

SHDSL.bis

Up to 60Mbps

E1 / Ethernet / Nx64



## Orion3

### TDM Based SHDSL.bis



#### Features

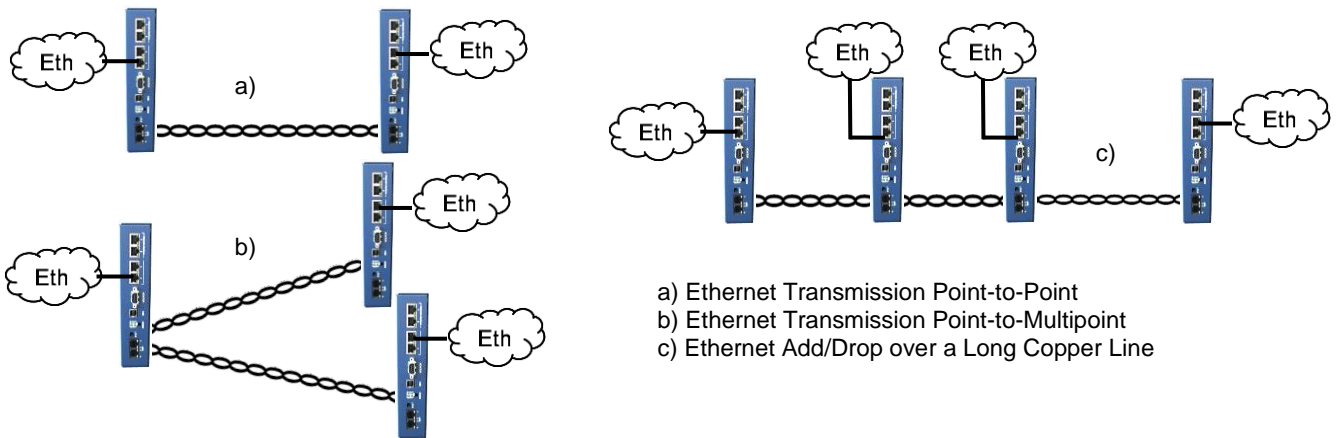
- Up to 15.2Mbps Data Transmission per Copper Pair
- SHDSL and SHDSL.bis, TC-PAM16/32
- Additional TC-PAM4/8/64/128 Available
- 60.8 Mbps over Quadruple Copper Pair
- E1 (G.703/704) and Nx64 (V.35, V.36, X.21)
- Ethernet with Integrated Layer 2 managed Ethernet Switch supports VLAN, RSTP and QoS
- RS-232 and RS-485 Daughterboards
- Multiservice Operation
- Point-to-Point, Point-to-Multipoint & Ring Operation
- Console Port, Telnet, Web, SNMP Management
- 24/48VDC Powered, Low Power Consumption
- Remote Power Support 120/200VDC
- Included Primary Protection
- Repeater supported and available
- 19", Plastic or Robust DIN-Rail Metal Enclosure
- Industrial Temperature Range Available

Orion Telecom Networks, Inc. presents the **Orion3 SHDSL.bis Extended** product family that 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 & MiniFlex). The Orion3 supports TC-PAM16/32 and the new TC-PAM4/8/64/128 line coding. The support of these line codes ensures compatibility with existing SHDSL equipment, that is already installed, in order to protect customer investments, while at the same time providing an upgrade path to the newest DSL technologies.

