INDUS-COMM

I/O System

Overview

System Overview

The system consists of several parts:

- A primary server
- A “Modbus Over Ethernet” interface
- Up to 6 Communication Channels*
- I/O boxes (boards)
- TADA HMI Software

Primary Server

Primary Server Functions :

- Communicate to and scan I/O boxes
- Configure I/O boxes
- Provide the Modbus interface
- Perform tasks within the “Block Processor”
- Provide testing and diagnostic information
- Simulation (offline)
- Connects to “Secondary” servers

Modbus Interface

The Modbus interface allows TADA and other external devices access to the internal memory map which represents the state of the I/O boxes.

Reading the contents of particular registers will give a representation of the current state of a particular I/O box.

Changing the contents of any particular register can affect the related I/O box and/or it's outputs.

Other devices like PLC's, other SCADA systems, HMI's, or other types of interfaces (like OPC) etc. can connect to the system through this mechanism.

Modbus

- Industry standard Modbus over IP (Network)
- Custom memory map
- Up to 10 Client network connections available

Communication Channels

Communication channel functions :

- Up to 6 Communication Channels*
- You can seamlessly mix and match any of these modes :

  1. Radio – VHF / UHF / 900 Mhz
  2. Serial
  3. Network

- They provide access to the I/O boxes over many possible types of media and in some cases can be of combined types.
- Simple and easy setup of additional I/O boxes

I/O Boxes

Current offerings include :

- FC (Fan control) in either serial or several radio based formats

  Can be used to control any 1* device (fan, pump, door, lights, etc.)

  Consists of 4 contact inputs, 2 contact outputs, 1 analog input*, and 1 analog output
- 4AI (4 analog input) in either serial or several radio based formats

  Can be used to monitor u to 4 analog devices like gas detectors etc.

  Consists of 4 analog inputs and 4 digital inputs

TADA

Thin Automation and Data Access :

- A simple HMI built specifically for the I/O system
- Built in pre-configured faceplates designed to represent a single field device (I/O box)
- Scaled for small areas of control and monitoring

TADA

- Quick and Easy Setup and Configuration
- Multiple Stations
- Multiple Screens
- Configuration can be setup in a centrally available storage location
- Alarm Sub-System
- Control or View Only
- Single, Group and broadcast based controls

I/O Scanner

- Connection type is “Transparent”
- Can run independently on Primary and Secondary servers
- Allows access of up to 197 remote devices
- Adjustable scan speeds
- Priority based I/O processing algorithm

Configuration, Diagnostics and Simulation

- Test and Check individual I/O boxes
- Collects statistics to help diagnose intermittent communication Issues
- Capture per-unit performance
- System can be run offline with simulated I/O boxes to allow development of systems, block processor schemes, I/O verification etc.

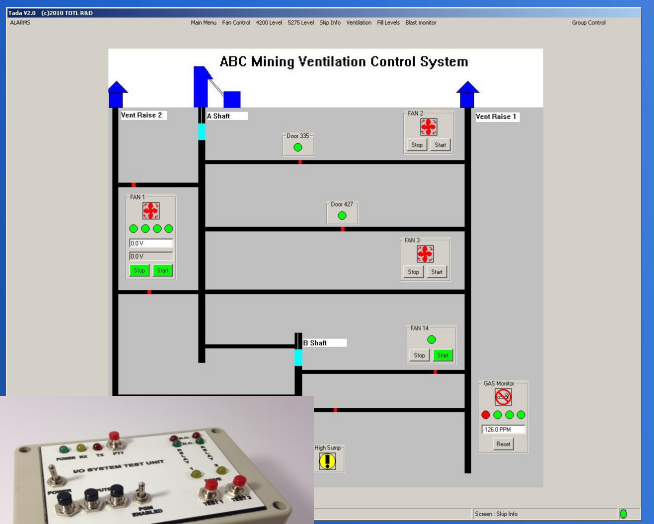
Block Processor

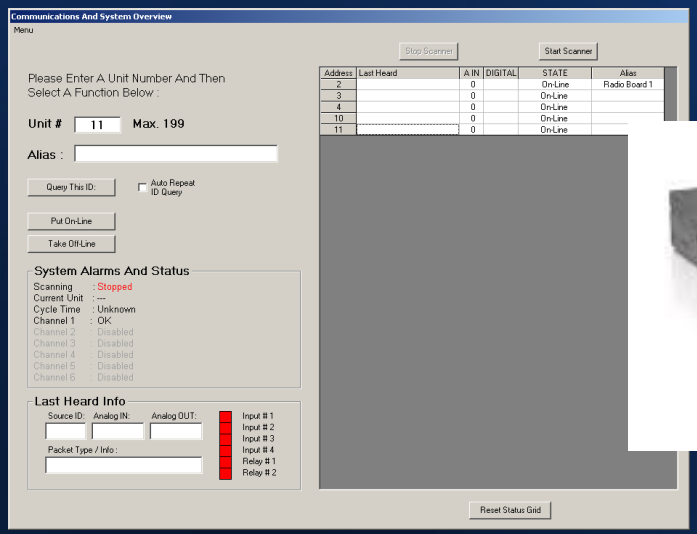
- Basic PLC functionality
- Works directly with Modbus memory map
- Enables great flexibility handling and piping data
- Move and manipulate input and output information
- Time based functions

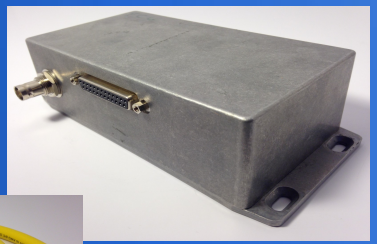
INDUS-COMM


POWER
PIT
DATA
CD
DIAG
MICRO
INDUS-COMM


INDUS-COMM
REMOTE I/O
SERIAL REMOTE I/O
VOLT: 24 VAC
AMPS: 2.0 A
MFG: INDUS-COMM
1-705-524-6348
info@induscomm.com


ABC Mining Ventilation Control System
Vent Raise 2
A Shaft
Vent Raise 1
B Shaft


Communications And System Overview
Menu
Stop Scanner
Start Scanner
Please Enter A Unit Number And Then
Select A Function Below :
Unit # 11 Max. 199
Alias :
Query This ID:
Auto Repeat ID Query
Put On-Line
Take Off-Line
System Alarms And Status
Scanning : Stopped
Current Unit : ---
Cycle Time : Unknown
Channel 1 : OK
Channel 2 : Disabled
Channel 3 : Disabled
Channel 4 : Disabled
Channel 5 : Disabled
Channel 6 : Disabled
Last Heard Info
Source ID:
Analog IN:
Analog OUT:
Packet Type / Info :
Input # 1
Input # 2
Input # 3
Input # 4
Relay # 1
Relay # 2
Address
Last Heard
A IN
DIGITAL
STATE
Alias
Radio Board 1
On-Line
Reset Status Grid



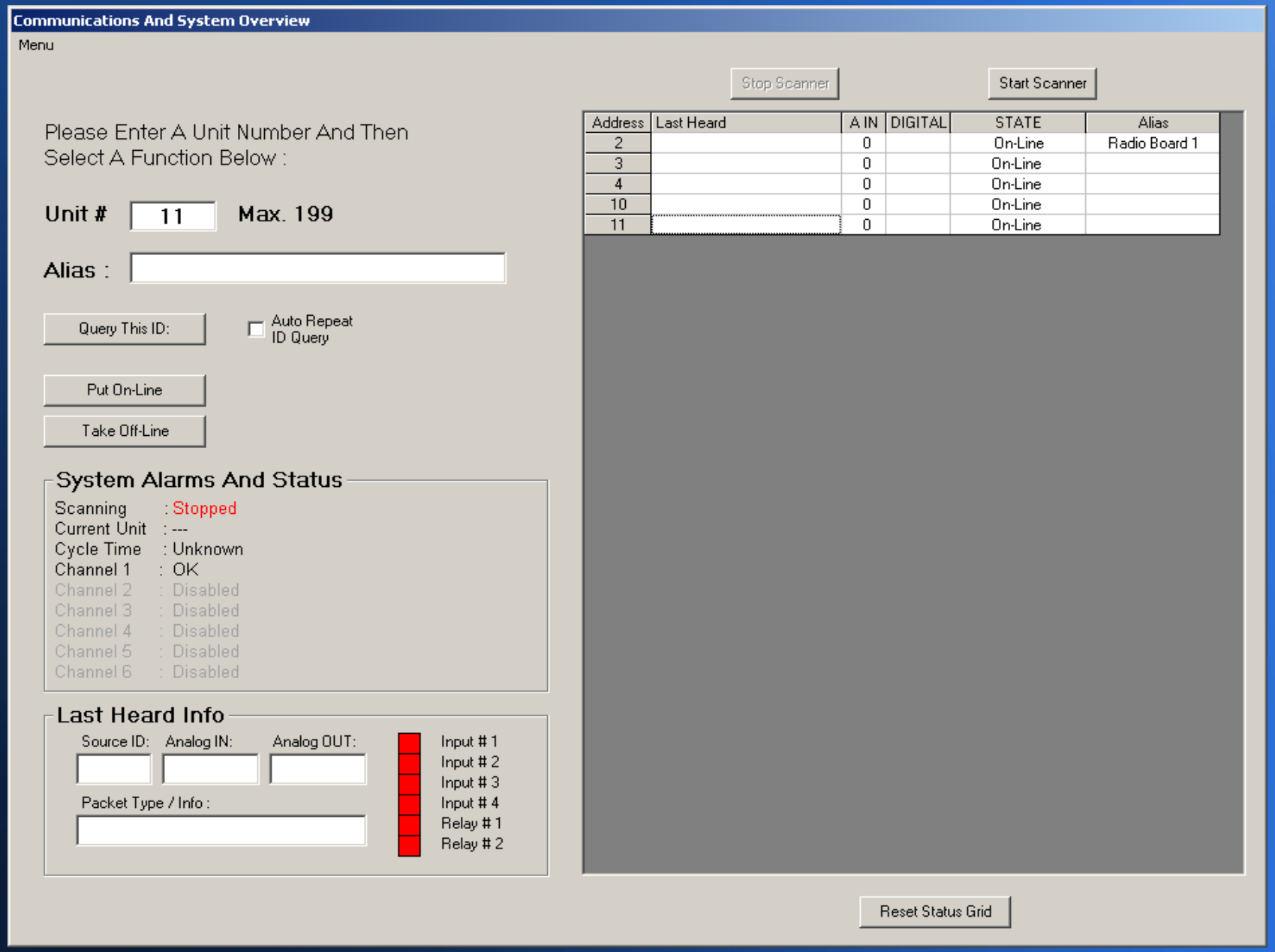
INDUS-COMM

Configuration and Setup Examples :

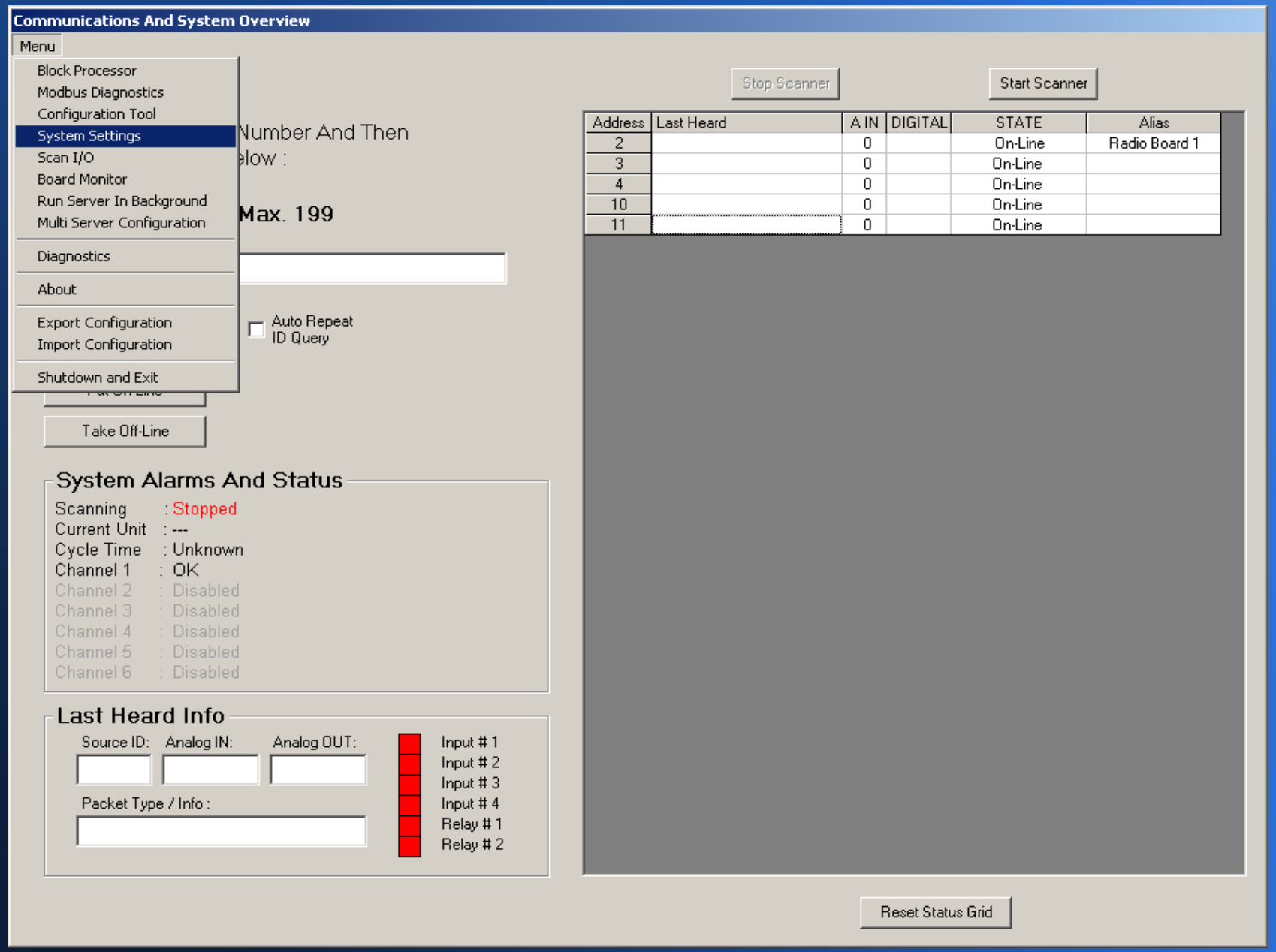
1) System Configuration and Communications Channel Setup
2) Scanner Setup and Diagnostics
3) I/O Box Configuration
4) Secondary Server Setup
5) Modbus Map and Interface information
6) Block Processor Example
7) OPC Interface Configuration

1. System Configuration and Communication Channel Setup

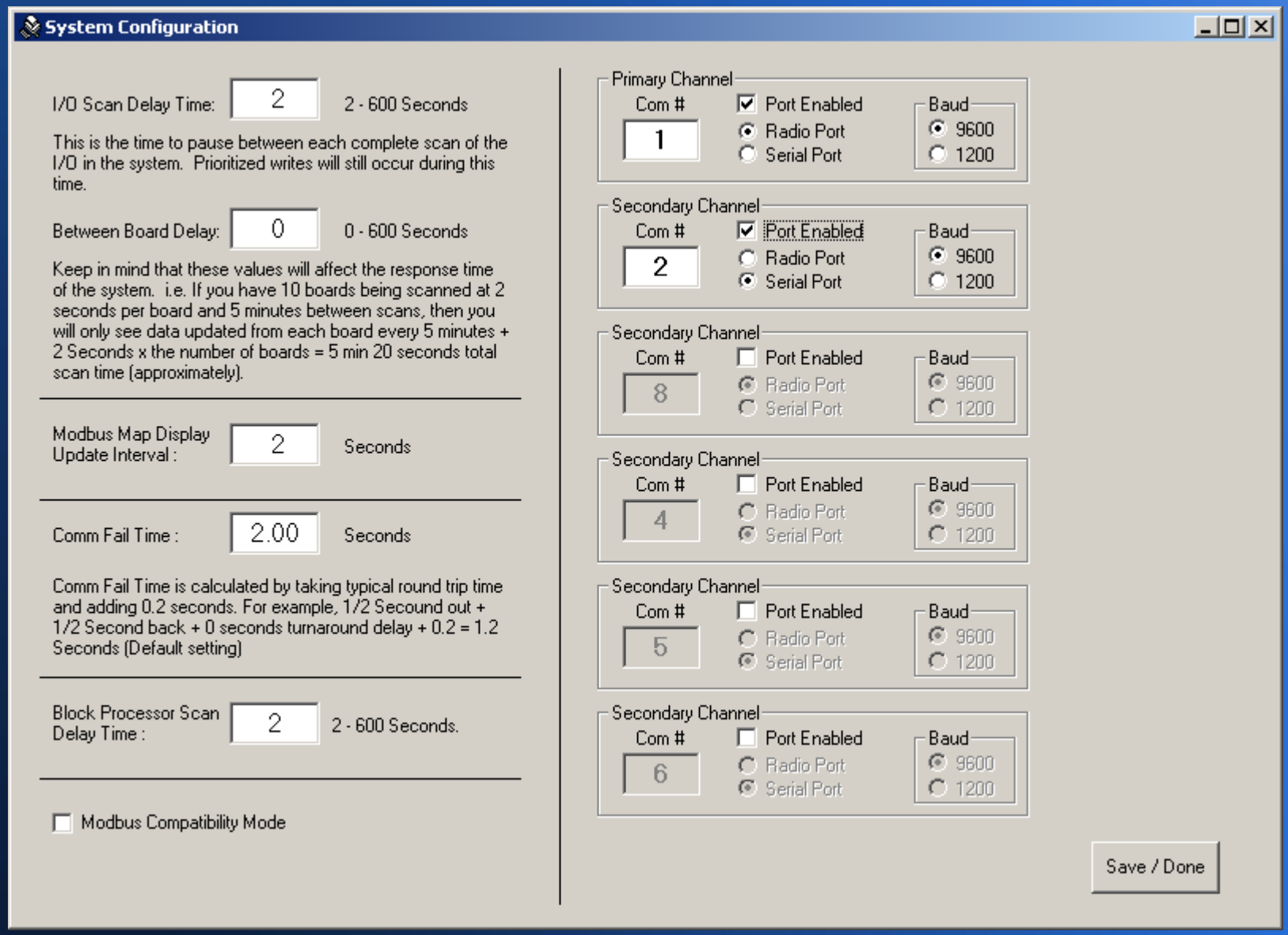
- Define Communication Channels
- Define Scanning and Timeout Parameters



Server main system overview.

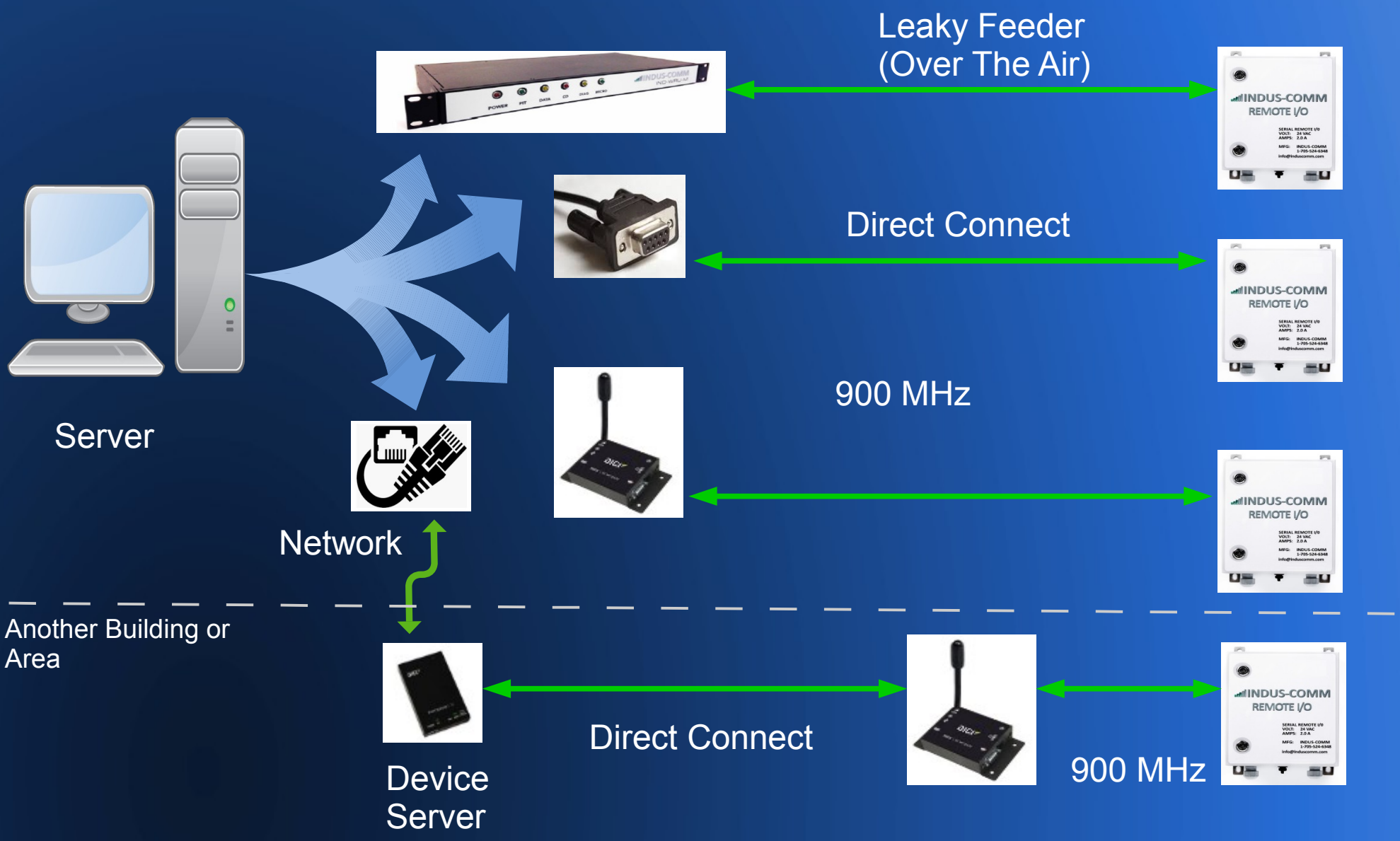


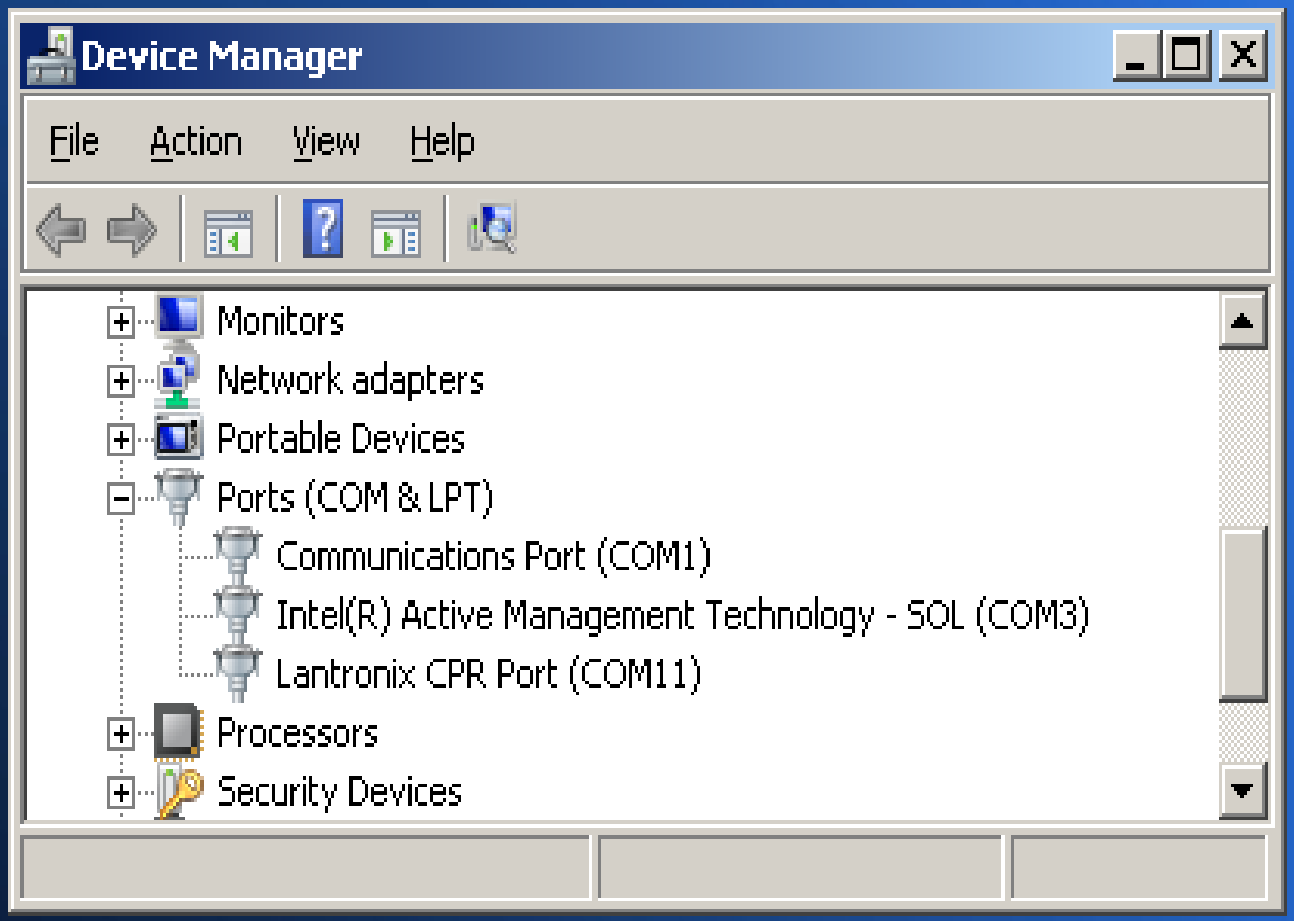
Menu Selections



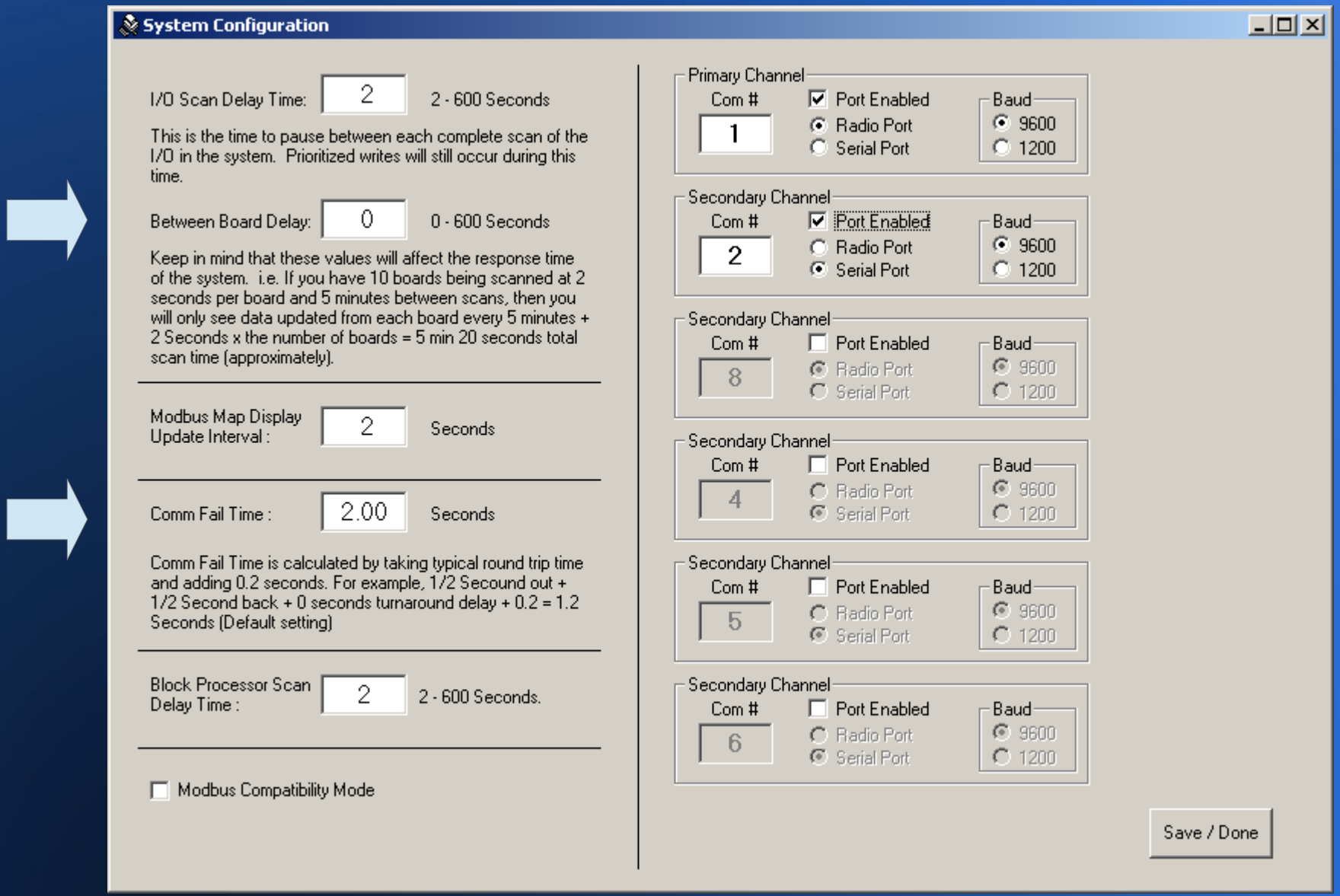
System Configuration and Com Channel Setup

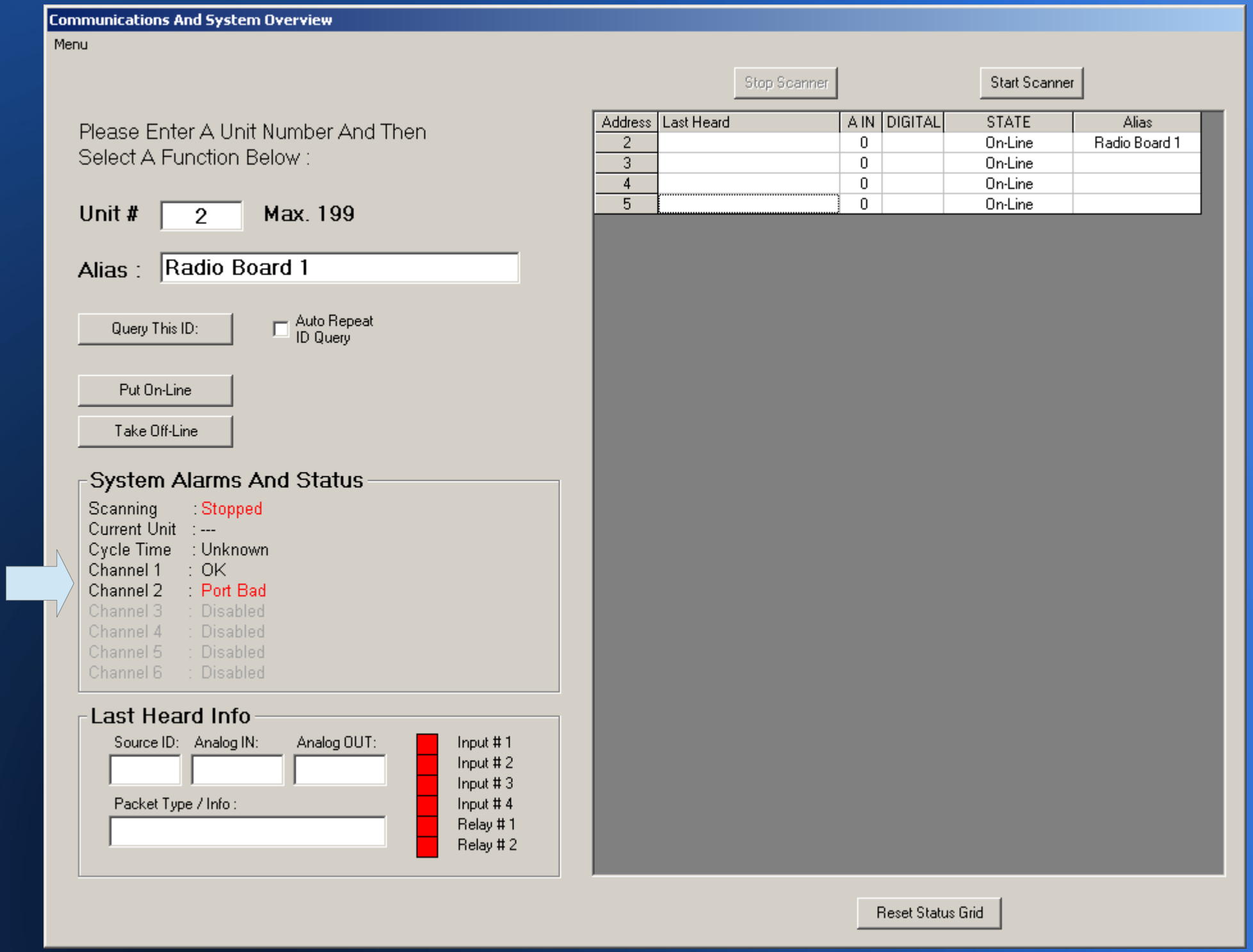
Some Channel Connection Possibilities :





