

SPEEDERLAN BIS - GE

MULTI PAIR ETHERNET EXTENSION

SYMMETRICAL 120 MBPS EFM BONDING

Benefits

- Ethernet bridge over 4 or 8 telephone copper pairs
- High data rate, symmetrical 15 Mbps on 1 pair, 60 Mbps on 4 pairs and 120 Mbps on 8 pairs
- SHDL Bis, UIT-T G.991.2 Standard, IEEE 802.3.ah
- Automatic rate adaptation from 192 kbps to 120 Mbps according to the line quality
- Distance up to 8 km on 0.4 mm cable
- Bonding : EFM, IEEE 802.3ah
- Four Gigabit Ethernet ports, 10/100/1000
- One Gigabit Ethernet optical SFP socket
- Ethernet, 802.1d bridge
- Per port VLAN and 802.1q
- QoS and traffic prioritization
- Rapid Spanning Tree, 802.1d
- Management : Web interface, http / https, ssh, local console port, USB memory card
- Remote management in IP and out of band supervision through EOC channel
- Industrial compact and economic solution
- Rack card for 19" chassis
- 1 or 2x 48Vdc or 110 / 230 Vac mains supply

ETHERNET 802.3AH SHDSL Bis/EFM



SpeederLan-Bis-GE is a Ethernet First Mile network extension unit that provides high rate connection over one and up to eight bonded copper pairs. It operates as a manageable Gigabit Ethernet switch with VLAN, QOS, Traffic shaping and security capabilities. It complies to the ITU-T G.991.2, G.SHDSL Bis standard with 15 Mbps throughput per pair in both directions. It delivers up to 120 Mbps over eight pairs with EFM, Ethernet First Mile, IEEE 802.3ah standard. The modular Gigabit Ethernet optical interface provides very long distance connection. Four Gigabit Ethernet ports connect to the LAN and terminal equipment.

SpeederLan-Bis-GE offers a maximum rate of 120 Mbps or a maximum distance of 8 km over existing 0.4mm / AWG26 copper pairs - and much more on thicker cables.

SpeederLan-Bis-GE is suitable for any professional environment. It comes as a metallic compact and robust device powered from either a 110-230 Vac mains, or one or two 48Vdc power supply converters with redundancy. As a rack mount card, it can fit in an AMS4 or AMS16, 19" chassis. The AMS16 chassis supports 16 device slots, 2 power supply slots and one slot for a centralized management card with TCP-IP, SNMP protocols.

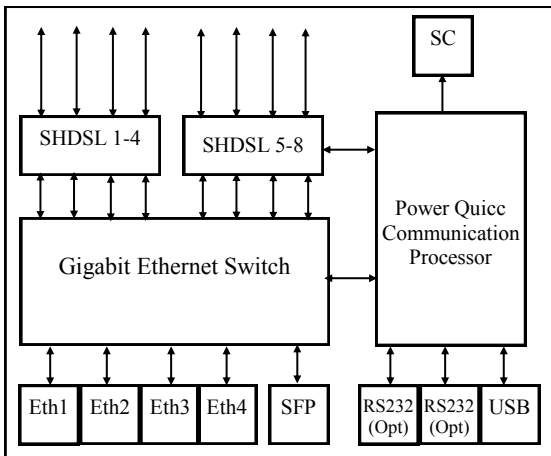
SpeederLan-Bis-GE is a perfect aggregation / central point for many industry applications. It can be the first network access of Transportation or Utility infrastructure. For such Utility substation requirement the **SpeederLan-Bis-GE** is offered with a choice of single DIN Rail isolation transformer or a 19" shelf of 16 isolation transformers for the 6 to 20 kV substation environment.



One single **SpeederLan-Bis-GE-8** card can aggregate traffics of up to 8x remote devices or sub-networks of remote sites made of Add-Drop SHDSL modems. AMS16 chassis has a capacity of 96 SHDSL lines.

