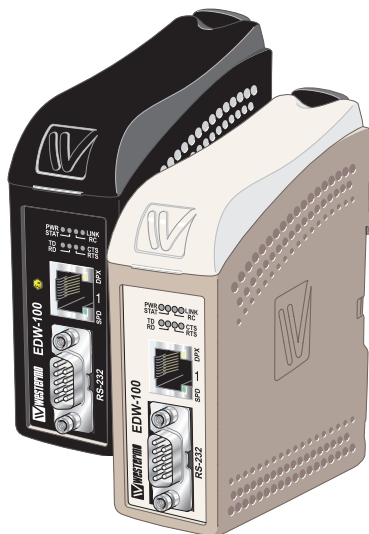


EDW-100



Serial Adapter



Software tools

Related software tools are available in the folder software tools under technical support on the Westermo website.

Legal information

The contents of this document are provided "as is". Except as required by applicable law, no warranties of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, are made in relation to the accuracy and reliability or contents of this document. Westermo reserves the right to revise this document or withdraw it at any time without prior notice.

Under no circumstances shall Westermo be responsible for any loss of data or income or any special, incidental, and consequential or indirect damages howsoever caused.

More information about Westermo can be found at the following Internet address:

<http://www.westermo.com>

Safety



Before using this unit:

Read this manual completely and gather all information on the unit. Make sure that you understand it fully. Check that your application does not exceed the safe operating specifications for this unit.

Hazardous voltage may occur within this unit when connected to power supply or TNV circuits.

Prevent access to hazardous voltage by disconnecting the unit from power supply and all other electrical connections.

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap).



Before installation:

This unit should only be installed by qualified personnel.

This unit should be built-in to an apparatus cabinet, or similar, where access is restricted to service personnel only.

The power supply wiring must be sufficiently fused, and if necessary it must be possible to disconnect manually from the power supply. Ensure compliance to national installation regulations.

Branch circuit protection (fuse) is required for this unit with rating not exceeding 20 A.

This unit uses convection cooling. To avoid obstructing the airflow around the unit, follow the spacing recommendations (see Installation section).

Care recommendations

Follow the care recommendations below to maintain full operation of unit and to fulfil the warranty obligations.

This unit must not be operating with removed covers or lids.

Do not attempt to disassemble the unit. There are no user serviceable parts inside.

Do not drop, knock or shake the unit, rough handling above the specification may cause damage to internal circuit boards.

Do not use harsh chemicals, cleaning solvents or strong detergents to clean the unit.

Do not paint the unit. Paint can clog the unit and prevent proper operation.

Do not expose the unit to any kind of liquids (rain, beverages, etc). The unit is not waterproof. Keep the unit within the specified humidity levels.

Do not use or store the unit in dusty, dirty areas, connectors as well as other mechanical part may be damaged.

If the unit is not working properly, contact the place of purchase, nearest Westermo distributor office or Westermo Tech support.

Maintenance

No maintenance is required, as long as the unit is used as intended within the specified conditions.




ATEX and IECEx Information (Applicable for EDW-100 Ex only)

General

This unit is intended for use in Zone 2 hazardous location only.

Marking

Baseefa 14ATEX0294X


 II 3 G

Ex nA IIC T4 Gc

IECEx BAS 14.0137X

SPECIAL CONDITION

WARNING – DO NOT SEPARATE WHEN ENERGIZED

	Indicate that this unit complies with relevant European standards that are harmonised with the 2014/34/EU Directive (ATEX).
II	Equipment group II. This unit can be installed in all places with an explosive gas atmosphere other than mines susceptible to firedamp
3	Equipment category 3. A category is the classification according to the required level of protection. This unit ensures the requisite level of protection during normal operation and is intended for use in areas in which explosive atmosphere caused by gases, vapours, mists, or dust mixtures are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short periode only.
G	Indicates protection concerning explosive atmospheres caused by gases, vapours or mists (G).
Ex	Indicates that this unit is in conformity with relevant European Ex standard(s).
nA	Type of protection used. This unit is a non-sparking device "nA" which is constructed to minimize the risk of occurrence of arcs or sparks capable of creating an ignition hazard during conditions of normal operation.
IIC	Gas group, a typical gas i hydrogen.
T4	Temperature class T4 (T4 = 135°C). This unit is classified in accordance with its maximum surface temperature (external and internal).
Gc	Equipment protection level Gc (EPL Gc). Equipment for explosive gas atmospheres, having a "enhanced" level of protection, which is not a source of ignition in normal operation and which may have some additional protection to ensure that it remains inactive as an ignition source in the case of regular expected occurrences. EPL Gc are analogous to the ATEX Categories (Category 3 G = EPL Gc).
SPECIAL CONDITION	This unit has a special condition of use. The special conditon for safe use contains safety related information that is necessary for the correct installation and safe use.

Ratings

Power	12 – 48 VDC; 250 mA
Ambient temperature	-25°C ≤ Ta ≤ +70°C
Ingress protection (IP)	IP21
Maximum surface temperatur	135°C (temperature class T4)

Safety Control Drawing

Degree of protection	IP 21
Ambient temperature	-25°C to +70°C
Installation spacing	Minimum 25 mm above / below Minimum 10 mm left / right



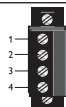
Position	Descripton	Input / Output values
1	In/Out / TD+	$U = \pm 1\text{ V}$ (4 μ V/s) $I = \pm 20\text{ mA}$ Data rate: 10/100 Mbit/s
2	In/Out / TD-	
3	In/Out / RD+	
4	Not connected	
5	Not connected	
6	In/Out / RD-	
7	Not connected	
8	Not connected	

Galvanically isolated via signal transformer and capacitively isolated to signal ground through a 3 kV 470 pF capacitor. See user manual for proven transient protection.

Position	Descripton	Input /Output values
1	Not connected (DCD)	$U_{\text{max}} = \pm 12\text{ Vpk}$ $I_{\text{max}} = \pm 60\text{ mA}$ Data rate: 0.3 – 115.2 kbit/s
2	In / Received Data (RD)	
3	Out / Transmitted Data (TD)	
4	Out / Data Terminal Ready (DTR)	
5	- / Signal Ground (SG)	
6	In / Data Set Ready (DSR)	
7	Out / Request To Send (RTS)	
8	In / Clear To Send (CTS)	
9	Not connected	

Position	Descripton	Input / Output values
1	In / R+ line RS-422	$U_{\text{max}} = \pm 5\text{ Vpk}$ $I_{\text{max}} = \pm 250\text{ mA}$ Data rate: 0.3 – 115.2 kbit/s
2	In / R- line RS-422	
3	In/out / T+ line RS-422/485	
4	In/out / T- line RS-422/485	

Position	Descripton	Input values
1	In / Common	$U_{\text{min/max}} = 10 - 60\text{ VDC}$ $I_{\text{max}} = 300\text{ mA}$ $P_{\text{max}} = 3\text{ W}$
2	In / +Voltage A	
3	In / +Voltage B	
4	In / Common	



See section *Type tests and environmental conditions* in this user manual for proven transient protection.

