USB to RS-422 Converter

Part Number: USB-422-1



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Windows 8 / 7

For Windows 8 and 7, drivers will be installed automatically when your computer is connected to the Internet. Alternatively, you may install the drivers from the CD provided with the product.

■ INTRODUCTION

The USB-422-1 is a port-powered USB to RS-422 converter that can be used to convert any standard USB port (USB 2.0 - backward compatible) into a four-wire balanced RS-422/RS-485 port and vice versa. The unit can be used to communicate with one loop of up to 256 units of RS-422/RS-485 devices and it comes with a built-in selectable 120-Ohm terminator for system reliability and easy installation. This USB to RS-422/RS-485 converter cable is powered from the USB port and it supports data auto-sensing & self-adjusting, therefore, no baud rate setting is required. The USB-422-1 uses the latest FTDI chipset and is fully compatible with Windows 8/7/Vista/XP/Server 2008/Server 2003/2000/98 (32-bit), Windows 8/7/Vista/XP/Server 2008/Server 2003 (64-bit), Win CE, Mac, and Linux.

FEATURES

- Adds one RS-422/RS-485 port to your USB port.
- Supports 256 nodes of 4-wire RS-422/RS-485 devices.
- Rugged terminal block with built-in selectable 120Ω terminator.
- Operates reliably from 300 to 3M baud.
- Supports Windows 8/7/Vista/XP/Server 2008/Server 2003/2000/98 (32-bit), Windows 8/7/Vista /XP/Server 2008/Server 2003 (64-bit), Win CE, Mac, and Linux.
- Supports remote wakeup and power management.
- Built-in 15kV ESD static and circuit protection.
- Port-powered, no external power required.
- Plug and play (hot-pluggable, data format auto-sensing and self-adjusting).
- No IRQs required, no IRQ conflicts.
- Surface Mount Technology manufactured to RoHS and ISO-9001 standards.
- Safety: Strictly certified by SGS (Cert no. E1/2013/90006C; E1/2013/90007C).
- 5-year manufacturer's warranty.

■ SPECIFICATIONS

Compatibility:	USB 2.0 and FIA/TIA RS-232/RS-422/RS-485 standards
Dowor Courses	Erom LICE nort
Power Source.	
Current Consumption:	Less than 60mA
RS-232 Data Rate:	300 to 3M bps (auto-sensing and self-adjusting)
Distance:	USB side: 10ft (3m); RS-422/RS-485 side: Up to 4000ft (1.2k
	m) at 19,200 bps
Connectors:	USB side: Type A Female; RS-422/RS-485 side: DB-9 Male/
	7-Way Terminal Block
LEDs:	TX, RX and Power
Maximum number of drops:	256
End-of-Line Terminator:	120Ω (built-in, selectable)
Static Protection (ESD):	Up to 15KV
Dimensions (H \times W \times D):	0.8 x 1.4 x 3.6 in (20 x 36 x 92 mm) (excluding cable)
Cable Length:	3.3 ft (1 m)
Weight:	4.2 oz (118 g)
Operating Temperature:	32°F to 104°F (0°C to 40°C)
Operating Humidity:	Up to 90% RH (no condensation)

■ PIN ASSIGNMENT

RS-422/RS-485 Side (DB-9 Male Connector / Terminal Block):

DB-9 Male:	1	2	3	4	5	6,7	,
Function:	TX-	TX+	RX+	RX-	GND	Tie to turn ON the	e 120Ω end-of-
						line term	iinator
Terminal Block:	TX+	RX+	TX-	RX-	G	120)
Function:	TX+	RX+	TX-	RX-	GND	Tie to turn ON the	e 120Ω end-of-
						line term	inator
-							
vision: 1.0			www.Co	mmFror	nt.com		Page 2 of 16
	DB-9 Male: Function: Terminal Block: Function: vision: 1.0	DB-9 Male: 1 Function: TX- Terminal Block: TX+ Function: TX+ evision: 1.0	DB-9 Male: 1 2 Function: TX- TX+ Terminal Block: TX+ RX+ Function: TX+ RX+	DB-9 Male: 1 2 3 Function: TX- TX+ RX+ Terminal Block: TX+ RX+ TX- Function: TX+ RX+ TX- vision: 1.0 www.Ccc	DB-9 Male: 1 2 3 4 Function: TX- TX+ RX+ RX- Terminal Block: TX+ RX+ TX- RX- Function: TX+ RX+ TX- RX- wision: 1.0 www.CommFrom	DB-9 Male: 1 2 3 4 5 Function: TX- TX+ RX+ RX- GND Terminal Block: TX+ RX+ TX- RX- GND Function: TX+ RX+ TX- RX- GND vision: 1.0 www.CommFront.com	DB-9 Male: 1 2 3 4 5 6,7 Function: TX- TX+ RX+ RX- GND Tie to turn ON the line term line term Terminal Block: TX+ RX+ TX- RX- G 122 Function: TX+ RX+ TX- RX- GND Tie to turn ON the line term vision: 1.0 www.CommFront.com V V V V



