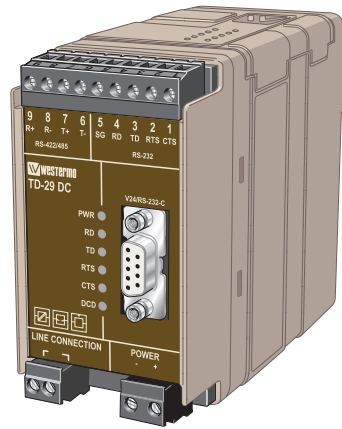




TD-29 DC



**FSK-modem
Multidrop 2-wire**

Legal information

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Safety



General:

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.



Before installation, maintenance or modification work:

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap). Prevent access to hazardous voltages by disconnecting the unit from DC power supply and all other electrical connections.



Installation:

This unit should only be installed by qualified personnel.

This unit should only be installed in a “restricted access area”, for example a lockable cabinet where access is restricted to service personnel only.

This unit is intended for permanent connection to the DC power supply.

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

Units with the rated voltage up to 42.4 V peak or 60 VDC, are defined as class III equipment and shall be separated from hazardous voltage by double or reinforced insulation.

This unit uses convection cooling. To avoid obstructing the air flow around the unit, follow the spacing recommendations (see Installation section on page 13).

The TD-29 is designed to be used on dedicated lines and is not approved to European standard CTR-15 (2-wire leased line).

Maintenance

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

Agency approvals and standards compliance

Type	Approval / Compliance
EMC	2004/108/EC, Electromagnetic compatibility
	EN 61000-6-2, Immunity industrial environments
	61000-6-4, Emission residential environments

Declaration of Conformity



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
Multidrop FSK-modem	TD-29 DC	3611-0001


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

No	Short name
2004/108/EC	Electromagnetic Compatibility (EMC)
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

References of standards applied for this EC declaration of conformity.

No	Title	Issue
EN 61000-6-2	Electromagnetic compatibility – Immunity for industrial environments	2005
EN 61000-6-4	Electromagnetic compatibility – Emission for industrial environments	2007 +A1:2011

The last two digits of the year in which the CE marking was affixed: 13



Signature

Pierre Öberg
Technical Manager
27th March 2013

Postadress/Postal address	Tel.	Telefax	Postgiro	Bankgiro	Org.nr/ Corp. identity number	Registered office
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	Int+46 16428000	Int+46 16428001				

Description

The TD-29 is designed for communication on 2-wire copper cable (twisted pair). Multidrop or point to point is possible. The TD-29 will support half duplex at baud rates up to 19.2 kbit/s.

The TD-29 is easy to configure for different operating conditions with DIP-switches. Character formats, baud rate, transmission level, DCD detection level and communication interface are selectable. DTE-equipment can be connected through an RS-232 or an RS-422/485 interface. The RS-232 connection can be made through either the DB-9 connector or screw terminal on the front of the unit. There are four baud rate settings. When using the RS-232 interface the direction of communication can be controlled by RTS handshake signal or incoming data.

When connecting in multidrop configuration the maximum bus length depends on the number of units connected. (see below)

Maximum range and signal loss

Transmission speed (bit/s)	Range point-to-point (km)	Signal loss (dB/km)	Loss per unit (multidrop) (dB)
2 400	16	1.5	0.2
4 800	14	1.7	0.2
9 600	11	2.1	0.3
19 200	9	2.5	0.4

Measured with Cat. 5 cable UTP 4x2x24AWG. Signal level >-24 dBm. The bus length depends on the line quality.