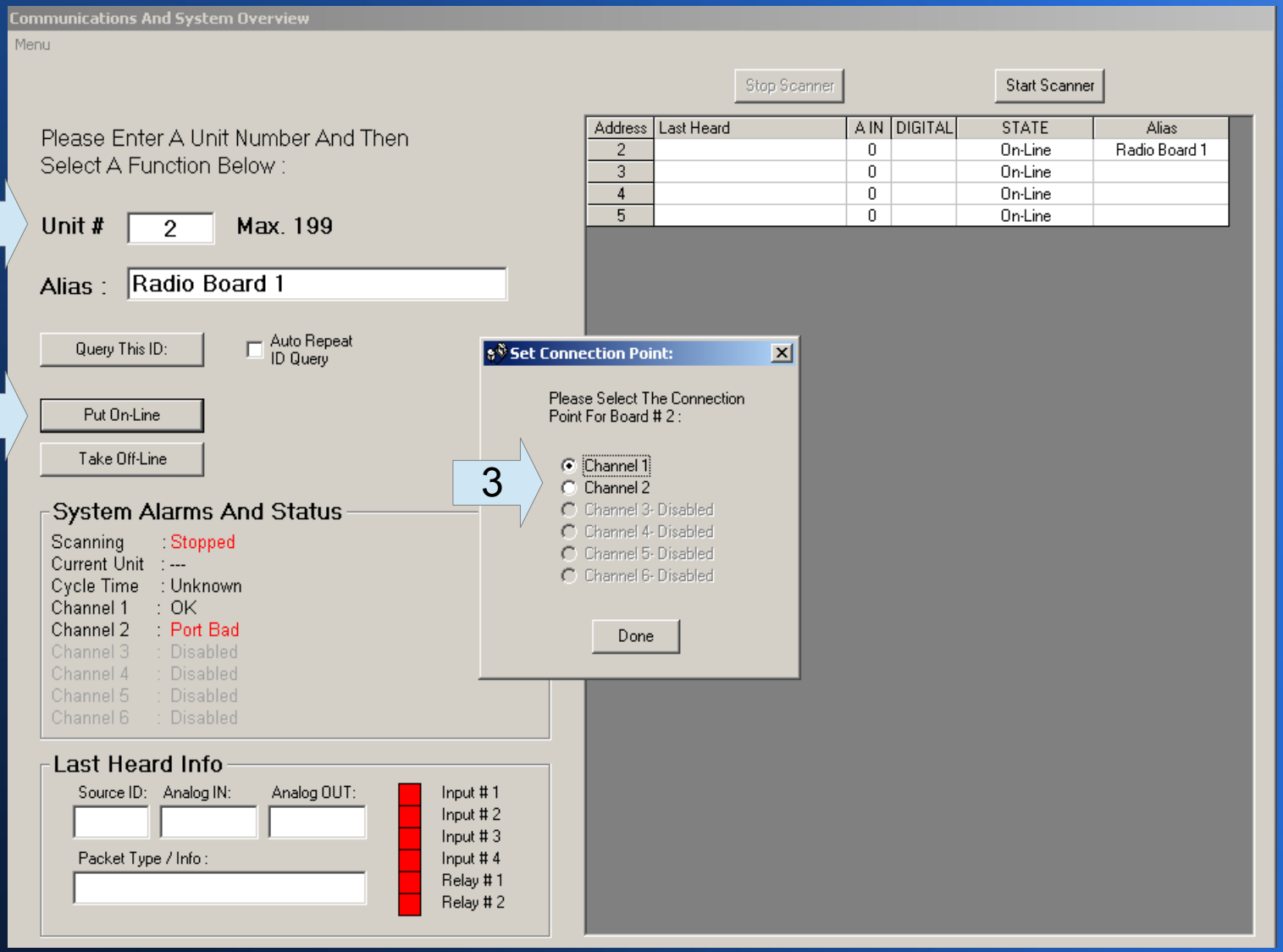
Windows Device Manager


System Configuration
I/O Scan Delay Time: 2 2 - 600 Seconds
This is the time to pause between each complete scan of the I/O in the system. Prioritized writes will still occur during this time.
Between Board Delay: 0 0 - 600 Seconds
Keep in mind that these values will affect the response time of the system. i.e. If you have 10 boards being scanned at 2 seconds per board and 5 minutes between scans, then you will only see data updated from each board every 5 minutes + 2 Seconds x the number of boards = 5 min 20 seconds total scan time (approximately).
Modbus Map Display Update Interval : 2 Seconds
Comm Fail Time : 2.00 Seconds
Comm Fail Time is calculated by taking typical round trip time and adding 0.2 seconds. For example, 1/2 Secound out + 1/2 Second back + 0 seconds turnaround delay + 0.2 = 1.2 Seconds (Default setting)
Block Processor Scan Delay Time : 2 2 - 600 Seconds.
Modbus Compatibility Mode
Primary Channel
Com # 1
Port Enabled
Radio Port
Serial Port
Baud
9600
1200
Secondary Channel
Com # 2
Port Enabled
Radio Port
Serial Port
Baud
9600
1200
Secondary Channel
Com # 8
Port Enabled
Radio Port
Serial Port
Baud
9600
1200
Secondary Channel
Com # 4
Port Enabled
Radio Port
Serial Port
Baud
9600
1200
Secondary Channel
Com # 5
Port Enabled
Radio Port
Serial Port
Baud
9600
1200
Secondary Channel
Com # 6
Port Enabled
Radio Port
Serial Port
Baud
9600
1200
Save / Done


Communications And System Overview
Menu
Stop Scanner
Start Scanner
Please Enter A Unit Number And Then
Select A Function Below :
Unit #
2
Max. 199
Alias :
Radio Board 1
Query This ID:
Auto Repeat
ID Query
Put On-Line
Take Off-Line
System Alarms And Status
Scanning : Stopped
Current Unit : ---
Cycle Time : Unknown
Channel 1 : OK
Channel 2 : Port Bad
Channel 3 : Disabled
Channel 4 : Disabled
Channel 5 : Disabled
Channel 6 : Disabled
Last Heard Info
Source ID:
Analog IN:
Analog OUT:
Packet Type / Info :
Input # 1
Input # 2
Input # 3
Input # 4
Relay # 1
Relay # 2
Address
Last Heard
A IN
DIGITAL
STATE
Alias
2
0
On-Line
Radio Board 1
3
0
On-Line
4
0
On-Line
5
0
On-Line
Reset Status Grid

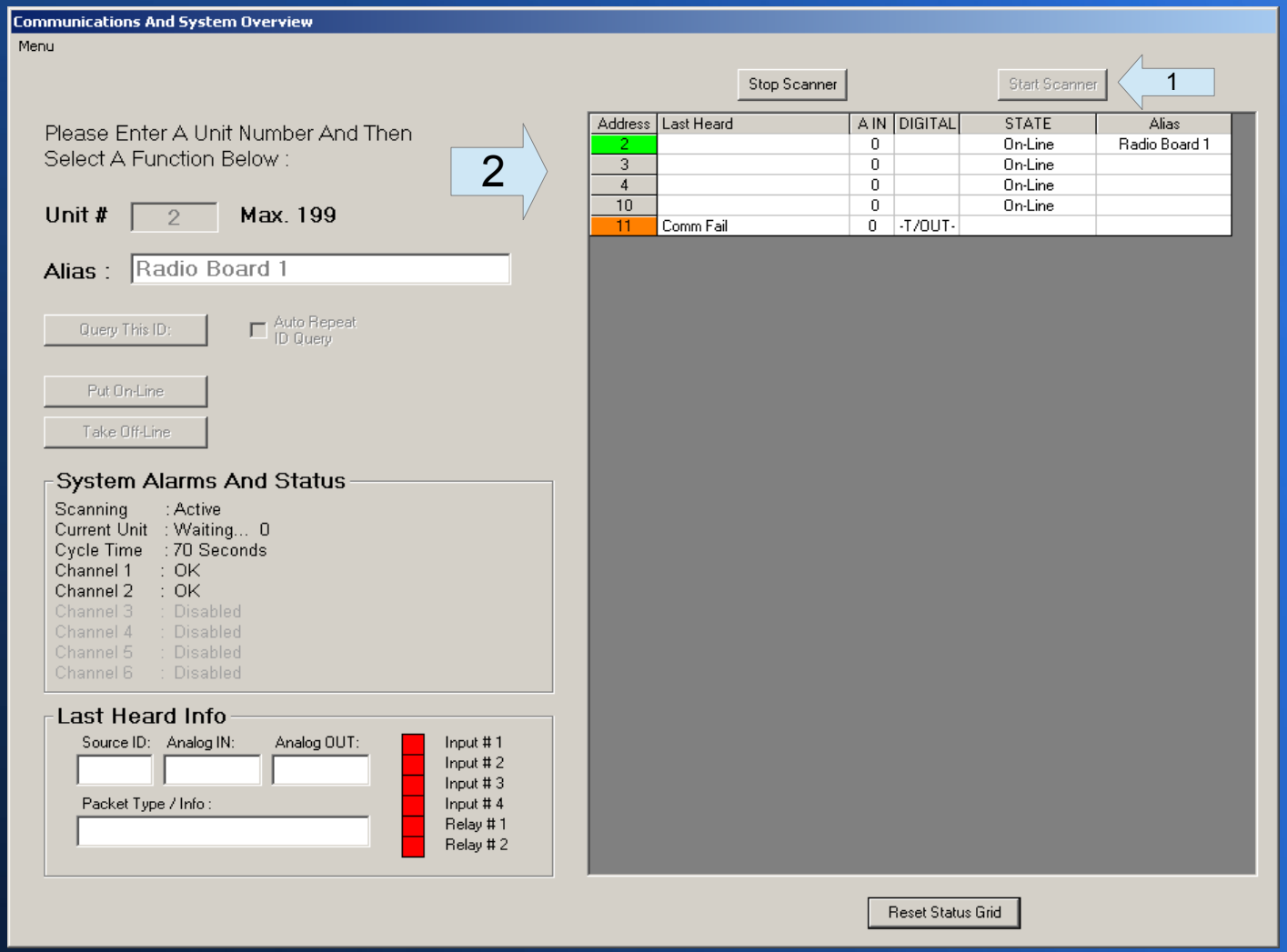
Scanning System Setup

- Put I/O Boxes On-line
- Start / Stop Scanner
- Look at Diagnostics and Diagnostic Files

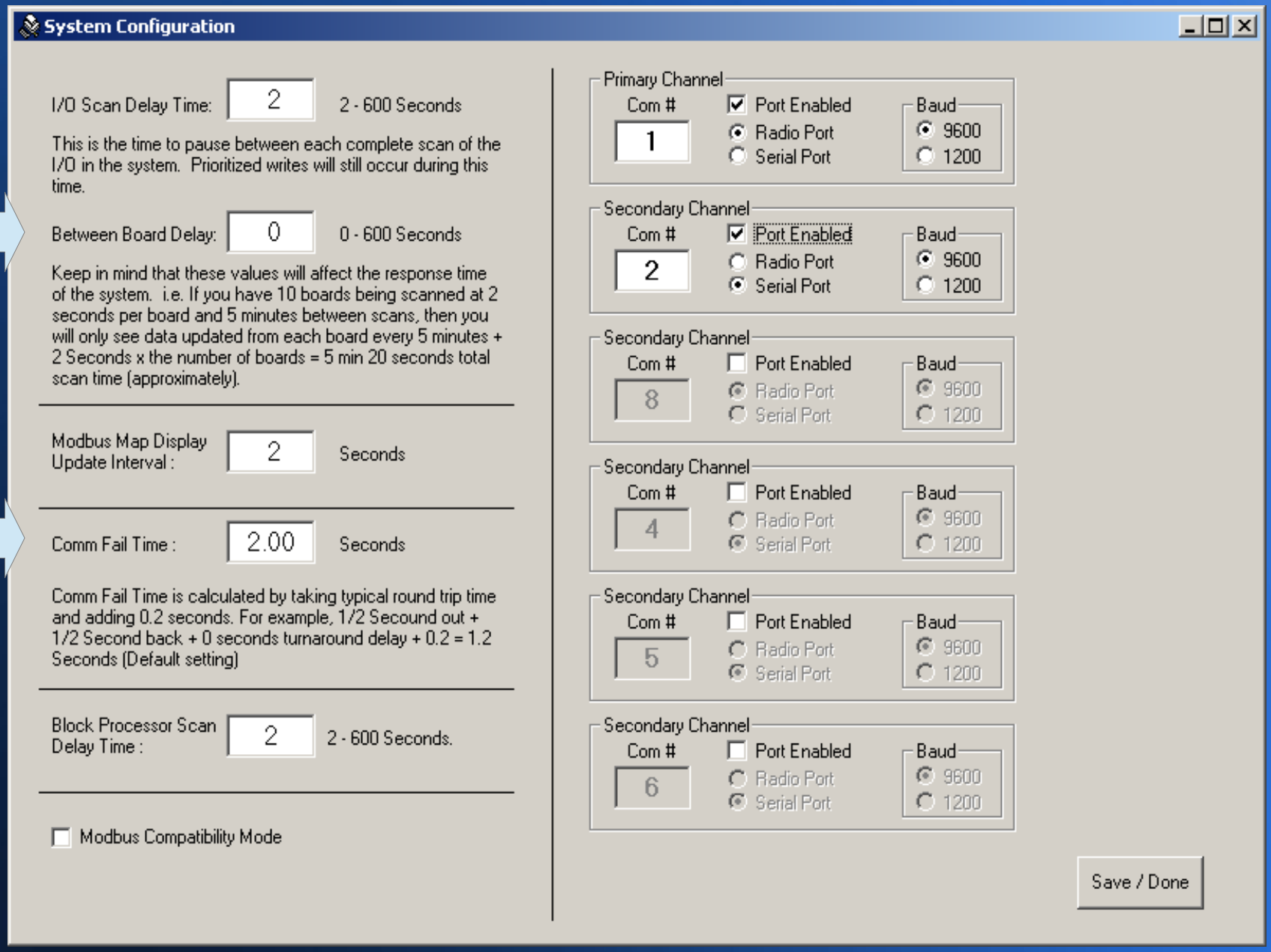


1. Select box (unit) number
2. Select “Put On-Line”
3. Select the communications channel the box is connected to
4. Select “Done”

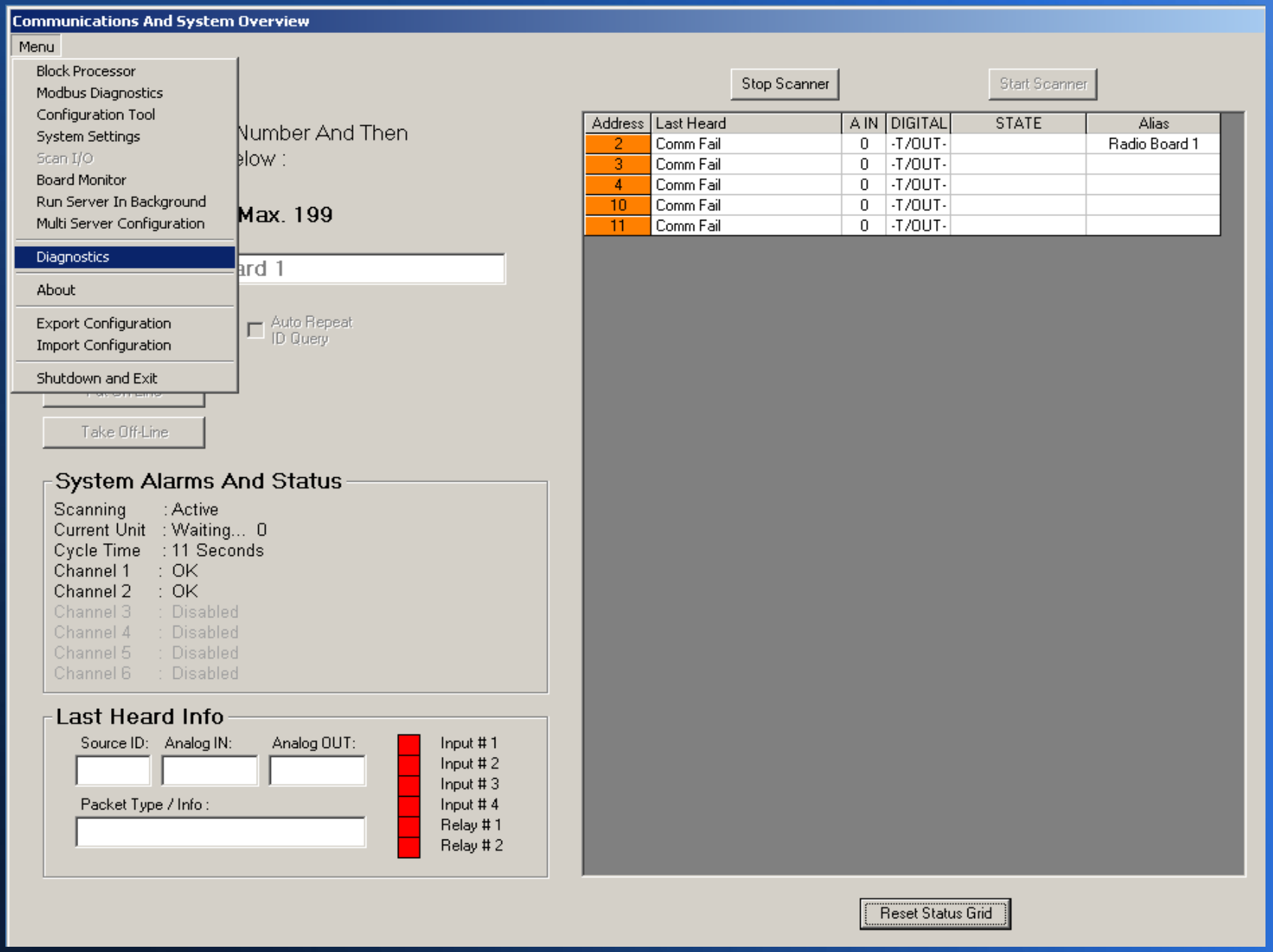
Note: To change a connection point (the channel a box is connected to) just follow the same procedure and put it on-line on the new channel.



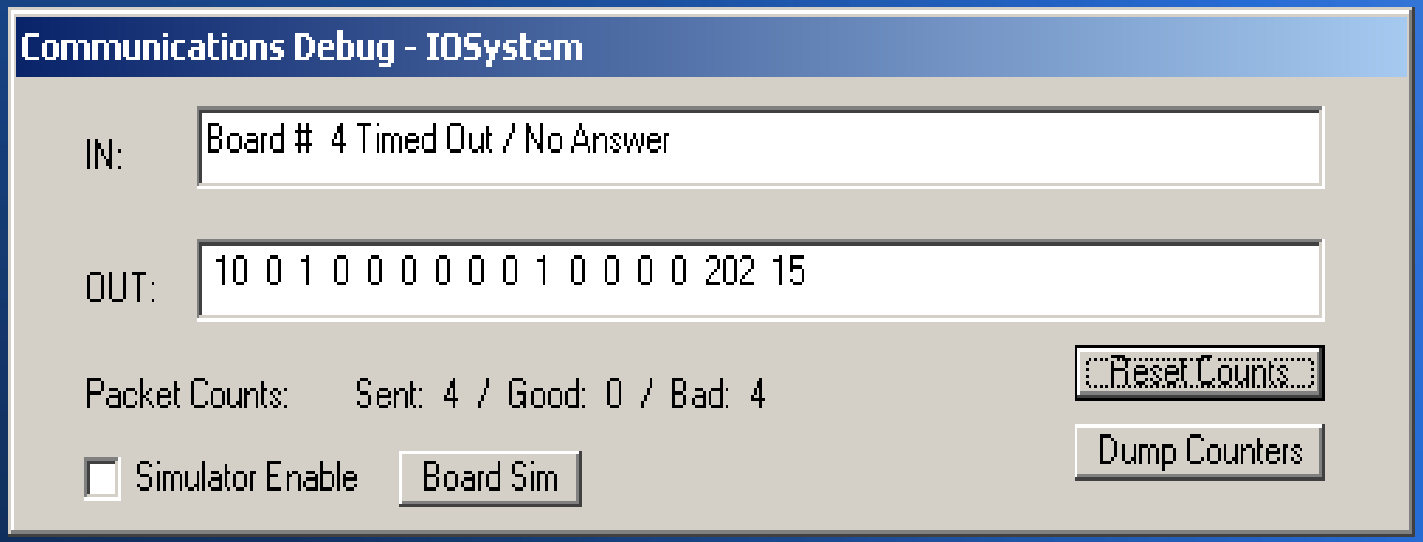
1. Scanner Start and Stop controls
2. Status Indications -
   - Green = Currently being queried
   - Orange = Comm Failed
   - Cyan = Priority Scan in Progress
   - Grey = OK / normal
   - Grey all across = Box heard but not set “on scan”



Note: These settings may need to be adjusted if you are seeing failures.

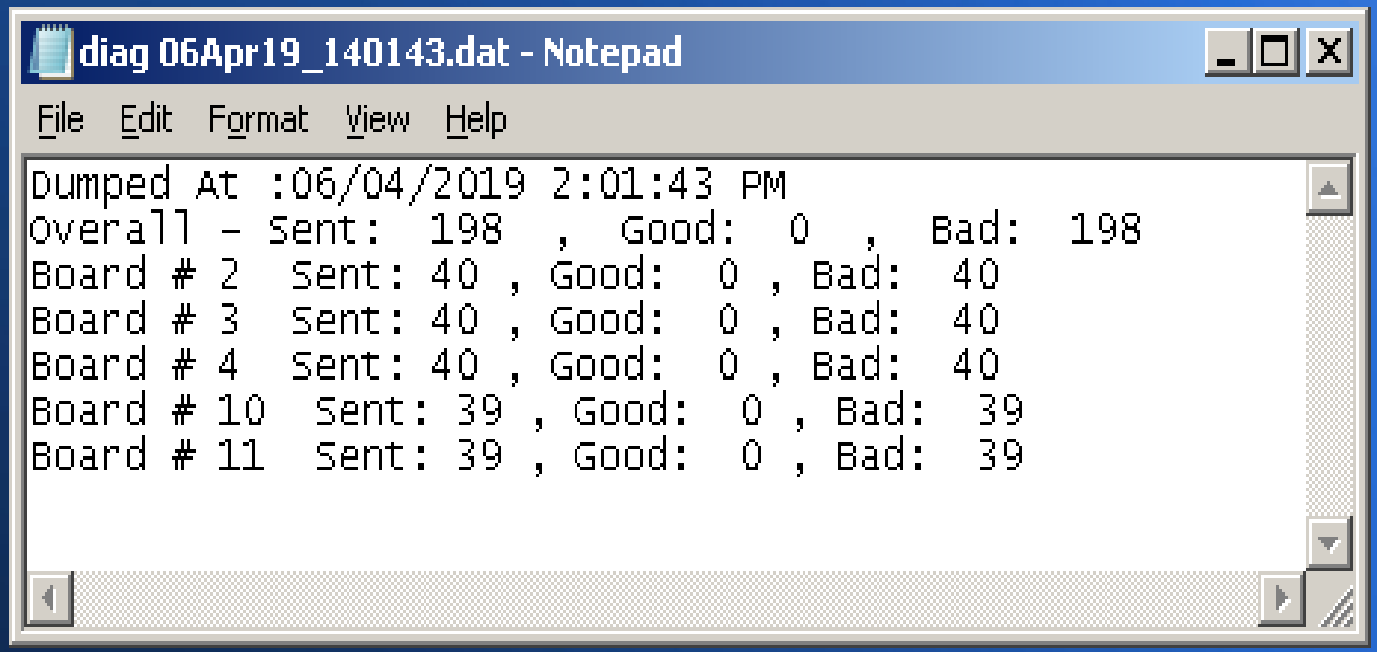


Select “Diagnostics” from the main menu



Diagnostic Detail Window :

1. Shows the raw data and status of communications going to and from the current box being scanned.
2. Selecting “Reset Counts” will zero the packet counts AND historical statistics.
3. Selecting “Dump Counters” will generate a file showing the statistics of ALL boxes.
4. The count shown is the OVERALL count for all boxes



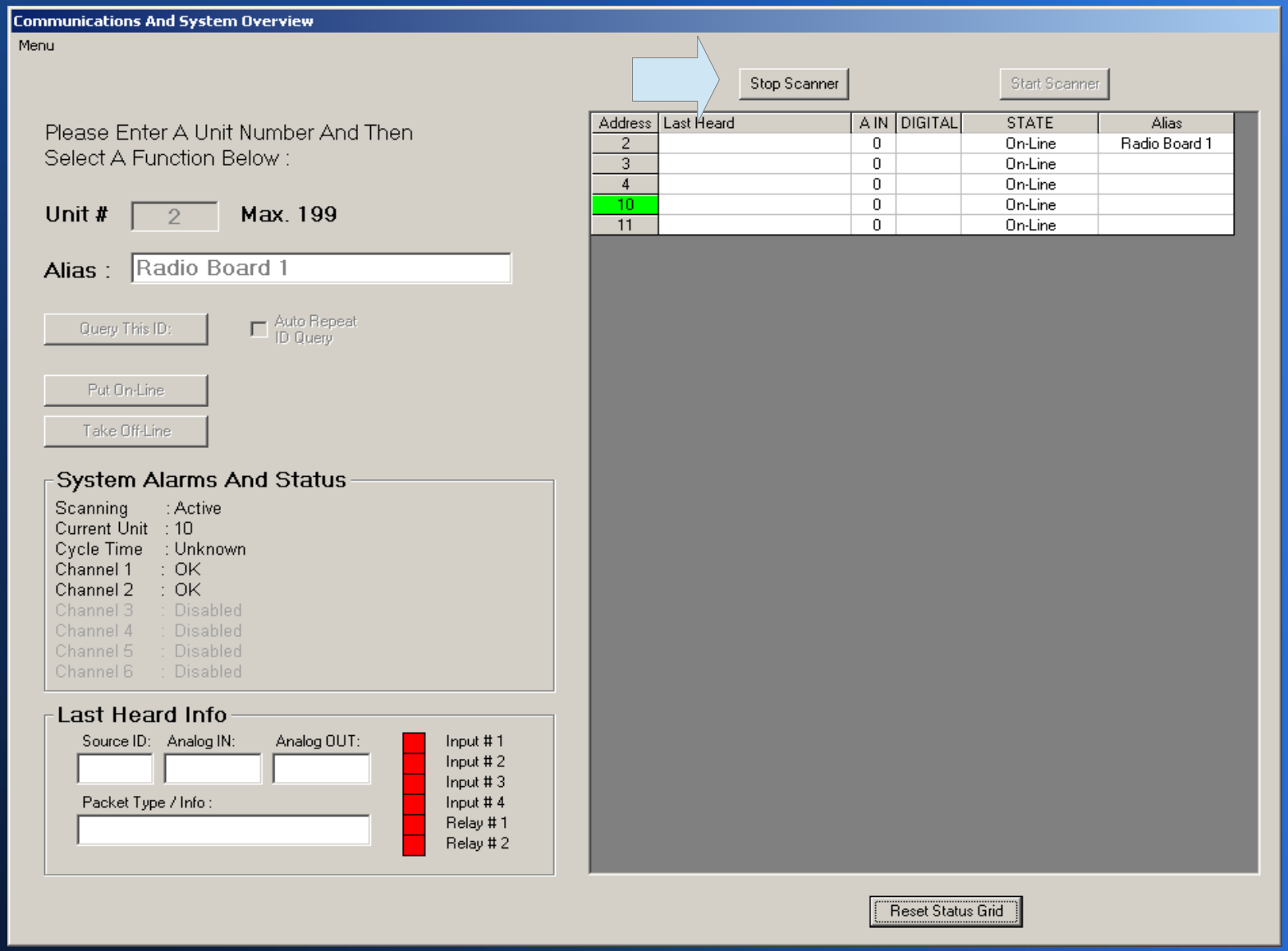
Sample “Diagnostic Dump” file

Notes:

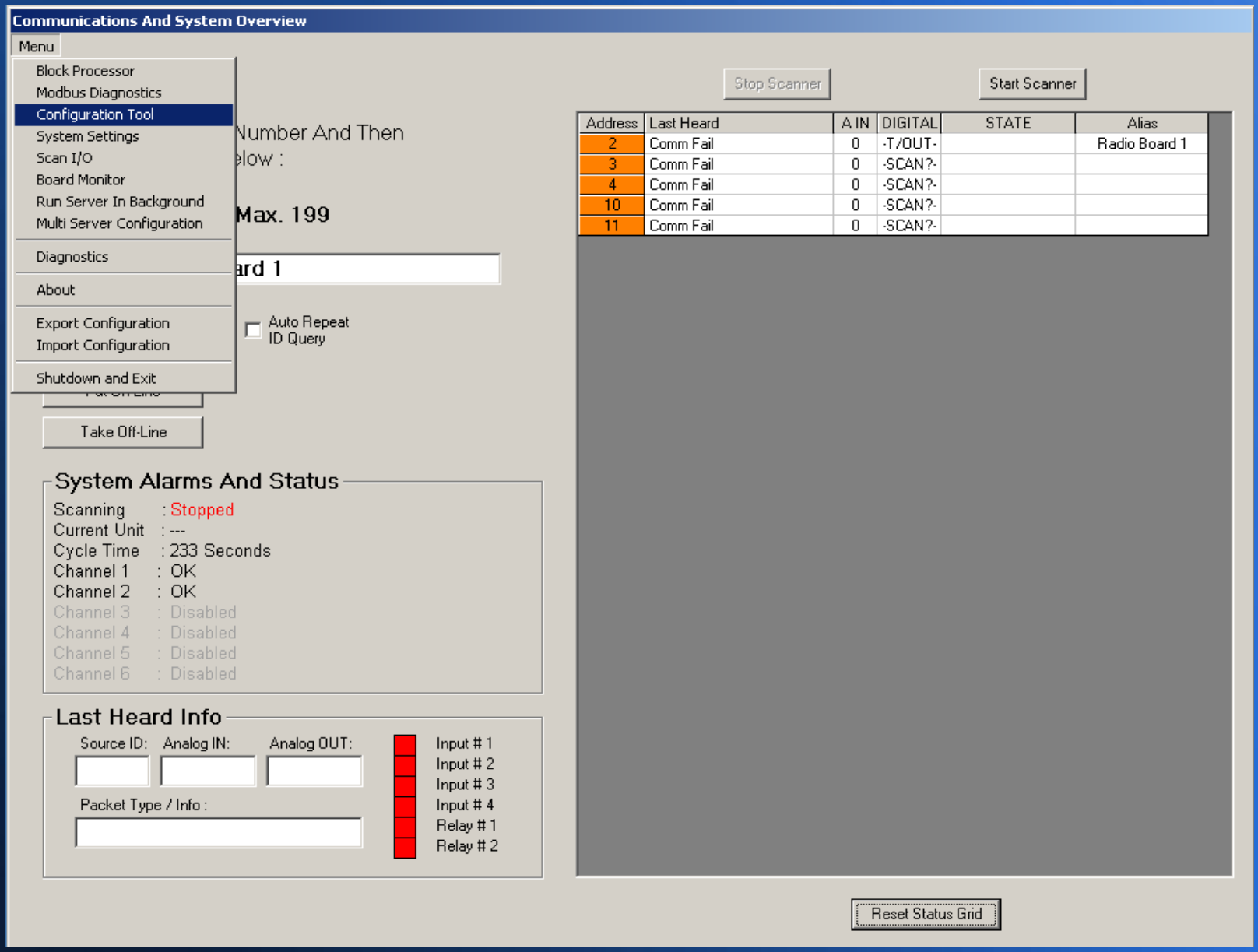
1. By default, the file is stored in the program installation folder.
2. The dump also occurs anytime the software is closed.
3. Daily dumps (at midnight) will occur automatically occur if the “Modbus Diagnostics” window is left open.

