INTELLIGENT CONTROLS INC
PO BOX 638
34 SPRING HILL RD SACO, ME 04072 U S A

Application Bulletin

000-1121 REV C

OPTImizer / TS-MLS / TS-M / SC-01 Communication Link

Purpose:

- To instruct technicians in proper installation and set-up of a communication link to OPTImizers in remote sites using a multi link phone line switch and phone modems.

Scope:

- This procedure applies specifically to the INCON model TS-MLS multi link switch and the INCON model TS-M phone modem. It also covers the use of the model SC-01 Smart Converters for communication to multiple OPTImizers in the same station.

General Description

The INCON OPTImizer is a valuable tool for recording information about circuit breaker operation and condition. As a stand-alone device, the data is available to the technician visually, through the front panel LED indicators and electronically through a local data dump to a laptop computer. These methods require regular site visits to the OPTImizer. The data would then need to be transferred to an engineer, who would use it to make decisions regarding maintenance of the breaker. This bulletin describes a method whereby the engineer can easily retrieve the OPTImizer's data remotely.

The OPTImizer Host program is able to automatically, at pre-determined intervals, dial up each substation poll each OPTImizer, and download its data into an ACCESS database. In the past, this required a dedicated phone line at each substation. By using an INCON model TS-MLS multi link switch, the substation phone line can be shared with other devices, even other phone line switchers. The phone line is used by the OPTImizer only while the Host program is downloading the OPTImizers'data, otherwise the phone line if free for use by other communication or data devices.

How It Works

The OPTImizer Host program decides that it is time to retrieve the data from a particular substation. The program makes a phone call through a modem, to the substation. The phone number programmed for that substation includes a suffix that tells the TS-MLS to switch the phone line from the substation's normal phone duties to the INCON TS-M modem. The TS-M answers the phone call and connects the OPTImizer Host program to the SC-01 network. From there, the Host program calls out the address of each OPTImizer on the network and issues the command to retrieve its data. When the data has been retrieved from each OPTImizer, the Host program hangs up the phone and the TS-MLS switches the phone line back to its normal use.

