VT-MODEM Interfaces with the Allen-Bradley MicroLogix 1500 PLC using Rockwell's RSLogix 500 & RSLINX Lite Software

Abstract: The information in this document was provided by **Rock Interface Systems, Inc**. It explains the procedure for interfacing a SIXNET Industrial Telephone Modem with an AB MicroLogix 1500 controller and a computer running the Rockwell RSLogix 500 programming software and the RSLINX communication software. This setup will allow a remote computer to go on-line with a MicroLogix via a telephone modem connection.

Hardware and Software Used:

- SIXNET Industrial Modem (Part Number: VT-MODEM-1US)
- Serial cable (Part Number: VT-CABLE-MDM) (Incl. with VT-MODEM-1US)
- SIXNET VT-MODEM Setup Wizard v1.15
- Allen-Bradley MicroLogix 1500 CPU (i.e. 1764-LSP)
- Allen-Bradley Advanced Interface Converter (i.e. 1761-NET-AIC)
- Allen-Bradley HHP cable for AIC module to CPU port connection (i.e. 1761-CBL-HM02, Ser.B)
- Allen-Bradley cable for PC to Micrologix processor (i.e. 1761-CBL-PM02, Ser.B)
- Null modem adapter cable
- Rockwell RSLogix Software v3.01.02.00
- Rockwell RS LINX Communication Driver v2.10.118.0
- Internal Modem on PC
- **Analog** phone line connections at both ends (digital lines may not work). The phone line at the MicroLogix end must also be a direct-dial number from the outside (It is recommended that if possible the analog line should not be routed through a PBX system).

(Note: The Micrologix 1000 can be used as an alternative to the Micrologix 1500.)

Pin-out of Null Modem Adapter Cable				
DB9 Male to Modem			DB9 Male to 1761-CBL-PM02	
CD	1	→	1	CD
RD	2	→	3	RD
TD	3	←	2	SD
GND	5	↔	5	GND
RTS	7	→	8	CTS
CTS	8	←	7	RTS

Receiving Modem (SIXNET VT-MODEM-1) Setup Procedure :

Use Window's HyperTerminal to communicate to the modem.

> **Note:** *For information on how to use HyperTerminal, please consult the SIXNET VT-MODEM online help guide located on the SIXNET CD in the Product Catalog*.

Settings can be changed by connecting the straight through cable, which comes as part of the Industrial Modem package (VT-CABLE-MDM) to the serial port on the modem and the serial port of the computer (i.e. serial port COM1).

> **Important:** *Choose the baud rate that matches the PLC or other device that will be connected to the modem. Anytime a setting is saved using &W0 or &W1, the RS232 baud rate is memorized by the VT-Modem. The saved baud rate will be used for future communications with any attached device that does not initiate communications with the modem (such as most PLC's).*

To check communication, type **AT <*Enter*>. *OK*** should appear.

To Set Up Modem:

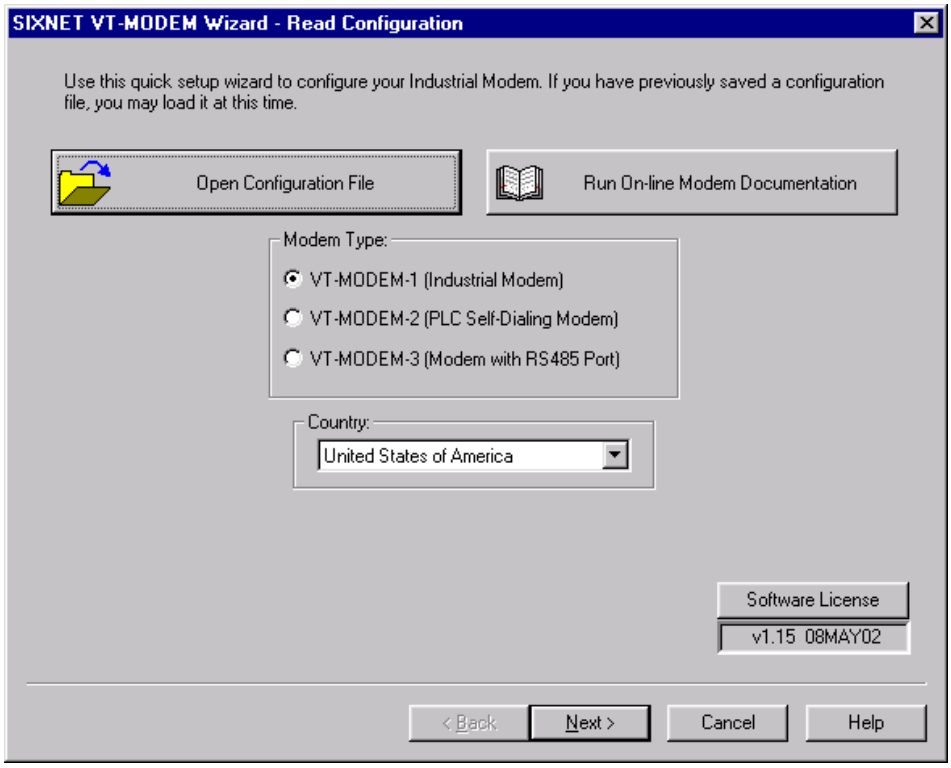
Type In: **AT&F<*Enter*>**	- This sets the modem to factory defaults
Type In: **ATS0=1<*Enter*>**	- This set the modem to auto-answer
Type In: **ATS46=136<*Enter*>**	- This turns off data compression
Type In: **AT&W0&W1<*Enter*>**	- This save changes to both profiles
Type In: **AT&V<*Enter*>**	- Use this to verify changes

