenix Mini Combicon (SHDSL), RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex Dual EFM Line Card

Model:	**MF-EFM-SR2L-2Eth, V1**
DSL Version:	EFM SHDSL / SHDSL.bis / Extended
Modulation:	TC-PAM4 / TC-PAM8 / TC-PAM16 / TC-PAM32 / TC-PAM64 /TC-PAM128
Data Rate:	128kbps - 30.464Mbps, 2x 15.232Mbps
Copper Pairs:	2 with Modes Master / Slave / Auto / Multipoint / Bonding
Interfaces:	1x Ethernet 10/100/1000BaseT on Backplane to Switch 2x Ethernet 10/100/1000BaseT on the front panel 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	Phoenix Mini Combicon (EFM), RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3

MiniFlex Quad EFM Line Card

Model:	**MF-EFM-SR4L-2Eth, V1**
DSL Version:	EFM SHDSL / SHDSL.bis / Extended
Modulation:	TC-PAM4 / TC-PAM8 / TC-PAM16 / TC-PAM32 / TC-PAM64 /TC-PAM128
Data Rate:	128kbps - 60.928Mbps, 4x 15.232Mbps
Copper Pairs:	4 with Modes Master / Slave / Auto / Multipoint / Bonding
Interfaces:	1x Ethernet 10/100/1000BaseT on Backplane to Switch 2x Ethernet 10/100/1000BaseT on the front panel 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	Phoenix Combicon DMC (EFM), RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex SHDSL.bis BYPASS Line Card

Model:	**MF-BYP-SR2L, V1**
Copper Pairs:	Bypass for 2 copper pairs (2xSHDSL to 2xSHDSL)
Physical Interfaces:	Phoenix Mini Combicon (SHDSL)
Management:	Bypass On/Off switch

MiniFlex Single Fiber Optic Line Card

Model:	**MF-FOM-SRL, V1**
Fiber Optic:	100Base-FX
Data Rate:	100 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch
	1x Ethernet 100Base-FX (SFP) on the front panel
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	SFP cage, Backplane (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex Dual Fiber Optic Line Card

Model:	**MF-FOM-SR2L-2Eth, V1**
Fiber Optic:	100Base-FX
Data Rate:	100 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch
	2x Ethernet 10/100BaseT on the front panel
	2x Ethernet 100Base-FX (SFP) on the front panel
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	SFP cage, RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex Dual Giga Fiber Optic Line Card

Model:	**MF-GFOM-SR2L-2Eth, V1**
Fiber Optic:	100Base-FX / 1000Base-X
Data Rate:	100 / 1000 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	1x Ethernet 10/100/1000BaseT on Backplane to Switch
	2x Ethernet 10/100/1000BaseT on the front panel
	2x Ethernet 100Base-FX or 1000Base-X (SFP) on the front panel
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	SFP cage, RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex POE (Power over Ethernet) Line Card

Model:	**MF-POE-SRL-2Eth, V1**
Ethernet:	IEEE-802.3
Modes:	MDI / MDI-X auto crossover, Auto Negotiation, Full/Half Duplex
PoE:	IEEE 802.3af, 15.4Watts
PoE Modes:	Mode A or Mode B, Jumper settings
Interfaces:	2x Ethernet 10/100BaseT on Backplane to Switch
	2x Ethernet (with PoE) 10/100BaseT on the front panel
Physical Interfaces:	RJ45 (Ethernet)
Management:	No

MiniFlex Managed Switch Line Card

Model:	**MF-SW-SRL-8Eth, V1**
Ethernet:	IEEE-802.3, VLAN IEEE-802.1Q, QoS IEEE-802.1P
Modes:	MDI / MDI-X auto crossover, Auto Negotiation, Full/Half Duplex
Interfaces:	4x Ethernet 10/100BaseT on Backplane to Switch/other cards 4x Ethernet 10/100BaseT on the front panel 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex Managed Gigabit Ethernet Switch Line Card

