

# FlexDSL GigaFlex

## Universal Transmission System for Mission-critical Applications



### Features

- Up to 15.2Mbps Data Transmission per Copper Pair
- Up to 4x SHDSL & SHDSL.bis, EFM-based
- Additional TC-PAM4/8/64/128 Modes Available
- Integrated Layer 3 Managed Ethernet Switch:
  - 2x SFP Gigabit Ethernet
  - 4x or 8x Gigabit Ethernet (Twisted Pair)
- RSTP, MSTP, VLAN, QoS, NAT, VPN, RIP, OSPF
- 2x RS-232/422/485
- 2x Inputs, 2x Outputs
- PoE Support
- Transparent Transmission of Modbus RTU / ASCII, DNP3 and IEC 60870.5 Protocol
- Point-to-Point, Point-to-Multipoint, Chain & Ring Operation
- Console Port, SSH, HTTPs, SNMPv3
- SD-card Support for Easy Maintenance
- 24/48VDC Redundant Power Supplies
- Included Primary Protection
- Robust DIN-Rail Metal Enclosure

The FlexDSL GigaFlex universal transmission system was developed for mission-critical applications such as SCADA (Supervisory Control and Data Acquisition) or Telecontrol Networks. It can be operated along oil, gas and water pipelines, railways, highways, and electrical lines. The FlexDSL GigaFlex units can be used in distribution networks, connecting sensors and controllers, traffic lights, control signals and in video surveillance systems. It can connect electrical, gas and water meters with the measurement equipment.

The modern high-performance Network Processor of the FlexDSL GigaFlex unit allows smooth operation in the layer 2 and layer 3 packet networks.

The FlexDSL GigaFlex unit was developed having security aspects in mind. Secured management protocols such as SSH, SFTP, HTTPS and SNMPv3 are implemented. It also supports RADIUS and 802.1x authentication for terminal devices. With available separate software license, the GigaFlex unit can be transformed into an IPsec-enabled VPN gateway or can encrypt the traffic at wire speed on MAC-layer with MACSec protocol.

Up to four EFM-based SHDSL.bis interfaces and two Gigabit SFP cages implement data connectivity over copper or fiber cables, allowing the GigaFlex unit to deliver Ethernet data from modern SCADA systems and controllers as well as Serial RS-232/422/485 data together with Relay contacts from legacy systems. The modern Ethernet and legacy Serial interfaces work in parallel. The application data occupies defined bandwidth, therefore different data-sources do not influence each other.

The FlexDSL GigaFlex allows seamless migration from traditional Serial applications to modern packet-based services. Upgrading the terminal device from legacy Serial to Packet-based will only require the proper connectivity. This makes the usage of the GigaFlex platform future-proof and reduces the network construction costs.