(Note: Using a Rev 1.09 VT-MODEM-1, Rev 1.04 VT-MODEM-2, Rev 1.02 VT-MODEM-3 may require different AT commands. Loading pre-configured settings from the latest VT-MODEM Setup Wizard will eliminate the need of AT commands.)

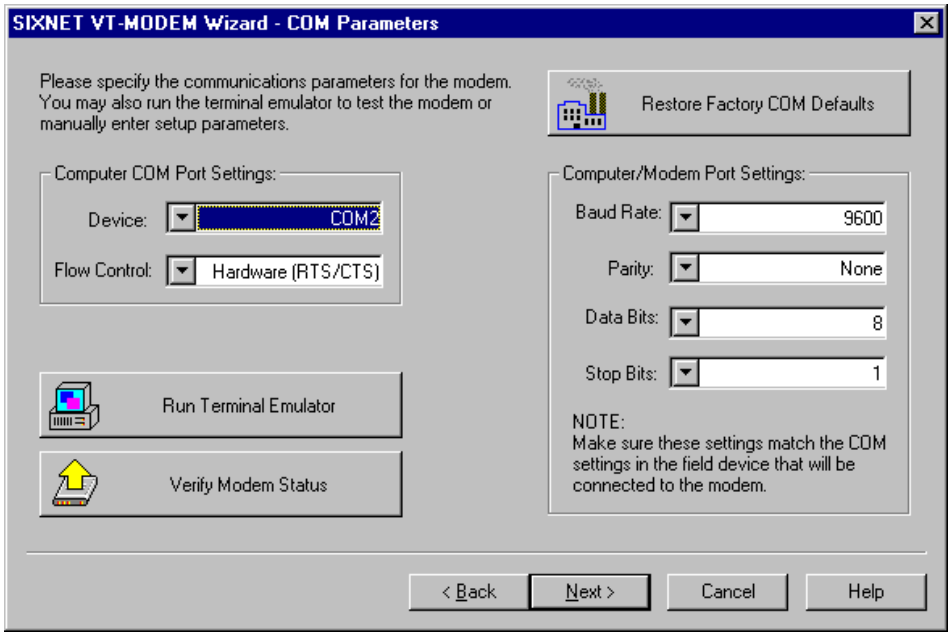
Loading Pre-Configured Settings:

SIXNET provides a pre-configured file (AB_Micrologix1500.6ms and AB_Micrologix1000.6ms) that can be loaded to the modem via the VT-MODEM Setup Wizard; a Setup Utility included with every SIXNET VT-MODEM-#. The AB_Micrologix1500.6ms file is located on the latest SIXNET CD, from your local SIXNET representative, or in the modem section at www.Get2Support.com.

