RS422/RS485 HAT

Application Note: How to use DMX512/RDM

1 Introduction

The RS422/RS485 HAT for the Raspberry Pi can be used for lighting controls via DMX512 bus. In DMX512 bus systems RS-485 is used as the physical layer.
Our RS422 / RS485 Serial HAT is a fully galvanic isolated serial communication HAT designed for use with the Raspberry Pi and the perfect choice for such kind of applications.
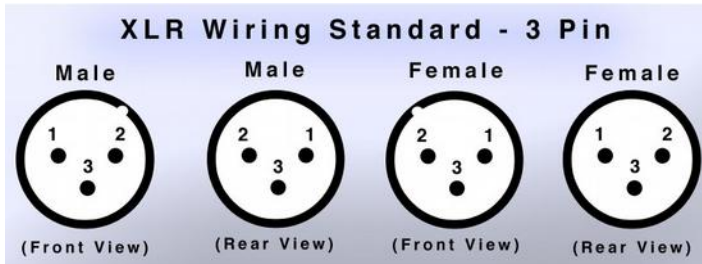
2 Bill of Material

- Raspberry Pi B+, B2 or B3
- RS422/RS485 serial HAT (available in our webstore)
- 5pole XLR connectors (male & female) for professional use
- 3pole XLR connectors (male & female) for semi professional use
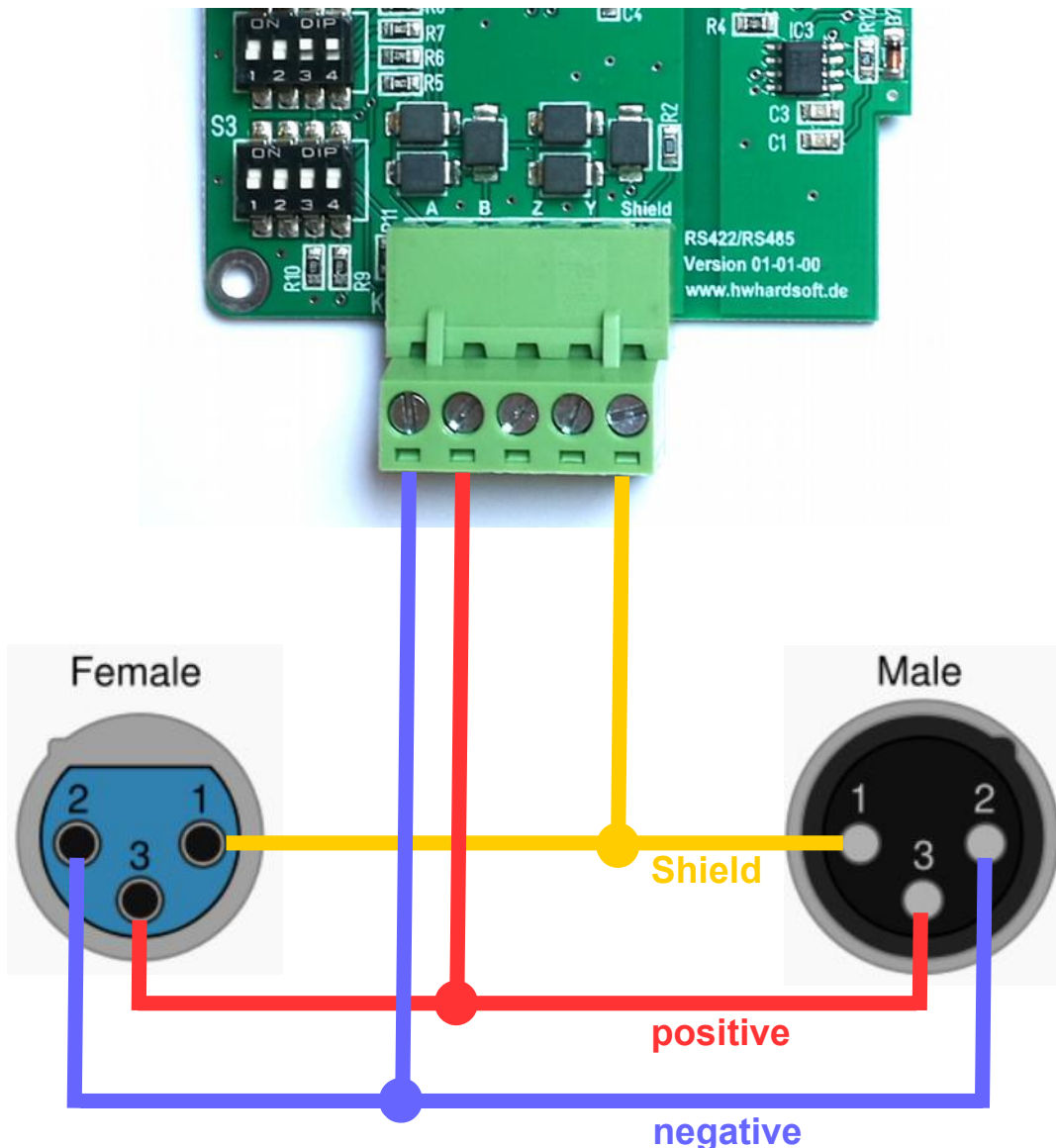- hook-up wires