Architecture

The **SpeederLan-Bis-GE** is an Ethernet switch equipped with four 10/100/1000BT Ethernet ports, one Gigabit Ethernet optical port, and eight SHDSL, Ethernet First Mile modem interfaces. A Power Quicc Pro communication processor manages the operation of the system, controls Ethernet and IP protocols, and converts the communication of two external devices or RTU through 2x serial RS232 ports (on option).



Architecture of the SpeederLan-Bis-GE

Power supply (and RS232 - option) connectors are on the rear panel of the products. USB, DSL and Ethernet connectors are accessed from the front.

Ethernet Switch

The **SpeederLan-Bis-GE** is based on a high performance and low latency Gigabit Ethernet switch that delivers four external Gigabit Ethernet ports, one modular Gigabit optical port, up to 8 SHDSL-Bis interfaces and a link to the Power Quicc Communication Processor.

The switching engine has a total Content Addressable Memory of 8K Ethernet MAC addresses to learn device addresses attached to each port of the product as to forward Ethernet traffics onto the proper interface. It has also 1 Mb Ethernet frame memory to adapt and regulate the traffic to and from the lower speed copper interfaces and to optimize the traffic on higher speed Ethernet ports.

This Ethernet switch supports many traffic control and optimization functions. Ingress traffic is classified and applied shaping rules from the Quality of Services protocols, IEEE 802.1P protocol. Rate limiting prevents high bandwidth streams to saturate the network. The Quality of Service parameters adapt to the various network requirement as to give priority to mission critical traffics (such as signalling or security data).

The VLAN process can isolate traffics from Ethernet ports, assign VLAN Tags on ingress traffic, and apply Quality of Services strategies. IEEE 802.1Q VLAN's are valuable to prevent broadcast frame in VLAN domains, to separate traffic classes and applications,

to improve Ring topology controls, and to deliver best Quality of Services throughout the network. The four RJ45 ports run at 10, 100 or 1,000 Mbps with automatic speed negotiation and polarity detection which make it compatible with any Ethernet device with plug and play installation.

The Gigabit SFP optical interface delivers very long distance connectivity (up to 120 km) and total ease of installation through modular and industry standard SFP optical modules. WDM single fiber models are available to save fiber utilization.

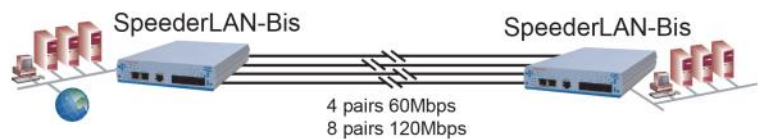
Ethernet First Mile, G.SHDSL-Bis

The **SpeederLan-Bis-GE** has up to eight Ethernet First Mile, SHDSL-Bis interfaces that conforms with the IEEE 802.1ah standard. The EFM processor delivers minimum latency to transmit Ethernet traffic over the DSL interfaces.

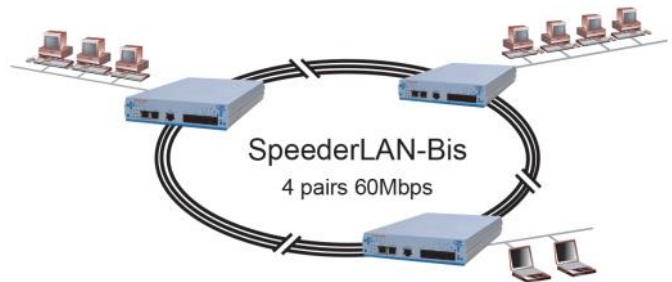
The **SpeederLan-Bis-GE** allows Add - Drop and secured Ring topologies over long distances and high speed symmetrical traffic up to 120 Mbps.

Network Topologies and Applications

The **SpeederLan-Bis-GE** allows point to point connections at speeds up to 120 Mbps on 8 copper pairs.



It can also operate as a add-drop modem in a daisy-chain or Ring topology with RSTP protocol, each direction can provide up to 60 Mbps bandwidth.



