Soft Logic programmable controller

ADAM-5510 KW

Your ePlatform Partner

ADVANTECH

Course Topics

- What's "Soft Logic" ?
- Compare 'Soft Logic' with 'PLC'
- ADAM-5510 KW Specification
- KW Soft Logic Introduction
- Configuration and Programming
- Modbus address mapping
- How to expand I/O ?
- Q and A

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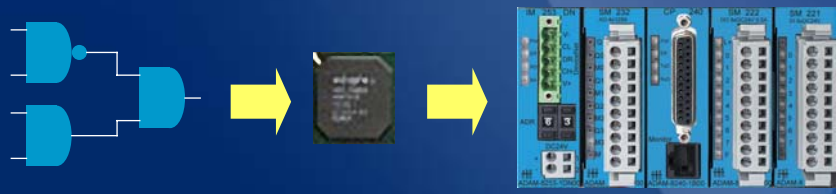
What's "PCL" ?

The Structure of PLC

The structure of PLC is build in the command or logic gateway into the CPU. The program code is decoding and executing thru hardware. In other word, the CPU is special use for PLC.



Command or Logic gateway

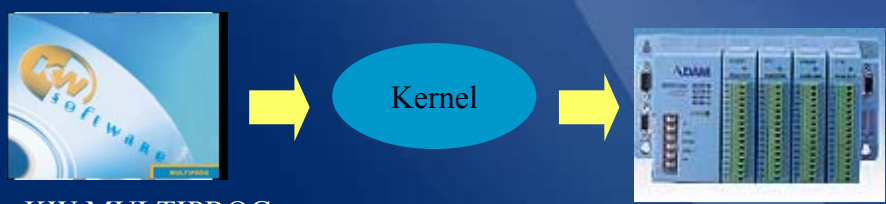
Micro Processor

PLC

What's "Soft Logic" ?

The Structure of Soft Logic

The structure of Soft Logic is running a kernel program under the OS of the controller. The function of this program is to decode the downloaded program from Host PC and execute this program. The CPU of Soft Logic is for x86 system.

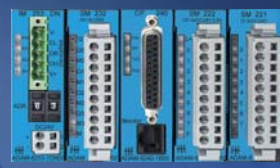


KW MULTIPROG Host PC

Soft Logic controller

Compare Soft Logic with PLC

PLC



Advantage:

*The decode action by hardware, the speed of execution is higher.

Defect:

*Can't do the complex operation or command. ◦

Soft Logic

Advantage:

*Can make the complex program or operation (Floating Operation)

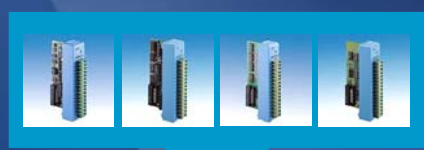
Defect:

*The Active speed is slower than PLC.

ADAM-5510 KW Specification

CPU:	X86
Memory:	Program →150KB Retain (User) →16KB Modbus (User)→ 16KB
OS:	ProCon OS
KW kernel:	ProCon Realtime OS
Slot:	4
Remote IO:	255 extension of ADAM-4000 Modbus series modules.
Protocol:	Modbus RTU / KW OPC
I/O Module:	All ADAM-5000 series
WDT:	1.6 s(hardware process)

5000 serial modules



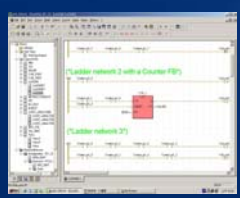
KW Soft Logic Introduction

- IEC61131-3 Standard.
- Support Language: LD, ST, FBD, SFC & IL.
- Graphic User Interface.
- Trend Monitoring Online.
- PID control components are included.
- Multi-Task system structure.
- Cross-language in the signal task.
- Develop the personal FB Library

KW Soft Logic Introduction

3.Download

5.I/O Action by Controller



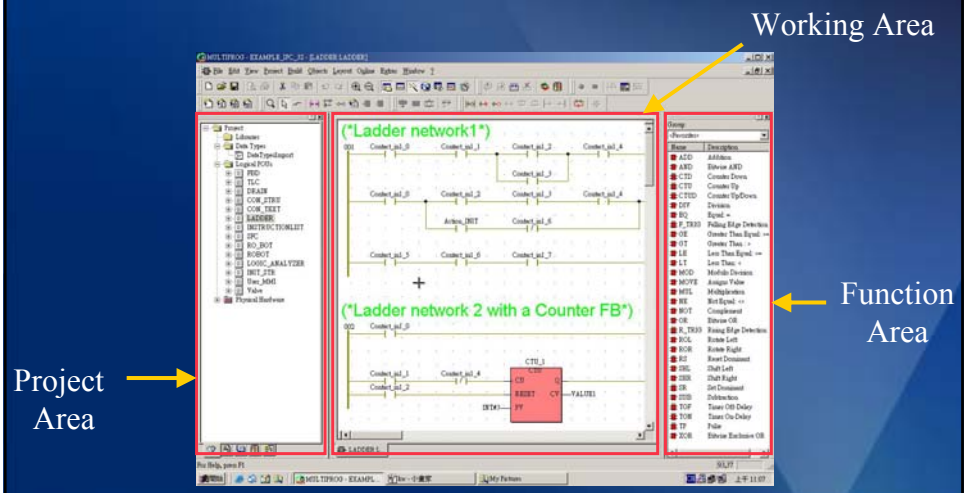
ProCon Realtime OS

ADAM-5510KW

1.KW MultiProg
2.Compile

4.The kernel executes the program code.

