

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
- FXO, FXS or Voice Frequency Tributary cards
- RS232/485 and digital Input Output Tributary Cards
- Integrated Layer 2 / 3 Managed Ethernet Switch
- 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

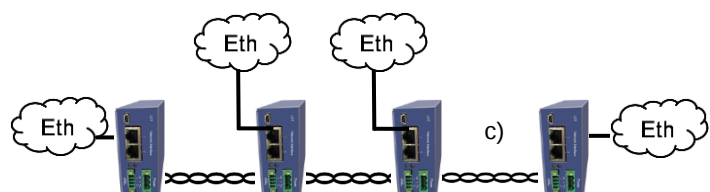
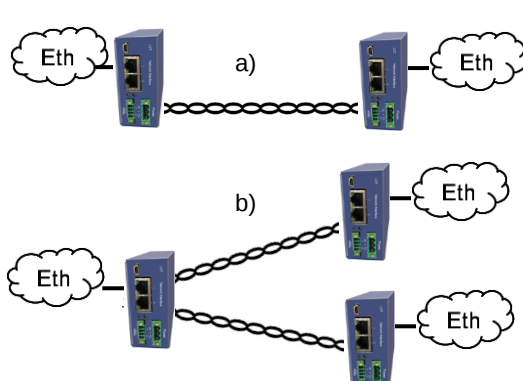
The FlexDSL **MiniFlex** platform is a special part of the **Orion3** product family. Beside of having up to 10 dual **Orion3 SHDSL.bis Extended** line cards there is a feature-rich managed layer 2 Ethernet switch included. This switch has 8 auto-sensing front accessible 10/100Base-T ports as well as 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.

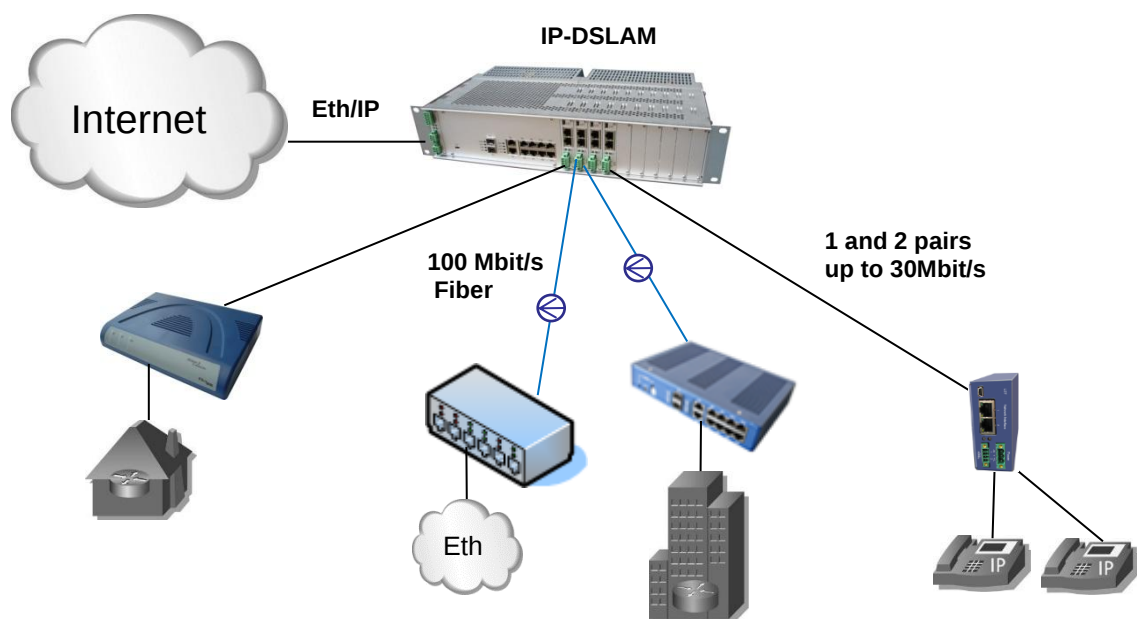
In addition to SHDSL.bis, the **MiniFlex** platform supports subscriber access over Fiber Optic. The optical line card has built-in SFP jack for standard 100 or 1000 Mbps Ethernet module. The protocol is compatible with third-party switches, media converters, etc. Like all FlexDSL Orion products, the 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

