

Subsea Qualified DSL Hybrid Gateway

Model 922-DSLH

Focal's Model 922 product line is a modular set of interface and telemetry cards specifically designed and tested for long term deployment in subsea communications systems. With full qualification to API/ISO standards, this flexible platform combines the high reliability and performance of custom, rugged solutions with the ready availability and cost-effectiveness of standard industrial products.



The Model 922-DSLH is a combined (hybrid) DSL modem, optical modem, Ethernet switch, and serial server. As a modem, it offers redundant long range telemetry over copper and up to 200 km of optical fiber. With the integrated Ethernet switch and a configurable serial server, this highly integrated and multi-functional gateway card integrates well into Subsea Electronics Modules (SEM) and other types of subsea nodes, often replacing several cards with one board to save space and minimize sparing costs. An optional interface module enables the DSL to run over existing AC power lines.

Supported communication formats include SIIIS Level 3 Ethernet and serial protocols (RS-232/422/485, IWIS 420). The card also performs format conversion, such as Modbus RTU to Modbus TCP. System integrators can easily adapt legacy serial sensor interfaces to Ethernet based systems with both fiber-optic and high-speed copper telemetry links. Conversely, Ethernet traffic can now be extended over existing low-speed serial telemetry links using PPP (Point to Point Protocol).

Model 922 software provides advanced diagnostics via Modbus TCP for real-time health monitoring of the system as well as easy configuration of all interfaces and modes of operation.

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Features

- Redundant modem via optical fiber (100Base-FX) or copper (DSL) with automatic failover
- User configurable 10/100M Ethernet switch
- User configurable serial server (RS-232/422/485, IWIS 422) with protocol conversions
- Isolated, fault-tolerant power and signal interfaces
- Option for DSL operation over AC power lines
- Qualified per ISO 13628-6 and API 17F to Q1 levels
- Advanced diagnostics and setup via Modbus TCP or Telnet
- Proven hi-rel components rated for -40 °C to +85 °C
- Robust remote update method for subsea firmware with multistage validation and permanent factory fallback code
- UDP heartbeat packet with IP settings and key diagnostics
- 3U Eurocard size for card rack or bolt-down installation

Benefits

- Reduces overall system costs and size
- Saves costs for qualifications and obsolescence management; avoids requalification of industrial solutions
- Replaces many card types with one common card, reducing sparing costs, space requirements, and system complexity
- Provides an easy upgrade path via remote code updates to "future proof" system designs

Applications

- Subsea communications for drilling and production controls
- Subsea Electronics Modules (SEM) and other subsea nodes
- Upgrades to existing subsea systems and sensor hubs
- Highly reliable industrial networking

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Specifications

Long Range DSL Interface	
No. Ports	1 (via M80 connector)
Protocol	SHDSL Bidirectional over a single twisted pair
Baud Rate	64 kb/s to 15 Mb/s
Cable Length	6.5 km max. (21,325 feet)
Protection	ESD ±15 kV air, ±8 kV contact 500 Vrms isolation
Options	Power line interface (AC power)
Serial Interfaces	
No. Ports	2 (via DIN connector)
Protocols	RS-232, RS-422 (IWIS), RS-485 Software configurable
Baud Rate	230.4 kb/s max., NRZ
Protection	Over-voltage up to ±25 V ESD ±15 kV air, ±8 kV contact 500 Vrms isolation
Ethernet Interfaces (SIIS Level 3)	
No. Ports	2 x Copper (via DIN connector) 1 x Optical (via SFP cage)
Protocols	10/100Base-T(X), copper 100Base-FX, optical
Protection	ESD and transient suppressors (TVS) 500 Vrms isolation
Gateway Modes	Serial (RS-232/485/422) to Ethernet (UDP) PPP server and client Modbus RTU-TCP conversion
Ethernet Switch Layer 2 Functions	Includes broadcast storm protection, rate limiting, flow control, 802.1q VLAN, 802.1p port priority, port mirroring, fast aging
IP Configuration	DHCP with configurable static IP fallback
Diagnostics and Control	Modbus TCP, Webserver, CLI, Telnet
Diagnostics and Control Parameters	Includes temperature, humidity, voltage, current draw, optical power (Tx/Rx), on time and power off events, Ethernet port status/configuration, MIB counters, DSL port status/configuration, DSL SNR, card mfr. data (s/n, p/n, F/W revision)
Redundancy	Automatic link failover (fiber, DSL)

Optical ¹	
Wavelengths	1310 nm and 1550 nm standard CWDM wavelengths (e.g. 1471 to 1611 nm)
Optical Power Budget	20 to 45 dB, depending on SFP installed
Range	10 to 200 km, depending on SFP installed
Options	Bidirectional (single fiber) transceivers
¹ See Subsea Qualified SFP Modules datasheet for available optical transceivers.	
Connectors	
Rear Card Edge	1 x 96-pin DIN 41612 (Ethernet, serial, power)
Front Card Edge	1 x 4-pin Harwin M80 (DSL) 1 x SFP (Ethernet, optical), single or dual LC
Power	
Consumption	5 W typical (8 W max.)
Operating Voltage	+20 to +28 VDC, regulated input
Rated Current	0.4 A max.
Protection	ESD, EMI, over-voltage, reverse voltage, overcurrent (no fuses), 500 Vrms isolation
Mechanical	
Dimensions	3U Eurocard, 4 HP, 160 mm x 100 mm
Mounting	3U Eurocard rack or M2.5 hardware
Options	Front panel
Reliability	
Design Life	> 20 years @ +40 °C
MTBF	> 250,000 hrs @ +40 °C
Testing	Factory Acceptance Test (FAT) At Tmin and Tmax design temperatures
Qualification	ISO 13628-6, API 17F (Q1 Levels) Includes 30 g shock, 5 g vibration
Firmware Update	Failsafe remote firmware update
Options	Environmental Stress Screening (ESS) Custom qualifications per OEM specification
Environmental	
Temperature	-18 °C to +70 °C (design and operation) -40 °C to +85 °C (storage)
Humidity	5 % to 85 % RH, non-condensing

All specifications and information are subject to change without notice. Please contact Focal for the latest updates.

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