KW Soft Logic Introduction



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Configuration and Programming

- **Configuration**

  Step 1 :Open a new project

  Step 2 :Choose a suitable template

  (Template for DOS)

  Step 3 :Set the communication port

  Step 4 :Set Data Area

  Step 5 :Configure the I/O Module.

  (Module Type，Slot，Memory Mapping …)

Your ePlatform Partner

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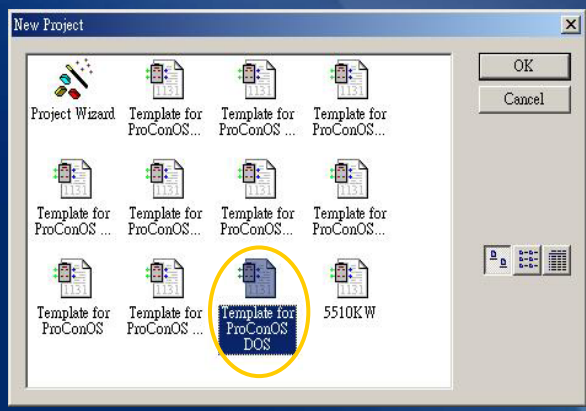
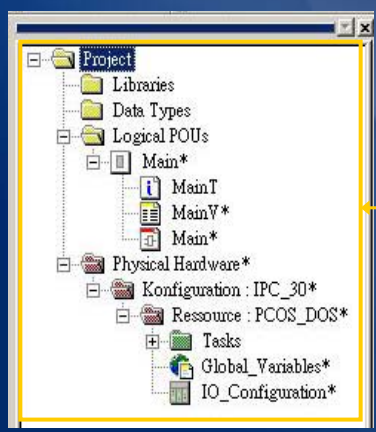
Configuration

- **Step 2 :Choose the Template (Template for ProConOS DOS)**



Configuration

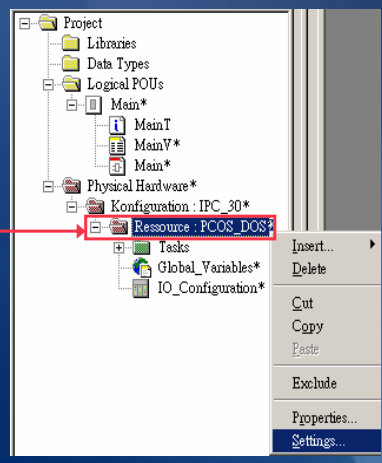


The Project area will be created automatically after the project is opened.