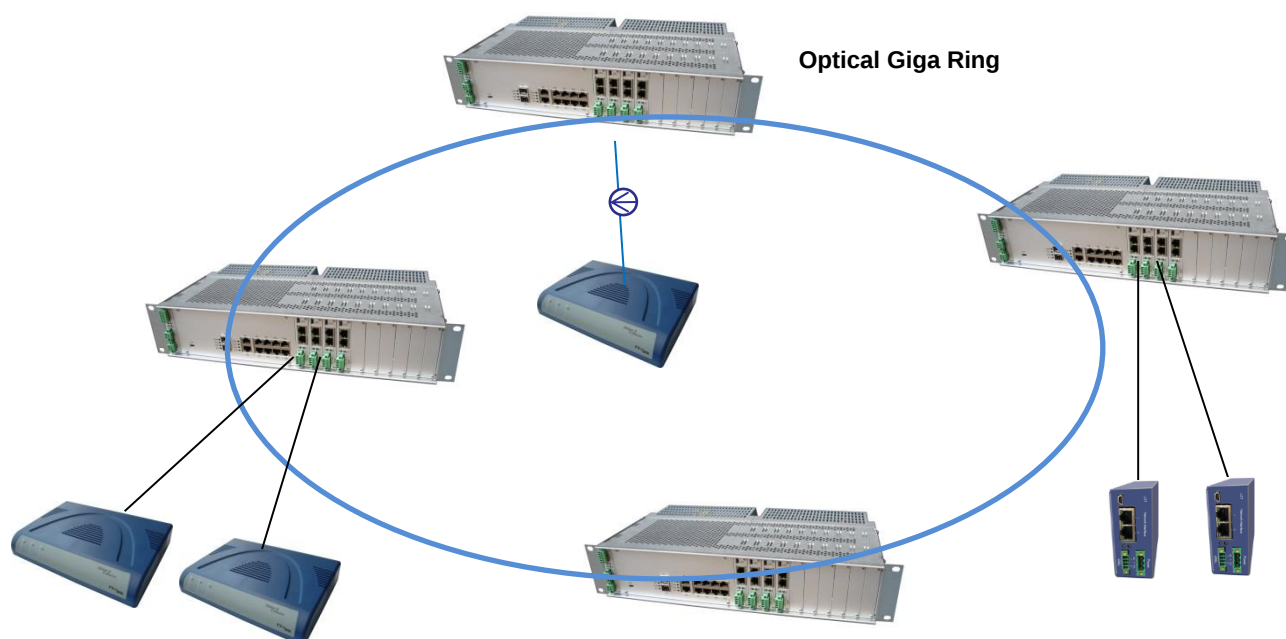


- a) Ethernet Transmission Point-to-Point
 b) Ethernet Transmission Point-to-Multipoint
 c) Ethernet Add/Drop over a Long Copper Line