SPECIAL CONDITION FOR SAFE USE

Ambient temperature:

This unit is designed for use in extreme ambient temperature conditions as follows:
 $-25^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$

Installation in an apparatus cabinet:

The equipment must be installed in an area of not more than pollution degree 2 in accordance with IEC 60664-1, and in an enclosure that provides a minimum degree of protection of at least IP54 and complies with the relevant requirements of EN 60079-0 and EN 60079-15.

Secureness of energisation:

External connections to the equipment must not be inserted or removed unless either the area in which the equipment is installed is known to be non-hazardous, or the circuits connected have been de-energised.

Resistance to impact:

This unit requires installation in an apparatus cabinet where adequate resistance to impact is provided by the apparatus cabinet. See "Installation in an apparatus cabinet" above for requirements on the external apparatus cabinet.

Resistance to light:

This unit requires installation in an apparatus cabinet where it is protected from light (for example daylight or light from luminaires). See "Installation in an apparatus cabinet" above for requirements on the external apparatus cabinet.

Secureness of plugs:

When this unit is installed in explosive atmospheres, all connectors must be mechanically secured to prevent loosening by the use of cable ties or similar.

Conductor temperature:

When this unit is installed in locations with high ambient temperature, special precautions shall be taken upon the choice of external conductors and the temperature rating of the conductor(s).

Directive 2014/34/EU alongside with other directives:

Directive 2014/35/EU (EMC) applies and to assure a safe performance of this unit under the scope of Directive 2014/34/EU, refer to the electromagnetic immunity level specified under "Type tests and environmental conditions" in this manual.

Standards and date of compliance

ATEX: EN 60079-0: 2012
EN 60079-15: 2012
IECEX: IEC 60079-0: 2011 EDITION 6
IEC 60079-15: 2010 EDITION 4

Agency approvals and standards compliance

Type	Approval / Compliance
EMC	EN 50121-4, Railway signalling and telecommunications apparatus
	EN 55022, Emission IT equipment
	EN 55024, Immunity IT equipment
	EN 61000-6-1, Immunity for residential, commercial and light-industrial environments
	EN 61000-6-2, Immunity industrial environments
	EN 61000-6-4, Emission industrial environments
	IEC 62236-4, Railway signalling and telecommunications apparatus
Safety	UL/CSA/IEC/EN 60950-1, IT equipment*
	EN 60950-1, IT equipment**
ATEX**	EN 60079-0 and EN 60079-15
IECEX**	IEC 60079-0 and IEC 60079-15

* Applicable for EDW-100 only

** Applicable for EDW-100 Ex only

FCC Part 15.105

Notice:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EN 55022 Notice: Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Declaration of Conformity, EDW-100 / EDW-100 EX



Westermo Teleindustri AB

Declaration of conformity

The manufacturer Westermo Teleindustri AB
SE-640 40 Stora Sundby, Sweden

Herewith declares that the product(s)

Type of product	Model	Art no
Ethernet to serial adapter	EDW-100	3616-0020
	EDW-100 EX	3616-5020
	EDW-120	3616-0010
	EDW-120 EX	3616-5010

is in conformity with the following EU directive(s).

No	Short name
2014/35/EU	Electromagnetic Compatibility (EMC)
2014/30/EU	Low Voltage Directive (LVD)
2014/34/EU ¹	Equipment Explosive Atmospheres (ATEX)
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

References of standards applied for this EU declaration of conformity.

No	Title	Issue
EN 61000-6-1	Electromagnetic compatibility – Immunity for residential environments	2007
EN 61000-6-2	Electromagnetic compatibility – Immunity for industrial environments	2005
EN 61000-6-4	Electromagnetic compatibility – Emission for industrial environments	2007 +A1:2011
EN 55022	Information technology equipment - Emission	2010
EN 55024	Information technology equipment - Immunity	2010
EN 50121-4	Railway applications - Electromagnetic compatibility Emission and immunity of the signalling and telecommunications apparatus	2006
EN 60950-1	Information technology equipment - Safety - Part 1: General requirements	2006 +A11: 2009
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	2012
EN 60079-0 ¹	Explosive atmospheres Equipment – General requirements	2012
EN 60079-15 ¹	Electrical apparatus for explosive gas atmospheres – Construction, test and marking of type of protection “n” electrical apparatus	2012

The last two digits of the year in which the CE marking was affixed:

16

Signature

Pierre Öberg
Technical Manager
10th Mars 2016

¹ Only applicable for EDW-100 EX and EDW-120 EX.

Postaddress/Postal address	Tel.	Telefax	Postgiro	Bankgiro	Org.nr/ Corp. identity number	Registered office
S-640 40 Stora Sundby Sweden	016-428000 Int+46 16428000	016-428001 Int+46 16428001	52 72 79-4	5671-5550	556361-2604	Eskilstuna

Type tests and environmental conditions

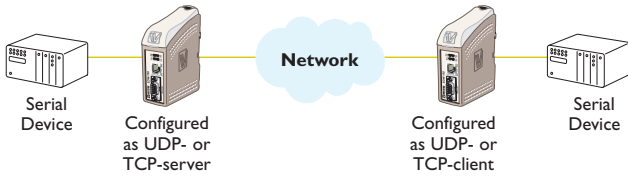
Electromagnetic Compatibility			
Phenomena	Test	Description	Test levels
ESD	EN 61000-4-2	Enclosure contact	± 6 kV
		Enclosure air	± 8 kV
RF field AM modulated	IEC 61000-4-3	Enclosure	20V/m 80% AM (1 kHz), 80 – 2 000 MHz 12V/m 80% AM (1 kHz), 2 000 – 2 700 MHz
RF field 900 MHz	ENV 50204	Enclosure	20V/m 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	10V 80% AM (1 kHz), 0.15 – 80 MHz
		Power ports	10V 80% AM (1 kHz), 0.15 – 80 MHz
Pulse magnetic field	EN 61000-4-9	Enclosure	1000 A/m, 6.4 / 16 ms pulse
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	CISPR 16-2-3	Enclosure	EN 61000-6-4
	ANSI C63.4		FCC part 15
Conducted emission	CISPR 16-2-1	DC power ports	EN 61000-6-4
Dielectric strength	EN 60950	Signal port to other isolated ports	1.5 kVrms 50 Hz 1 min
		Power port to other isolated ports	2 kVrms 50 Hz 1 min
Environmental			
Temperature	EN 60068-2-1 EN 60068-2-2	Operating	–25 to +70°C
		Storage & Transport	–40 to +70°C
		Maximum surface temperature	135°C (temperature class T4)
Humidity	EN 60068-2-30	Operating	5 to 95% relative humidity
		Storage & Transport	5 to 95% relative humidity
Altitude		Operating	2 000 m / 70 kPa
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			
EDW-100	UL 94	PC / ABS	Flammability class V-1
EDW-100 Ex	–	Cabelec CA6141	–
Dimension W x H x D			35 x 121 x 121 mm
Weight			0.2 kg
Degree of protection	IEC 529	Enclosure	IP21
Cooling			Convection
Mounting			On 35 mm DIN-rail

