



ELECTRO INDUSTRIES

G A U G E T E C H

UNICOM-2500

UNIVERSAL COMMUNICATION CONVERTER

USER'S INSTALLATION & OPERATION MANUAL

Version 1.2/ 2-98

Address:

Electro Industries/Gaugetech
Division of E. I. Electronics, Inc.
1800 Shames Drive Westbury, New York 11590 U. S. A

For Customer or Technical Assistance, Repair and Calibration:

Phone: (516) 334-0870 Fax: (516) 338-4741

Customer Support & Repair Service

Customer support is available 9:00 A.M. to 4:30 P.M., Eastern Time, Monday through Friday. Please have the model, serial number and a detailed problem description available. If the problem concerns a particular reading, please have **all** meter readings available. When returning any merchandise to E.I.G., a return authorization number is required.

**PRODUCT
WARRANTY:**

Electro Industries/Gaugetech warrants this product to be free from defects in material and workmanship for a period of 1 year from date of shipment. During the warranty period, we will, at our option, either repair or replace any product that proves to be defective.

To exercise this warranty, fax or call our customer service department. You will receive prompt assistance and return instructions. Send the instrument, transportation prepaid, to the address above. Repairs will be made and the instrument will be returned.

**LIMITATION
OF
WARRANTY:**

This warranty does not apply to defects resulting from unauthorized modification, misuse, use for any reason other than electrical power monitoring. This unit is not to be used for primary over current protection. Any protection feature in this unit is to be used for alarm or secondary protection only.

This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness for a particular purpose. Electro Industries/Gaugetech shall not be liable for any indirect, special or consequential damages arising from any authorized or unauthorized use of any Electro Industries / Gaugetech product.

**STATEMENT
OF
CALIBRATION:**

This instrument has been inspected and tested in accordance with specifications published by Electro Industries/Gaugetech. The accuracy and calibration of this instrument are traceable to the National Bureau of Standards through equipment which is calibrated at planned intervals by comparison to certified standards.

DISCLAIMER:

Information presented in this publication has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies. The information contained in this document is subject to change without notice.

COPYRIGHT:

No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or information storage or retrieval systems or any future forms of duplication, for any purpose other than the purchaser's use, without the expressed written permission of Electro Industries/Gaugetech, division of E. I. Electronics, Inc.

UNICOM-2500

SPECIFICATIONS:

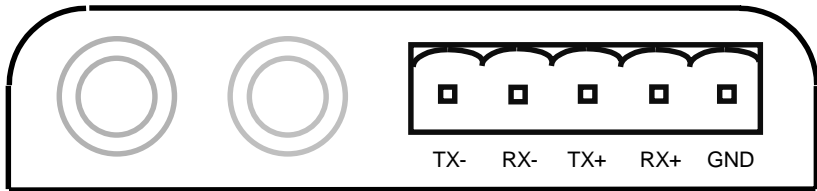
Power Voltage: Requirements	9Vdc - 30Vdc or 7Vac-20Vac
Maximum Power: Consumption	3VA
Isolation Voltage:	2500Vrms (RS232 to RS485)
Data rate:	1200 - 115,000 baud
Switches:	DTE-DCE selection HALF-FULL duplex selection (HD/FD) 232/FO-232/485-485/FO selection. Only with fiber optic option
Indicator Lights:	TX transmit (RS232 or Fiber Optic) RX receive (RS232 or Fiber Optic) CTRL control (RS485) ERR error (RS232 or Fiber Optic)
Connectors:	DB-9(RS-232) 5 screw terminal (RS-485) ST [®] receive and transmit (Fiber Optic), optional
Enclosure:	Rugged aluminum resistant to Electro Magnetic Interference
Outside Dimensions:	L=4 ⁷ / ₈ " (124mm), W=2 ⁹ / ₁₆ "(65mm), H= 1"(25mm)
Mounting:	Stand alone or wall mounted with mounting plate supplied
Operating Temperature:	-20C ⁰ to +70C ⁰
Port Configuration:	RS232 - 9 Pin Female RS485 - 4 wire and 2 wire connector Fiber Port - 50/125μm, 62.5/125μm and 100/140μm fiber sizes using ST terminated cables. Wavelength=820nm

