

SHDSL.bis and Fiber

Up to 60Mbps over Copper

Ethernet, Serial, Input & Output

FlexDSL[®]
Telecommunications AG

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 Interfaces, TC-PAM16/32
- Additional TC-PAM4/8/64/128 Modes Available
- Integrated Layer 3 Managed Ethernet Switch:
 - 6x Gigabit Ethernet Ports (4x TP / 2x SFP)
- 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, Telnet, SSH, HTTP, HTTPS, SNMP Management
- 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.

In the heart of the FlexDSL GigaFlex unit is a modern high-performance Network Processor located that allows the integration in layer 2 and in layer 3 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 an available separate software license, the GigaFlex unit is transformed to an IPSec-enabled VPN gateway.

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, as different 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.

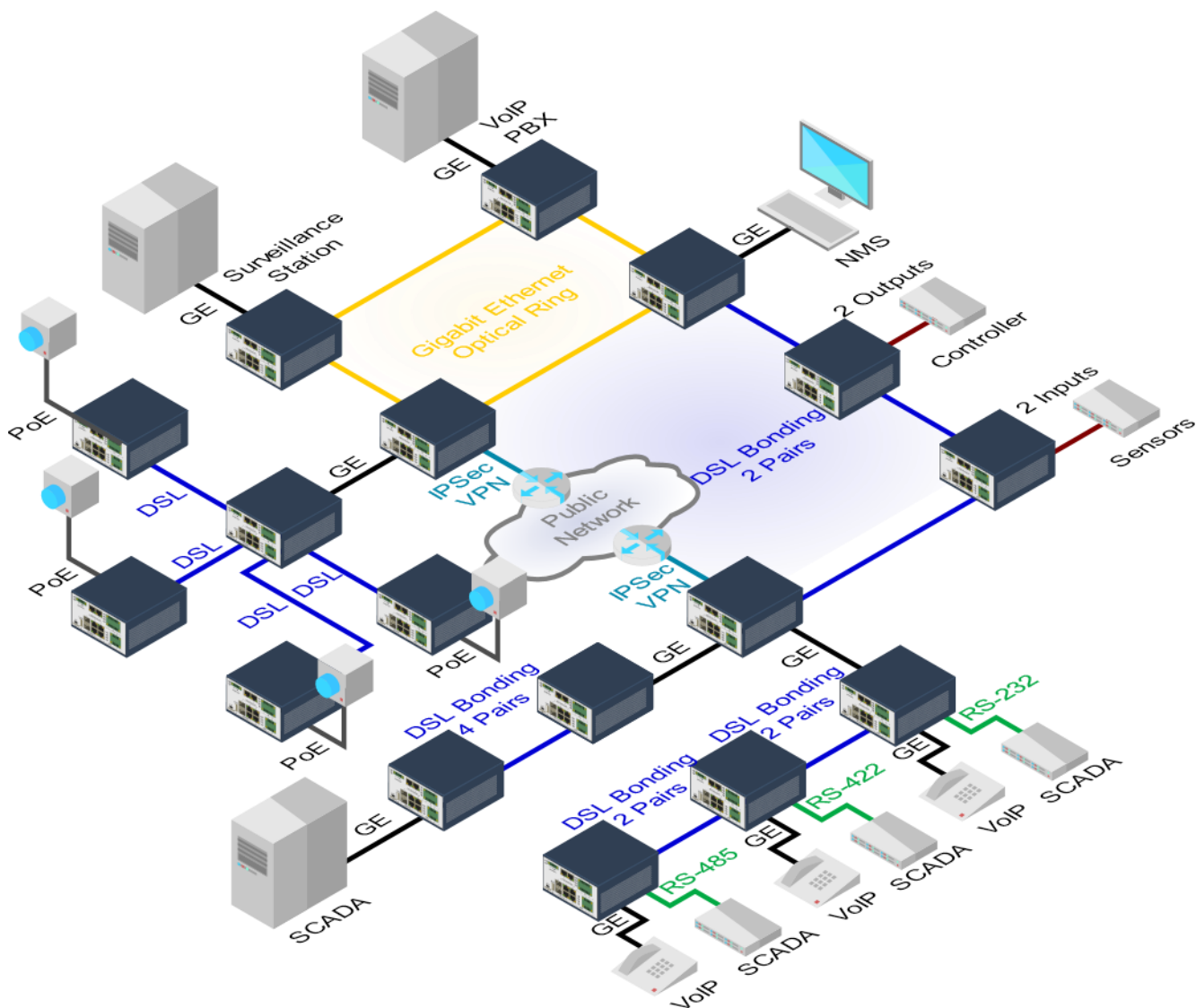
The FlexDSL GigaFlex operates in point-to-point, ring, star, daisy chain, even with branch lines, and mesh network topologies. It combines copper and fiber paths, together with secured connection through public networks into universal infrastructure with high reliability and performance.

