Industrial RS485 ⇔ TTL 5V Converter

(Part Number: TTL-485-2)

CE

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■ **INTRODUCTION**

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

■ **FEATURES**

- Operates reliably from 300 to 115,200 baud.
- 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: -40ºF to 185ºF (-40ºC to 85ºC).
- Built-in 600W surge protection, 15kV static protection and circuit protection.
- Built-in selectable 120Ω end-of-line terminator for reliability and easy installation.
- 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 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 side: Up to 4000ft (1.2km) at 19,200bps;
Connectors:	TTL side: DB-9 Male; RS-485 side: DB-9 Male; Termination Board (TTL): DB-9 Female and a 3-way Terminal Block; Termination Board (RS-485): DB-9 Female and a 4-Way Terminal Block
Maximum number of drops:	128
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 4.5 in (16 x 32 x 115 mm) (with termination boards)
Weight:	1.66 oz (47 g) (with termination boards)
Operating Temperature:	-40ºF to 185ºF (-40ºC to 85ºC)
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

5 ⊘ GND
3 ⊘ RX
1 ⊘ TX

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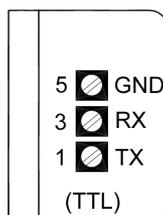
- Numbers on the left indicate the pin assignment of DB-9 Connectors (TTL side).
- TX is the TTL Output, RX is the TTL Input.

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

DB-9 Male Connector:	1	3	5	6,7	9
Terminal Block:	A+	B-	GND	Jumper (120)	+5V
Function:	RS485+	RS485-	GND	Terminate/remove Jumper 120 to turn ON/OFF the 120Ω end-of-line terminator	+5VDC input
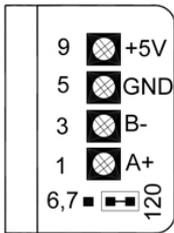
- Numbers on the left indicate the pin assignment of DB-9 Connectors (RS-485 side).
- Connect an external +5VDC regulated power supply to +5V and GND.
- The unit comes with a built-in selectable 120Ω end-of-line terminator; connect it (move the 3-way Jumper 120 to the left side) when the data rate is over 19.2kbps or the RS-485's distance exceeds 660ft (200m).
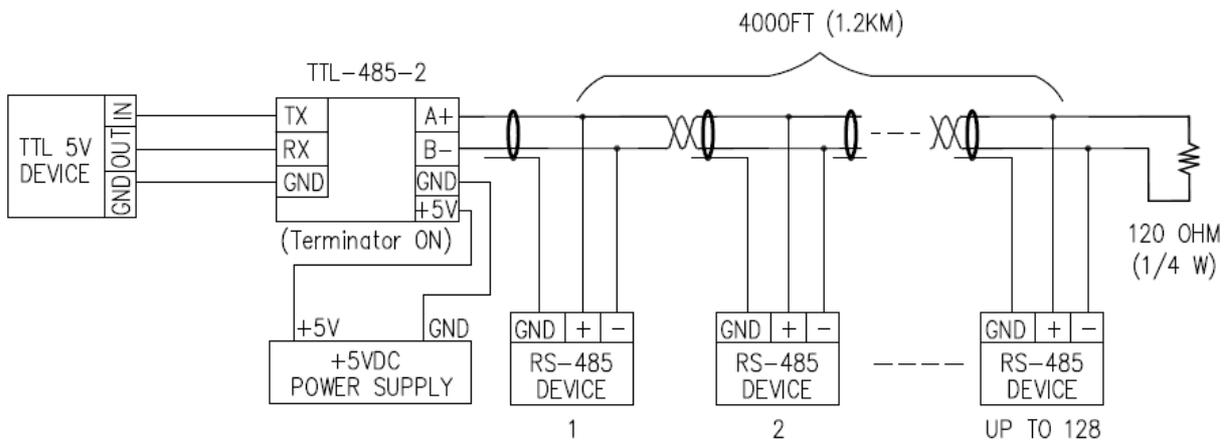
■ CONNECTIONS

