Why my ISaGRAF project cannot connect Modbus slave device correctly?

The I-8417/8817/8437/8837, I-7188EG/XG, Wincon-8xx7 supports the “Delay_time” (time gap) setting between two Modbus commands since below driver version.

I-7188EG + X607/ X608:	version 2.20 or later version
I-7188XG + X607/ X608:	version 2.18 or later version
I-8xx7+ S256/ S512:	version 3.22 or later version
Wincon-8xx7:	version 3.39 or later version

New released driver can be download at
https://www.icpdas.com/en/download/show.php?num=368&nation=US&kind1=&model=&kw=ISaGRAF

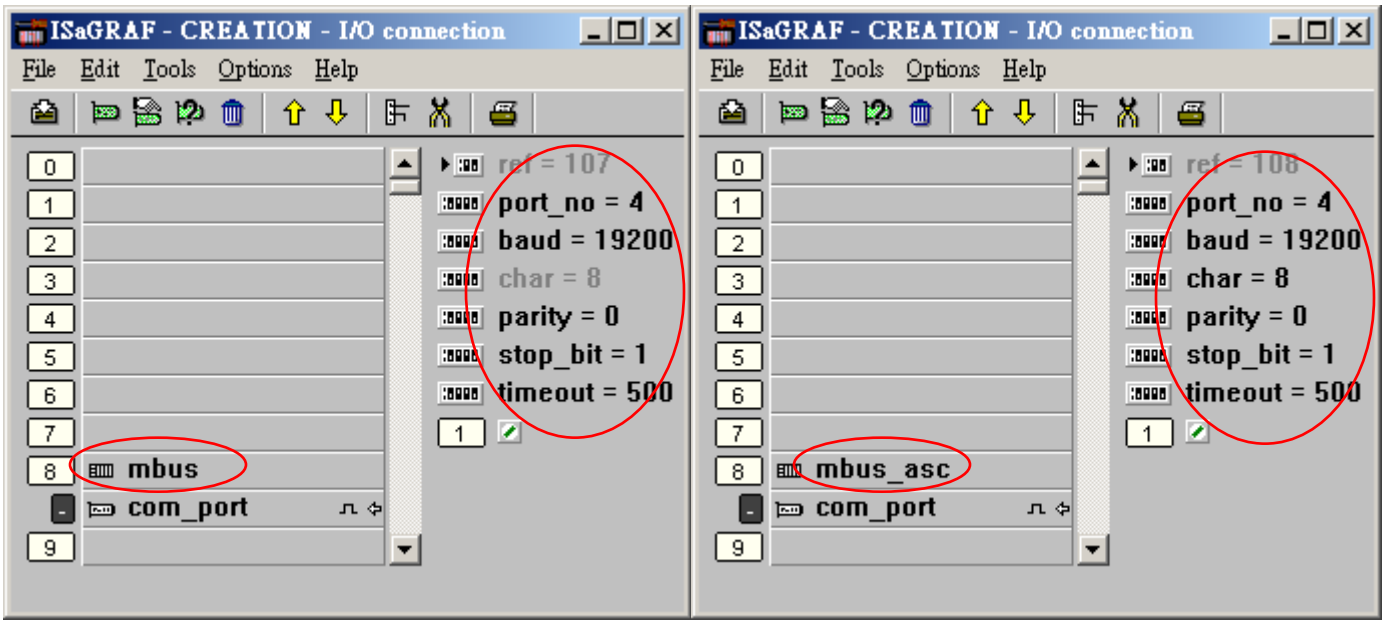
Please refer to “ISaGRAF User’s Manual” – Chapter 8 for more information about “Modbus Master” function. It can be found in the below position.

Web list:
https://www.icpdas.com/en/download/show.php?num=333&nation=US&kind1=&model=&kw=ISaGRAF
File location:
https://www.icpdas.com/en/download/file.php?num=419

The normal reasons which make the ISaGRAF Controller cannot connect the Modbus Slave devices well are listed as below.