The **SpeederLan-Bis-GE** can finally operate as an aggregator of up to 8 links in a star or Ring topology to either remote end points or a first hop to daisy-chained network of a multipoint infrastructure (as per first page diagram).

Designed on Industry Standards

The **SpeederLan-Bis-GE** is designed on industry standards and it is compatible with other Ethernet compatible products. This philosophy secures the customer investments and it is a guarantee of best

Integration and Presentation

SpeederLan-Bis-GE comes in a very robust aluminum enclosure that guarantees perfect mechanical strength, high electromagnetic immunity, and best performance in difficult environments. It is also a rackmount card for the CXR AMS4 (4x modems) and AMS16 shelves that can host 16 modem cards, 2 redundant power cards, and a SNMP management card.

RS232 Serial Interface

As an option, the **SpeederLan-Bis-GE** brings two RS232 serial interfaces to asynchronous equipment such as RTU devices. The serial to IP conversion is very versatile to adapt and optimize the connection of serial devices over the Ethernet network. Serial data can be transported over TCP with error correction and reordering features, or over UDP where the user application protocol takes care of acknowledgement and retransmission. A message and delay coherence process takes care of any specific application timeout that could occur when data are transmitted over a packet network.

SpeederLan-Bis-GE emulates any modem operation and even Point to Multipoint topologies with a large number of slave devices.

Topology, Redundancy and Reliability

SpeederLan-Bis-GE allows Daisy-chained or Ring topologies with a mix of copper and optical media and STP / RSTP resiliency protocols. **SpeederLan-Bis-GE** and the AMS16 chassis can have two power supply converters with load sharing and redundancy. **SpeederLan-Bis-GE** was designed for best reliability and hard environment resistance. It embeds industrial grade components and all interfaces are protected against electrostatic discharges and reverse / over-voltages. The SHDSL interfaces are equipped with ST3 lightning protection devices. The **SpeederLan-Bis-GE** is aimed at supporting most stringent choc, vibration and electromagnetic immunity requirements.

Security and Access Control

SpeederLan-Bis-GE takes care of the station security through several levels of security. The 802.1X protocol and an embedded MAC address authentication memory allows strong authentication of Ethernet devices that connect to the network. The Mac Authentication memory helps securing the access of simple devices that do not support the 802.1X protocol. Unused ports can be disabled and strong password authentication is required to change the product settings. The product passed strong test for best immunity against protocol violations.

Management

SpeederLan-Bis-GE brings a complete set of management features and protocols such as a Command Line Interface from the USB interface and from the network with Telnet and SSH protocols. A clear and intuitive Web interface comes via Http and secured Https protocols from both the USB port and the Ethernet network. The system software and configuration files can be saved and transferred via the Ftp protocol or automatically to a Memory card from the USB port. Managing the product is protected by two passwords providing monitoring only permission or full system control permissions.

A large network of **SpeederLan-Bis-GE** and other communication equipment can be monitored and controlled from a management centre through the Snmp protocol and a management software. CXR products come with a Graphical MIB for the Snmp-C software providing the administrator with a real time view of the product including its light indicators.

SpeederLan-Bis-GE is very easy to install as its factory configuration is well suited for most applications. Installation is even more simple as configuration files can be prepared on a USB memory stick and automatically uploaded when the product gets started.

Alarms and Event Logs

SpeederLan-Bis-GE records a log of system / major / critical events that can be displayed but also saved on a USB memory card.

It sends alarms to the Snmp management system, and Syslog messages to a simple alarm notification host.

Network Architecture and Services

SpeederLan-Bis-GE is part of a complete product portfolio aimed at servicing a full network requirement. This includes several SHDSL-Bis / EFM products for remote sites, accessories, but also Ethernet aggregation switches with security, protection and routing functions. CXR network engineers are aimed at helping customers in their architecture design, system operation and monitoring strategies.

Sustainable Practices

CXR is ISO 14001 certified for its good environmental practices. **SpeederLan-Bis-GE** benefits results of an Eco-Design process that focus on best material selection and lower power consumption.

