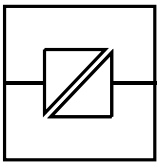
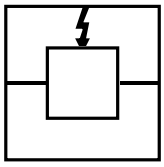
MA-49

# INSTALLATIONSANVISNING
# INSTALLATION MANUAL
# INSTALLATIONS ANLEITUNG

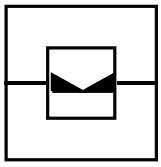
**6049-2001**



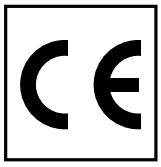
Galvanic Isolation



Transient Protection

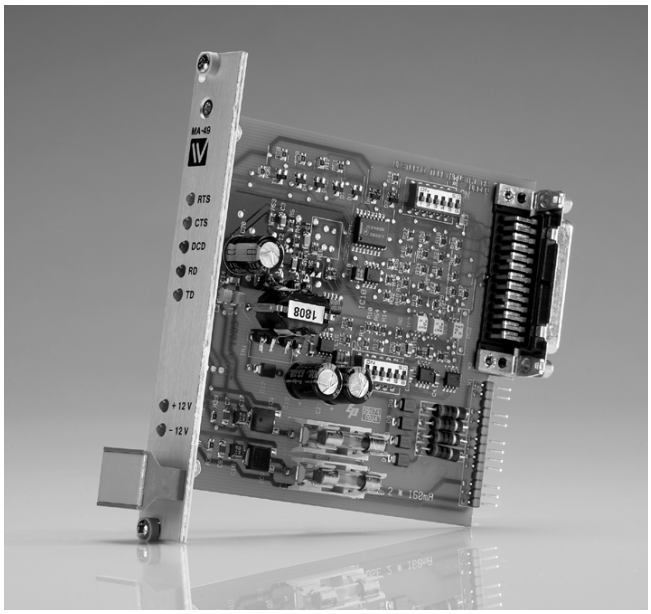


Balanced Transmission



CE Approved






***Omvandlare RS-232 – RS-422/485***
***Converter RS-232 – RS-422/485***
***Wandler RS-232 – RS-422/485***

westermo®
www.westermo.se

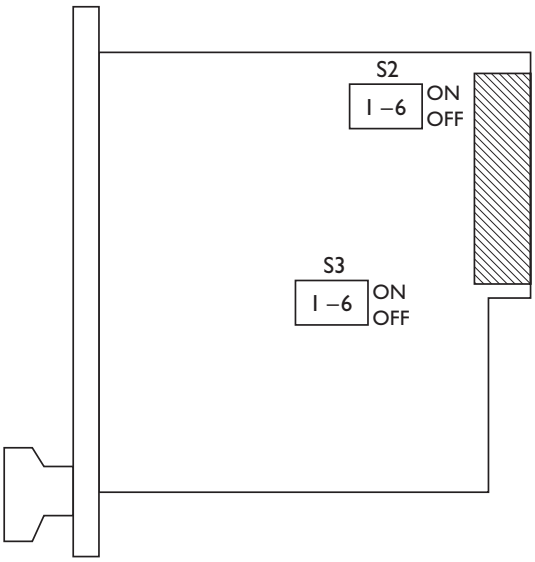
# Specifications

| | |
|---|---|
| **Transmission** | Asynchronous, full/half duplex or simplex |
| **Interface 1** | EIA RS-232-C/RS-423-A<br>ITU-T V.24/V.10<br>25-position D-sub female, DCE |
| **Interface 2** | EIA RS-422/RS-485/ITU-T V.11 |
| **Data rate** | Up to 100 kbit/s |
| **Indicators** | RTS, CTS, DCD, RD, TD<br>+12 V, –12 V |
| **Isolation** | Galvanic insulation with opto-coupler (data transmission) and transformer (supply) |
| **Isolation voltage** | 1 500 V |
| **Overvoltage protection** | Breakdown voltage transmitter and receiver 7 V.<br>Surge capacity 0.6 kW for 1ms. |
| **Power supply** | External through PS-02 mounted in rack RV-01.<br>±20 V DC ±20% |
| **Fuse** | 2x100 mA fast 5x20 mm |
| **Power consumption** | +20 V 70 mA, –20 V 80 mA |
| **Temperature range** | 5–50°C, ambient temperature |
| **Humidity** | 0–95% RH, non-condensing |
| **Dimensions** | 100x100 mm |
| **Weight** | 0.1 kg |
| **Mounting** | To be mounted in rack RV-01, takes one card slot. |

**NOTE!** Max 9 MA-49 with one power supply (PS-02) in rack RV-01.

# Switch settings

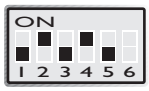
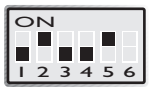
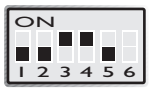
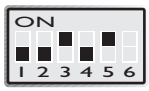
The MA-49 can through different switch settings be adapted to a variety of running conditions.