I/O Box Configuration

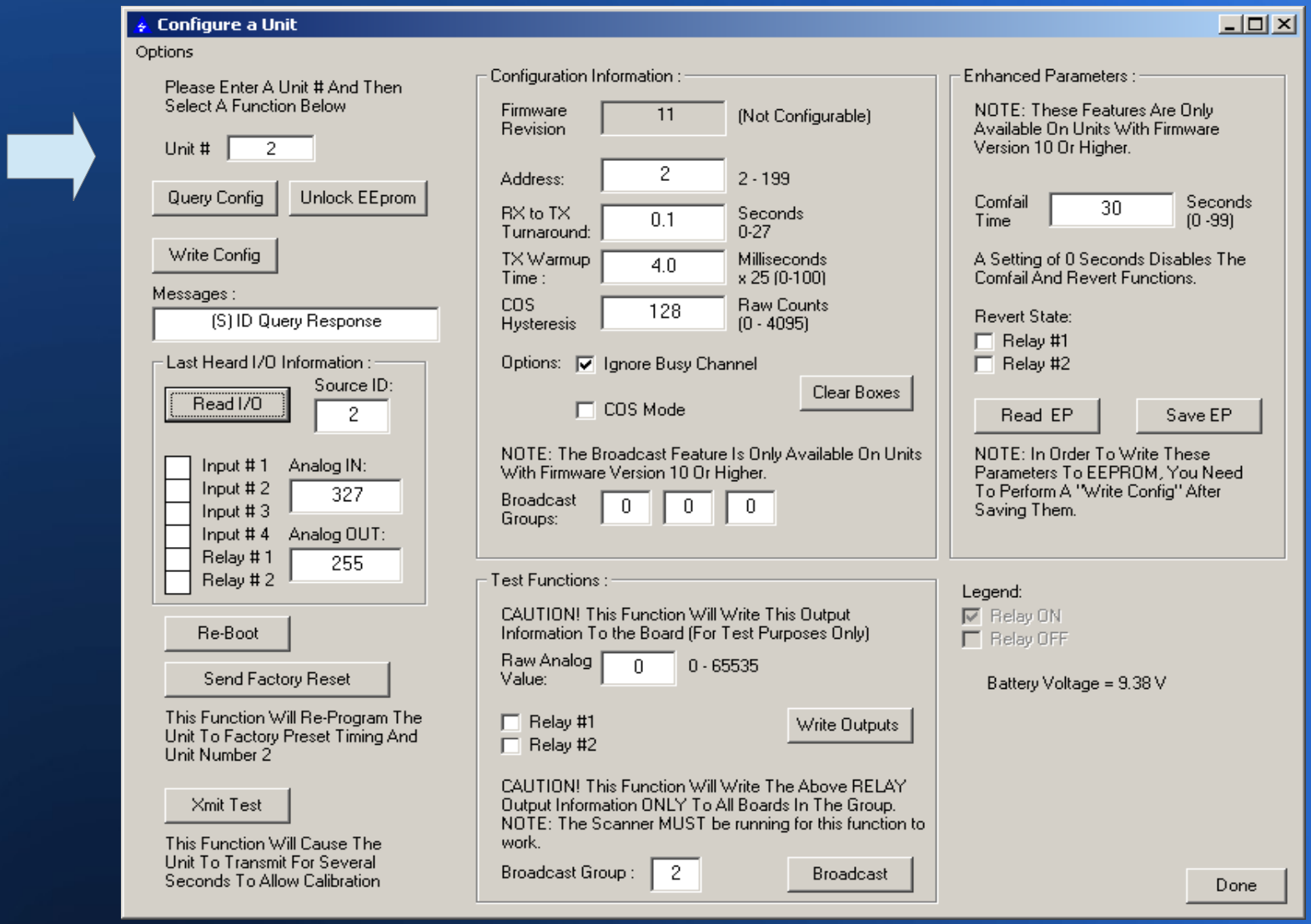
- Configure I/O boxes
- Test all I/O box functions
- Diagnose I/O box issues



Select “Stop Scanner”

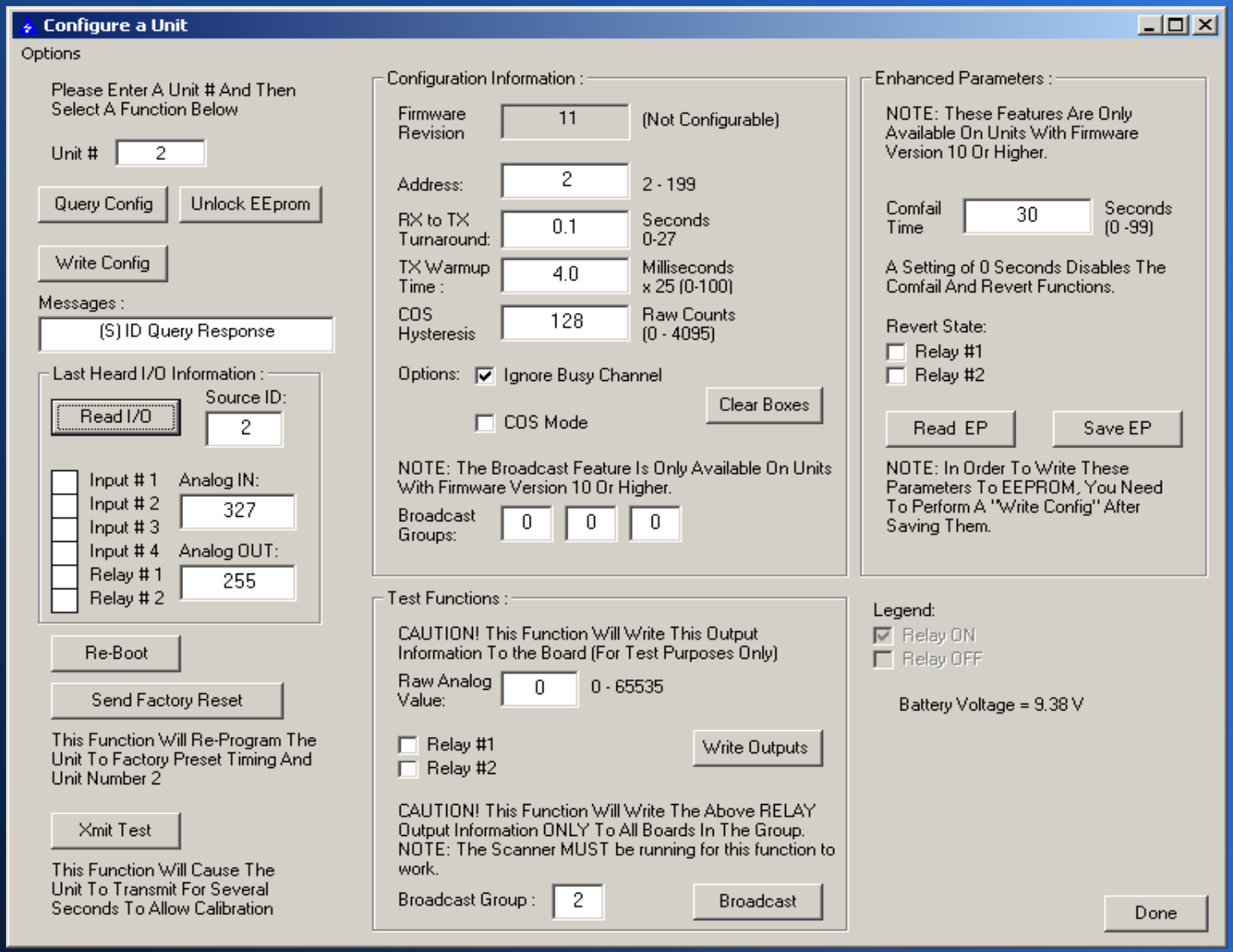


Select “Configuration Tool” from the main menu



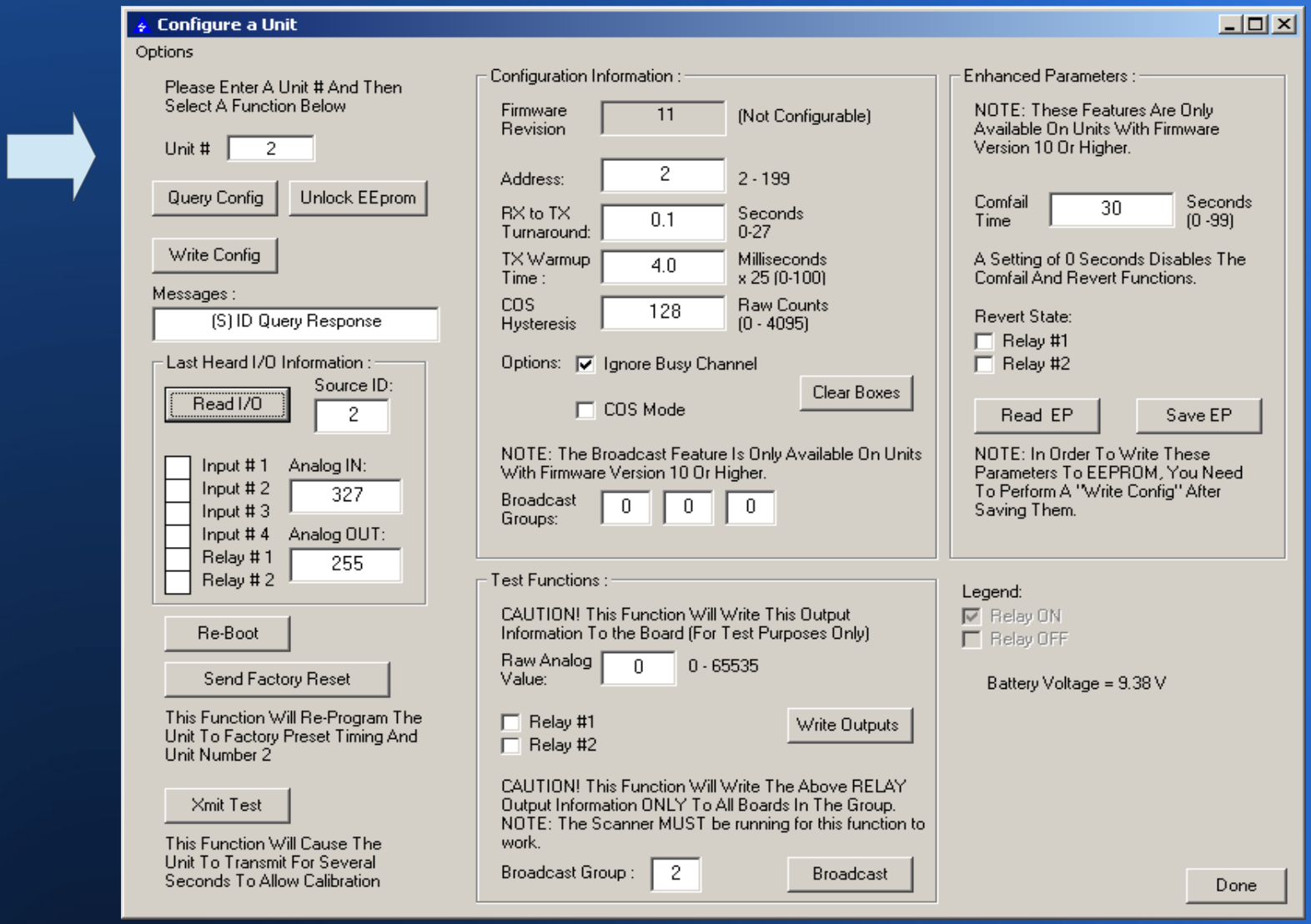
To examine and configure a box:

1. Enter the box number in the “Unit #” field
2. Select “Query Config”
3. Make any necessary changes
4. Select “Unlock Eeprom”
5. Select “Write Config”



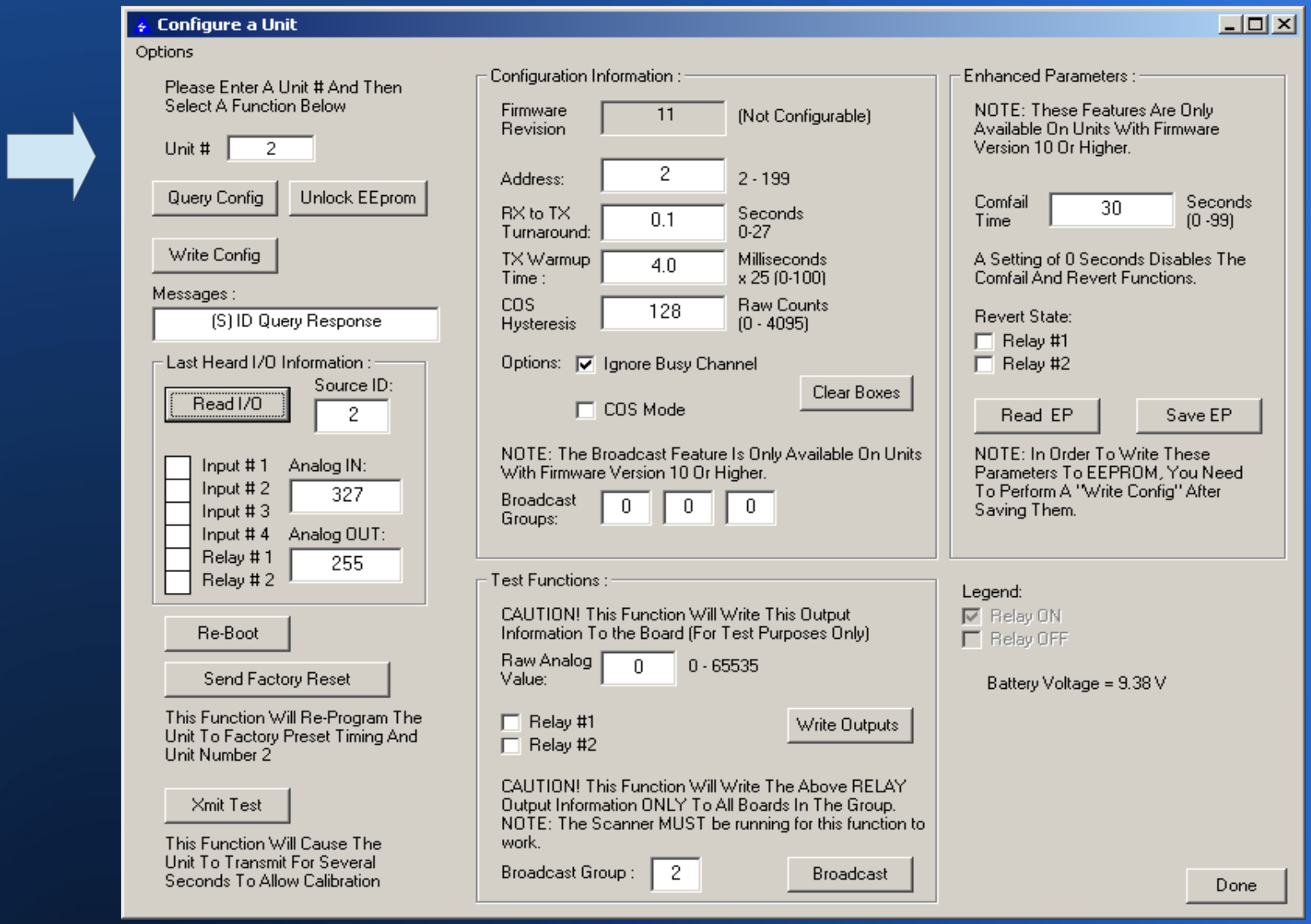
To adjust the Enhanced parameters you should do the following:

1. Query the config
2. Read EP
3. Make any necessary changes
4. Save EP
5. Unlock Eeprom
6. Within 5 seconds, Write EEprom



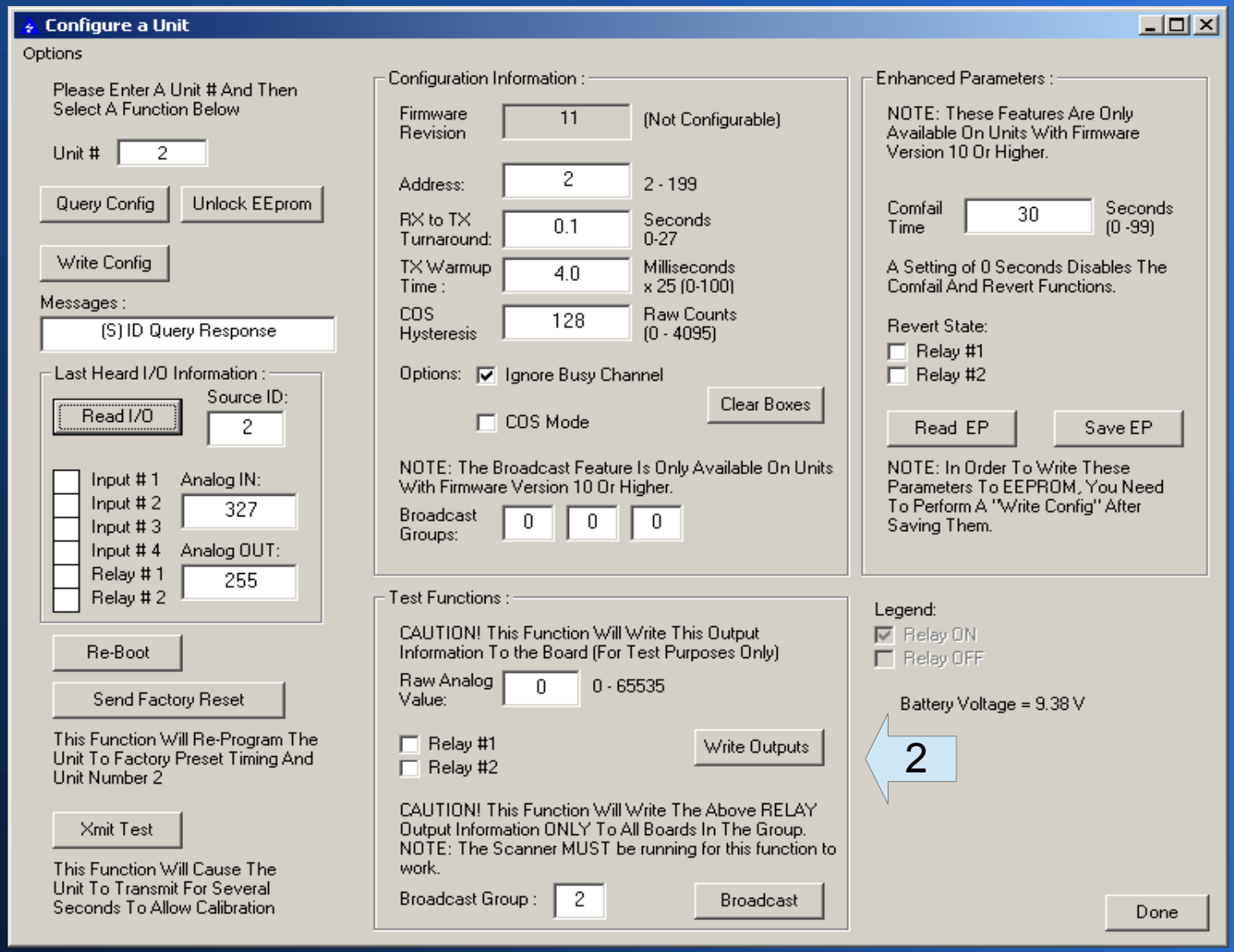
Notes:

1. Only the applicable parameters for the box you are examining will show up
2. If you don't know the number of the box you wish to query, use the “Advanced Mode” (See the manual) to find out the current box number
3. Firmware revision determines the available features

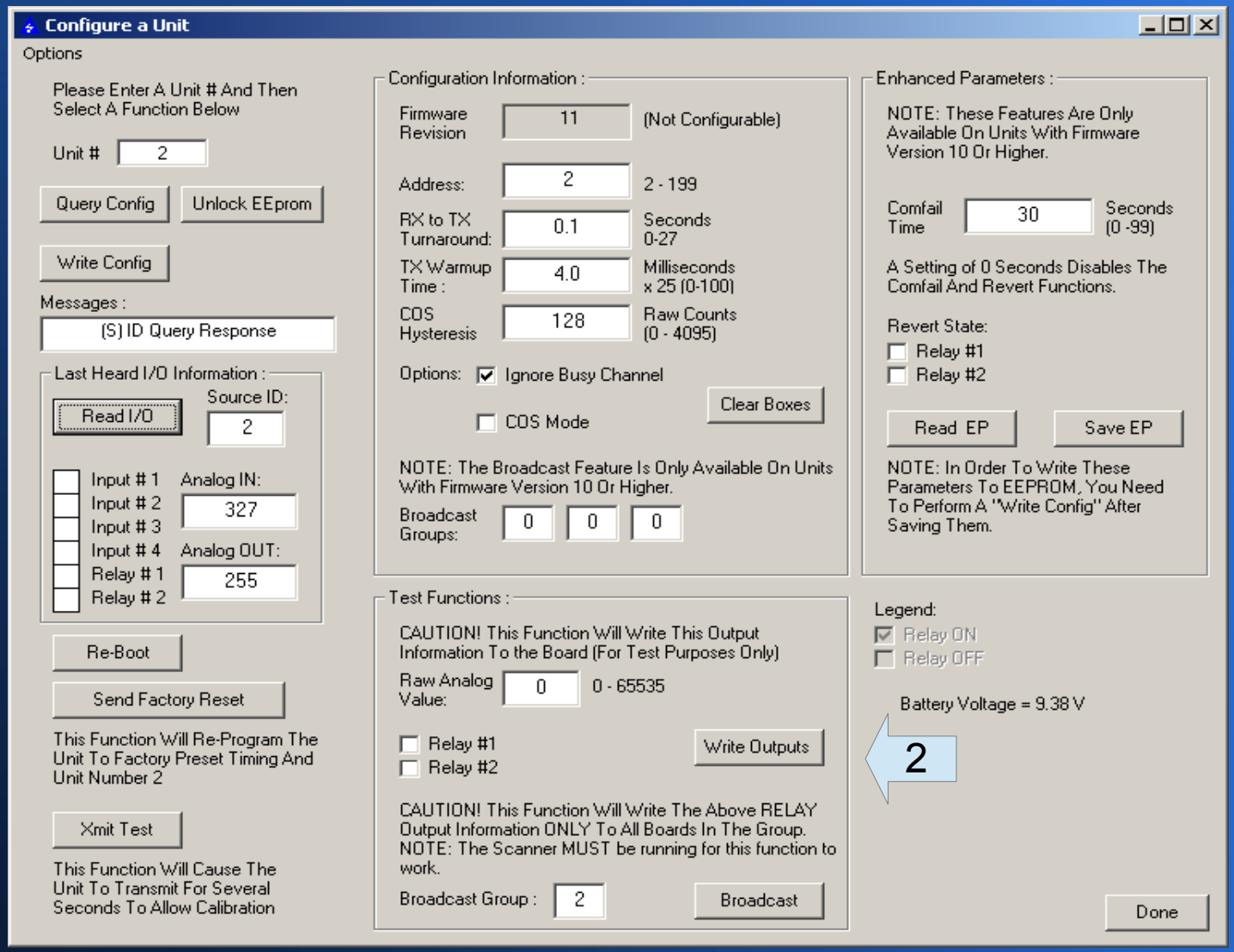


Notes:

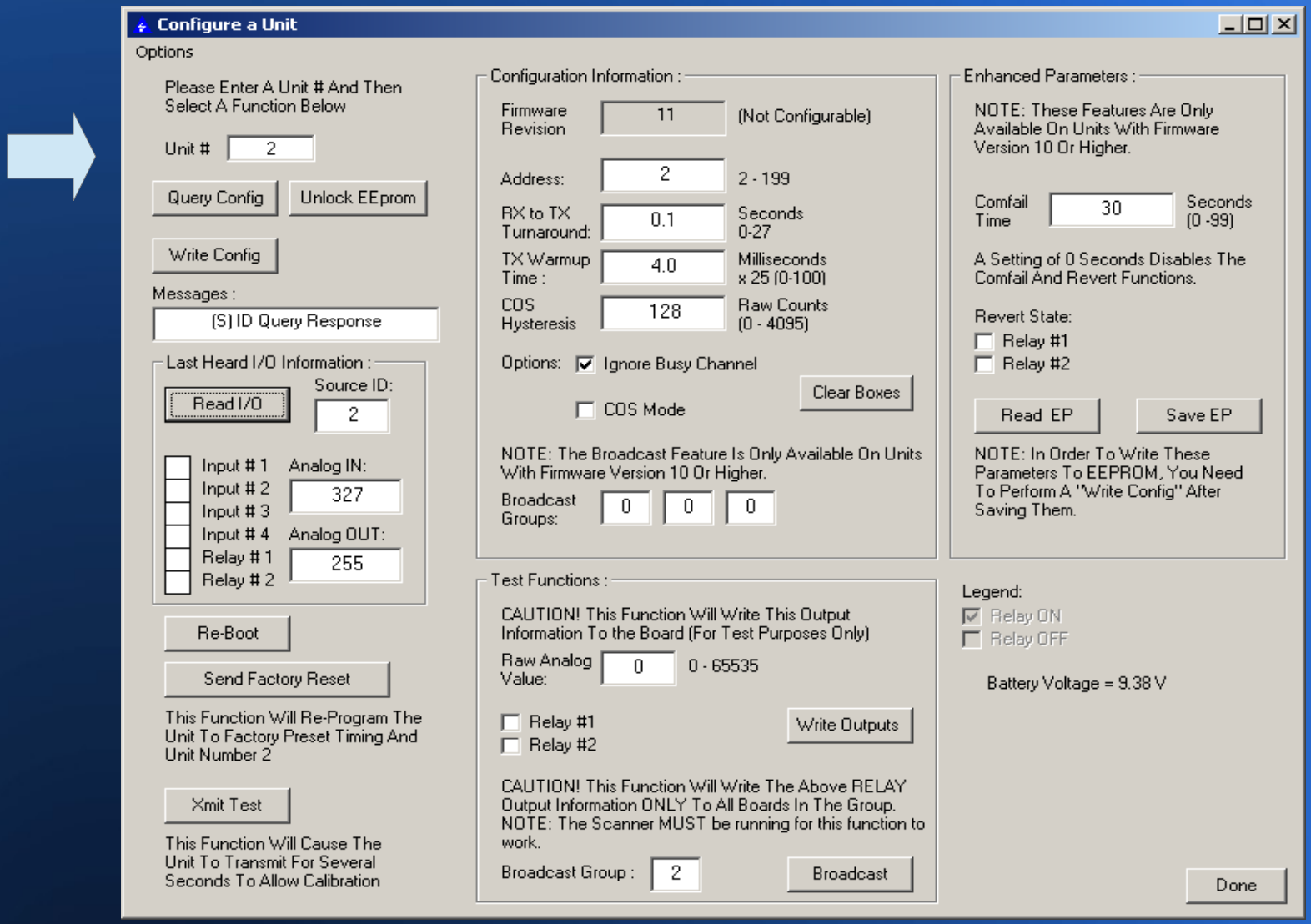
4. The EEprom MUST be unlocked in order to write a new configuration or setting a unit back to factory defaults
5. The factory default box number is 2
6. Most units (with recent firmware) can also be configured with a programming cable and a dumb terminal program



1. In order to test a box, enter the Unit number and select “Read I/O”. The current I/O states should show up. On boxes that support the function, the battery voltage (supply voltage) will also show up.
2. If you wish to test the outputs, enter and select the output states you wish and select “Write Outputs”

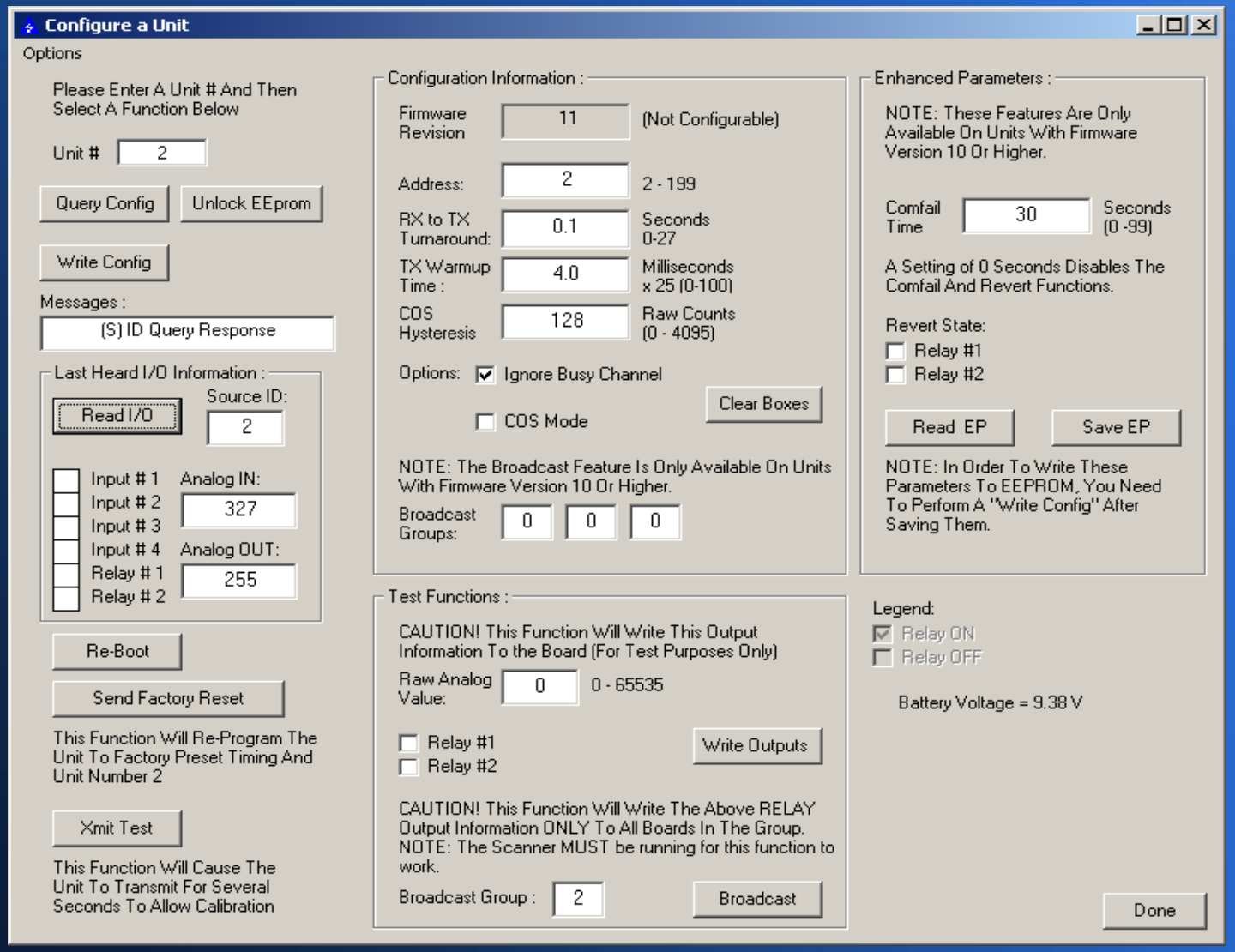


Note: Caution should always be taken when working on a live system so as not to inadvertently turn on or off outputs, of configure a different (incorrectly specified) box on the system. i.e. One with a duplicate number.