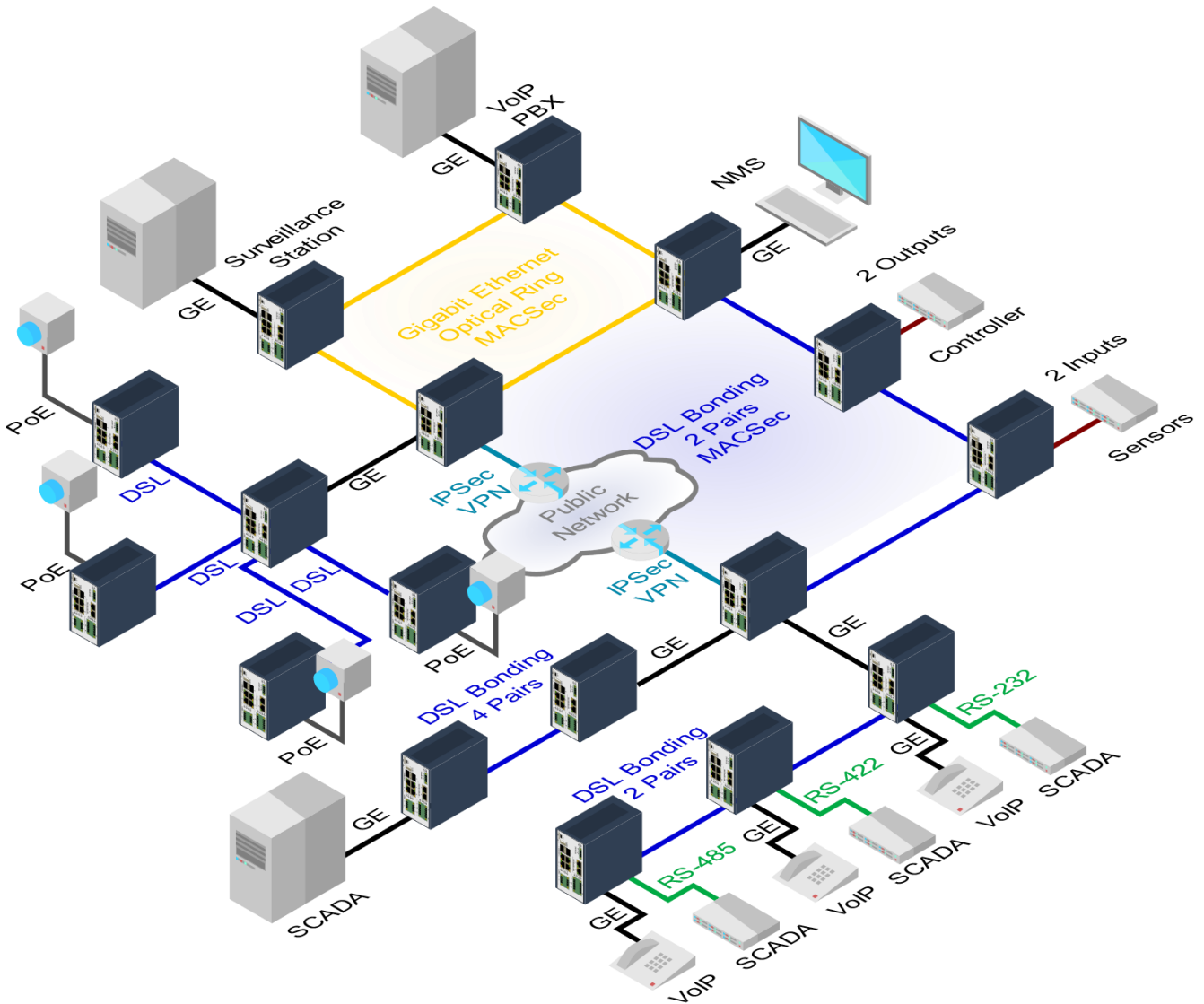
The FlexDSL GigaFlex operates in point-to-point, ring, star, daisy chain, even with branch lines, and mesh network topologies. It combines copper and fiber paths, together with secured connection through public networks into universal infrastructure with high reliability and performance.

The FlexDSL GigaFlex universal transmission system is compact and flexible. It takes up very little space and can be installed on a DIN-rail, in a street cabinet, in 19" rack, in underground containers or on the pole. The selected GigaFlex versions provide PoE for VoIP phones, Wireless Hotspots or Surveillance Cameras.

The GigaFlex is based on extremely reliable hardware and software designs. The hardware is especially designed for a long-lasting production and includes high-quality and reliable industrial components. This allows the GigaFlex series to be used for a failure-free operation in harsh environment. The intelligent software design is reliable as well, it controls data integrity for preventing the errors in any data flow. The build-in access control mechanism prevents the malfunctions caused by possible hacker attacks and vulnerability treats.

The WEB- and CLI-based management platform simplifies the daily operation and maintenance of the GigaFlex unit. The build-in SNMP agent allows easy integration into existing upper-level network management systems.

**Possible Applications:**



**Legend:**

- DSL: Digital Subscriber Line
- GE: Gigabit Ethernet
- IPsec: Internet Protocol Security
- MACSec: Media Access Control Security
- NMS: Network Management System
- PBX: Public Exchange
- PoE: Power over Ethernet
- SCADA: Supervisory Control and Data Acquisition
- VoIP: Voice over IP
- VPN: Virtual Private Network

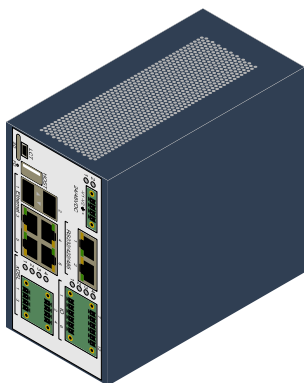
## Supported Protocols and Features:

- Ethernet IEEE 802.3u 100BASE-TX, 100BASE-FX
- Ethernet IEEE 802.3z 1000BASE-X, IEEE 802.3ab 1000BASE-T
- DDM (SFP parameters reading)
- SD Card support
- ITU-T G.991.2 G.SHDSL (EFM)
- RS over IP
- IO over IP
- IPv4 and IPv6
- IEEE 802.1D:2004 MAC Bridges and Spanning Tree
- IEEE 802.1Q:2005 VLAN, MSTP, Multiple VLAN Registration (GVRP/MVRP)
- ITU-T G.8031 ELPS 1+1, 1:1
- ITU-T G.8032 Ethernet Ring Protection Switching (ERPS)
- RFC 4330 SNTP
- RFC 3339 Date and Time on the Internet
- RFC 2865 RADIUS
- RFC 1492 TACACS
- IEEE 802.1X:2004 Port-based Access Control
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
- Telnet, SSH, Serial Console
- HTTP, HTTPS
- SNMP v1, v2c, v3
- RFC 4303 IPsec
- IEEE 802.1AE MACsec
- RFC 4787 NAT
- RFC 2131 DHCP
- RFC 3046 DHCP Relay Agent
- RFC 2453 RIPv2
- RFC 5798 VRRPv3
- RFC 3228 OSPF v 2
- RFC 5340 OSPF v 3
- RFC 3164 Syslog
- RFC 2819 RMON1
- RFC 4502 RMON2
- IGMP

## Protocols and Features in Development:

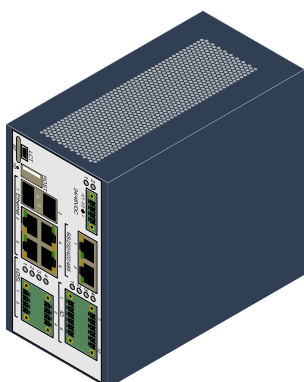
- IEEE 802.1ad Provider bridging
- IEEE 802.1ah Ethernet link OAM, including Dying Gasp.
- IEEE 802.1ag Connectivity Fault Management
- IEEE 1588 Precision Time Protocol PTPv2
- ITU-T G.8261, G.8262, G.8264 (SyncE)

## GigaFlex SHDSL.bis Dinrail Modems:



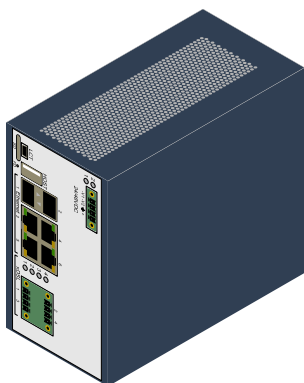
### Model: GF-RAIL2N-6Eth-2I2O/2SER-24V,V21

DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
Interfaces: 2x Ethernet 1000Base-FX (SFP)  
4x Ethernet 10/100/1000BaseT, MACSec  
2x Inputs, 2x Outputs  
2x RS-232/422/485  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 18W Max  
Physical Interfaces: Phoenix Mini Combicon (SHDSL, Power, IO), SFP Cages, RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



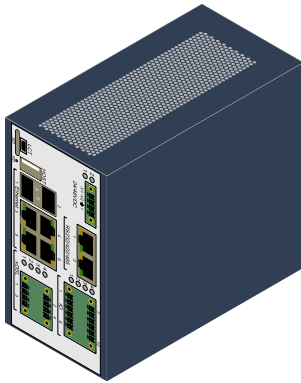
### Model: GF-RAIL2N-6Eth-2I2O/2SER-PoE-24V,V25

DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
PoE: PSE, IEEE 802.3af (15.4W Output Power)  
Power Sourcing: Mode A  
Power Polarity: MDI and MDI-X (Make a note if MDI-X is required when ordering)  
Interfaces: 2x Ethernet 1000Base-FX (SFP)  
4x Ethernet 10/100/1000BaseT, MACSec  
2x Inputs, 2x Outputs  
2x RS-232/422/485  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 38W Max  
Physical Interfaces: Phoenix Mini Combicon (SHDSL, Power, IO), SFP Cages, RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