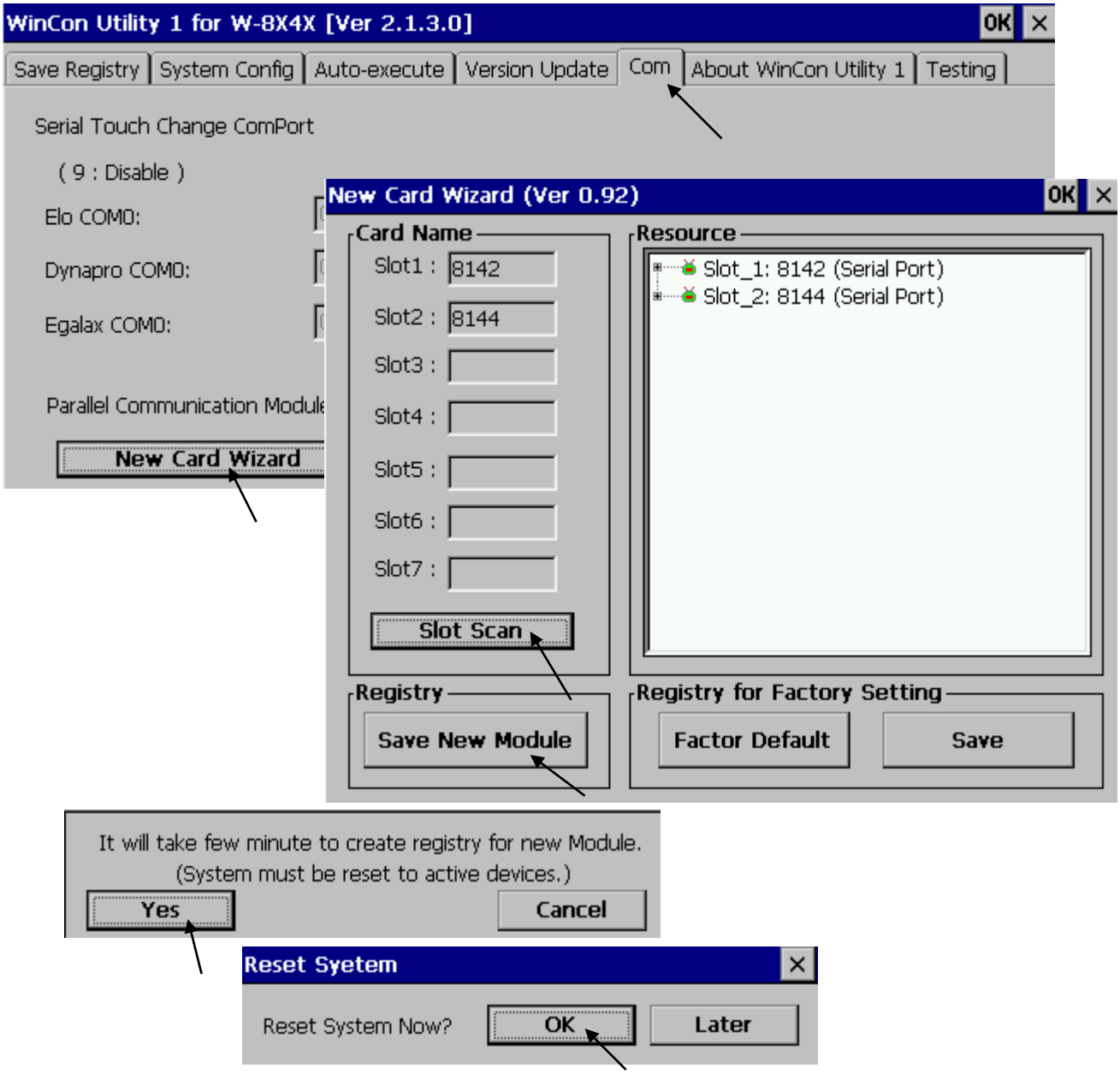
1. The connected device doesn’t support the Modbus RTU Slave or Modbus ASCII Slave protocols.
2. The ISaGRAF Controller doesn’t run the ISaGRAF program which setup the “mbus” or “mbus_asc” in the IO connection windows (Please refer to the “ISaGRAF User’s manual” – Chapter 8).
3. The “baud”, “parity”, “stop_bit” setting in the “mbus” and “mbus_asc” doesn’t fit the same setting with the Modbus Slave devices. Or the com port wiring is not correct.