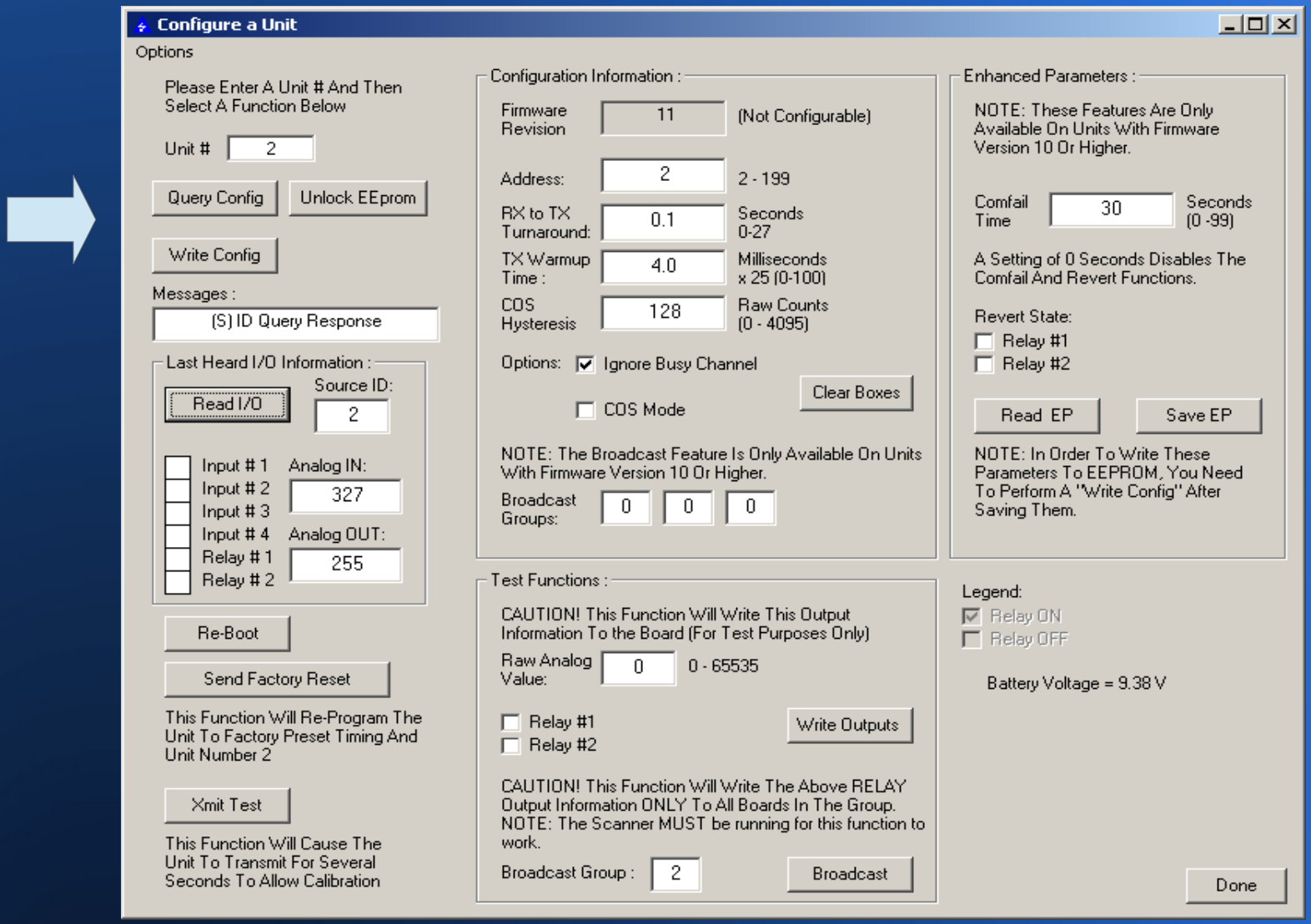
Practical example: Change a box number from factory default

1. Connect the box to the system
2. Enter 2 in the Unit # field
3. Select Query Config (Watch the box to make sure the box you want to change is responding)
4. Change the Address in the Configuration Information area



Practical example: Change a box number from factory default (Cont'd)

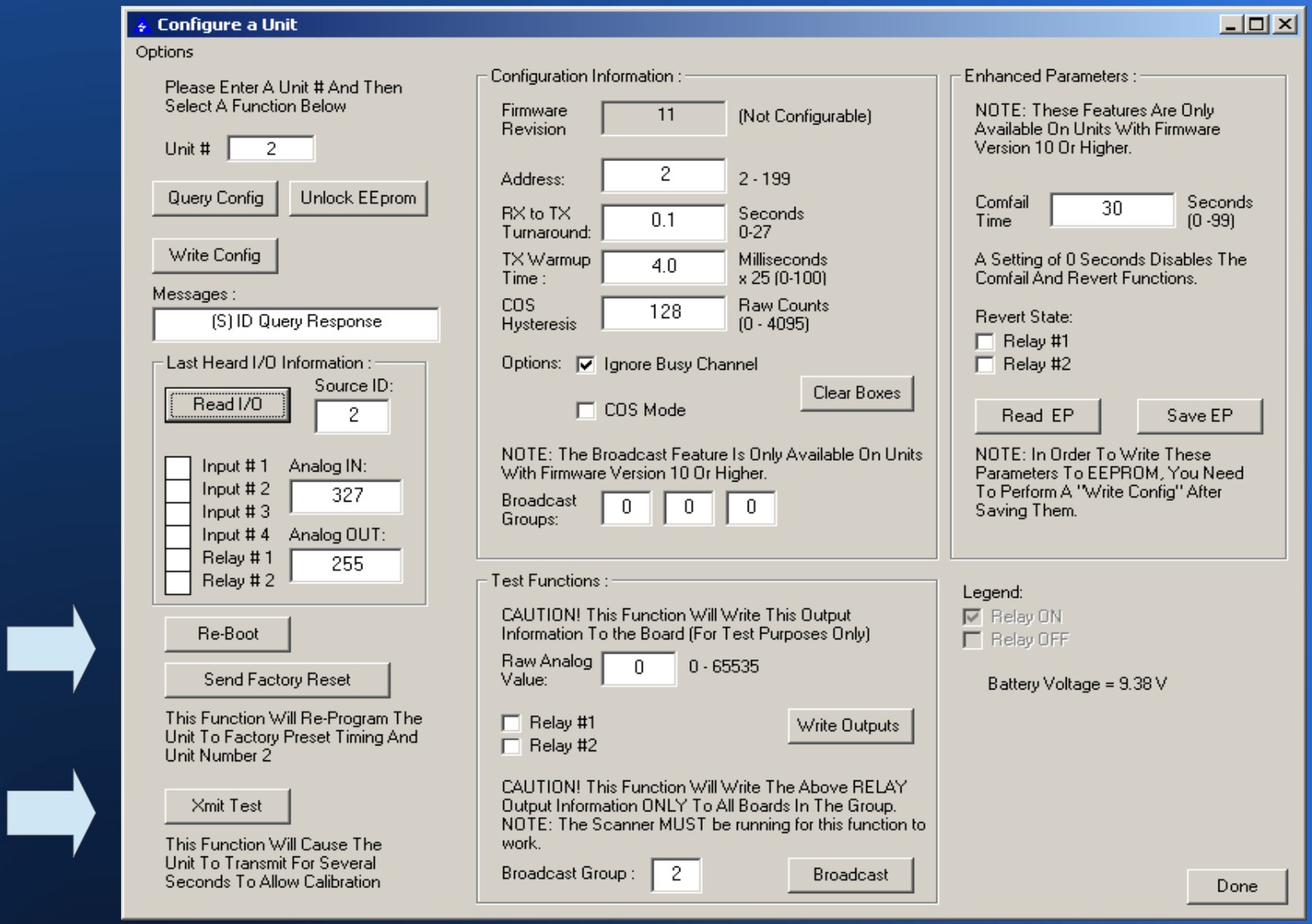
5. Select Unlock Eeprom
6. Within 5 seconds, select Write Config
7. Enter the new number in the Unit # field
8. Select Read I/O and verify the box is responding correctly to the new address



Practical example: Change a box number from factory default (Cont'd)

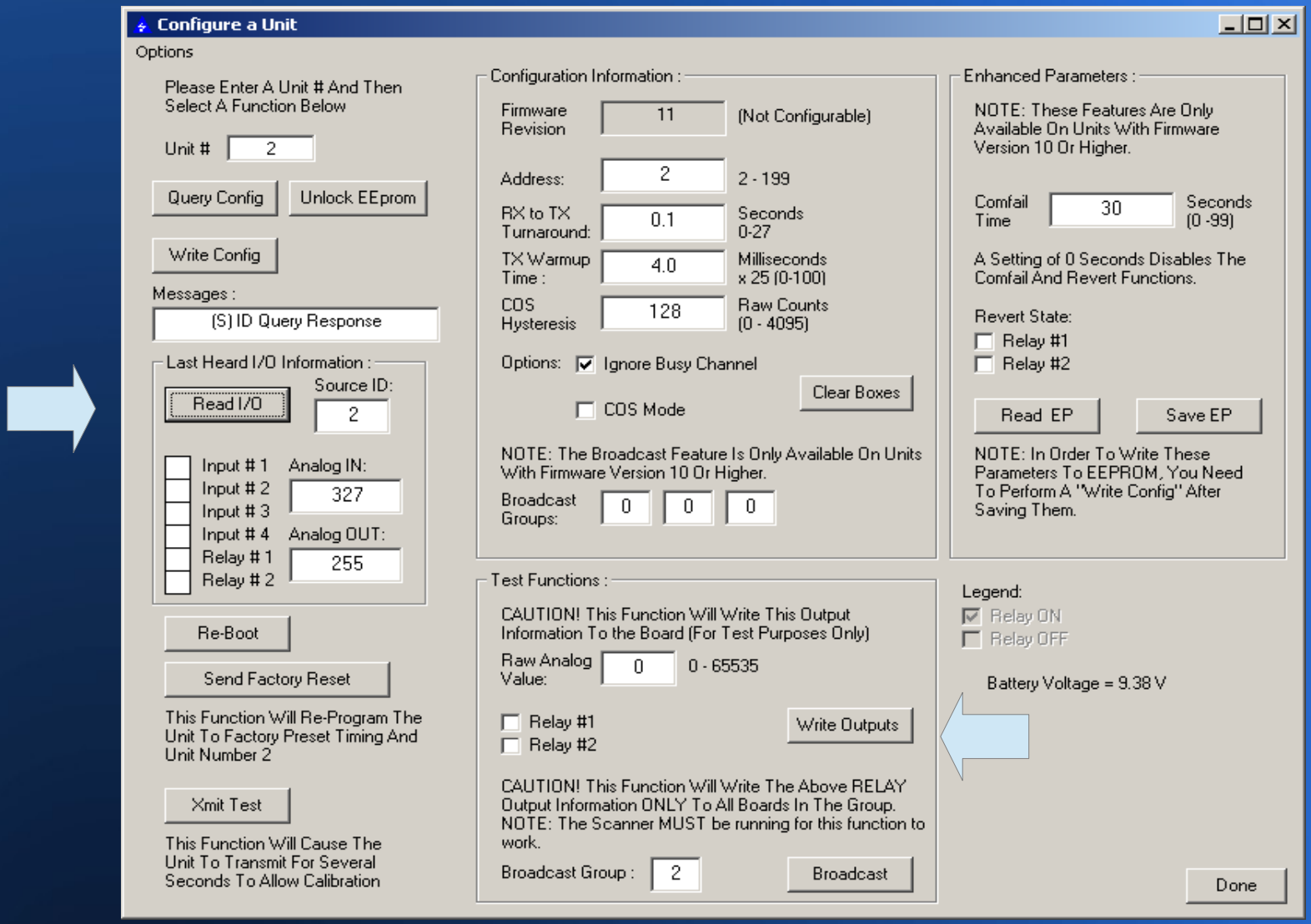
Notes:

1. All Configuration commands are sent as broadcasts (on every communications channel)
2. The scanner MUST be stopped before attempting to configure a box
3. The only test function that requires the scanner to be running is the “Broadcast” function



Diagnostic Notes:

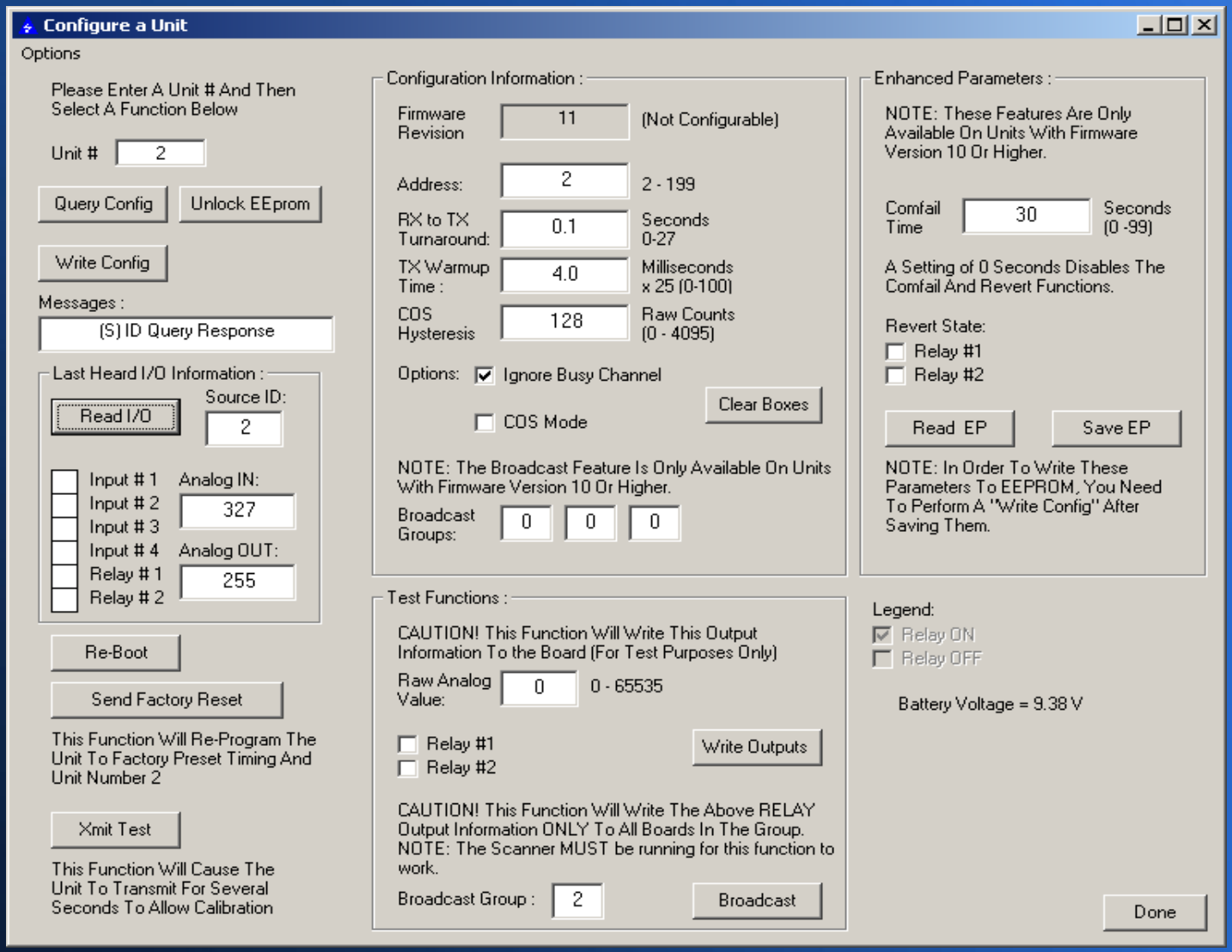
Some communication issues can be diagnosed by using the features shown. Note that the Xmit (transmit) test only works on radio based I/O (excluding 900 Mhz versions). It is used to make a box transmit test tones that can help determine the quality of the radio path. You can use a portable radio to listen to the audio sound of the output frequency to determine if the signal is reasonable.



Diagnostics Notes:

You can use the Read I/O and Write Outputs functions to allow full testing of every feature that is supported by the box being examined.

By selecting “Advanced Mode” from the “Options” menu, you may query any (and every connected) box (simultaneously) by entering Unit # 65535. *** Caution should be used in order to avoid undesired ramifications when using this function. ***



Diagnostics Notes:

You should always use box # 3 or higher in your system

- Box # 0 represents internal flags in the software and cannot be used
- Box # 1 represents the radio head-end
- Box # 2 is the factory default
- Box # 199 is the maximum usable box number

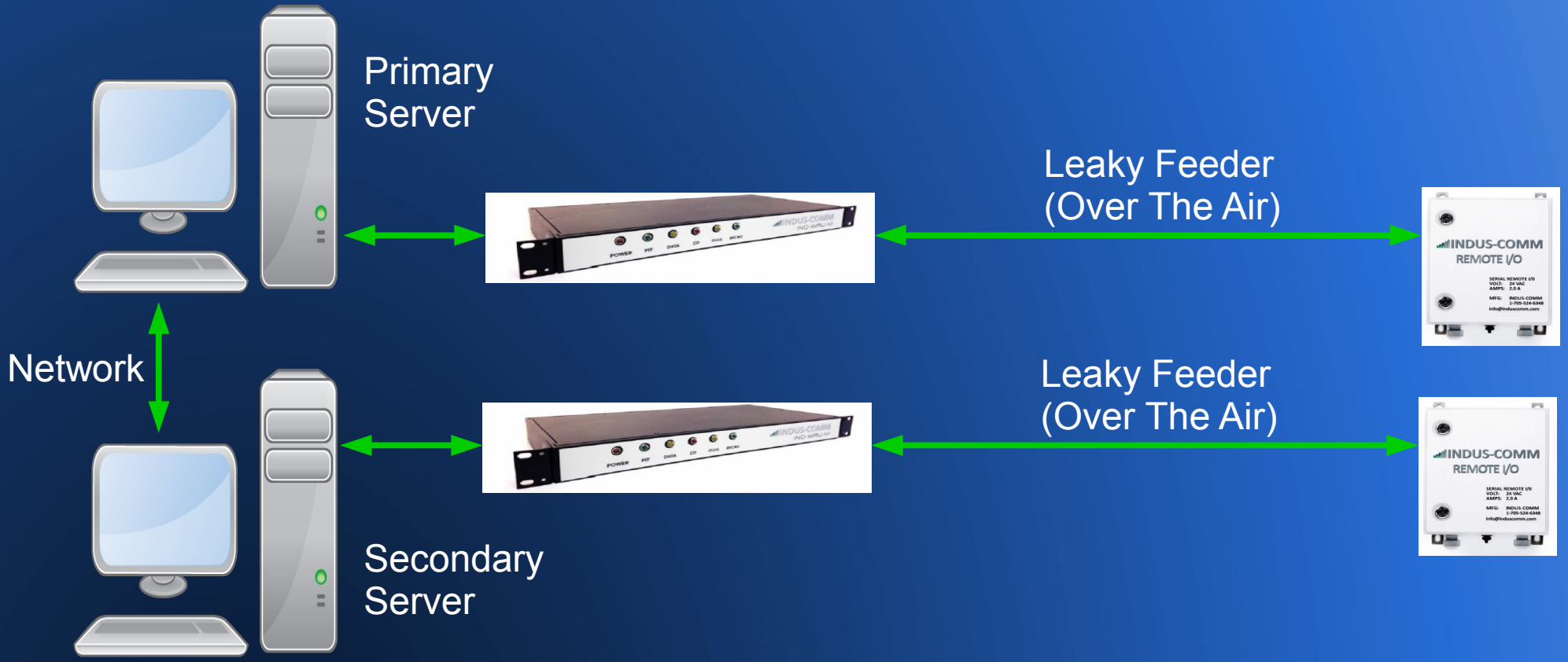
Secondary Server Configuration

- Secondary servers allow different scan groups
- No box number may be duplicated anywhere in the system
- Only 1 Primary server (and therefore 1 Modbus interface) is allowed
- Up to 3 Secondary servers allowed
- Secondary servers are allowed on the same computer as the primary server

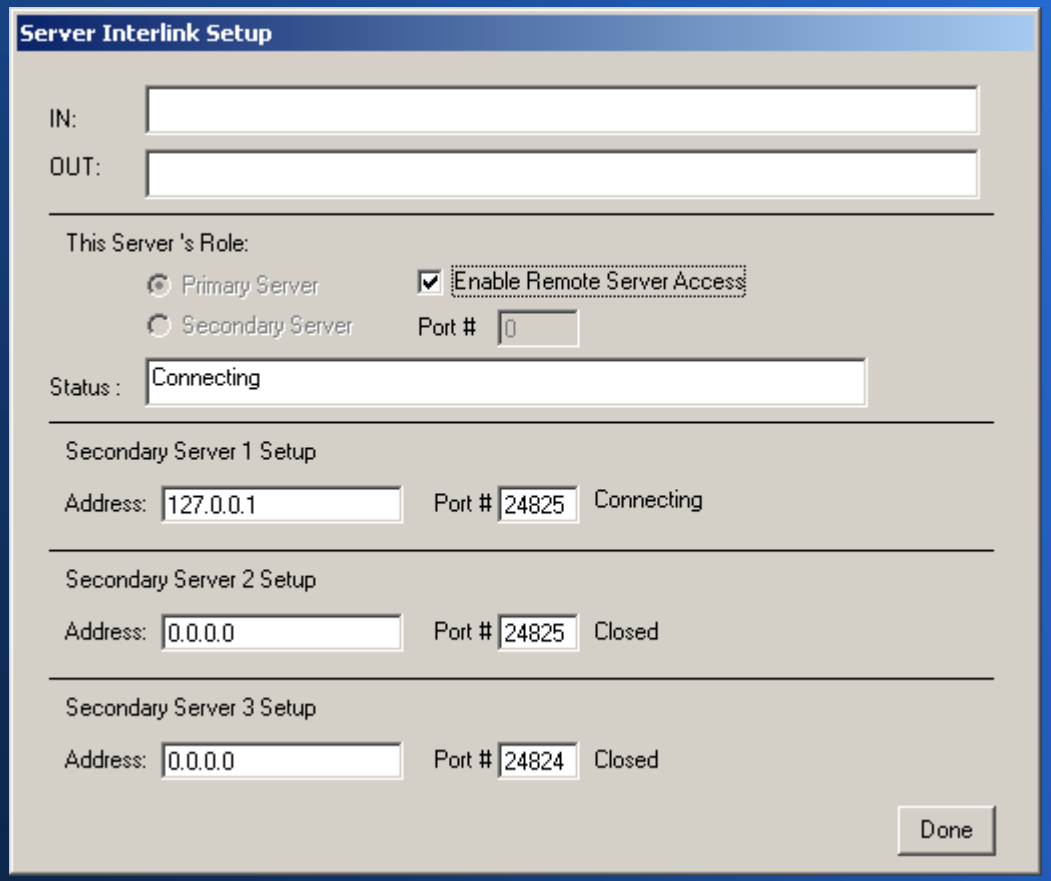
Multi Server Configuration

You can run the Primary and Secondary server(s) on a single computer

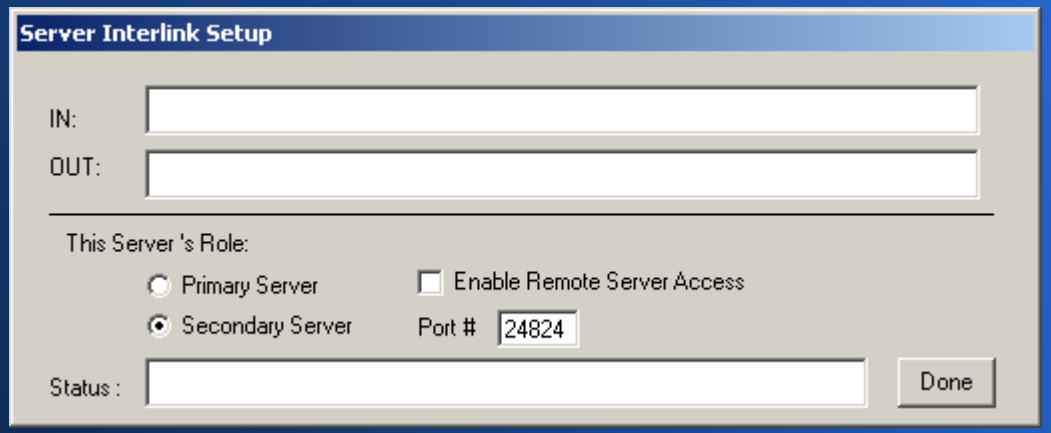
Multi Server Configuration



You can run the Primary and Secondary server(s) or on separate computers on the same network



Primary Configuration: The connection information for Secondary Servers is specified and remote services can be enabled in this window.



Secondary Configuration: The connection information for Primary Server is specified and remote services can be enabled in this window.

Modbus Interface

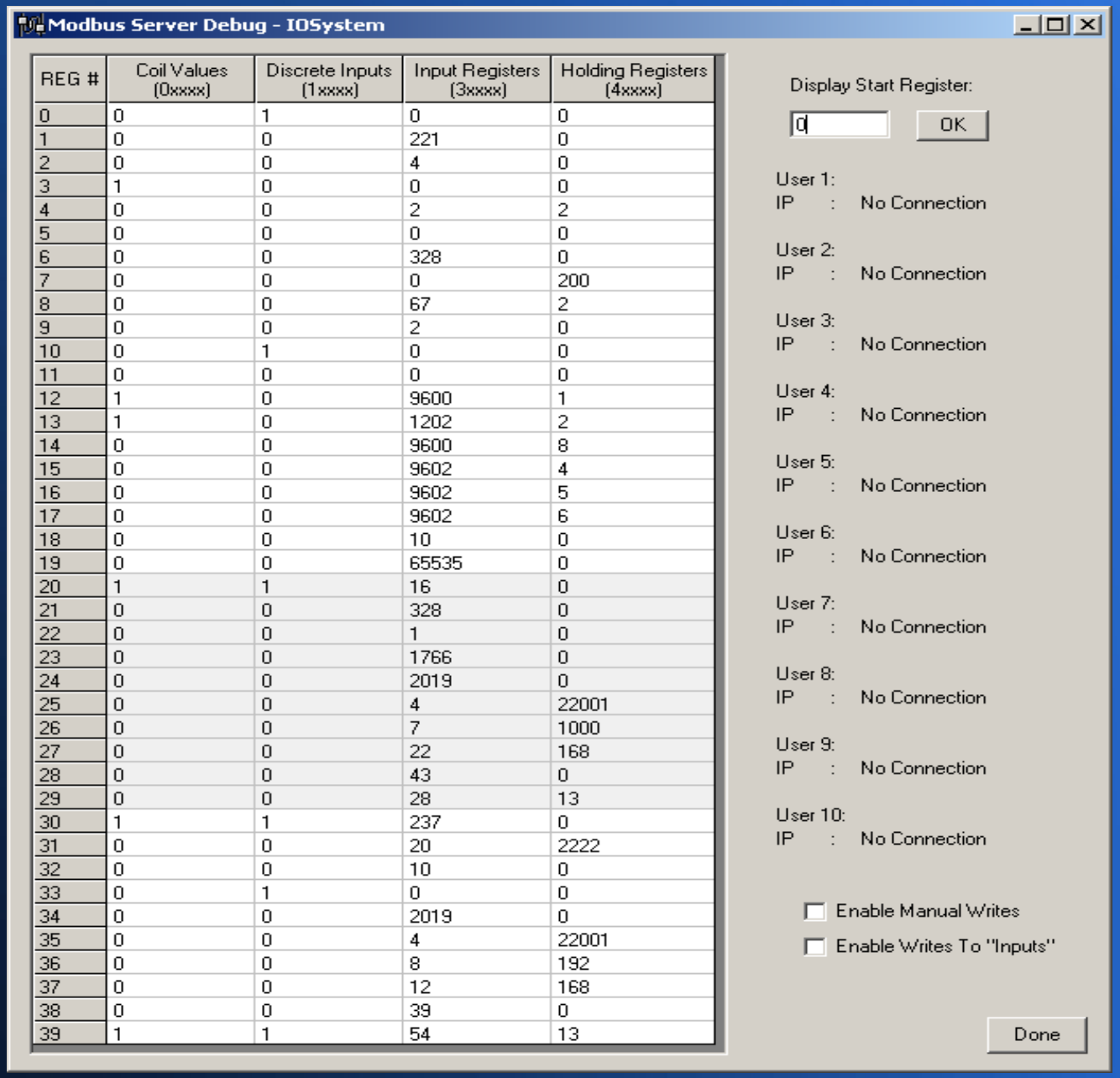
- Allows access to functions and settings of the system
- Allows access to box I/O
- Custom memory map
- Up to 10 devices can connect *
- Allows TADA to connect and control I/O

	(Writable)	(Read Only)	(Read Only)	(Writable)	
Register #	Coils	Discrete INPUT	Input Registers	Holding Registers	NOTES:
Function	Digital OUT (0xxxx)	Digital IN (1xxxx)	Analog IN (3xxxx)	Analog OUT (4xxxx)	
0					Registers 1 to 19 are for System Statistics/Diagnostics/Options
1	Scan ON/OFF		Head End HB	Diag Dest LO	Box Address x 10 = Base Address For I/O
2	Server Hidden/Not		Current Board #	Diag Dest HI	Current Board # is the board that is being read/written now
3	TBP Scan On/Off		Head End RSSI	Diag CMD / Bcast Group	
4	Server Pri/Sec		Last Heard Board #	Block Processor Delay	Currently MAX Board # is 199, Limited in Head End Software
5	Remote Server Enabled		L.H. Packed I/O	Scan Period	
6	Compatibility Mode		L.H. Analog In		DO NOT write any values "Diag" Registers
7			L.H. Type Code	CommFail Time (x100)	
8			LH Update HB	Between Board Delay	Comport(X) Bad = 1 means Comm port is unavailable, 0 = OK
9			Last Comm Fail BD#	Bcast Data	Comport Port # (X) = 3 means Com 3 etc.
10					Comport type (X) > 0 = Radio, 1 = TCPIP, 2 = Serial, (+ Baud rate, e.g. 9601)
11	Broadcast Go / Done				IP ADDR 1 / Board port –> 1-255 = IP Board, 1000 + = (Port x 1000)
12	Comport (0) Enabled	Comport (0) Bad	Comport type (0)	Comport Port # (0)	
13	Comport (1) Enabled	Comport (1) Bad	Comport type (1)	Comport Port # (1)	L.H. = Last Heard
14	Comport (2) Enabled	Comport (2) Bad	Comport type (2)	Comport Port # (2)	
15	Comport (3) Enabled	Comport (3) Bad	Comport type (3)	Comport Port # (3)	Block Processor Delay is in sec.
16	Comport (4) Enabled	Comport (4) Bad	Comport type (4)	Comport Port # (4)	Between Board Delay is in Seconds
17	Comport (5) Enabled	Comport (5) Bad	Comport type (5)	Comport Port # (5)	Comm fail is in seconds x 100 (hundredths of a second)
18					
19					Addresses in the 20 range can be used but the factory
20					default board number is 2 so this is not suggested.
21					
.					A-Out is 0-65535 - scale to be set
(Box Addr 3) 30	ON-Line	Comm Fail	Board HB	Broadcast Group 1	A-IN is 0 4095 - scale to be set (0-20 Volts approx)
31	Relay 1 Output	D-IN 1	A-IN 1 / RSSI	A-OUT 1	A-IN 2 is not supported on all boards
32	Relay 2 Output	D-IN 2	Comm Fail Count	Broadcast Group 2	Broadcast Groups are 1 - 250
33		D-IN 3	A-IN 2	Broadcast Group 3	
34		D-IN 4	Last Read Year	Remote Server #	HB = Heartbeat
35		Relay 1 Status	Last Read Month	IP Port	All heartbeats count from 0 to 255 then cycle around.
36		Relay 2 Status	Last Read Day	IP ADDR 1 / Board port	
37			Last Read Hour	IP ADDR 2	Head End HB counts every transmission attempt
38	Remote Server Flag		Last Read Minute	IP ADDR 3	
39	Don't Scan	SW Board Ind	Last Read Second	IP ADDR 4	Board HB counts every time board is accessed successfully
.					
(Box Addr 4) 40	ON-Line	Comm Fail	Board HB	Broadcast Group 1	Comm Fail =1 means no contact, 0 = OK
41	Relay 1 Output	D-IN 1	A-IN 1 / RSSI	A-OUT 1	On-Line : 1 = Scan this board, 0 = Skip it
42	Relay 2 Output	D-IN 2	Comm Fail Count	Broadcast Group 2	
43		D-IN 3	A-IN 2	Broadcast Group 3	Scan Period is Seconds Per I/O Board
44		D-IN 4	Last Read Year	Remote Server #	Scan On/Off = 1 means Scanning is enabled, 0 = Scan Stopped
45		Relay 1 Status	Last Read Month	IP Port	
46		Relay 2 Status	Last Read Day	IP ADDR 1 / Board port	Packed I/O Byte Map:
47			Last Read Hour	IP ADDR 2	I/O Bit 7
48	Remote Server Flag		Last Read Minute	IP ADDR 3	I/O Bit 6
49	Don't Scan	SW Board Ind	Last Read Second	IP ADDR 4	I/O Bit 5 – IN 4
.					I/O Bit 4 – IN 3
(Box Addr 5) 50	ON-Line	Comm Fail	Board HB	Broadcast Group 1	I/O Bit 3 – Relay # 2
51	Relay 1 Output	D-IN 1	A-IN 1 / RSSI	A-OUT 1	I/O Bit 2 – Relay # 1
52	Relay 2 Output	D-IN 2	Comm Fail Count	Broadcast Group 2	I/O Bit 1 – IN 2
53		D-IN 3	A-IN 2	Broadcast Group 3	I/O Bit 0 – IN 1
54		D-IN 4	Last Read Year	Remote Server #	
55		Relay 1 Status	Last Read Month	IP Port	SW Board Ind = Software Board Indicator
56		Relay 2 Status	Last Read Day	IP ADDR 1 / Board port	Allows Other devices to fill in TADA's I/O map
57			Last Read Hour	IP ADDR 2	1= SW, 0=Normal (basically chooses whether hardware exists or not)
58	Remote Server Flag		Last Read Minute	IP ADDR 3	* SW boards should not be scanned (Don't Scan turned on)
59	Don't Scan	SW Board Ind	Last Read Second	IP ADDR 4	as there is no hardware to connect to.
.					1 = Don't Scan, 0 = Scan
.					* Don't Scan Boards are not processed in any way and data should be
.					populated from the block processor or other software.
.					Normally for use in TADA or for COS only boards.