Turning time (RS-485)

Data rate bit/s	Turning time μ s
2 400	800
4 800	400
9 600	320
19 200	300

Environmental conditions

Environmental phenomena	Basic standard	Description	Test levels
Temperatures		Operating	5 to +50°C (41 to +122°F)*
		Storage and transport	-40 to +85°C (-40 to +185°F)
Humidity		Operating	5 to 95 % relative humidity
		Storage and transport	5 to 95 % relative humidity
Altitude		Operating	2 000 m / 70 kPa
Service life		Operating	10 year

Interface specifications

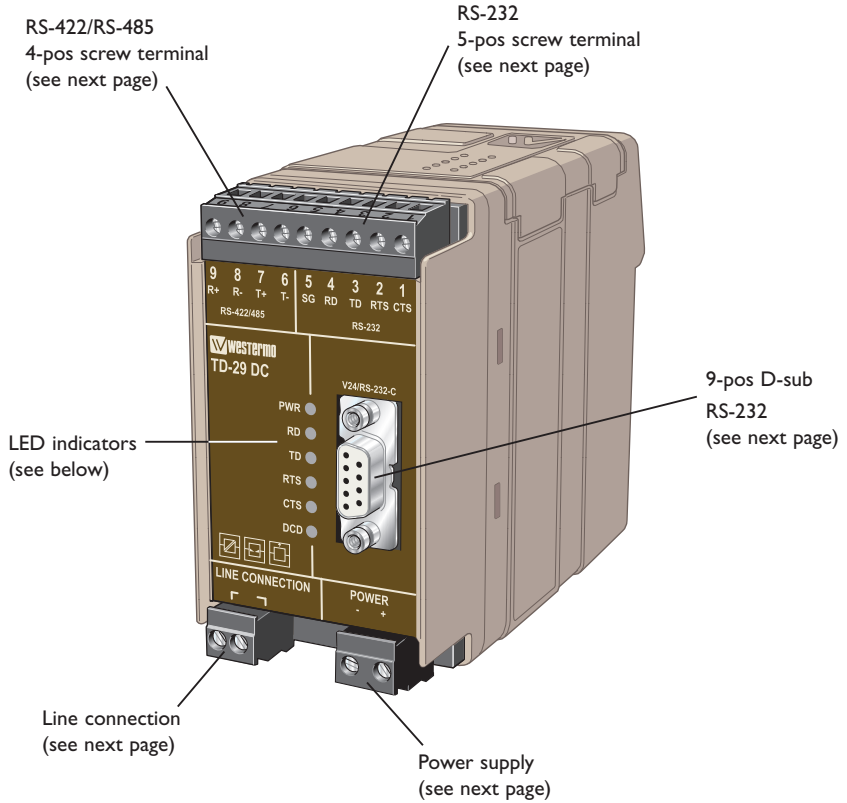
Power	TD-29 DC
Rated voltage	24 VDC
Operating voltage	12–36 VDC
Rated current	200 mA
Rated frequency	–
Connection	2-pos. screw term.
Connector size	0.2–2.5 mm ² (AWG 24-12)

RS-422/485	
Electrical specification	RS-422/485
Data rate	2 400 bit/s–19.2 kbit/s
Connection	5-position screw terminal
Connector size	0.2–2.5 mm ² (AWG 24-12)
Circuit type	TNV-1, twisted pair, shielding not required

RS-232	
Electrical specification	RS-232
Data rate	2 400 bit/s–19.2 kbit/s
Connection	9 position D-sub, DCE
Circuit type	SELV, max 15 m length, shielding not required

Line interface	
Electrical specification	–
Data rate	2 400 bit/s–19.2 kbit/s
Connection	2 position screw terminal
Connector size	0,2–2,5 mm ² (AWG 24-12)
Circuit type	TNV-3

Connections

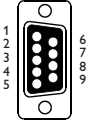



LED Indicators

LED	Status	Description
PWR	LED on LED off	Power on Power off
RD	LED on LED off	Receive Line Data active
TD	LED on LED off	Transmit Line Data active Receive Line Data inactive
RTS	LED on LED off	Request To Send active Request To Send inactive
DCD	LED on LED off	Data Carrier Detect active Data Carrier Detect inactive
CTS	LED on LED off	Clear To Send active Clear To Send inactive


