101-0020C

USB to 2-Wire RS-485 Converter

RS-485
CONVERTER

Installation Operation & Specifications Manual

General Description

The 101-0020C USB to RS-485 converter provides a simple, low cost interface between a PC or laptop with a USB port, and 2-wire RS-485 devices. Universal Serial Bus (USB) drivers make this converter compatible with most software developed for RS-232 serial port interfaces because it appears as an RS-232 port to your software. Switching between receive and transmit is automatically controlled so RTS (request to send) is not needed. Power for the converter is taken from the USB port. No external power supply is required.

A rugged design makes the 101-0020C an ideal choice for field engineers and technicians who service RS-485 2-wire equipment in an industrial environment. Because the 101-0020C RS-485 converter is used on devices without a ground terminal, voltage suppression is used to clamp the common mode voltage to +/- 7 volts to help prevent damage to the converter.

Microflex

CE FC

Converter Setup - USB Driver

Download the Setup software from microflx.com/pages/rs485-setup

Run the file to extract it to a folder. After you extract the files run **Setup.exe** to open the RS-485 Converter Setup Utility application.

Important!

Install the driver before connecting to the USB port.

The converter uses virtual serial port USB drivers to make it appear as a serial port device to the Windows operating system. The driver is required and should be installed before connecting the converter to the USB port. Use the Setup Utility to install the driver.

RS-485 Converter Setup Utility

The USB driver installer will guide you through the process.

USB Driver Installer

When you first connect the converter to a USB port, Windows will automatically detect it, complete the driver setup, and assign a COM port number to the converter.

The assigned port number will stay the same as long as the same USB port is used. If the converter is moved to a different USB port, a new COM number will be assigned.

Finding the Assigned COM Port Number

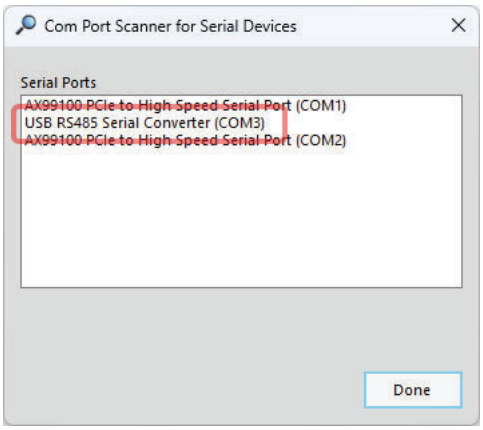
The virtual serial port driver assigns a COM port number to your converter. The software you use with the converter must be set to use the same COM port number.

The Setup Utility includes a tool to help find your assigned COM number.

When the converter is connected to a USB port, it will be added to the Serial Ports list. When unplugged, it will be removed from the list.

In the example below, the converter is assigned to COM3.

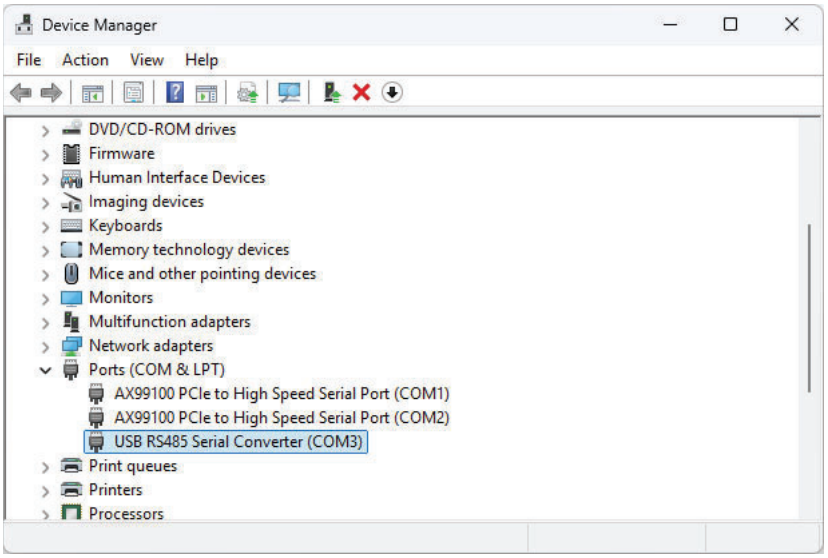
Windows Device Manager can also be used to determine the COM port number.



COM Port number finder. This converter is assigned to COM3.

Changing the COM Port Number

The assigned serial COM port number can be changed to any available COM port by using Windows Device Manager. Open the Device Manager and select **View > Devices by Type**. Expand **Ports (COM & LPT)** in the list to see which port the converter is assigned to. In the example shown below, the converter is assigned to COM3.



Windows Device Manager

Right click on **USB RS485 Serial Converter** and select **Properties** from the pop-up menu.

On the **Port Settings** tab, click **Advanced**. Drop down the **COM Port Number** list and select the desired port number. Click **OK** to use the new port number and close the window.

Click **OK** again to close the Properties window.

Uninstalling the USB Drivers

If needed, use Windows Device Manager to uninstall the driver from your system. With the converter connected to the USB port, locate it in the Device Manager hardware tree under **Ports (COM & LPT)**. Right click on **USB RS485 Serial Converter** and select **Uninstall** from the pop-up menu. When the process has finished, unplug the modem from the USB port.