G.SHDSL Bis, EFM LAN Extension



CXR Anderson Jacobson
Rue de l'Ornette
28410 Abondant - France

T +33 (0) 237 62 87 90
F +33 (0) 237 62 88 01
email: contact@cxr.com

TECHNICAL SPECIFICATIONS

SHDSL interface

- G.SHDSL Bis, UIT-T G.991.2 Annex A/B, ETSI TS-101524, IEEE 802.3ah
- 15 Mbps symmetrical rate per pair
- 4/8 pairs mode : bonding EFM, IEEE 802.3ah and 802.3ad group Trunking
- Code : TC-PAM 16/32/64/128
- Media : 4/8 pairs with metallic continuity
- Line rate : 192 kbps to 15 Mbps per pair
- Type 3 line protection, external Type 2 GDT surge arrestor recommended
- Impedance : 135 Ohms
- Connectors : RJ45

Gigabit Ethernet interfaces

- 4 Ethernet ports, 10/100/1000 BaseT
- RJ45 connectors
- Automatic speed : 10/100/1000
- Auto MDI/MDI-X

Gigabit Optical interface

- 1 optical SFP
- Speed: 1,000 Mbps

Ethernet bridge

- Ethernet bridge, 802.1d
- Frame memory : 1 MB
- MAC address memory : 8 K@
- Aging : 300 s
- Per port VLAN and 802.1q VLAN
- Spanning Tree : 802.1d
- Frame size : 1,536 bytes
- QoS and traffic prioritization : DSCP, VLAN
- Rate limiting

Power supply

- Max power consumption : 18 W
- 48 Vdc input : 36-72 Vdc, 1 or 2 inputs
- Mains input : 110 / 230 Vac

DSL range: no-noise conditions on AWG26 line

Speed Mbps	0.192	1.280	2.048	4.6	5.7	11.4	15.3
Distance km	7	4.5	4	2.5	2	0.9	0.4

Management

- USB M/H port: CLI, web interface, file transfer for configuration / software / event log
- Web interface, http / https
- Ssh, Telnet
- ftp : backup and editing configuration file
- snmp v1/v2/v3
- Syslog : critical event report
- Log of critical events
- Local and remote management, tcp-ip
- Local console port, USB
- Extended status and statistics of interfaces and protocols
- Real Time Clock with battery backup for real time event stamping (8 pairs models)

Light indicators

- Power
- CD1-8 : SHDSL line activation
- ACT : frame transmission on the Ethernet interfaces
- FO: Gigabit Ethernet optical link
- TD/RD: activity of the RS232 interfaces (on option)

General characteristics

- Size (DxWxH): 260 x 160 x 35 mm
- Weight : 1 kg
- Enclosure Protection: IP-40
- Operating temperature : -10 à +60 °C
- Hygrometry : 10 to 90%, non condensing
- MTBF : 180 000 H
- Safety : EN-60950
- EMC : EN-55022, EN-55024, EN-50121-4

RANGE OF PRODUCTS

SpeederLanBisGE-4C : standalone unit with 24-48 Vdc supply, 4 SHDSL Bis pairs, 60 Mbps
 SpeederLanBisGE-4I : standalone unit with 110/230Vac supply, 4 SHDSL Bis pairs, 60 Mbps
 SpeederLanBisGE-4R : rack card for AMS16 chassis, 4 SHDSL Bis pairs, 60 Mbps

SpeederLanBisGE-8C : standalone unit with 24-48Vdc supply, 8 SHDSL Bis pairs, 120 Mbps
 SpeederLanBisGE-8CD : standalone unit with 2x 24-48Vdc supplies, 8 SHDSL Bis pairs, 120 Mbps
 SpeederLanBisGE-8I : standalone unit with 110/230Vac supply, 8 SHDSL Bis pairs, 120 Mbps
 SpeederLanBisGE-8R : rack card for AMS16 chassis, 8 SHDSL Bis pairs, 120 Mbps