MILLTRONICS

APPLICATION GUIDE

Communicating to EnviroRanger

using the Data-Linc DLM4000 Leased line Modem and Wonderware InTouch 95 (version 7.0.1)

This application guide describes how to setup the modems and drivers so that you can exchange information from the EnviroRanger and a host computer over a 2 wire leased line modem. A leased line modem is a modem that uses leased phone lines that are a direct connect in the sense that you do not have to dial. Leased lines typically come in one of two types either 4 wires using RJ-45 jack or 2 wire using a RJ-11 jack.

This application had a computer running the Windows 95 operating system and the Human Machine Interface (HMI) program Wonderware InTouch. The HMI program comes with a Modbus RTU/ASCII driver. The leased line modems used were the DLM4000 model made by the Data-Linc Group.

In this test, the HMI was polling one EnviroRanger. Figure 1 below shows a typical configuration.

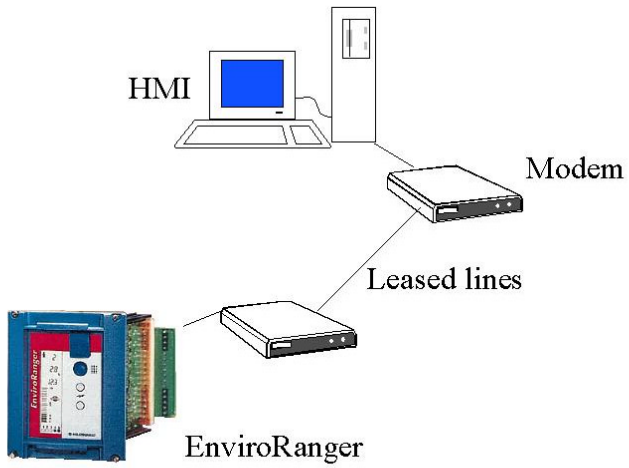

Figure 1 – Typical Configuration

Keywords:
EnviroRanger, Data-Linc DLM4000, Leased Line modem, SCADA, HMI, Wonderware InTouch 95, Modbus, remote communication.

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Details

Modems:

The modems had been pre-configured for dial-up operation. In order to configure the modems for leased line operation, we did the following steps:

1. Remove the 4 screws on top of the unit and removed the top cover.
2. Verify that the jumper J2 is in the left-center position (located at the front of the device, and to the left of the LEDs)
3. Connect the cable that was shipped with the modem (standard modem cable), to the modem and the computer's serial port (COM1 in our case). There is one cable shipped with each modem, one cable will have a DB-25 serial connection on one end and the other cut off, the other cable will have DB-9 pin on one end and a DB-25 on the other end. You need the DB-9 to DB25 pin cable for this part.
4. Run the program Hyper Terminal (part of Windows 95, under Accessories in the Start menu). Double clicked on Hypertrm.exe, then pick a name and icon. Then when asked for a phone number, pick the connection to be 'Direct to Com1', and then set the connection to be 9600 baud, 8 bits, no parity, 1 stop bit, no flow control.
5. Enter AT on the Hyper terminal screen and the modem responded with 'OK' on the screen.
6. Enter AT&L1S0=0&W, and the modem responded with 'OK' on the screen.
7. Disconnect the power and remove the J2 jumper (hung it on one pin) and put the top back on.
8. Repeat steps 1 to 7 for the second modem with the exception replace step 6 with 'Now enter AT&L1S0=1&W'
9. Put the covers back on and the modems were ready to work.

After configuring the modems, one modem was used at the HMI end and one at the EnviroRanger end. It does not matter which one went where. For the HMI end, a standard modem cable (that came with the modem) was used. For the EnviroRanger end, the following pin out was used:

Modem DB-25		EnviroRanger
Pin 2 TXD	→	TB 39 TXD
Pin 3 RXD	→	TB 38 RXD
Pin 7 GND	→	TB 41 GND

Also, since the cable length was very short (1/2 meter), the shield was not used.

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Modbus Driver:

The driver used was the Modbus driver that comes with Wonderware InTouch.

The driver was set up to use COM1 with the following parameters under the Configure/ Comm Port Settings… menu:

Com Port: COM1
Reply Timeout: 5 secs
Baud Rate: 9600
Data Bits: 8
Stop Bits: 1
Parity: None
Protocol: RTU

Under Configure/Topic Definition… menu, the following were set:

Topic: any name you want (max. 8 characters long)
Com Port: Com1
Slave ID: 1
Slave Device Type: 584/984 PLC
String Variable Style: select 'Full length (padded with spaces on the end)'
Register Type: Binary
Block I/O Sizes
Coil Read: 8
Coil Write: 8
Register Read: 100
Register Write: 100
Update Interval: 1000 (may need to increase this to 2000 or more)

Note: The topic name must be the same as the topic name that was use in Wonderware. The name can be anything but it should reflect what you are communicating to. For example, STATION1, would be a good name.

Under Configure/DDE Server Settings… the default settings were used.

Wonderware InTouch 95:

Please consult your Wonderware InTouch manual for details on its use. The following are some useful hints and some details that are hard to find.

1. For this application, some display screens and tagnames were set up to allow access to required information in the EnviroRanger:

- The tagnames were defined as I/O Integer.
- The Topic was the same one defined in the driver.
- The item was the register number with nothing in front of it. For example, because level is contained in register 41,011, so the Item is set to '41011'.

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- For the double precision integers, the range of the variable was changed from 32767 to 2147483647. The item was defined with a space L after the number. For example, the pumped hours for pump 1 had an item defined as '41450 L'

2. With InTouch, bit information that is referenced in registers as "I/O discrete" can be read, but cannot be written to.

   To be able to write to I/O discrete registers, use one tagname for the entire register, and then reference the bits in the tagname. (Please see Milltronics Application Guide 99001, "Communicating to EnviroRanger & BW500 Using Wonderware Version 7.0.1").

EnviroRanger:

In the EnviroRanger, the following parameters were set:

P770, index 2:	3	(Modbus RTU slave)
P771, index 2:	1	(network address)
P772, index 2:	9.6	(9600 baud)
P773, index 2:	0	(No Parity)
P774, index 2:	8	(8 data bits)
P775, index 2:	1	(1 stop bit)
P776, index 2:	0	(No flow control)
P777, index 2:	0	(no key-up delay)
P778, index 2:	1	(modem connected)
P779, index 2:	300	(modem inactivity timeout = 300 seconds)