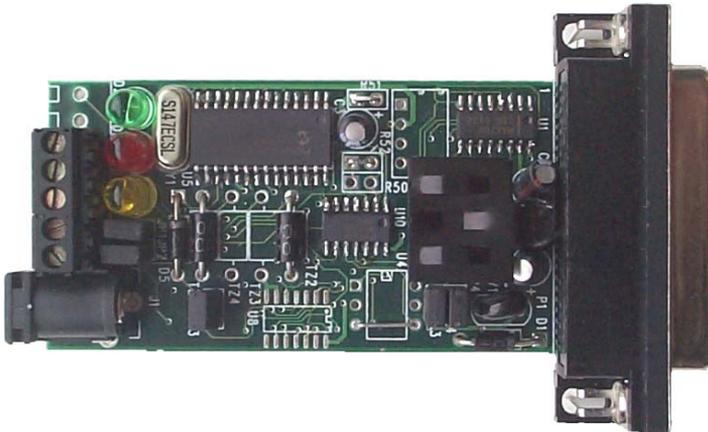


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XP485-25E
ISOLATED XP485-25EI
RS-232 to RS-485
Auto Enabled
Converter

Integrity Instruments XP485-25E/EI User Manual

Performance Characteristics		
Operating Temperature Range	-40°C to 85°C (-40F to +185F)	
DC input voltage min. (+V)	7.5 Vdc	
DC input voltage maximum. (+V)	24 Vdc	
DC input current nominal (+V) XP485-25E	22 ma	
DC input current nominal (+V) XP485-25EI	55 ma	
DC input current max. (+V)	250 ma	
ESD static discharge (A/B)	1500 V	
Baud Rate maximum	115.2 Kbps	
Baud Rate minimum	600 bps	
Number of RS-485 nodes	256	
Maximum cable length	4000 feet +	
Termination resistance	120 ohms	
MPU (14.7456 Mhz)	PIC16C63A	
RS-485 line driver	SP483EEN	
Isolation voltage (XP485-25EI ONLY)	3,000 volts	
JUMPER SETTINGS		
JUMPER NUMBER	FUNCTION	FACTORY DEFAULT
JP1 JP2	TERMINATION	ON (TERMINATED)
JP3	ECHO	ON (NO ECHO)
JP4 JP5	DTE OR DCE	DTE (ORIENTATION)

DB25 Pinning

RS-232 TxD transmit (output): **DB25 pin 2**
RS-232 RxD receive (input): **DB25 pin 3**
RS-232 Ground **DB25 pin 7**

LED Operation

The **XP485-25E/EI** provides a power status and signal LEDs to aid in cabling problems and general operation. Since the signal LEDs are powered only when data is present, they may be illuminated for somewhat brief periods.

POWER YELLOW LED : Power to unit when on
SIGNAL RED LED : RS-232 transmitting when on
SIGNAL GREEN LED : RS-485 receiving when on

