Getting Started : Wincon ISaGRAF PAC

Important: Please always set a **fixed IP** address to the Wincon. (No more DHCP)
Please always set W-8x47/8x46's LAN2 as disabled if not using it (refer to appendix D).
Please use NS-205 or NS-208 Industrial Ethernet Switch for Wincon-8x46/8x47.

ICP DAS CO., LTD. would like to congratulate you own your purchase of our Web Programmable Automation Controller (Web PAC)

Wincon-8037/8337/8737 (support ISaGRAF, 10M ethernet port x 1)
Wincon-8036/8336/8736 (support ISaGRAF & Indusoft, 10M ethernet port x 1)
Wincon-8047/8347/8747 (support ISaGRAF, 10/100M ethernet port x 2)
Wincon-8046/8346/8746 (support ISaGRAF & Indusoft, 10/100M ethernet port x 2)

Legal Liability

ICP DAS CO., LTD. assumes no liability for any and all damages that may be incurred by the user as a consequence of this product. ICP DAS CO., LTD. reserves the right to change this manual at any time without notice.

ICP DAS CO., LTD. constantly strives to provide our customers with the most reliable and accurate information possible regarding our products. However, ICP DAS CO., LTD. assumes no responsibility for its use, or for any infringements of patents or other rights of third parties resulting from its use.

Trademark & Copyright Notice

The names of products and name of company are used for identification purposes only, and are the registered trademarks of their respective owners or companies.

Development Software

Two options:
-ISaGRAF: Ver. 3.4x (or Ver. 3.5x), IEC61131-3 standard. LD, ST, FBD, SFC, IL & FC or
- Non-ISaGRAF: Microsoft EVC++4.0 or VS.NET 2003 (VB.NET , C#.net)

Reference Guide

- ISaGRAF English User's Manual:

Wincon ISaGRAF CD: \napdos\isagraf\wincon\english_manu\ "user_manual_i_8xx7.pdf"

- ISaGRAF中文使用手冊:

Wincon ISaGRAF CD:
\napdos\isagraf\wincon\chinese_manu\ "chinese_user_manual_i_8xx7.pdf"

- Resource on the Internet: http://www.icpdas.com/products/PAC/i-8000/isagraf.htm

Technical Service:

Please contact local agent or email problem-report to service@icpdas.com .
FAQ on the Web - http://www.icpdas.com/faq/isagraf.htm

Table of Contents

Reference Guide

ISaGRAF English User's Manual:

Wincon ISaGRAF CD: \napdos\isagraf\wincon\english_manu\ "user_manual_i_8xx7.pdf"

ISaGRAF 中文使用手冊:

Wincon ISaGRAF CD:
\napdos\isagraf\wincon\chinese_manu\ "chinese_user_manual_i_8xx7.pdf"

Resource on the Internet:

Newly updated ISaGRAF IO libraries, drivers and manuals can be found at
http://www.icpdas.com/products/PAC/i-8000/isagraf.htm

Industrial Ethernet Switch : NS-205 / NS-208

Best choice for Industrial Ethernet Communication.
http://www.icpdas.com/products/Switch/industrial/ethernet_switch.htm

Model:NS-205

Model:NS-208

FAQ:

Please visit www.icpdas.com - "FAQ" - "Software" - "ISaGRAF" for Frequently Asked Question, or visit http://www.icpdas.com/faq/isagraf.htm

New functions will be available in the near future.

Delivering message via TCP/IP:
Around Jun.30,2006. Manual will be available at
ftp.icpdas.com/pub/cd/wincon_isagraf/napdos/isagraf/wincon/english_manu/ “msg_tcp.pdf”
W-8xx7 CD-ROM: /napdos/isagraf/wincon/english_manu/ “msg_tcp.pdf”

W-8xx7/8xx6 connect to Modbus TCP/IP slave IO or devices:
Around July.31,2006. Manual will be available at
ftp.icpdas.com/pub/cd/wincon_isagraf/napdos/isagraf/wincon/english_manu/ “mtcp_io.pdf”
W-8xx7 CD-ROM: /napdos/isagraf/wincon/english_manu/ “mtcp_io.pdf”

Sending email via ethernet:
Around July.31,2006. Manual will be available at
ftp.icpdas.com/pub/cd/wincon_isagraf/napdos/isagraf/wincon/english_manu/ “email_net.pdf”
W-8xx7 CD-ROM: /napdos/isagraf/wincon/english_manu/ “email_net.pdf”

How to select between W-8x47 , W-8x37 , I-8xx7, I-7188EG & I-7188XG

Memory considerations:
1. The I-8417/8817/8437/8837 , I-7188EG and I-7188XG has memory limitation. The ISaGRAF code size can not exceeds 64K bytes. (size of the “appli.x8m” file)
2. W-8037/8337/8737 and W-8047/8347/8747 has code size limitation of 1M bytes. It is 16 times of the size of I-8xx7 & I-7188EG/XG.

CPU speed considerations:
The CPU of I-8417/8817/8437/8837 , I-7188EG and I-7188XG is 80188 or compatible. It is a 16-bit cpu. It is not good at doing floating point value calculation. If your application will do lots of floating point value calculation, it is better to use W-8037/8337/8737 and W-8047/8347/8747 or future advanced ISaGRAF controllers. The CPU is 32-bit and its speed is about 10 to 20 times compared to the I-8xx7 & I-7188EG/XG, especially for floating point value calculation.

Redundant considerations:
Wincon-8047/8347/8747 supports redundant solution. Two controllers to be one redundant system. One is redundant Master, one is redndant slave. Master handles all inputs & outputs of the remote RS-485 I/O (I-7k & I-87K) at run time. If master is dead, Slave will take over the control of the remote I/O. **All Outputs** should be configured as RS-485 remote I/O. **Inputs** can locate at slot 1 through 7 or configured as RS-485 remote I/O.
Redundant Change Over Time: <= 500 ms, Synchronization: <= 75ms

Ethernet considerations:
Up to now, only W-8047/8347/8747’s ethernet is 10/100 Mbyte type and dual ports. I-7188EG , W-8037/8337/8737 & I-8437/8837 is 10 Mbyte type. All of them support Modbus TCP/IP slave protocol.
I-7188XG & I-8417/8817 no supports Ethernet.
2. W-8037/8337/8737 & W-8047/8347/8747 or future advanced ISaGRAF controllers support sending / receiving user’s defined message (string) via UDP/IP or TCP/IP to PC or other devices. However I-7188EG & I-8437/8837 no support them.

Windows considerations:
Only W-8037/8337/8737 & W-8047/8347/8747 or future advanced ISaGRAF controllers support Window CE.
The W-8036/8336/8736 & W-8046/8346/8746 support both ISaGRAF driver & Indusoft driver.

Size considerations:
The controller size is W-8747/8737 > I-8817/8837 > W-8347/8337 > I-8417/8437 > W-8037/8047 > I-7188EG/XG.

Price considerations:
Please consult with your local agent.

Specifications: W-8047 / 8347 / 8747 (Dual Ethernet)

Development software	
ISaGRAF Version 3	IEC61131-3 standard. Languages: LD, ST, FBD, SFC, IL & FC
Max. code size	accepts max. 1M bytes ISaGRAF code size (Appli.x8m must < 1M)
Non-ISaGRAF	Options: Microsoft EVC++4.0 or VS.NET 2003 (VB.NET, C#.NET)
Web HMI	PC running Internet Explorer can access to the Wincon-8047/8347/8747 via Local Ethernet or Internet or dial Modem, monitoring and Control.
Security	Three Level username and password protection
Power supply	10 to 30VDC (unregulated), 20W (when I/O slots are empty)
Protection	Built-in power protection & network protection circuit
General environment	
Temperature	Operating: -25 to +75°C , Storage: -30 to +85°C,
Humidity	5 to 95 % (non-condensed)
System	
CPU	Intel Strong ARM CPU, 206MHz, or compatible
Watchdog timer	Yes
Real time clock	Gives hour, minute, sec, date of week, date of month, month & year
SDRAM & FLASH	SDRAM:64M bytes , FLASH Memory: 32M bytes for OS image
Compact Flash Card	One Compact Flash slot: CF memory card is 128M bytes or more
EEPROM	16K bytes, retention > 100 years. 1,000,000 erase/write cycles
I/O slots	I/O slots: W-8047: 0 , W-8347: 3 , W-8747: 7. accept I-8K & I-87K boards
VGA Port	1 VGA port: resolution: 320x240x16 to 1024x768x16
Two USB ports	USB 1.1 Host ports for USB drive or USB mouse or USB Key-board
Reset Button & Led	1 reset button & 1 power Led
Unique Serial Number	64-bit hardware unique serial number
NET ID	From 1 to 255, set by software
Serial ports	
COM1	Internal use for I-87K IO boards of W-8347/8747. W-8047 has no COM1
COM2	RS232: full modem signals, Speed: 115200 bps max.
COM3	RS-485, Speed: 115200 bps max. D+, D-
Two Ethernet ports	**10/100M** bps, NE2000 compatible, 10 BaseT, Program download port. **Please use NS-205 / NS-208 Industrial Ethernet Switch.**
Motion	W-8347/8747 integrate with one I-8091(2-axes) or two I-8091(4-axes) can do motion control.
PWM output	8 channels max. 250Hz max. for Off=2 & On=2 ms . Output square curve: Off: 2 to 32766 ms, On: 2 to 32766 ms. Optional D/O boards: i-8037, 8041, 8042, 8054, 8055, 8056, 8057, 8060, 8063, 8064, 8065, 8066,8068, 8069 (Relay boards can not generate fast square curve)
Counters	
Parallel D/I counter	8 ch. max. for 1 controller. Counter value: 32 bit. 250Hz max. Min. ON & OFF width must > 2ms. Optional D/I boards: i-8040, 8042, 8051, 8052, 8053, 8054, 8055, 8058, 8063, 8077
Serial D/I counter	Counter input: 100Hz max. Counter value: 0 to 65535 (16 bit) Optional serial I-87K D/I boards: i-87040, 87051, 87052, 87053, 87054, 87055, 87058, 87063

Remote D/I counter	All remote I-7000 & I-87K D/I modules support counters. 100Hz max. value: 0 to 65535
High speed counter	i-87082: 100kHz max. 32 bit, i-8080: 450kHz max. 32 bit
Protocols	
Modbus serial protocol	Up to 5 COM ports (COM2, 3, 5, 6,7 or 8) can support Modbus RTU slave protocol for connecting ISaGRAF, PC/HMI/OPC Server & HMI panels.
Modbus TCP/IP	Supports Modbus TCP/IP slave protocol for ISaGRAF & PC/HMI.
Web HMI protocol	Ethernet port for connecting PC running Internet Explorer
I-7000 & I-87K Remote I/O	COM3 supports I-7000 I/O modules & (I-87K base + I-87K serial I/O boards) as remote I/O. Max. 255 I-7000/87K remote I/O modules for one controller
M-7000 series Modbus I/O	Max. 10 R-485 ports – COM3 & (COM5 to COM14 if I-8142/8142i/8144 are found) can support M-7000 series Modbus I/O. Each port can connect up to 247 M-7000 Modules.
Modbus master protocol (multi-port)	Supports multi-ports of Modbus RTU / ASCII master protocol to connect to other Modbus slave devices. COM2,COM3,(or COM4 to COM14 if I-8112/8114/8142/8142i/8144 are found)
Ebus	to exchange data between ICP DAS's ISaGRAF Ethernet controllers via Ethernet port.
SMS: Short Message Service	One of COM2 (or COM5 if I-8112/8114 is found) can link to a GSM modem to support SMS. User can request data/control the controller by cellular phone. The controller can also send data & alarms to cellular phone. Optional GSM modems: M1206 or GM29 (GSM 900/1800)
User defined protocol	User can write his own protocol applied at COM2, COM3, (& COM5 to COM14 in multi-serial port boards) by serial comm. function blocks.
Modem_Link	COM2 supports PC remotely download & monitor the controller through a normal modem.
MMICON / LCD	COM2 (or COM5 if I-8112/8114 is found) supports ICP DAS's MMICON. The MMICON is featured with a 240 x 64 dot LCD & a 4 x 4 Keyboard to display picture, string, integer, float, & input a char, string, integer & float.
Delivering Message	Ethernet port can setup to send/receive message via UDP/IP protocol to commnunicate with PC or other device.
Redundant Solution	Two controllers to be one redundant system. One is redundant Master, one is redndant slave. Master handles all inputs & outputs of the remote RS-485 I/O (I-7k & I-87K) at run time. If master is dead, Slave will take over the control of remote I/O. All Outputs should be configured as RS-485 remote I/O. Inputs can locate at slot 1 to 7 or configured as RS-485 remote I/O. Change Over Time: <= 500 ms, Synchronization: <= 75ms
Battery Backup SRAM	W-8347/8747 supports up to 4096 retain variables with a S256/S512 plug in the socket of the new back-plane(ver. 3-slot:2.6 , 7-slot:2.8). Optional: S256: 256kbytes, S512: 512kbytes Note: W-8047 doesn't support S-256 / S-512
File Access	The Compact Flash card can be used for storing run time data & any controller setting with file operation (by f_xxx function block). The CF card size default is 128Mbytes, can be more.
Modbus TCP/IP IO	(Will be available) W-8047/8347/8747 's second ethernet port will support connecting to Modbus TCP/IP IO modules

Specifications: W-8037 / 8337 / 8737

Development software	
ISaGRAF Version 3	IEC61131-3 standard. Languages: LD, ST, FBD, SFC, IL & FC
Max. code size	accepts max. 1M bytes ISaGRAF code size (Appli.x8m must < 1M)
Non-ISaGRAF	Options: Microsoft EVC++4.0 or VS.NET 2003 (VB.NET, C#.NET)
Web HMI	PC running Internet Explorer can access to the Wincon-8037/8337/8737 via Local Ethernet or Internet or dial Modem, monitoring and Control.
Security	Three Level username and password protection
Power supply	10 to 30VDC (unregulated), 20W (when I/O slots are empty)
Protection	Built-in power protection & network protection circuit
General environment	
temperature	Operating: -25°C to +75°C , Storage : -30°C to +85°C
Humidity	5 to 95 % (non-condensed)
System	
CPU	Intel Strong ARM CPU, 206MHz, or compatible
Watchdog timer	Yes
Real time clock	Gives hour, minute, sec, date of week, date of month, month & year
SDRAM FLASH Memory	SDRAM:64M bytes , FLASH: 32M bytes for OS image
Compact Flash Card	One Compact Flash slot: CF memory card is 128M bytes or more
EEPROM	16K bytes, retention > 100 years. 1,000,000 erase/write cycles
I/O slots	I/O slots: W-8037: 0 , W-8337: 3 , W-8737: 7, accept I-8K & I-87K boards
VGA Port	1 VGA port: resolution: 320x240x16 to 1024x768x16
PS/2 Port & USB port	2 PS/2 ports: keyboard and mouse. 1 USB 1.1 Host port for USB drive or USB mouse
Reset Button & Led	1 reset button & 1 power Led
Unique Serial Number	64-bit hardware unique serial number
NET ID	From 1 to 255, set by software
Serial ports	
COM1	Internal use for I-87K boards of W-8337/8737. W-8037 has no COM1
COM2	RS232: full modem signals, Speed: 115200 bps max.
COM3	RS-485, Speed: 115200 bps max. D+, D-
Ethernet	10M bps, NE2000 compatible, 10 BaseT, Program download port.
Motion	W-8337/8737 integrate with one I-8091(2-axes) or two I-8091(4-axes) can do motion control.
PWM output	8 channels max. 250Hz max. for Off=2 & On=2 ms. Output square curve: Off: 2 to 32766 ms, On: 2 to 32766 ms. Optional D/O boards: i-8037, 8041, 8042, 8054, 8055, 8056, 8057, 8060, 8063, 8064, 8065, 8066,8068, 8069 (Relay boards can not generate fast square curve)
Counters	
Parallel D/I counter	8 ch. max. for 1 controller. Counter value: 32 bit. 250Hz max. Min. ON & OFF width must > 2ms. Optional D/I boards: i-8040, 8042, 8051, 8052, 8053, 8054, 8055, 8058, 8063, 8077
Serial D/I counter	Counter input: 100Hz max. Counter value: 0 to 65535 (16 bit) Optional serial I-87K D/I boards: i-

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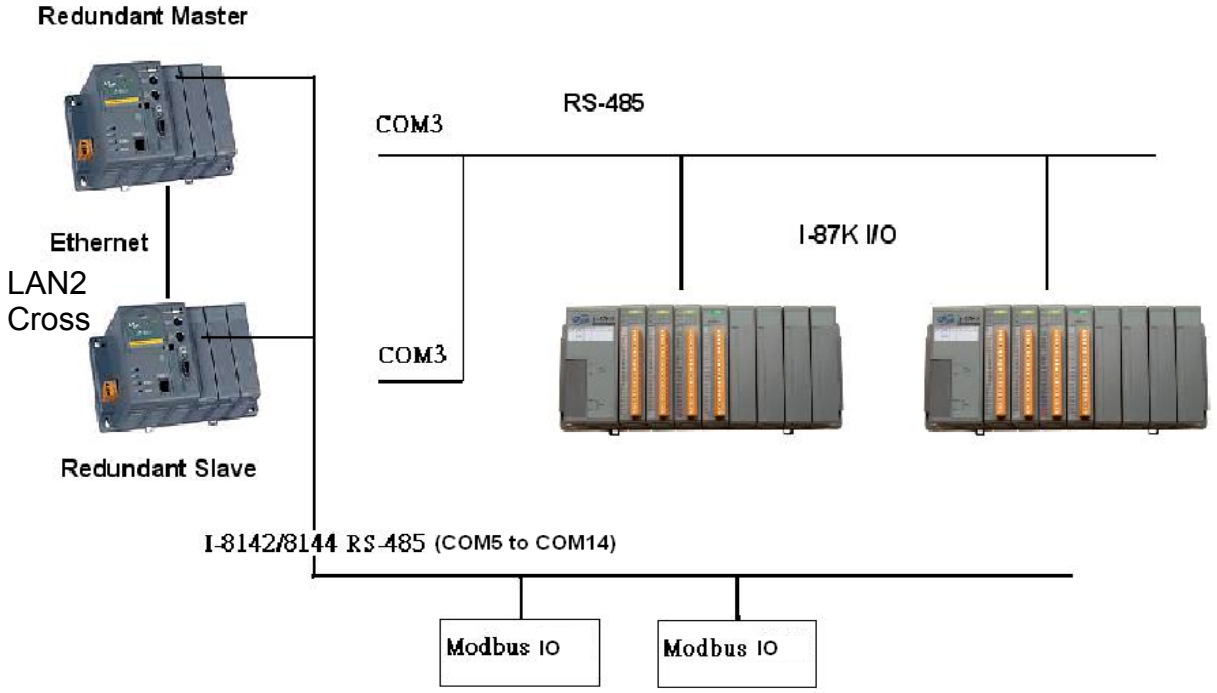
Modbus TCP/IP	Supports Modbus TCP/IP slave protocol for ISaGRAF & PC/HMI.
Web HMI protocol	Ethernet port for connecting PC running Internet Explorer
I-7000 & I-87K Remote I/O	COM3 supports I-7000 I/O modules & (I-87K base + I-87K serial I/O boards) as remote I/O. Max. 255 I-7000/87K remote I/O modules for one controller
M-7000 series Modbus I/O	Max. 10 R-485 ports – COM3 & (COM5 to COM14 if I-8142/8142i/8144 are found) can support M-7000 series Modbus I/O. Each port can connect up to 247 M-7000 Modules.
Modbus master protocol (multi-port)	Supports multi-ports of Modbus RTU / ASCII master protocol to connect to other Modbus slave devices. COM2,COM3,(or COM4 to COM14 if I-8112/8114/8142/8142i/8144 are found)
Ebus	to exchange data between ICP DAS's ISaGRAF Ethernet controllers via Ethernet port.
SMS: Short Message Service	One of COM2 (or COM5 if I-8112/8114 is found) can link to a GSM modem to support SMS. User can request data/control the controller by cellular phone. The controller can also send data & alarms to cellular phone. Optional GSM modems: M1206 or GM29 (GSM 900/1800)
User defined protocol	User can write his own protocol applied at COM2, COM3, (& COM5 to COM14 if multi-serial port boards are plugged) by serial communication function blocks.
Modem_Link	COM2 supports PC remotely download & monitor the controller through a normal modem.
MMICON / LCD	COM2 (or COM5 if I-8112/8114 is found) supports ICP DAS's MMICON. The MMICON is featured with a 240 x 64 dot LCD & a 4 x 4 Keyboard to display picture, string, integer, float, & input a char, string, integer & float.
Deliverngi Message	Ethernet port can setup to send/receive message via UDP/IP protocol to commnunicate with PC or other device.
Redundant Solution	Two controllers to be one redundant system. One is redundant Master, one is redndant slave. Master handles all inputs & outputs of the remote RS-485 I/O (I-7k & I-87K) at run time. If master is dead, Slave will take over the control of remote I/O. All Outputs should be configured as RS-485 remote I/O. Inputs can locate at slot 1 to 7 or configured as RS-485 remote I/O. Change Over Time: <= 500 ms, Synchronization: <= 75ms
Battery Backup SRAM	W-8337/8737 supports up to 4096 retain variables with a S256/S512 plug in the socket of the new back-plane(ver. 3-slot:2.6 , 7-slot:2.8). Optional: S256: 256kbytes, S512: 512kbytes Note: W-8037 doesn't support S-256 / S-512
File Access	The Compact Flash card can be used for storing run time data & any controller setting with file operation (by f_xxx function block). The CF card size default is 128Mbytes, can be more.

Chapter 1: Typical Application

1.1: Redundant System: Two Wincon-8x47/8x46

Redundant with RS-485 I-7000 & I-87K modules:
- At least one RS-485 I-7000 or I-87K module should be used.
- All Output channels should be at RS-485 I-7000 & I-87K modules.
- Input channel can locate at Slot 1 to 7 or at RS-485 I-7000 & I-87K IO.

Redundant with Modbus device & RS-485 I-7000 & I-87K modules:
- At least one RS-485 I-7000 or I-87K module should be used.
- All Output channels should be at Modbus devices or RS-485 I-7000 & I-87K modules.
- Input channel can locate at Slot 1 to 7 or at Modbus devices or RS-485 I-7000 & I-87K IO.



Note: Please refer to Chapter 20 of the ISaGRAF User's Manual for more information.

1.2: Delivering Message Via UDP

Wincon-8x36/8x37 or Wincon-8x47/8x46

• Each Wincon can send string to other Local or Internet IP, Can send to max. 4 IP

• Each Wincon can receive string from remote IP, storing strings in the buffer, then pull out each one by one (First In, First Out)

• Using UDP/IP, Can be “PC <--> Wincon” or “Wincon <--> Wincon” or “Wincon <--> other device which supports UDP”

• Easy to program in ISaGRAF software by using “UDP_send” & “UDP_recv” functions. Users don’t need to care about the ethernet communication.

• Wincon may send the received string to other device via RS232/485/422.

Note: Please refer to Chapter 19.2 of the ISaGRAF User’s Manual for more information.

1.3: Get Clear Temperature value of temperature IO

ICPDAS provides many temperature input modules as below.

With “broken-line detection” or called “wire opening detection”
Thermocouple type: I-87018R, 87019R, 7018R, 7018BL, 7019, 7019R
RTD type: I-87013, 87015, 7013, 7015, 7033
Thermister type: I-87005, 7005

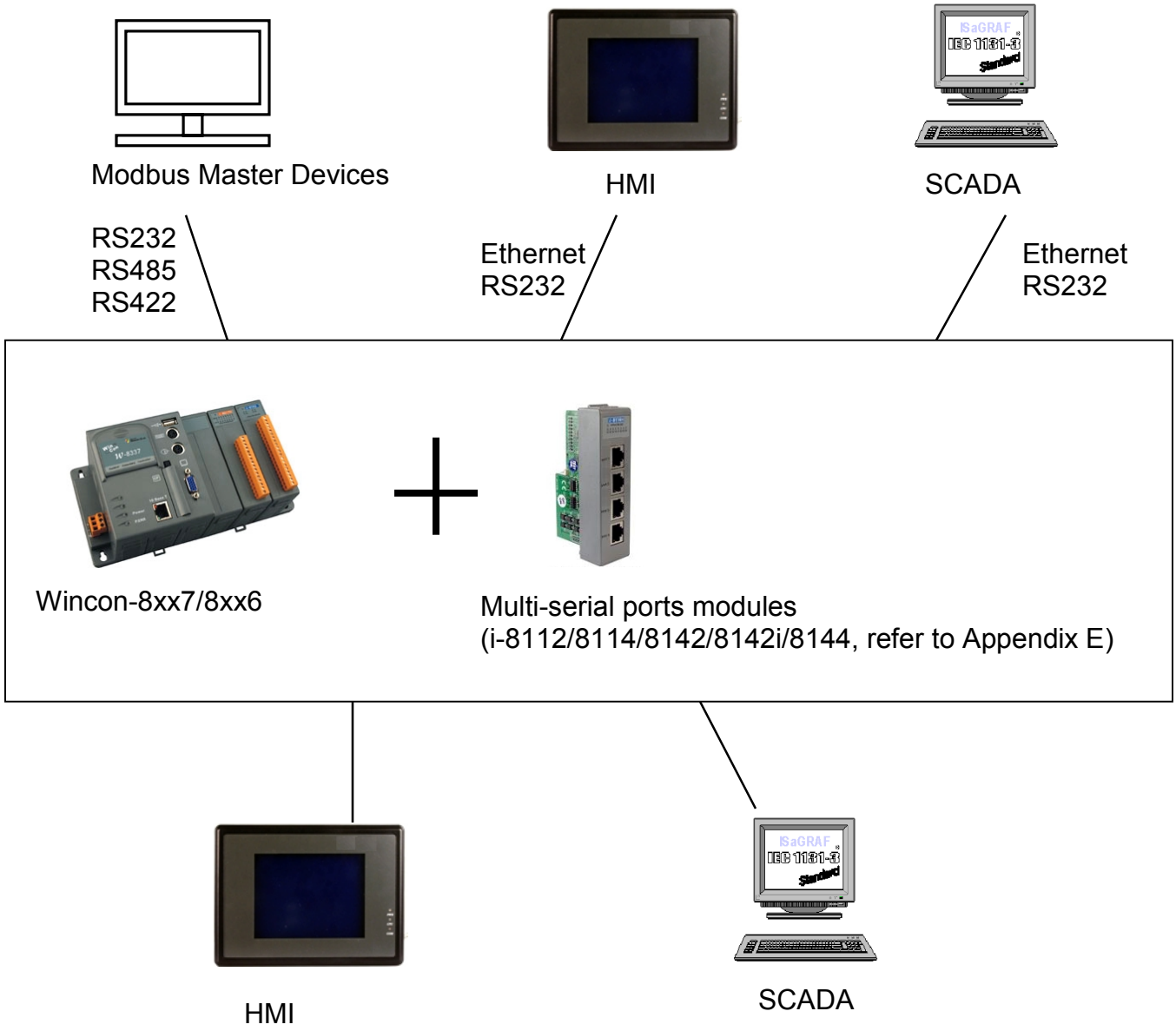
Without “broken-line detection”
Thermocouple type: I-87018, 7018, 7018P

User can directly get a clear temperature integer value in “Degree Celsius” or “Degree Fahrenheit”, **for example “2567” means 25.67 Degree**. Please refer to **Chapter 3.2.2 & 6.3.2** of the ISaGRAF User’s Manual for more information

1.4: Up To 5 Modbus RTU Slave Ports (RS232, 485 or 422)

W-8xx7/8xx6 can support up to Five Modbus RTU slave ports at COM2 or COM3 (Or COM5, COM6, COM7, COM8 if I-8112/8114/8142/8142i/8144 is plug in slot 1 or slot 2)
(Please refer to Appendix G of this manual for more information)

W-8xx7/8xx6 also supports Modbus TCP/IP slave port. (Max. 8 Modbus TCP/IP connections)



1.5: Indusoft Web Feature in Wincon-8x36 / 8x46

Wincon-8x36 / 8x46 integrate the power of Indusoft HMI software and the ISaGRAF soft-logic.

User may design the HMI Application by Indusoft Development Kit, while plus the PLC logic by ISaGRAF workbench. Then running the HMI & logic application together in the same Wincon-8x36 / 8x46.

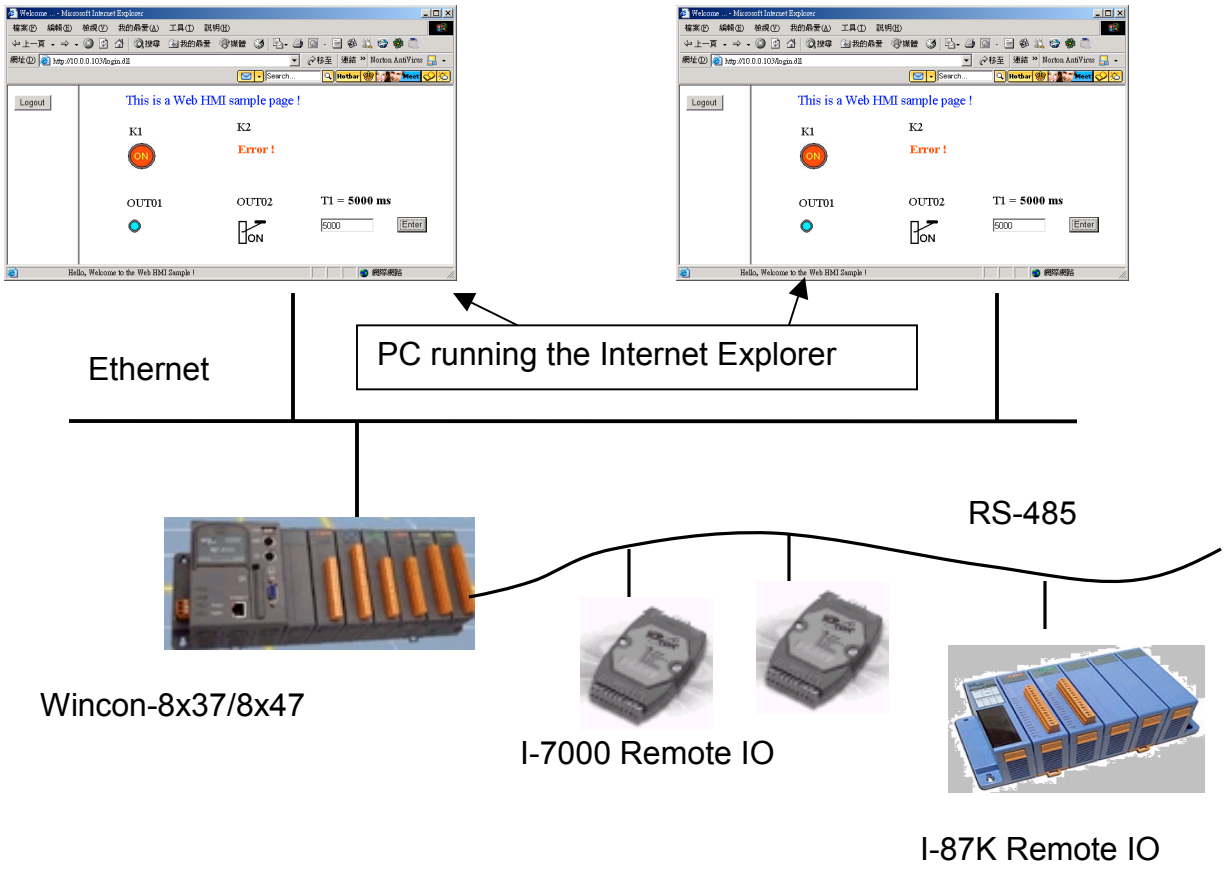
Moreover the W-8x36/ 8x46 support Indusoft's "Web Thin client" feature, that PC can run Internet explorer to monitor / control the W-8x36/ 8x46 on the Internet.
(No license fee charged in the PC , just running Internet Explorer)

Remote Visualization
(Web Thin Client)

Internet

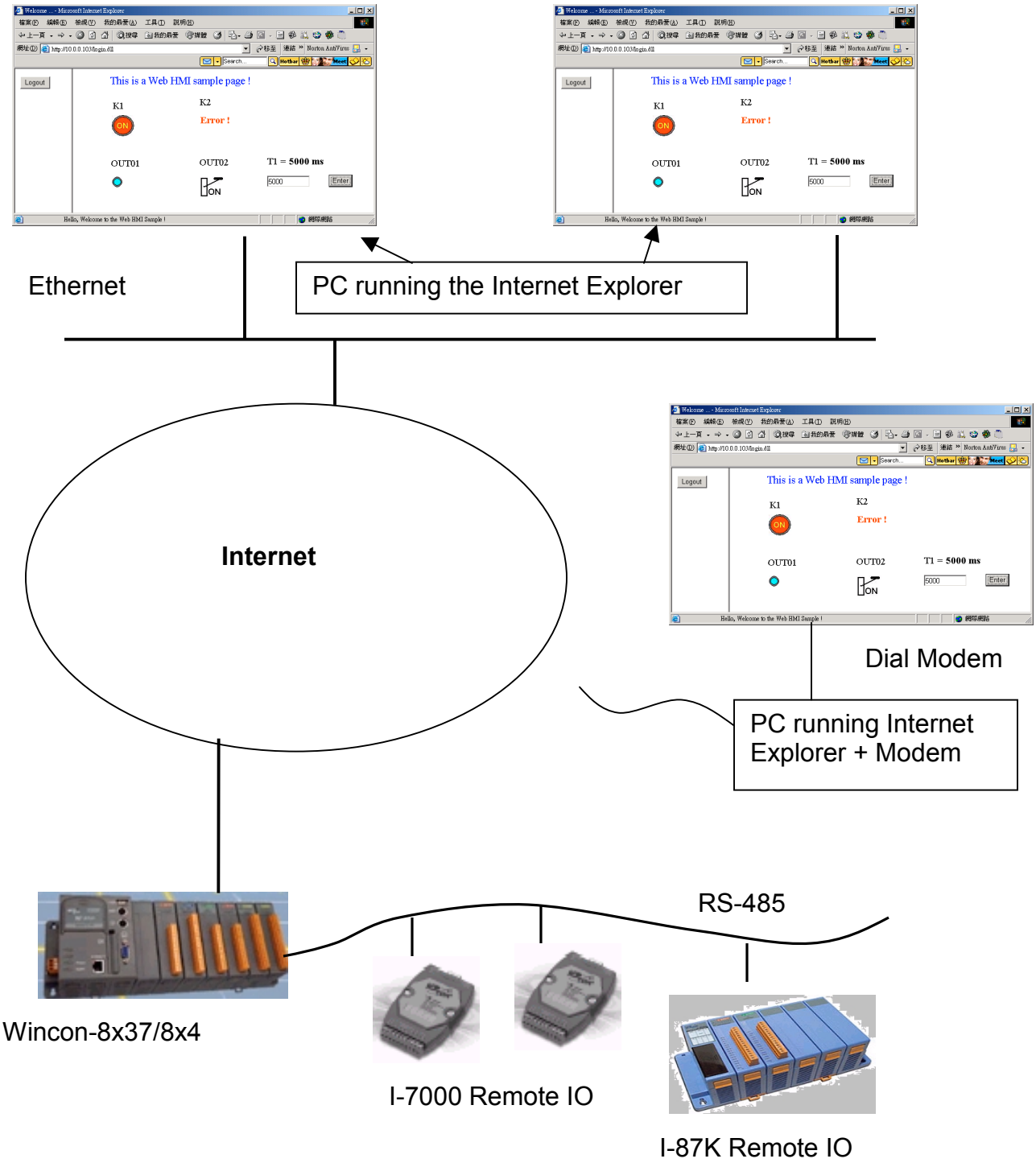
(Please refer to Chapter 8 of this manual for more information)

1.6: Wincon Web HMI On The Local Ethernet



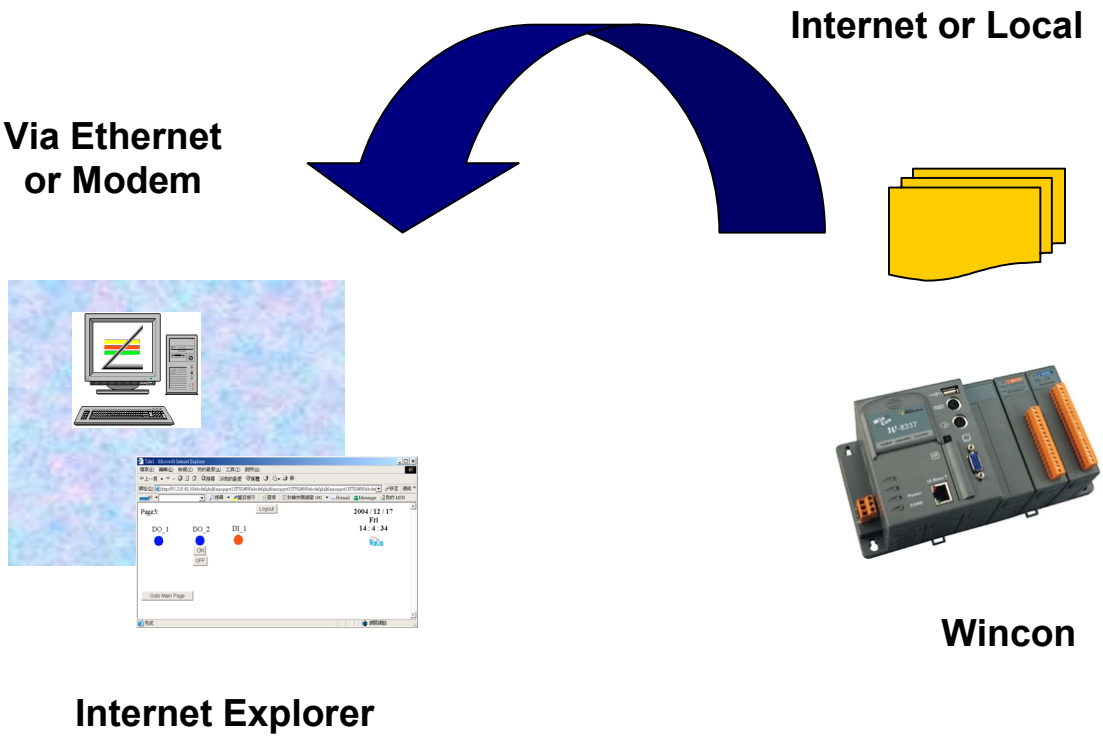
Free HMI.
No extra software to be installed on the PC.
Just Running Microsoft Internet Explorer.

1.7: Wincon Web HMI On The Internet



Monitoring & Control Everywhere !
Free HMI.
No extra software to be installed on the PC.
Just Running Microsoft Internet Explorer

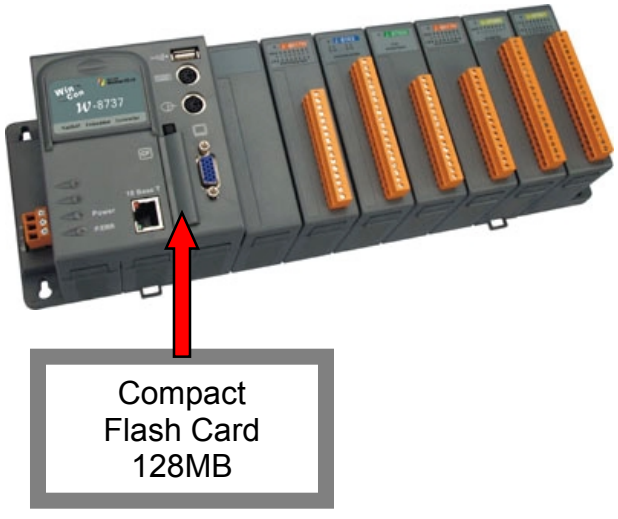
1.8: Download Data File From The Wincon Controller



1.9: PLC With Large Storage Memory

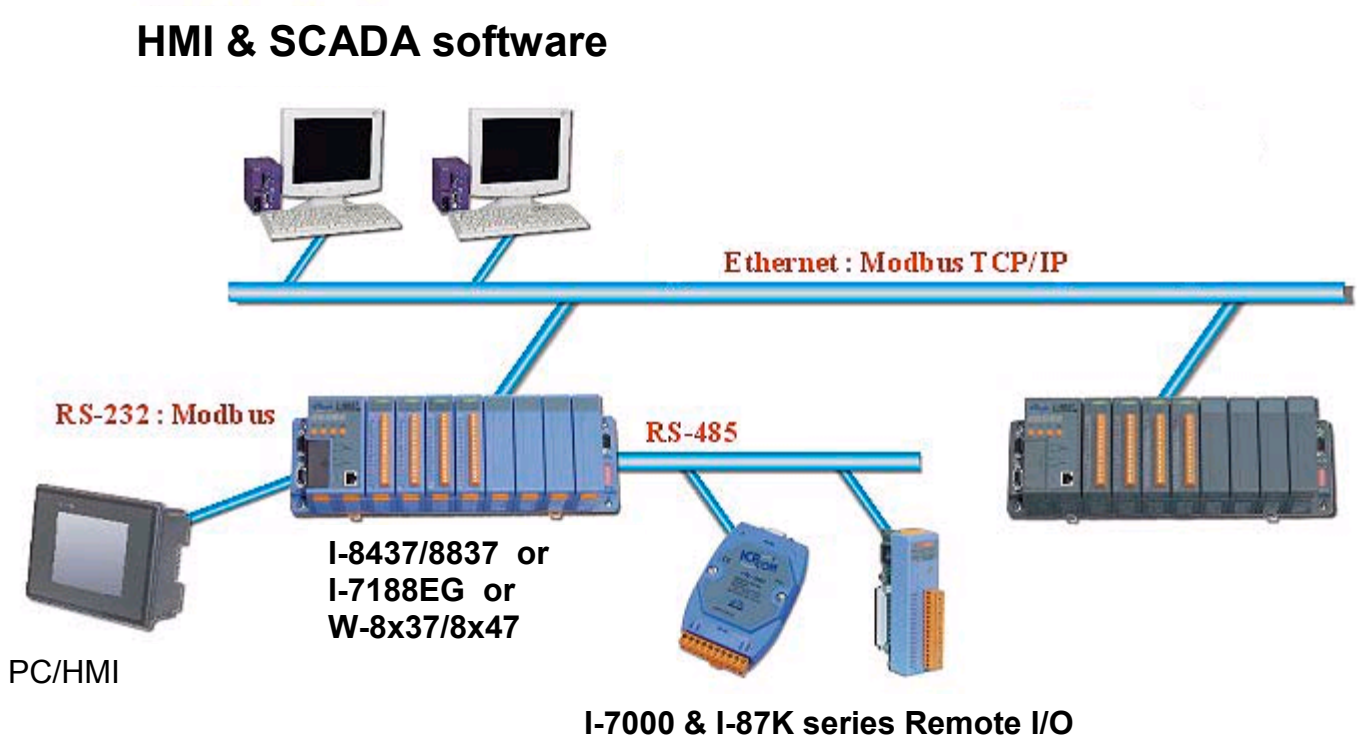
Supporting ISaGRAF IEC61131-3 programming language.
Data can save in the Compact Flash Disk – 128MB or more.

W-8x37/8x47



IEC61131-3 Standard
Ladder, SFC, ST, FBD, IL & FC

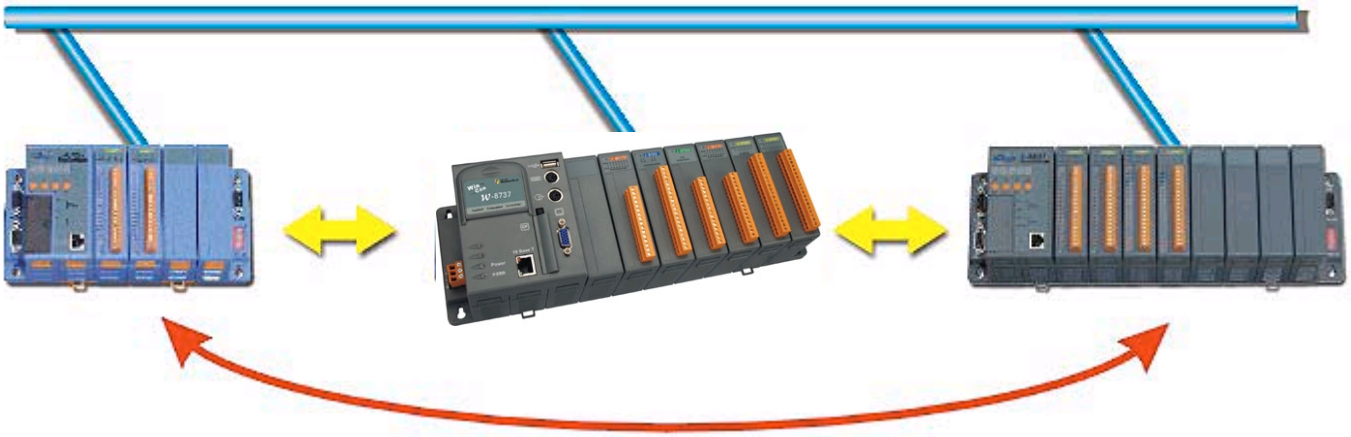
1.10: Multi-HMI & Remote I/O



1.11: SMS

1.12: Data Exchange through Ethernet & RS485

Controller to controller data exchange
Ethernet: W-8x37/8x47, I-8437/8837 & I-7188EG
RS485: I-8417/8817/8437/8837, I-7188EG & I-7188XG



1.13: Motion Control

One I-8091 can control 2-axes: X-Y plane, or 2 axes independent
Two I-8091 can control 4-axes: X-Y plane + 2 axes independent, or 4 axes independant

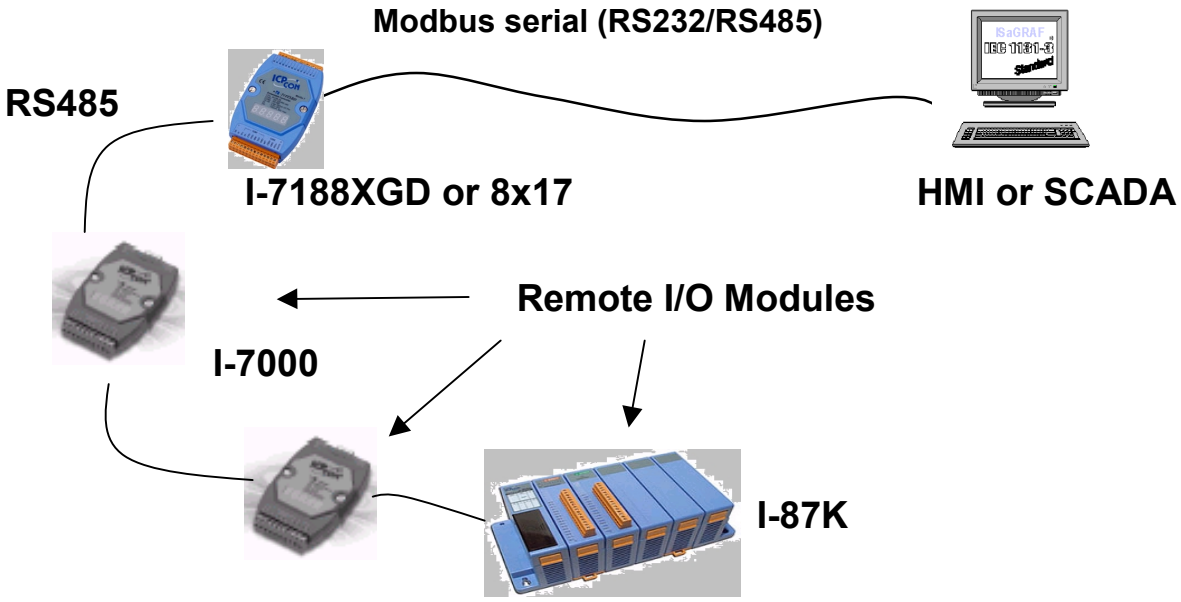
Wincon-8x37/8x47

I-8091: 2 axes

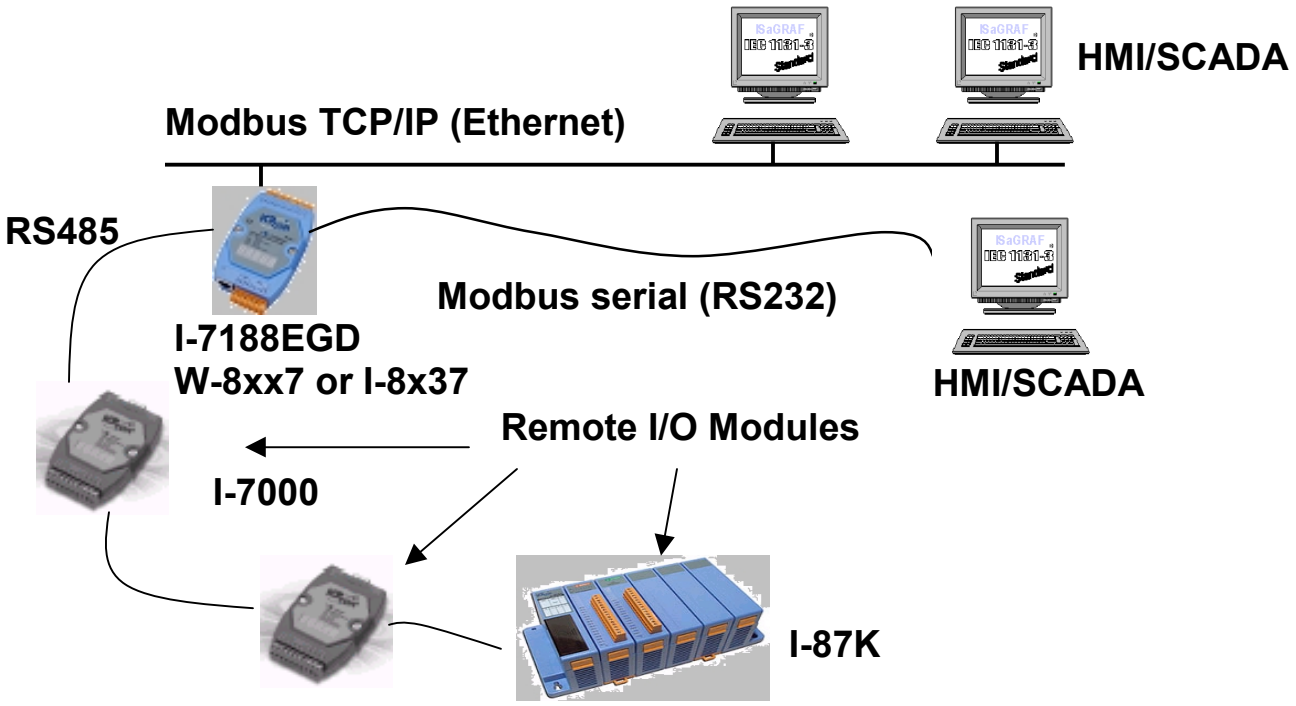
I-8090: 3 axes Encoder

1.14: Modbus Converter Of I-7000 & I-87K I/O

I-7188XG & I-8417/8817 can be a Modbus RTU serial converter of I-7000 & I-87K series I/O modules.

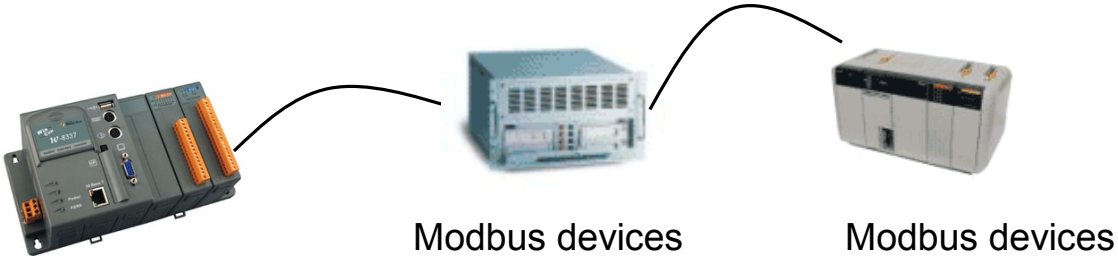


W-8x37/8x47, I-7188EG & I-8437/8837 can be a Modbus RTU serial & TCP/IP converter of I-7000 & I-87K series I/O modules.



1.15: Modbus Master (RTU or ASCII, RS232 or 485 or 422)

COM2:RS232 or COM3:RS485 (or COM5 to COM14 if i8112/8114/8142/8144/8142i is found in Slot 1 to 5) may link to other Modbus PLC or devices



1.16: Download & Monitoring Via Modem_Link

Chapter 2: Software Installation

Important: Please always set a **fixed IP** address to the Wincon. (No more DHCP)
Please always set W-8x47/8x46's LAN2 as disabled if not using it (refer to appendix D).
Please use NS-205 or NS-208 Industrial Ethernet Switch for Wincon-8x46/8x47.

Please refer to below location for detailed ISaGRAF English User's Manual.
Wincon ISaGRAF CD: \napdos\isagraf\wincon\english_manu\ "user_manual_i_8xx7.pdf"

NOTE:
W-8xx7 is the abbreviation for the W-8037/8337/8737 and W-8047/8347/8747 controller.
W-8xx6 is the abbreviation for the W-8036/8336/8736 and W-8046/8346/8746 controller.
W-8x37/8x36 is the abbreviation for the W-8037/8337/8737 and W-8036/8336/8736 controller.
W-8x47/8x46 is the abbreviation for the W-8047/8347/8747 and W-8046/8346/8746 controller.

The Wincon-8037/8337/8737/8036/8336/8736 & Wincon-8047/8347/8747/8046/8346/8746 supports ISaGRAF programming method & provides Web HMI solution by default.

If user prefer to program Wincon-8x37/8x47 by using Microsoft EVC++ 4.0 or VS.net 2003 (VB.net & C#.net) and access to the Web HMI, it is also possible. **In such a case**, user don't need to purchase any ISaGRAF Software(ISaGRAF-256-C or ISaGRAF-256-E). **Please refer to Chapter 10**.

If user would like to program W-8x37/8x47 by using both ISaGRAF & (EVC++ or VS.net), it is also possible. Please refer to Chapter 6 or Chapter 7.

2.1: Step 1 - Installing The ISaGRAF Software

The user has to install two kinds of software before he can program on the W-8x37/8x4 controller system. They are

A. **ISaGRAF Workbench** &
B. **ICP DAS Utilities For ISaGRAF**

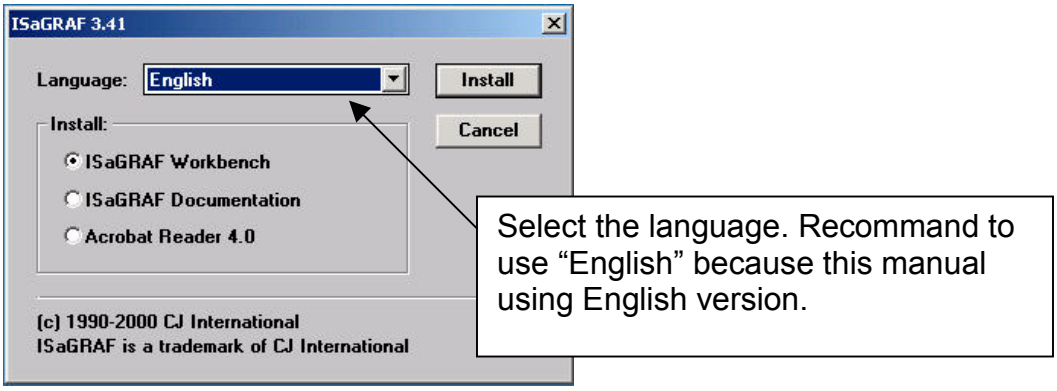
User has to purchase at least one pcs. of ISaGRAF (Ver. 3.4x or Ver. 3.5x ISaGRAF-256-E or ISaGRAF-256-C) to install on his PC to edit, download, monitor & debug the controller system. Item (B) is free and it is burned inside the CD-ROM which is delivered with the W-8x37/8x47.

Operating system Requirements:
One of the following computer operating systems must be installed on the target computer system before you can install the ISaGRAF Workbench software program.

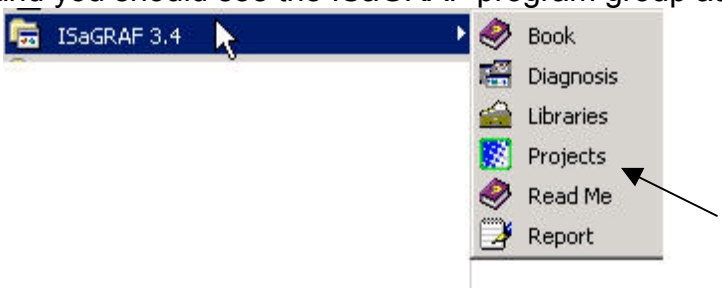
- Windows 95
- Windows 98
- Windows NT Version 3.51 or Windows NT Version 4.0
- Windows 2000 Or Windows XP

Steps To Installing The ISaGRAF Workbench:

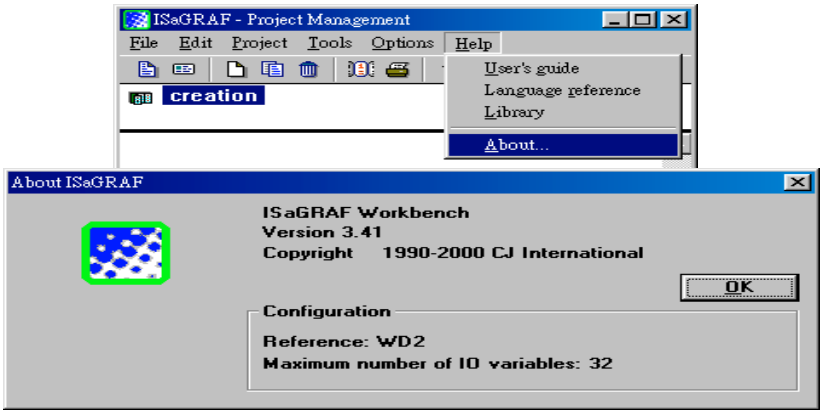
Insert the ISaGRAF Workbench CD into your CD-ROM drive. If your computer does not have the auto-start feature active, use the Windows Explorer and go to the CD-ROM drive where the Workbench CD is installed, then double-click on the "install.bat" file listed on the ISaGRAF CD. If the "install.bat" file is not found on your ISaGRAF CD, then double-click on the "ISaGRAF.exe" file to start the installation process.



To begin the ISaGRAF 3.x software program, click on the Windows "Start" button, then on "Programs", and you should see the ISaGRAF program group as illustrated below.



NOTE: You must install the hardware protection device (dongle) provided with the ISaGRAF software on your computers parallel port to for the ISaGRAF program to achieve fully authorized functionality.



While using ISaGRAF and the dongle is plugged well, if the “Help” – “About” says “Maximum number of IO variables: 32”, it means ISaGRAF workbench cannot find the dongle well. Please reset your PC and then check the “Help” – “About” again. If it still displays “Maximum number of IO variables: 32”, the dongle driver may not be installed well. Please execute the ISaGRAF

CD_ROM \Sentinel5382\setup.exe for ISaGRAF-80 or \Sentinel\setup.exe for other ISaGRAF version and then reset the PC again.

If your ISaGRAF Key-Pro is USB type, please follow below steps to install the proper USB driver.

1. To make your PC recognize the ISaGRAF USB protection-key, please **un-plug** the USB protection-key from your USB port first, then run "**\Sentinel\SSD5411-32bit.exe**" in the ISaGRAF 3.51 SP6 CD-ROM after you have installed the ISaGRAF. Then please reset your PC.
2. To run ISaGRAF Ver. 3.51,please always plug the USB protection-key in the PC's USB port.

Important Notice For Window NT Users
If your computer is using the Windows NT operating system, you will need to add one line to the "isa.ini" file in the ISaGRAF Workbench "EXE" subdirectory.

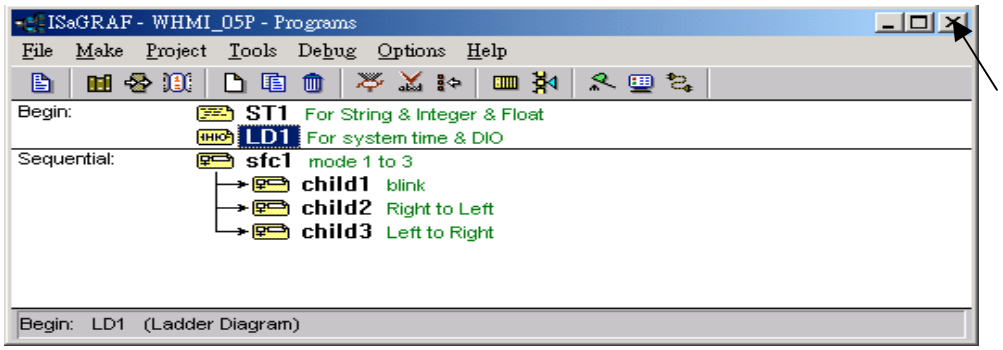
C:\isawin\exe\isa.ini

You can use any ASCII based text editor (such as Notepad or UltraEdit32) to open the "isa.ini" file. Locate the [WS001] header in the "isa.ini" initialization file (it should be at the top of the file). Anywhere within the [WS001] header portion of the "isa.ini" initialization file, add the entry shown below within the [WS001] header:

[WS001]
NT=1
Isa=C:\ISAWIN
IsaExe=C:\ISAWIN\EXE
Group=Samples
IsaApl=c:\isawin\smp
IsaTmp=C:\ISAWIN\TMP

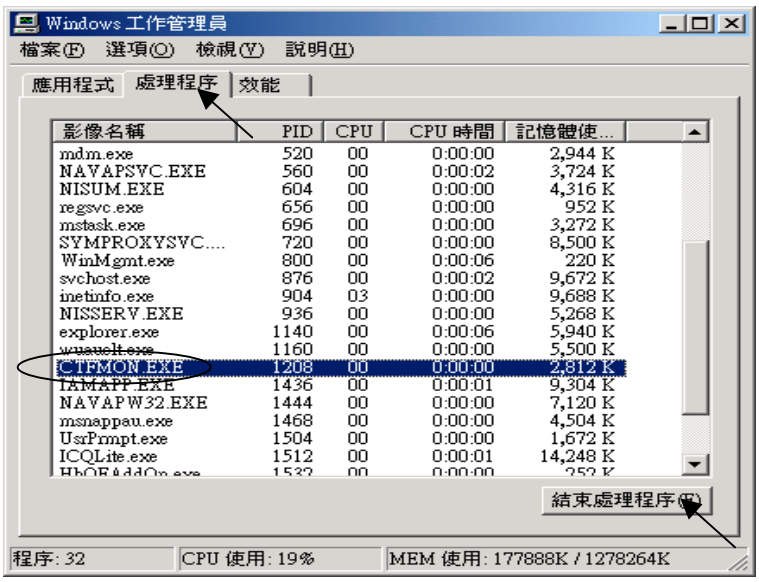
2.1.1: When closing my ISaGRAF window on windows 2000, it holds. Why ?

This problem usually happens on the windows 2000. When you close some ISaGRAF windows by clicking on the "X" , it holds about 20 to 40 seconds (No response).



