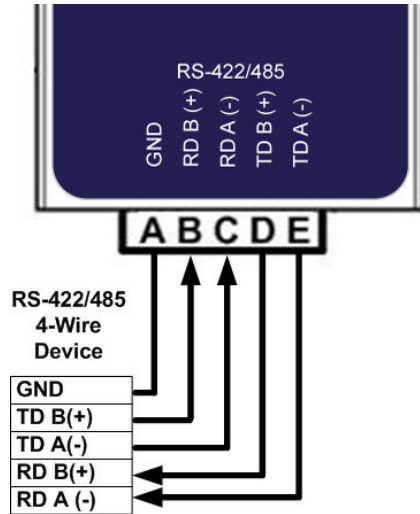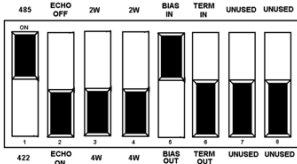## 6 | Wiring Examples: RS-422 4-Wire & RS-485 4-Wire
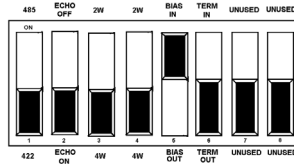
1. In this example, the converter is set up to use internal bias and no termination.

RS-485 4-Wire DIP Switch   **RS-422 4-Wire DIP Switch**

7 | Bias & Termination

1. The circuit can be biased using the built in 1 kΩ pull-up and pull-down resistors. This is controlled with DIP Switch Position 5. The default setting is ON (bias resistors "in.")

a. When an RS-485 network is in an idle state, all nodes are in listen (Receive) mode. Under this condition, there are no active drivers on the network. All drivers are tri-stated. Without anything driving the network, the state of the line is unknown. If the voltage level at the receiver's A and B inputs is less than ±200mV, the logic level at the output of the receivers will be the value of the last bit received. In order to maintain the proper idle voltage state, bias resistors must be applied to force the data lines to the idle condition.

2. If Termination is necessary on the receive lines, a built in 120 Ω resistor can be switched in using DIP Switch Position 6. In most cases, termination is not required. The default setting is OFF (termination "out".)

a. Termination is used to match impedance of a node to the impedance of the transmission line being used. Termination increases load on drivers, increases installation complexity, changes biasing requirements and makes system modification more difficult. Generally, termination should only be used for long distances. "If in doubt, leave it out."

8 | Loop-back Test/Troubleshooting

☐ Configure for RS-485 4-wire.
☐ Jumper terminals B to D and C to E.
☐ Connect a PC to the RS-232 port.
☐ TD and RD LED's are ON when power is applied.
☐ Using hyper terminal or similar program, connect to the appropriate COM port. Turn off hyper terminal local echo.
☐ Transmit data. The same data should be returned. When data is sent and looped back, the TD and RD LED's blink On and Off indicating data flow.

+ Recommended Accessories

12V DC, 6W, Int'l AC Input, Stripped/Tinned Power Supply
#SMI6-12-V-ST

10-30V DC, 2.5W Power Supply
#MDR-40-24

DIN Rail Adapter Clips
#DRAD35 (pair)

+ QUICK START GUIDE

RS-232 to RS-422/485 Industrial Converters

SCP211-DFTB3, SCP211T-DFTB3 or SCP311T-DFTB3

Before you begin, be sure you have the following:

+ SCPx11x-DFTB3 Converter
+ Quick Start Guide (included)
+ 10-30V DC, 2.5W Power Supply (not included)

B+B SmartWorx
Powered by **ADVANTECH**

*Fast and easy on the web:* **www.advantech-bb.com**

Product Overview

1 | Specifications & Compliances

SCP211-DFTB3 - Non-isolated, standard temperature
SCP211T-DFTB - Non-isolated, wide temperature
SCP311T-DFTB3 - 2kV isolation, wide temperature

UL Installation Information:
- One Conductor Per Terminal
- Use Copper Wire Only
- Wire Size: 28 to 16 AWG
- Tightening Torque: 5 KG-CM
- Wire Temperature Rating: 105 °C Minimum (sized for 60 °C Ampacity)
- Surrounding Ambient Air Temperature: 80 °C max.