CONNECTORS:

RS-232 Port: Switch Position

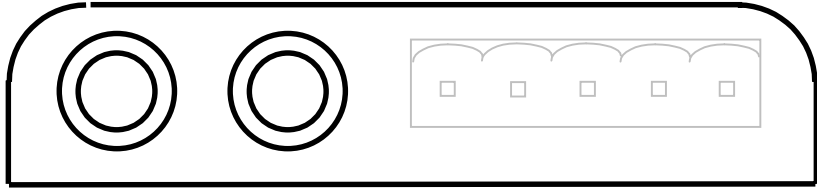
DCE		DTE	
pin	name	pin	name
2	TX	2	RX
3	RX	3	TX
5	GND	5	GND

RS-485 Port: Pin assignment is also indicated on the enclosure



Rear view of enclosure

FIBER OPTIC PORTS (optional) : The Fiber Optic ports accept ST[®] terminated fibers (50/125µm, 62.5/125µm, 100/140µm)

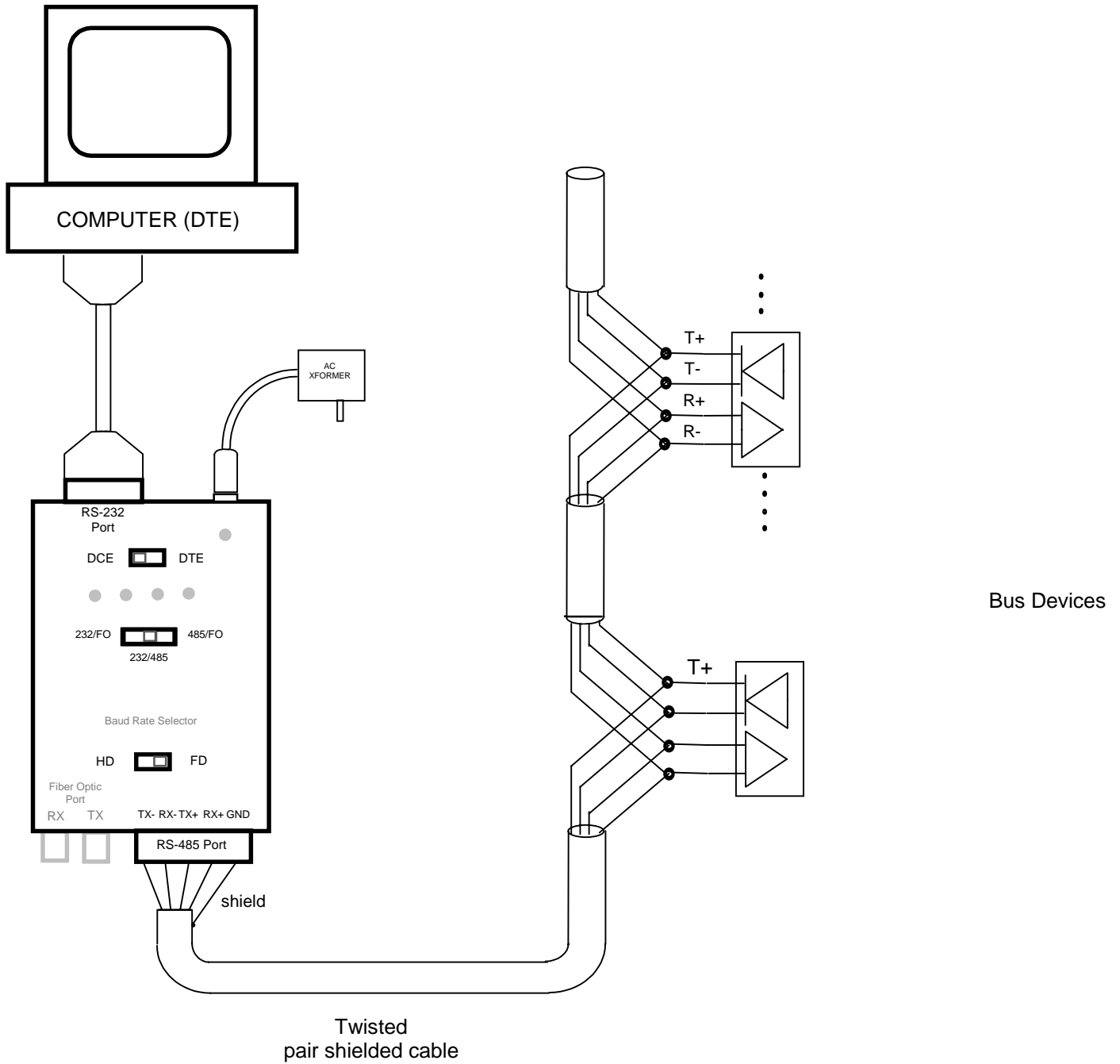


Rear view of enclosure

Power Connection: DC Jack barrel type (not polarized)
 Outside diameter: 5.5mm
 Inside diameter: 2.5mm

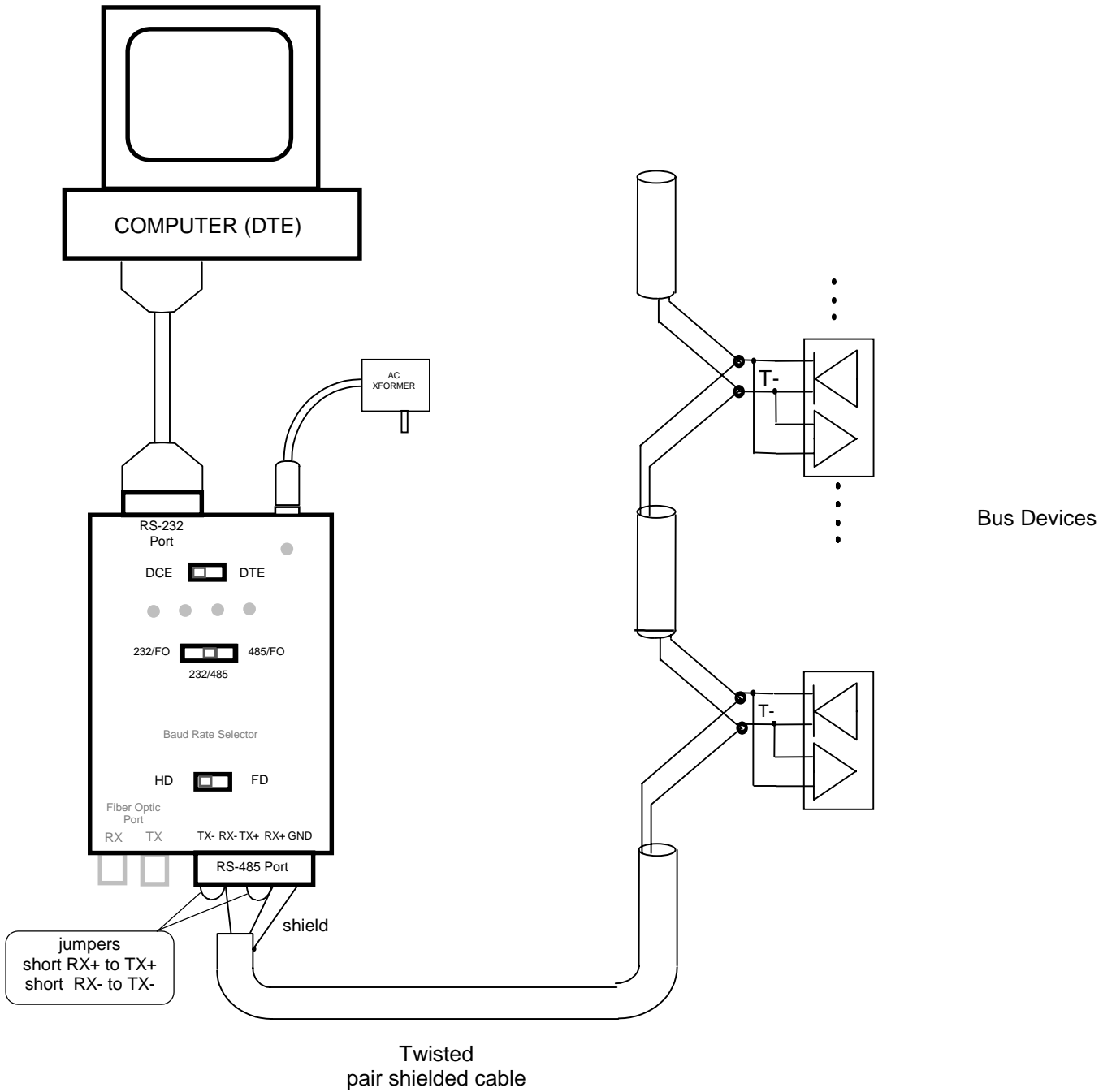
HOOKUP DIAGRAMS:

