

Wolverine **Ethernet SHDSL Extender** **DDW-120**

High Speed Ethernet extension over copper

The DDW-120 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 ranges the data rate will be as high as 5.7 Mbit/s in both directions. The technology used suggests transmission distances of up to 10 km at lower data rates, depending on the quality of the cables. In practical applications however much greater distances have been achieved.

The SHDSL transmission technology makes the DDW-120 perfect for the re-use of existing copper cable installations from older communications networks. It is transparent for multicast addressing, VLAN packets, allows VPN pass-through for IPsec and can be used with protocols like MODBUS/TCP and Profinet IO. 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. DDW-120 can be used in point-to-point applications or as start or termination unit together with the DDW-220/221/222 in daisy-chain applications.



Configuration and diagnostics

The DDW-120 is a very simple device designed to be transparent to all protocols meaning that the installation and configuration is very simple, no software configuration is required to make the units operational. When long or poor cabling is used some settings can be adjusted via DIP-switches for optimised performance and the unit is also supplied with an advanced diagnostic utility that allows the installer to analyse the quality of the line and the connection status, (requires diagnostic cable).

Harsh industrial environment

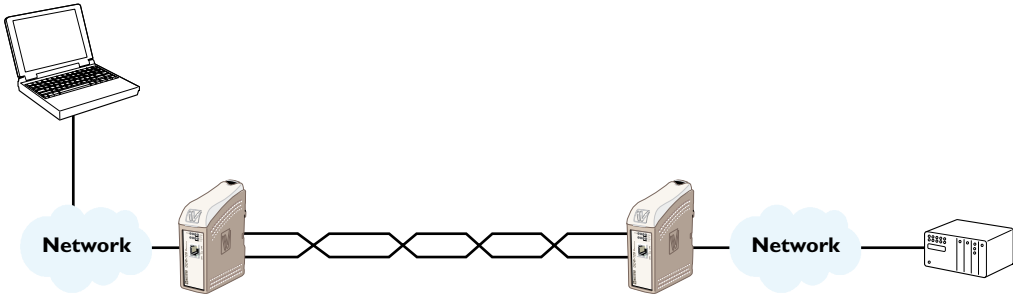
The units are well prepared for use in harsh industrial environments. Total galvanic isolation and transient protection are standard for all interfaces. The line interface are also equipped with extensive protection against over-voltages and transients.

The DIN mounted case makes the unit robust and allows for the surrounding air temperature to be between -40 to 70°C . To allow for uninterrupted communication the units are equipped with redundant power inputs that allow the use of two separate supplies with operating voltage range of $10 - 60$ VDC.

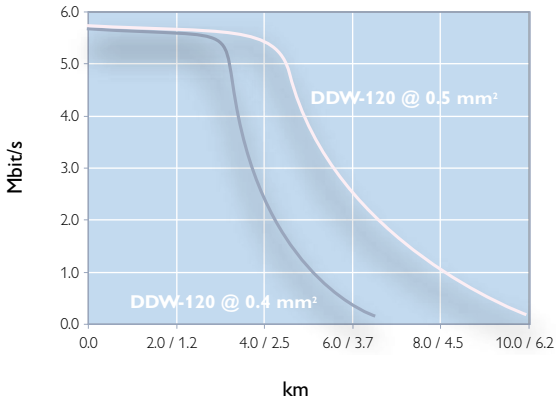
Approvals

The construction of the units has gone through extensive testing and approvals both by Westermo and accredited test houses. The DDW-120 has approvals for industrial as well as railway use.

