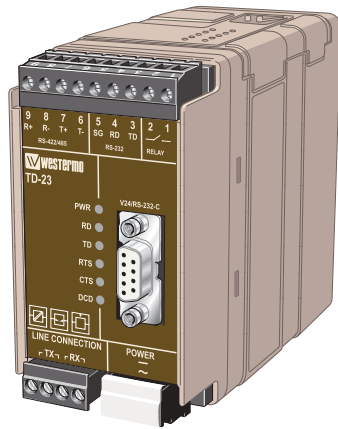


User Guide
6600-2204



TD-23



*Leased Line
V.23 Modem
Multidrop applications*

www.westermo.com

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 installation:

This modem is for restricted access area use only.

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.

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.

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



Before mounting, using or removing this unit:

Prevent access to hazardous voltage by disconnecting the unit from power supply.

Warning! Do not open connected unit. Hazardous voltage may occur within this unit when connected to power supply.

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 water-proof. 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.

Agency approvals and standards compliance

| Type | Approval / Compliance |
|--------|------------------------------------------------------------------|
| EMC | EN 61000-6-2, Immunity industrial environments |
| | EN 55024, Immunity IT equipment |
| | EN 61000-6-3, Emission residential environments |
| | FCC part 15 Class B |
| | EN 50121-4, Railway signalling and telecommunications apparatus |
| | IEC 62236-4, Railway signalling and telecommunications apparatus |
| Safety | EN 60950-1, IT equipment |

FCC Part 15.105 Notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ⌘ Reorient or relocate the receiving antenna
- ⌘ Increase the separation between the equipment and receiver
- ⌘ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- ⌘ Consult the dealer or an experienced radio/TV technician for help.

Declaration of Conformity, TD-23 LV



Westermo Teleindustri AB

Declaration of conformity

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

Herewith declares that the product(s)

| Type of product | Model | Art no | |
|------------------------|-------------------------|-----------|--|
| Leased Line V.23 Modem | TD-23 LV | 3600-2001 | |
| | TD-23 LV (relay option) | 3600-2051 | |

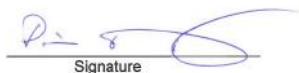
is in conformity with the following EC directive(s).

| No | Short name |
|-------------|-------------------------------------|
| 2004/108/EC | Electromagnetic Compatibility (EMC) |

References of standards applied for this EC declaration of conformity.

| No | Title | Issue |
|--------------|-----------------------------------------------------------------------|------------------------------|
| EN 55022 | Information technology equipment - Emission | 2006 +A1:2007 |
| EN 55024 | Information technology equipment - Immunity | 1998 +A1:2001 +A2:2003 |
| EN 61000-6-1 | Electromagnetic compatibility – Immunity for residential environments | 2007 |
| EN 61000-6-2 | Electromagnetic compatibility – Immunity for industrial environments | 2005 |
| EN 61000-6-3 | Electromagnetic compatibility – Emission for residential environments | 2007 |
| EN 61000-6-4 | Electromagnetic compatibility – Emission for industrial environments | 2007 |

The last two digits of the year in which the CE marking was affixed: 10


Signature

Pierre Öberg
Technical Manager
31th August 2010

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

Declaration of Conformity, TD-23 HV



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 | |
|------------------------|-------------------------|-----------|--|
| Leased line V.23 modem | TD-23 HV | 3600-2101 | |
| | TD-23 HV (relay option) | 3600-2151 | |


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

| No | Short name |
|-------------|-------------------------------------|
| 2004/108/EC | Electromagnetic Compatibility (EMC) |
| 2006/95/EC | Low Voltage (LVD) |

References of standards applied for this EC declaration of conformity.

| No | Title | Issue |
|--------------|-----------------------------------------------------------------------|---------------------------------|
| EN 55022 | Information technology equipment - Emission | 2006 +A1:2007 |
| EN 55024 | Information technology equipment - Immunity | 1998 +A1:2001 +A2:2003 |
| EN 61000-6-1 | Electromagnetic compatibility – Immunity for residential environments | 2007 |
| EN 61000-6-2 | Electromagnetic compatibility – Immunity for industrial environments | 2005 |
| EN 61000-6-3 | Electromagnetic compatibility – Emission for residential environments | 2007 |
| EN 61000-6-4 | Electromagnetic compatibility – Emission for industrial environments | 2007 |
| EN 60950-1 | Information technology equipment – Safety – General requirements | 2006 + A1:2006 + A11:2009 |