Introduction

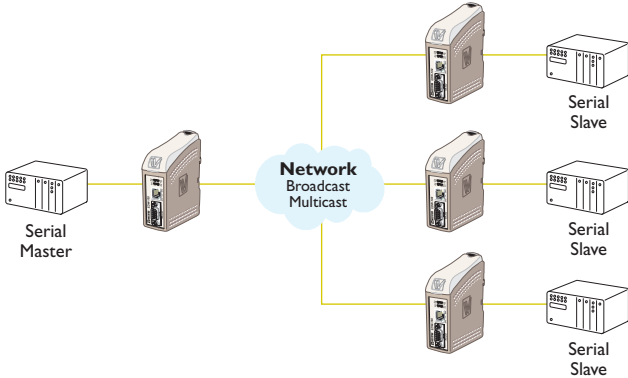
The EDW-100 is an Industrial Ethernet to serial adapter or Ethernet Terminal Server. The serial interface is selectable between RS-232 and RS-422/485. The Ethernet interface is 10/100BASE-T and supports the following networking protocols: TCP, UDP, ICMP, IGMP, HTTP, ARP.

Two EDW-100 can be used to provide a serial point to point link over an Ethernet network using either UDP or TCP. When using TCP the EDW-100 can be configured as client or server.

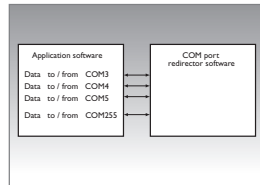
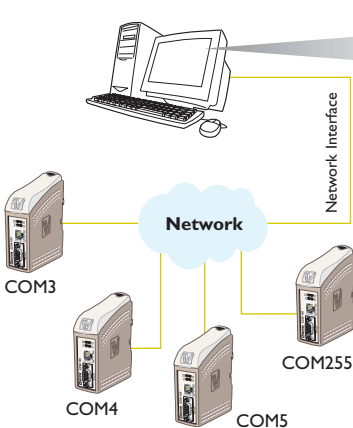
In addition to a transparent serial point-to-point link and ethernet to serial adapter, the EDW-100 MG can also be configured to act as a Modbus gateway.



Each unit passes data from its serial interface to the serial interface of the other unit. This enables long distance serial communication using pre-existing networks.



When EDW-100 is used with the UDP protocol it is also possible to communicate one to many (e.g. master to multiple slaves), by using a broadcast address or multicast addressing

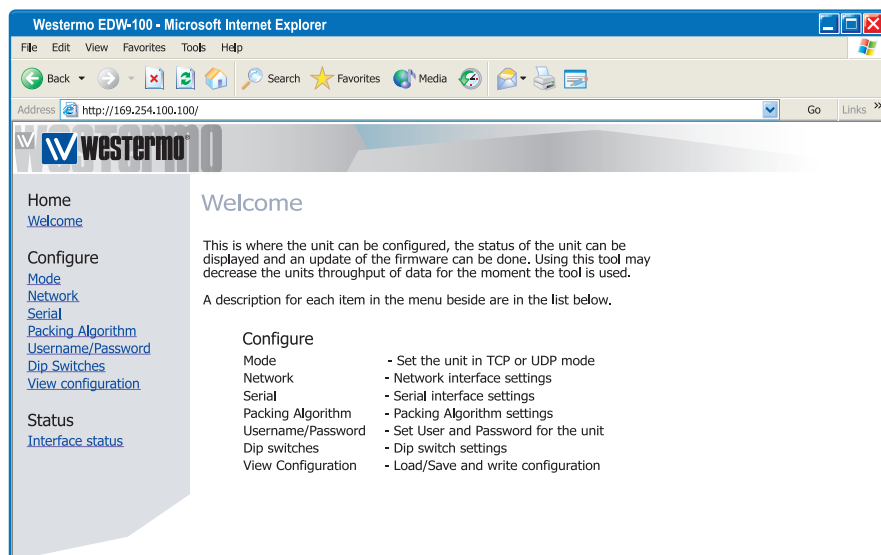


EDW-100 can also provide a remote serial interface for a computer connected through a TCP/IP network using a comport redirection software.

A COM port redirector or customer written software can be used to create virtual COM ports. This software will redirect data, originally sent to a local COM port, to the remote serial interface of the EDW-100. No changes are required on the computer application software.

For more information on applications and technical data visit www.westermo.com. The Web tool also includes an integrated help where all functions and modes are described in details.

More help can be found inside the web tool and the "?" button on each configuration page.



Product description

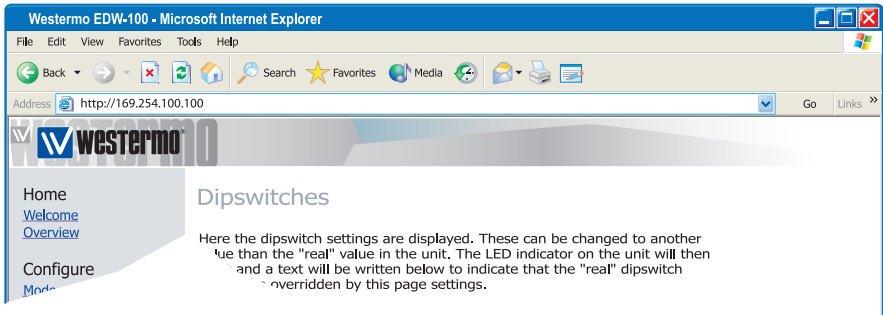
The EDW-100 is an industrial Ethernet to serial interface adapter designed for harsh environments.

It allows serial devices to interface through a new or existing Ethernet network. The unit can support either RS-232, RS-485 or RS-422 based protocols running at up to 115.2 kbit/s. Ethernet connection is via a standard RJ-45 port with MDI/MDI-X.

The protocols used for network communication is UDP or TCP. This allows the EDW-100 to be setup as a TCP-server or -client as well as an UDP unit.

Configuration of the unit

The EDW-100 can be easily configured via the onboard Web based configuration tool, alternatively some functions can also be set by hardware DIP-switches on the PCB.

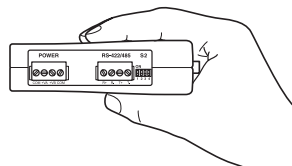


The network interface properties such as speed, duplex and auto-negotiation can be configured by the Web based configuration tool and some settings can be made by hardware DIP-switches.

