EasyPAC

EPC-1000 User Manual

Version: V0.1 2011M05

To properly use the product, read this manual thoroughly is necessary.

Part NO.: 81-00EPC10-020

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Electrical safely

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. Disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension card. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the voltage available in your area.
- If the power supply is broken, contact a qualified service technician or your retailer.

Operational safely

- Please carefully read all the manuals that came with the package, before installing the new device.
- Before use ensure all cables are correctly connected and the power cables are not damaged. If you detect and damage, contact the dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- If you encounter technical problems with the product, contact a qualified service technician or the dealer.

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1. Introduction

EasyPAC EPC-1100 is a compact all-in-one Programmable Automation Controller PAC. EasyPAC supports direct and wire-saving connection of Motionnet slave modules. EasyPAC contains abundant common used I/O interfaces provides industrial automation control industry easily access to the equipments. The front of the EasyPAC system includes one standard LAN port, two standard USB ports, two Motionnet ports, one GPIO connector (8 digital inputs and 8 digital outputs), two rotary switches, four COM ports (two RS-232 and two RS-422) and one optional PC104 expansion slot. EasyPAC also provides one external compact flash slot compatible with type II compact flash cards.
EasyPAC is running based on WinCE real-time operating system with built-in ProConOS kernel for running SoftPLC and two utilities for system diagnosis, MyConfig and MyLink. MyConfig is used to set the system configuration and MyLink is used to diagnose and test the functions of Motionnet slave modules.

1.1. Basic

The operating system for EasyPAC is Microsoft WinCE5.0 RTOS (Real-Time Operating System). Based on the RTOS, an application ProConOS which is a PLC operating system from KW is running on it. Users can use the SoftPLC development tool named MULTIPROG to develop the application. EasyPAC supports Modbus server over RTU/TCP to be connected with HMI's that support Modbus protocol.

1.1.1. Complete Industrial System Solution

EasyPAC offers complete software and tools:

- Built-in ProConOS
- MULTIPROG + PLCopen Functional Block. Users are able to customize their own functionalities.
- MyConfig: Utility for setting of system parameters.
- MyLink: Utility for diagnose Motionnet slave modules.
- Communicate between HMI and main system through Ethernet or serial communications.

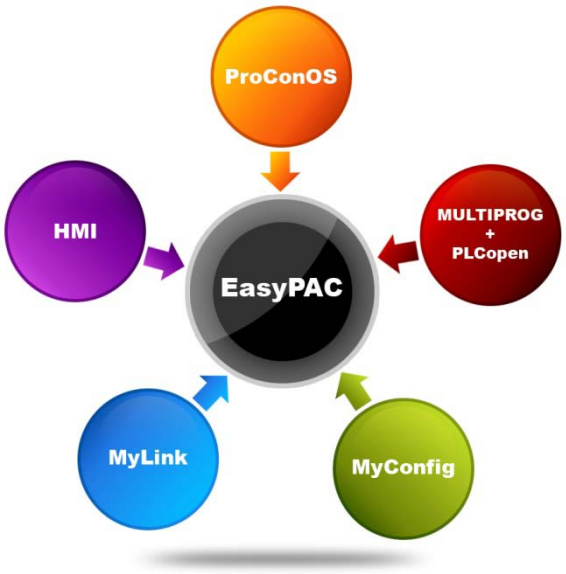


Figure 1-1: EasyPAC offers complete software and tools

1.1.2. Compact Size + Motionnet = High Extension and Integration

EasyPAC provides two Motionnet Rings:

- Ring_0: For digital I/O, analog I/O and pulse counters.
  - Supports up to maximum 64 slave modules.
  - Transfer speed: 2.5/5/10/20 Mbps.
- Ring_1: For motion control.
  - Supports up to maximum 32 axes.
  - Transfer speed: 2.5/5/10/20 Mbps

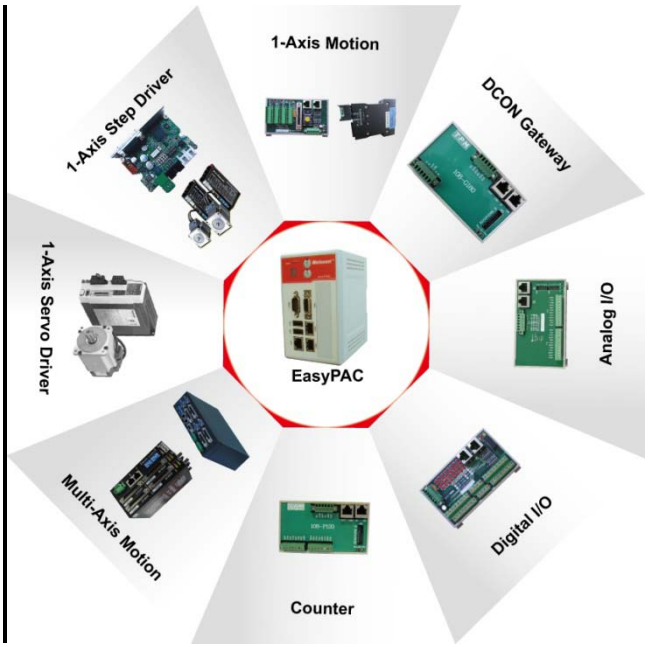


Figure 1-2: EasyPAC and supported slave modules

1.2. Features

- Fanless and compact size
- Standard PC interfaces: LAN/ USB2.0/ RS-232/ RS-422/ Compact Flash Disk
- Microsoft Windows CE5.0 embedded real-time operating system
- Local digital I/O interface: DIx8, DOx8
- Built-in two Motionnet Masters (Ring_0 and Ring_1)
  - Ring_0: For digital I/O, analog I/O and pulse counters. Supports up to maximum 64 slave modules.
  - Ring_1: For motion control. Supports up to maximum 32 axes.
- Configurable Motionnet transfer rate: up to 20Mbps maximum.
- Combine HMI (Human Machine Interface) by Modbus-TCP or Modbus-RTU
- System utility: MyConfig.
- Motionnet utility: MyLink.
- Programming software tool: MULTIPROG5.35 Express
- Power input spec.
  - Output voltage: 24V DC
  - Power Consumption: 7W

1.3. Hardware

The following table shows the hardware specifications of EasyPAC:

TPM EasyPAC	Specifications
1. Vortex86DX	**800 MHz**
2. DDR2 RAM	**256 MBytes**
3. BIOS Flash	**2 MBytes**
4. D-SUB 15 Male Connector x 2	**RS-422 x 1, RS-232 x 1 (COM)** **RS-422 x 1, RS-232 x 1 (CN 1)**
5. USB Connector x 2	**USB 2.0**
6. RJ-45 Connector x 2	**Motionnet x 2 (CN3, CN4)**
7. RJ-45 Connector x 1	**Ethernet (LAN)**
8. Hardware Security	**Hardware IC + AES encryption**
9. FRAM	**32 KBytes**
10. DI/O (Isolation 2.5KVDC)	**8 Channel Input / Output**
11. CF Card Socket x 1	
12. 16 step Rotary Switch x 2	
13. 7-segment display x 1	

TPM EasyPAC	Specifications
14. LED display x 4	
15. Reset Button (PB1) x 1	

1.4. Software

There are two utilities provided to diagnose and test EasyPAC, MyConfig and MyLink. In addition to standard DIO/AIO interfaces, EasyPAC also supports Motion Function Block (Motion FB) used to program the Motionnet based motion control slave modules connected to Ring_1.

- MyConfig: System configuration utility configures IP address, system information etc.
- MyLink: A diagnostic utility used to test, set and verify the functionalities of slave modules hooked up to Motionnet.
- Motion FB: Visualized functional block based on MULTIPROG. It supports single and multiple axes.

1.5. Motionnet Devices

EasyPAC is equipped with 2 two Motionnet masters named Ring_0 and Ring_1. Ring_0 is mostly for digital I/O and analog I/O and Ring_1 is for motion control. The detailed data is in the following table:

Item	Specifications	port of Motionnet		Remark
		Ring_0	Ring_1	
106-D240-NX	32-ch digital input with NPN	Yes	No	
106-D222-NN	16-ch digital input and 16-ch digital output with NPN	Yes	No	
106-D204-XN	32-ch digital output with NPN	Yes	No	
106-D440-NX	32-ch digital input with NPN	Yes	No	
106-D422-NN	16-ch digital input and 16-ch digital output with NPN	Yes	No	
106-D404-XN	32-ch digital output with NPN	Yes	No	
106-D520-NX	16-ch digital input with NPN	Yes	No	
106-D502-XN	16-ch digital output with NPN	Yes	No	
107-D140-NX	32-ch digital input with NPN	Yes	No	
107-D122-NN	16-ch digital input and 16-ch digital output with NPN	Yes	No	
107-D104-XN	32-ch digital output with NPN	Yes	No	
EZM-D140-NX	32-ch digital input with NPN	Yes	No	
EZM-D122-NN	16-ch digital input and 16-ch digital output with NPN	Yes	No	
EZM-D104-XN	32-ch digital output with NPN	Yes	No	
106-A104-01	4-ch analog output (±10V)	Yes	No	
106-A180-01	8-ch analog input (±10V, ±5V, ±2.5V, ±1.25V)	Yes	No	

Item	Specifications	port of Motionnet		Remark
		Ring_0	Ring_1	
108-A122	8-ch analog input and 4-ch analog output	Yes	No	
108-G180	DCON Gateway	Yes	No	coming soon
108-P120	4-ch, 32 bites up-down counter	Yes	No	
102-M1x1	1-axis Motion connector series	No	Yes	
BCD-4020FU	1-axis 2-phase stepper driver	No	Yes	
BCD-4020FB	1-axis Micro stepper driver	No	Yes	
Ezi-Servo	close-loop stepper driver	No	Yes	coming soon
Kingservo	King servo motor & driver	No	Yes	coming soon

Table 1-1: Motionnet compatible devices

1.6. System Architecture

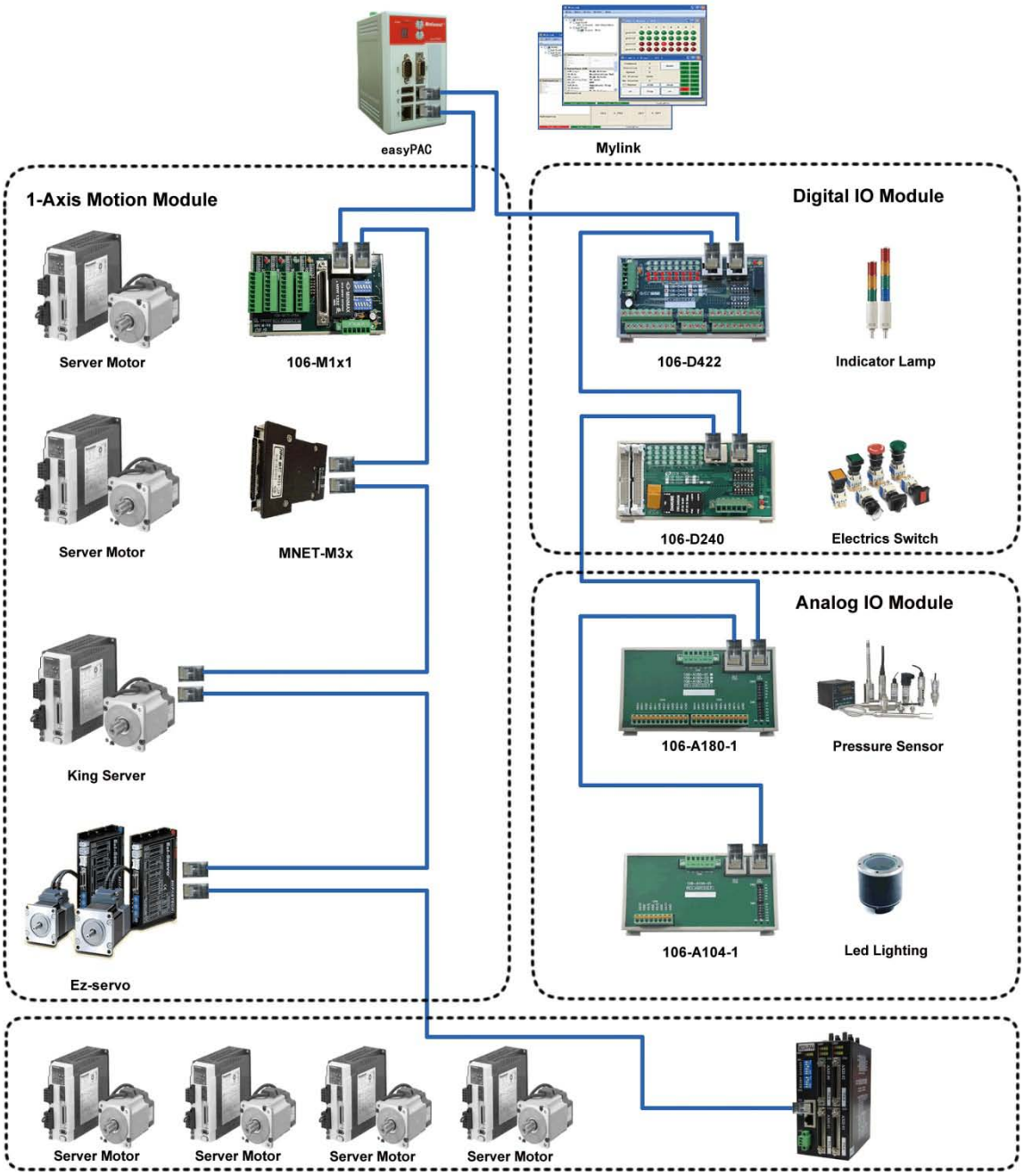


Figure 1-3: EasyPAC system architecture

1.7. 24V DC Power Module

Features:

- Universal AC input / Full range
- Protections: Short circuit / Overload / Over Voltage

- Cooling by free air convection
- Can be installed on DIN rail TS-35 / 7.5 or 15
- NEC class 2 / LSP compliant
- LED indicator for power on
- DC OK relay contact
- No load power consumption < 0.75W
- 100% full load burn-in test
- Safety standards: CE / UL / RU

The detailed hardware specification is listed as the following table:

SPECIFICATION

MODEL		MDR-40-24
OUTPUT	DC VOLTAGE	24V
	RATED CURRENT	1.7A
	CURRENT RANGE	0 ~ 1.7A
	RATED POWER	40.8W
	RIPPLE & NOISE (max.) Note.2	150mVp-p
	VOLTAGE ADJ. RANGE	24 ~ 30V
	VOLTAGE TOLERANCE Note.3	±1.0%
	LINE REGULATION	±1.0%
	LOAD REGULATION	±1.0%
	SETUP, RISE TIME Note.5	500ms, 30ms/230VAC 500ms, 30ms/115VAC at full load
	HOLD UP TIME (Typ.)	50ms/230VAC 20ms/115VAC at full load
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC
	FREQUENCY RANGE	47 ~ 63Hz
	EFFICIENCY (Typ.)	88%
	AC CURRENT (Typ.)	1.1A/115VAC 0.7A/230VAC
	INRUSH CURRENT (Typ.)	COLD START 30A/115VAC 60A/230VAC
	LEAKAGE CURRENT	<1mA / 240VAC
PROTECTION	OVERLOAD	105 ~ 150% rated output power
		Protection type : Constant current limiting, recovers automatically after fault condition is removed
	OVER VOLTAGE	15.6 ~ 18V
		Protection type : Shut down o/p voltage, re-power on to recover
FUNCTION	DC OK SIGNAL	Relay contact rating(max.): 30V/1A resistive
ENVIRONMENT	WORKING TEMP.	-20 ~ +70℃ (Refer to output load derating curve)
	WORKING HUMIDITY	20 ~ 90% RH non-condensing
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)
	VIBRATION	Component : 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes ; Mounting : Compliance to IEC60068-2-6
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL508, UL60950-1, TUV EN60950-1 approved, NEC class 2 / LPS compliant (12V,24V,48V only)
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:>100M Ohms / 500VDC / 25℃/ 70% RH
	EMI CONDUCTION & RADIATION	Compliance to EN55011, EN55022 (CISPR22), EN61204-3 Class B
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3
	EMS IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, ENV50204, EN55024, EN61000-6-2, EN61204-3, heavy industry level, criteria A
OTHERS	MTBF	301.7K hrs min. MIL-HDBK-217F (25℃)
	DIMENSION	40*90*100mm (W*H*D)
	PACKING	0.3Kg; 42pcs/13.6Kg/0.82CUFT
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. 5. Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time.	

Table 1-2: hardware specification

1.8. Package List

Package list is as below:

- EasyPAC EPC-1100
- Specific power module
- System CF card with built-in software license (WinCE5.0 / ProConOS)
- Product CD (Including: manuals and installation tools)

Note that if you have any question for package, please contact our local distributor or register on our web-site. We will offer the new library, template and demo programs.

2. Hardware Installation

2.1. Dimension

The outline dimension of EasyPAC is shown below.

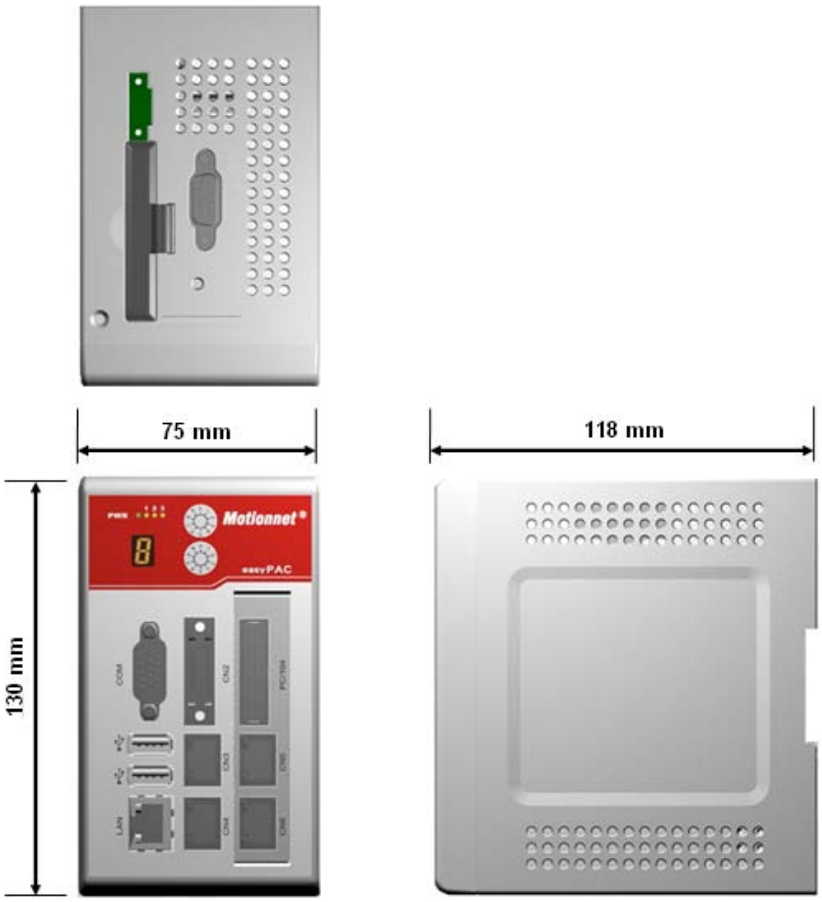


Figure 2-1: outline and dimension

2.2. Connectors

All connectors and switches of EasyPAC are shown below.

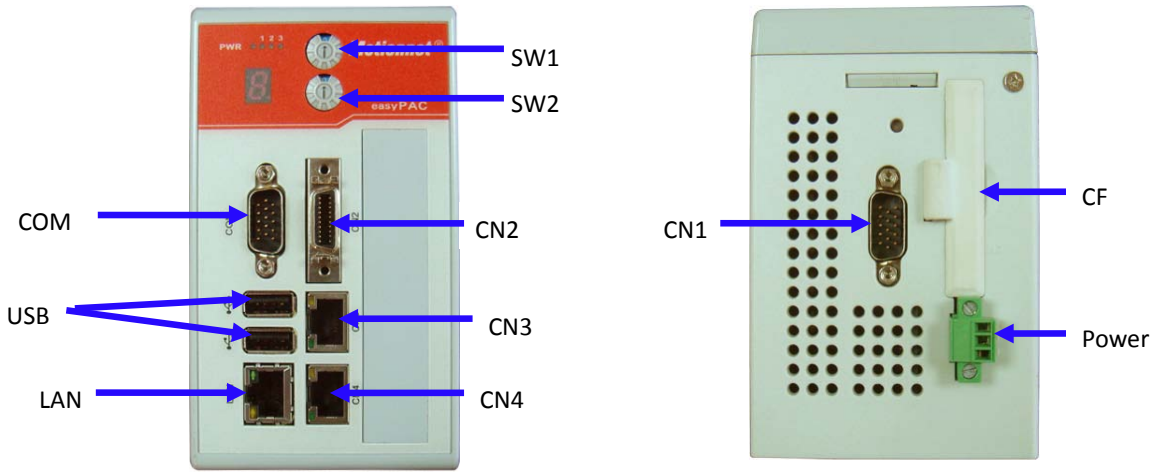


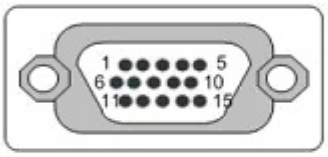
Figure 2-2: Connections of EasyPAC

Name	Function
COM	D-SUB COM port (COM1/COM3) connector
CN1	D-SUB COM port (COM2/COM4) connector
CN2	SCSI-20Pin Digital I/O connector
CN3	RJ-45, expanding connector of Motionnet DI/O and AI/O
CN4	RJ-45, expanding connector of Motionnet Motion
Power	3 Pin connector
CF	Extension slot of CF
USB	Standard USB 2.0connector
LAN	RJ-45, LAN 10/100
SW1	System operating mode setting
SW2	Baud rate of Motionnet setting

Table 2-1: EasyPAC connectors and switches

2.2.1. COM Port – COM & CN1

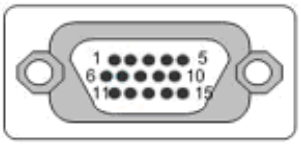
EasyPAC is equipped with four COM ports, two RS-232 and two RS-485. They are deployed in COM (COM1 RS-422 & COM3 RS-232) and CN1 (COM2 RS-422 & COM4 RS-232) separately that is the D-SUB 15-pin connector. The pin definition of this connector is in the following:



COM

Pin	Pin Mark	Pin Description
1	Reserve	NC
2	RS232_RX3	RS232 RX
3	RS232_TX3	RS232 TX
4	Reserve	NC
5	RS232_GND	RS232 GND
6	Reserve	NC
7	RS232_RTS3	RS232 RTS signal
8	RS232_CTS3	RS232 CTS signal
9	Reserve	NC
10	Reserve	NC
11	RS422_R1+	RS422 RX(+)
12	RS422_R1-	RS422 RX(-)
13	RS422_T1+	RS422 TX(+)
14	RS422_T1-	RS422 TX(-)
15	RS422_1_GND	RS422 GND

Figure 2-3: COM port pin assignment



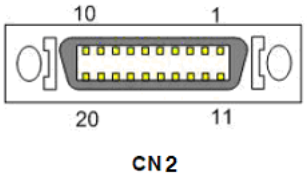
CN1

Pin	Pin Mark	Pin Description
1	Reserve	NC
2	RS232_RX3	RS232 RX
3	RS232_TX3	RS232 TX
4	Reserve	NC
5	RS232_GND	RS232 GND
6	Reserve	NC
7	RS232_RTS3	RS232 RTS signal
8	RS232_CTS3	RS232 CTS signal
9	Reserve	NC
10	Reserve	NC
11	RS422_R1+	RS422 RX(+)
12	RS422_R1-	RS422 RX(-)
13	RS422_T1+	RS422 TX(+)
14	RS422_T1-	RS422 TX(-)
15	RS422_1_GND	RS422 GND

Figure 2-4: CN1 pin assignment

2.2.2. GPIO – CN2

The pin definition of this 8DI/ 8DO connector is shown below:



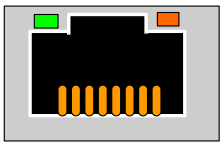
CN2

Pin	Pin Mark	Pin Description
1	EXT_IN0	GPIO Input 0
2	EXT_IN1	GPIO Input 1
3	EXT_IN2	GPIO Input 2
4	EXT_IN3	GPIO Input 3
5	EXT_IN4	GPIO Input 4
6	EXT_IN5	GPIO Input 5
7	EXT_IN6	GPIO Input 6
8	EXT_IN7	GPIO Input 7
9	GPIO_COM	GPIO COM
10	EGND	GPIO GND
11	EXT_OUT0	GPIO Output 0
12	EXT_OUT1	GPIO Output 1
13	EXT_OUT2	GPIO Output 2
14	EXT_OUT3	GPIO Output 3
15	EXT_OUT4	GPIO Output 4
16	EXT_OUT5	GPIO Output 5
17	EXT_OUT6	GPIO Output 6
18	EXT_OUT7	GPIO Output 7
19	Reserve	NC
20	E24V	External 24VDC

Figure 2-5: pin assignment of CN2

2.2.3. Ring_0 – CN3

The Ring_0 of Motionnet on CN3 is used for digital input/ output and analog input/ output slave modules. The pin definition of this connector is in the following:



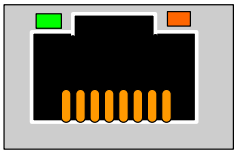
Pin	Pin Mark	Pin Description
1	NC	Reserved
2	NC	Reserved
3	RS485+	Motionnet protocol +
4	NC	Reserved
5	NC	Reserved
6	RS485-	Motionnet protocol -
7	NC	Reserved
8	NC	Reserved

Table 2-2: pin assignment of CN3

2.2.4. Ring_1 – CN4

The Ring_1 of Motionnet on CN4 is used for motion control slave modules. The pin definition of this

connector is in the following:



Pin	Pin Mark	Pin Description
1	NC	Reserved
2	NC	Reserved
3	RS485+	Motionnet protocol +
4	NC	Reserved
5	NC	Reserved
6	RS485-	Motionnet protocol -
7	NC	Reserved
8	NC	Reserved

Table 2-3: pin assignment of CN4

2.2.5. 24V DC Input

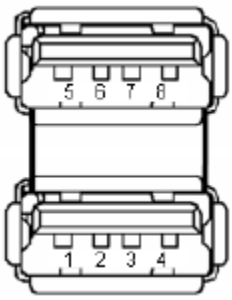
Pin definition of this connector is in the following.

Pin	Pin Mark	Pin Description
1	24	Power 24V
2	0	GND
3	FG	Frame GND

Table 2-4: main power connector pin assignment

2.2.6. USB Connector

There are two sets of USB in the EasyPAC. The pin definition of this connector is in the following:

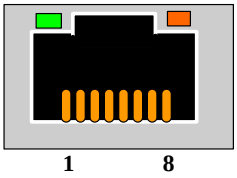


USB signal	pin	pin	USB signal
Vcc	1	5	Vcc
USB_D0-	3	6	USB_D1-
USB_D0+	5	7	USB_D1+
Ground	7	8	Ground

Table 2-5: USB connector pin assignment

2.2.7. LAN Connector

EasyPAC provides one LAN port with 10/100Mpbs. The default IP address is 192.168.1.100 and user can modify it with MyConfig. The pin definition of this connector is in the following:



Pin	LAN Signal Name
1	LAN_TDP
2	LAN_TDN
3	LAN_RDP
4	NC
5	NC
6	LAN_RDN
7	NC
8	GND

Table 2-6: LAN connector pin assignment

2.3. Rotary Switch

There are two rotary switches on EasyPAC. One is to set the run mode of system and the other is to set the baud-rate of Motionnet.

2.3.1. System Mode Setting – SW1

The SW1 is used to set the mode of EasyPAC. User can choose the system mode by setting SW1. The corresponding setting of this switch is in the following:

SW1	Operating Mode	Details
0	MyConfig Server Mode	Set default IP address 192.168.1.100
1	MyConfig Server Mode	
2	MyLink Server Mode	
3	Reserve	Reserve
4	Reserve	Reserve
5	Reserve	Reserve
6	Reserve	Reserve
7	KW Mode + Modbus Slave over RTU	Cold
8	KW Mode + Modbus Slave over RTU	Stop
9	KW Mode + Modbus Slave over RTU	Warm
A	KW Mode + Modbus Slave over TCP	Cold
B	KW Mode + Modbus Slave over TCP	Stop
C	KW Mode + Modbus Slave over TCP	Warm
D	KW Mode	Cold
E	KW Mode	Stop
F	KW Mode	Warm

Table 2-7: SW1 assignment

2.3.2. Motionnet Baud-Rate – SW2

The SW2 is used to set the baud-rate of Motionnet Rings. User can choose the baud-rate by switching SW2. The definition of this switch is as followed: The default setting is: Ring_0: 10Mpbs, Ring_1: 10Mbps.

	Ring 0	Ring 1		Ring 0	Ring 1
0	20	20	8	10	20
1	20	5	9	10	5
2	20	10	A	10	10
3	20	2.5	B	10	2.5
4	5	20	C	2.5	20
5	5	5	D	2.5	5
6	5	10	E	2.5	10
7	5	2.5	F	2.5	2.5

Table 2-8: SW1 assignment

3. Motionnet Introduction

3.1. What Is Motionnet?

Motionnet is a super high-speed serial communication system. The G9000 devices provide input/output control, motor control, CPU emulation and message communication with high speed serial communications (up to 20Mbps) all of which are required by current Factory Automation techniques. Motionnet always transfers 4 bytes of data in 15.1μsec using cyclic communication to control input and output. While this data is being transferred, it can communicate at maximum of 256 bytes, such as motor control data. Communication times can be calculated using formulas, allowing users to see that Motionnet guarantees the real-time oriented support needed by FA industries.