(Figure 1: 4-WIRE RS-422/RS-485 MASTER-SLAVE MULTI-DROP CONNECTIONS)

Note: The 120Ω end-of-line terminator adds heavy DC loading to a system; connect it only when the data rate is over 19.2kbps or the RS-422/RS-485's distance exceeds 660ft (200m).

DRIVER INSTALLATION – QUICK GUIDE

- For Windows 8 and 7, drivers will be installed automatically when your computer is connected to the Internet.
- For other Operating Systems, drivers are included on the CD supplied with the converter, please refer to the details below:
 - 1) Insert the CD into the drive.
 - 2) Connect the USB-422-1 to an available USB port, and the "Found New Hardware Wizard" will guide you through the installation process. When prompted to connect to Windows Updates to search for drivers, select "No, not at this time", and follow the instructions for installing from the CD.
 - 3) Once the drivers are successfully installed, the USB-422-1 will show up in the Windows Device Manager: under "Ports (COM & LPT)" – labeled as "USB Serial Port (COMx)", and under "Universal Serial Bus controllers" - labeled as "USB Serial Converter" (Figure 2).



Important notes:

- If it's the first time you install the driver for CommFront's USB to Serial device, you will need to install the driver twice. One is for "USB Serial Converter", and the other one is for "USB Serial Port". DO NOT close the 2nd "Found New Hardware Wizard" window while installing the driver.
- 2) Upon completion of driver installations, remember to check the Windows Device Manager to make sure that the drivers are installed properly (Figure 2). If the drivers are not installed correctly, there will be a yellow exclamation icon displayed under the "Ports (COM & LPT)" or "USB Serial Bus controllers", right-click on the yellow exclamation icon and select "Update driver". Then search for the driver in the CD supplied.
- 3) The drivers are not available via Microsoft Windows Updates, however, Windows Vista will search for the drivers via Microsoft Windows Updates by default, so **disconnect your Vista PC from the internet before the driver installation**.

■ DRIVER INSTALLATION - EXAMPLES

- Example 1 (Windows Vista)
 - 1) **Disconnect your PC from the internet before driver installation**. This is because the drivers are not available via Microsoft Windows Updates, but Windows Vista will search for the drivers via Microsoft Windows Updates by default.
 - 2) Insert the CD into the drive and connect the USB-422-1 to an available USB port, the "Found New Hardware" window will pop up. Click on the "Locate and install driver software (recommended)" button to continue (Figure 3).

Vir	idows needs to install driver software for your USB HS IAL CONVERTER
۲	Locate and install driver software (recommended) Windows will guide you through the process of installing driver software for your device.
•	Ask me again later Windows will ask again the next time you plug in your device or log on.
8	Don't show this message again for this device Your device will not function until you install driver software.
	Cancel

(Figure 3)

 Windows Vista will look for the driver in the CD, click on the "Next" button to continue. This will start the driver installation for "USB Serial Converter" (Figure 4).



(Figure 4)

4) When the driver is successfully installed, the following window will pop up - confirming that the driver installation of "USB Serial Converter" has been completed successfully. Click on the "Close" button to continue (Figure 5).

	Found New Hardware - USB Serial Converter		
	The software for this device has been successfully installed		
	Windows has finished installing the driver software for this device:		
	USB Serial Converter		
(Fig	ure 5)		l
The drive 4) to	2 nd "Found New Hardware" window will pop up, prom er for "USB Serial Port". DO NOT close this window!	pting you And repe	to install at steps 1

6) When the 2nd driver installation is completed, remember to check the Windows Device Manager to confirm that the drivers are installed successfully (Figure 2). The USB-422-1 will show up in the Windows Device Manager: under the "Ports (COM & LPT)" – labeled as "USB Serial Port (COMx)", and "Universal Serial Bus controllers" - labeled as "USB Serial Converter".