Power Supply

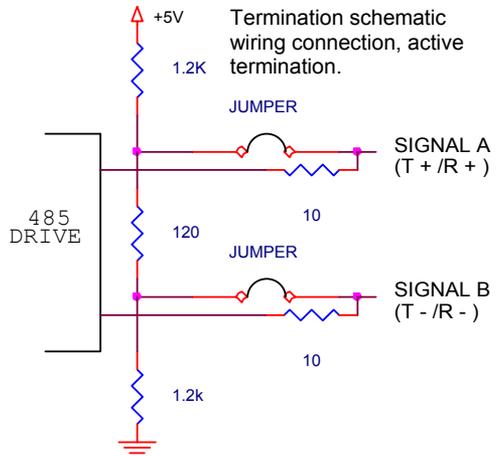
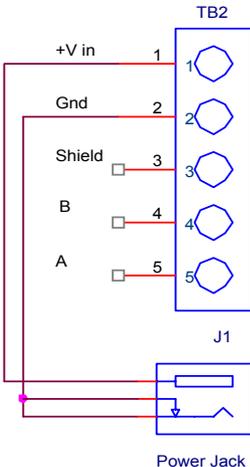
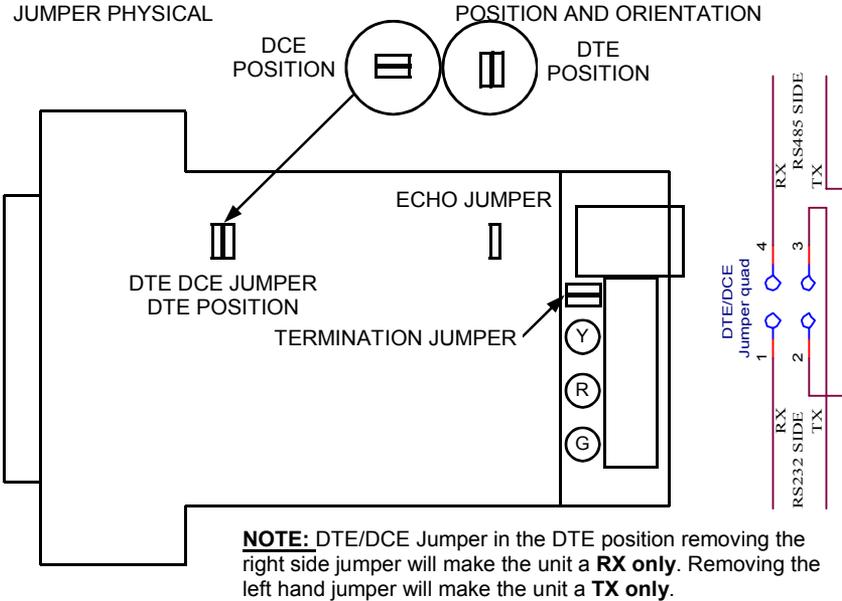
The **XP485-25E/EI** requires an external power supply for proper operation. We suggest a 9 Vdc 400 ma power supply. Power must be in the voltage range 7.5 Vdc to 24.0 Vdc.

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Jumpers

There are several jumpers associated with the **XP485-25E/EI** unit. The rs-485 termination jumpers are exposed on the end of the unit. The echo and dte/dce jumpers are inside the unit. The echo jumper echoes the transmitted data back to the unit. If this function is desirable the echo jumper must be removed.

If DCE wiring is needed, or if the echo feature is desired, the case will have to be opened. Use a small screwdriver in the slots on the side of the case and twist, this will open the case so the jumpers can be changed. When the jumpers are changed re-assemble the case by squeezing the case pieces together.



Integrity Instruments XP485-25E/EI User Manual

RS-485 Cabling

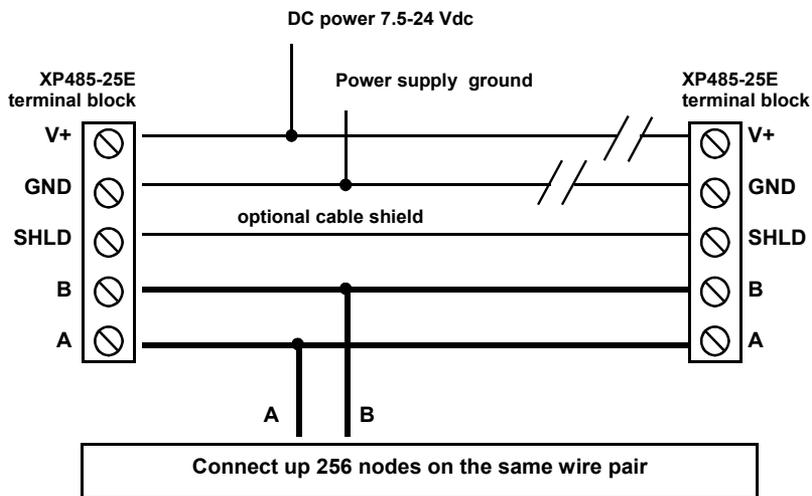
The **XP485-25E/EI** is designed to operate in a Multi-Drop RS-485 LAN configuration. In a half-duplex multi-drop environment all RS-485 nodes share the same data lines. A single pair of data lines act as both Transmit and Receive wires.