3.2. Motionnet Functions

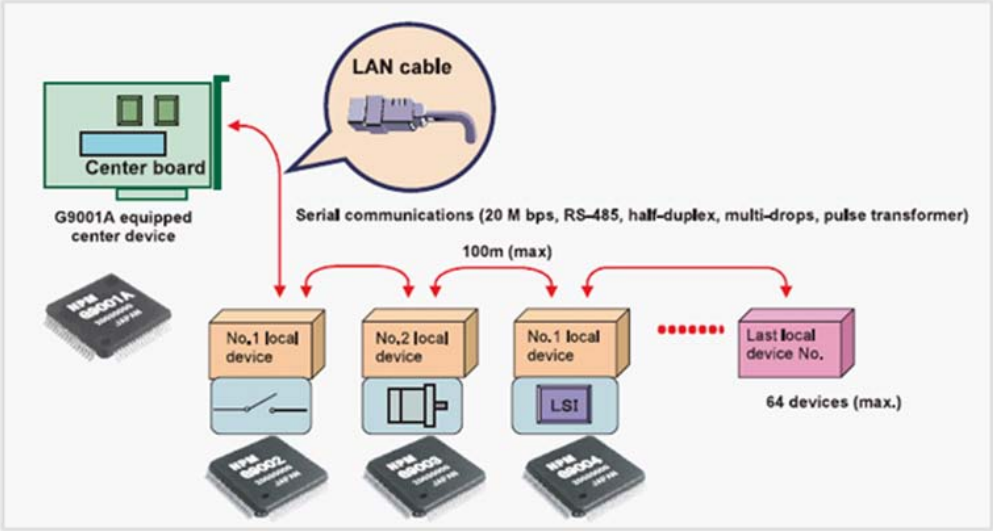


Figure 3-1: Motionnet system architecture

- Provides a communication protocol based on the RS485 standard.
- Can communicate variable length of data from 1 to 128 words (when a 16-bit CPU is used)
- An LSI center device (G9001) controls the bus.
- I/O wiring can be greatly reduced by using a G9002 I/O device.
- Motor control wiring can be reduced by using a G9003 PCL.
- Using a G9004 CPU emulation device reduces the wiring for general devices connected to a CPU. Data can be exchanged between CPUs by changing the G9004 mode.
- New devices can be added to the system on the fly.

- Systems can be isolated using pulse transformers.
- Transfer speed up to 20 Mbps.
- Maximum 64 slave devices for each serial line on a master device. Input/output control of up to 256 ports (2048 points), motion control of up to 64 axes.
- Input/output and status communication time for each device when inputting/outputting and reading status data for each device, the system automatically refreshes the center device RAM each communication cycle. (Cyclic communication: 15.1 µsec./local device) When 32 local devices are connected (1024 points of input/output): 0.49 msec. When 64 local devices are connected (2048 points of input/output): 0.97 msec.
- Data communication time cyclic communication can be interrupted with a command from the CPU. Data communication time: 19.3 µsec. to send or receive 3 bytes (e.g. when writing feed amount data to the G9003). Data communication time: 169.3 µsec. to send or receive 256 bytes.
- Serial communication connection cable. Multi-drop connections using LAN cables or dedicated cables. Total cable length of one line: 100 m (20 Mbps/32 local boards) (10 Mbps/64 local boards). Cable length between local boards: 0.6 m or longer.

3.3. Advantage of Motionnet

- It is possible to connect from center to terminal controller parts by one cable.

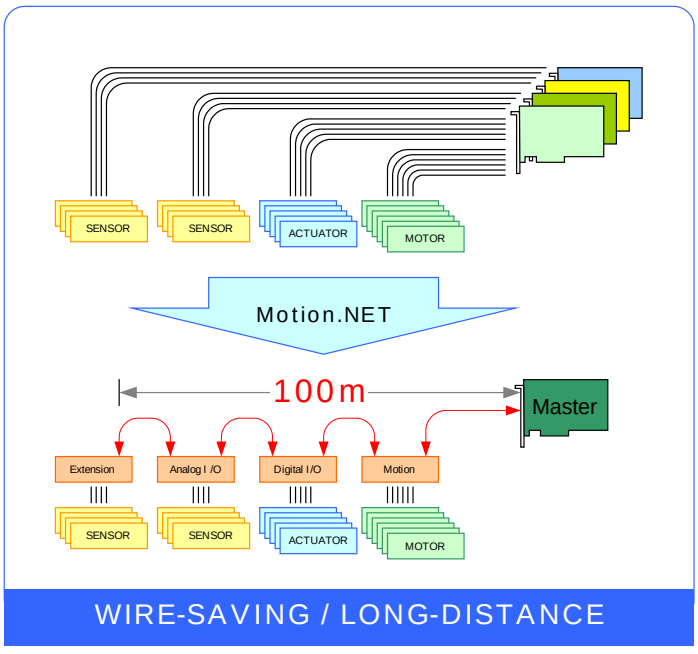


Figure 3-2: wire-saving and long-distance support

- In cyclic communication, a communication cycle is as follows when a 20 Mbps speed is selected.

Number of local devices	Communication cycle	Remarks
8	0.12 ms	If all of the local devices connected are I/O devices,

Number of local devices	Communication cycle	Remarks
		256 input/output points can be used.
16	0.24 ms	If all of the local devices connected are I/O devices, 512 input/output points can be used.
32	0.49 ms	If all of the local devices connected are I/O devices, 1024 input/output points can be used.
65	0.97 ms	If all of the local devices connected are I/O devices, 2048 input/output points can be used.

If a different number of local devices are connected, or when the communication cycle is interrupted by data communications, refer to the calculation formulas in the user's manual to calculate the time latency.

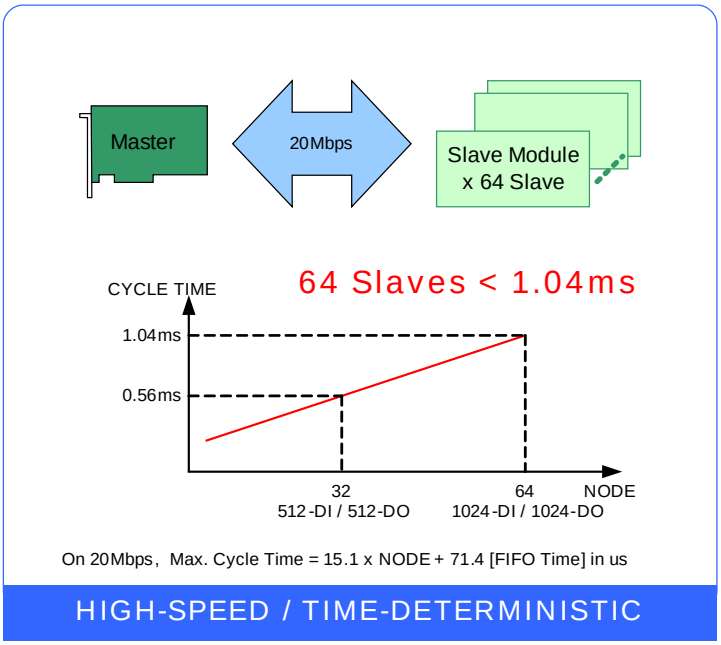


Figure 3-3: high-speed and time deterministic support

3.4. Motionnet Product Family

Figure 3-4: EasyPAC and Motionnet product family

4. Software Utilities

3 different software utilities are developed to help users easily make use of EasyPAC:

1. MyConfig
2. MyLink
3. MyDataCheck

4.1. MyConfig

MyConfig is a software utility designed for EasyPAC. Besides providing basic hardware information, MyConfig also support online update so that users could set and view the hardware status though Ethernet.

Recommended Hardware Requirement
PC Hardware: PC or laptop with Intel Centrino up CPU
Memory: 1GB RAM
OS: Windows 2000/XP/Win7
LAN card: RJ-45 10/100/1000 Mbps

Software Installation
EasyPAC needs 2 files: MyConfigSvr.exe and EZPACSDK.dll
PC needs 1 file: MyConfig.exe

4.1.1. Server on EasyPAC

Before powered up EasyPAC, please make sure the SW1 is switched to position 1. PC is supposed to have the same network section as EasyPAC (IP address: 192.168.0.100) when the network cable is hooked up. If these two settings are correct, we can power up the EasyPAC. It will beep an alert sound if the system is successfully brought up and MyConfigSrv.exe will be started automatically. If there is no beep for a while means Ethernet failure or the IP address is in conflict with someone else.

4.1.2. PC Side Settings

4.1.2.1 Login

Users can login MyConfig with EasyPAC IP address and password. MyConfig provides two kinds of login account which have different privilege. Default password for administrator is admin and default password for guest is guest. The password could be updated after login. The administrator has the privilege to view and change settings and the guest only could view the current settings.

After logging in, there are five more tabs – PAC info, Update, AES code, Modbus parameters, About MyConfig.

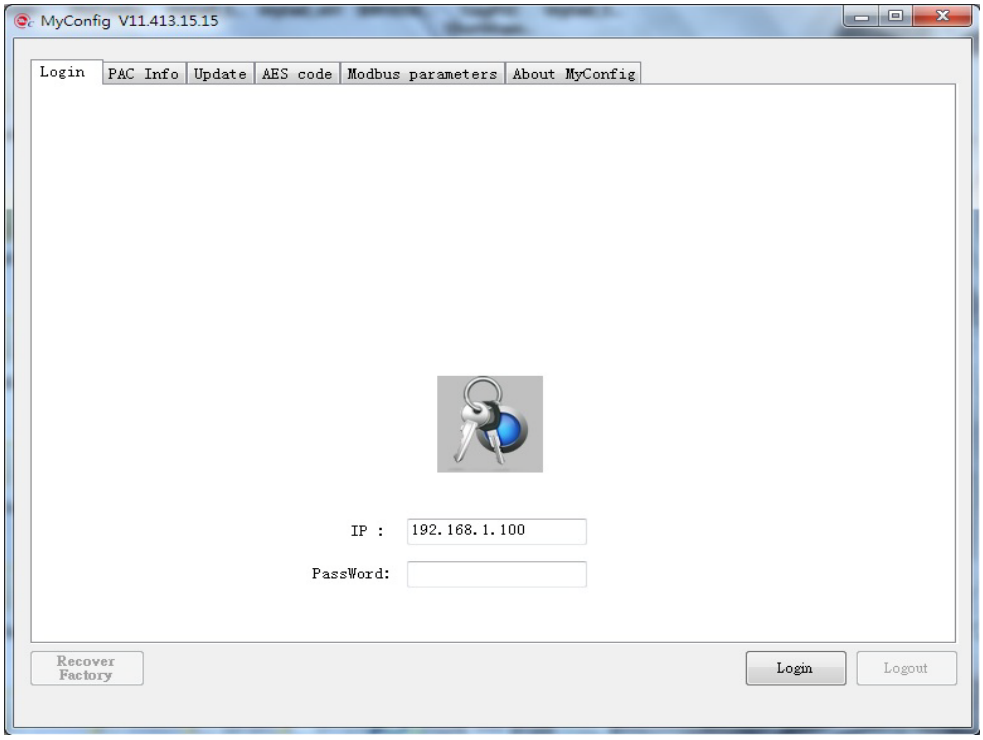


Figure 4-1: MyConfig login page

4.1.2.2 PAC Info

Users can see the EasyPAC basic hardware information at the top half of the page. At the bottom half, users could set up IP address, admin password and guest password.

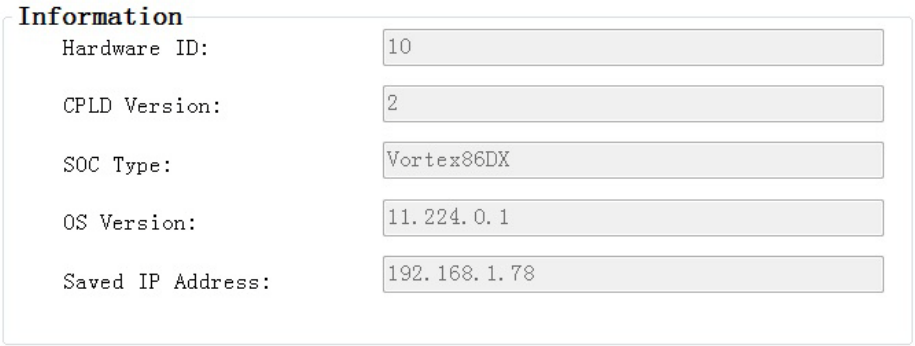


Figure 4-2: Hardware basic information

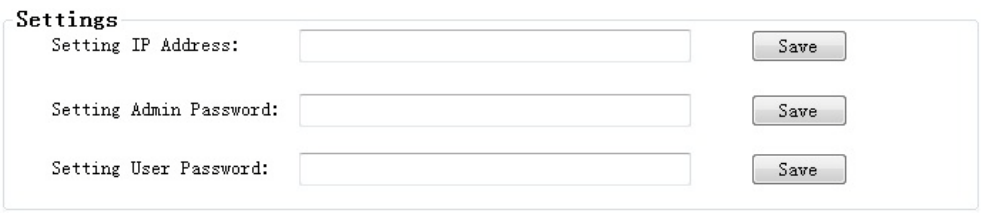


Figure 4-3: change settings of IP, admin password and guest password

Note that only if the user is in the same network section can change the EasyPAC IP address. Press the "Save" button would update the EasyPAC IP address after reboot. The admin and guest password would change immediately when new a password is input and "Save" button is pressed.

4.1.2.3 Update

It provides online software update. Please make sure the PC is connected to the internet before online update. If the "Check for Updates" button is pressed, it will show up the software versions on EasyPAC and user's PC at the top half. At the bottom half shows the latest software versions provided from TPM.

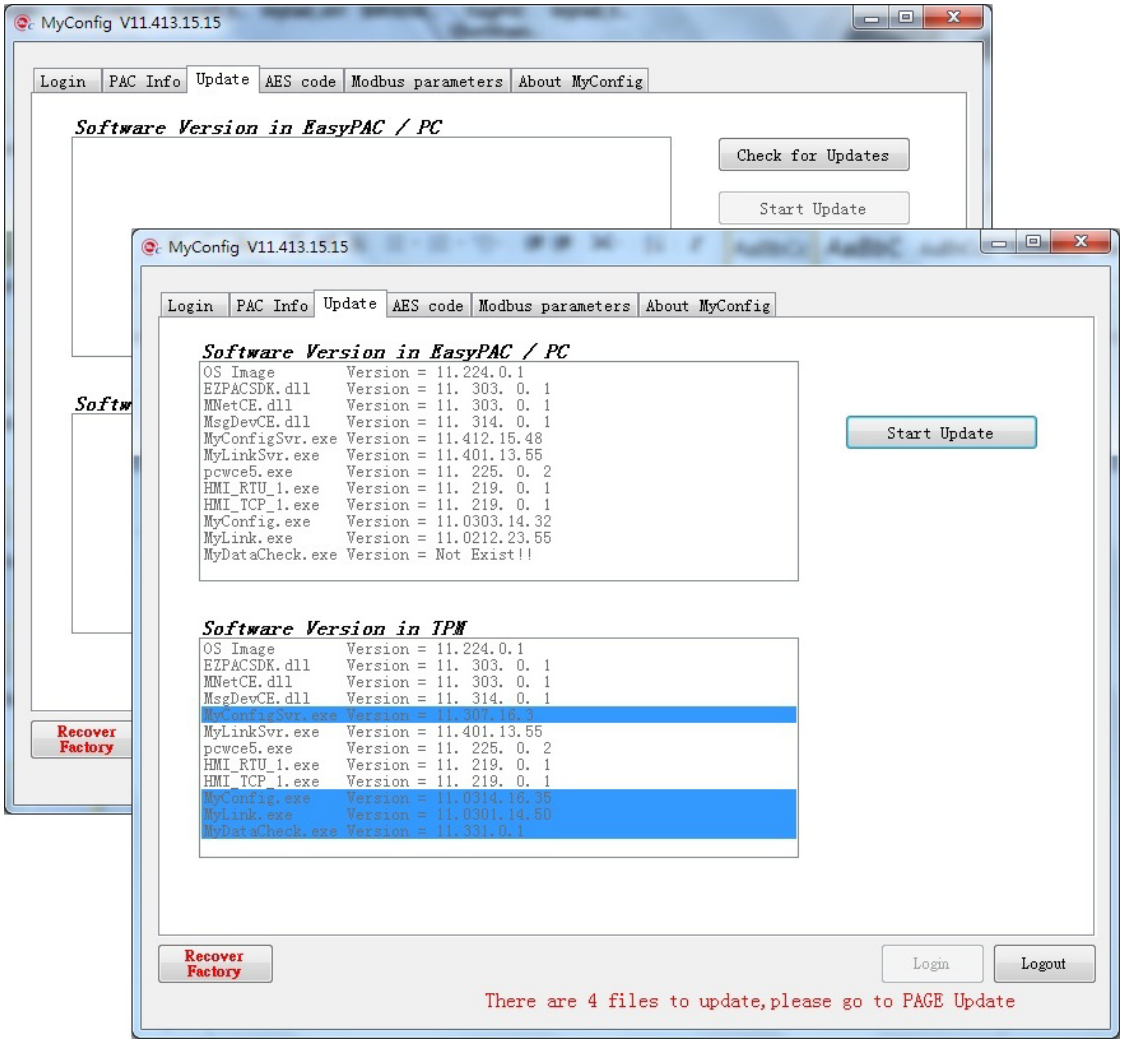


Figure 4-4: update software page

In this “Update” tab, it would show up the software versions that are out of date. There is also a hint message informing software needs to be updated. Select files needed to be updated and press the “Start Update” button and then it will start updating and pop-up a progress bar like below.

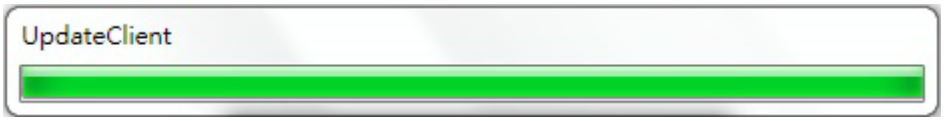


Figure 4-5: progress bar of software updating

If the software update completes, it will pop up a dialog saying the update completed. EasyPAC needs to reboot to apply new software.

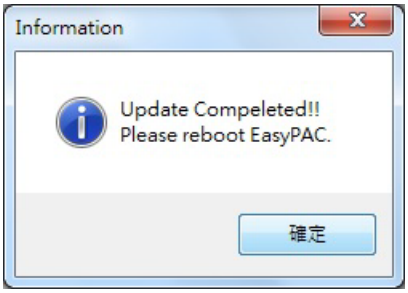


Figure 4-6: update complete dialog

4.1.2.4 AES Code

Figure 4-7: dialog window for generating AES key

Secure ID: display the hardware id of the EasyPAC. Moreover, the system integrator could input the hardware id of other EasyPAC in the “Secure ID” text box to generate the corresponding AES key. EasyPAC provides an AES key encryption mechanism to protect our customers. The SI key is supposed to be 16 numeric digits. If the SI key is not 16 digits or it contains non-numeric digits, an error message will show up as figure below.

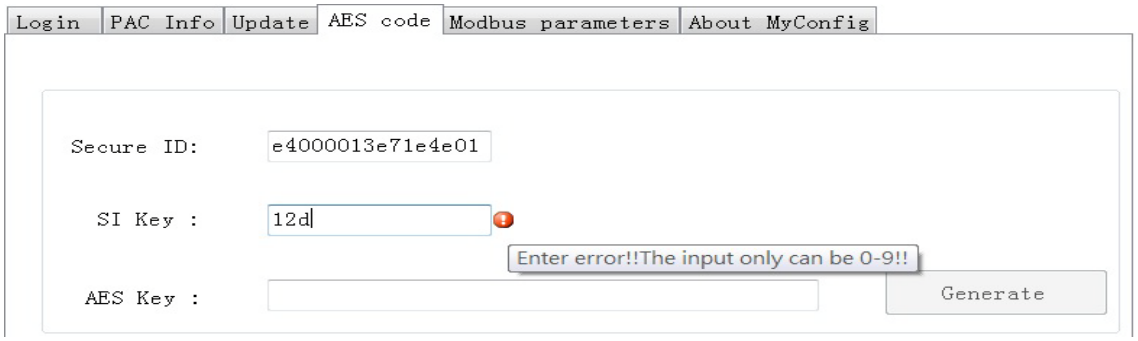


Figure 4-8: SI key could only accept numeric digits

4.1.2.5 Modbus Parameter

The “Modbus Parameters” page let users edit Modbus related parameters for KW applications of EasyPAC. Modbus requires settings of slave ID, TCP and RTU parameters. MyConfig provides sets of default settings in advance. Users can change the settings and press the “Save Settings” button to transmit the settings to EasyPAC.

Next time when users login to MyConfig, the settings set last time or the default values will be shown in the Modbus parameters page. Users can always login to check in this page. This page is shown in the following figure.

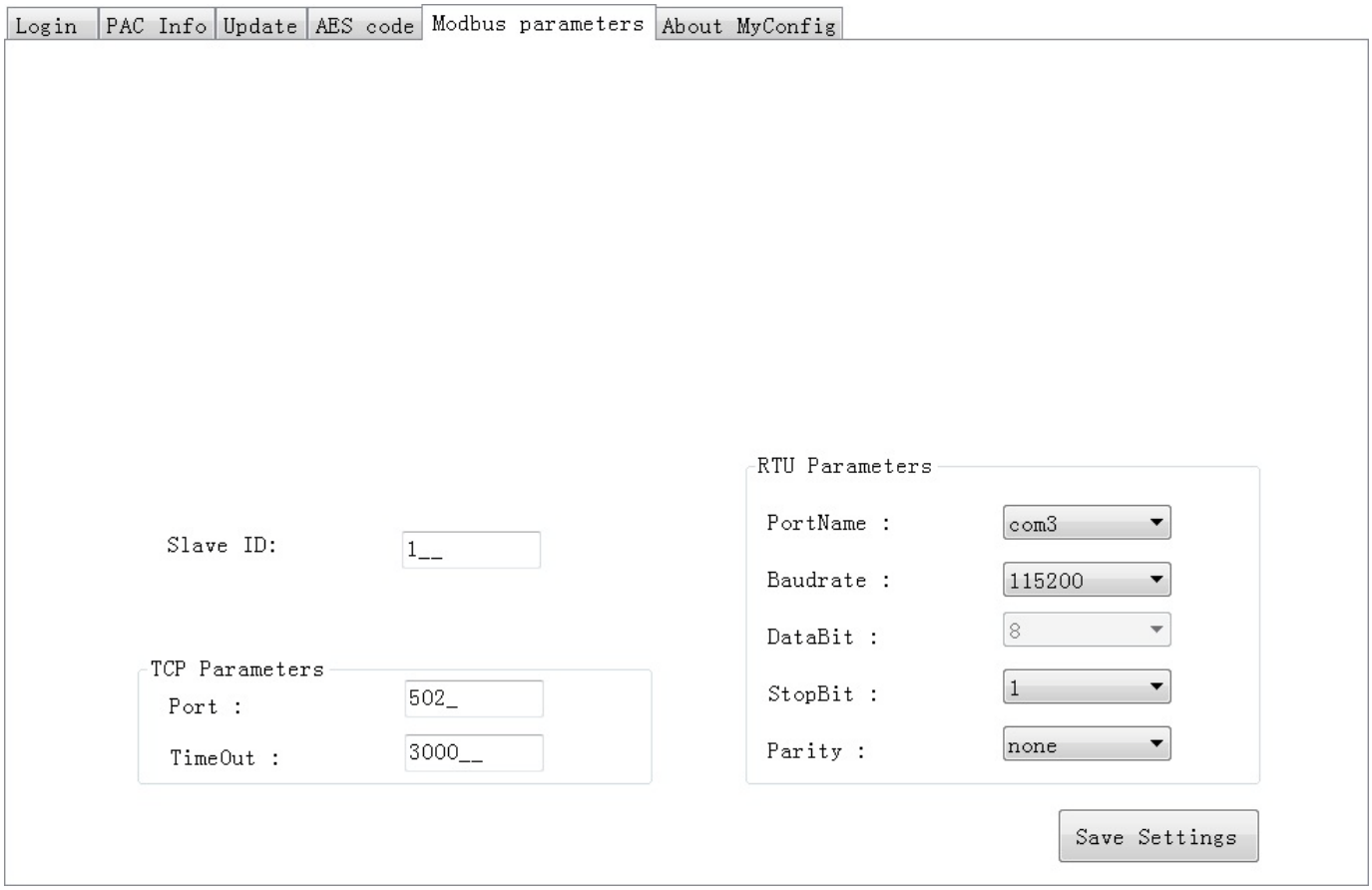


Figure 4-9: setting of Modbus parameter dialog

4.1.2.6 Recover Factory Default Settings

If users forget the changed password of admin or guest, or the changed settings of the IP, Modbus, etc is not working, a solution is to recover factory settings. The step-by-step recovery from factory settings is as follows:

1. Press the recovery button 

and then reboot.
2. The EasyPAC would roll back to the default IP address: 192.168.0.100. Now we could connect to it with MyConfig.
3. The “PAC info” tab has previous set IP address shown in “Saved IPAddress”.

4.2. MyLink

MyLink is utility software used to test, diagnose and verify the functions of the remote Motionnet slave modules. The following slave modules are available: DIO、AIO、Counter and Axis modules. After successful installation, MyLink.exe with icon  could be found in the remote PC.

Recommended Hardware Requirement

PC Hardware: PC or laptop with Intel Centrino up CPU
Memory: 1GB RAM
OS: Windows 2000/XP/Win7
LAN card: RJ-45 10/100/1000 Mbps

Software Installation

1 executable file: MyLink.exe

4.2.1. Interface

Tool Bar

Figure 4-10: MyLink main functions

There are 4 main functions in the tool bar.

- **File**
  This is used for file access especially for KW. Also this is used to set and save of axes module parameters or copy the parameters for other axes.

Figure 4-11: functions under file option

- **Tools**

  Provides functions for setting system parameters and initialize the system. There are 3 sub-functions:

  1. Initial: Execute the Initialization. Initialize Ring_0 and Ring_1 after setting the Motionnet parameters in "Settings…" option.
  2. Settings…: Initialize hardware options of EasyPAC and USB_L131. More detailed illustrations would be introduced later.
  3. Edit Path…: This option is only available when two axes module are grouped up. Later we will discuss about the "Group" function.

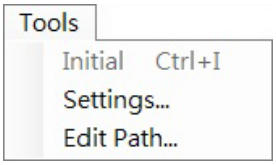


Figure 4-12: functions under tools option

  - **Settings**

    The supported master contains two kinds of devices – EasyPAC and USB-L131. If users select USB-L131, the baud rate option of Ring_0 and Ring_1 would be enabled. If users select EasyPAC as the master device, the baud rate would keep disabled since that is set by switching the rotary switch (SW2) on the front side of EasyPAC.

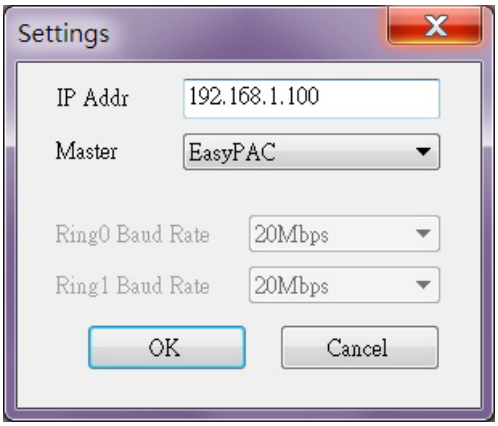


Figure 4-13: screenshot of settings

- **Windows**

  When multiple slave modules are displayed in the same time, the related menu will be re-arranged accordingly.

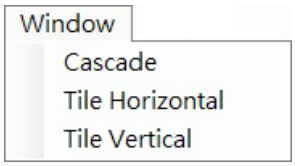


Figure 4-14: functions under window option

- **Help**

  This shows the MyLink revision number.

4.2.2. Module Status

After clicking the initial button, the found and identified slave modules will be shown accordingly. Click the check box in front of the slave module and the corresponding menu will pop-up. Except USB-L131, it will show up two Motionnet masters at the top left corner – Ring_0 and Ring_1. If the master is EasyPAC, MyLink could save the profile according to data type designated for KW. Moreover, the slave modules besides axes control are supposed to connect to Ring_0 and axes control is supposed to connected to Ring_1. Check the slave device at the check box will pop up the corresponding control window at the main frame of MyLink and the properties will show at the left bottom corner.

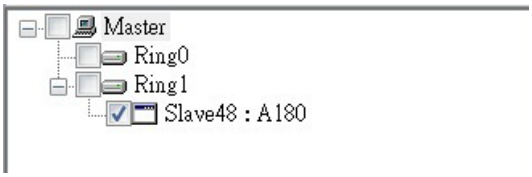


Figure 4-15: slave devices found by the Motionnet master

- **Properties**

  The related item will be shown according to the selected slave module type. If the property is grayed out means it is read only.

Figure 4-16: the property window

If the parameter comes with a combo box means the input options are pre-arranged. If the input is a text box, users should key in the value needed within the acceptable range. The combo box for a parameter

is shown as the following figure.

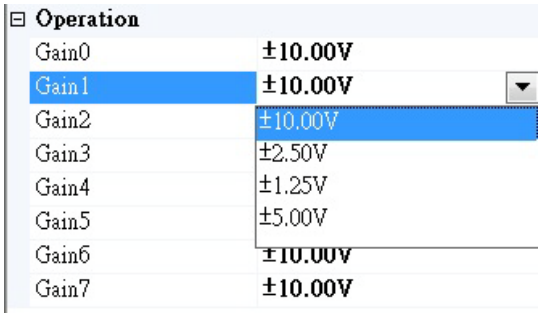


Figure 4-17: screenshot of updating properties

- **Description**

This is located below the property page. The main purpose is illustration and suggestion.

Figure 4-18: property description

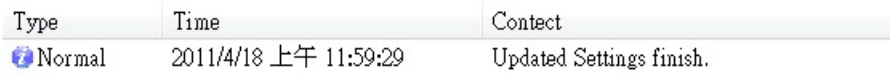
- **Ring Status**

Ring status is shown in the bottom. Green means **enabled** and red means **disabled**.

Figure 4-19: Ring status

- **Message**

There is a block above the ring status displaying responses from MyLink. The responses include time stamp the event occurred and error or hint messages.



