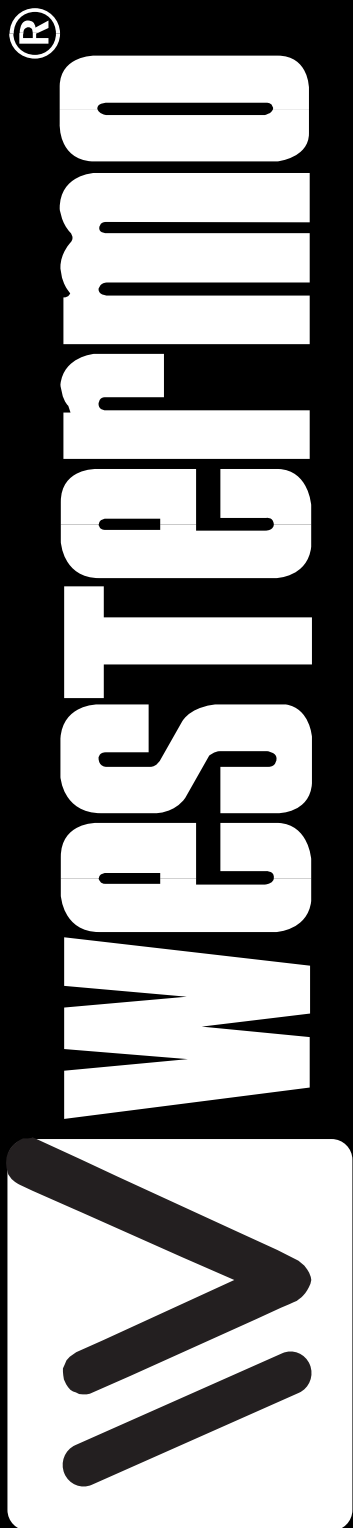
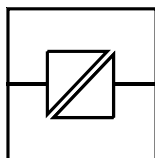


**MA-21 AC  
MA-21 DC**

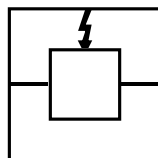


# **INSTALLATIONSANVISNING INSTALLATION MANUAL INSTALLATIONS ANLEITUNG**

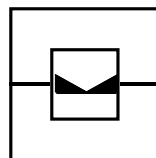
**6021-2002**



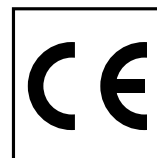
Galvanic  
Isolation



Transient  
Protection



Balanced  
Transmission



CE  
Approved



***Strömslingeomvandlare  
Current Loop Converter  
Stromschleifenwandler***

 **westermo<sup>®</sup>**  
[www.westermo.se](http://www.westermo.se)

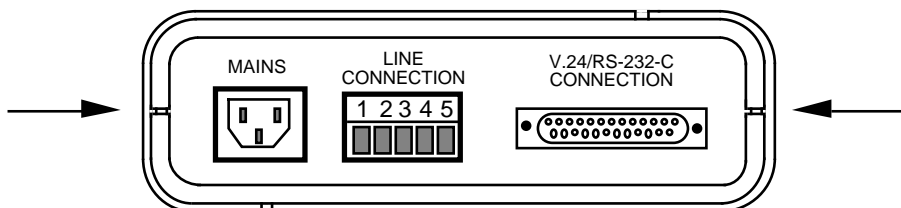
## Specifications

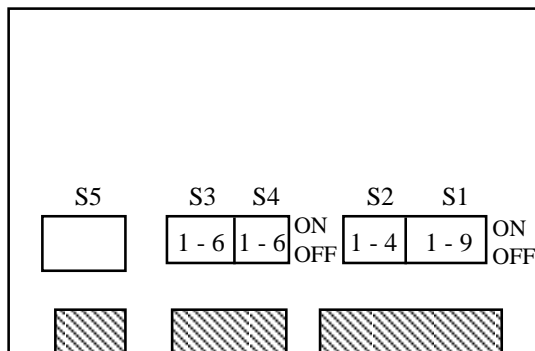
<b>Transmission</b>	Asynchronous, full/half duplex or simplex
<b>Interface 1</b>	EIA RS-232-C/CCITT V.24 25-position D-sub female, DCE
<b>Interface 2</b>	20 mA current loop, selectable active or passive
<b>Data rate</b>	Up to 19.2 bit/s
<b>Indicators</b>	Power, RD, TD
<b>Isolation</b>	Galvanic isolation with opto-coupler (data transmission) and transformer (supply)
<b>Isolation voltage</b>	1500V
<b>Overvoltage protection</b>	<b>Mains:</b> Breakdown voltage 440V at 230V AC and 220V at 115V AC <b>Interface 2:</b> Breakdown voltage transmitter and receiver 37V Surge capacity 0.6 kW for 1ms
<b>Power supply</b>	Switchable 115/230V +15/ -10% 48–62Hz
<b>Fuse</b>	100mA fast 5x20 mm
<b>Power consumption</b>	Max 5VA at 230V AC
<b>Temperature range</b>	5–50°C, ambient temperature
<b>Humidity</b>	0–95% RH, non-condensing
<b>Dimensions WxHxD</b>	161x53x139 mm
<b>Weight</b>	0.5 kg
<b>Mounting</b>	With rubber pads or screws. Screws: remove the two "keyholes" on the bottom of the case