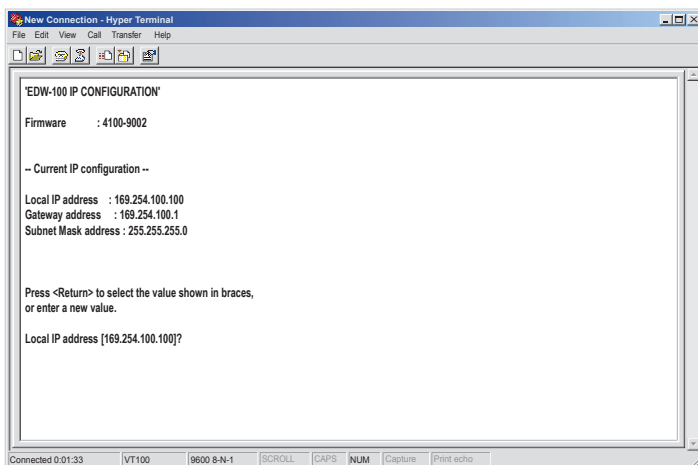
It is also possible to monitor and override the hardware settings by using the Web tool, if that is done this is indicated by the RC LED (Remotely Controlled).

The serial port properties such as data rate, flow control and data bits etc. are configured by the Web based configuration tool.

Termination and fail-safe of the RS-422/485 serial interface can only be made by DIP-switches only.



The local IP address of the unit can be configured by using a terminal program.



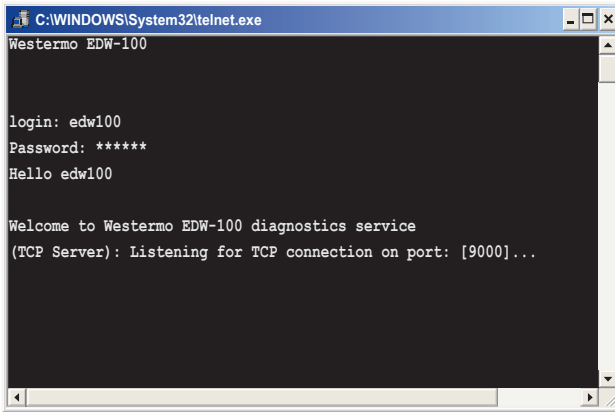
Unique features

- ⌘ Packing algorithm that enables the user to decide how and when the serial data should be encapsulated in a TCP or UDP data frame and sent out on the network.
- ⌘ Galvanic isolation, this feature eliminates communication errors. One of the most common errors is caused by potential differences between interconnected equipment.
- ⌘ Redundant power supply with wide input range.

These features along with the high EMC immunity enable the device to be used in projects where a high degree of reliability is required.

Diagnostic information

The first level of diagnostic information is the status indicated by the LEDs.



```
C:\WINDOWS\System32\telnet.exe
Westermo EDW-100

login: edw100
Password: *****
Hello edw100

Welcome to Westermo EDW-100 diagnostics service
(TCP Server): Listening for TCP connection on port: [9000]...
```

The Telnet diagnostic service provide the user with information such as UDP- or TCP mode, connected or listening state (TCP) etc.

Getting started

IP Address

The default IP address of the EDW-100 when delivered is 169.254.100.100.

Default port 9000

Default gateway 169.254.100.1

IP address configuration

The IP address is configurable by the Web tool and/or by using a terminal program.

Below is an description of how to configure the IP address by using a terminal program.

1. If the address is known, connect the unit from a Web browser with the address to EDW-100. If the address is unknown, connect the serial RS-232 interface to a terminal program with settings:

Data rate: 9600 bit/s

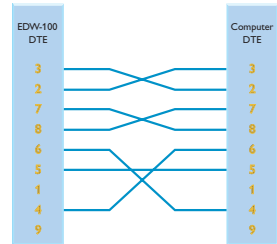
Data bits: 8

Stop bits: 1

Parity: None

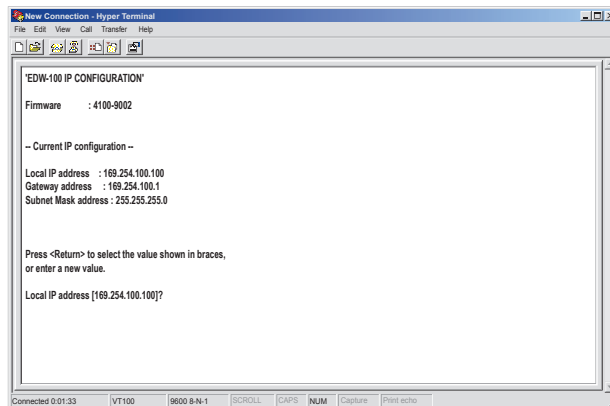
Flow control: None

Note! When connecting EDW-100 to a Comport in a computer you have to use a “Cross-over” cable, because both EDW-100 and the computer interface is DTE. 1.8 m standard cable is supported by Westermo art.no. 1211-2172.



2. Setting DIP S1:1 to ‘On’ and power-up the EDW-100 will enable the local IP address to be configured via serial interface.

Once connected with the terminal program you can change the IP address, Gateway address and Subnet Mask according to the picture below:



See also configuration by Web Tool

3. Set DIP S1:1 to ‘Off’ and power cycle the EDW-100.
4. The unit is now ready for a complete configuration by the Web tool. Address EDW-100 in a browser with the configured IP address. Note that the used computer have to be on the same

Username and Password for configuration

The EDW-100 is username and password protected. These are used when connecting with Web browser during configuration and with Telnet for diagnostics.

Default username: edw100

Default password: edw100

Browser Login

The Webtool has two different login accounts.

The first is the EDW-100 Guest account that only allows the user to read the units settings but he has no rights to configure the unit in any way. This accounts Username and Password are fixed and aren't configurable.

EDW-100 Guest

Username: guest

Password: guest

or

Username: anonymous

Password: anonymous

EDW-100 Config

The second account is the EDW-100 Config that gives the user rights to configure the unit with new parameter values. This accounts Username and Password can also be configured when the user are logged in as EDW-100 Config. Default Username and Password are listed below.

Default Username: edw100

Default Password: edw100

Restore Factory default settings



Note! This will clear your customized settings.

The factory default settings can be restored using DIP-switch S1:2.

1. Force this to 'On' and Power-up the EDW-100 for at least 5 seconds.
2. Force the DIP-switch to 'Off' and power cycle the EDW-100.

The EDW-100 now contains the factory default settings.