• Example 2 (Windows XP)

 Insert the CD into the drive and connect the USB-422-1 to an available USB port, the "Found New Hardware Wizard" window will pop up. Select "No, not this time" and click on the "Next" button to continue (Figure 6).

ound New Hardware Wize	ard
	Welcome to the Found New Hardware Wizard Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission). Read our privacy policy Can Windows connect to Windows Update to search for software? Yes, this time only Yes, now and gvery time I connect a device No, not this time
	Cick New to Continue.
	< Back Next > Cancel
Figure 6)	

 Select "Install from a list or specific location (Advanced)" to install the driver from CD (Figure 7).



'lease ch	oose your search and installation options.
<u>ی و (</u>	tch for the best driver in these locations.
Use path	the check boxes below to limit or expand the default search, which includes local s and removable media. The best driver found will be installed.
E	Search removable media (floppy, CD-ROM)
[Include this location in the search:
	BIowse
O Dor	't search. I will choose the driver to install.
Cho the	ose this option to select the device driver from a list. Windows does not guarantee tha driver you choose will be the best match for your hardware.
	Canada Nanta Canada

4) When the driver is successfully installed, the following window will pop up, confirming that the driver installation of "USB Serial Converter" has been completed. Click on the "Finish" button to continue (Figure 9).

Completing the Found New Hardware Wizard The wizard has finished installing the software for: USB Serial Converter
Click Finish to close the wizard.

(Figure 9)

- 5) The 2nd "Found New Hardware" window will pop up, prompting you to install the driver for "USB Serial Port". DO NOT close this window! And repeat steps 1) to 4) to install the driver for "USB Serial Port".
- 6) When the 2nd driver installation is completed, remember to check the Windows Device Manager to confirm that the drivers are installed successfully (Figure 2). The USB-422-1 will show up in the Windows Device Manager: under "Ports (COM & LPT)" – labeled as "USB Serial Port (COMx)", and under "Universal Serial Bus controllers" – labeled as "USB Serial Converter".

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- Example 3 (Windows 2000)
 - 1) Insert the CD into the drive and connect the USB-422-1 to an available USB port, the "Found New Hardware Wizard" window will pop up. Click on the "Next" button to continue (Figure 10).

Found New Hardware Wizard	
	Velcome to the Found New Hardware Wizard his vizard helps you install a device driver for a ardware device.
	<back cancel<="" td=""></back>

(Figure 10)

 Select "Search for a suitable driver for my device (recommended)" and click on the "Next" button to continue (Figure 11).

ound New Hardware Wizard
Install Hardware Device Drivers A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
USB HS SERIAL CONVERTER
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next. What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
 Display a list of the known drivers for this device so that I can choose a specific driver
< <u>R</u> ack <u>N</u> ext > Cancel
Figure 11)

 Check the box of "CD-ROM drives", and then click on the "Next" button to continue (Figure 12).

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Locate Driver Files Where do you want Windows to search	for driver files?
Search for driver files for the following ha	ardware device:
USB HS SERIAL CONVERTE	R
The wizard searches for suitable drivers any of the following optional search loca	in its driver database on your computer and in stions that you specify.
To start the search, click Next. If you an insert the floppy disk or CD before clicki	e searching on a floppy disk or CD-ROM drive, ng Next.
Optional search locations:	
Floppy disk drives	
CD-ROM drives	
Specify a location	
Microsoft Windows Update	
	(Rack Nevt) Cancel

4) Windows will automatically locate the driver, for example, "e:\drivers\windows 2000_server 2003_xp_vista x32\ftdibus.inf". Click on the "Next" button to continue (Figure 13).

river File	es Search Results
The wi	zard has finished searching for driver files for your hardware device.
The wid	zard found a driver for the following device:
2	USB HS SERIAL CONVERTER
Window	vs found a driver for this device. To install the driver Windows found, click Next.
- <u>(75</u> 8	e:\drivers\windows 2000_server 2003_xp_vista x32\ftdibus.inf
The with these d Next.	rard also found other drivers that are suitable for this device. To view a list of rivers or install one of these drivers, select the following check box, and then click.
🗖 Inst	all one of the other drivers
	<back next=""> Cance</back>

5) When the driver is successfully installed, the following window will pop up, confirming that the driver installation of "USB Serial Converter" has been completed. Click on the "Finish" button to continue (Figure 14).

Completing the Found New Hardware Wizard	
USB Senal Converter	
The hardware you installed will not work until you restart your computer.	
To close this wizard, click Finish.	