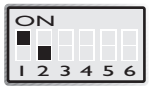

S2 Selection of signal activating the transmitter
Selection of signal controlling DCD
Selection of CTS delay

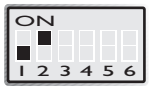
S3 Selection of termination with fail-safe 1)
Selection of 2- or 4-wire communication

## Selection of signal activating

| | | Transmitter activated by | CTS controlled by | DCD controlled by |
|---|---|---|---|---|
| S2 |  | RTS | RTS | RTS |
| S2 |  | RTS | RTS | Always high |
| S2 |  | DTR | DTR | DTR |
| S2 |  | DTR | DTR | Always high |
| S2 |  | Always active | Always high | Always high |
| S2 |  | Always active | Always high | Always high |

## Selection of 2-/4-wire

S3  4-wire

S3  2-wire

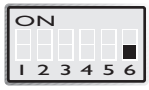
## Termination with fail-safe 1)

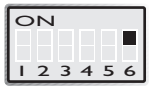
S3  Receiver termination (4-wire)

S3  Transmitter/Receiver termination (2-wire)

S3  No termination

## CTS delay

S2  0ms

S2  20ms

1) The fail-safe function forces the signal state of the receiver to OFF when the connected transmitter is in tri-state (transmitter inactive). The receiver located furthest away shall be terminated.

## Factory settings

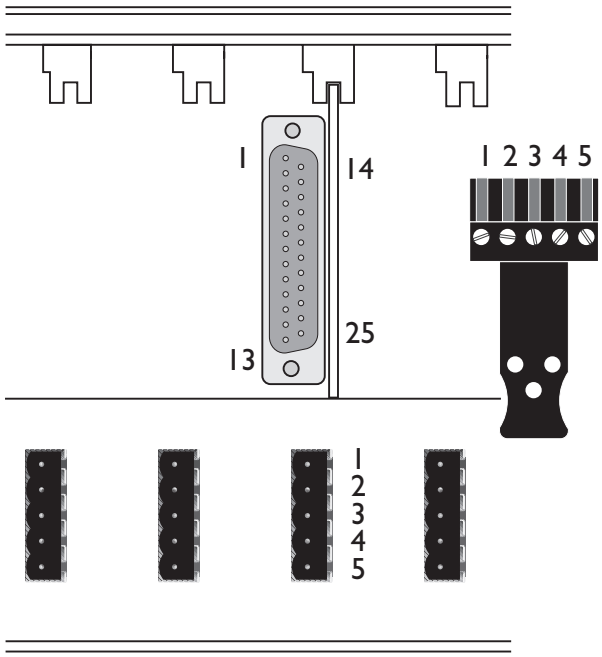
S2  S3 

# Connections

### Line connection
(5-position screw-terminal)

| Direction | Pin no. | CCIT V.11 Description |
|---|---|---|
| Receiver | 1 | A' (R+) |
| Receiver | 2 | B' (R-) |
| Transmitter | 3 | A (T+) |
| Transmitter | 4 | B (T-) |
| | | Shield |

The definations R+/R–, T+/T– can be various between different manufactures.



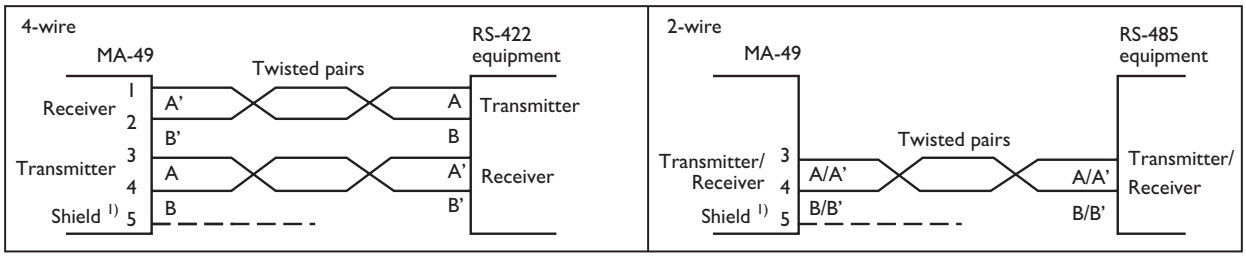

Look right for a section of rack RV-01 with one MA-49 mounted.
Terminal connection to a 25-position D-sub (female) connector on MA-49.
Line connection to a 5-position detachable screw-terminal, which is mounted on the male connector located at the rear of RV-01.