The last two digits of the year in which the CE marking was affixed: 11



Signature

Pierre Öberg
Technical Manager
8th July 2011

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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 | 6 V/m 80% AM (1 kHz) 2000 – 2700 MHz 10 V/m 80% AM (1 kHz), 80 – 1000 MHz 20 V/m 80% AM (1 kHz), 80 – 2000 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, 20, 5000 ms interruption 10 & 500 ms, 30% reduction 200 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 line |
| Voltage dips and interruption | EN 61000-4-29 | DC power ports | 10 & 100 ms, interruption 500 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 | -25 to +70°C |
| | | Storage & Transport | -30 to +70°C |
| Humidity | | 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 | UL 94 | PC / ABS | Flammability class V-1 |
| Dimension W x H x D | | | 55 x 100 x 132 mm |
| Weight | | | 0.25 kg |
| Degree of protection | IEC 529 | Enclosure | IP 20 |
| Cooling | | | Convection |
| Mounting | | | Horizontal on 35 mm DIN-rail |

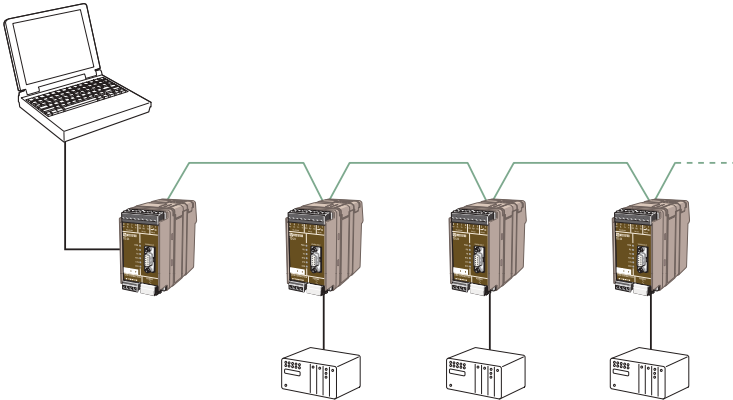
Description

TD-23 is designed to satisfy industry's demands on reliability and functionality in environments with high levels of interference. TD-23 communicates via a 2- or 4-wire leased line according to the V.23 standard. Equipment with an RS-232 or RS-422/485 interface can be connected and communicate point-to-point or in a multidrop application. The modem is equipped with DIP-switches to set specific functions in hardware, for example, reception sensitivity, output signal level, etc.

This is of particular importance as it allows each modem to be optimised according to the line quality. A general calculation allows 16 units over a distance of up to 25 km (15.5 miles).

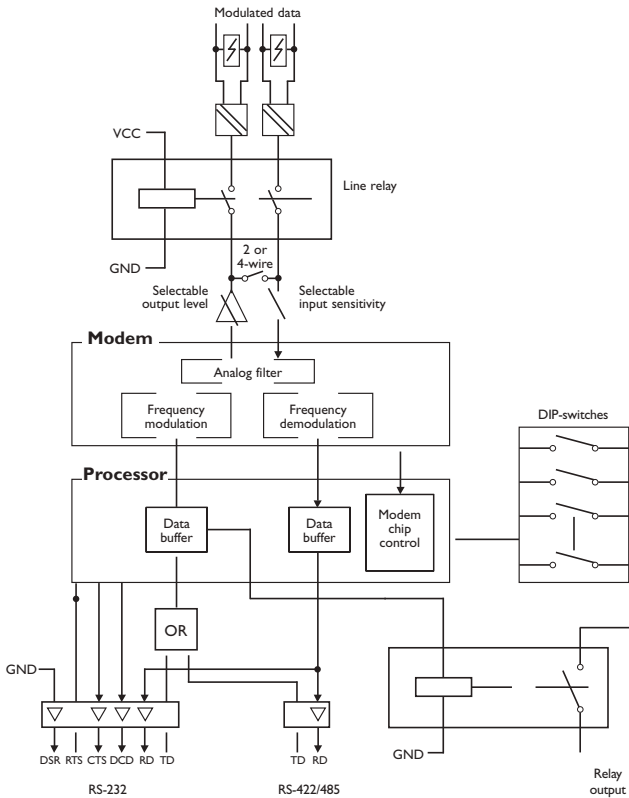
TD-23 is intended for mounting on a 35 mm DIN-rail, where the modem is attached and locked in a single action.