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3 Wiring of RS422/RS485 HAT and 3pole XLR

Pin 1: Shield / Ground
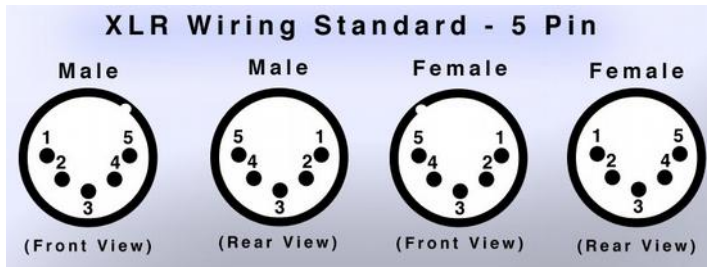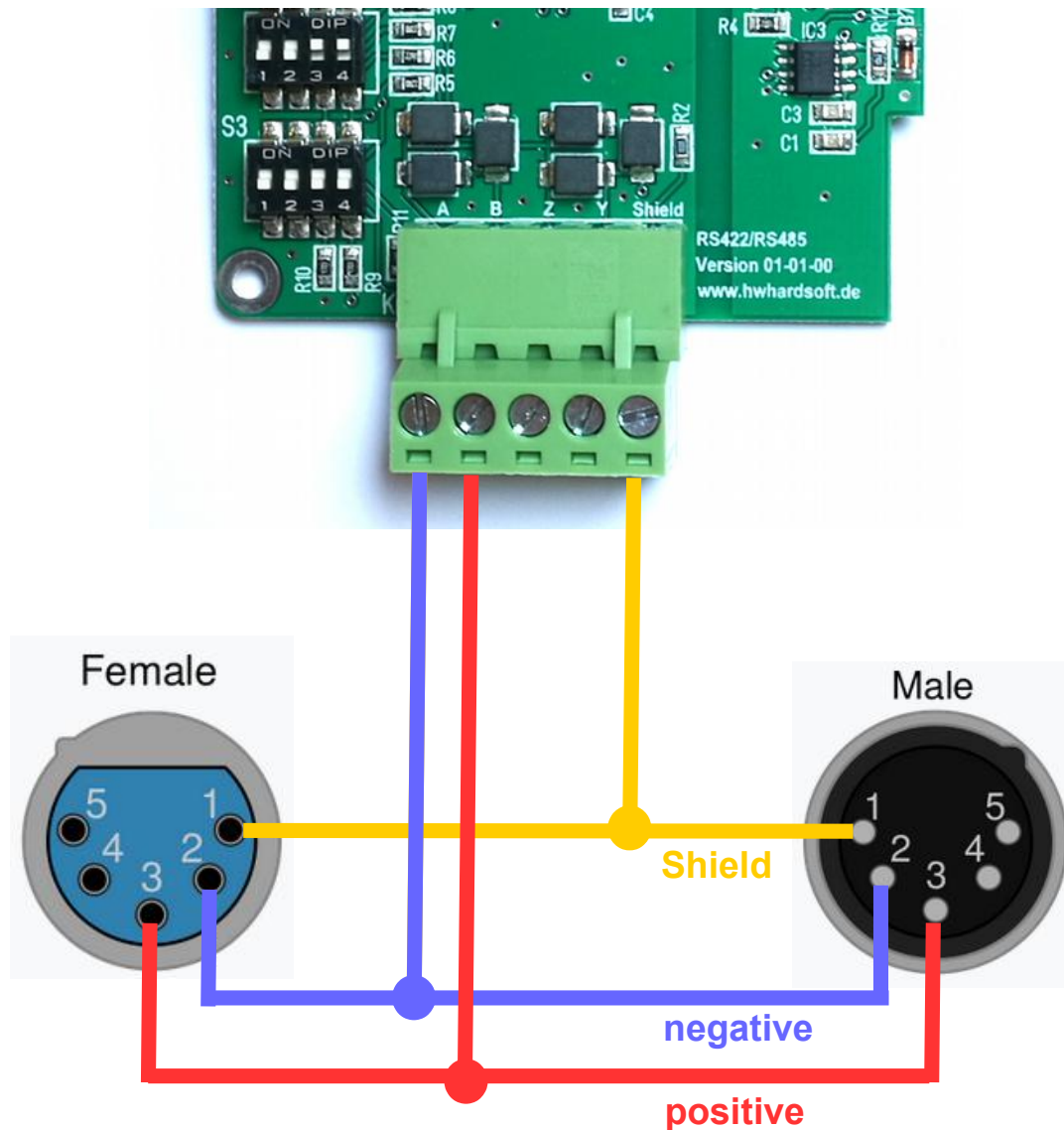Pin 2: Negative
Pin 3: Positive