Configuration

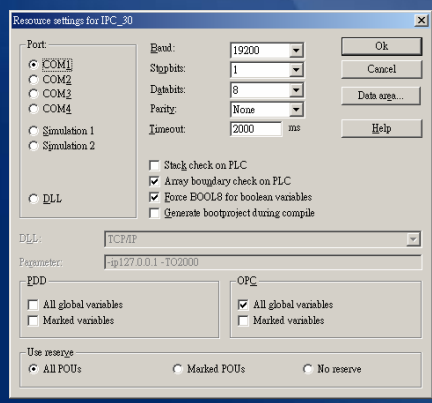
- **Step 3-1 :Set communication port**

Right Click on it



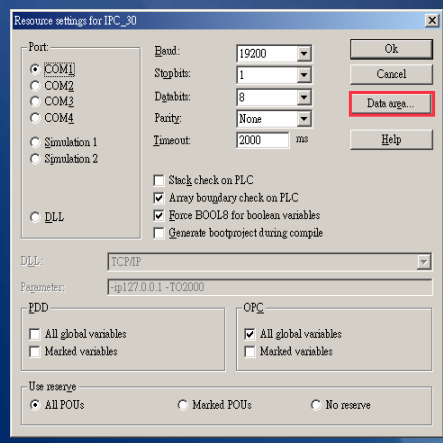
Configuration

- **Step 3-2 :Set the communication port**



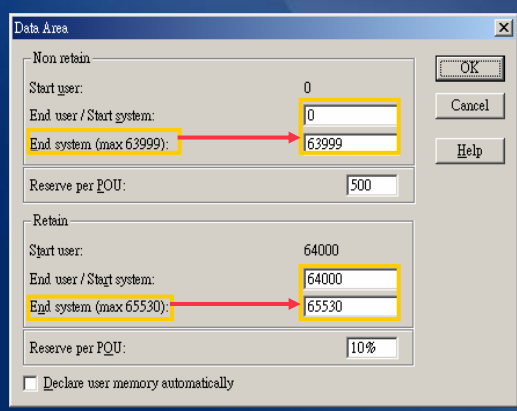
Configuration

- **Step 4-1 :Set the Data area**



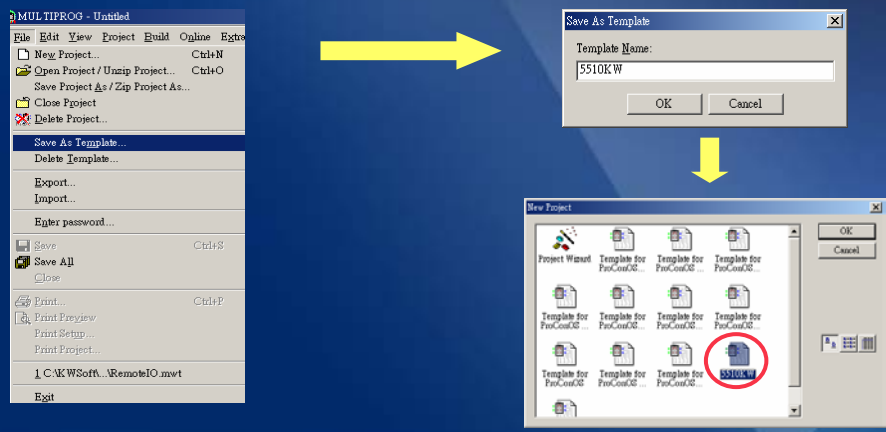
Configuration

- **Step 4-2 :Set the Data Area**



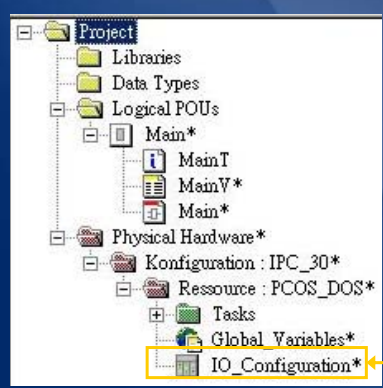
Configuration

- **Step 4-3 :Save as a new template**



Configuration

- **Step 5-1 : Configure the I/O Module**

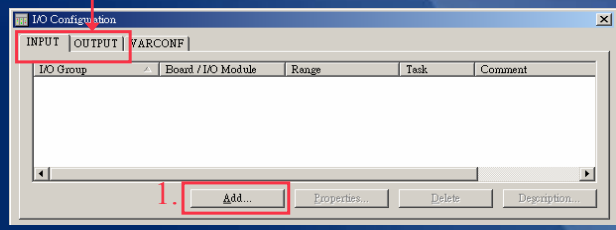


Double click the IO_Configuration

Configuration

- Step 5-2 : Configure the I/O Module

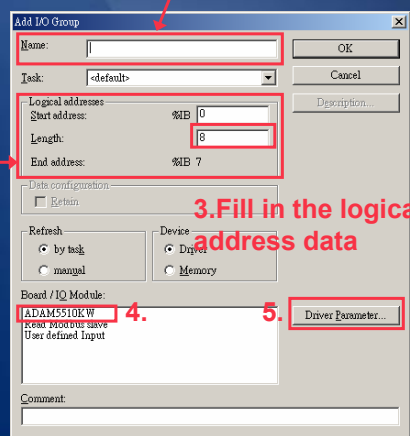
Configure the INPUT and OUTPUT module individually



Configuration

- Step 5-3 : Configure the I/O Module

2.Define the Module Name



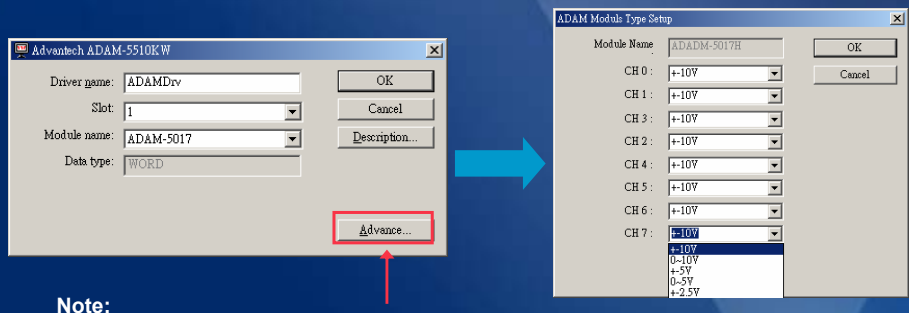
3.Fill in the logical address data

Note:
The definition of the Logical Address is for INPUT and OUTPUT. The maximize length of a slot is 16 bytes.

Input : IB0~IB63 for 64 bytes
Output : QB0~QB63 for 64 bytes

Configuration

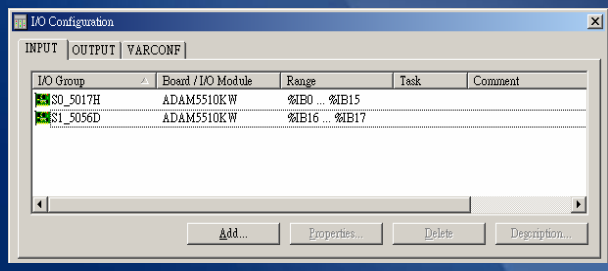
- **Step 5-4 : Configure the I/O Module**



Note:
If the module is for Analog Input / Output module. The button will enable and you can make the advance setting.