* **Data lines (A/B) are the only wires required between RS-485 nodes**

* **All RS-485 nodes need not share the same V+ and GND**

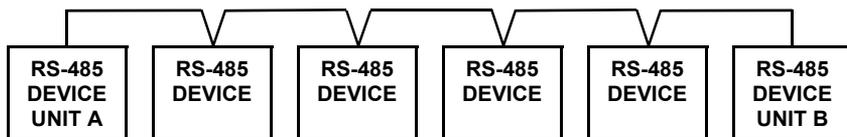
UNIT CAN BE POWERED VIA TERMINAL CONNECTIONS, OR POWER JACK.

IF POWERED BY POWER JACK, OTHER UNITS CAN BE POWERED VIA TERMINALS.



Cabling Notes:

- 1) Gnd and Shld are connected internally within the **XP485-25E/EI**.
- 2) Cable termination is important for long distance and high-speed applications
- 3) Suggested cable: 24 awg stranded twisted pair with shield for cable runs in excess of 200 feet. See also Belden cable #9841 and #9463.
- 4) The normal connection method is the "Daisy Chain" type shown below. there are other kinds of connections, but this is considered as the standard.
- 5) The end units (**A**) and (**B**) should be terminated. All other units should not.



DAISY CHAIN

Integrity Instruments XP485-25E/EI User Manual

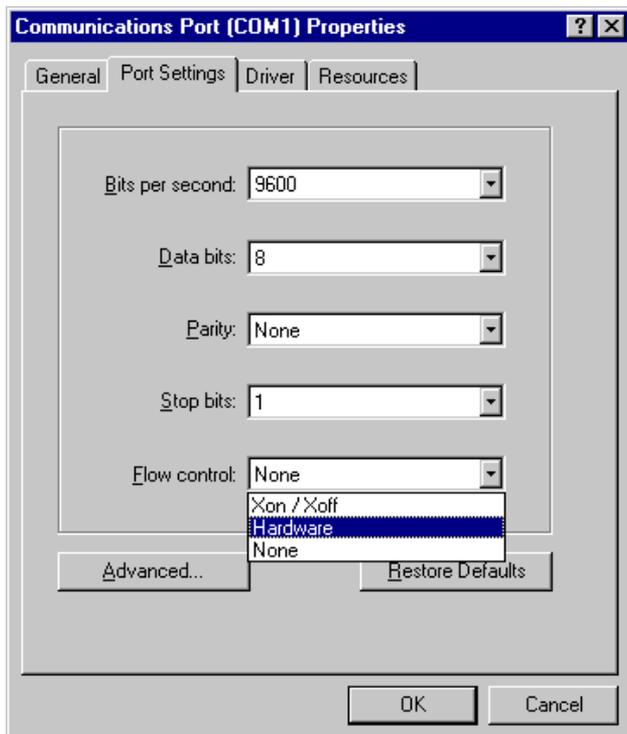
Flow Control Options

The Microsoft Windows operating systems allow a user to select several RS-232 flow control options. The **XP485-25E/EI** supports both **Hardware** and **None** options. The Xon/Xoff flow control is supported only if your RS-485 target device supports Xon/Xoff.