- ⌘ Data rate 1200 bit/s (V.23)
- ⌘ 2-wire (half duplex), 4-wire (full duplex)
- ⌘ Number of multidrop points, 16 (typical value)
- ⌘ Transmission distance up to 25 km (15.5 miles)
- ⌘ Adjustable output signal level
- ⌘ Adjustable reception sensitivity
- ⌘ Transient protection on the line side
- ⌘ AC-/DC-supply
- ⌘ Galvanic isolation (line/supply)
- ⌘ Optional relay output reflecting the transmitter carrier



Functional description

Block diagram



Interface specifications

| Power LV | |
|---------------------------------|------------------------------------------------------------------------------------------------------------|
| Rated voltage | 12 to 48 VDC 12 to 27 VAC |
| Operating voltage | 10 to 60 VDC 10 to 30 VAC |
| Rated current | 125 mA @ 12 VDC 50 mA @ 24 VDC 28 mA @ 48 VDC 125 mA @ 12 VAC 50 mA @ 24 VAC 25 mA @ 32 VAC |
| Rated frequency | DC / AC 48 – 62 Hz |
| Inrush current I ² t | 0.09 A ² s |
| Startup current [*] | 0.35 A peak |
| Polarity | Polarity independent |
| Isolation to | RS-232 / RS-422/485 / Leased Line |
| Connection | Detachable screw terminal |
| Connector size | 0.2 – 2.5 mm ² (AWG 24-12) |
| Shielded cable | Not required |

| Power HV | |
|---------------------------------|------------------------------------------------------------------------|
| Rated voltage | 110 to 250 VDC 95 to 240 VAC |
| Operating voltage | 88 to 300 VDC 85.5 to 264 VAC |
| Rated current | 10 mA @ 110 VDC 7 mA @ 250 VDC 30 mA @ 95 VAC 23 mA @ 240 VAC |
| Rated frequency | DC / 48 – 62 Hz |
| Inrush current I ² t | 0.05 A ² s |
| Startup current [*] | 0.03 A peak |
| Polarity | Polarity independent |
| Isolation to | RS-232 / RS-422/485 / Leased Line |
| Connection | Detachable screw terminal |
| Connector size | 0.2 – 2.5 mm ² (AWG 24-12) |
| Shielded cable | Not required |

* Ska startup current beskrivas?

| RS-422/485 | |
|--------------------------|------------------------------------------------------------------------------|
| Electrical specification | EIA RS-485 2-wire or 4-wire twisted pair |
| Data rate | 300 bit/s – 1200 bit/s |
| Data format | 7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits; Σ 9-12 bits |
| Protocol | Transparent |
| Retiming | No |
| Turn around time | 4.2 ms (half duplex) |
| Transmission range | ≤ 1200 m, depending on data rate and cable type (EIA RS-485) |
| Settings | 120 Ω termination and failsafe biasing 680 Ω |
| Protection | Installation Fault Tolerant (up to ±60 V) |
| Isolation to | Power / Leased Line |
| Connection | Detachable screw terminal |
| Connector size | 0.2 – 2.5 mm ² (AWG 24 – 12) |
| Shielded cable | Not required* |

| RS-232 | |
|--------------------------|------------------------------------------------------------------------------|
| Electrical specification | EIA RS-232 |
| Data rate | 300 bit/s – 1200 bit/s |
| Data format | 7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits; Σ 9-12 bits |
| Protocol | Transparent |
| Retiming | No |
| Transmission range | 15 m |
| Isolation to | Power / Leased Line |
| Connection | 9-pin D-sub female (DCE) or Detachable screw terminal (DCE) |
| Connector size | 0.2 – 2.5 mm ² (AWG 24 – 12) |
| Shielded cable | Not required* |
| Conductive housing | Isolated to all other housings |

* Railway installation close to the rails.