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
- 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

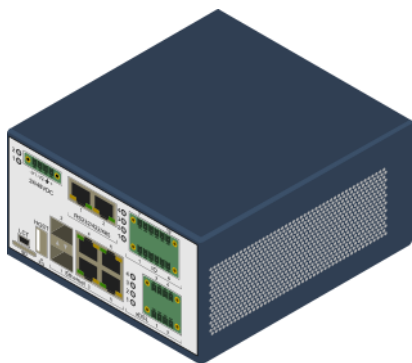
Supported Protocols and Features:

- 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)
- RFC 4330 SNTP
- RFC 3339 Date and Time on the Internet
- RFC 2865 RADIUS
- 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
- 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:

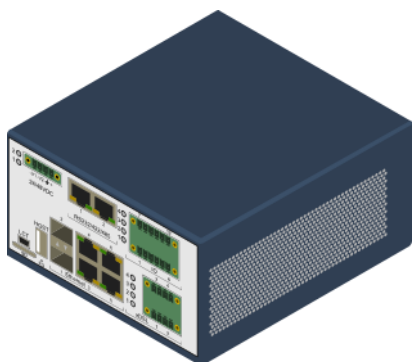
- IEEE 802.1ad Provider bridging
- IEEE 802.1ah Ethernet link OAM, including Dying Gasp
- IEEE 802.1ag Connectivity Fault Management
- IEEE 802.1AE MACsec
- ITU-T G.8031 ELPS 1+1, 1:1
- ITU-T G.8032 Ethernet Ring Protection Switching (ERPS)
- RFC 1492 TACACS
- IEEE 1588 Precision Time Protocol PTPv2
- 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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
Interfaces: 2x Ethernet 1000Base-FX (SFP)
4x Ethernet 10/100/1000BaseT
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 Combicom (SHDSL, Power, IO), SFP Cages, RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)
Management: Console Port, Telnet, SSH, Web, SNMP and 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



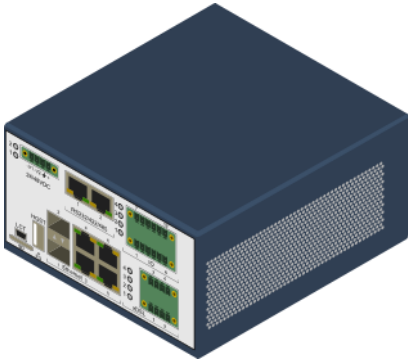
Model: GF-RAIL2N-6Eth-2I2O/2SER-PoE-24V,V25

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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
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
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, 48W Max
Physical Interfaces: Phoenix Mini Combicom (SHDSL, Power, IO), SFP Cages, RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)
Management: Console Port, Telnet, SSH, Web, SNMP and 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



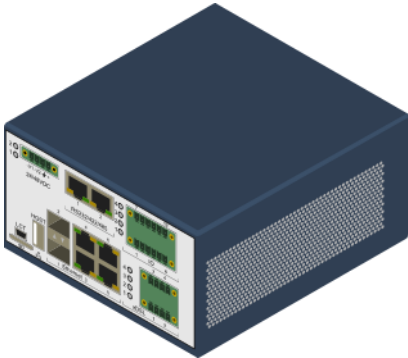
Model: GF-RAIL2N-6Eth-24V,V26

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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
Interfaces: 2x Ethernet 1000Base-FX (SFP)
4x Ethernet 10/100/1000BaseT
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 Combicom (SHDSL, Power), SFP Cages, RJ45 (Ethernet), Mini-B (USB), Type A (USB)
Management: Console Port, Telnet, SSH, Web, SNMP and 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