### Terminal connection (DCE)
(RS-232-C/V.24, 25-Position D-sub, female)

| Direction | Pin no. | ITU-T V.24 Circuit number | Signal name |
|---|---|---|---|
| **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** | 20 | 108/2 | DTR/Data Terminal Ready |

**I** = Input, **O** = Output MA-49

# Line connection




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

# Transmission range (interface 2)

Use twisted pair cable. Max transmission range 1 200 m. (cable specifications 0.3 $mm^2$ and capacitance 42 pF/m).
The transmission range will increase if a cable with lower capacitance and larger diameter is used. Use shielded cable in heavy industrial environments.

# Hints

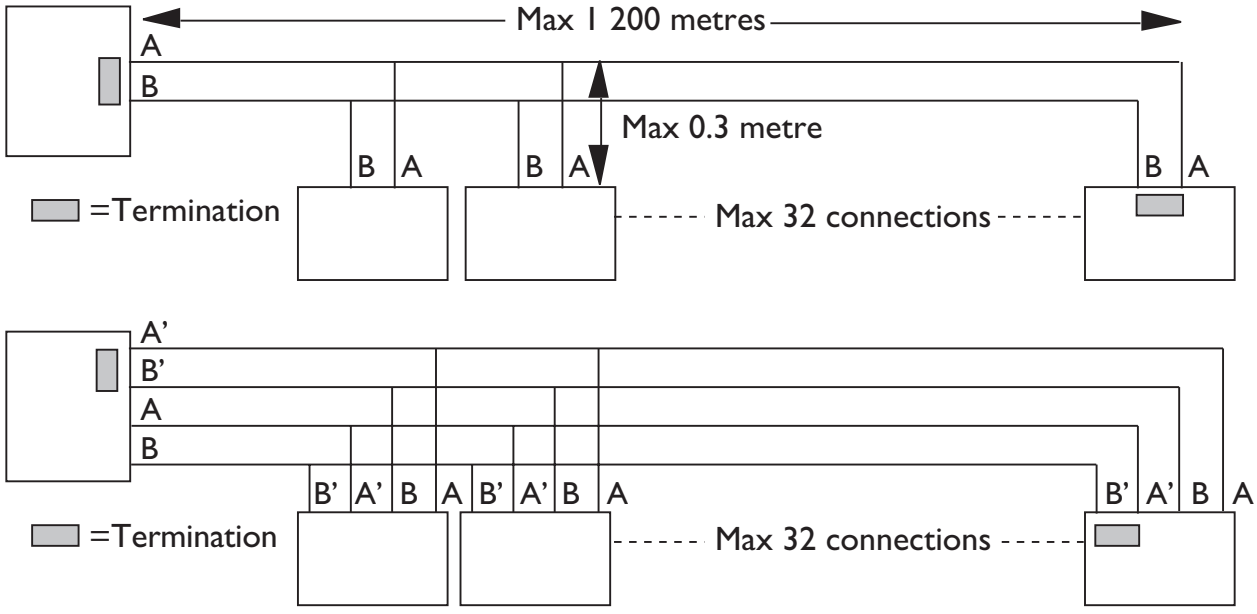
The MA-49 uses the RS-422/485 interface.
RS-422/485 was designed for multidrop applications. When a system is installed it should form a bus structure (see diagrams). Star shaped networks should never be created, there are other Westermo products designed to work in star net applications. To correctly install, an RS-422/485 network should be terminated at the correct points.

The recommendation is to terminate the receivers at both end of network.
See diagrams for details of how this is done with RS-485 (2 wire) and RS-422 (4 wire).

On 4 wire systems when the MA-49 is on a slave system, it's transmitter is linked to the same bus as all the other slave transmitters. A status signal (RTS or DTR) is used to control the MA-49's transmitter, to ensure only one slave is active on the bus at one time. The status signal is also used to control direction for RS-485 (2 wire) transmission.