## Switch settings

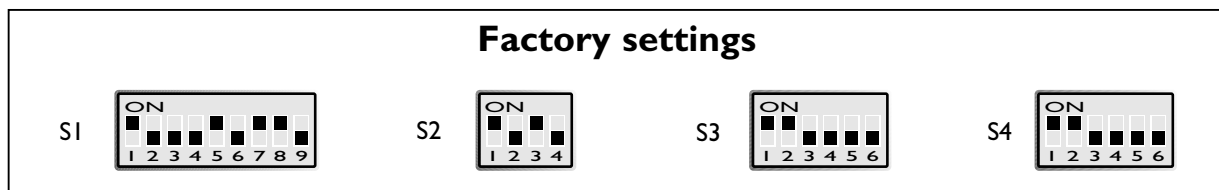
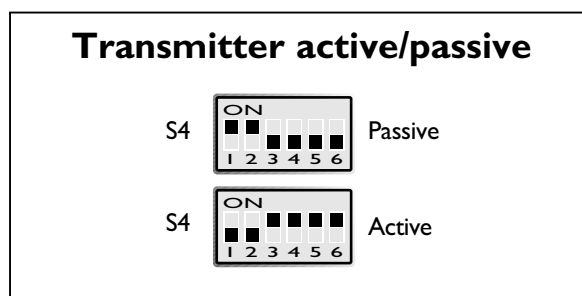
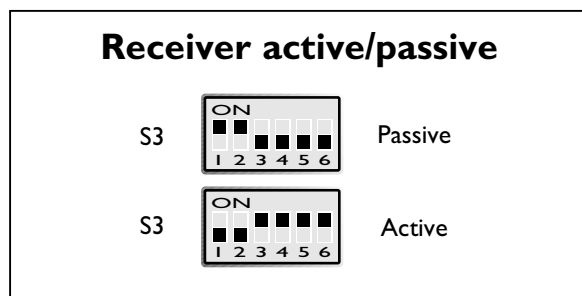
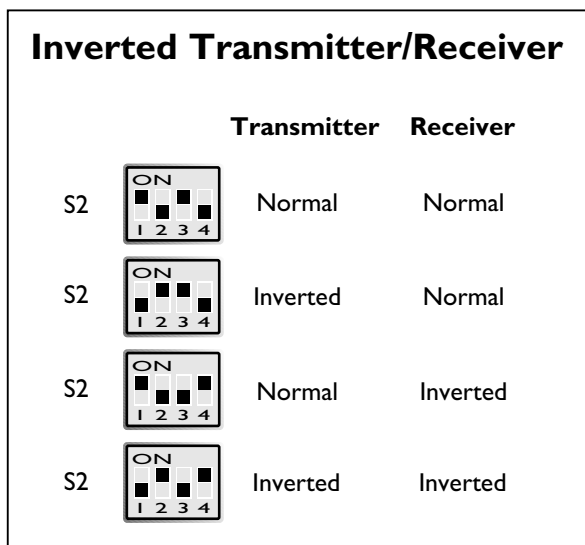
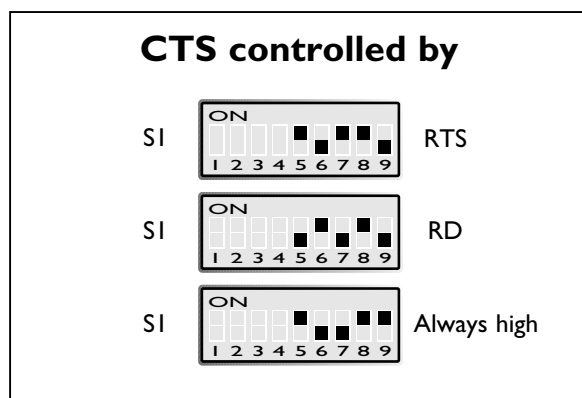
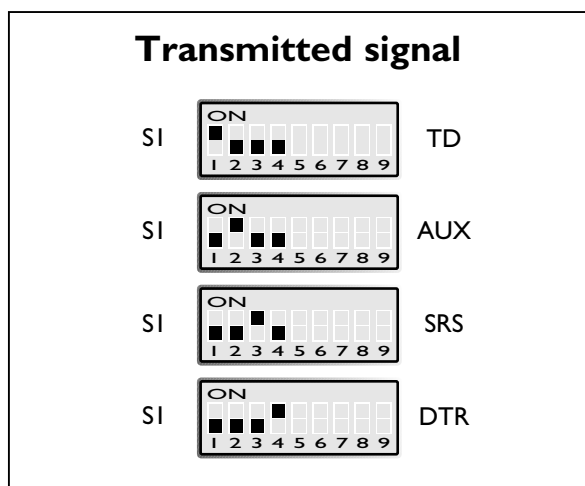
The MA-21 can through different switch settings be adapted to a variety of running conditions. To set the switches, open the plastic case by placing and turning a screwdriver between top and bottom at the rear of the case.