4.2.3. DIO Module Operation

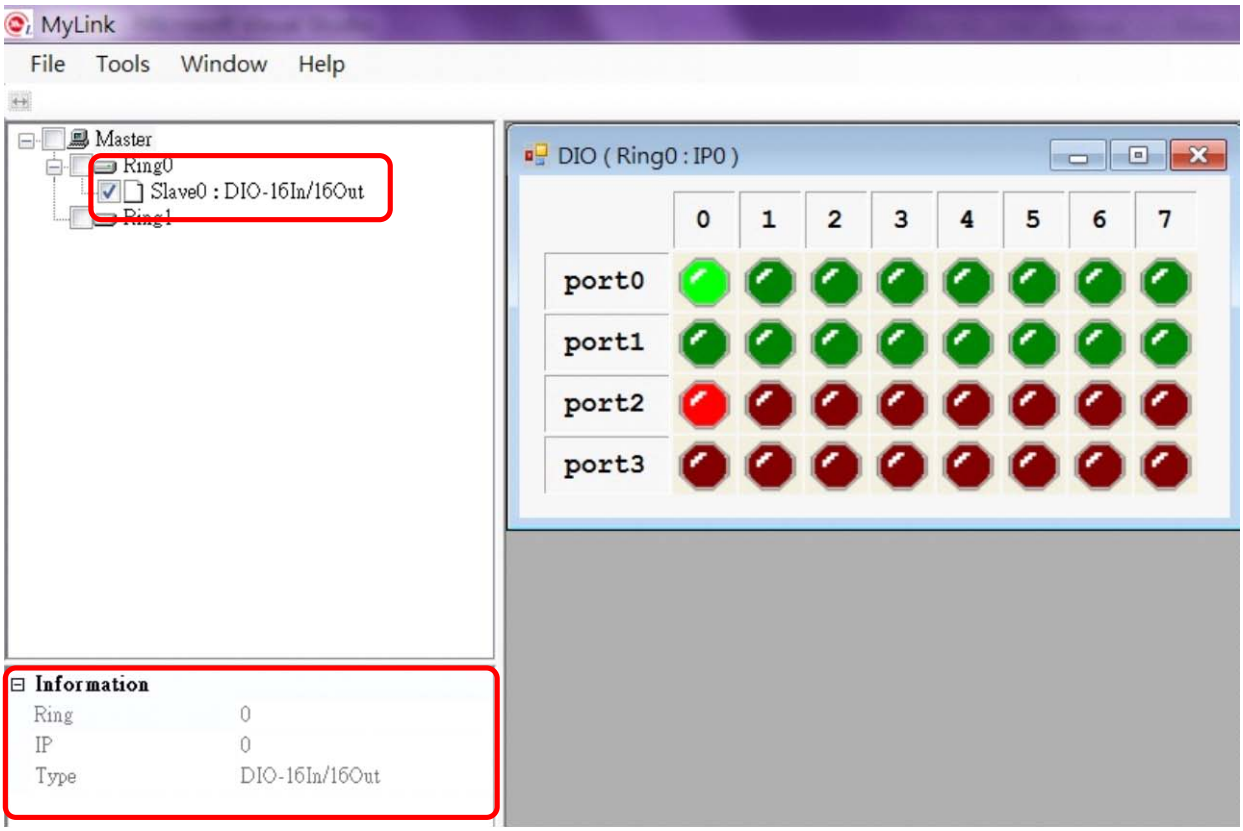


Figure 4-20: information of connected devices

- **Module Status**
  As shown in the above menu, a DIO module is identified in Ring 0. This example is a 16 input /16 output module.
- **Property**
  No setting is required for DIO module.
- **Operation**
  The DO is connected with DI in the illustrated DIO module accordingly. When turn on the DO channel, both the DO and corresponding DI are ON.

4.2.4. AIO Module Operation

4.2.4.1 A104 & A180

In this example, 4 AO (A104) channels are connected to the 4 AI (A180) channels. The remaining 4 channels of AI connect to ground.

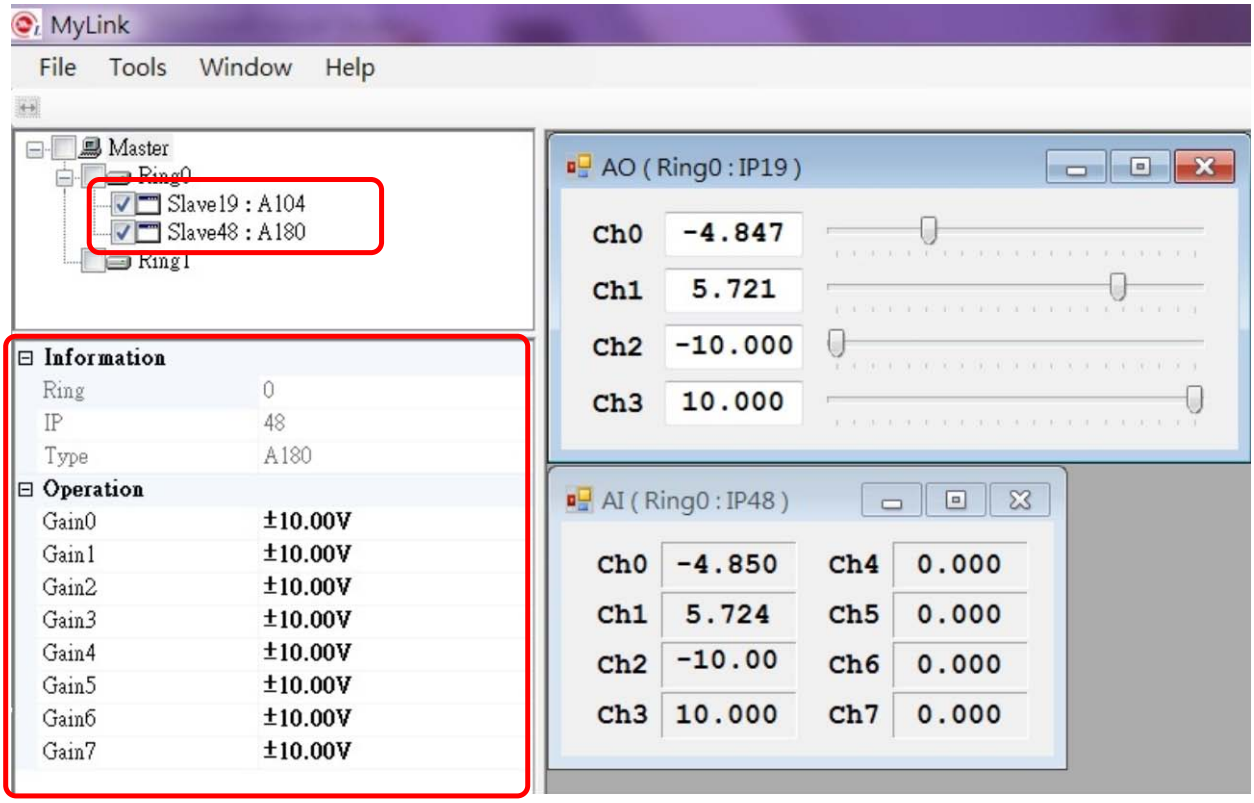


Figure 4-21: information of connected devices

- **Module Status**
  AO module with IP19 and AI module with IP48 are identified.
- **Property**
  The property of AO module is similar to DIO module. The input range property can be set here. There are 8 channels with 4 ranges (±1.25/ ±2.50/ ±5.0/ ±10.0).
- **Operation**
  Move the track bar to change the output value of AO module and the value will also be shown in the AI module.

4.2.4.2 108-A122

The only difference between 108-A122 and A104/A180 is 108-A122 has an EEPROM storage device. The operation is almost the same as A104/A180 illustrated later.

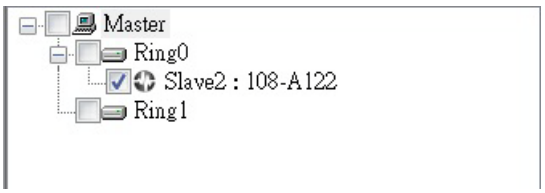


Figure 4-22: 108-A122 slave module

- **Module Status**
  The property sub-frame shows the information of 108-A122 with EEPROM.

Information	
Ring	1
IP	0
Type	108-A122
Input Setting-1.Mode	
Mode	**SingleEnded**
Input Setting-2.Gain	
Gain_Channel1	**+10.24V/-5.12**
Gain_Channel2	**+10.24V/-5.12**
Gain_Channel3	**+10.24V/-5.12**
Gain_Channel4	**+10.24V/-5.12**
Gain_Channel5	**+10.24V/-5.12**
Gain_Channel6	**+10.24V/-5.12**
Gain_Channel7	**+10.24V/-5.12**
Gain_Channel8	**+10.24V/-5.12**
Input Setting-3.ValueType	
ValueType	**Voltage**
Output Setting-1.PowerOnValue	
PowerOnValue_Ch1	**4.00**
PowerOnValue_Ch2	**3.00**
PowerOnValue_Ch3	**2.00**
PowerOnValue_Ch4	**1.00**

Figure 4-23: properties of 108-A122

- **Property**

  The extensions of 108-A122 are inputs – Mode, Gain and ValueType and output – PowerOnValue. All parameter values could be stored in the EERPOM except the ValueType.

  Mode: select the input mode single end or differential end.

  Gain: select the input voltage range. It is separated into 8 grades - +/-80mV, +/-160mV, +/-320mV, +/-640mV, +/-1.28V, +/-2.56V, +/-5.12V, +10.24/-5.12V. The input voltage larger than 5.12V is not recommended.

  ValueType: set the view of input/output as transformed voltage or the raw data. The rules to transform to the voltage value by calling APIs are as following:

  1. Take reference only on the positive voltage value. Take +10.24V for example, Range = 10.24 * 2, Start = -10.24, the result could be obtained by calling API a122_get_input_value.
  2. Input voltage Vin = (Value x Range) /65536 + Start
  3. PowerOnValue: when the power supplies, the initial value of 108-A122. Default value is 0.

- **Operation**

  The demo program is cross-connection from 4 outputs to 8 inputs separately (ex. AO1 – A1+ – A3+)

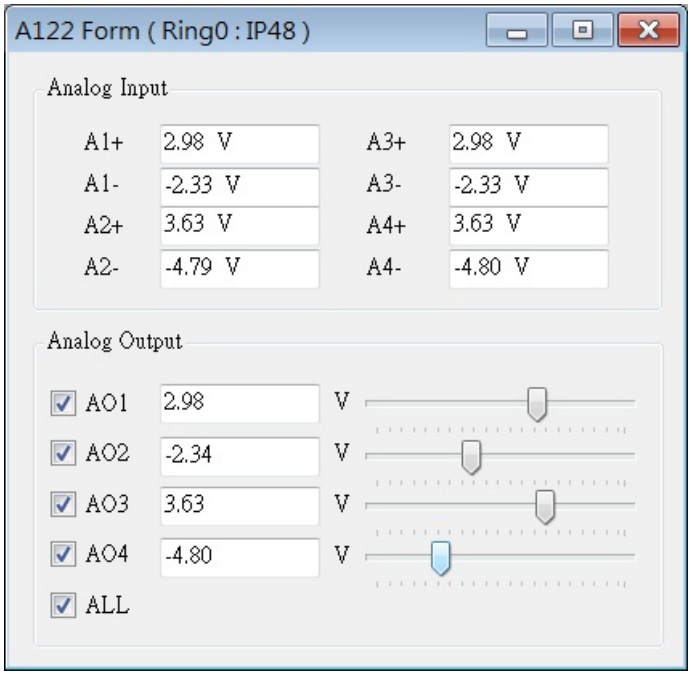


Figure 4-24: screenshot of the example

The program keeps polling of the analog input data. There are only a few options users could change – **Input Setting-1.Mode** (single end or differential), **Input Setting-2.Gain** (voltage) and the **ValueType** (voltage output or raw data).

Users could change the output value by inputting the voltage value directly or by scrolling the slide bar. Select the check box to choose which to output.

- **Retain Parameters**

As mentioned above, 108-A122 is a module with an EEPROM for data storage and MyLink is a parameter setting utility. It is very important to save the setting in the EEPROM so that users do not have to set the parameters every time when system is brought up. Moreover, users who do not thoroughly understand the settings could also use this module with the preset parameters.

Users could write the configuration in the EEPROM through **File → Backup Config to**… as following shown figure.

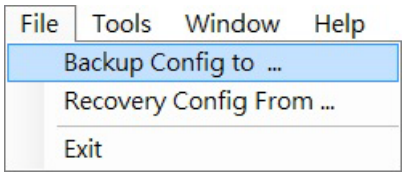


Figure 4-25: save parameters to EEPROM

If the **Backup Config to**… option is hit, a new dialog will be popped up as figure below.

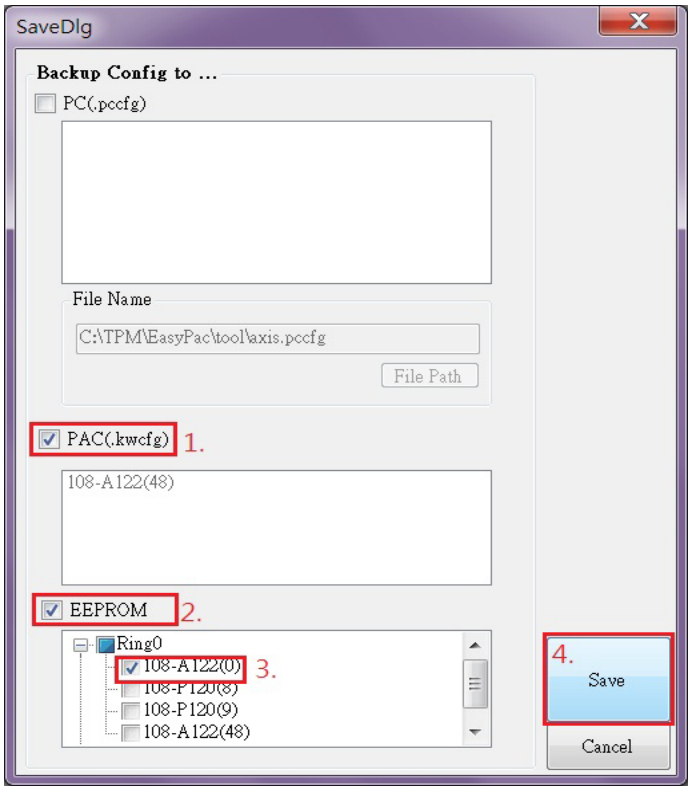


Figure 4-26: save configuration dialog

There are two targets of configuration storage – PAC and EEPROM

1. PAC

   This option is saving the configuration as an AI.kwcfg file and then transferring to PAC for KW use. It is not necessary to select devices from device list if the PAC checkbox is checked. Press the "Save" button will finish the saving.

   Note that the each AI IP address is supposed to be within 48 to 63. It will not be in the list if the IP address is out of range.

2. EEPROM

   Users need to take few steps to save the configuration in the EEPROM as following.

   1. Check the EEPROM option, and all the modules with EEPROM will show up in the list.
   2. Select modules need to store to EEPROM by checking the checkbox.
   3. Press "Save" button.

The status window displays the saving result with time stamps and messages.

Type	Time	Contect
Normal	2011/4/20 下午 05:23:35	Backup to EEPROM success 1 module.
Error	2011/4/20 下午 05:23:35	NO any Axis in PAC !!
Normal	2011/4/20 下午 05:23:35	Save AI to PAC Success!!

Figure 4-27: saving status window

- **Duplication**

This function is made to efficiently duplicate configuration profiles among same type of modules. For example, users could duplicate the configuration profile to other 108-A122 from the settings of the previous bought identical type product. The steps to duplicate are as following.

Select "**File → Recovery Config From…**" from file option.

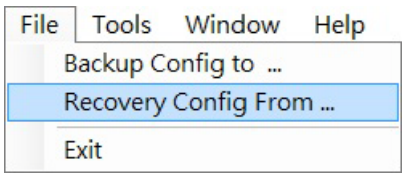


Figure 4-28: duplicate configuration option

If the **Recovery Config From**… option is hit, a new dialog will be popped up as figure below.

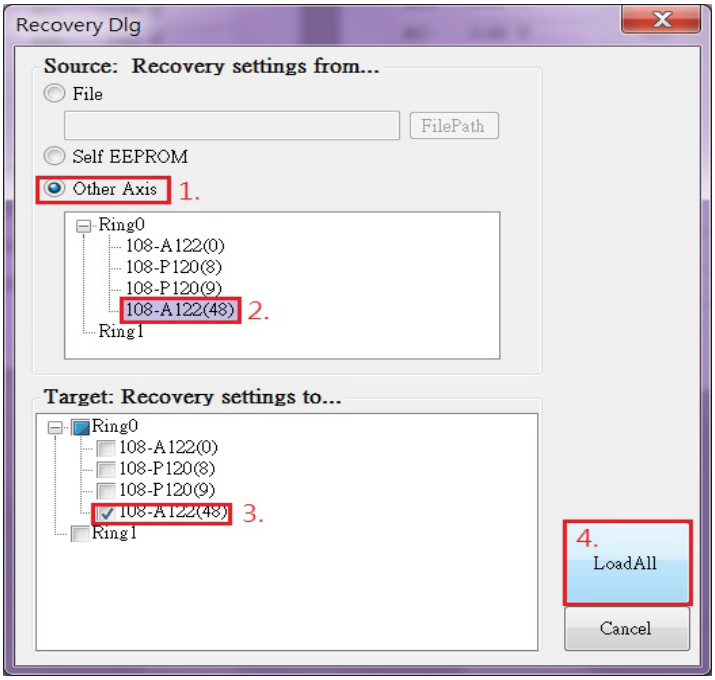


Figure 4-29: recover profile dialog

Here is the duplicating sequence:

i. Select "Other Axis" from the radio button as the recovery source.

ii. Select the copy source from the module list.

iii. Select the destinations. Users could select multiple devices by multi-checking devices or check the Ring to select all devices under the Ring.

iv. Press the “LoadAll” to finish the recovery.

The status window displays the recovery result with time stamps and messages.

Type	Time	Contect
Normal	2011/4/20 下午 05:48:54	Recovery from other axes' settings success!!Copied count: 1

Figure 4-30: recovery status window

Note that the recovery is just recovering to the specified devices, not saving to EEPROM. If the profile needs to be saved eternally, users still need to save it to the EERPOM.

4.2.5. PIO Counter Module Operation

The PIO counter module operation is illustration in this chapter. A signal generator is connected to channel 0 and channel 1 of a counter module.

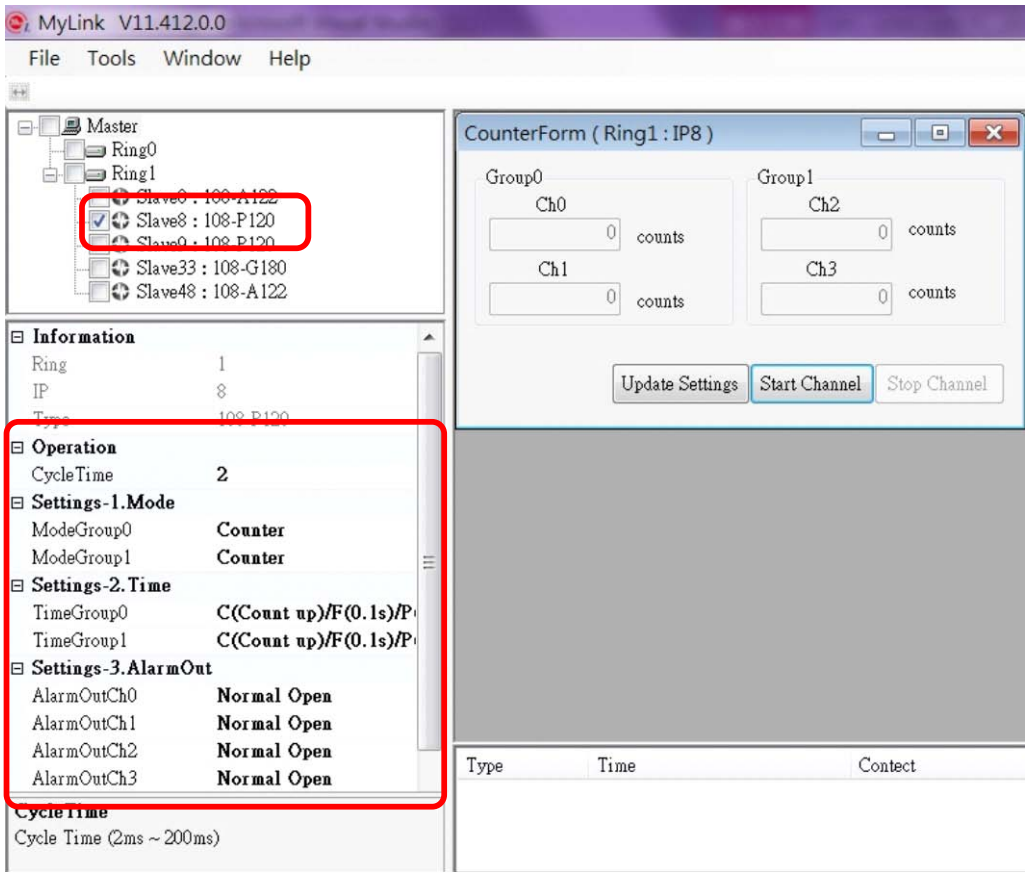


Figure 4-31: MyLink control for counter module

- **Module Status**

  Displays counter modules found with corresponding IP address. The module name is a little bit different with AI/O and DI/O. There are five modes of counter configurable. The frequency mode is adapted hereafter.

- **Property**

The 108-P120 extension properties include: Mode, Time, AlarmOut, Average, Edge, PowerOn, SafeValue, UpperLimit and LowerLimit. Except the options of Mode and Time are set with Group as a unity, other are set with each channel independently. IN0 and IN1 are grouped up as Group0 and IN2 and IN3 are grouped up as Group1.

The details of the properties are listed below:

1. Cycle Time

   It is the time period between two sampling times. The default value is 2ms and maximum at 200ms.

2. Mode

   5 modes are available: Counter, Frequency, Period, GT and GC.

Mode name	Parameter	Description
Counter	–	Counter mode
	Time	0: up-count 1: down-count
	Average	Unused
	Edge	Trigger type: Rise/Fall
	Upper Limit	0 to 4,294,967,295 Maximum number for up-count and initial number for down-count.
	Lower Limit	0 to 4,294,967,295. Initial number for up-count and minimum number for down-count.
	AlarmOut	Measured Value < Lower Limit or Measured value > Upper Limit
Frequency	–	Frequency mode
	Time	0.1s/1s/10s/100s the sampling period. 1s: INx gets 1000 pulses within 1 second, the measured frequency is 1KHz.
	Average	unused
	Edge	Trigger Type: Rise/Fall
	Upper Limit	Hz (0 ~ 4,294,967,295)
	Lower Limit	Hz (0 ~ 4,294,967,295)
	AlarmOut	Measured Value < Lower Limit or Measured value > Upper Limit
Period	–	Period measurement mode, this is used to measure the ON-OFF time of the incoming pulses, the max measured time is 800ms.
	Time	2ms/20m/200ms/800ms Set the max measure time for INx input pulse. Example: The period of INx input pulse is 1.5ms. The most accurate measure value can be obtained by 2ms. If the input pulse period ranges from 1.5ms to 500ms, please use 800ms to measure

Mode name	Parameter	Description
		the period.
	Average	Calculate the value with different number for average. “2” means the period is averaged with 2 samples.
	Edge	Trigger type: Rise/Fall
	Upper Limit	ms (0 ~ 4,294,967,295)
	Lower Limit	ms (0 ~ 4,294,967,295)
	AlarmOut	When value < Lower Limit or value > Upper Limit
GT	–	Gate Time. To measure the Gate ON or OFF time with sampling period 0.1ms.
	Time	Unused
	Average	Unused
	Edge	Trigger type: Rise/Fall
	Upper Limit	Sec (0 ~ 4,294,967,295)
	Lower Limit	Sec (0 ~ 4,294,967,295)
	AlarmOut	When value < Lower Limit or value > Upper Limit
GC	–	Gate Counter is used to measure the number of pulses on the gate. Example: The input pulse source is 1mm/pulse encoder. When the measured gate count is 1000, the length is 1 meter. Only 2 channels are available in this mode: IN0: Count0 IN2: Count1 IN1: Gate0 IN3: Gate1
	Time	Unused
	Average	Unused
	Edge	Trigger type: Rise/Fall
	Upper Limit	(0 ~ 4,294,967,295)
	Lower Limit	(0 ~ 4,294,967,295)
	AlarmOut	When value < Lower Limit or value > Upper Limit

3. DO Output

AlarmOut:	AlarmOut will be activated according to the set value as foregoing.
PowerOn Value:	It is composed by 4 bits (0b0000). The power on state of DO can be set as ON or OFF. If the value is 1, the output is ON when power on. If the value is 0, the output is OFF when power on. The bit sequence from left to right are DO3, DO2, DO1, DO0 correspondingly.
Safe Value:	It is composed by 4 bits (0b0000). Safe value of DO can be set here. If the value is 1, the output is ON when the safe protection is triggered. If the value is 0, the output is OFF when the safe protection is triggered. The main purpose is to protect from hardware damage when the module failure.

- **Operation**
  - In this example, IN0 and IN1 are connected with a signal generator.
  - Set Mode to Frequency.
  - Set Time with default value.
  - Set Average to 1
  - Press StartChannel to get the measured value.

Note: please remember to save the set parameters to EEPROM in case the set parameters are gone after reboot. Please go through AIO Module Operation subsection for reference.

4.2.6. Single Axis Module

Single Axis module is described in this section.

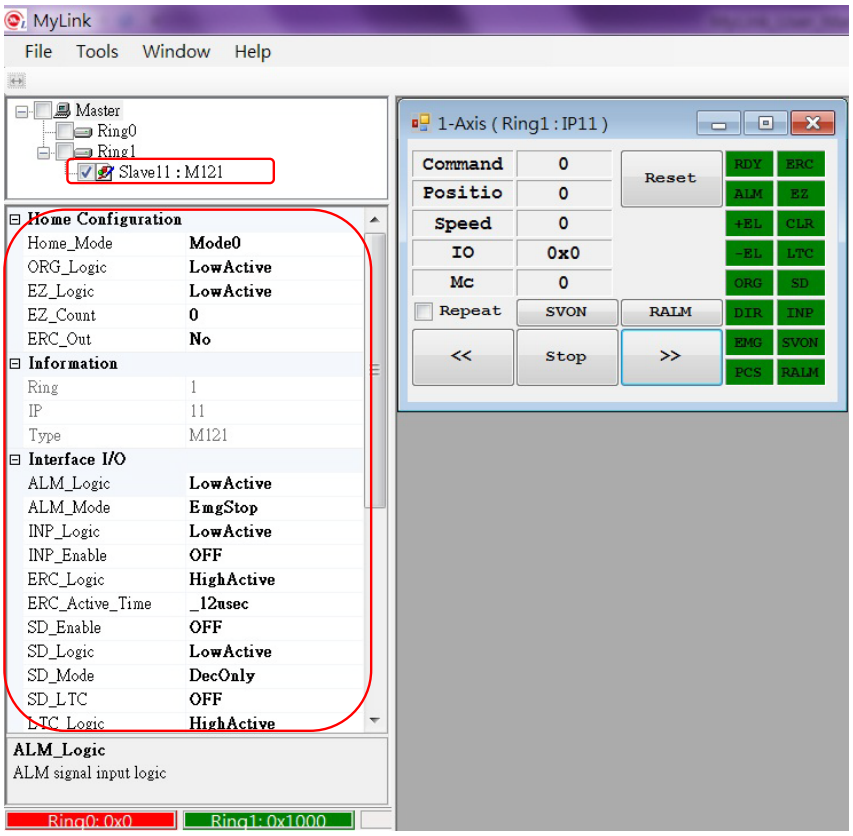


Figure 4-32: screenshot of single axis module

- **Module status**

  M121 module is identified and displayed in the above and is equipped with EEPROM. Motion slave module without EEPROM will be limited by 1. No grouped axes motion; and 2. SA_LoadConfigFile is needed to download parameter.

- **Property**

There are 3 categories of setting: Homing mode, Driver I/O interface, Machine I/O interface. Please refer to GA_GetSensor in this manual.

4.2.7. Grouped Axes

Multiple axes can be grouped up together by right click on the Ring and select “Set Axis Groups” as shown below:

Figure 4-33: group up axes

When the “Set Axis Groups” option is clicked, a dialog will pop up as the following figure.

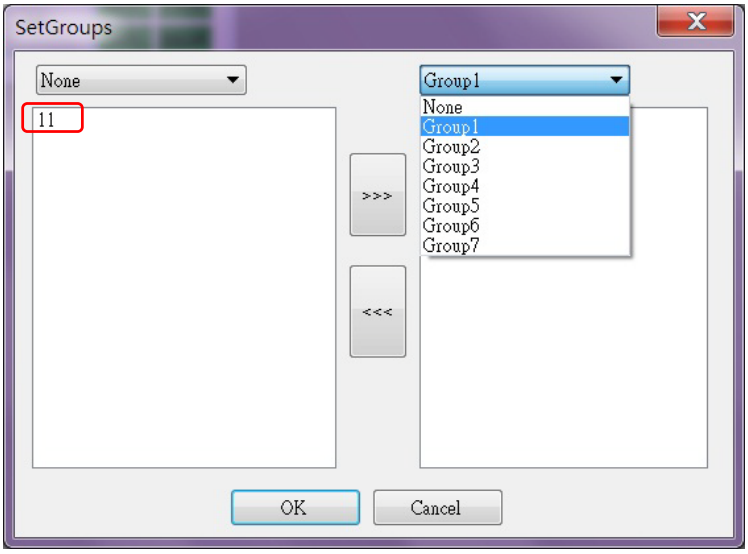


Figure 4-34: set group dialog

The “None” option of the left and right side means the axes have not joined groups. Select the non-grouped axes with one of Group1~7 specified and press the arrow button “>>>” will make the selected axes group up as a group. The grouped axes will show up in the device monitor as following:

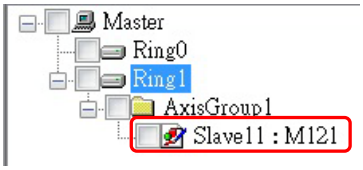


Figure 4-35: grouped axes

In this example, M121 is a grouped axis under AxisGroup1 instead an independent axis.

- **Save And Recover Configurations**

  The reading and writing of configuration profile are almost the same as AI/O in the previous section except one more place to save the configuration profile – pc.

■ **Save**

As mentioned above, a saving dialog will pop up if the “Back Config to…” option is hit.