RS-232/RS-485 CONVERSION: 4 Wire (Full Duplex installation)



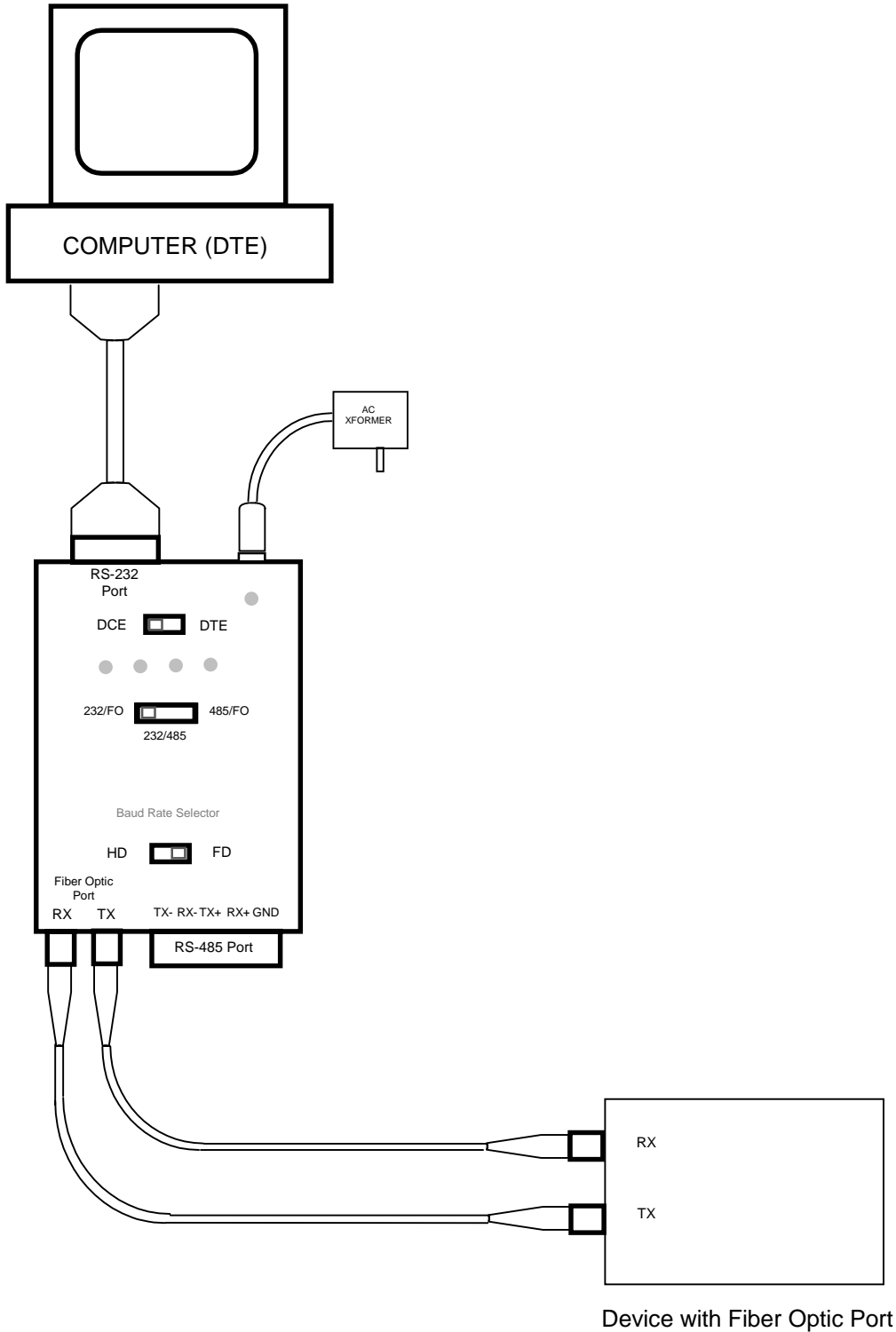
HOOKUP DIAGRAMS:

RS-232/RS-485 CONVERSION: 2 Wire (Half Duplex installation)



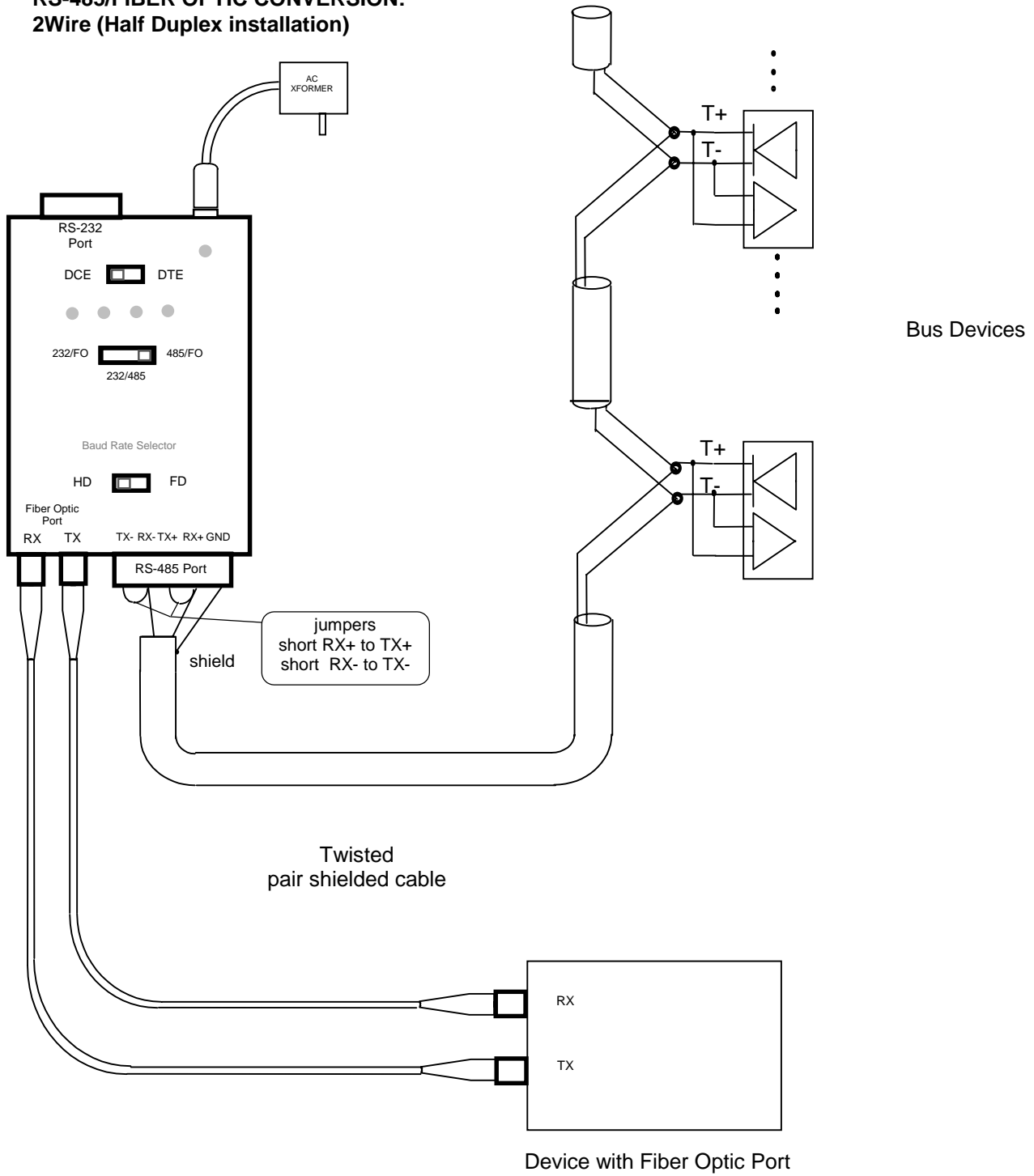
HOOKUP DIAGRAMS:

RS-232/FIBER OPTIC CONVERSION:



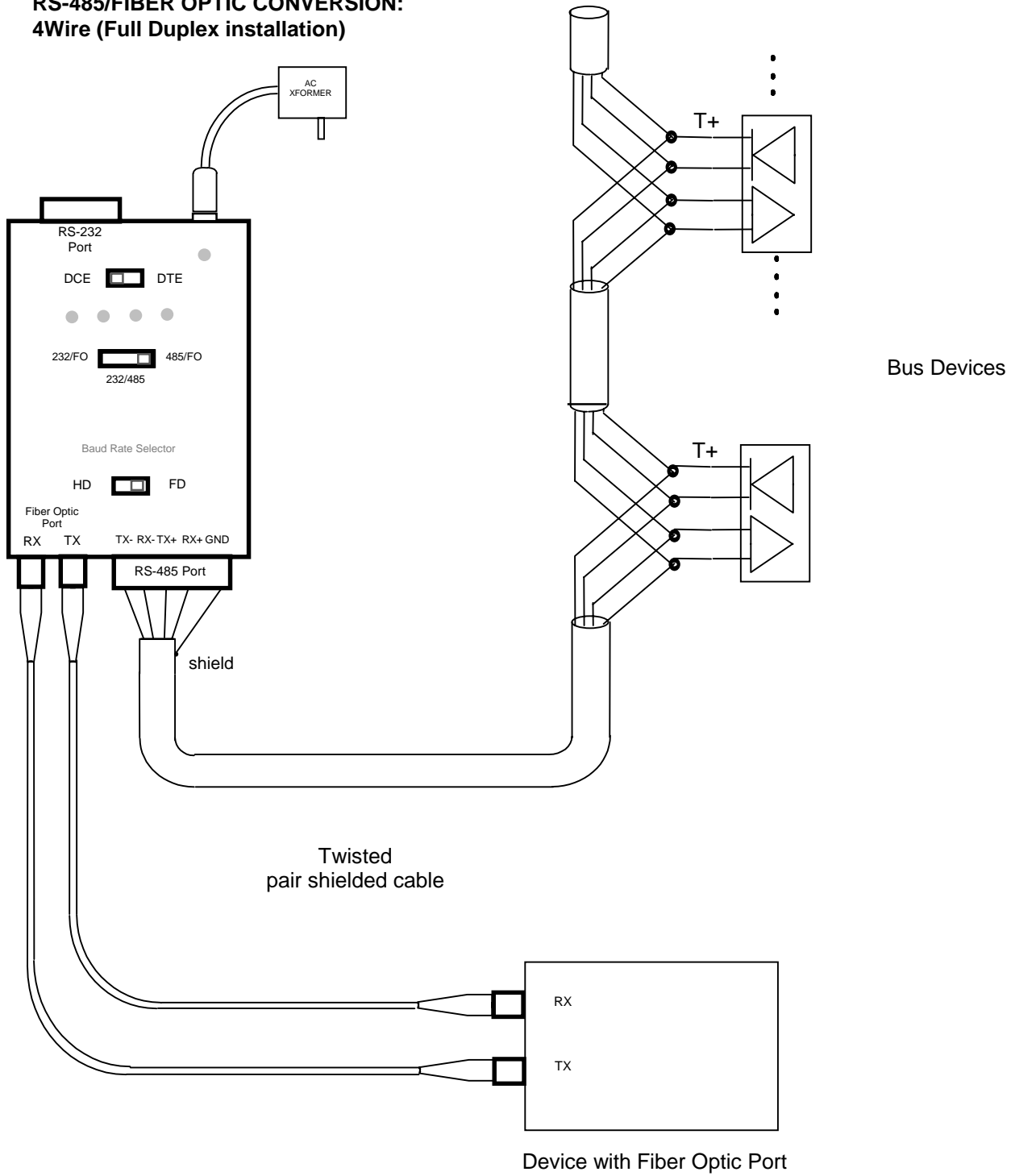
HOOKUP DIAGRAMS:

RS-485/FIBER OPTIC CONVERSION: 2Wire (Half Duplex installation)



HOOKUP DIAGRAMS:

RS-485/FIBER OPTIC CONVERSION: 4Wire (Full Duplex installation)



DESCRIPTION OF FEATURES

SWITCHES:

DTE-DCE : Configures the wiring of the RS-232 port. When DCE (Data Communication Equipment) is selected the Unicom-2500 receives data on Pin3 and transmits on Pin2 (DB-9 connector). When DTE (Data Terminal Equipment) is selected, Pin3 is the transmit and Pin2 is the receive. For example if the Unicom-2500 is connected to a computer, DCE should be selected. If it is connected to a modem or another Unicom-2500(with DCE selected) DTE should be selected.

CONFIGURATION SWITCH (RS232/FO - RS232/RS485 - RS485/FO), only for units with Fiber Optic Option:

Determines the path for the throughput.

FD-HD(Full Duplex/Half Duplex),(RS-485): Used to setup the Unicom-2500 for Full Duplex or Half Duplex mode. Full duplex requires a 4 wire hookup on the RS-485 Bus to enable simultaneous receive and transmit. In this mode, the Baud Rate Selector Switch is not enabled since there is no need to control the RS-485 transmit driver (Receive is constantly enabled). Half Duplex mode requires only two wires to be hooked up on the RS-485 Bus. In this mode, transmit and receive signals are on the same pair of wires. When the unit is transmitting, the receive device is disabled, when the transmission is complete the unit is then in the receive mode (receive enabled). The Unicom-2500 automatically controls this operation. It only needs the Baud Rate to determine the turnaround time from transmit to receive, therefore the *Baud Rate selection switch must be in the right position!*

See also software/firmware considerations in Half Duplex mode (Pg. 11).

Half Duplex installation requires these modifications on the RS-485 connection port! :

TX+ Pin connected to RX+ Pin (use jumper wire)

TX- Pin connected to RX- Pin (use jumper wire)

Baud Rate Selector Switch (For Half Duplex, two wire setup only):

Sets up the current communication Baud Rate. Range : 1200 to 115000 Baud.

STATUS LIGHTS:

Power: Indicates the unit is on

RX: Indicates the RS-232 or Fiber Optic port is receiving

TX: Indicates the RS-232 or Fiber Optic port is receiving

ERR: Indicates an illegal condition on the RS-232 or Fiber Optic port.

A start bit is detected on the RS-232 or Fiber Optic receive line, but there is no data. This condition would enable the transmit driver on the RS-485 port forever which would load down the RS-485 Communication Bus. When the *ERR* light comes on, Unicom-2500 automatically disables the transmit driver to prevent this unwanted situation. Such a condition is usually caused by software/firmware lockup. A new start bit will reset the unit.

CTRL: indicates the RS-485 port data direction, and is used only in Half Duplex mode. The On state indicates transmit, the Off state indicates receive.

RS485 WIRING

For long distances or higher baud rates use high quality twisted pair shielded cable. Termination of the transmission line is also recommended. The termination resistor is usually 100Ω $1/2W$ and not less than 90Ω . Termination resistors should be hooked up at the first device and the last device on the transmission line.