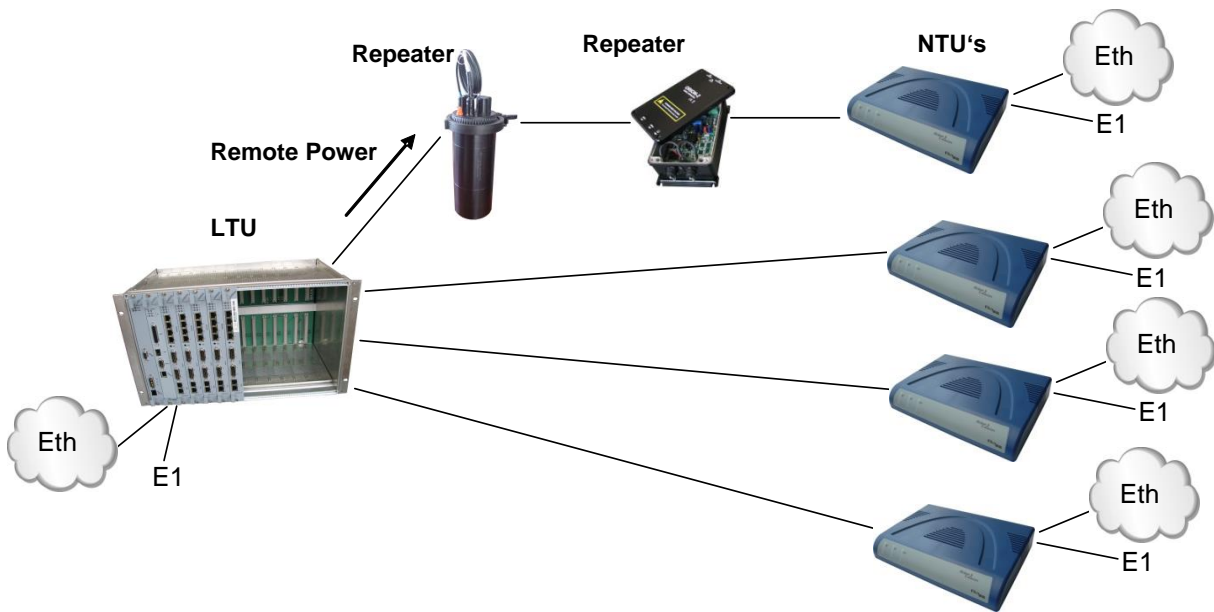
SHDSL.bis Extended allows symmetrical data and voice transmission at speeds up to 15.2Mbps over a single pair of copper. In addition, the Orion3 modem range also supports DSL channel bonding for up to 4 copper pairs in order to achieve speeds to 60.8Mbps! This incredible speed makes Fiber installations in a lot of places needless. Orion3 SHDSL.bis Extended modems can provide up to 4 complete E1 interfaces, which support framed and unframed services (G.703/G.704). An integrated 2 or 4 port Ethernet layer 2 managed switch with VLAN, RSTP and QoS support (10/100BaseT) ensures connectivity to IP services. Beside of E1 and Ethernet we have additional interfaces like Nx64 (that can be configured to be a V.35, V.36, X.21 or V.24 interface by software) and RS-232/485. This makes Orion3 SHDSL.bis Extended modems a perfect solution for a wide range of applications in which TDM and IP services need to be transmitted over copper wires.

Like all Orion & MiniFlex products, the Orion3 SHDSL.bis Extended modems family is based on industrial components and is 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 Orion3 SHDSL.bis Extended product family make it the perfect choice for all your DSL needs.

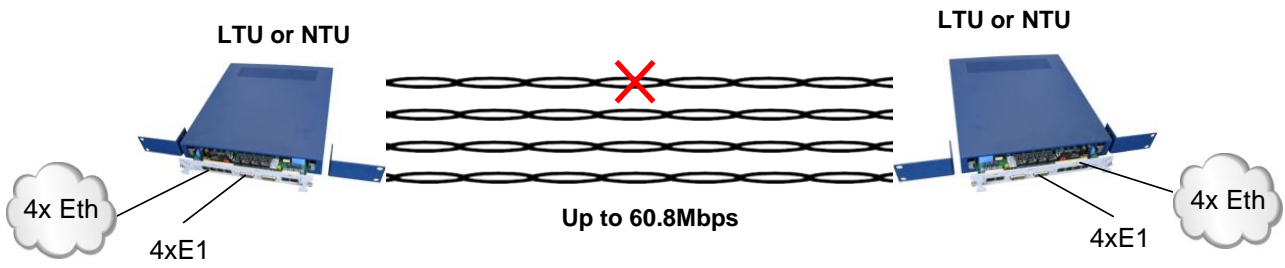
**Possible Application: Point-to-Point & Point-to-Multipoint**