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4. The “timeout” setting in the “mbus” and “mbus_asc” is too small for those connected Modbus slave devices. Its unit is ms (0.001 second). For example, if the slave device will reply in 200 ms later after it received the requested command, then please set “timeout” as twice of this 200 ms. That is 400 ms. If it will reply in 350 ms later, then please set “timeout” as 700. And so on.
5. The “port_no” setting is not correct in the “mbus” and “mbus_asc”. For example, if using W-8xx7 and I-8xx7‘s COM3 as Modbus Master port, please set “port_no” as 3. If using W-8xx7‘s COM5 to COM14 as Modbus Master port, please power off Wincon first. Then plug the I-8112/ 8114/ 8142/ 8144 expansion card in the W-8xx7‘s slot 1 to 4, then power On Wincon, run Wincon-utility > Com > New-Card-Wizard > Slot-Scan > Save-New-Module once. It will setup the serial expansion ports and reboot Wincon once, then COM5 to COM14 should work.

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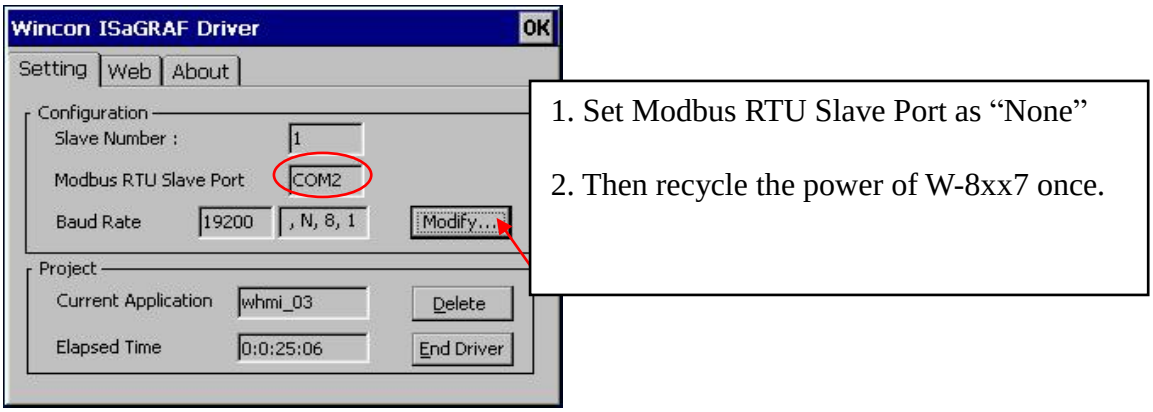


If the controller is I-8xx7, only two of its COM1, COM3, COM4 and COM5 ports can be used (I-8xx7's COM5 resides at the I-8112/8114/8142/8144 expansion card). While only two ports of the I-7188EG's COM1, COM2 and COM3 can be used. And only two ports of the I-7188XG's COM2 and COM3 can be used. (I-7188EG/XG's COM3 resides at the X-5xx expansion card)

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6. The set “port_no” is occupied by other functions. For ex, if using “bus7000b” at the same port No. or using I-8xx7 or I-7188EG‘s COM1 as Modbus RTU slave port. Or using Wincon-8xx7‘s COM2 or COM3 as Modbus RTU slave port.

Please follow below steps to disable the Wincon‘s COM2/ COM3 Modbus RTU slave setting.



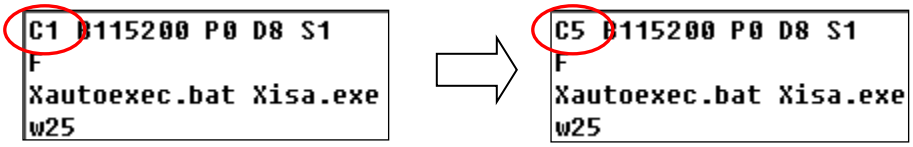
Please follow below steps to disable the I-8xx7‘s COM1 Modbus RTU Slave setting.

A. Create a “8000” folder in your PC‘s hard drive (for ex, "**c:\8000**".)

B. Download at https://www.icpdas.com/en/download/file.php?num=932, and Copy 7188xw.ini to this “8000” folder.

C. Run this 7188xw.exe. A "7188 xw" window will show up.

D. Connect PC’s COM1 or COM2 to I-8xx7‘s COM1 by a RS-232 cable.
If your PC is using other COM port Number, please modify the “7188xw.ini” and then run “7188xw.exe” again.



E. Power off the I-8437/ 8837, short its “INIT” pin to ”INIT COM”. (Short INIT to GND for 7188EG). Then power it on again.

