

Precautions (Please be sure to read before use.)

⊘ Do Not

1. This product uses ordinary off-the-shelf electronic components, and is therefore inappropriate for use in applications that require special quality or reliability and are expected to protect human lives or prevent accidents, such as safety mechanisms in fields including space, aeronautics, medicine, and nuclear power.
2. Do not be used underwater or in high-humidity environments.
3. Do not be used in the presence of corrosive gases, combustible gases, or other flammable gases.
4. Do not turn on power when circuit board surface is in contact with other metal.
5. Do not apply voltage higher than rated voltage.

⚠ Attention

6. This manual may be revised in the future without notice owing to improvements.
7. All efforts have been made to produce the best manual possible, but if users notice an error or other problem, we ask that they notify us.
8. Item 7 notwithstanding, HuMANDATA cannot be held liable for the consequences arising from use of this product.
9. HuMANDATA cannot be held liable for consequences arising from using this product in a way different from the uses described herein, or from uses not shown herein.
10. This manual, circuit diagrams, sample circuits, and other content may not be copied, reproduced, or distributed without permission.
11. If the product emits smoke, catches fire, or becomes unusually hot, cut the power immediately.
12. Do not install the control cables or communication cables together with the main circuit lines or power cables. In such an environment, it may result in malfunction due to noise.
13. Be careful of static electricity.

1. Revision History

Date	Revision	Description
Jul. 30, 2020	1.0	Initial release
Apr. 11, 2025	1.1	Correct typo

2. Product packaging

Thank you very much for purchasing the USB-503-RJ45. In this package, you will find the following items included. If there are any shortages or issues, please contact us.

□ USB to RS485 Converter (RJ45 type)	1
USB-503-RJ45	
□ USB cable (1.8m)	1
□ Driver & Application CD	1

3. Introduction

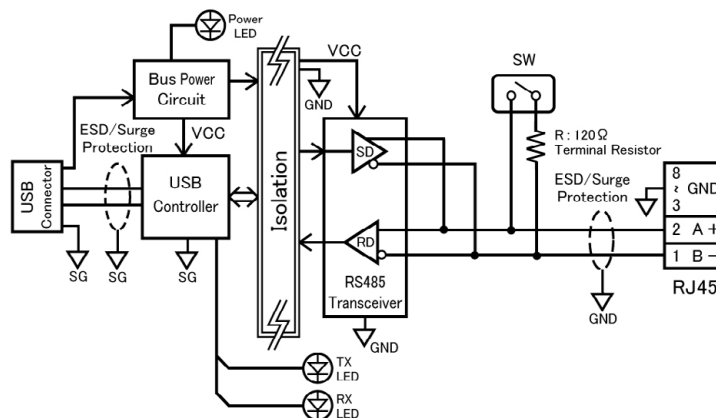
Thank you very much for purchasing our product of USB-503-RJ45.

USB-503-RJ45 is a USB to RS-485 converter that isolated between RS-485 and a USB port. So, it's safe for use in factory automation environment.

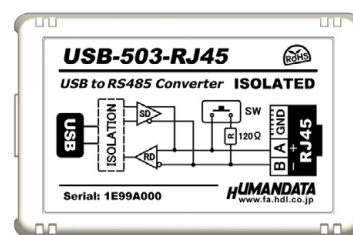
RS485 is equipped with RJ45 connectors used for LANs, and commercially available LAN cable can be used as communication cables, so the work of wiring steps can be reduced.

4. Block Diagram

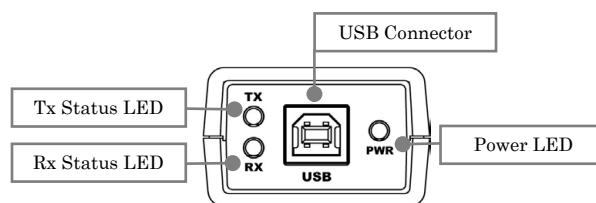
Between USB and RS-485 are isolated.



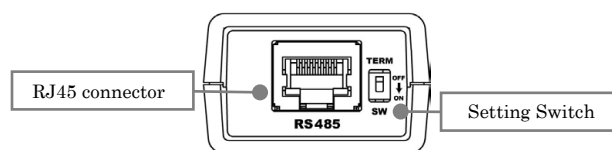
5. Overview



TOP side (Block diagram)



Front Side (USB)



Rear Side (RS-485)

6. Power Supply

USB-503-RJ45 is powered through a USB port (Bus-powered). No external power supply is required.