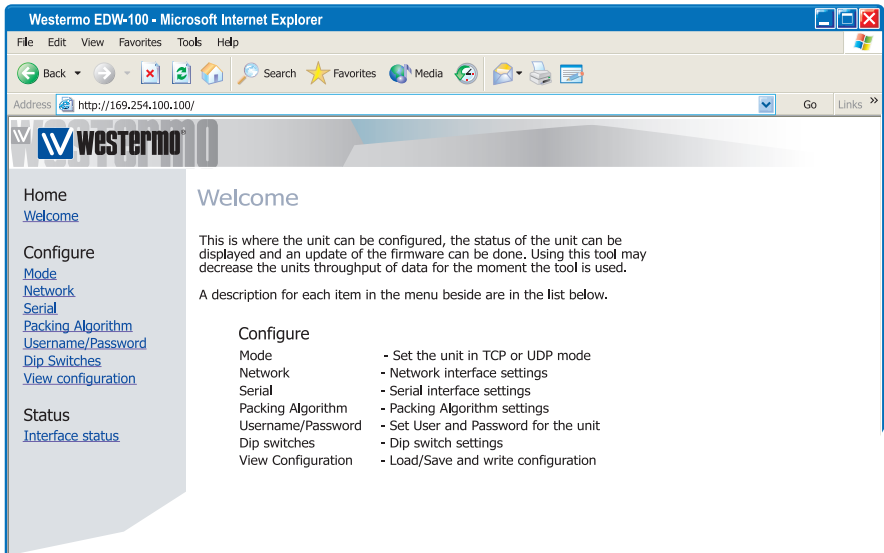
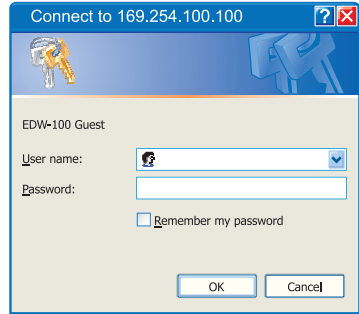
Note ! If the default address of the unit is valid on the connected network it is possible to access the unit directly from a browser.

Configuration by Web Tool

The EDW-100 includes an easy-to-use Web configuration tool. The Web tool is very intuitive and includes useful help information for the configurable parameters.

Connect and login to the EDW-100 with the EDW-100 Config account on the default IP address and with default username- and password combination (or your customized if configured) using a standard Web browser.

Use the Configuration Wizard to set all parameters then press the button "Program Unit" to write the parameters into the unit or save the parameters to a file.



Serial/IP® and Telnet Options

EDW-100 are bundled with Serial/IP® virtual Com port director software. The Serial/IP® use portions of the "Telnet Environment Option" (RFC1572) to verify that it is connected to an EDW-100.

The EDW-100 has partial support for the "Telnet Com Port Control Option" (RFC2217). This makes it possible to remotely (on the fly) change serial port parameters. Currently supported parameters are baud rate, parity, number of data bits and number of stop bits.

As default the Telnet Options are disabled. If the Serial/IP® software is to be used, the Telnet options must be enabled in the web tool. This parameter can be found on the Serial/IP page.

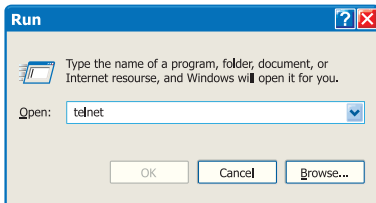
Diagnostics via Telnet

The EDW-100 provides the user with diagnostics information via a Telnet connection on port 23.

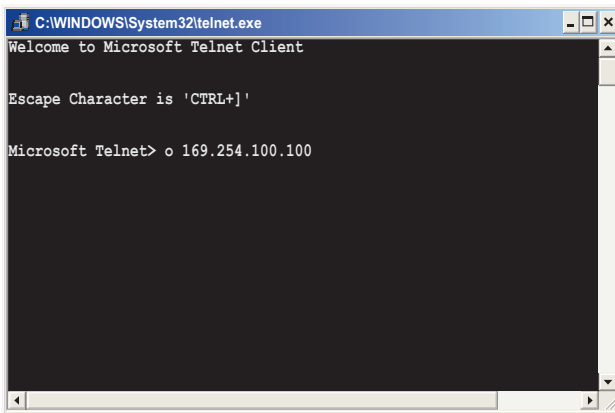
Information presented to the user is:

- ⌘ Operational mode (UDP,TCP-server or client)
- ⌘ Operational status (Listening for connection (TCP server), connected to host (TCP server or client),Attempting to connect (TCP client))
- ⌘ The 'Status' LED on the EDW-100 will lit during Telnet session.

Below is an description of how to start a Windows Telnet session and get diagnostics information from the EDW-100.



1. Start a Telnet session.



2. Connect to EDW-100 by typing 'o 169.254.100.100' or the configured IP address of the EDW-100.
3. Login using default username and password (or your customized settings if configured).

Application modes

The EDW-100 can be setup for use in one of four different application modes:

- ⌘ TCP Server
- ⌘ TCP Client
- ⌘ UDP
- ⌘ Modbus gateway

Short description of TCP and UDP

User Datagram Protocol (UDP)

UDP provides a connectionless datagram service. This means that the arrival of datagram's or data packets is not controlled and the reliability of the communication is the responsibility of the application layer protocol. In this way UDP is a simpler method of communication than TCP. As data is sent and received without any established connection the data transfer is more efficient and often faster. UDP is therefore used in applications that require efficient use of the bandwidth and also have a higher level protocol to handle lost data.

Transmission Control Protocol (TCP)

TCP is a connection-oriented delivery service. Connection oriented means that a connection must be established before hosts can exchange data. An acknowledgement is used to verify that the data was received by the other host. For data segments sent, the receiving host must return an acknowledgement (ACK). If an ACK is not received, the data is retransmitted. Flow-control between the hosts is managed by TCP. For larger amounts of data that have to be split between packets TCP provides a method for reliably reassembling the data in the correct order. Because of the requirement to establish a connection and acknowledge transmissions, TCP takes longer time to transmit data than UDP and uses more bandwidth.

When delivered the EDW-100 is in **TCP server** mode.

TCP Server mode

This mode makes it possible to accept incoming TCP connections attempts to the EDW-100 from an TCP client e.g. a EDW-100 in TCP client mode. Other examples of TCP clients: Telnet client establishing a raw TCP connection, COM-port redirector software running on a Windows PC.

TCP Client mode

This mode makes it possible to establish a TCP connection to a remote TCP server e.g. a EDW-100 in TCP Server mode.

DSR signal rising or a powering up the unit will trigger the EDW-100 to make an connection attempt to the specified server depending on configuration.

UDP mode

UDP is a connection less protocol sending datagram's i.e. there are less overhead traffic compared to TCP and no acknowledgement packets will be sent between the peer's during communication.