Application

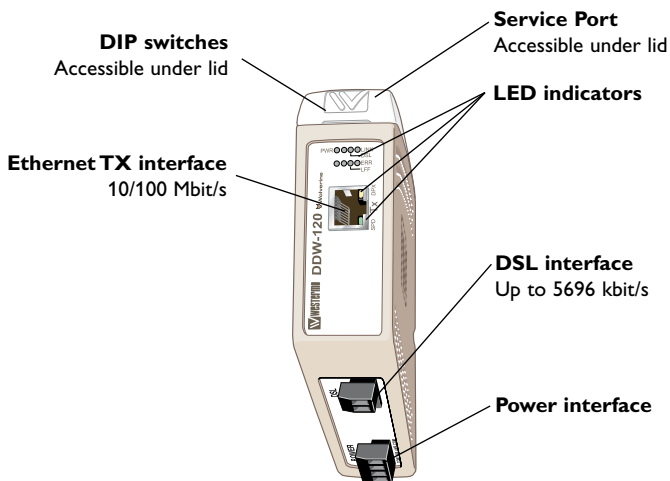


Speed versus distance



Distance is tested without noise.

Interfaces



Technical Data

Power	
Rated voltage	12 to 48 VDC
Operating voltage	10 to 60 VDC
Rated current	240 mA @ 12 VDC 110 mA @ 24 VDC 60 mA @ 48 VDC
Rated frequency	DC
Inrush current, I _t	0.23 A _s
Startup current*	0.65 A _{peak}
Polarity	Reverse polarity protected
Redundant power input	Yes
Isolation to	All other
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 start up current

Service port	
Electrical specification	TTL-level
Data rate	115.2 kbit/s
Data format	8 data bits, none parity, 1 stop bits, no flow control
Circuit type	SELV
Transmission range	15 m
Isolation to	All other
Galvanic connection to	None
Connection	2.5 mm jack, use Westermo cable 1211-2027

DSL

Electrical specification	IEEE 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	All other
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm ² (AWG 24 - 12)
Shielded cable	Not required

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, manual or auto
Circuit type	SELV
Transmission range	100 m
Isolation to	All other
Connection	RJ-45 MDI or auto MDI/MDI-X
Shielded cable	Not required, except when installed in Railway applications as signalling and telecommunications apparatus and located close to rails*
Conductive housing	Isolated to all other circuits
Miscellaneous	If Auto-Neg. is disabled then this interface will be set MDI, see below.
Number of ports	1

* 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.

The cable shield should be properly connected (360°) to an earthing point within 1 m from this port. This earthing point should have a low impedance connection to the conductive enclosure of the apparatus cabinet, or similar, where the unit is built-in. This conductive enclosure should be connected to the earthing system of an installation and may be directly connected to the protective earth.

Type tests and environmental conditions

Electromagnetic Compatibility			
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	10 V/m 80% AM (1 kHz), 80 – 1 000 MHz 20 V/m 80% AM (1 kHz), 80 – 2 000 MHz
RF field 900 MHz	ENV 50204	Enclosure	20 V/m pulse modulated 200 Hz, 900 ± 5 MHz
Fast transient	EN 61000-4-4	Signal ports	± 2 kV
		Power ports	± 2 kV
Surge	EN 61000-4-5	Signal ports unbalanced	± 2 kV line to earth, ± 2 kV line to line
		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	100 A/m, 50 Hz, 16.7 Hz & 0 Hz
Pulse magnetic field	EN 61000-4-9	Enclosure	300 A/m, 6.4 / 16 µs pulse
Voltage dips and interruption	EN 61000-4-11	AC power ports	10 & 5 000 ms, interruption 10 & 500 ms, 30% reduction 100 & 1 000 ms, 60% reduction
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 earth
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 B
	FCC part 15		Class B
Conducted emission	EN 55022	AC power ports	Class B
	FCC part 15	AC power ports	Class B
	EN 55022	DC power ports	Class B
Dielectric strength	EN 60950	Signal port to other isolated ports	2 kVrms 50 Hz 1 min
		Power port to other isolated ports	3 kVrms 50 Hz 1 min 2 kVrms 50 Hz 1 min (@ rated power <60 V)
Environmental			
Temperature		Operating	-40 to +70°C
		Storage & Transport	-40 to +70°C
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	600 000h
Service life		Operating	10 year
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
Packaging			
Enclosure	UL 94	PC / ABS	Flammability class V-1
Dimension W x H x D			35 x 121 x 119 mm
Weight			0.2 kg
Degree of protection	IEC 529	Enclosure	IP 21
Cooling			Convection
Mounting			Horizontal on 35 mm DIN-rail

Approvals