7. Product Specification

Item	Description	Remarks
Model	USB-503-RJ45	
Input Power	5VDC Supplied through a USB port (Bus-powered)	No external power supply required
Current Consumption	Less than 80 mA	
I/O Interface	RS-485 (2-wire)	ESD protection ±15KV
HOST interface	USB 2.0 Compliant (Support Full Speed)	USB 1.1 compatible ESD protection
Baud Rate	300 bps to 250 Kbps	Support custom baud rate
Data Bits	7 or 8 bit	
Stop Bits	1 or 2 bit	
Parity	Even, Odd, No-parity	
FIFO RX Buffer Size	384 bytes	
FIFO TX Buffer Size	128 bytes	
Isolation Method	Bus isolation	
Isolation Protection	2000 VDC	Designed value
Processor	FT232BL	FTDI
USB Driver	Virtual COM port driver	
Supports OS	Windows 11/10/8.1/8/7	
LED	PWR : USB bus power RX : Receive data TX : Transmit data	
USB connector	Standard Type B Female	
RS-485 Connector	RJ45 connector	Available LAN cable
Operating Ambient temp.	-10 to 60 [°C] (14 to 140 [°F])	No condensation permitted
Operating Ambient Humidity	10 to 85 %RH	
Storage Ambient temp.	-20 to 55 [°C] (-4 to 131 [°F])	
Storage Ambient Humidity	10 to 85 %RH	
Weight	Approx. 70 [g]	Only main body
Dimensions	67 x 43.5 x 27 [mm] (2.638" x 1.713" x 1.063")	Without projections

* There is a case to be changed to the parts of the compatibility.

* Power saving function (suspend, standby, sleep and others) is not supported.

8. Optional Accessories

Model	Image	Description
PEN-003		Attachment with clamping screw JAN : 4937920800709
PEN-003-DIN		Attachment for 35mm DIN rail JAN : 4937920800716
PEN-003-MG		Attachment with neodymium magnet JAN : 4937920801201

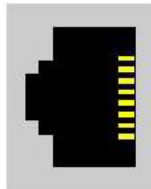
9. RS-485 (2 wire) Mode

Item	Specification	Remarks
Comm. Method	Half-duplex transmission	
Baud Rate	300bps to 250 Kbps	Custom baud rate is supported
Number of Connectable Terminals	128	Typical example
Terminal Resistor	120 Ω	Configurable by setting switch ON/OFF
Transmit-Receive Switching	Automatically controlled by USB controller	

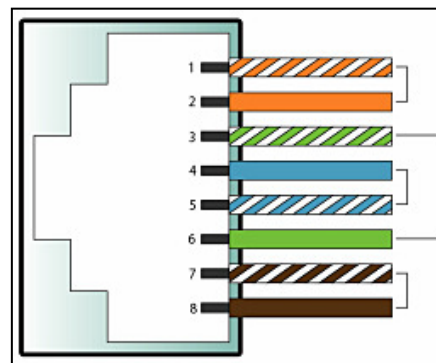
RS-485 mode can communicate with multiple terminals by using a twist pair cable.

10. RJ45 connector

Do not remove it while the power is supplied. The GND (Ground) pin is recommended to be wired.

Pin Number		Signal	Signal and Polarity
	1	B	Transmit/Receive data +
	2	A	Transmit/Receive data -
	3	GND	GND
	4		GND
	5		GND
	6		GND
	7		GND
	8		GND

LAN Twisted Pair Cable Color Codes



- 1-2 are a twisted pair
- Make sure to use 8-core cable
- The color codes might be different in the straight and cross cable

11. Setting Switch

The setting of terminal resistor is changeable by the setting switch.

SW	Terminal Resistor (120Ω)
OFF	Disable
ON	Enable



Factory setting

12. Device Driver

When the device is connected to a USB port of PC for the first time, the device driver is needed to install on the USB port. When there are multiple USB ports, the driver is needed to install on each port. The device driver and its install manual are included in the CD bundled with the product. And they are also available on its product page. Please refer to the Chapter 8. "Additional Documentation and User Support".

13. Latency Timer

In some cases, adjusting “Latency Timer” will help to speed up the response time of application. The default value is set by device driver. If you reduce the value of “Latency Timer”, its priority will be higher. But be careful that the response time of the other applications will probably be slow.

Following steps of Windows OS show how to set “Latency Timer”.
Open “Device Manager” and right click “[USB-503...]”. Open “Properties” window and open “Port Setting” tab, then click “Advanced” button.

14. Additional Documentation and User Support

The following documents and other supports are available at

- Product Documents:
<https://www.hdl.co.jp/en/faspc/USB/usb-503-rj45>
- Support Center:
<https://www.fa.hdl.co.jp/en/support.html>

15. Warranty and Compensation

Please refer to the following URL for the warranty.

<https://www.fa.hdl.co.jp/en/fa-warranty.html>

16. Contact us

Please contact us using the inquiry form on our company's website or email us at SPC2@hdl.co.jp, providing the product model number and serial number.

HuMANDATA LTD.

Address	1-2-10-2F, Nakahozumi, Ibaraki Osaka, Japan ZIP 567-0034
TEL	81-72-620-2002 (Japanese)
FAX	81-72-620-2003 (Japanese/English)
URL	https://www.fa.hdl.co.jp (Japan) https://www.fa.hdl.co.jp/en/ (Global)
