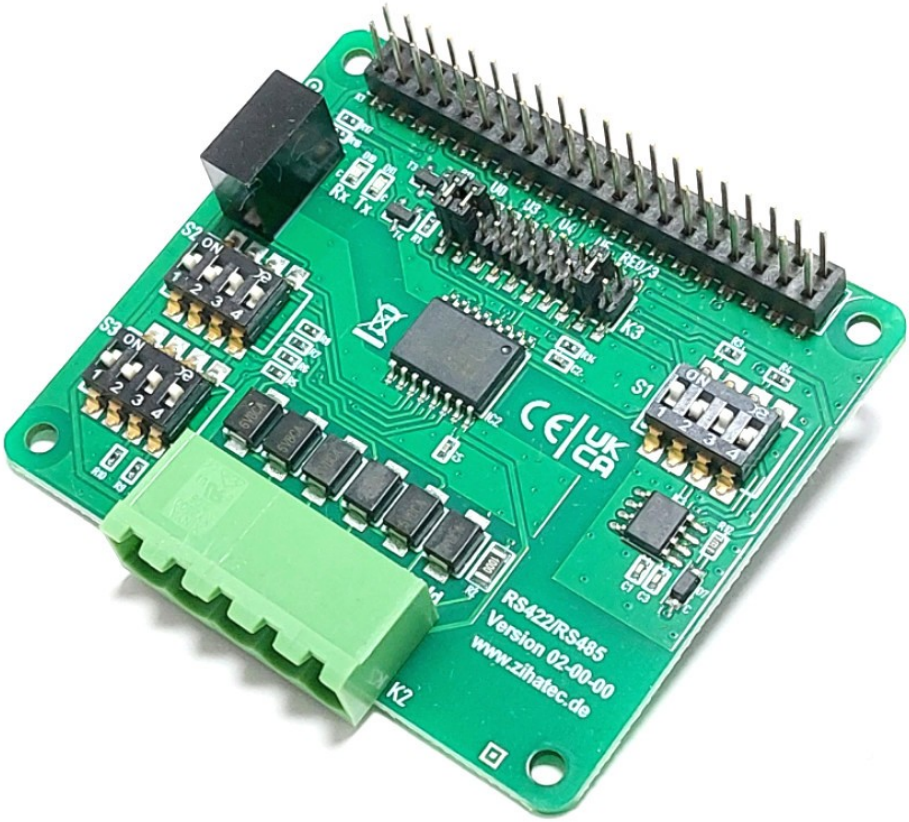
RS422/RS485 Shield

for Raspberry Pi



Features:

- RS485 mode (half duplex)
- RS422 mode (full duplex)
- galvanic isolation between Raspberry Pi and connected RS485 bus
- Enhanced ESD protection
- adjustable automatic transceiver switching for RS485 mode
- adjustable control of transceiver/receiver via GPIO pin
- adjustable Pull-Up, Pull-Down und terminating resistors
- removable block terminal for bus connection
- Indicator LEDs for RX and TX signals
- many options adjustable via DIP switches
- UART selection via Jumper
- Stacked header

Electrical Characteristics:

- Max. Datarate: 500-Kbps
- Number of nodes: 256
- ESD: 4 kV (IEC 61000-4-4) / 16kV (IEC 61000-4-2)
- Isolation Rating: 5000 Vrms
- Working Voltage: 1500 Vpk
- Operating Temp.: 0°C to 80°C
- Power Consumption: 6mA (3,3V) / 28mA (5V)

Compatibility :

Raspberry Pi B+, 2 B, 3 B, 3 B+

Raspberry Pi 4 B, Pi 5 B

Raspberry Pi A+, 3 A+

Raspberry Pi Zero (w / 2)

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Part number table:

Part-No.	EAN	Version
RPIHT485S	676424951367	With **stacked** header

A version with standard header is no longer offered from version 02-0x for production reasons

Used Raspberry Pi Pins:

Depending on the selected UART via jumper K3 different pins are used:

Function	UART0	UART3	UART4	UART5
GND	PIN 6, 9, 14, 25, 39			
3,3V	PIN 1			
5V	PIN 2, 4			
TX_EN	GPIO18 (12) or GPIO6 (31)			
TX	GPIO14 (8)	GPIO4 (7)	GPIO8 (24)	GPIO12 (32)
RX	GPIO15 (10)	GPIO5 (29)	GPIO9 (21)	GPIO13 (33)

Applications:

- Smart Home
- Building Control
- Industrial Control
- Lighting Control
- Video Surveillance
- Door Access

Protocols:

- Modbus
- DMX
- NMEA0183
- Profibus
- etc

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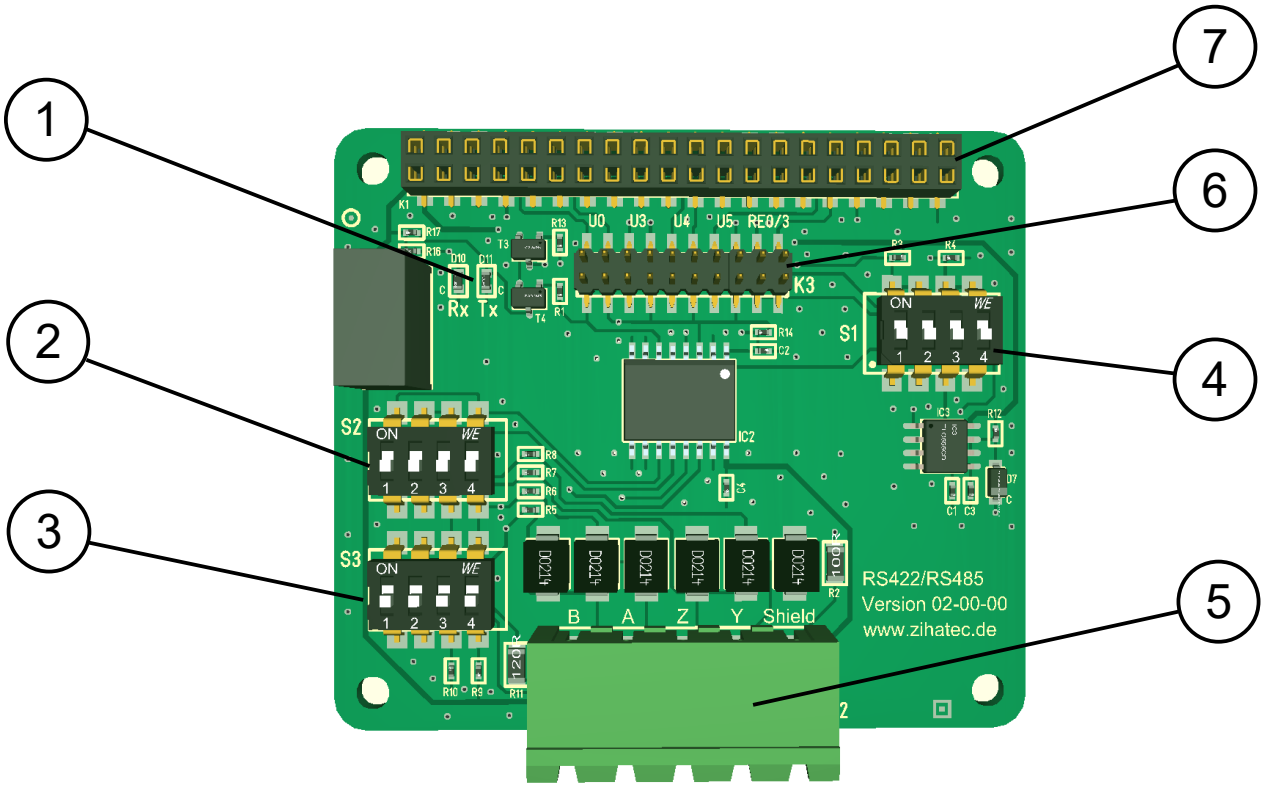
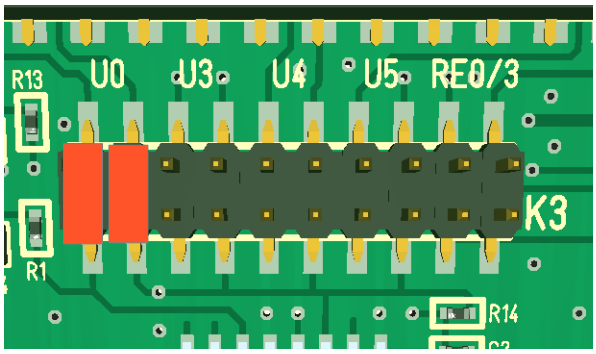
Control Elements:



① Indicator LEDs
② DIP Switch S2
③ DIP Switch S3
④ DIP Switch S1
⑤ Header for removable terminal block
⑥ Jumper K3 for UART configuration
⑦ Header for Raspberry Pi (on backside)

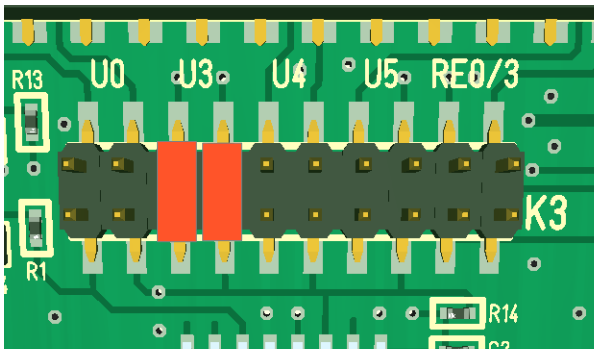
UART configuration via Jumper K3:

When using a Raspberry Pi 4 or Pi5, other UARTs can be selected Alternatively via jumper K3 besides UART0:



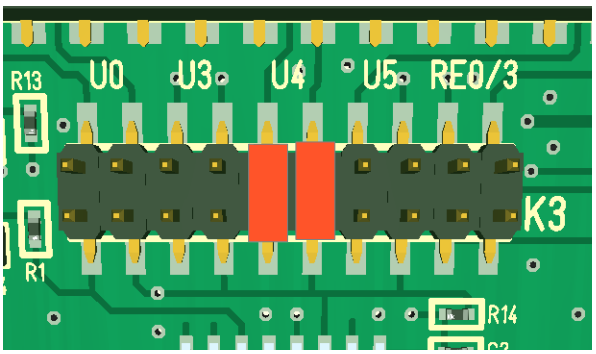
UART0 – default

(for all Raspberry Pi models,
Not recommend for Pi5)



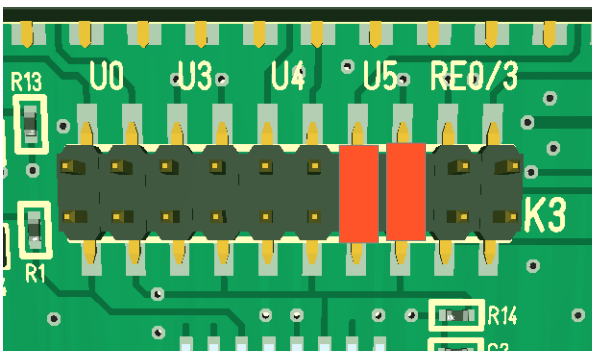
UART3 (Raspberry Pi 4 only)

UART2 (Raspberry Pi 5 only)



UART4 (Raspberry Pi 4 only)

UART3 (Raspberry Pi 5 only)

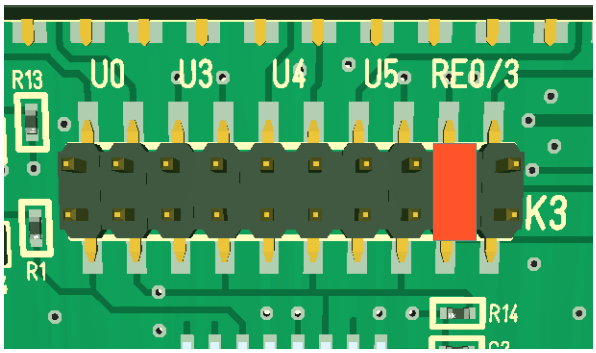


UART5 (Raspberry Pi 4 only)

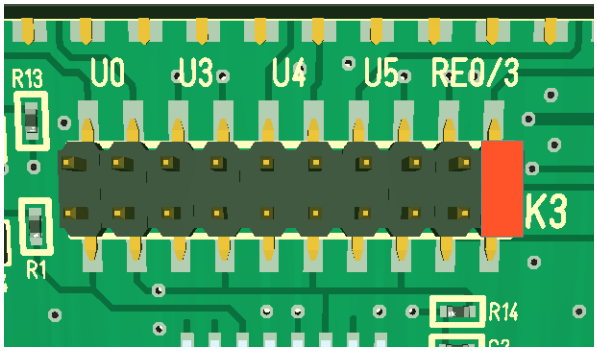
UART4 (Raspberry Pi 5 only)

configuration of TX control pin via Jumper K3:

The GPIO18 or GPIO6 can be used to switch the interface between receive mode (GPIO is LOW) and transmit mode (GPIO is HIGH) via software. We recommend using the automatic switchover, but in some cases it may be useful to carry out this switchover under program control.



TX control via GPIO18



TX control via GPIO6

Please note that the HAT must also be configured for manual switching via DIP switch S1 for this jumper setting to have an effect.

S1 - DIP Switch Configuration – send/receive control:

Channel	Description
1	Receiver always on
2	Transmitter connected to Receiver
3	Automatic DE/RE control
4	DE/RE control via GPIO18

S2 - DIP Switch Configuration – RS422/485 mode:

Channel	Description
1	Connect Y to terminal K2
2	Connect Z to terminal K2
3	Connect internally Y to A
4	Connect internally Z to B

S3 - DIP Switch Configuration – termination resistors:

Channel	Description
1	Terminating Resistor on
2	Not used
3	4k7 Pull-down Resistor on B
4	4k7 Pull-up Resistor on A

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Example RS422 mode:

SW1	
1	ON
2	OFF
3	OFF
4	ON *

SW2	
1	ON
2	ON
3	OFF
4	OFF

SW3	
1	ON
2	OFF
3	ON
4	ON

Examples RS485 mode:

Send/receive control via GPIO18 or 6, no terminating resistor

SW1	
1	OFF
2	ON
3	OFF
4	ON *

SW2	
1	OFF
2	OFF
3	ON
4	ON

SW3	
1	OFF
2	OFF
3	ON
4	ON

automatic send/receive control, terminating resistor on

SW1	
1	OFF
2	ON
3	ON
4	OFF

SW2	
1	OFF
2	OFF
3	ON
4	ON

SW3	
1	ON
2	OFF
3	ON
4	ON

* Set GPIO18 or GPIO6 to high level to transmit protocols