(Figure 14)

- 6) The 2nd "Found New Hardware" window will pop up, prompting you to install the driver for "USB Serial Port". DO NOT close this window! And repeat steps 1) to 5) to install the driver for "USB Serial Port".
- 7) When the 2nd driver installation is completed, remember to check the Windows Device Manager to confirm that the drivers are installed successfully (Figure 2). The USB-422-1 will show up in the Windows Device Manager: under "Ports (COM & LPT)" – labeled as "USB Serial Port (COMx)", and under "Universal Serial Bus controllers" - labeled as "USB Serial Converter".

■ TROUBLESHOOTING

General

- Make sure that the USB-422-1 is connected to your USB port, and the driver is installed correctly (Figure 2); otherwise, please reinstall the driver (Please refer to the "Driver reinstallation examples" below).
- 2) Make sure the "Power" LED on USB-422-1 is lit up.
- 3) Perform a loopback test by using CommFront's 232Analyzer software (included on the CD supplied with the converter): Connect TX+ to RX+ and TX- to RX- and then send command from the software, you should receive an echo of the commands sent. By performing a simple loopback test like this, you can test both the transmitter and receiver of the converter. This is very helpful when you are in doubt about the performance of your converter (Figure 15).

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Communic	ation mode: De	ebuaaina /	Simulation	1								
Send co	mmands	coalduid .	omanoung									
Data f	ormat (TX)			Input ASCII (eg ATI1) an	d control code	Hextor	mat e.g	D.A.	to be set	nt	
C 11	C 0 C	-	- C ACC	ConnEvert	Communicatio	ons					Send	
A. 00	· · Dec ·	UCC C B	en 14 ASC	L Delay	0 1	Repeat	0	Interval.	0	-	Stop	
Freque	with used comma	nds -G 0	h.OFh C	10b . 1Eb	Programm	sable buttons I	ASCIL	- 6	1.16	C 17.30	-	
- maps	l and and			in the second	Trogram.	inable building	(Docin)			10.00		
NUL	SOH STX	ETX EC	DT ENQ	ACK BEL	AT1	AT2 AT3	AT4	AT5	AT6	AT7	AT8	
BS	HT LF	VT F	FCR	SO SI	S1	\$2 53	S4	55	56	57	58	
1/2/200 COM po Commu	8 5:18:40 PM ort. 5: Boud rat nication mode	e: 19200b e: Debugo	ps: Parity: ing / Simul	Even; Data bi lating	t 8: Stop b	it 1; Hands	haking	None	150 mi	1	Cea	
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1/2/200 COM po Commu TX data	8 5:18:40 PM ort 5: Baud rat nication mode format ASCII	le: 19200b e: Debugg I; FX data ort Opene	ps:Parity: jing/Simul format:AS d	Even; Data bi lating CII	t 8; Stop b	it 1. Hands	haking	: None	1.50 mil			Ī
1/2/200 COM po Commu TX date	8 5:18:40 PM ort 5: Boud rat nication mode format ASCII ***** COM Pre- ent: CommiFrom	te: 19200b e: Debugg l; RX data ort Opener nt Commu	ps: Perity: ing / Simu format: AS d nicetions	Even: Data bi ating CII	t 8: Stop b	it 1; Hands	haking	: None	1.50 mil			
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Driver reinstallation examples

Drivers might not be installed properly if the above driver installation procedures were not followed; for example, the user did not disconnect the PC from the internet while installing drivers on Vista machines, or the 2nd "Found New Hardware Wizard" window was closed before the driver installation was completed. Below are some examples showing how to reinstall the drivers.

Example 1 (Windows Vista)

Symptoms: A yellow exclamation icon appears besides the "USB Serial Converter". Also, there is no display of the "Ports (COM & LPT)" in the Windows Device Manager (Figure 16).

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Device Manager		
File Action View Help		
>> (() () () () () ()	12 N 15	
COMMERONT-PC		
🗈 🕵 Computer		
Disk drives		
Display adapters		
DVD/CD-ROM drives		
High Hoppy disk drives		
Bill Human Interface Devices		
DE ATA/ATAPI controlle	13	
E C Keyboards		
A Mice and other pointing	devices	
H Monitors		
Network adapters		
🗉 🛄 Portable Devices		
Processors		
Sound, video and game	controllers	
Storage controllers		
In the System devices	Tarr	
in Standard Enhanced D	Cite LISE Hert Controller	
Standard OpenHCD I	ISB Host Controller	
USB Mass Storage De	vice	
USB Root Hub		
USB Root Hub		
USB Serial Converted		
	Update Driver Software	
unches the Update Driver Softw	Disable	
	Uninstall	
	Scan for hardware changes	

(Figure 16)

- 1) Right-click on the "USB Serial Converter" that displays with the yellow exclamation icon, and select "Update Driver Software..." (Figure 16).
- 2) Click on the "Browse my computer for driver software" button to continue (Figure 17).