F. If the connection is fine, the 7188xw.exe will display something like ”I-8000>”.

G. Key-in "isa *f=1" to free this COM1 (Free COM1 as non-Modbus-Slave port)

```
i-8000>
ICP_DAS MiniOS7 for I-8000 Ver. 2.00 build 002,Apr 08 2005 17:06:02
SRAM:512K, FLASH MEMORY:512K
[CPU=Am188ES]
Serial number= 09 63 4A 60 03 00 00 76

i-8000>isa *f=1

 Com1 is free now
```


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H. Press at ALT_X to exit the "7188xw" window, or the PC's COM1 or COM2 will be blocked always.

I. Remove the connection between "INIT" and "INIT COM". Recycle the I-8437/8837 once.

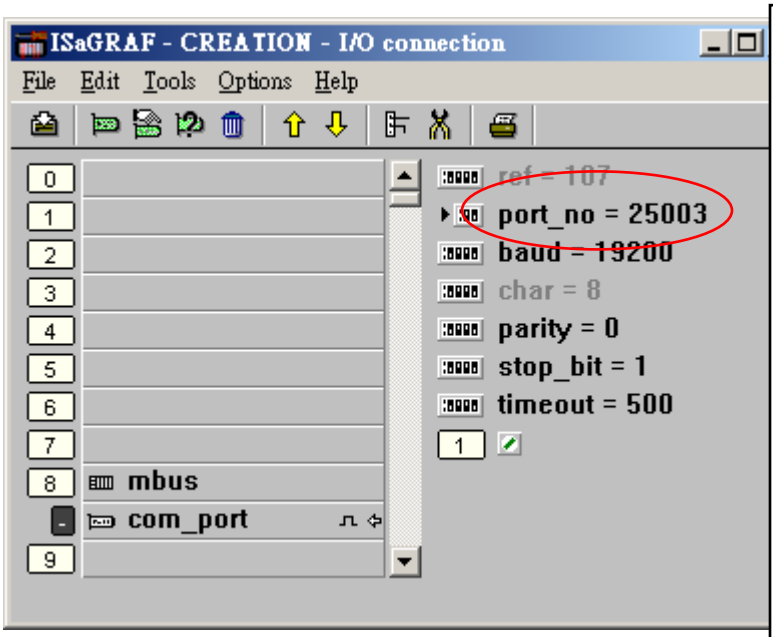
Please follow below steps to disable the I-7188EG's COM1 Modbus RTU Slave setting.

The steps are the similar as the steps in the former page except step "G".

G. Key-in "isa7188e *f=1" to free COM1 (Free COM1 as non-Modbus-Slave port)

i7188E> isa7188e *f=1 (for I-7188EG)
i7188E> isa7186e *f=1 (for µPAC-7186EG)

7. Some Modbus Slave devices need longer time gap between two Modbus commands.
The normal time gap between two Modbus commands is 3.5 Character time. The "mbus" and "mbus_asc" default uses this time gap setting. They will delay about 3.5 Character time, then sending next Modbus command. If your Modbus Slave device need longer delay time, please set a special "port_no" value in the IO connection "mbus" and "mbus_asc". (Max. Delay Time is 1000 ms = 1 second)



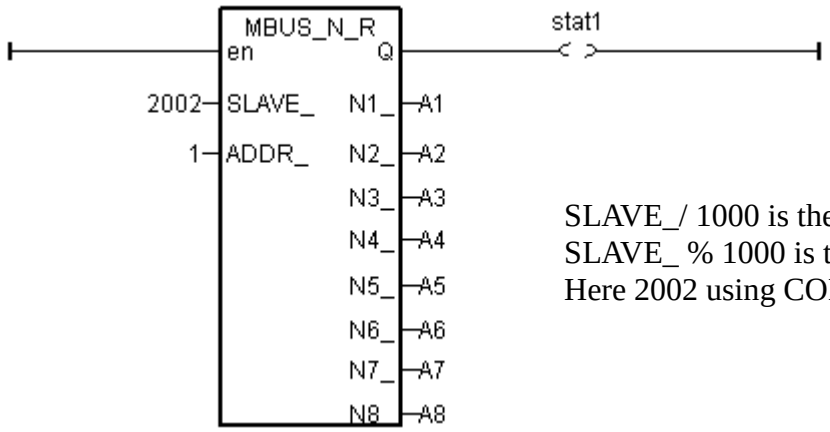
Delay_time between two commands =
port_no / 100 + 3.5 character Time,
(Here is 250 ms + 3.5 character Time)
Port used = port_no mod 100
(Here is COM3)