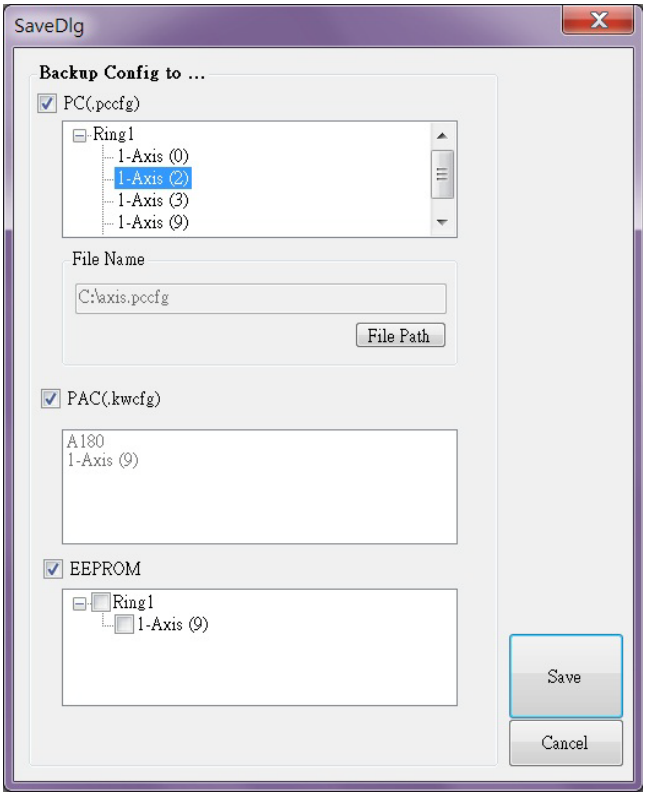


Figure 4-36: the saving dialog for group axes

1. PC

   Users could select the axes to be saved in the tree diagram. The “File Path” button let users change storage path at will. Press “Save” to save the information including information, interface I/O, pulse I/O and operation in the PC.

2. PAC

   If the PAC check box is checked, all the modules to be saved would be in the list without selection needed. If an AI module is not in this list means the IP address is not within the illegal range, 48~63. If the IP address of an axis module is not within the illegal range, 1~32 would not be in the list. Modules within legal IP range will be saved as .kwcfg file in the PAC.

3. EEPROM

   Modules with EEPROM are in the list. Users could select modules need to save the profile in the EEPROM and then press “Save” to save the configuration profile in the EEPROM.

■ **Recovery**

The recovery dialog will show up if enters “**File → Recovery Config From…**”.

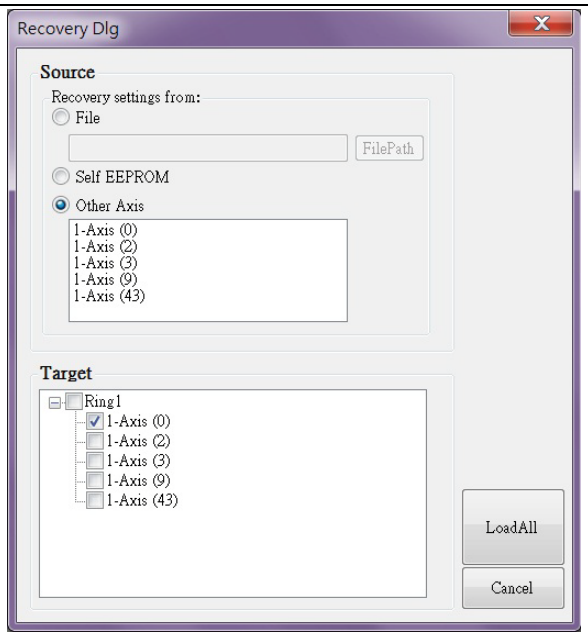


Figure 4-37: recovery dialog with file source

1. File
   The recovery source could be stored as a file. Users could recover from the file to targets in the target list.
2. Self EEPROM
   Targets could be multi selected to be recovered from self EEPROM.
3. Other Axis
   It is to duplicate the axis configuration profile from one source axis to the designated target axes.

Press “LoadAll” to recover the configuration profile.

- **Edit Path File**

Users could edit the interpolation motion path and save it as a .kwpts file under “**Tool → Edit Path**” option.

[Path]

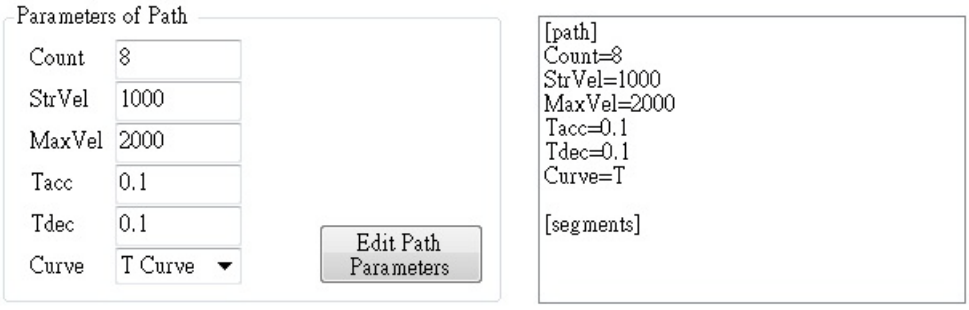


Figure 4-38: screenshot of the editing interpolation motion path

This is the very first step to edit the motion path should be done before settings of the segments. Edit

the parameters and press the “Edith Path Parameters” button to update the file content at the right side. The parameter will be described later.

[Segments]

Two axes say X and Y are supposed to be selected to form a segment. The X and Y need to be grouped already. The corresponding IP of Y-axis will be removed if the X-axis has selected the one in advance.

Figure 4-39: picking IP of X and Y axis

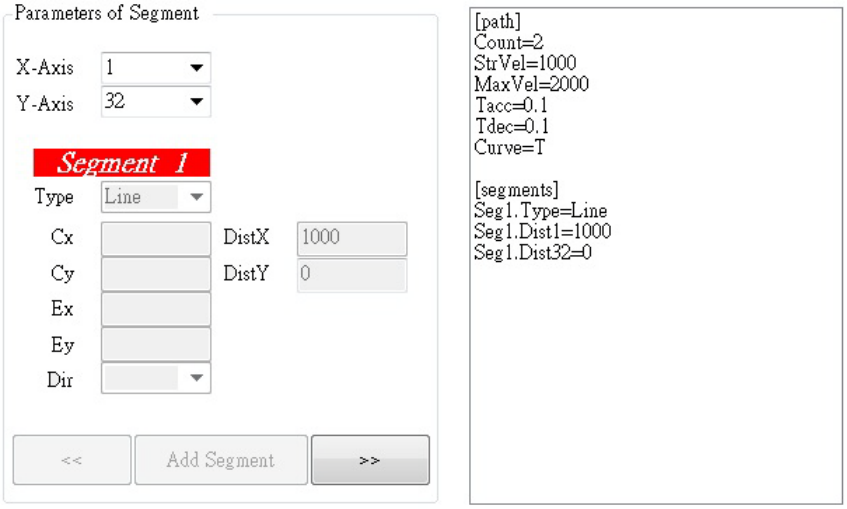


Figure 4-40: parameters of a segment

After setting of IP addresses of X and Y axis, users could edit the parameters of the segment. The first parameter is “Type” with options “Line” and “Arc”. It needs DistX and DistY for type Line. With respect to type Arc, it takes five parameters. Input all the necessary parameters then press “Add Segment” to add the settings as a new segment in the path file at right hand side. Users could press “>>” to start a new segment or press “<<” to modify the previous added segment.

If all the segments are finished, the “Save” button in the “Save Path to PAC” area will be enabled to save the path to EasyPAC as shown below.

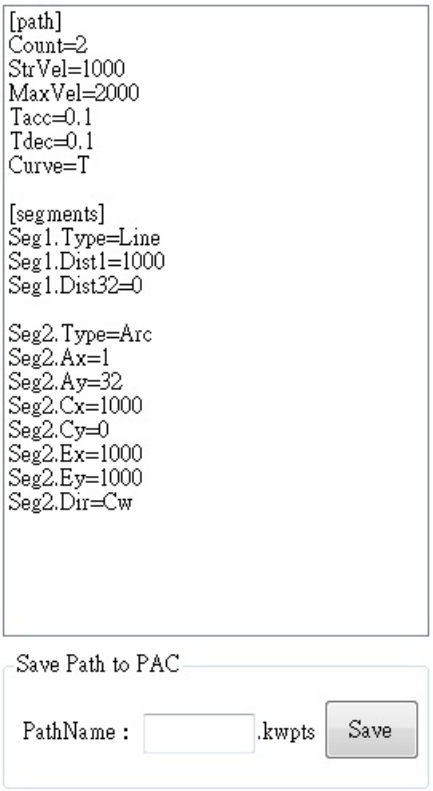


Figure 4-41: motion profile formed by segments

Here is an example that two axes form a round-angle rectangular with interpolation.

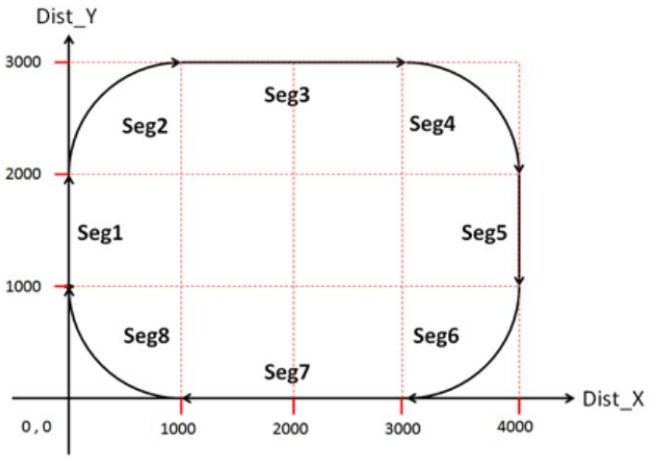


Figure 4-42: motion path of two axes interpolation

[Path]

Count=8

StrVel=100

MaxVel=6000

Tacc=0.1

Tdec=0.1

Curve: T

[Segments]
Seg1.Type=Line
Seg1.Dist8=0
Seg1.Dist9=1000

Seg2.Type=Arc
Seg2.Ax=8
Seg2.Ay=9
Seg2.Cx=1000
Seg2.Cy=0
Seg2.Ex=1000
Seg2.Ey=1000
Seg2.Dir=Cw

Seg3.Type=Line
Seg3.Dist8=2000
Seg3.Dist9=0

Seg4.Type=Arc
Seg4.Ax=8
Seg4.Ay=9
Seg4.Cx=0
Seg4.Cy=-1000
Seg4.Ex=1000
Seg4.Ey=-1000
Seg4.Dir=Cw

Seg5.Type=Line
Seg5.Dist8=0
Seg5.Dist9=-1000

Seg6.Type=Arc
Seg6.Ax=8
Seg6.Ay=9
Seg6.Cx=-1000
Seg6.Cy=0
Seg6.Ex=-1000
Seg6.Ey=-1000
Seg6.Dir=Cw

Seg7.Type=Line
Seg7.Dist8=-2000
Seg7.Dist9=0

Seg8.Type=Arc
Seg8.Ax=8
Seg8.Ay=9
Seg8.Cx=0
Seg8.Cy=1000
Seg8.Ex=-1000
Seg8.Ey=1000
Seg8.Dir=Cw

The path file stores each segment motion of each axis as a .kwpts file. Rules for motion path file editing are listed below.

[Path]

Count = 8	No. of path segments, max. 100
StrVel = 100	Start velocity, unit is pps. Value is 0~6666666
MaxVel = 6000	Maximum velocity, unit is pps. Value is 0~6666666, must be > StrVel
Tacc = 0.1	Acc. time unit is sec, data type is float
Tdec = 0.1	Dec. time unit is sec, data type is float
Curve: T	Velocity profile is T curve or S curve
Segment description:	Start Point is (0, 1000)
Seg1.Type = Line	Path type is line
Seg1.Dist8 = 0	Axis with IP8 is grouped, 0 pulses. Range: Dist1~Dist32
Seg1.Dist9 = 1000	Axis with IP9 is grouped, 1000 pulses. Range: Dist1~Dist32
Seg2.Type = Arc	Path type is circle
Seg2.Ax = 8	Axis with IP8 is assigned as X-Axis. Range: 1~32
Seg2.Ay = 9	Axis with IP9 is assigned as Y-Axis. Range: 1~32
Seg2.Cx = 1000	Center of circle is 1000 relative to X-Axis. Range: -134217728 ~ 134217727
Seg2.Cy = 0	Center of circle is 0 relative to Y-Axis. Range: -134217728 ~ 134217727
Seg2.Ex = 1000	End point in X-Axis is 1000. Range: -134217728 ~ 134217727
Seg2.Ey = 1000	End point in Y-Axis is 1000. Range: -134217728 ~ 134217727
Seg2.Dir = Cw	Clockwise circle

Seg3.Type = Line	Path type is line
Seg3.Dist8 = 2000	Axis with IP8 is grouped, 2000 pulses. Range: Dist1~Dist32
Seg3.Dist9 = 0	Axis with IP9 is grouped, 0 pulses. Range: Dist1~Dist32
Seg4.Type = Arc	Path type is circle
Seg4.Ax = 8	Axis with IP8 is assigned as X-Axis. Range: 1~32
Seg4.Ay = 9	Axis with IP9 is assigned as Y-Axis. Range: 1~32
Seg4.Cx = 0	Center of circle is 0 relative to X-Axis. Range: -134217728 ~ 134217727
Seg4.Cy = -1000	Center of circle is 1000 relative to Y-Axis. Range: -134217728 ~ 134217727
Seg4.Ex = 1000	End point in X-Axis is 1000. Range: -134217728 ~ 134217727
Seg4.Ey = -1000	End point in Y-Axis is 1000. Range: -134217728 ~ 134217727
Seg4.Dir = Cw	Clockwise circle

The sequence of Seg5 ~ Seg8 are similar to which of Seg1 ~ Seg4 which are skipped here.

- Operation

All the signals are displayed in green background after the hardware properties are set. The single axis motion window is shown in the following figure.

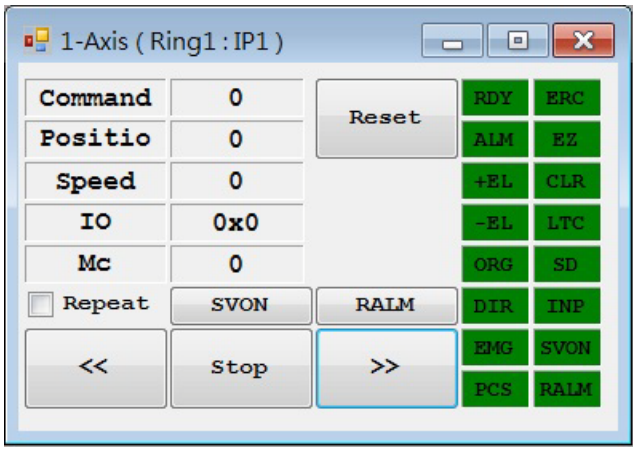


Figure 4-43: screenshot of axis control window

Before testing the axis, it is necessary to make the motor servo on. The “SVON” signal will become from green to red. If the “Servo Drive Alarm Reset” is connected to the output signal, the “RALM” must be pressed and the corresponding signal turns red. If the “Repeat” option is checked, the motion will go back and forth infinitely with the pre-defined position. The “DIR” signal will toggle as well.

With respect to the group axes, the “SVON” action should be done as mentioned. Users could check the group folder to bring up the axis group option.

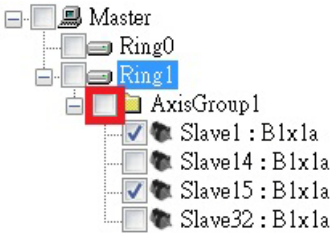


Figure 4-44: check the group folder to update axis parameters

The window of grouped axes properties is as the following figure.

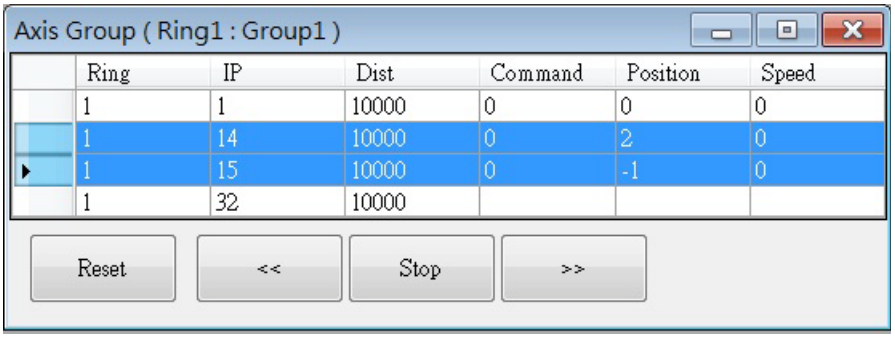


Figure 4-45: axis group properties

Before running the axis, please make sure the properties are set correctly.

Information	
Ring	1
Group	3
Operation	
MoveMode	**Relative**
StopMode	**SdStop**
VelProfile	**TCurve**
StrVel	**100**
MaxVel	**10000**
Tacc	**0.1**
Tdec	**0.1**
InterpolationMode	**Line**
Cx	**10000**
Cy	**0**
Ex	**10000**
Ey	**10000**

Figure 4-46: axis properties window

MoveMode: the options are Relative or Absolute move.
StopMode: the options are abrupt stop or slow down stop
VelProfile: the options are T-curve or S-curve
InterpolationMode: the options are Line or Arc

The group operation depends on the VelProfile (Line/Arc). More than two axes could be joined together as a group in line interpolation mode.

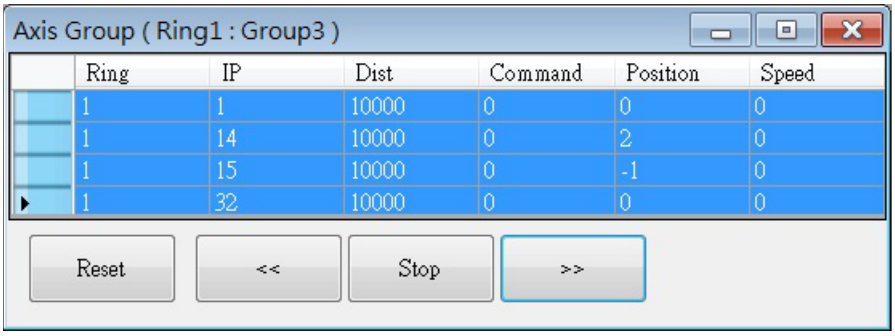


Figure 4-47: more than two axes are possible to run together in line interpolation mode

Users could only choose exactly two axes to do arc interpolating motions. More than two or less than two axes will cause an error message in the message window.

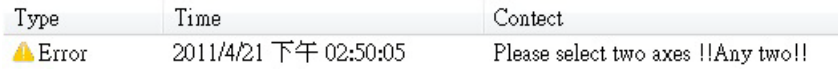


Figure 4-48: error message if not two axes are doing arc interpolating motion

4.3. MyDataCheck

EasyPAC provides 2 kinds of data type for MULTIPROG and Modbus:

1. The data type defined by I/O Configuration on ProConOS is to be used for MULTIPROG.
2. The data type defined by Modbus is to be used for HMI connection.

MyDataCheck is used to map easily and correctly the data in ProConOS to MULTIPROG and Modbus.
MyDataCheck is installed in the remote PC but the EasyPAC.

Recommended Hardware Requirement

PC Hardware: PC or laptop with Intel Centrino up CPU
Memory: 1GB RAM
OS: Windows 2000/XP/Win7
LAN card: RJ-45 10/100/1000 Mbps

Software Installation

1 executable file: MyDataCheck.exe

ProConOS/MULTIPROG I/O Configuration

There are 3 types of memory: INPUT (%I), OUTPUT (%Q), VARCONF (%M).

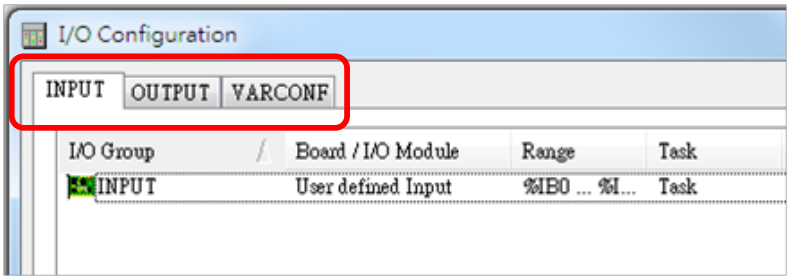


Figure 4-49: three tabs of each type of memory

Ring_0 of EasyPAC supports up to 48 DIO modules and 16 (IP48~IP63) AIO or PIO modules. INPUT/OUTPUT is explained in the following:

Total length of INPUT:
Local DI (1) + Motionnet DI (IP0~IP47) + Motionnet AI (IP48~IP63)
= 1 + 48 (IP) x 4 (Port) x 1 (Byte) + 16 (IP) x 8 (Channel) x 2 (Byte)
= 1 + 192 + 256
= 449 (Byte)

Total length of OUTPUT:
Local DO (1) + Motionnet DO (IP0~IP47) + Motionnet AO (IP48~IP63)
= 1 + 48 (IP) x 4 (Port) x 1 (Byte) + 16 (IP) x 8 (Channel) x 2 (Byte)
= 1 + 192 + 256
= 449 (Byte)

The reference table is shown below.

Type			Length (Byte)	
INPUT (%I)	Non Retain 0 ~ 448	Local DI	449	1
		Motionnet DI		192
		Motionnet AI		256
OUTPUT (%Q)	Non Retain 0 ~ 448	Local DO	449	1
		Motionnet DO		192
		Motionnet AO		256
VARCONF (%M)	Non Retain 0 ~ 47999	MB (Coil)	48000	1024
		MB (Holding Register)		1024
		MB (Discrete Input)		1024
		MB (Input Register)		1024
		User Define		35904
		Motion (Single)		5000
		Motion (Multiple)		1000
		Gateway		2000
	Retain 10000000 ~ 10013311	User Define	13312	13312

Table 4-1: data type with memory occupation table

Real variable (%I, %Q)

%IX: Bit Input, %IX 1.2 means bit 2 of byte 1.

%IQ: Bit Output, %QX 2.3 means bit 3 of bye 2.

%IB: Byte input, %IB 1 means byte 1.

%QB: Byte output, %QB 2 means byte 2.

Local 8DI/8DO is mapped to port 0 and can be accessed by %IB 0 (%IX 0.0 ~ %IX 0.7) and %QB 0 (%QX 0.0~%QX 0.7).

Each Motionnet DIO slave module has 4 ports (0~3) and each port is 8-bit.

%IW: Word input. This is used to get AI value by channel.

%QW: Word output. This is used to set AO value by channel.

The maximum channel number of Motionnet AIO slave module is 8 (0~7).

%ID: Double Word Input. This is used to get counter value by channel.

The maximum channel number of Motionnet counter module is 4 (0~3).

VARCONF

Virtual variable (%M)

%MX: used for BOOL type

%MB: used for BYTE type

%MW: used for WORD type

%MD: used for DWORD type

The following 8 non-retain data types are designed for Modbus:

MB (Coil): is mapped to Tag for Modbus.

MB (Holding Register): is mapped to Output for Modbus.

MB (Discrete Input): is mapped to Input Tag for Modbus.

MB (Input Register): is mapped to Input for Modbus.

User Define: is defined by user.

Motion (Single): Single Axis Data.

Motion(Multiple): Multiple Axis Data.

Gateway: to be implemented.

Retain Memory is ranged from %MB 3.10000000 to %MB 3.10013311 (i.e. 13312 Bytes).

Type	MULTIPROG Memory Address			
	Begin	Access Tag	End	Access Tag
Local DI	%IB 0	%IX 0.0	%IB 0	%IX 0.7
Motionnet DI	%IB 1	%IX 1.0	%IB 192	%IX 192.7
Motionnet AI	%IB 193	%IW 193	%IB 448	%IW 447
Local DO	%QB 0	%QX 0.0	%QB 0	%QX 0.7
Motionnet DO	%QB 1	%QX 1.0	%QB 192	%QX 192.7
Motionnet AO	%QB 193	%QW 193	%QB 448	%QW 447
MB (Coil)	%MB 3.0		%MB 3.1023	
MB (Holding Register)	%MB 3.1024		%MB 3.2047	
MB (Discrete Input)	%MB 3.2048		%MB 3.3071	
MB (Input Register)	%MB 3.3072		%MB 3.4095	
User Define	%MB 3.4096		%MB 3.39999	
Motion (Single)	%MB 3.40000		%MB 3.44999	
Motion (Multiple)	%MB 3.45000		%MB 3.45999	
Gateway	%MB 3.46000		%MB 3.47999	
User Define	%MB 3.10000000		%MB 3.10013311	

Table 4-2: MULTIPROG memory table

To support connection with HMI by Modbus the following memory design is implemented

Modbus Memory

Modbus Memory is grouped into the following 4 sections:

Coil: Output Tag (Bit)

Real I/O: ranged from 0 to 1543 (BOOL)

Virtual: ranged from 1544 to 9735 (BOOL)

Holding Register: Output Data (Word)

Real I/O: ranged from0 to 127 (WORD)

Virtual: ranged from 128 to 639 (WORD)

Discrete Input: Input Tag (Bit)

Real I/O: ranged from 0 to 1543 (BOOL)

Virtual: ranged from 1544 to 9735 (BOOL)

Input Register: Input Data (Word)

Real I/O: ranged from 0 to 127 (WORD)

Virtual: ranged from 128 to 639 (WORD)

Please refer to the following summary table.

Type	Modbus Memory Address	
	Begin	End
Local DI	0 (BOOL)	7 (BOOL)
Motionnet DI	8 (BOOL)	1543 (BOOL)
Motionnet AI	0 (WORD)	127 (WORD)
Local DO	0 (BOOL)	7 (BOOL)
Motionnet DO	8 (BOOL)	1543 (BOOL)
Motionnet AO	0 (WORD)	127 (WORD)
MB(Coil)	1544 (BOOL)	9735 (BOOL)
MB(Holding Register)	128 (WORD)	639 (WORD)
MB(Discrete Input)	1544 (BOOL)	9735 (BOOL)
MB(Input Register)	128 (WORD)	639 (WORD)
User Define		
Motion(Single)		
Motion(Multiple)		
Gateway		
User Define		

Table 4-3: Modbus memory table

4.3.1. Data Address Mapping

MyDataCheck is designed for data transforming of Motionnet slave modules supported by EasyPAC.

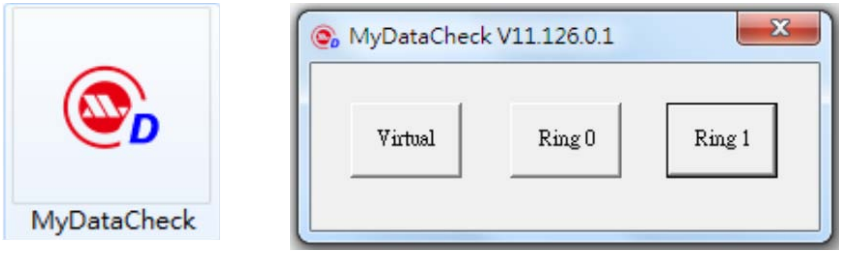


Figure 4-50: MyDataCheck icon and main window

Title: MyDataCheck V11.126.0.1 is the version information.
Virtual: is for virtual Memory Address mapping.
Ring_0: is for Motionnet DIO/AIO/PIO modules address mapping.
Ring_1: is for Motionnet Axis Module address mapping.

4.3.1.1 Ring_0 Memory Address Mapping

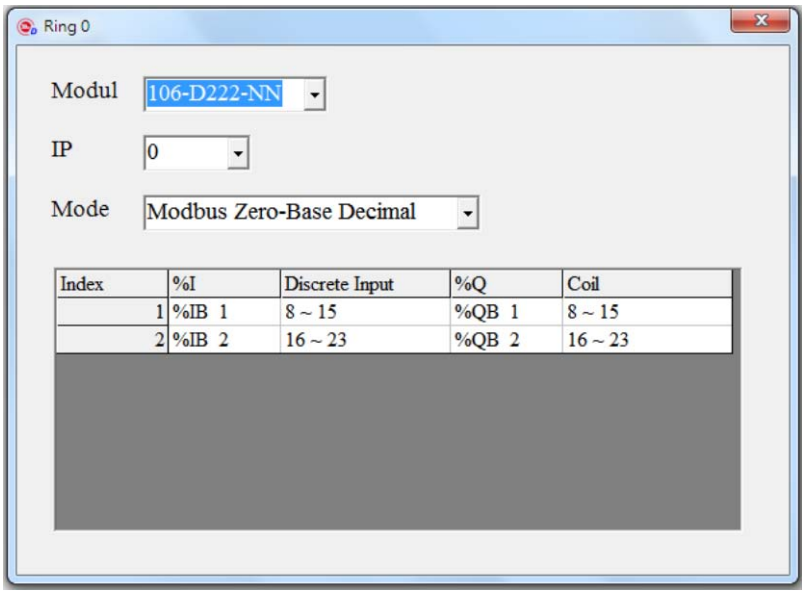


Figure 4-51: Ring_0 memory address mapping

Module: Select the module model for Ring_0.
IP: slave module IP, IP0~IP47 is for DIO and IP48~IP63 is for AIO or PIO.
Mode: Select the Modbus type.

4.3.1.2 Ring_1 Memory Address Mapping

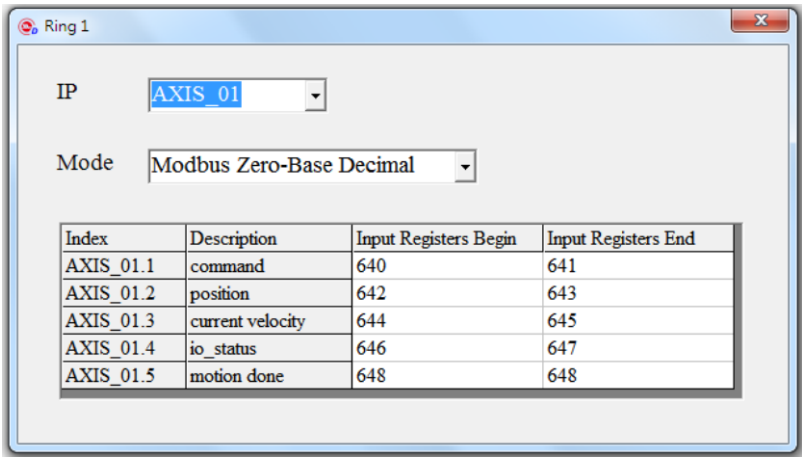


Figure 4-52: Ring_1 memory address mapping

The available Axis module for Ring_1 is listed here.

