

MiMiC Simulation Driver for Open Modbus TCP/IP

Introduction

The MiMiC Simulation Driver for Open Modbus TCP/IP allows IO and process simulation for devices that support this protocol. Simulation system setup over Industrial Ethernet networks is fast and easy using this powerful IO driver. MiMiC Simulation Software can be used for software acceptance testing and operating training systems that use this migration simulation. This application note will show the user how to set up a simulation environment using MiMiC and the MiMiC Simulation Driver for Open Modbus TCP/IP.

This simulation driver supports non-intrusive simulation for controllers that support Modbus TCP/IP protocol such as:

- ❖ Schneider Quantum PLCs (Concept and Unity)
- ❖ HIMA SIS PLCs

Simulation System Setup

The MiMiC Simulation Workstation uses an Ethernet Network Interface Card to communicate to the controller that supports the Modbus TCP/IP protocol. Selection of the Modbus TCP/IP protocol is done during initialization of the MiMiC dataset by selecting Modicon Modbus for the Driver and TCP/IP for the Port as shown in Figure 1.

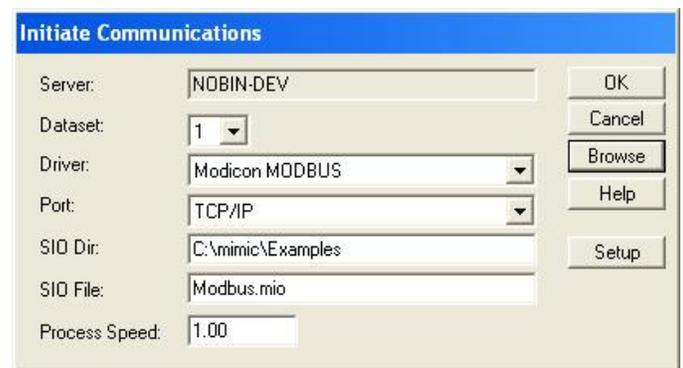


Figure 1: Modbus TCP/IP Initiate Communications Window

The Simulated IO file (SIO) is identical to the definition file used for Modbus Serial Simulation. In that test file, the user declares the register type and addresses of interest for the simulation. This file can be loaded using the Browse button. An example of a Modbus IO definition is shown in Figure 2.

```
* Modicon SIO file

OUTPUT COILS, 1500
DISCRETE INPUTS, 200
INPUT REGISTERS, 750
HOLDING REGISTERS, 490
TYPE, 20-21, INPUT
TYPE, 40-50, INPUT

* END
```

Figure 2: Modbus SIO File

The final step for simulation system setup is to set the IP address of the target controller. This is done by selecting the Setup button and entering the IP address of the target controller as shown. In addition, users should enter the Modbus address and select Extended Addressing if the address range is in the Extended Modbus address range (XXX,XXX registers). The Setup Window is shown in Figure 3.

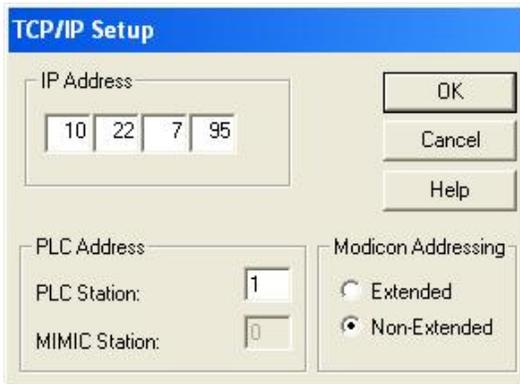


Figure 3: Controller IP Address Setup

This simulation driver supports read and write to Modbus TCP/IP registers with the following limitations:

- ❖ Writes to 1XXX and 3XXX registers is only supported in Schneider Modicon PLCs. In this application, MiMiC becomes the Modbus master to write to the 1XXX and 3XXX registers.
- ❖ To make changes in the PLC program, the MiMiC user must terminate communications while the PLC configuration program logs in as master. When the change is complete, the PLC programmer logs out and the MiMiC dataset is Initiated.
- ❖ While MiMiC is logged out, it only reads data from the PLC and cannot make any PV changes in the PLC.
- ❖ Read and write to 0XXX (Coils) and 4XXX(Holding) registers is supported for all devices.

