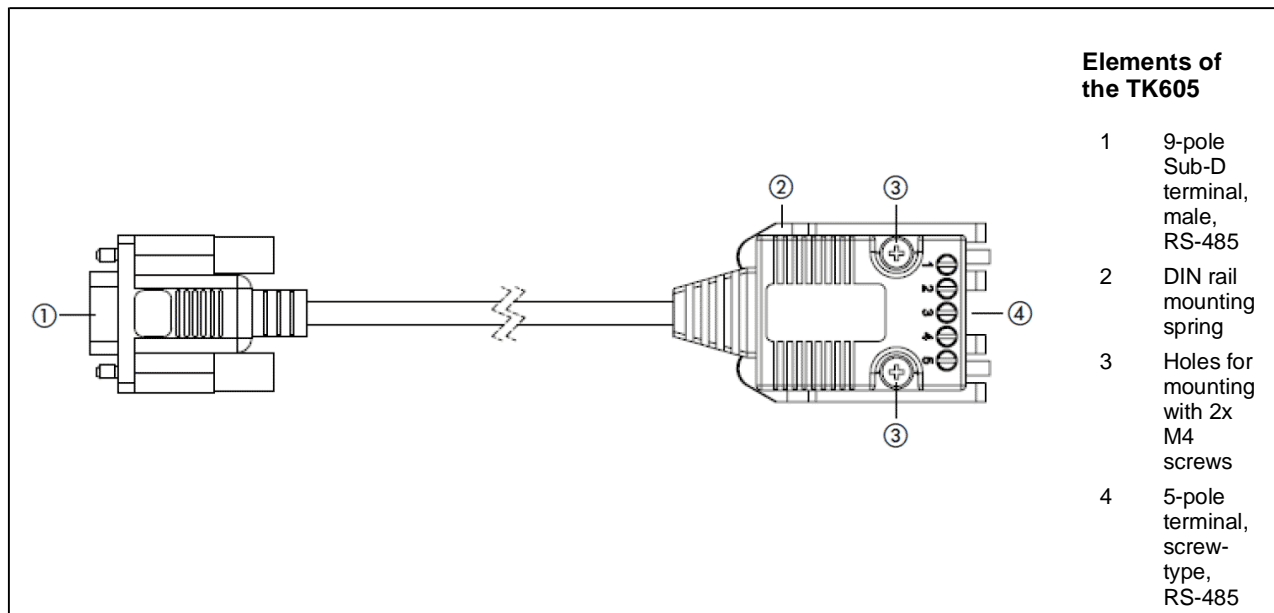


## TK506 RS-485 Isolator for COM1 of PM55x and PM56x CPUs

- Isolated side: 5-pole terminal
- PM5x4-side: SUB-D, 9-pin, male
- Length 0.6 m



### Contents

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### Intended Purpose

The RS485 Isolator TK506 for COM1 of CPU modules PM55x and PM56x allows longer cable length for serial communication. The product can be used for the communication protocols Modbus RTU or CS31 System Bus.

The RS-485 Isolator TK506 can only be used with PM55x and PM56x CPUs with version index A3 and higher. You can find this index on the type label on the right side of the CPU (see photo of type label below).

**NOTE**

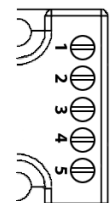
**ABB** PM554-T-ETH **A3**  
 1TNE968900R0110  
 Central Processing Unit 128kB ETHERNET  
 80I/6DO, Transistor, Ethernet  
 24VDC, 2.5W, 1xRS485  
 2x Opt.slot, Screw terminals  
 LISTED 90F1 IND. CONT. EQ.  
 1S5000200000002 1280 MAC: 00-24-59-02-00-49  
 Made in Taiwan

The isolator provides galvanic isolation of the RS-485 communication signals. It is supplied via the 3.3 V output of the COM1 interface of the CPU. The isolator automatically detects and follows serial data flow direction changes. It is adapted to communication speeds up to 187.5 kBaud.