IP: IP1~IP32 is for single axis module. IP1 = AXIS_01 and IP32 = AXIS_32.

Mode: Select the Modbus type.

4.3.1.3 Virtual Memory Address Mapping

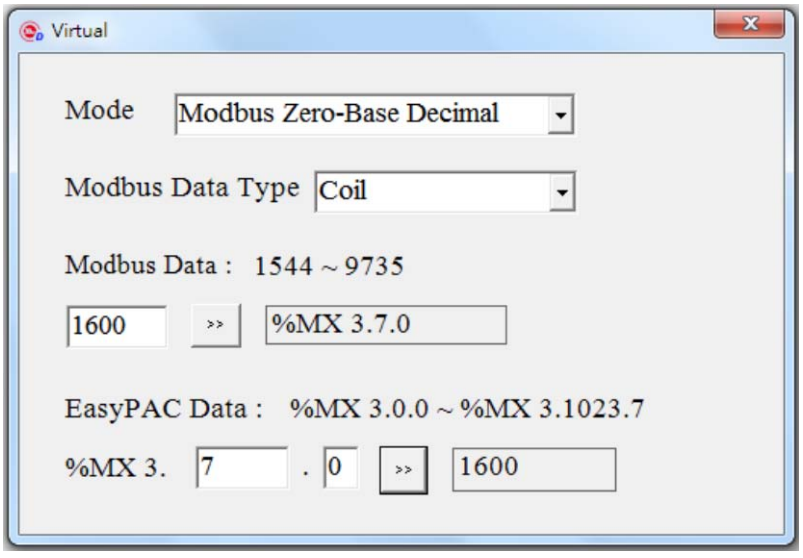


Figure 4-53: virtual memory address mapping

Mode: Select the Modbus type.

Modbus Data Type: Coil (Output Tag), Discrete Input (Input Tag), Holding Register (Output Data) or Input Register (Input Data).

Modbus Data: Modbus data is mapped to %M of MULTIPROG.

EasyPAC Data: %M of MULTIPROG is mapped to Modbus data.

4.3.2. Address Mapping Table

Data type of Modbus is in the following table.

Primary tables	Object type	Type of
Discrete Input	Single bit	Read-Only
Coils	Single bit	Read-Write
Input Registers	16-bit word	Read-Only
Holding Registers	16-bit word	Read-Write

Table 4-4: data type of Modbus

Ring_0 DI/O

IP	DI	MODBUS				DO	MODBUS			
	%I	Discrete Input				%Q	Coil			
		Begin		End			Begin		End	
		DEC	HEX	DEC	HEX		DEC	HEX	DEC	HEX
L	%IB 0	0	0	7	7	%QB 0	0	0	7	7
0	%IB 1	8	8	15	F	%QB 1	8	8	15	F
	%IB 2	16	10	23	17	%QB 2	16	10	23	17
	%IB 3	24	18	31	1F	%QB 3	24	18	31	1F
	%IB 4	32	20	39	27	%QB 4	32	20	39	27

Table 4-5: table of Ring_0 DI/O

IP: “L” represents Local DI (%IB 0) and Local DO (%QB 0).

“0” is the slave module with IP 0. Available IP ranges from 0~47.

The following data type is available with same slave IP: 32DI (IB1~4), 32DO (QB1~4) or 16DI/16DO (IB1~2/QB1~2).

Ring_0 AI/O and Counter

IP	AI	COUNTER	MODBUS		AO	MODBUS	
	%I		Input Registers		%Q	Holding Registers	
			DEC	HEX		DEC	HEX
48	%IW 193	%ID 193	0	0	%QW 193	0	0
	%IW 195		1	1	%QW 195	1	1
	%IW 197	%ID 197	2	2	%QW 197	2	2
	%IW 199		3	3	%QW 199	3	3
	%IW 201	%ID 201	4	4	%QW 201	4	4
	%IW 203		5	5	%QW 203	5	5
	%IW 205	%ID 205	6	6	%QW 205	6	6
	%IW 207		7	7	%QW 207	7	7

Table 4-6: table of Ring_0 AI/O and counter

IP: “48” Available IP for AIO/PIO is ranged from 48 to 63 and the total number is 16.

The following data types are available with the same slave IP: 8 Channel AI (%IW 193 ~ 207), 8 Ch. AO (%QB 193 ~ 207) and 4 Channel PI Counter (%ID 193 ~ 205).

The data type of AIO is WORD (Hex 0x0000~0xFFFF). The engineering unit can be calculated. When the gain of Ch.0 of AI is ±10V, %IW 193 = 0x0000 (-10V) ~ 0xFFFF (+10V)

The data type of PIO counter module is DWORD (Hex 0x00000000~0xFFFFFFFF).

In the case of 108-P120, different modes can be set as described in the following:

1. Counter: Count the no. of pulses.
2. Frequency: Measure the frequency of the input pulse (Time is 0.1s~100s).
   For example, When Time is set to 1s and gets 1000 pulse from IN0, %ID 193 = 0x000003E8. The freq. is 1 KHz.
3. Period: Measure the period of the incoming pulse in the unit of ns.
   For example, when the input pulse is with 2ms width in IN0, %ID 193 = 0x001E8480, period is 2000000ns. The freq. is 500 Hz.
4. GT: Measure the ON/Off Time in the Gate, sampling period is 0.1ms.
   For example, the signal in the gate is 2 seconds, 2000ms/0.1ms= 20000, %ID 193 = 0x00004E20.
5. GC: Only 2 channels are available in this mode:
   Channel 0 Channel 1
   IN0: Count0 IN2: Count1
   IN1: Gate0 IN3: Gate1
   IN1 and IN3: Measure the Gate input time
   IN0 and IN2: Measure the pulse input Count

Ring_1 Axis

IP	AXES		MODBUS			
			Input Registers			
			Begin		End	
			DEC	HEX	DEC	HEX
1	AXIS_01.1	Command	640	280	641	281
	AXIS_01.2	Position	642	282	643	283
	AXIS_01.3	current velocity	644	284	645	285
	AXIS_01.4	io_status	646	286	647	287
	AXIS_01.5	motion done	648	288	648	288

Table 4-7: table of Ring_1 axis

IP: “1” The available IP for Axis module is 1 ~32 (Total no. is 32).
IP1 is for Axis_01
AXIS_01.1 command: DWORD
Command Position: 0x00000000~0xFFFFFFFF (Pulse).
AXIS_01.2 position: DWORD
Current Position: 0x00000000~0xFFFFFFFF (Pulse).
AXIS_01.3 current velocity: DWORD
Current velocity: 0x00000000~0xFFFFFFFF (PPS).
AXIS_01.4 io_status: DWORD
I/O status of the axis: “1” is ON, “0” is OFF, Bit16 ~ Bit31 is reserved.

Bit0 (RDY): RDY pin input
Bit1 (ALM): Alarm Signal
Bit2 (+EL): Positive Limit Switch
Bit3 (-EL): Negative Limit Switch
Bit4 (ORG): Origin Switch
Bit5 (DIR): DIR output
Bit6 (EMG): Emergency signal input
Bit7 (PCS): PCS signal input
Bit8 (ERC): ERC pin output
Bit9 (EZ): Index signal
Bit10 (CLR): Clear Counter Input
Bit11 (Latch): Latch signal input
Bit12 (SD): Slow Down signal input
Bit13 (INP): In-Position signal input
Bit14 (SVON): Servo-ON output status
Bit15 (RALM): Alarm Reset output status

AXIS_01.5 motion done: WORD

Motion done is the axis status, WORD, value is 0x0000~0x000B, 0x000C ~ 0xFFFF is reserved.

0x0000: Stop
0x0001: Wait STA
0x0002: Wait ERC finish
0x0003: Wait Dir change
0x0004: BackLashing
0x0005: Wait PA/PB
0x0006: In FA motion
0x0007: In FL motion
0x0008: Acc
0x0009: In FH motion
0x000A: Dec.
0x000B: Wait INP

Virtual Data

Digital output:

%M	%M				MODBUS			
					Coil			
	Begin		End		Begin		End	
					DEC	HEX	DEC	HEX
B 3.	X 3.							
0	0	0	0	7	1544	608	1551	60F

Table 4-8: digital output of virtual data

Digital Output is described in the following:

%MB 3.0 = Coil 1544 ~ Coil 1551

%MX 3.0.0 = Coil 1544

%MX 3.0.1 = Coil 1545

%MX 3.0.2 = Coil 1546

%MX 3.0.3 = Coil 1547

%MX 3.0.4 = Coil 1548

%MX 3.0.5 = Coil 1549

%MX 3.0.6 = Coil 1550

%MX 3.0.7 = Coil 1551

Digital input:

%M	%M				MODBUS			
					Discrete Input			
	Begin		End		Begin		End	
					DEC	HEX	DEC	HEX
B 3.	X 3.							
2048	2048	0	2048	7	1544	608	1551	60F

Table 4-9: digital input of virtual data

Digital Input is described in the following

%MB 3.2048 = Discrete Input 1544 ~ Discrete Input 1551

%MX 3.2048.0 = Discrete Input 1544

%MX 3.2048.1 = Discrete Input 1545

%MX 3.2048.2 = Discrete Input 1546

%MX 3.2048.3 = Discrete Input 1547

%MX 3.2048.4 = Discrete Input 1548

%MX 3.2048.5 = Discrete Input 1549

%MX 3.2048.6 = Discrete Input 1550

%MX 3.2048.7 = Discrete Input 1551

Register:

%M	MODBUS		%M	MODBUS	
	Holding Registers			Input Registers	
	DEC	HEX		DEC	HEX
W 3.			W 3.		
1024	128	80	3072	128	80

Table 4-10: register of virtual data

Virtual data is described in the following:

%MW 3.1024 = Holding Registers 128

%MW 3.3072 = Input Registers 128

4.3.3. Mapping Tables

Ring 0																				Ring 1								
IP	DI	MODBUS				DO	MODBUS				IP	AI	COUNTER	MODBUS		AO	MODBUS		IP	AXES		MODBUS					
	%I	Discrete Input				%Q	Coil					%I		Input Registers		%Q	Holding Registers					Input Registers					
		Begin		End			Begin		End													Begin		End			
		DEC	HEX	DEC	HEX		DEC	HEX	DEC	HEX				DEC	HEX		DEC	HEX				DEC	HEX	DEC	HEX		
L	%IB 0	0	0	7	7	%QB 0	0	0	7	7																	
0	%IB 1	8	8	15	F	%QB 1	8	8	15	F		%IW 193	%ID 193	0	0	%QW 193	0	0		AXIS_01.1	command	640	280	641	281		
	%IB 2	16	10	23	17	%QB 2	16	10	23	17		%IW 195		1	1	%QW 195	1	1		AXIS_01.2	position	642	282	643	283		
	%IB 3	24	18	31	1F	%QB 3	24	18	31	1F		%IW 197	%ID 197	2	2	%QW 197	2	2	1	AXIS_01.3	current velocity	644	284	645	285		
	%IB 4	32	20	39	27	%QB 4	32	20	39	27	48	%IW 199		3	3	%QW 199	3	3		AXIS_01.4	io_status	646	286	647	287		
1	%IB 5	40	28	47	2F	%QB 5	40	28	47	2F		%IW 201	%ID 201	4	4	%QW 201	4	4		AXIS_01.5	motion done	648	288	648	288		
	%IB 6	48	30	55	37	%QB 6	48	30	55	37		%IW 203		5	5	%QW 203	5	5		AXIS_02.1	command	649	289	650	28A		
	%IB 7	56	38	63	3F	%QB 7	56	38	63	3F		%IW 205	%ID 205	6	6	%QW 205	6	6		AXIS_02.2	position	651	28B	652	28C		
	%IB 8	64	40	71	47	%QB 8	64	40	71	47		%IW 207		7	7	%QW 207	7	7	2	AXIS_02.3	current velocity	653	28D	654	28E		
2	%IB 9	72	48	79	4F	%QB 9	72	48	79	4F		%IW 209	%ID 209	8	8	%QW 209	8	8		AXIS_02.4	io_status	655	28F	656	290		
	%IB 10	80	50	87	57	%QB 10	80	50	87	57		%IW 211		9	9	%QW 211	9	9		AXIS_02.5	motion done	657	291	657	291		
	%IB 11	88	58	95	5F	%QB 11	88	58	95	5F		%IW 213	%ID 213	10	A	%QW 213	10	A		AXIS_03.1	command	658	292	659	293		
	%IB 12	96	60	103	67	%QB 12	96	60	103	67	49	%IW 215		11	B	%QW 215	11	B		AXIS_03.2	position	660	294	661	295		
3	%IB 13	104	68	111	6F	%QB 13	104	68	111	6F		%IW 217	%ID 217	12	C	%QW 217	12	C	3	AXIS_03.3	current velocity	662	296	663	297		
	%IB 14	112	70	119	77	%QB 14	112	70	119	77		%IW 219		13	D	%QW 219	13	D		AXIS_03.4	io_status	664	298	665	299		
	%IB 15	120	78	127	7F	%QB 15	120	78	127	7F		%IW 221	%ID 221	14	E	%QW 221	14	E		AXIS_03.5	motion done	666	29A	666	29A		
	%IB 16	128	80	135	87	%QB 16	128	80	135	87		%IW 223		15	F	%QW 223	15	F		AXIS_04.1	command	667	29B	668	29C		
4	%IB 17	136	88	143	8F	%QB 17	136	88	143	8F		%IW 225	%ID 225	16	10	%QW 225	16	10		AXIS_04.2	position	669	29D	670	29E		
	%IB 18	144	90	151	97	%QB 18	144	90	151	97		%IW 227		17	11	%QW 227	17	11	4	AXIS_04.3	current velocity	671	29F	672	2A0		
	%IB 19	152	98	159	9F	%QB 19	152	98	159	9F		%IW 229	%ID 229	18	12	%QW 229	18	12		AXIS_04.4	io_status	673	2A1	674	2A2		
	%IB 20	160	A0	167	A7	%QB 20	160	A0	167	A7	50	%IW 231		19	13	%QW 231	19	13		AXIS_04.5	motion done	675	2A3	675	2A3		
5	%IB 21	168	A8	175	AF	%QB 21	168	A8	175	AF		%IW 233	%ID 233	20	14	%QW 233	20	14		AXIS_05.1	command	676	2A4	677	2A5		
	%IB 22	176	B0	183	B7	%QB 22	176	B0	183	B7		%IW 235		21	15	%QW 235	21	15		AXIS_05.2	position	678	2A6	679	2A7		
	%IB 23	184	B8	191	BF	%QB 23	184	B8	191	BF		%IW 237	%ID 237	22	16	%QW 237	22	16	5	AXIS_05.3	current velocity	680	2A8	681	2A9		
	%IB 24	192	C0	199	C7	%QB 24	192	C0	199	C7		%IW 239		23	17	%QW 239	23	17		AXIS_05.4	io_status	682	2AA	683	2AB		
6	%IB 25	200	C8	207	CF	%QB 25	200	C8	207	CF		%IW 241	%ID 241	24	18	%QW 241	24	18		AXIS_05.5	motion done	684	2AC	684	2AC		
	%IB 26	208	D0	215	D7	%QB 26	208	D0	215	D7		%IW 243		25	19	%QW 243	25	19		AXIS_06.1	command	685	2AD	686	2AE		
	%IB 27	216	D8	223	DF	%QB 27	216	D8	223	DF		%IW 245	%ID 245	26	1A	%QW 245	26	1A		AXIS_06.2	position	687	2AF	688	2B0		
	%IB 28	224	E0	231	E7	%QB 28	224	E0	231	E7		%IW 247		27	1B	%QW 247	27	1B	6	AXIS_06.3	current velocity	689	2B1	690	2B2		
7	%IB 29	232	E8	239	EF	%QB 29	232	E8	239	EF		%IW 249	%ID 249	28	1C	%QW 249	28	1C		AXIS_06.4	io_status	691	2B3	692	2B4		
	%IB 30	240	F0	247	F7	%QB 30	240	F0	247	F7		%IW 251		29	1D	%QW 251	29	1D		AXIS_06.5	motion done	693	2B5	693	2B5		
	%IB 31	248	F8	255	FF	%QB 31	248	F8	255	FF		%IW 253	%ID 253	30	1E	%QW 253	30	1E		AXIS_07.1	command	694	2B6	695	2B7		
	%IB 32	256	100	263	107	%QB 32	256	100	263	107	51	%IW 255		31	1F	%QW 255	31	1F		AXIS_07.2	position	696	2B8	697	2B9		
8	%IB 33	264	108	271	10F	%QB 33	264	108	271	10F		%IW 257	%ID 257	32	20	%QW 257	32	20		AXIS_07.3	current velocity	698	2BA	699	2BB		
	%IB 34	272	110	279	117	%QB 34	272	110	279	117		%IW 259		33	21	%QW 259	33	21	7	AXIS_07.4	io_status	700	2BC	701	2BD		
	%IB 35	280	118	287	11F	%QB 35	280	118	287	11F		%IW 261	%ID 261	34	22	%QW 261	34	22		AXIS_07.5	motion done	702	2BE	702	2BE		
	%IB 36	288	120	295	127	%QB 36	288	120	295	127	52	%IW 263		35	23	%QW 263	35	23		AXIS_08.1	command	703	2BF	704	2C0		
9	%IB 37	296	128	303	12F	%QB 37	296	128	303	12F		%IW 265	%ID 265	36	24	%QW 265	36	24		AXIS_08.2	position	705	2C1	706	2C2		
	%IB 38	304	130	311	137	%QB 38	304	130	311	137		%IW 267		37	25	%QW 267	37	25	8	AXIS_08.3	current velocity	707	2C3	708	2C4		
	%IB 39	312	138	319	13F	%QB 39	312	138	319	13F		%IW 269	%ID 269	38	26	%QW 269	38	26		AXIS_08.4	io_status	709	2C5	710	2C6		
	%IB 40	320	140	327	147	%QB 40	320	140	327	147		%IW 271		39	27	%QW 271	39	27		AXIS_08.5	motion done	711	2C7	711	2C7		
10	%IB 41	328	148	335	14F	%QB 41	328	148	335	14F		%IW 273	%ID 273	40	28	%QW 273	40	28		AXIS_09.1	command	712	2C8	713	2C9		
	%IB 42	336	150	343	157	%QB 42	336	150	343	157		%IW 275		41	29	%QW 275	41	29		AXIS_09.2	position	714	2CA	715	2CB		
	%IB 43	344	158	351	15F	%QB 43	344	158	351	15F		%IW 277	%ID 277	42	2A	%QW 277	42	2A	9	AXIS_09.3	current velocity	716	2CC	717	2CD		
	%IB 44	352	160	359	167	%QB 44	352	160	359	167	53	%IW 279		43	2B	%QW 279	43	2B		AXIS_09.4	io_status	718	2CE	719	2CF		
11	%IB 45	360	168	367	16F	%QB 45	360	168	367	16F		%IW 281	%ID 281	44	2C	%QW 281	44	2C		AXIS_09.5	motion done	720	2D0	720	2D0		
	%IB 46	368	170	375	177	%QB 46	368	170	375	177		%IW 283		45	2D	%QW 283	45	2D		AXIS_10.1	command	721	2D1	722	2D2		
	%IB 47	376	178	383	17F	%QB 47	376	178	383	17F		%IW 285	%ID 285	46	2E	%QW 285	46	2E		AXIS_10.2	position	723	2D3	724	2D4		
	%IB 48	384	180	391	187	%QB 48	384	180	391	187		%IW 287		47	2F	%QW 287	47	2F	10	AXIS_10.3	current velocity	725	2D5	726	2D6		
12	%IB 49	392	188	399	18F	%QB 49	392	188	399	18F		%IW 289	%ID 289	48	30	%QW 289	48	30		AXIS_10.4	io_status	727	2D7	728	2D8		
	%IB 50	400	190	407	197	%QB 50	400	190	407	197		%IW 291		49	31	%QW 291	49	31		AXIS_10.5	motion done	729	2D9	729	2D9		
	%IB 51	408	198	415	19F	%QB 51	408	198	415	19F		%IW 293	%ID 293	50	32	%QW 293	50	32		AXIS_11.1	command	730	2DA	731	2DB		
	%IB 52	416	1A0	423	1A7	%QB 52	416	1A0	423	1A7		%IW 295		51	33	%QW 295	51	33		AXIS_11.2	position	732	2DC	733	2DD		
13	%IB 53	424	1A8	431	1AF	%QB 53	424	1A8	431	1AF	54	%IW 297	%ID 297	52	34	%QW 297	52	34	11	AXIS_11.3	current velocity	734	2DE	735	2DF		
	%IB 54	432	1B0	439	1B7	%QB 54	432	1B0	439	1B7		%IW 299		53	35	%QW 299	53	35		AXIS_11.4	io_status	736	2E0	737	2E1		
	%IB 55	440	1B8	447	1BF	%QB 55	440	1B8	447	1BF		%IW 301	%ID 301	54	36	%QW 301	54	36		AXIS_11.5	motion done	738	2E2	738	2E2		
	%IB 56	448	1C0	455	1C7	%QB 56	448	1C0	455	1C7		%IW 303		55	37	%QW 303	55	37		AXIS_12.1	command	739	2E3	740	2E4		
14	%IB 57	456	1C8	463	1CF	%QB 57	456	1C8	463	1CF		%IW 305	%ID 305	56	38	%QW 305	56	38		AXIS_12.2	position	741	2E5	742	2E6		
	%IB 58	464	1D0	471	1D7	%QB 58	464	1D0	471	1D7		%IW 307		57	39	%QW 307	57	39	12	AXIS_12.3	current velocity	743	2E7	744	2E8		
	%IB 59	472	1D8	479	1DF	%QB 59	472	1D8	479	1DF		%IW 309	%ID 309	58	3A	%QW 309	58	3A		AXIS_12.4	io_status	745	2E9	746	2EA		
	%IB 60	480	1E0	487	1E7	%QB 60	480	1E0	487	1E7	55	%IW 311		59	3B	%QW 311	59	3B		AXIS_12.5	motion done	747	2EB	747	2EB		
15	%IB 61	488	1E8	495	1EF	%QB 61	488	1E8	495	1EF		%IW 313	%ID 313	60	3C	%QW 313	60	3C		AXIS_13.1	command	748	2EC	749	2ED		
	%IB 62	496	1F0	503	1F7	%QB 62	496	1F0	503	1F7		%IW 315		61	3D	%QW 315	61	3D		AXIS_13.2	position	750	2EE	751	2EF		
	%IB 63	504	1F8	511	1FF	%QB 63	504	1F8	511	1FF		%IW 317	%ID 317	62	3E	%QW 317	62	3E	13	AXIS_13.3	current velocity	752	2F0	753	2F1		
	%IB 64	512	200	519	207	%QB 64	512	200	519	207		%IW 319		63	3F	%QW 319	63	3F		AXIS_13.4	io_status	754	2F2	755	2F3		
16	%IB 65	520	208	527	20F	%QB 65	520	208	527	20F		%IW 321	%ID 321	64	40	%QW 321	64	40		AXIS_13.5	motion done	756	2F4	756	2F4		
	%IB 66	528	210	535	217	%QB 66	528	210	535	217		%IW 323		65	41	%QW 323	65	41		AXIS_14.1	command	757	2F5	758	2F6		
	%IB 67	536	218	543	21F	%QB 67	536	218	543	21F		%IW 325	%ID 325	66	42	%QW 325	66	42		AXIS_14.2	position	759	2F7	760	2F8		
	%IB 68	544	220	551	227	%QB 68	544	220	551	227	56	%IW 327		67	43	%QW 327	67	43	14	AXIS_14.3	current velocity	761	2F9	762	2FA		
17	%IB 69	552	228	559	22F	%QB 69	552	228	559	22F		%IW 329	%ID 329	68	44	%QW 329	68	44		AXIS_14.4	io_status	763	2FB	764	2FC		
	%IB 70	560	230	567	237	%QB 70	560	230	567	237		%IW 331		69	45	%QW 331	69	45		AXIS_14.5	motion done	765	2FD	765	2FD		
	%IB 71	568	238	575	23F	%QB 71	568	238	575	23F		%IW 333	%ID 333	70	46	%QW 333	70	46		AXIS_15.1	command	766	2FE	767	2FF		
	%IB 72	576	240	583	247	%QB 72	576	240	583	247		%IW 335		71	47	%QW 335	71	47		AXIS_15.2	position	768	300	769	301		
18	%IB 73	584	248	591	24F	%QB 73	584	248	591	24F		%IW 337	%ID 337	72	48	%QW 337	72	48	15	AXIS_15.3	current velocity	770	302	771	303		
	%IB 74	592	250	599	257	%QB 74	592	250	599	257		%IW 339		73	49	%QW 339	73	49		AXIS_15.4	io_status	772	304	773	305		
	%IB 75	600	258	607	25F	%QB 75	600	258	607	25F		%IW 341	%ID 341	74	4A	%QW 341	74	4A		AXIS_15.5	motion done	774	306	774	306		
	%IB 76	608	260	615	267	%QB 76	608	260	615	267	57	%IW 343		75	4B	%QW 343	75	4B		AXIS_16.1	command	775	307	776	308		
19	%IB 77	616	268	623	26F	%QB 77	616	268	623	26F		%IW 345	%ID 345	76	4C	%QW 345	76	4C		AXIS_16.2	position	777	309	778	30A		
	%IB 78	624	270	631	277	%QB 78	624	270	631	277		%IW 347		77	4D	%QW 347	77	4D	16	AXIS_16.3	current velocity	779	30B	780	30C		
	%IB 79	632	278	639	27F	%QB 79	632	278	639	27F		%IW 349	%ID 349	78	4E	%QW 349	78	4E		AXIS_16.4	io_status	781	30D	782	30E		
	%IB 80	640	280	647	287	%QB 80	640	280	647	287		%IW 351		79	4F	%QW 351	79	4F		AXIS_16.5	motion done	783	30F	783	30F		