	How do you want to search for driver software?			
	Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device.			
	Browse my computer for driver software Locate and install driver software manually.			
		Cancel		
-ig	ure 17)			
	ate the driver in the CD provided and click or	n the "Ne	ext" button t	o cont

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Search for driver software in this location: E\Drivers\Windows 2000_Server 2003_XP_VISTA X32		
E:\Drivers\Windows 2000_Server 2003_XP_VISTA X32		
	 Browse 	
Let me pick from a list of device drivers on my This list will show installed driver software compatible with th software in the same category as the device.	computer e device, and all driver	

4) When the driver is successfully updated, the following window will pop up, confirming that the driver installation of "USB Serial Converter" has been completed. Click on the "Close" button to exit (Figure 19).

Update Driver Software - USB Serial Converter	
Windows has successfully updated your driver software	
Windows has finished installing the driver software for this device:	
USB Serial Converter	
	Close

Example 2 (Windows Vista)

Symptoms: A yellow exclamation icon appears besides the "USB Serial Port" (Figure 20).

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Device Manager		
File Action View Help		
• • • • • • • • • • • • • • • • • • • •	2 Br 1 1 10	
Disk drives Disk drives Display adapters Display adapters Display data Display adapters Display disk drives Display disk drives Display disk drives D	s es Hers g devices	
Ports (COM & LPT) USB Senal Port (DSB Senal Port (SenaP	Update Driver Software Disable	
System devices Universal Serial Bus Standard Enhan-	Scan for hardware changes	
USB Mass Storage I USB Mass Storage I USB Root Hub USB Root Hub	Device	

(Figure 20)

- 1) Right-click on the "USB Serial Port" that displays with the yellow exclamation icon, and select "Update Driver Software..." (Figure 20).
- 2) Click on the "Browse my computer for driver software" button to continue (Figure 21).

•	Search automatically for updated driver software	
	generation automatically for updated unversionware windows will search your computer and the Internet for the latest driver software for your device.	
•	Browse my computer for driver software Locate and install driver software manually.	
Lo	cate and install driver software manually.	

(Figure 21)

 Locate the driver in the CD provided, and click on the "Next" button to continue (Figure 22).

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Browse	for driver softw	vare on your con	nputer			
Search for	driver software in t	his location:				
E:\Driver	s\Windows 2000_Se	wer 2003 XP_VISTA X3	8	- Brow	se	
Include	e subfolders					
🕈 Le Thi soft	t me pick from a list will show instal ware in the same ca	a list of device dr led driver software co tegory as the device.	ivers on my mpatible with th	computer e device, and a	ll driver	
				-	-	

4) When the driver is successfully updated, the following window will pop up, confirming that the driver installation of "USB Serial Port" has been completed. Click on the "Close" button to exit (Figure 23).

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Example 3 (Windows Vista/XP/2003/2000/98/ME)

Symptoms: No yellow exclamation signs, but COM port does not exist or is not functioning.

- Locate and execute the driver un-installation program FTDIUNIN.exe in its respective folder. For example, for Windows 2000/Server_2003/XP/Vista 32-bit, the un-installation program is located at "E:\Drivers\Windows 2000_Server 2003_XP_Vista X32\"
- 2) Unplug the USB-422-1, and click on the "Continue" button to uninstall the drivers (Figure 24).

If your USB device is connected Press Continue to uninstall the	l, please unplug it now drivers, or Cancel to quit.	
Continue	Cancel	

3) Click on the "Finish" button to complete the un-installation of the drivers (Figure 25).

Uninstalling V	ID_0403&PID_601	0	
Deleting regis	try entries		
Deleting mes.	••		
Press Finish to	exit.		

- (Figure 25)
- 4) Follow the correct driver installation procedures above to reinstall the drivers for your USB-422-1 converter.

SUPPORT

Check out CommFront's website: <u>www.CommFront.com</u> for product updates, FAQs, and other support.

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