Model:	**MF-GSW-SRL-8Eth, V1**
Ethernet:	IEEE-802.3, VLAN IEEE-802.1Q, QoS IEEE-802.1P
Modes:	MDI / MDI-X auto crossover, Auto Negotiation, Full/Half Duplex
Interfaces:	4x Ethernet 10/100/1000 BaseT on Backplane to Switch/other cards 4x Ethernet 10/100/1000 BaseT on the front panel 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex Serial Interfaces Line Card

Model:	**MF-SER-SRL-4V24, V1**
Serial:	RS-232, V.24/28
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch 4x RS-232 (V.24/28) on the front panel 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (RS-232), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

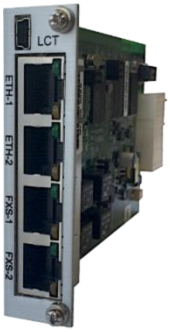
MiniFlex Dual Fiber Optic Serial Interface Line Card

Model:	**MF-FOM-SR2L-SER/Eth, V1**
Fiber Optic:	100Base-FX
Data Rate:	100 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch 1x RS-232/422/485 on the front panel 1x Ethernet 10/100BaseT on the front panel 2x Ethernet 100Base-FX (SFP) on the front panel 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	SFP cage, RJ45 (RS-232/422/485), RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex E1 Interface Line Card

Model:	**MF-TDM-SRL-4E1B, V1**
Modes:	Converter (Ethernet over E1)
	TDMoIP (special SW)
PWE Protocols:	SAToP (RFC4553)
	CESoPSN (RFC5086)
	CESoETH (MEF-8)
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch
	4x E1 (120Ohm) on the front panel
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (E1), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex VoIP FXS Line Card

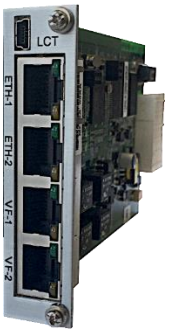


Model:	**MF-VOIP-SRL-2Eth/2FXS, V1**
VoIP:	RFC3261 SIP: Session Initiation Protocol
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch
	2x FXS on the front panel
	2x Ethernet 10/100BaseT on the front panel
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), RJ45 (FXS), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex VoIP FXO Line Card

Model:	**MF-VOIP-SRL-2Eth/2FXO, V1**
VoIP:	RFC3261 SIP: Session Initiation Protocol
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch
	2x FXO on the front panel
	2x Ethernet 10/100BaseT on the front panel
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), RJ45 (FXO), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex VoIP VF Line Card



Model:	**MF-VOIP-SRL-2Eth/2VF, V1**
VoIP:	RFC3261 SIP: Session Initiation Protocol
Interfaces:	1x Ethernet 10/100BaseT on Backplane to Switch
	2x VF (voice frequency + E&M Type 5) on the front panel
	2x Ethernet 10/100BaseT on the front panel
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), RJ45 (VF), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex Input / Output Line Card

Model:	**MF-IO-SRL-4I4O/Eth, V1**
Interfaces:	4 Inputs, 4 Outputs
	1x Ethernet 10/100BaseT on Backplane to Switch
	1x Ethernet 100Base-FX (SFP) on the front panel
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	DB26F, SFP cage, Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3t

MiniFlex SHDSL.bis Dinrail Modem

Model:	**MF-PAM-RAIL2N-2Eth-24V, V1** **MF-PAM-RAIL2N-2Eth-230V, V1** **MF-PAM-RAIL2N-2Eth-24V, V1-PC** **MF-PAM-RAIL2N-2Eth-230V, V1-PC**
DSL Version:	SHDSL / SHDSL.bis / Extended
Modulation:	TC-PAM4 / TC-PAM8 / TC-PAM16 / TC-PAM32 / TC-PAM64 /TC-PAM128
Data Rate:	128kbps - 30.464Mbps, 2x 15.232Mbps
Copper Pairs:	2 with Modes Master / Slave / Auto / Multipoint / Multipair / Ring
Interface:	2x Ethernet 10/100BaseT (Layer 2 Managed Switch) 1x USB 2.0 (Local Consol Port)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 4W Typ.
Physical Interfaces:	RJ45 (Ethernet), Phoenix Mini Combicon (Power & SHDSL), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs, SNMPv1/v2c/v3, SD-Card support
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC
PC–Version:	Protective Coating of PCB's against Humidity