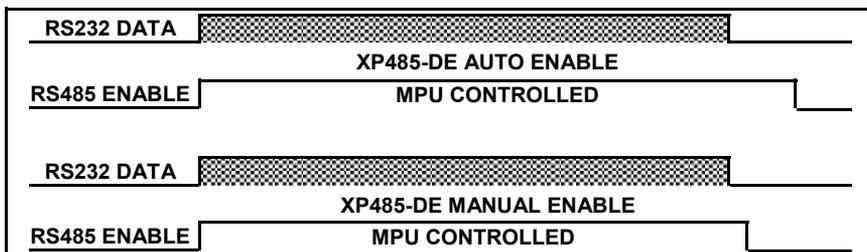
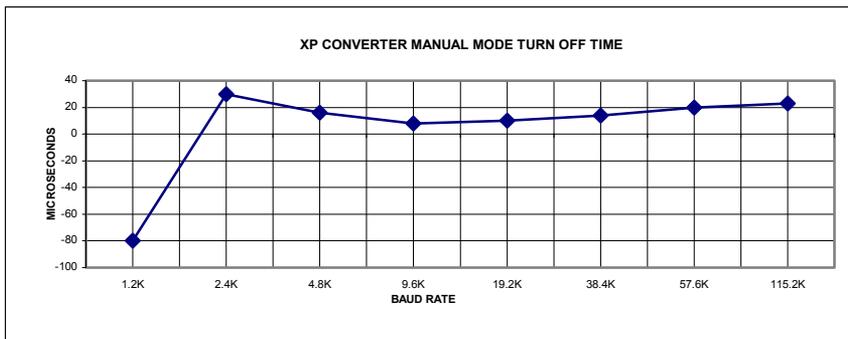
Hardware flow control is also known as RTS/CTS flow control. The PC asserts the RTS (Ready To Send) signal and waits for the connected device to assert CTS (Clear To Send) before transmitting any RS-232 data. The microprocessor in the **XP485-25E/EI** monitors the RTS line and asserts the CTS line when the unit is ready for RS-485 transmission.

None flow control setting is also supported by the unit. Since the **XP485-25E/EI** monitors the RS-232 transmit line, it seizes the RS-485 transmit immediately and begins sending data when any RS-232 data is sent.

Regardless of the flow control method selected, the **XP485-25E/EI** will automatically handle RS-485 transmit enable.



Integrity Instruments XP485-25E/EI User Manual



Auto Enable (Data Send Control)

The **XP485-25E/EI** automatically handles the RS-485 half-duplex control via an adaptive algorithm running in the on-board PIC16C63A MPU. When RS-232 data is received, the RS-485 transmit enable is asserted immediately. After approximately one RS-232 byte time (auto detected baud rate) of no RS-232 data, the **XP485-25E/EI** de-asserts RS-485 transmit enable and reverts back to RS-485 receive.

Conversely, other converters like our **485-25A** begin RS-485 transmit when the RTS line is asserted. RS-485 transmit continues until the RTS line is de-asserted.

Note:

When using the **XP485-9E/EI** the responding RS-485 device must wait for the auto transmit enable to revert back to the receive state. If the responding RS-485 device transmits a packet back less than one RS-232 byte time after the end of the packet, then you should consider using the **XP485-9E/EI** in the manual mode.

PROGRAMMING AND RS-232 DATA

The **XP485-25E/EI** has two modes that it can operate in.

The first mode, mode 1 is the auto enabled mode.

The second mode, mode 2 is the manual mode.

NOTE: The manual mode, mode 2 can only be used if one or more of the XP485-9E/EI converters is used on the rs-485 link and has the termination jumpers on!

Integrity Instruments XP485-25E/EI User Manual

PROGRAMMING AND RS-232 DATA

The **XP485-9E/EI** can be programmed for Auto or Manual mode, baud rate, and silent or active on power up. When in **active** on power up, when power is applied to the unit, it will respond with:

Integrity Instruments XP Converter v1.01

at 9600 baud.