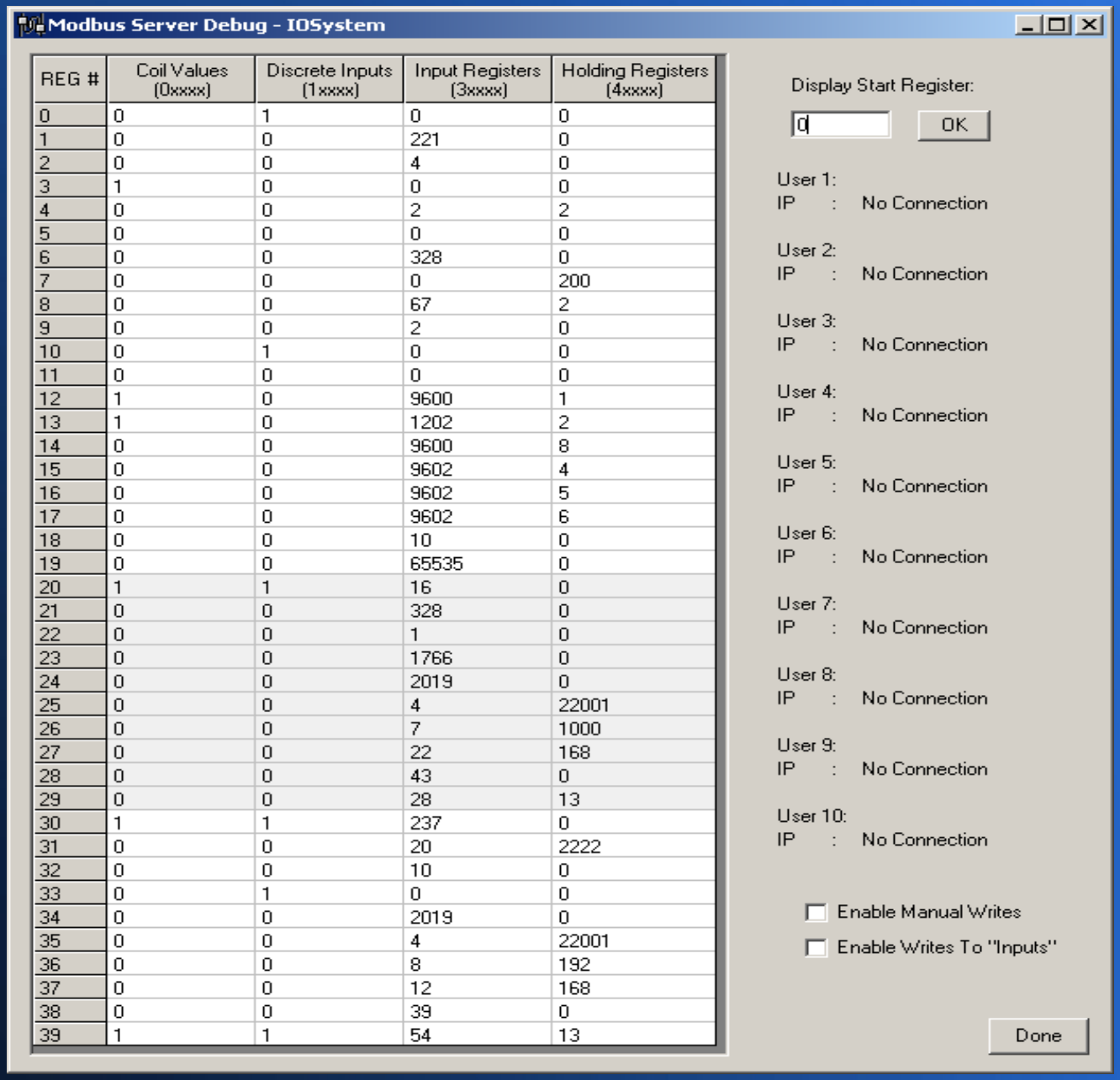
Modbus Custom Map

	(Writable)	(Read Only)	(Read Only)	(Writable)
Register #	Coils	Discrete INPUT	Input Registers	Holding Registers
Function	Digital OUT (0xxxx)	Digital IN (1xxxx)	Analog IN (3xxxx)	Analog OUT (4xxxx)
.				
(Box Addr 3) 30	ON-Line	Comm Fail	Board HB	Broadcast Group 1
31	Relay 1 Output	D-IN 1	A-IN 1 / RSSI	A-OUT 1
32	Relay 2 Output	D-IN 2	Comm Fail Count	Broadcast Group 2
33		D-IN 3	A-IN 2	Broadcast Group 3
34		D-IN 4	Last Read Year	Remote Server #
35		Relay 1 Status	Last Read Month	IP Port
36		Relay 2 Status	Last Read Day	IP ADDR 1 / Board port
37			Last Read Hour	IP ADDR 2
38	Remote Server Flag		Last Read Minute	IP ADDR 3
39	Don't Scan	SW Board Ind	Last Read Second	IP ADDR 4

Modbus Custom Map – Single Box Detail



Modbus Debug screen



REG #	Coil Values (0xxxx)	Discrete Inputs (1xxxx)	Input Registers (3xxxx)	Holding Registers (4xxxx)
0	0	1	0	0
1	0	0	221	0
2	0	0	4	0
3	1	0	0	0
4	0	0	2	2
5	0	0	0	0
6	0	0	328	0
7	0	0	0	200
8	0	0	67	2
9	0	0	2	0
10	0	1	0	0
11	0	0	0	0
12	1	0	9600	1
13	1	0	1202	2
14	0	0	9600	8
15	0	0	9602	4
16	0	0	9602	5
17	0	0	9602	6
18	0	0	10	0
19	0	0	65535	0
20	1	1	16	0
21	0	0	328	0
22	0	0	1	0
23	0	0	1766	0
24	0	0	2019	0
25	0	0	4	22001
26	0	0	7	1000
27	0	0	22	168
28	0	0	43	0
29	0	0	28	13
30	1	1	237	0
31	0	0	20	2222
32	0	0	10	0
33	0	1	0	0
34	0	0	2019	0
35	0	0	4	22001
36	0	0	8	192
37	0	0	12	168
38	0	0	39	0
39	1	1	54	13

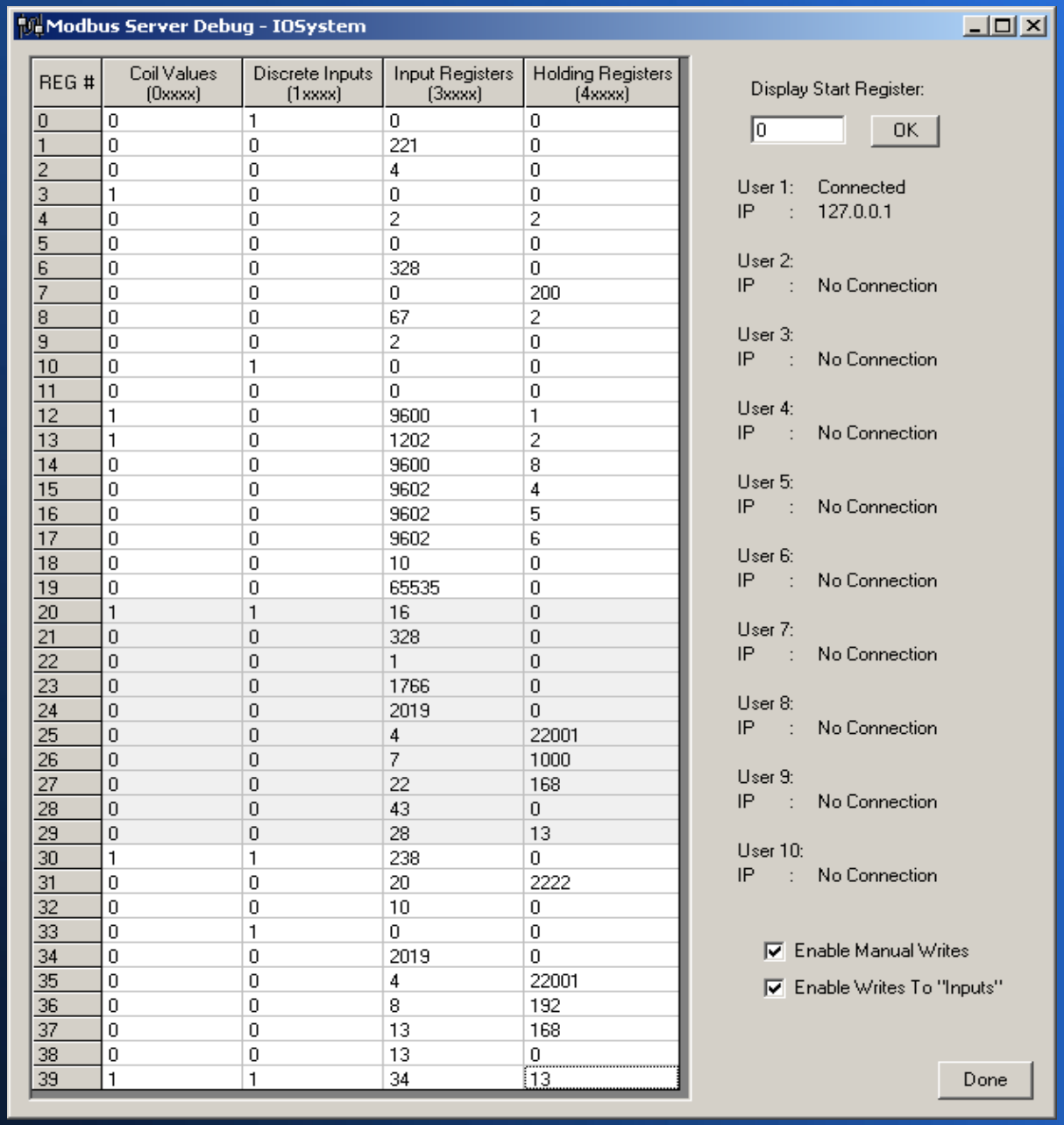
1

2

Notes:

1. Do not adjust registers 0 – 19 ! (Advanced users only)

2. Blocks of 10 registers represent a single box



Notes:

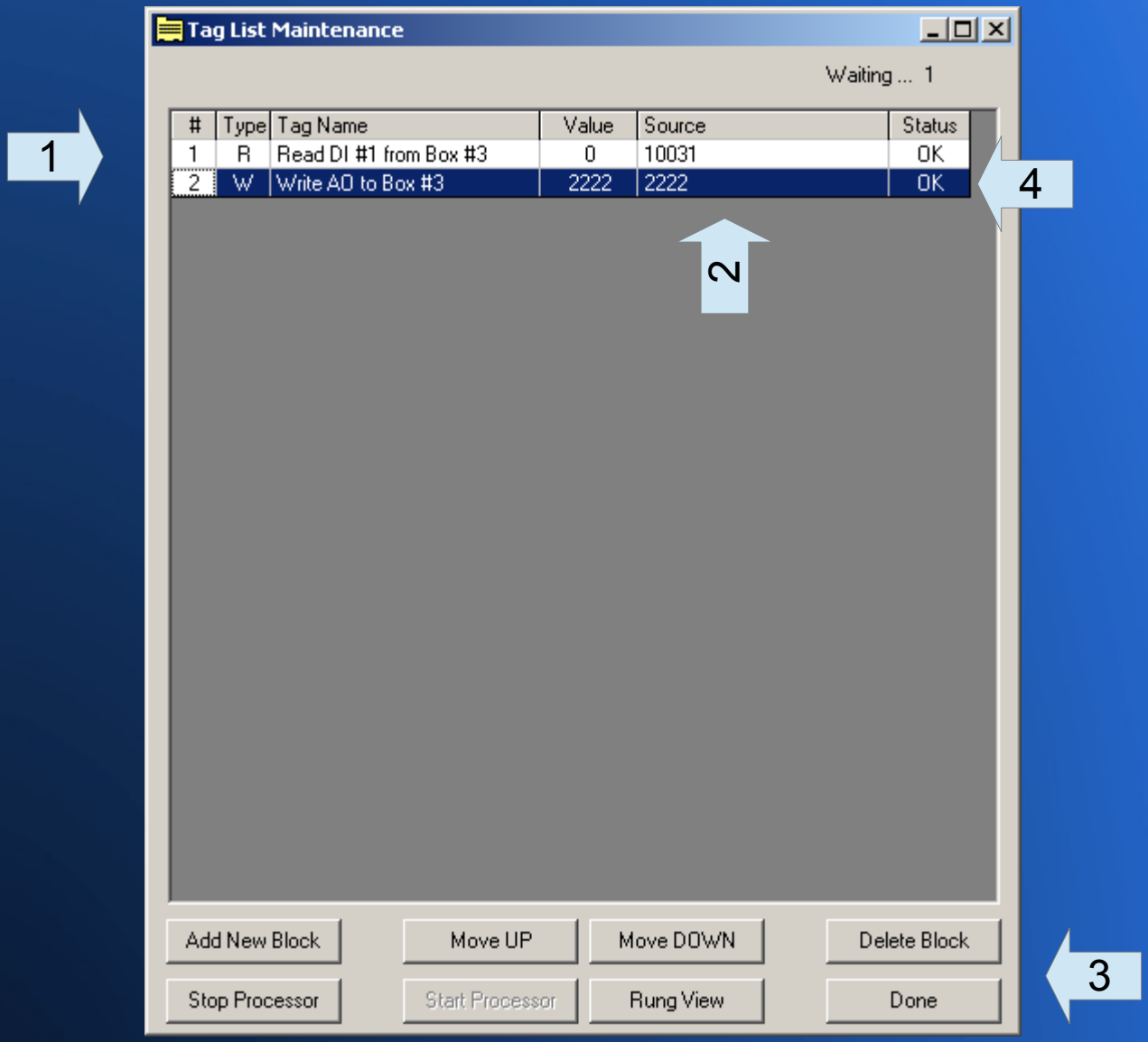
3. No changes can be made unless Enabled

4. Connected Devices (Including TADA) are shown

5. Hovering over a cell will give details on it's use

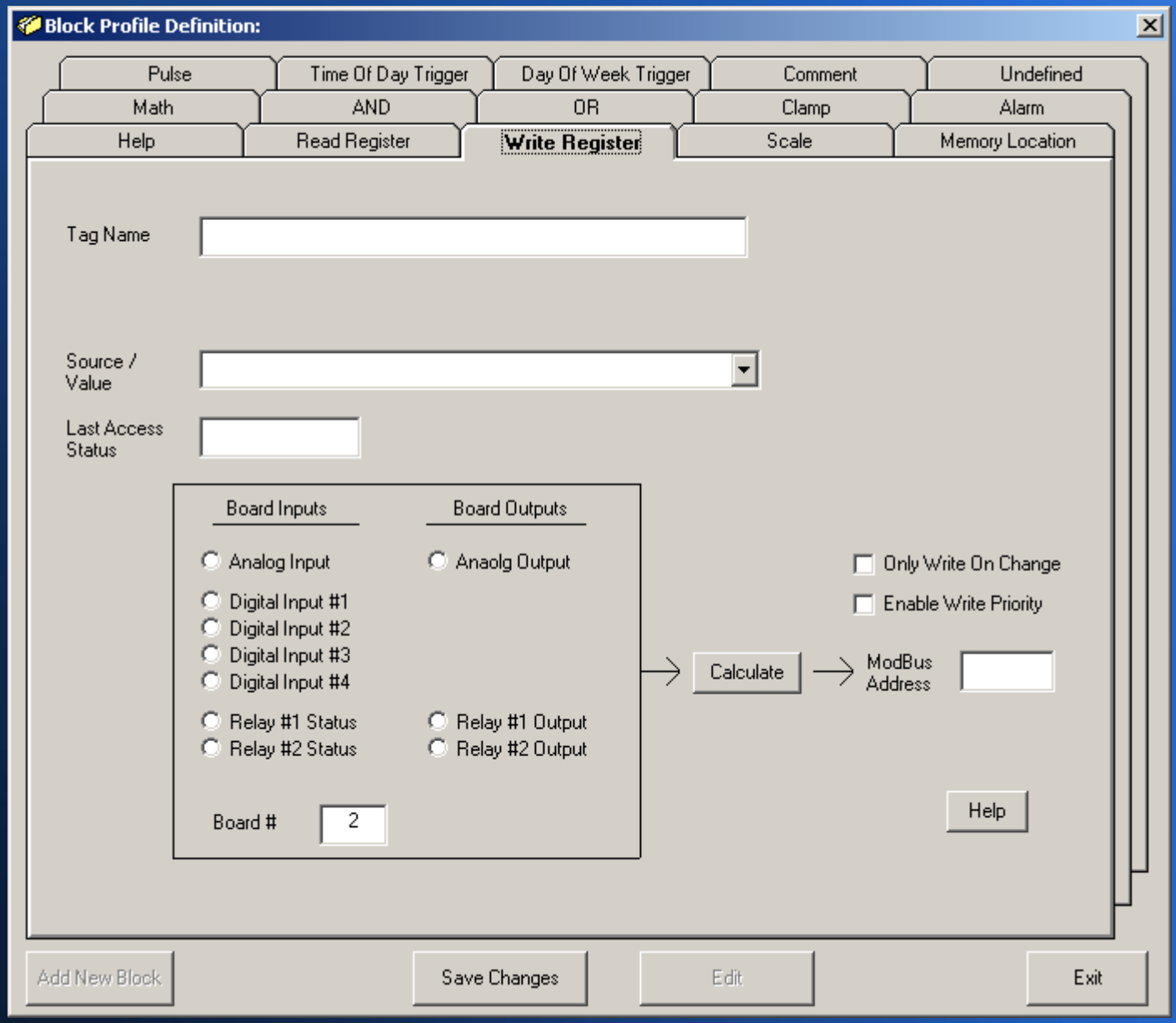
Block Processor

- Allows rudimentary calculations and functions
- Allows propagation of Data or I/O from one box to another
- Works by stepping through commands sequentially to achieve more complex results



Notes:

1. Commands are listed in the order of execution
2. Output Values, Source info and Status from the last scan are shown.
3. Editing and Control options
4. Double Clicking a row will bring up the editor for that block



Notes:

1. Tabs indicate which blocks are available
2. Every Block has a source and generates an output “Tag”
3. Any tag or real number can be a source
4. Click Help for details on any individual block

Block Processor Tutorial:

Adding An Alarm And Sending It To An Output Relay

Prerequisites / Assumptions:

- 1 Fan Control Box, #35 (or simulator mode may be used)

- The analog input #1 of Box 35 would be connected to a 0-500 PPM gas sensor generating a 4-20 mA input signal

- Output relay #1 on the same board would be used as the alarm output contact.

- Alarm limit would be at 50 PPM

- Analog range (Raw counts) 191-949 represent 0-500 PPM

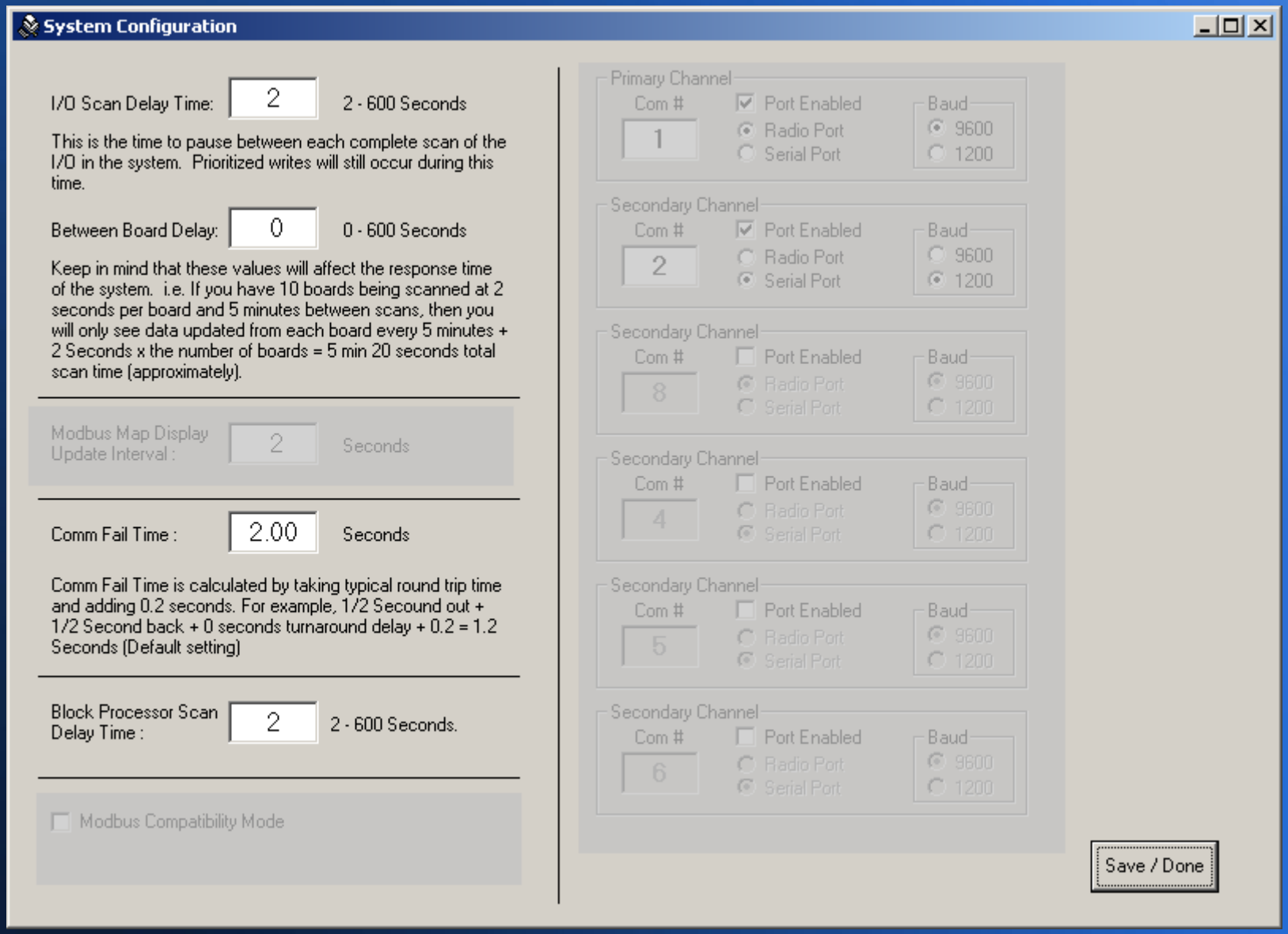
This is the order of events that will occur in this demonstration:

The remote unit will be read, the block processor will run through its program and set the alarm output, then the system will need to send the updated information back to the remote board to turn the relay on. Each step could take up to 2 seconds, thus, the time to turn on or off the alarm relay could be as long as 6 seconds.

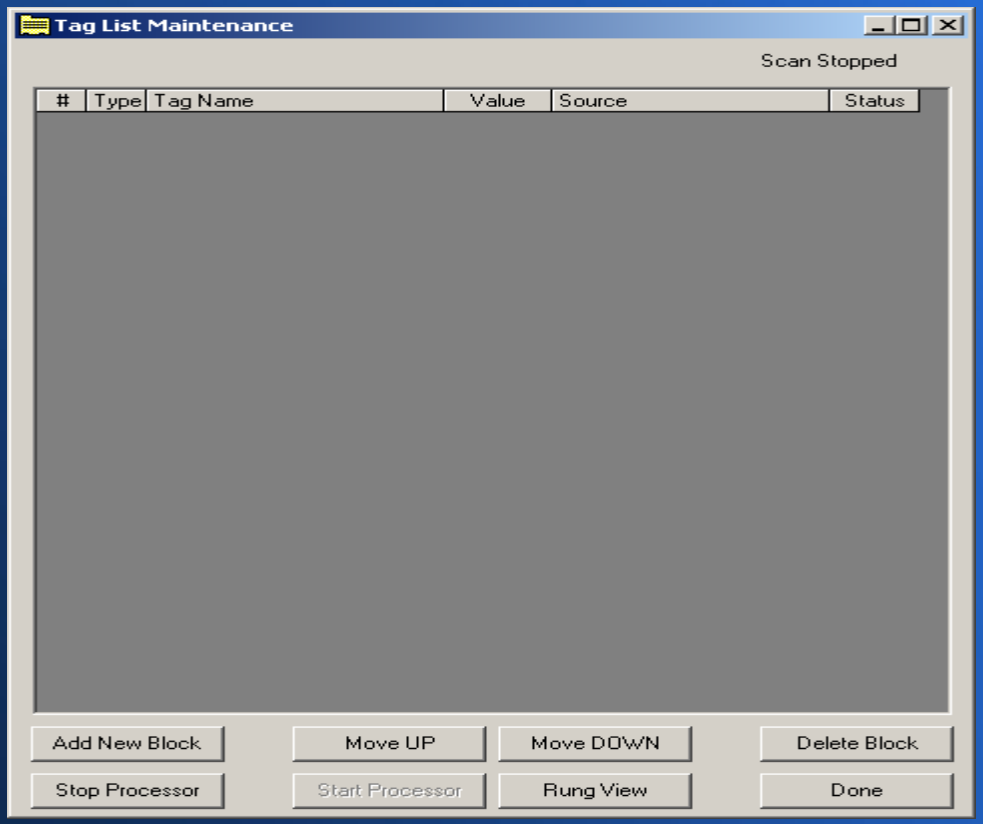
Steps:

1. Make sure the box #35 is online and functioning properly

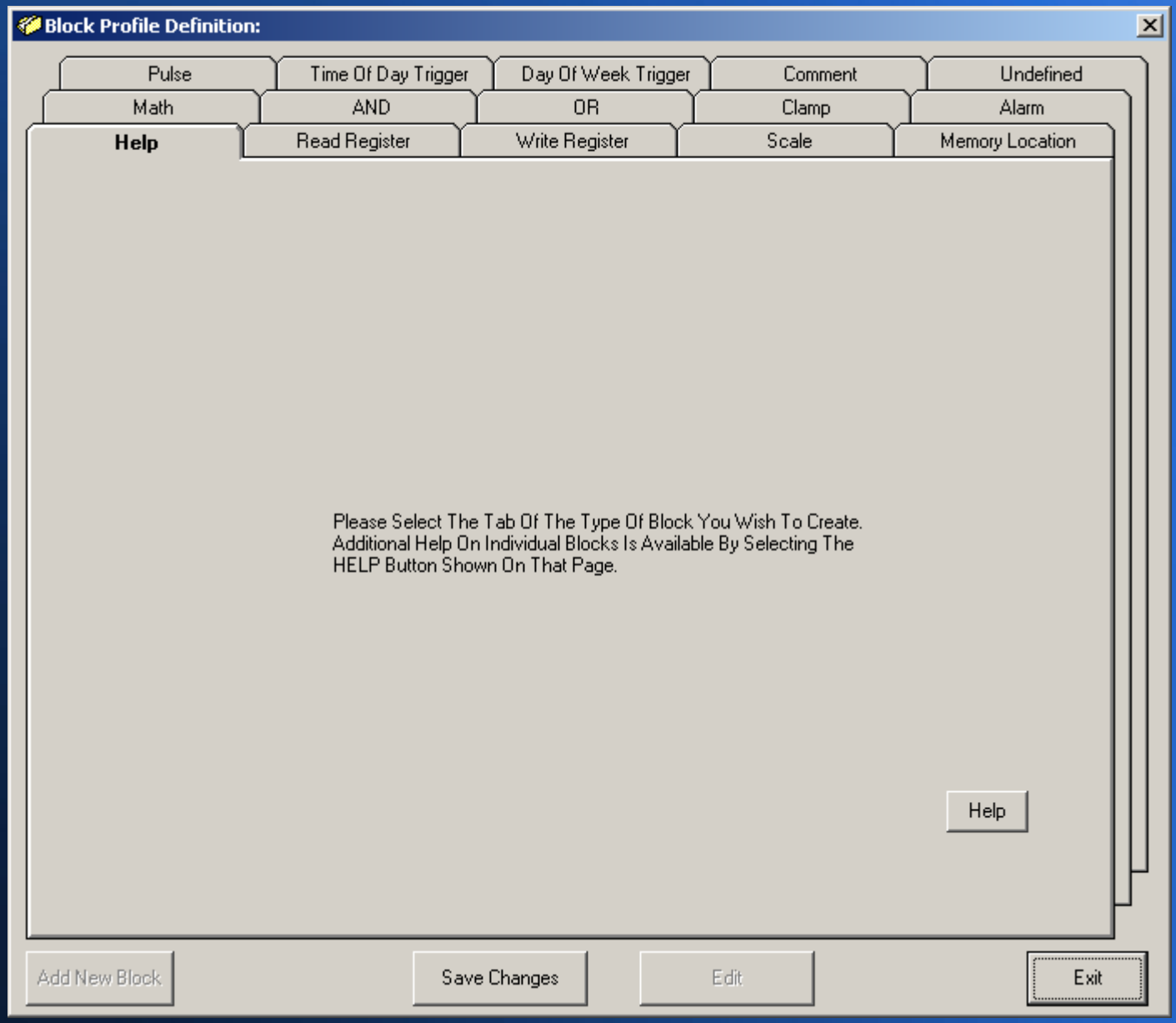
2. On the main screen select “Menu” and then “System Settings”. Careful setting of the timing factors on this screen will minimize the wait time that it takes the output relay to turn on.



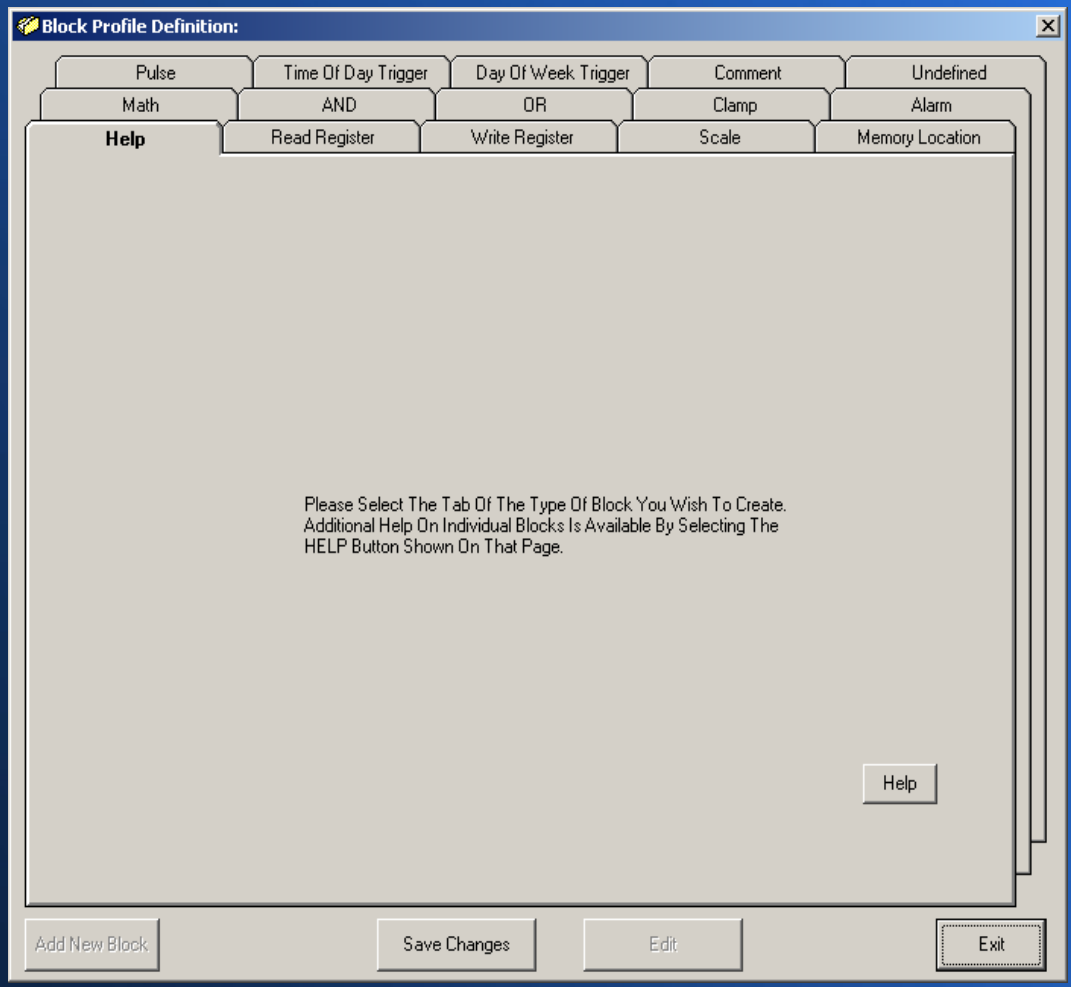
For optimum results setup the system as indicated below, only the “I/O Scan Delay Time”, “Between Board Delay”, and “Block Processor Scan Delay Time” are relevant to this procedure, DO NOT adjust the other settings. Click on Save/Done when complete



3. From the main screen select “Menu” then “Block Processor”. The screen should look like the screen shown above. We will be adding 3 blocks to achieve our goal. First we need to read the analog input (PPM reading) into a tag. Then we set an alarm bit tag accordingly (Alarm Output). We then need to move that alarm indication back to the remote unit’s memory in order to set the relay’s state (Relay 1 Output). You may need to adjust these settings slightly to match your configuration.