For a cable located inside 3 m boundary and connected to this port, the use of shielded cable is recommended, this is to minimise the risk of interference. 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.

| Relay (optional) | |
|-------------------------|----------------------------------------------------------------------------------|
| Rated voltage | Up to 48 VDC |
| Operating voltage | Up to 60 VDC |
| Contact rating | 50 mA @ 48 VDC |
| Contact resistance | 8 Ω |
| Transmission range | \leq 3 m, depending on data rate and cable type |
| Function | The output follows the transmit carrier, i.e. output shorted when carrier is ON. |
| Isolation to | Power, Leased Line, RS-232, RS-485/422 |
| Connection | Detachable screw terminal |
| Connector size | 0.2 – 2.5 mm ² (AWG 24 – 12) |
| Shielded cable | Not required |

| Leased Line | |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Electrical specification | 2- or 4-wire Leased Line |
| Data rate | 300 bit/s – 1200 bit/s |
| Transmission level | +3, -3, -6, -9, -10, -12, -13, -15 dBm Transmission levels above -9 dBm are not allowed on PTT networks only on private wires |
| Sensitivity reseption | -45, -33, -27, -23 dBm |
| Protocol | V23hdx, V23fdx |
| Turn around time | 33 ms (half duplex) |
| Transmission range / Budget | 30dB |
| Protection | Installation Fault Tolerant (up to \pm 60 V) |
| Isolation to | Power / RS-232 / RS-422/485 |
| Connection | Detachable screw terminal |
| Connector size | 0.2 – 2.5 mm ² (AWG 24 – 12) |
| Shielded cable | Not required |

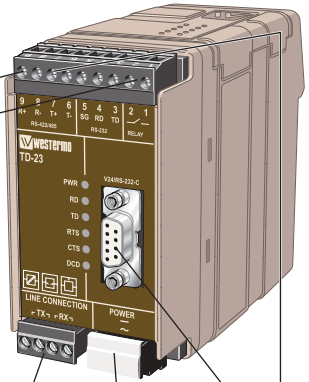
Location of Interface ports, LED's and DIP-switches TD-23 HV

RS-422/485

| 9-pos. | Direction* | Description | Product marking |
|--------|------------|----------------------------------------------------|-----------------|
| No 9 | In | R+ (A') Receive RS-422/485 4-wire | R+ |
| No 8 | In | R- (B') Receive RS-422/485 4-wire | R- |
| No 7 | Out | T+ (A) Transmit RS-422/485 4-wire | T+ |
| | In/Out | T+/R+ (A/A') Transmit/Receive RS-422/485 2-wire | |
| No 6 | Out | T- (B) Transmit RS-422/485 4-wire | T- |
| | In/Out | T-/R- (B/B') Transmit/Receive RS-422/485 2-wire | |

Relay (optional)

| Position | Direction* | Description |
|----------|------------|-------------|
| No. 1 | Out | Normal open |
| No. 2 | Out | Common |



Leased Line
Fore details, se below

RS-232 (DTE)
Fore details, se below

Power connection HV
Fore details, se below

RS-232 (DTE)

| Position | | Direction* | Description | D-sub description |
|----------|----------------|------------|---------------------------|-------------------|
| D-sub | Screw terminal | | | |
| No. 1 | | Out | Data Carrier Detect (DCD) | |
| No. 2 | No. 4 | Out | Received Data (RD) | |
| No. 3 | No. 3 | In | Transmitted Data (TD) | |
| No. 4 | | NC | Data Terminal Ready (DTR) | |
| No. 5 | No. 5 | - | Signal Ground (SG) | |
| No. 6 | | Out | Data Set Ready (DSR) | |
| No. 7 | | In | Request To Send (RTS) | |
| No. 8 | | Out | Clear To Send (CTS) | |
| No. 9 | | NC | Ring Indicator (RI) | |