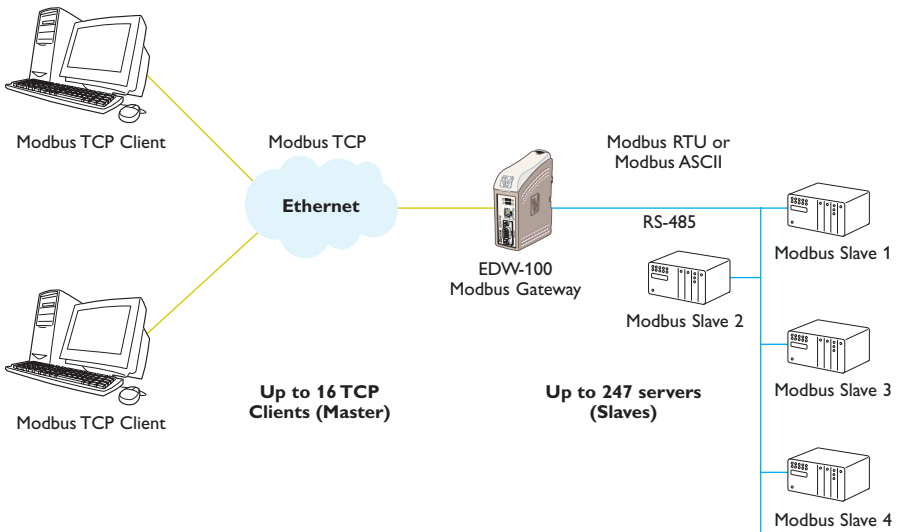
Using UDP will enable the EDW-100 to send and listen to broadcast- and multicast messages.

Short description of Modbus

Modbus is a communication protocol developed by Modicon systems. The EDW-100 Modbus gateway is used for interconnecting a TCP/IP Modbus network and a serial line Modbus network (either RTU or ASCII). It permits Modbus clients (masters) on either of the TCP/IP or the serial network to connect to Servers (slaves) on the other network. In a standard Modbus network, there is one master and up to 247 Slaves, each with a unique slave address from 1 to 247. The master can also write information to the slaves. The official Modbus specification can be found at www.modbus.org.

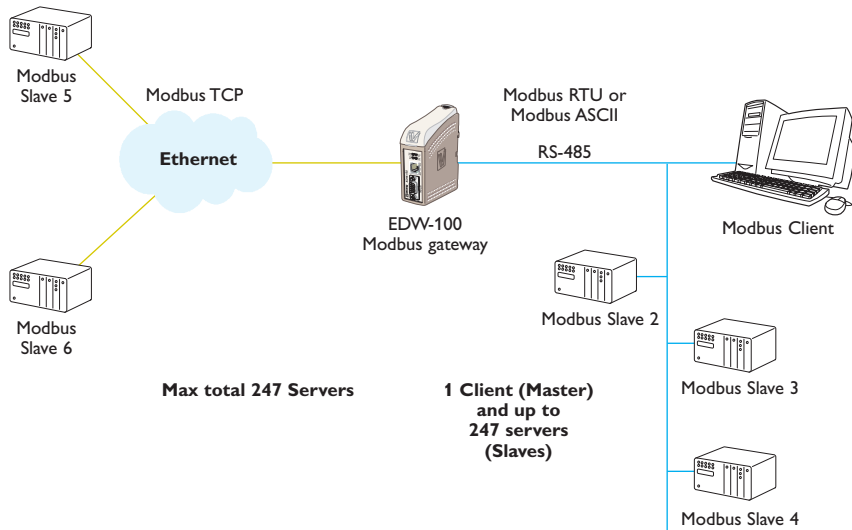
Gateway Server mode

Allows up to 16 Modbus clients (masters) on a TCP/IP network to connect to servers (slaves) on the serial network.



Gateway Client mode

Allows one Modbus client (master) on a serial network to connect to one or more servers (slaves) on the TCP/IP network.



Setting up the EDW-100 as a Modbus Gateway

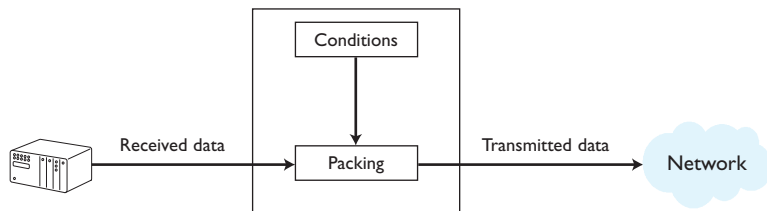
Set the EDW-100 application mode to Modbus gateway to enable the gateway functionality. Serial settings and ip-configuration is shared with the other application mode but the rest of the Modbus configuration is done on the specific Modbus configuration page.

To set up the gateway it is necessary to know details about the TCP and the serial Modbus network. Please refer to the web tool help page for more configuration details.

Packing algorithm

When data arrives at the serial port of the EDW-100 there must be one or more criteria fulfilled to trigger the EDW-100 to encapsulate the received serial data into a frame and send it out on the network.

These criteria are setup using different parameters i.e. the 'packing algorithm'. The default settings are selected to be compatible to most applications but can be optimized to the customer specific application. Detailed description can be received from the Web configuration tool.



Advanced settings

Advanced settings configure the unit for special application requirements or special interface functions, these settings are default disabled.

Detailed description can be received from the Web configuration tool.

Interface specifications

Power LV	
Rated voltage	12 to 48 VDC
Operating voltage	10 to 60 VDC
Rated current	250 mA @ 12 VDC
	125 mA @ 24 VDC
	63 mA @ 48 VDC
Rated frequency	DC
Maximum inrush current @ 10 ms	0.3 A ² s @ 48 VDC
Polarity	Reverse polarity protected
Redundant power input	Yes
Isolation to	All other 2 kV _{rms}
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm ² (AWG 24 – 12)

RS-422/485	
Electrical specification	EIA RS-485 2-wire or 4-wire twisted pair
Data rate	300 bit/s – 115.2 kbit/s
Data format	7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits
Protocol	Transparent, optimised by packing algorithm
Retiming	Not applicable
Turn around time	< 3 bits
Circuit type	TNV-1
Transmission range	≤ 1200 m, depending on data rate and cable type (EIA RS-485)
Settings	120 Ω termination and fail-safe biasing 680 Ω
Protection	Installation Fault Tolerant (up to ±60 V)
Isolation to	Power 2 kV Ethernet 1; 1.5 kV _{rms}
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm ² (AWG 24 – 12)
Shielded cable	Not required, except when installed in Railway applications as signalling and telecommunications apparatus and located close to rails*
Conductive housing	No

* 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.

RS-232	
Electrical specification	EIA RS-232
Data rate	300 bit/s – 115.2 kbit/s
Data format	7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits.
Protocol	Transparent, optimised by packing algorithm
Retiming	Not applicable
Circuit type	SELV
Transmission range	15 m
Isolation to	Power 2 kV Ethernet 1; 1.5 kV _{rms}
Connection	9-pin D-sub male (DTE)
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
Number of ports	1

Ethernet	
Electrical specification	IEEE std 802.3. 2000 Edition
Data rate	10 Mbit/s or 100 Mbit/s, auto-negotiated or manually set by DIP-switches
Protocol	UDP, TCP, ICMP, HTTP and ARP
Duplex	Full- or half duplex, auto-negotiated or manually set by DIP-switches
Circuit type	TNV-1
Transmission range	100 m
Isolation to	Power 2 kV _{rms} RS-232 1.5 kV _{rms} RS-422/485 1.5 kV _{rms}
Connection	RJ-45 shielded, 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

* 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.