If any problems do occur on set up of the MA-49, the LED's will be helpful.

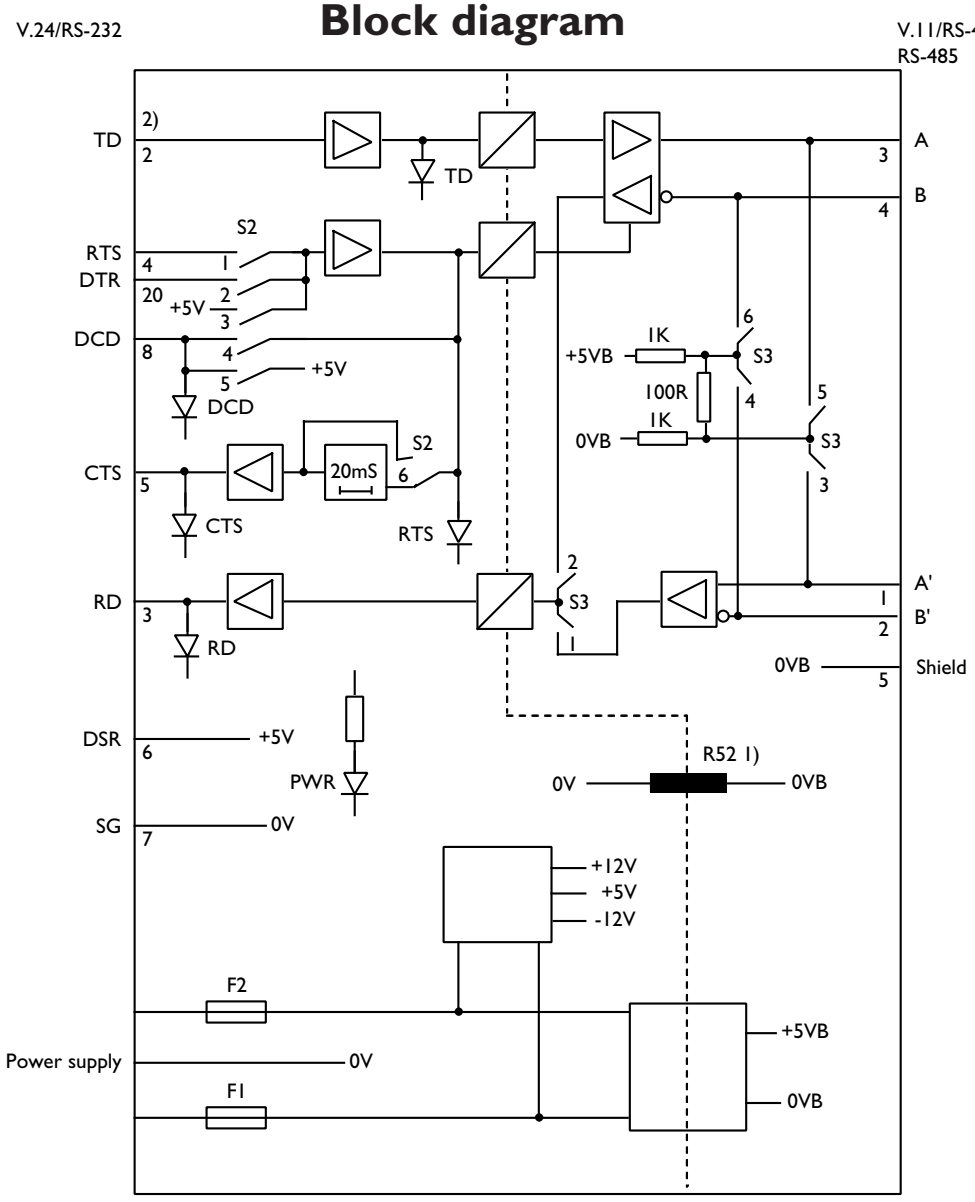
- RTS:Indicates that the RS-422/485 transmitter is activated.
- CTS: Follows RTS.
- DCD:Simulated carrier due to the setting of S2.
- RD:Data received on the RS-422/485 interface.
- TD:Data received on the RS-232 interface.
- +12V, –12V:Indicates positive and negative power supply respectivly.




**N.B.** R+/R–, T+/T– definitations are not standard, it can help to shift A and B if the unit not will work.

# OWN COMMENTS

# Block diagram




1) 0 Ω resistors R52 is normally not mounted.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