## 2 | Control & Indicators
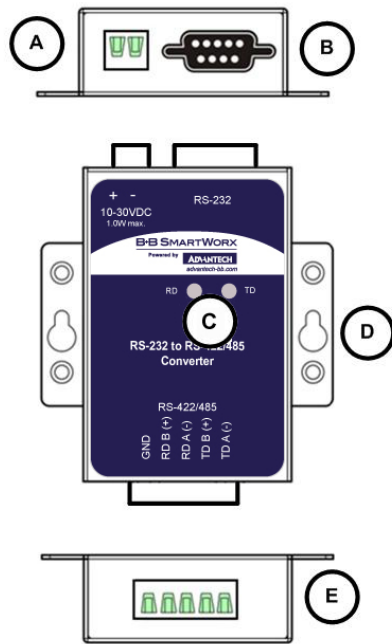
PRODUCT FEATURES

A	Power Terminal Block	2-position, removable
B	DB9 Female	RS-232 (wired DCE)
C	Data LEDs	Green - ON when power is applied. Blinking to indicate data flow.
D	Mounting Ears	Use for panel mounting. (Use #DRAD35 adapter clip for DIN rail mounting.)
B	RS-422/485 TB	5-position, removable
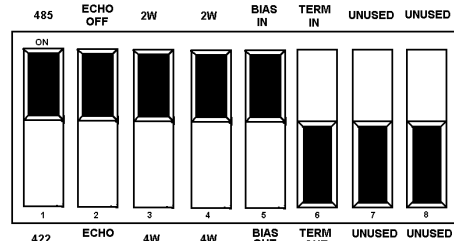
8-Position DIP Switch - located on back
(Shown in default configuration.)
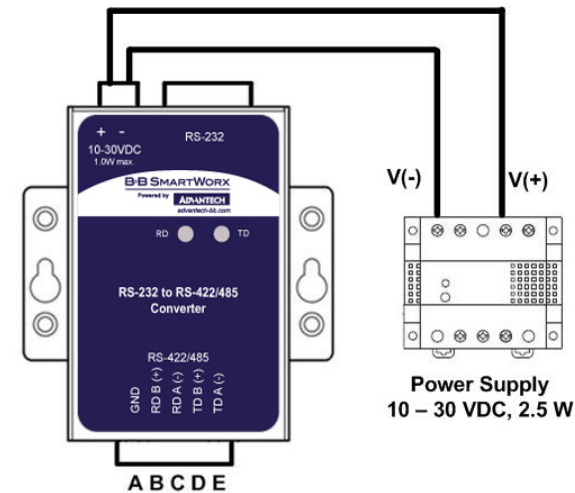
3 | Pinouts & Terminal Identification

DB9 Female Connector
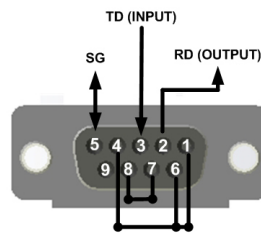
Pins 1, 6, & 4 are tied together internally.
Pins 7 & 8 are tied together internally.

DCE (DB9 FEMALE)

PIN	SIGNAL	DIRECTION
1	DCD	–
2	RD	Output
3	TD	Input
4	DTR	–
5	GND	–
6	DSR	–
7	RTS	–
8	CTS	–
9	RI	–

Power Supply 10 – 30 VDC, 2.5 W

RS-422/485 4-WIRE

A	Ground
B	RDB(+)
C	RDA(-)
D	TDB(+)
E	TDA(-)

RS-422/485 2-WIRE

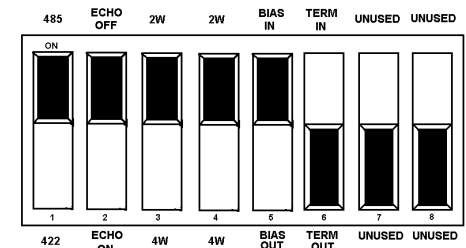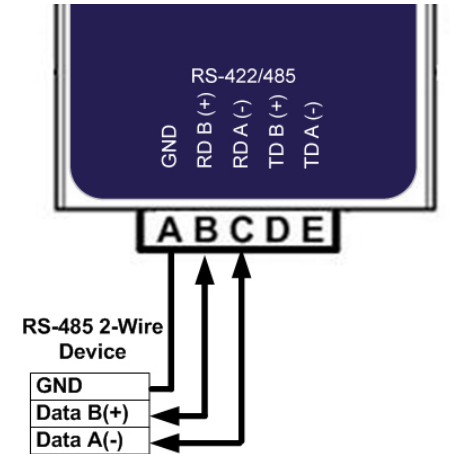|	
A	Ground
B	Data B(+)
C	Data A(-)
D	–
E	–

4 | Power Connection

1. Connect your external power supply to the 2-position power terminal block (A). Polarity is indicated on the front label. The converter will accept 10 to 30 V DC, 2.5W maximum.

2. The terminal block will accept 28 to 12 AWG Wire.

5 | Wiring Example: RS-485 2-Wire

1. In this example, the converter is set up to use internal bias and no termination.

   (NOTE: this is the default factory/shipping configuration.)

RS-485 2-Wire DIP Switch