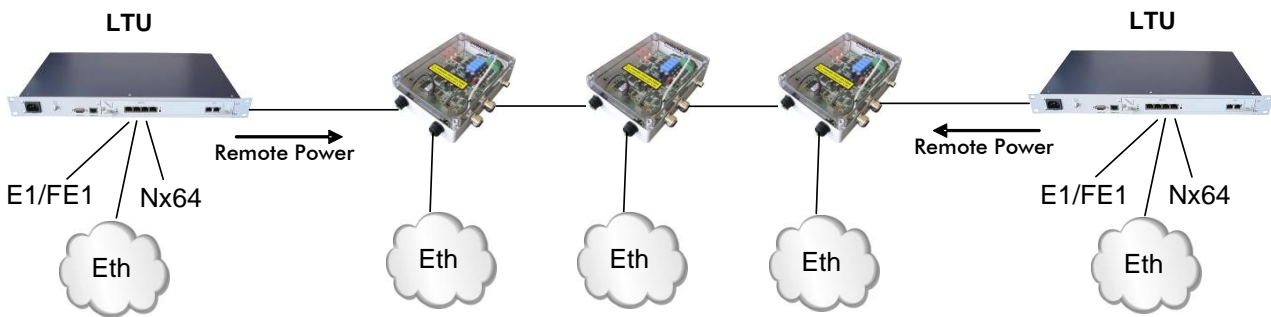
**Possible Application: Typical Service Provider Application**



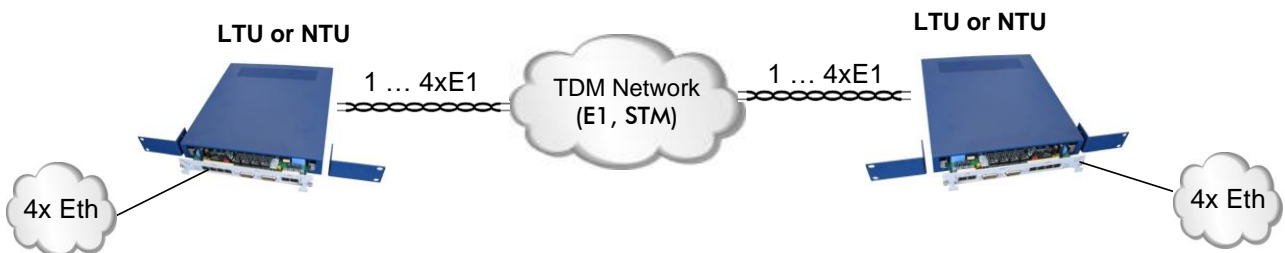
**Possible Application: Point-to-Point Application with Failure Protection**



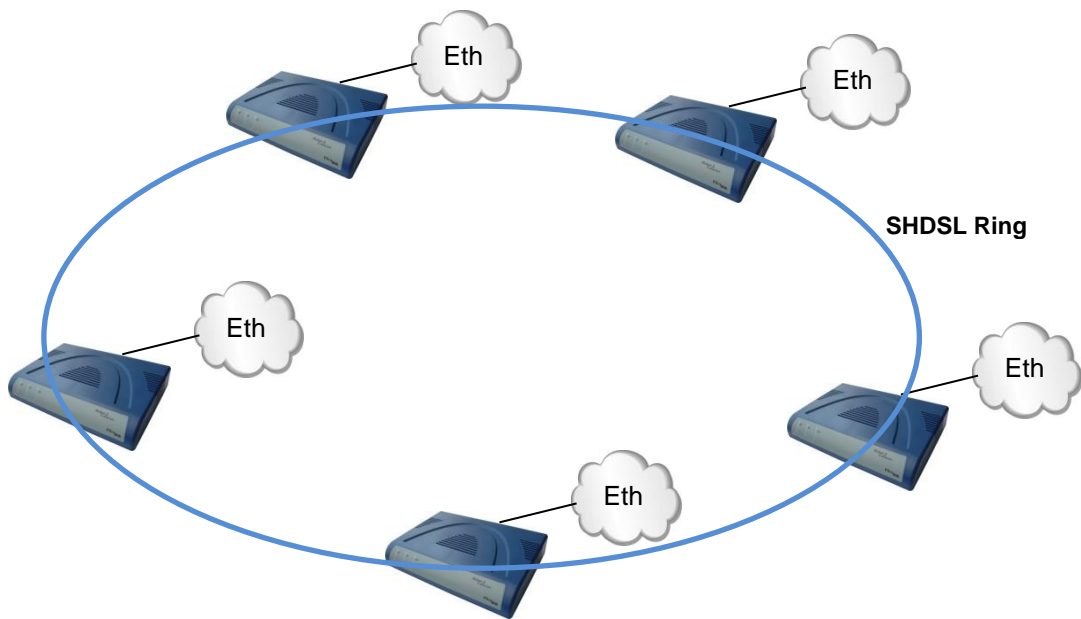
**Possible Application: Ethernet Add/Drop Repeater Application with Remote Power**