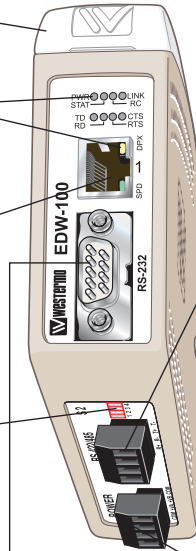
Connections

S1 DIP-switch under lid
(for details see page 25)

LED indicators, also
integrated in the RJ-45
connector.
(for details see next page)

Ethernet 1
RJ-45 connection
(for details see next page)

S2 DIP-switch
Termination
(for details see page 25)



RS-422/485 interface screw terminal

4-position	Direction*	Description
No. 1	In	R+ line RS-422
No. 2	In	R- line RS-422
No. 3	In/Out	T+ line RS-422/485
No. 4	In/Out	T- line RS-422/485

* Direction relative this unit

Power connection screw terminal

4-position	Description
No. 1	Common
No. 2	+VA
No. 3	+VB
No. 4	Common

The EDW-100 supports redundant power connection. The positive input are +VA and +VB, the negative input for both supplies are COM. The power is drawn from the input with the highest voltage.

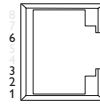
RS-232 (DTE)

9-position	Direction	Description
No. 1	N/C	Not connected (DCD)
No. 2	In	Received Data (RD)
No. 3	Out	Transmitted Data (TD)
No. 4	Out	Data Terminal Ready (DTR)
No. 5	-	Signal Ground (SG)
No. 6	In	Data Set Ready (DSR)
No. 7	Out	Request To Send (RTS)
No. 8	In	Clear To Send (CTS)
No. 9	N/C	Not connected (RI)

Ethernet

Ethernet TX connection (RJ-45 connector), automatic MDI/MDI-X crossover*.

Contact	Signal Name	Direction	Description/Remark
1	TD+	In/Out	Transmitted/Received data
2	TD-	In/Out	Transmitted/Received data
3	RD+	In/Out	Transmitted/Received data
4			NC
5			NC
6	RD-	In/Out	Transmitted/Received data
7			NC
8			NC
Shield			HF-connected

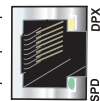
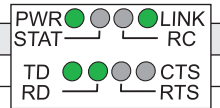


CAT 5 cable is recommended. Unshielded (UTP) or shielded (STP) connector might be used.

* Depend of settings on S1; 6, 7 and 8.

LED Indicators

LED	Status	Description
PWR Power	OFF	No internal power
	ON	Internal Power OK
TD Transmit data	OFF	No serial data transmitted from the unit, (RS-232 or RS-422/485)
	ON	Serial data transmitted from the unit, (RS-232 or RS-422/485)
RD Receive data	OFF	No serial data received to the unit, (RS-232 or RS-422/485)
	ON	Serial data received to the unit, (RS-232 or RS-422/485)
RTS Request to send	OFF	No RTS to the RS-232 interface or RS-422/485 transmitting.
	ON	RTS to the RS-232 interface or RS-422/485 receiving.
CTS Clear to send	OFF	No CTS from the RS-232 interface
	ON	CTS from the RS-232 interface
LINK	OFF	No Ethernet link. Cable not connected.
	ON	Good Ethernet link.
	Flash	Ethernet data is transmitted or received, traffic indication.
STAT Status	OFF	Normally Off
	ON	Telnet session established to Telnet diagnostics service or Ongoing configuration by Web tool
RC Remotely controlled	OFF	DIP switch settings are valid.
	ON	One or more DIP switches are overrid by remote configuration
SPD Speed Integrated in RJ-45 Green	ON	Ethernet 100 Mbit/s
	OFF	Ethernet 10 Mbit/s
DPX Duplex Integrated in RJ-45 Yellow	ON	Full duplex
	OFF	Half duplex

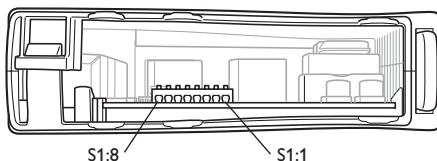


DIP-switch settings



Before DIP-switch settings:

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap).



S1* DIP-switch



Normally OFF



Enable local IP configure via serial interface.



Normally OFF



Restore factory default.



Ethernet Auto-negotiation enabled. Auto-crossover enabled. 10 Mbit/s.



Ethernet Auto-negotiation disabled. Auto crossover (MDI/MDIX) disabled. 10 Mbit/s.



Ethernet 100 Mbit/s when Auto-negotiation disabled



Ethernet 10 Mbit/s when Auto-negotiation disabled



Ethernet Full duplex when Auto-negotiation disabled or is not supported.



Ethernet Half Duplex Auto-negotiation disabled or is not supported.

* DIP switch functions may be override by WEB configuration tool. Override is indicated by RC LED. S1, 3, 4 and 5 not used.

Note! DIP-switch alterations are only effective after a power on.

A setting configured by any other method during normal operation, possibly overrides the DIP-switch setting. However, an override situation is indicated by the RC LED.

S2 Below panel



4-wire termination.

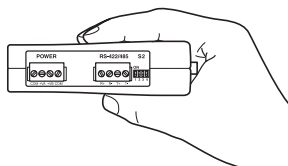


120 ohm 4-wire termination and fail-safe



2-wire termination.

120 ohm 2-wire termination and fail-safe

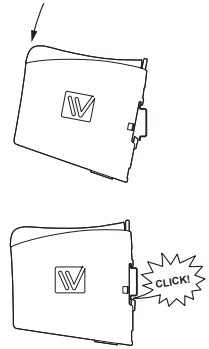


Factory settings



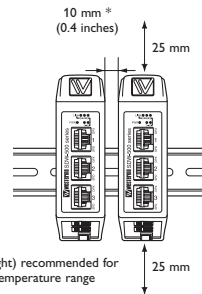
Mounting

This unit should be mounted on 35 mm DIN-rail, which is horizontally mounted inside an apparatus cabinet, or similar. Snap on mounting, see figure.



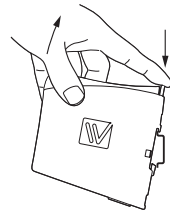
Cooling

This unit uses convection cooling. To avoid obstructing the airflow around the unit, use the following spacing rules. Minimum spacing 25 mm (1.0 inch) above /below and 10 mm (0.4 inches) left /right the unit. Spacing is recommended for the use of unit in full operating temperature range and service life.