### DANGER! DO NOT OPEN CONNECTED UNIT





- S1 Selection of transmitted signal, selection of signal controlling CTS
- S2 Selection of transmitter/receiver normal or inverted
- S3 Selection of receiver active/passive
- S4 Selection of transmitter active/passive
- S5 Selection of power supply  
115/230V AC



## Connections

### Line connection

(5-position screw-terminal)

Direction	No.	Description
Receiver	1	R+
Receiver	2	R-
Transmitter	3	T+
Transmitter	4	T-
	5	Shield

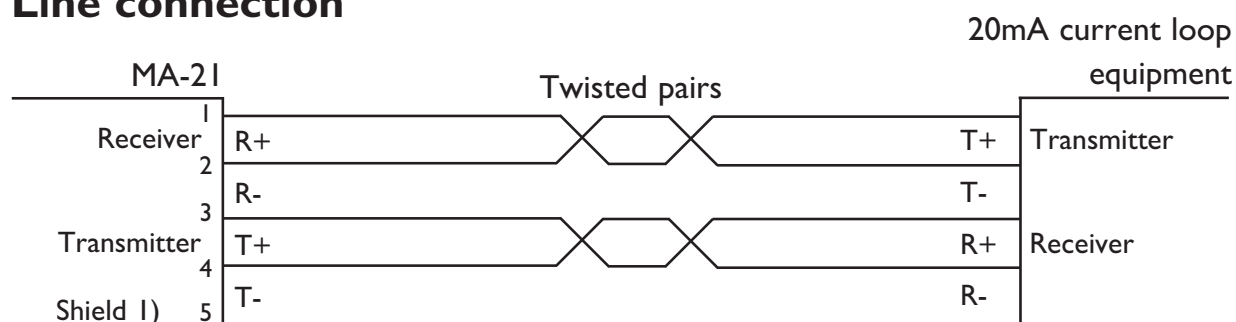
### Terminal connection (DCE)

(RS-232-C/V.24, 25-position D-sub, female)

Direction I)	Pin no.	CCITT V.24 Circuit no.	Description
I	2	103	TD/Transmitted Data
O	3	104	RD/Received Data
I	4	105	RTS/Request To Send
O	5	106	CTS/Clear To Send
O	6	107	DSR/Data Set Ready
–	7	102	SG/Signal Ground
O	8	109	DCD/Data Carrier Detect
I	11	–	AUX/Auxiliary
I	19	120	SRS/Secondary Request to Send
I	20	108/2	DTR/Data Terminal Ready

I) I= Input O= Output on MA-21

## Line connection



I) If shielded cable is used, connect the shield only at one end to avoid ground currents.