Configuration

- **Step 5-5 : Configure the I/O Module**

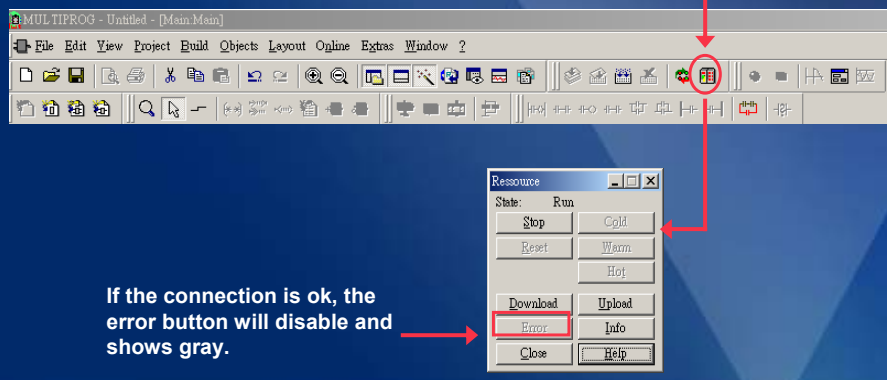


Add the module for your usage step by step and finish the configuration.

Programming

- Step 1 : Confirm the Connection

Project control dialog



If the connection is ok, the error button will disable and shows gray.

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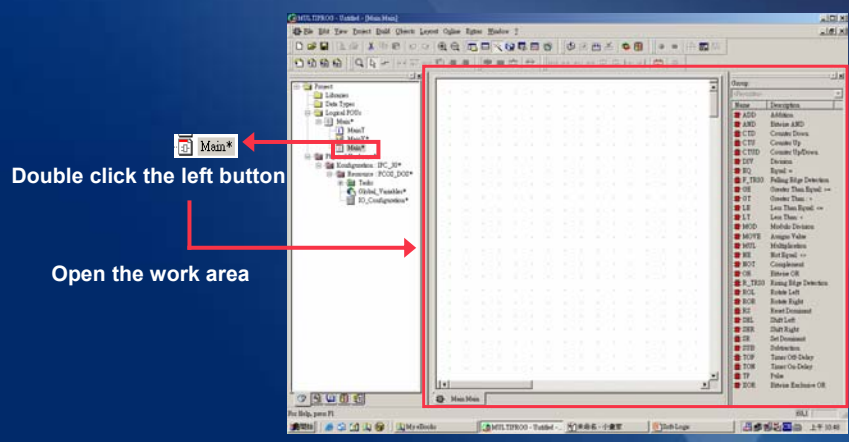
Programming

- Step 2 : Open and Edit the Work Area



Double click the left button

Open the work area

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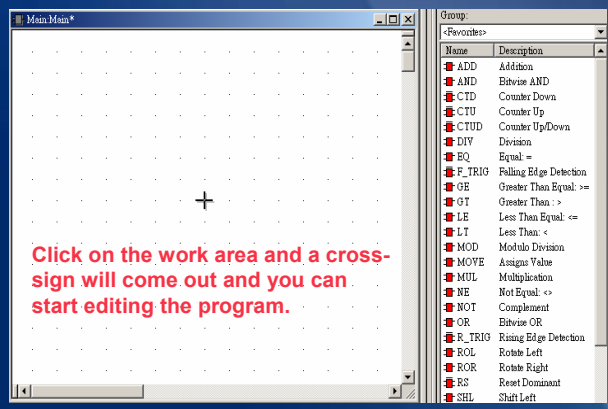
Programming