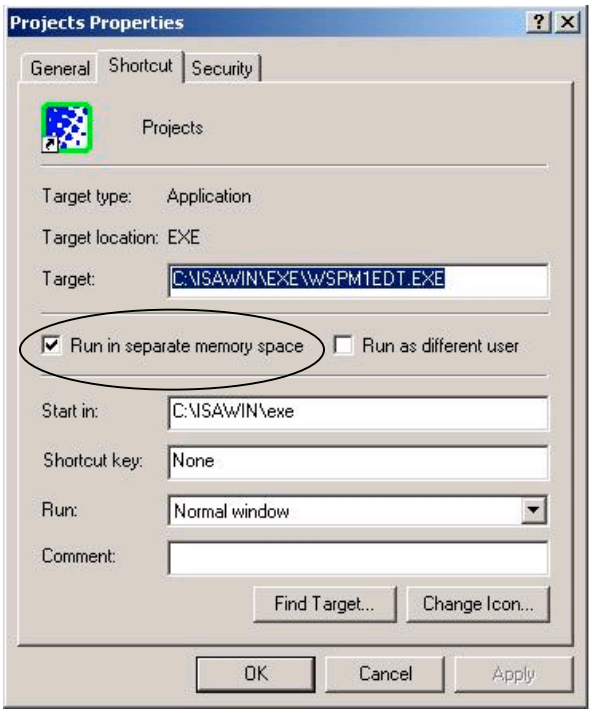
This “hold” behavior is caused by the “CTFMON.EXE” process. We still don’t know the reason yet. You may stop this process by click on the “Ctrl” & “Alt” & “Del” at the same time to open the window Task Manager, and then stop it as next page.

However you will find the “CTFMON.EXE” still load to run when you reboot your PC or run Microsoft Office. So you need to stop it every time when your windows 2000 is rebooted. If you want to know more about the “CTFMON.EXE”, please visit www.microsoft.com & search “CTFMON.EXE”.



2.1.2: One Quick way to avoid the “hold” problem on windows 2000.

You may create a short cut for the “ISaGRAF project manager. And then check on "run in separate memory space" option in the shortcut property.



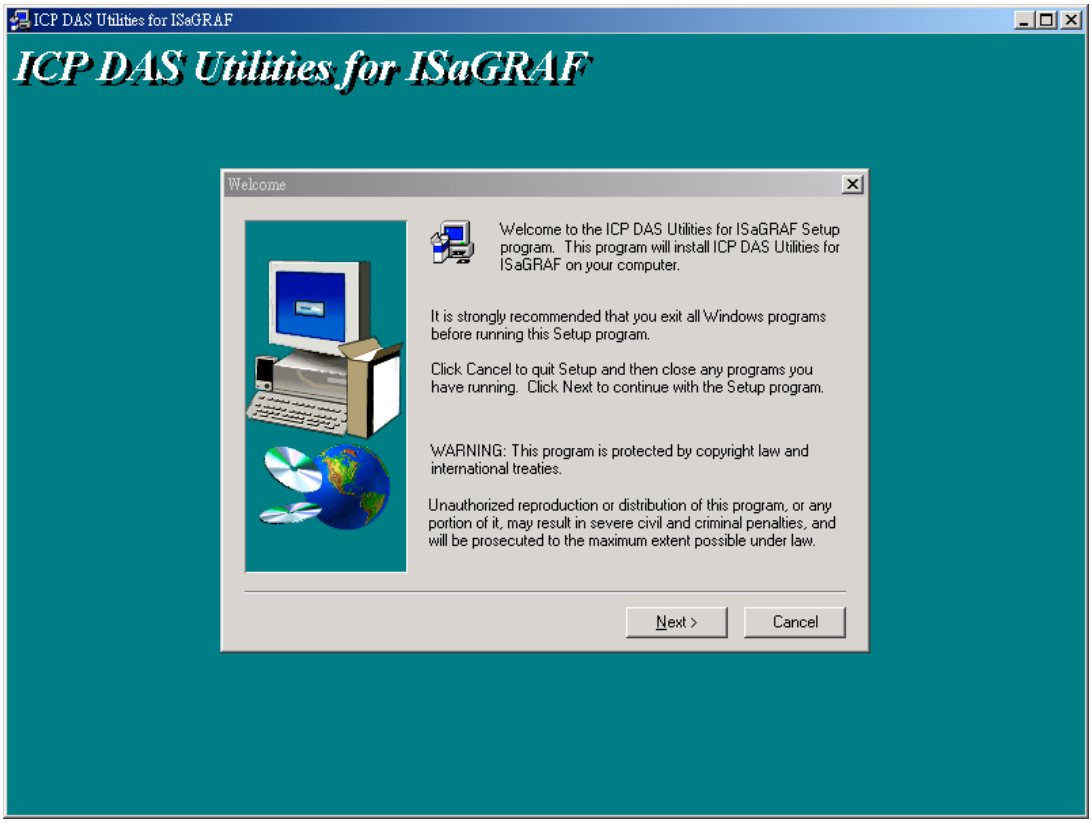
2.2: Step 2 - Installing The ICP DAS Utilities For ISaGRAF

The “ICP DAS Utilities For ISaGRAF” consists of 3 major items.

I/O libraries of I-8417/8817/8437/8837, I-7188EG, I-7188XG & W-8x37/8x47
Modem_Link utility
Auto-scan I/O utility

Note:
The ISaGRAF Workbench software program must be installed before attempting to install the “ICP DAS Utilities for ISaGRAF”. If you have not already installed the ISaGRAF Workbench program, please refer to **step 1** before continuing.

There is a CD-ROM supplied with each of the W-8x37/8x47 controllers with the “ICP DAS Utilities for ISaGRAF”. Please insert the CD-ROM into your CD-ROM drive. Then run **CD-ROM: \napdos\isagraf\setup.exe** . Follow the steps to install it.



Note:
If “ICP DAS Utilities for ISaGRAF” is not in your CD-ROM, please download “**ICP DAS Utilities For ISaGRAF.zip**” from http://www.icpdas.com/products/PAC/i-8000/isagraf.htm.

2.3: Step 3 - Installing The Web Page Editor

This is an option. You may not need it if you are very familiar with the HTML design. It is also possible to use any text editor to build web pages. For example, “Notepad” on the windows 2000 or XP.

We will use “Microsoft Office FrontPage 2003” (or higher version) to build web pages in this manual.

User may choose your prefer web page editor to do the same thing.

Chapter 3: Setting Up A Web HMI Demo

Important: Please always set a **fixed IP** address to the Wincon. (No more DHCP)
Please always set W-8x47/8x46's LAN2 as disabled if not using it (refer to appendix D).
Please use NS-205 or NS-208 Industrial Ethernet Switch for Wincon-8x46/8x47.

3.1: Web Demo List

The Web page location:
Wincon ISaGRAF CD-ROM: \napdos\isagraf\wincon\WebHMI_Demo\

The respective ISaGRAF project location:
Wincon ISaGRAF CD-ROM: \napdos\isagraf\wincon\demo\

New demo will be found at http://www.icpdas.com/products/PAC/i-8000/isagraf.htm

Demo list:

Name	Description	IO board
sample	A Web HMI sample	No I/O board
example1	A simple example listed in Chapter 4	slot 1: I-8077
whmi_01	Display controller's date & time	No I/O board
whmi_02	DI & DO demo	slot 1: I-8077
whmi_03	Read / Write Long, float & Timer value	No I/O board
whmi_04	Read / Write controller's String	No I/O board
whmi_05	Multi-Pages demo (slot 1: I-8077) Page menu is on the Left	slot 1: I-8077
whmi_05a	Multi-Pages demo (slot 1: I-8077) Page menu is on the Top	slot 1: I-8077
whmi_06	AIO demo, scaling is in ISaGRAF	slot 2: I-87024 slot 3: I-8017H
whmi_07	AIO demo, scaling is in PC	slot 2: I-87024 slot 3: I-8017H
whmi_08	download controller's file to PC	slot 1: I-8077
whmi_09	pop up an alarm window on PC	slot 1: I-8077
whmi_11	Trend curve.	slot 2: I-87024 slot 3: I-8017h

3.2: Steps To Set Up A Web HMI Demo

3.2.1: Step 1 - Setup The Hardware

A. Please have a W-8337/8737 or W-8347/8747 & plug one I-8077 board in its slot 1.

If you don't have the I-8077 (8 IN & 8 OUT simulation board), please follow the same steps as below however your Web HMI demo may be replaced to "whmi_01" not "whmi_05"

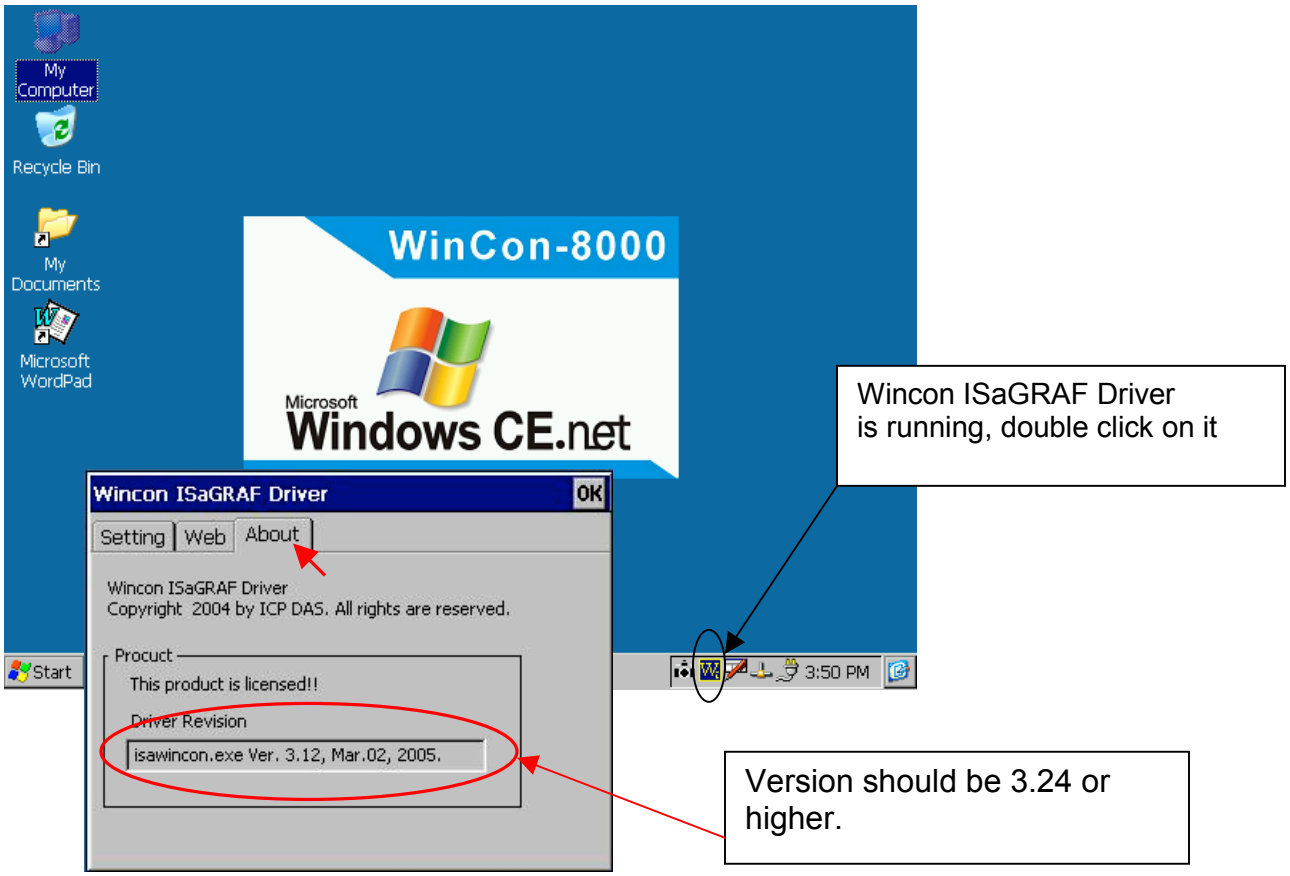
B. Prepare one VGA monitor, one USB mouse, one Keyboard and one ethernet cable and then connect them to the Wincon.

C. Power the Wincon up.

3.2.2: Step 2 - Make Sure The Right ISaGRAF Driver Installed

To run a Web HMI Demo, please make sure the ISaGRAF driver installed in the Wincon-8x37/8x47 is version 3.24 or high. If the version is lower than 3.24, please upgrade it. The procedure is listed in Appendix B or in the CD-ROM:
Wincon ISaGRAF CD: \napdos\isagraf\wincon\english_manu\ "Update_w8xx7.pdf"

Note: If you have upgraded the driver, please recycle the power of your Wincon.

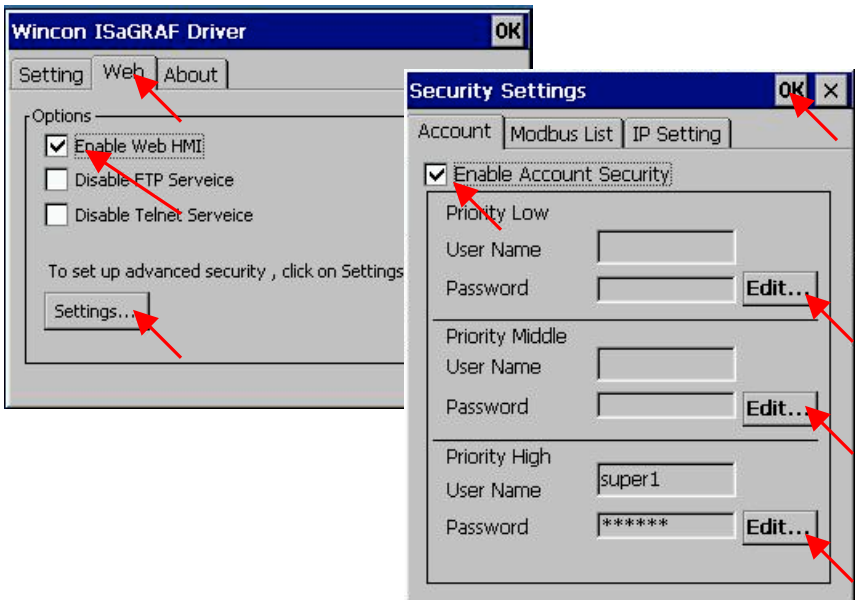


3.2.3: Step 3 - Setting The Web Options

A. Please set a **fixed IP** address to the Wincon. (No more DHCP)

B. Check on “Enable Web HMI” and then click on “Setting”, Please check on “Enable Account Security” and then click on “Edit” to set (username , password). **Then remember to click on “OK”**

Note: If “Enable Account Security” is not check, any user can easily get access to your Wincon through the Internet Explorer.



3.2.4: Step 4 - Download ISaGRAF Project

Please download ISaGRAF project “whmi_05” to the W-8X37/8X47. This project is in the CD-ROM:\napdos\isagraf\wincon\demo\ “whmi_05.pia”

whmi_05 demo need one I-8077.If you don’t have the I-8077 (8 IN & 8 OUT simulation board), you may download “whmi_01” (CD-ROM:\napdos\isagraf\wincon\demo\ “whmi_01.pia”)

If you know how to restore “whmi_05.pia” to your ISaGRAF Workbench and download it to the controller, please go ahead to section 3.2.5.

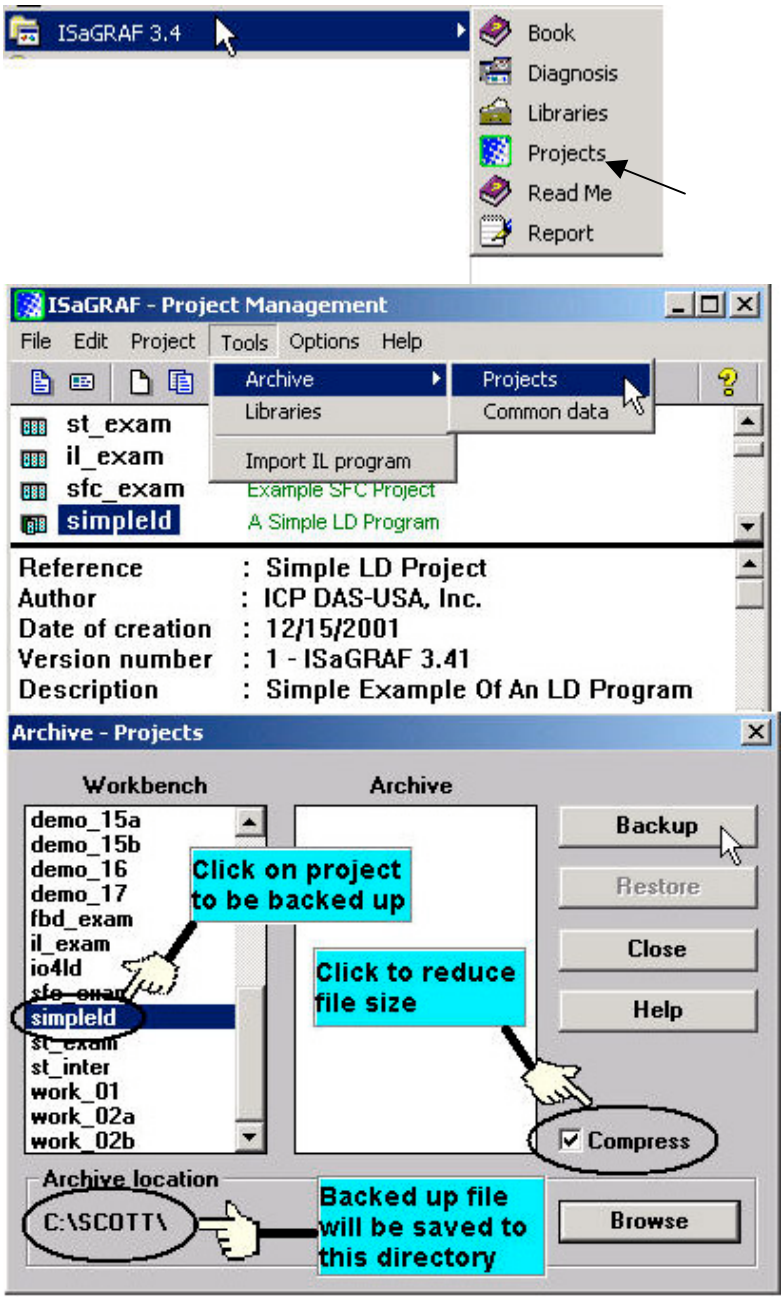
However if you don’t know it, please refer to the below steps. Please make sure the ISaGRAF Workbench is already installed to your PC. (refer to section 2.1 & 2.2)

Steps To Backing Up & Restoring An ISaGRAF Project:

For archiving purposes you can "Back Up" and "Restore" an ISaGRAF project. For example, you may want someone to test your program or email to service@icpdas.com for ICP DAS’s ISaGRAF technical service.

Backing Up An ISaGRAF Project

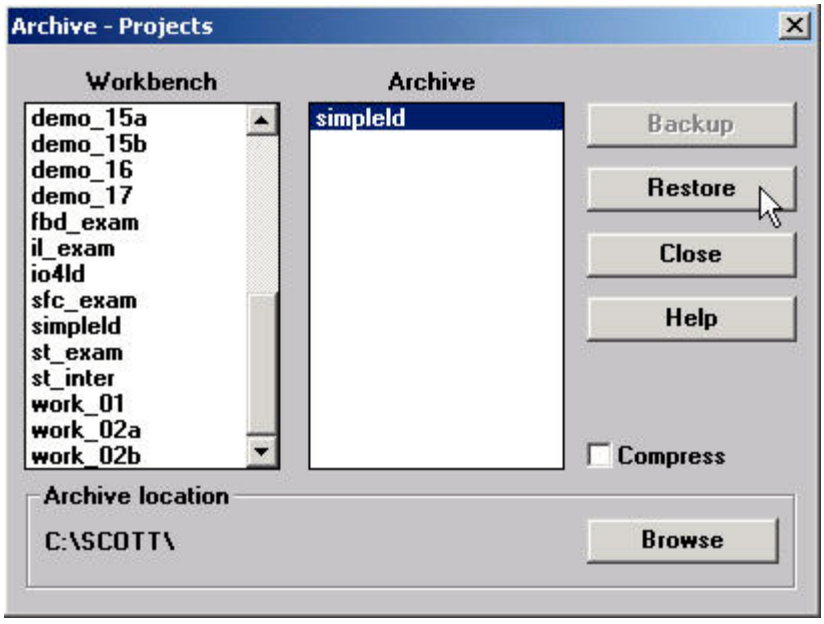
Open the "ISaGRAF Project Management" , select "Tools" from the menu bar, click on "Archive", and then click on "Projects". An "Archive Projects" window will open which allows you to designate where you want to save the ISaGRAF project to. Click on the name of the ISaGRAF project you want to backup, and then click on the "Backup" button. You can compress the size of the file you have backed up by clicking on the "Compress" checkbox BEFORE you click on the "Backup" button.



You will now find the backed up ISaGRAF project file in the "Archive" location you have designated. In the example above, the name of the backed up file is "simpleld.pia".

Restoring An ISaGRAF Project

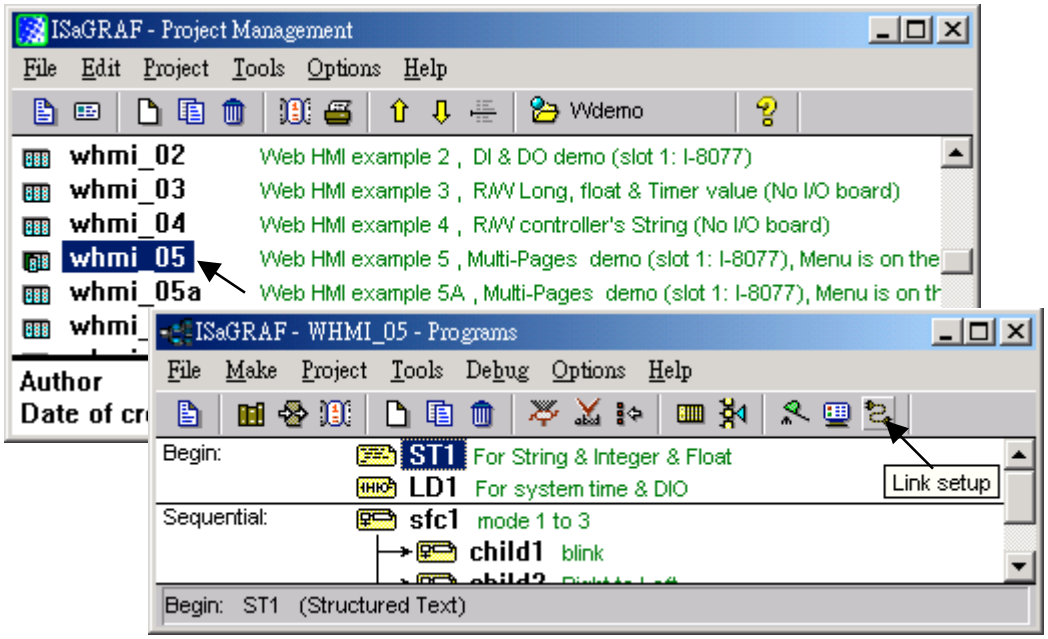
To restore an ISaGRAF project from a backed up file(*.pia), use the same method as above to access the "Archive Projects" window, click on the name of the project you want to restore from the "Workbench" window, then click on the name of the backed up file from the "Archive" window, then click on the "Restore" button. The ISaGRAF project will now be restored to the sub-directory you designated.



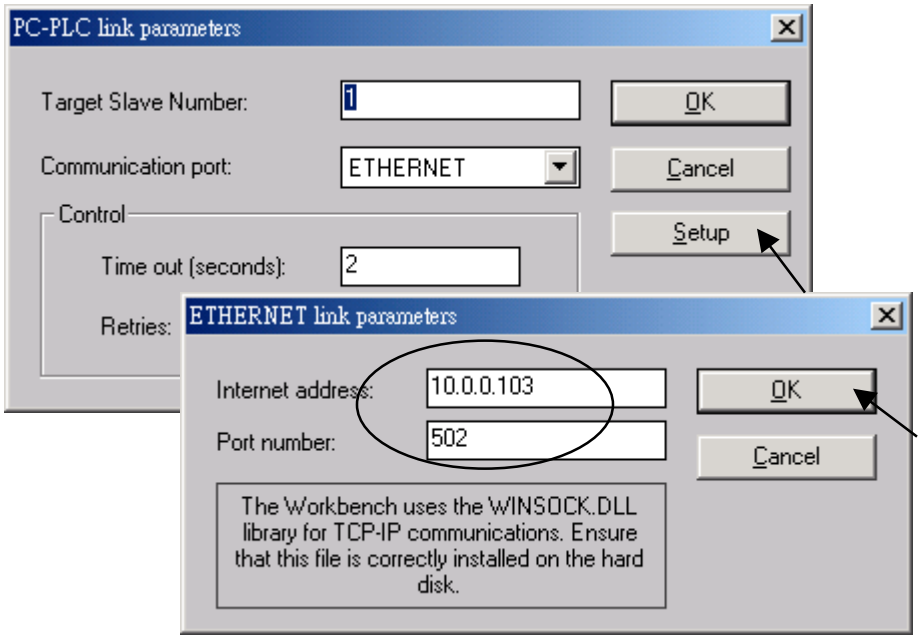
You can now open, edit and download the restored ISaGRAF project file.

3.2.4.1: Steps To Download a ISaGRAF Project To The Controller:

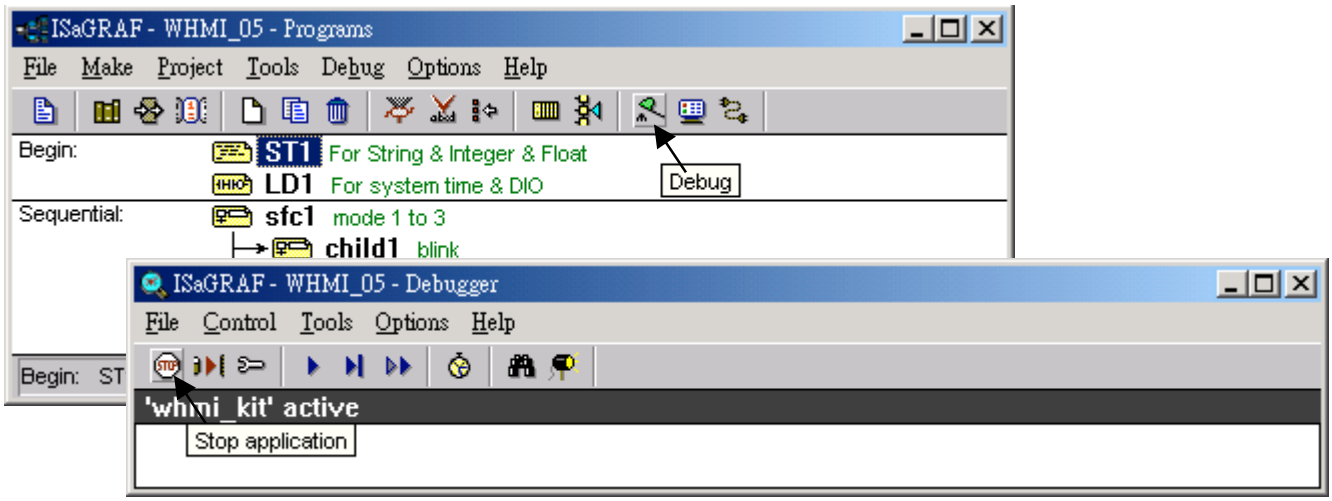
Double click on the “whmi_05” to get into the project. Then click on “Link setup” .



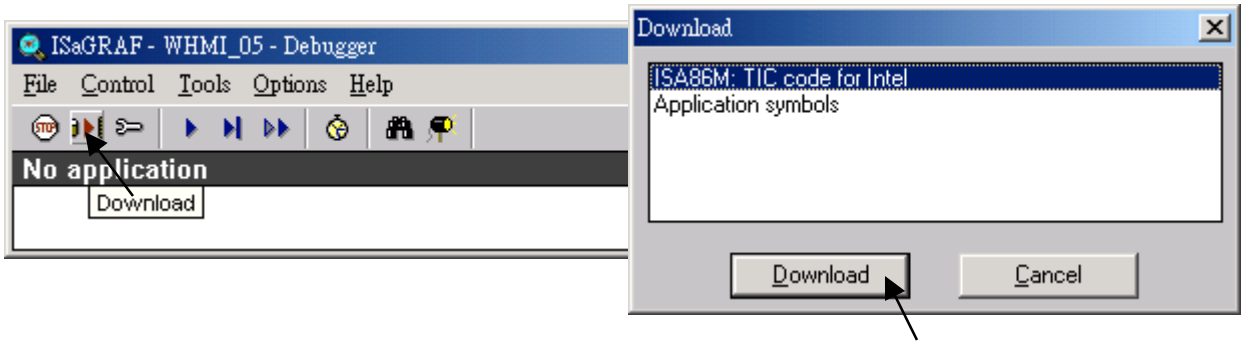
Click on “Setup” first and then entering the IP address of your controller. The port number should be 502.



To download “whmi_05” project to the Wincon-8xx7, Click on “Debug” . If the communication is established, click on “stop” first to stop the old project running in the W-8xx7.



Then click on “Download” to download it to the controller.



3.2.5: Step 5 - Download Web Pages To The Wincon

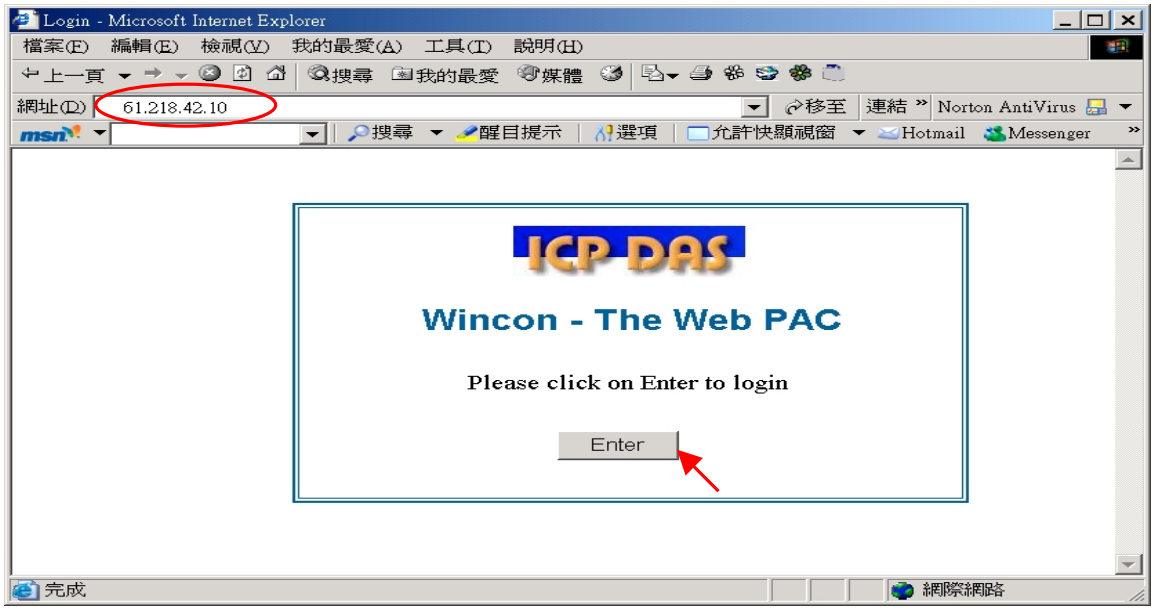
Please copy all files in the CD-ROM:
Wincon ISaGRAF CD: \napdos\isagraf\wincon\WebHMI_demo\whmi_05\ *.*
to the W-8X37/8X47's CompactFlash\Temp\HTTP\WebHMI\

whmi_05 demo need one I-8077.If you don't have the I-8077 (8 IN & 8 OUT simulation board), you may download "whmi_01" (CD-ROM:\napdos\isagraf\wincon\WebHMI_demo\whmi_01\)

B. Since the Web Pages are modified or new copied, please run "rs_whmi.exe" to reset the Web server. **The "rs_whmi.exe" must be run every time when user has modified any file in the W-8xx7's CompactFlash\Temp\HTTP\WebHMI**

3.2.6: Step 6 - Show Time

Please run Internet Explorer (Rev. 6.0 or higher), key in the IP address of your W-8xx7. For example: 61.218.42.10 or http://61.218.42.10



Chapter 4: Programming A Web HMI Example

Important: Please always set a **fixed IP** address to the Wincon. (No more DHCP)
Please always set W-8x47/8x46's LAN2 as disabled if not using it (refer to appendix D).
Please use NS-205 or NS-208 Industrial Ethernet Switch for Wincon-8x46/8x47.

This chapter show you how to build a simple ISaGRAF project and its Web HMI pages.

Please refer to CD-ROM: \napdos\isagraf\wincon\english_manu\ "user_manual_i_8xx7.pdf" - Section 2.1 for detailed ISaGRAF programming basics.

The Wincon-8xx7 supports ISaGRAF programming method & provides Web HMI solution by default.

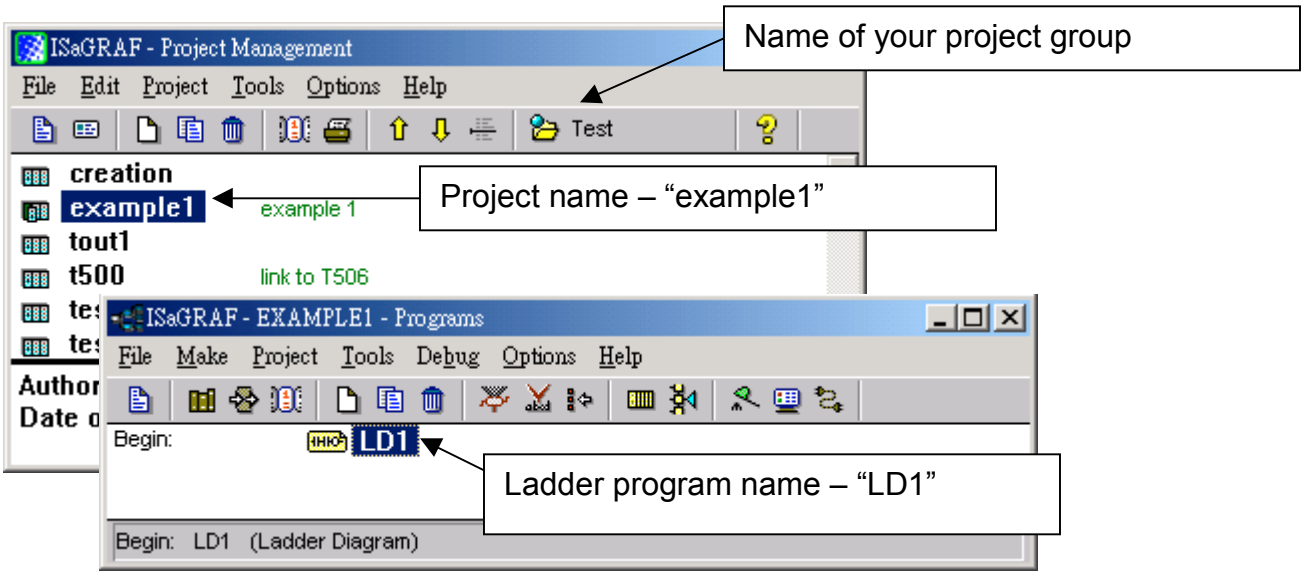
If user prefer to program Wincon-8xx7 by using Microsoft EVC++ 4.0 or VS.net 2003 (VB.net & C#.net) and access to the Web HMI, it is also possible. **In such a case**, user don't need to purchase any ISaGRAF Software(ISaGRAF-256-C or ISaGRAF-256-E). **Please refer to Chapter 10**.

If user would like to program W-8xx7 by using both ISaGRAF & (EVC++ or VS.net), it is also possible. Please refer to Chapter 6 or Chapter 7.

4.1: Writing A Simple ISaGRAF Program

We are going to use ISaGRAF Workbench to write a simple ISaGRAF example program, then download it to the W-8xx7 controller (with one **I-8077** I/O board in it) to make it work. If you havn't installed "ISaGRAF" & "ICP DAS Utilities for ISaGRAF", please back to chapter 2.

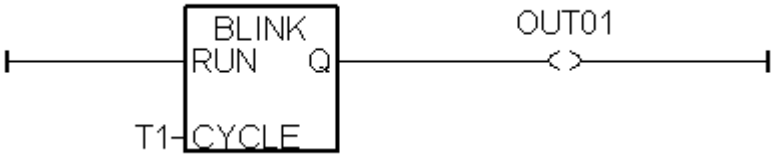
This example contains one Ladder program.



Variables declaration:

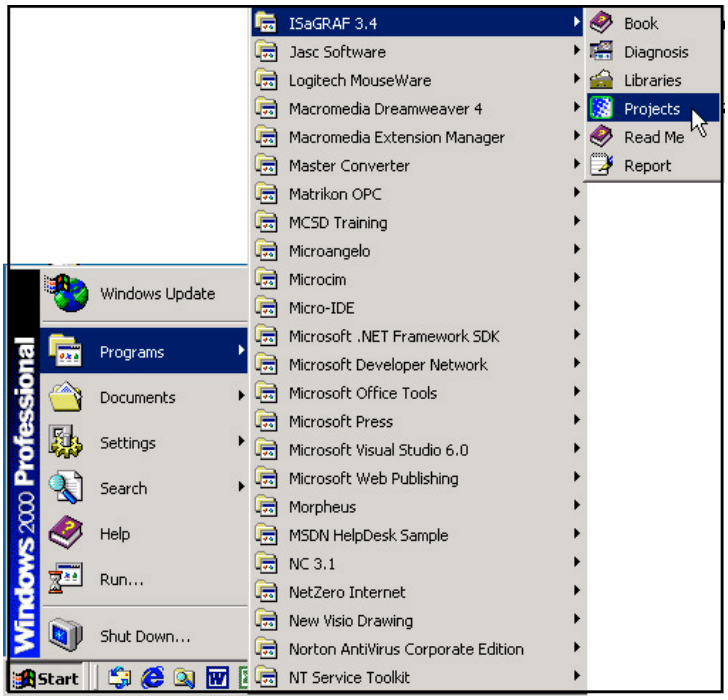
Name	Type	Attribute	Description
OUT01	Boolean	**Output**	Output 1 in the I-8077 board, Modbus network addr = 1
OUT02	Boolean	**Output**	Output 2 in the I-8077 board, Modbus network addr = 2
K1	Boolean	**Input**	Input 1 in the I-8077 board, Modbus network addr = 11
K2	Boolean	**Input**	Input 2 in the I-8077 board, Modbus network addr = 12
T1	Timer	**Internal**	Time Period of blinking, initial value set as T#8s Modbus network addr = 21

Ladder Logic Program Outline:



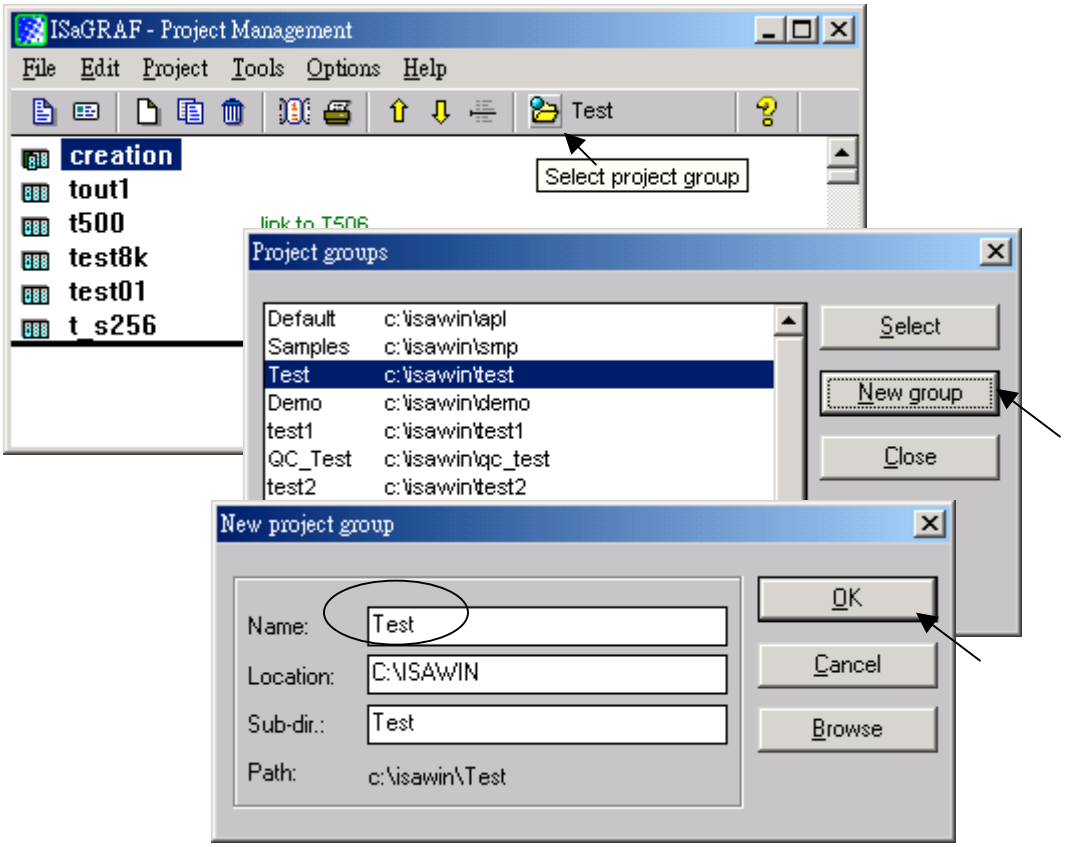
4.1.1: Open ISaGRAF-Project Management

Click on the Windows "Start" button, then click on "Programs", then click on "ISaGRAF 3.4", (or ISaGRAF 3.5) then click on "Projects" as shown below.



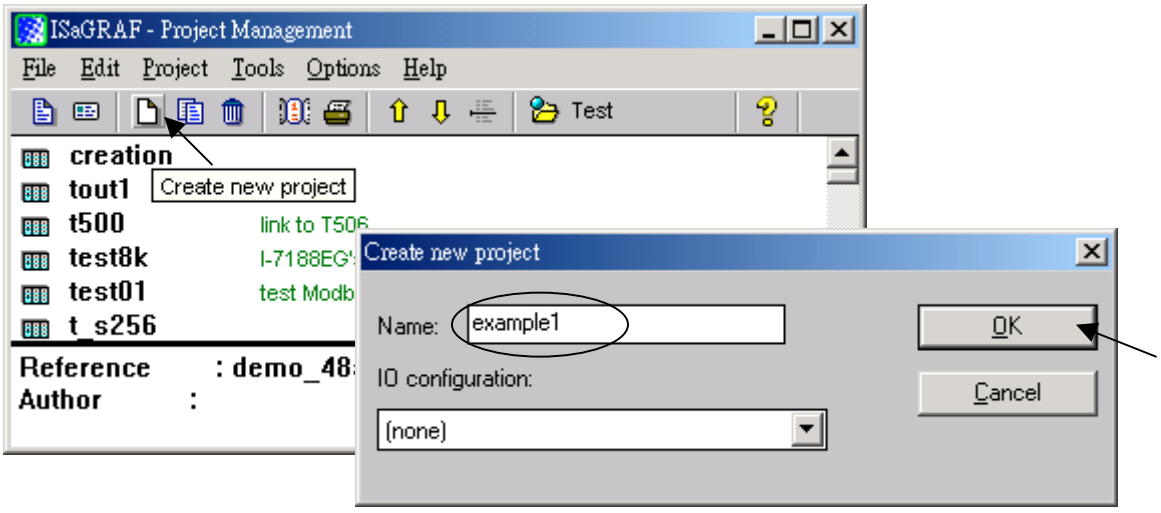
4.1.2: Creating An ISaGRAF User's Group

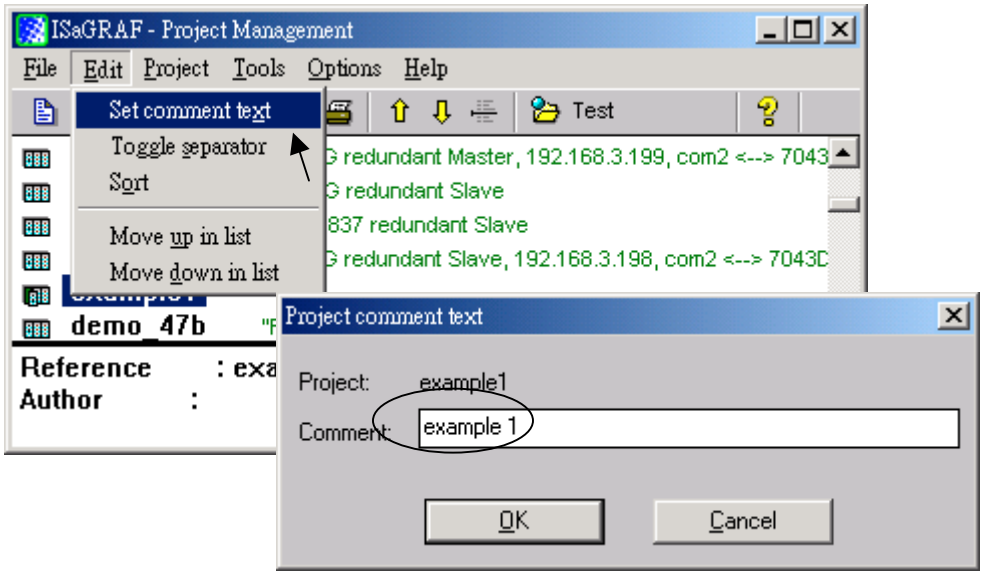
Click on the "Select Project Group", and then click on "New Group", then type in the name for the new user's group you wish to create, and last click on "OK".



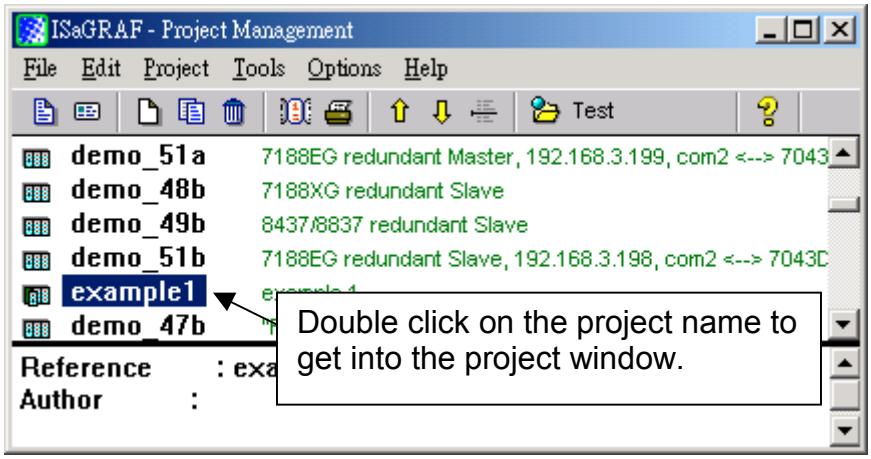
4.1.3: Creating A New ISaGRAF Project

To start a new ISaGRAF project, click on the "Create New Project" icon and then enter in the name for the new project. You can then enter additional information for your project by clicking on the "Edit" and then "Set Comment Text" menu as illustrated below.



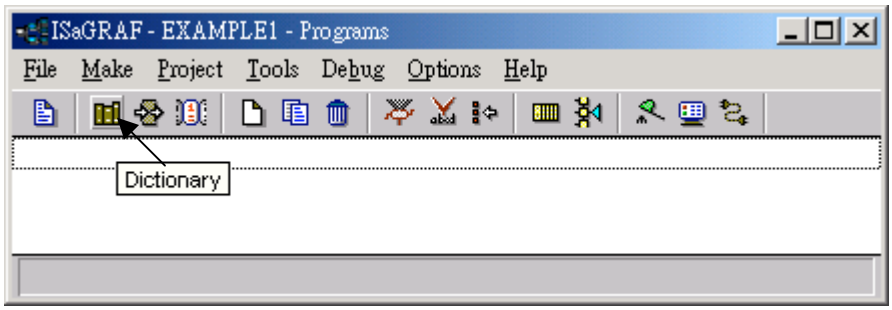


You will now see the name of the new project in the "Project Management" window. Double click on the name of the new project to open the new project.



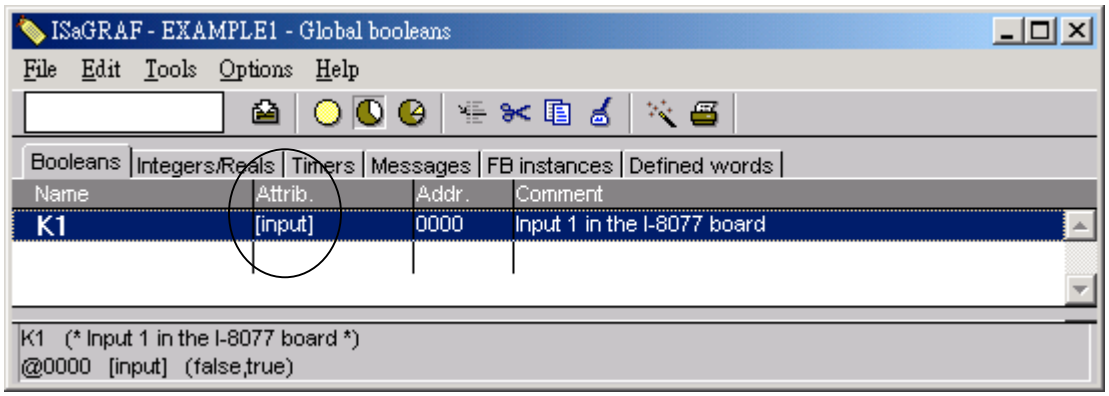
4.1.4: Declaring The ISaGRAF Project Variables

Before you can start creating an ISaGRAF program, you must first declare the variables that will be used in the ISaGRAF program. To begin this process, first click on the "Dictionary" icon and then click on the "Boolean" tab to declare the Boolean variables that will be used in our example program.



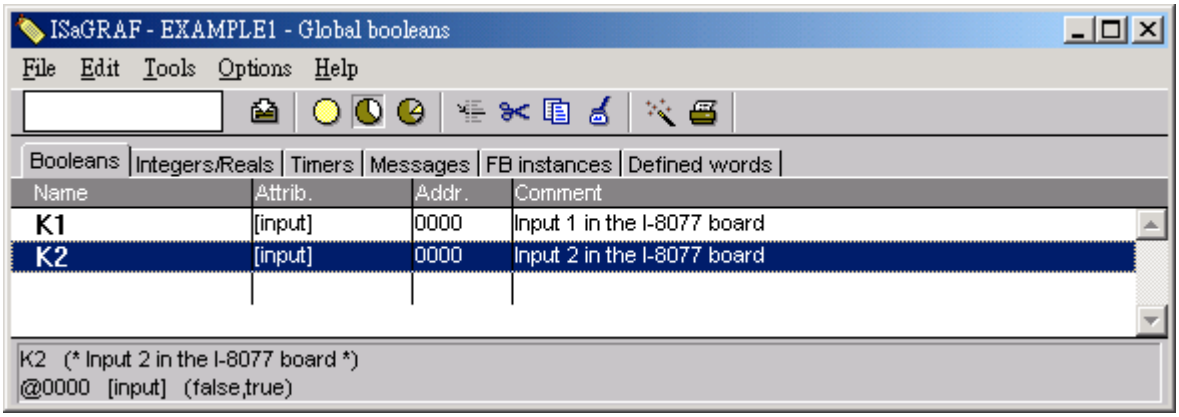
To declare the program variables for the ISaGRAF project, double click on the colored area below the "Boolean" tab, and a "Boolean Variable" window will open. Enter in the name of the variable to be used in the project. For the purpose of this example program the variable "Boolean Variable Name" is "K1", and "Input 1 in the I-8077 board" is added to the "Comment Section". The next item that must be declared is what type of "Attribute" the variable will possess. In this example program, K1's attribute will be an "Input". Then press the "Store" button to save it.

The new Boolean variable has now been declared.

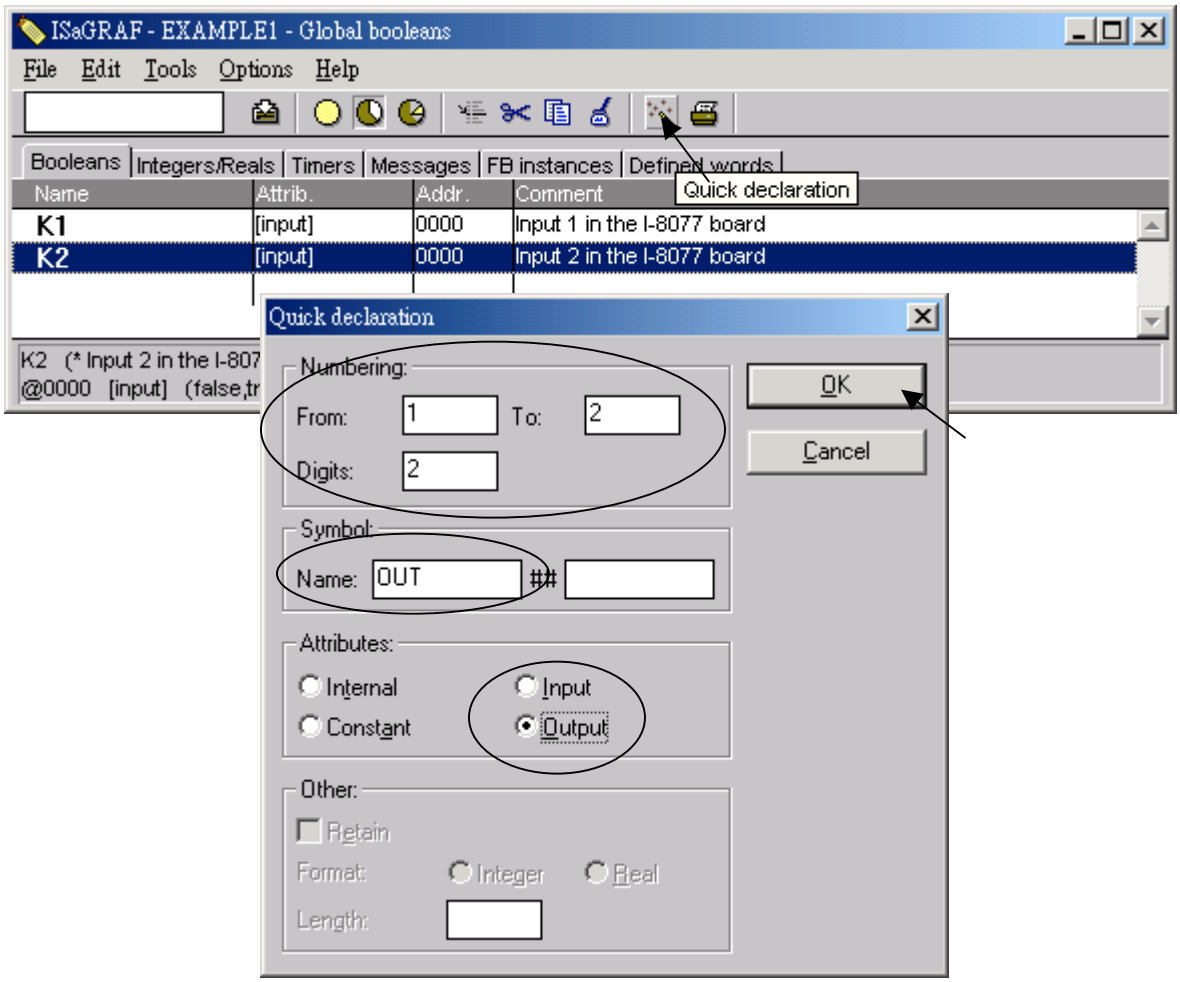


NOTE: You MUST make sure that the variable you have declared has the desired **Attribute** assigned. If you decide that you want to change a project variable's attribute, just double click on the variable name and you can reassign the attribute for the variable

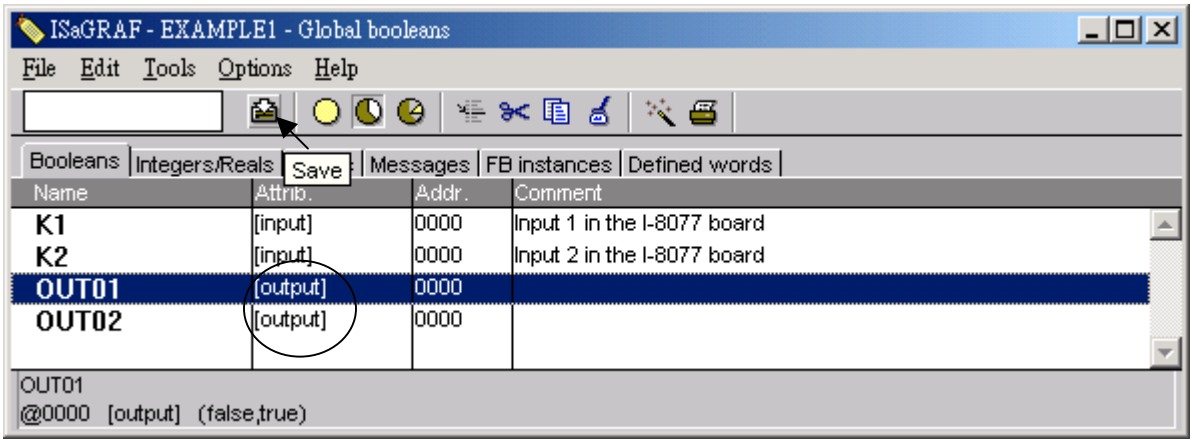
Please follow the above same step to declare one another boolean variable – “K2”. Then you will have as below.



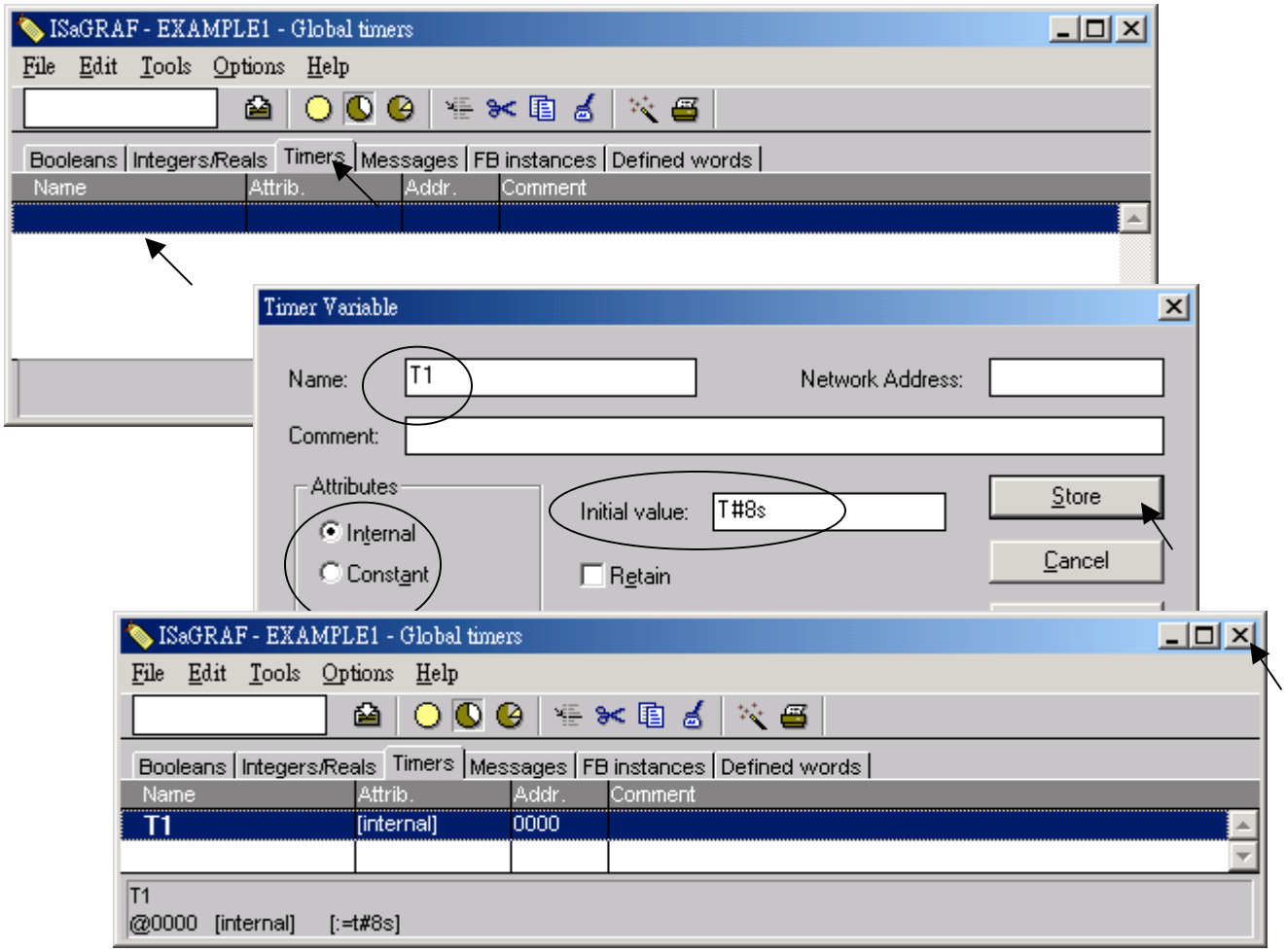
There are two outputs used in this example program named "OUT01 and OUT02". ISaGRAF provides a quick and easy way to declare like variables that are sequentially ordered. To begin this process, click on the "Quick Declaration" icon, and enter in the output number that you will start with in the "Numbering" from and "To" field (this example uses from 1 to 2). Enter the "Symbol" name for the output variables being declared, and lastly, set the attribute to "Output



When you click on the "OK" button, all two outputs will be immediately added to the "Global Boolean" window. Click on Save to store them.



To declare the timer (T1) variable used in this example program, click on the "Timers" tab in the setup screen. Double click on the colored area and enter the Name as "T1", set the "Attributes" to "Internal", the "Initial Value" to "T#8s", then click on the "Store" button.
Then please click on “X” to close the “dictionary” window.



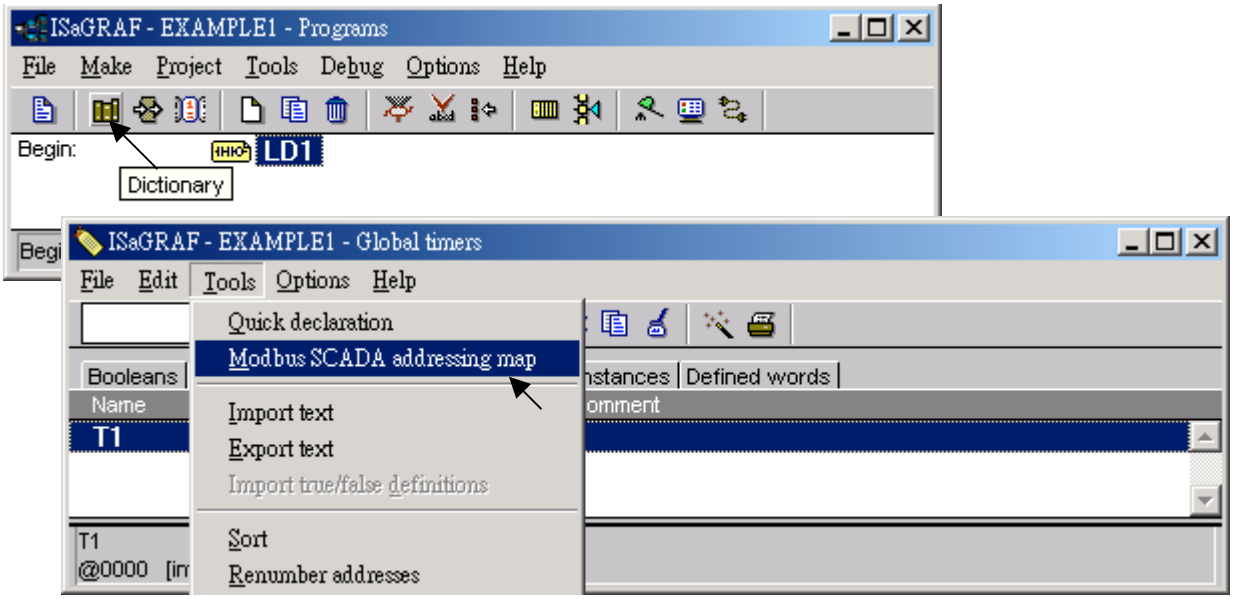
4.1.5: Assign Modbus Network Address No to Variables

The Web HMI will exchange the variable value with the ISaGRAF project if they have assigned the proper “Modbus network address”. The Web HMI only recognize Modbus No. from 1 to 1024. However other SCADA software may R/W the Modbus No. from 1 to 8191 in the W-8xx7.

