

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
August 7, 2026	1.0	Initial release

2. Product packaging

Thank you very much for purchasing the USB-046. In this package, you will find the following items included. If there are any shortages or issues, please contact us.

☐ USB to Serial/MPSS Converter USB-046

1

☐ USB cable (1.8m)

1

☐ Wiring harness with connector housing (approx. 200 mm)

1

3. Introduction

Thank you very much for purchasing our product of USB-046.

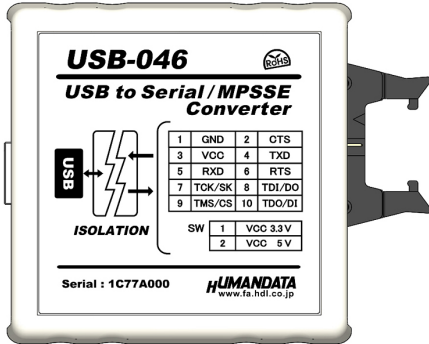
USB-046 is a USB to Serial/MPSS converter that enables independent control of two serial signals via a USB connection. The USB and serial signal interfaces are electrically isolated from each other.

The onboard FTDI FT2232H chip can be configured to use Channel A as a Serial (UART) interface and Channel B as an MPSS (Multi-Protocol Synchronous Serial Engine) interface. The MPSS enables communication by emulating serial protocols such as I2C, SPI, and JTAG.

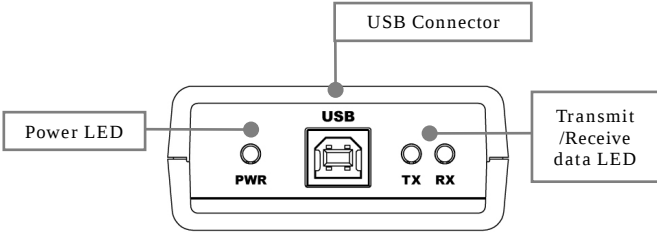
The converter provides an isolated power supply, selectable between 3.3 V and 5 V via a switch.

4. Block Diagram

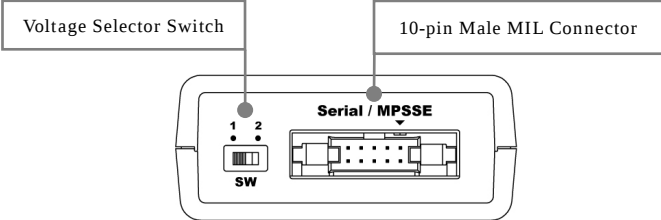
5. Overview



TOP side



Front Side



Rear Side

6. Product Specification		
Item	Description	Remarks
Model	USB-046	
Input Power	5 VDC Supplied through a USB port (Bus-powered)	No external power supply required
Current Consumption	Less than 700 mA	
HOST interface	USB 2.0 Compliant Support High Speed	USB 1.1 compatible ESD protection ±11 KV
Processor	FT2232H (FTDI)	
Isolation Method	Bus isolation	
Isolation Protection	5000 VDC	Designed value
User Interface	10-pin Male MIL Connector FAP-1001-2202-0BF (Yamaichi Electronics)	
Power Supply for Secondary Side	3.3 V or 5.0 VDC (±10% max.) 100 mA max.	Voltage selectable via switch
Supports OS	Windows 11/10	
LED	PWR: USB bus power RX: Receive data (Serial) TX: Transmit data (Serial)	
USB Driver	Virtual COM port driver	Serial Side
Operating Ambient Temperature	-20°C to 60°C (-4°F to 140°F)	No condensation permitted
Operating Ambient Humidity	10% to 85%RH	
Storage Ambient Temperature	-20°C to 60°C (-4°F to 140°F)	
Storage Ambient Humidity	10% to 85%RH	
Noise Tolerance	Not defined	
Transmission and other Standard	Not defined	
Weight	Approx. 50 g	Only main body
Dimensions	67 x 67 x 28 mm (2.638" x 2.638" x 1.102")	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

7. 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

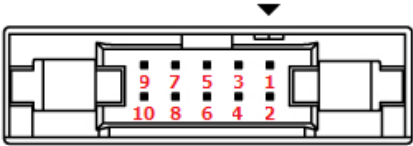
8. Main Power Supply and Secondary-side Power Supply		
Output Voltage	3.3V	5V
Voltage Selector Switch	 SW Position 1	 SW Position 2

9. User Interface

Channel A of the FT232H can be used as a Serial (UART) interface. By installing the device driver, it can be used as a standard COM port.

Channel B can be used as an MPSSE interface. Port control must be performed through the FTDI API. The connector pin assignment is shown in the figure below.

Ch.	Dir.	Signal	Pin No.		Signal	Dir.	Ch.
-	-	GND	1	2	CTS	IN	A
-	-	VCC	3	4	TXD	OUT	A
A	IN	RXD	5	6	RTS	OUT	A
B	OUT	TCK/SK	7	8	TDI/DO	OUT	B
B	OUT	TMS/CS	9	10	TDO/DI	IN	B



10-pin Male MIL Connector
FAP-1001-2202-0BF (Yamaichi Electronics)

10. Device Driver Installation Guide
When this device is connected to a PC for the first time, the device driver must be installed for that USB port. If multiple USB ports are available, the device driver must be installed separately for each USB port. The device driver and installation manual are available for download from the product documentation page. Please refer to the next Section for details.

11. Additional Documentation and User Support
The following documents and other supports are available at
• Product Documents and Device Driver: https://www.hdl.co.jp/en/faspc/USB/usb-046/
• Support Center: https://www.fa.hdl.co.jp/en/support.html

12. Warranty and Compensation
Please refer to the following URL for the warranty. https://www.fa.hdl.co.jp/en/fa-warranty.html

13. 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.

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