

RS-485 CONVERTER

Installation Operation & Specifications Manual

101-0020

USB to 2-Wire RS-485 Converter



General Description

The 101-0020 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 to control transmit. Power for the converter is taken from the USB port so no external power supply is required.

A rugged design makes the 101-0020 an ideal choice for field engineers and technicians who service RS-485 2-wire equipment in an industrial environment. Because the 101-0020 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.

For an RS-485 converter with a RS-232 interface Microflex offers the 101-0009.

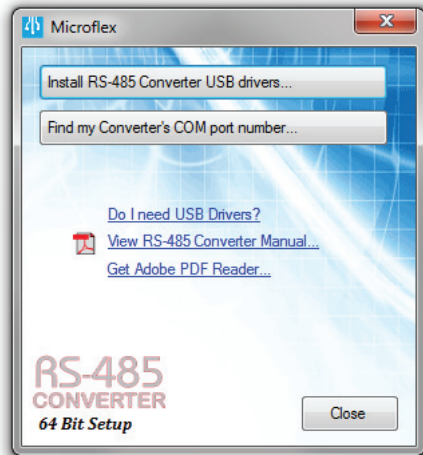


Driver Pre-Installation

The USB drivers should be installed before the RS-485 converter is connected to the PC's USB port. After the drivers are installed, Windows will automatically detect the converter when it is connected to a USB port and complete the setup.

To pre-install the drivers, run **Setup.exe** from the included CD and follow the on-screen prompts. The CD will auto-run this file if the Windows Autorun feature is enabled for your CD drive. **Setup.exe** is a utility that will determine your operating system and run the correct installer. Click the **Install RS-485 Converter USB drivers...** button to pre-install the drivers. The driver installer will guide you through the setup process.

Important!
Install USB driver before connecting to the USB port.



RS-485 Convert Setup Utility



Installers can also be run manually from the CD using `\\x86\DPInstx86.exe` for 32 bit operating systems or `\\x64\DPInstx64.exe` for 64 bit operating systems.

Driver - Manually Installed

To manually install the driver...

1. Connect the Converter to the USB port.
2. Open the Windows Device Manager.
3. The new device wizard will have added the converter under **Ports (COM & LPT)** and will appear as **USB RS485 Serial Converter (COMx)**. Right click the device and select **Update Driver Software...**
4. Choose to Browse for the driver software and browse to the CD or the location of the **Mflex485.inf** file.
5. Follow the wizard prompts to complete the driver setup.

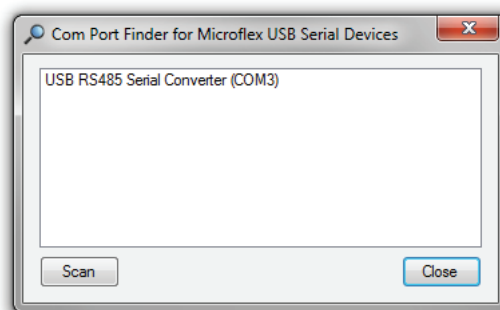
Uninstalling the USB Drivers

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.

Finding the Assigned COM Port Number

When Windows installed the serial port emulator driver the next available COM port number was assigned to the converter. The software you use with the converter must be set to use the same COM port number. To find the number assigned to your converter run the setup utility from the CD and click **Find my Converter's COM port number...**

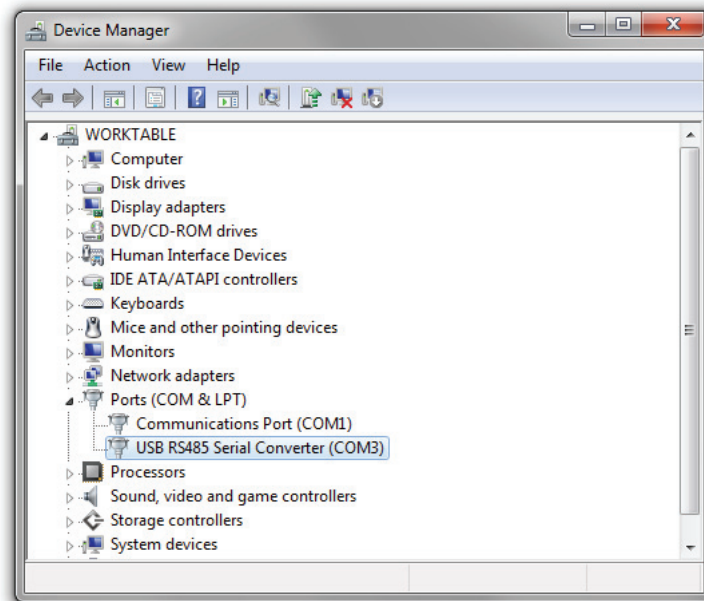
The assigned COM port number can also be found using the Windows Device Manager. You may need to expand the Device Manager tree under **Ports (COM and LPT)** to see the converter.



COM Port number finder. This converter is assigned to COM 3.

Changing the COM Port Number

The assigned serial COM port number can be changed to any available COM port by using the 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.

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


FC 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.

CE 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-A
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 -20°C to 50°C (-4°F to 122°F)
Storage Temperature -40°C to 85°C (-40°F to 185°F)
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.

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