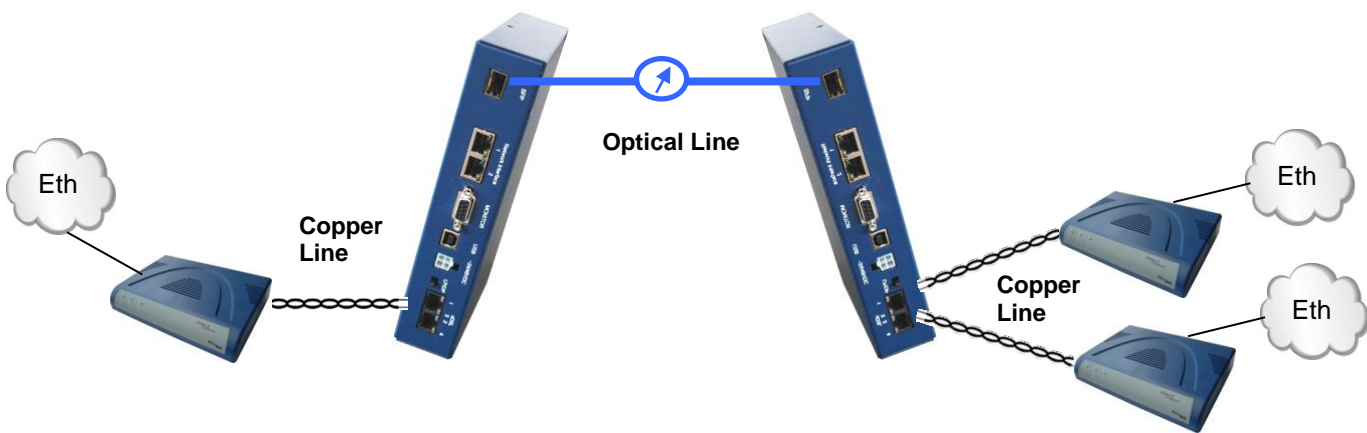
**Possible Application: Ethernet to E1 Converter**



**Possible Application: Ring Application**



**Possible Application: Copper to Fiber Converter with V84S**



## Orion3 SHDSL Standalone Modem



**Model: FG-PAM-SAN-2E1B/2Eth,V80**  
**FG-PAM-SAN-2E1B/2Eth-24V,V80**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
Copper Pairs: 1 with Modes Master / Slave / Auto  
Interface: 2x E1 (120Ohm), 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power, 2.8W Typ.  
18 to 230VDC, no remote power when FG-PAM-SAN-2E1B/2Eth-24V,V80  
Physical Interfaces: RJ48 (E1), RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



**Model: FG-PAM-SA2N-2E1B/2Eth,V81**  
**FG-PAM-SA2N-2E1B/2Eth-24V,V81**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2 with Modes Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x E1 (120Ohm), 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power, 3.6W Typ.  
18 to 230VDC, no remote power when FG-PAM-SA2N-2E1B/2Eth-24V,V81  
Physical Interfaces: RJ48 (E1), RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



**Model: FG-PAM-SAN-2Eth,V82**  
**FG-PAM-SAN-2Eth-24V,V82**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
Copper Pairs: 1 with Modes Master / Slave / Auto  
Interface: 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power, 2.3W Typ.  
18 to 230VDC, no remote power when FG-PAM-SAN-2Eth-24V,V82  
Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



**Model: FG-PAM-SA2N-2Eth,V83**  
**FG-PAM-SA2N-2Eth-24V,V83**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2 with Modes Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power, 3.1W Typ.  
18 to 230VDC, no remote power when FG-PAM-SA2N-2Eth-24V,V83  
Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

## Orion3 SHDSL Standalone Modem



### Model: FG-PAM-SA4N-4Eth,V84 FG-PAM-SA4N-4Eth-24V,V84

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair  
Interface: 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power, 5.1W Typ.  
18 to 230VDC, no remote power when FG-PAM-SA4N-4Eth-24V,V84  
Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SA4N-2E1B/2Eth,V84E FG-PAM-SA4N-2E1B/2Eth-24V,V84E

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x E1 (120Ohm), 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power, 5.3W Typ.  
18 to 230VDC, no remote power when FG-PAM-SA4N-2E1B/2Eth-24V,V84E  
Physical Interfaces: RJ48 (E1), RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SA4N-3Eth,V84S FG-PAM-SA4N-3Eth-24V,V84S