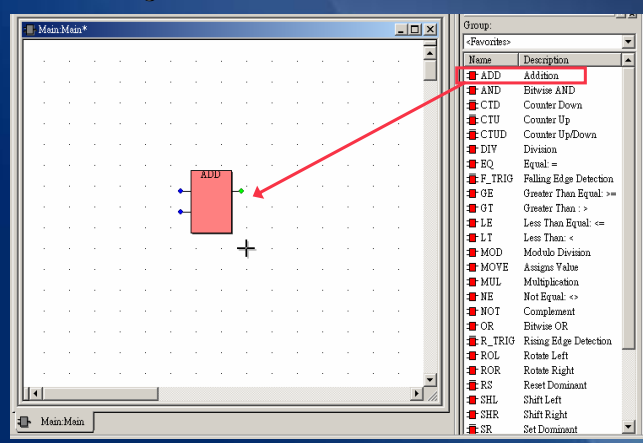
- Step 3 : Start Programming



Programming

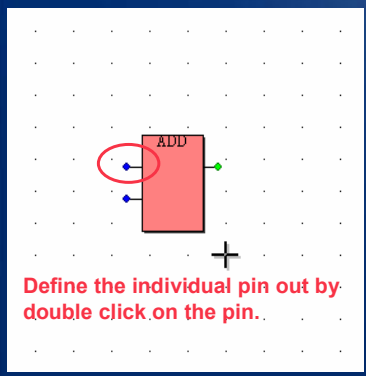
- Step 4 : Start Editing

Double click on the function you need

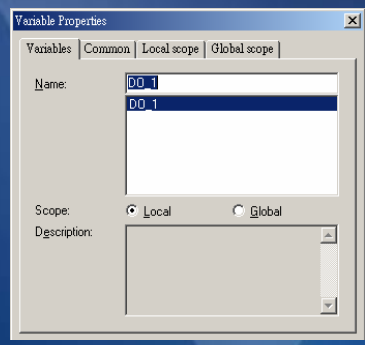


Programming

- Step 4-1 : Start Editing

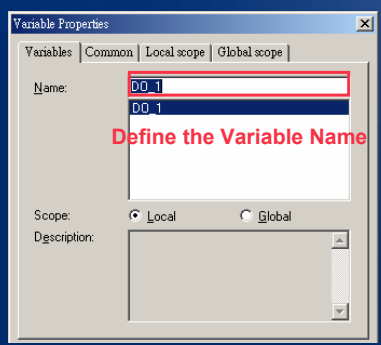


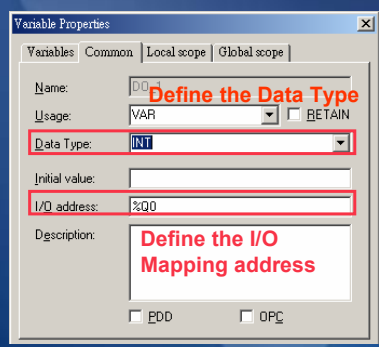
The dialog box of the attribute of the pin.



Programming

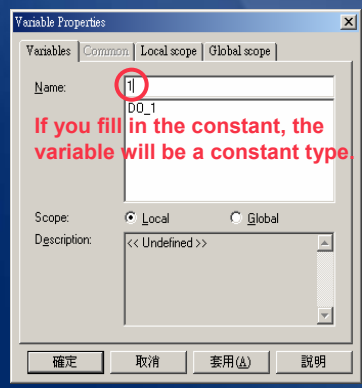
- Step 4-2 : Define the Variable Name and the Data Type





Programming

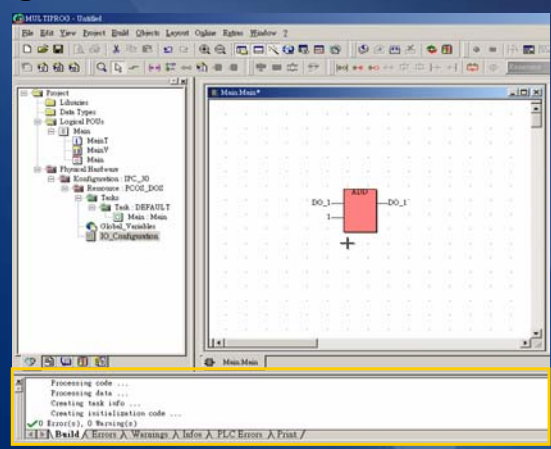
- Step 4-3 : Define the Variable Name and Data Type