### Electrical Connection

#### Interface

Pin No.	Signal	Description
1	Terminator P	Terminator positive
2	RxD/TxD-P	Receive/transmit positive
3	RxD/TxD-	Receive/transmit negative

	4	N Terminator N	Terminator negative
	5	FE	Functional earth (internally connected to DIN rail spring)

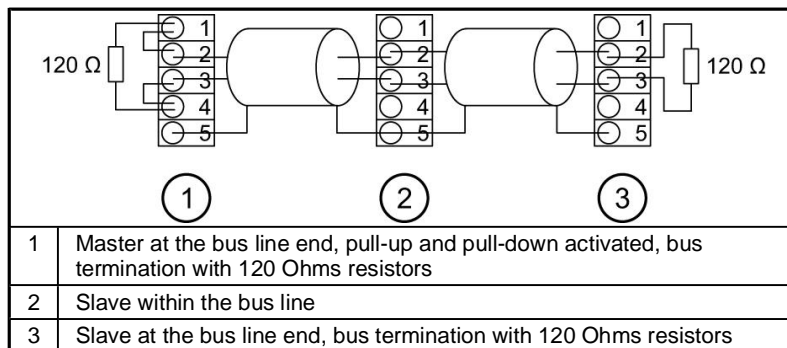
RS-485 communication requires an electrical termination of the communication line. The following is necessary:

- 2 resistors of 120 Ohms each at both line ends (to avoid signal reflections)
- a pull-up resistor at RxD/TxD-P and a pull-down resistor at RxD/TxD-N. These 2 resistors care for a defined high level on the bus, while there is no data exchange.

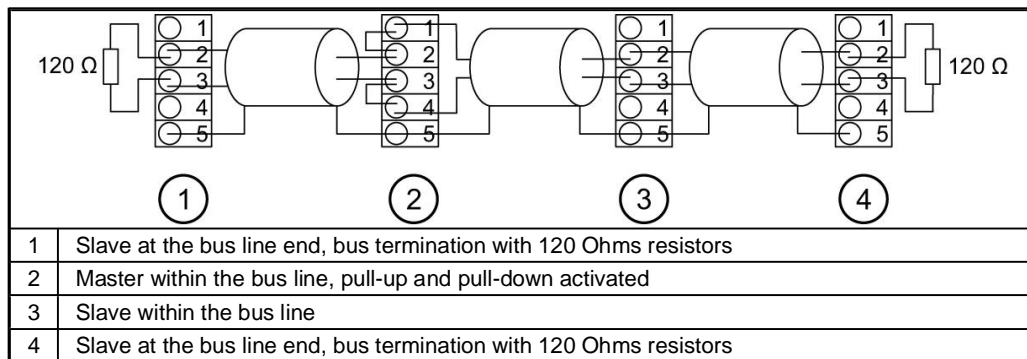
In every RS-485 network 1 pull-up and pull-down resistors must be activated. It is recommended to activate the pull-up and the pull-down resistors at the bus master. These 2 resistors are integrated inside the TK506 RS-485 isolator. They can be activated by connecting the terminals 1-2 and 3-4 of the terminal block with cable bridges.

### Modbus Protocol

The following figure shows an RS-485 bus with the bus master at the line end.



If the master is located within the bus line, it does not need a terminating resistor. The pull-up and the pull-down resistors, however, are necessary (see the following figure).



#### Risk of EMC disturbances!

Unshielded cables may cause EMC disturbances.  
Always use shielded cables and connect the shield at every device.



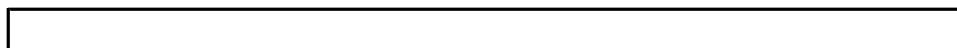
#### Risk of malfunctions!

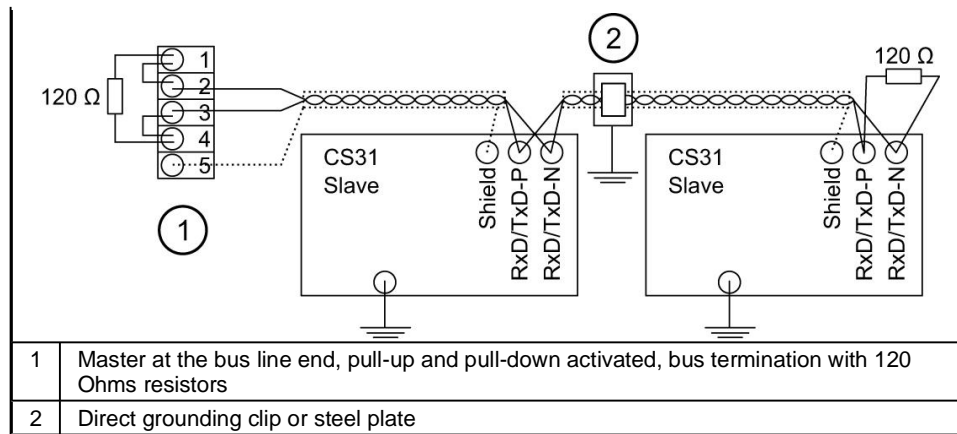
The pull-up resistors must be used only one time within a bus line.  
Use the pull-up resistors only at 1 master.

