



Solutions. Technology. Simple.

Semaphore S20 SHDSL Modem



Now convert existing copper wire infrastructure into a high-speed Ethernet network when installing a new SCADA or telemetry system – even if it spans distances previously unattainable by conventional DSL technology.

The Semaphore S20 SHDSL Modem extends communication speed and reach without the additional investment of installing new communications media. An alternative to wireless technology, the S20 SHDSL Modem's unique repeater capability enables communications over existing copper wire networks spanning up to hundreds of kilometers. The modem is ideal for railway, pipeline, utility and power transmission applications that presently employ a copper wire communications network.

Semaphore's S20 SHDSL Modem extends dual Ethernets at high speeds over copper wire pairs to allow for the connection of multiple devices using standard IP protocols. Unlike most products, which inherently limit transmission distance, our S20 SHDSL Modem features a repeater mode which provides excellent reach capabilities.

Configuration of the S20 is extremely simple and uses a web interface to display DSL and Ethernet port status and configure line speeds, network address, and authentication permissions.

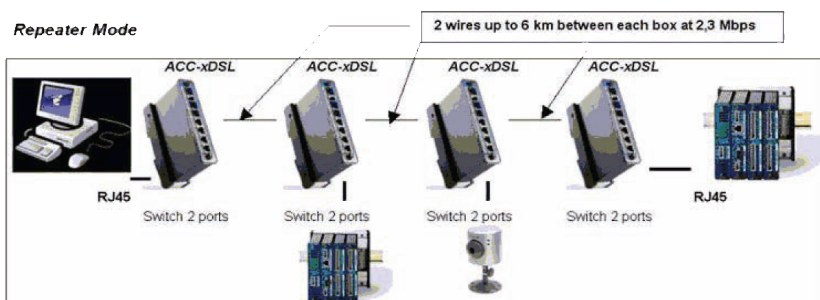
Semaphore's S20 uses G.SHDSL (Symmetric High-bit rate Digital Subscriber Loop) technology for sending and receiving high-speed symmetrical data streams over a single pair of copper wires at rates between 192 kbps to 2.31 mbps. Also known as

G.991.2, G.SHDSL is an international standard for symmetric DSL developed by the ITU.

G.SHDSL was developed to incorporate the features of other DSL technologies, such as ADSL and SDSL, to transport T1, E1, ISDN, ATM and IP signals. This is the first DSL technology to be developed from the ground up as an international standard.

Semaphore's S20 SHDSL Modem features:

- Two Ethernet connections, with an embedded switch, over a single copper wire pair
- Two G.SHDSL modems in one package
- Up to 2.31 Mbps speed with up to 17 kilometers between nodes
- Repeater function which permits repetition over hundreds of kilometers
- Transparent Ethernet/IP connectivity
- Support of any standard IP communications, e.g. Modbus TCP
- Symmetric communication that also allows voice and video
- Simple configuration via web interface
- DIN rail mounting
- Rugged design for industrial applications
- Operating temperature of -40 to +65°C



Semaphore S20 SHDSL Modem Specifications

Product description	Industrial grade S20 modem: converts copper wires into a high-speed IP network
SHDSL ports	2 x lines
Ethernet ports	2 x RJ45 10-100BaseT Ethernet ports
Ethernet cable type	Cross cable or standard (auto crossing support)
IP router	Embedded switch
RS232 Port	Used for setup
Protocol support	All IP protocols
Maximum speed	2.3 Mbps
Maximum SHDSL length	Up to 6 km on a simple phone cable pair Up to 13 km on a 0.9 mm pair cable
Field-tested efficiency	5 km with cable of 0.5 mm @ 2,048 Mbps
Accepted topologies	Point to Point, Multipoint (repeater mode)
Switch	For Stop, Reset and Run
Internal coding T	C-PAM
Power supply input	8 to 30 VDC
Housing	Anodized Aluminum
Mounting	DIN rail mounting
Dimensions	152mm x 85mm x 29mm
Weight	520 grams
I/O protection	Protection of I/O according to IEC-61131 norm
Line protection	Electronic fuses in series: 0.24A Crowbar between lines and between each line and earth (surge protection): 170 V
Operating conditions	-40 to +65°C
Storage conditions	-40 to +70°C
Humidity	0-95% non-condensing
CE approvals	Yes
Product reference	ACC-XDSL

T-BOX LP – Specifications

	Models		
	LP-400	LP-401	LP-450
Analog/Discrete Inputs/Outputs			
Digital inputs, dry contact, 0-12 V dc*	8		
*2 Digital input points are also 1KHz counters. Optional front panel pushbuttons use 2 points.			
Digital outputs, open drain	8		
Analog inputs, 0–5 V dc only	4		
Analog inputs, 0–5 V dc and 0/4–20 mA	4		4
Source low power voltage transmitters via 12 V dc	8		
Source 4–20 mA transmitters via 12 and 24 V dc	Yes		Yes
Integral Communications			
RS-232 local “programming” port w/RTS and CTS	Yes		
RS-485 2-wire port	Yes		
RS-232 network port with full modem control option	Yes		
GSM quad band option	Yes		
CDMA option	Contact Semaphore for availability		
Spread spectrum 900 MHz, 2.4 GHz, 9600 baud option	Contact Semaphore for availability		
Power			
	Battery		External Nominal 12 V dc
Internal battery	Lithium D Cell, Saft LSH20-BA		-
Number of batteries	1 or 2		-
Operating voltage	3.6 V dc		8.0 to 16.1 V dc
Battery life calculation and low alarm	Yes		
Average current draw at nominal input voltage	0.1 to 2.6 mA		0.03 to 0.8 mA
Battery life using 2 batteries*	1 to 10 years		N/A
*Please refer to the T-BOX LP Battery Life Calculator spreadsheet to determine life time based on specific operating conditions.			
Processor/Memory			
Processor	Low power Mitsubishi 16-bit microprocessor		
Real time clock	Yes		
Flash	768K		
RAM	128K + 256K (chronologies + sample tables: 72k; additional tables: 256k)		
Environment			
Operating temperature	-40 to 70° C (GSM option requires industrial-grade SIM)		
Storage temperature	-40 to 80° C		
Humidity	5 to 95% RH		
Safety certifications	CE LVD 2006/95/EC; CEBEC IEC 60950-1:2005 (2nd edition) and IEC 60950-1:2006; CAN/CSA C22.2 No. 60950-1-07; ANSI/UL 60950-1, 2nd Edition		
Telecom certifications	Industry Canada RSS-132 Issue 2, RSS-133 Issue 5; A-Tick AS/ACIF S002:2005; Telepermit PTC 211/09/043-044		
Other certifications	GOST-R		
DIN Rail-mounting package			
	T-BOX LP		Battery compartment
Size, inches	5.91 H x 4.53 D x 1.58 W		4.4 H x 4.33 D x 1.97 W
Size, mm	150 H x 115 D x 40 W		112 H x 110 D x 50 W
Weight	300 g (9.65 oz)		140 g (4.83 oz)
IP68 housing — available in two materials			
	Aluminum		Manganese bronze
Approvals	IP68 and Nema 6		IP68, Nema 4x, Nema 6
Size, inches	8.15 H x 3.0 D x 8.15 W		
Size, mm	Size, mm 207 H x 77 D x 207 W		
Weight with GSM, LCD, one battery	2.35 kg (5.2 lb)		6.3 kg (13.86 lb)
Installation	Wall-mount and pipe-mount accessories optional		
LCD and pushbutton option	Yes		
Hazardous Area Approvals			
Class I, Division 2, Groups C, D		Pending	Pending
ATEX Zone 2		Approved	Approved