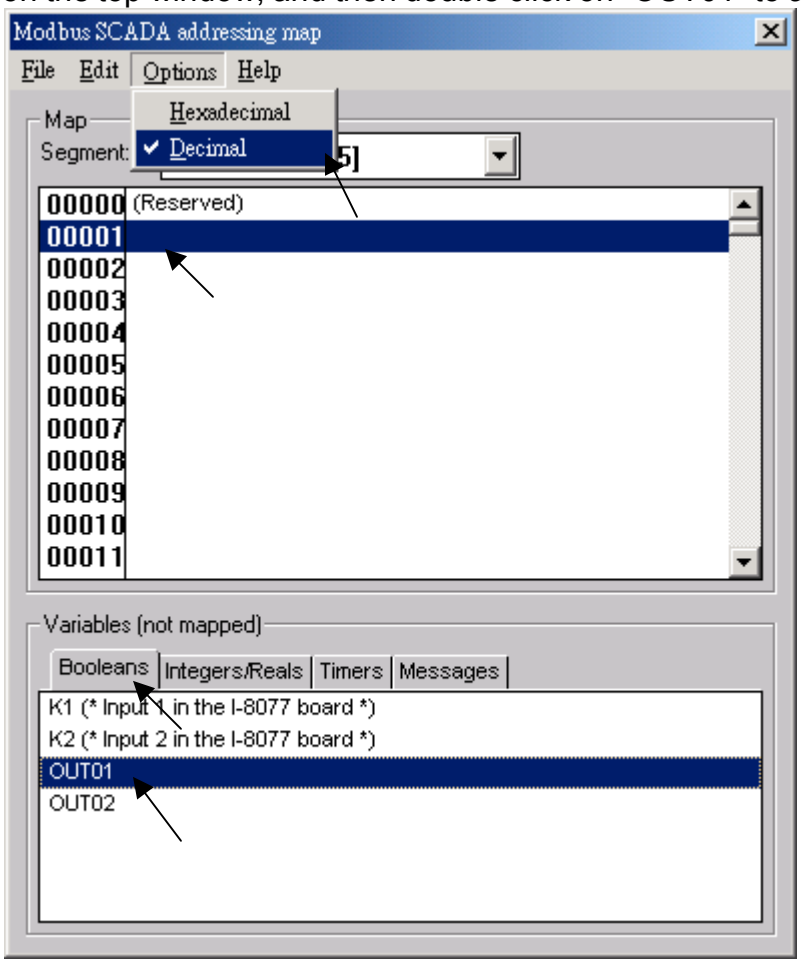
Variables without assigning Modbus No. will not be available by Web HMI and other SCADA software or HMI devices.

Please refer to CD-ROM:
\napdos\isagraf\wincon\english_manu\ "user_manual_i_8xx7.pdf”
for section 4.1 & 4.2 for detailed information about assigning Modbus network address.

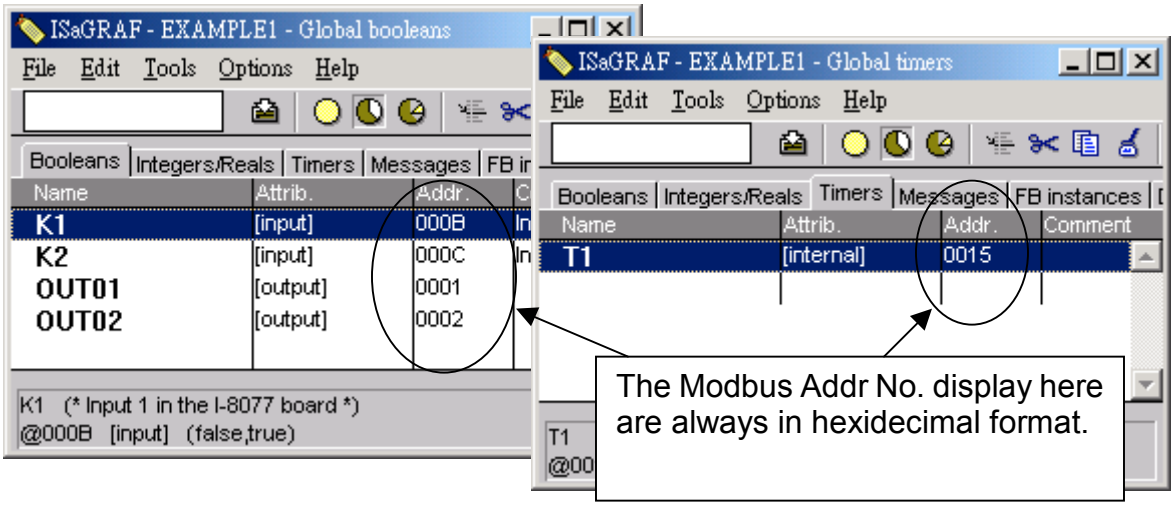
Please get into the dictionary, then click on “Tools – Modbus SCADA addressing map”



Please click on “Options – Decimal” , or it will use Hexadecimal format as default. First click on “00001” on the top window, and then double click on “OUT01” to attatch it to the Modbus No. 1.



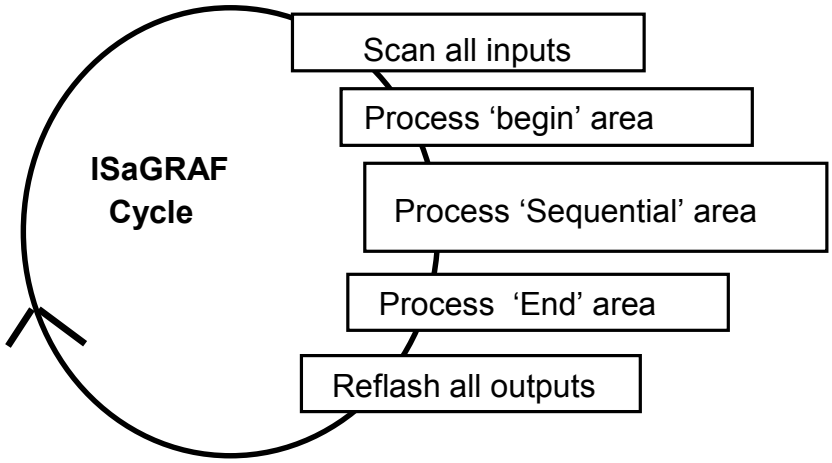
Please follow the same method to assign OUT01 to No.2 , K1 to No.11 , K2 to No.12 and then Timer variable T1 to No.21 . Then we have below window.



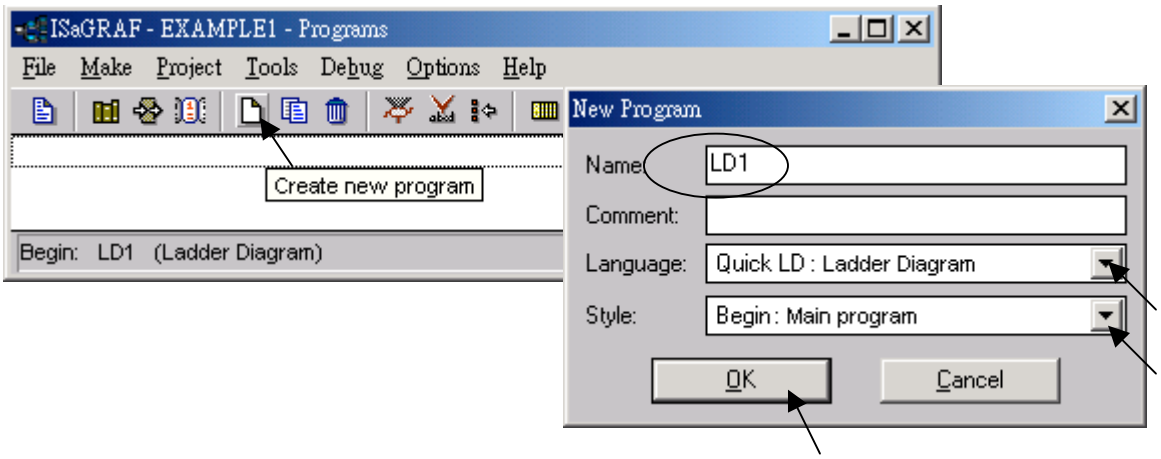
Very Important: If assign Modbus No. to Long integer or Float or Timer variables, they should occupy two Modbus No. Please refer to CD-ROM: \napdos\isagraf\wincon\english_manu\ "user_manual_i_8xx7.pdf” - Section 4.2 for detailed information.

4.1.6: Create The LD - "LD1" Program

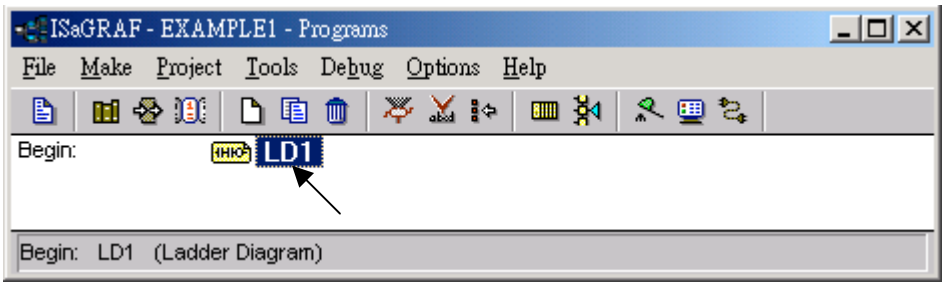
ISaGRAF will run every program one time in each PLC scan cycle. Programs in the “begin” area will run first, then the “Sequential” area, and last the “End” area. An ISaGRAF cycle run in the way as the below scheme.



Click on the "Create New Program" icon and the "New Program" window will appear. Enter the "Name" as "LD1", next, click on the "Language" scroll button and select "Quick LD: Ladder Diagram", and make sure the "Style" is set to "Begin: Main Program". You can add any desired text to the "Comment" section for the LD program, but it isn’t required.

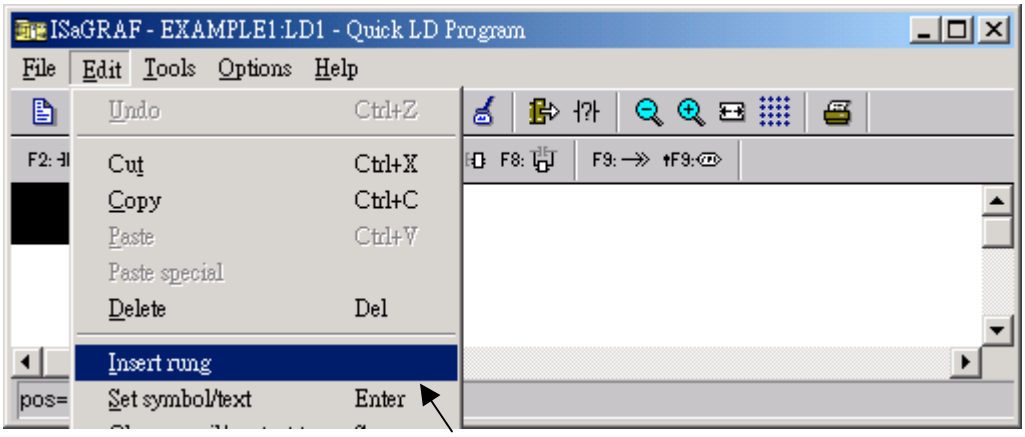


Now we have one program inside this project. Please double click on the “LD1” to get into it.

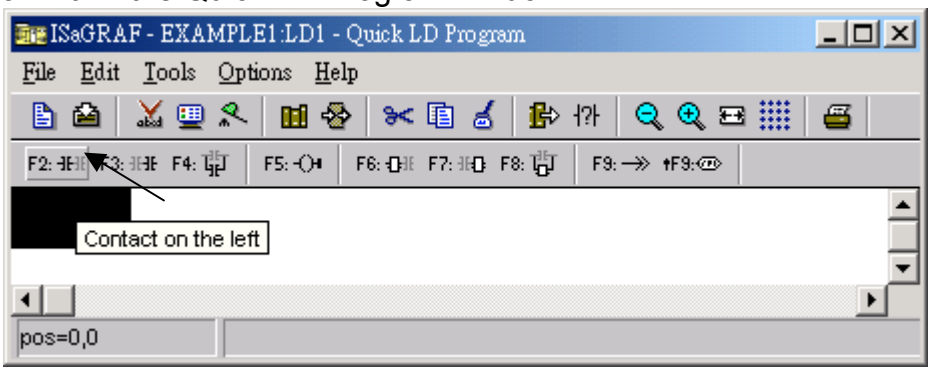


4.1.7: Edit The "LD1" Program

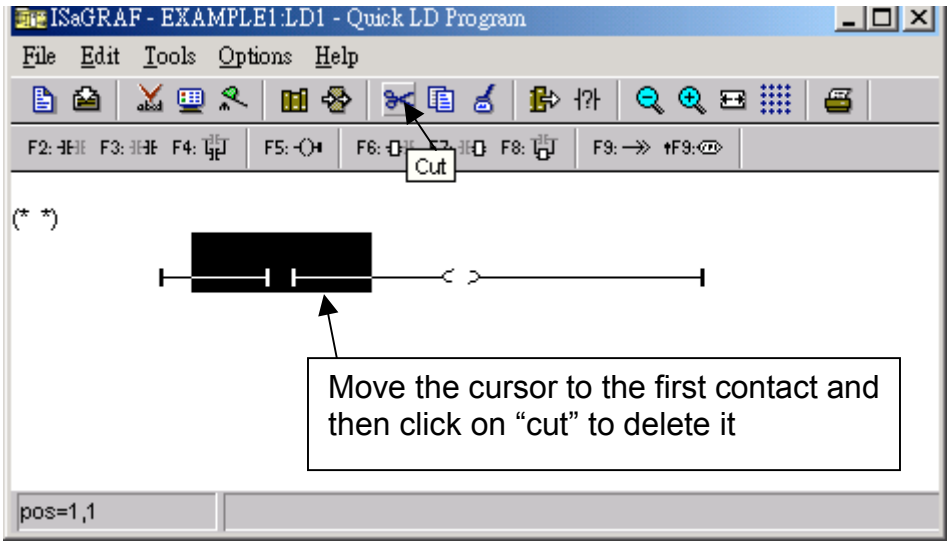
When you double click on the "LD1" name the "Quick LD Program" window will appear. To start programming our LD program, click on "Edit" from the main menu bar, then click on "Insert Rung" . “Insert Rung” means to insert a basic LD rung just above the current position.



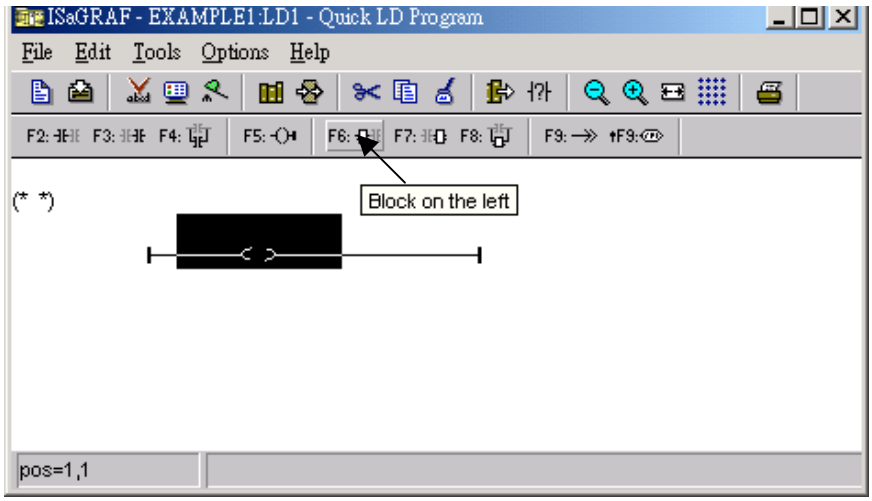
Or, you may just simply click on the "F2 (Contact On The Left)” icon, and the following will appear within the Quick LD Program window.



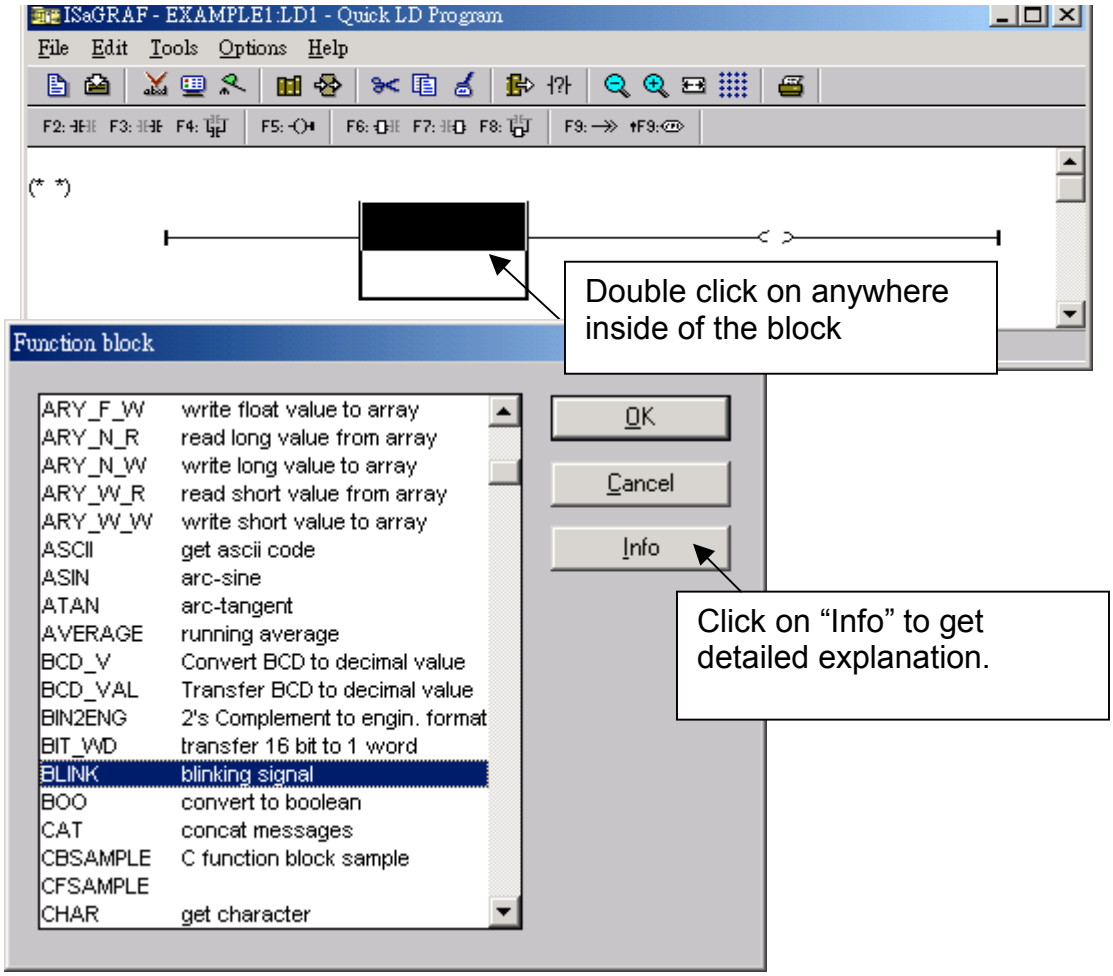
We are going to write the first line of the LD1 program. Move the cursor to the first “contact” and then click on “cut” to delete it.



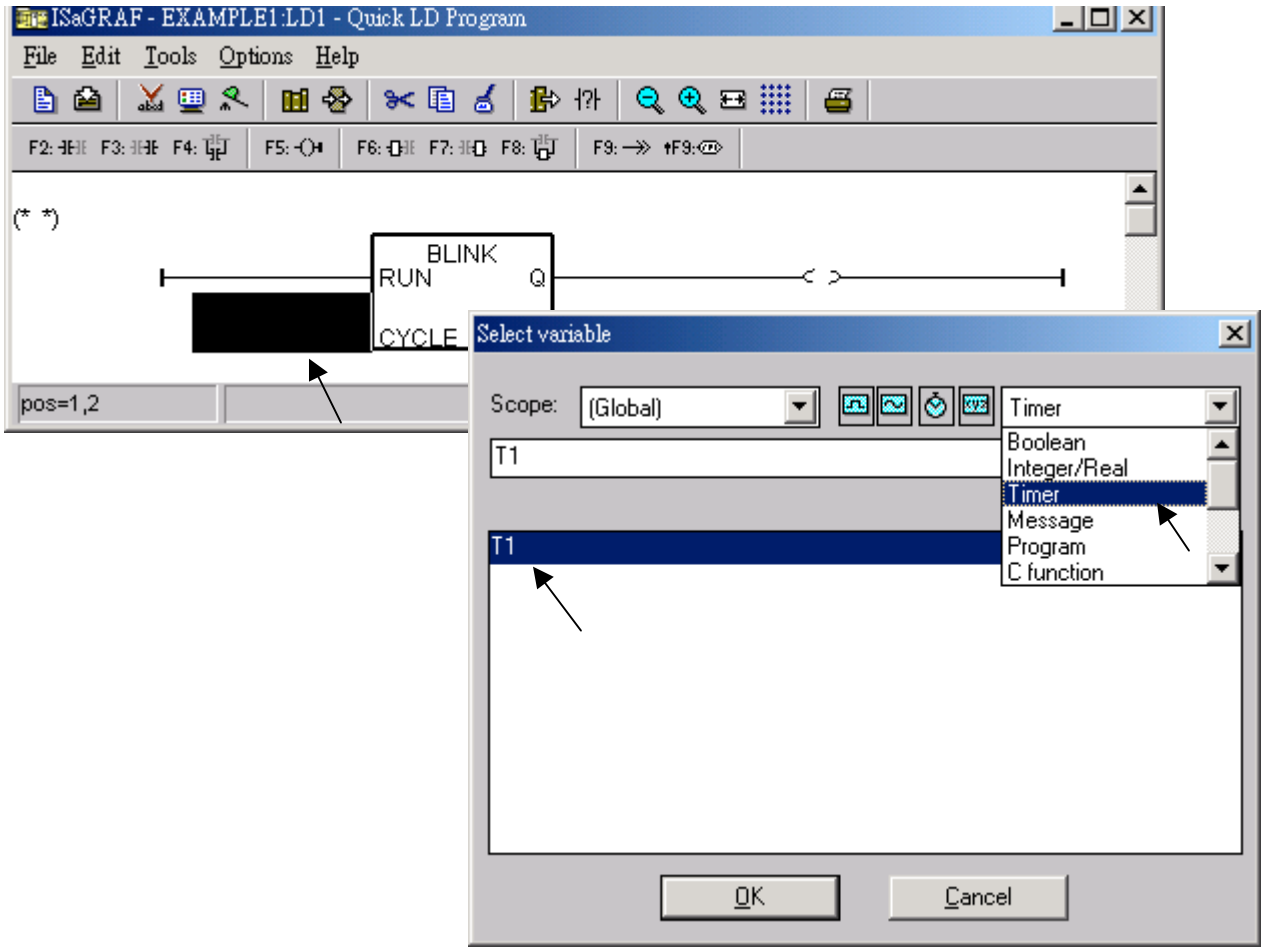
Click on the "F6 (Block on the left)" icon and you will create a block on the left of the “coil”.



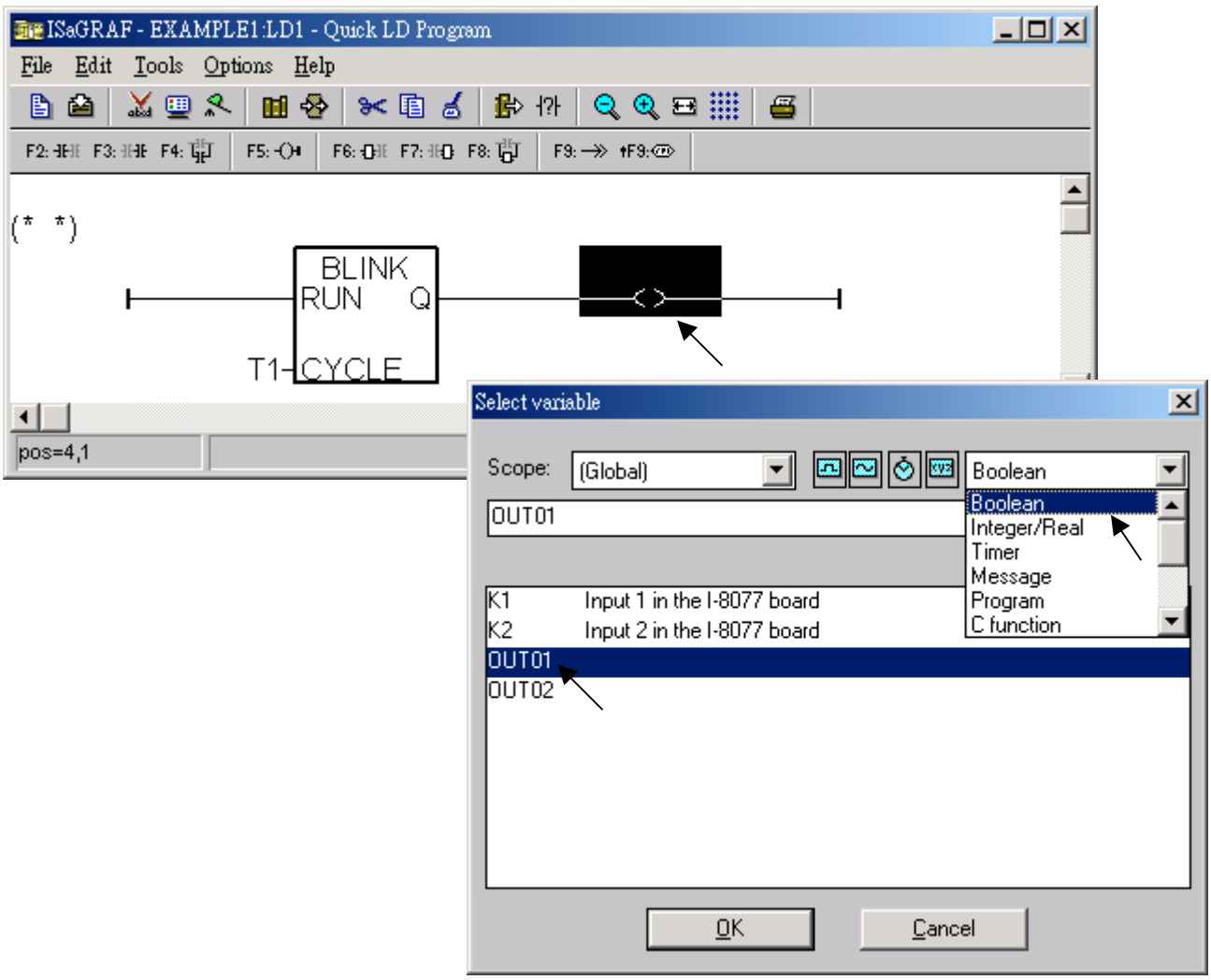
Now we are going to assign the associated variable & constant to each item. Double click anywhere inside of the block and the "Function Block" assignment window appears. Select the "BLINK" type function block . To learn how the "BLINK" function operates you can click on the "Info" button for a detailed explanation of its functionality



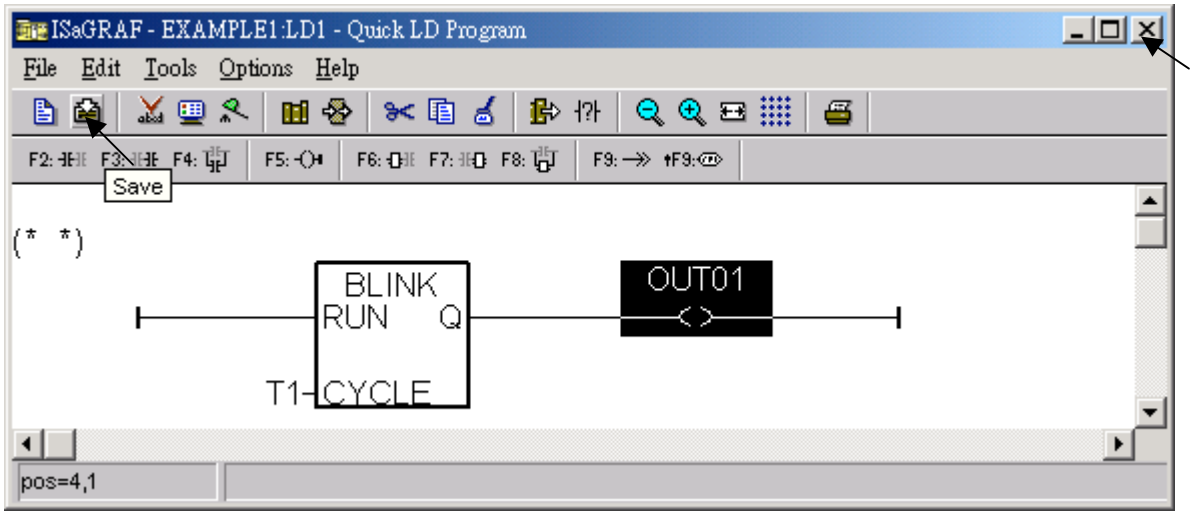
Now move your cursor to the left of the parameter “CYCLE” of the “BLINK” block. Double click on it, select “Timer” and then double click on variable name - “T1”



Move your cursor to the “coil”. Double click on it, select “Boolean” and then double click on variable name – “OUT01”.

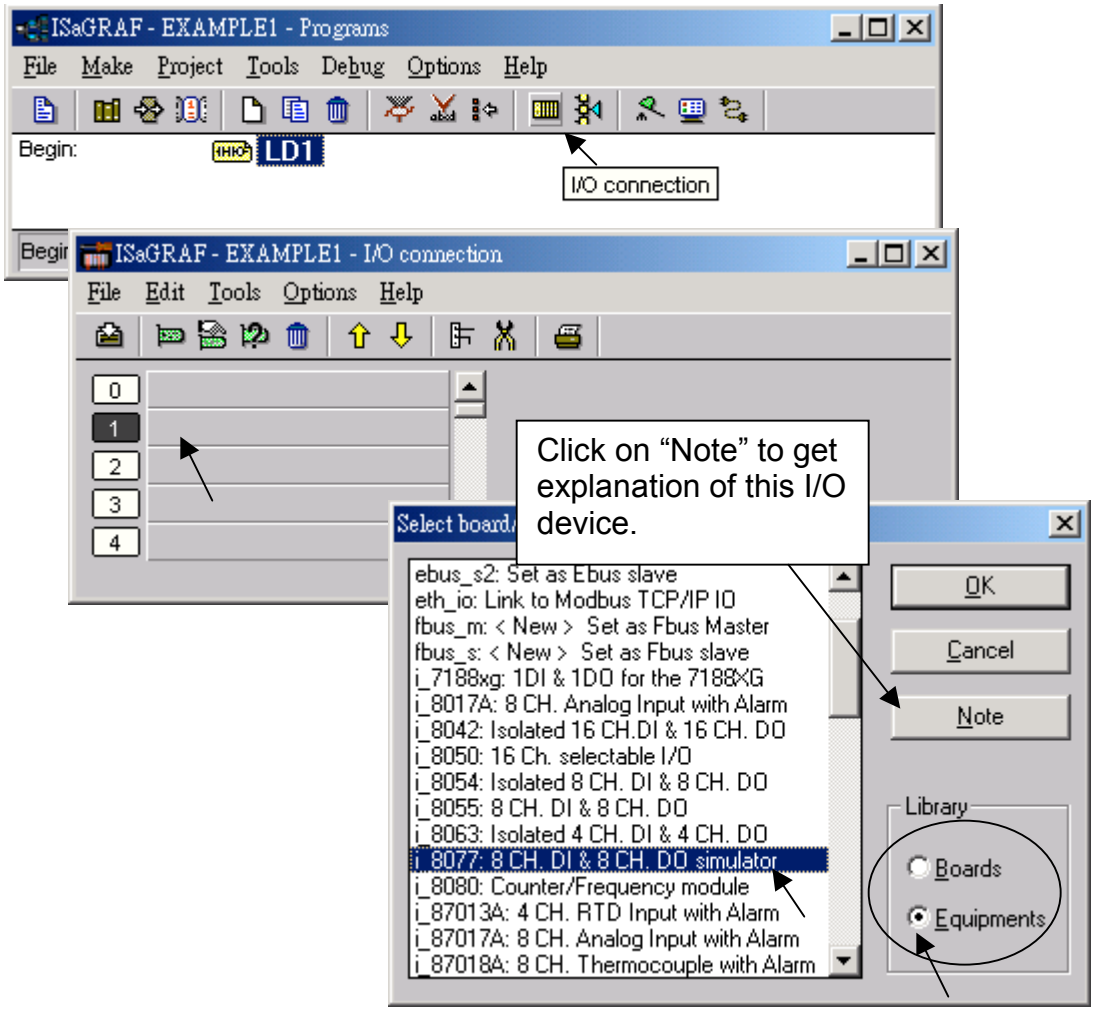


Now we have finished our Ladder code, click on “Save” and then click on “X” to exit.

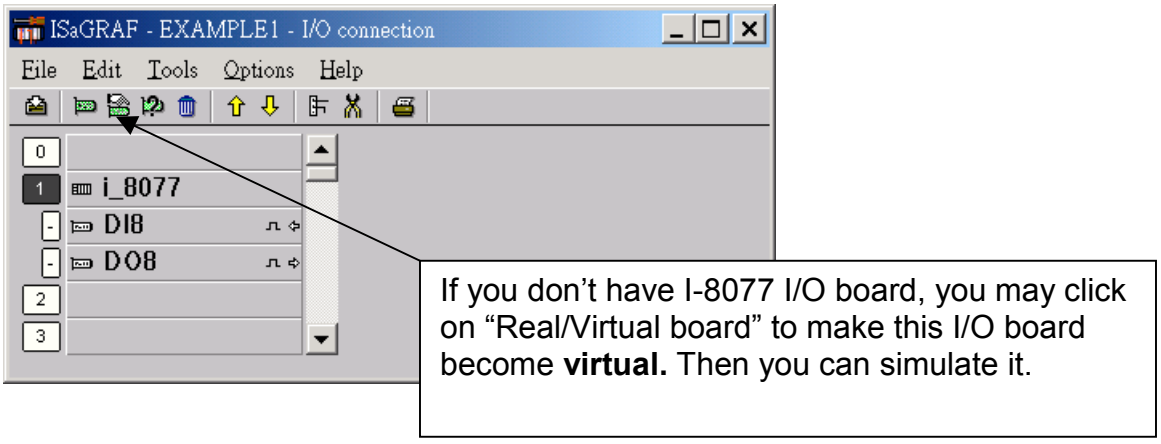


4.1.8: Connecting The I/O

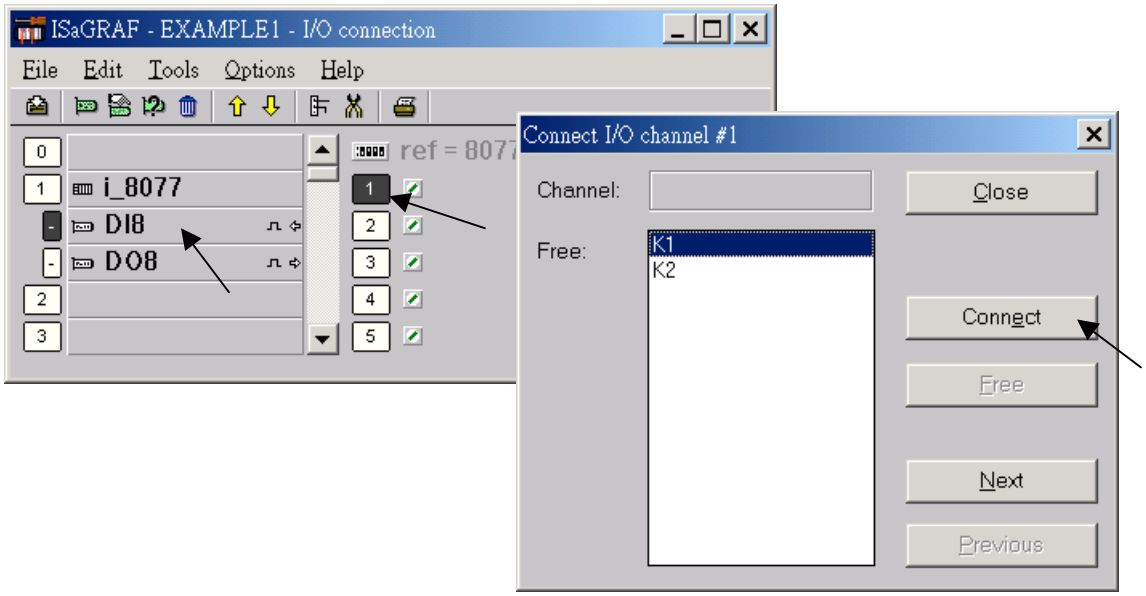
We have defined variables name of “OUT01” , “OUT02” as “output” attribution, while “K1” & “K2” as “input” attribution in step 4.1.4. These “input” & “output” variables should be map to physical I/O in the controller before they can work. To do that, click on “I/O connection” to get into the I/O connection window. Double click on the No. 1 slot (Please make sure your I-8077 I/O board is plug in slot 1) & then check on the “Equipments” & double click on the “I_8077: 8 CH. DI & 8 CH. DO simulator”.



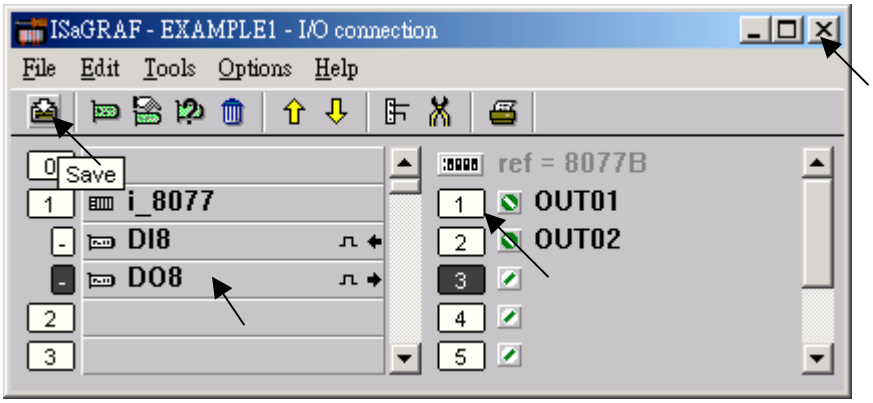
Then we have.



To map input variables “K1” & “K2” to the input channel No. 1 & 2 of the “I-7077”, double click on the channel 1 and then click on “Connect” .Then click on “Connect” again to connect channel 2.



By the same way, please connect “OUT01” , “OUTPUT02” to output channel 1 to 2. Then we have below window. Click on “Save” and then exit.



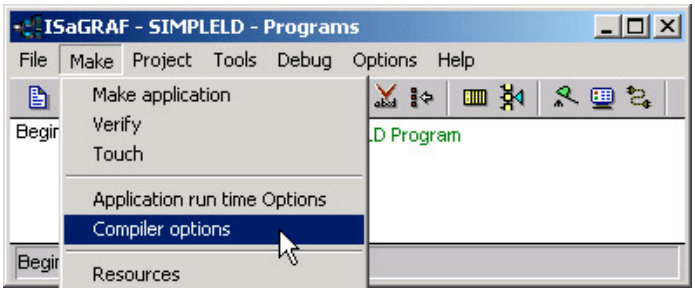
IMPORTANT NOTICE:
1. I/O Slots 1 through 7 are reserved for REAL I/O boards that will be used in the W-8xx7. You can use slot No. 8 and above for additional functionality.

2. All of the variables with “Input” and “Output” attribute MUST be connected through the I/O connection as described above for any program to be successfully compiled. Only the Input and Output attributed variables will appear in the "I/O Connections" window. In this example we have only 2 boolean output variables - OUT01, OUT02 and 2 boolean input variables – K1 & K2.

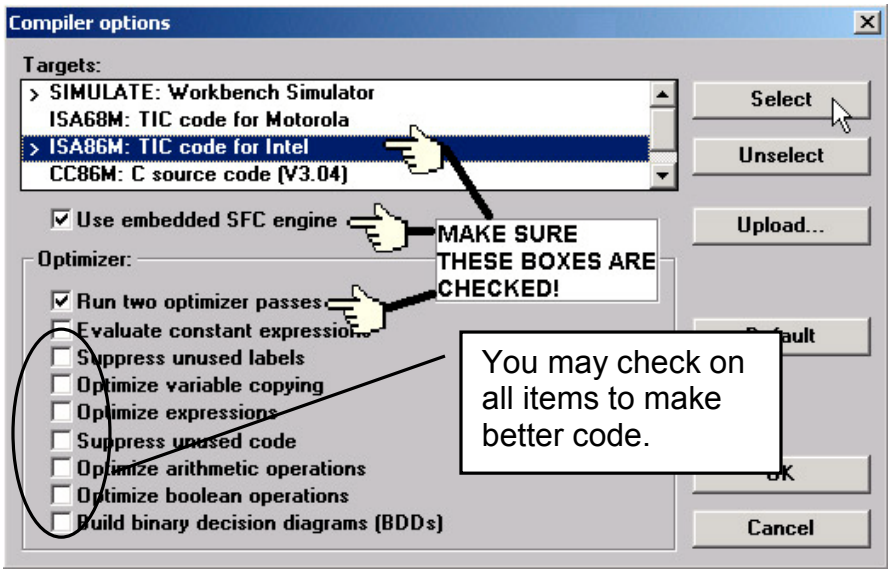
4.2: Compiling & Simulating The Example Project

For ANY AND EVERY ISaGRAF program to work properly with any of the I-7188EG, 7188XG, I-8417/8817/8437/8837 , Wincon-8xx7 controller systems, it is the responsibility of the programmer to properly select the correct "Compiler Options". You MUST select the "ISA86M: TIC Code For Intel" option as described below.

To begin the compilation process, first click on the "MAKE" option from the main menu bar, and then click on "Compiler Options" as shown below.



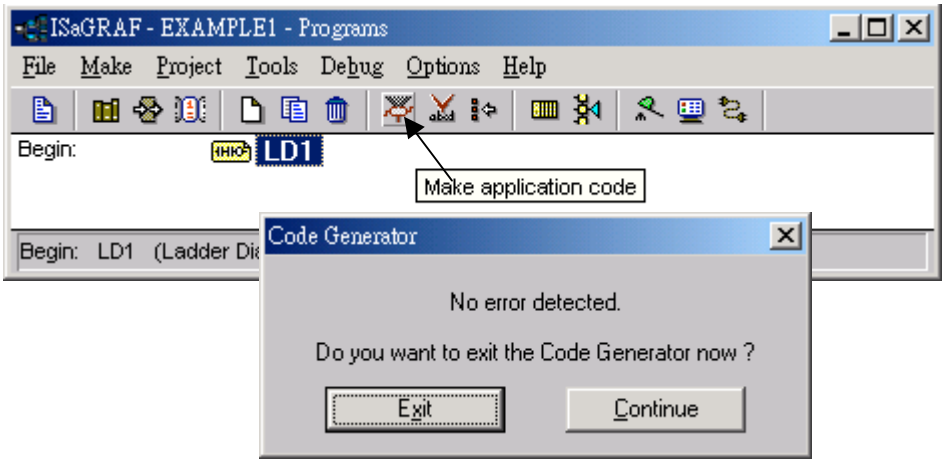
The "Compiler Options" window will now appear. Make sure to select the options as shown below then press the "OK" button to complete the compiler option selections.



4.2.1: Compiling Error Result In Different ISaGRAF Version

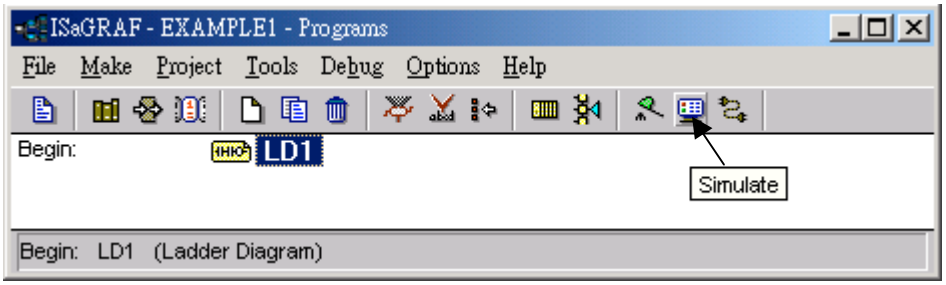
Please refer to appendix H of this manual.

TIME TO COMPILE THE PROJECT!
Now that you have selected the proper compiler options, click on the "Make Application Code" icon to compile the example project. If there are no compiler errors detected during the compilation process, CONGRATULATIONS, you have successfully created our example program.



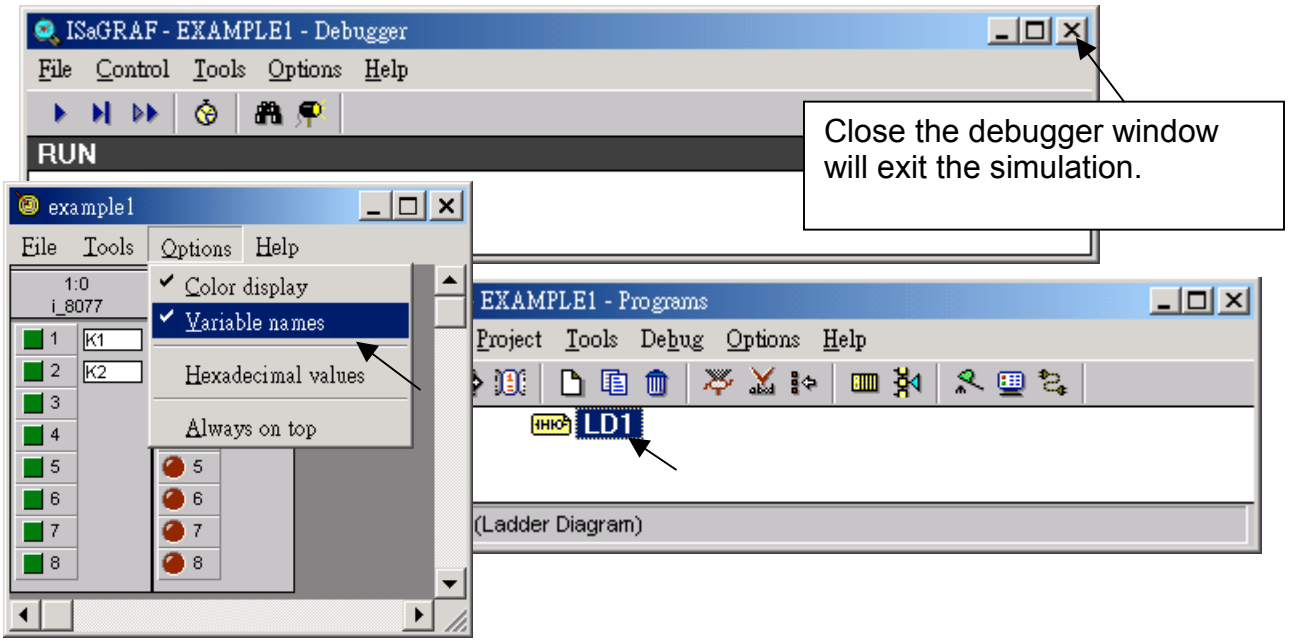
If errors are detected during the compilation process, just click on the "CONTINUE" button to review the error messages. Return to the Project Editor and correct the errors as outlined in the error message window.

TIME TO SIMULATE THE PROJECT!
If the compilation is Ok, you may simulate the project on the PC to see how the program works without the controller. To do that, click on the “Simulate” icon.



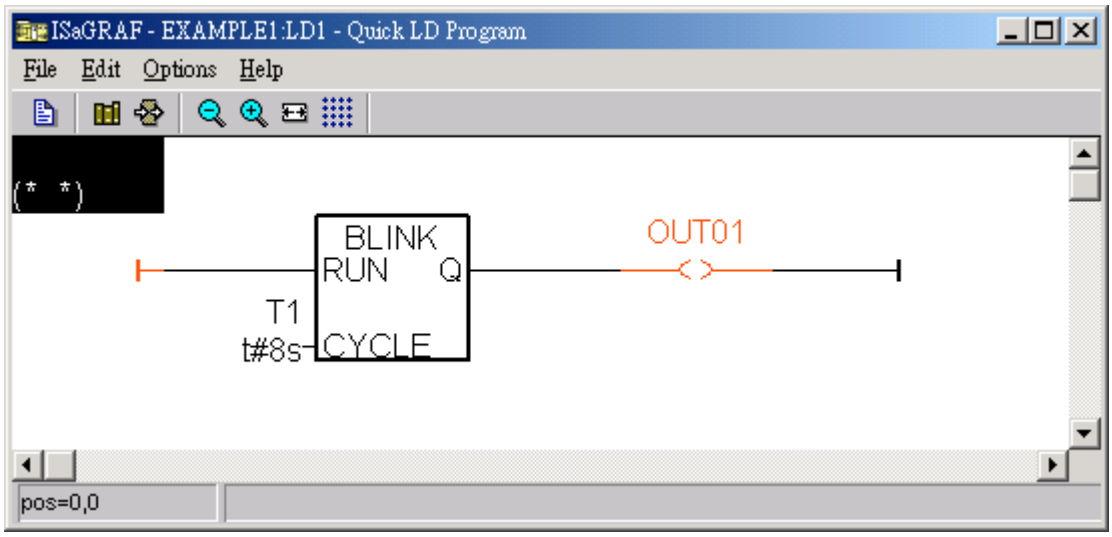
When you click on the "Simulate" icon three windows will appear. The windows are the "ISaGRAF Debugger", the "ISaGRAF Debug Programs", and the "I/O Simulator" windows. If the I/O variable names you have created DO NOT appear in the I/O simulator window, just click on the "Options" and "Variable Names" selection and the variable names you have created will now appear next to each of the I/O’s in the simulator window.

In the "ISaGRAF Debug Program" window, double click on the "LD1" where the cursor below is positioned. This will open up the ISaGRAF Quick LD Program window and you can see the LD program you have created.



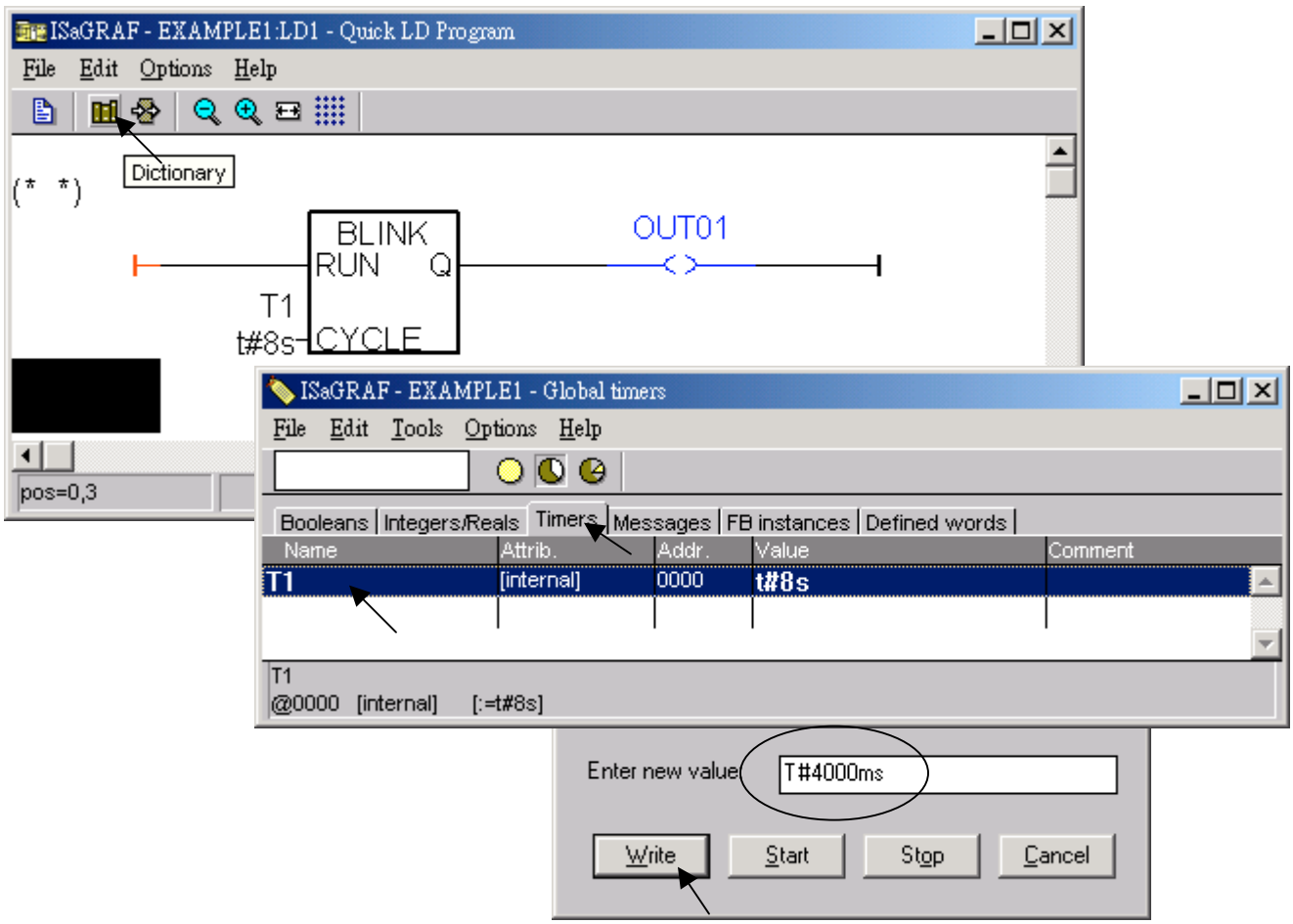
Running The Simulation Program

When you double click on "LD1" in the "ISaGRAF Debug Programs" window, the follow window should appear.

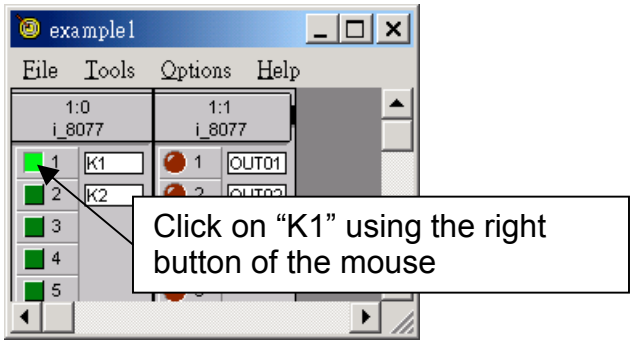


You can see outputs “OUT01” will blink in the period of 8 seconds.

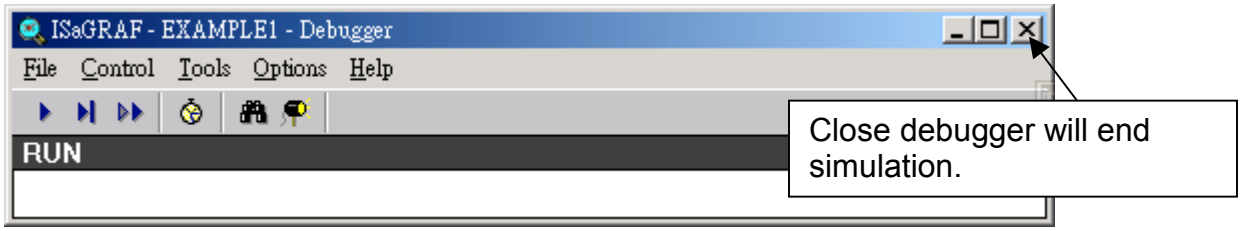
You can adjust the "T1" variable while the program is running. To accomplish this, click on the "Dictionary" icon which will open the "ISaGRAF Global Variables" window as shown in the first two pictures below. Click on “Timer” tab and then double click on “T1” to change the timer value to “T#4000ms” (this means 4000 ms). Then click on “Write”.



Now we are going to simulate the “K1” & “K2” input. Click on “K1” using the right button of the mouse.



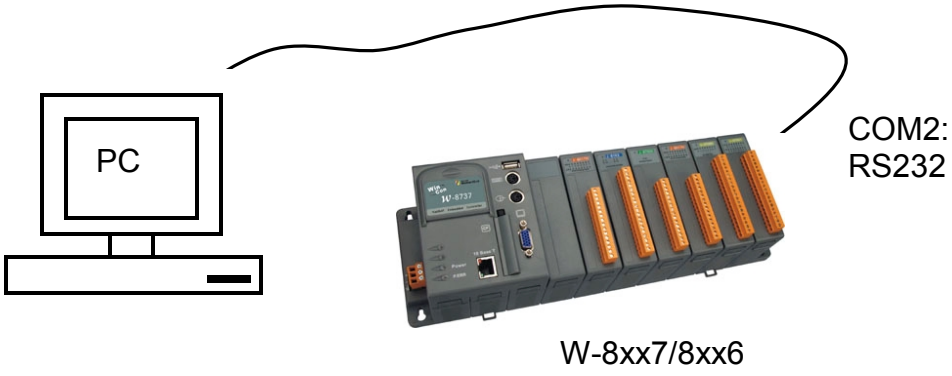
To exit simulation, please close the debugger window.

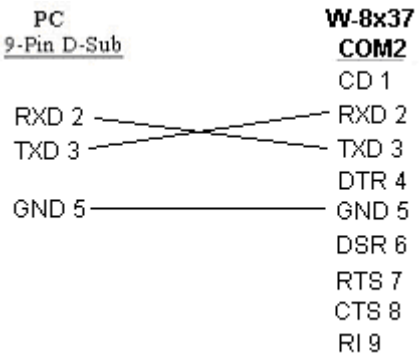


4.3: Download & Debug The Example Project

We have 2 ways to download the project to the Wincon. One is using Ethernet cable, the other one is using RS232 cable. Here will show you the RS232 way. (**Please refer to section 3.2.4.1 if you would like to download the project via ethernet**)

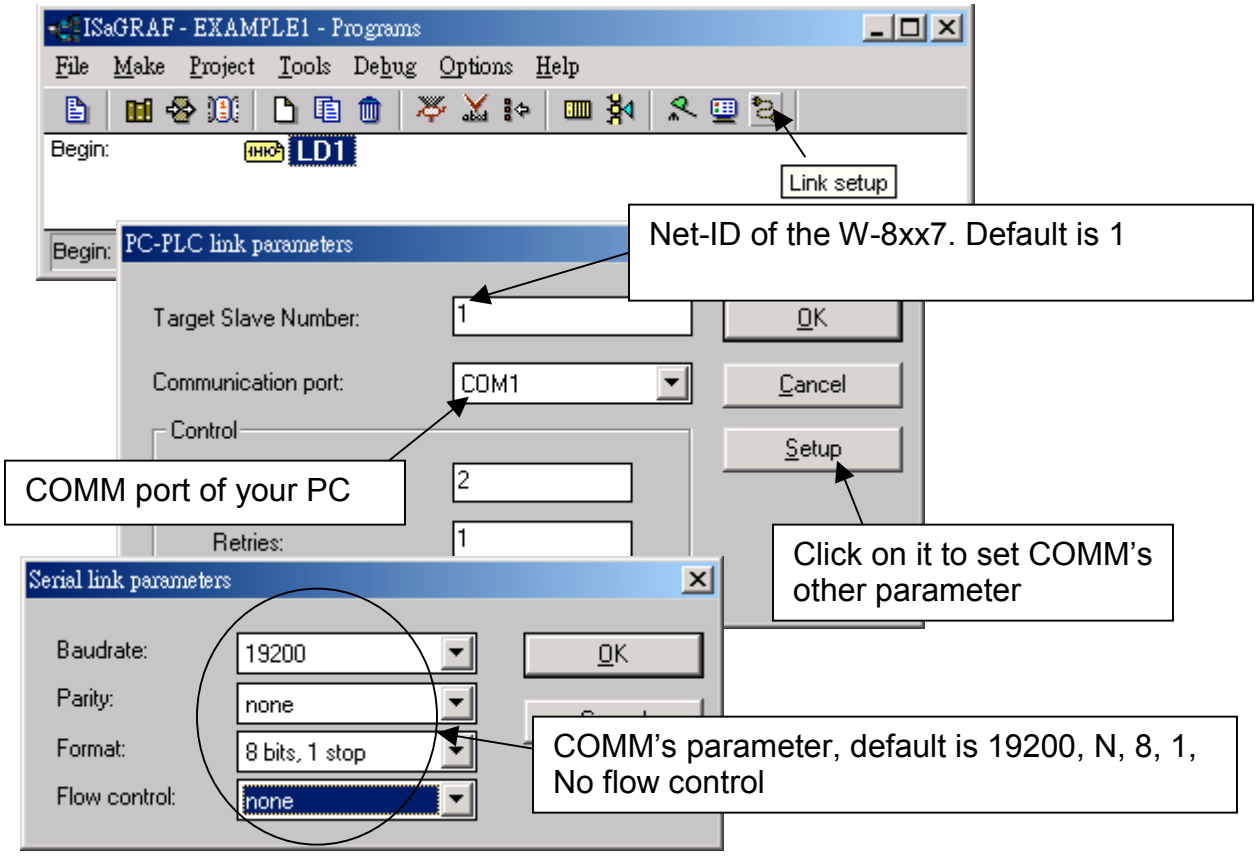
To begin this process, please install the hardware as below. The RS232 cable wiring should be 2, 3 cross as below figure. (**Please make sure the "Modbus RTU Slave Port" is set as COM2 (refer to Appendix A.2, or it can only be download via ethernet**)





This section lists how to download the ISaGRAF program via RS232 cable. However user may also use Ethernet cable to download prgram to the Wincon-8xx7 (please refer to section 3.2.4.1)

Click on the "Link Setup" icon in the "ISaGRAF Programs" window. When you click on the "Link Setup" icon, the following window will appear. Please set the proper value.