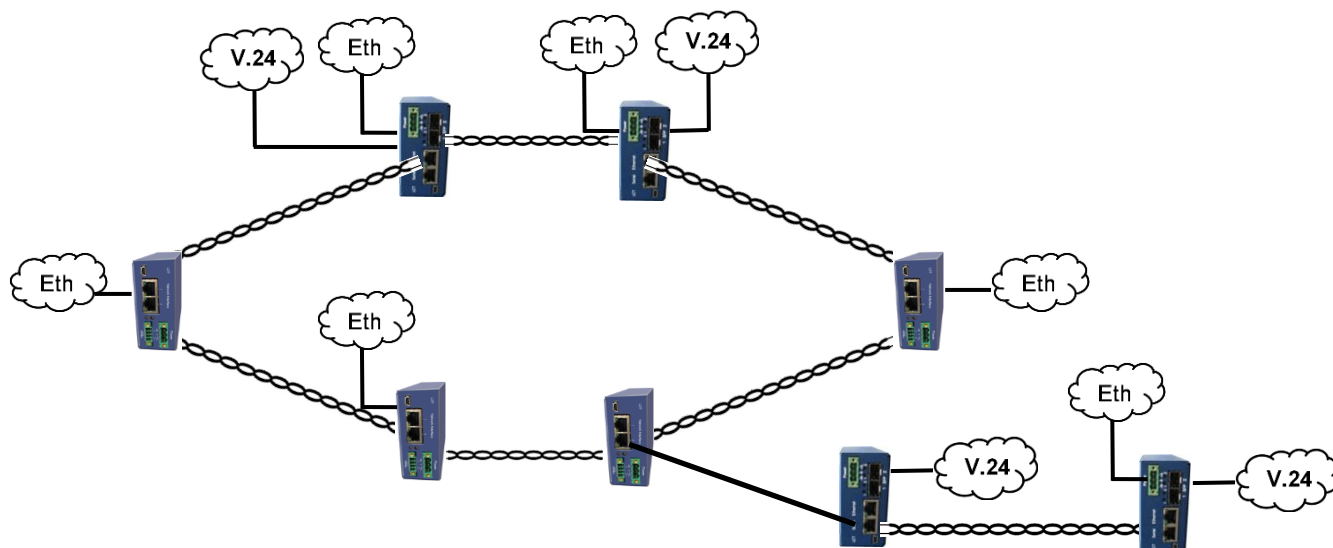
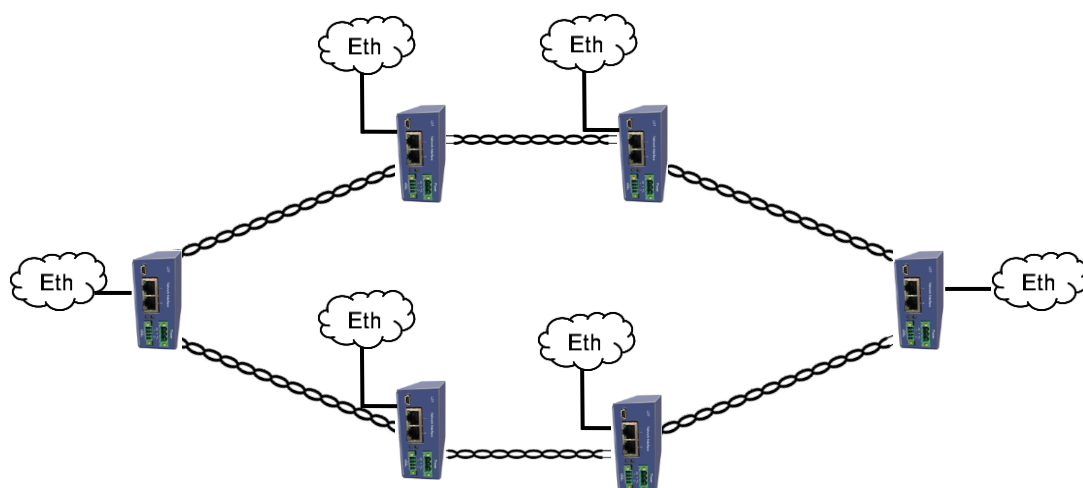
Possible Application: Typical Internet Service Provider (ISP) Application



Possible Application: Ring with the 19"MiniFlex Racks



Possible Application: Ring with the MiniFlex Dinrail Modems



MiniFlex Rack with included Switch for 10 Linecards



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 Console 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, 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



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 Console 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 RFC 2819, 4502 RMON 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 Port Mirror IGMP Snooping IEEE 802.1X Port-based Access Control MAC Filter IEEE 802.1AB LLDP
Alarm Interface:	Major and Minor Alarm Relays



Model: MF-MR2N-SW-10Eth,V2

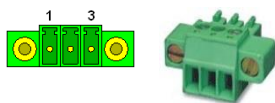
- Switch Interfaces: 6x Ethernet 10/100/1000BaseT (Auto Sensing)
4x Ethernet 100/1000Base-X (SFP)
1x USB 2.0 (Local Console Port)
10x Ethernet 10/100BaseT on Backplane to Line Card
- Physical Interfaces: SFP cage, RJ45 (Ethernet), Mini-B (USB)
- Management: Local Console Port, Telnet/SSH, SNMP v1 and 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)
ITU-T G.8031 ELPS 1+1, 1:1 protection
ITU-T G.8032 Ethernet Ring Protection Switching (ERPS)
IEEE 802.1ah Ethernet link OAM, including Dying Gasp
VLAN
4K IEEE 802.1q VLANs
GVRP
Link Aggregation
IEEE 802.3ad LACP
Multicast Features
IGMP v1, v2, v3, IGMP Snooping
- 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-based, IP- based
- L3 Features: RFC 4787 NAT
RFC 2131 DHCP
RFC 2453 RIPv2
RFC 5798 VRRPv3
RFC 3228 OSPFv2
RFC 5340 OSPFv3
- Security: IEEE 802.1X:2004
RFC 2865 RADIUS
RFC 1492 TACACS
IEEE 802.1AE MACsec
RFC 4303 IPsec
- Timing: RFC 4330 SNTP
IEEE 1588 Precision Time Protocol PTPv2
- Alarm Interface: Major and Minor Alarm Relays

MiniFlex Rack without Switch for 10 Linecards

Model: MF-MR2N,V2

- Alarm Interface: Major and Minor Alarm Relays





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 MiniRail 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 MiniRail 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 Console 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 Console 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 Console 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 Console 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 Console 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 Console 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

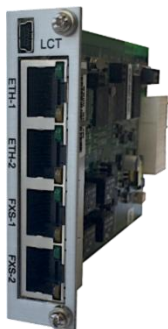
Model: MF-TDM-SRL-4E1B, V1

- 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 Console 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 +45°C, Extended: -25 to +80°C
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 Console 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 +45°C, Extended: -25 to +80°C