To change the settings, connect the unit to your PC and enable a RS-232 control program as our **EZTerminal**. Set the port settings for 8 data bits no parity and 1 stop bit at 9600 baud. With the unit connected, re cycle the power to the **XP485-25E/EI**. When power is first applied to the **XP485-25E/EI** and it is connected to an active PC terminal with the port settings just stated, if the space bar is actuated on the keyboard within 3 seconds of power being applied, the unit will go into a programming state.

If the space bar is hit within 3 seconds after power is applied, the unit will respond:

Programming Mode

If you now enter ? and carriage return the unit will respond with the current settings:

```

Integrity Instruments XP Converter v1.01
S/N FFFFFFFF
Mode 01 (Mx where x=1 or 2) automatic
Default Baud 08 (Bx where x=1...9) 115,200 BPS
Silent Power Up OFF (Sx where x=0 or 1)
    
```

PROGRAMMING COMMANDS	
USE ALL CAPITALS, ↵ SIGNIFYS A CARRIAGE RETURN	
COMMAND	FUNCTION
Mx ↵	Mode change if x = 1 >>>> Mode 1 Auto mode 2 >>>> Mode 2 Manual mode
Bx ↵	Baud rate if x = 0 >>>> 1200 1 >>>> 1200 2 >>>> 2400 3 >>>> 4800 4 >>>> 9600 5 >>>> 19,200 6 >>>> 38,400 7 >>>> 57,600 8 >>>> 115,200 9>>>>> 230,400
Sx ↵	Power up if x = Model and Version 0 >>>> Model and version sent 1 >>>> Model and version not sent
? ↵	Returns current settings of unit

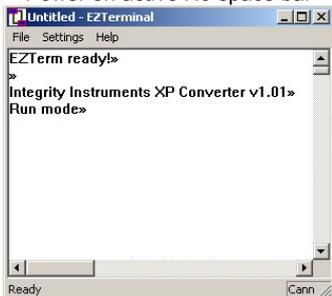
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PROGRAMMING AND RS-232 DATA

In Auto mode, the baud rate has no function.

EXAMPLES

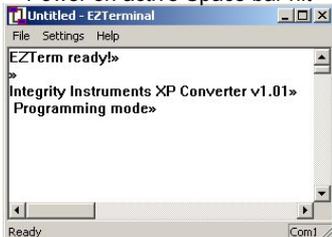
Power on active No space bar



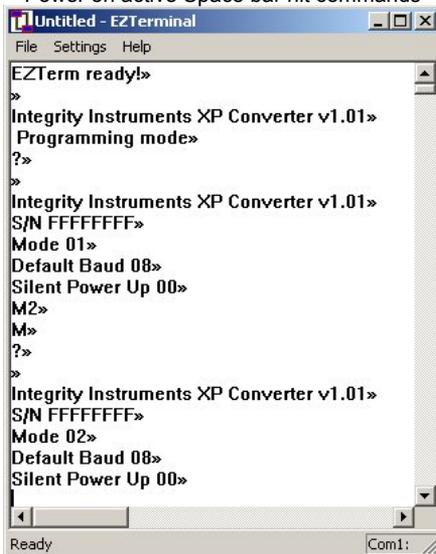
Power on active Space bar, ?



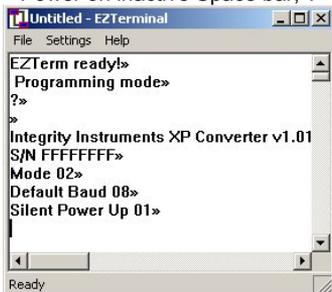
Power on active Space bar hit



Power on active Space bar hit commands



Power on inactive Space bar, ?



WARRANTY

Integrity Instruments warranties all products against defective workmanship and components for the life of the unit. Integrity Instruments agrees to repair or replace, at its sole discretion, a defective product if returned to Integrity Instruments with proof of purchase. Products that have been mis-used, improperly applied, or subject to adverse operating conditions fall beyond the realm of defective workmanship and are not covered by this warranty.

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