MiniFlex Dual EFM SHDSL.bis Dinrail Modem

Model:	**MF-EFM-RAIL2N-2Eth-24V, V1** **MF-EFM-RAIL2N-2Eth-230V, V1**
DSL Version:	EFM SHDSL / SHDSL.bis / Extended
Modulation:	TC-PAM4 / TC-PAM8 / TC-PAM16 / TC-PAM32 / TC-PAM64 /TC-PAM128
Data Rate:	128kbps - 30.464Mbps, 2x 15.232Mbps
Copper Pairs:	2 with Modes Master / Slave / Auto / Multipoint / Bonding
Interface:	2x Ethernet 10/100/1000BaseT (Layer 2 Managed Switch) 1x USB 2.0 (Local Consol Port)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 4W Typ.
Physical Interfaces:	RJ45 (Ethernet), Phoenix Mini Combicon (Power & SHDSL), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs, SNMPv1/v2c/v3, SD-Card support
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Quad EFM SHDSL.bis Dinrail Modem

Model:	**MF-EFM-RAIL4N-2Eth-24V, V1** **MF-EFM-RAIL4N-2Eth-230V, V1**
DSL Version:	EFM SHDSL / SHDSL.bis / Extended
Modulation:	TC-PAM4 / TC-PAM8 / TC-PAM16 / TC-PAM32 / TC-PAM64 /TC-PAM128
Data Rate:	128kbps - 60.928Mbps, 4x 15.232Mbps
Copper Pairs:	4 with Modes Master / Slave / Auto / Multipoint / Bonding
Interface:	2x Ethernet 10/100/1000BaseT (Layer 2 Managed Switch) 1x USB 2.0 (Local Consol Port)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 5W Typ.
Physical Interfaces:	RJ45 (Ethernet), Phoenix Mini Combicon (Power), Phoenix Combicon DMC (EFM SHDSL), Mini-B (USB)
Management	Console Port, Telnet, SSH, HTTP, HTTPs, SNMPv1/v2c/v3, SD-Card support
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Single Fiber Optic Dinrail Modem

Model:	**MF-FOM-RAILN-Eth-24V, V1** **MF-FOM-RAILN-Eth-230V, V1**
Fiber Optic:	100Base-FX
Data Rate:	100 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	1x Ethernet 10/100BaseT 1x Ethernet 100Base-FX (SFP) 1x USB 2.0 (Local Consol Port)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 4W Typ.
Physical Interfaces:	RJ45 (Ethernet), SFP cage, Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Dual Fiber Optic Dinrail Modem

Model:	**MF-FOM-RAIL2N-2Eth-24V, V1** **MF-FOM-RAIL2N-2Eth-230V, V1**
Fiber Optic:	100Base-FX
Data Rate:	100 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	2x Ethernet 10/100BaseT 2x Ethernet 100Base-FX (SFP) 1x USB 2.0 (Local Consol Port)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 5W Typ.
Physical Interfaces:	RJ45 (Ethernet), SFP cage, Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs, SNMPv1/v2c/v3, SD-Card support
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Dual Giga Fiber Optic Dinrail Modem

Model:	**MF-GFOM-RAIL2N-2Eth-24V, V1** **MF-GFOM-RAIL2N-2Eth-230V, V1**
Fiber Optic:	100Base-FX or 1000Base-X
Data Rate:	100 / 1000 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	2x Ethernet 10/100/1000BaseT 2x Ethernet 100Base-FX or 1000Base-X (SFP) 1x USB 2.0 (Local Consol Port)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 5W Typ.
Physical Interfaces:	RJ45 (Ethernet), SFP cage, Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs, SNMPv1/v2c/v3, SD-Card support
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Managed Switch Dinrail Unit

Model:	**MF-SW-RAIL-4Eth-24V, V1** **MF-SW-RAIL-4Eth-230V, V1**
Ethernet:	IEEE-802.3, VLAN IEEE-802.1Q, QoS IEEE-802.1P
Modes:	MDI / MDI-X auto crossover, Auto Negotiation, Full/Half Duplex
Interfaces:	4x Ethernet 10/100BaseT
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 4W Typ.
Physical Interfaces:	RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Gigabit Ethernet Managed Switch Dinrail Unit