Interface RS-232

9-pos. D-sub Pin. no.	9-pos. Screw terminal	Direction	Description
1	–	–	–
2	4	Out	RD/Received Data
3	3	In	TD/Transmitted Data
4	–	–	–
5	5	–	SG/Signal Ground
6	–	Out	DSR/Data Set Ready
7	2	In	RTS/Request to Send
8	1	Out	CTS/Clear to Send
9	–	–	–

Interface RS-422/485


9-pos. Screw terminal	Direction	ITU-T V.11 Description	Description
9	In	A' (R+)	RS-422 Receiver
8	Out	B' (R-)	RS-422 Receiver
7	In/Out	A (T+)	RS-422/485 Transmitter/Receiver
6	In/Out	B (T-)	RS-422/485 Transmitter/Receiver



The definition of R+/R-, T+T- can vary between different manufacturers.


Line interface

2-pos. screw terminal	Direction	Description
1	In/Out	Transmitter/Receiver
2	In/Out	(2-wire)



Power connection DC

Screw no.	Description	Power supply
1	–	0V DC
2	+	12–36 VDC



Configuration



DIP switch settings

DIP-switches are accessible under the lid on top of the unit. DIP-switches are used to configure the modem.



Warning!

Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap), before the lid on top of the modem is removed.

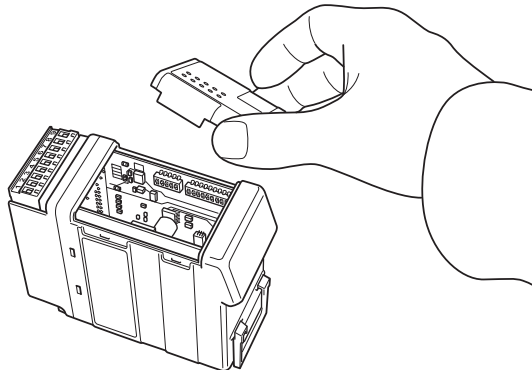


Warning! Do not open connected equipment.

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

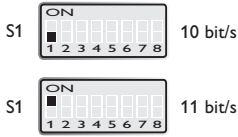
NOTE

When configuring via DIP-switches, the settings of DIP-switches configure the unit only after a power reset. A setting configured by any other method during normal operation, overrides the DIP-switch setting. However, at power up, the DIP-switch settings have precedence over the setting configured by any other method.

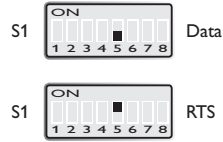


Switch block 1 – S1

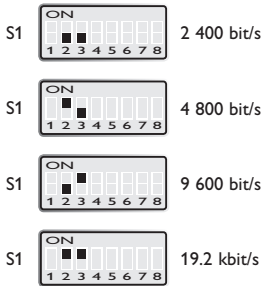
Character format



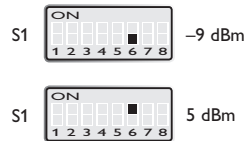
Carrier active using RTS or incoming data



Selection of Baud rate

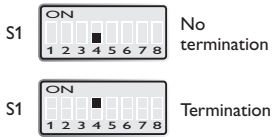


Selection of transmission level*



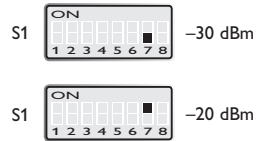
* Load 600 Ω

Termination of the line*



* The line should be terminated at the end points.

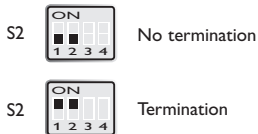
Selection of minimum detection level



S1: 8 not used

Switch block 2 – S2

Termination of RS-422*



* The line should be terminated at the end points.

