# MODEM APPLICATION:

Programming a Remote PLC Via SixNet Industrial Modem

These application notes are provided to help users configure a dial-up telephone connection to an A-B Data Highway Plus network for remote programming and monitoring applications. The interface to DH+ is provided using a DataLink DL3000- KFX connected to the telephone line via a SixNet Industrial 33.6K pr 57.6K modem. The remote computer connection can use any free-standing or internal modem.

Typical System Setup:
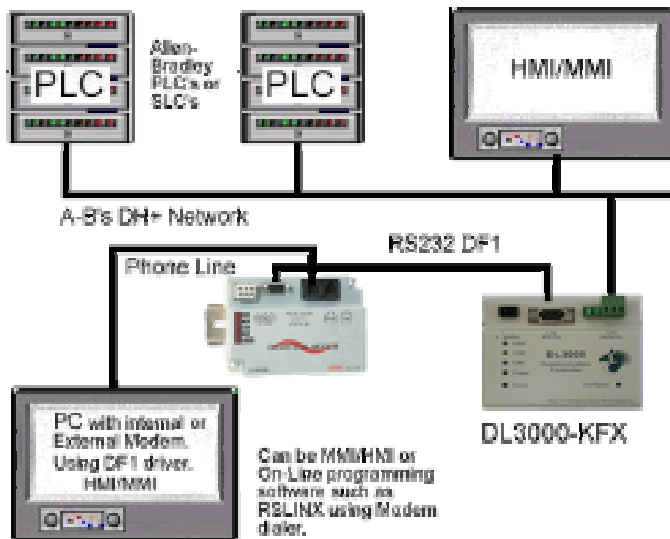
The general procedure used to communicate with PLCs at a remote location is as follows:

Modem communications
- Load a dial-up communication program (herein referred to as "communicator") such as "Terminal.exe" into the PC
- Initiate a dial-up sequence to establish communication with the remote modem (SixNet Modem)
- When communications are established exit the communicator leaving the line established

Note: Some programs (like Windows 95 HyperTerminal) will automatically close **the** connection once you exit the program. Make sure you are using software that will let you keep the connection open after exiting, such as Windows 95 "Terminal.exe".

PLC / SLC Programming and Monitoring
- Load the appropriate PLC programming or monitoring application software on the PC
- You may want to perform a Who Active to verify proper communication between the PLC and the remote terminal (the online DH+ diagnostics in DataLink's DL2, DL97, and DL32 configuration software can be used for this)
- The modems create a link to the PLC and should be transparent to the software; the PLC may be monitored or programmed from the remote PC

Signals From Modem, PC, and DL3000:

2 –RXD (Received Data)

3 – TXD (Transmitted Data)

4 – DTR (Data Terminal Ready)

5 – GND (Ground)

7 – RTS (Request To Send)

8 – CTS (Clear To Send)

Cabling:

9 Pin Connector – PC/Computer To Modem - Supports Handshaking

		1	
TXD	3	2	
RXD	2	3	
RTS	7	4	
CTS	8	5	
DSR	6	6	
GND	5	7	
DCD	1	8	
DTR	4	20	

DB9F   DB25M

9 Pin Connector - PC/DL3000 To SixNet Modem - Supports Handshaking

SHLD	1	
TXD	2	2
RXD	3	3
RTS	4	4
CTS	5	5
DSR	6	6
GND	7	7
DCD	8	8
DTR	9	9

DB9F   DB9M

Device Settings:

Depending on the particular modem being used, modem parameters and connection speeds can be set using dip switches, jumpers, or "AT" command strings. The model used in this example uses AT command strings and SixNet's VT Modem Setup Wizard. To transmit the AT commands to the modem, use a standard terminal emulation program (herein referred to as "terminal emulator") such as HyperTerminal, and select a direct connection to the com port on which the modem resides.
Other parameters such as the serial port connection rate, handshaking, error correction, parity, and start/stop/data bits are set through the terminal emulator's configuration menus (often labelled "port settings" under a properties or settings option). The serial connection rate on the DL and the SixNet do not need to match the serial rate on the PC and Modem 1, but must match each other. The handshaking, error correction, parity, and start/stop/data bit settings must be the same on the DataLink, the PC, and both modems.

