



## Industrial Opto-Isolated RS-422/485 Repeater

Double the range of RS-422/485 data communications in heavy industrial areas.

Rugged IP30-rated metal case for panel mounting.



# ICD202A Quick Start Guide

Customer  
Support  
Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)  
FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax  
724-746-0746 • Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence,  
PA 15055-1018 • Web site: [www.blackbox.com](http://www.blackbox.com) • E-mail: [info@blackbox.com](mailto:info@blackbox.com)

## 1. What's Included:

- ICD202A Industrial Opto-Isolated RS-422/485 Repeater
- This Quick Start Guide

### User-Supplied Components

- 10- to 48-VDC power supply; this repeater draws a maximum of 2.3 watts.
- RS-422/485 cables. Recommended characteristics: (1) or (2) shielded or unshielded twisted pairs.

## 2. Certifications

- FCC Class A
- CE
- IEC 61850-3
- IEEE 1613
- RoHS

A detailed declaration of conformity is available at [www.blackbox.com](http://www.blackbox.com).

### 3. Front and Back Panels, DB9 Pin-out

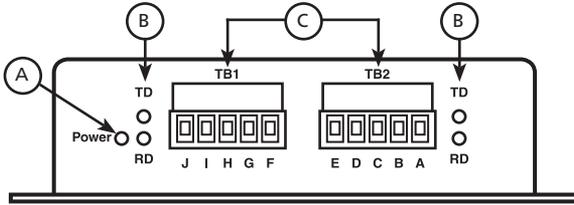


Figure 1. Front panel

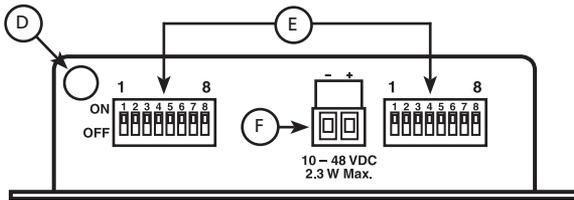


Figure 2. Back panel.

Table 1: Front and Back Panels

A	Power LED	Red, "on" when power is applied; see Section 9
B	Data LEDs	Green LEDs flash when data is on port; see Section 9
C	422/485 Terminal Block	Five-position, removable; see Sections 7 and 8
D	Grounding Lug	Chassis ground to earth ground; see Section 5
E	DIP Switches	Used to configure the repeater; see Section 4
F	Power Terminal Block	Two-position, removable; see Section 6

## 4. Configuration DIP Switch

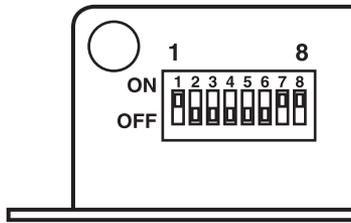


Figure 3. Switch position 8 is not used. Illustration shows factory default settings.

Table 2: Communications Mode Switch

	1	2	3	4
RS-485 2-Wire Half Duplex	On	On	On	On
RS-485 4-Wire Full Duplex	On	Off	Off	Off
RS-422 Full Duplex	Off	Off	Off	Off

Table 3: Built-in Termination Resistor	Switch 5
Use the 120-ohm built-in termination	On
Use external or no termination	Off

Table 4: Built-in Transmit Bias Resistor	Switch 6
Use the external or no bias resistor	On
Use the 1.2K ohm transmit bias resistor	Off

Table 5: Built-in Receive Bias Resistor	Switch 7
Use the external or no bias resistor	On
Use the 1.2K ohm receive bias resistor	Off

For an explanation of RS-485 termination and biasing requirements, refer to Black Box’s white paper, “The Elements of an RS-422 and 485 System,” which can be downloaded at [www.blackbox.com](http://www.blackbox.com) > Resources > White Papers.

## 5. Ground Connection

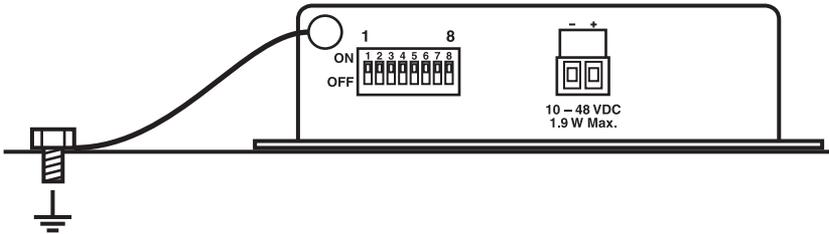


Figure 4. Black Box recommends that you ground the chassis as shown here. Connect a grounding wire from the ground lug to a good grounding source.