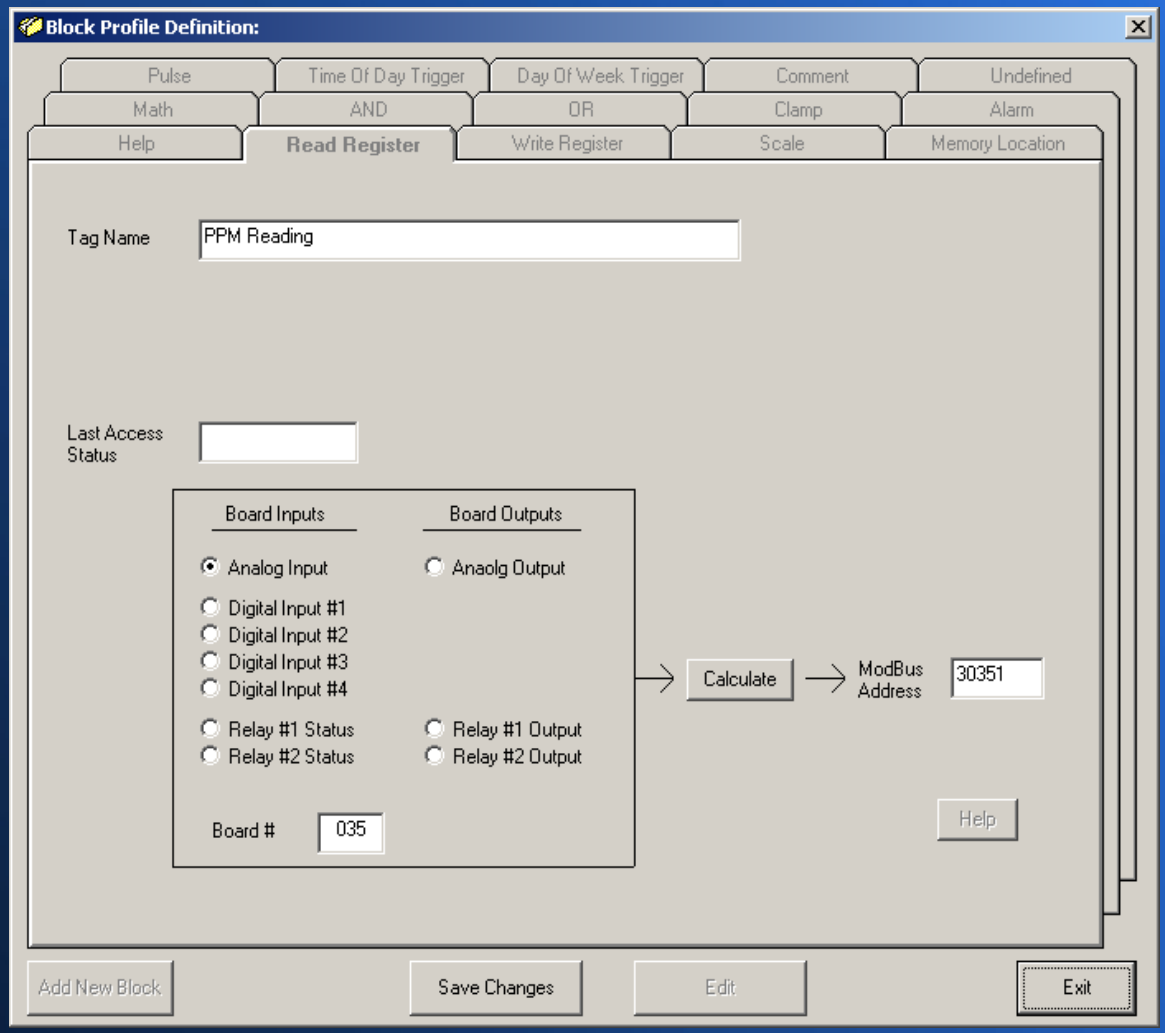


4. Click on “Add New Block”, the above screen should appear:

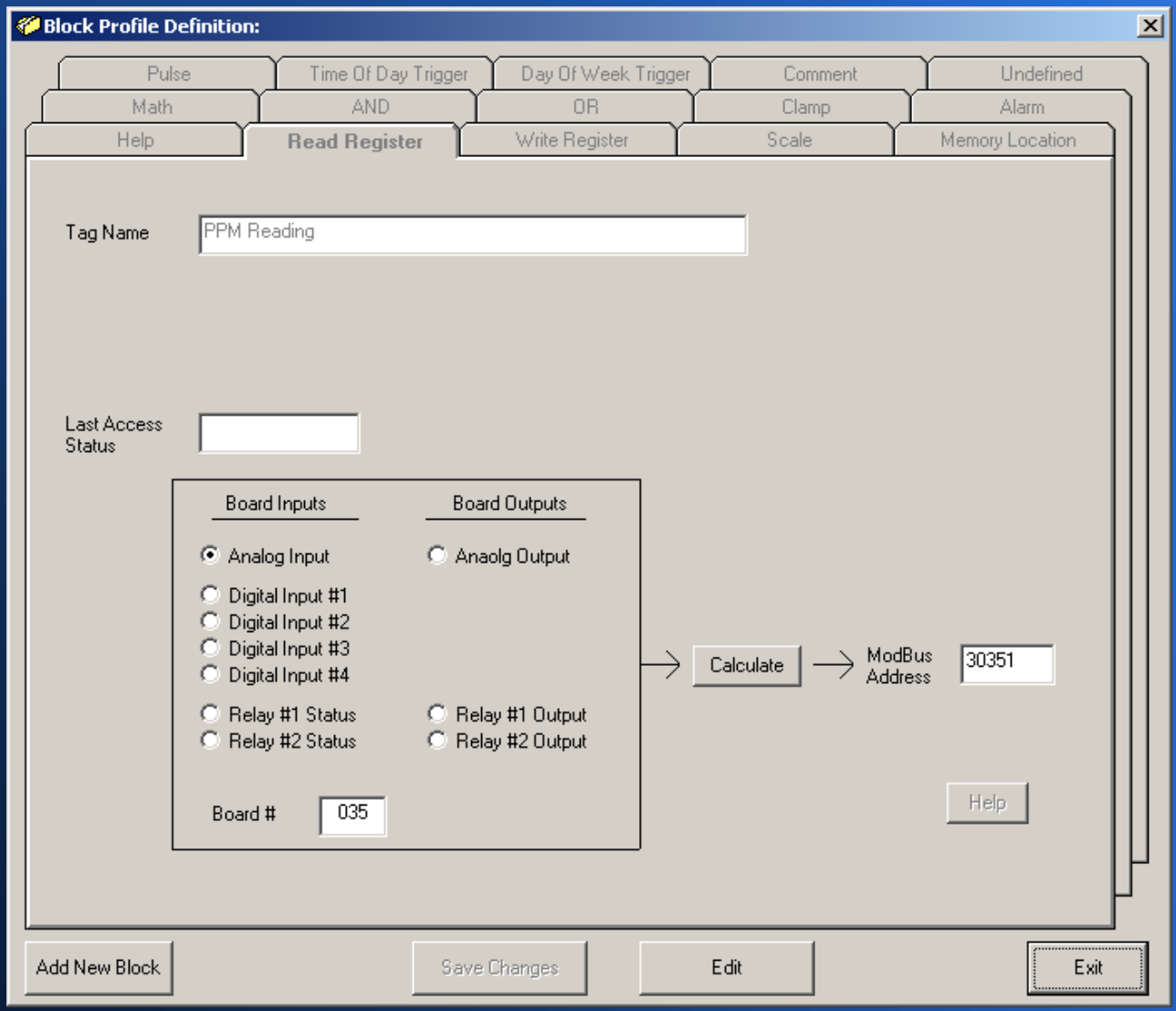


5. Select the “Read Register” tab:

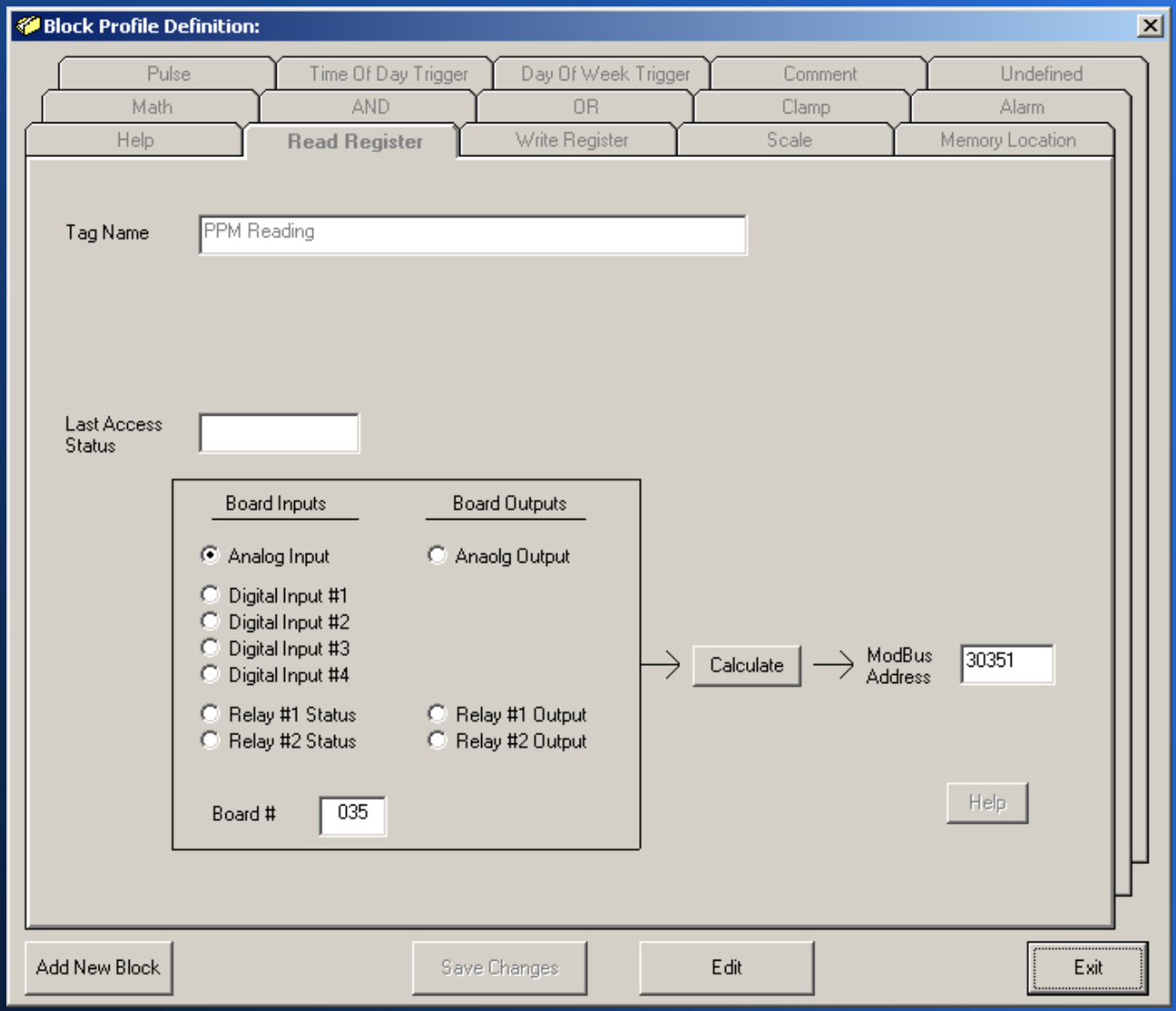
Note: At any time you can select the “HELP” button for further info in the screen that is currently showing.



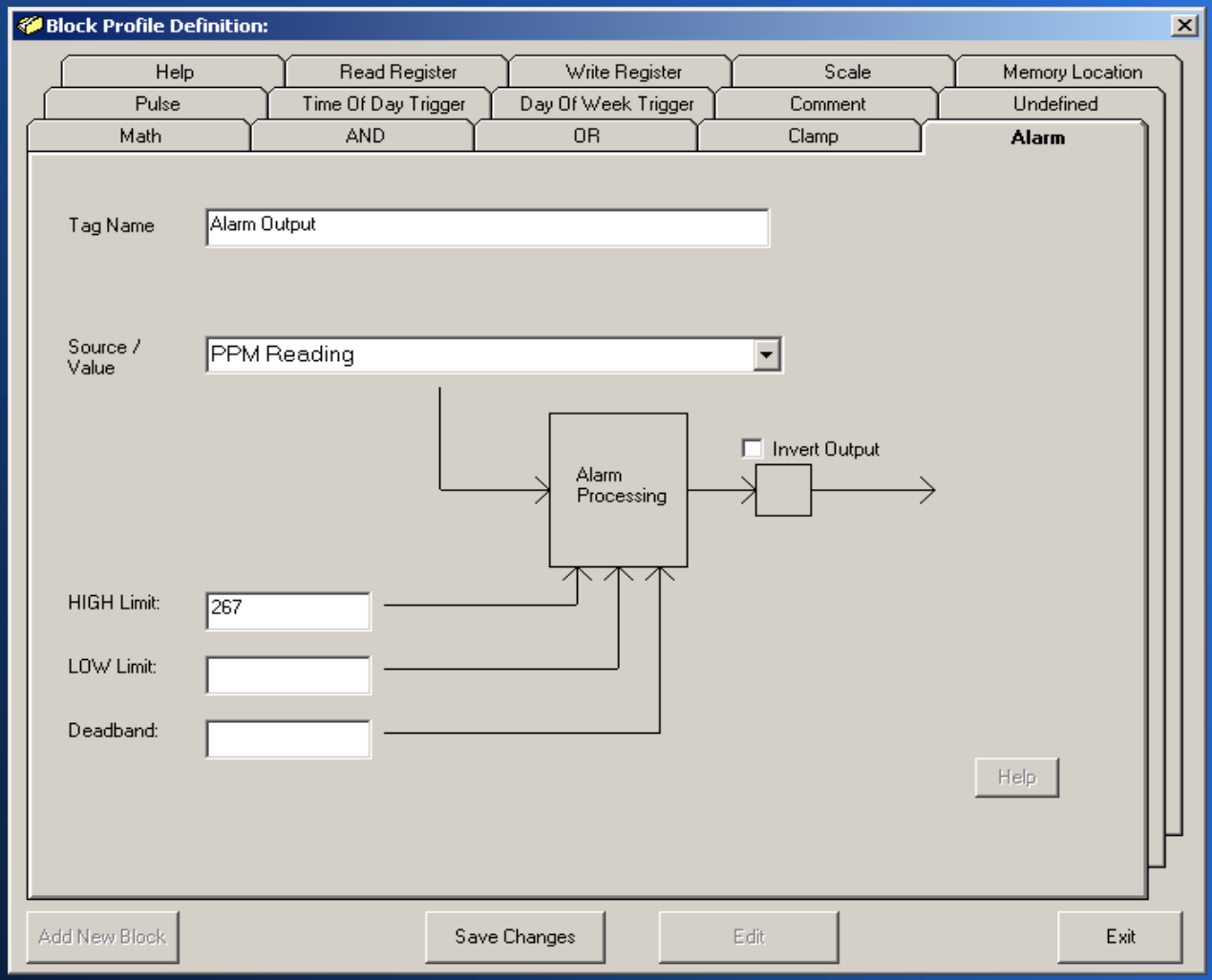
6. Configure the screen as follows:
- In the “Tag Name” enter “PPM Reading”.
- Select “Analog Input”.
- Enter 035 for “Board #”
- Click “Calculate” (30351 should appear in the “Modbus Address Box”)
- Select “Save Changes



We have just asked the Block Processor to read the analog input of the remote unit (#35) and place the result in a tag called “PPM Reading”



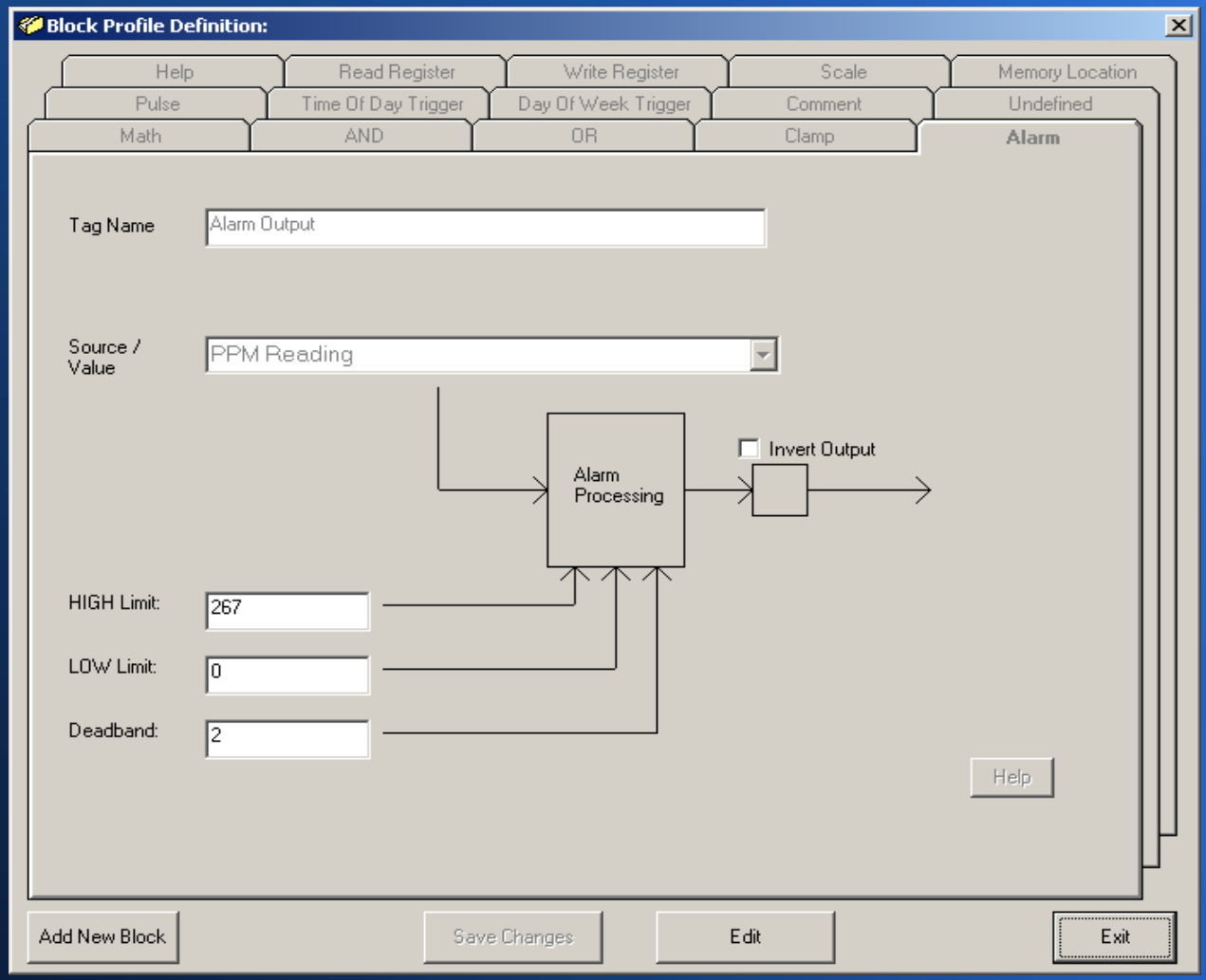
7. Select “Add New Block” on the bottom left of the above screen and then select the “Alarm” tab.



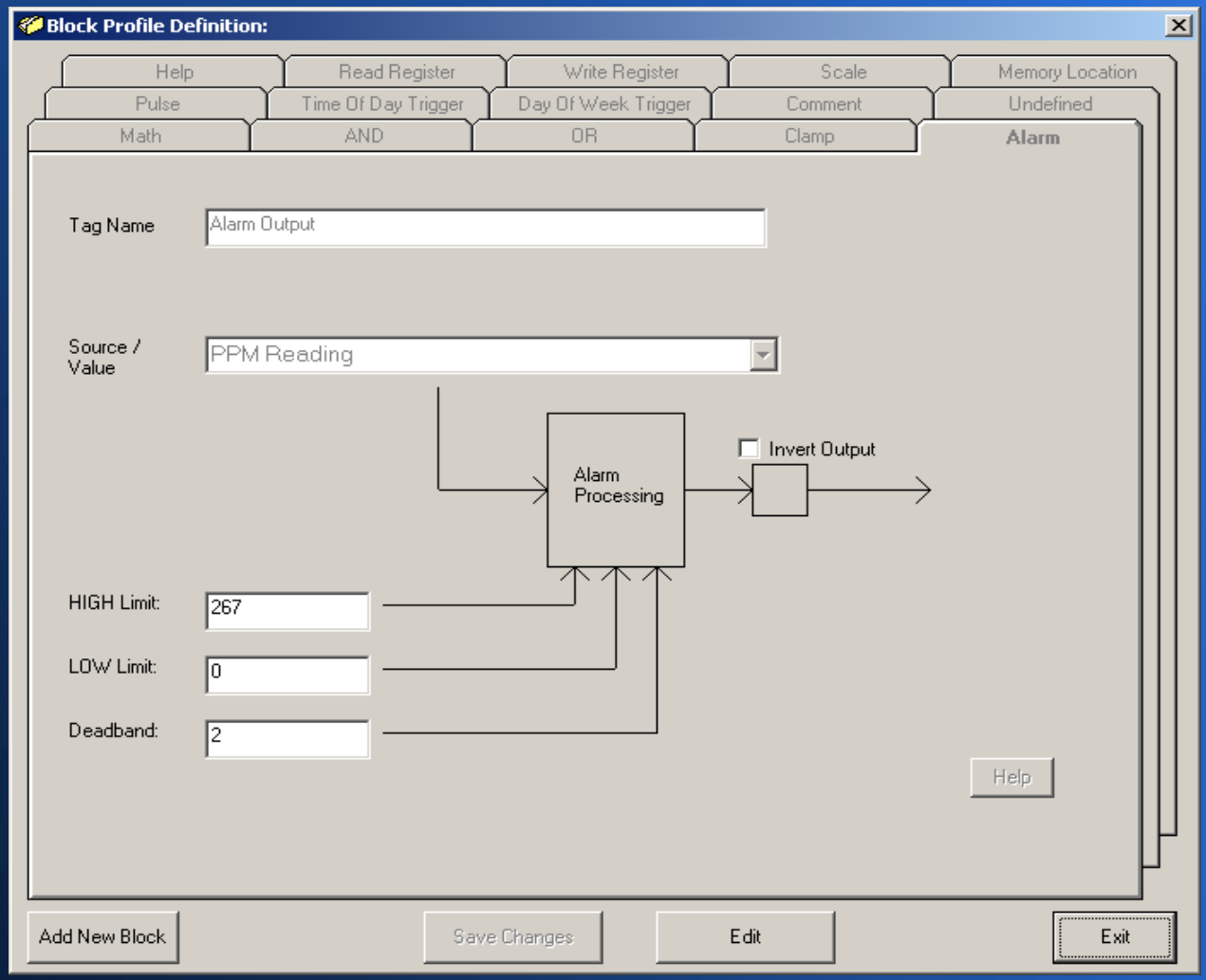
Configure the screen as follows:

- In the “Tag Name” enter “Alarm Output”.
- In the “Source / Value” box, Select the down arrow and pick “PPM Reading” from the list
- In the “High Limit” box, enter the calculated high limit (in raw counts)

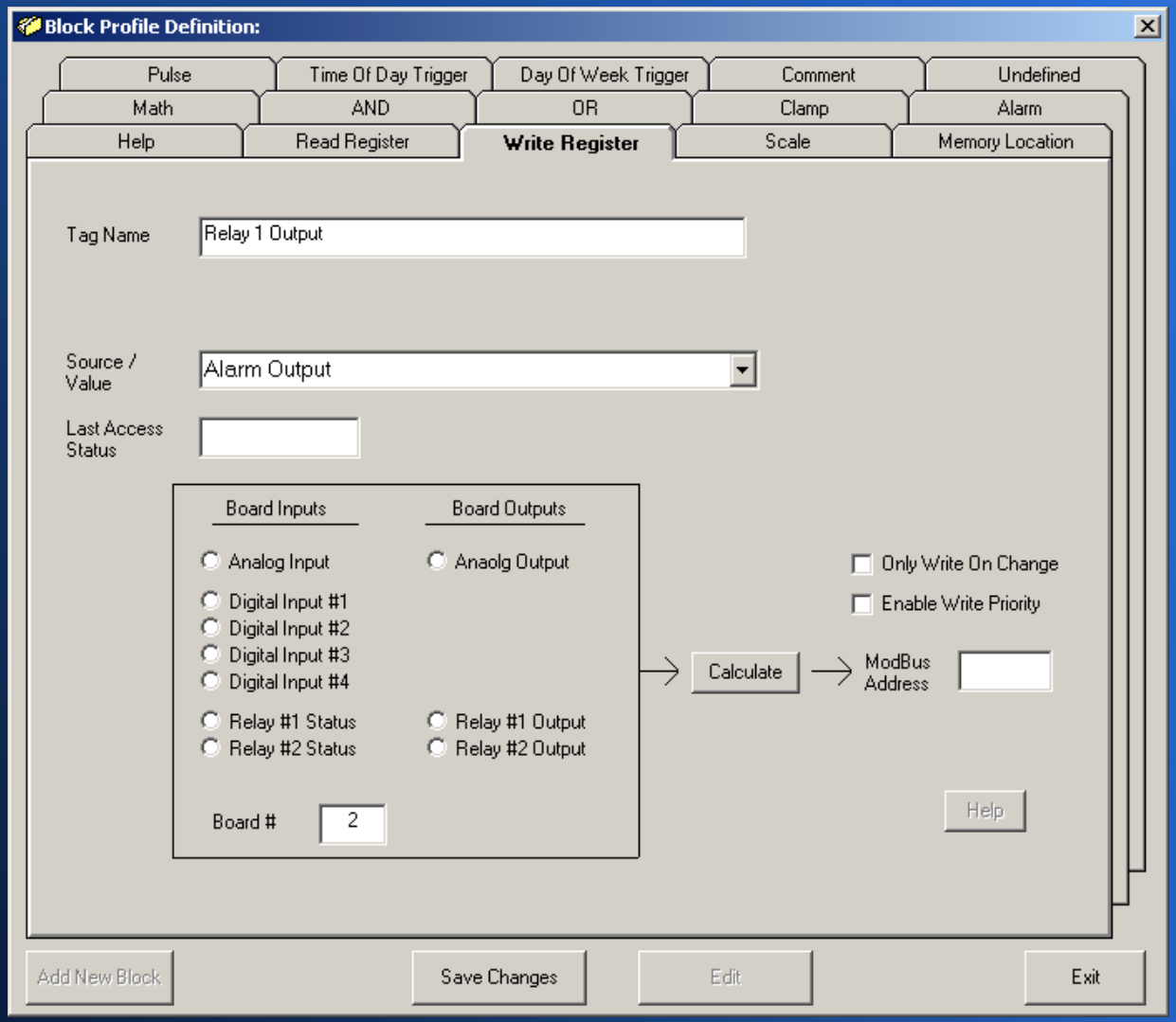
For 50 PPM on a 0 – 500 PPM scale, that would be: 267 Raw Counts (typically the raw count range is approximately 191 – 949 : it changes by a few counts board to board due to component tolerances)



- Leave the “Low Limit” as 0
- Enter a number of raw counts you wish to use as a deadband in the “Deadband” box
I suggest 2 for a deadband (about 1.3% of scale)
- Select “Save Changes”

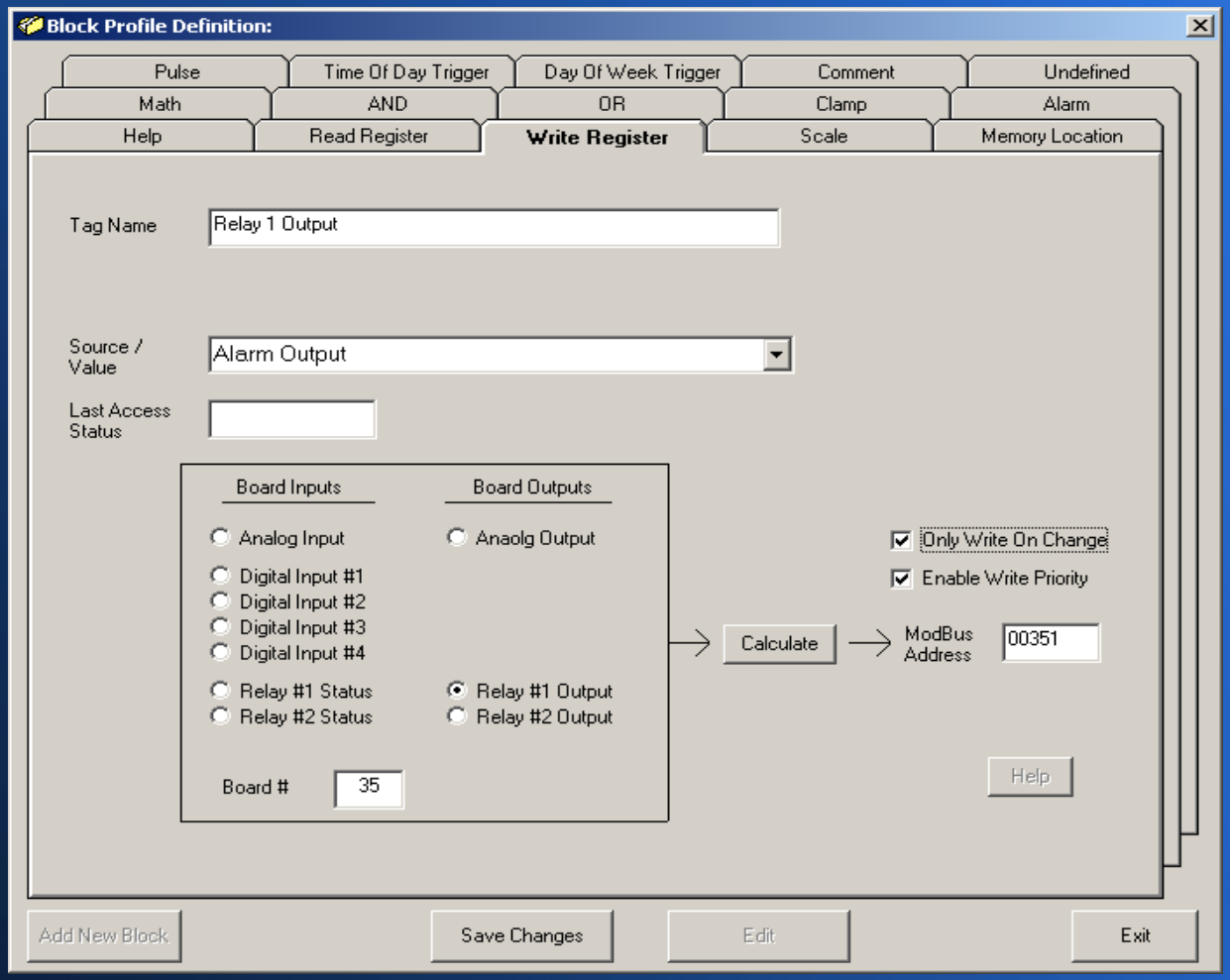


We have just asked the Block Processor to take the PPM reading (in raw counts), generate an alarm bit based on our calculated limit, and store it in the tag called “Alarm Output”

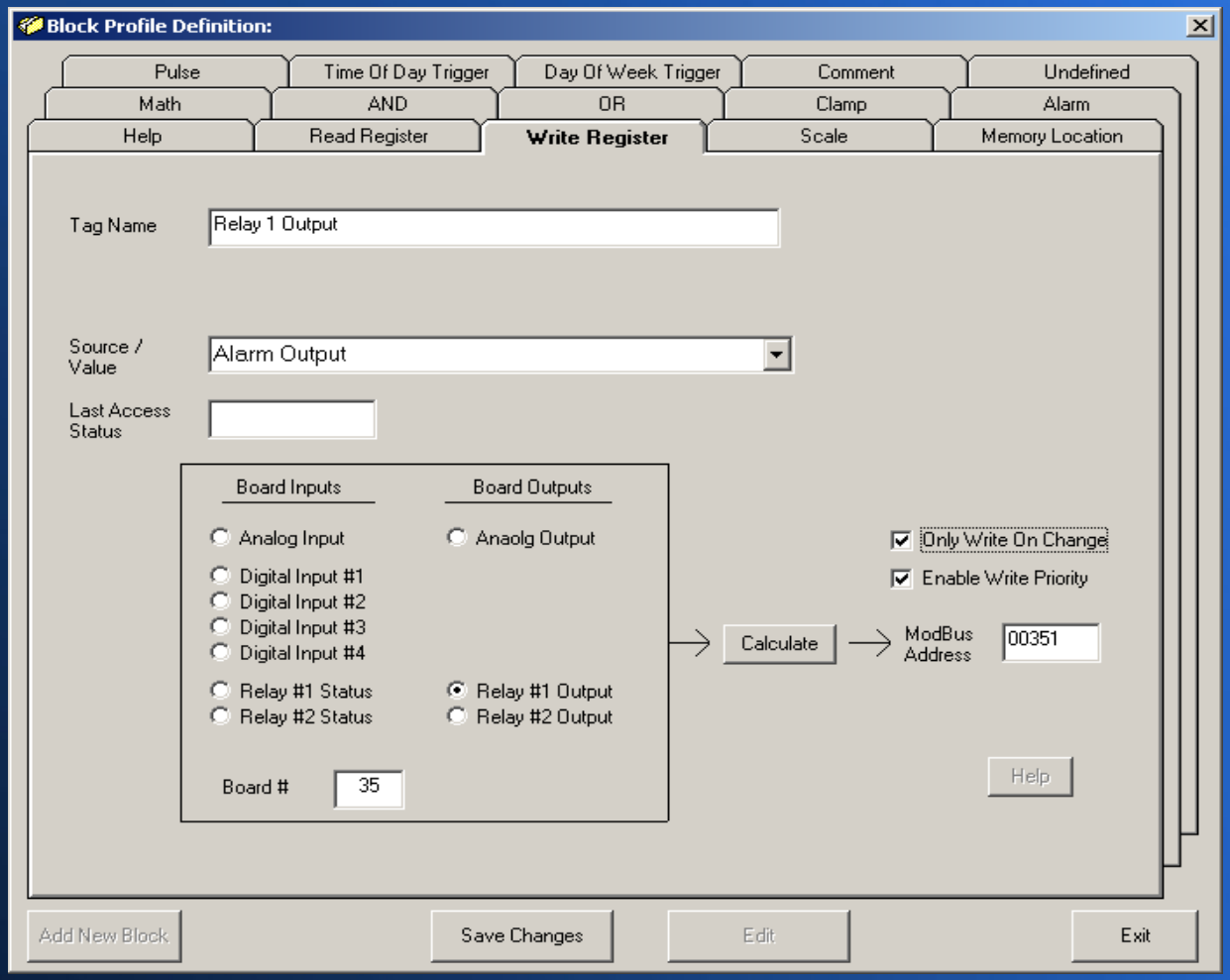


8. Select “Add New Block” on the bottom left of the above screen and then select the “Write Register” tab. Configure the screen as follows:

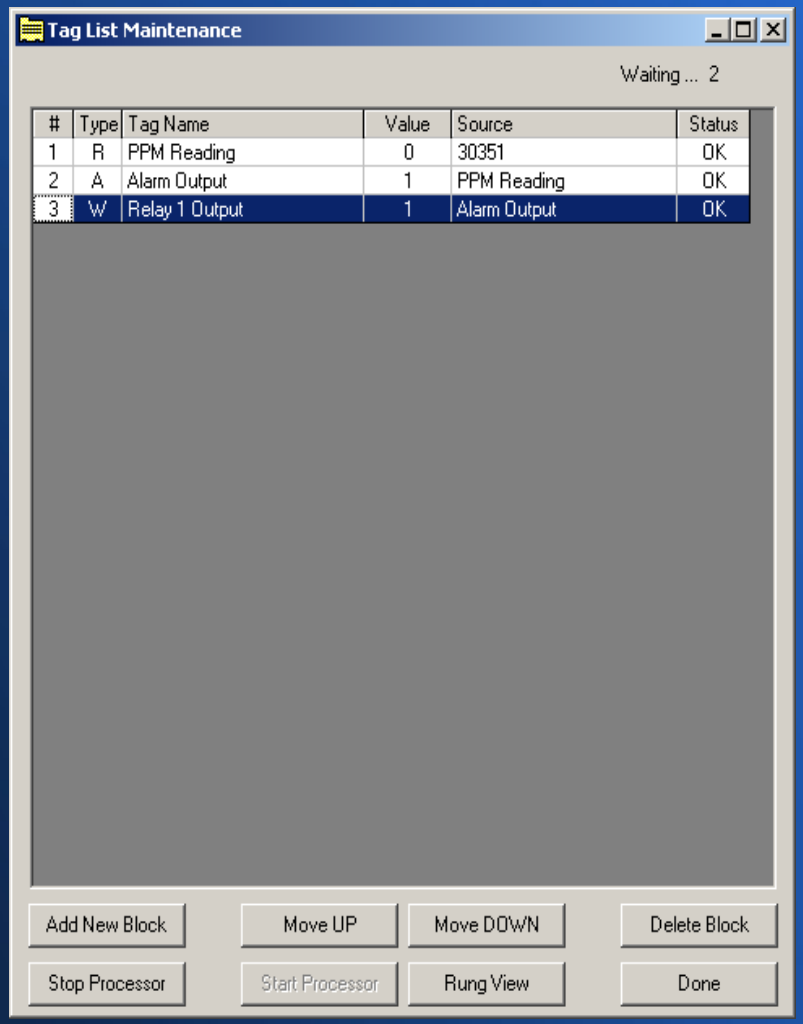
- In the “Tag Name” enter “Relay 1 Output”.
- In the “Source / Value” box, Select the down arrow and pick “Alarm Output” from the list



- Select “Relay 1 Output”
- Enter board # 035
- Select “Calculate”
- Select “Enable Write Priority” – This will force the system to write this board as soon as a change is detected
- Select “Only Write On Change” – This will tell the system only to write when necessary instead of every scan, this setting is used to make sure scans are not overloaded with unnecessary writes to remote boards.
- Select “Save Changes”

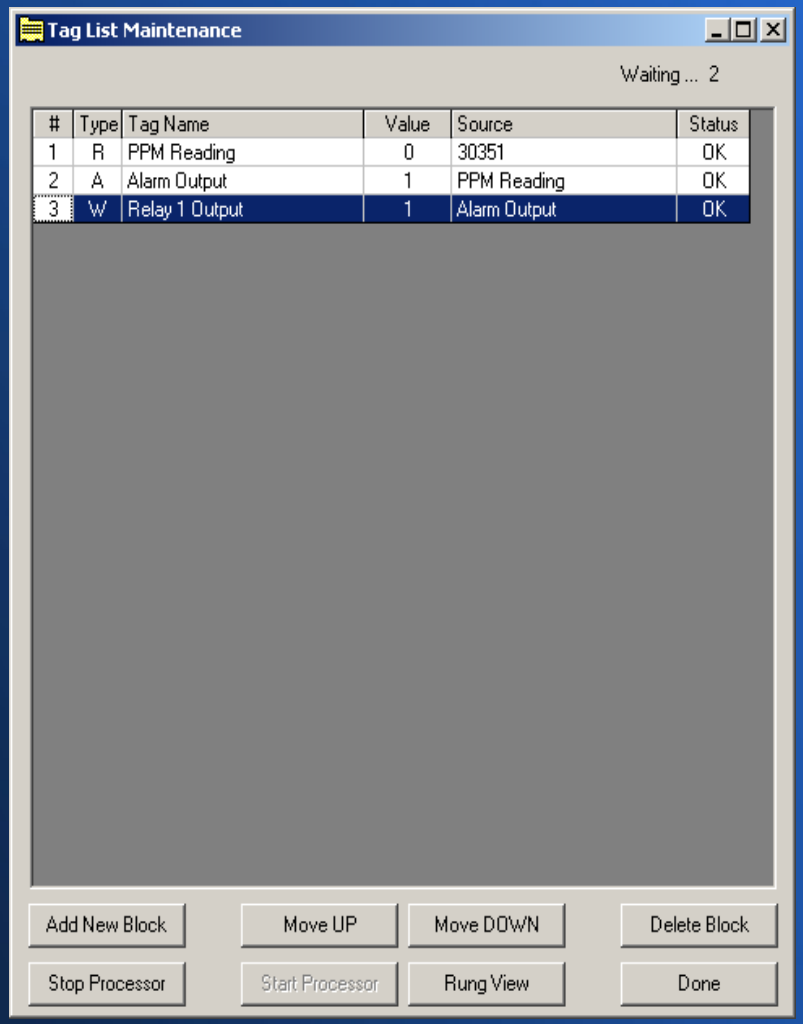


We have just asked the Block Processor to write the alarm state back to the memory location that corresponds to relay 1 on board #35. This data will be written next time the board is scanned. We have forced a scan to occur immediately upon change by selecting "Write Priority."