Programming

- Step 4-4 : Compiling

Compile

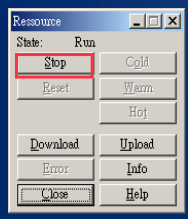


Message

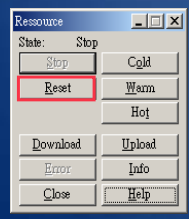
Programming

- Step 4-5 : Download project to controller

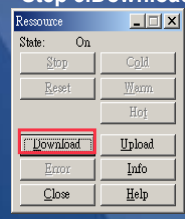
Step 1.Stop



Step 2.Reset



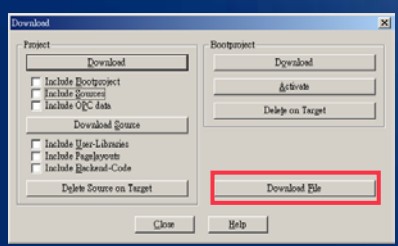
Step 3.Download



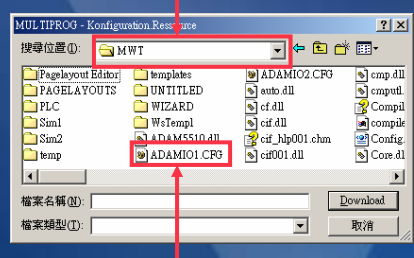
Programming

- Step 4-6 : Download the configuration file

1



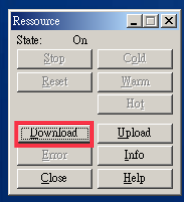
Choose the 'MWT' folder



The configuration file will be ADAMIO(N).CFG , N for NODE ID

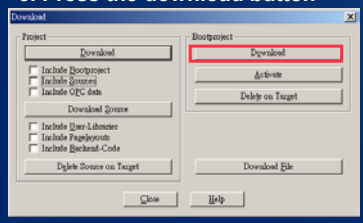
Programming

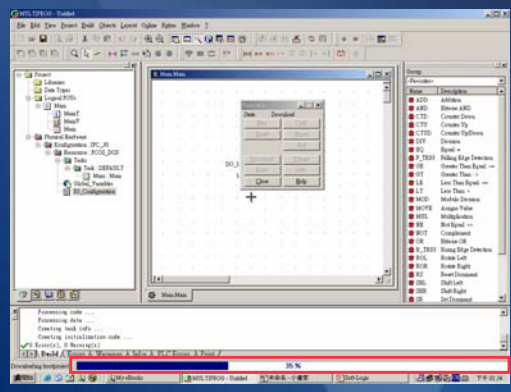
- **Step 4-7 : Download the project**



2

3. Press the download button



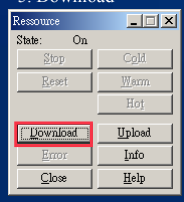


4. Download percentage.

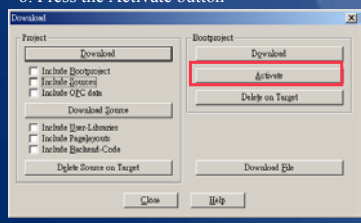
Programming

- **Step 4-8 : Start up the project**

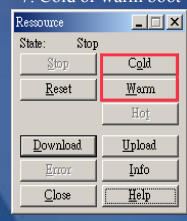
5. Download



6. Press the Activate button



7. Cold or warm boot

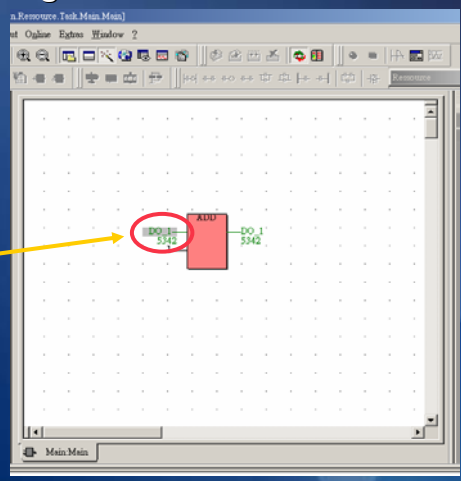


Programming

- Step 4-9 : Online Monitoring

Debug

After click on the 'Debug' button,
You can monitor the online value



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Modbus address mapping

- Modbus address mapping
- Exchange Data By Modbus
- Exchange Data By ProCon
- Remote Modbus series I/O module

Your ePlatform Partner

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Modbus address mapping

There are 16K bytes memory for modbus use, that is 16K bytes for non-retain memory use. The memory block can transfer data through modbus protocol. The data type should be in 'WORD (4X)'; no matter your data are 'Integer' or 'Boolean'. In other word, the totally capacity of this area is almost 8000 words. In ADAM-5510KW, the modbus address is assigned from '42001' to '49999'.

If you want to exchange the data through modbus, you should move the data into this memory block manually. The memory address of this block is assigned from 'MW3.0' to 'MW3.16000'.

Modbus address mapping

*** Data Type for BOOL ; BYTE or WORD :**

In fact, the 'MW3.0' is a memory address count for 'Byte'. The definition of '4X' is a 'WORD' type. We have to consider the 'MW3.0' and 'MW3.1' as a unit for 'WORD'. The unit will mapping to modbus address to '420001'

Equal to a byte capacity

Data 1	MW3.0	MW3.1	42001
Data 2	MW3.2	MW3.3	42002
Data 3	MW3.4	MW3.5	42003

Modbus address mapping

* Data Type for DWORD or REAL :

When using the 'REAL' data type, the length will be 4 bytes, it means it will be mapping to 2 of modbus address.

'Real' Data Type space

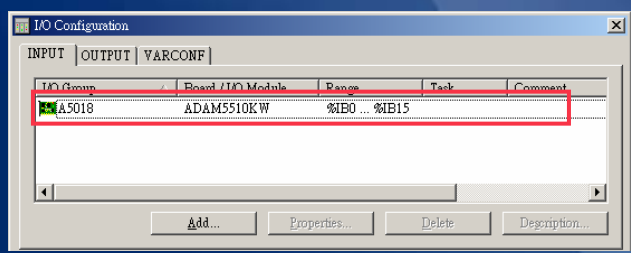
Data 1	MW3.0	MW3.1	MW3.2	MW3.3	42001 ; 42002
Data 2	MW3.4	MW3.5	MW3.6	MW3.7	42003 ; 42004
Data 3	MW3.8	MW3.9	MW3.10	MW3.11	42005 ; 42006

In other word, when using 'REAL' as your data type, you have to skip one modbus address. For example, data 1 mapping to 42001 and data 2 must be mapping to 42003

Modbus address mapping

*How to move the Data to Modbus Area

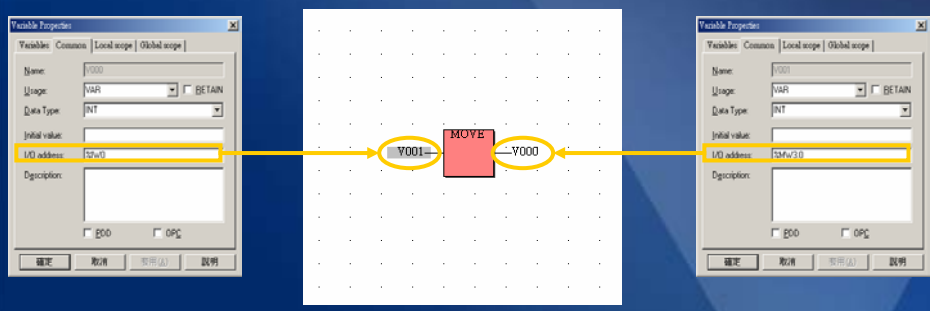
Step 1 : Add a new AI Module for ADAM-5018. ADAM-5018 is a 8 channels AI module, the length of logical address should be 16 Bytes, The memory mapping address is IB0~IB15. (IB means INPUT BYTE)