Software Setup

Make sure your software is set to use the same serial COM port that the RS-485 converter was assigned to. Refer to Finding the Assigned COM Port Number and Changing the COM Port Number in this manual for details. There are no hardware settings required by the RS-485 Converter and power is provided by the USB port. All other settings, such as BAUD rate, are taken care of by your software. The converter automatically switches between transmit and receive so RTS is not required.

Connecting to the RS-485 Device

Connect the two mini-clips to the RS-485 bus. Following the RS-485 standards, the black clip is the A connection and the red clip is the B connection.

BLACK = A RS-485 Connection
RED = B RS-485 Connection

Converter Grounding

The 101-0020 converter does not provide an RS-485 ground terminal. Unless the other device's interface is isolated, there is a risk of a ground loop current that could result in equipment damage. The converter should only be used where the common mode voltage (ground potential difference between the two interfaces) is within the standard RS-485 common mode voltage of +/- 7 volts.

Safety Considerations

Conformity in accordance with Part 2, and Part 15, Subparts A and B of the Federal Communications Rules and Regulations, and ICES-003 of the Industry Canada standards.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by Microflex, LLC could void the user's authority to operate this equipment.

Emissions EN55022: 1998

Electrostatic Discharge EN61000-4-2: 1995, A1: 1998, A2: 2001

Radiated Immunity EN 61000-4-3: 2002

Safety Compliance EN 60950-1: 2002

This device does not have protection from over-voltages which may exist on USB ports of computers and relies on the protection existing in a host computer.

This device is not intended for connection to the phone line through the appropriate converters and shall not be connected to telecommunication lines because it has no protection against over-voltages which may exist in these lines.

The user shall ensure the protection of the operator from access to areas with hazardous voltages or hazardous energy in their equipment.

The user shall ensure that the connection port of the field device and the converter is separated at least by basic insulation from any primary circuit existing in the field device.

Specifications

Enclosure

Buna-N Rubber with Stainless Steel Cover
Weight ..... 4 ounces
Converter Dimensions ..... 2.17” x 1.5” x 0.57”

USB

Connector ..... USB-C
Cable Length ..... 6 feet
Compatibility ..... USB 1.1 and USB 2.0
Active Current ..... 30mA Max
Suspend Current ..... Less than 600µA Typical

RS-485

Termination ..... Pamona Electronics Mini-Clips
A = Black Clip
B = Red Clip
Leads ..... 1 Foot High Flexibility Test Lead Wire
Max BAUD Rate ..... 115,200 BPS
Driver Output Voltage ..... Unloaded 5V
@ 27Ω Load 1.5V Min
Δ Input Threshold Receive Voltage ..... +/- 0.2V
Receiver Input Hysteresis ..... 45 mV Typ.
Receiver Input Current ..... +/- 1mA Max
Surge Protection ..... 600W Silicone Avalanche Diodes

- Does not include RS-485 termination resistor
- Auto transmit control
- Supports up to 32 Transceivers on the Bus
- Power Up/Down glitch-free permits live insertion or removal
- Common mode range permits +/-7V ground difference
- 7-bit no parity mode requires 2 stop bits

Environmental

Operating Temperature ..... -20ºC to 50ºC (-4ºF to 122ºF)
Storage Temperature ..... -40ºC to 85ºC (-40ºF to 185ºF)
Humidity ..... 0 to 99% (non-condensing)

Limited Warranty

Microflex, LLC warrants this unit against defects in materials and workmanship for a period of one year from the date of shipment. Microflex, LLC will, at its option, repair or replace equipment that proves to be defective during the warranty period. This warranty includes parts and labor.

A Return Materials Authorization (RMA) number must be obtained from the factory and clearly marked on the outside of the package before equipment will be accepted for warranty work.

Microflex, LLC believes that the information in this manual is accurate. In the event that a typographical or technical error exist, Microflex, LLC reserves the right to make changes without prior notice to holders of this edition. The reader should consult Microflex, LLC if any errors are suspected. In no event should Microflex, LLC be liable for any damages arising out of or related to this document or the information contained in it.

EXCEPT AS SPECIFIED HEREIN, MICROFLEX, LLC MAKES NO WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CUSTOMER'S RIGHT TO RECOVER DAMAGES CAUSED BY FAULT OR NEGLIGENCE ON THE PART OF MICROFLEX SHALL BE LIMITED TO THE AMOUNT THERETOFORE PAID BY THE CUSTOMER. MICROFLEX, LLC WILL NOT BE LIABLE FOR DAMAGES RESULTING FROM LOSS OF DATA, PROFITS, USE OF PRODUCTS, OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITIES THEREOF. This limitation of the liability of Microflex, LLC will apply regardless of the form of action, whether in contract or tort, including negligence. Any action against Microflex, LLC must be brought within one year after the cause of action accrues. The warranty provided herein does not cover damages, defects, malfunctions, or service failures caused by owners failure to follow Microflex, LLC's installation, operation, or maintenance instructions; owners modification of the product; owner's abuse, misuse, or negligent acts; and power failure or surges, fire, flood, accident, actions of third parties, or other events outside reasonable control.

Microflex, LLC
35900 Royal Road
Pattison, Texas 77423
USA

Phone 281-855-9639
Fax 832-422-4391
www.microflx.com