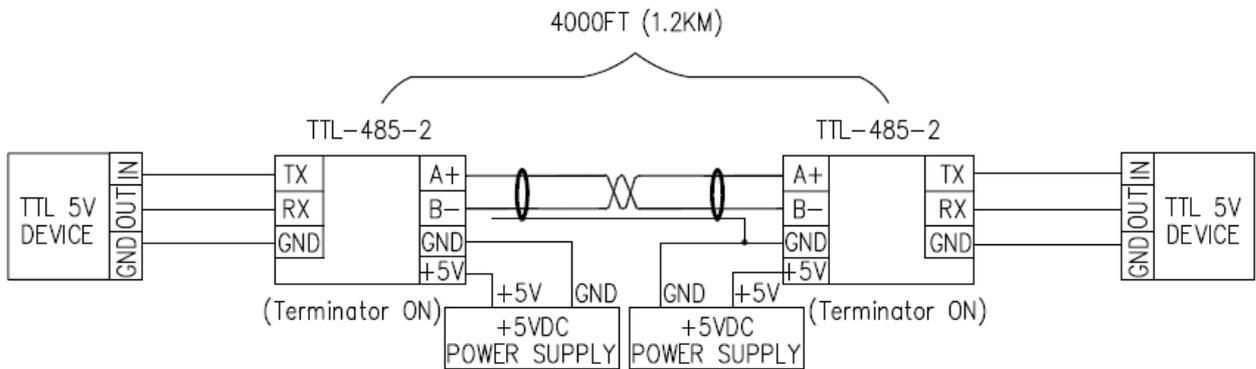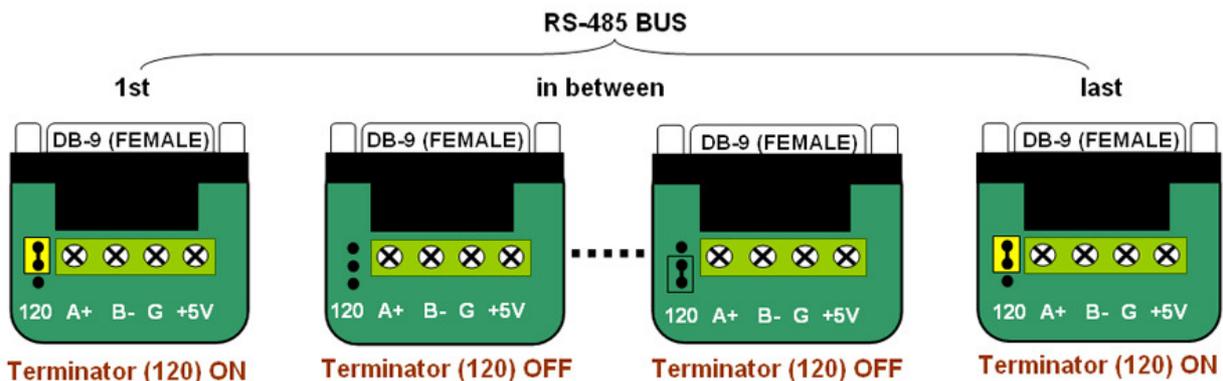FIGURE 1: MASTER—SLAVE MULTI—DROP CONNECTIONS (RS—485)

FIGURE 2: EXTENDING TTL DISTANCE (HALF—DUPLEX)

■ 120-OHM END-OF-LINE TERMINATION

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

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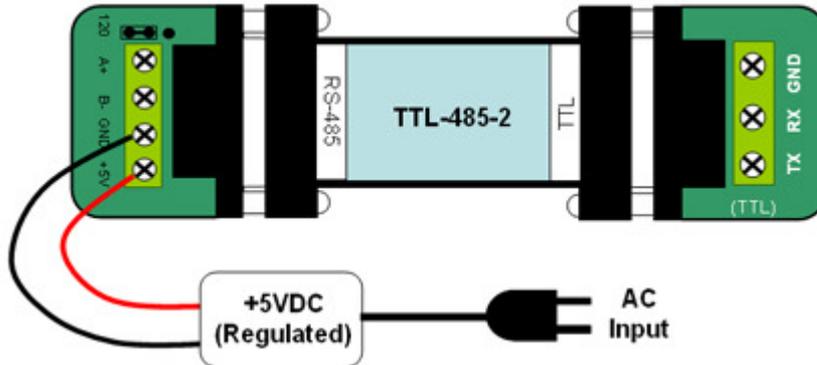
   · The 120Ω end-of-line terminator adds heavy DC loading to a system; connect it only when the data rate is over 19.2kbps or the RS-485's distance exceeds 660ft (200m).

■ **TTL SIGNAL LEVELS**

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

■ **TROUBLESHOOTING**

Perform a loopback test by using CommFront's 232Analyzer software: Connect two numbers of TTL-485-2 to your PC's RS-485 COM ports and connect the TTL terminals with a crossover cable (TX to RX and RX to TX), then run two instances of the 232Analyzer software and send commands from one COM port, you should receive an echo of the commands sent on the other COM port (Note: You will need a RS-232 to RS-485 converter if there is no RS-485 port on your PC). 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/TTL converter. This is very helpful when you are in doubt about the performance of your converter.