Model:	**MF-GSW-RAIL-4Eth-24V, V1** **MF-GSW-RAIL-4Eth-230V, V1**
Ethernet:	IEEE-802.3, VLAN IEEE-802.1Q, QoS IEEE-802.1P
Modes:	MDI / MDI-X auto crossover, Auto Negotiation, Full/Half Duplex
Interfaces:	4x Ethernet 10/100/1000BaseT
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 5W Typ.
Physical Interfaces:	RJ45 (Ethernet), Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex POE (Power over Ethernet) Dinrail Unit

Model:	**MF-POE-RAILN-Eth-24V, V1**
Ethernet:	IEEE-802.3, VLAN IEEE-802.1Q, QoS IEEE-802.1P
Modes:	MDI / MDI-X auto crossover, Auto Negotiation, Full/Half Duplex
PoE:	IEEE 802.3af, 15.4Watts
PoE Modes:	Mode A or Mode B, Jumper settings
Interfaces:	1x Ethernet 10/100BaseT
	1x Ethernet (with PoE) 10/100BaseT
Power:	18 to 72VDC, max 25W
Physical Interfaces:	RJ45 (Ethernet)
Management:	No
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Dual Fiber Optic Serial Interface Dinrail Modem

Model:	**MF-FOM-RAIL2N-SER/Eth-24V, V1** **MF-FOM-RAIL2N-SER/Eth-230V, V1**
Fiber Optic:	100Base-FX
Data Rate:	100 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	1x Ethernet 10/100BaseT
	1x RS-232/422/485
	2x Ethernet 100Base-FX (SFP)
	1x USB 2.0 (Local Consol Port)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 5W Typ.
Physical Interfaces:	RJ45 (Ethernet), RJ45 (RS-232/422/485), SFP cage, Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Dual Fiber Optic Serial Interface Dinrail Modem

Model:	**MF-FOM-RAIL2N-2V24-24V, V1** **MF-FOM-RAIL2N-2V24-230V, V1**
Fiber Optic:	100Base-FX
Data Rate:	100 Mbps
Line Budget:	Dependent on SFP module type
Number of Fiber:	1 or 2, depending on the SFP module type
Modes:	Auto
Interfaces:	2x RS-232 (V.24/28)
	2x Ethernet 100Base-FX (SFP)
	1x USB 2.0 (Local Consol Port)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 5W Typ.
Physical Interfaces:	RJ45 (RS-232), SFP cage, Mini-B (USB)
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex E1 Interface Dinrail Unit

Model:	**MF-TDM-RAILN-4E1B/2Eth-24V, V1** **MF-TDM-RAILN-4E1B/2Eth-230V, V1**
Modes:	Converter (Ethernet over E1)
	TDMoIP (special SW)
PWE Protocols:	SAToP (RFC4553)
	CESoPSN (RFC5086)
	CESoETH (MEF-8)
Interfaces:	2x Ethernet 10/100BaseT
	4x E1 (120Ohm)
	1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), RJ45 (E1), Mini-B (USB)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 4W Typ.
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex VoIP FXS Dinrail Unit

Model:	**MF-VOIP-RAILN-2Eth/2FXS-24V, V1** **MF-VOIP-RAILN-2Eth/2FXS-230V, V1**
VoIP:	RFC3261 SIP: Session Initiation Protocol
Interfaces:	2x FXS 2x Ethernet 10/100BaseT 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), RJ45 (FXS), Mini-B (USB)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 6W Max.
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex VoIP FXO Dinrail Unit

Model:	**MF-VOIP-RAILN-2Eth/2FXO-24V, V1** **MF-VOIP-RAILN-2Eth/2FXO-230V, V1**
VoIP:	RFC3261 SIP: Session Initiation Protocol
Interfaces:	2x FXO 2x Ethernet 10/100BaseT 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), RJ45 (FXO), Mini-B (USB)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 2W Typ.
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex VoIP VF Dinrail Unit