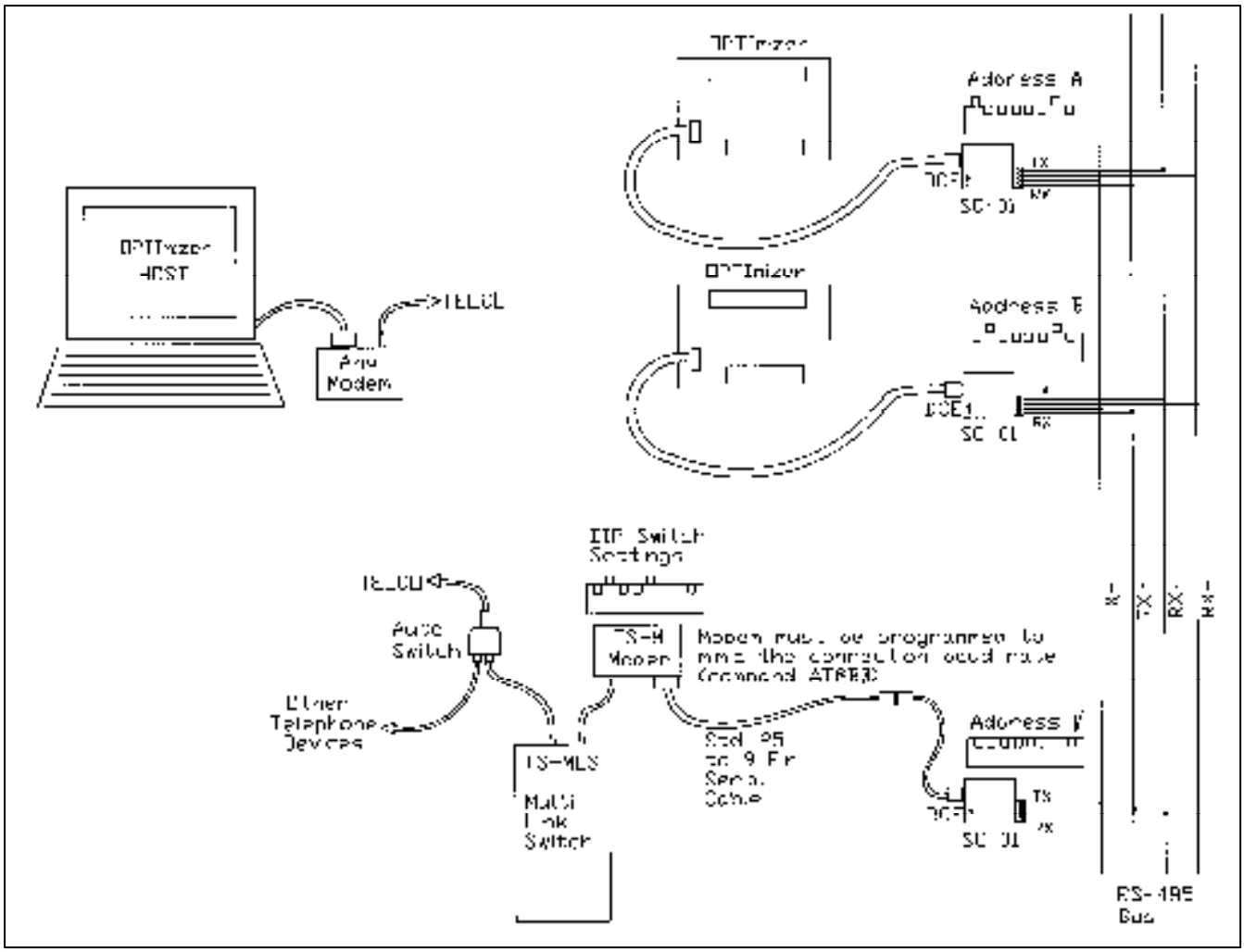

Figure 1: Wiring Diagram

Connections & Setup

The TS-MLS, TS-M, and SC-01 are shipped with documentation that explains proper wiring of each device. This document is not meant to supercede those documents, but will highlight some of the details involved when combining all of these devices in a system.

Steps:

1. Connect the "T" connector to the phone line. The male plug goes into the phone outlet and the phone line to all other phone devices plugs into the smaller female jack. Connect the cable provided with the TS-MLS to the larger female jack. The other end of this cable plugs into the TS-MLS switch labeled "LINE/DEVICE 1".
2. Connect the TS-MLS power supply's plug into the TS-MLS power socket.
3. Connect a phone cable to the TS-MLS's output jack, labeled "DEVICE 3". The other end of this cable connects to the phone line input on the TS-M.
4. Connect the TS-M power supply's plug into the TS-M power socket. Turn on DIPswitches #2, 5, 6, and 7. When the DIPswitches are set, you may turn on the modem's power switch.
5. Connect a standard 25-pin to 9-pin serial cable to the TS-M's serial port. Connect the other end of this cable to your computer's serial port.
6. Run the Windows HyperTerminal program. Make sure the port is set for **1200** baud, **8** data bits, parity is **NONE**, **1** stop bit, and flow control is **NONE**. Establish a connection with the TS-M, type the "**At@B0**" command and press the **ENTER** key. This command sets up the TS-M to respond to whatever baud rate is being transmitted through it.
7. Disconnect the serial cable from the computer; turn off power to the TS-M.
8. Connect the 9-pin end of this cable to the SC-01 cable with **8** connections.
9. The other end of the SC-01 cable with **3** connections plugs into the "Master" SC-01. This SC-01 has all address switches OFF.
10. Connect Power, Transmit and Receive lines to the SC-01 as describe in the SC-01 User's Guide (000-0250).

11. Connect each OPTImizer to an SC-01 and set the address switches for the desired addresses as describe in the SC-01 User's Guide (000-0250). Note that each "Slave" SC-01 has its RX lines connected to the TX lines on the Bus and its TX lines connected to the RX lines on the Bus.
12. In the OPTImizer Host program, when setting up the phone number for each substation, add the following characters after the phone number: "**,,,33,33,33**". More than three starting commas may be inserted if more time is needed for the phone call to reach the substation. Each comma adds about one second of delay. The "33" is the TS-MLS command to open the phone link to Device 3.
13. When the phone numbers have been entered with the proper suffix, test the system by clicking on a substation in the "Substations and Devices" column, then click on the "Poll Scheme" button. Select "Manual". Click on the "Poll Scheme" button again, then click the "Poll the Station" button.
14. The computer should automatically dial the substation's phone number, the TS-MLS should receive the "33" command, the TS-M should answer the call with the typical modem "hissing" sounds. When the modems are connected, the Host program will send the proper address command to open a communication link to the first OPTImizer on the Bus at the substation.
15. When the data is retrieved, the Host program will send the next address command and the data will be retrieved from the next OPTImizer, etc… until all OPTImizers at that substation have been polled, then the modems should hang up the phone and the line should be free for other uses.