



Industrial RS485/RS422 ⇔ TTL 5V Converter
(Part Number: TTL-485_422-2)



<http://www.CommFront.com>



■ **INTRODUCTION**

The TTL-485_422-2 is a compact, rugged, industrial-grade RS-485/422 to 5VDC TTL converter, which can be used to convert RS-485 or RS-422 to 5VDC TTL compatible levels and vice versa. The unit is powered from an external 5VDC power supply, it supports data direction auto-turnaround, and therefore, no software drivers or flow control is required.

■ **FEATURES**

- Industrial grade enclosed in a rugged, rustless ABS housing.
- Plug and play (hot-pluggable, data format auto-sensing and self-adjusting).
- Data direction auto-turnaround, no software drivers or flow control is required.
- Operating temperature: -40°F to 185°F (-40°C to 85°C).
- Built-in 600W surge protection, 15kV static protection and circuit protection.
- Built-in selectable 120Ω end-of-line terminator.
- Surface Mount Technology manufactured to RoHS and ISO-9001 standards.
- Safety: Strictly certified by TUV (Cert No. SG-CE-090012).
- 5-year manufacturer's warranty.

■ **SPECIFICATIONS**

Compatibility:	EIA/TIA RS-485/422 standard and TTL 5VDC level
Power Source:	+5VDC (±5%) Regulated Power Supply (included)
Current Consumption:	Less than 30mA
Baud Rates:	300 to 115,200bps (auto-sensing and self-adjusting)
Distance:	TTL side: 10ft (3m); RS-485/422 side: Up to 4000ft (1.2km) at 19,200bps;
Connectors:	TTL side: DB-9 Male; RS-485/422 side: DB-9 Male; Termination Board (TTL): DB-9 Female and a 3-way Terminal Block; Termination Board (RS-485/422): DB-9 Female and a 6-Way Terminal Block
Max. number of drops:	64
End-of-Line Terminator:	120Ω (built-in, selectable)
Surge Protection:	600W
Static Protection (ESD):	Up to 15KV
Dimensions (H x W x D):	0.63 x 1.3 x 4.6 in (16 x 32 x 118 mm) (with termination boards)
Weight:	1.8 oz (51 g) (with termination boards)
Operating Temperature:	-40°F to 185°F (-40°C to 85°C)
Operating Humidity:	Up to 90% RH (no condensation)

■ **PIN ASSIGNMENT**

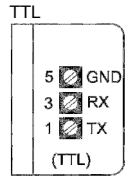
TTL Side (DB-9 Male Connector / Terminal Block):

DB-9 Male Connector:	1	3	5
Terminal Block:	TX	RX	GND
Function:	TTL OUT	TTL IN	GND

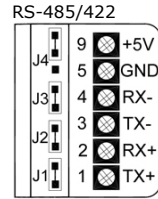
RS-485/RS-422 Side (DB-9 Male Connector / Termination Board):

DB-9 Pin:	1	2	3	4	5	6	7	8	4
Jumper:	J2 (default: ON)		J3 (default: ON)			J1 (default: ON)		J4 (default: OFF)	
RS-485:	A+ (J2 ON)		B- (J3 ON)		GND	(J1 ON)		Terminate/remove Jumper J4 to turn ON/OFF the 120Ω end-of-line terminator	
RS-422:	(J2 OFF)		(J3 OFF)		GND	(J1 OFF)			
	TX+	RX+	TX-	RX-					

Termination Boards:



- Numbers on the left indicate the pin assignment of DB-9 Connectors (TTL side).
- TX is the TTL Output, RX is the TTL Input.



- Numbers on the left indicate the pin assignment of DB-9 Connectors.
- Connect an external +5VDC regulated power supply to +5V and GND.
- Turn ON the 120Ω end-of-line terminator (Jumper J4 ON) when the RS-485/RS422's distance exceeds 660ft (200m).

TTL SIGNAL LEVELS

TTL Input	TTL Output
High (>2.0V)	High (5.0V)
Low (<0.8V)	Low (0.0V)

CONNECTIONS

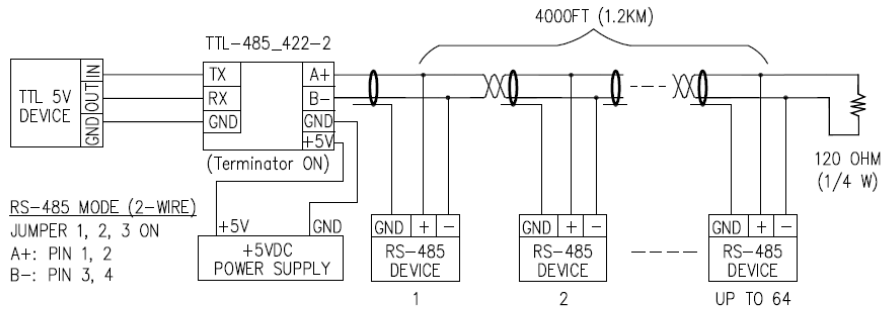


FIGURE 1: MASTER-SLAVE MULTI-DROP CONNECTIONS (RS-485)

