Wolverine
Industrial Ethernet Extender
DDW-220

High Speed Ethernet extension over copper

The DDW-220 Ethernet Extender is the ideal solution for extending your Ethernet network over copper cables where in the past the only option would have been fibre. At shorter range the transfer rate will be as fast as 5.7 Mbit/s in both directions. Transmission distances up to 10 km (6.2 mi) are possible, however at a reduced data rate.

The transmission technology used makes the DDW-220 perfect for the re-use of existing copper cable installations from older communications networks. The Ethernet Extender has got two SHDSL interfaces and can therefore be used to create a multidrop network.

The units will auto negotiate the transmission speed but can also be forced to choose a slower (more reliable) or faster (less reliable) data rate. With it's built in four-port Ethernet switch the DDW-220 need be the only unit required to build a complete Ethernet solution.

Configuration and diagnostics

Configuration of the unit is kept to a minimum for ease of use. The units are preconfigured for multidrop application meaning a simple installation can be made with no software configuration at all. For further configuration a built in web interface is provided so that only a computer with a standard web browser is required. Help text for more advanced configuration is available within the web interface.

There are also comprehensive web screen diagnostics for both the SHDSL transmission interfaces and Ethernet switch allowing statistics to be viewed.

The units also support SNMP allowing them to be managed as part of the overall network infrastructure.

Harsh industrial environment

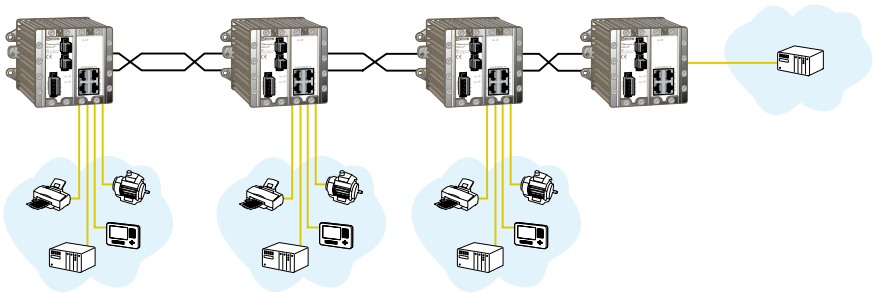
The units are well prepared for use in harsh industrial environments. Total galvanic isolation and transient protection are standard for all interfaces. The line interfaces are also equipped with extensive protection against over-currents and voltage suppression.

The DIN mounted metal case of the unit makes it robust and allows for the surrounding air temperature to be between –40 to 70°C. To allow for uninterrupted communication the units are supplied with redundant power inputs that can be powered from two separate supplies and handle an operating voltage range of 16 – 60 VDC.

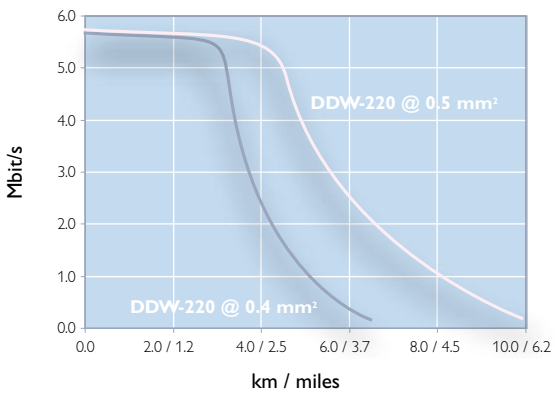
Approvals

The construction of the units has gone through extensive testing and approvals both by Westermo and approved test houses. The DDW-220 has approvals for industrial and railway use as well as in explosive environments.

Application

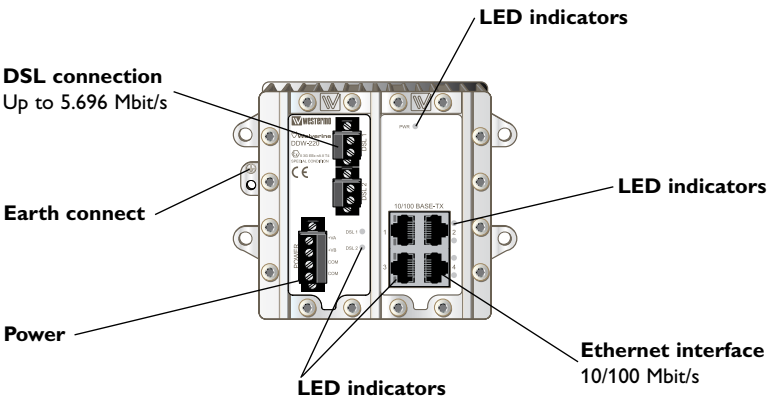


Speed versus distance



Distance is tested without noise.