Modbus address mapping

How to move the Data to Modbus Area

Step 2 : Use "Move" Function to move the data to MW3.0

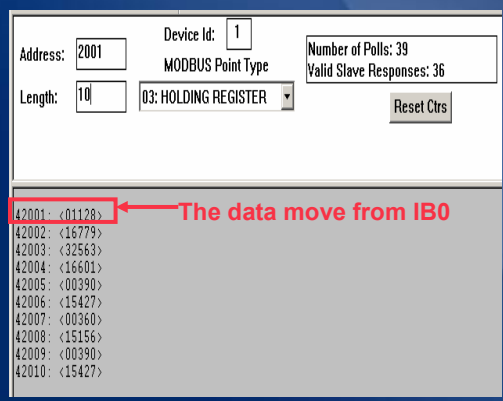


Notes : The I/O address for **Input byte** (**IB**) and **Output Byte** (**QB**) we mentioned before are just for ADAM-5510KW system as the operation and data transfer function. It can be consider as a **Private Variable**. The memory address of **MW3.0** is for **User Memory** use. It uses for the data transferring between system and outside. It can be consider as a **Public Variable**.

Modbus address mapping

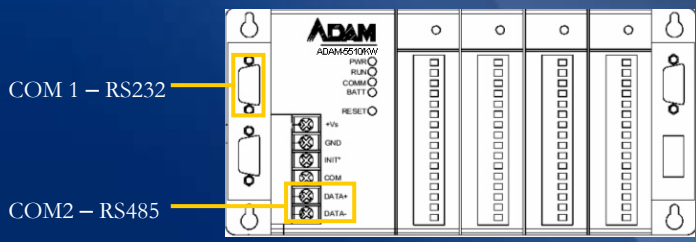
How to move the Data to Modbus Area

Step 3 : To confirm the data transferring with Modscan Tools

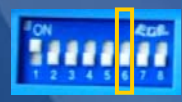


Exchange Data By Modbus

* COM port for Modbus protocol :

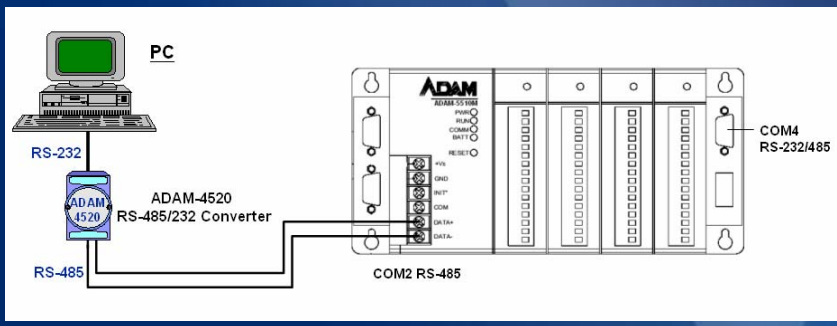


DIP 6	COM 1	COM 2
ON	Modbus	ProCon
OFF	ProCon	Modbus



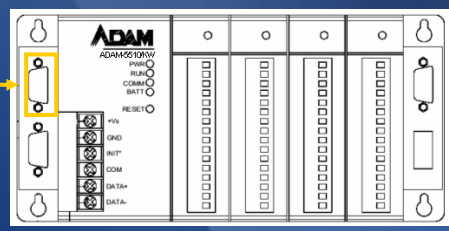
Exchange Data By Modbus

Modbus by RS485 :



Exchange Data By Modbus

Modbus by RS232 :



It is necessary to crossover the data line when you use COM1 port for transferring data.

PC COM port			ADAM-5510KW COM1	
CD	1		1	N/A
RX	2		2	TX
TX	3		3	RX
DTR	4		4	N/A
GND	5		5	GND
DSR	6		6	N/A
RTS	7		7	N/A

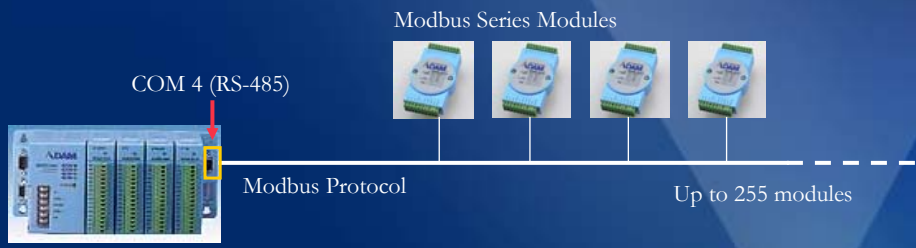
Exchange Data By ProCon

The ProCON Protocol is special communication format for KW software. The format is used for communicating with KW MULTIPROG. KW Software also provide 'OPC Server' for customer integration use.
Because we integrated the Modbus protocol into ADAM-5510KW, we can communicate with ADAM-5510KW thru Modbus OPC Server or standard Modbus protocol. In other word, the ProCON OPC Server will be the optional package.