The driver uses the following Modbus functions:

- ❖ Class 0 - Read Multiple Registers (3), Write Multiple Registers (16)
- ❖ Class 1 - Read Coils (1), Read Input Discretes(2), Read Input Registers (4), Write Coil (5), Write Single Register (6)
- ❖ Class 2 - Force Multiple Coils (15)

Generating MiMiC Simulation

The MiMiC Convert Utility will generate the Simulation Tieback (.tbk) and Tags (.pts) file from a Comma Separated Values (CSV) file generated from the controller configuration utility. The Simulated IO File is a text file with six simple arguments and can be generated in a matter of minutes.

An example of a Modbus SIO file is contained in the MiMiC \examples\ directory. This allows the user to begin testing and training with simulation as soon as the control system is ready. Please refer to MiMiC User Manual for more information.

MiMiC Simulation Interface

The MiMiC Workstation reads and writes Modbus registers through an Ethernet Network Interface Card (NIC). This NIC must be configured in Windows with a static IP address.

We recommend the use of a separate NIC for simulation communications from the office or plant network interface card. One MiMiC Workstation can provide Modbus TCP/IP IO simulation connections for up to 32 Modbus slave devices.

The Open Modbus TCP/IP driver is included as part of the Modbus Modicon Driver pack, MIM-2102. It is supported in MiMiC v2.8.44 or higher.

An architecture drawing of a simulation system using MiMiC and the Open Modbus TCP/IP driver is shown below.

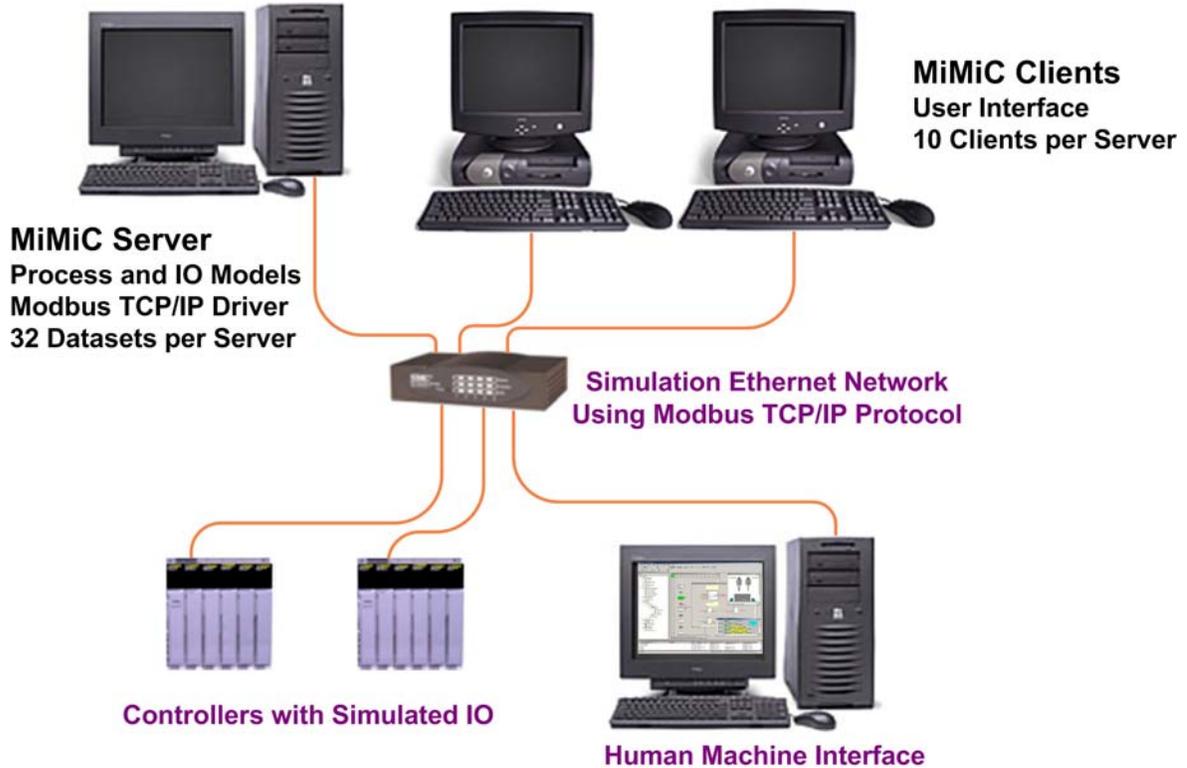


Figure 4: MiMiC Simulation System with Modbus TCP/IP Architecture

HOW TO CONTACT US:

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