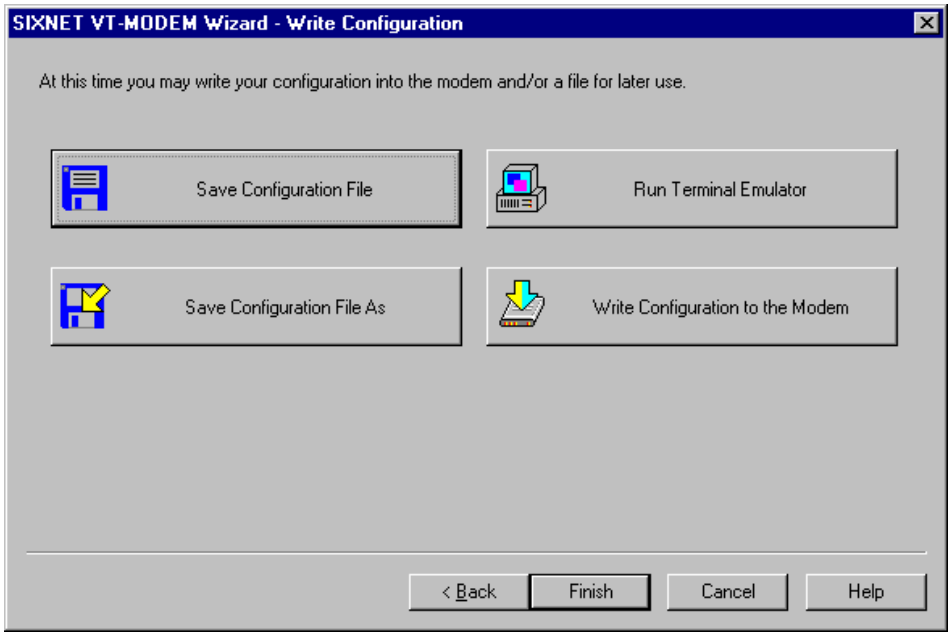
To load the pre-configured file into the modem click on the "Open Configuration File" button in the *Load Configuration* window, and open the AB_Micrologix1500.6ms file (See Screen Shot 1). Select the communications port the SIXNET VT-MODEM-1 is connected to (COM 2 in this case) in the *COM Parameters* window (See Screen Shot 2). Load the configuration into the modem using the "Write Configuration to the Modem" button in the *Write Configuration* Window (See Screen Shot 3).



Screen Shot 1



Screen Shot 2



Screen Shot 3

MicroLogix 1500 Controller Channel Configuration:

Whatever PLC program is running in the processor is not important; however the programming port Channel 0 system port must be configured properly and the changes saved with the program.

a) Start up RSLogix and go on-line (this requires the 1761-CBL-PM02 cable connected to channel 0). Double click on the channel configuration. Select Channel 0 - System.
b) The Channel Configuration must be set up so that the modem will properly communicate with the MicroLogix 1500. Make sure that the following parameters match those of the MicroLogix 1500 Channel Configuration.

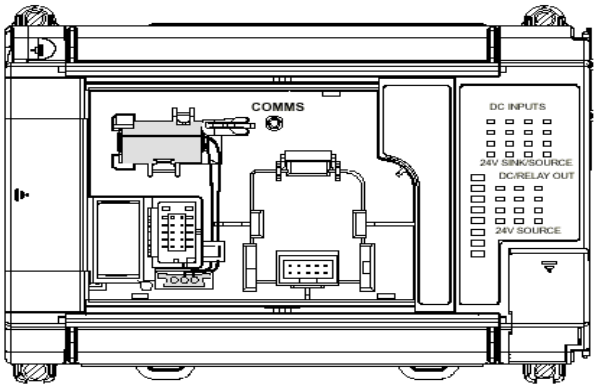
IMPORTANT: To communicate to the Channel 0 port after making the following changes, follow the directions below:

When the Channel 0 settings have been changed, the 1761-CBL-PM02 cable can be removed between the computer and the MicroLogix 1500. The 1761-CBL-HM02 cable must now be installed between the AIC module and the Channel 0 Port of the Micrologix 1500 processor.