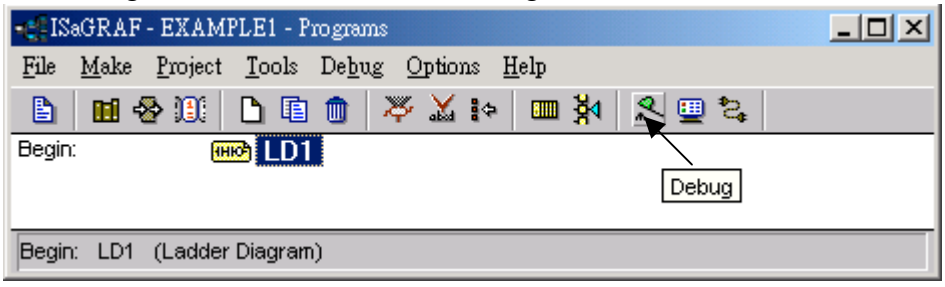


The RS232 communication parameters for the target W-8xx7 controller MUST be set to the same serial communication parameters for the development PC. For W-8xx7 controllers (serial port communications), the default parameters for COM2 (RS232) port are:

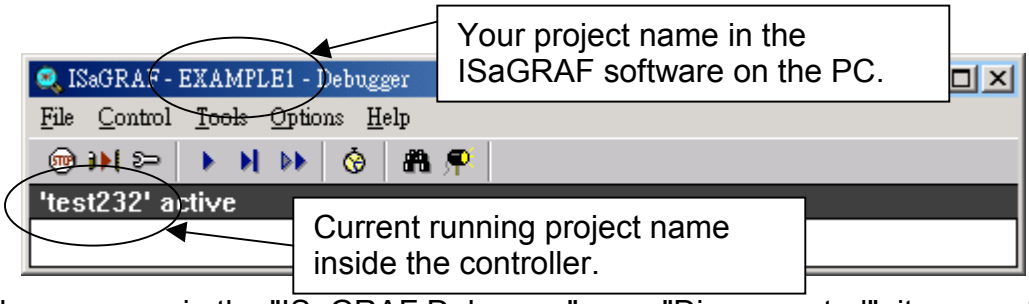
Baudrate:	19200
Parity:	none
Format:	8 bits, 1 stop
Flow control:	none

DOWNLOADING THE EXAMPLE PROJECT

Before you can download the project to the controller, you must first verify that your PC and the controller system are communicating with each other. To verify proper communication, click on the "Debug" icon in the "ISaGRAF Programs" window as shown below.



If the development PC and the W-8xx7 controller system are communicating properly with each other, the following window displayed below will appear (or if a program is already loaded in the controller system, the name of the project will be displayed with the word "active" following it.

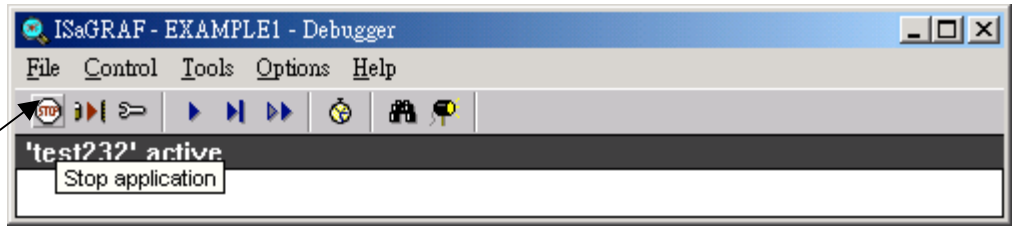


If the message in the "ISaGRAF Debugger" says "Disconnected", it means that the development PC and the controller system have not established communications with each other.

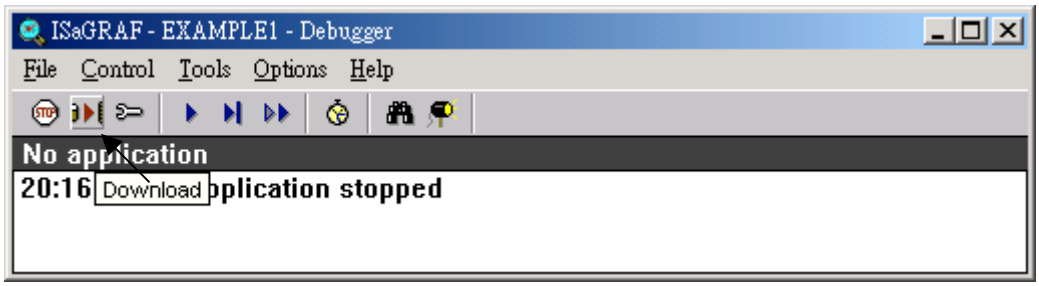
The most common causes for this problem is either the serial port cable not being properly configured, or the development PC's serial port communications DO NOT match that of the W-8xx7 controller system.

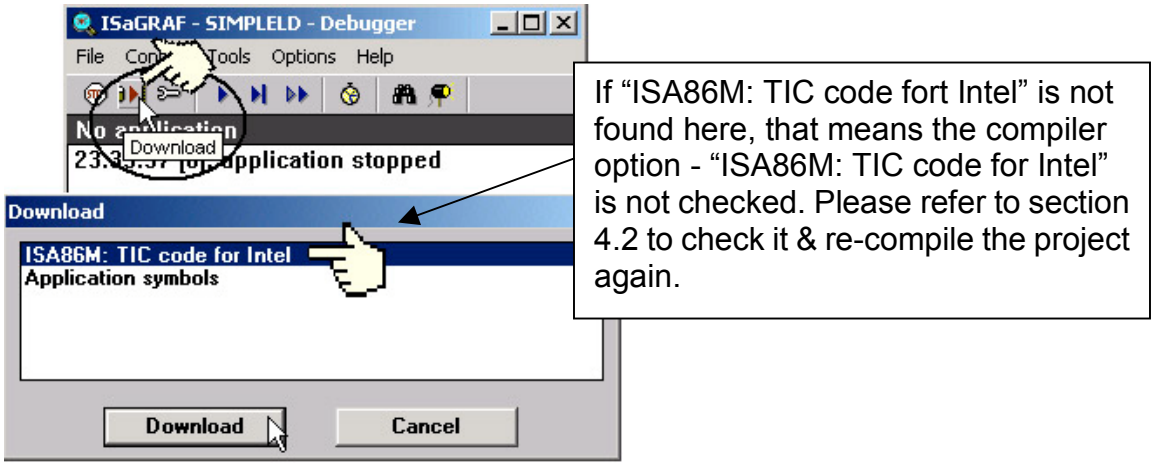
You may have to either change the serial port communication settings for the development PC (which may require changing a BIOS setting) or change the "Serial Link Parameters" in the ISaGRAF program.

If there is a project already loaded in the controller system you will need to stop that project before you can download the example project. Click on the "STOP" icon as illustrated above to halt any applications that may be running.

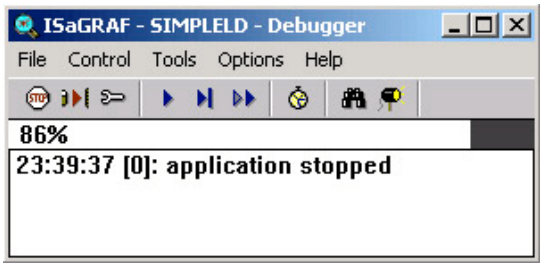


STARTING THE DOWNLOADING PROCESS
From the "ISaGRAF Debugger" window click on the "Download" icon, then click on "ISA86M: TIC Code For Intel" from the "Download" window as shown below.

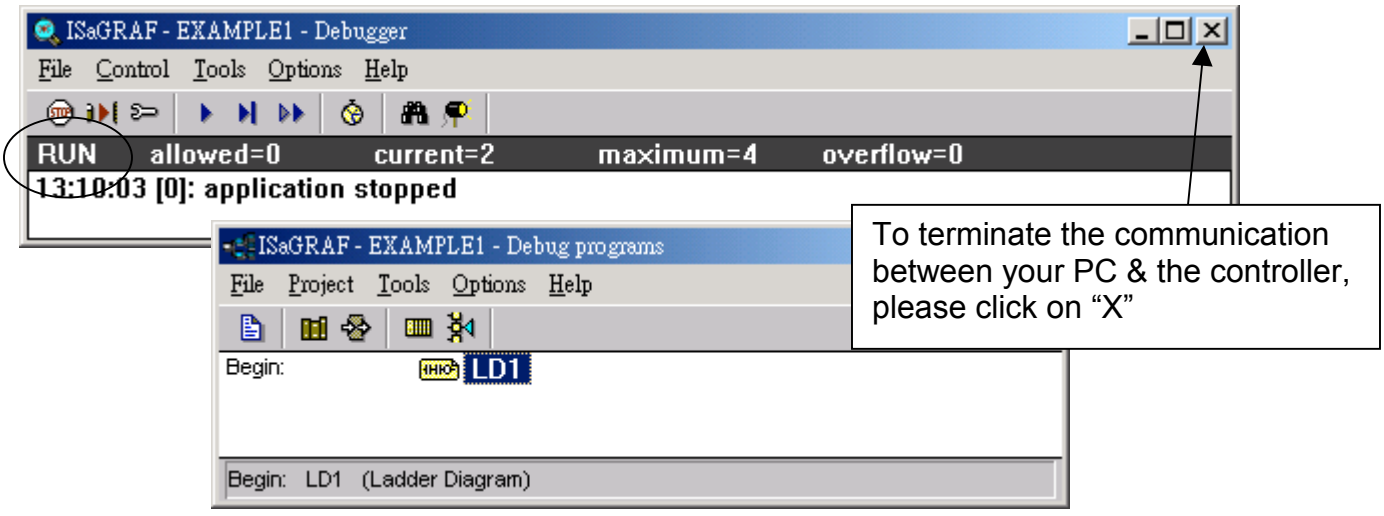




The example project will now start downloading to the W-8xx7 controller system. A progress bar will appear in the "ISaGRAF Debugger" window showing the project downloading progress.

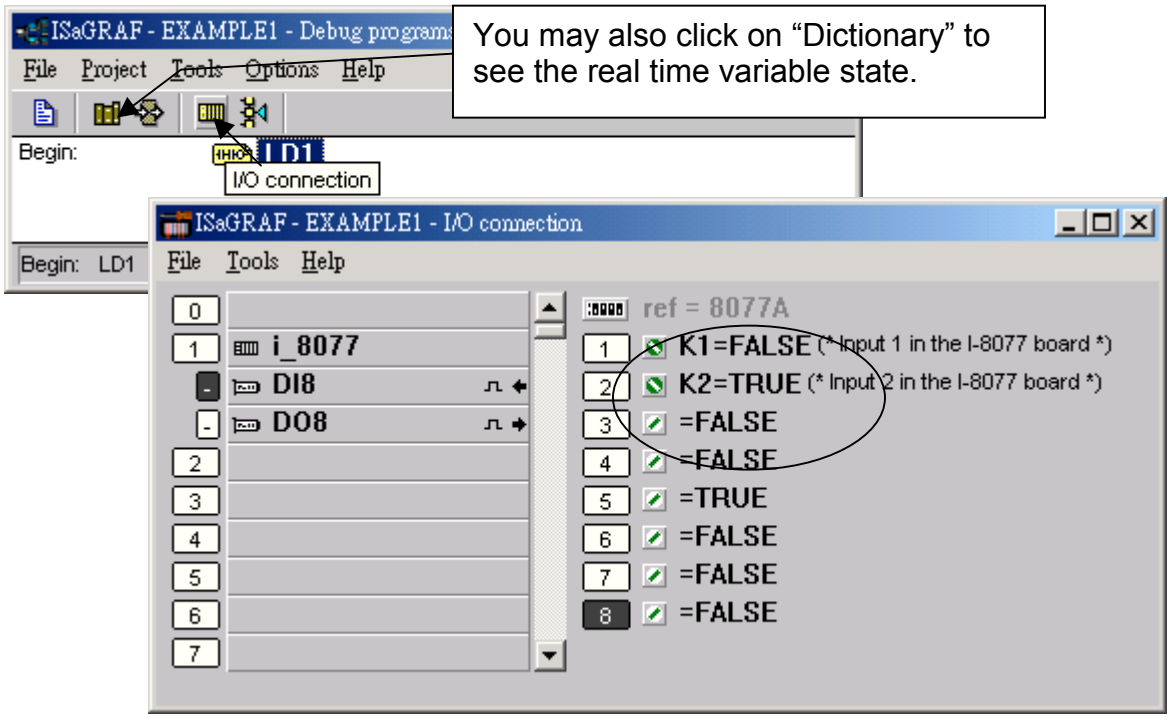


When the example project has successfully completed the downloading process to the W-8xx7 controller system the following two windows will appear.

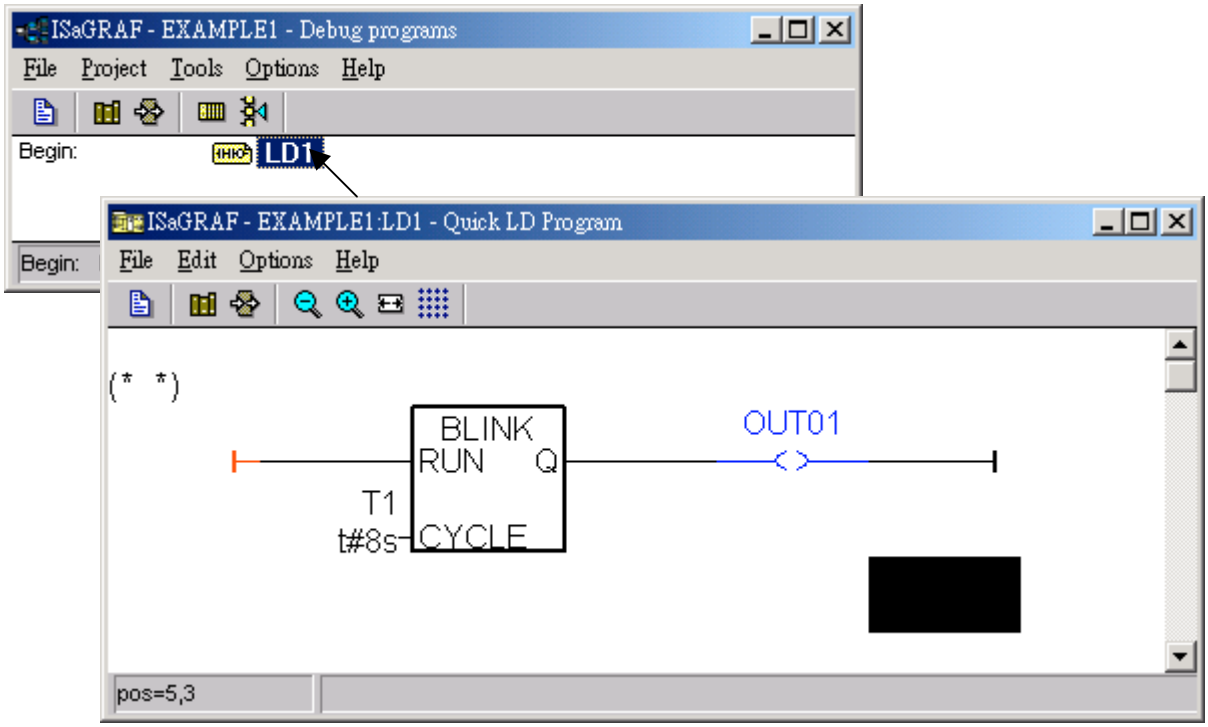


RUNNING THE EXAMPLE LD PROGRAM

You can observe the real time I/O status from several ISaGRAF windows while you are running the example project. One of the windows is the "I/O Connections" window, which shows each of the inputs and outputs as assigned. Click on the "I/O Connections" icon in the ISaGRAF Debugger window to open the "I/O Connections" screen. You may switch ON/OFF the D/I on the front panel of the I-8077 I/O board to see what happens about “K1” & “K2”



Another VERY helpful window you can open is the "Quick LD Program" window. From this window you can observe the LD program being executed in real time.



4.4: Design The Web Page

After finishing the ISaGRAF project & download it to the Wincon-8xx7, we are going to design the Web Page for this ISaGRAF project.

If you havn't practiced "Setting Up A Web HMI Demo" listed in the Chapter 3, it's better to do it once to get familiar with it.

We will use "**Microsoft Office FrontPage 2003**" **(or higher version)** to build web pages in this manual. User may choose your prefer web page editor to do the same thing.

You may refer to the finished web pages of this example in the W-8xx7 CD-ROM at design time. However it is better to do it one time by yourself to get more understanding.

Wincon ISaGRAF CD: \napdos\isagraf\wincon\WebHMI_Demo\example1

4.4.1: Step 1 – Copy The Sample Web HMI pages

These is a sample Web HMI pages in the Wincon-8xx7 CD-ROM:
\napdos\isagraf\wincon\WebHMI_Demo\sample

Please copy this "sample" folder to your drive and rename it, for example, "**example1**".

The basic Web HMI files includes 2 folders and 3 DLL files and 4 htm files as below.

./img/	(default image files - *.jpg , *.bmp , *.gif)
./msg/	(default message files – wincon.js & xxerror.htm)
whmi_filter.dll	(three DLL files)
login.dll	
main.dll	
index.htm	(first default page)
login.htm	(the Web HMI welcome page)
menu.htm	(the page-menu page, normally on the left on the Internet Explorer)
main.htm	(first page when successfully login)

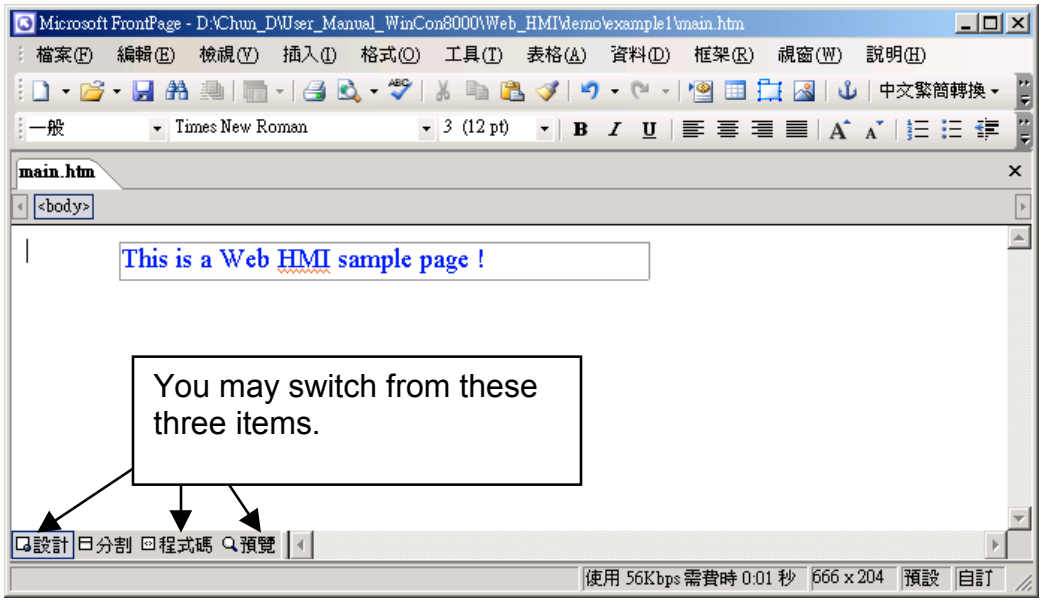
User may put his own image files into the folder named as "user_img". And put user-defined javascript file or css file into the folder named as "user_msg". Other folder name is not acceptable by the Wincon Web HMI.

The "index.htm" file is the default entry page of the web server. User should not modify it. The "index.htm" re-directs to the "login.htm" file in 1 to 2 second when someone visits the Wincon-8xx7 via the Internet Explorer.

User may modify the "login.htm" , "menu.htm" & "main.htm" to fit his own need. We will only modify the "main.htm" in this example.

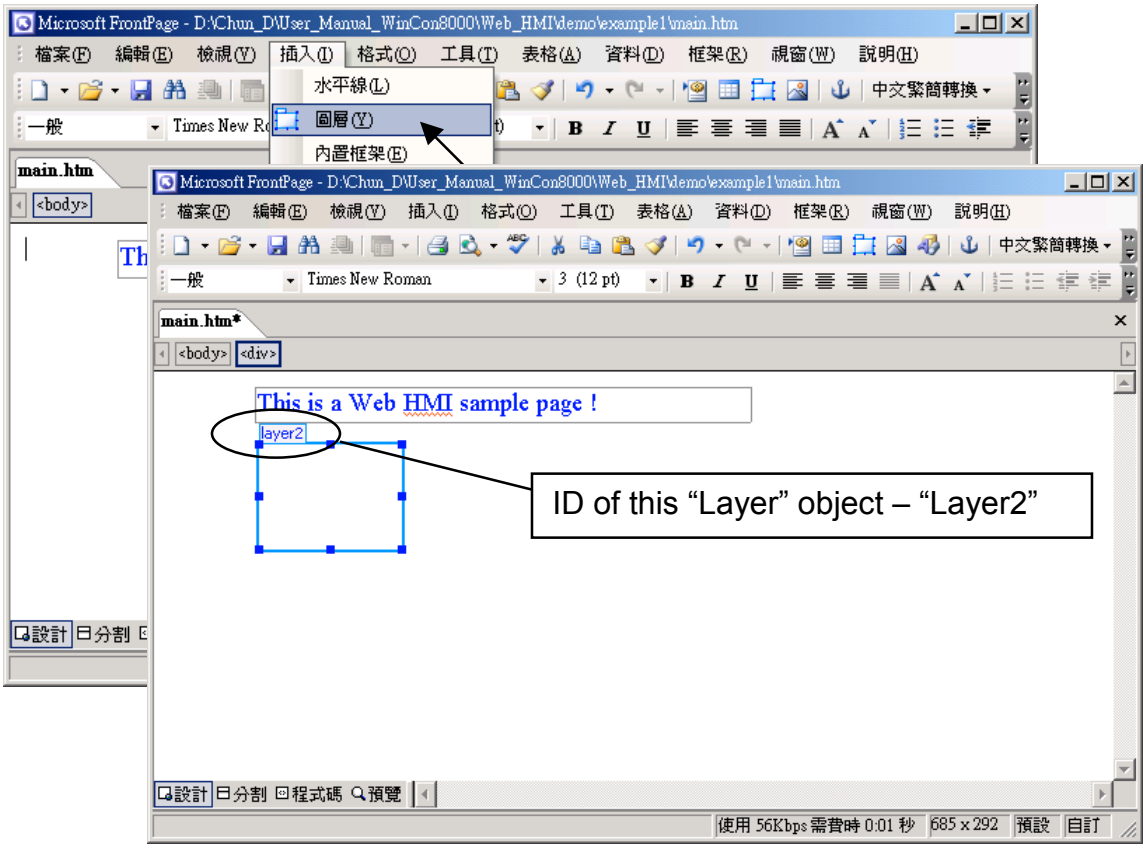
4.4.2: Step 2 – Building The Main.htm

Please run the Microsoft Office FrontPage 2003 (or higher version) and open the “main.htm”

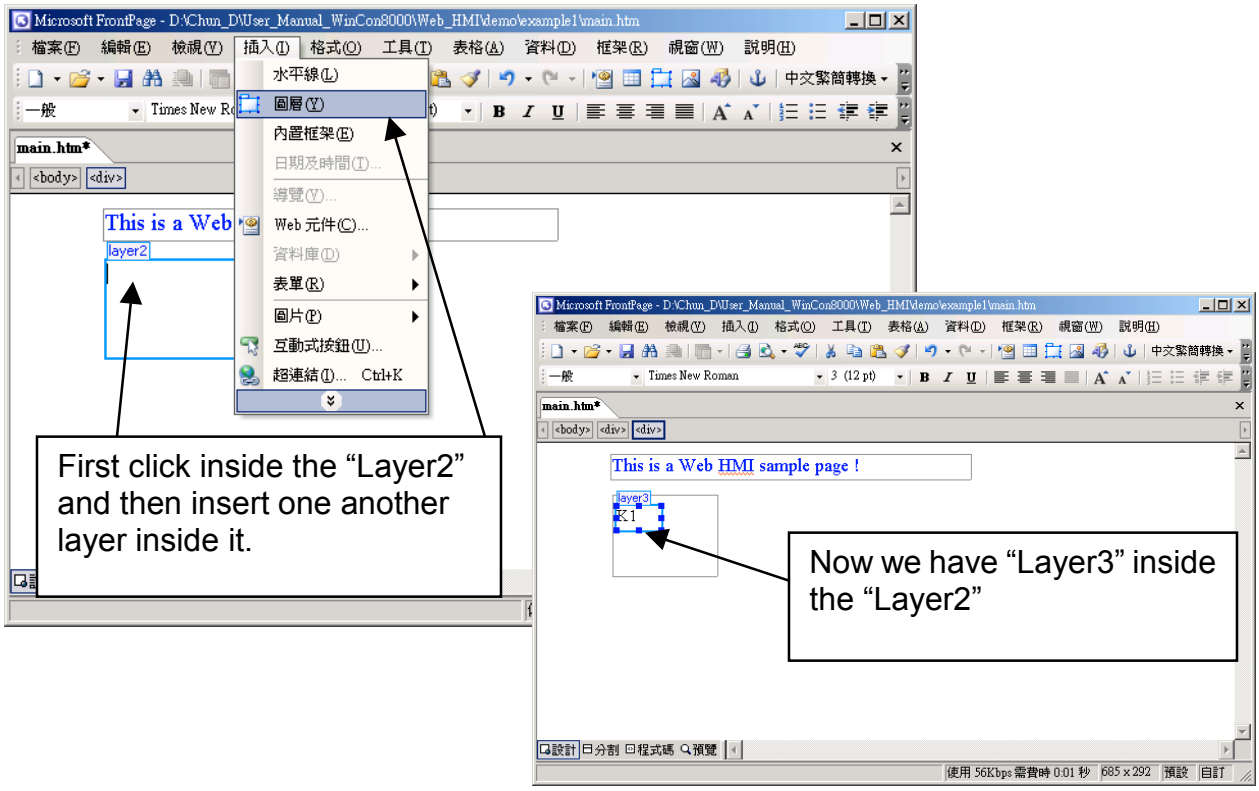


Please switch the window to design the page.

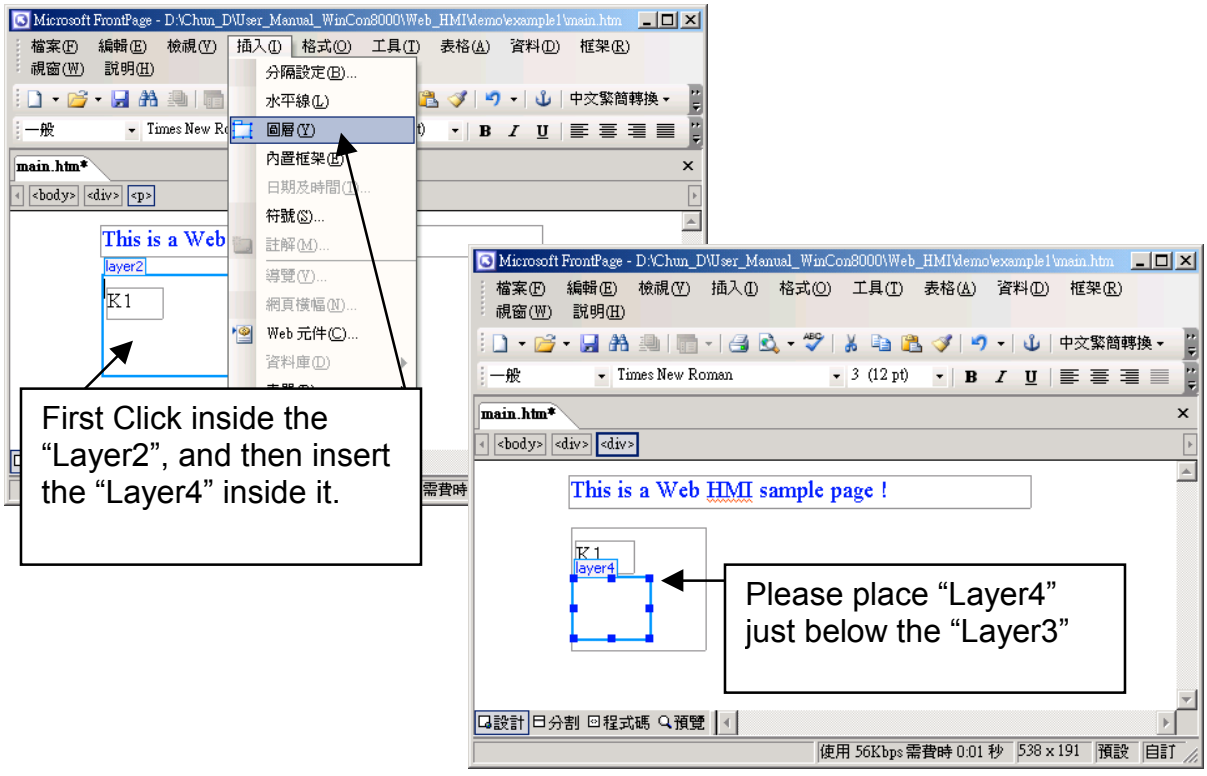
Please insert a layout object – “Layer” as below.



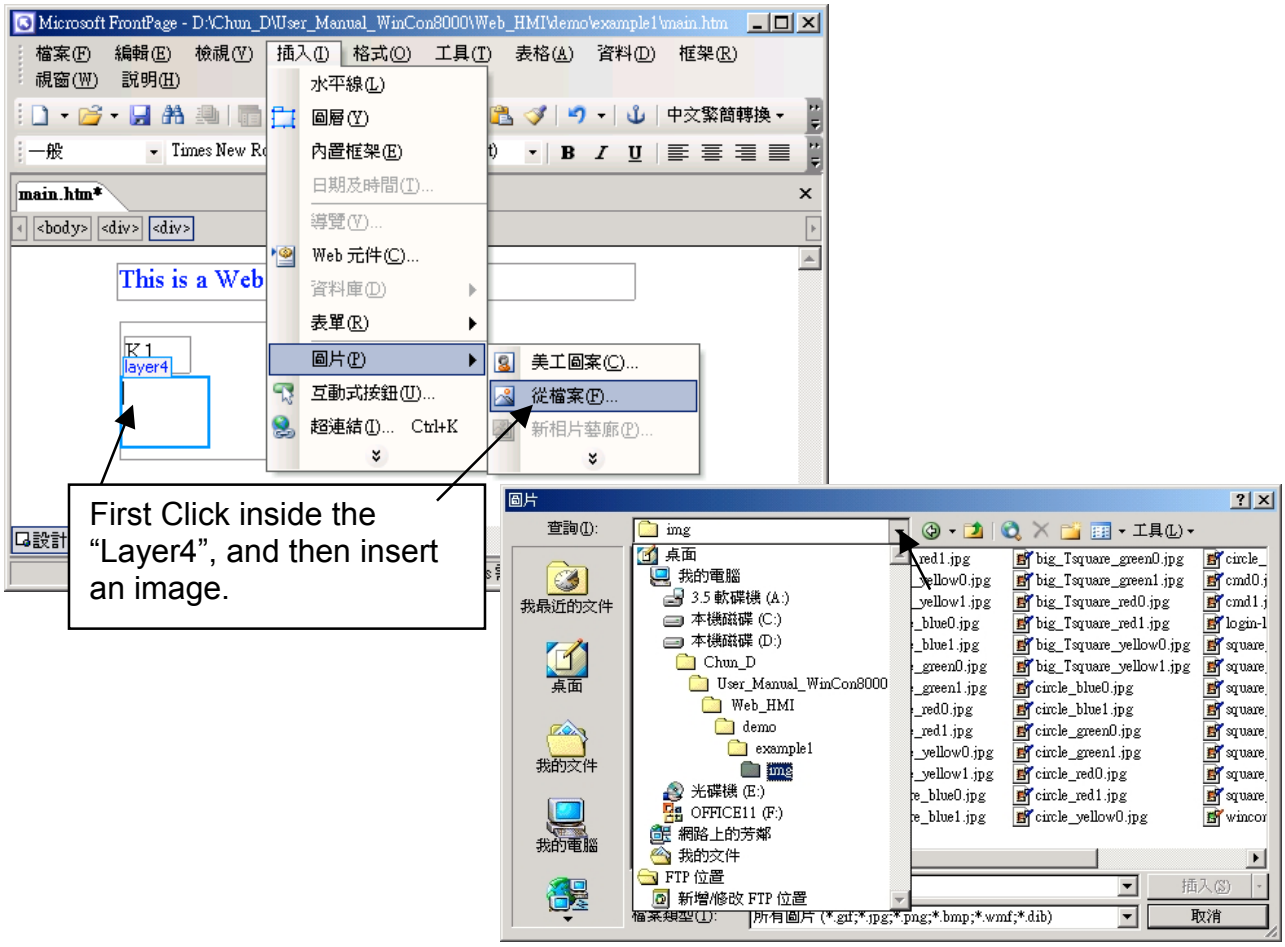
Click inside this “Layer” and then insert one another layer inside it as below. Please enter “K1” into the new created “Layer”.



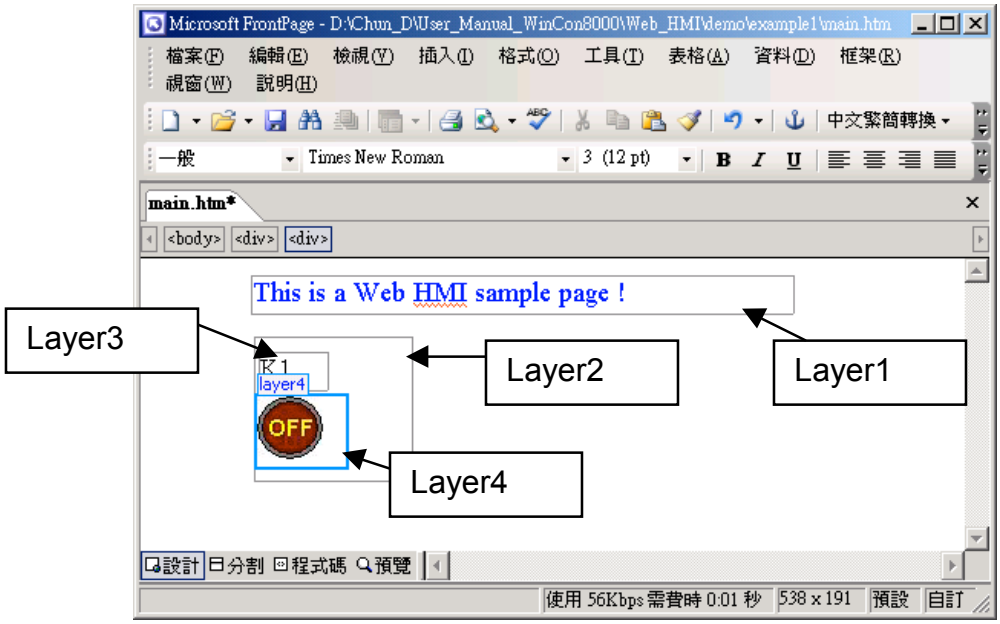
Follow the same former steps to insert one another “Layer” to be in just below the “Layer3” as below.



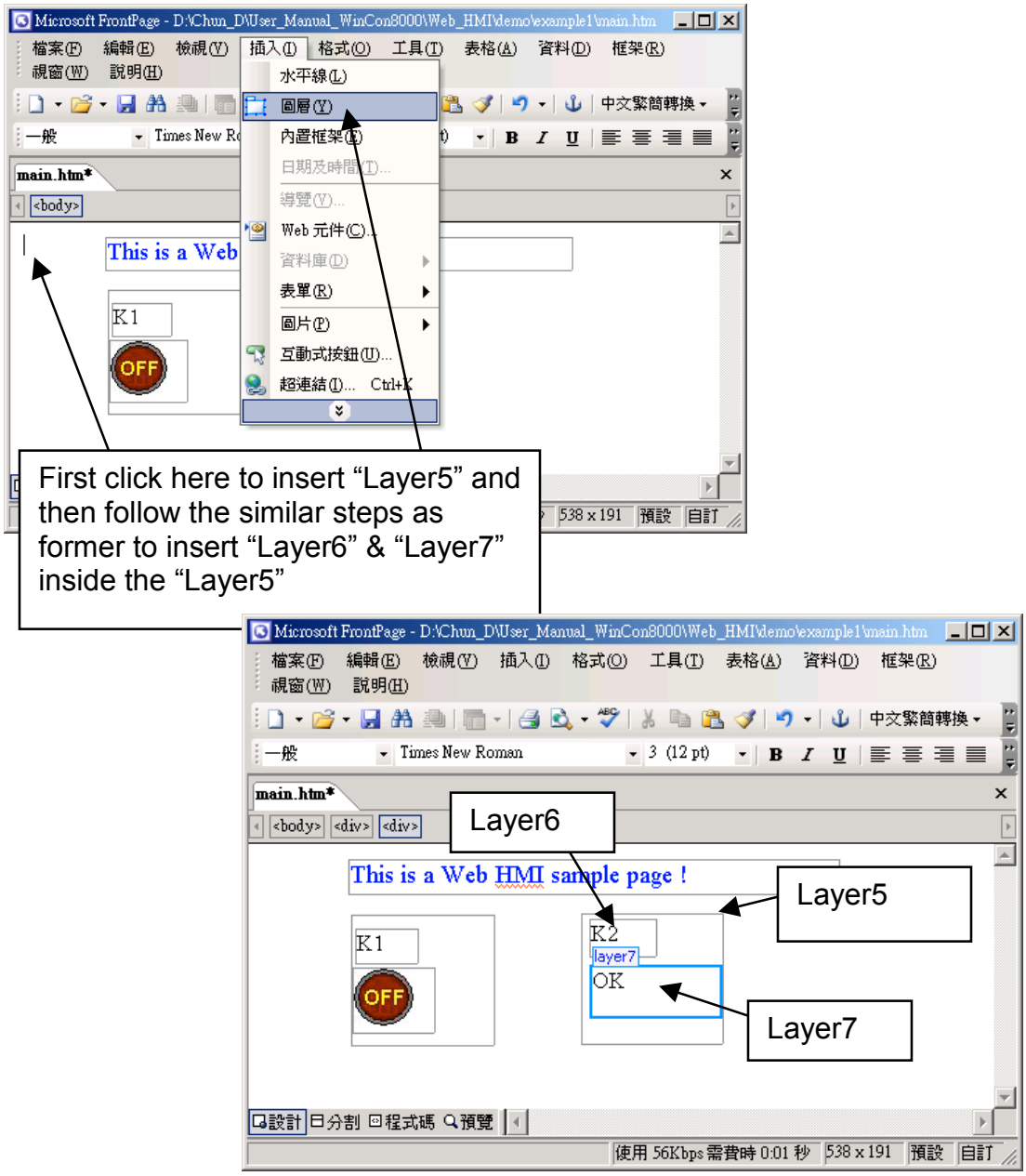
Inside the “Layer4”, we are going to insert one image file to it as below. The image file name is “./img/big_Tcircle_red0.jpg”. Please browse to the correct folder in your hard driver. Here we use “example1/img/” in this example.



You will see a window as below.

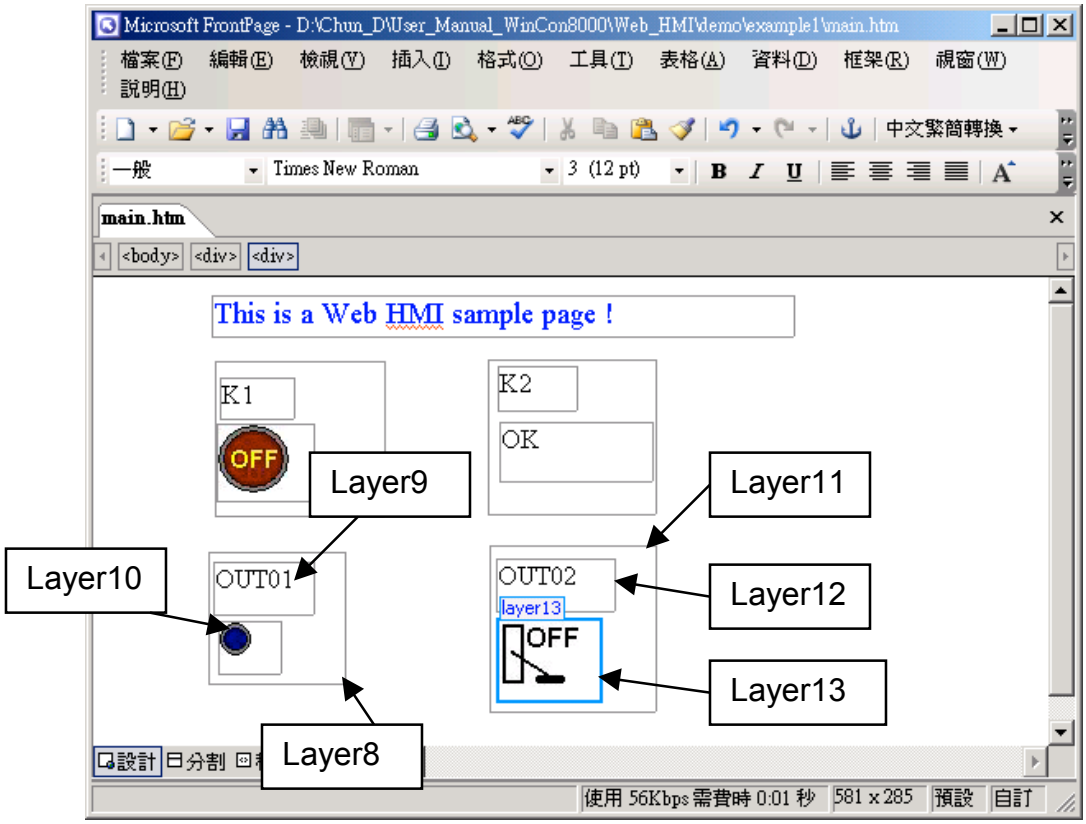


Please follow the similar steps to insert one another “Layer5” and one “Layer6” with a “K2” symbol inside it, and also a “Layer7” with a “OK” symbol inside it as below.



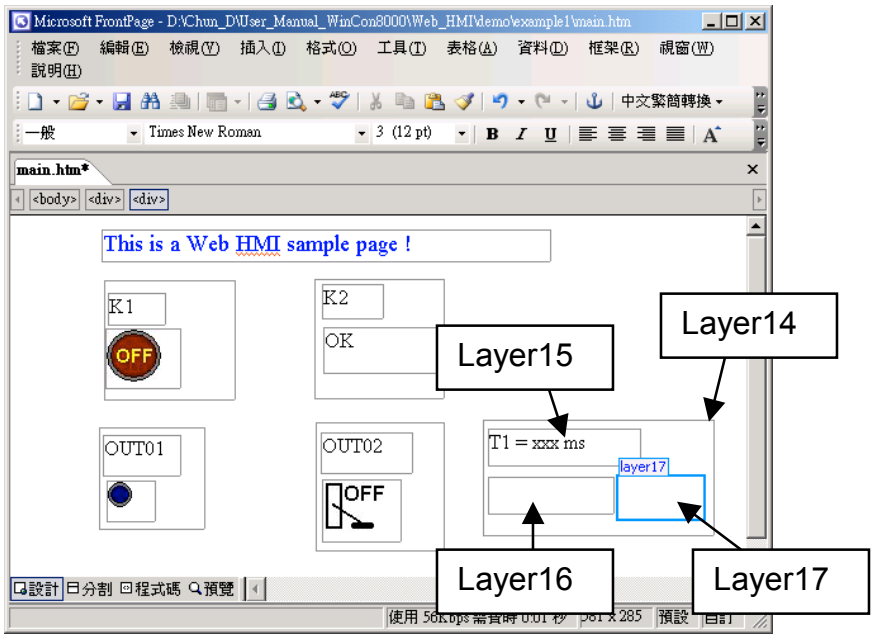
We will use “K1” to display the state of the first input of the I-8077 board, and “K2” for its second input.

Please follow the similar steps to insert “OUT01” & “OUT02” as below. The OUT01 uses “./img/circle_blue0.jpg” as its image source, while OUT02 using “./img/cmd0.jpg”.

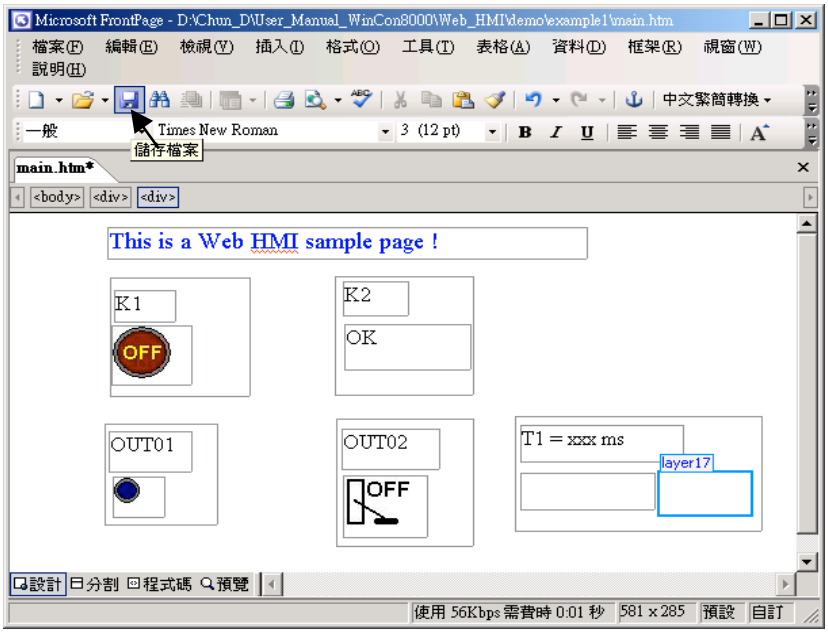


We will use OUT01 to display the state of the first output of the I-8077 board, while “OUT02” is for controlling and displaying the second output of the I-8077.

Now please insert one another “Layer14”. Inside the “Layer14” please insert one “Layer15” with a “T1 = xxx ms” symbol. And two empty Layers – “Layer16” & “Layer17” just below the “Layer15”. We will use T1 to display the Timer value “T1” in the ISaGRAF project.

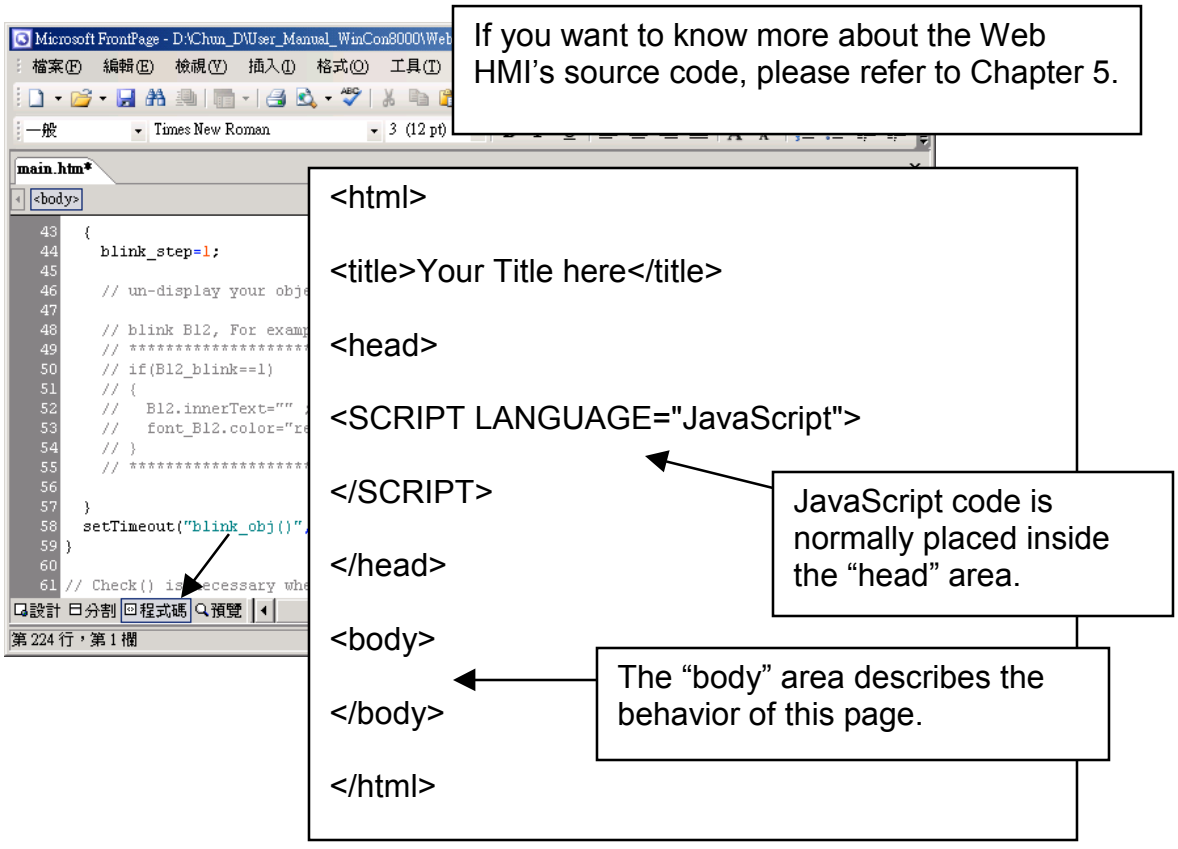


Click on “Save” to save this page.



4.4.3: Step 3 – Adding Control Code To The Main.htm

Please switch the window to the source code. A valid HTML document will contain the basic objects as below.



Please go to the body area and then modify the code as below.

Caption Area: Layer1
A Layer is starting with “<div “ & ending with “ ” tag

```
<!-- Caption -->
<font color="blue" size="4">
<div style="position: absolute; width: 353px; height: 24px; z-index: 1; left: 73px; top: 12px" id="layer1">
This is a Web HMI sample page !</div>
</font>
```

K1 Area: Layer2 to Layer4

```
<div style="position: absolute; width: 102px; height: 93px; z-index: 2; left: 75px; top: 52px" id="layer2">
<div style="position: absolute; width: 44px; height: 24px; z-index: 1; left: 3px; top: 10px" id="layer3">
K1</div>
<div style="position: absolute; width: 58px; height: 46px; z-index: 2; left: 1px; top: 38px" id="layer4">
<img  name=”B11”  border="0" src="img/big_Tcircle_red0.jpg" width="43" height="41"></div>
<p> </div>
```

Please insert name=”B11” just after the “<img “

K2 Area: Layer5 to Layer7

```
<div style="position: absolute; width: 101px; height: 93px; z-index: 3; left: 241px; top: 51px" id="layer5">
<div style="position: absolute; width: 47px; height: 26px; z-index: 1; left: 6px; top: 4px" id="layer6">
K2</div>
<div style="position: absolute; width: 92px; height: 35px; z-index: 2; left: 7px; top: 38px" id="layer7">
```

****
** OK **
****

```
<p> </div>
```

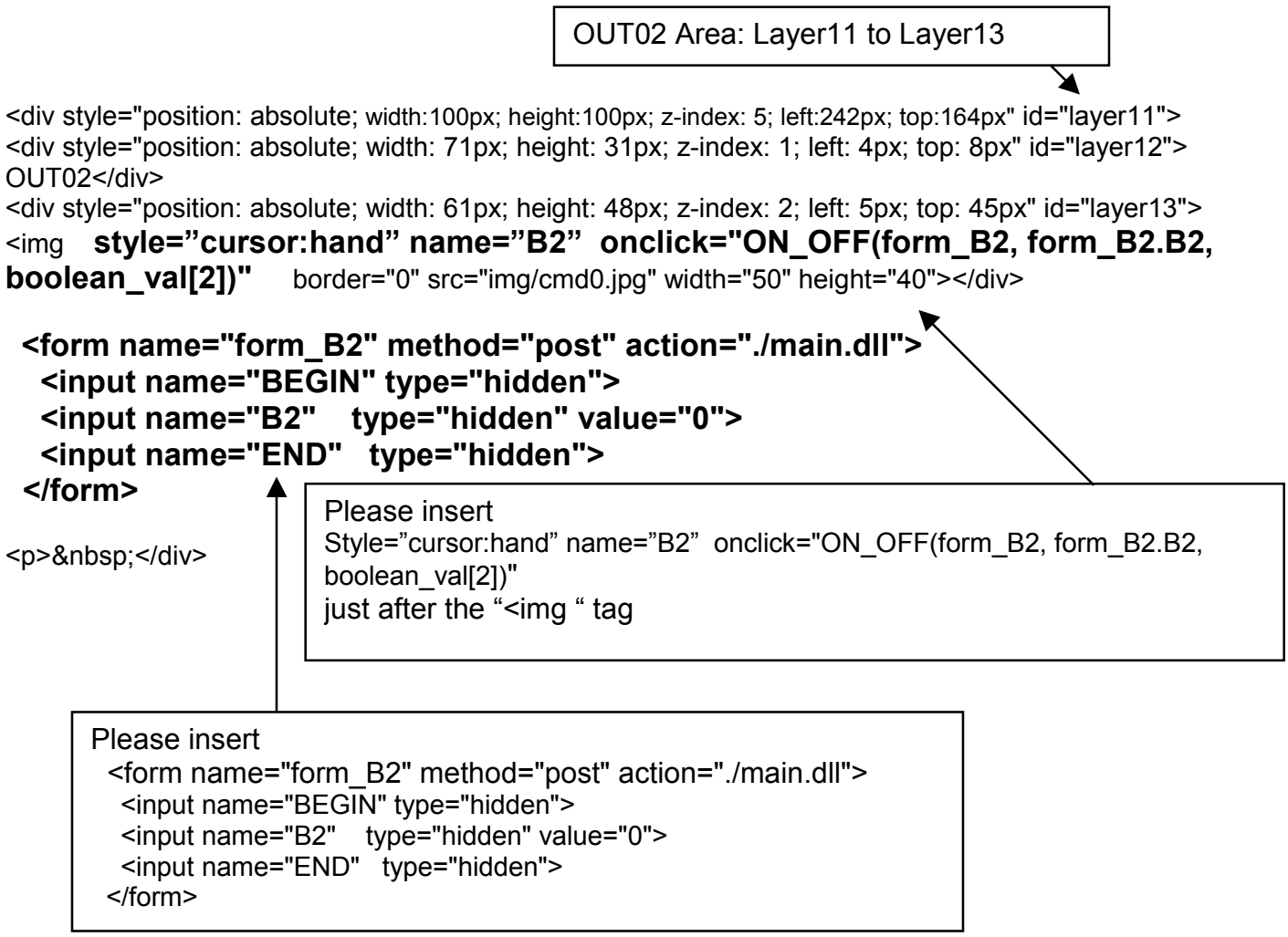
Please modify “OK ” to become

```
<font  id=”font_B12” color=”blue” size=”3”>
<b  id=”B12”> OK </b>
</font> </div>
```

OUT01 Area: Layer8 to Layer10

```
<div style="position: absolute; width: 82px; height: 79px; z-index: 4; left: 71px; top: 168px" id="layer8">
<div style="position: absolute; width: 60px; height: 31px; z-index: 1; left: 3px; top: 6px" id="layer9">
OUT01</div>
<div style="position: absolute; width: 37px; height: 31px; z-index: 2; left: 6px; top: 42px" id="layer10">
<img  name=”B1”  border="0" src="img/circle_blue0.jpg" width="19" height="20"></div>
<p> </div>
```

Please insert name=”B1” just after the “<img “


OUT02 Area: Layer11 to Layer13

OUT02

<img style=”cursor:hand” name=”B2” onclick="ON_OFF(form_B2, form_B2.B2, boolean_val[2])" border="0" src="img/cmd0.jpg" width="50" height="40">
<form name="form_B2" method="post" action="./main.dll">
<input name="BEGIN" type="hidden">
<input name="B2" type="hidden" value="0">
<input name="END" type="hidden">
</form>
<p>
Please insert
Style=”cursor:hand” name=”B2” onclick="ON_OFF(form_B2, form_B2.B2, boolean_val[2])"
just after the “<img “ tag
Please insert
<form name="form_B2" method="post" action="./main.dll">
<input name="BEGIN" type="hidden">
<input name="B2" type="hidden" value="0">
<input name="END" type="hidden">
</form>

T1 Area: Layer14 to Layer17

T1 = xxx ms

Please modify "T1 = xxx ms " to become
T1 = xxx ms

<form name="form_L21" method="post" action="./main.dll">
<input name="BEGIN" type="hidden">
<input name="L21" type="text" size="8" value="xxx">
<input name="END" type="hidden">
</form>

Please insert below code inside "Layer16"

```
<form name="form_L21" method="post" action="./main.dll">
   <input name="BEGIN" type="hidden">
   <input name="L21" type="text" size="8" value="xxx">
   <input name="END" type="hidden">
  </form>
```


<input type="button" value="Enter" onclick="Check_L21( )">

Inside the "Layser17", please insert
<input type="button" value="Enter" onclick="Check_L21( )">

<p>

We have finished the code in the <body> </body> area.

Now please go to the "head" area

In the “head” area, please modify the sample code to be as below.

```
// variable to record object's blink state, 0:not blink, 1: blink, For example:
// ********************************
var B12_blink=0;  // init as 0:not blink
// ********************************

// function to blink object
var blink_step=0;
function blink_obj()
{
  if(blink_step==1)
  {
    blink_step=0;

    // display your object here

    // blink B12, For example:
    // ********************************
    if(B12_blink==1)
    {
      B12.innerText="Error !" ;
      font_B12.color="red";
    }
    // ********************************

  }
  else
  {
    blink_step=1;

    // un-display your object here

    // blink B12, For example:
    // ********************************
    if(B12_blink==1)
    {
      B12.innerText="" ;
      font_B12.color="red";
    }
    // ********************************

  }
  setTimeout("blink_obj()", blink_period);
}
```

The “Error !” symbol will blink when the K2 = True in this example. Please un-mask the code inside these 3 areas.

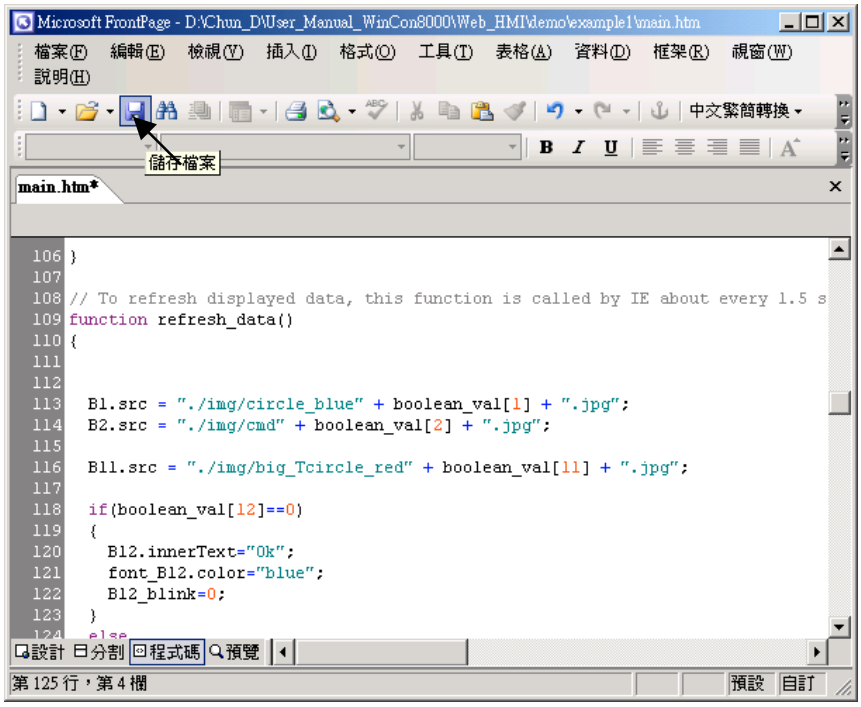
We need a function “Check_L21 to check the entered T1 value and post it to the Wincon. Please un-mask the sample code to be as below.

```
// form sample, to check value of L21 & then post val to controller
// For example:
// ************************************************************
function Check_L21()
{
  var val=form_L21.L21.value;
  if(val>12000 || val<4000)
  {
    alert("T1's value should be in the range of 4000 to 12000");
    return;
  }
  Check(form_L21);  // post value to the controller
}
// ************************************************************
```

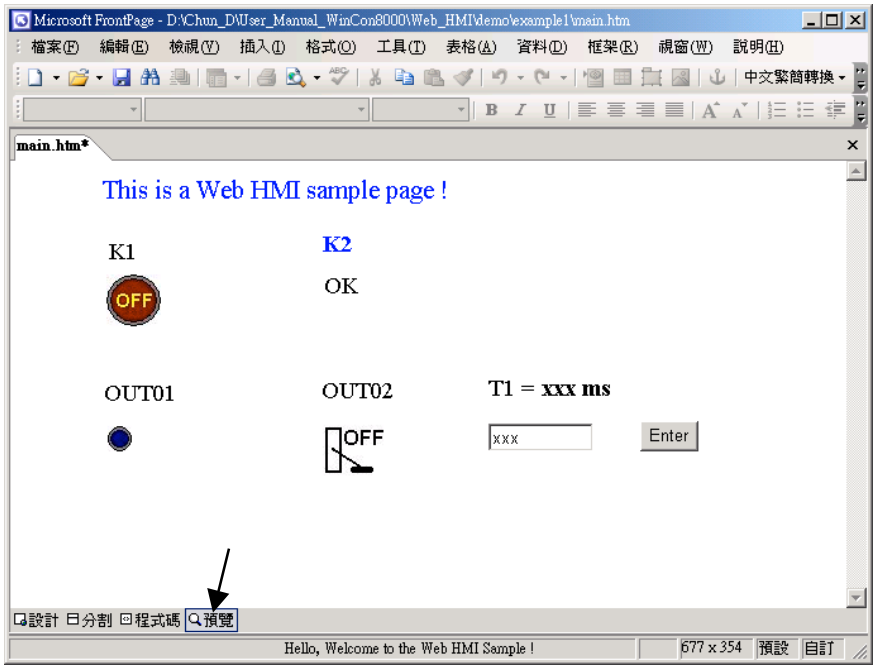
And also inside the “refresh_data() “ function, please insert below code.

```
// To refresh displayed data, this function is called by IE about every 1.5 sec later
function refresh_data()
{
  B1.src = "./img/circle_blue" + boolean_val[1] + ".jpg";
  B2.src = "./img/cmd" + boolean_val[2] + ".jpg";

  B11.src = "./img/big_Tcircle_red" + boolean_val[11] + ".jpg";

  if(boolean_val[12]==0)
  {
    B12.innerText="Ok";
    font_B12.color="blue";
    B12_blink=0;
  }
  else
  {
    B12_blink=1;
  }

  T1.innerText=timer_val[21] + " ms";
}
```

Now we have finished all the code. Please save it.



You may click on “Preview” to simulate its run time behavior.