Termination of RS-485*



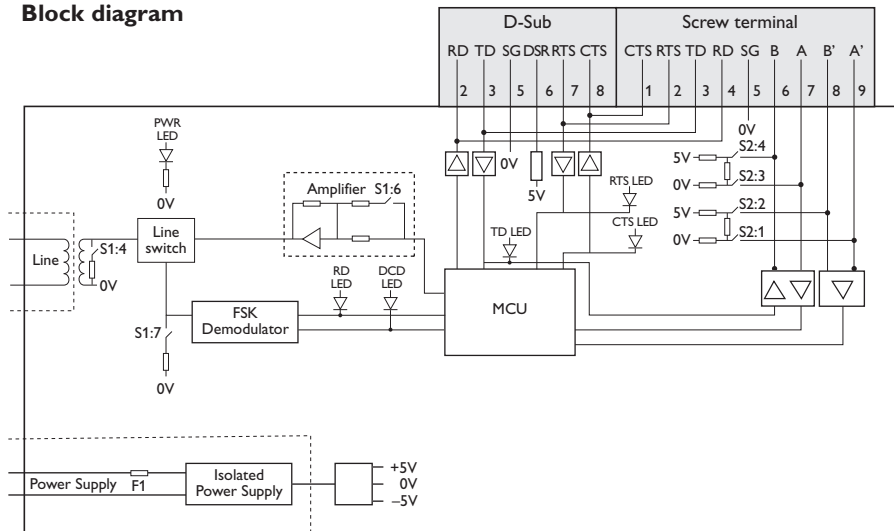
* The line should be terminated at the end points.

Factory setting

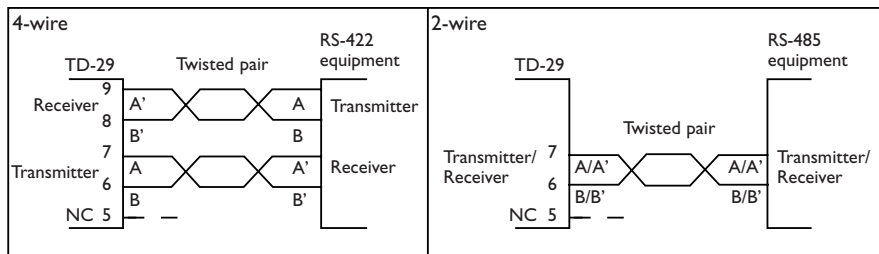


Functional description

Block diagram



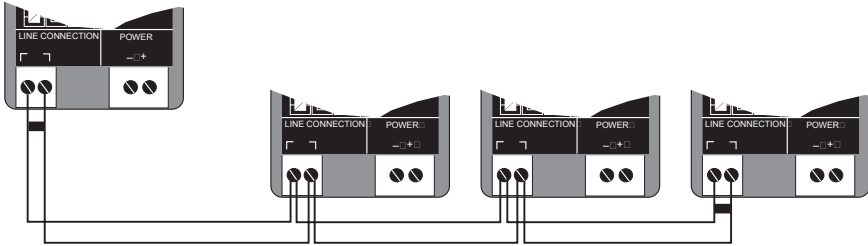
RS-422/485 connection



Line connection

2-position

detachable screw terminal

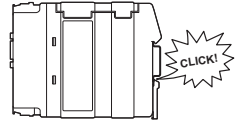
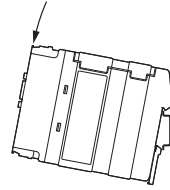


Multidrop half duplex with TD-29

- Termination to be set with DIP-switches

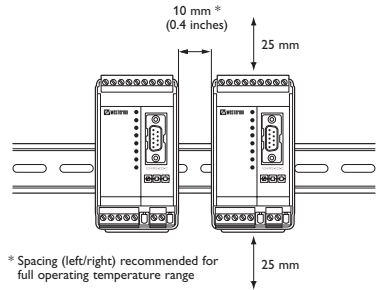
Mounting

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.



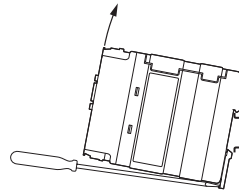
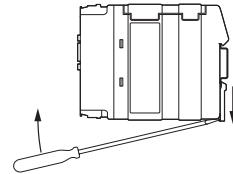
Cooling

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 back of the unit using a screwdriver, see figure.





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