Power connection HV

| Pos. | Direction* | Description | Product marking |
|------|------------|-----------------------------|-----------------|
| L | In | AC: Live DC: +Voltage | |
| N | In | AC: Neutral DC: -Voltage | |
| ⊕ | - | Not used | |

Leased Line

| Pos. | Direction* | Description | Product marking |
|-------|------------|--------------------------------|-----------------|
| No. 1 | Out | 4-wire Transmit | TX |
| | In/Out | 2-/4-wire Receive/ Transmit | |
| No. 2 | Out | 4-wire Transmit | |
| | In/Out | 2-/4-wire Receive/ Transmit | |
| No. 3 | In | 4-wire Receive | RX |
| No. 4 | In | 4-wire Receive | |

* Direction relative this unit. NC = Not Connected

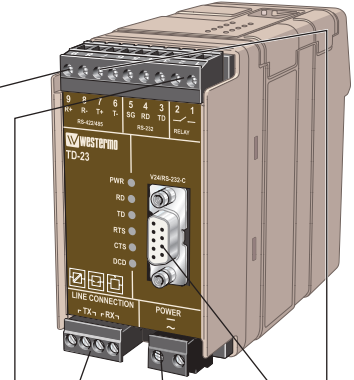
Location of Interface ports, LED's and DIP-switches TD-23 LV

RS-422/485

| 9-pos. | Direction* | Description | Product marking |
|--------|------------|----------------------------------------------------|-----------------|
| No 9 | In | R+ (A') Receive RS-422/485 4-wire | R+ |
| No 8 | In | R- (B') Receive RS-422/485 4-wire | R- |
| No 7 | Out | T+ (A) Transmit RS-422/485 4-wire | T+ |
| | In/Out | T+/R+ (A/A') Transmit/Receive RS-422/485 2-wire | |
| No 6 | Out | T- (B) Transmit RS-422/485 4-wire | T- |
| | In/Out | T-/R- (B/B') Transmit/Receive RS-422/485 2-wire | |

Relay (optional)

| Position | Direction* | Description |
|----------|------------|-------------|
| No. 1 | Out | Normal open |
| No. 2 | Out | Common |



Leased Line
Fore details,
se below

RS-232 (DTE)
Fore details, se below

Power connection LV
Fore details, se below

RS-232 (DTE)

| Position | | Direction* | Description | D-sub description |
|----------|----------------|------------|---------------------------|-------------------|
| D-sub | Screw terminal | | | |
| No. 1 | | Out | Data Carrier Detect (DCD) | |
| No. 2 | No. 4 | Out | Received Data (RD) | |
| No. 3 | No. 3 | In | Transmitted Data (TD) | |
| No. 4 | | NC | Data Terminal Ready (DTR) | |
| No. 5 | No. 5 | - | Signal Ground (SG) | |
| No. 6 | | Out | Data Set Ready (DSR) | |
| No. 7 | | In | Request To Send (RTS) | |
| No. 8 | | Out | Clear To Send (CTS) | |
| No. 9 | | NC | Ring Indicator (RI) | |

Power connection LV

| Pos. | Direction* | Description | Product marking |
|-------|------------|-----------------------------|-----------------|
| No. 1 | In | AC: Neutral DC: -Voltage | |
| No. 2 | In | AC: Line DC: +Voltage | |

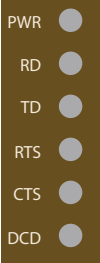
Leased Line

| Pos. | Direction* | Description | Product marking |
|-------|------------|--------------------------------|-----------------|
| No. 1 | Out | 4-wire Transmit | TX |
| | In/Out | 2-/4-wire Receive/ Transmit | |
| No. 2 | Out | 4-wire Transmit | |
| | In/Out | 2-/4-wire Receive/ Transmit | |
| No. 3 | In | 4-wire Receive | RX |
| No. 4 | In | 4-wire Receive | |