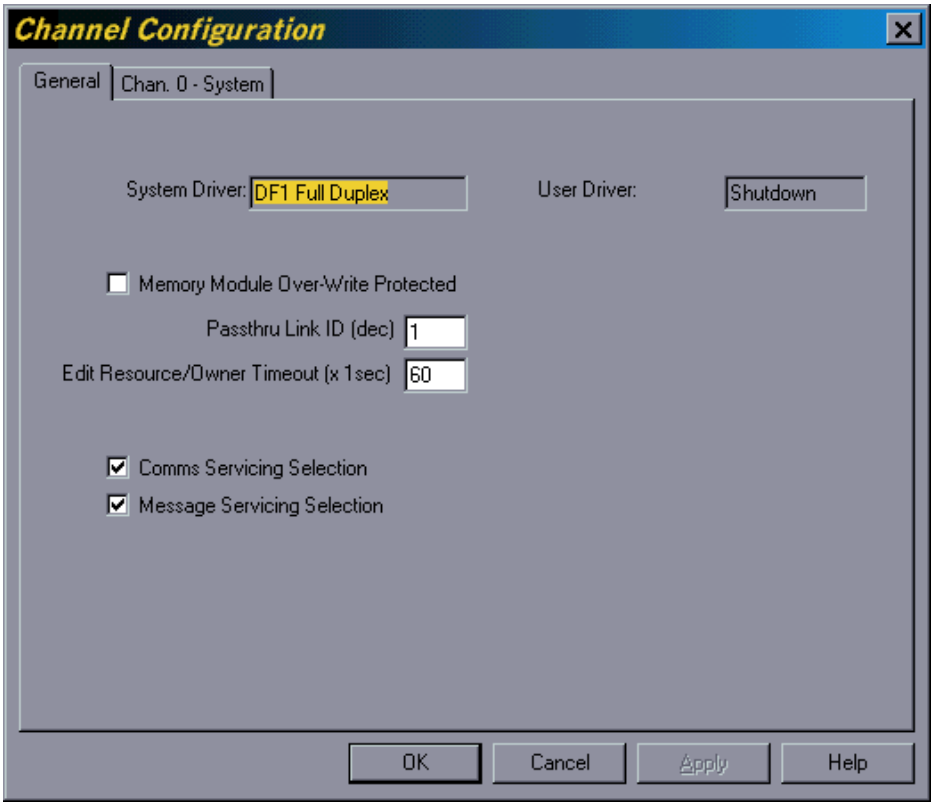
Using the Communications Toggle Push Button

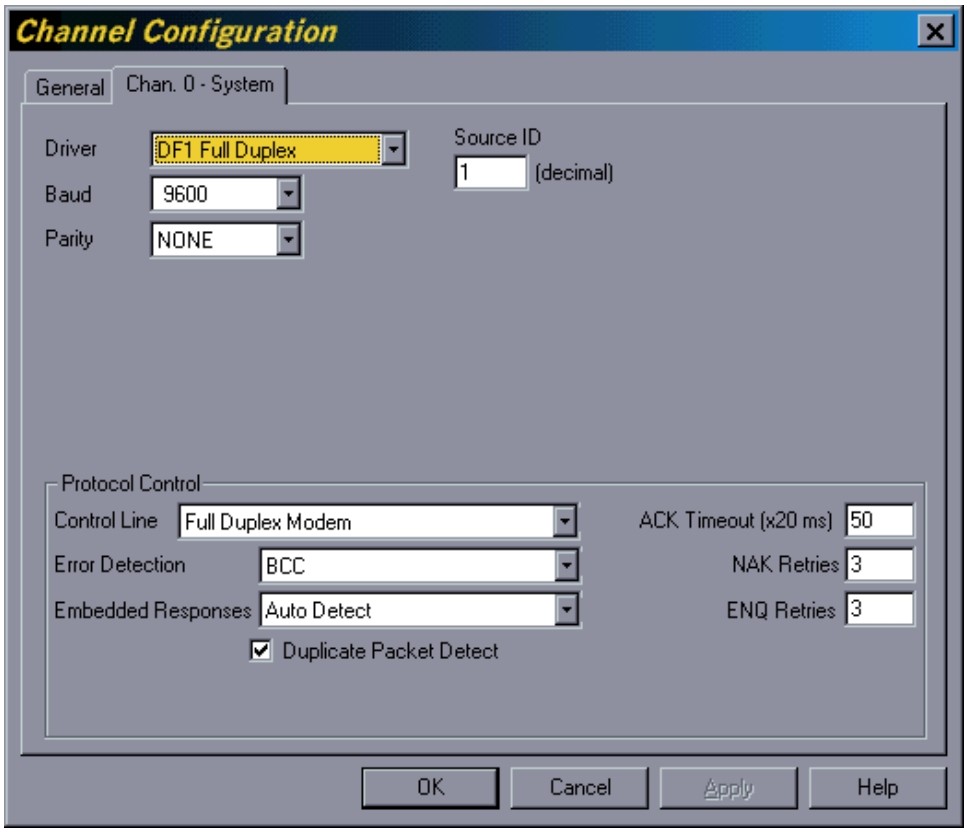
The Communications Toggle Push Button is located on the processor. You cannot access the button if the processor door or DAT is installed.