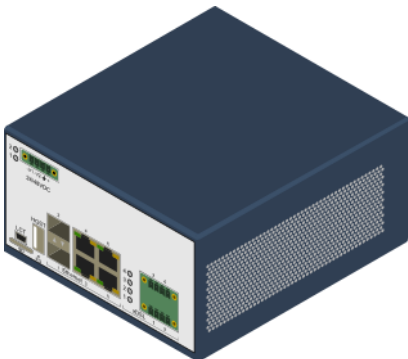
Model: GF-RAIL4N-6Eth-2I2O/2SER-24V,V31

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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
Interfaces: 2x Ethernet 1000Base-FX (SFP)
4x Ethernet 10/100/1000BaseT
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 Interfaces: Phoenix Mini Combicom (SHDSL, Power, IO), SFP Cages, RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)
Management: Console Port, Telnet, SSH, Web, SNMP and 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



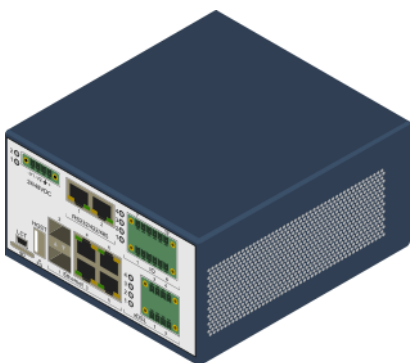
Model: GF-RAIL4N-6Eth-2I2O/2SER-PoE-24V,V35

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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
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
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, 50W Max
Physical Interfaces: Phoenix Mini Combicom (SHDSL, Power, IO), SFP Cages, RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)
Management: Console Port, Telnet, SSH, Web, SNMP and 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



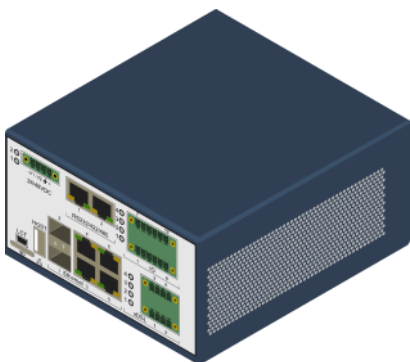
Model: GF-RAIL4N-6Eth-24V,V36

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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
Interfaces: 2x Ethernet 1000Base-FX (SFP)
4x Ethernet 10/100/1000BaseT
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 Interfaces: Phoenix Mini Combicom (SHDSL, Power), SFP Cages, RJ45 (Ethernet), Mini-B (USB), Type A (USB)
Management: Console Port, Telnet, SSH, Web, SNMP and 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



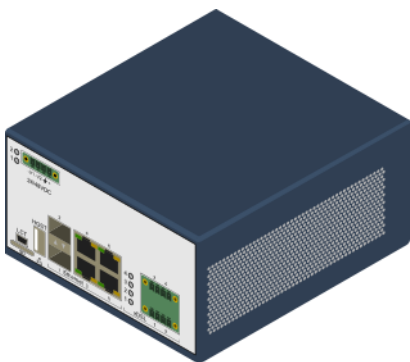
Model: GF-RAIL4N-6EthP-2120/2SER-24V,V41

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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
 Interfaces: 2x Ethernet 1000Base-FX (SFP), single-step PTP
 4x Ethernet 10/100/1000BaseT, single-step PTP
 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 Interfaces: Phoenix Mini Combicom (SHDSL, Power, IO), SFP Cages, RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)
 Management: Console Port, Telnet, SSH, Web, SNMP and 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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
 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), single-step PTP
 4x Ethernet 10/100/1000BaseT, single-step PTP
 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, 50W Max
 Physical Interfaces: Phoenix Mini Combicom (SHDSL, Power, IO), SFP Cages, RJ45 (Ethernet, Serial), Mini-B (USB), Type A (USB)
 Management: Console Port, Telnet, SSH, Web, SNMP and 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 with Modes Master / Slave / Auto / Multipoint / Bonding / Ring
 Interfaces: 2x Ethernet 1000Base-FX (SFP), single-step PTP
 4x Ethernet 10/100/1000BaseT, single-step PTP
 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 Interfaces: Phoenix Mini Combicom (SHDSL, Power), SFP Cages, RJ45 (Ethernet), Mini-B (USB), Type A (USB)
 Management: Console Port, Telnet, SSH, Web, SNMP and 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