The cable shields must be grounded (see chapter [CS31 System Bus \(PM55x, PM56x\)](#) for more information).

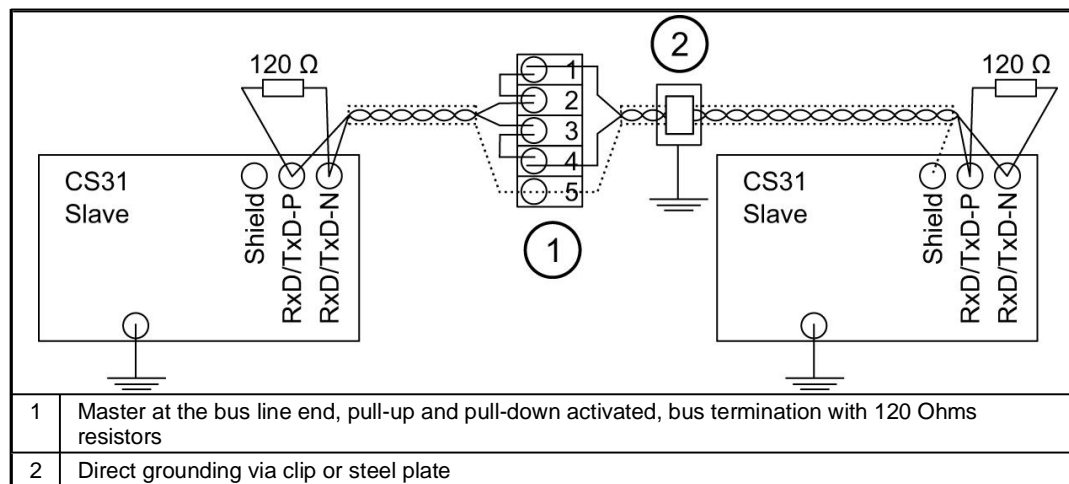
### CS31 Protocol

The following figure shows an CS31 Bus with the bus master at the line end.





If the master is located within the bus line, it does not need a terminating resistor. The pull-up and the pull-down resistors, however, are necessary (see the following figure).



#### Risk of EMC disturbances!

Unshielded cables may cause EMC disturbances.  
Always use shielded cables and connect the shield at every device.

CAUTION

## Technical Data

The [System Data of AC500 and S500](#) are valid here. Only additional details are therefore documented below.

Physical link	RS-485
Electrical Isolation	Yes
Usage / Supported protocols	Modbus (Master and Slave) CS31 (Master only)
Supported baudrates [baud]	
Modbus	9.6 k, 14.4 k, 19.2 k, 38.4 k and 187.5 k
CS31 System Bus	187.5 k
Connector at the communication line	5 pole screw terminal block
Connector at the CPU PM554 or PM564	SUB-D, 9-pin, male
Cable type and specification	Twisting rate minimum 10 per meter, with common shield Capacitance between the cores: < 55 nF/km Characteristic impedance: 120 $\Omega$
Recommended cable cross section	Conductor cross section 0.5 mm <sup>2</sup> Resistance per core: < 40 $\Omega$ /km
Thinnest cable cross section	Conductor cross section 0.22 mm <sup>2</sup> Resistance per core: < 100 $\Omega$ /km
Max. cable length for Modbus	
at 38.4 kBaud or below	1200 m with cable cross section 0.5 mm <sup>2</sup> or 400 m with cable cross section 0.22 mm <sup>2</sup>
at 187.5 kBaud	500 m with cable cross section 0.5 mm <sup>2</sup> or 400 m with

	cable cross section 0.22 mm <sup>2</sup>
Max. cable length for CS31 System Bus	500 m with cable cross section 0.5 mm <sup>2</sup> or 400 m with cable cross section 0.22 mm <sup>2</sup>
Specification for external termination resistor	120 Ω, 1 %, 0.25 W
Length	0.6 m
Weight	80 g

### Ordering Data

Ordering No.	Scope of delivery
1SAP 186 100 R0001	TK506, RS-485 Isolator D-SUB/5-pole terminal

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