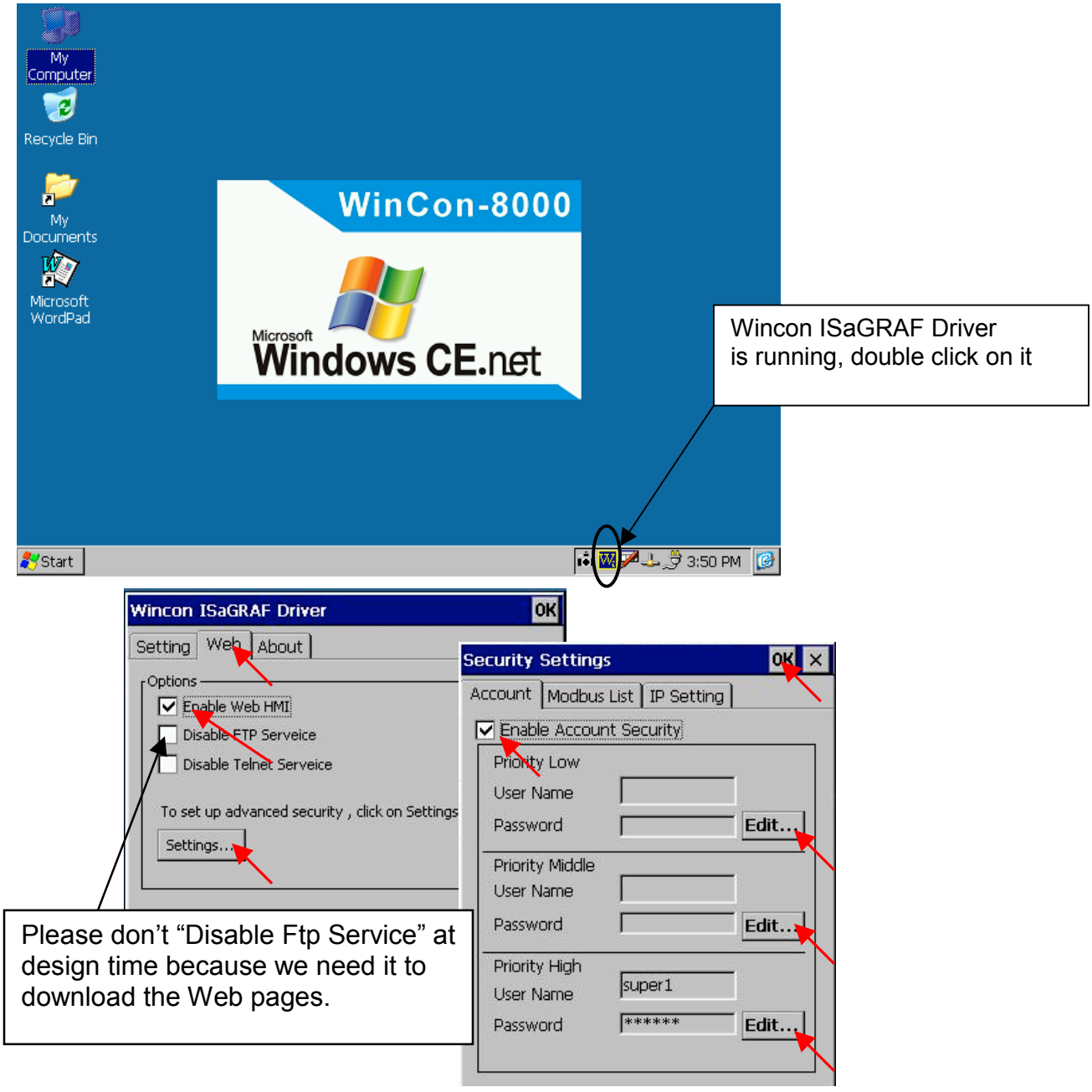
4.4.4: Step 4 – Download Web HMI Pages To The Controller

The steps are similar as listed in Section 3.2. If you havn't practiced "Setting Up A Web HMI Demo" listed in the Chapter 3, it's better to do it once to get familiar with it.

First set the web options.

Check on "Enable Web HMI" and then click on "Setting", Please check on "Enable Account Security" and then click on "Edit" to set (username , password). **Then remember to click on "OK"**

Note: If "Enable Account Security" is not check, any user can easily get access to your Wincon through the Internet Explorer.



And then, please copy all files in this example1 to the controller

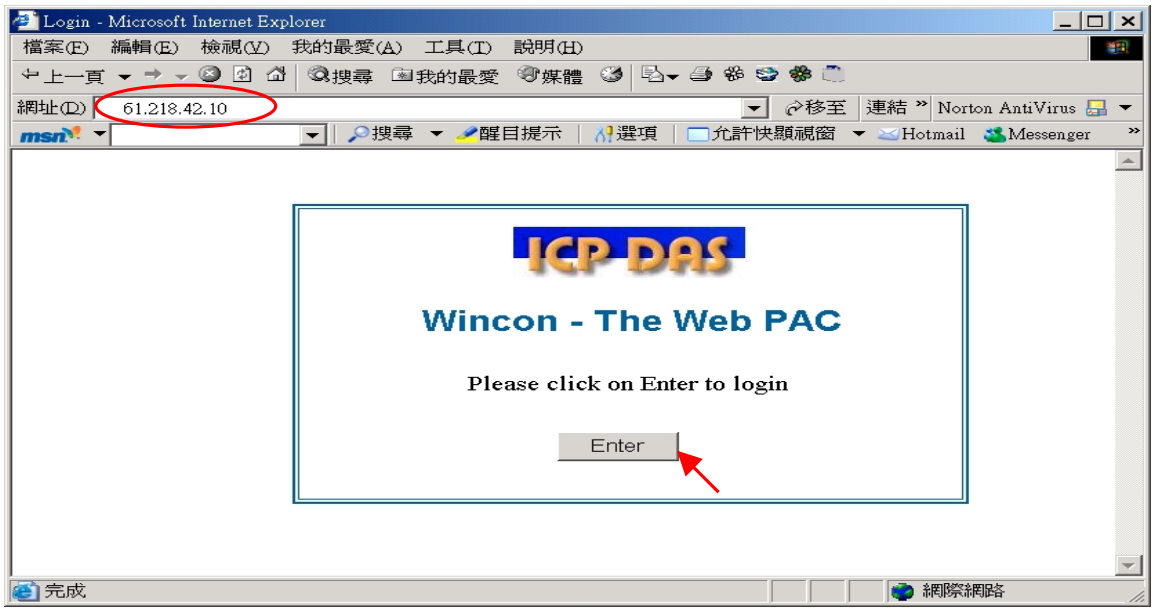
<your hard drive>:\example1\ *.*

to the Wincon-8xx7's

CompactFlash\Temp\HTTP\WebHMI\

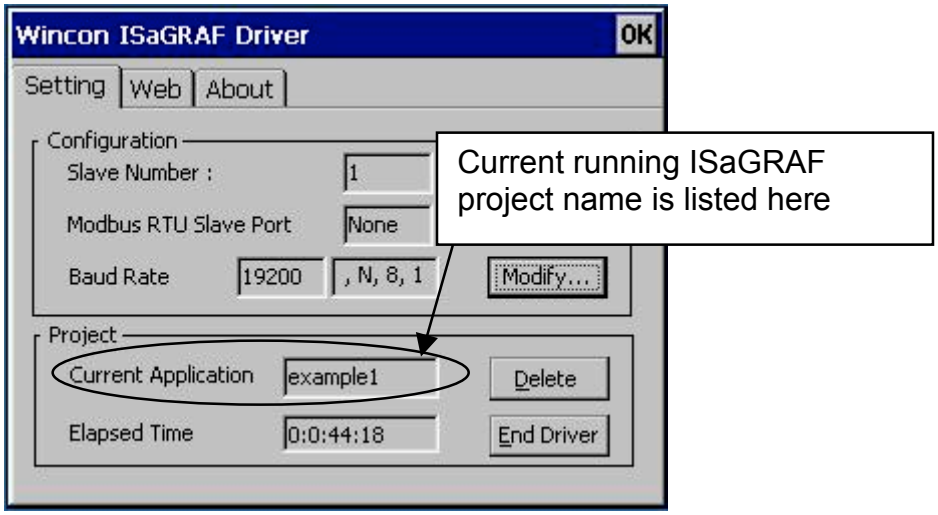
Since the Web Pages are modified or new copied, please run "rs_whmi.exe" to reset the Web server. **The "rs_whmi.exe" must be run every time when user has modified any file in the W-8xx7's CompactFlash\Temp\HTTP\WebHMI**

Show Time:
Please run Internet Explorer (Rev. 6.0 or higher), key in the IP address of your W-8xx7.
For example: 61.218.42.10 or http://61.218.42.10



If there is something wrong with the web page. You may enable the below item to display the debug message every time it has error.

And also check if your ISaGRAF project already download to the controller (Section 4.3 or or section 3.2.4).



And do you assign the correct Modbus Network address to the respective ISaGRAF variables ? (Section 4.1.5).

Chapter 5: Web HMI Basics

Important: Please always set a **fixed IP** address to the Wincon. (No more DHCP)
Please always set W-8x47/8x46's LAN2 as disabled if not using it (refer to appendix D).
Please use NS-205 or NS-208 Industrial Ethernet Switch for Wincon-8x46/8x47.

Note:
1.This chapter describes the programming basics for the Web HMI. We will not focus on the HTML programming basics. If you want to know more about the HTML programming, the best way is to "buy a HTML related book" from the bookstore. There are a lot of books doing this job.

2. The Web HMI only supports the basic HTML tags. It doesn't support ASP, PHP or JSP or other Page Server language.

3. Please do not use <frameset> </frameset> , <frame> </frame> in the Web HMI.

4. Note: The object name & object ID & code & variable name & function name is case sensitive. For example, refresh_data( ) and Refresh_data( ) is different.

5. There are more than 10 Web HMI examples in the Wincon-8xx7's CD-ROM. Please refer to section 3.1.

5.1: Basic Files For The Web HMI

The basic Web HMI files includes 2 folders and 3 DLL files and 4 htm files as below.

./img/	(default image files - *.jpg , *.bmp , *.gif)
./msg/	(default message files – wincon.js & xxerror.htm)
whmi_filter.dll	(three DLL files)
login.dll	
main.dll	
index.htm	(first default page)
login.htm	(the Web HMI welcome page)
menu.htm	(the page-menu page, normally on the left on the Internet Explorer)
main.htm	(first page when successfully login)

User may put his own image files into the folder named as "user_img". And put user-defined javascript file or css file into the folder named as "user_msg". Other folder name is not acceptable by the Wincon Web HMI.

The "index.htm" file is the default entry page of the web server. User should not modify it. The "index.htm" re-directs to the "login.htm" file in 1 to 2 second when someone visits the Wincon-8xx7 via the Internet Explorer.

User may modify the "login.htm" , "menu.htm" & "main.htm" to fit his own need.

5.2: Login.htm

Login.htm is the first welcome page when a user visiting. It can be modified. Below is the basic code for the login.htm

```
<html>
<head>

<title>Login</title>

<meta http-equiv=pragma content=no-cache>

<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" >

<script language="JavaScript">
var random_val=123;
function get_random_val()
{
  var rightNow = new Date();
  random_val += 323456789*rightNow.getMinutes() +
107654321*(rightNow.getTime()%1000);
  setTimeout("get_random_val()", 197); // repeat call
}

//check if username and possword are empty
function validate(fm)
{
  setKey(fm);
  return true;
}

//Embed key whille submitting
function setKey(fm)
{
  var rightNow = new Date();
  cookieVal = random_val+rightNow.getTime();
  fm.key_.value = cookieVal;
}
</script>

</head>

<body onload="get_random_val()">

<div style="position: absolute; width: 332px; height: 34px; z-index: 5; left: 147px; top: 27px"
id="layer1">
Welcome !</div>
```

This line is only for the “Login.htm” , please do not apply to other pages. For example, the “menu.htm” & “main.htm” & other .htm pages.

Please apply your charset here.
For example,
English: UTF-8
Chinese: gb2312
Traditional Chinese: big5
or other language

get_random_val( ) should be always called at the beginning of the Login.htm . It is the entry point of the Login.htm

Your caption here.

```
<div style="position:absolute; width:122px; height:38px; z-index:4; left: 171px; top: 95px;"
id="layer2">

  <form name="form1" action="./login.dll" method="post">
    <input type="hidden" name="key_">
    <input type="submit" name="Submit" value="  Enter  " style="cursor:hand" onClick="return
validate(this.form)">
  </form>

</div>

</body>

<!-- To ensure no-cache work -->
<head>
<meta http-equiv=pragma content=no-cache>
</head>

</html>
```

"form1" is necessary

You may modify " Enter " to your own word. For example "請進" .This may require to modify the related charset at the beginning of this page.

This code is only for the "Login.htm" , please do not apply to other pages. For example, the "menu.htm" & "main.htm" & other .htm pages.

That's all the login.htm need. You can insert more images or text to it. Only remember to keep its basic code.

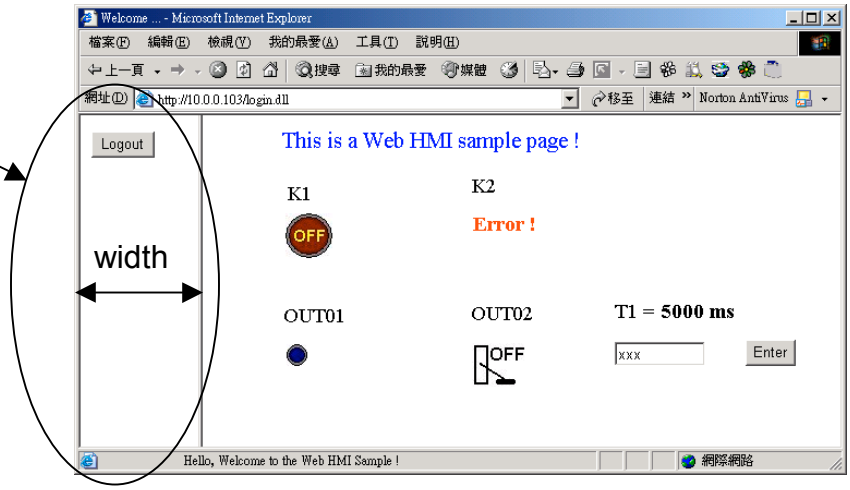
5.3: menu.htm

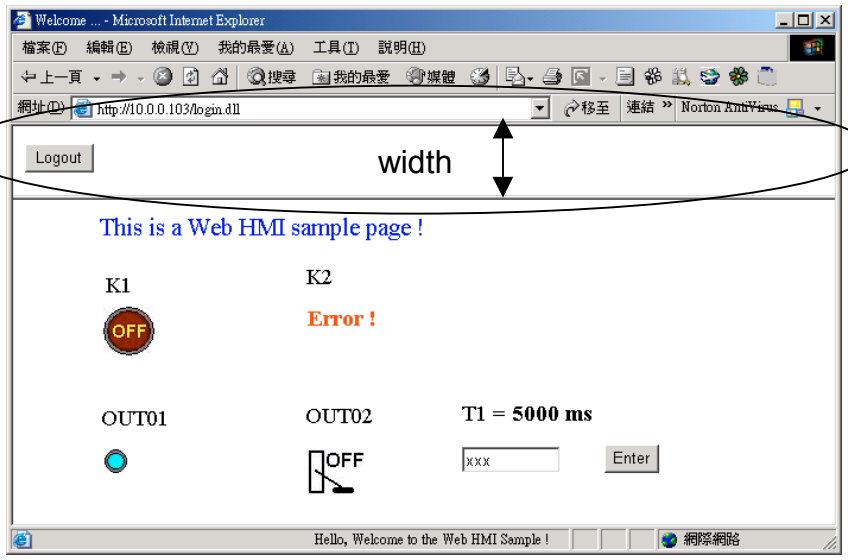
Note:
If you want to know more about the multi-page application, there are two demos in the Wincon-8xx7 CD-ROM: \napdos\isagraf\wincon\WebHMI_Demo\demo_05 & demo_05a . Demo_05 place its page-menu on the left, while Demo_05a on the top.

Menu.htm defines the Page-menu of the Web HMI especially for the multi-page application. The page-menu can place only on the left or on the top.

On the left.

The width & scrolling can be modified.





On the top.

The width & scrolling can be modified.

Below is the basic code for the menu.htm

```
<!-- top_or_left=1 , scrolling=0 , width=60 , resize=1 -->
```

The fist line is not a comment, it defines the Page-Menu behavior
- top_or_left: 1:Top , 0:Left
- scrolling: 1:Yes , 0:No
- width: width of the Menu Frame, 0 – 999 (unit is pixel)
- resize 1:Yes , 0:No

```
<html>
<head>
<title>Title1</title>

<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" >

<SCRIPT LANGUAGE="JavaScript" src="./msg/wincon.js"></SCRIPT>

<SCRIPT LANGUAGE="JavaScript">

function start1()
{
  A_11();
}
function refresh_data()
{
  if(run_at_pc==1) return;
}
</SCRIPT>

</head>

<body onload="start1()">
```

This line is necessary for menu.htm , main.htm & other multi-pages

Please apply your charset here. For example,
- English: UTF-8
- Chinese: gb2312
- Traditional Chinese: big5
- or other language

start1( ) is the entry point of the menu.htm

```
<!-- Logout button -->
<form name="form_logout" method="post" action="./login.dll">
  <input style="cursor:hand" name="CMD" type="submit" value="Logout" onClick="return
logout(this.form)">
</form>

</body>
</html>
```

form_logout is for the logout button.

Note:
If you want to know more about the multi-page application, there are two demos in the Wincon-8xx7 CD-ROM: \napdos\isagraf\wincon\WebHMI_Demo\demo_05 & demo_05a . Demo_05 place its page-menu on the left, while Demo_05a on the top

5.4: main.htm

5.4.1: A Simple Main.htm Example

Before going further in the main.htm, first take a look at a simple main.htm example. This example only display a “Hello !” message when successfully login, nothing else.

```
<html>
<head>
<title>Title1</title>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" >

<SCRIPT LANGUAGE="JavaScript" src="./msg/wincon.js"></SCRIPT>

<SCRIPT LANGUAGE="JavaScript">
show_scroll_word(200,"Hello, Welcome to the Web HMI Sample !");

function refresh_data()
{
}

</SCRIPT>
</head>

<body onLoad="init()">

<font color="blue" size="4">
<div style="position: absolute; width: 353px; height: 24px; z-index: 1; left: 73px; top: 12px"
id="layer1">   Hello !</div>
</font>

</body>
</html>
```

Please apply your charset here. For example, English: UTF-8 Chinese: gb2312 , Traditional Chinese: big5 , or other language

This line is necessary for menu.htm , main.htm & other multi-pages

Calling show_scroll_world( ) will display a moving word at the bottom of the Internet Explorer. Here 200 means 200 ms. You may make it slower, for example, using 500.

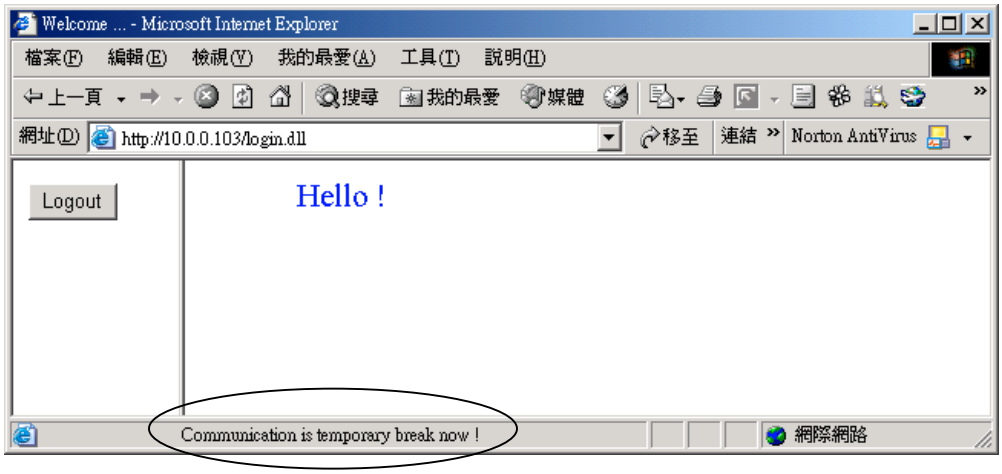
refresh_data( ) is called when the Internet Explorer has received the requested data from the controller. It is called in the period about 1.25 to 5 seconds depends on the communication quality.

init( ) is the entry pint of the main.htm & other multi-pages.

A layout object is starting with “<div” & ending at “ ” tags. Here only show a message “Hello !”

You may replace the main.htm in the Wincon-8xx7 CD-ROM:
\napdos\isagraf\wincon\WebHMI_Demo\sample
to the above main.htm & download it to the controller (refer to section 4.4.4). You will see the below window when you login successfully.

User may try to plug out the Ethernet cable of the Wincon or of your PC. You will see it show "Communication is temporary break now !" in about 10 seconds. When you plug the cable back, the communication will be recovered in about 10 to 45 seconds.



If the communication break time exceeds 120 seconds, it will show the below message. You have to close the Internet Explorer & open it again to re-login.

5.4.2: More About The refresh_data( ) Function And Dynamic Data

Note: The code & variable name & function name is case sensitive. For example, refresh_data( ) is correct, however Refresh_data( ) is not correct.

The refresh_data( ) function must always apply in the main.htm and other multi-pages. It is called when the Internet Explorer has received the requested data from the controller. The calling period is about 1.25 to 5 seconds depends on the communication quality

The refresh_data( ) is often used for refreshing the dynamic data. For example, the boolean value , integer value, timer value or float value of the variables in the ISaGRAF project.

The Internet Explorer can access to the data in the ISaGRAF project only when they are assigned a unique Modbus Network Address No (refer to section 4.1.5). The Web HMI only accepts Network Address No in the range of 1 to 1024. The data without a Network Address No (No. = 0) or not in the range of (1 to 1024) is not accessible by the Internet Explorer.

The main.htm and other multi-pages can use the below variable array to access to the ISaGRAF's data (case sensitive). The identifier appeared in the [ ] is the related Network Address No. For example boolean_val[2] means the boolean value of the ISaGRAF boolean data which is assigned with the Network Address No. = 2.

boolean_val	boolean value in the ISaGRAF
word_val	word value in the ISaGRAF, -32768 to +32767
float_val	real value in the ISaGRAF, for ex, 1.234 , -0.456E-02
timer_val	timer value in the ISaGRAF, unit is ms, max = 86399999 (< 1 day)
string_val	message value in the ISaGRAF, max string length is 255

To access to long integer value (32-bit integer) please use get_long_val( ) function. For example, get_long_val(11) , get_long_val(13) , get_long_val(15).

get_long_val( )	long integer value in the ISaGRAF, -2147483648 to +2147483647

Note:
The long integer & timer & float variable's Network Address No. must occupy 2 No. in the ISaGRAF project (refer to section 4.2 of "User's Manual of ISaGRAF Embedded Controllers" or in the CD-ROM:\napdos\isagraf\wincon\english_manu\" User_Manual_I_8xx7.pdf").

That means if you assign a Network Address No.= 11 to a Real type variable(or Timer or integer will have 32-bit value – larger than 32767 or smaller than -32768), the next No. 12 should not assigned to any other variable in the ISaGRAF project. However you may assign No.=13 to one another variable.

5.4.2.1: Displaying Dynamic Boolean Data

Demo example: whmi_02 & whmi_05 (section 3.1)

Let's look back to the refresh_data function. If user want to display the dynamic boolean value, the below code can be used.

```
…
function refresh_data()
{
  B1.src = "./img/circle_blue" + boolean_val[1] + ".jpg" ;
}
…

<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px; top: 79px">
<img name="B1" src="img/circle_blue0.jpg"></div>

…
</body>
```

The action of the image object "B1" is defined here.

if boolean_val[1]=1, it display image "B1" as "img/circle_blue1.jpg"
if boolean_val[1]=0, it display image "B1" as "img/circle_blue0.jpg"

The layout (or location) of the image object "B1" is defined here by the "<div" " " tags.

The declaration of image "B1" is defined here by the "img" tag & name="B1" src= … ← "src=" defines the initial value of B1

5.4.2.2: Displaying Dynamic Float & Word & Timer Data

Demo example: whmi_01 & whmi_03 & whmi_05 (section 3.1)

If user want to display the dynamic float value, the below code can be used.

```
…
function refresh_data()
{
  F21.innerText = float_val[21] ;
}
…


<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px; top: 79px">
<b  id="F21"> xxxx </b> </div>

…
</body>
```

The action of the Text object "F21" is defined here.

If want to display Word data, please use "word_val[ ]"
If want to display Timer data, please use "timer_val[ ]".
For ex, F21.innerText = timer_val[21] + " ms";

The layout (or location) of the Text object "F21" is defined here by the "<div" " " tags.

The declaration of Text object "F21" is defined here by the "<b" tag & id="F21" & "" tag initial value of this F21 is "xxxx"

5.4.2.3: Displaying Dynamic Long Integer Data

Demo example: whmi_03 & whmi_05 (section 3.1)

If user want to display the dynamic long integer value (32-bit format), the below code can be used.

```
…
function refresh_data()
{
  L11.innerText = get_long_val(11) ;
}
…

<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px; top: 79px">
<b  id="L11"> xxx </b> </div>

…
</body>
```

The action of the Text object “L11” is defined here.

The layout (or location) of the Text object “L11” is defined here by the “<div” “ ” tags.

The declaration of Text object “L11” is defined here by the “<b” tag & id=”L21” & “” tag initial value of this L11 is “xxx”

5.4.2.4: Displaying Dynamic String Data

If user want to display the dynamic string value (max length is 255), the below code can be used.

```
…
function refresh_data()
{
  S31.innerText = string_val[31] ;
}
…

<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px; top: 79px">
<b  id="S31"> empty </b> </div>

…
</body>
```

The action of the Text object “S31” is defined here.

The layout (or location) of the Text object “S31” is defined here by the “<div” “ ” tags.

The declaration of Text object “S31” is defined here by the “<b” tag & id=”S31” & “” tag initial value of this S31 is “empty”

5.4.2.5: Trigger A Boolean Object To Blink

Demo example: whmi_02 & whmi_05 (section 3.1)

Some application may need a message to blink when the boolean value changes. For example, If boolean_val[12] is False, it means “OK”. However if boolean_val[12] is True, it means “Error !” . User may want to make this “Error !” blink to attract viewer’s attention.

The below code can do this job.

```
…
var blink_period=500;

setTimeout("blink_obj()", blink_period);

var B12_blink=0;   // init as 0:not blink

var blink_step=0;

function blink_obj()
{
 if(blink_step==1)
 {
  blink_step=0;
  if(B12_blink==1)
  {
   B12.innerText="Error !" ;
   font_B12.color="red";
  }
 }
 else
 {
  blink_step=1;
  if(B12_blink==1)
  {
   B12.innerText="" ;
   font_B12.color="red";
  }
 }
 setTimeout("blink_obj()", blink_period);
}

…
```

The blinking period, unit is ms

Setup a timer to handle the blinking action

1: to blink , 0: not blink

Blink step 1:
To display “Error !” in red color.

Blink step 2:
To display “” (nothing) in red color.

```
function refresh_data()
{
  if(boolean_val[12]==0)
  {
    B12.innerText="Ok";
    font_B12.color="blue";
    B12_blink=0;
  }
  else
  {
    B12_blink=1;
  }
}
…

<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px; top: 79px">

<font  id=”font_B12” color=”blue” size=”3”>

<b  id="B12">OK</b>

</font>

</div>

…
</body>
```

The action of the Text object “B12” is defined here.
If boolean_val[12]=0, not blink.
However If boolean_val[12]=1, blink.

The layout (or location) of the Text object “B12” is defined here by the “<div” “ ” tags.

The ““ & “” tags can be used for controlling the font’s color and font’s size.

The declaration of Text object “B12” is defined here by the “<b” tag & id=”B12” & “” tag initial value of this B2 is “OK”

5.4.2.6: Displaying Float Value With Fixed Digit Number Behind The “.” Symbol
Demo example: whmi_06 & whmi_07 (section 3.1)

The float_str1(para1 , para2) function can convert float value to a string with fixed digit number behind the dot "." symbol

para1 is the float value to be converted, for ex, 1.234567
para2 is the digit number behind the “.” dot symbol, 0 to 6
for ex, float_str1(1.234567, 3) return “1.234” , while float_str1(1.234567, 2) return “1.23”

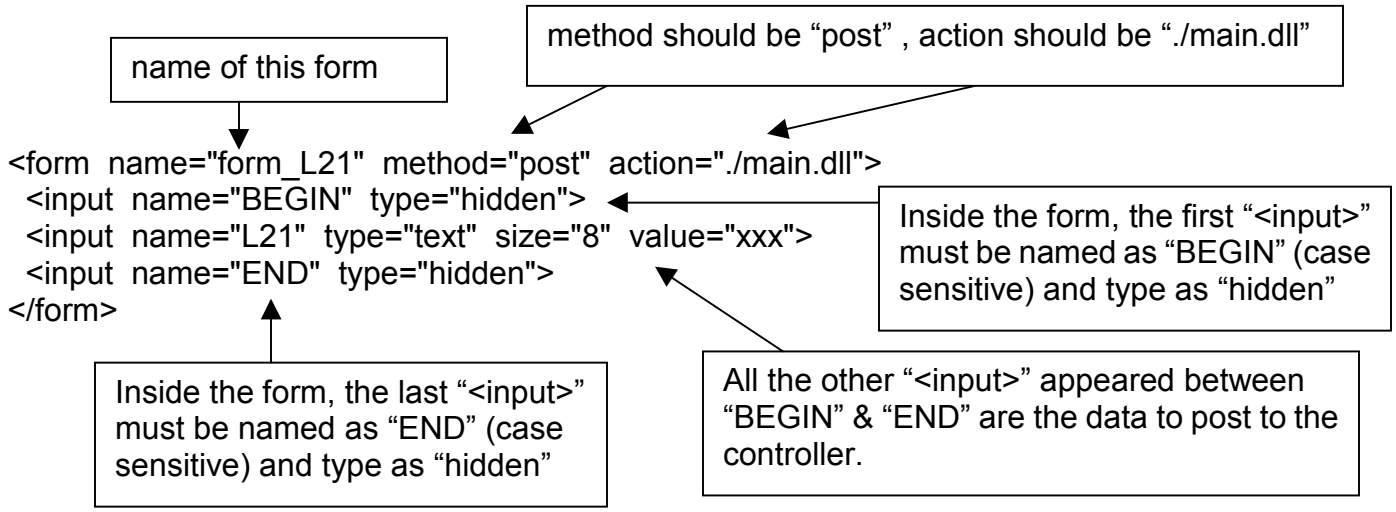
```
…
function refresh_data()
{
  F21.innerText = float_str1( float_val[21] , 3) ;
}
```

Convert float val at Network Address 21 to a string with digit number = 3 behind the “.” dot symbol

5.4.3: Post Data To The Controller

The former section 5.4.2 listing how to get and display data from the controller. This section focuses on posting data to the controller, in other word to control the Wincon via the Internet Explorer.

To set a new value to the boolean, word, long integer, float , timer and string variables in the ISaGRAF project, we need “form” object appeared in the main.htm or other multi-pages. A “form” object looks like as below.



The “<input>” name to control the Wincon’s data must follow below format. The number follows behind the first letter should be in the range of 1 to 1024. This number point to the variable name in the ISaGRAF project with the same Modbus Network Address No.

B	point to the ISaGRAF boolean data , for ex, B5 , B109
W	point to the ISaGRAF word data (-32768 to +32767), for ex, W9 , W1001
L	point to the ISaGRAF long integer data (-2147483648 to +2147483647), for ex, L21 This “L” Also point to the ISaGRAF timer data
F	point to the ISaGRAF real data, for ex, F13 , F235
S	point to the ISaGRAF message data , for ex, S18

Note:
The long integer & timer & float variable’s Network Address No. must occupy 2 No. in the ISaGRAF project (refer to section 4.2 of “User’s Manual of ISaGRAF Embedded Controllers” or in the CD-ROM:\napdos\isagraf\wincon\english_manu\” User_Manual_I_8xx7.pdf”).

That means if you assign a Network Address No.= 11 to a Real type variable(or Timer or integer will have 32-bit value – larger than 32767 or smaller than -32768), the next No. 12 should not assigned to any other variable in the ISaGRAF project. However you may assign No.=13 to one another variable.

5.4.3.1: Post Boolean Value to The Controller

A. To post by the image

```
…
function ON_OFF(form_obj, obj, current_boo_value)
{
  if(current_boo_value==0)
  {
    flag = confirm("turn ON ?");
    if(flag) obj.value=1;
  }
  else
  {
    flag = confirm("turn OFF ?");
    if(flag) obj.value=0;
  }
  if(flag)
  {
   if(GetUserID(form_obj)==true) form_obj.submit();
  }
}
function refresh_data()
{
  B2.src = “img/cmd” + boolean_val[2] + “.jpg” ;
}
…

<body onLoad="init()">
…

<div style="position: absolute; width: 100px; height:100px; z-index: 5; left: 242px; top: 164px" >

<img style="cursor:hand" name="B2"  onclick="ON_OFF(form_B2, form_B2.B2, boolean_val[2])"
src="img/cmd0.jpg">

<form name="form_B2" method="post" action="./main.dll">
   <input name="BEGIN"  type="hidden">
   <input   name="B2"     type="hidden" value="0">
   <input name="END"    type="hidden">
</form>

</div>
…
</body>
```

ON_OFF function is used for posting boolean value to the controller by reference to the current boolean value.

The first parameter is the name of the “form”.
The second paramenter is the “<input>” name inside the form.
The last parameter is the current boolean value.

Demo example: whmi_02 & whmi_05 (section 3.1)

Display the current boolean image. In this example,
0: display “img/cmd0.jpg” , 1: “img/cmd1.jpg”

The layout (or location) of the image object “B2” is defined here by the “<div” “ ” tags.

“cursor:hand” will display the mouse arrow as a hand when entering the image area

Name of the form

Name of the image object

The onclick will call ON_OFF( ) when the mouse click on it.

The first parameter is the name of the “form”. Here is “form_B2”

The second paramenter is the “<input>” name inside the form. Here is “form_B2.B2”

The last is the current boolean value. Here is boolean_val[2]

Name of “<input>” inside the form. Here is “B2”. Because it is inside “form_B2”, then we must use the name of “form_B2.B2” to identify it.

B.To post by buttons

Demo example: whmi_02 & whmi_05 (section 3.1)

```
…
function ON_(form_obj, obj)
{
  flag = confirm("turn ON ?");
  if(flag)
  {
    obj.value=1;
    if(GetUserID(form_obj)==true) form_obj.submit();
  }
}
function OFF_(form_obj, obj)
{
  flag = confirm("turn OFF ?");
  if(flag)
  {
    obj.value=0;
    if(GetUserID(form_obj)==true) form_obj.submit();
  }
}
function refresh_data()
{
  B2.src = "img/big_Tcircle_red" + boolean_val[2] + ".jpg" ;
}
…

<body onLoad="init()">
…
<div style="position: absolute; width: 56px; height:40px; z-index: 5; left: 82px; top: 69px" >
<img name="B2" src="img/big_Tcircle_red0.jpg">
</div>

<div style="position:absolute; left:85px; top:124px; width:42px; height:27px;">
<input type="button" value="ON" style="cursor:hand" onClick="ON_(form_B2, form_B2.B2)">
<form name="form_B2" method="post" action="./main.dll">
   <input name="BEGIN"  type="hidden"  value="">
   <input  name="B2"      type="hidden"  value="1">
   <input name="END"    type="hidden"  value="">
</form>
</div>

<div style="position:absolute; left:85px; top:166px; width:47px; height:31px">
<input type="button" value="OFF" style="cursor:hand" onClick="OFF_(form_B2, form_B2.B2)">
</div>
…
</body>
```

ON_ function is used for posting boolean value as “True” to the controller .

OFF_ function is used for posting boolean value as “Fasle” to the controller .

Display the current boolean image. In this example,
0: “img/big_Tcircle_red0.jpg” , 1: “img/ big_Tcircle_red1.jpg”

The layout (or location) of the image object “B2” is defined here by the “<div” “ ” tags.

A button to call ON_( )
First parameter is the name of the form. Here is “form_B2”
The second is the name of the “<input>” inside the form. Here is “form_B2.B2”

Name of “<input>” inside the form. Here is “B2”. Because it is inside “form_B2”, then we must use the name of “form_B2.B2” to identify it.

A button to call OFF_( )
First parameter is the name of the form. Here is “form_B2”
The second is the name of the “<input>” inside the form. Here is “form B2.B2”

5.4.3.2: Post Word & Long & Float & Timer & String Value to The Controller

```
…
function Check(form_obj)
{
  flag = confirm("Are you sure?");
  if(flag)
  {
    if(GetUserID(form_obj)==false) { return false; }
    form_obj.submit();
    return true;
  }
  else
  {
    return false;
  }
}
```

Check( ) is used for posting any “form”.

Demo example:
whmi_03 & whmi_04 & whmi_05 & whmi_06 & Whmi_07 (section 3.1)

```
function refresh_data()
{
  L15.innerText=get_long_val(15);
  F17.innerText=float_val[17];
}
…
```

Display dynamic value here.
If data is word , please use word_val[ ]
If data is timer, please use timer_val[ ]
If data is string, please use string_val[ ]

```
<body onLoad="init()">
…
```

The layout (or location) of the text object “L15” & “F17” are defined here by the “<div” “ ” tags.

```
<div style="position: absolute; width: 195px; height: 25px; z-index: 2; left: 45px; top: 52px" >
L15 = <b id="L15">xxxx</b></div>
<div style="position: absolute; width: 196px; height: 29px; z-index: 3; left: 45px; top: 82px" >
F17 = <b id="F17">xxxx</b></div>

<div style="position:absolute; left:47px; top:131px; width:204px; height:60px">
  <form name="form1" method="post" action="./main.dll">
    <input name="BEGIN"  type="hidden"  value="">
    <input name="L15"    type="text"    value="Enter long val (L15)">
    <input name="F17"    type="text"    value="Enter float val (F17)">
    <input name="END"    type="hidden"  value="">
  </form>
</div>
<div style="position:absolute; width:74px; height:31px; left: 234px; top: 150px;">
  <input type="button" style="cursor:hand" onClick="return Check(form1)"  value="Enter">
</div>
…

</body>
```

text input L15 & F17 inside the “form1” if data is timer, please use “L” . And “W” for word. “S” for string

“cursor:hand” will display the mouse arrow as a hand when entering the button area

When mouse click on this button, it calls Check( ) to post to the controller

5.5: Multi-Pages

The Web HMI in the Wincon-8xx7 supports multi-pages application. You may refer to Chapter 3 to setup the multi-page demo – “whmi_05” to see how it work.

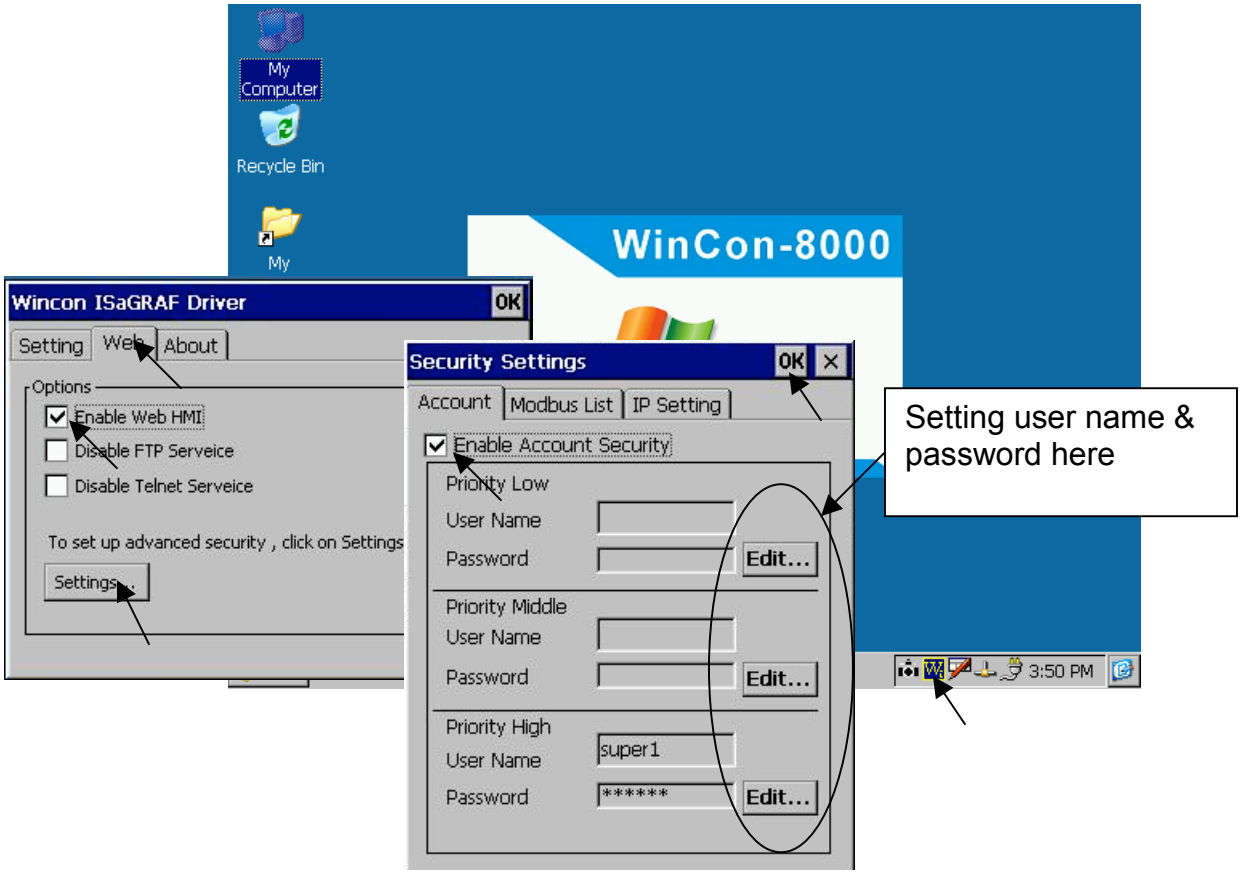
5.5.1: Level 2 And Level 3 Page

The multi-page name can be any valid html file name. For example, “page2.htm”, “kitchen.htm” , “u2-page4.htm” .

If “u2-“ appear in front of the page name, the page will become a Level 2 page. For example, the “u2-Page4.htm” in the “whmi_05” demo. If “u3-“ appear in front of the page name, the page will become a Level 3 page. For example, the “u3-time.htm” in the “whmi_05” demo.

What is a Level2 page ? Only users login with the Middle or High priority can get access to it. To access to the Level3 page, users have to login as a High priority user. The page name without “u2-“ and “u3-“ is identified as Level 1 page. That means any user successfully login can access to it. For example, the “main.htm”

The other rules for multi-pages are almost the same as “main.htm” (section 5.4)



Note: If “Enable Account Security” is not check, any user can easily get access to your Wincon through the Internet Explorer.

5.5.2: Switch One Page To One Another Page

Please take a look at the “menu.htm” of the “whmi_05” demo as below. The “goto_R_page( )” function can be used for switching to other page.

```
<!-- top_or_left=0 , scrolling=0 , width=110 , resize=1 -->

<html>
<head>
<title>Title1</title>
<meta http-equiv="Content-Type" content="text/html; charset=big5" >
<SCRIPT LANGUAGE="JavaScript" src="./msg/wincon.js"></SCRIPT>

<SCRIPT LANGUAGE="JavaScript">
function start1()
{
  A_11();
}
function refresh_data()
{
  if(run_at_pc==1) return;  // if simulate at the PC, just return

  …

}
</SCRIPT>
</head>
<body onload="start1()">

<!-- Logout button -->
<form name="form_logout" method="post" action="./login.dll">
  <input style="cursor:hand" name="CMD" type="submit" value="Logout" onClick="return
logout(this.form)">
</form>
<br/>
<br/>

<!-- Goto main.htm -->
<A style="cursor:hand" onClick="goto_R_page('main.htm')">第1頁</A>
<br/>
<br/>

<!-- Goto kitchen.htm -->
<A style="cursor:hand" onClick="goto_R_page('kitchen.htm')">Kitchen</A><br/>
<br/>
<br/>
…
```

“cursor:hand” will display the mouse arrow as a hand when entering the button area

Switch page to “main.htm”

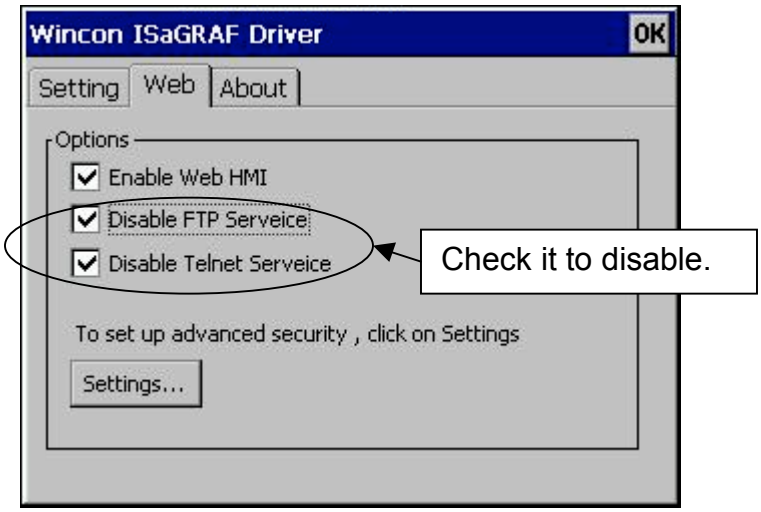
Switch page to “kitchen.htm”

5.6: Web Security

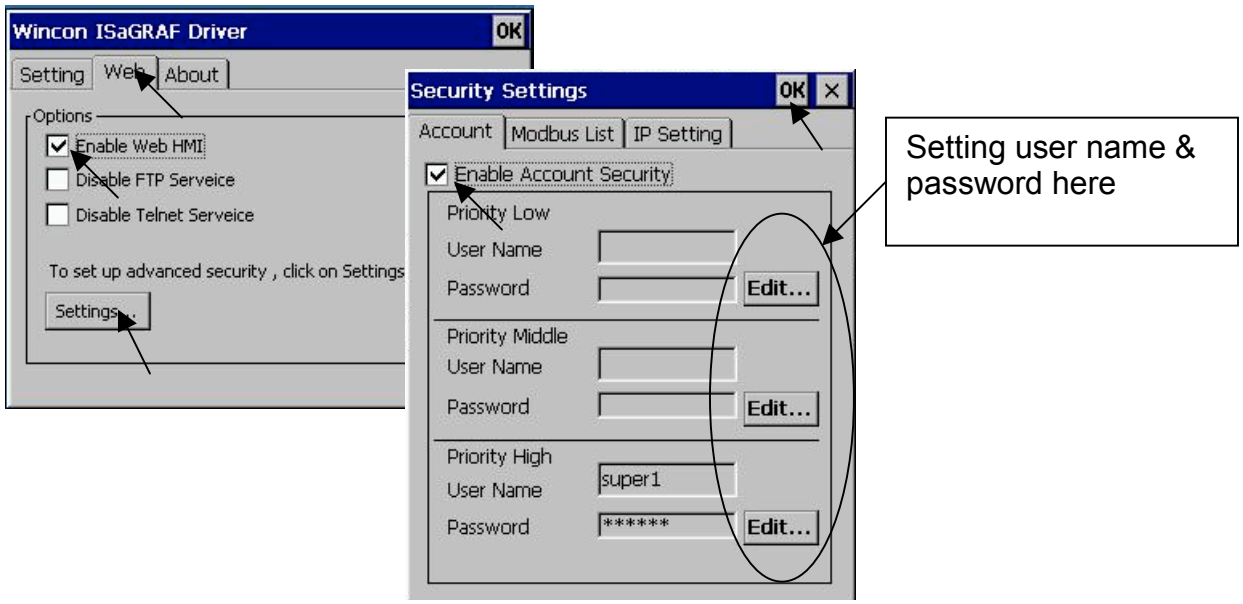
There are some ways user can get access to the Wincon-8xx7 via its ethernet port.

1. Using Modbus TCP protocol at port No.= 502. (ISaGRAF and other HMI can do this)
2. Using ftp (for example, keyin “ftp://10.0.0.103” on the Internet Explorer)
3. Using telent (for example, keyin “telnet 10.0.0.103 in the “command” window)
4. Using the Web server (The Web HMI does)

For safety, recommand to disable item 2 and 3 at run time.

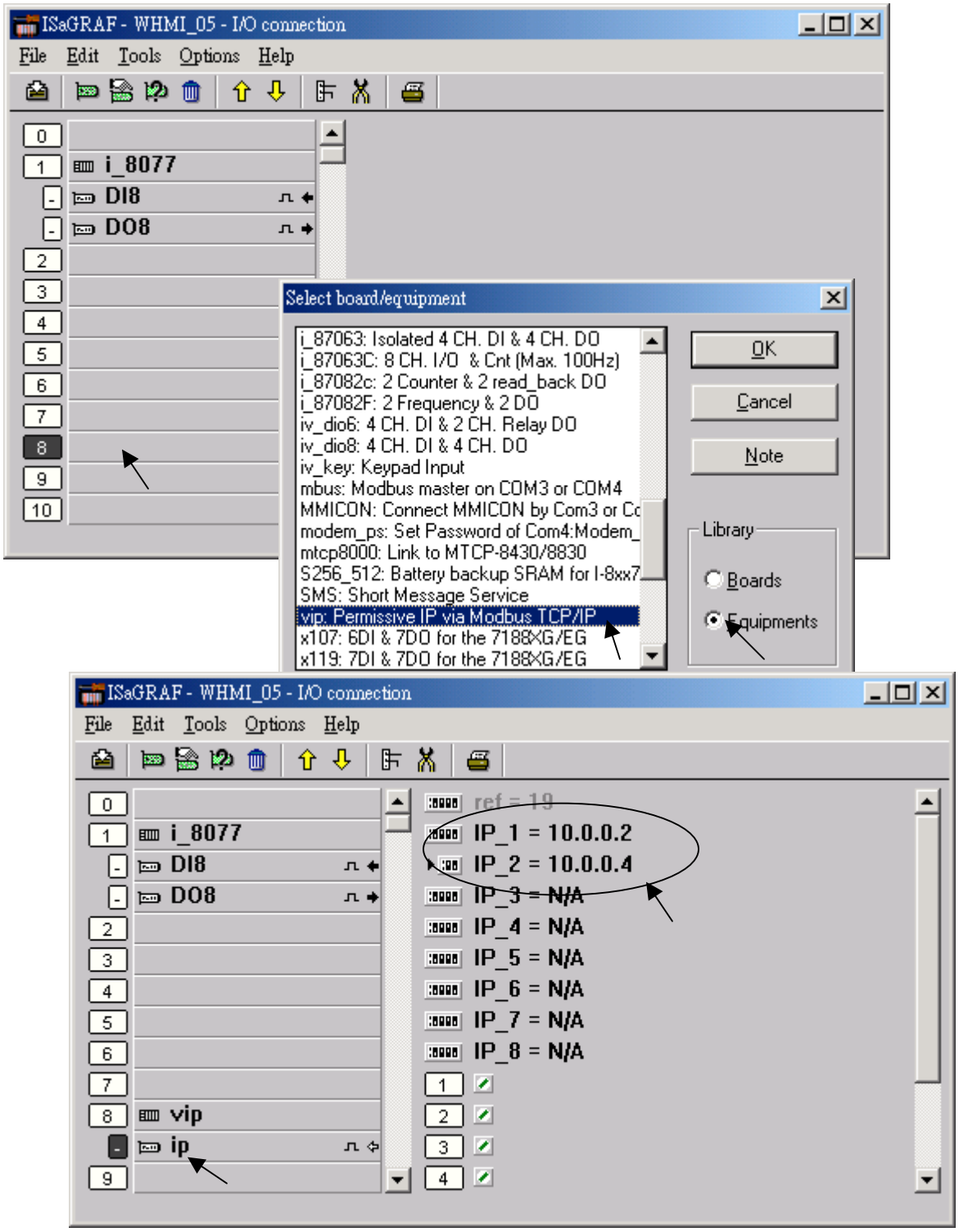


And about item 4, please set proper username & password for the Web HMI.



About item 1, user may set up to 8 IP address for ISaGRAF or other HMI to get access to the W-8xx7 via the Modbus TCP/IP protocol as below.

On the IO connection window of ISaGRAF. Please connect “vip” and entering the IP which can get access to the W-8xx7 via Modbus TCP/IP protocol. If “vip” is not connected, any remote IP can get access to your W-8xx7 via Modbus TCP/IP protocol. If “vip” is connected and No IP is entered (all assigned as “N/A”), No HMI and ISaGRAF can get access to it anymore.



Please re-compile your ISaGRAF project and download it to the controller if you have modified the IO connection.

Chapter 6: VB.net Program Running In Wincon Access To ISaGRAF Variables

This chapter lists the procedure for creating the first demo program by Visual Studio .NET development tool. The ISaGRAF driver of the Wincon-8xx7 supports “QuickerNet.dll” & “Web HMI” since Rev. of 3.12

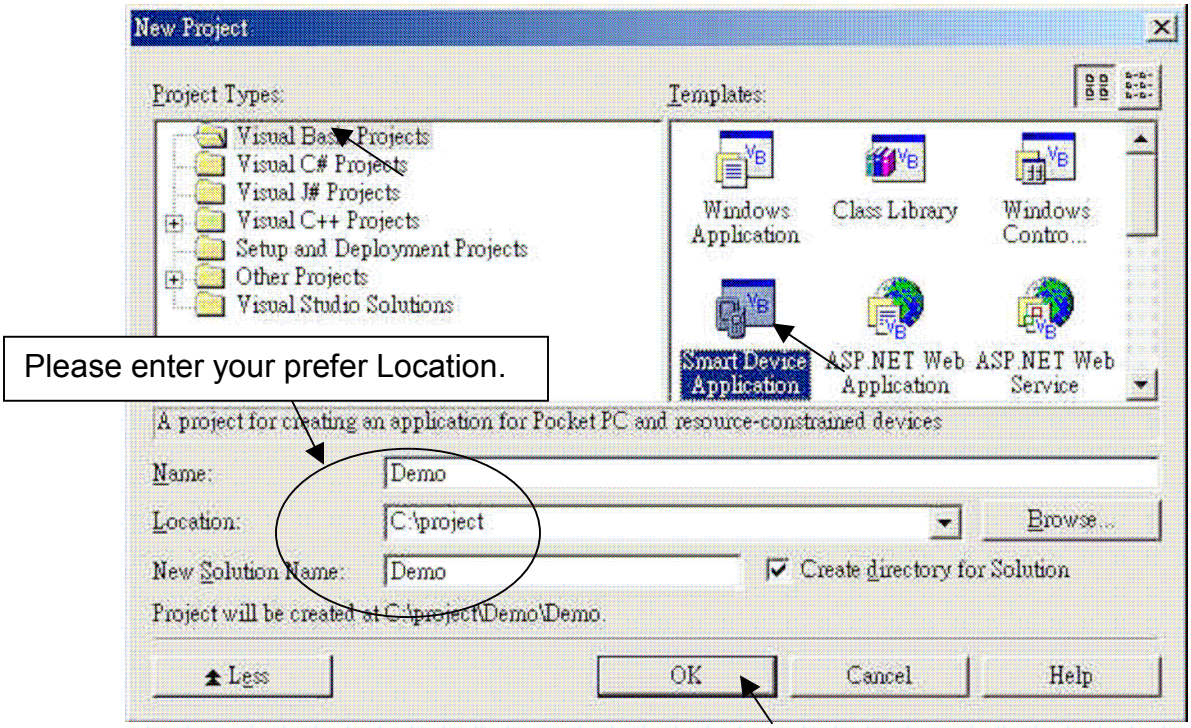
6.1 Create a New SDE Project

Let's start with the traditional "Demo" application, which, while clearly trivial, still illustrates in a nutshell the entire development process. We will assume you have installed both of Visual Studio.NET and the Smart Device Extensions (SDE) development tool. Furthermore, you are trying to develop the user program for applied in Wincon-8000 controller target device. The following steps illustrate in detail for the developing process.

1. In the first, users need to open Microsoft Visual Studio .NET 2003 software. And then in the menu of “**File**”, please click the “**New**”, and select the project item to open the “**New Project**” dialog.

2. Open the "**New Project**" dialog, and select development tool as following. Here we provide two ways for developing application for Wincon-8000.

(2a.) Select from "**Visual Basic Projects**" and the "**Smart Device Application**" template.

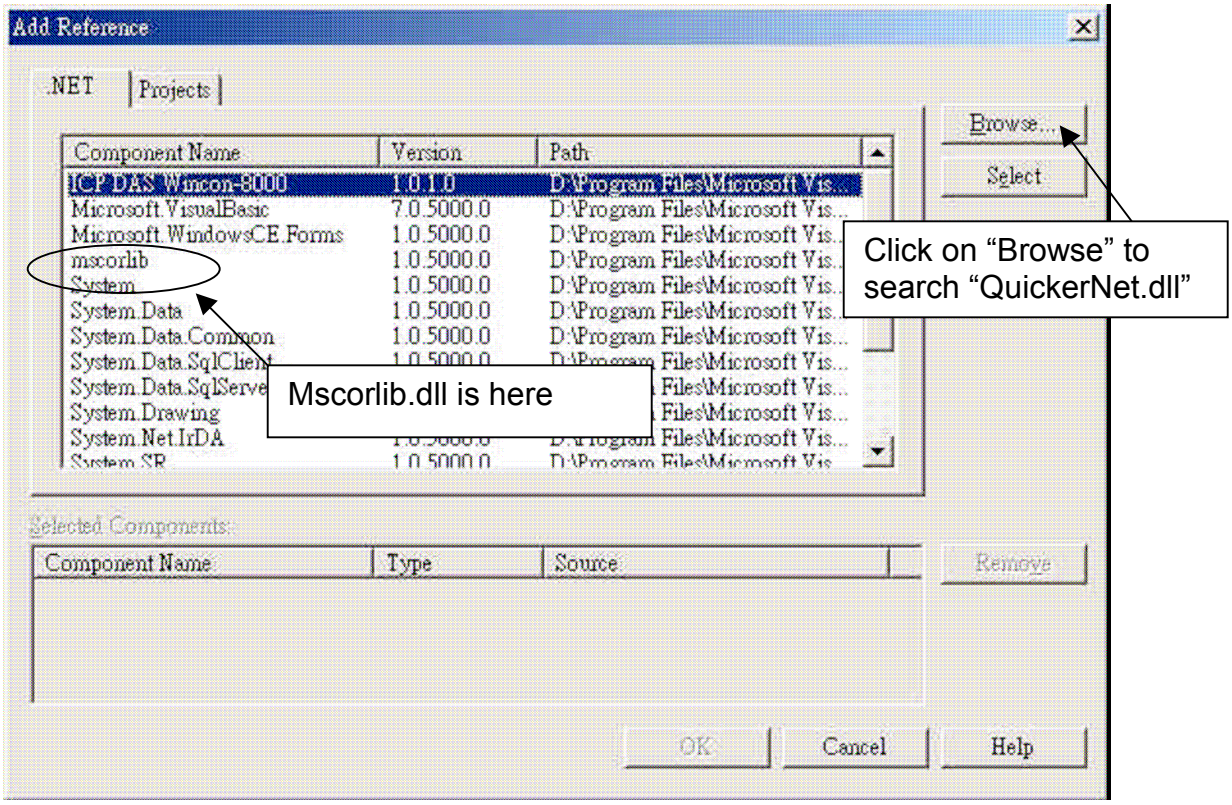


6.2 Add Project Reference for an Application

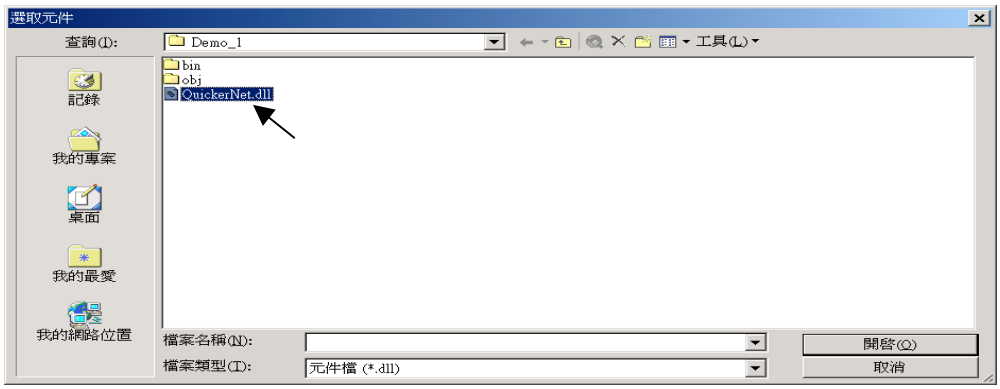
The “QuickerNet” library contains all modules’ functions. Before you use the “Quicker” keyword in the program design, you must add the “QuickerNet.dll” into the reference list of your application. Please follow the below process to import DLL into the project reference

1. Open the "**Add Reference**" dialog by choosing **Project→Add Reference.**
There are two libraries we have to add. One is “mscorlib.dll” and the other is “QuickerNet.dll”

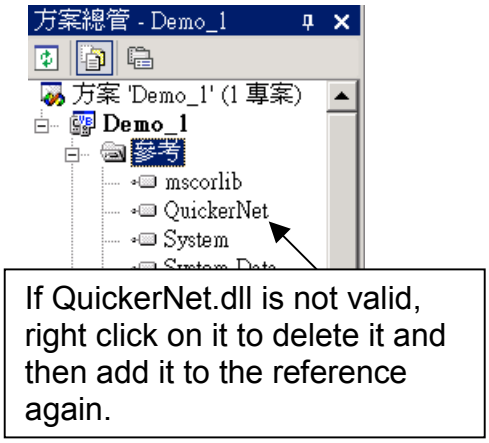
Select the “**mscorlib**” in the list box and click the button **Select** (the component “**mscorlib**” must appear in the Selected Components area)



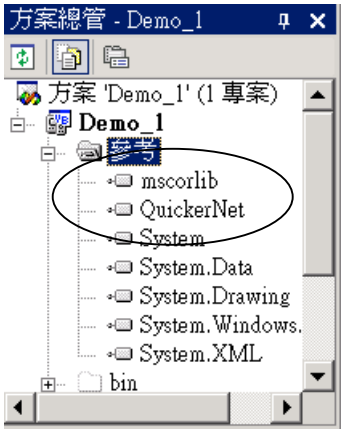
2. Click the “**Browse**” button. Select the “**QuickerNet.dll”** from **Wincon-8xx7 CD: \napdos\ISaGRAF\Wincon\VB.NET_Demo\VbDmo_01\Demo_1** subfolder or from your own location**.**



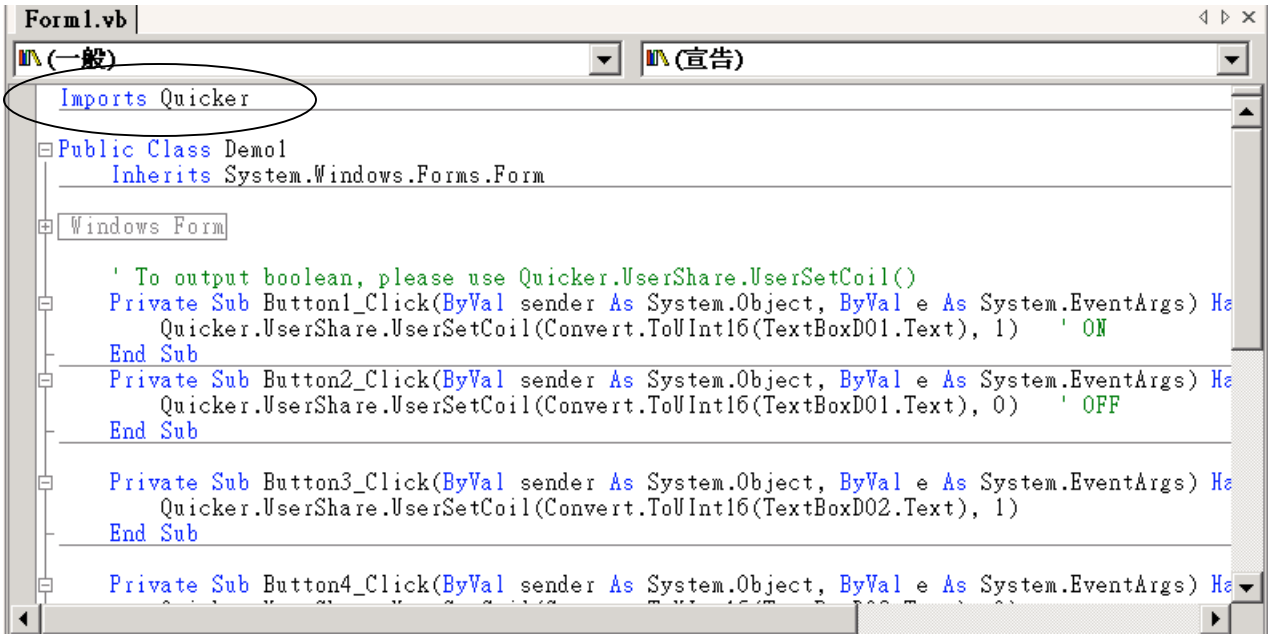
3. Click **OK** to close the "**Add Reference**" dialog.
   Note: If the "**The reference 'QuickerNet.dll' may or may not be valid for the active platform.** **You should delete old "QuickerNet.dll" reference and then add new "QuickerNet.dll" reference again** **with care to ensure your application will run correctly**" .