Use Communications Toggle Push Button to change from the user defined communication configuration to the default communications mode and back. The Default Communications (DCOMM) LED operates to show when the controller is in the default communications mode (settings shown on 4-1).



Note: The Communications Toggle Push Button must be pressed and held for one second to activate.



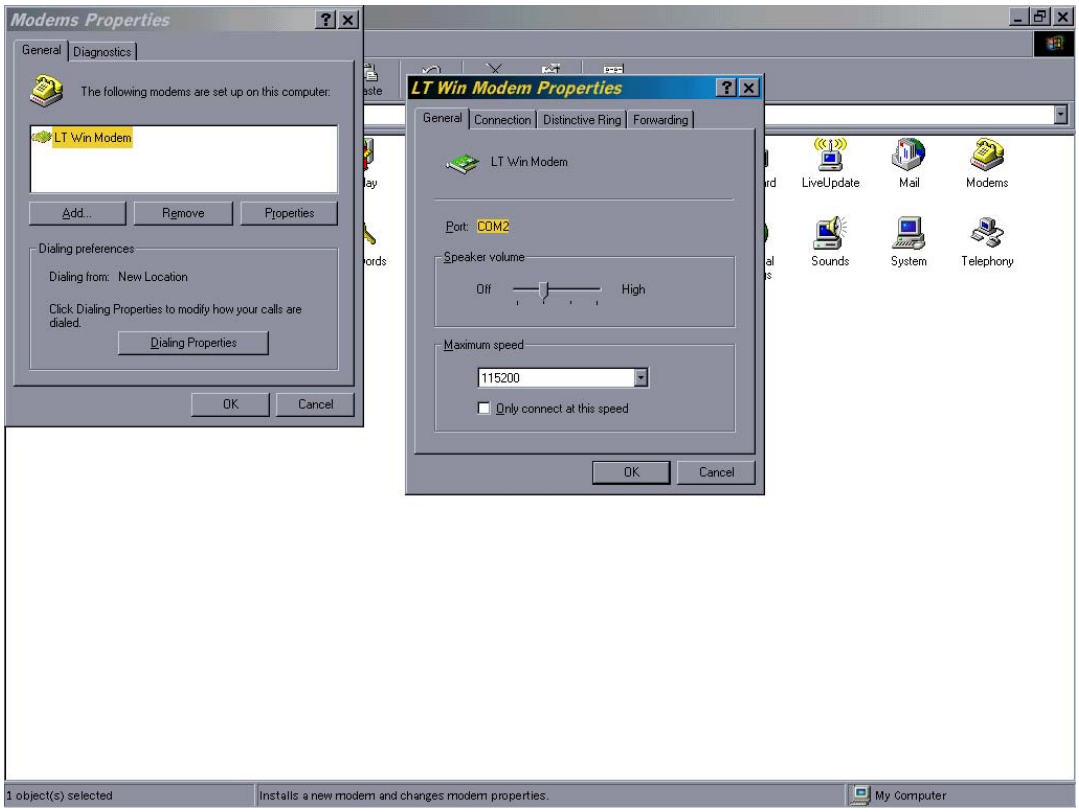

Channel Configuration
General
Chan. 0 - System
Driver
DF1 Full Duplex
Baud
9600
Parity
NONE
Source ID
1
(decimal)
Protocol Control
Control Line
Full Duplex Modem
Error Detection
BCC
Embedded Responses
Auto Detect
Duplicate Packet Detect
ACK Timeout (x20 ms)
50
NAK Retries
3
ENQ Retries
3
OK
Cancel
Apply
Help