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x Ethernet 10/100BaseT, 1x Ethernet SFP 100BaseFX (Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power, 5.1W Typ.  
18 to 230VDC, no remote power when FG-PAM-SA4N-3Eth-24V,V84S  
Physical Interfaces: RJ45/SFP (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SAN-N64/2E1B,V85 FG-PAM-SAN-N64/2E1B-24V,V85

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
Copper Pairs: 1 with Modes Master / Slave / Auto  
Interface: 2x E1 (120Ohm), 1x Nx64 (V.35,V.36,X.21)  
Power: 36 to 230VDC, accepts local and remote power, 2.8W Typ.  
18 to 230VDC, no remote power when FG-PAM-SAN-N64/2E1B-24V,V85  
Physical Interfaces: RJ48 (E1), DB26 (Nx64), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

## Orion3 SHDSL Standalone Modem



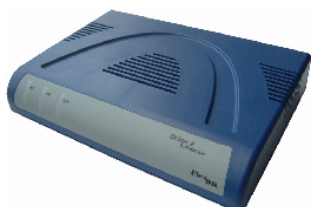
**Model:** **FG-PAM-SA2N-N64/2E1B,V86**  
**FG-PAM-SA2N-N64/2E1B-24V,V86**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2 with Modes Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x E1 (120Ohm), 1x Nx64 (V.35,V.36,X.21)  
Power: 36 to 230VDC, accepts local and remote power, 3.6W Typ.  
18 to 230VDC, no remote power when FG-PAM-SA2N-N64/2E1B-24V,V86  
Physical Interfaces: RJ48 (E1), DB26 (Nx64), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



**Model:** **FG-PAM-SAN-N64/2Eth,V87**  
**FG-PAM-SAN-N64/2Eth-24V,V87**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
Copper Pairs: 1 with Modes Master / Slave / Auto  
Interface: 1x Nx64 (V.35,V.36,X.21), 2x Ethernet 10/100BaseT (Layer2 Manag. Switch)  
Power: 36 to 230VDC, accepts local and remote power, 2.8W Typ.  
18 to 230VDC, no remote power when FG-PAM-SAN-N64/2Eth-24V,V87  
Physical Interfaces: DB26 (Nx64), RJ45 (ETH), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



**Model:** **FG-PAM-SA2N-N64/2Eth,V88**  
**FG-PAM-SA2N-N64/2Eth-24V,V88**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2 with Modes Master / Slave / Auto / Multipoint / Multipair  
Interface: 1x Nx64 (V.35,V.36,X.21), 2x Ethernet 10/100BaseT (Layer2 Manag. Switch)  
Power: 36 to 230VDC, accepts local and remote power, 3.6W Typ.  
18 to 230VDC, no remote power when FG-PAM-SA2N-N64/2Eth-24V,V88  
Physical Interfaces: DB26 (Nx64), RJ45 (ETH), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

**Attention:** All Standalone modems having an interface like N64 (V.35,V.36,X.21), V24 (RS-232, V.24), 485 (RS-485), 703 (G.703, E0) and 4I4O can be adapted to any of these interfaces.

## Orion3 SHDSL DIN Rail Modem



### Model: FG-PAM-RAIL2N-2E1B/2Eth, V81 FG-PAM-RAIL2N-2E1B/2Eth-24V, V81

DSL Version: SHDSL / SHDSL.bis / Extended  
 Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
 Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
 Copper Pairs: 2 with Modes Master / Slave / Auto / Multipoint / Multipair  
 Interface: 2x E1 (120Ohm), 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
 Power: 36 to 230VDC, accepts local and remote power, 3.6W Typ.  
 18 to 230VDC, no remote power for FG-PAM-RAIL2N-2E1B/2Eth-24V, V81  
 Physical Interfaces: RJ48 (E1), RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
 Management: Console Port, Telnet, Web, SNMP and SD-Card support  
 Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
 Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-RAIL2N-2Eth, V83 FG-PAM-RAIL2N-2Eth-24V, V83

DSL Version: SHDSL / SHDSL.bis / Extended  
 Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
 Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
 Copper Pairs: 2 with Modes Master / Slave / Auto / Multipoint / Multipair  
 Interface: 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
 Power: 36 to 230VDC, accepts local and remote power, 3.1W Typ.  
 18 to 230VDC, no remote power when FG-PAM-RAIL2N-2Eth-24V, V83  
 Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
 Management: Console Port, Telnet, Web, SNMP and SD-Card support  
 Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
 Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-RAIL4N-4Eth, V84 FG-PAM-RAIL4N-4Eth-24V, V84