The following sections describe settings for the devices involved in the application where AT command strings are in italics. The commands cited in these sections are for the USR Sportster 33.6 Kbps fax/data modem, and the SixNet Industrial 33.6K Modem. It is recommended that you consult your modem manual for the command codes used by your particular modem brand and model.

On PC's Modem (Modem 1):
• Set modem for Hardware Flow Control in the communicator's set-up
• The PC and Modem 1 must have the same serial port connection rate, parity, start/stop/data bits, and handshaking mode
• Set the modem's telephone line connection rate to the same as the SixNet modem's connection rate (if one or both modems are set to variable connection rate, then they will negotiate a compatible connection rate and this setting is unnecessary)
• Set Ignore DTR (AT&D0): This holds the connection even after the dial-up program has been closed
• Set modem to recall saved configuration upon power-up (ATY0 or ATY1)
• View configuration (ATI4)
• Save configuration to non-volatile memory (AT&W0 or AT&W1)
• View saved configuration (ATI5)

On DL's Modem (SixNet Modem):
Method 1: SixNet VT-Modem Setup Wizard

	1. Insert the SixNet CD supplied with the modem 2. When the opening screen appears, click on the VT-MODEM SETUP WIZARD button
	3. If you already have a modem configuration saved, click the OPEN CONFIGURATION FILE button, and select the configuration file to open 4. Select the **Modem Type** you are using 5. Click NEXT
	6. Select the **COM Port** to which the modem is presently connected 7. Select HARDWARE (RTS/CTS) **Flow Control** 8. Choose the **Computer/Modem Port Settings** so they are the same as on the DL3000 9. Click NEXT
	10. Set the modem for IGNORE DTR 11. ENABLE AUTO ANSWER on 1 ring 12. DISABLE COMMAND ECHO 13. Set **Flow-Control** to NONE 14. Disable **Error Correction** 15. Set the **Auto-Detect Speed** according to the connection speed set for Modem 1 16. Click NEXT
	17. If you want to save the configuration, save it now 18. Click WRITE MODEM SETUP TO THE MODEM 19. Click FINISH

Method 2: AT Command Strings

- Set the modem's serial port connection rate to match that of the DataLink (DL3000)
- Set the modem's telephone line connection rate to the same as Modem 1's connection rate (if one or both modems are set to variable connection rate, then they will negotiate a compatible connection rate and this setting is unnecessary)
- Set to answer on first ring (ATS0=1)
- Set Ignore DTR (AT&D0): Current DataLinks exert DTR when they are in on-line operational mode. For earlier DataLinks it may be necessary to either set the remote modem (Modem 2) to ignore DTR or to jumper DTR pin 20 to pin 6 on the modem end of the DL3000 to Modem 2 connection.
- Disable Flow Control (AT&K0)
- Disable Echo (ATE0)
  - **Note: you will not see what you type after disabling echo**
- Disable Response Codes (ATQ1)
  - **Note: the modem will no longer respond with OK when you enter AT commands**
- Set modem to recall saved configuration upon power-up (AT&Y0 or AT&Y1)
- View configuration (ATI4)
- Save configuration to non-volatile memory (AT&W0 or AT&W1)
- View saved configuration (AT&V)

On DataLink Unit (DL3000-KFX):

- Using the DataLink configuration software (DL2, DL97, or DL32) configure the DL3000 to communicate at the same baud rate as the SixNet Modem's serial port.
- Ensure that both the DL3000 and the SixNet Modem have the same settings for handshaking, error correction, parity, and start/stop/data bits
- Ensure that the PC program and the DataLink use the same error correction method, parity, and start/stop/data bits