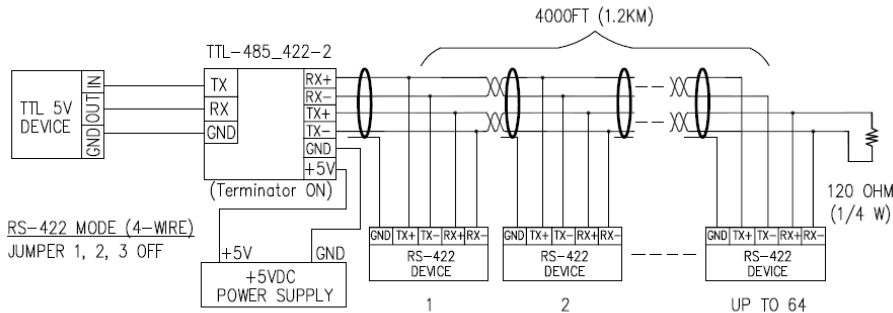


FIGURE 2: MASTER-SLAVE MULTI-DROP CONNECTIONS (RS-422)

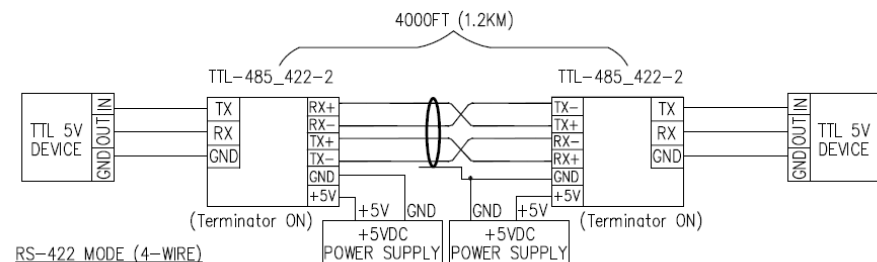
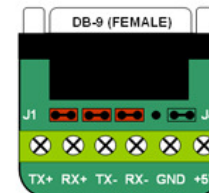
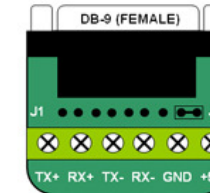


FIGURE 3: EXTENDING TTL DISTANCE (FULL-DUPLEX)

RS-485 / RS-422 MODE SETTING

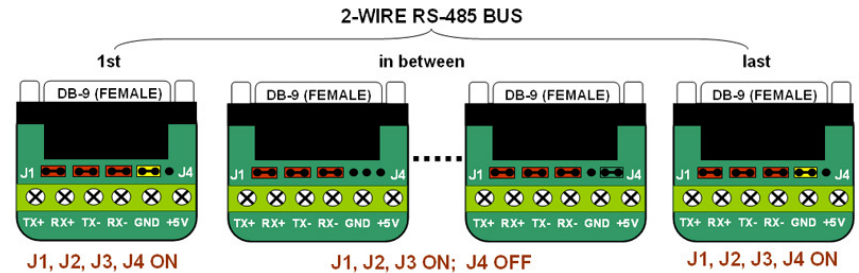


2-WIRE RS-485: J1, J2, J3 ON



4-WIRE RS-422: J1, J2, J3 OFF

120-OHM END-OF-LINE TERMINATION



4-WIRE RS-422 BUS termination diagram. Shows 1st, in between, and last devices. For 1st and last, J1, J2, J3 are OFF and J4 is ON. For in between, J1, J2, J3, J4 are OFF.

Turn on the 120Ω end-of-line terminator on both ends of the RS-485/RS-422 bus when the data rate is over 19.2kbps or the RS-485/RS-422's distance exceeds 660ft (200m).

INSTALLATION NOTES

- CAUTION:** Be sure that the DC power applied to pin +5V and GND is within the range of +4.75V to +5.25V (5V ±5%). Excessive input voltage or incorrect polarity connection could damage the converter.
- 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-485's distance exceeds 660ft (200m).

TROUBLESHOOTING

- Perform a loopback test by using CommFront's 232Analyzer software: Short TX and RX on the TTL side, connect your PC's RS-485 or RS-422 port to the RS485/422 side, and then send commands from the 232Analyzer 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 RS-485/422 to TTL converter. This is very helpful when you are in doubt about the performance of your converter.