9. Select “Exit on the “Block Profile Definition” screen, we’re finished making blocks.

10. Look back at the “Tag List Maintenance” screen, there should now be 3 entries. You may need to put them in the correct order. Select a row on the chart and using the “Move UP” and “Move Down” buttons, arrange the steps as shown. If everything is correct and your system is running (scanning), you should be seeing live information in the “Value” column. You can select “Done” when everything looks OK. Double clicking on a row will bring up the configuration for that row and allow you to make changes if necessary.



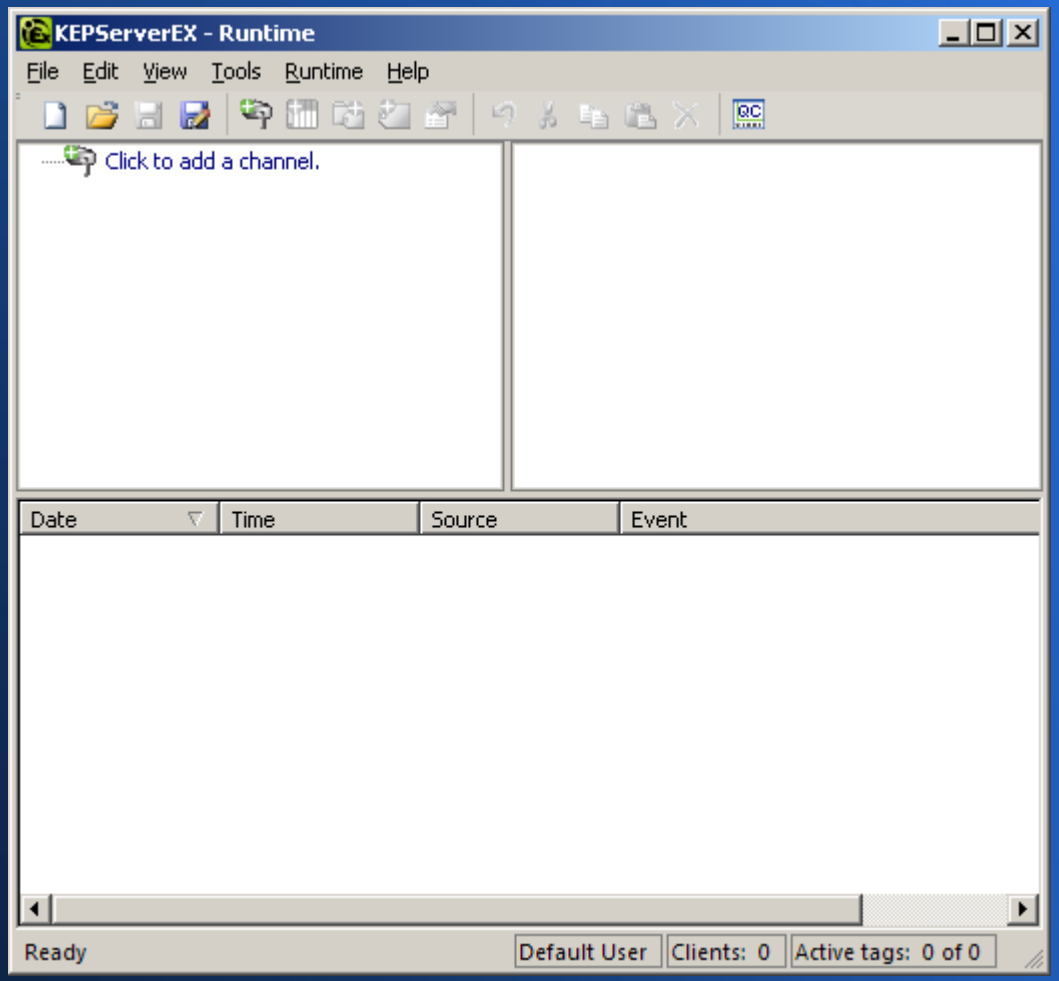
You may need to select “Start Processor” if it is not running – indicated by the count changing in the top right corner of this screen.

The programming is now complete, testing / commissioning should now follow.

OPC Interface Configuration Example:

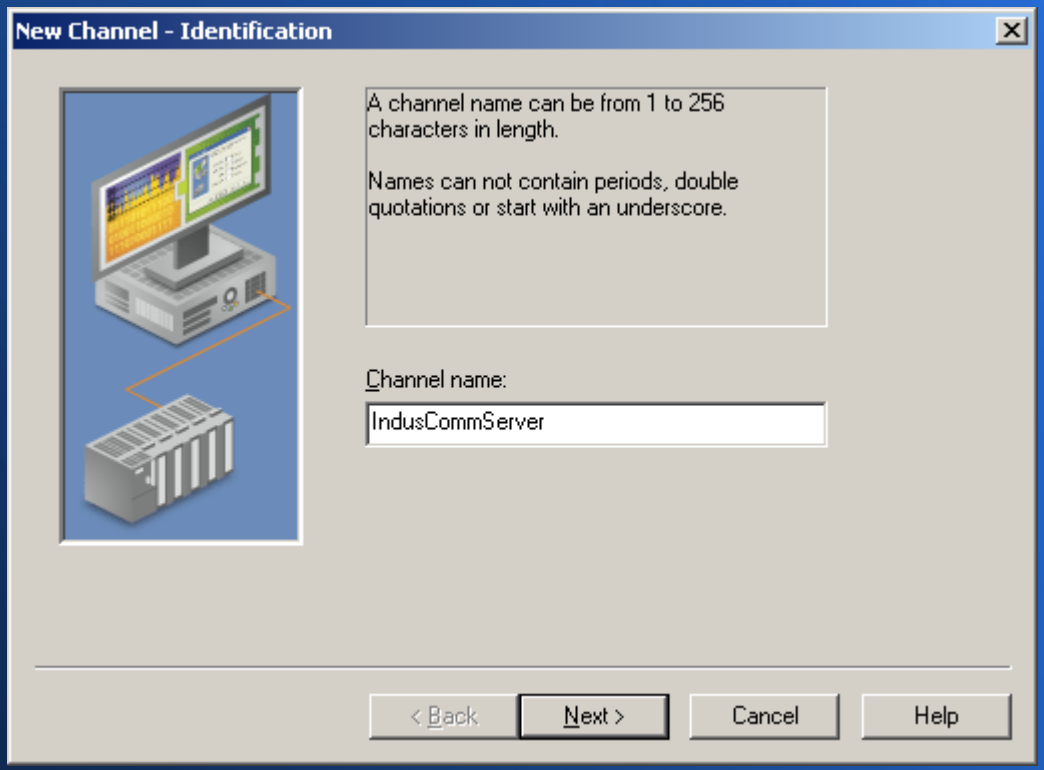
In this example we use KEPWare's OPC server software

KEPWare Server Recommended configurations:
Please follow these recommended settings when installing your KEPWare server. If you are attaching to an existing server, please verify the property pages match the settings shown. All settings are recommendations and can be adjusted in most cases to suit the customer's needs. Critical settings are noted and you should avoid changes to these settings.

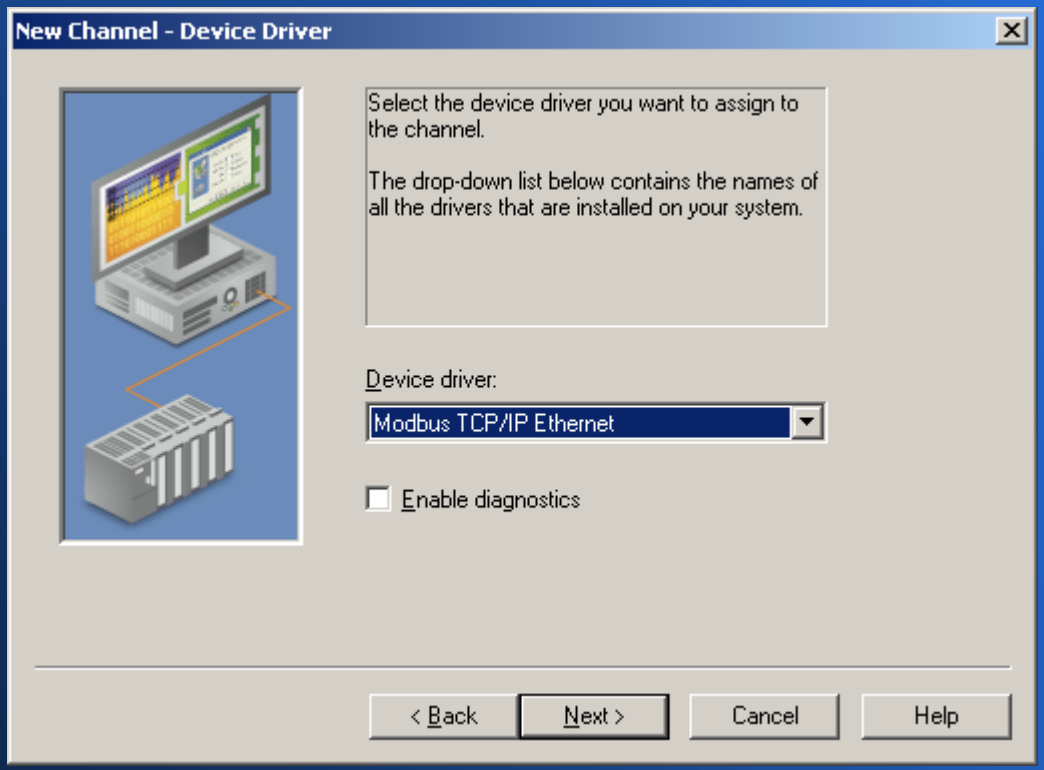


Steps:

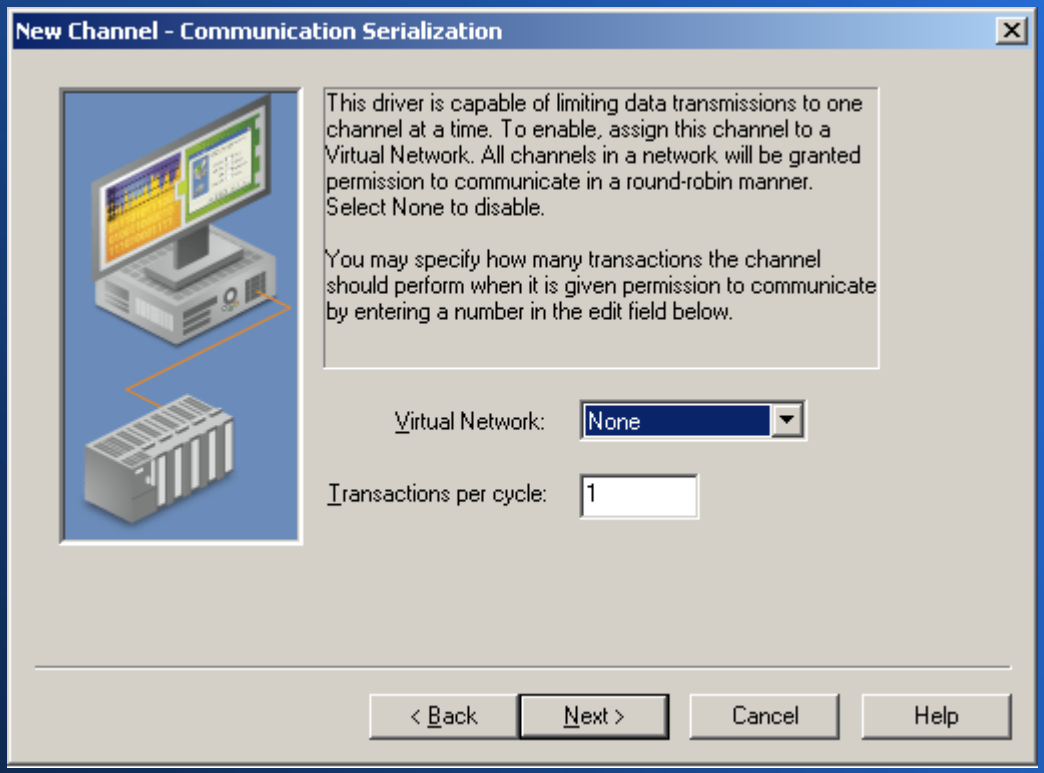
1. Add a Channel



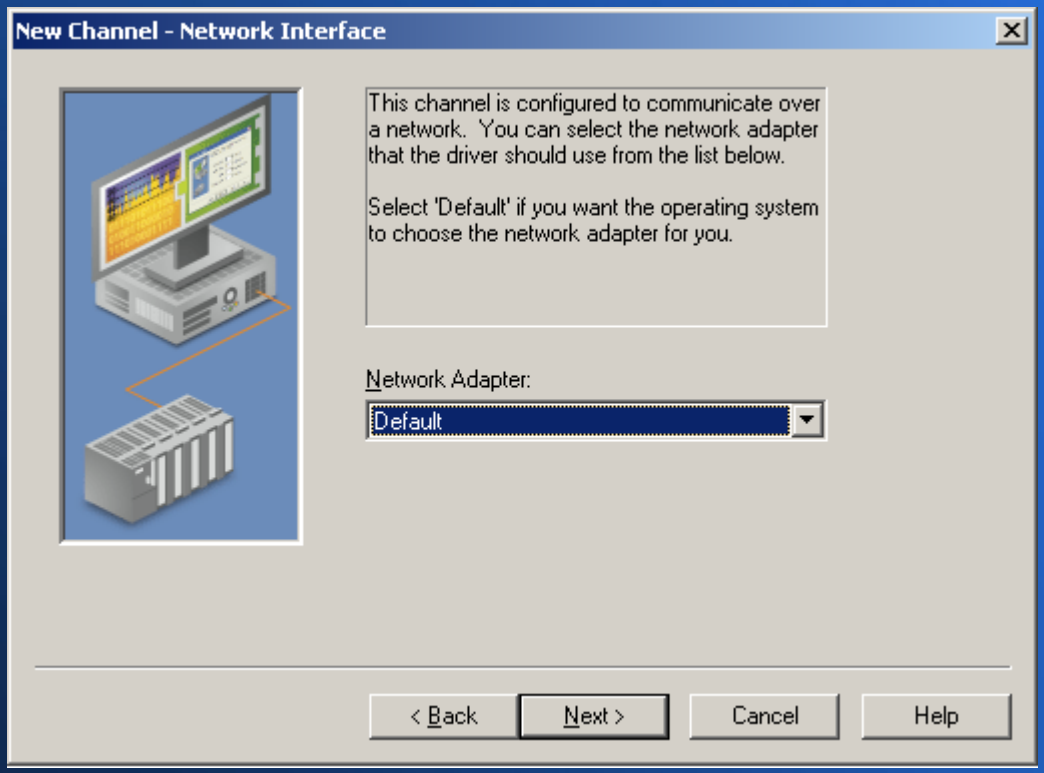
2. Name the Channel



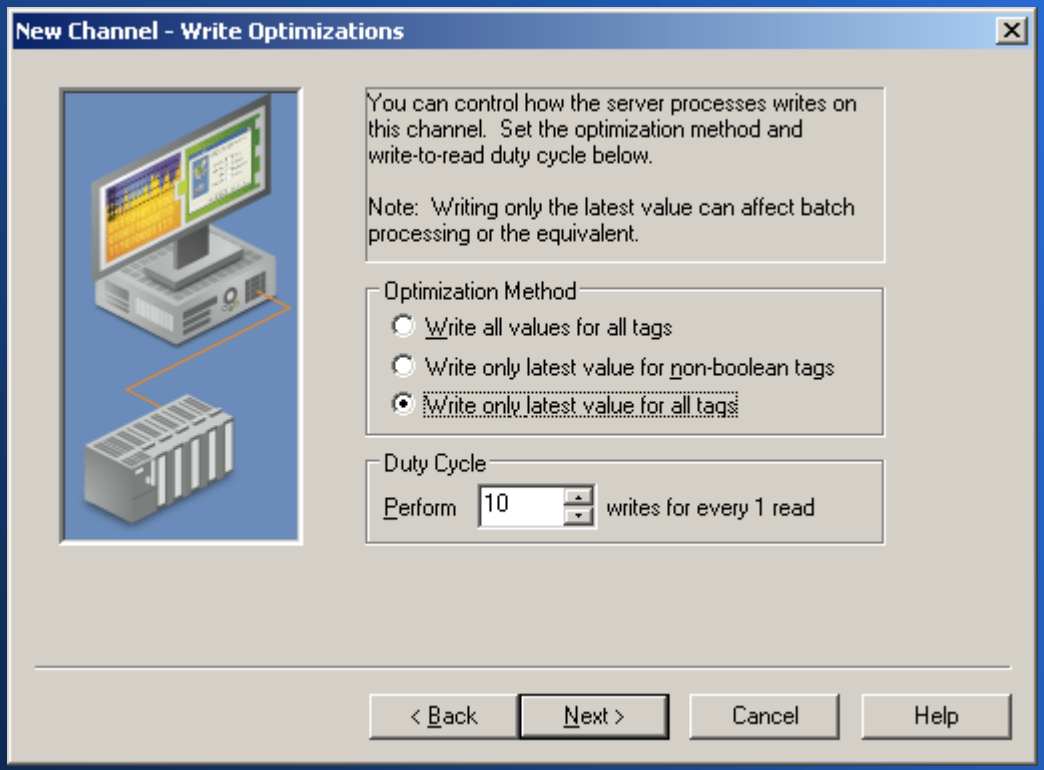
3. Select the Modbus driver as shown
You can enable the diagnostics if needed.



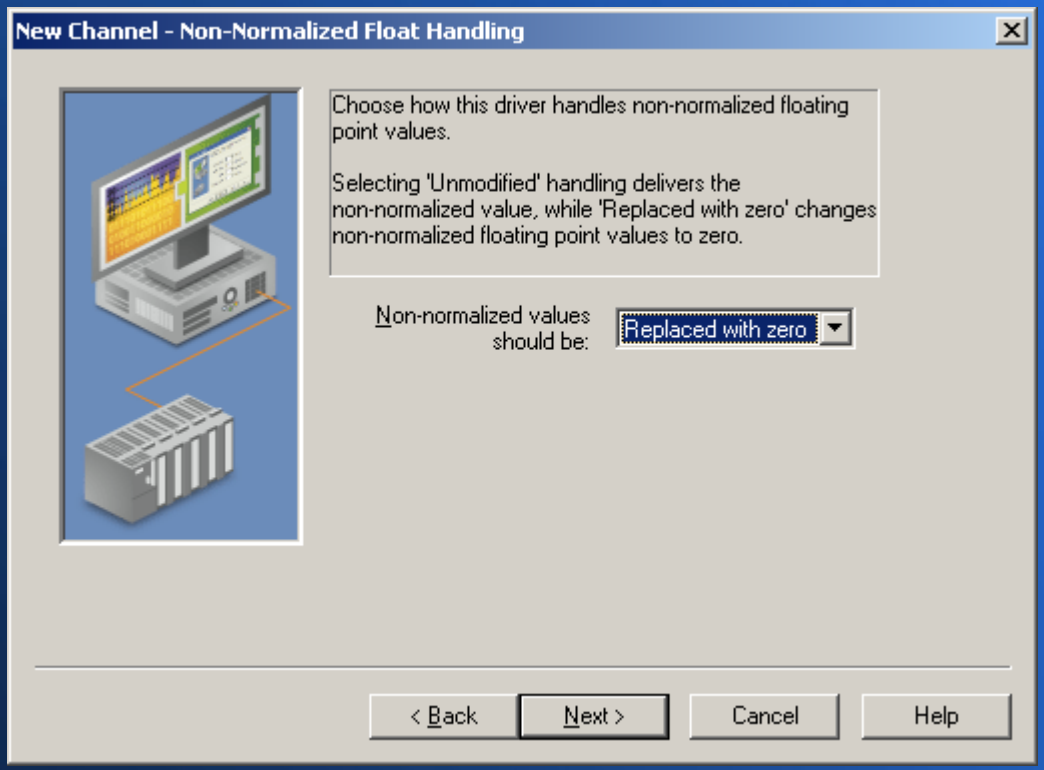
4. Select configuration options as shown



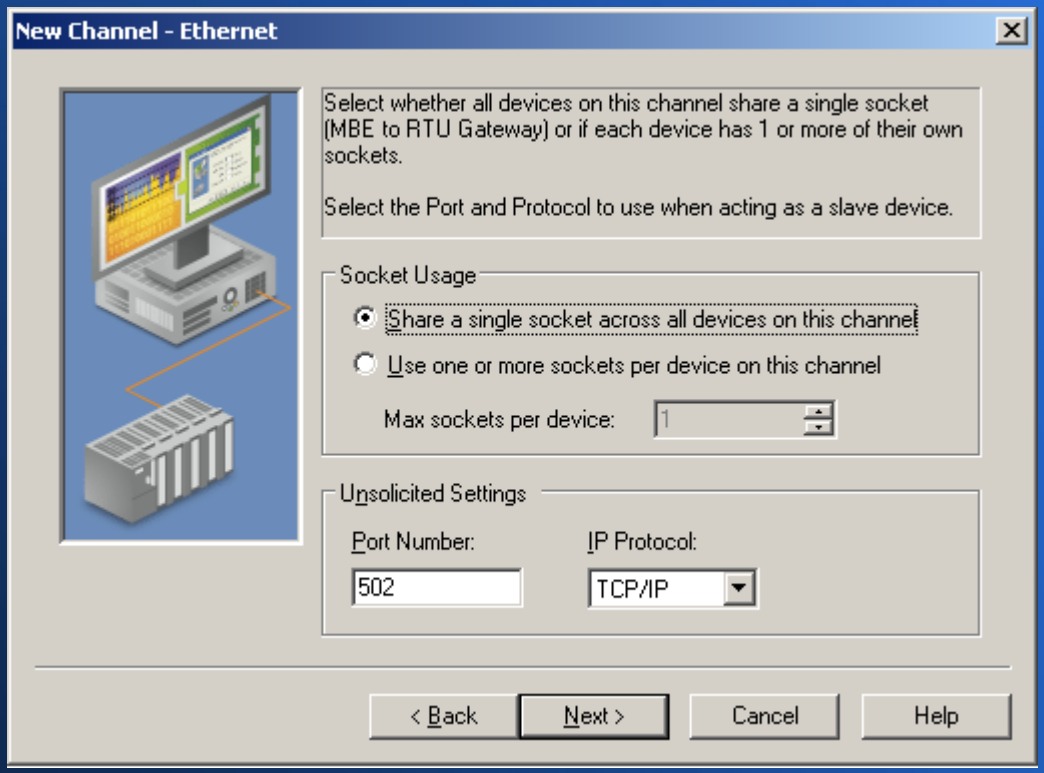
4. Select configuration options as shown (cont'd)



4. Select configuration options as shown (cont'd)

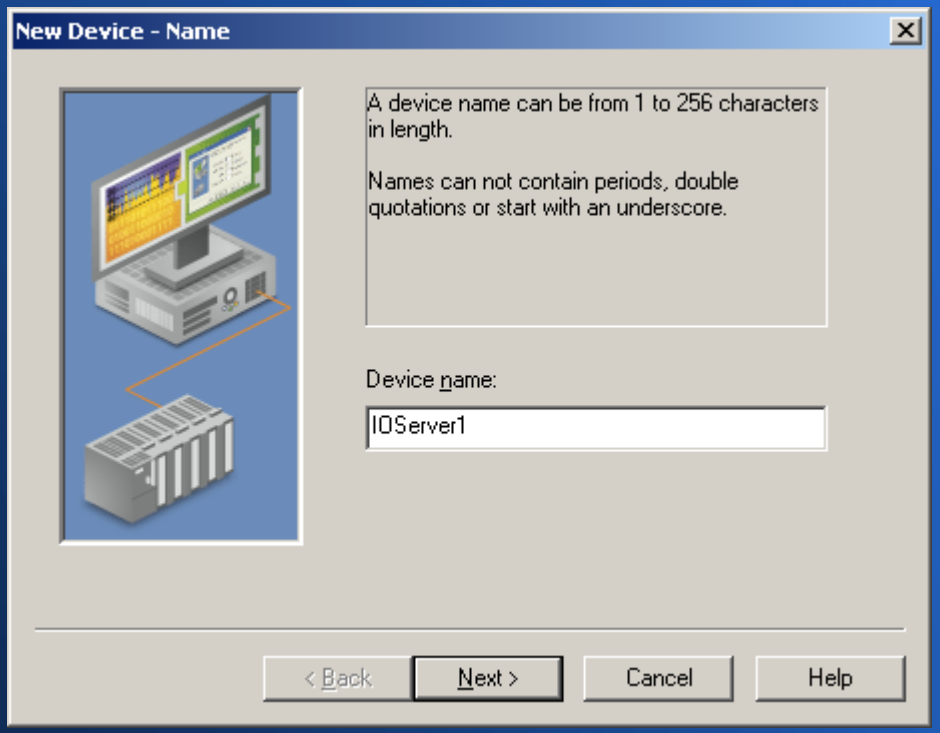


4. Select configuration options as shown (cont'd)

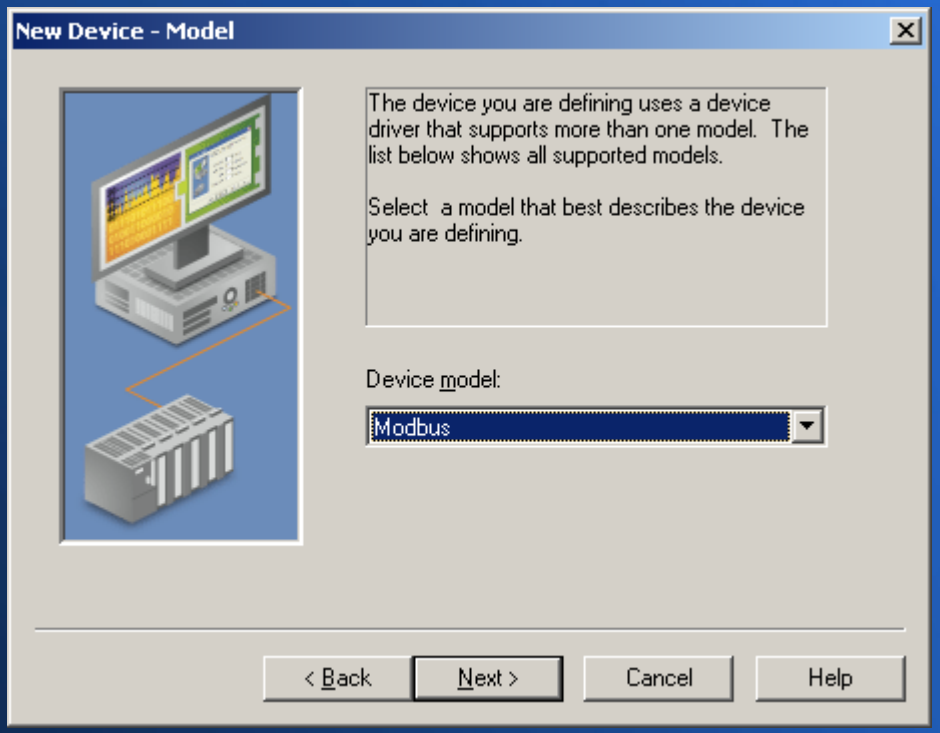


4. Select configuration options as shown (cont'd)

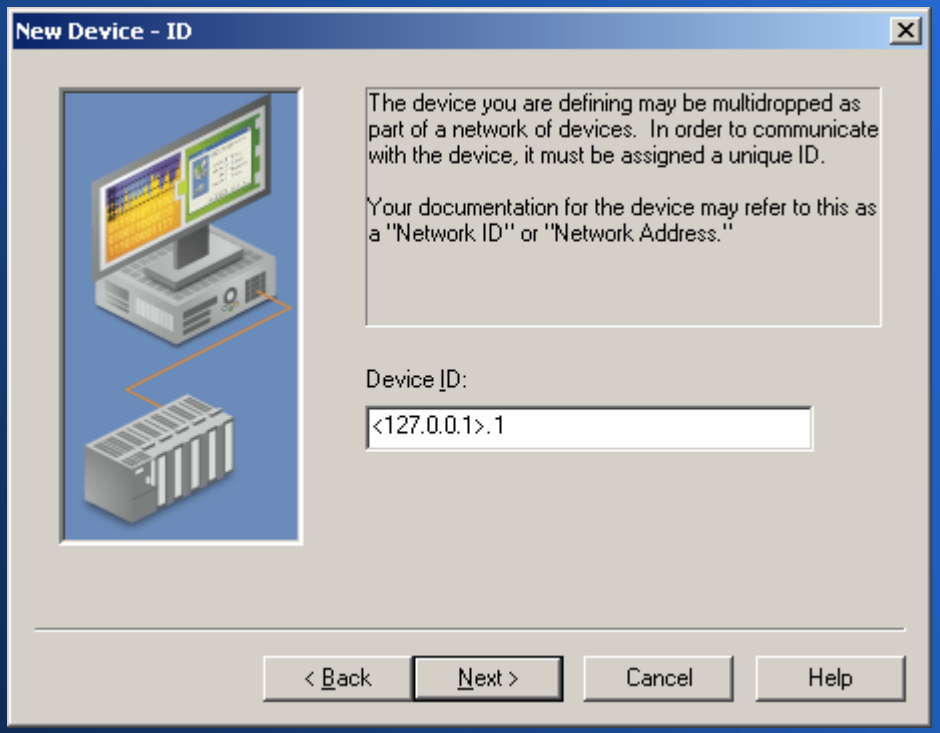
* This one is critical, if you use more sockets, there may be less connections available for other clients like the TADA package.