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 Console 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 +45°C, Extended: -25 to +80°C

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 Console 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 +45°C, Extended: -25 to +80°C

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 Console 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 +45°C, Extended: -25 to +80°C

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 Console 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 +45°C, Extended: -25 to +80°C

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 +45°C, Extended: -25 to +80°C

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 +45°C, Extended: -25 to +80°C



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 +45°C, Extended: -25 to +80°C



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 Console 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 +45°C, Extended: -25 to +80°C



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 Console 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 +45°C, Extended: -25 to +80°C



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 Console 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 +45°C, Extended: -25 to +80°C



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 Console 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 +45°C, Extended: -25 to +80°C



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 Console 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 +45°C, Extended: -25 to +80°C



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 Console 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 +45°C, Extended: -25 to +80°C



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 Console 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 +45°C, Extended: -25 to +80°C

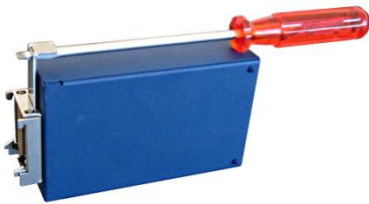


MiniFlex Dinrail Wallmount Kit

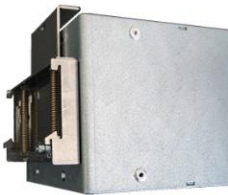
Model: MF-RAILN-WALLMOUNT, V1

MiniFlex Comfortable Dinrail Clips

Model: FG-RAIL-ComfortClip-MF



Model: FG-RAIL-ComfortClip-MFMR



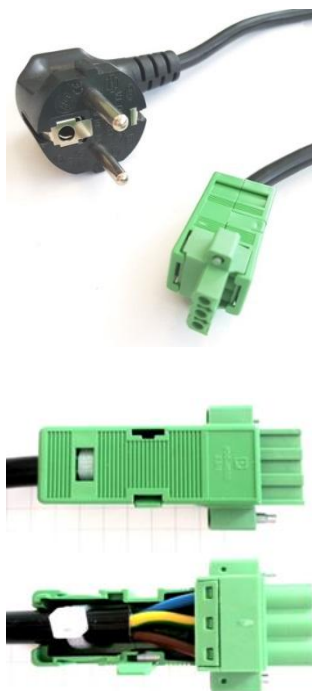
MiniFlex 19" Installation

Model: FG-RAIL-MRN-1U



Model: FG-RAIL-R-2U

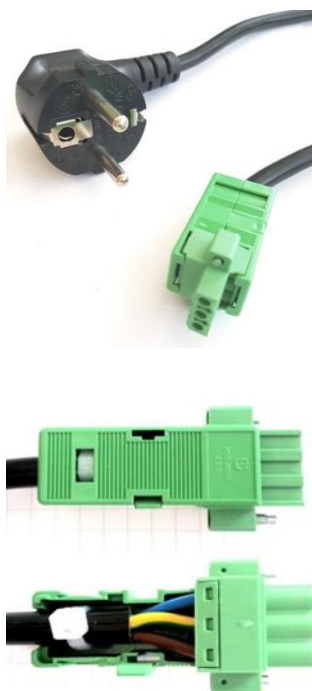




MiniFlex AC Power Cables for RAIL Units

Model	Connector A	Connector B	Length
FG-CAB-Power-MiniFlex-TypF (Europe)	CEE 7/7 	1805314* 1803947(case)*	~1.8m
FG-CAB-Power-MiniFlex-TypG (United Kingdom)	BS 1363 	1805314* 1803947(case)*	~1.8m
FG-CAB-Power-MiniFlex-TypI (Australia)	AS 3112 	1805314* 1803947(case)*	~1.8m
FG-CAB-Power-MiniFlex-TypJ (Switzerland)	SEV 1011 	1805314* 1803947(case)*	~1.8m
FG-CAB-Power-MiniFlex-TypL (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-TypF (Europe)	CEE 7/7 	1777992* 1803947(case)*	~1.8m
FG-CAB-Power-FlatRack-TypG (United Kingdom)	BS 1363 	1777992* 1803947(case)*	~1.8m
FG-CAB-Power-FlatRack-TypI (Australia)	AS 3112 	1777992* 1803947(case)*	~1.8m
FG-CAB-Power-FlatRack-TypJ (Switzerland)	SEV 1011 	1777992* 1803947(case)*	~1.8m
FG-CAB-Power-FlatRack-TypL (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.