4 Wiring of RS422/RS485 HAT and 5pole XLR

Pin 1: Shield (Common)
Pin 2: DMX 1 Negative
Pin 3: DMX 1 Positive
Pin 4: DMX 2 Negative
Pin 5: DMX 2 Positive

5 DIP Switch Settings

The transmitting / receiving direction have to be controlled by GPIO18:

SW1	
1	OFF
2	ON
3	OFF
4	ON

SW2	
1	OFF
2	OFF
3	ON
4	ON

Depending of the position of the RS422/RS485 HAT in the DMX512 bus line you have to switch the terminating resistor ON or OFF. Please switch the resistor to ON position only if the HAT is on one end of the bus line. In all other cases switch the terminating resistor OFF:

SW3	
1	ON/OFF
2	OFF
3	OFF
4	OFF

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6 Free up Serial Line and Enable UART

Preventing Linux from using the serial port

http://elinux.org/RPi_Serial_Connection#Preventing_Linux_using_the_serial_port

Update : raspi-config -> 5 Interfacing Options ; Yes , No

Enable UART PL011

Add the following lines to the `/boot/config.txt`

```
# OLA UART DMX Output
dtoverlay=pi3-disable-bt
init_uart_clock=16000000
```

reboot

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7 Software for DMX512 & RDM

You will find tutorials and software packages for the Raspberry Pi
On www.raspberrypi-dmx.org

The RS422/RS485 HAT can be used with the OLA UART native
DMX plugin (DMX output only). Baremetal implementation
(full DMX512/RDM support) is successfully tested with:

Raspberry Pi Art-Net 3 ->DMX Out

http://www.raspberrypi-dmx.org/raspberry-pi-art-net-dmx-out

Raspberry Pi DMX Real-time Monitor

http://www.raspberrypi-dmx.org/raspberry-pi-dmx-real-time-monitor

Raspberry Pi RDM Responder

http://www.raspberrypi-dmx.org/raspberry-pi-rdm-responder