## 6. Power Connection

1. Connect the power: Requirements are 10 to 48 VDC, 2.3 watts maximum.
2. The terminal block will accept 28 to 12 AWG wire.

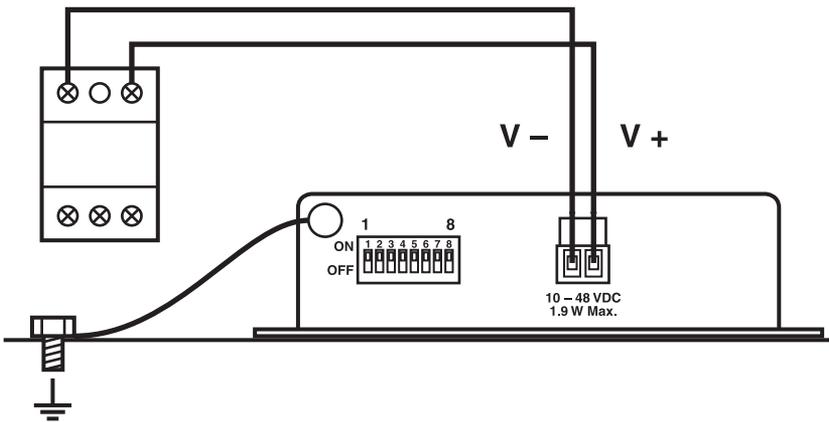


Figure 5. Power connection.

## 7. RS-422/485 Terminal Blocks

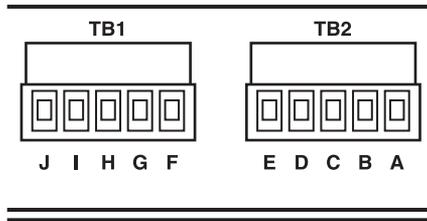


Figure 6. See cable recommendations in Section 1.

Table 6: Terminal Connections

Terminal	RS-422	RS-485
A and F	--	TDA(-)
B and G	--	TDB(+)
C and H	Data A(-)	RDA(-)
D and I	Data B(+)	RDB(+)
E and J	Ground	Ground

## 8. Wiring Examples

RS-485 2-Wire

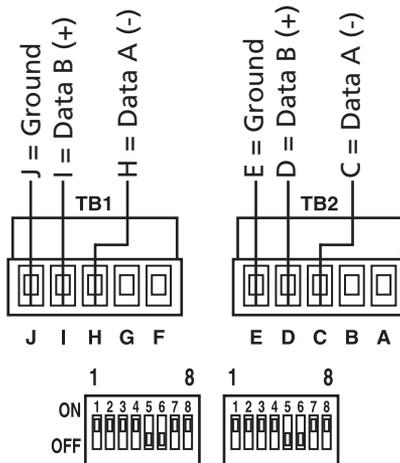


Figure 7. Terminal block wiring examples.

Table 7: RS-422/485 4-wire DIP Switch configuration

1	2	3	4	5	6	7
On	On	On	On	X	X	X

Positions 5, 6, and 7 are used for termination and biasing. See Section 4. Position 8 is not used.

RS-422/RS-485 4-wire

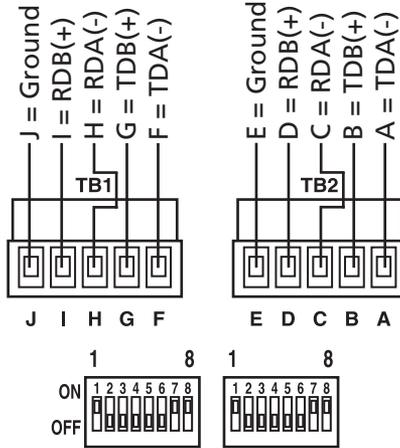


Table 8: RS-422/485 4-wire DIP Switch configuration

1	2	3	4	5	6	7
X	Off	Off	Off	X	X	X

Position 1 is ON for RS-485 and OFF for RS-422.

Positions 5, 6, and 7 are used for termination and biasing.

Position 8 is not used.

## 9. Operation

During normal operation, the Power LED should be illuminated.

When data is sent or received on either port, the corresponding Data LED should flash.

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