If setting port_no as 50002, it means
Delay time is 500 ms + 3.5 character time.
Used Port is COM2

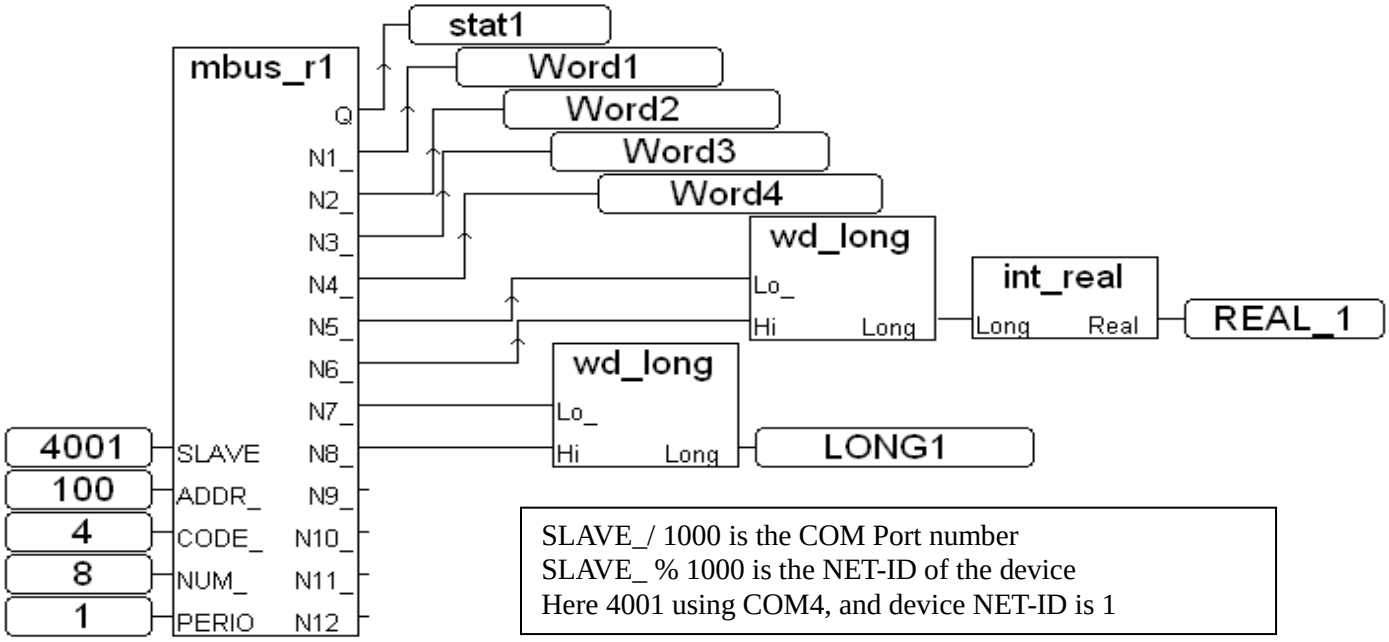
If setting port_no as 2, it means
Delay_time is 0 ms + 3.5 character time.
Used Port is COM2

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8. The input parameter of the “mbus_xxx” block is not correct. (Please refer to Chapter 8)



SLAVE_/ 1000 is the COM Port number
SLAVE_ % 1000 is the NET-ID of the device.
Here 2002 using COM2, and device NET-ID is 2.



SLAVE_/ 1000 is the COM Port number
SLAVE_ % 1000 is the NET-ID of the device
Here 4001 using COM4, and device NET-ID is 1

Some Modbus Slave devices can be read only one or two words in one modbus command. So the “mbus_N_R” block will not work with these devices. Alternately, please use “mbus_r” or “mbus_r1” in such a case. Their “NUM” parameter set the word amount can be read in one command.

Some Modbus Slave devices support only Modbus function call = 4 to read words, while function call = 2 to read bits. So the “mbus_N_R” and the “mbus_B_R” will not work with these devices. Alternately, please use “mbus_r” or “mbus_r1” in such a case. Their “CODE” parameter set the “modbus function call” number will be used.

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