

# Port Powered RS-232/485 Converters

Models 4WSD9R, 4WSD9TB

B+B SMARTWORX

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## PRODUCT FEATURES

- Change RS-232 TD and RD to RS-485 signals
- Extend RS-232 data signals up to 1.2 km (4,000 ft.)
- Automatic Send Data Control
- Baud rates up to 115.2 kbps
- RS-232 port power or external 12 VDC power jack
- Dipswitch selectable RS-422 or RS-485

Models 4WSD9TB and 4WSD9R, universal serial converters, provide RS-232 to RS-422/RS-485 conversion using either port-power or an external power supply. Model 4WSD9TB has a terminal block RS-485 connector; Model 4WSD9R has a DB9 female RS-485 connector.

Data is converted in both directions, RS-232 Transmit Data is converted to balanced RS-422 or RS-485 Transmit Data. Received RS-422/485 signals are converted to RS-232. Unlike converters which require programming hardware handshaking signals to control RS-422 or RS-485 operation, Models 4WSD9TB and 4WSD9R provide automatic Send Data Control. In RS-485 mode, the RS-485 driver is enabled by circuitry which senses the RS-232 TD input. In half-duplex RS-485 mode, the receiver is enabled when not transmitting. For full-duplex operation, the receiver is set always enabled.

In RS-422 mode, the transmitter and receiver are always enabled. The operating mode is set with 4 switches see **Table 1**. The converters are powered by the RS-232 signal lines whether they are set high or low. If not enough power is available from the port, or no handshaking lines are available, a DC jack is provided to connect an external 12VDC supply. The DB9 female connector for RS-232 is wired as DCE (like a modem).

Table 1. RS-422/485 PINOUT

PIN #	SIGNAL
2	RD (A)-
3	TD (B) +
4	GND
6	GND
7	RD (B)+
8	TD (A)-

No external power is required if two RS-232 output handshake lines are available and the cable run is short. If the handshake lines are raised and no termination is used, the power efficiency is greatly increased. Less than 3 mA is required to operate the converter - plus the load current. For applications that do not have handshake lines or require a large load current, power may be externally supplied with a +12 VDC power supply with a 2.5mm plug (tip positive).

## ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR (DCE)	RS-485 CONNECTOR	OUTPUT	OPTIONAL POWER SUPPLY
4WSD9R	DB9 Female	DB9 Female	RS-485 2 or 4-wire or RS-422	✓
4WSD9TB	DB9 Female	Terminal Block	RS-485 2 or 4-wire or RS-422	✓

## ACCESSORIES

**SMI6-12-V-P230-C1** - Power Supply, 12 VDC 6 Watt, 2.5MM Plug, International AC Input, International AC Blades

**9PAMF6** - DB9 male to DB9 female adapter cable, 1.8 m (6 ft.)

The RS-232 port has a female DB9 connector with pins 2 (RD), 3 (TD), and 5 (Signal Ground) supported. Pins 7 (RTS) and 8 (CTS) are tied together, and pins 6 (DSR), 1 (DCD), and 4 (DTR) are also tied together. Any incoming data lines in either the high or low state are used to port power the converter. The more handshake lines available, the more likely the unit can be port powered. **Table 2** shows the RS-232 pinout.

Table 2. RS-232 PINOUT

PIN #	SIGNAL
1	DCD
2	RD
3	TD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

Although handshake lines can be used to power the converter, no handshaking is required to control the RS-422/RS-485 driver. With Switch 1 set to RS-422, the driver is always enabled. When Switch 1 is in the RS-485 position, the RS-485 driver is automatically enabled during each spacing state on the RS-232 side. During the marking or idle state, the RS-485 driver is disabled and the data lines are held in the marking state by the 4.7K Ohm pull-up and pull-down resistors. The value of these resistors may need to be changed to a different value when termination is used in order to maintain the proper DC bias during the idle state.

All product specifications are subject to change without notice.  
4WSD9R\_4WSD9TB\_3417ds

# Port Powered RS-232/485 Converters

Models 4WSD9R, 4WSD9TB



## SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-232	
Connector	4WSD9R: DB9 female 4WSD9TB: DB9 female
Signals / Port Power *	RD, TD, GND supported. Pins 7 (RTS) and 8 (CTS) are tied together. Pins 6 (DSR), 1 (DCD), and 4 (DTR) are tied together.
RS-422/485	
Connector	4WSD9R: DB9 female 4WSD9TB: Terminal block
Biasing Resistors	4.7k Ohms
Signals	TDA (-), TDB (+), RDA (-), RDB (+), GND
Termination	None
Operation	Dipswitch selectable RS-422 or RS-485 4WSD9R: RS-485 2 or 4-wire or RS-422 4WSD9TB: RS-485 2 or 4-wire or RS-422
POWER	
Source	Port-powered: from RS-232 handshake lines. External 12 VDC power supply, optional.
* Port-Power	Port-powering requires 7 to 12 VDC supplied on at least one handshake line.
Power Connector	2.5 mm plug (tip positive)
Input Voltage	12 VDC

MECHANICAL	
Dimensions,	4WSD9R: 7.8 x 4.3 x 2.0 cm (3.0 x 1.6 x 0.8 in) 4WSD9TB: 9.0 x 4.3 x 2.3 cm (3.6 x 1.7 x 0.9 in)
Enclosure	Plastic, Inline
Weight	4WSD9R: 49 g (0.10 lbs.) 4WSD9TB: 50 g (0.11 lbs.)
MTBF	4WSD9R: 880179 4WSD9TB: 345242
MTBF Calc. Method	Parts Count Reliability Prediction
ENVIRONMENTAL	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	-40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 - 95% Non-condensing
DECLARATION OF CONFORMITY - 4WSD9R	
FCC, CE	
Directives	2014/30/EC - Electromagnetic Compatibility Directive 2011/65/EU - Reduction of Hazardous Substances Directive (RoHS) 2012/19/EU - Waste Electrical and Electronic Equipment (WEEE)
EMC Standards	EN55032 - Information Technology Equipment - Class B RF Emissions EN55024 - Information Technology Equipment - Immunity (Light-Industrial Environments)
DECLARATION OF CONFORMITY - 4WSD9TB	
FCC, CE	
Directives	2014/30/EC - Electromagnetic Compatibility Directive 2011/65/EU - Reduction of Hazardous Substances Directive (RoHS) 2012/19/EU - Waste Electrical and Electronic Equipment (WEEE)
EMC Standards	EN55022:2010+AC - Information Technology Equipment - Class B RF Emissions EN55024 - Information Technology Equipment - Immunity (Light-Industrial Environments) EN61000-4-2 - ESD Immunity EN61000-4-3 - Radiated Immunity EN61000-4-4 - EFT/Burst Immunity EN61000-4-6 - RF Conducted Immunity