DSL Version: SHDSL / SHDSL.bis / Extended  
 Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
 Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
 Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair  
 Interface: 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
 Power: 36 to 230VDC, accepts local and remote power, 5.1W Typ.  
 18 to 230VDC, no remote power when FG-PAM-RAIL4N-4Eth-24V, V84  
 Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
 Management: Console Port, Telnet, Web, SNMP and SD-Card support  
 Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
 Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-RAIL4N-2E1B/2Eth, V84E FG-PAM-RAIL4N-2E1B/2Eth-24V, V84E

DSL Version: SHDSL / SHDSL.bis / Extended  
 Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
 Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
 Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair  
 Interface: 2x E1 (120Ohm), 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
 Power: 36 to 230VDC, accepts local and remote power, 5.3W Typ.  
 18 to 230VDC, no remote power when FG-PAM-SA4N-2E1B/2Eth-24V, V84E  
 Physical Interfaces: RJ48 (E1), RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
 Management: Console Port, Telnet, Web, SNMP and SD-Card support  
 Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
 Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



## Orion3 SHDSL DIN Rail Modem



**Model:** FG-PAM-RAIL2N-V24/2Eth, V88  
FG-PAM-RAIL2N-V24/2Eth-24V, V88

DSL Version: SHDSL / SHDSL.bis / Extended  
 Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
 Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
 Copper Pairs: 2 with Modes Master / Slave / Auto / Multipoint / Multipair  
 Interface: 1x RS-232 (V.24), 2x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
 Power: 36 to 230VDC, accepts local and remote power, 3.6W Typ.  
 18 to 230VDC, no remote power for FG-PAM-RAIL2N-V24/2Eth-24V, V88  
 Physical Interfaces: DB26 (RS-232), RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9 (LCT)  
 Management: Console Port, Telnet, Web, SNMP and SD-Card support  
 Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
 Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

**Attention:** Instead of V24 (RS-232, V.24) interface, this unit can be also equipped with N64 (V.35, V.36, X.21), 485 (RS-485), 703 (G.703, E0) or 4140 interface.



**Model:** FG-PAM-RAIL4N-3Eth, V84S  
FG-PAM-RAIL4N-3Eth-24V, V84S

DSL Version: SHDSL / SHDSL.bis / Extended  
 Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
 Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
 Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair  
 Interface: 2x Ethernet 10/100BaseT, 1x Ethernet SFP 100BaseFX (Managed Switch)  
 Power: 36 to 230VDC, accepts local and remote power, 5.1W Typ.  
 18 to 230VDC, no remote power when FG-PAM-RAIL4N-3Eth-24V, V84S  
 Physical Interfaces: RJ45/SFP (Ethernet), RJ48 (SHDSL), Molex (Power), DB9/USB (LCT)  
 Management: Console Port, Telnet, Web, SNMP and SD-Card support  
 Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
 Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



**Model:** FG-PAM-RAIL4N-4Eth-24V, V84I

DSL Version: SHDSL / SHDSL.bis / Extended  
 Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
 Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
 Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair  
 Interface: 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
 Power: 18 to 230VDC, no remote power  
 Physical Interfaces: RJ45 (Ethernet), Combicon (SHDSL & Power), DB9/USB (LCT)  
 Management: Console Port, Telnet, Web, SNMP and SD-Card support  
 Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
 Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



**Model:** FG-PAM-RAIL4N-4Eth-24V, V84IS

DSL Version: SHDSL / SHDSL.bis / Extended  
 Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
 Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
 Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair  
 Interface: 2x Ethernet 10/100BaseT, 2x Ethernet SFP 100BaseFX (Managed Switch)  
 Power: 18 to 230VDC, no remote power  
 Physical Interfaces: RJ45/SFP (Ethernet), Combicon (SHDSL & Power), DB9/USB (LCT)  
 Management: Console Port, Telnet, Web, SNMP and SD-Card support  
 Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
 Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