* Direction relative this unit. NC = Not Connected

LED Indicators

| LED | Status | Description |
|----------------------------|--------|--------------------------------------------------|
| PWR Power | ON | In service |
| | OFF | Out of service |
| RD Receive data | ON | Data transmitted on the RS-232 or RS-485 port |
| | OFF | No data transmitted on the RS-232 or RS-485 port |
| TD Transmit data | ON | Data received on the RS-232 or RS-485 port |
| | OFF | No data received on the RS-232 or RS-485 port |
| RTS Request to send | ON | RTS signal active on the RS-232 port |
| | OFF | RTS signal inactive on the RS-232 port |
| CTS Clear to send | ON | CTS signal active on the RS-232 port |
| | OFF | CTS signal inactive on the RS-232 port |
| DCD Data carrier detect | ON | DCD signal active on the RS-232 port |
| | OFF | DCD signal inactive on the RS-232 port |



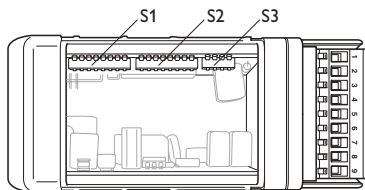
DIP-switch settings



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).

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



S1 DIP-switch

Selection of transmission level



3 dBm



-9 dBm



-13 dBm



-3 dBm



-10 dBm



-15 dBm



-6 dBm



-12 dBm

Selection of transmission level specifies the maximum output power level. The maximum value is 3 dBm. By selecting the higher transmission levels communication over longer distances can be achieved, but the noise and disturbance levels will increase. We recommend that you try your system with the factory default setting first. If disturbances are detected (faulty characters or other errors) decrease the power level step by step. If the transmission fails because of a weak signal the transmission level can be increased step by step until a satisfactory transmission quality is achieved. Please note that levels above -9 dBm are not allowed on PTT networks and can only be used on private wires!

S1 DIP-switch

Selection of minimum level detection DCD



-45 dBm



-27 dBm



-33 dBm



-23 dBm

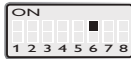
Selection of minimum level, DCD detection specifies the minimum power level the receiver can handle. With the receiver having a dynamic range of 30 dBm, this means that with the level set to -15 dBm the TD-23 will pick up signals in the range -15 dBm to -45 dBm. We recommend that you try your network with the factory settings. If disturbances are detected (faulty characters or other errors) decrease the level step by step. If there is no communication because of a weak signal the receiver sensitivity can be increased step by step until satisfactory transmission quality is achieved.

S1 DIP-switch

2 or 4 Wire Line side



4-wire



2-wire

S1 DIP-switch

Carrier active using RTS or incoming data



RTS



Incoming data



Permanent carrier

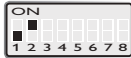
If the DTE uses the control signal- (RTS) the RTS signal is used to activate the transmitter. If the DTE does not control RTS or if RS-485 is used then the transmitter is activated by incoming data. In this case the data is buffered in the TD-23 while the carrier is established. By setting RTS always active a permanent carrier will be established. This is the typical setting for a full duplex 4-wire communication.

S2 DIP-switch

Selection of 2/4 wire RS-422/485 side



2-wire



4-wire



Deactivate
RS-422/485

All RS-422/485 lines should be terminated at the end-points. The RS-422/485 interface also has a fail-safe circuit which forces a non-active line into idle state.

S2 DIP-switch

RTS-CTS delay, 23 or 60 ms



60 ms



23 ms

When a 23 ms delay is chosen, the modem can handle the normal RTS-CTS behaviour as well as handle that TxD data is received before the 23 ms delay has elapsed. If TxD data is received before the modem has activated the CTS signal, the data is buffered. The time the data is delayed depends on how long after the activation of the RTS the first data bit is received. If a delay of 60 ms is chosen, all data received from the DTE interface (TxD) before the modem has activated the CTS signal is ignored.

S2 DIP-switch

Termination of the line



No
termination



Termination

The line should be terminated at the end-points.

S2:6 Not used.

S2 DIP-switch

Activity timer



Off



On 1 min

The use of the timer is a fail safe to ensure that a faulty unit connected to the modem will not block the line.

S2:6 Not used.