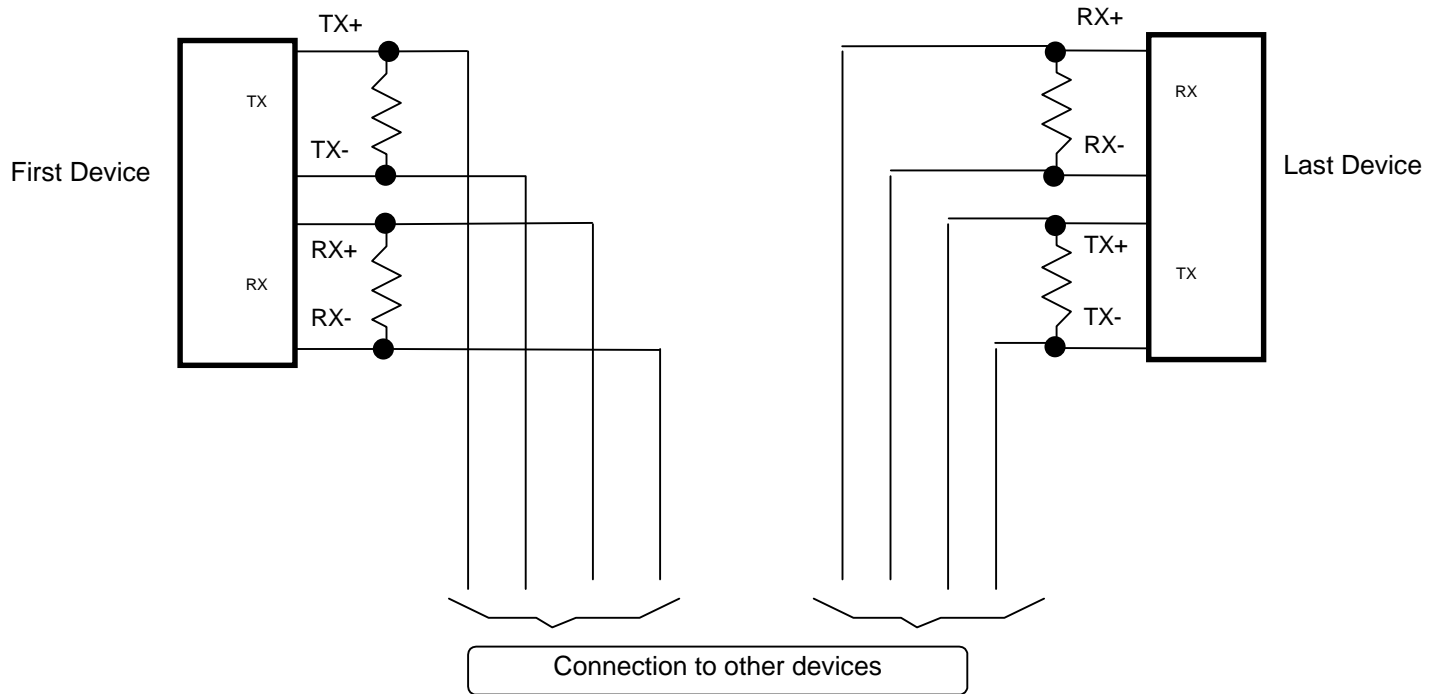


Fig.1 Full Duplex installation with terminating resistors.

In Half Duplex (two wire) installation there are only two terminating resistors to hook up.

Software/Firmware considerations when using RS-485 Half Duplex(two wire) installation:

In Half Duplex mode care must be taken in order to achieve successful operation. The automatic control of the Unicom-2500 detects the transitions on the incoming RS-232 or Fiber Optic(optional) receive line. When a transition occurs it enables the transmit driver of the RS-485 port. After the last transition is detected, the unit holds transmit enable for 13 bit-times, disables the transmit driver, and then enables the receive device of the RS-485 port. In order to avoid collisions on the transmission line, a time delay of at least 13 bits must be inserted before transmitting back to Unicom-2500.