## Orion3 SHDSL DIN Rail Modem



### Model: FG-PAM-RAIL4N-V24/4Eth-24V, V84IS

- DSL Version: SHDSL / SHDSL.bis / Extended
- Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128
- Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps
- Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair
- Interface: 1x RS-232 (V.24), 2x Ethernet 10/100BaseT, 2x Ethernet SFP 100BaseFX (Managed Switch)
- Power: 18 to 230VDC, no remote power
- Physical Interfaces: RJ45 (RS-232), RJ45/SFP (Ethernet), Combicon (SHDSL & Power), DB9/USB (LCT)
- Management: Console Port, Telnet, Web, SNMP and SD-Card support
- Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)
- Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-RAIL4N-V24/2E1/2Eth-24V, V84IE

- DSL Version: SHDSL / SHDSL.bis / Extended
- Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128
- Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps
- Copper Pairs: 4 with Modes Master / Slave / Auto / Multipoint / Multipair
- Interface: 1x RS-232 (V.24), 2x E1 (1200hm), 2x Ethernet SFP 100BaseFX (Managed Switch)
- Power: 18 to 230VDC, no remote power
- Physical Interfaces: RJ45 (RS-232), RJ45 (E1), SFP (Ethernet), Combicon (SHDSL & Power), DB9/USB (LCT)
- Management: Console Port, Telnet, Web, SNMP and SD-Card support
- Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)
- Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

**Attention:** Instead of V24 (RS-232, V.24) interface, two above models can be also equipped with 485 (RS-485) interface.

## Orion3 SHDSL Sub Rack Module



### Model: FG-PAM-SRL-2E1B/4Eth-RP,V90

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
Copper Pairs: 1  
Modes: Master / Slave / Auto  
Interface: 2x E1 (120Ohm), 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 72VDC local power, 120/200VDC remote power source  
Physical Interfaces: DB15 (E1), RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Backplane)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SRL-2E1B/N64/4Eth-RP,V91

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
Copper Pairs: 1  
Modes: Master / Slave / Auto  
Interface: 2x E1 (120Ohm), 1x Nx64 (V.35,V.36,X.21), 4x Ethernet 10/100BaseT  
Power: 36 to 72VDC local power, 120/200VDC remote power source  
Physical Interfaces: DB15 (E1), DB26 (Nx64), RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Back)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SR2L-4E1B/4Eth-RP,V93

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2  
Modes: Master / Slave / Auto / Multipoint / Multipair  
Interface: 4x E1 (120Ohm), 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 72VDC local power, 120/200VDC remote power source  
Physical Interfaces: DB15 (E1), RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Backplane)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SR2L-2E1B/N64/4Eth-RP,V94

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2  
Modes: Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x E1 (120Ohm), 1x Nx64 (V.35,V.36,X.21), 4x Ethernet 10/100BaseT  
Power: 36 to 72VDC local power, 120/200VDC remote power source  
Physical Interfaces: DB15 (E1), DB26 (Nx64), RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Back)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

## Orion3 SHDSL Sub Rack Module



### Model: FG-PAM-SR2L-2E1B/V24/4Eth-RP,V94

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 2  
Modes: Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x E1 (120Ohm), 1x RS-232 (V.24), 4x Ethernet 10/100BaseT  
Power: 36 to 72VDC local power, 120/200VDC remote power source  
Physical Interfaces: DB15 (E1), DB26 (RS-232), RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Ba  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SR4L-4E1B/4Eth-RP,V96

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4  
Modes: Master / Slave / Auto / Multipoint / Multipair  
Interface: 4x E1 (75/120Ohm), 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 72VDC local power, 120/200VDC remote power source  
Physical Interfaces: DB15 (E1), RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Backplane)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SR4L-4Eth,V98

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4  
Modes: Master / Slave / Auto / Multipoint / Multipair  
Interface: 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 72VDC local power  
Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Backplane)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C



### Model: FG-PAM-SR4L-2V24/4Eth,V98

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4  
Modes: Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x RS-232 (V.24), 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 72VDC local power  
Physical Interfaces: DB26 (RS-232), RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Backplane)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

## Orion3 SHDSL Sub Rack Module



### Model: FG-PAM-SR4L-4Eth-RP,V98

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4  
Modes: Master / Slave / Auto / Multipoint / Multipair  
Interface: 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 72VDC local power, 120/200VDC remote power source  
Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Backplane)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