Interfaces



Technical Data

Power	
Rated voltage	20 to 48 VDC
Operating voltage	16 to 60 VDC
Rated current	300 mA @ 20 VDC 150 mA @ 48 VDC
Rated frequency	DC
Inrush current, I^2t	3.1 A^2s
Startup current*	400 mA
Polarity	Reverse polarity protected
Redundant power input	Yes
Isolation to	Ethernet, SHDSL
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required

* If external power supply is used it must meet specified inrush current.

SHDSL	
Electrical specification	ITU-T G.991.2 Annex B
Data rate	192 kbit/s to 5696 kbit/s
Protocol	EFM according to IEEE 802.3-2004
Transmission range	According to ITU-T G.991.2 depending on the line quality
Protection	Overcurrent / overvoltage protection circuit and varistor
Isolation to	Power, Ethernet
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required
Number of ports	2

Ethernet TX	
Electrical specification	IEEE std 802.3 2000 Edition
Data rate	10 Mbit/s, 100 Mbit/s, manual or auto
Duplex	Full or half
Transmission range	100 m / 328 ft
Isolation to	Power, SHDSL
Connection	RJ-45
Shielded cable	Not required, except when installed in Railway applications as signalling and telecommunications apparatus and located close to rails**
Number of ports	4 ports marked as 1, 2, 3, 4

** To minimise the risk of interference, a shielded cable is recommended when the cable is located inside 3 m boundary to the rails and connected to this port.

Type tests and environmental conditions

Phenomena	Test	Description	Test levels
ESD	EN 61000-4-2	Enclosure contact	± 6 kV
		Enclosure air	± 8 kV
RF field AM modulated	IEC 61000-4-3	Enclosure	20 V/m 80% AM (1 kHz), 80 – 1000 MHz 10 V/m 80% AM (1 kHz), 1400 – 2100 MHz 5 V/m 80% AM (1 kHz), 2100 – 2500 MHz 1 V/m 80% AM (1 kHz), 2500 – 2700 MHz
Fast transient	EN 61000-4-4	Signal ports	± 2 kV
		Power ports	± 2 kV
Surge	EN 61000-4-5	Signal ports balanced	± 2 kV line to earth, ± 1 kV line to line
		Power ports	± 2 kV line to earth, ± 2 kV line to line
RF conducted	EN 61000-4-6	Signal ports	10 V 80% AM (1 kHz), 0.15 – 80 MHz
		Power ports	10 V 80% AM (1 kHz), 0.15 – 80 MHz
Power frequency magnetic field	EN 61000-4-8	Enclosure	300 A/m
Pulse magnetic field	EN 61000-4-9	Enclosure	300 A/m
Mains freq. 50 Hz	EN 61000-4-16	Signal ports	100 V 50 Hz line to earth
Mains freq. 50 Hz	SS 436 15 03	Signal ports	250 V 50 Hz line to line
Voltage dips and interruption	EN 61000-4-29	DC power ports	10 & 100 ms, interruption 10 ms, 30% reduction 10 ms, 60% reduction +20% above & –20% below rated voltage
Radiated emission	EN 55022	Enclosure	Class A
	FCC part 15		Class A
Conducted emission	EN 55022	DC power ports	Class B
Dielectric strength	EN 60950	Signal port to other isolated ports	1500 Vrms 50 Hz 1 min
		Power port to other isolated ports	1500 Vrms 50 Hz 1 min
Temperature		Operating	-40 to +70°C
		Storage & Transport	-40 to +70°C
		Maximum surface temperatur	100 °C (temperatur class T5)
Humidity		Operating	5 to 95% relative humidity
		Storage & Transport	5 to 95% relative humidity
Altitude		Operating	2 000 m / 70 kPa
Reliability prediction (MTBF)	MIL-HDBK- 217F	Operating	700 000 hours @ 25°C
Vibration	IEC 60068-2-6	Operating	7.5 mm, 5 – 8 Hz 2 g, 8 – 500 Hz
Shock	IEC 60068-2-27	Operating	15 g, 11 ms
Enclosure	UL 94	Aluminium/Zink	Flammability class V-0
Dimension W x H x D			134 x 105 x 122 mm
Weight			1.5 kg
Degree of protection	IEC 529	Enclosure	IP40
Cooling			Convection
Mounting			Horizontal on 35 mm DIN-rail

Approvals

Part 15

EN 61000-6-2 Industrial Immunity

EN 61000-6-4 Industrial Emission

50121-4 Railway Trackside