4. You have completed adding "**mscorlib**" and "**QuickerNet.dll**" reference for your application; now expand the "**Demo**" and "**References**" folders in the "**Solution Explorer**" tab to make sure the "**QuickerNet.dll**" has been added into the project references.



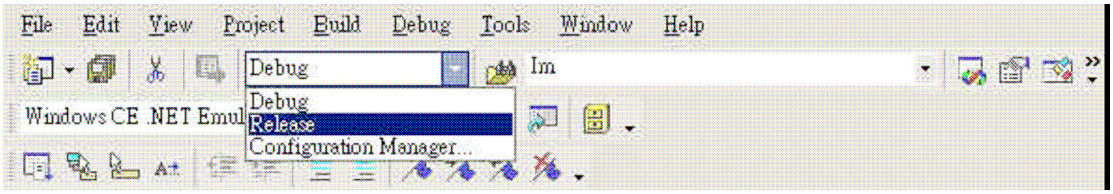
5. Right-click on the "**Form1**" and select "**View Code**" from the pop-up
Move cursor to top and insert the "**Imports Quicker**" in the first statement.



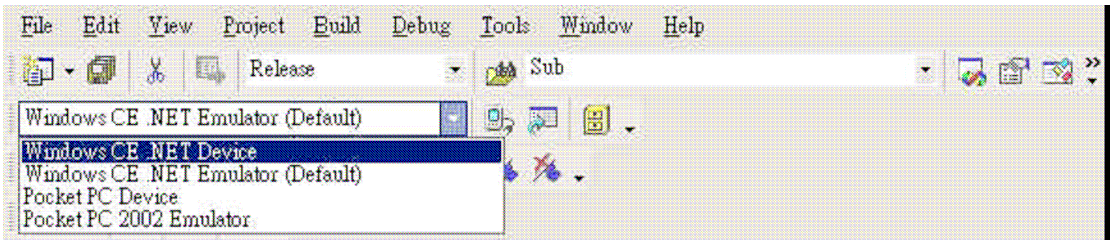
6.3 Building an Application Program

When you have finished writing a demo, you can build an application by the following steps.

1. In the toolbox menu select “**Release**” from the solution Configurations of Combo box.

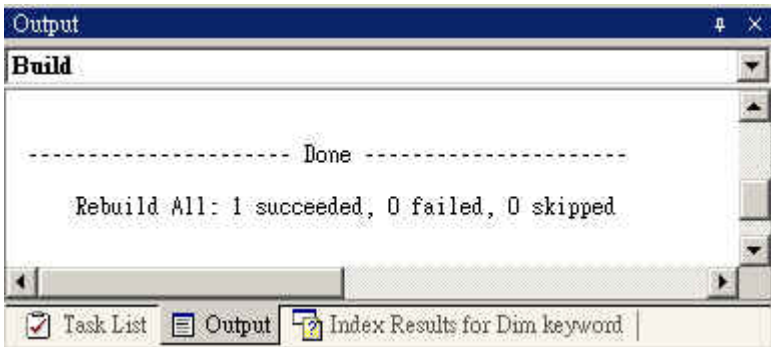


2. In the toolbox menu select “**Windows CE .NET Device**” from the Development Device Combo box.



3. On the “**Build**“ menu, choose “**Build Demo**”.

4. If you have finished the step 1~4, you will obtain the following message in the Output window, which means the execution application is built. Otherwise, you will get error messages. Therefore, you need to debug the source code and rebuild the application.



5. You can find the Demo.exe file in <Your VB.net Project folder>\bin\Release\demo.exe

6.4 Execute The Application In The Wincon-8xx7 Platform

When you have finished the building process for Demo.exe, You can apply the developed execution file, Demo.exe into the Wincon-8xx7 target controller device.

1. Copy the Demo.exe , Mscorlib.dll , Quicker.DLL and QuickerNet.DLL to your prefer folder of Wincon-8000. (**If you are copying file to the \CompactFlash\ISaGRAF\", it already has Mscorlib.dll , Quicker.DLL and QuickerNet.DLL, please do not replace them, just copy your demo.exe into it**)

2. Double-click on the Demo.exe file to excute it.

6.5 Examples

There are several VB.NET example demo in the Wincon-8xx7 CD-ROM: \napdos\ISaGRAF\Wincon\VB.NET_Demo". User can copy the files to your hard drive and open the *.sln file to run the project by Microsoft Visual Studio .Net 2003

6.6 QuickerNET.DLL

This section we will focus on the description of the application example of QuickerNET.DLL functions. There are some functions that can be used to R/W data from/to the ISaGRAF softlogic. The functions of QuickerNET.DLL can be clarified as 2 groups as depicted as below:

1. Digital R/W Functions
2. Analog R/W Functions

6.6.1 Digital R/W Functions

- **UserSetCoil**

Description:
This function is to set the value to a Boolean variable by Modbus network address.

Syntax:

ScanKernel.UserShare.UserSetCoil (iUserAddress As System.UInt16, iStatus As byte)

Parameter:
iUserAddress : Specify the Modbus Network Address of Variable (1 to 8191)
iStatus : Set the status. For instance, iStatus = 1 for True, iStatus = 0 for False

Return Value:
None

Example:
‘ Set the output variable of Modbus Network Address “1” to True.
ScanKernel.UserShare.UserSetCoil(Convert.ToUInt16(1), 1)

Demo program :
WINCON ISaGRAF CD-ROM: \napdos\isagraf\wincon\VB.NET_Demo\vbdmo_01
\napdos\isagraf\wincon\VB.NET_Demo\vbdmo_02
\napdos\isagraf\wincon\VB.NET_Demo\vbdmo_03

■ UserGetCoil

Description:
This function is to get the value from a boolean variable by Modbus network address.

Syntax:

ScanKernel.UserShare.UserGetCoil (iUserAddress As System.UInt16, ByRef iStatus As byte)

Parameter:
iUserAddress : Specify the Modbus Network Address of Variable (1 to 8191)
iStatus : Get the variable status , iStatus = 1 for True, iStatus = 0 for False

Return Value:
None

Example:
‘ Get the variable status of Network Address “1”.
Dim iStatus As Byte
ScanKernel.UserShare.UserGetCoil(Convert.ToUInt16(1), iStatus)

Demo program :
WINCON ISaGRAF CD-ROM: \napdos\isagraf\wincon\VB.NET_Demo\vbdmo_02
\napdos\isagraf\wincon\VB.NET_Demo\vbdmo_03

6.6.2 Analog R/W Functions

■UserSetReg_short ■UserSetReg_long ■UserSetReg_float

Description:
These functions are to set 16-bit short integer , 32-bit long integer & 32-bit float value to the specified Modbus network address.

Syntax:

ScanKernel.UserShare.UserSetReg_Short (ByVal *iUserAddress* As System.UInt16, ByRef *iStatus* As Integer) As Byte

ScanKernel.UserShare.UserSetReg_Long (ByVal *iUserAddress* As System.UInt16, ByRef *iStatus* As Integer) As Byte

ScanKernel.UserShare.UserSetReg_Float (ByVal *iUserAddress* As System.UInt16, ByRef *iStatus* As Single) As Byte

Parameter:
iUserAddress : Specify the Network Address of Variable (1 to 8191)
iStatus : Set the short or long integer or float value.

Example:
‘ Set a long value “1234567” to the variable of Modbus Network Address “1”.
ScanKernel.UserShare.UserSetReg_long(Convert.ToUInt16(1), Convert.ToInt32(1234567))

‘ Set a short value “-1234” to the variable of Modbus Network Address “3”.
ScanKernel.UserShare.UserSetReg_short(Convert.ToUInt16(3), Convert.ToInt16(-1234))

‘ Set a float value “2.174” to the variable of Modbus Network Address “4”.
ScanKernel.UserShare.UserSetReg_float(Convert.ToUInt16(4), Convert.ToSingle(2.174))

Demo program :
Please refer to WINCON ISaGRAF CD-ROM
1. \napdos\isagraf\wincon\VB.NET_Demo\vbdmo_05 & vbdmo_06 for R/W Analog Input / Output (16-bit short)
2. \napdos\isagraf\wincon\VB.NET_Demo\vbdmo_07 for R/W long integer value (32-bit) , float value (32-bit) & Timer (32-bit)

Note:
The long integer & timer & float variable’s Network Address No. must occupy 2 No. in the ISaGRAF project (refer to section 4.2 of “User’s Manual of ISaGRAF Embedded Controllers” or in the CD-ROM:\napdos\isagraf\wincon\english_manu\” User_Manual_I_8xx7.pdf”)

■UserGetReg_short ■UserGetReg_long ■UserGetReg_float

Description:
These functions are to get 16-bit short integer , 32-bit long integer & 32-bit float value from the specified Modbus network address.

Syntax:

ScanKernel.UserShare. UserGetReg_Short (ByVal *iUserAddress* As System.UInt16, ByRef *iStatus* As Integer) As Byte

ScanKernel.UserShare. UserGetReg_Long (ByVal *iUserAddress* As System.UInt16, ByRef *iStatus* As Integer) As Byte

ScanKernel.UserShare. UserGetReg_Float (ByVal *iUserAddress* As System.UInt16, ByRef *iStatus* As Single) As Byte

Parameter:
iUserAddress : Specify the Network Address of Variable (1 to 8191)
iStatus : Get the short or long integer or float value.

Example:
```
Dim float_val As Single
Dim short_val As Int16
Dim long_val As Int32

‘ Get float value of the variable of Modbus Network Address “7”.
ScanKernel.UserShare.UserGetReg_float(Convert.ToUInt16(7), float_val)

‘ Get long value of the variable of Modbus Network Address “9”.
ScanKernel.UserShare.UserGetReg_long(Convert.ToUInt16(9), long_val)

‘ Get short value of the variable of Modbus Network Address “11”.
ScanKernel.UserShare.UserGetReg_short(Convert.ToUInt16(11), short_val)
```

Demo program :
Please refer to WINCON ISaGRAF CD-ROM
1. \napdos\isagraf\wincon\VB.NET_Demo\vbdmo_05 & vbdmo_06 for R/W Analog Input / Output (16-bit short)
2. \napdos\isagraf\wincon\VB.NET_Demo\vbdmo_07 for R/W long integer value (32-bit) , float value (32-bit) & Timer (32-bit)

Note:
The long integer & timer & float variable’s Network Address No. must occupy 2 No. in the ISaGRAF project (refer to section 4.2 of “User’s Manual of ISaGRAF Embedded Controllers” or in the CD-ROM:\napdos\isagraf\wincon\english_manu\” User_Manual_I_8xx7.pdf”)

Chapter 7: EVC++ Program Running In Wincon Access To ISaGRAF Variables

User can write his EVC++ 4.0 application to access to the ISaGRAF variables running at the same Wincon by using the below functions for Read/Write boolean, word, long and float value.

The include file and library at design time are “WinConAgent.h” and “Quicker.lib”. (CD-ROM: \napdos\isagraf\wincon\EVC++_LIB\ ). The DLL at run time is the “Quicker.dll” which is in Wincon - \CompactFlash\ISaGRAF\ (Please copy and run your EVC++ application at Wincon - \CompactFlash\ISaGRAF\)

Set boolean value:
unsigned char UserSetCoil(unsigned short iUserAddress, unsigned char iStatus);

iUserAddress:1 to 8191 (Variable’s network address in ISaGRAF project)
iStatus: 0: set boolean to False, 1: set boolean to True
for ex. UserSetCoil(100 , 1) // set boolean at network addr 100 as True

Set word or float or long value:

unsigned char UserSetReg(unsigned short iUserAddress,long *iStatus,unsigned char iDType);

iUserAddress:1 to 8191 (Variable’s network address in ISaGRAF project)
iStatus: A pointer to a long type, which stores the data to set
iDType 0: type is word
1: data type is float
2: data type is long (use long for Timer value in ISaGRAF, unit is ms)
for ex.

```
float   float_val;
long    word_val, long_val;
long    *temp_val;

// set word_val (-32768 to +32767) to ISaGRAF variable with network address 1
word_val = -20000 ;
temp_val = (long *)(&word_val);
UserSetReg(1 , temp_val, 0);

// set float_val to ISaGRAF variable with network address 2
float_val = 1.2345 ;
temp_val = (long *)(&float_val);
UserSetReg(2 , temp_val, 1);

// set long_val to ISaGRAF variable with network address 4
long_val = 12345678 ;
temp_val = (long *)(&long_val);
UserSetReg(4 , temp_val, 2);
```

Get boolean value:

unsigned char UserGetCoil(unsigned short iUserAddress, unsigned char *iStatus);

iUserAddress:1 to 8191 (Variable's network address in ISaGRAF project)
iStatus: 0: boolean is False, 1: boolean is True

for ex.

```
unsigned char bVal;
UserGetCoil(5 , &bVal)  // get boolean value at network addr 5
```

Get word or float or long value:

unsigned char UserGetReg(unsigned short iUserAddress,long *iStatus,unsigned char iDType);

iUserAddress:1 to 8191 (Variable's network address in ISaGRAF project)
iStatus: A pointer to a long type, which stores the data returned
iDType 0: type is word
1: data type is float
2: data type is long (use long for Timer value in ISaGRAF, unit is ms)

for ex.

```
float   float_val;
long    word_val, long_val;
long    ret_val;

// get word_val (-32768 to +32767) of ISaGRAF variable with network address 10
UserGetReg(10, &ret_val, 0);
if ( ret_val>=0  &&  ret_val<=32767 )  word_val = ret_val;
else  word_val = ret_val  |  0xFFFF0000;

// get float of ISaGRAF variable with network address 11
UserGetReg(11, &ret_val, 1) ;
float_val = *(float *) (&ret_val) ;

// get long of ISaGRAF variable with network address 13
UserGetReg(13, &ret_val, 2) ;
long_val = ret_val ;
```

Note:
The long integer & timer & float variable's Network Address No. must occupy 2 No. in the ISaGRAF project (refer to section 4.2 of "User's Manual of ISaGRAF Embedded Controllers" or in the CD-ROM:\napdos\isagraf\wincon\english_manu\" User_Manual_I_8xx7.pdf")

Chapter 8: InduSoft Project & Web Server Running In Wincon Access To ISaGRAF Variables

Note: If the HMI program behavior is not so smooth or slow, please refer to Appendix F.

Important: Please always set a **fixed IP** address to the Wincon. (No more DHCP)
Please always set W-8x47/8x46's LAN2 as disabled if not using it (refer to appendix D).
Please use NS-205 or NS-208 Industrial Ethernet Switch for Wincon-8x46/8x47.

Please refer to CD-ROM: \napdos\isagraf\wincon\english_manu\ "user_manual_i_8xx7.pdf" for detailed ISaGRAF English User's Manual.

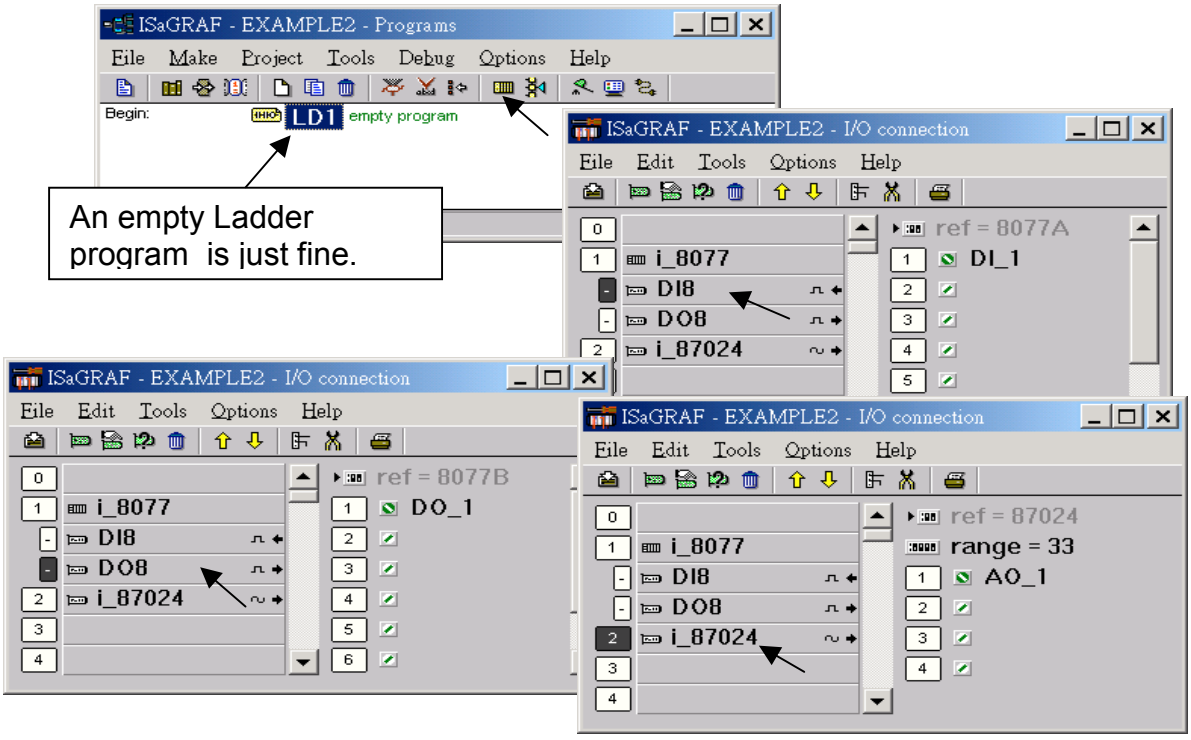
Wincon-8x36/8x46 supports InduSoft and ISaGRAF logic running in the same controller.

A simple example to run InduSoft & ISaGRAF logic in the same controller:

Step 1: Create a new ISaGRAF project as below.

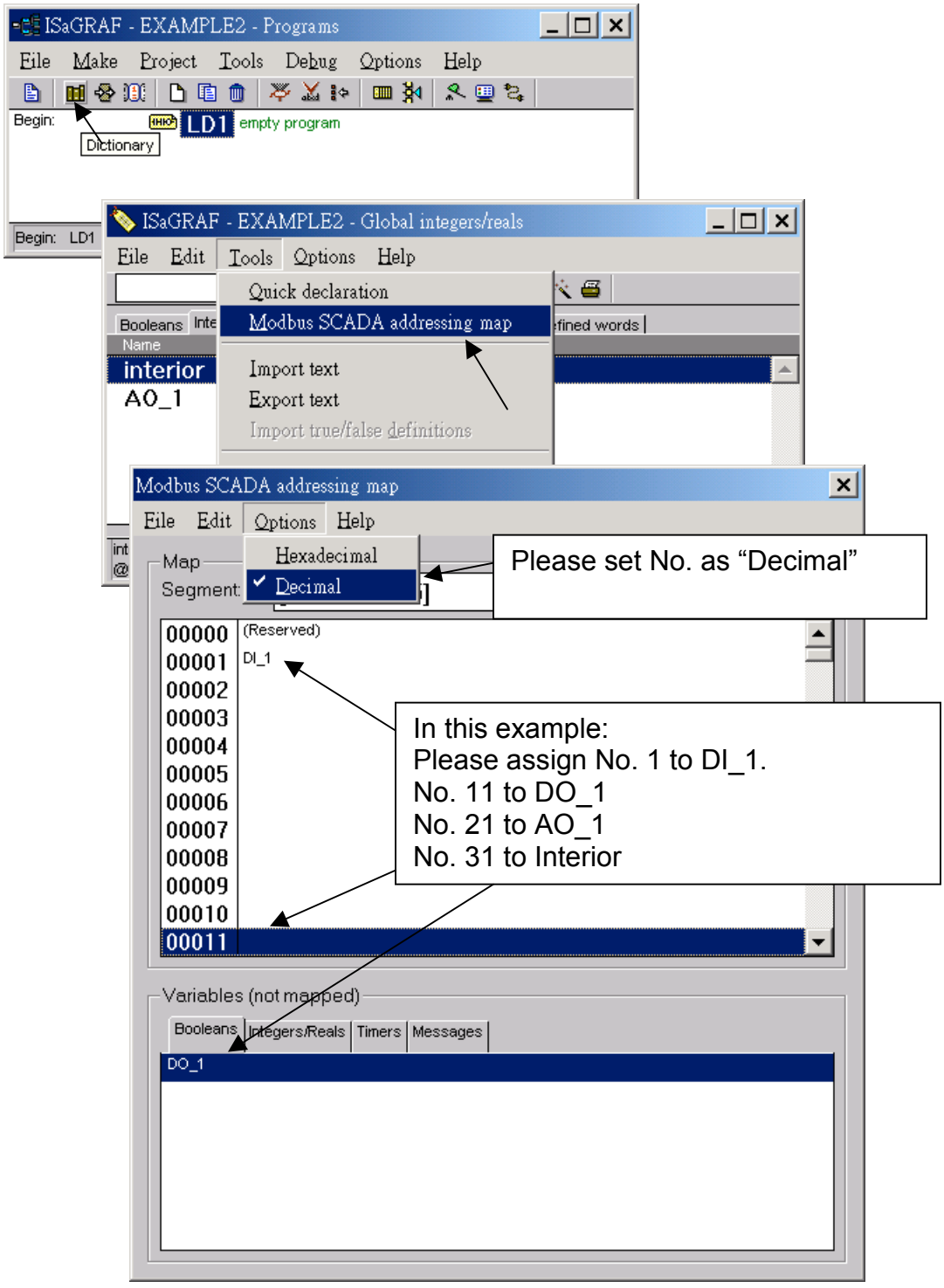
This demo uses a DIO module I-8077 in slot 1 of W-8336/8436, and an AO module I-87024 in slot 2 and one internal variable defined as follow.

Variable Type	Name	Network Address	Comment	Attributes
Boolean	DI_1	**1**	8077 DI channel 1	**Input**
Boolean	DO_1	**11**	8077 DO channel 1	**Output**
Integers	AO_1	**21**	87024 AO channel 1	**Output**
Integers	Interior	**31**	Internal variable	**Internal**



If you are not familiar with ISaGRAF, please refer to section 4.1 to 4.3.

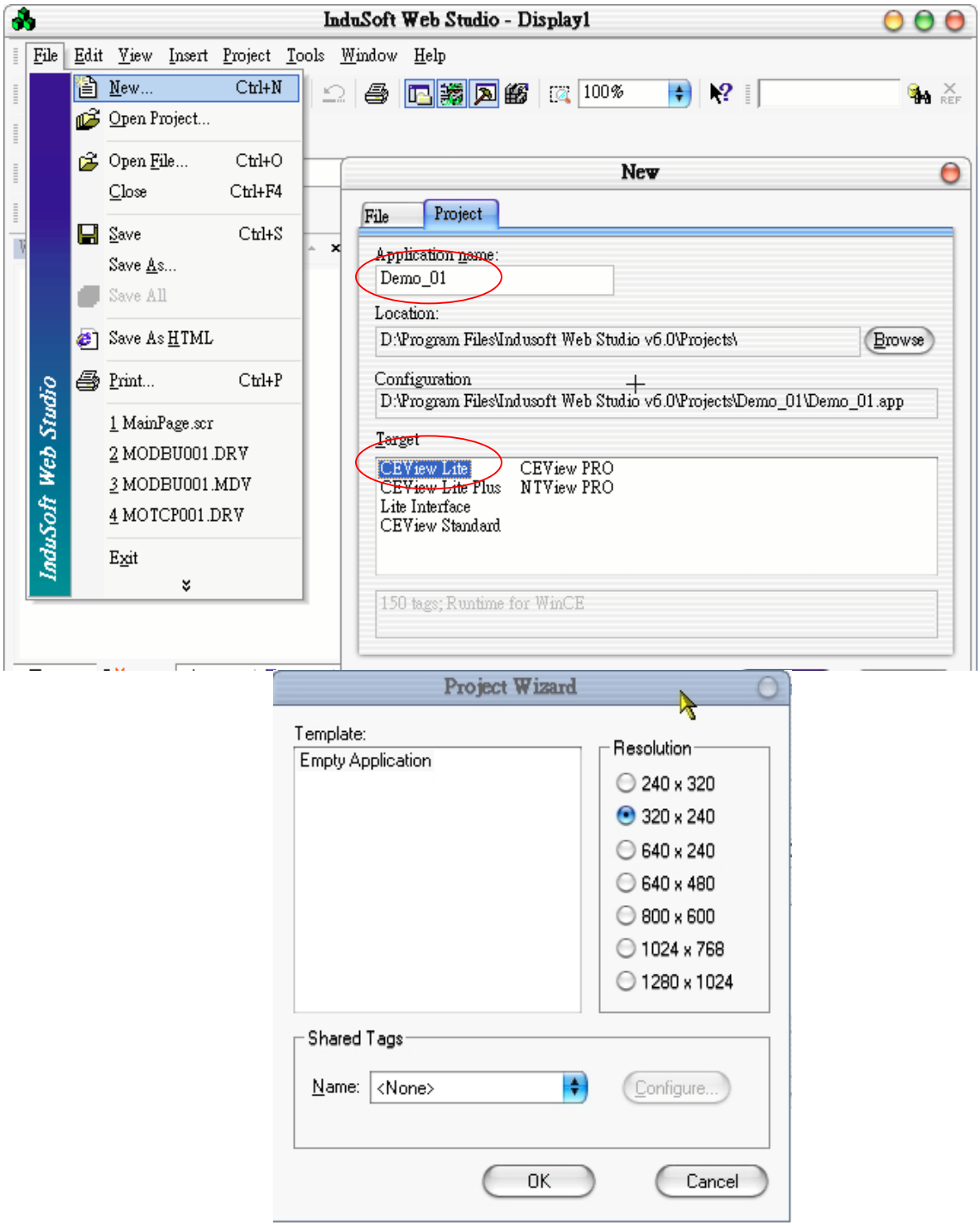
The ISaGRAF variables to be exchanged with Indusoft must be declared with a Modbus “Network Address” as below.



Please save & compile the ISaGRAF example project & then download to the W-8336. If you are not familiar with it, please refer to Section 4.1 to 4.3

Step 2: Create an Indusoft project.

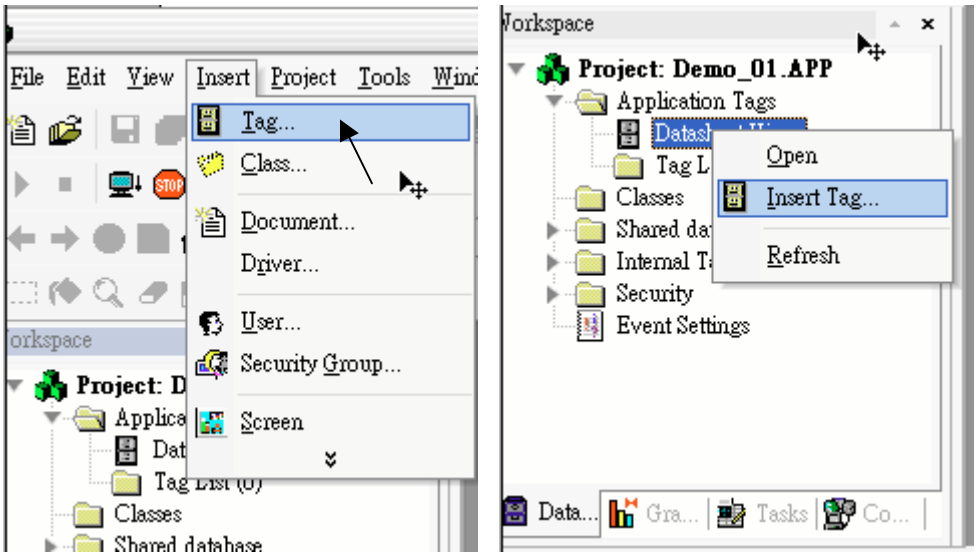
Select “File -> New” from the “InduSoft Web Studio” main menu, the “New” window will appear and click on “Project” tab. Then type in the name for the new user’s project in the “Application name” and select “CEView Lite” in the “Target”. Press “OK” and the “Project Wizard” window will appear. Select “Empty Application” on the “Template”, “320 x 240” on the “Resolution” and “None” on the “Shared Tags”.



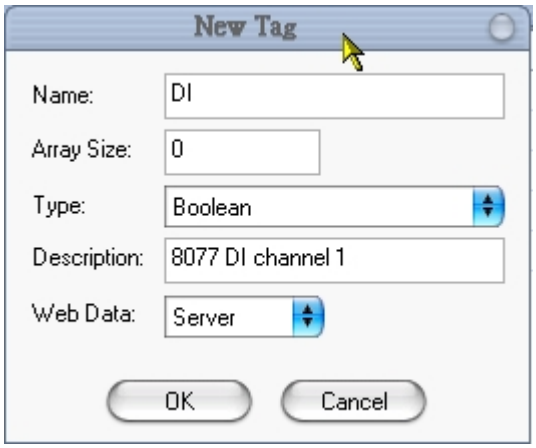
Now you could see the new project shown on the “Workspace” window as below.

Define application tags

Select “Insert -> Tag” on the main menu bar or click on the right button of the mouse in the “Database” tab of the “Workspace”.



The “New Tag” window will show as below.

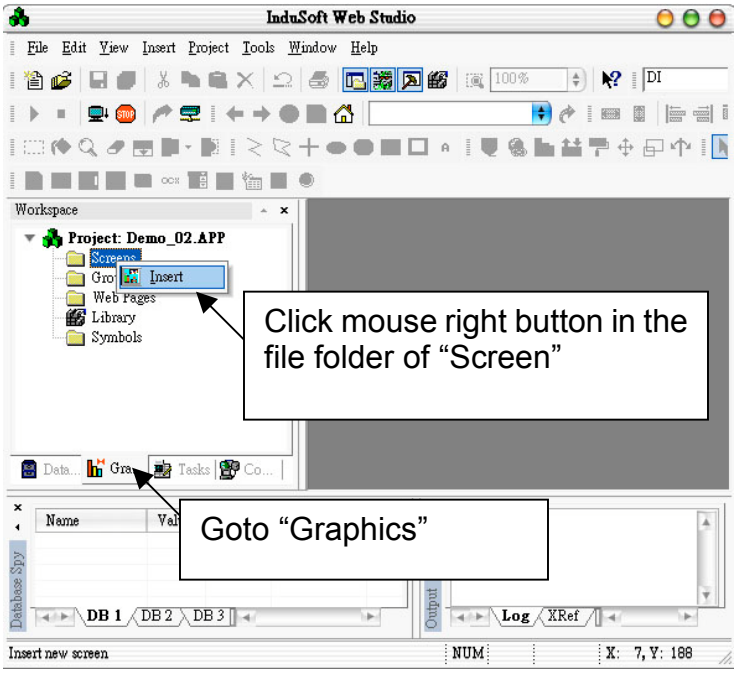


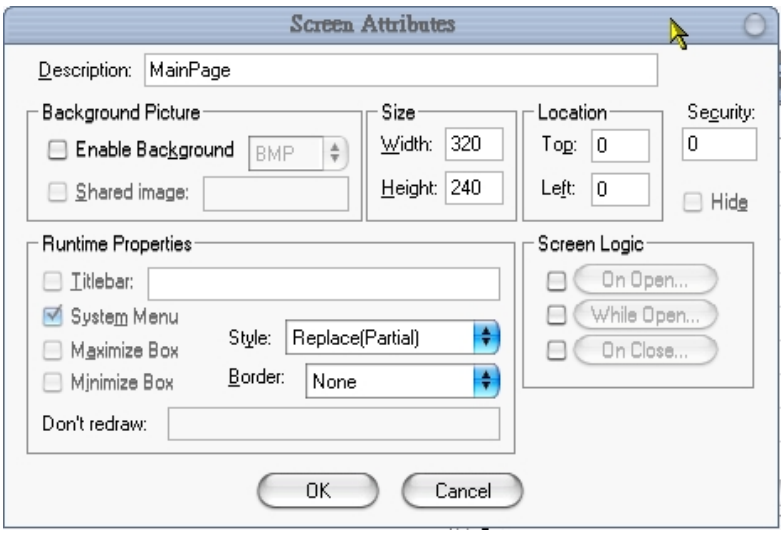
This demo uses a DIO module I-8077,an AO module I-87024 and one internal variable defined as follow. Please create these tags one by one.

Type	Name	Array Size	Description	Web Data
Boolean	DI	0	8077 DI channel 1	Input
Boolean	DO	0	8077 DO channel 1	Output
Integers	AO	0	87024 AO channel 1	Output
Integers	Interior	0	Internal variable	Internal

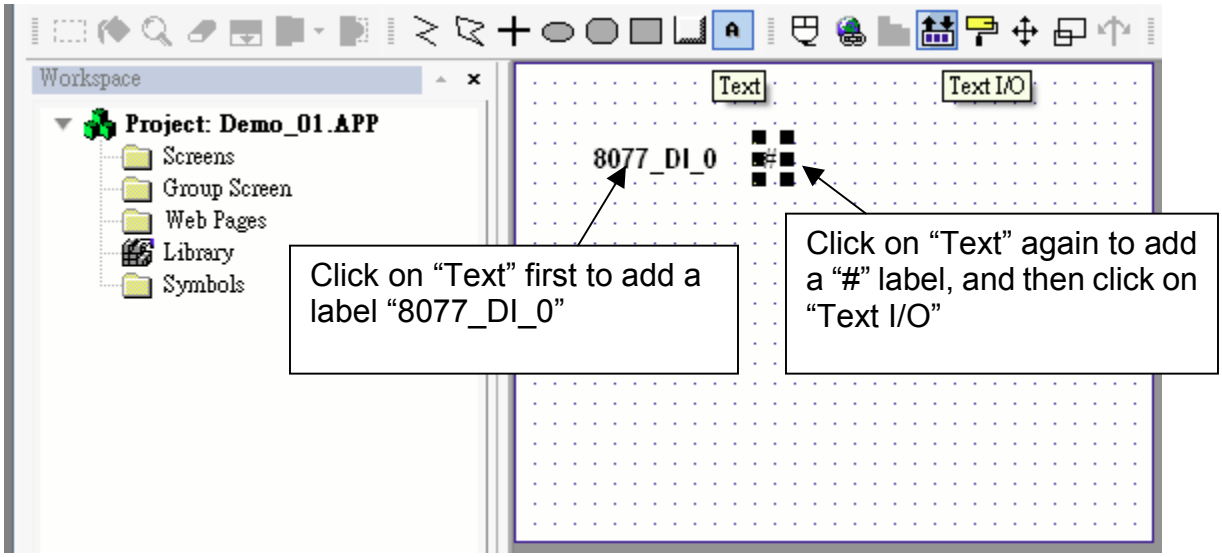
Create main screen

Click mouse right button in the file folder of “Screen” of the “Graphics” tab in the “Workspace” then the “Screen Attributes” window appears. Setting screen attributes such as “Size”, “Location”, “Runtime Properties” and “Background Picture” then press “OK” to edit screen.

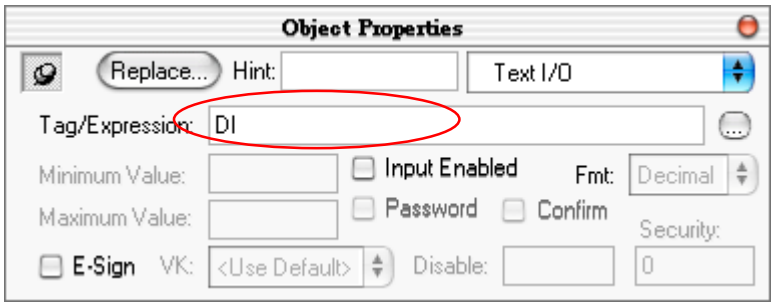




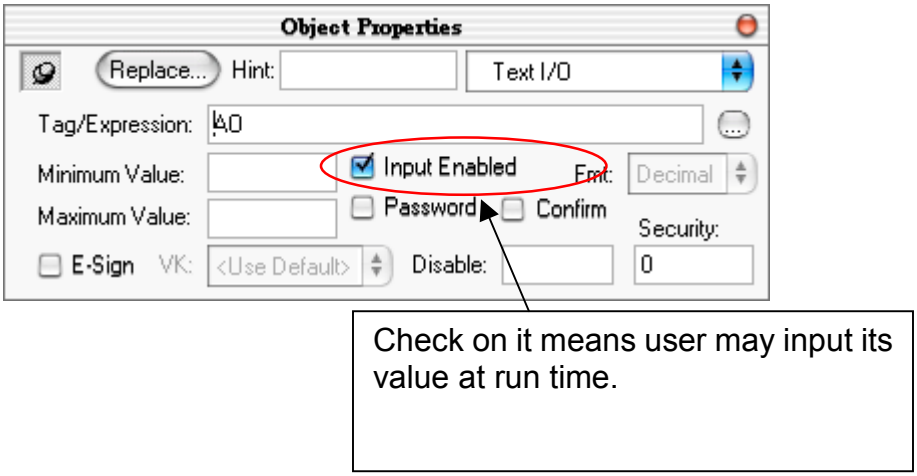
Select “Text” icon, then clink on the main screen where want to establish a text and type “8077_DI_0”. And select “Text” again following the previous text and type “#” then select “Text I/O”

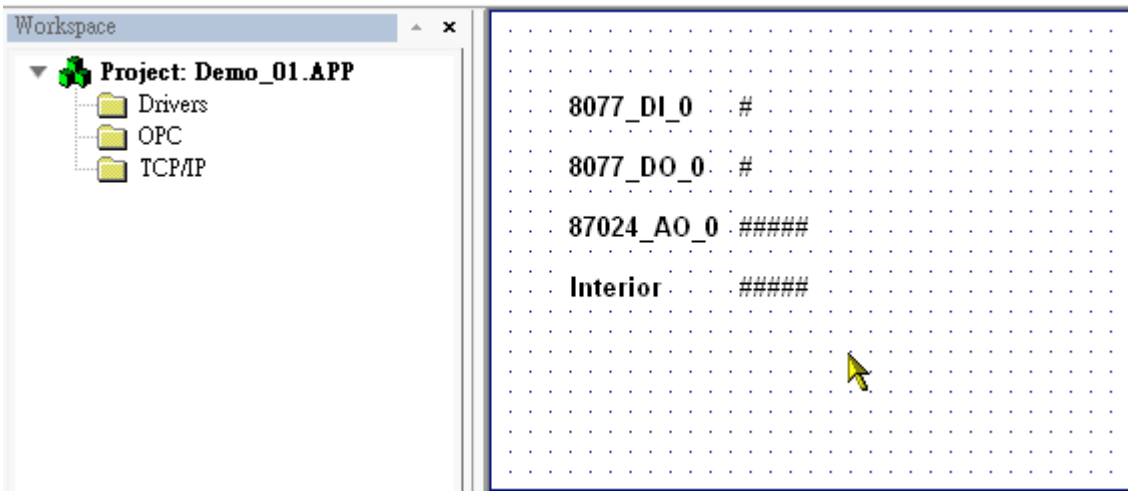


Double click the “#” object and the “Object Properties” window will show as below then type DI in the “Tag/Expression”.



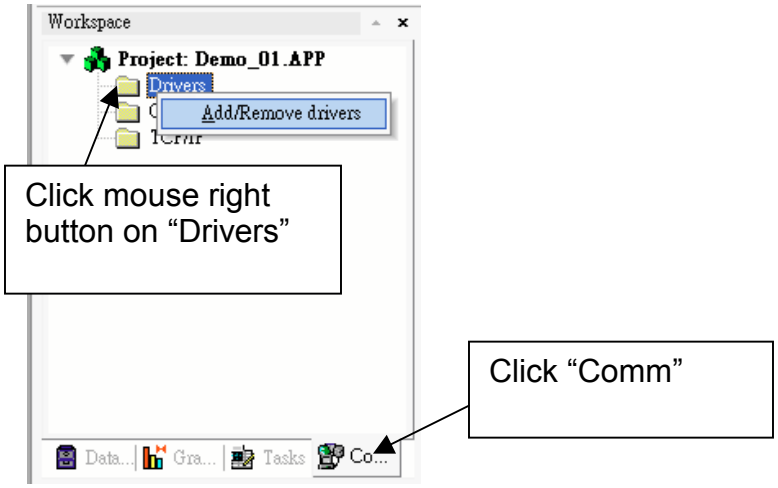
Repeat former method to create other objects and click “Save” icon on the main menu to save this main screen page as “MainPage.scr”.(**Select “File ➔ Save As HTML” to create this screen that can be visualized in a remote station using a regular web browser.**) Note: For the Output object, as 87024_AO_0 and 8077_DO_0, the “Input Enabled” of the “Text I/O” should be checked as below.

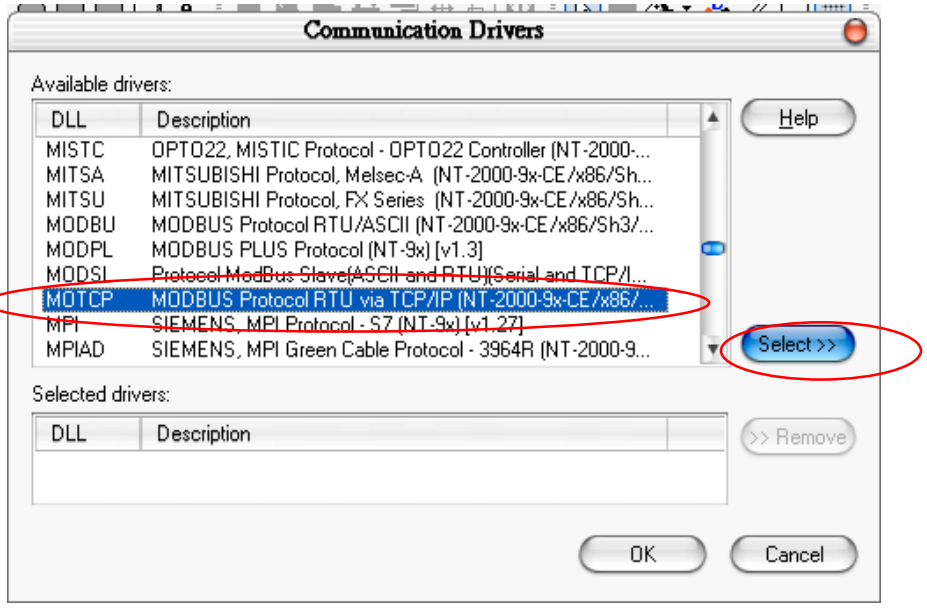




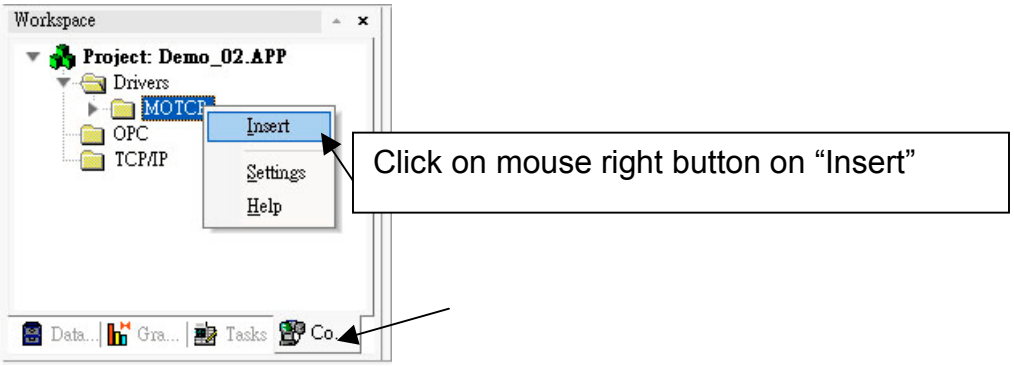
Create Modbus TCP workspace

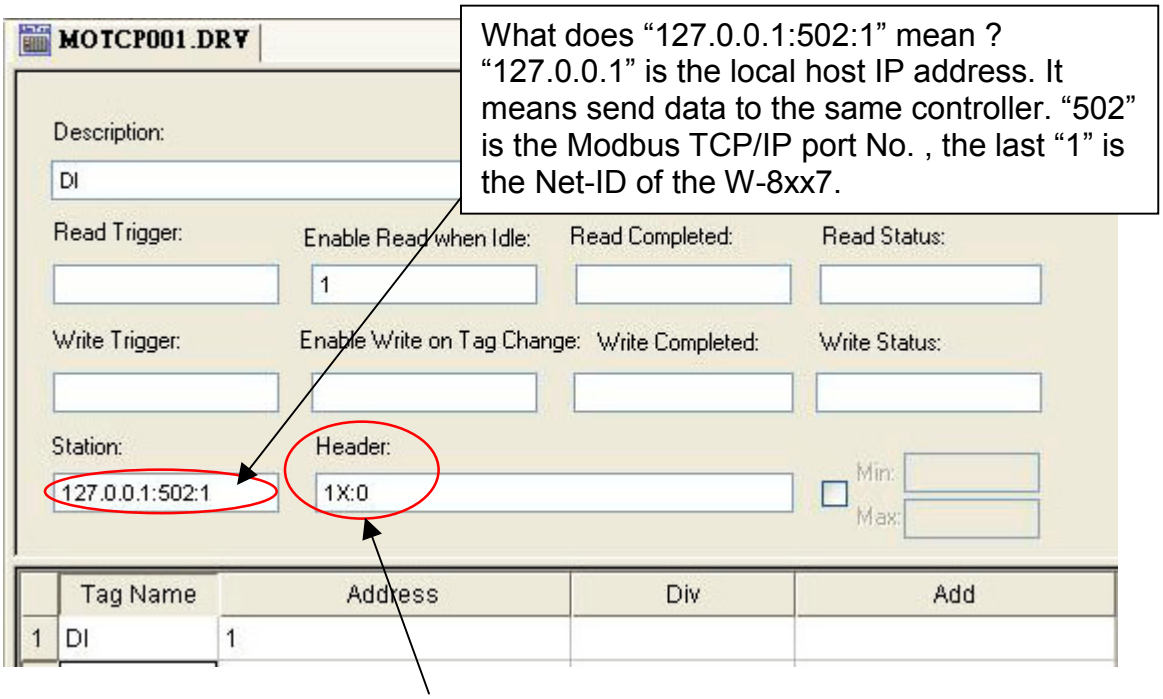
Click “Comm” in the “Workspace” and in the folder of “Drivers” click right mouse button and select “Add/Remove drivers” to open “Communication Drivers” window as below.





Click “MOTCP” driver then click “Select” and click “OK” to close this window. Expanding file folder of “Drivers” and it will show a file folder named “MOTCP”. Click right mouse button and select “Insert” to add a workspace of Modbus TCP. When a “MOTCP001.DRV” window appears, fill in following data as corresponding field.





1X:0 is for reading “Boolean” data
0X:0 is for writing “Boolean” data”
3X:0 is for reading short “integer” data (16-bit integer, Word: -32768 to +32767)
4X:0 is for writing short “integer” data (16-bit integer , Word: -32768 to +32767)
DW:0: is for reading & writing long “integer” (32-bit integer, Double Word)
FP:0: is for reading & writing floating point data (32-bit REAL)
For more details, please refer form as below

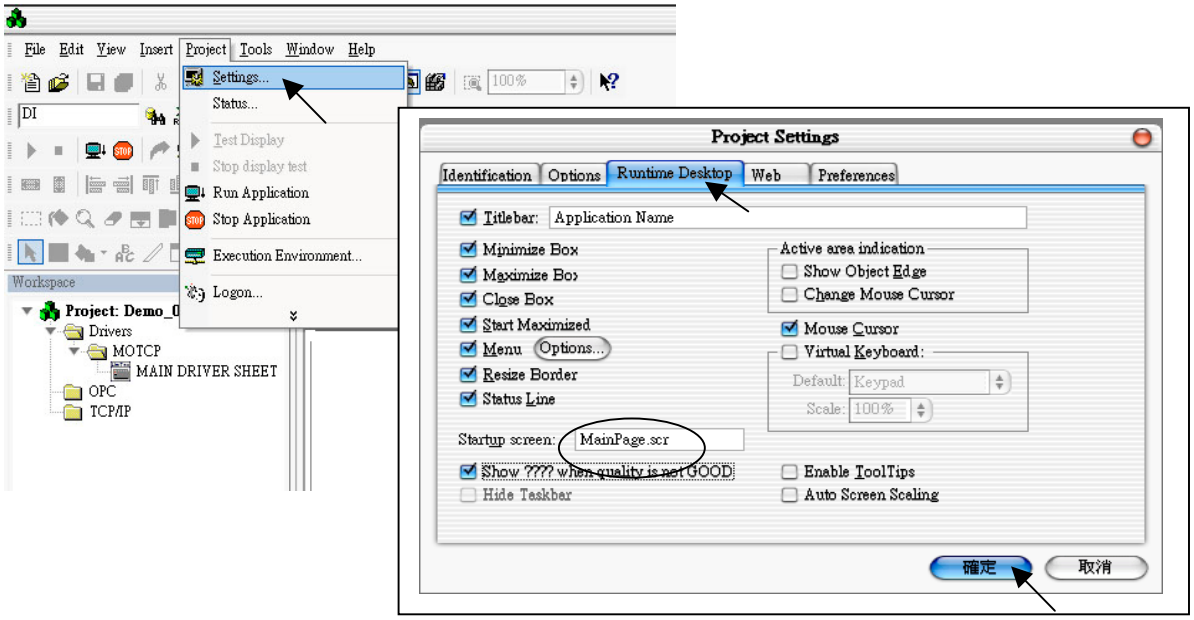
Data Type	Sample Syntax	Valid Range of Initial Addresses per Worksheet	Comments
0X	0X:1	Varies according to the equipment	Coil Status: Read and write events using Modbus instructions 01, 05, and 15
1X	1X:5	Varies according to the equipment	Input Status: Read events using Modbus instructions 02
3X	3X:4	Varies according to the equipment	Input Register: Read events using Modbus instruction 04
4X	4X:5	Varies according to the equipment	Holding Register: Read and write events using Modbus instructions 03, 06, 16
FP	FP:1	Varies according to the equipment	Floating-point value (Holding Register): Read and write float-point values using two consecutive Holding Registers.
DW	DW:2	Varies according to the equipment	32-bit Integer value (Holding Register): Read and write 32-bit integer values using two consecutive Holding Registers.

DRV Name	MOTCP001.DRV	MOTCP002.DRV	MOTCP003.DRV	MOTCP004.DRV
Description	DI	DO	AO	Internal
Station	127.0.0.1:502:1			
Header	1X:0	0X:0	4X:0	3X:0
Tag Name	DI	DO	AO	Interior
Enable Read when Idle	**1**			**1**
Wnable Write on Tag Change		**1**	**1**	
Address	**1**	**11**	**21**	**31**

When finished all setting, press “Ctrl + F4” to close all inside windows and save all files.

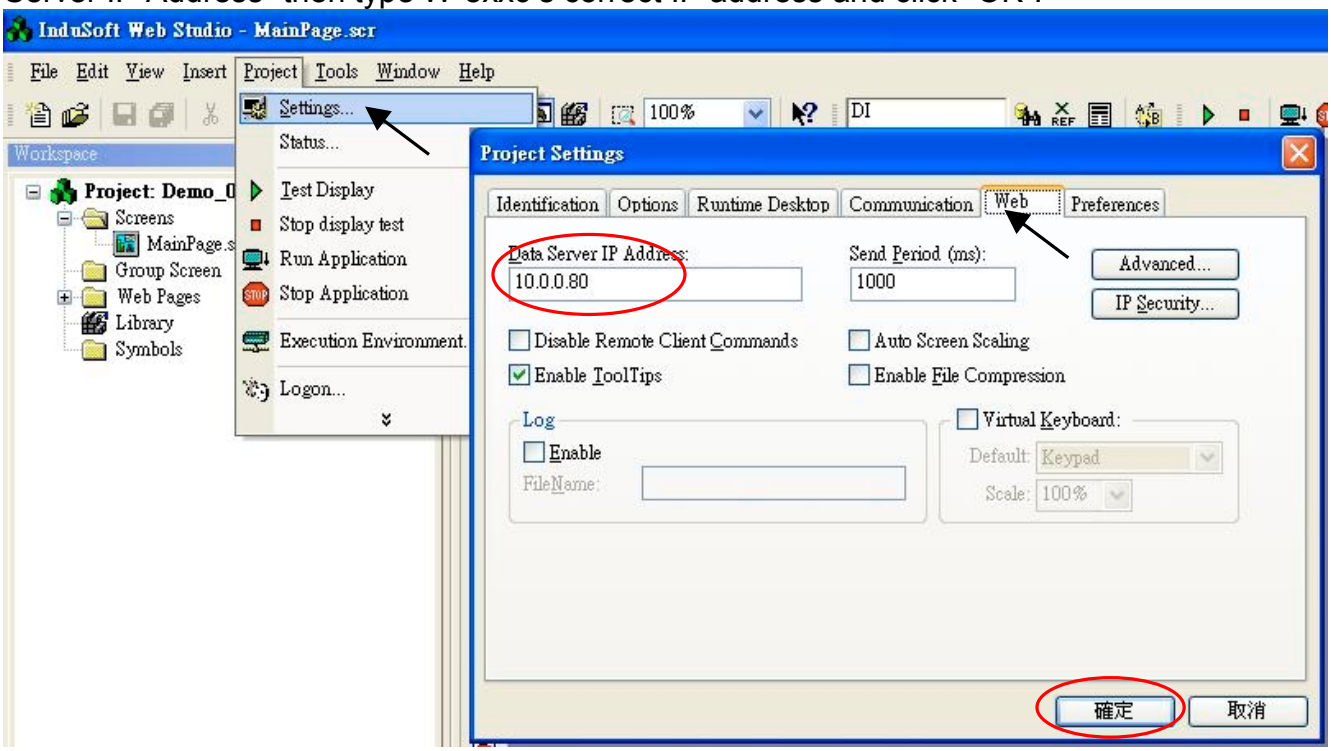
Project Setting

Select “Project -> Settings” to open “Project Settings” window .Click the tab of “Runtime Desktop”. In the “Startup screen” edit box, fill in “MainPage.scr” then click “OK” to close this window.



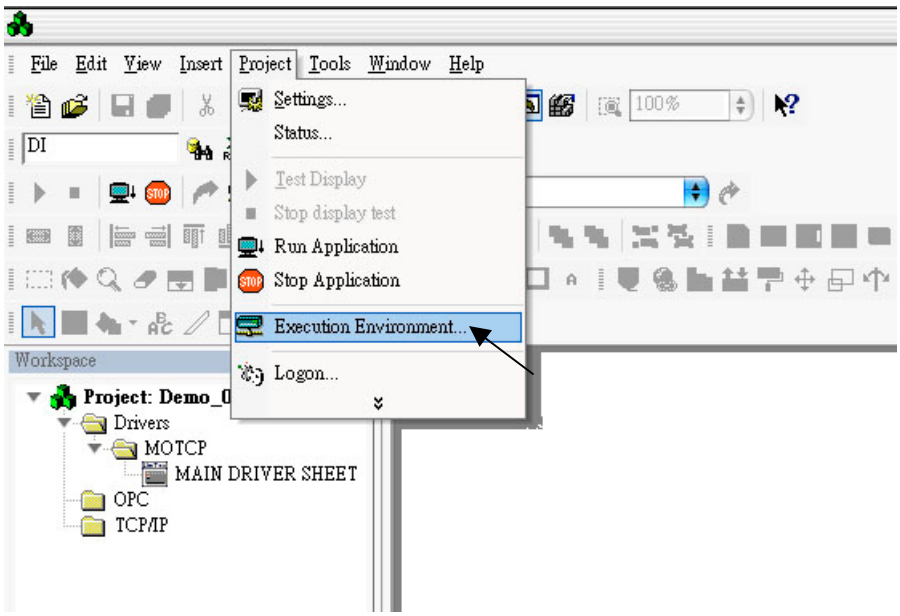
Web Thin Clients

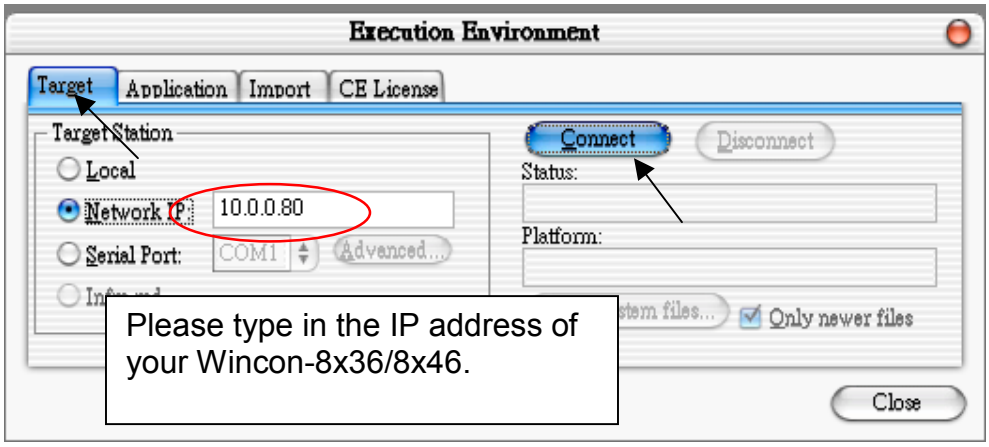
Select “Project -> Settings” to open “Project Settings” window. On the Web tab, select “Data Server IP Address” then type W-8xx6’s correct IP address and click “OK”.



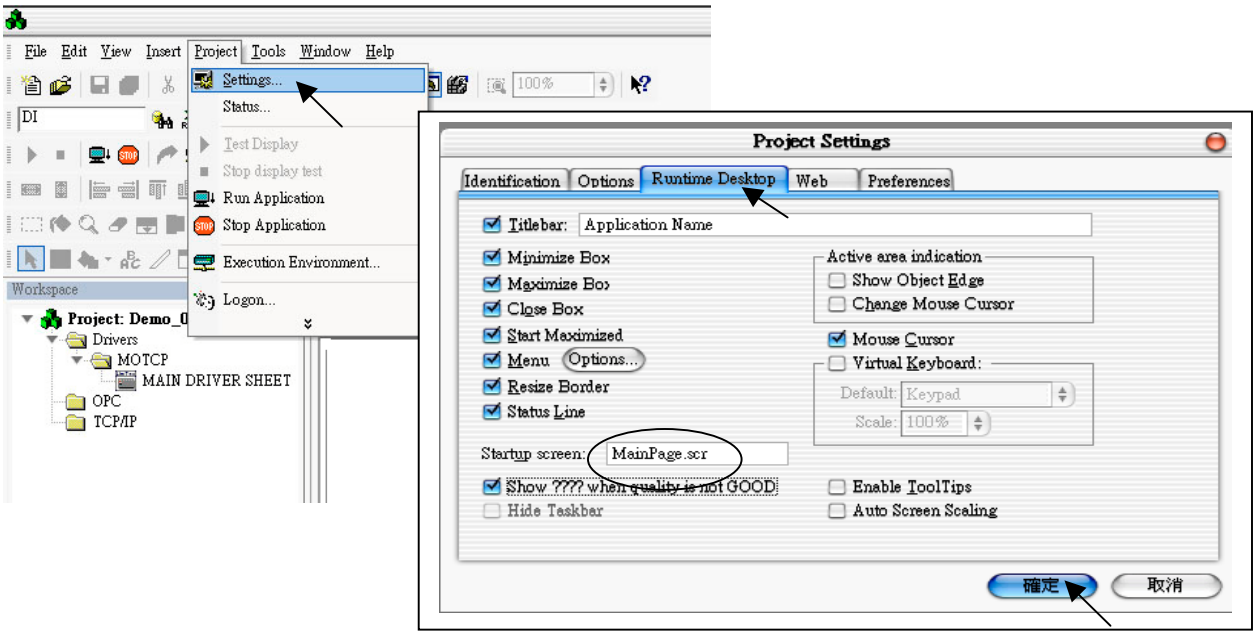
Download and run the project

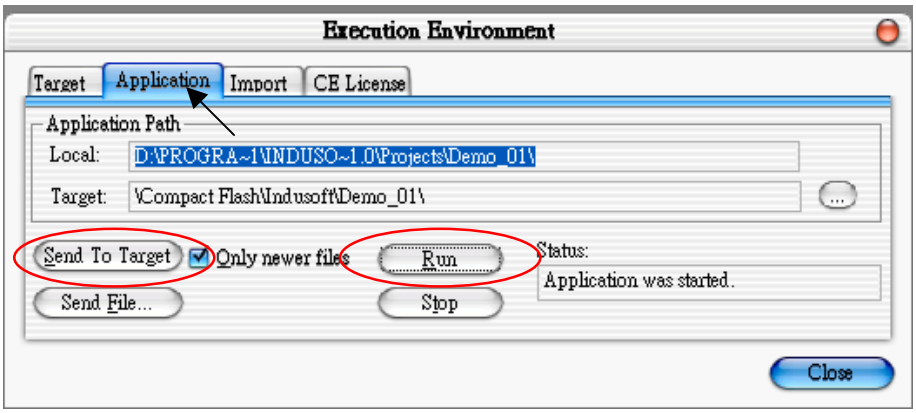
Select “Project -> Execution Environment” to open “Execution Environment” window. On the Target tab, select “Network IP” then type W-8xx6’s correct IP address and click “Connect”.