Model:	**MF-VOIP-RAILN-2Eth/2VF-24V, V1** **MF-VOIP-RAILN-2Eth/2VF-230V, V1**
VoIP:	RFC3261 SIP: Session Initiation Protocol
Interfaces:	2x VF (voice frequency + E&M Type 5) 2x Ethernet 10/100BaseT 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	RJ45 (Ethernet), RJ45 (VF), Mini-B (USB)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 4.4W Max.
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Input / Output Dinrail Unit

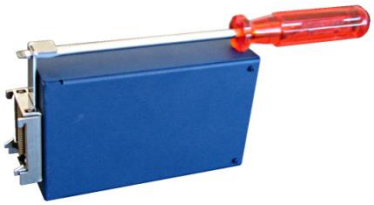
Model:	**MF-IO-RAILN-4I4O/Eth-24V, V1** **MF-IO-RAILN-4I4O/Eth-230V, V1**
Interfaces:	4 Inputs, 4 Outputs 1x Ethernet 10/100BaseT on the front panel 1x USB 2.0 (Local Consol Port)
Physical Interfaces:	DB26F, RJ45 (Ethernet), Mini-B (USB)
Power:	18 to 72VDC or 85 to 264VAC & 120 to 370VDC, 4.4W Max.
Management:	Console Port, Telnet, SSH, HTTP, HTTPs and SNMPv1/v2c/v3
Temperature:	Standard: -5 to +45ºC, Extended: -25 to +80ºC

MiniFlex Dinrail Wallmount Kit

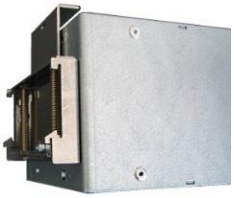
Model: MF-RAILN-WALLMOUNT, V1

MiniFlex Comfortable Dinrail Clips

Model: FG-RAIL-ComfortClip-MF



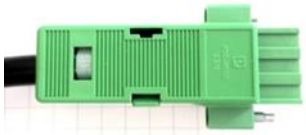
Model: FG-RAIL-ComfortClip-MFMR



MiniFlex 19” Installation

Model: FG-RAIL-MRN-1U

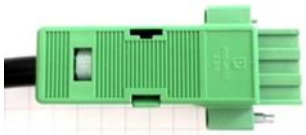
Model: FG-RAIL-R-2U



MiniFlex AC Power Cables for RAIL Units

Model	Connector A	Connector B	Length
FG-CAB-Power-MiniFlex-Typ**F** (Europe)	CEE 7/7	1805314* 1803947(case)*	~1.8m
FG-CAB-Power-MiniFlex-Typ**G** (United Kingdom)	BS 1363	1805314* 1803947(case)*	~1.8m
FG-CAB-Power-MiniFlex-Typ**I** (Australia)	AS 3112	1805314* 1803947(case)*	~1.8m
FG-CAB-Power-MiniFlex-Typ**J** (Switzerland)	SEV 1011	1805314* 1803947(case)*	~1.8m
FG-CAB-Power-MiniFlex-Typ**L** (Italy)	CEI 23-50	1805314* 1803947(case)*	~1.8m

* Manufacture is Phoenix Contact (www.phoenixcontact.com)
Attention: Other types of connectors A are available upon request.



MiniFlex AC Power Cables for FlatRack

Model	Connector A	Connector B	Length
FG-CAB-Power-FlatRack-Typ**F** (Europe)	CEE 7/7	1777992* 1803947(case)*	~1.8m
FG-CAB-Power-FlatRack-Typ**G** (United Kingdom)	BS 1363	1777992* 1803947(case)*	~1.8m
FG-CAB-Power-FlatRack-Typ**I** (Australia)	AS 3112	1777992* 1803947(case)*	~1.8m
FG-CAB-Power-FlatRack-Typ**J** (Switzerland)	SEV 1011	1777992* 1803947(case)*	~1.8m
FG-CAB-Power-FlatRack-Typ**L** (Italy)	CEI 23-50	1777992* 1803947(case)*	~1.8m

* Manufacture is Phoenix Contact (www.phoenixcontact.com)
Attention: Other types of connectors A are available upon request.