S2 DIP-switch

Filtering of DCD and RXD



Off



On

If this is enabled, RxD is delayed (buffered) 6 ms in order to avoid garbage characters when carrier is deactivated. The turn around time for the modem from sending to receiving on the line is 10 ms if this filter is enabled.

S3 DIP-switch RS-422/485 termination



No termination
or failsafe



2-wire termination with
failsafe; T+/R+ and T-/R-



4-wire termination with failsafe;
R+ and R-

Factory settings



S1

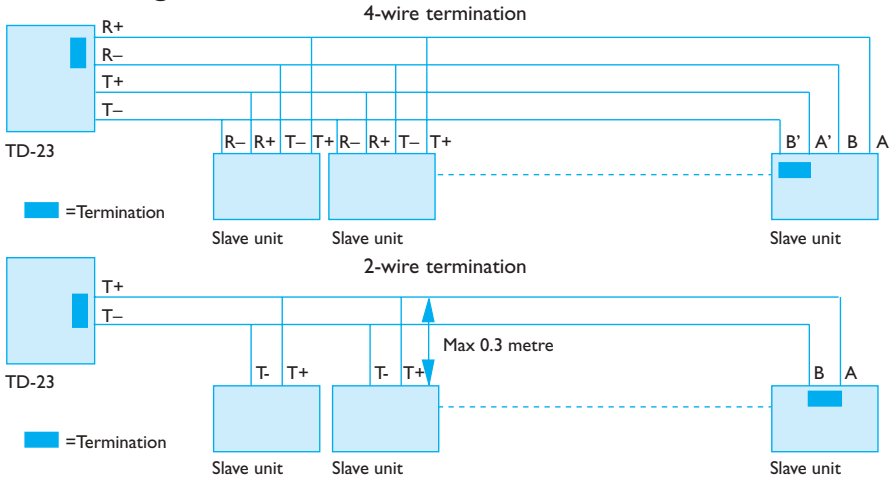


S2



S3

RS-422/485 general advice



Termination recommendations

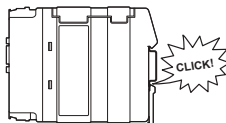
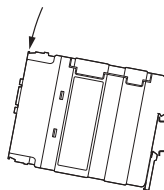
The RS-422/485 line must be terminated. In the TD-23 the termination is combined with fail-safe functionality. For that reason it is important that the termination is used not to get undefined states when the bus is in three state condition.

- ⚡ At 2-wire RS-485 both ends shall be terminated at the other most units of the bus.
- ⚡ At 4-wire RS-485 both pairs shall be terminated at both ends.
- ⚡ At 4-wire RS-422 it is only necessary to terminate the receivers.

RS-422/485 connection pins can be differently named. For some brands the T+ corresponds to A, but other brands might use some other naming convention. If a unit does not work it can help to swap A and B.

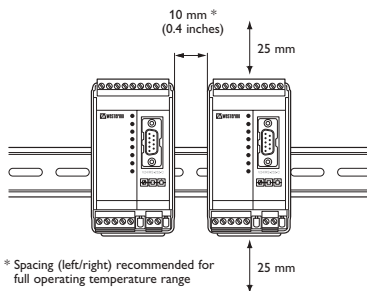
Mounting

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.



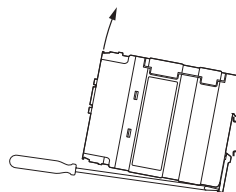
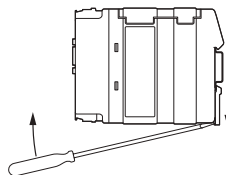
Cooling

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.



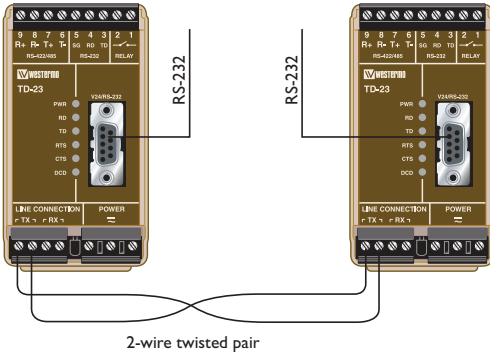
Removal

Press down the black support at the back of the unit using a screwdriver, see figure.