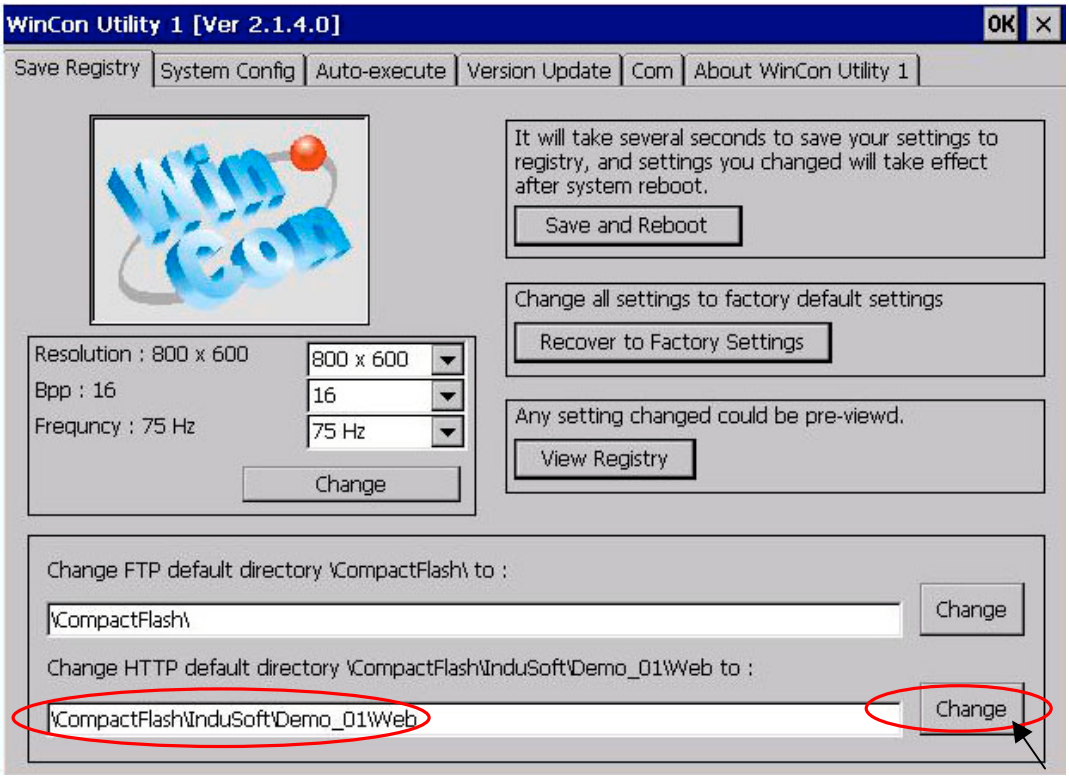
If connection is fine, click on the tab of “Application” then click “Send to Target”. When download finished, click “RUN” to start the project.





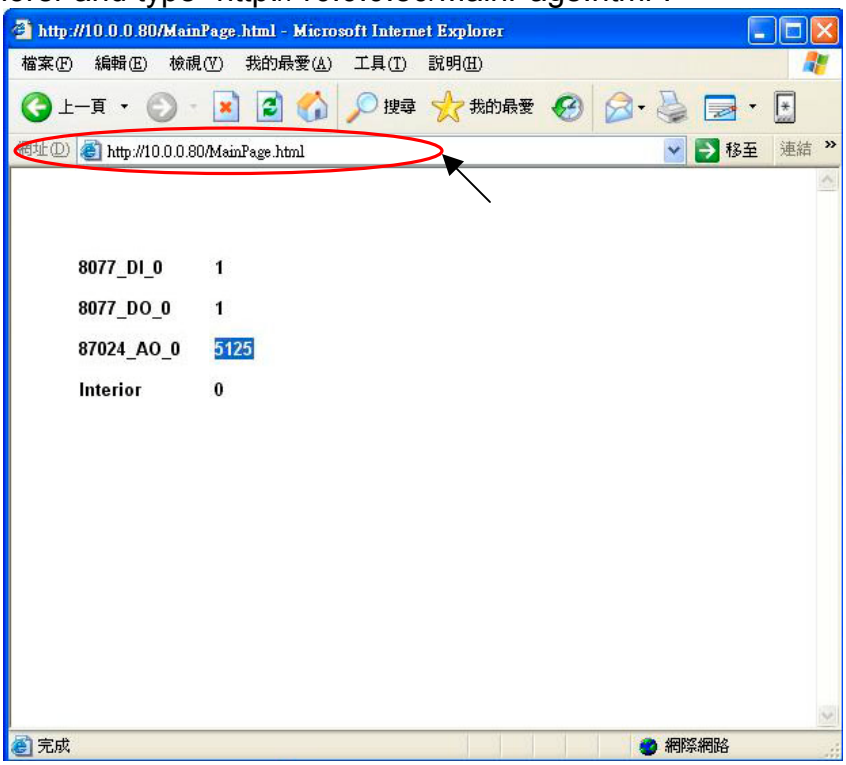
Configuration Web directory of WinCon

Run WinCon Utility and change default Web directory to "\CompactFlash\InduSoft\Demo_01\Web". Click "Change" and "Save and Reboot" to finish this configuration.



Visualize your project in a remote station

Run Internet Explorer and type "http://10.0.0.80/MainPage.html".



Note:
Users must install ISSymbol control layer in a remote station at first time. The procedure to install ISSymbol in each operation system is described below:

Windows NT/2K/XP:

Copy the files ISSymbolReg.exe and **ISSymbol.cab** from the \BIN sub-folder of Indusoft Web Studio v6.0 and paste them in any directory of the Web Thin Client station. Make sure that both files are stored in the same directory.
Run ISSymbolReg.exe to register ISSymbol control in the Web Thin Client station.

Windows 9x/ME:

Copy the files ISSymbolReg.exe and **ISSymbolA.cab** from the \BIN sub-folder of Indusoft Web Studio v6.0 and paste them in any directory of the Web Thin Client station. Make sure that both files are stored in the same directory.
Run ISSymbolReg.exe to register ISSymbol control in the Web Thin Client station.

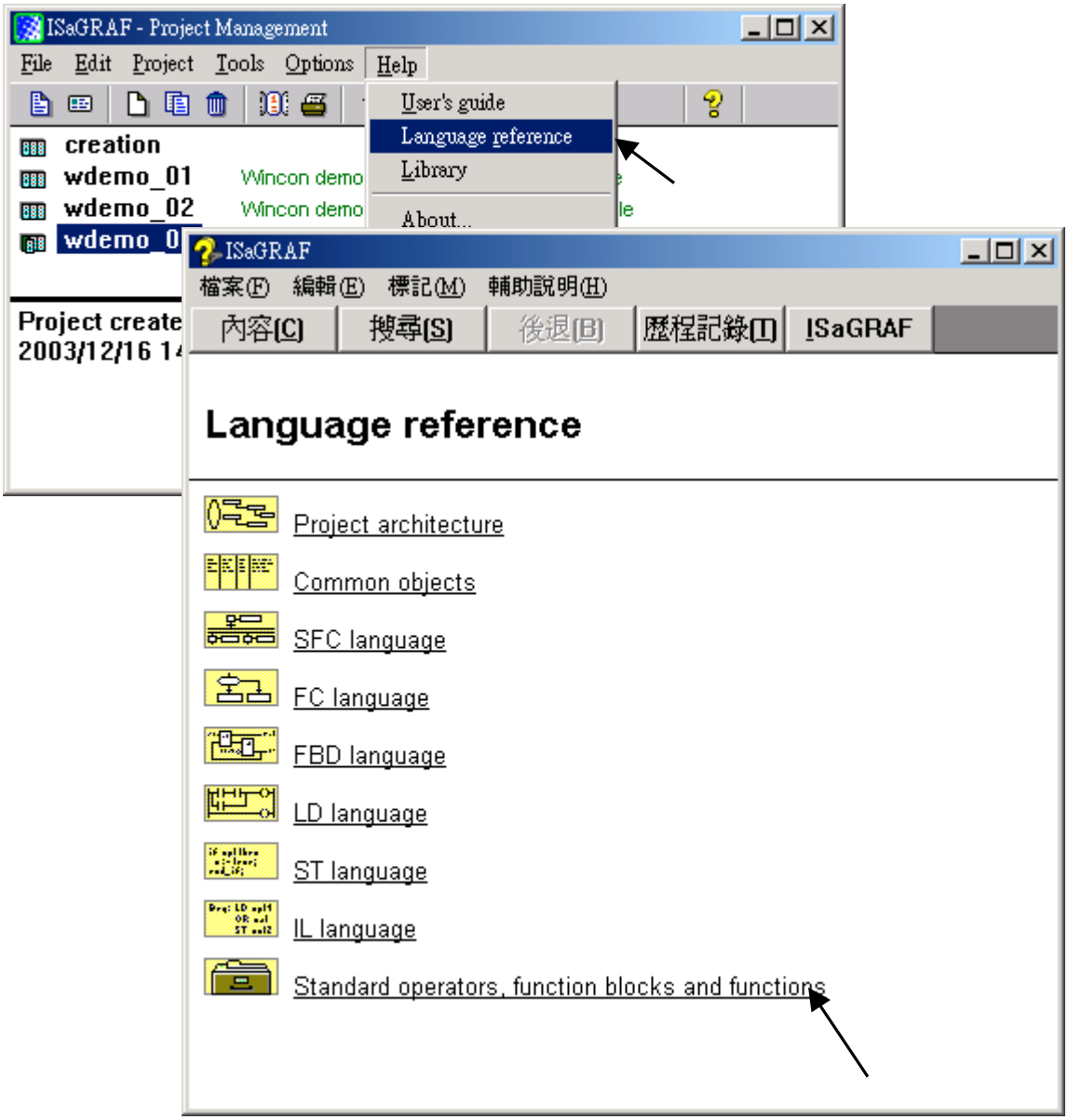
Chapter 9: ISaGRAF Example Program

Please refer to CD-ROM: \napdos\isagraf\wincon\english_manu\ "user_manual_i_8xx7.pdf" for detailed English User's Manual.

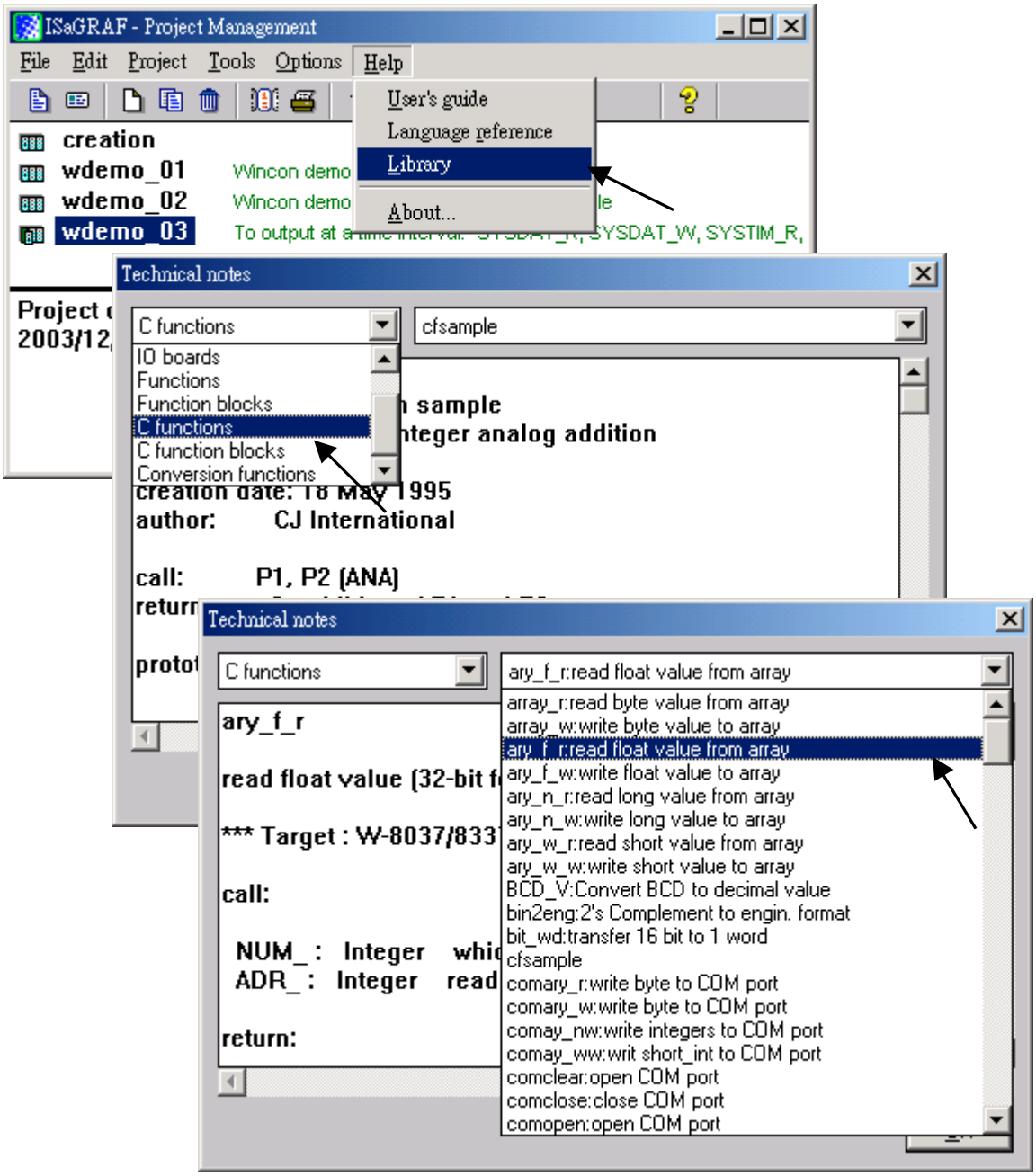
9.1: Get On-Line help

If you have question, you may email to service@icpdas.com.

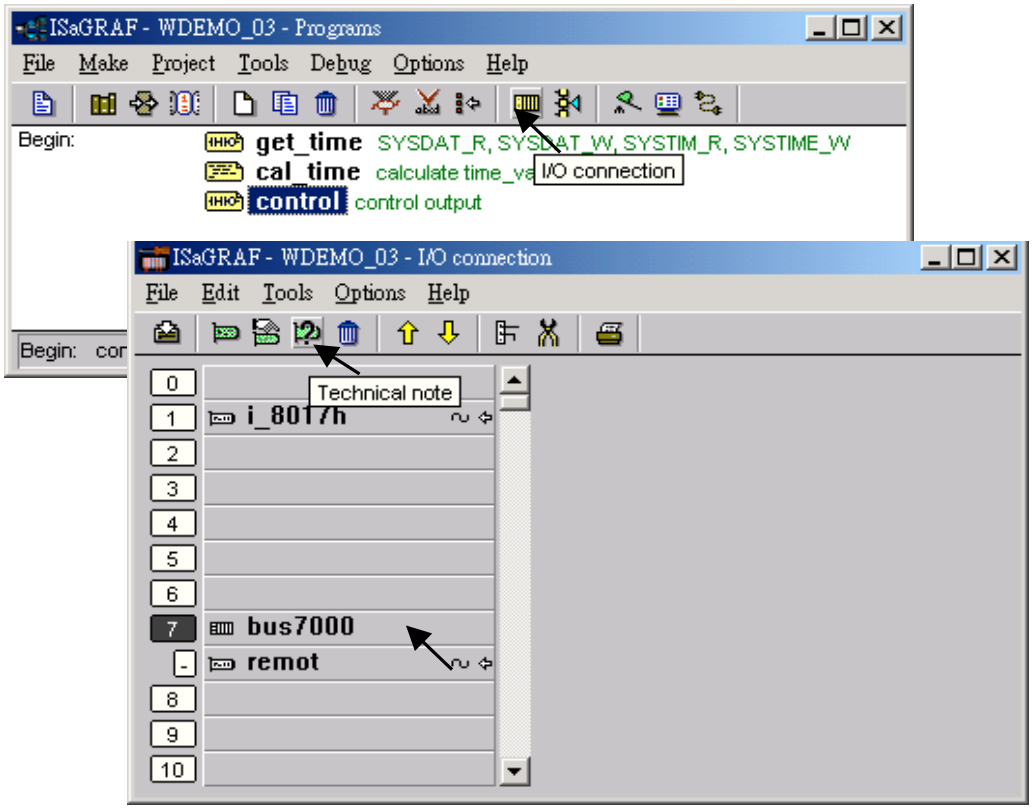
On-line help of ISaGRAF standard functions & function blocks:



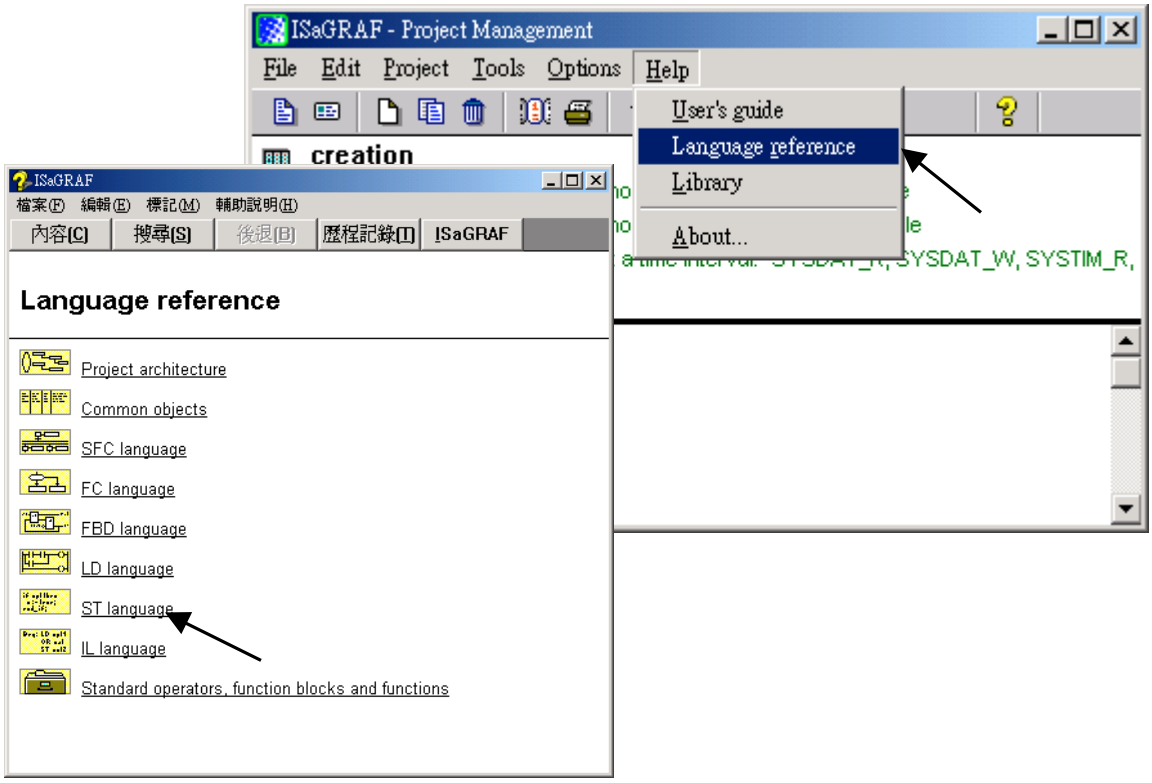
On-line help of ICP DAS add-on functions & function blocks:



On-line help of ICP DAS add-on I/O boards & I/O complex equipments:



On-line help of ISaGRAF languages:



9.2: Installing The ISaGRAF Programming Examples

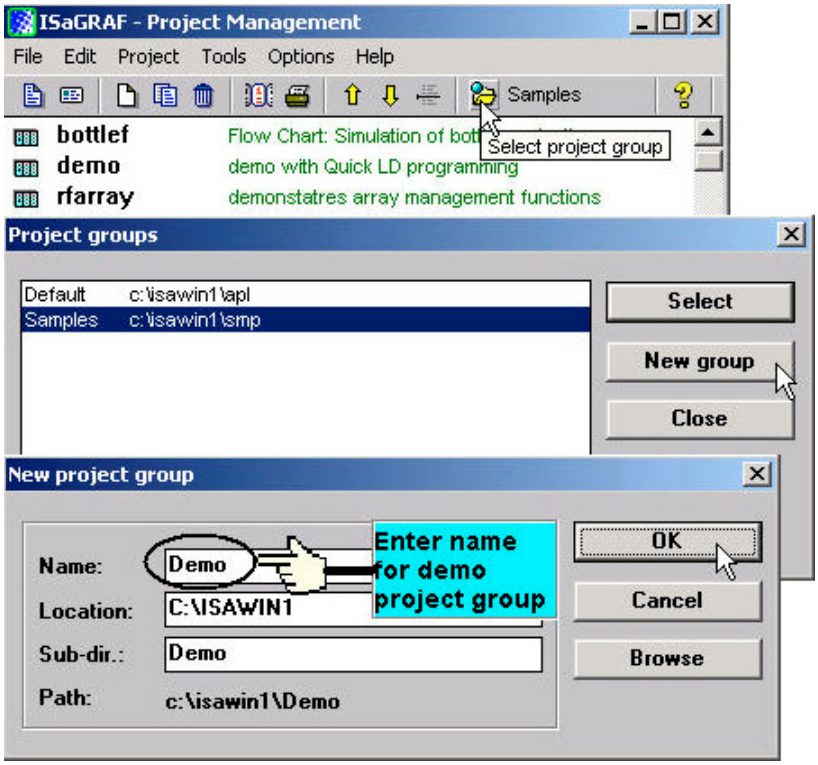
The ISaGRAF programming examples are installed on the same CD-ROM that you receive with the Wincon controller system. You will find the programming example files in the **Wincon ISaGRAF CD-ROM: \Napdos\ISaGRAF\Wincon\Demo** sub-directory on the CD-ROM.

Example lists:

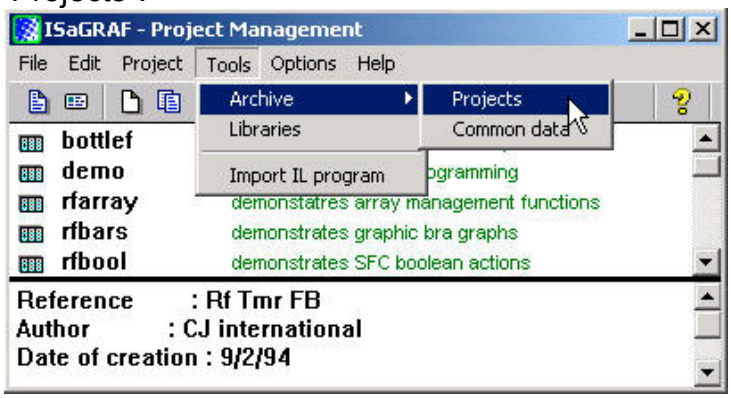
Project Name	Description	I/O Boards Or Complex Equipment Used
wdemo_01	R/W float value from file	
wdemo_02	R/W long integer value from file	
wdemo_03	To output something at a scheduled time interval: For ex. Moday, 09:00 ~ 18:00, Sunday, 10:00 ~ …	
wdemo_04	User defined Modbus protocol (No using "Mbus")	
wdemo_05	To do something at some sec later when an event happens	i-8055
wdemo_06	Using Message Array - MsgAry_r , MsgAry_w	
wdemo_07	Convert float value to string, using real_str & rea_str2	
wdemo_08	PID control, refer to CD: \napdos\isgraf\wincon\english_manu\"PID...htm"	
wdemo_09	Store & backup boolean & long integer value To/From files	
wdemo_10	Store & backup boolean & long integer value To/From EEPROM	
wdemo_11	Dir is \Compact Flash ,save 3val to 3 file per 10min,change file name per month	
wdemo_12	Same as Wdemo_11,but Dir is \CompactFlash (no blank between Compact & Flash)	
wdemo_13	record i-8081 ODM-2 's frequency into files for 5 seconds	i-081F2 i-8055
wdemo_14	Retain variable by Retain_b, Retain_N, Retain_f, Retain_t	
wdemo_16	Dir is \Compact Flash ,save 3val to 1 file per min,change file name per day	
wdemo_17	Same as Wdemo_16,but Dir is \CompactFlash (no blank between Compact & Flash)	
wdmo_18	Redundant Master & slave, Wincon + I-87K4/5/8/9 + I-87055, Master IP is 10.0.0.103, slave is 10.0.0.104	
wdemo_19	Send String to remote PC or controller via UDP/IP	

wdemo_20	receive String coming from remote PC or controller via UDP/IP	
wdemo_21	using "com_MRTU" to disable/enable Modbus RTU slave port,	
wdemo_22	PWM I/O demo. (Pulse Width Modulation), minimum scale is 2ms for Wincon	i-8055
wdemo_23	Send time string to COM2:RS232 every second by COMOPEN & COMSTR_W	
wdemo_24	Send string to COM2 when alarm 1 to 8 happens (Access to variables as array)	Slot 1: i8077
wdemo_26	To move some pulse at x-axis of i-8091 of slot 1 in W-8337/8737	i-8091
wdemo_27	Motion x, slot 1: i-8091, slot 2: i-8090, Napdos\ISaGRAF\8000\Driver\motion.pdf	i-8091 i-8090
wdemo_28	Motion x-y, slot1: i-8091, slot2: i-8090, Napdos\ISaGRAF\8000\Driver\motion.pdf	i-8091 i-8090
wdemo_29	Moving to he Abs. position when CMD is given, slot 1 : i-8091, slot 2: i-8090	i-8091 i-8090

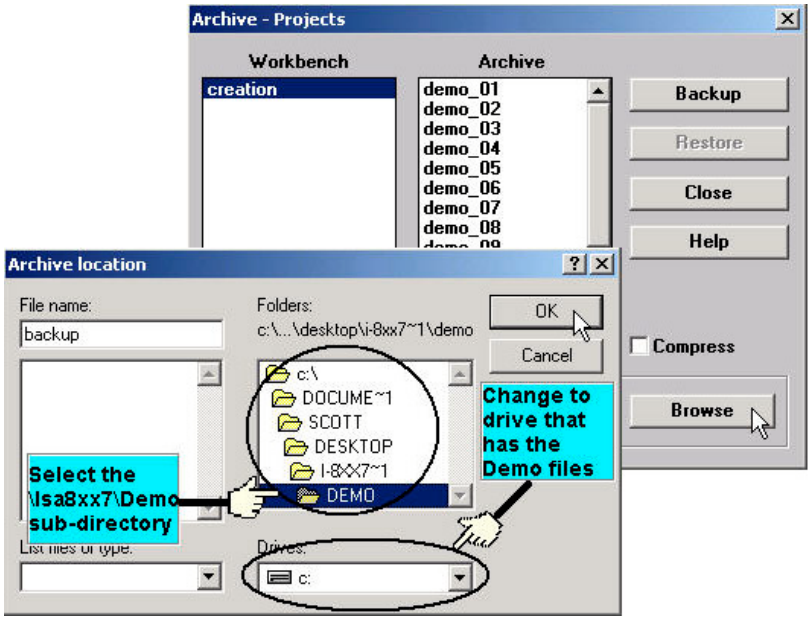
When you install the ISaGRAF programming example for the Wincon controller it is recommended that you create an "ISaGRAF Project Group" to install the demo program files into.



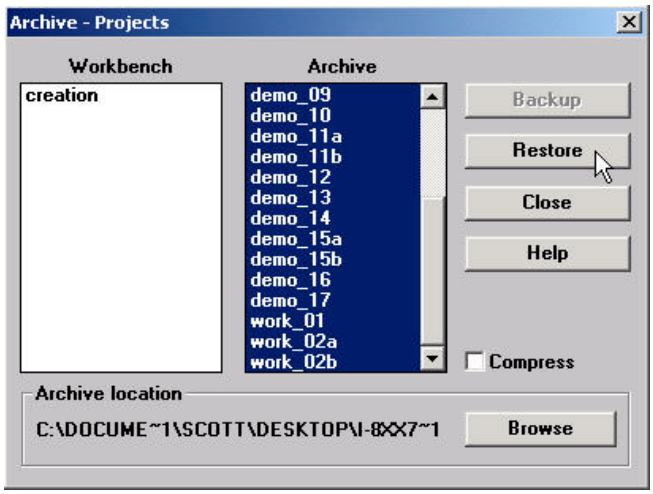
To install the demo programs into the project you have created open the "ISaGRAF Project Management" window to select "Tools" from the menu bar, then select the "Archive" option and then click on "Projects".



When you click on the "Projects" selection the "Archive Projects" window will open. Click on the "Browse" button to select the drive and the sub-directory where the demo files are located (**\Napdos\ISaGRAF\Wincon\Demo\ on the CD-ROM**) .



To install all of the Demo files, click on the "wdemo_01" file, then press and hold down the "Shift" key, continue to hold down the "Shift" key and use your mouse to scroll down to last file in the "Archive" window. Click on the last file name from the demo file location and that will select the entire group of demo files. Lastly, click on the "Restore" button in the "Archive Projects" window and all of the demo files will be installed into the sub-directory you have created.



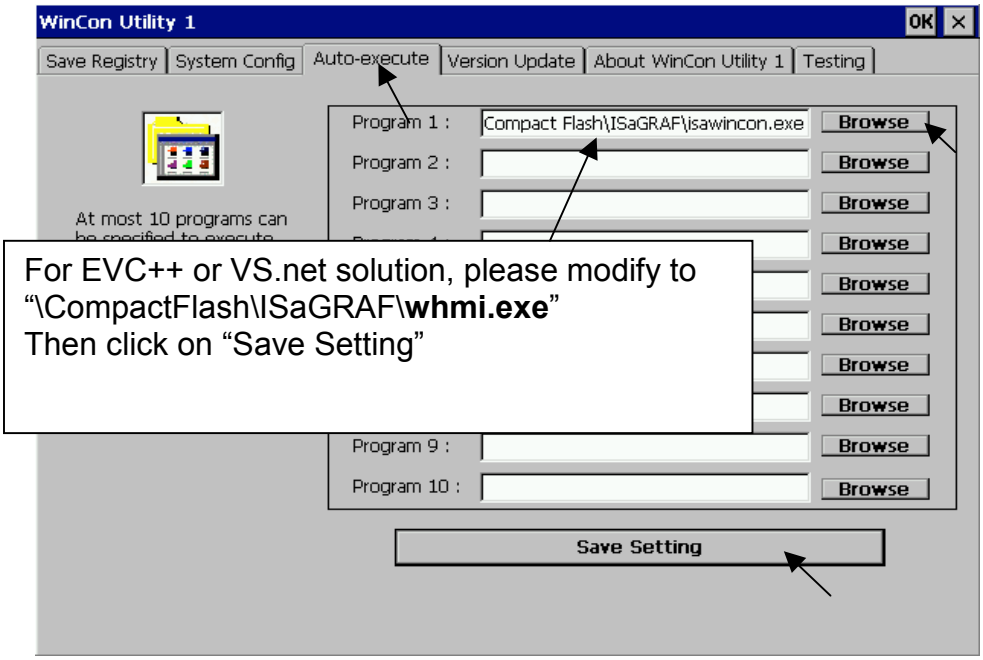
Chapter 10: Programming W-8xx7 By Non-ISaGRAF

10.1: Set Whmi.exe To Be First Auto-execute Program

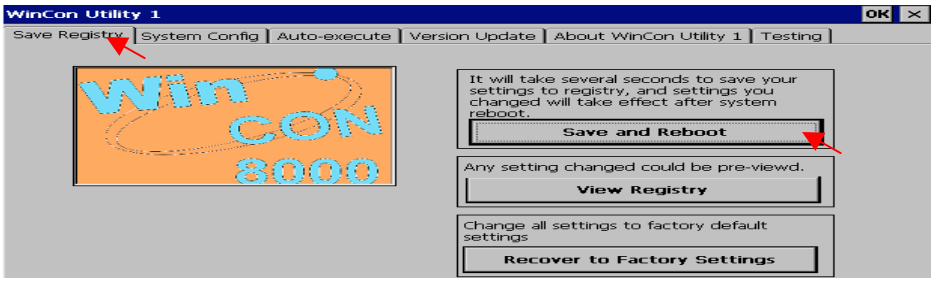
The Wincon-8xx7 supports ISaGRAF programming method & provides Web HMI solution by default by auto-running the “isawincon.exe” when controller is booting up.

If user prefer to program Wincon-8xx7 by using Microsoft EVC++ 4.0 or VS.net 2003 (VB.net & C#.net) and access to the Web HMI, it is also possible. In such a case, user don’t need to purchase any ISaGRAF Software (ISaGRAF-256-C or ISaGRAF-256-E). Please run “Start” – “Programs” – “Wincon Utility” and then modify “auto-execute” to run “**whmi.exe**”.

Please make sure your Wincon CompactFlash\ISaGRAF\ has at least 5 files - “**whmi.exe**” , **“rs_whmi.exe” , “mscorlib.dll” , “QuickerNet.dll” , “Quicker.dll”**. These files can be found at : CD-ROM: \napdos\isagraf\wincon\driver\w-8x37\(version No.)\
CD-ROM: \napdos\isagraf\wincon\driver\wincon-8x47(version No.)\
Or http://www.icpdas.com/products/Software/Web_HMI/Web_HMI.htm



Then save Registry. This step will re-boot your Wincon controller.



If user would like to program W-8xx7 by using both ISaGRAF & (EVC++ or VS.net), it is also possible. Please refer to Chapter 6 or Chapter 7.

10.2: Setting Up An EVC++ Web HMI Demo

10.2.1: Step 1 - Setup The Hardware

A. Please have a W-8337/8737 or W-8347/8747 & plug one I-8077 (or I-8055 or I-8054) board in its slot 1.

B. Prepare one VGA monitor, one PS2 mouse, one Keyboard and one ethernet cable and then connect them to the Wincon.

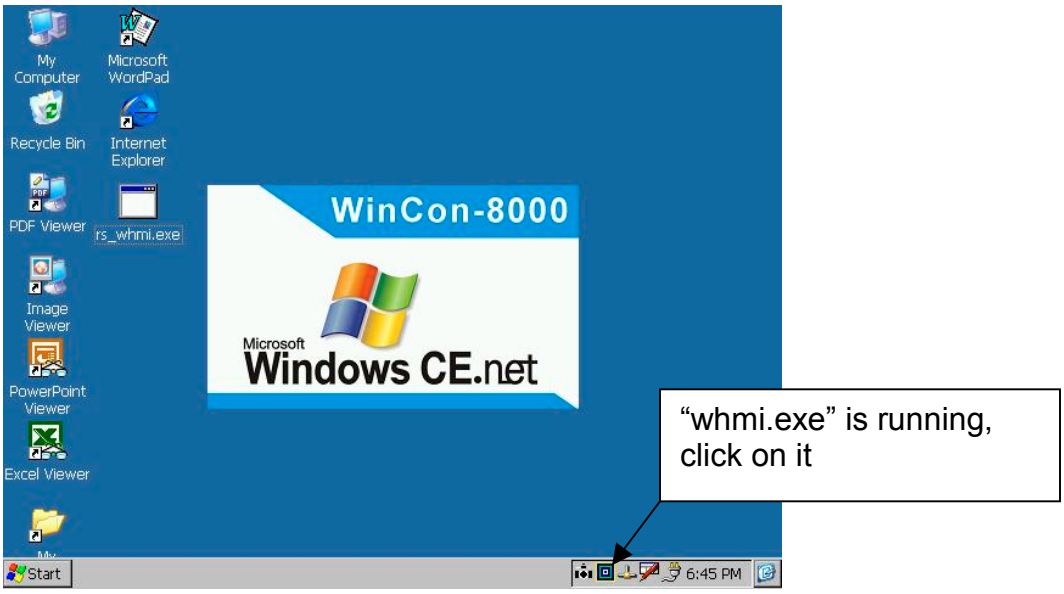
C. Power the Wincon up.

10.2.2: Step 2 - Make Sure Whmi.exe Installed

A. Please set a fixed IP address to the Wincon-8xx7. (No more DHCP)

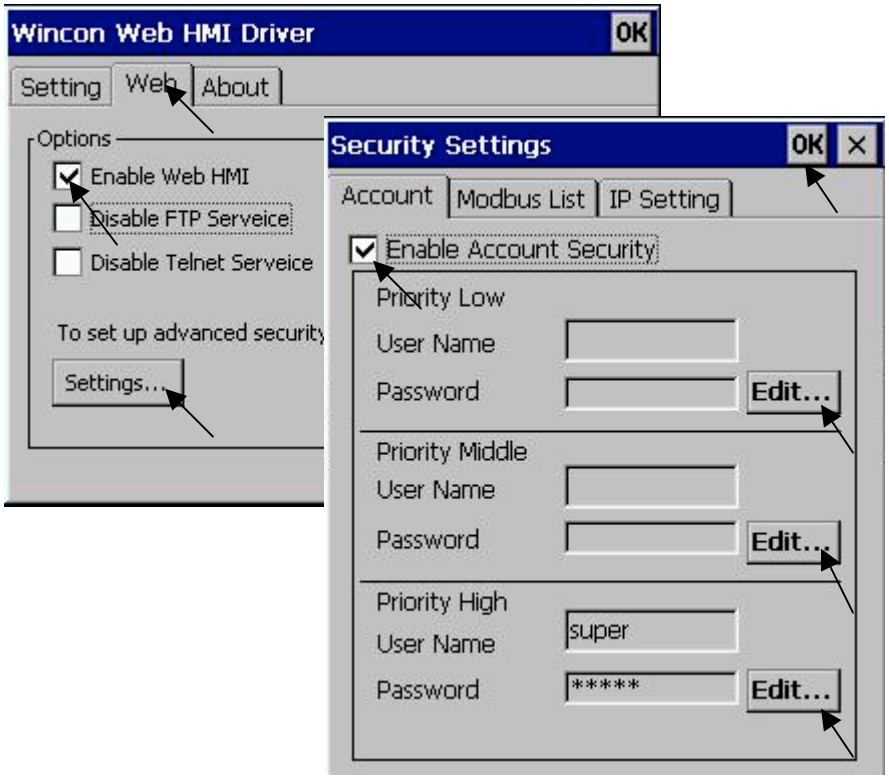
B. Please refer to section 10.1 to set “whmi.exe” to be first auto-execute program & then reboot your Wincon.

10.2.3: Step 3 - Setting The Web Options



Check on “Enable Web HMI”, and then click on “Setting”, Please check on “Enable Account Security” ,then click on “Edit” to set (username , password). **Then remember to click on “OK”**

Note: If “Enable Account Security” is not check, any user can easily get access to your Wincon through the Internet Explorer.



10.2.4: Step 4 - Download And Run EVC++ Demo Program

Please download EVC++ Demo program form the

Wincon ISaGRAF CD-ROM:
\napdos\isagraf\wincon\non_isagraf_demo\EVC++\whmi_c01\c\armv4rel\ “whmi_c01.exe”

to

Wincon: \CompactFlash\ISaGRAF\ and then run it.

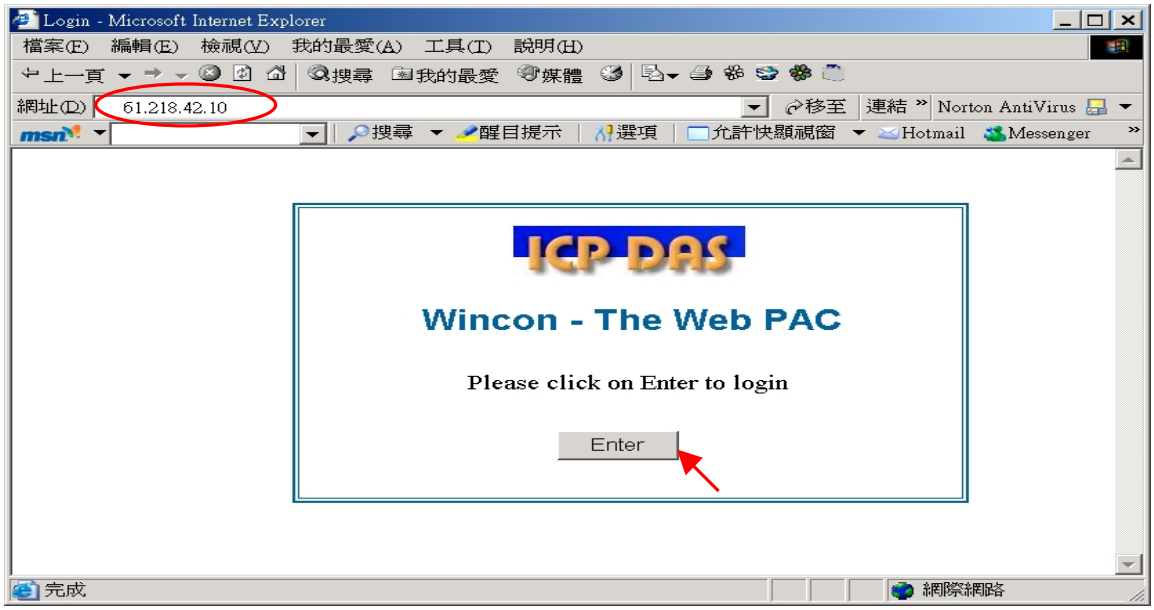
10.2.5: Step 5 - Download Web Pages To The Wincon

A. Please copy all files in the CD-ROM:
\napdos\isagraf\wincon\non_isagraf_demo\EVC++\whmi_c01\whmi\ *.* to
Wincon: \CompactFlash\Temp\HTTP\WebHMI\

B. Since the Web Pages are modified or new copied, please run “rs_whmi.exe” to reset the Web server. **The “rs_whmi.exe” must be run every time when user has modified any file in the W-8xx7’s CompactFlash\Temp\HTTP\WebHMI**

10.2.6: Step 6 - Show Time

Please run Internet Explorer (Rev. 6.0 or higher), key in the IP address of your W-8xx7.
For example: 61.218.42.10 or http://61.218.42.10



10.3: EVC++ Function To Access To The Web HMI

User can write his EVC++ 4.0 application to access to the Web HMI. The include file and library are “WinConAgent.h” and “Quicker.lib”. (CD-ROM:\napdos\isagraf\wincon\EVC++_LIB\ ). The DLL at run time is the “Quicker.dll” which is in Wincon - \CompactFlash\ISaGRAF\ (Please copy and run your EVC++ application at Wincon - \CompactFlash\ISaGRAF\). The below functions are used for access to the Web HMI data base. You may refer to CD-ROM:\napdos\isagraf\wincon\non_isagraf_demo\EVC++\ for example programs.

Note: Please check “whmi.exe” listed in section 10.1 has been installed for non_ISaGRAF solution.

Set boolean value to Web HMI:

unsigned char UserSetCoil(unsigned short iUserAddress, unsigned char iStatus);

iUserAddress:
1 to 1024 (Web HMI’s boolean data base)
2001 to 3024 (indicates if Internet Explorer post writing command to W-8x37)

iStatus: 0: set boolean to False, 1: set boolean to True

for ex,

```
long   temp_val;

// please set starting & ending Addr No. of each type at the beginning of your C program
temp_val = 100 ;
UserSetReg(2001 , &temp_val, 0) ; // set boolean’s starting addr. To 100
temp_val = 200 ;
UserSetReg(2002 , &temp_val, 0) ;  // set boolean’s ending addr. To 200
…

UserSetCoil(100 , 1)  // set boolean at network addr 100 as True
```

Note : The boolean’s Address No. 2001 to 3024 indicates if the IE on the PC gives writing command to the Web HMI’s data base. For example, If IE gives writing command to set Address 1 & 2’s boolean value to True (or False) and set Address 100’s float value to 1.234 (or any float value) and set Address 1009’s word value to –456 (or any word value), then the boolean value in Address 2001 & 2002 & 2100 & 3009 will set to 1 by the Web HMI. This means IE has given writing command to address 1 & 2 & 100 & 1009. User’s EVC++ program can get the information (by using **UserGetCoil**( ) to get boolean value in address 2001 to 3024) to know if “IE on the PC want to set value to the controller”. **Please be very careful to call UserSetCoil( ) to clear it** (set to 0 to the related Address in Address 2001 to 3024)**, if your C program has got the information**. The Web HMI driver will set flag value to 1 next time when IE post writing command.

Get boolean value from Web HMI:

unsigned char UserGetCoil(unsigned short iUserAddress, unsigned char *iStatus);

iUserAddress: **1 to 1024** (Web HMI's boolean data base)
2001 to 3024 (indicates if Internet Explorer post writing command to W-8xx7)

iStatus: 0: boolean is False, 1: boolean is True

for ex.

```
unsigned char bVal, flag_bVal;
…
UserGetCoil(2005 , &flag_bVal)  // get information flag of addr 5
UserGetCoil(5 , &bVal)  // get boolean value at network addr 5
UserSetCoil(2005 , 0)  // clear the information flag of Address 5
```

Set word or float or long value to Web HMI:

unsigned char UserSetReg(unsigned short iUserAddress,long *iStatus,unsigned char iDType);

iUserAddress:

1 to 1024 (Web HMI's analog data base)

2001 : starting Address No. of **boolean** data base to send to the IE on PC.
2002 : End Address No. of **boolean** data base.
2003 : starting Address No. of **word** data base to send to the IE on PC.
2004 : End Address No. of **word** data base.
2005 : starting Address No. of **float** data base to send to the IE on PC.
2006 : End Address No. of **float** data base.
2007 : starting Address No. of **long** data base to send to the IE on PC.
2008 : End Address No. of **long** data base.
2009 : starting Address No. of **string** data base to send to the IE on PC.
2010 : End Address No. of **string** data base.

iStatus: A pointer to a long type, which stores the data to set
iDType 0: type is word
1: data type is float
2: data type is long

Note:
1. The Address No. for each type must not conflict with each other. For ex, below assignment is OK. Boolean:(1 to 100), Word:(101 to 120), Float:(121 to 130), long:(131 to 132), String:(201 to 202). However, Boolean:(1 to 100), Word:(101 to 120), Float:(121 to 130), long:(125 to 132), String:(201 to 202) is not Ok, because Float & long conflict at No. of 125 to 130.

2. The more No. assigned will make the data size bigger to deliver to IE. Please do not assign too many No. especially for float, long & string data.

for ex.

```
float   float_val;
long    word_val, long_val[2];
long    temp_val;
long    *long_pt;

// please set starting & ending Addr No. of each type at the beginning of your C program
// set word starting addr. To 1
temp_val = 1;
UserSetReg(2003 , &temp_val, 0) ;
// set word ending addr. To 10
temp_val = 10 ;
UserSetReg(2004 , &temp_val, 0) ;
// set float's starting addr. To 11
temp_val = 11 ;
UserSetReg(2005 , &temp_val, 0) ;
// set float's ending addr. To 20
temp_val = 20 ;
UserSetReg(2006 , &temp_val, 0) ;
// set long's starting addr. To 21
temp_val = 21;
UserSetReg(2007 , &temp_val, 0) ;
// set long's ending addr. To 30
temp_val = 30 ;
UserSetReg(2008 , &temp_val, 0) ;
…

// set word_val (-32768 to +32767) to network address 1
word_val = -20000 ;
long_pt = (long *)(&word_val) ;
UserSetReg(1 , long_pt, 0);

// set float_val to network address 11
float_val = 1.2345 ;
long_pt = (long *)(&float_val);
UserSetReg(11 , long_pt, 1);

// set long_val to network address 21
long_val[0] = 12345678 ;
long_pt = (long *)(&long_val[0]) ;
UserSetReg(21 , long_pt, 2);

// set long_val to network address 23
long_val[1] = -4567 ;
long_pt = (long *)(&long_val[1]) ;
UserSetReg(23 , long_pt, 2);
```

Get word or float or long value from Web HMI:

unsigned char UserGetReg(unsigned short iUserAddress,long *iStatus,unsigned char iDType);

iUserAddress:1 to 1024 (Web HMI's analog data base)
iStatus: A pointer to a long type, which will store the data returned
iDType 0: type is word
1: data type is float
2: data type is long

for ex.

```
float   float_val;
long    word_val, long_val[2];
long    ret_val;
unsigned char flag_float_val, flag_ word_val, flag_long_val[2] ;

…

// get word_val (-32768 to +32767) of network address 1
UserGetCoil(2001 , &flag_word_val)  // get information flag of addr. 1
UserSetCoil(2001 , 0)  // clear the information flag of Address 1
UserGetReg(1, &ret_val, 0);
if ( ret_val>=0  &&  ret_val<=32767 )  word_val = ret_val;
else  word_val = ret_val  |  0xFFFF0000;

// get float value of network address 11
UserGetCoil(2011 , &flag_float_val)  // get information flag of addr. 11
UserSetCoil(2011 , 0)  // clear the information flag of Address 11
UserGetReg(11, &ret_val, 1) ;
float_val = *(float *) (&ret_val) ;

// get long value of network address 21
UserGetCoil(2021 , &flag_long_val[0])  // get information flag of addr. 21
UserSetCoil(2021 , 0)  // clear the information flag of Address 21
UserGetReg(21, &ret_val, 2) ;
long_val[0] = ret_val ;

// get long value of network address 23
UserGetCoil(2023 , &flag_long_val[1])  // get information flag of addr. 23
UserSetCoil(2023 , 0)  // clear the information flag of Address 23
UserGetReg(23, &ret_val, 2) ;
long_val[1] = ret_val ;
```

Set string value to Web HMI:

unsigned char UserSetReg_Str(unsigned short iUserAddress, char *iStatus);

iUserAddress:1 to 1024 (Web HMI's string data base)
iStatus: A pointer to a char[ ], which stores the string to set. Max string len is 255 bytes.

Get string value from Web HMI:

unsigned char UserGetReg_Str(unsigned short iUserAddress, char *iStatus);

iUserAddress:1 to 1024 (Web HMI's string data base)
iStatus: A pointer to a char[ ], which will store the string returned. Max string len is 255 bytes.

For example,

```
char str0[256] , str1[256];
long   temp_val;
unsigned char flag_str0 ;

// please set starting & ending Addr No. of each type at the beginning of your C program

// set string's starting addr. to 201
temp_val = 201 ;
UserSetReg(2009 , &temp_val, 0) ;
// set string's ending addr. to 202
temp_val = 202 ;
UserSetReg(2010 , &temp_val, 0) ;
…

UserGetCoil(2201 , &flag_str0)  // get information flag of addr. 201
UserSetCoil(2201 , 0)  // clear the information flag of Address 201

// get string of network address 201
UserGetReg_Str(201, str0);

// Set string to network address 202
UserSetReg_Str(202, str1);
```

Note:
1. The Address No. for each type must not conflict with each other. For ex, below assignment is OK. Boolean:(1 to 100), Word:(101 to 120), Float:(121 to 130), long:(131 to 132), String:(201 to 202). However, Boolean:(1 to 100), Word:(101 to 120), Float:(121 to 130), long:(125 to 132), String:(201 to 202) is not Ok, because Float & long conflict at No. of 125 to 130.

2. The more No. assigned will make the data size bigger to deliver to IE. Please do not assign too many No. especially for float, long & string data.

10.4: VB.NET Function To Access To The Web HMI

You may refer to
1. CD-ROM:\napdos\isagraf\wincon\non_isagraf_demo\VB.NET\ for example programs.
2. Section 10.2 for similar steps to set up VB.NET demo
vb demo program:
\napdos\isagraf\wincon\non_isagraf_demo\VB.NET\whmi_vb01\vb01\bin\release\ “vb01.exe”
Web pages:
\napdos\isagraf\wincon\non_isagraf_demo\VB.NET\whmi_vb01\whmi\ *.*

Note: Please check “whmi.exe” section 10.1 has been installed for non_ISaGRAF solution.

User can write his VB.NET application to access to the Web HMI. The Address rule is the same as the former section. The Address No. for each type must not conflict with each other.

Web HMI boolean data base:	Address No. 1 to 1024
Web HMI word data base:	Address No. 1 to 1024
Web HMI float data base:	Address No. 1 to 1024
Web HMI long data base:	Address No. 1 to 1024
Web HMI String data base:	Address No. 1 to 1024

Information Flag: boolean Address No. **2001** to **3024**

Word Address No. of

2001 : starting Address No. of **boolean** data base to send to the IE on PC.
2002 : End Address No. of **boolean** data base.
2003 : starting Address No. of **word** data base to send to the IE on PC.
2004 : End Address No. of **word** data base.
2005 : starting Address No. of **float** data base to send to the IE on PC.
2006 : End Address No. of **float** data base.
2007 : starting Address No. of **long** data base to send to the IE on PC.
2008 : End Address No. of **long** data base.

Please refer to section 6.6 for the VB.NET function to access to Web HMI.

“UserSetCoil” , “UserGetCoil” to access to Web HMI’s boolean data.

“UserSetReg_short” & “UserGetReg_short” to access to Web HMI’s word data.

“UserSetReg_float” & “UserGetReg_float” to access to Web HMI’s float data.

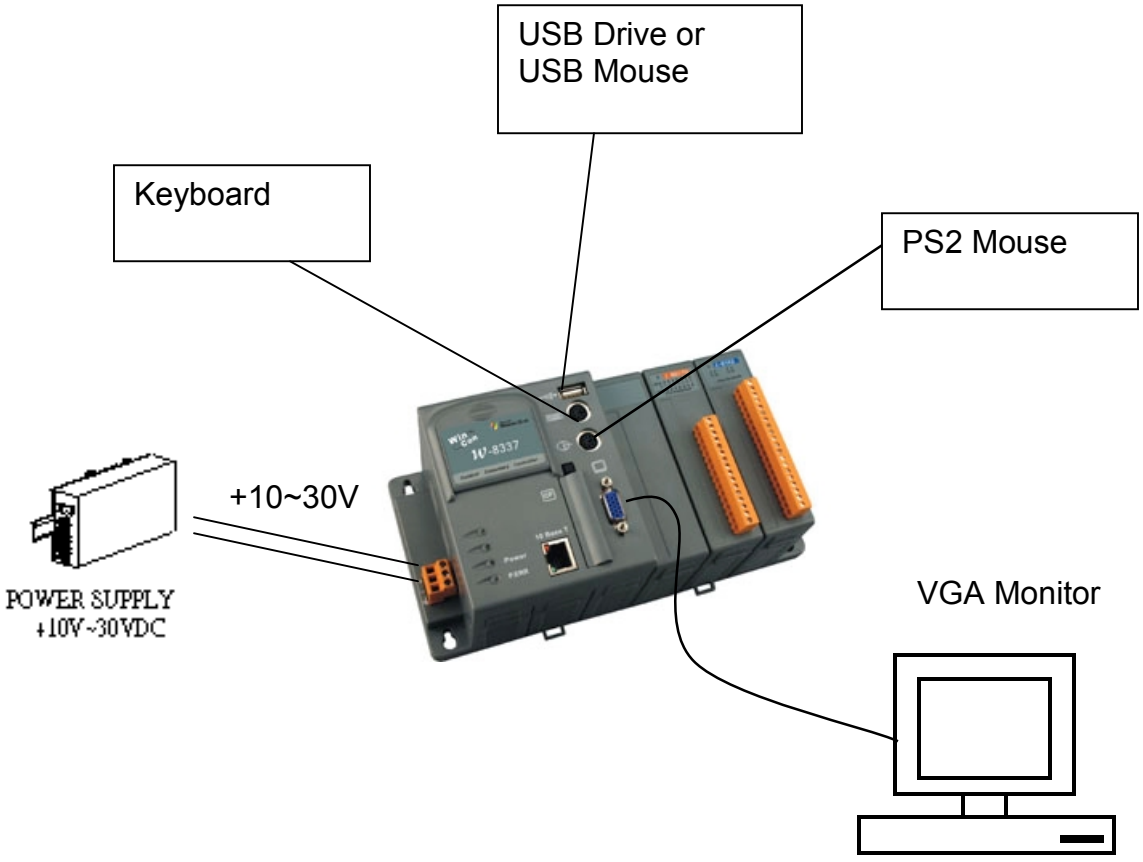
“UserSetReg_long” & “UserGetReg_long” to access to Web HMI’s long integer data.

Note: VB.net & C#.NET can not access to string data of the Web HMI.

Appendix A: Hardware System & Setting

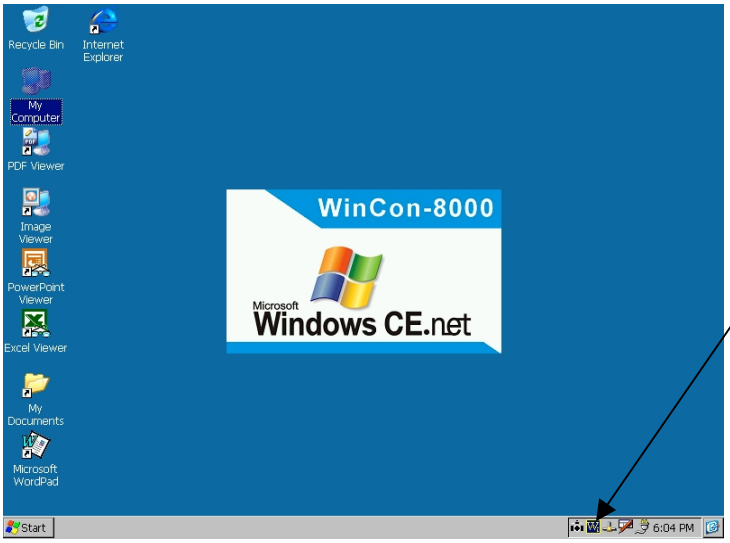
A.1: Applying Correct Power Supply

Please apply a power supply between +10V to +30V (> 25W or higher is better)

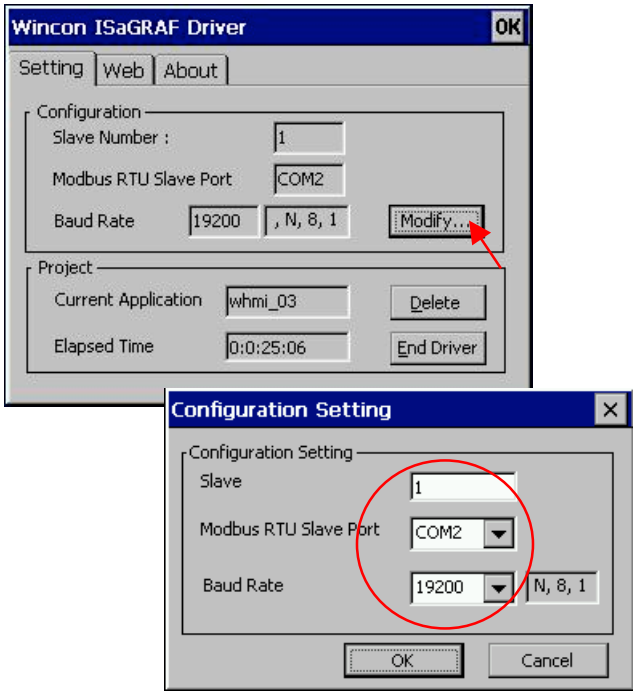


A.2: Modify The NET-ID & Modbus RTU Port Setting

User may set wincon-8xx7's Net-ID (Slave Number) to a No. from 1 to 255.
The default Modbus RTU slave port is None when shipped out. User may set it to others depends on its application (please also refer to appendix G & E for more Modbus RTU ports).



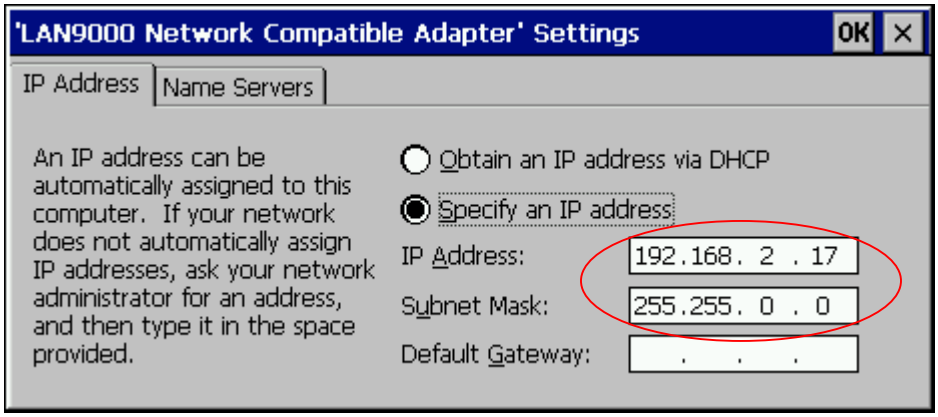
Double Click on the "W" icon on the Wincon.



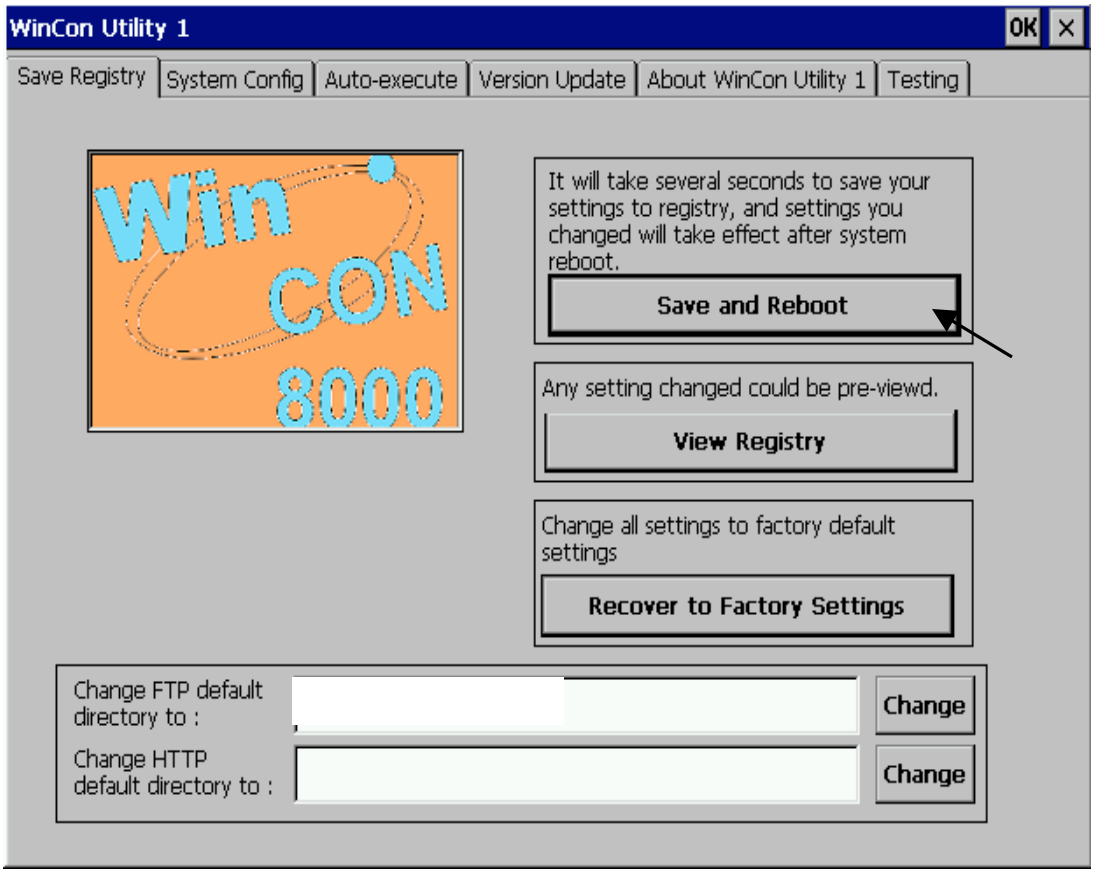
A.3: Setting The IP Address For The W-8xx7

Please refer to Appendix D for W-8x47 & W-8x46 (10/100 M ethernet port x 2).

Below is for W-8037/8337/8737 & W-8036/8336/8736 (10M ethernet port x 1) :
Please run “Start” – “Setting” – “Control Panel” on the Wincon, then double click on “Network and Dial-up Connections”. Then click on “LAN90001”. Set your Wincon’s IP address & its Subnet Mask.