How to expand I/O ?

The max. onboard I/O slot is 8 slots (ADAM-5510EKW). When you need more I/O Tags, how can we extend the I/O module?

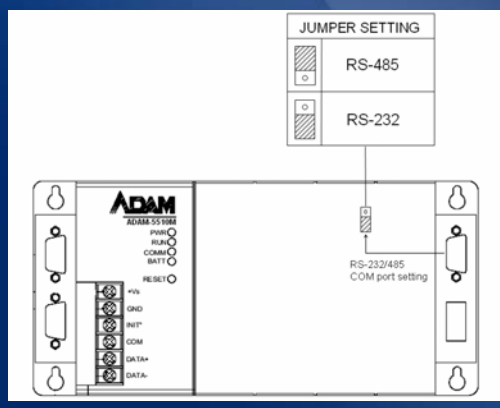
You can use the 'Remote I/O' function thru COM4 Port. (Up to 255 modules) The method of Remote I/O is as follow:



Note : The max. speed for communicating with Remote Module is 19200 bps .

How to expand I/O ?

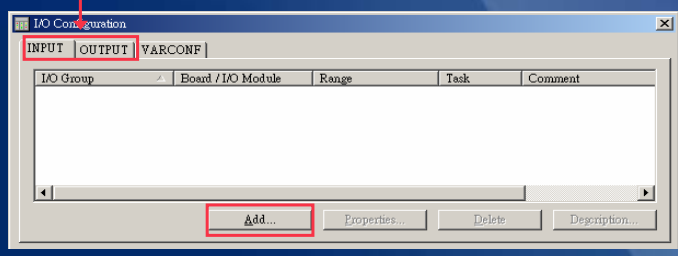
*** COM 4 type adjust :**



How to expand I/O ?

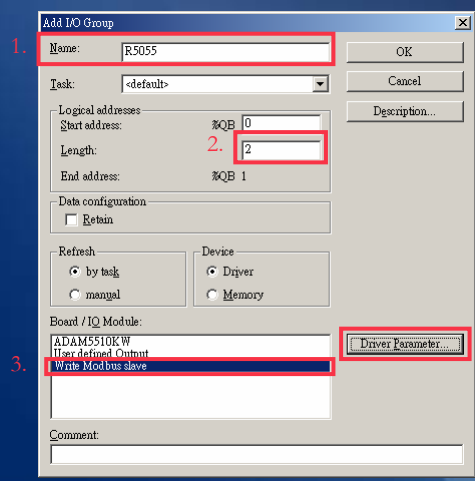
* Configuration :

Define the INPUT and OUTPUT Module individually



How to expand I/O ?

* Configuration :



How to expand I/O ?

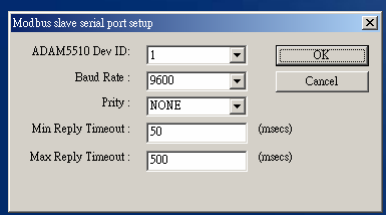
* Configuration :

ADAM5510 Dev : Fill in the Device ID
Modbus Slave ID : Fill in Module Device ID
Start Address : Fill in the data type and Start Address
Length : Fill in the length for data reading
Data type : Display the Data Type

How to expand I/O ?

* Configuration :

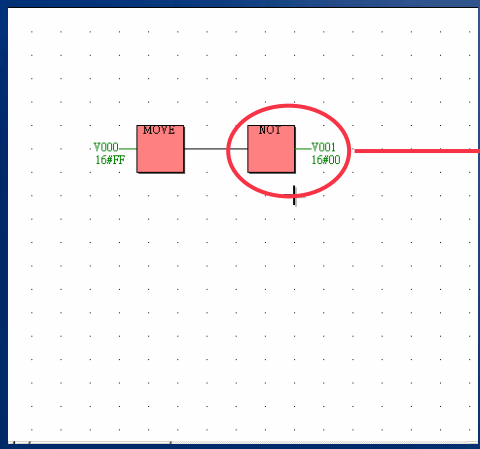
You have to set the **Remote I/O Module** with **ADAM Utility** first, then fill in the table for your setting value.
Note: The highest speed for Remote I/O is **19200 bps**.

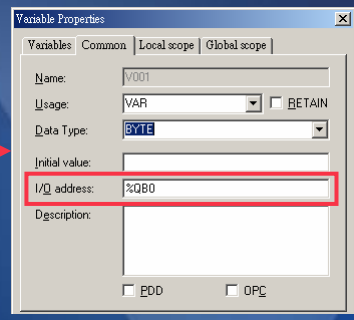


ADAM5510 Dev : Fill in the Device ID
Baud Rate : Fill in the Module's Baud Rate
Parity : Parity check value
Min Reply : Fill in minimum reply timeout value
Max Reply : Fill in maximize reply timeout value

How to expand I/O ?

*** Programming :**





The end …….I guess……

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