## Transmission range (interface 2)

Cable	Transmission rate bit/s					
	600	1200	2400	4800	9600	19200
	6000m	5000m	4000m	3000m	500m	200m
42pF/m 0.3mm <sup>2</sup>						

# MA-2I DC

## Specifications

Power supply	12–36V DC
Power consumption	Max 3W
Insulation	1000V
Fuse FI	1.6 A fast 5x20 mm

All other specifications according to MA-2I AC

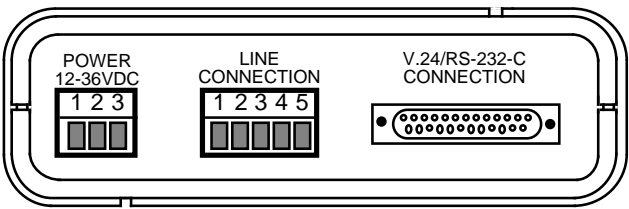
## Switch settings

According to MA-2I AC

## Connections

According to MA-2I AC, except power supply

Connection no.	Power Supply
1	– Voltage
2	+ Voltage
3	



## Hints

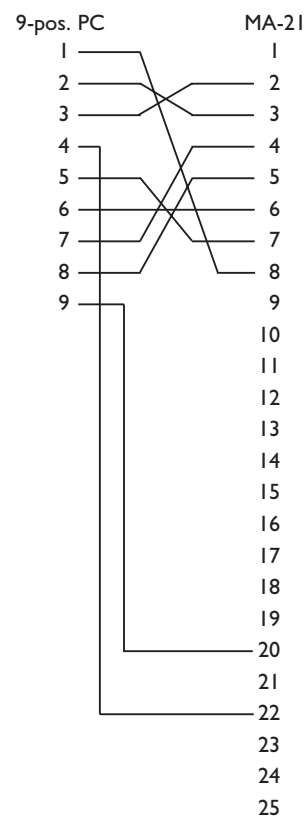
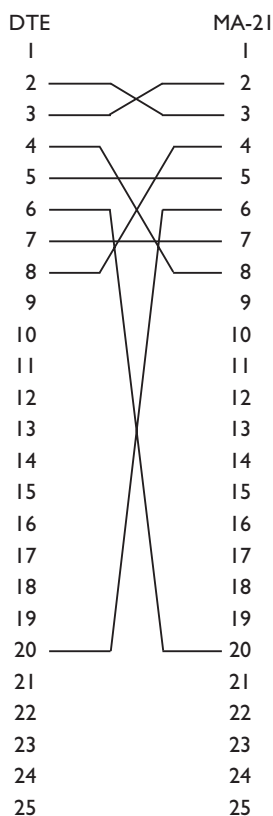
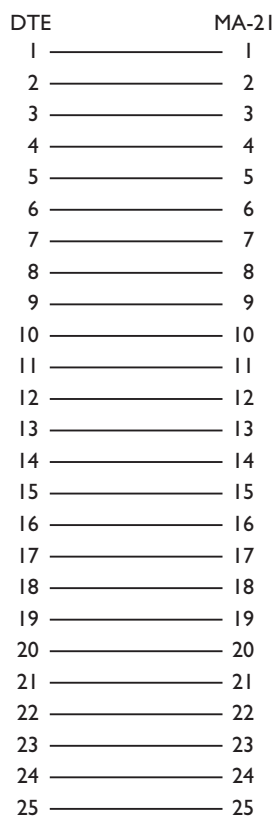
The 20mA current loop interface, or TTY as it is sometimes known, is a popular industrial communications standard. The system relies on a current generator running on both the transmit and receive circuits. On each circuit it is important to have only one current generator supplying current into that circuit. For this reason the MA-21 can have it's current generators set to be either active or passive. It is important to check the state of all attached equipment to ensure correct setting on the MA-21. The MA-21 has the same line interface as MD-21, MD-29 and are hence compatible.

The RS-232 interface is configured as DCE (Data Communication Equipment). Most printers, PC's and terminals are set as DTE (Data Terminal Equipment). Some recommendation of cable configurations are given below.