Please run “Start” – “Programs” – “Wincon Utility”, click on “Save and Reboot”

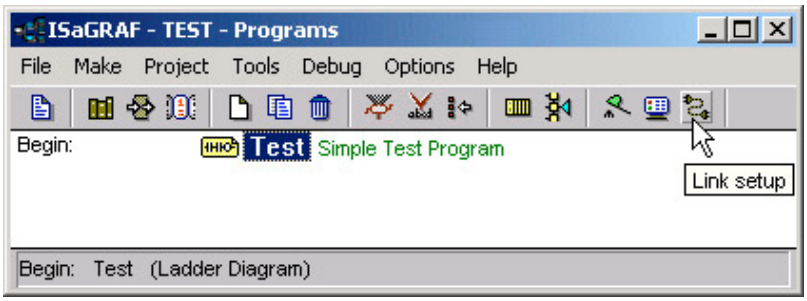


A.4: Connecting Your PC To The W-8xx7 Ethernet Port

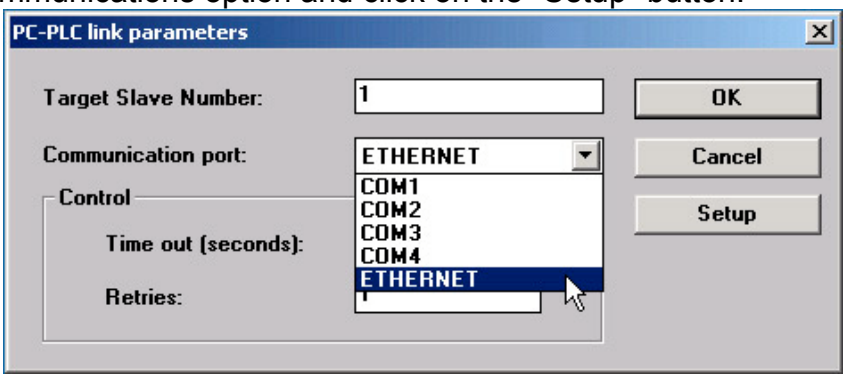
Before you can download an ISaGRAF application to the W-8xx7 controller system using the Ethernet port, you must first setup the Ethernet port to properly communicate with the host PC.

On the W-8xx7, Set IP, Mask and Gateway address:
Refer to former section – “A.3: Setting The IP Address For The W-8xx7”

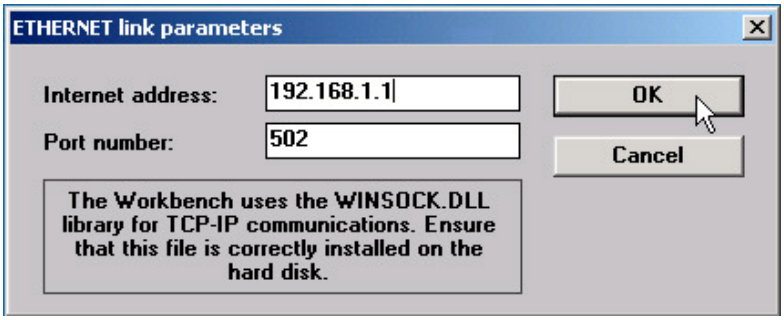
On your PC:
First open an ISaGRAF project and select a program you wish to communicate between your PC and the W-8xx7 controller system. Next, select the "Link Setup" button on the project screen as shown below.



A "PC-PLC Link Parameters" dialog box will appear as shown below. From here select the "Ethernet" communications option and click on the "Setup" button.



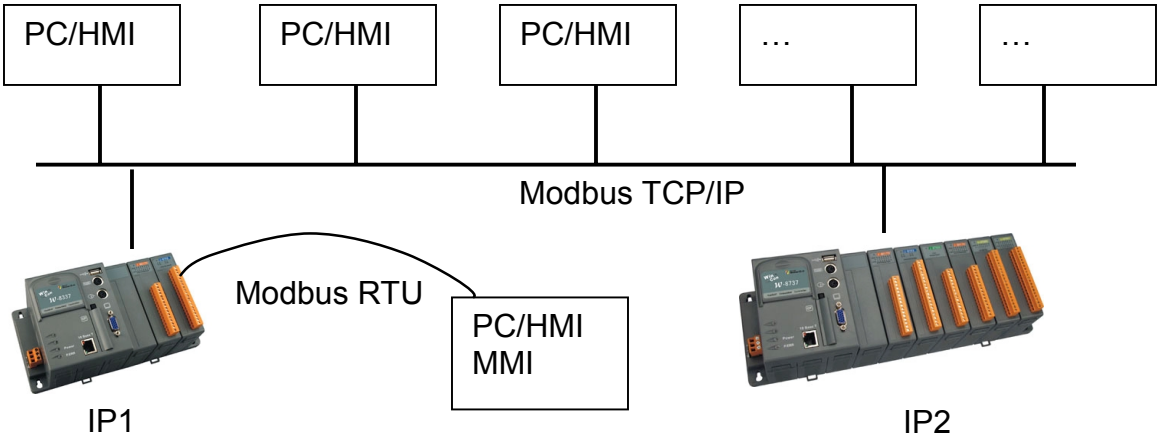
Once you have clicked on the "Setup" button, an "Ethernet Link Parameters" dialog box will appear. Set the "Port Number" to "**502**" and enter in the **Internet address (IP) of the W-8xx7** controller.



Once you have entered the appropriate information, click on the "OK" button, and now you have configured your PC to communicate with the W-8x37 through the Ethernet port.

A.5: Multi-Clients Connection to The W-8xx7 Ethernet Port

Each W-8xx7 has an IP address and with a fixed Ethernet port No. **502.** Up to 8 PCs can link to one W-8xx7 throughout Ethernet (Modbus TCP/IP protocol). Other PC or HMI can link to COM2: RS232 port or COM3:RS485 (or COM5,6,7,8, appendix G & E) (Modbus RTU slave)

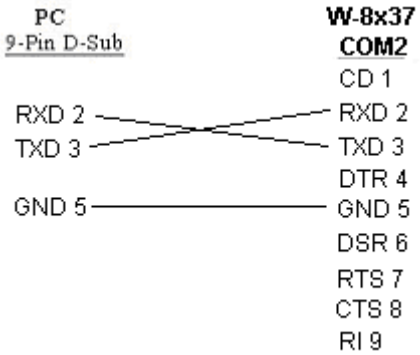


A.6: Connecting Your PC To The W-8xx7 COM2 or COM3

The default Modbus RTU slave port is None when product is shipped out. User may change it to “COM2:RS232” or “COM3:RS485” or “None”. (please refer to “A.2: Modify The NET-ID & Modbus RTU port setting”) . Please refer to appendix G & E for more Modbus RTU ports.

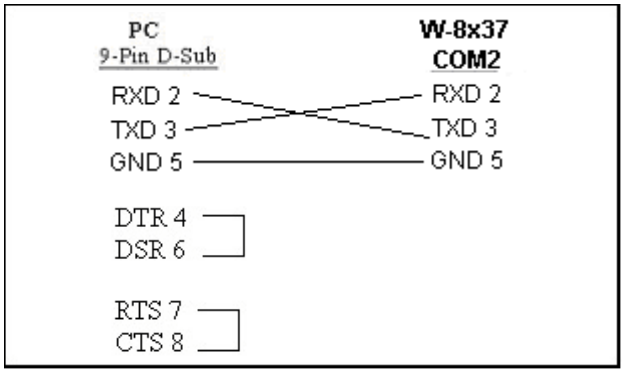
Default communication parameter is “19200,8,N,1”

Pin assignment of the Wincon’s COM2: RS232 is the same as PC’s COM1. So the cable should be 2, 3 cross.



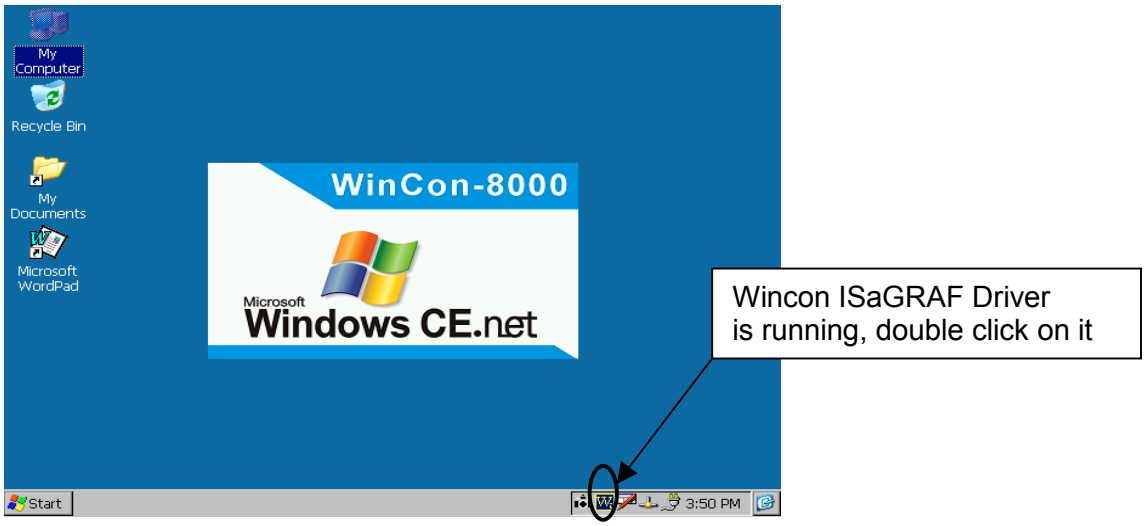
If connecting PC to Wincon’s COM3:RS485, a I-7520 (RS232/485 converter) is need as below.

For the ISaGRAF Workbench RS-232 communications to operate properly, only the RXD, TXD, and the GND signals are used. If your PC is running a hardware device or software program that uses the CTS and DSR signals, you will need to wire the RTS-CTS and DTR-DSR signals together as shown below.

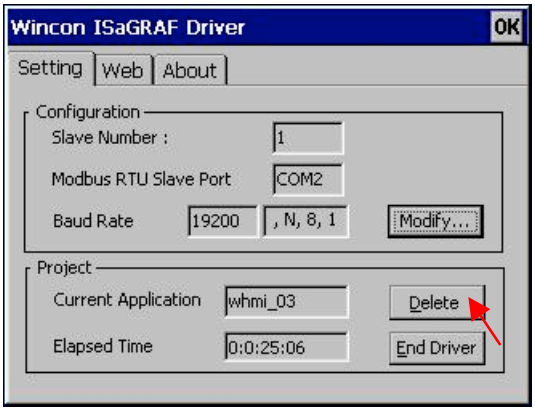


A.7: Deleting the ISaGRAF Project From The W-8xx7

For some reasons, user may delete the ISaGRAF program in the Wincon-8xx7/8xx6 controller.



Click on “Setting” & then click on “Delete ISaGRAF Project”.

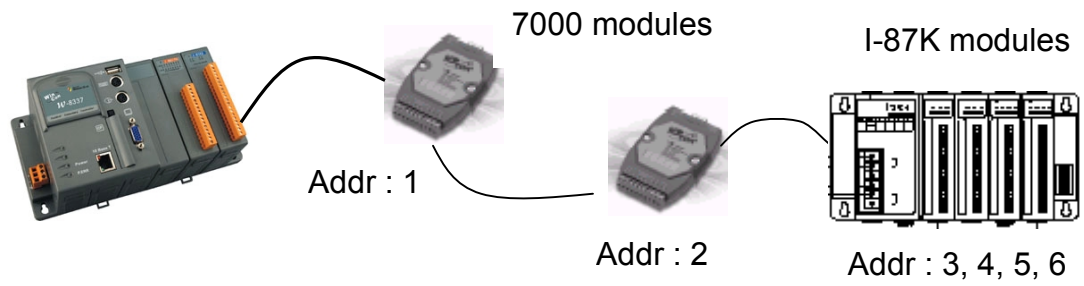


A.8: Linking I-7000 and I-87K Modules For Remote I/O

The W-8xx7 controller system can use its COM3 port to link to ICP DAS's "I-7000" and “I-87K” series of remote I/O modules. This configuration can be very useful in applications that require distributed remote I/O throughout the system.

You can link up to **255** I-7000 or I-87K series remote modules to one W-8xx7 controller system (It is better not to link up to 40 I-7000 or I-87K). You must remember to set each I-7000 and I-87K remote module must have a unique address, and be set to the same baud rate as the W-8xx7 controller system.

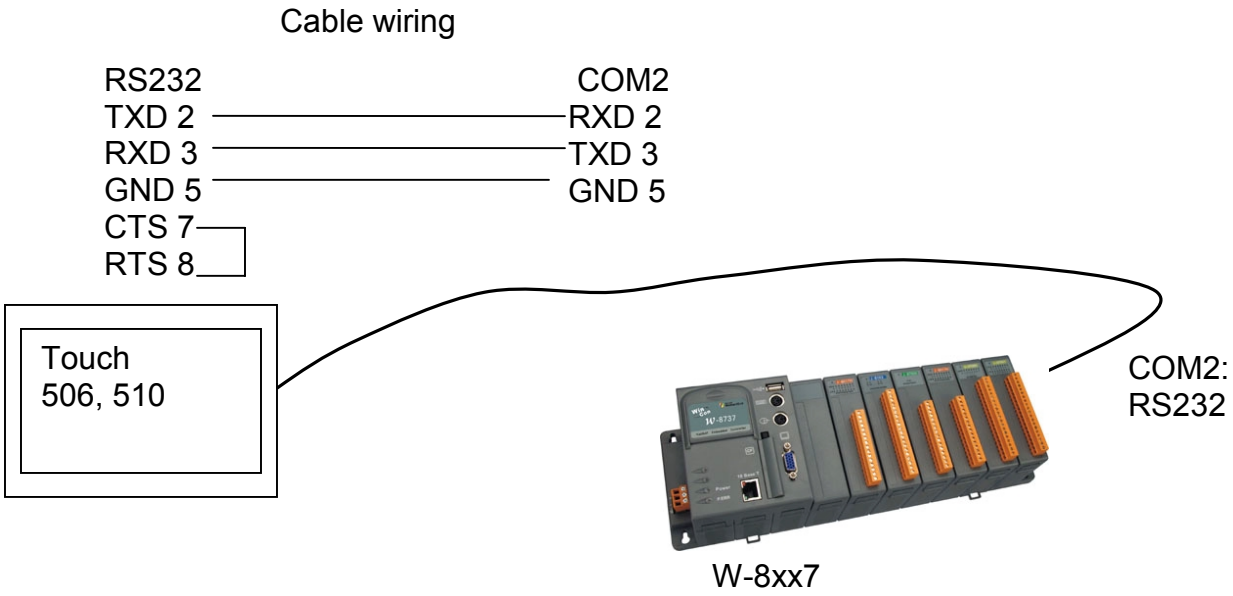
For more information regarding setting up and programming an I-7000 / I-87K remote module, please refer to Chapter 6 - "Linking To I-7000 and I-87K Modules" of the “User’s Manual Of The ISaGRAF Embedded Controller” .



A.9: Linking To An HMI Interface Device

The COM2 (RS-232) (or COM5, 6,7, 8, please refer to appendix G & E) ports of the W-8xx7 / 8xx6 controller system can be used to interface with additional Human Machine Interface (HMI) devices such as touch displays. Please refer to section A.2 first for setting Modbus RTU port. ICP DAS provides a full line of touch screen displays, such as the "Touch" series screens. The models in the product line include the Touch 506, and Touch 510 HMI products.

If you are using any of the “Touch” series of MMI devices to connect to an W-8xx7 controller, you can only interface the devices to the COM2 port on the W-8xx7 controller.

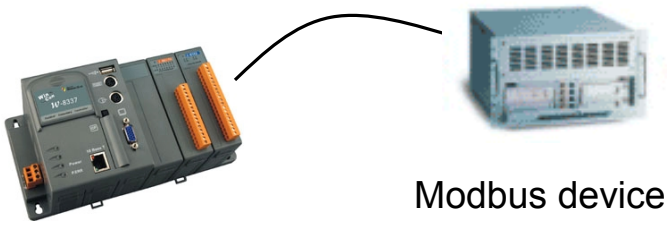


For more information regarding interfacing the Touch series of MMI devices to the W-8xx7 / 8xx6 controller system, please refer to Chapter 4- "Linking The I-8xx7 To HMI Devices" of the “User’s Manual Of The ISaGRAF Embedded Controller” ..

A.10: Linking To Other Modbus Devices

The COM2 (RS-232) or COM3 (RS-485) (or COM5 to COM14 if I-8112/8114/8142/8142/8142i is found in slot 1 to 5, refer to appendix E) supports Modbus Master protocol. Please refer to Chapter 8 of the “User’s Manual Of The ISaGRAF Embedded Controllers” for more information.

RS232 :

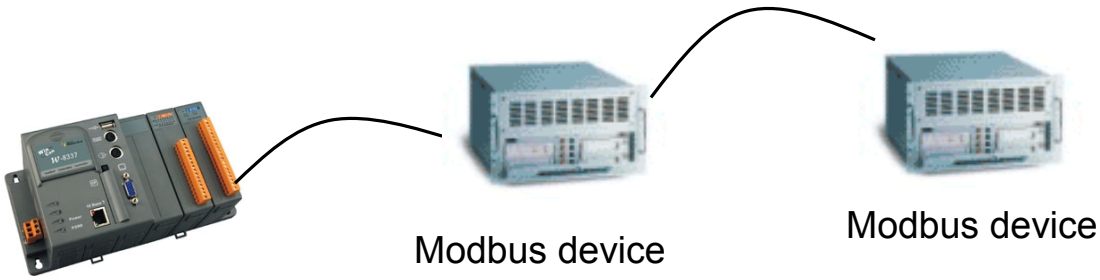


Modbus device

W-8xx7

COM2		RS232
RXD 2	———	TXD
TXD 3	———	RXD
GND 5	———	GND
		CTS
		RTS

RS485 :



Modbus device

Modbus device

W-8xx7

COM3		RS485		RS485
D +	———	485 +	———	485 +
D -	———	485 -	———	485 -

Appendix B: Update Wincon's ISaGRAF Driver to Higher Version

Note:
If you have purchased W-8x37/8x36 or W-8x47/8x46, the Wincon ISaGRAF Driver is already installed with license when shipping out. You don't need to install it. However if you want to upgrade to higher version, you may upgrade it by yourself.

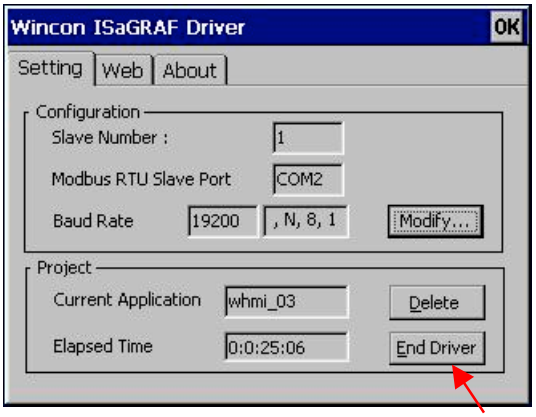
The Wincon ISaGRAF driver can be obtained at Wincon ISaGRAF CD:
W-8x37: \napdos\isagraf\wincon\driver**w-8x37**\<version Number>\
W-8x47: \napdos\isagraf\wincon\driver**wincon-8x47**\<version Number>\

For example, version 3.25 is located at
W8x37: \napdos\isagraf\wincon\driver**w-8x37**\3.25\ (**W8x37 & W8x47 driver are different**)
W8x47: \napdos\isagraf\wincon\driver**wincon-8x47**\3.25\

Or you may download it from http://www.icpdas.com/products/PAC/i-8000/isagraf.htm

1. If your Wincon is W-8xx7 / W-8xx6, please stop "Wincon ISaGRAF Driver" first. However if it is W-8x31/8x39 or W-8x41/8x49 (Wincon without ISaGRAF license), please goto step 2.

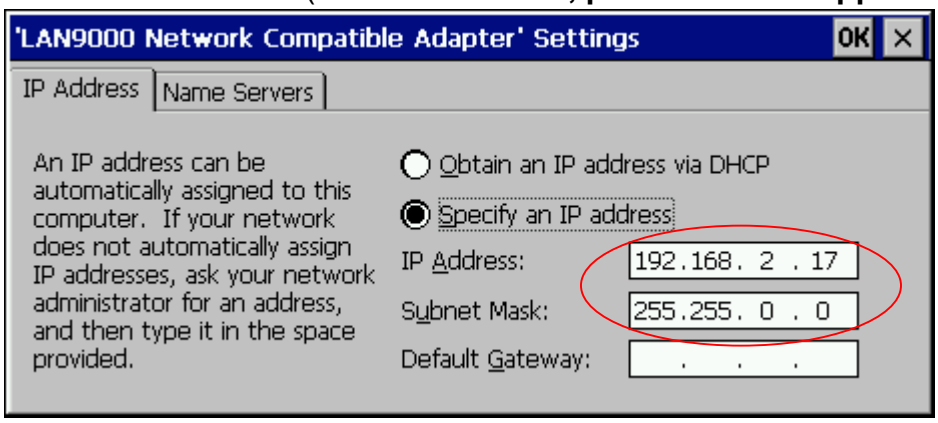
Click on "End Driver" to stop it.



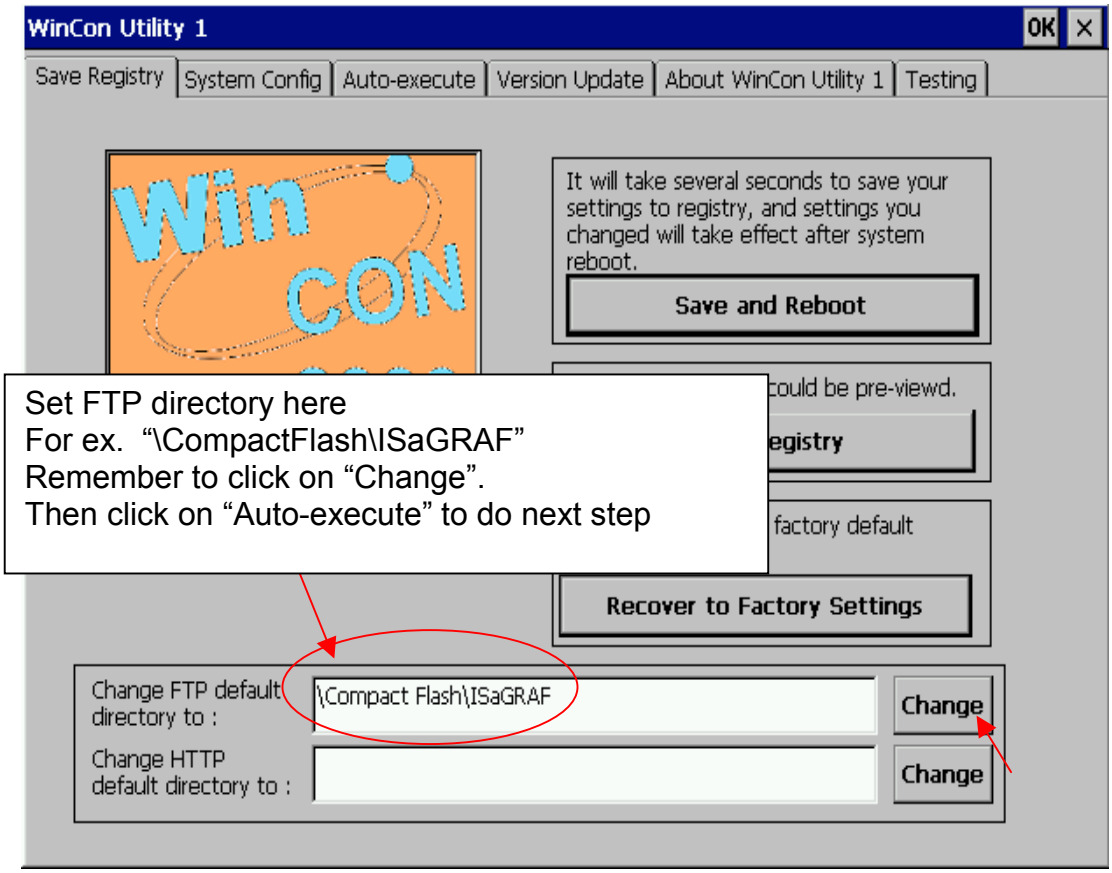
2. Set up Wincon's IP, Mask, FTP directory & Auto-execute

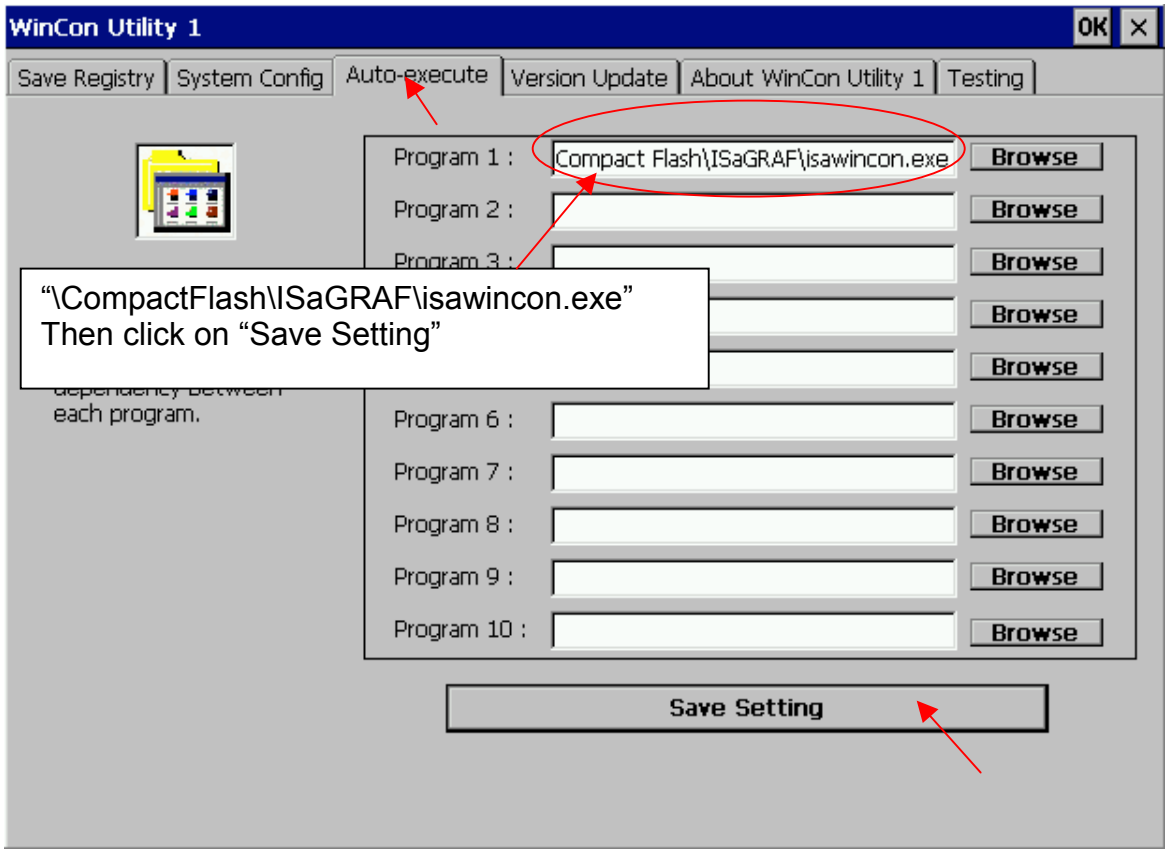
A. Please create a folder "ISaGRAF" inside "\CompactFlash" folder in your Wincon controller. Then it will be \CompactFlash\ISaGRAF

B. For W-8x37/8x36, please run "Start" – "Setting" – "Control Panel", then double click on "Network and Dial-up Connections". Then click on "LAN90001". Set your Wincon's IP address & its Subnet Mask. (**For W-8x47/8x46, please refer to Appendix D**)

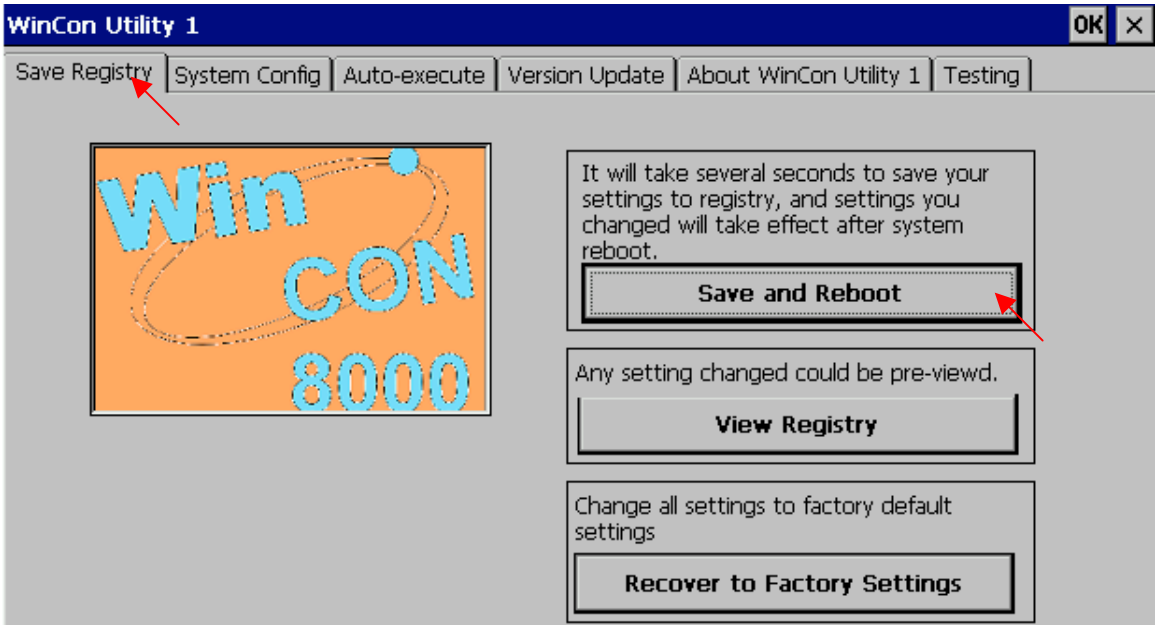


C. Please run "Start" – "Programs" – "Wincon Utility"





Save Registry. This step will re-boot your Wincon controller.



3. Download “isawincon.exe” , “rs_whmi.exe” , “mscorlib.dll” , “QuickerNet.dll” , “Quicker.dll” (**& license.bin if your Wincon is W-8x31/8x39 or W-8x41/8x49**) from your PC to your Wincon controller.

   Then please copy them to “**\CompactFlash\ISaGRAF**”. & then re-cycle your wincon’s power.

   You may use below methods to download these files.

   A. Using ftp:

      Wincon:
      Please run “Start” – “Run”, then type in “**services load ftpd**”

      PC:
      Please open browser and then type in ftp://<IP address>,
      for ex. ftp://192.168.2.17
      copy all of them & past it.

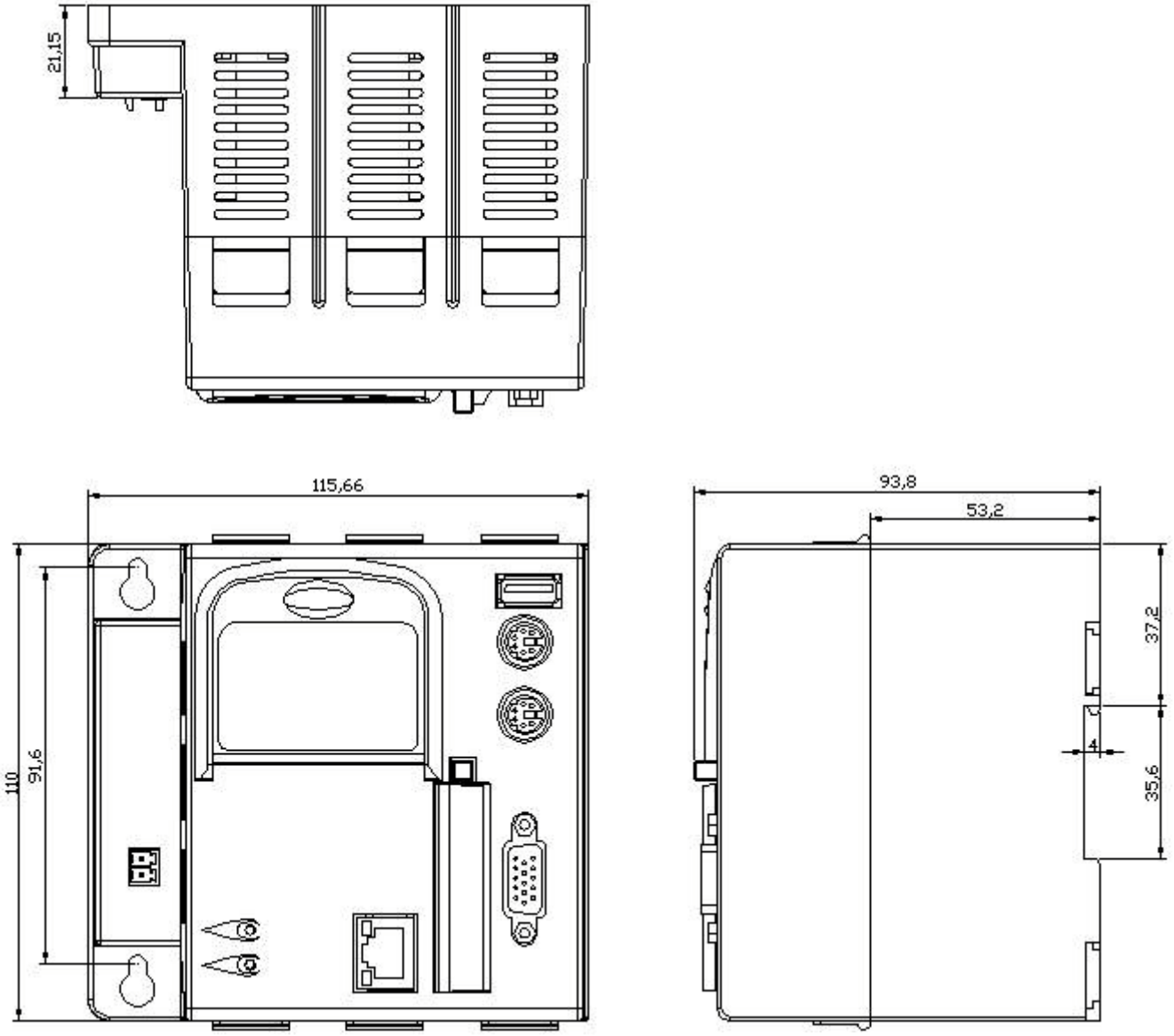
   B. Using Pen Drive

      Please copy **isawincon.exe , rs_whmi.exe , mscorlib.dll , QuickerNet.dll , Quicker.dll (& license.bin)** to “\CompactFlash\ISaGRAF\

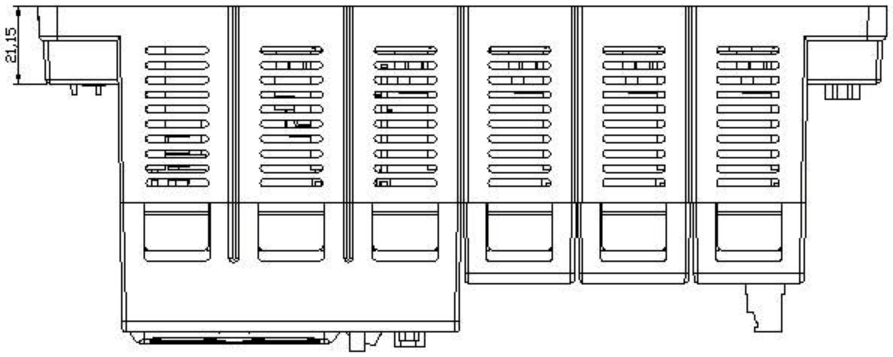
Remember to re-cycle your Wincon’s power.

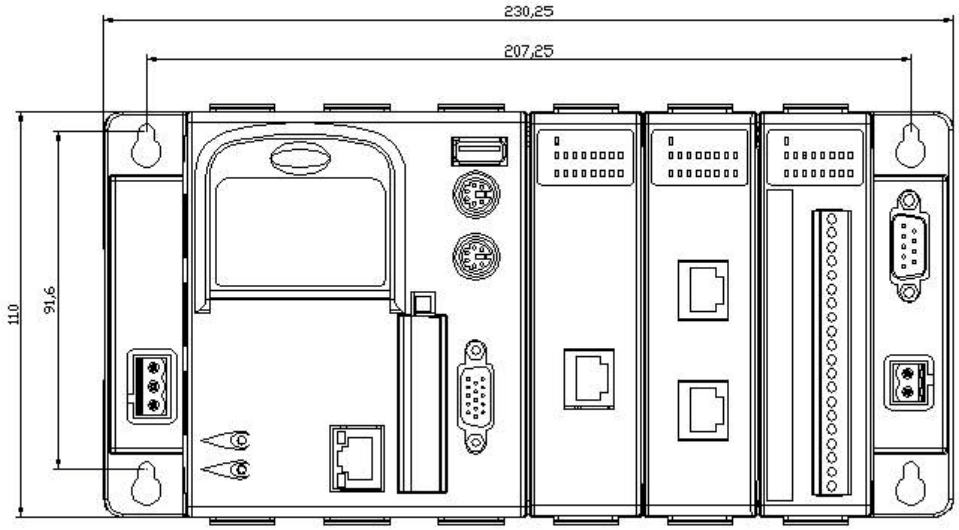
Appendix C: Dimension

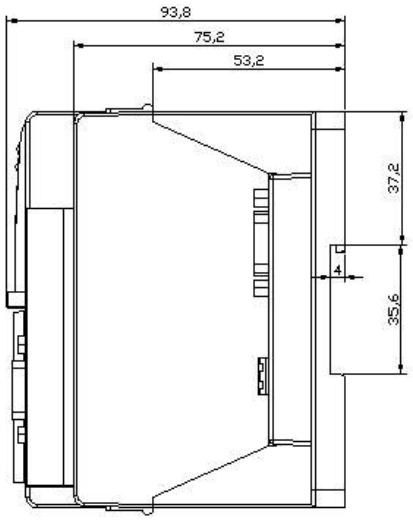
C.1: Wincon-8037/8036/8047/8046



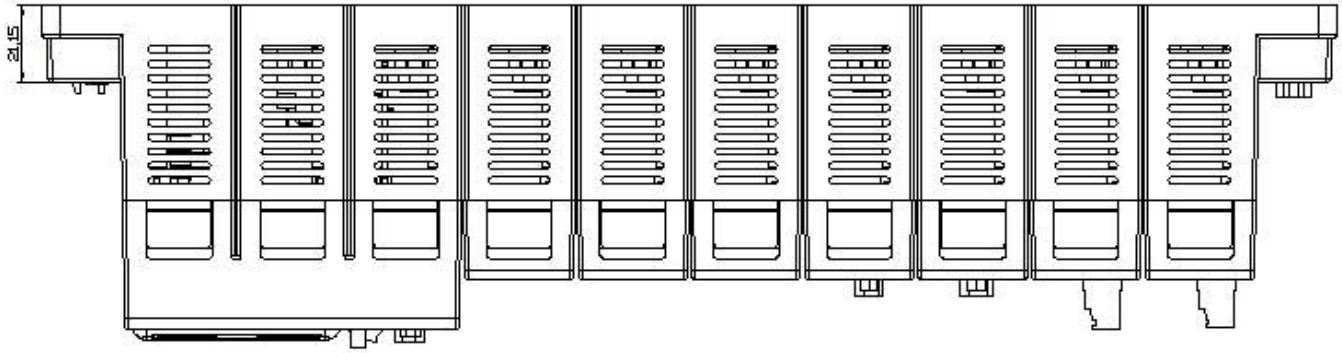
C.2: Wincon-8337/8336/8347/8346

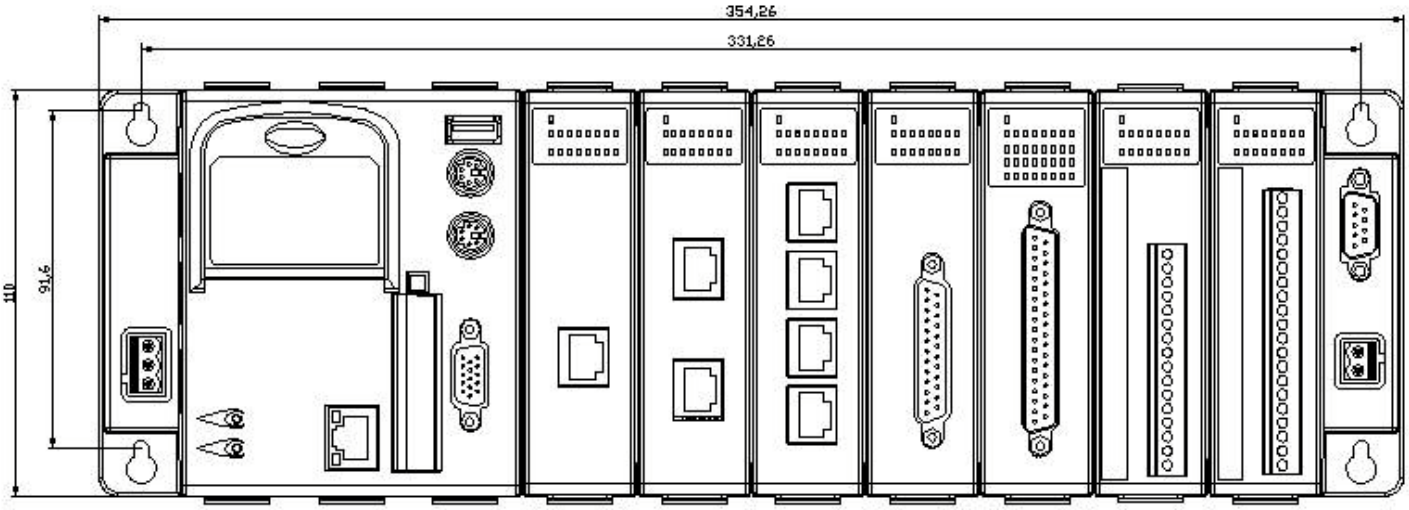


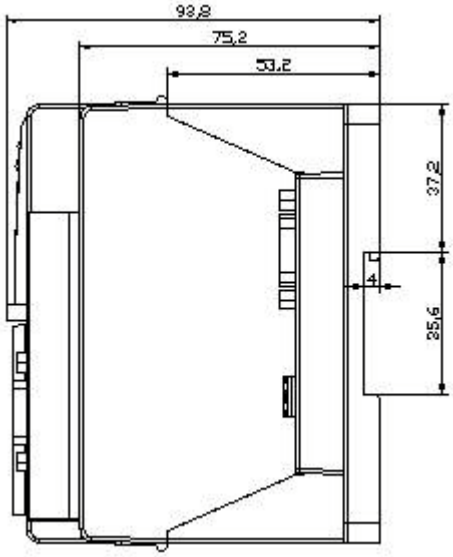




C.3: Wincon-8737/8736/8747/8746







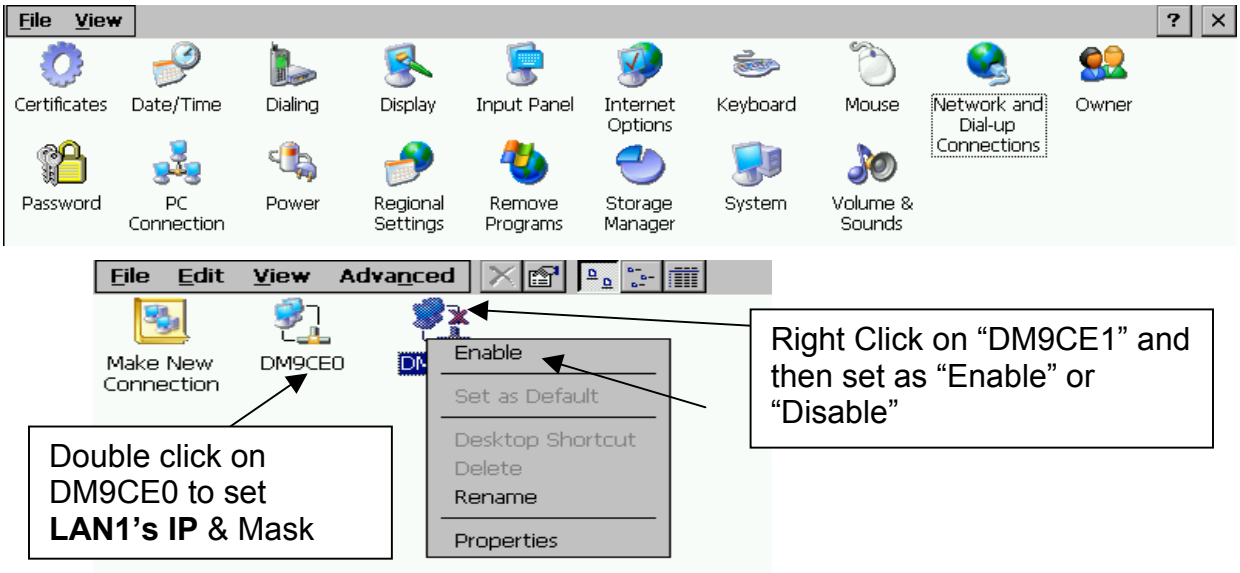
Appendix D: How to Enable/Disable W-8x47's LAN2

Important:
1. Please use NS-205 or NS-208 Industrial Ethernet Switch for Wincon-8x47 / 8x46.
2. Please always set LAN2 as disabled if not using it.
3. Please always set a fixed IP to LAN1 (or LAN2 if it is enabled).

The default setting of LAN2 port of W-8047/8347/8747 & W-8046/8346/8746 is disabled. User must enable it before using LAN2 port.

ISaGRAF **must** use W-8x47/8x37's LAN2 when using "Ebus" (section 7.5 of the ISaGRAF User's Manual). ISaGRAF **may** use LAN2 when using "Delivering message via UDP" or "Redundant system" (please refer to Chapter 19 & 20 of the ISaGRAF User's Manual). **IF THE APLLICATION DOESN'T USE LAN2, PLEASE DISABLE IT**.

Please open "Start" – "Setting" - "Control Panel" and then click on "Network and Dial-up Connections" to set as LAN2: DM9CE1 Enable or Disable



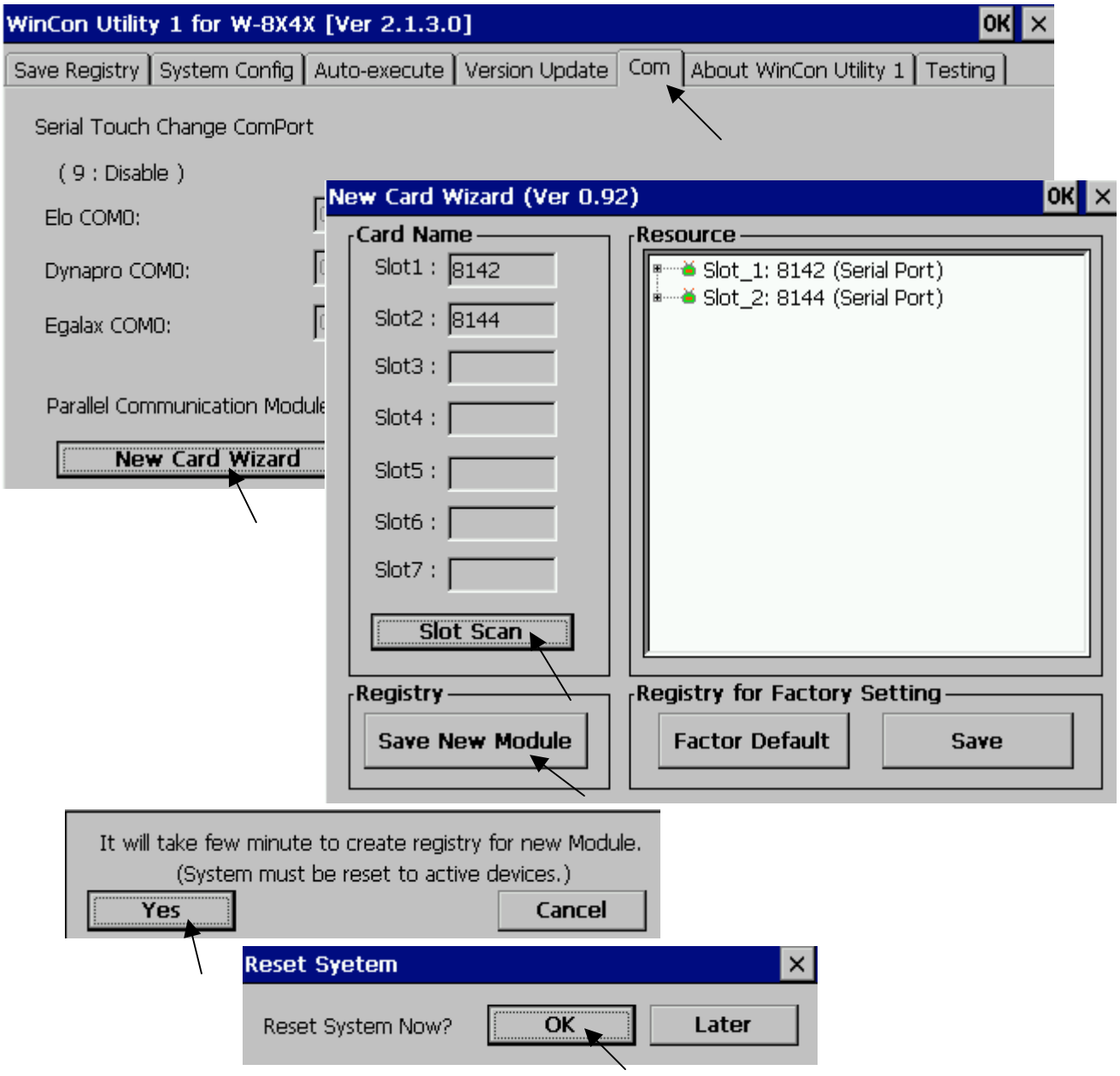
Then run "Start" – "Programs" – "Wincon Utility", click "Save and Reboot" to save the setting.

Appendix E: Using Expansion RS-232 or 485 or 422

Wincon can expand 10 more COM ports in its slot 1 to 5 by using below modules:

- i-8112 : 2-channel RS232
- i-8114 : 4-channel RS232
- i-8142 : 2-channel RS422/485
- i-8144 : 4-channel RS422/485
- i-8142i : 2-channel isolated RS422/485

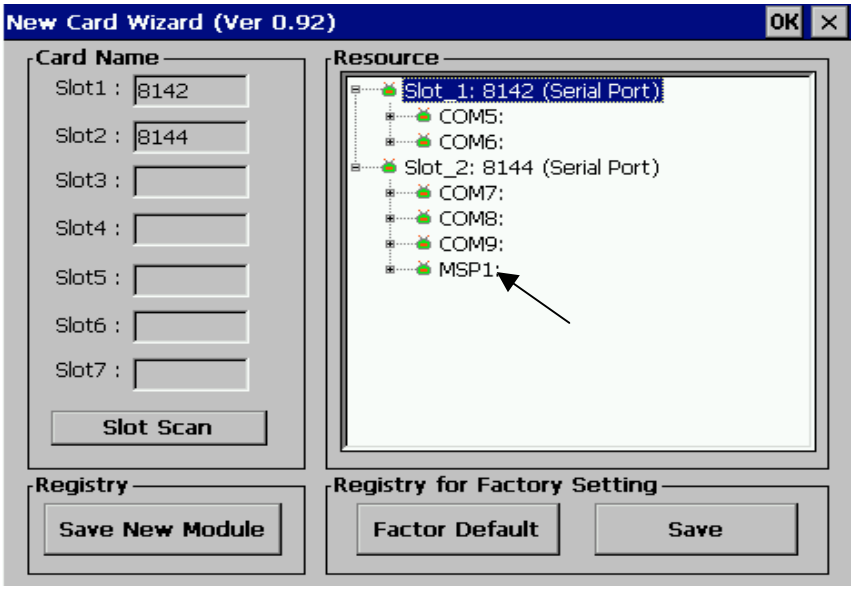
Before user can use them, please configure them By “Wincon utility” first.
Please plug them in slot 1 to 5 and then run “Wincon utility” – “Com” , then click on “New Card Wizard” and then “Slot Scan” and then click on “Save new Module” and Reset the Wincon.



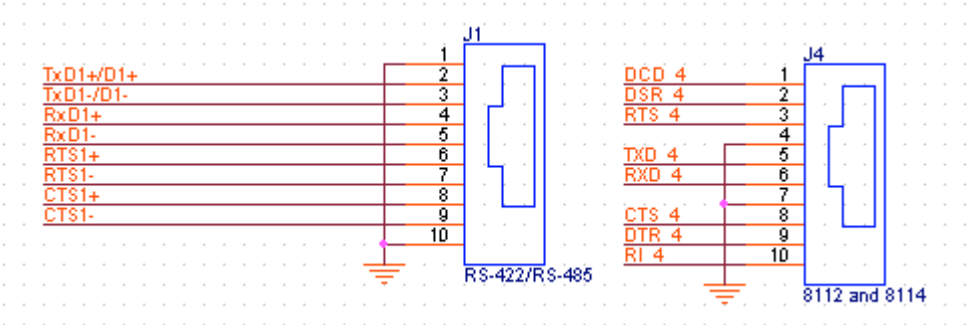
After the configuration succeed. The COM port No. for the expansion board is COM5 to COM14 in the ISaGRAF definition.

The relation between WinCE and ISaGRAF definition for COM10 to COM14 is

WinCE	ISaGRAF
MSP1:	COM10
MSP2:	COM11
MSP3:	COM12
MSP4:	COM13
MSP5:	COM14



Pin assignment of i-8142/8144/8142i i-8112/8114



(D1+ = RS485+ , D1- = RS485-) (RS232's signal GND is Pin 4 or 7)

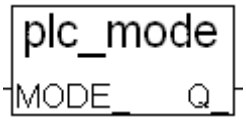
Note:
1. Please refer to section 8.4 of ISaGRAF User's Manual for multi-ports Modbus Master.
2. Please refer to Appendix A.4 of ISaGRAF User's Manual for COM_OPEN, COM_READ, … functions to read write COM ports.

Appendix F: Slow Down ISaGRAF Driver's Speed

You may wonder Why ? The fatser speed is not good ?

The reason to slow down the speed of ISaGRAF driver is when you running some other HMI program (For example, Indusoft, or VB.net program) with ISaGRAF at the same time. Because the CPU is the only one CPU, all program running in Wincon must share execution time of the same CPU. If you feel the HMI program behavior is not so smooth, or slow, you may use ISaGRAF function – "PLC_Mode( )" to slow download the speed of the ISaGRAF driver.

PLC_Mode



□ I-8417/8817 □ I-8437/8837 □ I-7188EG □ I-7188XG ■ W-8XX7/W-8XX6

Description:
Function **Change the ISaGRAF driver speed**

Argument:
MODE_ integer Can be 0 , 1, 2, or 3

0: Fast Mode, Default setting, the minimum PLC scan time is 4 ms
1: Slow Mode, the minimum PLC scan time is about 6 to 7 ms
2: Slower Mode, the minimum PLC scan time is about 9 to 11 ms
3 or other value: Slowest Mode, the minimum PLC scan time is about 19 to 21 ms

Return:
Q_ boolean always return True

Note:
1. The "PLC_mode" is supported since driver of version 3.24B
2. The system's default setting is "Fast Mode"
3. User may call "PLC_mode( )" in the first PLC scan to change the PLC speed.
4. The reason to slow down the PLC speed is to improve the speed performance of other HMI program running with ISaGRAF driver at the same time. For example, running Indusoft with ISaGRAF in the same Wincon.

Example:

```
(* TMP is declared as Boolean internal variable *)
(* INIT is declared as Boolean internal variable and init at TRUE *)
if  INIT  then
  INIT  :=  False ;   (* Only do it once in the 1st PLC scan *)
  TMP  :=  PLC_mode(2) ;   (* Set PLC speed to 2:slower mode *)
end_if ;
```

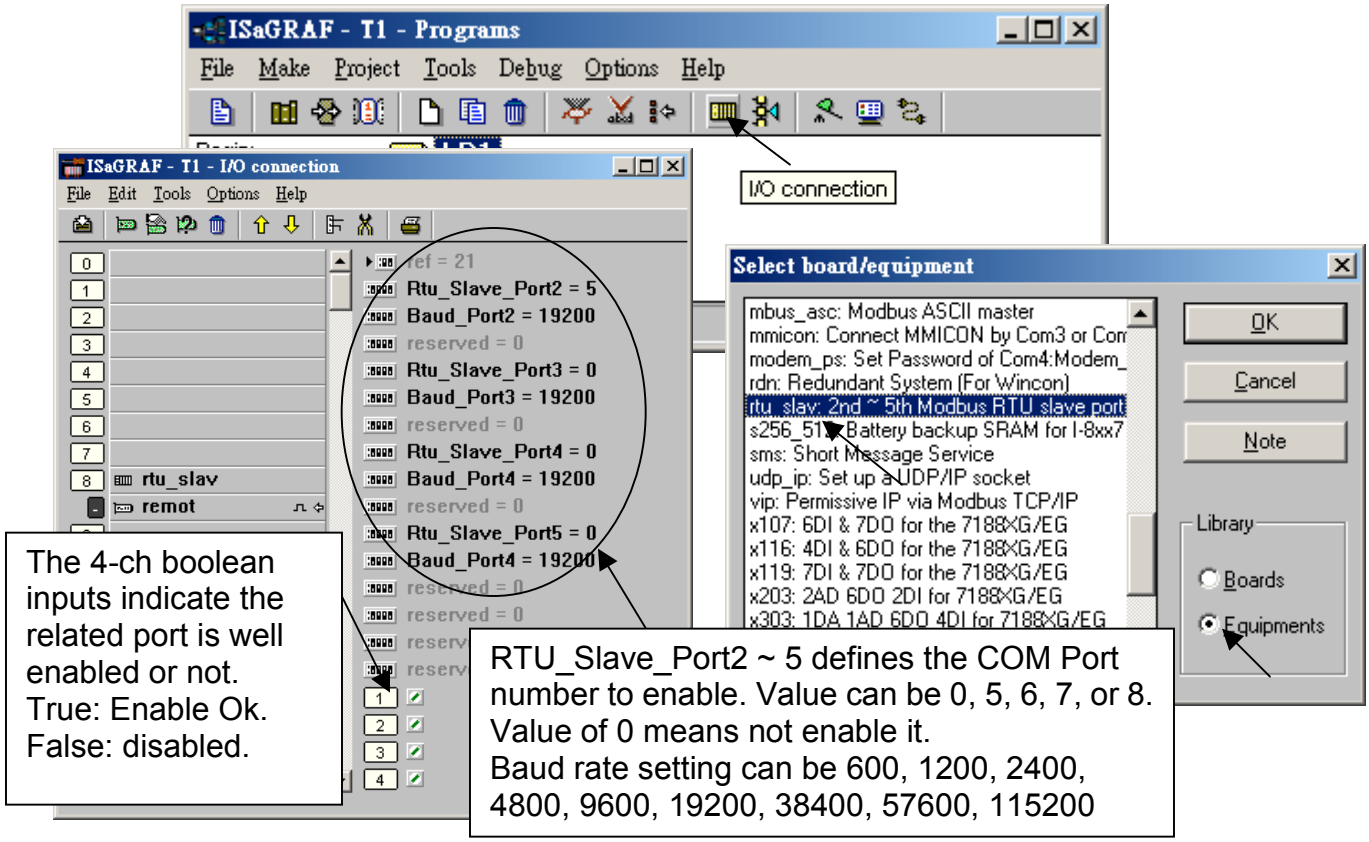
Appendix G: Setup More Modbus RTU Salve Ports

The Wincon-8xx7/8xx6 can setup up to five Modbus RTU slave ports in COM2 or COM3 or in COM5, COM6, COM7 COM8 (multi-serial ports in slot 1 or 2, refer to appendix E) since the driver version of 3.25.

Note:
1. Modbus RTU slave port 1 can be COM2 or COM3 which can be set on the "Wincon's monitor" by mouse (refer to appendix A.2).
2. User may enable 2nd , 3rd , 4th or 5th Modbus RTU slave port in COM5 , COM6 , COM7 or COM8 only. (No support other COM port number)
3. Before using this function, please make sure COM5 , COM6 (or COM7 , COM8) does exist and well configured. (refer to appendix E)
4. Via 2nd, 3rd, 4th or 5th Modbus RTU slave port, user may use ISaGRAF to Debug/Set_val to the controller, however user can not Stop/Download/Update the ISaGRAF program.
5. To Debug/Set_val/Stop/Download/Update the ISaGRAF program, please use Ethernet port (or Modbus RTU slave port 1, COM2 or COM3 if enabled). COM5 to COM8 is not for ISaGRAF to Stop/Download/Debug.

How to setup ?

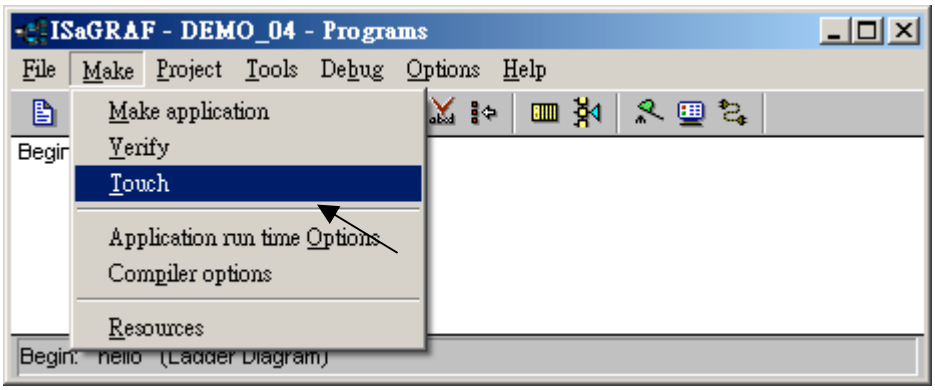
Please connect “Rtu_slav” in the ISaGRAF IO connection window as below. Re-compile the project and download to the Wincon via Ethernet (or first Modbus RTU port if it is enabled)

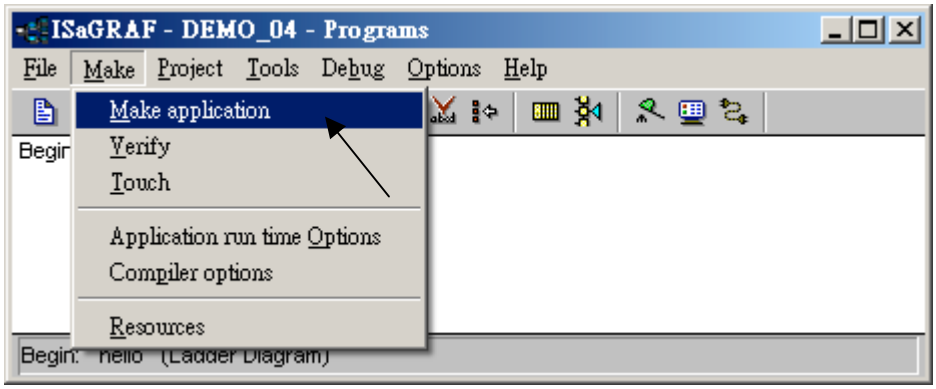


Appendix H: Compiling Error Result In Different ISaGRAF Version

In the recent four years since 2003, all the ISaGRAF example programs provided in the ICP DAS CD-ROM & Web site are written in ISaGRAF workbench version of 3.46. If your ISaGRAF workbench is version of 3.51 or later version, it may geneate error when you re-compile these example programs.

To erase this kind of error in different ISaGRAF workbench version, please run “Make” – “Touch” once. And then re-compile this example project.





The “Make” – “Touch” command will reset all files that have been successfully compiled to become “Not compiled yet”. Then the next “Make” – “Make application” command will re-compile all of them.