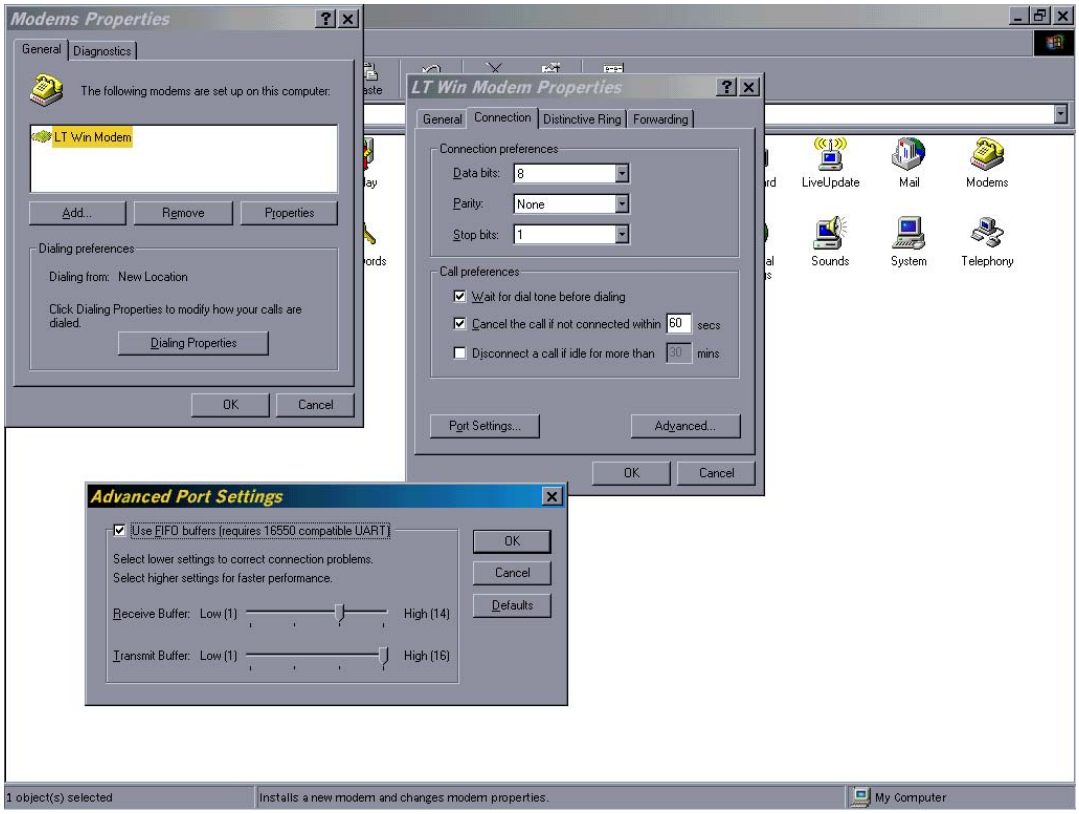
Connecting the Modem to the Micrologix:

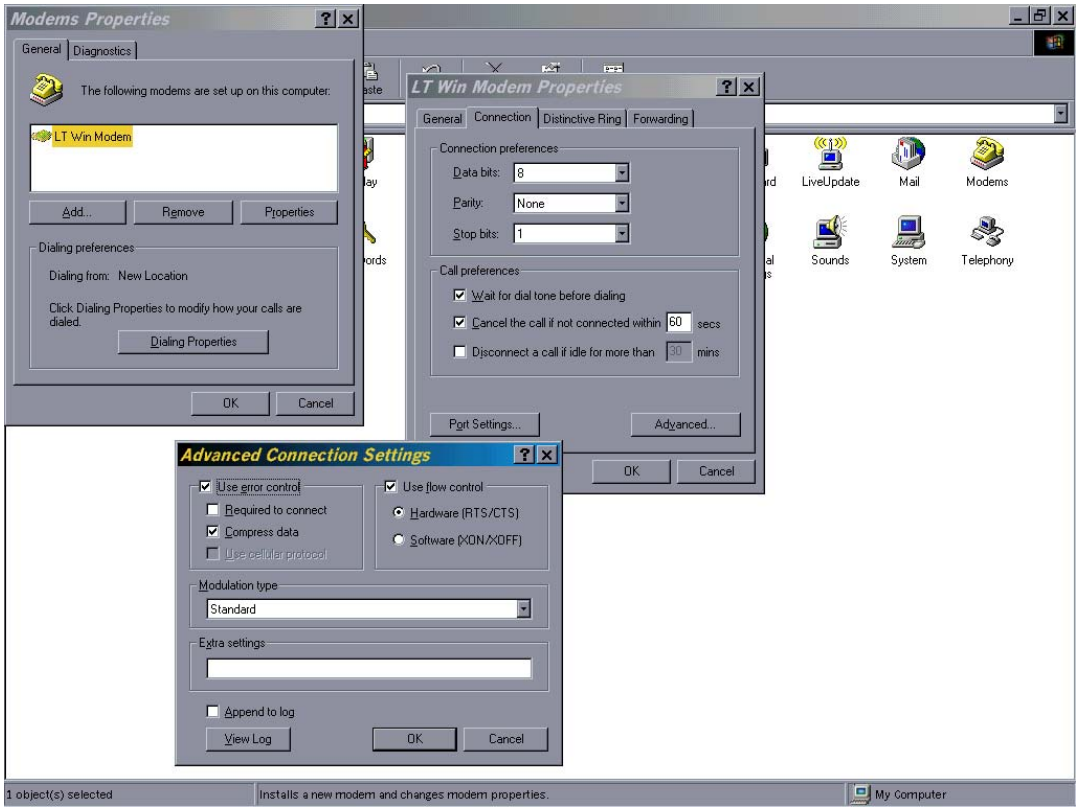
Connect the 1761-CBL-PM02 ser B to the MicroLogix 1500's Channel 0. Use a male-to-female DB9 null modem adapter to connect the 1761-CBL-PM02 ser B to the modem.