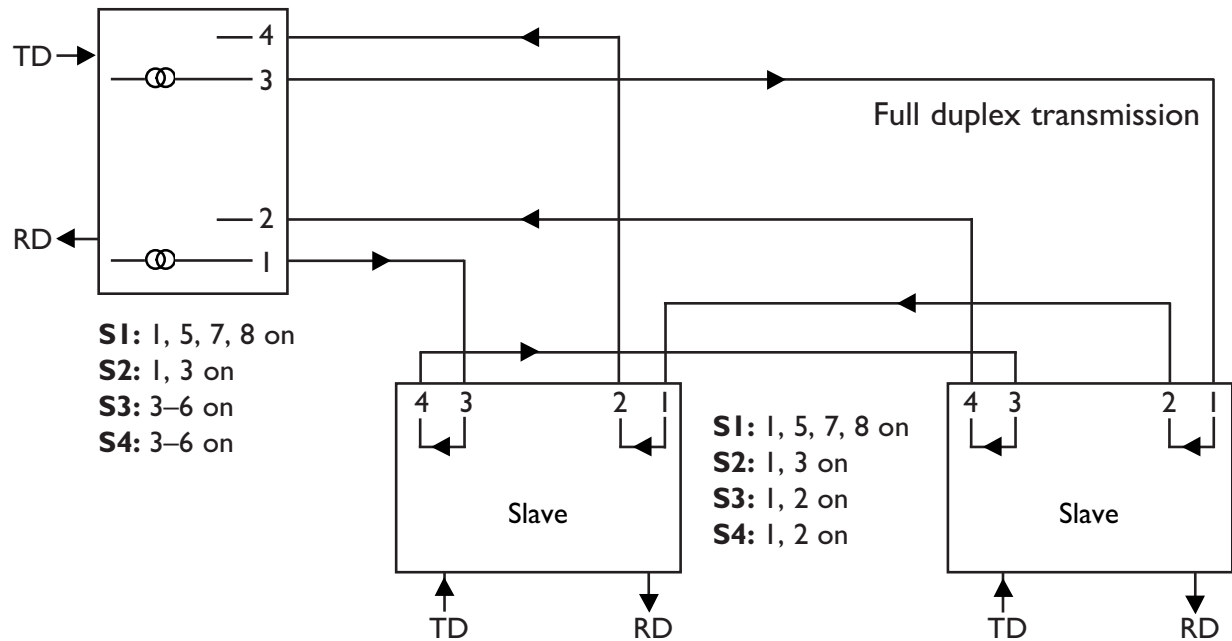
If any problems do occur on set up of the MA-21, the LED's will be helpful.

- PWR: The unit has power.
- RD: Data received on line interface.
- TD: Data received on RS-232 interface.

A good way to check the MA-21 is to carry out a loop back test. Ensure that either the transmitter or receiver are set to active, but not both active or passive. Connect T+ to R+ and T- to R-. Connect the RS-232 port to a terminal. When keys are pressed on the terminal you should receive the echo on screen. The TD & RD lights will both flicker simultaneously as you press the keys.

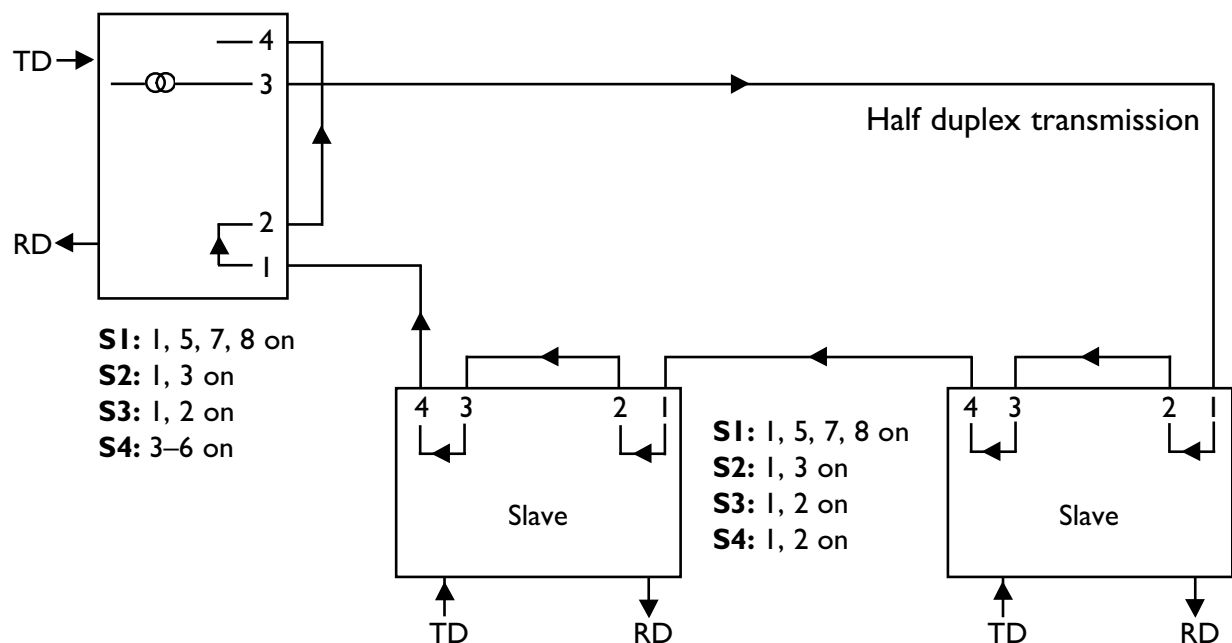


## Connecting the MA-2I in a current loop



### Functional description

The TD led flashes on the master when transmitting from it. The RD led flashes on the slaves. When transmitting from a slave the TD led flashes only on that unit. The RD led flashes only on the master modem.