5. Add a device using the settings shown



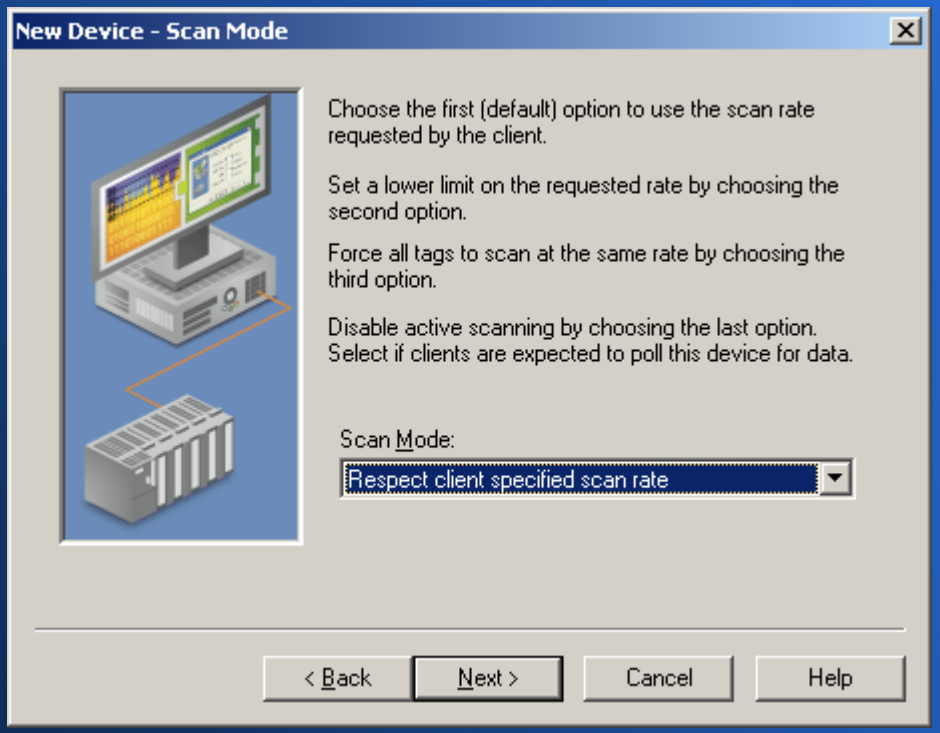
5. Add a device using the settings shown



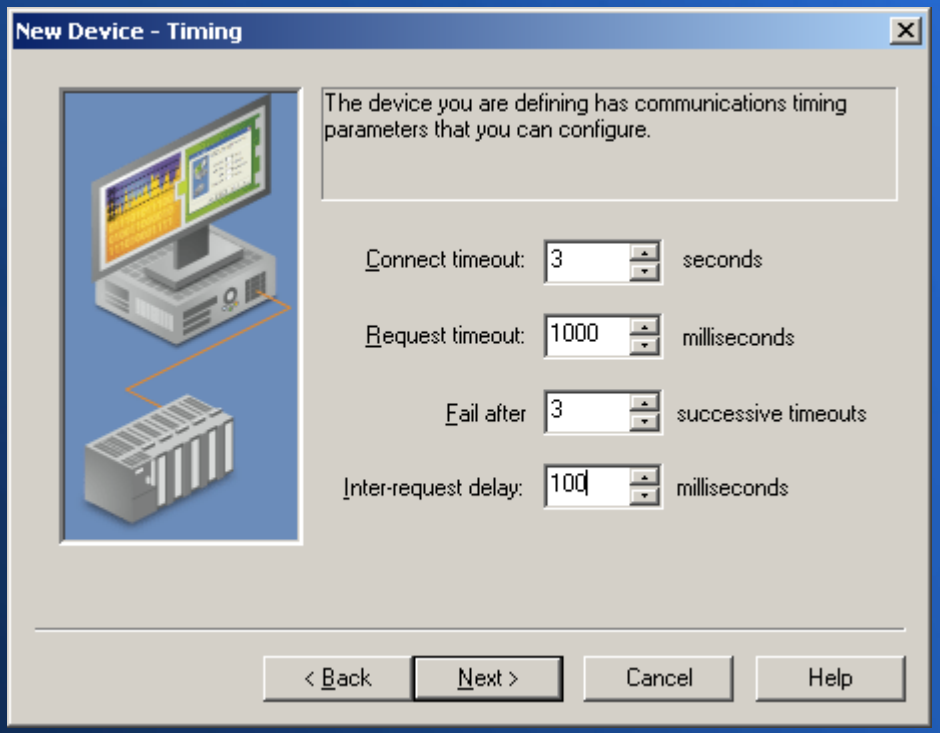
5. Add a device using the settings shown (cont'd)

The Device ID is the IP address and Device number, Please edit the address as necessary. The device number MUST be 1.
So your address will look something like this:

<192.168.0.22>.1

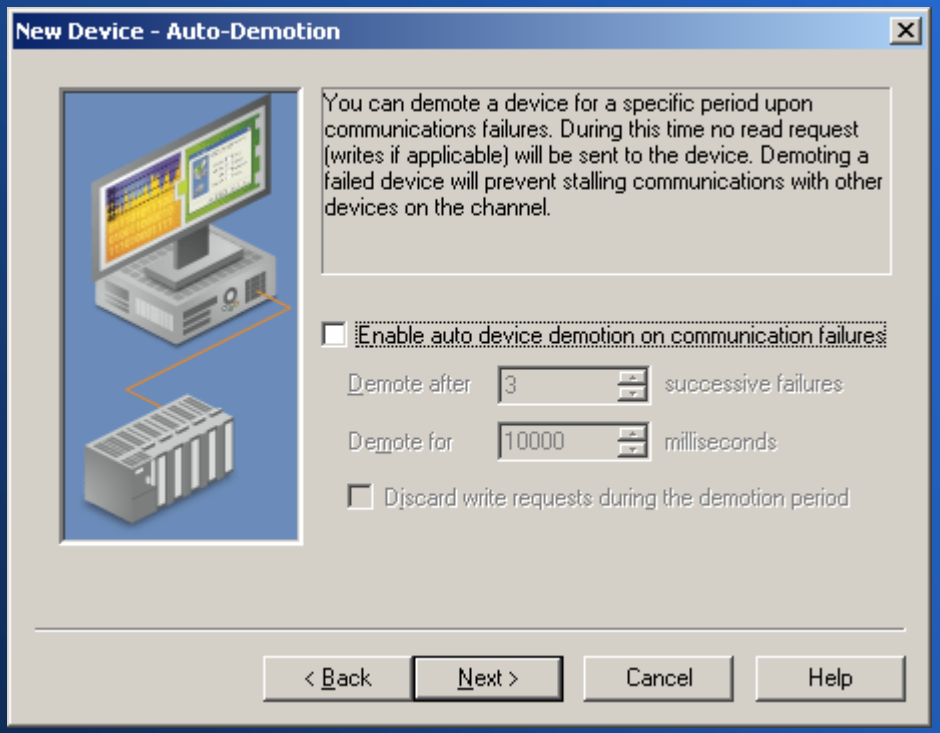


5. Add a device using the settings shown (cont'd)

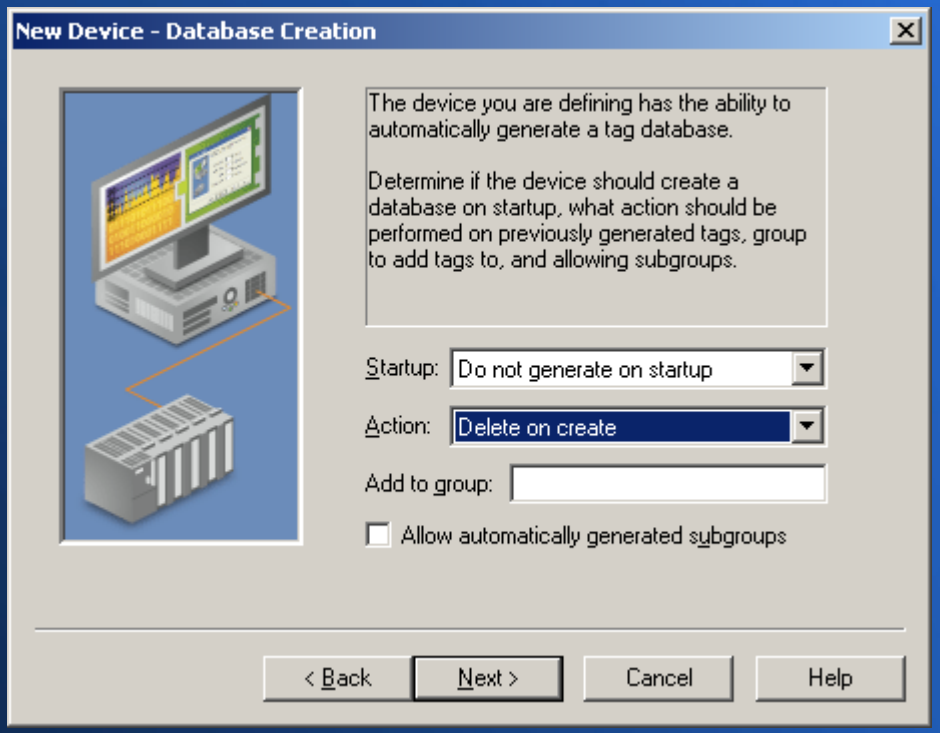


5. Add a device using the settings shown (cont'd)

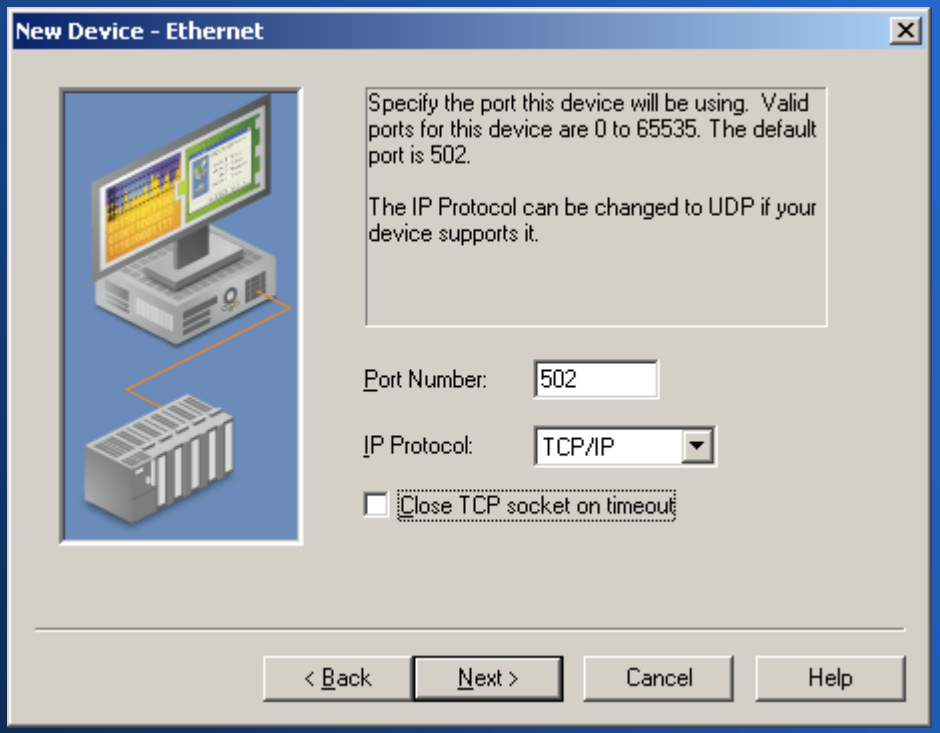
These settings are recommended for Indus-comm's I/O system, Making them faster won't make any difference as the system usually scans one I/O box every 3 seconds, so speed is not critical. This also helps to keep network and scanning loads down to make the system run better.



5. Add a device using the settings shown (cont'd)

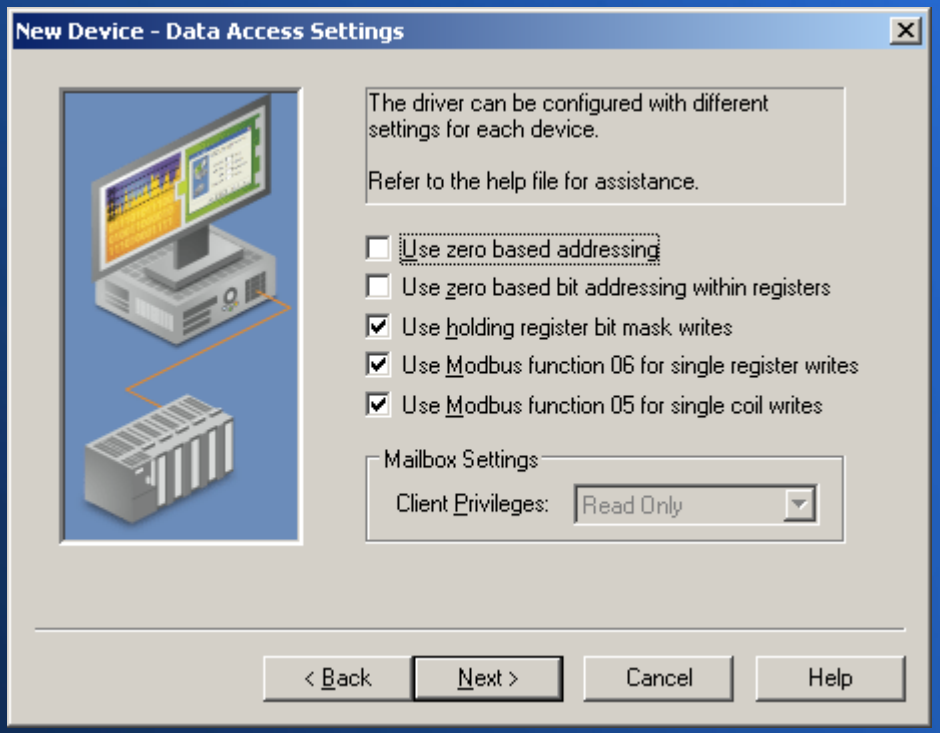


5. Add a device using the settings shown (cont'd)



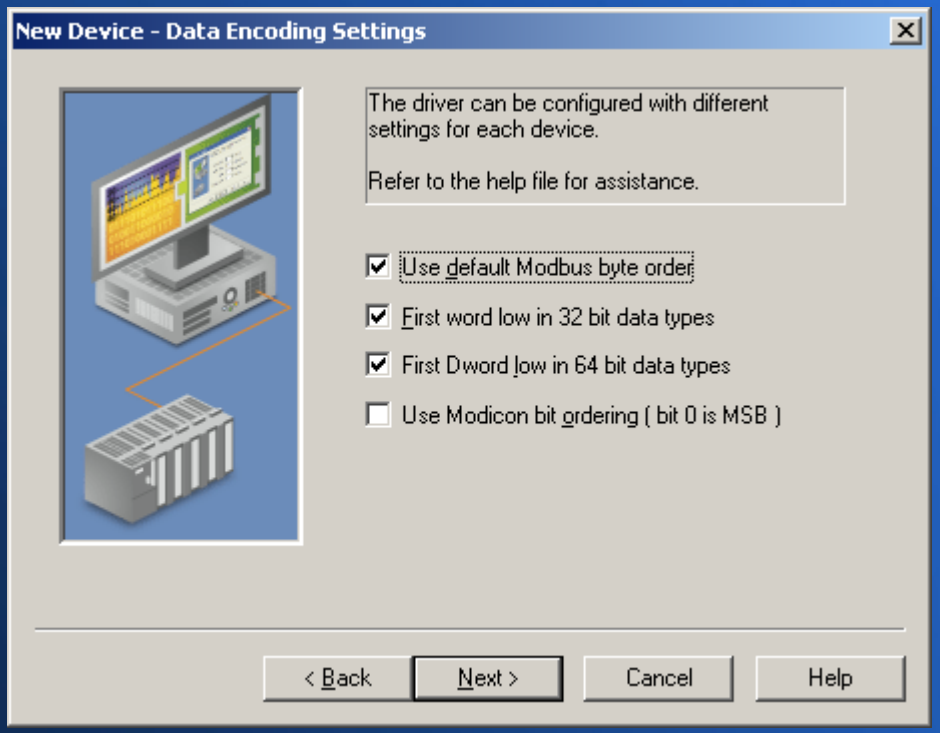
5. Add a device using the settings shown (cont'd)

Do not choose to close the socket on timeout, this may cause long time delays in re-establishing communications due to bad or unanswered requests.

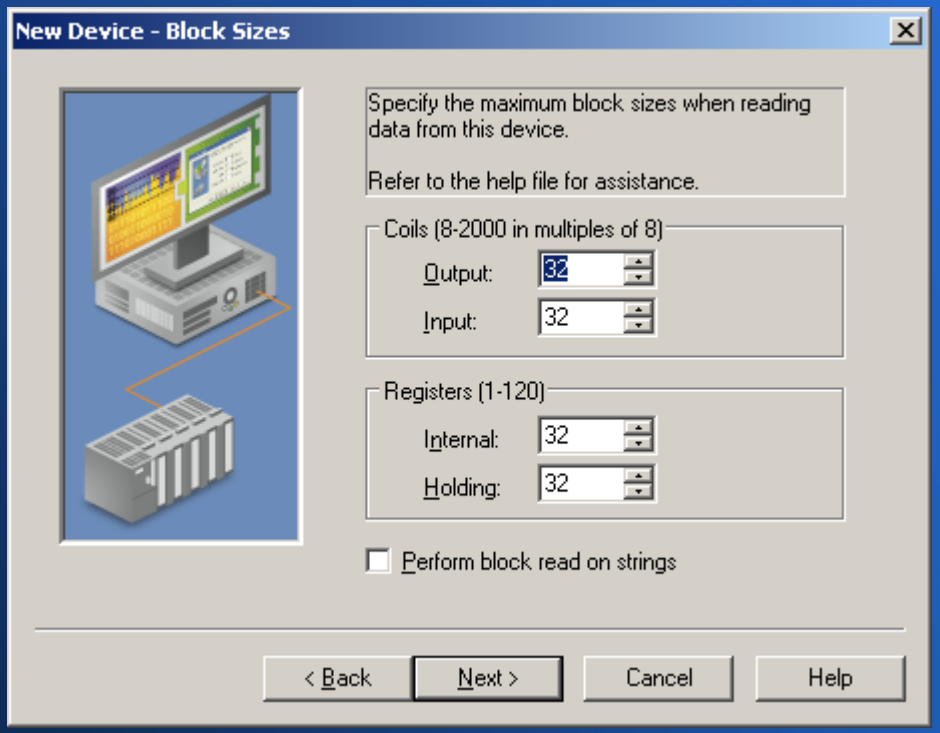


5. Add a device using the settings shown (cont'd)

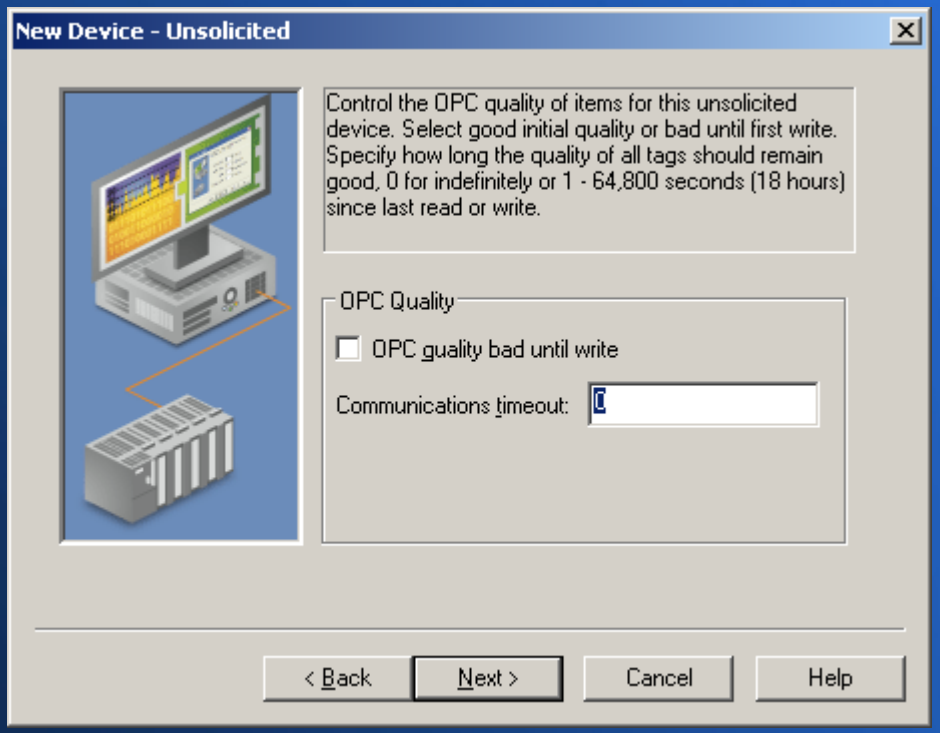
Please deselect zero based addressing options on order to make sure the included spreadsheet and tool-tips in the server software give you correct and matching Modbus addresses.



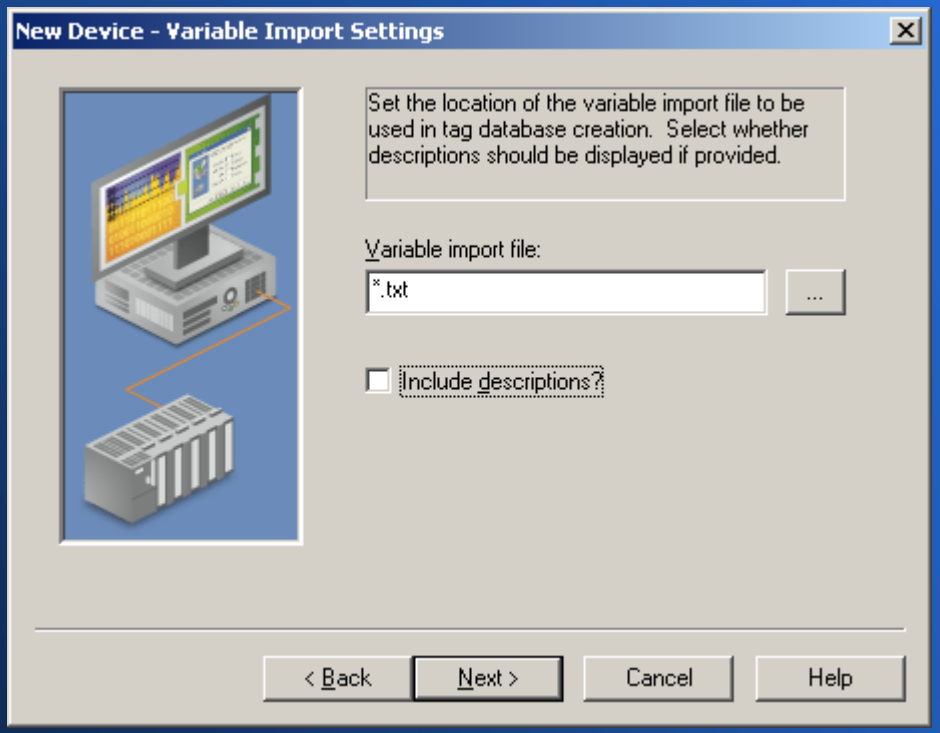
5. Add a device using the settings shown (cont'd)



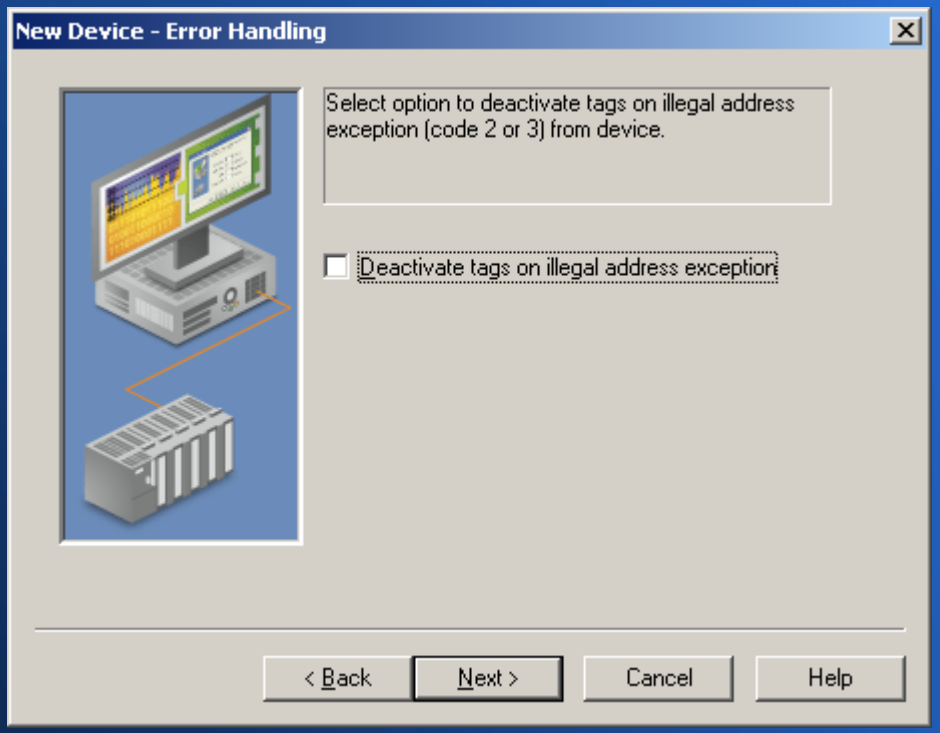
5. Add a device using the settings shown (cont'd)



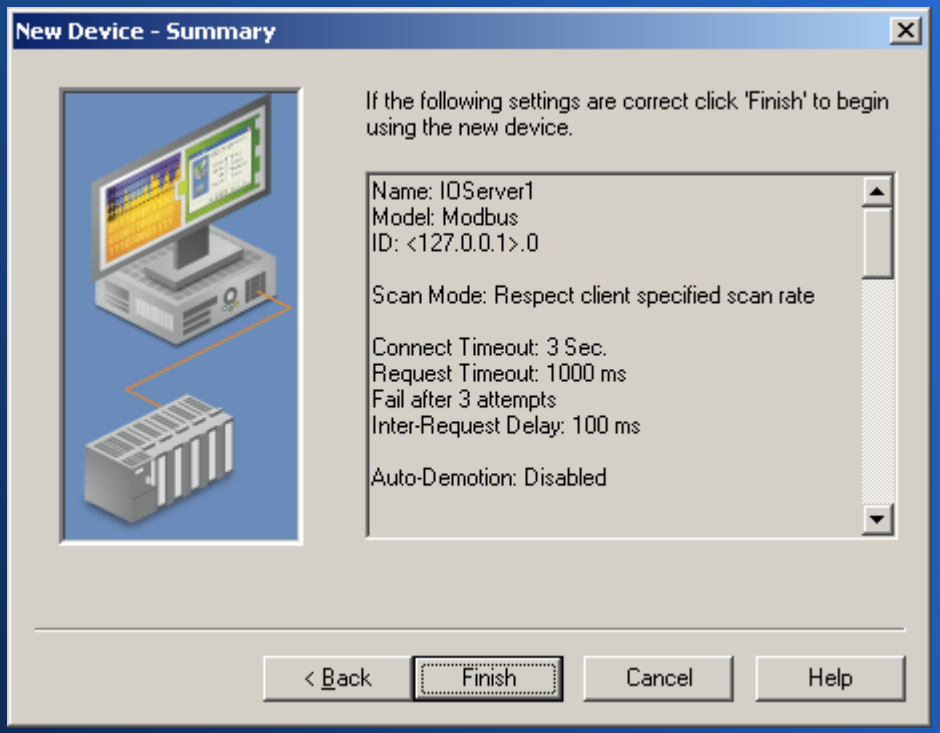
5. Add a device using the settings shown (cont'd)



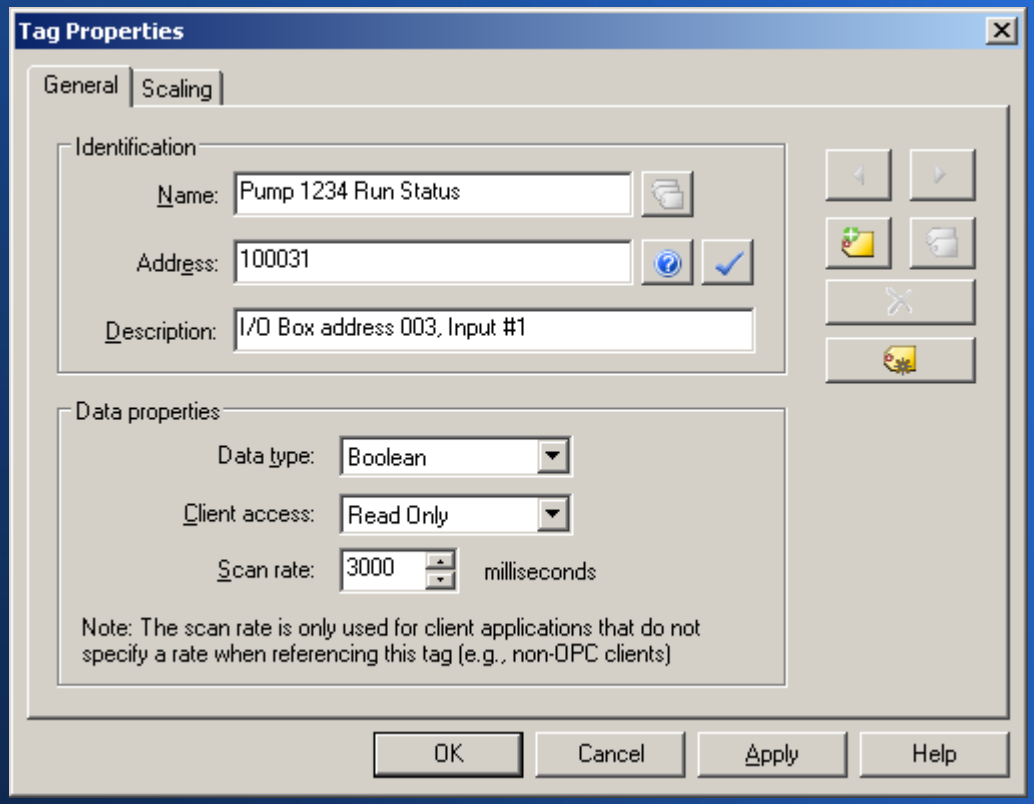
5. Add a device using the settings shown (cont'd)



5. Add a device using the settings shown (cont'd)

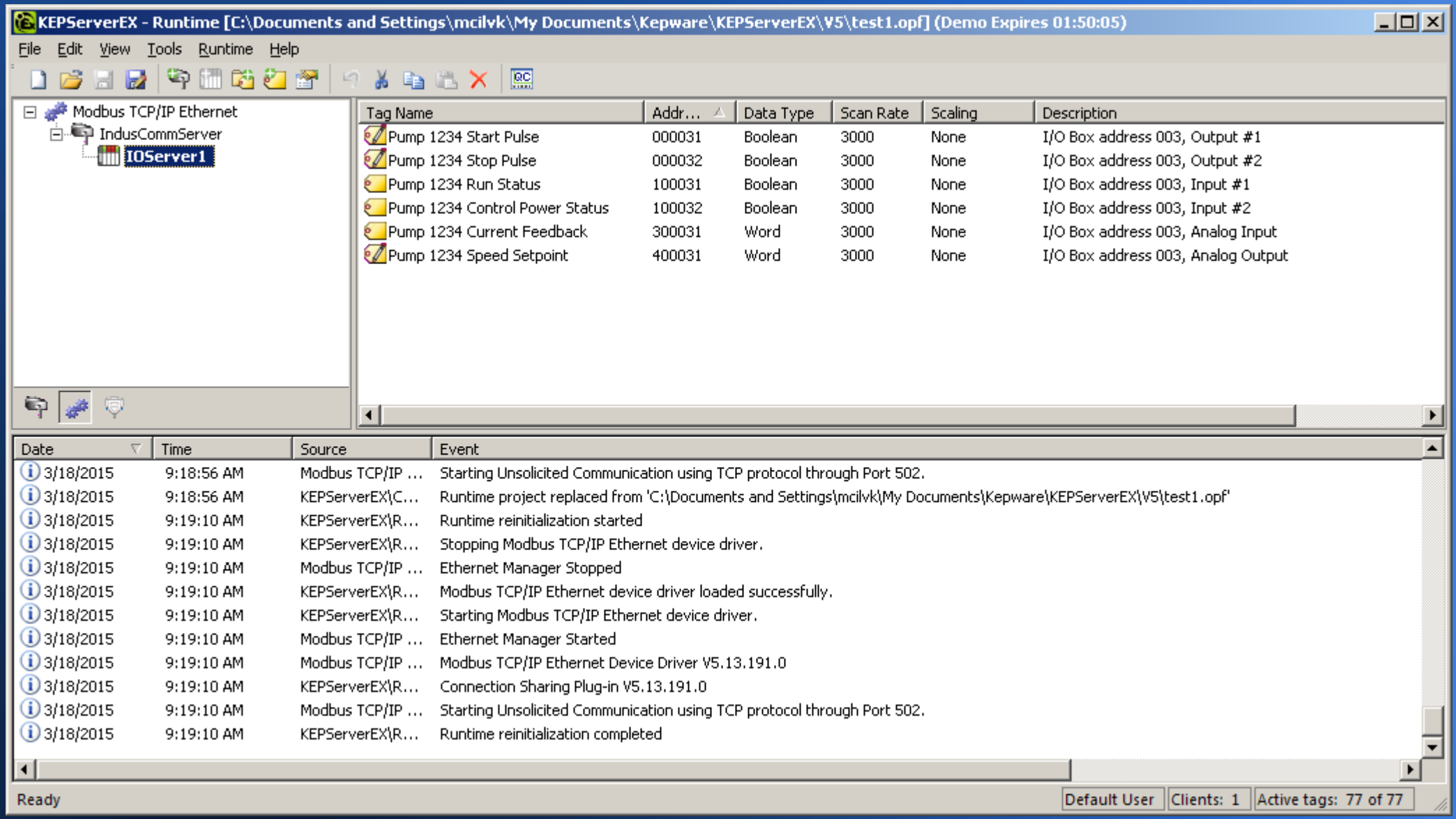


5. Add a device using the settings shown (cont'd)



6. Recommended Tag configuration

You can build other tags as necessary by following the example above and using the following table for reference. Please make sure data types (only the 2 types below are compatible with the I/O system) and addresses are checked carefully.



Sample Tag Configurations

Notes:

Modbus addresses in KEPware have an extra zero and follow this format:

D0BBBI

D = Data type as shown at the top of the spreadsheet
Where D is One of the following:

- 0 = Digital Outputs (Relay 1 and Relay 2 outputs and Special Function Bits)
- 1 = Digital Inputs (Inputs 1-4, Relay status feedback, Status Bits) – Read Only
- 3 = Analog Inputs/Registers (Analog Input and Status Registers) – Read Only
- 4 = Analog Outputs (Analog output, and Special Function Registers)

0 = Extra zero added here
BBB = Board (Box) number
I = Parameter number for the specific data on that box you are reading or writing.

- The KEPWare server will not begin actual scanning until a client is connected and requesting data
- You CANNOT run KEPWare and I/O server on the same PC as they will not share the Ethernet port 502, this can be adjusted but you may cause other issues if not done carefully.

INDUS-COMM

I/O System

Overview