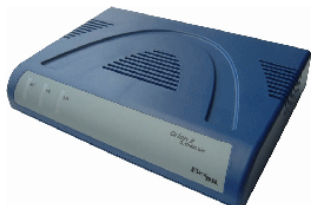


### Model: FG-PAM-SR4L-2V24/4Eth-RP,V98

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 60.928Mbps, 4x 15.232Mbps  
Copper Pairs: 4  
Modes: Master / Slave / Auto / Multipoint / Multipair  
Interface: 2x RS-232 (V.24), 4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 72VDC local power, 120/200VDC remote power source  
Physical Interfaces: DB26 (RS-232), RJ45 (Ethernet), RJ48 (SHDSL), DIN41612 (Backplane)  
Management: Telnet, HTTP, SNMP, SD-Card support and Console Port via ACU/TCU  
Temperature: Standard: -5 to +45°C, Extended: -20 to +80°C

**Attention:** All Sub Rack Modules having an interface like N64 (V.35,V.36,X.21), V24 (RS-232, V.24), 485 (RS-485), 703 (G.703, E0) and 4I4O can be adapted to any of these interfaces.

## Orion3 SHDSL Repeater



**Model: FG-PAM-RGN-Eth-PL, V83**  
**FG-PAM-RG2N-Eth-PL, V84**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 1 (FG-PAM-RGN-Eth-PL, V83)  
2 (FG-PAM-RG2N-Eth-PL, V84)  
Modes: Master / Slave / Auto  
Interface: 2/4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power  
Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9 (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: -25 to +80°C



**Model: FG-PAM-RGN-2Eth-RL, V81**  
**FG-PAM-RG2N-4Eth-RL, V84**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 1 (FG-PAM-RGN-2Eth-RL, V81)  
2 (FG-PAM-RG2N-4Eth-RL, V84)  
Modes: Master / Slave / Auto  
Interface: 2/4x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power  
Physical Interfaces: RJ45 (Ethernet), RJ48 (SHDSL), Molex (Power), DB9 (LCT)  
Management: Console Port, Telnet, Web, SNMP and SD-Card support  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: -25 to +80°C



**Model: FG-PAM-RGN-Eth-IPP, V83R**  
**FG-PAM-RG2N-Eth-IPP, V84R**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 1 (FG-PAM-RGN-Eth-IPP, V83R)  
2 (FG-PAM-RG2N-Eth-IPP, V84R)  
Modes: Master / Slave / Auto  
Interface: 1x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power  
Physical Interfaces: RJ45 (Ethernet), Screwing Terminal (SHDSL, Power), RJ45 (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: -25 to +80°C

## Orion3 SHDSL Repeater



**Model: FG-PAM-RGN-Eth-IPL, V83R  
FG-PAM-RG2N-Eth-IPL, V84R**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 1 (FG-PAM-RGN-Eth-IPL, V83R)  
2 (FG-PAM-RG2N-Eth-IPL, V84R)  
Modes: Master / Slave / Auto  
Interface: 1x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power  
Physical Interfaces: RJ45 (Ethernet), Screwing Terminal (SHDSL, Power), RJ45 (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: -25 to +80°C



**Model: FG-PAM-RGN-Eth-IPH, V83R  
FG-PAM-RG2N-Eth-IPH, V84R**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 1 (FG-PAM-RGN-Eth-IPH, V83R)  
2 (FG-PAM-RG2N-Eth-IPH, V84R)  
Modes: Master / Slave / Auto  
Interface: 1x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power  
Physical Interfaces: RJ45 (Ethernet), Screwing Terminal (SHDSL, Power), RJ45 (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: -25 to +80°C



**Model: FG-PAM-RGN-Eth-IPS, V83R  
FG-PAM-RG2N-Eth-IPS, V84R**

DSL Version: SHDSL / SHDSL.bis / Extended  
Modulation: TC-PAM16/32 and with License TC-PAM4/8/16/32/64/128  
Data Rate: 128kbps - 15.232Mbps  
128kbps - 30.464Mbps, 2x 15.232Mbps  
Copper Pairs: 1 (FG-PAM-RGN-Eth-IPS, V83R)  
2 (FG-PAM-RG2N-Eth-IPS, V84R)  
Modes: Master / Slave / Auto  
Interface: 1x Ethernet 10/100BaseT (Layer 2 Managed Switch)  
Power: 36 to 230VDC, accepts local and remote power  
Physical Interfaces: RJ45 (Ethernet), Screwing Terminal (SHDSL, Power), RJ45 (LCT)  
Management: Console Port, Telnet, HTTP and SNMP  
Power Supply: 90-260VAC option with FG-PAM-PA48G (not included)  
Temperature: -25 to +80°C

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