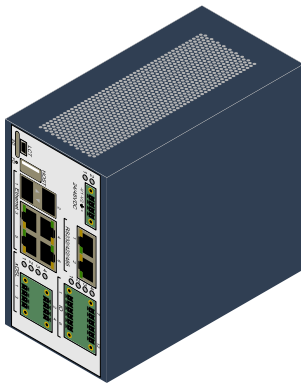
### Model: GF-RAIL2N-6Eth-24V,V26

DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
Interfaces: 2x Ethernet 1000Base-FX (SFP)  
4x Ethernet 10/100/1000BaseT, MACSec  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 18W Max  
Physical Interfaces: Phoenix Mini Combicon (SHDSL, Power), SFP Cages, RJ45 (Ethernet), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



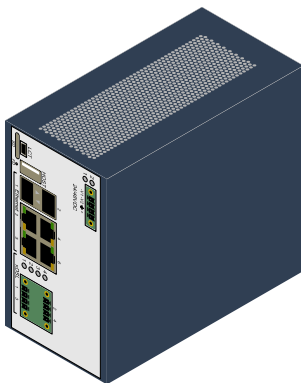
**Model: GF-RAIL4N-6Eth-2120/2SER-24V,V31**

DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 256kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
Interfaces: 2x Ethernet 1000Base-FX (SFP)  
4x Ethernet 10/100/1000BaseT, MACSec  
2x Inputs, 2x Outputs  
2x RS-232/422/485  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 20W Max  
Physical: Phoenix Mini Combicon (SHDSL, Power, IO), SFP Cages,  
Interfaces: RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



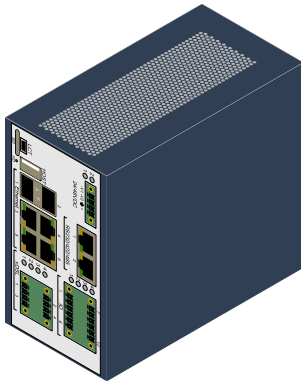
**Model: GF-RAIL4N-6Eth-2120/2SER-PoE-24V,V35**

DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 256kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
PoE: PSE, IEEE 802.3af (15.4W Output Power)  
Power Sourcing: Mode A  
Power Polarity: MDI and MDI-X (Make a note if MDI-X is required when ordering)  
Interfaces: 2x Ethernet 1000Base-FX (SFP)  
4x Ethernet 10/100/1000BaseT, MACSec  
2x Inputs, 2x Outputs  
2x RS-232/422/485  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 40W Max  
Physical: Phoenix Mini Combicon (SHDSL, Power, IO), SFP Cages,  
Interfaces: RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



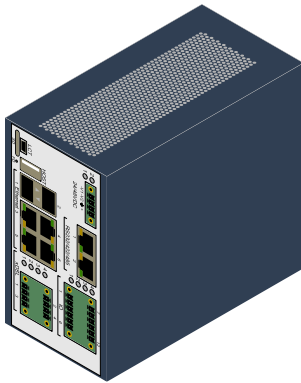
**Model: GF-RAIL4N-6Eth-24V,V36**

DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 256kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
Interfaces: 2x Ethernet 1000Base-FX (SFP)  
4x Ethernet 10/100/1000BaseT, MACSec  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 20W Max  
Physical: Phoenix Mini Combicon (SHDSL, Power), SFP Cages,  
Interfaces: RJ45 (Ethernet), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



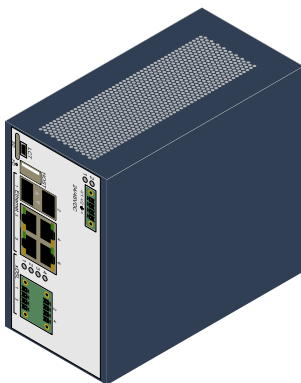
**Model: GF-RAIL4N-6EthP-2120/2SER-24V,V41**

DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 256kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
Interfaces: 2x Ethernet 1000Base-FX (SFP), MACSec  
4x Ethernet 10/100/1000BaseT, MACSec  
2x Inputs, 2x Outputs  
2x RS-232/422/485  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 20W Max  
Physical: Phoenix Mini Combicon (SHDSL, Power, IO), SFP Cages,  
Interfaces: RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



**Model: GF-RAIL4N-6EthP-2120/2SER-PoE-24V,V45**

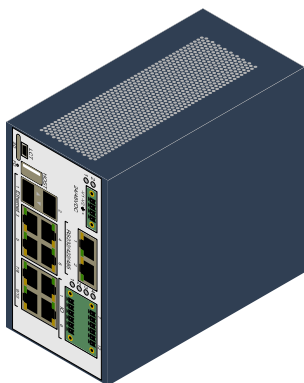
DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 256kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
PoE: PSE, IEEE 802.3af (15.4W Output Power)  
Power Sourcing: Mode A  
Power Polarity: MDI and MDI-X (Make a note if MDI-X is required when ordering)  
Interfaces: 2x Ethernet 1000Base-FX (SFP), MACSec  
4x Ethernet 10/100/1000BaseT, MACSec  
2x Inputs, 2x Outputs  
2x RS-232/422/485  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 40W Max  
Physical: Phoenix Mini Combicon (SHDSL, Power, IO), SFP Cages,  
Interfaces: RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



**Model: GF-RAIL4N-6EthP-24V,V46**

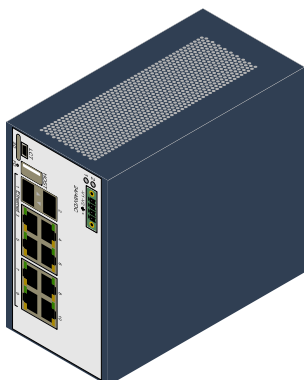
DSL Version: EFM SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16 / TC-PAM32  
Extended: TC-PAM4 / TC-PAM8 / TC-PAM64 / TC-PAM128  
Data Rate: 256kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4: Master / Slave / Auto / Multipoint / Bonding / Ring / MACSec  
Interfaces: 2x Ethernet 1000Base-FX (SFP), MACSec  
4x Ethernet 10/100/1000BaseT, MACSec  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 20W Max  
Physical: Phoenix Mini Combicon (SHDSL, Power), SFP Cages,  
Interfaces: RJ45 (Ethernet), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg

## GigaFlex Dinrail Switches:



### Model: **GF-GSW-RAIL-10Eth-2I2O/2SER-PoE-24V,V95**

Fiber Optic: 1000Base-X  
Data Rate: 1000 Mbps  
Line Budget: Depending on SFP module type  
Number of Fiber: 1 or 2, depending on the SFP module type  
PoE: PSE, IEEE 802.3af (15.4W Output Power)  
Power Sourcing: Mode A  
Power Polarity: MDI and MDI-X (Make a note if MDI-X is required when ordering)  
Interfaces: 2x Ethernet 1000Base-FX (SFP), MACSec  
8x Ethernet 10/100/1000BaseT, MACSec  
2x Inputs, 2x Outputs  
2x RS-232/422/485  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 40W Max  
Physical: Phoenix Mini Combicon (Power, IO), SFP Cages,  
Interfaces: RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg



### Model: **GF-GSW-RAIL-10Eth-24V,V96**

Fiber Optic: 1000Base-X  
Data Rate: 1000 Mbps  
Line Budget: Depending on SFP module type  
Number of Fiber: 1 or 2, depending on the SFP module type  
Interfaces: 2x Ethernet 1000Base-FX (SFP), MACSec  
8x Ethernet 10/100/1000BaseT, MACSec  
1x USB 2.0 mini-B (Local Console Port)  
1x USB 2.0 type A (Mass Storage Device)  
1x Micro SD slot  
Power: 18 to 72VDC, 20W Max  
Physical: Phoenix Mini Combicon (Power), SFP Cages, RJ45 (Ethernet),  
Interfaces: Mini-B (USB), Type A (USB)  
Management: Console Port, Telnet, SSH, Web, SNMP. SD-Card support  
Temperature: -25 to + 70°C for vertical mount; -25 to + 45°C for horizontal mount  
Size & Weight: 128 (W) x144 (D) x 74 (H) mm, 1.3 kg