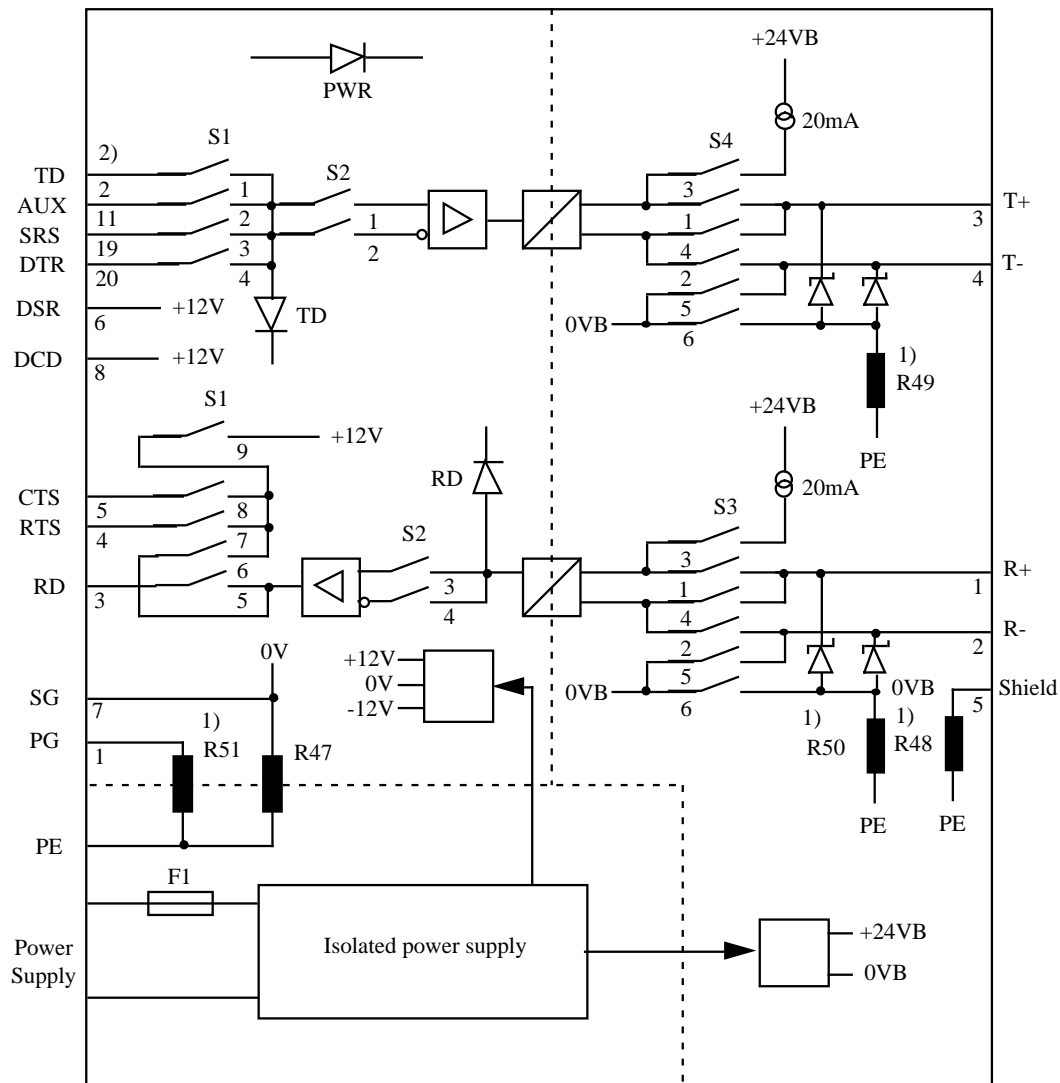
### Functional description

When transmitting from the master, RD and TD flash. RD flashes on the slaves. When transmitting from a slave both RD and TD flash. On the other slaves and the master RD flashes.

## Block diagram

V.24/RS-232

Line



- 1) 0  $\Omega$  resistors R48-R51 are normally not mounted.  
2) Metal housing on D-sub is connected to PE

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