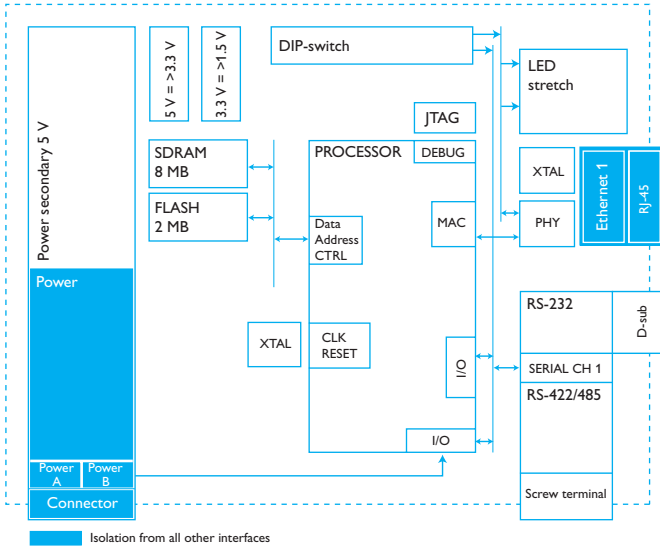


Removal

Press down the black support at the top of the unit. See figure.

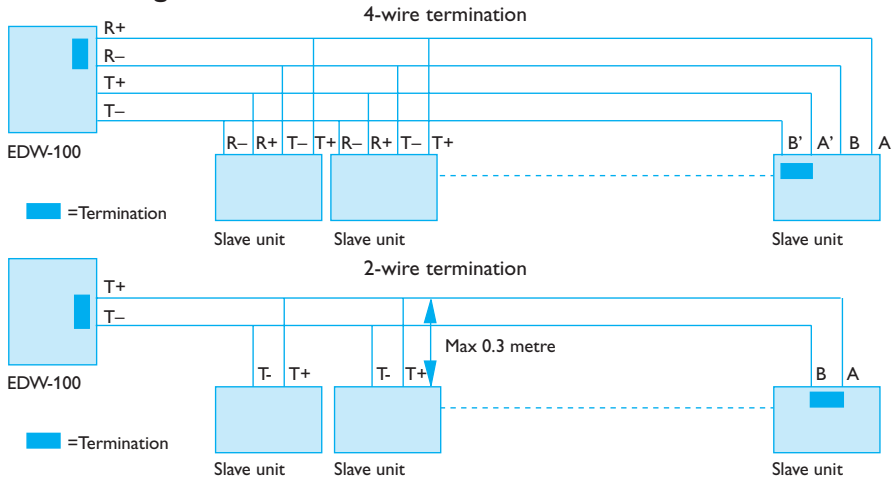


Applications



Buffer size
 Transmit Buffer 8Kbyte.
 Receive Buffer 8Kbyte.

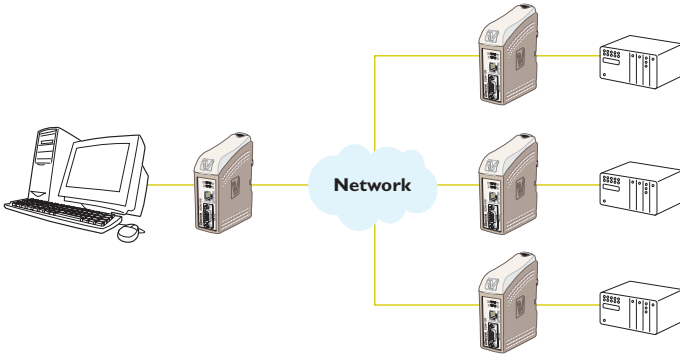
RS-422/485 general advice



Termination recommendations

The RS-422/485 line must be terminated regardless of the cable length. The termination is ideally placed at the extreme ends of the cable see examples above. The description of the RS-422/485 pin outs will vary between manufactures. For some brands the T+ corresponds to A T- to B, R+ to A' and R- to B', but other brands might use some other naming convention. If a unit does not work it can help to swap A and B. If difficulty is being experience contact Westermo for further guidance.

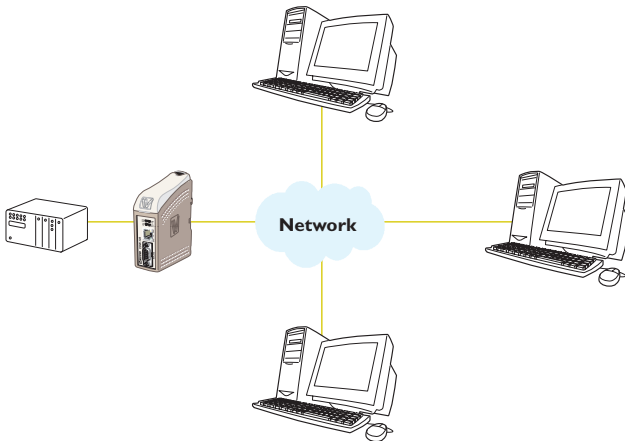
One to many using UDP using broadcast or multicast



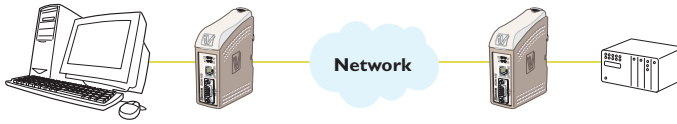
Description

The one to many function can be used in place of a traditional RS-422 or RS-485 multidrop application. Data entering one of the EDW-100 will be broadcast or Multicast to any other device in the broadcast or multicast group. A typical application would be a SCADA host computer communicating to a number of PLC's.

Point to point using TCP connection, server and client



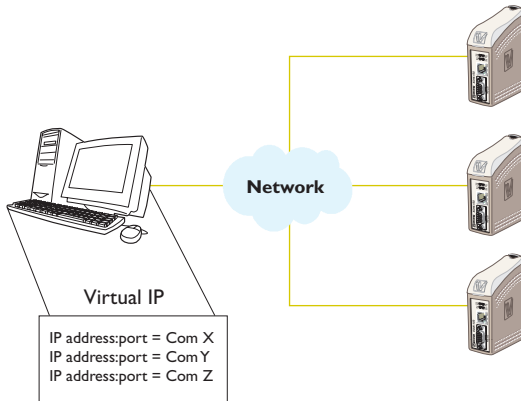
Point to point using UDP connection



Description

In a point to point application the EDW-100 can be to replace or extend a cable link. The distance between the EDW-100 units is only limited by the size of the LAN. Data can be sent across the network using ether UDP or TCP. A typical application would be a SCADA or Data logging application interrogating a sensor or PLC. To understand the differences between a UDP and TCP please see page 16–17.

Communication one to many using TCP



Description

Many legacy software applications do not have any facilities to directly use Ethernet but there is a requirement to use a newly installed or existing LAN to communication to many serial devices. This problem is solved by installing a serial port redirection software on the host PC. The redirection software works by creating virtual serial ports on the computer. The Virtual serial port can be selected and use in the same way as a hardware based port. The serial redirection software will encapsulate the serial data in a TCP/IP and send it to the relevant EDW-100 device. The EDW-100 will then strip off the TCP/IP frame and just forward the serial data to the target device. In the reverse direction the EDW-100 will encapsulate the data and the serial redirection software will strip off the TCP/IP frame. The serial redirection software can create up to 255 serial comms ports on a single computer.



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