Sending Modem Setup Procedure:

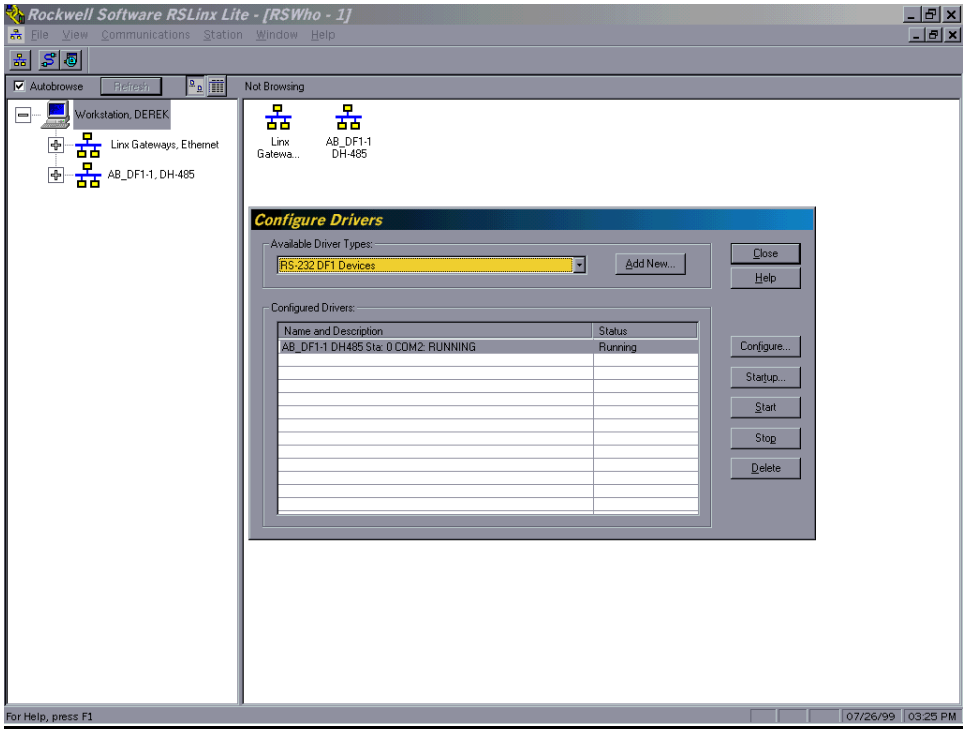
Open the control panel in Windows 98 (if applicable) and double-click on the modem icon. This will bring up a dialog box showing the modem properties. Make a note about which COM port the modem is set up on. If it is COM1 or COM2, then record this. If it is COM3 or COM4, then the exact IRQ and memory address must be obtained for the number shown and the address shown. Click on the OK button and then on the General tab, press the *"Properties"* button. Make sure modem properties match those listed on the following pages:

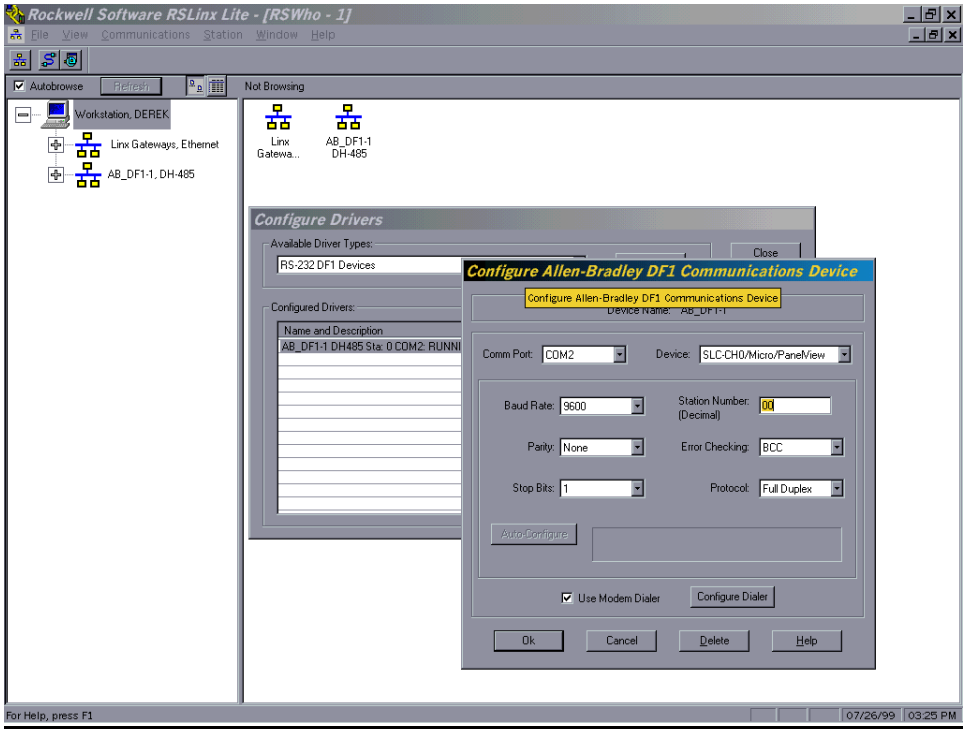



Modems Properties
General
Diagnostics
The following modems are set up on this computer:
LT Win Modem
Add...
Remove
Properties
Dialing preferences
Dialing from: New Location
Click Dialing Properties to modify how your calls are dialed.
Dialing Properties
OK
Cancel
LT Win Modem Properties
General
Connection
Distinctive Ring
Forwarding
Connection preferences
Data bits: 8
Parity: None
Stop bits: 1
Call preferences
Wait for dial tone before dialing
Cancel the call if not connected within 60 secs
Disconnect a call if idle for more than 30 mins
Port Settings...
Advanced...
OK
Cancel
Advanced Port Settings
Use FIFO buffers (requires 16550 compatible UART)
Select lower settings to correct connection problems.
Select higher settings for faster performance.
Receive Buffer: Low (1) High (14)
Transmit Buffer: Low (1) High (16)
OK
Cancel
Defaults
LiveUpdate
Mail
Modems
Sounds
System
Telephony
1 object(s) selected
Installs a new modem and changes modem properties.
My Computer


Modems Properties
General
Diagnostics
The following modems are set up on this computer:
LT Win Modem
Add...
Remove
Properties
Dialing preferences
Dialing from: New Location
Click Dialing Properties to modify how your calls are dialed.
Dialing Properties
OK
Cancel
LT Win Modem Properties
General
Connection
Distinctive Ring
Forwarding
Connection preferences
Data bits: 8
Parity: None
Stop bits: 1
Call preferences
Wait for dial tone before dialing
Cancel the call if not connected within 60 secs
Disconnect a call if idle for more than 30 mins
Port Settings...
Advanced...
OK
Cancel
Advanced Connection Settings
Use error control
Required to connect
Compress data
Use cellular protocol
Use flow control
Hardware (RTS/CTS)
Software (XON/XOFF)
Modulation type
Standard
Extra settings
Append to log
View Log
OK
Cancel
LiveUpdate
Mail
Modems
Sounds
System
Telephony
1 object(s) selected
Installs a new modem and changes modem properties.
My Computer

RSLogix Driver Setup:





Under Configure Dialer just enter the phone number and when you communicate the Rockwell software will automatically dial and make the phone connection. (Note: When configuring RSLINX to work with the Micrologix 1000 set the Error Checking to CRC.)