Application examples

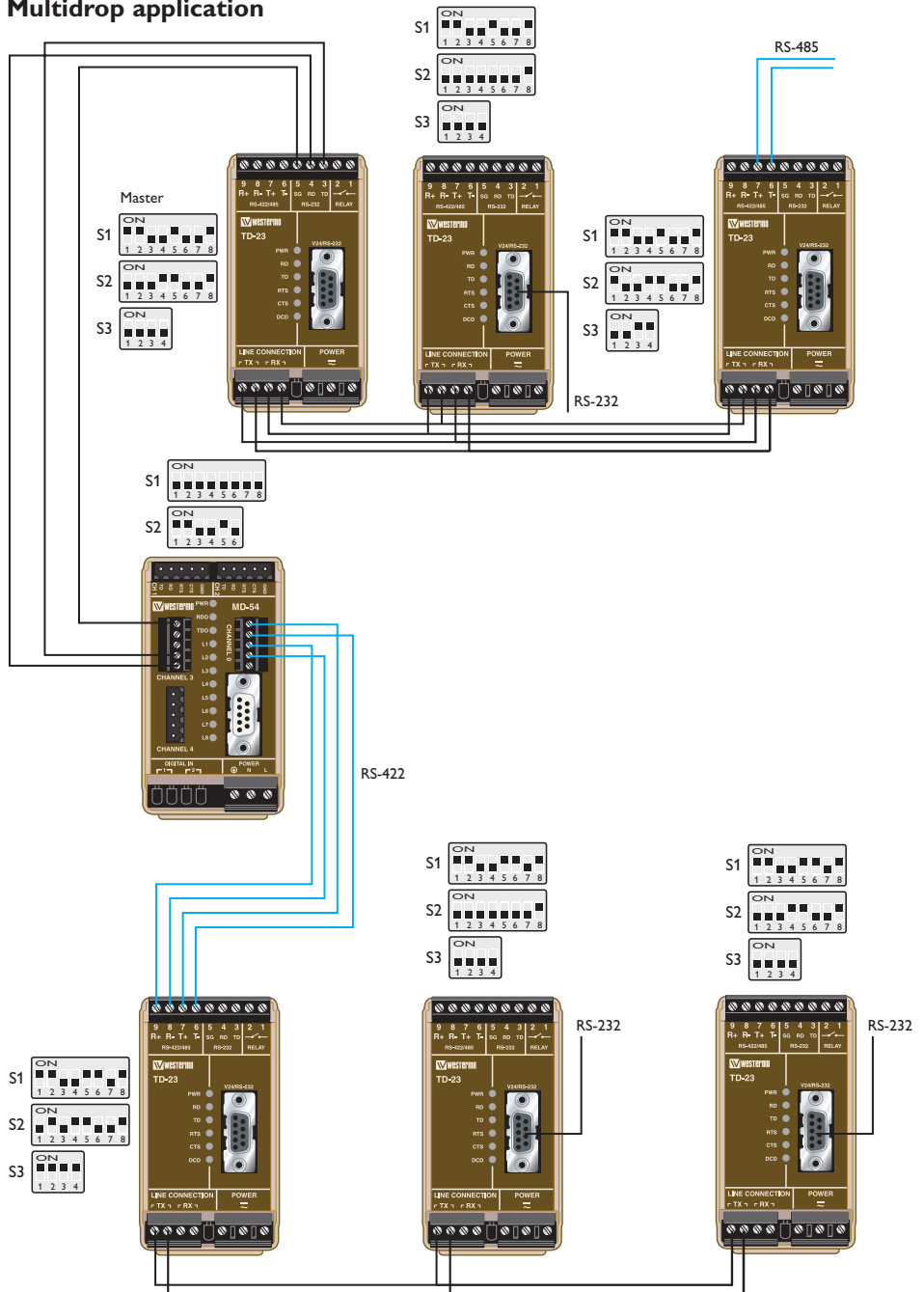
RS-232, 2-wire connection



DIP-switch setting for both units



Multidrop application





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