Ring 0

IP	DI	MODBUS				DO	MODBUS				IP	AI	COUNTER	MODBUS		AO	MODBUS		IP	Ring 1 AXES		MODBUS			
	%I	Discrete Input				%Q	Coil					%I		Input Registers		%Q	Holding Registers					Input Registers			
		Begin		End			Begin		End													Begin		End	
		DEC	HEX	DEC	HEX		DEC	HEX	DEC	HEX				DEC	HEX		DEC	HEX				DEC	HEX	DEC	HEX
20	%IB 81	648	288	655	28F	%QB 81	648	288	655	28F	58	%IW 353	%ID 353	80	50	%QW 353	80	50	17	AXIS_17.1	command	784	310	785	311
	%IB 82	656	290	663	297	%QB 82	656	290	663	297		%IW 355		81	51	%QW 355	81	51		AXIS_17.2	position	786	312	787	313
	%IB 83	664	298	671	29F	%QB 83	664	298	671	29F		%IW 357	%ID 357	82	52	%QW 357	82	52		AXIS_17.3	current velocity	788	314	789	315
	%IB 84	672	2A0	679	2A7	%QB 84	672	2A0	679	2A7		%IW 359		83	53	%QW 359	83	53		AXIS_17.4	io_status	790	316	791	317
21	%IB 85	680	2A8	687	2AF	%QB 85	680	2A8	687	2AF		%IW 361	%ID 361	84	54	%QW 361	84	54		AXIS_17.5	motion done	792	318	792	318
	%IB 86	688	2B0	695	2B7	%QB 86	688	2B0	695	2B7		%IW 363		85	55	%QW 363	85	55	18	AXIS_18.1	command	793	319	794	31A
	%IB 87	696	2B8	703	2BF	%QB 87	696	2B8	703	2BF		%IW 365	%ID 365	86	56	%QW 365	86	56		AXIS_18.2	position	795	31B	796	31C
	%IB 88	704	2C0	711	2C7	%QB 88	704	2C0	711	2C7		%IW 367		87	57	%QW 367	87	57		AXIS_18.3	current velocity	797	31D	798	31E
22	%IB 89	712	2C8	719	2CF	%QB 89	712	2C8	719	2CF	59	%IW 369	%ID 369	88	58	%QW 369	88	58		AXIS_18.4	io_status	799	31F	800	320
	%IB 90	720	2D0	727	2D7	%QB 90	720	2D0	727	2D7		%IW 371		89	59	%QW 371	89	59		AXIS_18.5	motion done	801	321	801	321
	%IB 91	728	2D8	735	2DF	%QB 91	728	2D8	735	2DF		%IW 373	%ID 373	90	5A	%QW 373	90	5A	19	AXIS_19.1	command	802	322	803	323
	%IB 92	736	2E0	743	2E7	%QB 92	736	2E0	743	2E7		%IW 375		91	5B	%QW 375	91	5B		AXIS_19.2	position	804	324	805	325
23	%IB 93	744	2E8	751	2EF	%QB 93	744	2E8	751	2EF		%IW 377	%ID 377	92	5C	%QW 377	92	5C		AXIS_19.3	current velocity	806	326	807	327
	%IB 94	752	2F0	759	2F7	%QB 94	752	2F0	759	2F7		%IW 379		93	5D	%QW 379	93	5D		AXIS_19.4	io_status	808	328	809	329
	%IB 95	760	2F8	767	2FF	%QB 95	760	2F8	767	2FF		%IW 381	%ID 381	94	5E	%QW 381	94	5E		AXIS_19.5	motion done	810	32A	810	32A
	%IB 96	768	300	775	307	%QB 96	768	300	775	307		%IW 383		95	5F	%QW 383	95	5F	20	AXIS_20.1	command	811	32B	812	32C
24	%IB 97	776	308	783	30F	%QB 97	776	308	783	30F	60	%IW 385	%ID 385	96	60	%QW 385	96	60		AXIS_20.2	position	813	32D	814	32E
	%IB 98	784	310	791	317	%QB 98	784	310	791	317		%IW 387		97	61	%QW 387	97	61		AXIS_20.3	current velocity	815	32F	816	330
	%IB 99	792	318	799	31F	%QB 99	792	318	799	31F		%IW 389	%ID 389	98	62	%QW 389	98	62		AXIS_20.4	io_status	817	331	818	332
	%IB 100	800	320	807	327	%QB 100	800	320	807	327		%IW 391		99	63	%QW 391	99	63		AXIS_20.5	motion done	819	333	819	333
25	%IB 101	808	328	815	32F	%QB 101	808	328	815	32F		%IW 393	%ID 393	100	64	%QW 393	100	64	21	AXIS_21.1	command	820	334	821	335
	%IB 102	816	330	823	337	%QB 102	816	330	823	337		%IW 395		101	65	%QW 395	101	65		AXIS_21.2	position	822	336	823	337
	%IB 103	824	338	831	33F	%QB 103	824	338	831	33F		%IW 397	%ID 397	102	66	%QW 397	102	66		AXIS_21.3	current velocity	824	338	825	339
	%IB 104	832	340	839	347	%QB 104	832	340	839	347		%IW 399		103	67	%QW 399	103	67		AXIS_21.4	io_status	826	33A	827	33B
26	%IB 105	840	348	847	34F	%QB 105	840	348	847	34F	61	%IW 401	%ID 401	104	68	%QW 401	104	68		AXIS_21.5	motion done	828	33C	828	33C
	%IB 106	848	350	855	357	%QB 106	848	350	855	357		%IW 403		105	69	%QW 403	105	69	22	AXIS_22.1	command	829	33D	830	33E
	%IB 107	856	358	863	35F	%QB 107	856	358	863	35F		%IW 405	%ID 405	106	6A	%QW 405	106	6A		AXIS_22.2	position	831	33F	832	340
	%IB 108	864	360	871	367	%QB 108	864	360	871	367		%IW 407		107	6B	%QW 407	107	6B		AXIS_22.3	current velocity	833	341	834	342
27	%IB 109	872	368	879	36F	%QB 109	872	368	879	36F		%IW 409	%ID 409	108	6C	%QW 409	108	6C		AXIS_22.4	io_status	835	343	836	344
	%IB 110	880	370	887	377	%QB 110	880	370	887	377		%IW 411		109	6D	%QW 411	109	6D		AXIS_22.5	motion done	837	345	837	345
	%IB 111	888	378	895	37F	%QB 111	888	378	895	37F		%IW 413	%ID 413	110	6E	%QW 413	110	6E	23	AXIS_23.1	command	838	346	839	347
	%IB 112	896	380	903	387	%QB 112	896	380	903	387		%IW 415		111	6F	%QW 415	111	6F		AXIS_23.2	position	840	348	841	349
28	%IB 113	904	388	911	38F	%QB 113	904	388	911	38F	62	%IW 417	%ID 417	112	70	%QW 417	112	70		AXIS_23.3	current velocity	842	34A	843	34B
	%IB 114	912	390	919	397	%QB 114	912	390	919	397		%IW 419		113	71	%QW 419	113	71		AXIS_23.4	io_status	844	34C	845	34D
	%IB 115	920	398	927	39F	%QB 115	920	398	927	39F		%IW 421	%ID 421	114	72	%QW 421	114	72		AXIS_23.5	motion done	846	34E	846	34E
	%IB 116	928	3A0	935	3A7	%QB 116	928	3A0	935	3A7		%IW 423		115	73	%QW 423	115	73	24	AXIS_24.1	command	847	34F	848	350
29	%IB 117	936	3A8	943	3AF	%QB 117	936	3A8	943	3AF		%IW 425	%ID 425	116	74	%QW 425	116	74		AXIS_24.2	position	849	351	850	352
	%IB 118	944	3B0	951	3B7	%QB 118	944	3B0	951	3B7		%IW 427		117	75	%QW 427	117	75		AXIS_24.3	current velocity	851	353	852	354
	%IB 119	952	3B8	959	3BF	%QB 119	952	3B8	959	3BF		%IW 429	%ID 429	118	76	%QW 429	118	76		AXIS_24.4	io_status	853	355	854	356
	%IB 120	960	3C0	967	3C7	%QB 120	960	3C0	967	3C7		%IW 431		119	77	%QW 431	119	77		AXIS_24.5	motion done	855	357	855	357
30	%IB 121	968	3C8	975	3CF	%QB 121	968	3C8	975	3CF	63	%IW 433	%ID 433	120	78	%QW 433	120	78	25	AXIS_25.1	command	856	358	857	359
	%IB 122	976	3D0	983	3D7	%QB 122	976	3D0	983	3D7		%IW 435		121	79	%QW 435	121	79		AXIS_25.2	position	858	35A	859	35B
	%IB 123	984	3D8	991	3DF	%QB 123	984	3D8	991	3DF		%IW 437	%ID 437	122	7A	%QW 437	122	7A		AXIS_25.3	current velocity	860	35C	861	35D
	%IB 124	992	3E0	999	3E7	%QB 124	992	3E0	999	3E7		%IW 439		123	7B	%QW 439	123	7B		AXIS_25.4	io_status	862	35E	863	35F
31	%IB 125	1000	3E8	1007	3EF	%QB 125	1000	3E8	1007	3EF		%IW 441	%ID 441	124	7C	%QW 441	124	7C		AXIS_25.5	motion done	864	360	864	360
	%IB 126	1008	3F0	1015	3F7	%QB 126	1008	3F0	1015	3F7		%IW 443		125	7D	%QW 443	125	7D	26	AXIS_26.1	command	865	361	866	362
	%IB 127	1016	3F8	1023	3FF	%QB 127	1016	3F8	1023	3FF		%IW 445	%ID 445	126	7E	%QW 445	126	7E		AXIS_26.2	position	867	363	868	364
	%IB 128	1024	400	1031	407	%QB 128	1024	400	1031	407		%IW 447		127	7F	%QW 447	127	7F		AXIS_26.3	current velocity	869	365	870	366
32	%IB 129	1032	408	1039	40F	%QB 129	1032	408	1039	40F										AXIS_26.4	io_status	871	367	872	368
	%IB 130	1040	410	1047	417	%QB 130	1040	410	1047	417										AXIS_26.5	motion done	873	369	873	369
	%IB 131	1048	418	1055	41F	%QB 131	1048	418	1055	41F									27	AXIS_27.1	command	874	36A	875	36B
	%IB 132	1056	420	1063	427	%QB 132	1056	420	1063	427										AXIS_27.2	position	876	36C	877	36D
33	%IB 133	1064	428	1071	42F	%QB 133	1064	428	1071	42F										AXIS_27.3	current velocity	878	36E	879	36F
	%IB 134	1072	430	1079	437	%QB 134	1072	430	1079	437										AXIS_27.4	io_status	880	370	881	371
	%IB 135	1080	438	1087	43F	%QB 135	1080	438	1087	43F										AXIS_27.5	motion done	882	372	882	372
	%IB 136	1088	440	1095	447	%QB 136	1088	440	1095	447									28	AXIS_28.1	command	883	373	884	374
34	%IB 137	1096	448	1103	44F	%QB 137	1096	448	1103	44F										AXIS_28.2	position	885	375	886	376
	%IB 138	1104	450	1111	457	%QB 138	1104	450	1111	457										AXIS_28.3	current velocity	887	377	888	378
	%IB 139	1112	458	1119	45F	%QB 139	1112	458	1119	45F										AXIS_28.4	io_status	889	379	890	37A
	%IB 140	1120	460	1127	467	%QB 140	1120	460	1127	467										AXIS_28.5	motion done	891	37B	891	37B
35	%IB 141	1128	468	1135	46F	%QB 141	1128	468	1135	46F									29	AXIS_29.1	command	892	37C	893	37D
	%IB 142	1136	470	1143	477	%QB 142	1136	470	1143	477										AXIS_29.2	position	894	37E	895	37F
	%IB 143	1144	478	1151	47F	%QB 143	1144	478	1151	47F										AXIS_29.3	current velocity	896	380	897	381
	%IB 144	1152	480	1159	487	%QB 144	1152	480	1159	487										AXIS_29.4	io_status	898	382	899	383
36	%IB 145	1160	488	1167	48F	%QB 145	1160	488	1167	48F										AXIS_29.5	motion done	900	384	900	384
	%IB 146	1168	490	1175	497	%QB 146	1168	490	1175	497									30	AXIS_30.1	command	901	385	902	386
	%IB 147	1176	498	1183	49F	%QB 147	1176	498	1183	49F										AXIS_30.2	position	903	387	904	388
	%IB 148	1184	4A0	1191	4A7	%QB 148	1184	4A0	1191	4A7										AXIS_30.3	current velocity	905	389	906	38A
37	%IB 149	1192	4A8	1199	4AF	%QB 149	1192	4A8	1199	4AF										AXIS_30.4	io_status	907	38B	908	38C
	%IB 150	1200	4B0	1207	4B7	%QB 150	1200	4B0	1207	4B7										AXIS_30.5	motion done	909	38D	909	38D
	%IB 151	1208	4B8	1215	4BF	%QB 151	1208	4B8	1215	4BF									31	AXIS_31.1	command	910	38E	911	38F
	%IB 152	1216	4C0	1223	4C7	%QB 152	1216	4C0	1223	4C7										AXIS_31.2	position	912	390	913	391
38	%IB 153	1224	4C8	1231	4CF	%QB 153	1224	4C8	1231	4CF										AXIS_31.3	current velocity	914	392	915	393
	%IB 154	1232	4D0	1239	4D7	%QB 154	1232	4D0	1239	4D7										AXIS_31.4	io_status	916	394	917	395
	%IB 155	1240	4D8	1247	4DF	%QB 155	1240	4D8	1247	4DF										AXIS_31.5	motion done	918	396	918	396
	%IB 156	1248	4E0	1255	4E7	%QB 156	1248	4E0	1255	4E7									32	AXIS_32.1	command	919	397	920	398
39	%IB 157	1256	4E8	1263	4EF	%QB 157	1256	4E8	1263	4EF										AXIS_32.2	position	921	399	922	39A
	%IB 158	1264	4F0	1271	4F7	%QB 158	1264	4F0	1271	4F7										AXIS_32.3	current velocity	923	39B	924	39C
	%IB 159	1272	4F8	1279	4FF	%QB 159	1272	4F8	1279	4FF										AXIS_32.4	io_status	925	39D	926	39E
	%IB 160	1280	500	1287	507	%QB 160	1280	500	1287	507										AXIS_32.5	motion done	927	39F	927	39F

Ring 0																				Ring 1								
IP	DI	MODBUS				DO	MODBUS				IP	AI	COUNTER	MODBUS		AO	MODBUS		IP	AXES			MODBUS				
	%I	Discrete Input				%Q	Coil					%I		Input Registers		%Q	Holding Registers						Input Registers				
		Begin		End			Begin		End														Begin		End		
		DEC	HEX	DEC	HEX		DEC	HEX	DEC	HEX				DEC	HEX		DEC	HEX					DEC	HEX	DEC	HEX	
40	%IB 161	1288	508	1295	50F	%QB 161	1288	508	1295	50F																	
	%IB 162	1296	510	1303	517	%QB 162	1296	510	1303	517																	
	%IB 163	1304	518	1311	51F	%QB 163	1304	518	1311	51F																	
	%IB 164	1312	520	1319	527	%QB 164	1312	520	1319	527																	
41	%IB 165	1320	528	1327	52F	%QB 165	1320	528	1327	52F																	
	%IB 166	1328	530	1335	537	%QB 166	1328	530	1335	537																	
	%IB 167	1336	538	1343	53F	%QB 167	1336	538	1343	53F																	
	%IB 168	1344	540	1351	547	%QB 168	1344	540	1351	547																	
42	%IB 169	1352	548	1359	54F	%QB 169	1352	548	1359	54F																	
	%IB 170	1360	550	1367	557	%QB 170	1360	550	1367	557																	
	%IB 171	1368	558	1375	55F	%QB 171	1368	558	1375	55F																	
	%IB 172	1376	560	1383	567	%QB 172	1376	560	1383	567																	
43	%IB 173	1384	568	1391	56F	%QB 173	1384	568	1391	56F																	
	%IB 174	1392	570	1399	577	%QB 174	1392	570	1399	577																	
	%IB 175	1400	578	1407	57F	%QB 175	1400	578	1407	57F																	
	%IB 176	1408	580	1415	587	%QB 176	1408	580	1415	587																	
44	%IB 177	1416	588	1423	58F	%QB 177	1416	588	1423	58F																	
	%IB 178	1424	590	1431	597	%QB 178	1424	590	1431	597																	
	%IB 179	1432	598	1439	59F	%QB 179	1432	598	1439	59F																	
	%IB 180	1440	5A0	1447	5A7	%QB 180	1440	5A0	1447	5A7																	
45	%IB 181	1448	5A8	1455	5AF	%QB 181	1448	5A8	1455	5AF																	
	%IB 182	1456	5B0	1463	5B7	%QB 182	1456	5B0	1463	5B7																	
	%IB 183	1464	5B8	1471	5BF	%QB 183	1464	5B8	1471	5BF																	
	%IB 184	1472	5C0	1479	5C7	%QB 184	1472	5C0	1479	5C7																	
46	%IB 185	1480	5C8	1487	5CF	%QB 185	1480	5C8	1487	5CF																	
	%IB 186	1488	5D0	1495	5D7	%QB 186	1488	5D0	1495	5D7																	
	%IB 187	1496	5D8	1503	5DF	%QB 187	1496	5D8	1503	5DF																	
	%IB 188	1504	5E0	1511	5E7	%QB 188	1504	5E0	1511	5E7																	
47	%IB 189	1512	5E8	1519	5EF	%QB 189	1512	5E8	1519	5EF																	
	%IB 190	1520	5F0	1527	5F7	%QB 190	1520	5F0	1527	5F7																	
	%IB 191	1528	5F8	1535	5FF	%QB 191	1528	5F8	1535	5FF																	
	%IB 192	1536	600	1543	607	%QB 192	1536	600	1543	607																	

Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
0	0	0	0	7	1544	608	1551	60F	2048	2048	0	2048	7	1544	608	1551	60F	1024	128	80	3072	128	80
1	1	0	1	7	1552	610	1559	617	2049	2049	0	2049	7	1552	610	1559	617	1026	129	81	3074	129	81
2	2	0	2	7	1560	618	1567	61F	2050	2050	0	2050	7	1560	618	1567	61F	1028	130	82	3076	130	82
3	3	0	3	7	1568	620	1575	627	2051	2051	0	2051	7	1568	620	1575	627	1030	131	83	3078	131	83
4	4	0	4	7	1576	628	1583	62F	2052	2052	0	2052	7	1576	628	1583	62F	1032	132	84	3080	132	84
5	5	0	5	7	1584	630	1591	637	2053	2053	0	2053	7	1584	630	1591	637	1034	133	85	3082	133	85
6	6	0	6	7	1592	638	1599	63F	2054	2054	0	2054	7	1592	638	1599	63F	1036	134	86	3084	134	86
7	7	0	7	7	1600	640	1607	647	2055	2055	0	2055	7	1600	640	1607	647	1038	135	87	3086	135	87
8	8	0	8	7	1608	648	1615	64F	2056	2056	0	2056	7	1608	648	1615	64F	1040	136	88	3088	136	88
9	9	0	9	7	1616	650	1623	657	2057	2057	0	2057	7	1616	650	1623	657	1042	137	89	3090	137	89
10	10	0	10	7	1624	658	1631	65F	2058	2058	0	2058	7	1624	658	1631	65F	1044	138	8A	3092	138	8A
11	11	0	11	7	1632	660	1639	667	2059	2059	0	2059	7	1632	660	1639	667	1046	139	8B	3094	139	8B
12	12	0	12	7	1640	668	1647	66F	2060	2060	0	2060	7	1640	668	1647	66F	1048	140	8C	3096	140	8C
13	13	0	13	7	1648	670	1655	677	2061	2061	0	2061	7	1648	670	1655	677	1050	141	8D	3098	141	8D
14	14	0	14	7	1656	678	1663	67F	2062	2062	0	2062	7	1656	678	1663	67F	1052	142	8E	3100	142	8E
15	15	0	15	7	1664	680	1671	687	2063	2063	0	2063	7	1664	680	1671	687	1054	143	8F	3102	143	8F
16	16	0	16	7	1672	688	1679	68F	2064	2064	0	2064	7	1672	688	1679	68F	1056	144	90	3104	144	90
17	17	0	17	7	1680	690	1687	697	2065	2065	0	2065	7	1680	690	1687	697	1058	145	91	3106	145	91
18	18	0	18	7	1688	698	1695	69F	2066	2066	0	2066	7	1688	698	1695	69F	1060	146	92	3108	146	92
19	19	0	19	7	1696	6A0	1703	6A7	2067	2067	0	2067	7	1696	6A0	1703	6A7	1062	147	93	3110	147	93
20	20	0	20	7	1704	6A8	1711	6AF	2068	2068	0	2068	7	1704	6A8	1711	6AF	1064	148	94	3112	148	94
21	21	0	21	7	1712	6B0	1719	6B7	2069	2069	0	2069	7	1712	6B0	1719	6B7	1066	149	95	3114	149	95
22	22	0	22	7	1720	6B8	1727	6BF	2070	2070	0	2070	7	1720	6B8	1727	6BF	1068	150	96	3116	150	96
23	23	0	23	7	1728	6C0	1735	6C7	2071	2071	0	2071	7	1728	6C0	1735	6C7	1070	151	97	3118	151	97
24	24	0	24	7	1736	6C8	1743	6CF	2072	2072	0	2072	7	1736	6C8	1743	6CF	1072	152	98	3120	152	98
25	25	0	25	7	1744	6D0	1751	6D7	2073	2073	0	2073	7	1744	6D0	1751	6D7	1074	153	99	3122	153	99
26	26	0	26	7	1752	6D8	1759	6DF	2074	2074	0	2074	7	1752	6D8	1759	6DF	1076	154	9A	3124	154	9A
27	27	0	27	7	1760	6E0	1767	6E7	2075	2075	0	2075	7	1760	6E0	1767	6E7	1078	155	9B	3126	155	9B
28	28	0	28	7	1768	6E8	1775	6EF	2076	2076	0	2076	7	1768	6E8	1775	6EF	1080	156	9C	3128	156	9C
29	29	0	29	7	1776	6F0	1783	6F7	2077	2077	0	2077	7	1776	6F0	1783	6F7	1082	157	9D	3130	157	9D
30	30	0	30	7	1784	6F8	1791	6FF	2078	2078	0	2078	7	1784	6F8	1791	6FF	1084	158	9E	3132	158	9E
31	31	0	31	7	1792	700	1799	707	2079	2079	0	2079	7	1792	700	1799	707	1086	159	9F	3134	159	9F
32	32	0	32	7	1800	708	1807	70F	2080	2080	0	2080	7	1800	708	1807	70F	1088	160	A0	3136	160	A0
33	33	0	33	7	1808	710	1815	717	2081	2081	0	2081	7	1808	710	1815	717	1090	161	A1	3138	161	A1
34	34	0	34	7	1816	718	1823	71F	2082	2082	0	2082	7	1816	718	1823	71F	1092	162	A2	3140	162	A2
35	35	0	35	7	1824	720	1831	727	2083	2083	0	2083	7	1824	720	1831	727	1094	163	A3	3142	163	A3
36	36	0	36	7	1832	728	1839	72F	2084	2084	0	2084	7	1832	728	1839	72F	1096	164	A4	3144	164	A4
37	37	0	37	7	1840	730	1847	737	2085	2085	0	2085	7	1840	730	1847	737	1098	165	A5	3146	165	A5
38	38	0	38	7	1848	738	1855	73F	2086	2086	0	2086	7	1848	738	1855	73F	1100	166	A6	3148	166	A6
39	39	0	39	7	1856	740	1863	747	2087	2087	0	2087	7	1856	740	1863	747	1102	167	A7	3150	167	A7
40	40	0	40	7	1864	748	1871	74F	2088	2088	0	2088	7	1864	748	1871	74F	1104	168	A8	3152	168	A8
41	41	0	41	7	1872	750	1879	757	2089	2089	0	2089	7	1872	750	1879	757	1106	169	A9	3154	169	A9
42	42	0	42	7	1880	758	1887	75F	2090	2090	0	2090	7	1880	758	1887	75F	1108	170	AA	3156	170	AA
43	43	0	43	7	1888	760	1895	767	2091	2091	0	2091	7	1888	760	1895	767	1110	171	AB	3158	171	AB
44	44	0	44	7	1896	768	1903	76F	2092	2092	0	2092	7	1896	768	1903	76F	1112	172	AC	3160	172	AC
45	45	0	45	7	1904	770	1911	777	2093	2093	0	2093	7	1904	770	1911	777	1114	173	AD	3162	173	AD
46	46	0	46	7	1912	778	1919	77F	2094	2094	0	2094	7	1912	778	1919	77F	1116	174	AE	3164	174	AE
47	47	0	47	7	1920	780	1927	787	2095	2095	0	2095	7	1920	780	1927	787	1118	175	AF	3166	175	AF
48	48	0	48	7	1928	788	1935	78F	2096	2096	0	2096	7	1928	788	1935	78F	1120	176	B0	3168	176	B0
49	49	0	49	7	1936	790	1943	797	2097	2097	0	2097	7	1936	790	1943	797	1122	177	B1	3170	177	B1
50	50	0	50	7	1944	798	1951	79F	2098	2098	0	2098	7	1944	798	1951	79F	1124	178	B2	3172	178	B2
51	51	0	51	7	1952	7A0	1959	7A7	2099	2099	0	2099	7	1952	7A0	1959	7A7	1126	179	B3	3174	179	B3
52	52	0	52	7	1960	7A8	1967	7AF	2100	2100	0	2100	7	1960	7A8	1967	7AF	1128	180	B4	3176	180	B4
53	53	0	53	7	1968	7B0	1975	7B7	2101	2101	0	2101	7	1968	7B0	1975	7B7	1130	181	B5	3178	181	B5
54	54	0	54	7	1976	7B8	1983	7BF	2102	2102	0	2102	7	1976	7B8	1983	7BF	1132	182	B6	3180	182	B6
55	55	0	55	7	1984	7C0	1991	7C7	2103	2103	0	2103	7	1984	7C0	1991	7C7	1134	183	B7	3182	183	B7
56	56	0	56	7	1992	7C8	1999	7CF	2104	2104	0	2104	7	1992	7C8	1999	7CF	1136	184	B8	3184	184	B8

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
57	57	0	57	7	2000	7D0	2007	7D7	2105	2105	0	2105	7	2000	7D0	2007	7D7	1138	185	B9	3186	185	B9
58	58	0	58	7	2008	7D8	2015	7DF	2106	2106	0	2106	7	2008	7D8	2015	7DF	1140	186	BA	3188	186	BA
59	59	0	59	7	2016	7E0	2023	7E7	2107	2107	0	2107	7	2016	7E0	2023	7E7	1142	187	BB	3190	187	BB
60	60	0	60	7	2024	7E8	2031	7EF	2108	2108	0	2108	7	2024	7E8	2031	7EF	1144	188	BC	3192	188	BC
61	61	0	61	7	2032	7F0	2039	7F7	2109	2109	0	2109	7	2032	7F0	2039	7F7	1146	189	BD	3194	189	BD
62	62	0	62	7	2040	7F8	2047	7FF	2110	2110	0	2110	7	2040	7F8	2047	7FF	1148	190	BE	3196	190	BE
63	63	0	63	7	2048	800	2055	807	2111	2111	0	2111	7	2048	800	2055	807	1150	191	BF	3198	191	BF
64	64	0	64	7	2056	808	2063	80F	2112	2112	0	2112	7	2056	808	2063	80F	1152	192	C0	3200	192	C0
65	65	0	65	7	2064	810	2071	817	2113	2113	0	2113	7	2064	810	2071	817	1154	193	C1	3202	193	C1
66	66	0	66	7	2072	818	2079	81F	2114	2114	0	2114	7	2072	818	2079	81F	1156	194	C2	3204	194	C2
67	67	0	67	7	2080	820	2087	827	2115	2115	0	2115	7	2080	820	2087	827	1158	195	C3	3206	195	C3
68	68	0	68	7	2088	828	2095	82F	2116	2116	0	2116	7	2088	828	2095	82F	1160	196	C4	3208	196	C4
69	69	0	69	7	2096	830	2103	837	2117	2117	0	2117	7	2096	830	2103	837	1162	197	C5	3210	197	C5
70	70	0	70	7	2104	838	2111	83F	2118	2118	0	2118	7	2104	838	2111	83F	1164	198	C6	3212	198	C6
71	71	0	71	7	2112	840	2119	847	2119	2119	0	2119	7	2112	840	2119	847	1166	199	C7	3214	199	C7
72	72	0	72	7	2120	848	2127	84F	2120	2120	0	2120	7	2120	848	2127	84F	1168	200	C8	3216	200	C8
73	73	0	73	7	2128	850	2135	857	2121	2121	0	2121	7	2128	850	2135	857	1170	201	C9	3218	201	C9
74	74	0	74	7	2136	858	2143	85F	2122	2122	0	2122	7	2136	858	2143	85F	1172	202	CA	3220	202	CA
75	75	0	75	7	2144	860	2151	867	2123	2123	0	2123	7	2144	860	2151	867	1174	203	CB	3222	203	CB
76	76	0	76	7	2152	868	2159	86F	2124	2124	0	2124	7	2152	868	2159	86F	1176	204	CC	3224	204	CC
77	77	0	77	7	2160	870	2167	877	2125	2125	0	2125	7	2160	870	2167	877	1178	205	CD	3226	205	CD
78	78	0	78	7	2168	878	2175	87F	2126	2126	0	2126	7	2168	878	2175	87F	1180	206	CE	3228	206	CE
79	79	0	79	7	2176	880	2183	887	2127	2127	0	2127	7	2176	880	2183	887	1182	207	CF	3230	207	CF
80	80	0	80	7	2184	888	2191	88F	2128	2128	0	2128	7	2184	888	2191	88F	1184	208	D0	3232	208	D0
81	81	0	81	7	2192	890	2199	897	2129	2129	0	2129	7	2192	890	2199	897	1186	209	D1	3234	209	D1
82	82	0	82	7	2200	898	2207	89F	2130	2130	0	2130	7	2200	898	2207	89F	1188	210	D2	3236	210	D2
83	83	0	83	7	2208	8A0	2215	8A7	2131	2131	0	2131	7	2208	8A0	2215	8A7	1190	211	D3	3238	211	D3
84	84	0	84	7	2216	8A8	2223	8AF	2132	2132	0	2132	7	2216	8A8	2223	8AF	1192	212	D4	3240	212	D4
85	85	0	85	7	2224	8B0	2231	8B7	2133	2133	0	2133	7	2224	8B0	2231	8B7	1194	213	D5	3242	213	D5
86	86	0	86	7	2232	8B8	2239	8BF	2134	2134	0	2134	7	2232	8B8	2239	8BF	1196	214	D6	3244	214	D6
87	87	0	87	7	2240	8C0	2247	8C7	2135	2135	0	2135	7	2240	8C0	2247	8C7	1198	215	D7	3246	215	D7
88	88	0	88	7	2248	8C8	2255	8CF	2136	2136	0	2136	7	2248	8C8	2255	8CF	1200	216	D8	3248	216	D8
89	89	0	89	7	2256	8D0	2263	8D7	2137	2137	0	2137	7	2256	8D0	2263	8D7	1202	217	D9	3250	217	D9
90	90	0	90	7	2264	8D8	2271	8DF	2138	2138	0	2138	7	2264	8D8	2271	8DF	1204	218	DA	3252	218	DA
91	91	0	91	7	2272	8E0	2279	8E7	2139	2139	0	2139	7	2272	8E0	2279	8E7	1206	219	DB	3254	219	DB
92	92	0	92	7	2280	8E8	2287	8EF	2140	2140	0	2140	7	2280	8E8	2287	8EF	1208	220	DC	3256	220	DC
93	93	0	93	7	2288	8F0	2295	8F7	2141	2141	0	2141	7	2288	8F0	2295	8F7	1210	221	DD	3258	221	DD
94	94	0	94	7	2296	8F8	2303	8FF	2142	2142	0	2142	7	2296	8F8	2303	8FF	1212	222	DE	3260	222	DE
95	95	0	95	7	2304	900	2311	907	2143	2143	0	2143	7	2304	900	2311	907	1214	223	DF	3262	223	DF
96	96	0	96	7	2312	908	2319	90F	2144	2144	0	2144	7	2312	908	2319	90F	1216	224	E0	3264	224	E0
97	97	0	97	7	2320	910	2327	917	2145	2145	0	2145	7	2320	910	2327	917	1218	225	E1	3266	225	E1
98	98	0	98	7	2328	918	2335	91F	2146	2146	0	2146	7	2328	918	2335	91F	1220	226	E2	3268	226	E2
99	99	0	99	7	2336	920	2343	927	2147	2147	0	2147	7	2336	920	2343	927	1222	227	E3	3270	227	E3
100	100	0	100	7	2344	928	2351	92F	2148	2148	0	2148	7	2344	928	2351	92F	1224	228	E4	3272	228	E4
101	101	0	101	7	2352	930	2359	937	2149	2149	0	2149	7	2352	930	2359	937	1226	229	E5	3274	229	E5
102	102	0	102	7	2360	938	2367	93F	2150	2150	0	2150	7	2360	938	2367	93F	1228	230	E6	3276	230	E6
103	103	0	103	7	2368	940	2375	947	2151	2151	0	2151	7	2368	940	2375	947	1230	231	E7	3278	231	E7
104	104	0	104	7	2376	948	2383	94F	2152	2152	0	2152	7	2376	948	2383	94F	1232	232	E8	3280	232	E8
105	105	0	105	7	2384	950	2391	957	2153	2153	0	2153	7	2384	950	2391	957	1234	233	E9	3282	233	E9
106	106	0	106	7	2392	958	2399	95F	2154	2154	0	2154	7	2392	958	2399	95F	1236	234	EA	3284	234	EA
107	107	0	107	7	2400	960	2407	967	2155	2155	0	2155	7	2400	960	2407	967	1238	235	EB	3286	235	EB
108	108	0	108	7	2408	968	2415	96F	2156	2156	0	2156	7	2408	968	2415	96F	1240	236	EC	3288	236	EC
109	109	0	109	7	2416	970	2423	977	2157	2157	0	2157	7	2416	970	2423	977	1242	237	ED	3290	237	ED
110	110	0	110	7	2424	978	2431	97F	2158	2158	0	2158	7	2424	978	2431	97F	1244	238	EE	3292	238	EE
111	111	0	111	7	2432	980	2439	987	2159	2159	0	2159	7	2432	980	2439	987	1246	239	EF	3294	239	EF
112	112	0	112	7	2440	988	2447	98F	2160	2160	0	2160	7	2440	988	2447	98F	1248	240	F0	3296	240	F0
113	113	0	113	7	2448	990	2455	997	2161	2161	0	2161	7	2448	990	2455	997	1250	241	F1	3298	241	F1

Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
114	114	0	114	7	2456	998	2463	99F	2162	2162	0	2162	7	2456	998	2463	99F	1252	242	F2	3300	242	F2
115	115	0	115	7	2464	9A0	2471	9A7	2163	2163	0	2163	7	2464	9A0	2471	9A7	1254	243	F3	3302	243	F3
116	116	0	116	7	2472	9A8	2479	9AF	2164	2164	0	2164	7	2472	9A8	2479	9AF	1256	244	F4	3304	244	F4
117	117	0	117	7	2480	9B0	2487	9B7	2165	2165	0	2165	7	2480	9B0	2487	9B7	1258	245	F5	3306	245	F5
118	118	0	118	7	2488	9B8	2495	9BF	2166	2166	0	2166	7	2488	9B8	2495	9BF	1260	246	F6	3308	246	F6
119	119	0	119	7	2496	9C0	2503	9C7	2167	2167	0	2167	7	2496	9C0	2503	9C7	1262	247	F7	3310	247	F7
120	120	0	120	7	2504	9C8	2511	9CF	2168	2168	0	2168	7	2504	9C8	2511	9CF	1264	248	F8	3312	248	F8
121	121	0	121	7	2512	9D0	2519	9D7	2169	2169	0	2169	7	2512	9D0	2519	9D7	1266	249	F9	3314	249	F9
122	122	0	122	7	2520	9D8	2527	9DF	2170	2170	0	2170	7	2520	9D8	2527	9DF	1268	250	FA	3316	250	FA
123	123	0	123	7	2528	9E0	2535	9E7	2171	2171	0	2171	7	2528	9E0	2535	9E7	1270	251	FB	3318	251	FB
124	124	0	124	7	2536	9E8	2543	9EF	2172	2172	0	2172	7	2536	9E8	2543	9EF	1272	252	FC	3320	252	FC
125	125	0	125	7	2544	9F0	2551	9F7	2173	2173	0	2173	7	2544	9F0	2551	9F7	1274	253	FD	3322	253	FD
126	126	0	126	7	2552	9F8	2559	9FF	2174	2174	0	2174	7	2552	9F8	2559	9FF	1276	254	FE	3324	254	FE
127	127	0	127	7	2560	A00	2567	A07	2175	2175	0	2175	7	2560	A00	2567	A07	1278	255	FF	3326	255	FF
128	128	0	128	7	2568	A08	2575	A0F	2176	2176	0	2176	7	2568	A08	2575	A0F	1280	256	100	3328	256	100
129	129	0	129	7	2576	A10	2583	A17	2177	2177	0	2177	7	2576	A10	2583	A17	1282	257	101	3330	257	101
130	130	0	130	7	2584	A18	2591	A1F	2178	2178	0	2178	7	2584	A18	2591	A1F	1284	258	102	3332	258	102
131	131	0	131	7	2592	A20	2599	A27	2179	2179	0	2179	7	2592	A20	2599	A27	1286	259	103	3334	259	103
132	132	0	132	7	2600	A28	2607	A2F	2180	2180	0	2180	7	2600	A28	2607	A2F	1288	260	104	3336	260	104
133	133	0	133	7	2608	A30	2615	A37	2181	2181	0	2181	7	2608	A30	2615	A37	1290	261	105	3338	261	105
134	134	0	134	7	2616	A38	2623	A3F	2182	2182	0	2182	7	2616	A38	2623	A3F	1292	262	106	3340	262	106
135	135	0	135	7	2624	A40	2631	A47	2183	2183	0	2183	7	2624	A40	2631	A47	1294	263	107	3342	263	107
136	136	0	136	7	2632	A48	2639	A4F	2184	2184	0	2184	7	2632	A48	2639	A4F	1296	264	108	3344	264	108
137	137	0	137	7	2640	A50	2647	A57	2185	2185	0	2185	7	2640	A50	2647	A57	1298	265	109	3346	265	109
138	138	0	138	7	2648	A58	2655	A5F	2186	2186	0	2186	7	2648	A58	2655	A5F	1300	266	10A	3348	266	10A
139	139	0	139	7	2656	A60	2663	A67	2187	2187	0	2187	7	2656	A60	2663	A67	1302	267	10B	3350	267	10B
140	140	0	140	7	2664	A68	2671	A6F	2188	2188	0	2188	7	2664	A68	2671	A6F	1304	268	10C	3352	268	10C
141	141	0	141	7	2672	A70	2679	A77	2189	2189	0	2189	7	2672	A70	2679	A77	1306	269	10D	3354	269	10D
142	142	0	142	7	2680	A78	2687	A7F	2190	2190	0	2190	7	2680	A78	2687	A7F	1308	270	10E	3356	270	10E
143	143	0	143	7	2688	A80	2695	A87	2191	2191	0	2191	7	2688	A80	2695	A87	1310	271	10F	3358	271	10F
144	144	0	144	7	2696	A88	2703	A8F	2192	2192	0	2192	7	2696	A88	2703	A8F	1312	272	110	3360	272	110
145	145	0	145	7	2704	A90	2711	A97	2193	2193	0	2193	7	2704	A90	2711	A97	1314	273	111	3362	273	111
146	146	0	146	7	2712	A98	2719	A9F	2194	2194	0	2194	7	2712	A98	2719	A9F	1316	274	112	3364	274	112
147	147	0	147	7	2720	AA0	2727	AA7	2195	2195	0	2195	7	2720	AA0	2727	AA7	1318	275	113	3366	275	113
148	148	0	148	7	2728	AA8	2735	AAF	2196	2196	0	2196	7	2728	AA8	2735	AAF	1320	276	114	3368	276	114
149	149	0	149	7	2736	AB0	2743	AB7	2197	2197	0	2197	7	2736	AB0	2743	AB7	1322	277	115	3370	277	115
150	150	0	150	7	2744	AB8	2751	ABF	2198	2198	0	2198	7	2744	AB8	2751	ABF	1324	278	116	3372	278	116
151	151	0	151	7	2752	AC0	2759	AC7	2199	2199	0	2199	7	2752	AC0	2759	AC7	1326	279	117	3374	279	117
152	152	0	152	7	2760	AC8	2767	ACF	2200	2200	0	2200	7	2760	AC8	2767	ACF	1328	280	118	3376	280	118
153	153	0	153	7	2768	AD0	2775	AD7	2201	2201	0	2201	7	2768	AD0	2775	AD7	1330	281	119	3378	281	119
154	154	0	154	7	2776	AD8	2783	ADF	2202	2202	0	2202	7	2776	AD8	2783	ADF	1332	282	11A	3380	282	11A
155	155	0	155	7	2784	AE0	2791	AE7	2203	2203	0	2203	7	2784	AE0	2791	AE7	1334	283	11B	3382	283	11B
156	156	0	156	7	2792	AE8	2799	AEF	2204	2204	0	2204	7	2792	AE8	2799	AEF	1336	284	11C	3384	284	11C
157	157	0	157	7	2800	AF0	2807	AF7	2205	2205	0	2205	7	2800	AF0	2807	AF7	1338	285	11D	3386	285	11D
158	158	0	158	7	2808	AF8	2815	AFF	2206	2206	0	2206	7	2808	AF8	2815	AFF	1340	286	11E	3388	286	11E
159	159	0	159	7	2816	B00	2823	B07	2207	2207	0	2207	7	2816	B00	2823	B07	1342	287	11F	3390	287	11F
160	160	0	160	7	2824	B08	2831	B0F	2208	2208	0	2208	7	2824	B08	2831	B0F	1344	288	120	3392	288	120
161	161	0	161	7	2832	B10	2839	B17	2209	2209	0	2209	7	2832	B10	2839	B17	1346	289	121	3394	289	121
162	162	0	162	7	2840	B18	2847	B1F	2210	2210	0	2210	7	2840	B18	2847	B1F	1348	290	122	3396	290	122
163	163	0	163	7	2848	B20	2855	B27	2211	2211	0	2211	7	2848	B20	2855	B27	1350	291	123	3398	291	123
164	164	0	164	7	2856	B28	2863	B2F	2212	2212	0	2212	7	2856	B28	2863	B2F	1352	292	124	3400	292	124
165	165	0	165	7	2864	B30	2871	B37	2213	2213	0	2213	7	2864	B30	2871	B37	1354	293	125	3402	293	125
166	166	0	166	7	2872	B38	2879	B3F	2214	2214	0	2214	7	2872	B38	2879	B3F	1356	294	126	3404	294	126
167	167	0	167	7	2880	B40	2887	B47	2215	2215	0	2215	7	2880	B40	2887	B47	1358	295	127	3406	295	127
168	168	0	168	7	2888	B48	2895	B4F	2216	2216	0	2216	7	2888	B48	2895	B4F	1360	296	128	3408	296	128
169	169	0	169	7	2896	B50	2903	B57	2217	2217	0	2217	7	2896	B50	2903	B57	1362	297	129	3410	297	129
170	170	0	170	7	2904	B58	2911	B5F	2218	2218	0	2218	7	2904	B58	2911	B5F	1364	298	12A	3412	298	12A

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
171	171	0	171	7	2912	B60	2919	B67	2219	2219	0	2219	7	2912	B60	2919	B67	1366	299	12B	3414	299	12B
172	172	0	172	7	2920	B68	2927	B6F	2220	2220	0	2220	7	2920	B68	2927	B6F	1368	300	12C	3416	300	12C
173	173	0	173	7	2928	B70	2935	B77	2221	2221	0	2221	7	2928	B70	2935	B77	1370	301	12D	3418	301	12D
174	174	0	174	7	2936	B78	2943	B7F	2222	2222	0	2222	7	2936	B78	2943	B7F	1372	302	12E	3420	302	12E
175	175	0	175	7	2944	B80	2951	B87	2223	2223	0	2223	7	2944	B80	2951	B87	1374	303	12F	3422	303	12F
176	176	0	176	7	2952	B88	2959	B8F	2224	2224	0	2224	7	2952	B88	2959	B8F	1376	304	130	3424	304	130
177	177	0	177	7	2960	B90	2967	B97	2225	2225	0	2225	7	2960	B90	2967	B97	1378	305	131	3426	305	131
178	178	0	178	7	2968	B98	2975	B9F	2226	2226	0	2226	7	2968	B98	2975	B9F	1380	306	132	3428	306	132
179	179	0	179	7	2976	BA0	2983	BA7	2227	2227	0	2227	7	2976	BA0	2983	BA7	1382	307	133	3430	307	133
180	180	0	180	7	2984	BA8	2991	BAF	2228	2228	0	2228	7	2984	BA8	2991	BAF	1384	308	134	3432	308	134
181	181	0	181	7	2992	BB0	2999	BB7	2229	2229	0	2229	7	2992	BB0	2999	BB7	1386	309	135	3434	309	135
182	182	0	182	7	3000	BB8	3007	BBF	2230	2230	0	2230	7	3000	BB8	3007	BBF	1388	310	136	3436	310	136
183	183	0	183	7	3008	BC0	3015	BC7	2231	2231	0	2231	7	3008	BC0	3015	BC7	1390	311	137	3438	311	137
184	184	0	184	7	3016	BC8	3023	BCF	2232	2232	0	2232	7	3016	BC8	3023	BCF	1392	312	138	3440	312	138
185	185	0	185	7	3024	BD0	3031	BD7	2233	2233	0	2233	7	3024	BD0	3031	BD7	1394	313	139	3442	313	139
186	186	0	186	7	3032	BD8	3039	BDF	2234	2234	0	2234	7	3032	BD8	3039	BDF	1396	314	13A	3444	314	13A
187	187	0	187	7	3040	BE0	3047	BE7	2235	2235	0	2235	7	3040	BE0	3047	BE7	1398	315	13B	3446	315	13B
188	188	0	188	7	3048	BE8	3055	BEF	2236	2236	0	2236	7	3048	BE8	3055	BEF	1400	316	13C	3448	316	13C
189	189	0	189	7	3056	BF0	3063	BF7	2237	2237	0	2237	7	3056	BF0	3063	BF7	1402	317	13D	3450	317	13D
190	190	0	190	7	3064	BF8	3071	BFF	2238	2238	0	2238	7	3064	BF8	3071	BFF	1404	318	13E	3452	318	13E
191	191	0	191	7	3072	C00	3079	C07	2239	2239	0	2239	7	3072	C00	3079	C07	1406	319	13F	3454	319	13F
192	192	0	192	7	3080	C08	3087	C0F	2240	2240	0	2240	7	3080	C08	3087	C0F	1408	320	140	3456	320	140
193	193	0	193	7	3088	C10	3095	C17	2241	2241	0	2241	7	3088	C10	3095	C17	1410	321	141	3458	321	141
194	194	0	194	7	3096	C18	3103	C1F	2242	2242	0	2242	7	3096	C18	3103	C1F	1412	322	142	3460	322	142
195	195	0	195	7	3104	C20	3111	C27	2243	2243	0	2243	7	3104	C20	3111	C27	1414	323	143	3462	323	143
196	196	0	196	7	3112	C28	3119	C2F	2244	2244	0	2244	7	3112	C28	3119	C2F	1416	324	144	3464	324	144
197	197	0	197	7	3120	C30	3127	C37	2245	2245	0	2245	7	3120	C30	3127	C37	1418	325	145	3466	325	145
198	198	0	198	7	3128	C38	3135	C3F	2246	2246	0	2246	7	3128	C38	3135	C3F	1420	326	146	3468	326	146
199	199	0	199	7	3136	C40	3143	C47	2247	2247	0	2247	7	3136	C40	3143	C47	1422	327	147	3470	327	147
200	200	0	200	7	3144	C48	3151	C4F	2248	2248	0	2248	7	3144	C48	3151	C4F	1424	328	148	3472	328	148
201	201	0	201	7	3152	C50	3159	C57	2249	2249	0	2249	7	3152	C50	3159	C57	1426	329	149	3474	329	149
202	202	0	202	7	3160	C58	3167	C5F	2250	2250	0	2250	7	3160	C58	3167	C5F	1428	330	14A	3476	330	14A
203	203	0	203	7	3168	C60	3175	C67	2251	2251	0	2251	7	3168	C60	3175	C67	1430	331	14B	3478	331	14B
204	204	0	204	7	3176	C68	3183	C6F	2252	2252	0	2252	7	3176	C68	3183	C6F	1432	332	14C	3480	332	14C
205	205	0	205	7	3184	C70	3191	C77	2253	2253	0	2253	7	3184	C70	3191	C77	1434	333	14D	3482	333	14D
206	206	0	206	7	3192	C78	3199	C7F	2254	2254	0	2254	7	3192	C78	3199	C7F	1436	334	14E	3484	334	14E
207	207	0	207	7	3200	C80	3207	C87	2255	2255	0	2255	7	3200	C80	3207	C87	1438	335	14F	3486	335	14F
208	208	0	208	7	3208	C88	3215	C8F	2256	2256	0	2256	7	3208	C88	3215	C8F	1440	336	150	3488	336	150
209	209	0	209	7	3216	C90	3223	C97	2257	2257	0	2257	7	3216	C90	3223	C97	1442	337	151	3490	337	151
210	210	0	210	7	3224	C98	3231	C9F	2258	2258	0	2258	7	3224	C98	3231	C9F	1444	338	152	3492	338	152
211	211	0	211	7	3232	CA0	3239	CA7	2259	2259	0	2259	7	3232	CA0	3239	CA7	1446	339	153	3494	339	153
212	212	0	212	7	3240	CA8	3247	CAF	2260	2260	0	2260	7	3240	CA8	3247	CAF	1448	340	154	3496	340	154
213	213	0	213	7	3248	CB0	3255	CB7	2261	2261	0	2261	7	3248	CB0	3255	CB7	1450	341	155	3498	341	155
214	214	0	214	7	3256	CB8	3263	CBF	2262	2262	0	2262	7	3256	CB8	3263	CBF	1452	342	156	3500	342	156
215	215	0	215	7	3264	CC0	3271	CC7	2263	2263	0	2263	7	3264	CC0	3271	CC7	1454	343	157	3502	343	157
216	216	0	216	7	3272	CC8	3279	CCF	2264	2264	0	2264	7	3272	CC8	3279	CCF	1456	344	158	3504	344	158
217	217	0	217	7	3280	CD0	3287	CD7	2265	2265	0	2265	7	3280	CD0	3287	CD7	1458	345	159	3506	345	159
218	218	0	218	7	3288	CD8	3295	CDF	2266	2266	0	2266	7	3288	CD8	3295	CDF	1460	346	15A	3508	346	15A
219	219	0	219	7	3296	CE0	3303	CE7	2267	2267	0	2267	7	3296	CE0	3303	CE7	1462	347	15B	3510	347	15B
220	220	0	220	7	3304	CE8	3311	CEF	2268	2268	0	2268	7	3304	CE8	3311	CEF	1464	348	15C	3512	348	15C
221	221	0	221	7	3312	CF0	3319	CF7	2269	2269	0	2269	7	3312	CF0	3319	CF7	1466	349	15D	3514	349	15D
222	222	0	222	7	3320	CF8	3327	CFF	2270	2270	0	2270	7	3320	CF8	3327	CFF	1468	350	15E	3516	350	15E
223	223	0	223	7	3328	D00	3335	D07	2271	2271	0	2271	7	3328	D00	3335	D07	1470	351	15F	3518	351	15F
224	224	0	224	7	3336	D08	3343	D0F	2272	2272	0	2272	7	3336	D08	3343	D0F	1472	352	160	3520	352	160
225	225	0	225	7	3344	D10	3351	D17	2273	2273	0	2273	7	3344	D10	3351	D17	1474	353	161	3522	353	161
226	226	0	226	7	3352	D18	3359	D1F	2274	2274	0	2274	7	3352	D18	3359	D1F	1476	354	162	3524	354	162
227	227	0	227	7	3360	D20	3367	D27	2275	2275	0	2275	7	3360	D20	3367	D27	1478	355	163	3526	355	163

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
228	228	0	228	7	3368	D28	3375	D2F	2276	2276	0	2276	7	3368	D28	3375	D2F	1480	356	164	3528	356	164
229	229	0	229	7	3376	D30	3383	D37	2277	2277	0	2277	7	3376	D30	3383	D37	1482	357	165	3530	357	165
230	230	0	230	7	3384	D38	3391	D3F	2278	2278	0	2278	7	3384	D38	3391	D3F	1484	358	166	3532	358	166
231	231	0	231	7	3392	D40	3399	D47	2279	2279	0	2279	7	3392	D40	3399	D47	1486	359	167	3534	359	167
232	232	0	232	7	3400	D48	3407	D4F	2280	2280	0	2280	7	3400	D48	3407	D4F	1488	360	168	3536	360	168
233	233	0	233	7	3408	D50	3415	D57	2281	2281	0	2281	7	3408	D50	3415	D57	1490	361	169	3538	361	169
234	234	0	234	7	3416	D58	3423	D5F	2282	2282	0	2282	7	3416	D58	3423	D5F	1492	362	16A	3540	362	16A
235	235	0	235	7	3424	D60	3431	D67	2283	2283	0	2283	7	3424	D60	3431	D67	1494	363	16B	3542	363	16B
236	236	0	236	7	3432	D68	3439	D6F	2284	2284	0	2284	7	3432	D68	3439	D6F	1496	364	16C	3544	364	16C
237	237	0	237	7	3440	D70	3447	D77	2285	2285	0	2285	7	3440	D70	3447	D77	1498	365	16D	3546	365	16D
238	238	0	238	7	3448	D78	3455	D7F	2286	2286	0	2286	7	3448	D78	3455	D7F	1500	366	16E	3548	366	16E
239	239	0	239	7	3456	D80	3463	D87	2287	2287	0	2287	7	3456	D80	3463	D87	1502	367	16F	3550	367	16F
240	240	0	240	7	3464	D88	3471	D8F	2288	2288	0	2288	7	3464	D88	3471	D8F	1504	368	170	3552	368	170
241	241	0	241	7	3472	D90	3479	D97	2289	2289	0	2289	7	3472	D90	3479	D97	1506	369	171	3554	369	171
242	242	0	242	7	3480	D98	3487	D9F	2290	2290	0	2290	7	3480	D98	3487	D9F	1508	370	172	3556	370	172
243	243	0	243	7	3488	DA0	3495	DA7	2291	2291	0	2291	7	3488	DA0	3495	DA7	1510	371	173	3558	371	173
244	244	0	244	7	3496	DA8	3503	DAF	2292	2292	0	2292	7	3496	DA8	3503	DAF	1512	372	174	3560	372	174
245	245	0	245	7	3504	DB0	3511	DB7	2293	2293	0	2293	7	3504	DB0	3511	DB7	1514	373	175	3562	373	175
246	246	0	246	7	3512	DB8	3519	DBF	2294	2294	0	2294	7	3512	DB8	3519	DBF	1516	374	176	3564	374	176
247	247	0	247	7	3520	DC0	3527	DC7	2295	2295	0	2295	7	3520	DC0	3527	DC7	1518	375	177	3566	375	177
248	248	0	248	7	3528	DC8	3535	DCF	2296	2296	0	2296	7	3528	DC8	3535	DCF	1520	376	178	3568	376	178
249	249	0	249	7	3536	DD0	3543	DD7	2297	2297	0	2297	7	3536	DD0	3543	DD7	1522	377	179	3570	377	179
250	250	0	250	7	3544	DD8	3551	DDF	2298	2298	0	2298	7	3544	DD8	3551	DDF	1524	378	17A	3572	378	17A
251	251	0	251	7	3552	DE0	3559	DE7	2299	2299	0	2299	7	3552	DE0	3559	DE7	1526	379	17B	3574	379	17B
252	252	0	252	7	3560	DE8	3567	DEF	2300	2300	0	2300	7	3560	DE8	3567	DEF	1528	380	17C	3576	380	17C
253	253	0	253	7	3568	DF0	3575	DF7	2301	2301	0	2301	7	3568	DF0	3575	DF7	1530	381	17D	3578	381	17D
254	254	0	254	7	3576	DF8	3583	DFF	2302	2302	0	2302	7	3576	DF8	3583	DFF	1532	382	17E	3580	382	17E
255	255	0	255	7	3584	E00	3591	E07	2303	2303	0	2303	7	3584	E00	3591	E07	1534	383	17F	3582	383	17F
256	256	0	256	7	3592	E08	3599	E0F	2304	2304	0	2304	7	3592	E08	3599	E0F	1536	384	180	3584	384	180
257	257	0	257	7	3600	E10	3607	E17	2305	2305	0	2305	7	3600	E10	3607	E17	1538	385	181	3586	385	181
258	258	0	258	7	3608	E18	3615	E1F	2306	2306	0	2306	7	3608	E18	3615	E1F	1540	386	182	3588	386	182
259	259	0	259	7	3616	E20	3623	E27	2307	2307	0	2307	7	3616	E20	3623	E27	1542	387	183	3590	387	183
260	260	0	260	7	3624	E28	3631	E2F	2308	2308	0	2308	7	3624	E28	3631	E2F	1544	388	184	3592	388	184
261	261	0	261	7	3632	E30	3639	E37	2309	2309	0	2309	7	3632	E30	3639	E37	1546	389	185	3594	389	185
262	262	0	262	7	3640	E38	3647	E3F	2310	2310	0	2310	7	3640	E38	3647	E3F	1548	390	186	3596	390	186
263	263	0	263	7	3648	E40	3655	E47	2311	2311	0	2311	7	3648	E40	3655	E47	1550	391	187	3598	391	187
264	264	0	264	7	3656	E48	3663	E4F	2312	2312	0	2312	7	3656	E48	3663	E4F	1552	392	188	3600	392	188
265	265	0	265	7	3664	E50	3671	E57	2313	2313	0	2313	7	3664	E50	3671	E57	1554	393	189	3602	393	189
266	266	0	266	7	3672	E58	3679	E5F	2314	2314	0	2314	7	3672	E58	3679	E5F	1556	394	18A	3604	394	18A
267	267	0	267	7	3680	E60	3687	E67	2315	2315	0	2315	7	3680	E60	3687	E67	1558	395	18B	3606	395	18B
268	268	0	268	7	3688	E68	3695	E6F	2316	2316	0	2316	7	3688	E68	3695	E6F	1560	396	18C	3608	396	18C
269	269	0	269	7	3696	E70	3703	E77	2317	2317	0	2317	7	3696	E70	3703	E77	1562	397	18D	3610	397	18D
270	270	0	270	7	3704	E78	3711	E7F	2318	2318	0	2318	7	3704	E78	3711	E7F	1564	398	18E	3612	398	18E
271	271	0	271	7	3712	E80	3719	E87	2319	2319	0	2319	7	3712	E80	3719	E87	1566	399	18F	3614	399	18F
272	272	0	272	7	3720	E88	3727	E8F	2320	2320	0	2320	7	3720	E88	3727	E8F	1568	400	190	3616	400	190
273	273	0	273	7	3728	E90	3735	E97	2321	2321	0	2321	7	3728	E90	3735	E97	1570	401	191	3618	401	191
274	274	0	274	7	3736	E98	3743	E9F	2322	2322	0	2322	7	3736	E98	3743	E9F	1572	402	192	3620	402	192
275	275	0	275	7	3744	EA0	3751	EA7	2323	2323	0	2323	7	3744	EA0	3751	EA7	1574	403	193	3622	403	193
276	276	0	276	7	3752	EA8	3759	EAF	2324	2324	0	2324	7	3752	EA8	3759	EAF	1576	404	194	3624	404	194
277	277	0	277	7	3760	EB0	3767	EB7	2325	2325	0	2325	7	3760	EB0	3767	EB7	1578	405	195	3626	405	195
278	278	0	278	7	3768	EB8	3775	EBF	2326	2326	0	2326	7	3768	EB8	3775	EBF	1580	406	196	3628	406	196
279	279	0	279	7	3776	EC0	3783	EC7	2327	2327	0	2327	7	3776	EC0	3783	EC7	1582	407	197	3630	407	197
280	280	0	280	7	3784	EC8	3791	ECF	2328	2328	0	2328	7	3784	EC8	3791	ECF	1584	408	198	3632	408	198
281	281	0	281	7	3792	ED0	3799	ED7	2329	2329	0	2329	7	3792	ED0	3799	ED7	1586	409	199	3634	409	199
282	282	0	282	7	3800	ED8	3807	EDF	2330	2330	0	2330	7	3800	ED8	3807	EDF	1588	410	19A	3636	410	19A
283	283	0	283	7	3808	EE0	3815	EE7	2331	2331	0	2331	7	3808	EE0	3815	EE7	1590	411	19B	3638	411	19B
284	284	0	284	7	3816	EE8	3823	EEF	2332	2332	0	2332	7	3816	EE8	3823	EEF	1592	412	19C	3640	412	19C

Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End								
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
285	285	0	285	7	3824	EF0	3831	EF7	2333	2333	0	2333	7	3824	EF0	3831	EF7	1594	413	19D	3642	413	19D
286	286	0	286	7	3832	EF8	3839	EFF	2334	2334	0	2334	7	3832	EF8	3839	EFF	1596	414	19E	3644	414	19E
287	287	0	287	7	3840	F00	3847	F07	2335	2335	0	2335	7	3840	F00	3847	F07	1598	415	19F	3646	415	19F
288	288	0	288	7	3848	F08	3855	F0F	2336	2336	0	2336	7	3848	F08	3855	F0F	1600	416	1A0	3648	416	1A0
289	289	0	289	7	3856	F10	3863	F17	2337	2337	0	2337	7	3856	F10	3863	F17	1602	417	1A1	3650	417	1A1
290	290	0	290	7	3864	F18	3871	F1F	2338	2338	0	2338	7	3864	F18	3871	F1F	1604	418	1A2	3652	418	1A2
291	291	0	291	7	3872	F20	3879	F27	2339	2339	0	2339	7	3872	F20	3879	F27	1606	419	1A3	3654	419	1A3
292	292	0	292	7	3880	F28	3887	F2F	2340	2340	0	2340	7	3880	F28	3887	F2F	1608	420	1A4	3656	420	1A4
293	293	0	293	7	3888	F30	3895	F37	2341	2341	0	2341	7	3888	F30	3895	F37	1610	421	1A5	3658	421	1A5
294	294	0	294	7	3896	F38	3903	F3F	2342	2342	0	2342	7	3896	F38	3903	F3F	1612	422	1A6	3660	422	1A6
295	295	0	295	7	3904	F40	3911	F47	2343	2343	0	2343	7	3904	F40	3911	F47	1614	423	1A7	3662	423	1A7
296	296	0	296	7	3912	F48	3919	F4F	2344	2344	0	2344	7	3912	F48	3919	F4F	1616	424	1A8	3664	424	1A8
297	297	0	297	7	3920	F50	3927	F57	2345	2345	0	2345	7	3920	F50	3927	F57	1618	425	1A9	3666	425	1A9
298	298	0	298	7	3928	F58	3935	F5F	2346	2346	0	2346	7	3928	F58	3935	F5F	1620	426	1AA	3668	426	1AA
299	299	0	299	7	3936	F60	3943	F67	2347	2347	0	2347	7	3936	F60	3943	F67	1622	427	1AB	3670	427	1AB
300	300	0	300	7	3944	F68	3951	F6F	2348	2348	0	2348	7	3944	F68	3951	F6F	1624	428	1AC	3672	428	1AC
301	301	0	301	7	3952	F70	3959	F77	2349	2349	0	2349	7	3952	F70	3959	F77	1626	429	1AD	3674	429	1AD
302	302	0	302	7	3960	F78	3967	F7F	2350	2350	0	2350	7	3960	F78	3967	F7F	1628	430	1AE	3676	430	1AE
303	303	0	303	7	3968	F80	3975	F87	2351	2351	0	2351	7	3968	F80	3975	F87	1630	431	1AF	3678	431	1AF
304	304	0	304	7	3976	F88	3983	F8F	2352	2352	0	2352	7	3976	F88	3983	F8F	1632	432	1B0	3680	432	1B0
305	305	0	305	7	3984	F90	3991	F97	2353	2353	0	2353	7	3984	F90	3991	F97	1634	433	1B1	3682	433	1B1
306	306	0	306	7	3992	F98	3999	F9F	2354	2354	0	2354	7	3992	F98	3999	F9F	1636	434	1B2	3684	434	1B2
307	307	0	307	7	4000	FA0	4007	FA7	2355	2355	0	2355	7	4000	FA0	4007	FA7	1638	435	1B3	3686	435	1B3
308	308	0	308	7	4008	FA8	4015	FAF	2356	2356	0	2356	7	4008	FA8	4015	FAF	1640	436	1B4	3688	436	1B4
309	309	0	309	7	4016	FB0	4023	FB7	2357	2357	0	2357	7	4016	FB0	4023	FB7	1642	437	1B5	3690	437	1B5
310	310	0	310	7	4024	FB8	4031	FBF	2358	2358	0	2358	7	4024	FB8	4031	FBF	1644	438	1B6	3692	438	1B6
311	311	0	311	7	4032	FC0	4039	FC7	2359	2359	0	2359	7	4032	FC0	4039	FC7	1646	439	1B7	3694	439	1B7
312	312	0	312	7	4040	FC8	4047	FCF	2360	2360	0	2360	7	4040	FC8	4047	FCF	1648	440	1B8	3696	440	1B8
313	313	0	313	7	4048	FD0	4055	FD7	2361	2361	0	2361	7	4048	FD0	4055	FD7	1650	441	1B9	3698	441	1B9
314	314	0	314	7	4056	FD8	4063	FDF	2362	2362	0	2362	7	4056	FD8	4063	FDF	1652	442	1BA	3700	442	1BA
315	315	0	315	7	4064	FE0	4071	FE7	2363	2363	0	2363	7	4064	FE0	4071	FE7	1654	443	1BB	3702	443	1BB
316	316	0	316	7	4072	FE8	4079	FEF	2364	2364	0	2364	7	4072	FE8	4079	FEF	1656	444	1BC	3704	444	1BC
317	317	0	317	7	4080	FF0	4087	FF7	2365	2365	0	2365	7	4080	FF0	4087	FF7	1658	445	1BD	3706	445	1BD
318	318	0	318	7	4088	FF8	4095	FFF	2366	2366	0	2366	7	4088	FF8	4095	FFF	1660	446	1BE	3708	446	1BE
319	319	0	319	7	4096	1000	4103	1007	2367	2367	0	2367	7	4096	1000	4103	1007	1662	447	1BF	3710	447	1BF
320	320	0	320	7	4104	1008	4111	100F	2368	2368	0	2368	7	4104	1008	4111	100F	1664	448	1C0	3712	448	1C0
321	321	0	321	7	4112	1010	4119	1017	2369	2369	0	2369	7	4112	1010	4119	1017	1666	449	1C1	3714	449	1C1
322	322	0	322	7	4120	1018	4127	101F	2370	2370	0	2370	7	4120	1018	4127	101F	1668	450	1C2	3716	450	1C2
323	323	0	323	7	4128	1020	4135	1027	2371	2371	0	2371	7	4128	1020	4135	1027	1670	451	1C3	3718	451	1C3
324	324	0	324	7	4136	1028	4143	102F	2372	2372	0	2372	7	4136	1028	4143	102F	1672	452	1C4	3720	452	1C4
325	325	0	325	7	4144	1030	4151	1037	2373	2373	0	2373	7	4144	1030	4151	1037	1674	453	1C5	3722	453	1C5
326	326	0	326	7	4152	1038	4159	103F	2374	2374	0	2374	7	4152	1038	4159	103F	1676	454	1C6	3724	454	1C6
327	327	0	327	7	4160	1040	4167	1047	2375	2375	0	2375	7	4160	1040	4167	1047	1678	455	1C7	3726	455	1C7
328	328	0	328	7	4168	1048	4175	104F	2376	2376	0	2376	7	4168	1048	4175	104F	1680	456	1C8	3728	456	1C8
329	329	0	329	7	4176	1050	4183	1057	2377	2377	0	2377	7	4176	1050	4183	1057	1682	457	1C9	3730	457	1C9
330	330	0	330	7	4184	1058	4191	105F	2378	2378	0	2378	7	4184	1058	4191	105F	1684	458	1CA	3732	458	1CA
331	331	0	331	7	4192	1060	4199	1067	2379	2379	0	2379	7	4192	1060	4199	1067	1686	459	1CB	3734	459	1CB
332	332	0	332	7	4200	1068	4207	106F	2380	2380	0	2380	7	4200	1068	4207	106F	1688	460	1CC	3736	460	1CC
333	333	0	333	7	4208	1070	4215	1077	2381	2381	0	2381	7	4208	1070	4215	1077	1690	461	1CD	3738	461	1CD
334	334	0	334	7	4216	1078	4223	107F	2382	2382	0	2382	7	4216	1078	4223	107F	1692	462	1CE	3740	462	1CE
335	335	0	335	7	4224	1080	4231	1087	2383	2383	0	2383	7	4224	1080	4231	1087	1694	463	1CF	3742	463	1CF
336	336	0	336	7	4232	1088	4239	108F	2384	2384	0	2384	7	4232	1088	4239	108F	1696	464	1D0	3744	464	1D0
337	337	0	337	7	4240	1090	4247	1097	2385	2385	0	2385	7	4240	1090	4247	1097	1698	465	1D1	3746	465	1D1
338	338	0	338	7	4248	1098	4255	109F	2386	2386	0	2386	7	4248	1098	4255	109F	1700	466	1D2	3748	466	1D2
339	339	0	339	7	4256	10A0	4263	10A7	2387	2387	0	2387	7	4256	10A0	4263	10A7	1702	467	1D3	3750	467	1D3
340	340	0	340	7	4264	10A8	4271	10AF	2388	2388	0	2388	7	4264	10A8	4271	10AF	1704	468	1D4	3752	468	1D4
341	341	0	341	7	4272	10B0	4279	10B7	2389	2389	0	2389	7	4272	10B0	4279	10B7	1706	469	1D5	3754	469	1D5

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
342	342	0	342	7	4280	10B8	4287	10BF	2390	2390	0	2390	7	4280	10B8	4287	10BF	1708	470	1D6	3756	470	1D6
343	343	0	343	7	4288	10C0	4295	10C7	2391	2391	0	2391	7	4288	10C0	4295	10C7	1710	471	1D7	3758	471	1D7
344	344	0	344	7	4296	10C8	4303	10CF	2392	2392	0	2392	7	4296	10C8	4303	10CF	1712	472	1D8	3760	472	1D8
345	345	0	345	7	4304	10D0	4311	10D7	2393	2393	0	2393	7	4304	10D0	4311	10D7	1714	473	1D9	3762	473	1D9
346	346	0	346	7	4312	10D8	4319	10DF	2394	2394	0	2394	7	4312	10D8	4319	10DF	1716	474	1DA	3764	474	1DA
347	347	0	347	7	4320	10E0	4327	10E7	2395	2395	0	2395	7	4320	10E0	4327	10E7	1718	475	1DB	3766	475	1DB
348	348	0	348	7	4328	10E8	4335	10EF	2396	2396	0	2396	7	4328	10E8	4335	10EF	1720	476	1DC	3768	476	1DC
349	349	0	349	7	4336	10F0	4343	10F7	2397	2397	0	2397	7	4336	10F0	4343	10F7	1722	477	1DD	3770	477	1DD
350	350	0	350	7	4344	10F8	4351	10FF	2398	2398	0	2398	7	4344	10F8	4351	10FF	1724	478	1DE	3772	478	1DE
351	351	0	351	7	4352	1100	4359	1107	2399	2399	0	2399	7	4352	1100	4359	1107	1726	479	1DF	3774	479	1DF
352	352	0	352	7	4360	1108	4367	110F	2400	2400	0	2400	7	4360	1108	4367	110F	1728	480	1E0	3776	480	1E0
353	353	0	353	7	4368	1110	4375	1117	2401	2401	0	2401	7	4368	1110	4375	1117	1730	481	1E1	3778	481	1E1
354	354	0	354	7	4376	1118	4383	111F	2402	2402	0	2402	7	4376	1118	4383	111F	1732	482	1E2	3780	482	1E2
355	355	0	355	7	4384	1120	4391	1127	2403	2403	0	2403	7	4384	1120	4391	1127	1734	483	1E3	3782	483	1E3
356	356	0	356	7	4392	1128	4399	112F	2404	2404	0	2404	7	4392	1128	4399	112F	1736	484	1E4	3784	484	1E4
357	357	0	357	7	4400	1130	4407	1137	2405	2405	0	2405	7	4400	1130	4407	1137	1738	485	1E5	3786	485	1E5
358	358	0	358	7	4408	1138	4415	113F	2406	2406	0	2406	7	4408	1138	4415	113F	1740	486	1E6	3788	486	1E6
359	359	0	359	7	4416	1140	4423	1147	2407	2407	0	2407	7	4416	1140	4423	1147	1742	487	1E7	3790	487	1E7
360	360	0	360	7	4424	1148	4431	114F	2408	2408	0	2408	7	4424	1148	4431	114F	1744	488	1E8	3792	488	1E8
361	361	0	361	7	4432	1150	4439	1157	2409	2409	0	2409	7	4432	1150	4439	1157	1746	489	1E9	3794	489	1E9
362	362	0	362	7	4440	1158	4447	115F	2410	2410	0	2410	7	4440	1158	4447	115F	1748	490	1EA	3796	490	1EA
363	363	0	363	7	4448	1160	4455	1167	2411	2411	0	2411	7	4448	1160	4455	1167	1750	491	1EB	3798	491	1EB
364	364	0	364	7	4456	1168	4463	116F	2412	2412	0	2412	7	4456	1168	4463	116F	1752	492	1EC	3800	492	1EC
365	365	0	365	7	4464	1170	4471	1177	2413	2413	0	2413	7	4464	1170	4471	1177	1754	493	1ED	3802	493	1ED
366	366	0	366	7	4472	1178	4479	117F	2414	2414	0	2414	7	4472	1178	4479	117F	1756	494	1EE	3804	494	1EE
367	367	0	367	7	4480	1180	4487	1187	2415	2415	0	2415	7	4480	1180	4487	1187	1758	495	1EF	3806	495	1EF
368	368	0	368	7	4488	1188	4495	118F	2416	2416	0	2416	7	4488	1188	4495	118F	1760	496	1F0	3808	496	1F0
369	369	0	369	7	4496	1190	4503	1197	2417	2417	0	2417	7	4496	1190	4503	1197	1762	497	1F1	3810	497	1F1
370	370	0	370	7	4504	1198	4511	119F	2418	2418	0	2418	7	4504	1198	4511	119F	1764	498	1F2	3812	498	1F2
371	371	0	371	7	4512	11A0	4519	11A7	2419	2419	0	2419	7	4512	11A0	4519	11A7	1766	499	1F3	3814	499	1F3
372	372	0	372	7	4520	11A8	4527	11AF	2420	2420	0	2420	7	4520	11A8	4527	11AF	1768	500	1F4	3816	500	1F4
373	373	0	373	7	4528	11B0	4535	11B7	2421	2421	0	2421	7	4528	11B0	4535	11B7	1770	501	1F5	3818	501	1F5
374	374	0	374	7	4536	11B8	4543	11BF	2422	2422	0	2422	7	4536	11B8	4543	11BF	1772	502	1F6	3820	502	1F6
375	375	0	375	7	4544	11C0	4551	11C7	2423	2423	0	2423	7	4544	11C0	4551	11C7	1774	503	1F7	3822	503	1F7
376	376	0	376	7	4552	11C8	4559	11CF	2424	2424	0	2424	7	4552	11C8	4559	11CF	1776	504	1F8	3824	504	1F8
377	377	0	377	7	4560	11D0	4567	11D7	2425	2425	0	2425	7	4560	11D0	4567	11D7	1778	505	1F9	3826	505	1F9
378	378	0	378	7	4568	11D8	4575	11DF	2426	2426	0	2426	7	4568	11D8	4575	11DF	1780	506	1FA	3828	506	1FA
379	379	0	379	7	4576	11E0	4583	11E7	2427	2427	0	2427	7	4576	11E0	4583	11E7	1782	507	1FB	3830	507	1FB
380	380	0	380	7	4584	11E8	4591	11EF	2428	2428	0	2428	7	4584	11E8	4591	11EF	1784	508	1FC	3832	508	1FC
381	381	0	381	7	4592	11F0	4599	11F7	2429	2429	0	2429	7	4592	11F0	4599	11F7	1786	509	1FD	3834	509	1FD
382	382	0	382	7	4600	11F8	4607	11FF	2430	2430	0	2430	7	4600	11F8	4607	11FF	1788	510	1FE	3836	510	1FE
383	383	0	383	7	4608	1200	4615	1207	2431	2431	0	2431	7	4608	1200	4615	1207	1790	511	1FF	3838	511	1FF
384	384	0	384	7	4616	1208	4623	120F	2432	2432	0	2432	7	4616	1208	4623	120F	1792	512	200	3840	512	200
385	385	0	385	7	4624	1210	4631	1217	2433	2433	0	2433	7	4624	1210	4631	1217	1794	513	201	3842	513	201
386	386	0	386	7	4632	1218	4639	121F	2434	2434	0	2434	7	4632	1218	4639	121F	1796	514	202	3844	514	202
387	387	0	387	7	4640	1220	4647	1227	2435	2435	0	2435	7	4640	1220	4647	1227	1798	515	203	3846	515	203
388	388	0	388	7	4648	1228	4655	122F	2436	2436	0	2436	7	4648	1228	4655	122F	1800	516	204	3848	516	204
389	389	0	389	7	4656	1230	4663	1237	2437	2437	0	2437	7	4656	1230	4663	1237	1802	517	205	3850	517	205
390	390	0	390	7	4664	1238	4671	123F	2438	2438	0	2438	7	4664	1238	4671	123F	1804	518	206	3852	518	206
391	391	0	391	7	4672	1240	4679	1247	2439	2439	0	2439	7	4672	1240	4679	1247	1806	519	207	3854	519	207
392	392	0	392	7	4680	1248	4687	124F	2440	2440	0	2440	7	4680	1248	4687	124F	1808	520	208	3856	520	208
393	393	0	393	7	4688	1250	4695	1257	2441	2441	0	2441	7	4688	1250	4695	1257	1810	521	209	3858	521	209
394	394	0	394	7	4696	1258	4703	125F	2442	2442	0	2442	7	4696	1258	4703	125F	1812	522	20A	3860	522	20A
395	395	0	395	7	4704	1260	4711	1267	2443	2443	0	2443	7	4704	1260	4711	1267	1814	523	20B	3862	523	20B
396	396	0	396	7	4712	1268	4719	126F	2444	2444	0	2444	7	4712	1268	4719	126F	1816	524	20C	3864	524	20C
397	397	0	397	7	4720	1270	4727	1277	2445	2445	0	2445	7	4720	1270	4727	1277	1818	525	20D	3866	525	20D
398	398	0	398	7	4728	1278	4735	127F	2446	2446	0	2446	7	4728	1278	4735	127F	1820	526	20E	3868	526	20E

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
399	399	0	399	7	4736	1280	4743	1287	2447	2447	0	2447	7	4736	1280	4743	1287	1822	527	20F	3870	527	20F
400	400	0	400	7	4744	1288	4751	128F	2448	2448	0	2448	7	4744	1288	4751	128F	1824	528	210	3872	528	210
401	401	0	401	7	4752	1290	4759	1297	2449	2449	0	2449	7	4752	1290	4759	1297	1826	529	211	3874	529	211
402	402	0	402	7	4760	1298	4767	129F	2450	2450	0	2450	7	4760	1298	4767	129F	1828	530	212	3876	530	212
403	403	0	403	7	4768	12A0	4775	12A7	2451	2451	0	2451	7	4768	12A0	4775	12A7	1830	531	213	3878	531	213
404	404	0	404	7	4776	12A8	4783	12AF	2452	2452	0	2452	7	4776	12A8	4783	12AF	1832	532	214	3880	532	214
405	405	0	405	7	4784	12B0	4791	12B7	2453	2453	0	2453	7	4784	12B0	4791	12B7	1834	533	215	3882	533	215
406	406	0	406	7	4792	12B8	4799	12BF	2454	2454	0	2454	7	4792	12B8	4799	12BF	1836	534	216	3884	534	216
407	407	0	407	7	4800	12C0	4807	12C7	2455	2455	0	2455	7	4800	12C0	4807	12C7	1838	535	217	3886	535	217
408	408	0	408	7	4808	12C8	4815	12CF	2456	2456	0	2456	7	4808	12C8	4815	12CF	1840	536	218	3888	536	218
409	409	0	409	7	4816	12D0	4823	12D7	2457	2457	0	2457	7	4816	12D0	4823	12D7	1842	537	219	3890	537	219
410	410	0	410	7	4824	12D8	4831	12DF	2458	2458	0	2458	7	4824	12D8	4831	12DF	1844	538	21A	3892	538	21A
411	411	0	411	7	4832	12E0	4839	12E7	2459	2459	0	2459	7	4832	12E0	4839	12E7	1846	539	21B	3894	539	21B
412	412	0	412	7	4840	12E8	4847	12EF	2460	2460	0	2460	7	4840	12E8	4847	12EF	1848	540	21C	3896	540	21C
413	413	0	413	7	4848	12F0	4855	12F7	2461	2461	0	2461	7	4848	12F0	4855	12F7	1850	541	21D	3898	541	21D
414	414	0	414	7	4856	12F8	4863	12FF	2462	2462	0	2462	7	4856	12F8	4863	12FF	1852	542	21E	3900	542	21E
415	415	0	415	7	4864	1300	4871	1307	2463	2463	0	2463	7	4864	1300	4871	1307	1854	543	21F	3902	543	21F
416	416	0	416	7	4872	1308	4879	130F	2464	2464	0	2464	7	4872	1308	4879	130F	1856	544	220	3904	544	220
417	417	0	417	7	4880	1310	4887	1317	2465	2465	0	2465	7	4880	1310	4887	1317	1858	545	221	3906	545	221
418	418	0	418	7	4888	1318	4895	131F	2466	2466	0	2466	7	4888	1318	4895	131F	1860	546	222	3908	546	222
419	419	0	419	7	4896	1320	4903	1327	2467	2467	0	2467	7	4896	1320	4903	1327	1862	547	223	3910	547	223
420	420	0	420	7	4904	1328	4911	132F	2468	2468	0	2468	7	4904	1328	4911	132F	1864	548	224	3912	548	224
421	421	0	421	7	4912	1330	4919	1337	2469	2469	0	2469	7	4912	1330	4919	1337	1866	549	225	3914	549	225
422	422	0	422	7	4920	1338	4927	133F	2470	2470	0	2470	7	4920	1338	4927	133F	1868	550	226	3916	550	226
423	423	0	423	7	4928	1340	4935	1347	2471	2471	0	2471	7	4928	1340	4935	1347	1870	551	227	3918	551	227
424	424	0	424	7	4936	1348	4943	134F	2472	2472	0	2472	7	4936	1348	4943	134F	1872	552	228	3920	552	228
425	425	0	425	7	4944	1350	4951	1357	2473	2473	0	2473	7	4944	1350	4951	1357	1874	553	229	3922	553	229
426	426	0	426	7	4952	1358	4959	135F	2474	2474	0	2474	7	4952	1358	4959	135F	1876	554	22A	3924	554	22A
427	427	0	427	7	4960	1360	4967	1367	2475	2475	0	2475	7	4960	1360	4967	1367	1878	555	22B	3926	555	22B
428	428	0	428	7	4968	1368	4975	136F	2476	2476	0	2476	7	4968	1368	4975	136F	1880	556	22C	3928	556	22C
429	429	0	429	7	4976	1370	4983	1377	2477	2477	0	2477	7	4976	1370	4983	1377	1882	557	22D	3930	557	22D
430	430	0	430	7	4984	1378	4991	137F	2478	2478	0	2478	7	4984	1378	4991	137F	1884	558	22E	3932	558	22E
431	431	0	431	7	4992	1380	4999	1387	2479	2479	0	2479	7	4992	1380	4999	1387	1886	559	22F	3934	559	22F
432	432	0	432	7	5000	1388	5007	138F	2480	2480	0	2480	7	5000	1388	5007	138F	1888	560	230	3936	560	230
433	433	0	433	7	5008	1390	5015	1397	2481	2481	0	2481	7	5008	1390	5015	1397	1890	561	231	3938	561	231
434	434	0	434	7	5016	1398	5023	139F	2482	2482	0	2482	7	5016	1398	5023	139F	1892	562	232	3940	562	232
435	435	0	435	7	5024	13A0	5031	13A7	2483	2483	0	2483	7	5024	13A0	5031	13A7	1894	563	233	3942	563	233
436	436	0	436	7	5032	13A8	5039	13AF	2484	2484	0	2484	7	5032	13A8	5039	13AF	1896	564	234	3944	564	234
437	437	0	437	7	5040	13B0	5047	13B7	2485	2485	0	2485	7	5040	13B0	5047	13B7	1898	565	235	3946	565	235
438	438	0	438	7	5048	13B8	5055	13BF	2486	2486	0	2486	7	5048	13B8	5055	13BF	1900	566	236	3948	566	236
439	439	0	439	7	5056	13C0	5063	13C7	2487	2487	0	2487	7	5056	13C0	5063	13C7	1902	567	237	3950	567	237
440	440	0	440	7	5064	13C8	5071	13CF	2488	2488	0	2488	7	5064	13C8	5071	13CF	1904	568	238	3952	568	238
441	441	0	441	7	5072	13D0	5079	13D7	2489	2489	0	2489	7	5072	13D0	5079	13D7	1906	569	239	3954	569	239
442	442	0	442	7	5080	13D8	5087	13DF	2490	2490	0	2490	7	5080	13D8	5087	13DF	1908	570	23A	3956	570	23A
443	443	0	443	7	5088	13E0	5095	13E7	2491	2491	0	2491	7	5088	13E0	5095	13E7	1910	571	23B	3958	571	23B
444	444	0	444	7	5096	13E8	5103	13EF	2492	2492	0	2492	7	5096	13E8	5103	13EF	1912	572	23C	3960	572	23C
445	445	0	445	7	5104	13F0	5111	13F7	2493	2493	0	2493	7	5104	13F0	5111	13F7	1914	573	23D	3962	573	23D
446	446	0	446	7	5112	13F8	5119	13FF	2494	2494	0	2494	7	5112	13F8	5119	13FF	1916	574	23E	3964	574	23E
447	447	0	447	7	5120	1400	5127	1407	2495	2495	0	2495	7	5120	1400	5127	1407	1918	575	23F	3966	575	23F
448	448	0	448	7	5128	1408	5135	140F	2496	2496	0	2496	7	5128	1408	5135	140F	1920	576	240	3968	576	240
449	449	0	449	7	5136	1410	5143	1417	2497	2497	0	2497	7	5136	1410	5143	1417	1922	577	241	3970	577	241
450	450	0	450	7	5144	1418	5151	141F	2498	2498	0	2498	7	5144	1418	5151	141F	1924	578	242	3972	578	242
451	451	0	451	7	5152	1420	5159	1427	2499	2499	0	2499	7	5152	1420	5159	1427	1926	579	243	3974	579	243
452	452	0	452	7	5160	1428	5167	142F	2500	2500	0	2500	7	5160	1428	5167	142F	1928	580	244	3976	580	244
453	453	0	453	7	5168	1430	5175	1437	2501	2501	0	2501	7	5168	1430	5175	1437	1930	581	245	3978	581	245
454	454	0	454	7	5176	1438	5183	143F	2502	2502	0	2502	7	5176	1438	5183	143F	1932	582	246	3980	582	246
455	455	0	455	7	5184	1440	5191	1447	2503	2503	0	2503	7	5184	1440	5191	1447	1934	583	247	3982	583	247

Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
456	456	0	456	7	5192	1448	5199	144F	2504	2504	0	2504	7	5192	1448	5199	144F	1936	584	248	3984	584	248
457	457	0	457	7	5200	1450	5207	1457	2505	2505	0	2505	7	5200	1450	5207	1457	1938	585	249	3986	585	249
458	458	0	458	7	5208	1458	5215	145F	2506	2506	0	2506	7	5208	1458	5215	145F	1940	586	24A	3988	586	24A
459	459	0	459	7	5216	1460	5223	1467	2507	2507	0	2507	7	5216	1460	5223	1467	1942	587	24B	3990	587	24B
460	460	0	460	7	5224	1468	5231	146F	2508	2508	0	2508	7	5224	1468	5231	146F	1944	588	24C	3992	588	24C
461	461	0	461	7	5232	1470	5239	1477	2509	2509	0	2509	7	5232	1470	5239	1477	1946	589	24D	3994	589	24D
462	462	0	462	7	5240	1478	5247	147F	2510	2510	0	2510	7	5240	1478	5247	147F	1948	590	24E	3996	590	24E
463	463	0	463	7	5248	1480	5255	1487	2511	2511	0	2511	7	5248	1480	5255	1487	1950	591	24F	3998	591	24F
464	464	0	464	7	5256	1488	5263	148F	2512	2512	0	2512	7	5256	1488	5263	148F	1952	592	250	4000	592	250
465	465	0	465	7	5264	1490	5271	1497	2513	2513	0	2513	7	5264	1490	5271	1497	1954	593	251	4002	593	251
466	466	0	466	7	5272	1498	5279	149F	2514	2514	0	2514	7	5272	1498	5279	149F	1956	594	252	4004	594	252
467	467	0	467	7	5280	14A0	5287	14A7	2515	2515	0	2515	7	5280	14A0	5287	14A7	1958	595	253	4006	595	253
468	468	0	468	7	5288	14A8	5295	14AF	2516	2516	0	2516	7	5288	14A8	5295	14AF	1960	596	254	4008	596	254
469	469	0	469	7	5296	14B0	5303	14B7	2517	2517	0	2517	7	5296	14B0	5303	14B7	1962	597	255	4010	597	255
470	470	0	470	7	5304	14B8	5311	14BF	2518	2518	0	2518	7	5304	14B8	5311	14BF	1964	598	256	4012	598	256
471	471	0	471	7	5312	14C0	5319	14C7	2519	2519	0	2519	7	5312	14C0	5319	14C7	1966	599	257	4014	599	257
472	472	0	472	7	5320	14C8	5327	14CF	2520	2520	0	2520	7	5320	14C8	5327	14CF	1968	600	258	4016	600	258
473	473	0	473	7	5328	14D0	5335	14D7	2521	2521	0	2521	7	5328	14D0	5335	14D7	1970	601	259	4018	601	259
474	474	0	474	7	5336	14D8	5343	14DF	2522	2522	0	2522	7	5336	14D8	5343	14DF	1972	602	25A	4020	602	25A
475	475	0	475	7	5344	14E0	5351	14E7	2523	2523	0	2523	7	5344	14E0	5351	14E7	1974	603	25B	4022	603	25B
476	476	0	476	7	5352	14E8	5359	14EF	2524	2524	0	2524	7	5352	14E8	5359	14EF	1976	604	25C	4024	604	25C
477	477	0	477	7	5360	14F0	5367	14F7	2525	2525	0	2525	7	5360	14F0	5367	14F7	1978	605	25D	4026	605	25D
478	478	0	478	7	5368	14F8	5375	14FF	2526	2526	0	2526	7	5368	14F8	5375	14FF	1980	606	25E	4028	606	25E
479	479	0	479	7	5376	1500	5383	1507	2527	2527	0	2527	7	5376	1500	5383	1507	1982	607	25F	4030	607	25F
480	480	0	480	7	5384	1508	5391	150F	2528	2528	0	2528	7	5384	1508	5391	150F	1984	608	260	4032	608	260
481	481	0	481	7	5392	1510	5399	1517	2529	2529	0	2529	7	5392	1510	5399	1517	1986	609	261	4034	609	261
482	482	0	482	7	5400	1518	5407	151F	2530	2530	0	2530	7	5400	1518	5407	151F	1988	610	262	4036	610	262
483	483	0	483	7	5408	1520	5415	1527	2531	2531	0	2531	7	5408	1520	5415	1527	1990	611	263	4038	611	263
484	484	0	484	7	5416	1528	5423	152F	2532	2532	0	2532	7	5416	1528	5423	152F	1992	612	264	4040	612	264
485	485	0	485	7	5424	1530	5431	1537	2533	2533	0	2533	7	5424	1530	5431	1537	1994	613	265	4042	613	265
486	486	0	486	7	5432	1538	5439	153F	2534	2534	0	2534	7	5432	1538	5439	153F	1996	614	266	4044	614	266
487	487	0	487	7	5440	1540	5447	1547	2535	2535	0	2535	7	5440	1540	5447	1547	1998	615	267	4046	615	267
488	488	0	488	7	5448	1548	5455	154F	2536	2536	0	2536	7	5448	1548	5455	154F	2000	616	268	4048	616	268
489	489	0	489	7	5456	1550	5463	1557	2537	2537	0	2537	7	5456	1550	5463	1557	2002	617	269	4050	617	269
490	490	0	490	7	5464	1558	5471	155F	2538	2538	0	2538	7	5464	1558	5471	155F	2004	618	26A	4052	618	26A
491	491	0	491	7	5472	1560	5479	1567	2539	2539	0	2539	7	5472	1560	5479	1567	2006	619	26B	4054	619	26B
492	492	0	492	7	5480	1568	5487	156F	2540	2540	0	2540	7	5480	1568	5487	156F	2008	620	26C	4056	620	26C
493	493	0	493	7	5488	1570	5495	1577	2541	2541	0	2541	7	5488	1570	5495	1577	2010	621	26D	4058	621	26D
494	494	0	494	7	5496	1578	5503	157F	2542	2542	0	2542	7	5496	1578	5503	157F	2012	622	26E	4060	622	26E
495	495	0	495	7	5504	1580	5511	1587	2543	2543	0	2543	7	5504	1580	5511	1587	2014	623	26F	4062	623	26F
496	496	0	496	7	5512	1588	5519	158F	2544	2544	0	2544	7	5512	1588	5519	158F	2016	624	270	4064	624	270
497	497	0	497	7	5520	1590	5527	1597	2545	2545	0	2545	7	5520	1590	5527	1597	2018	625	271	4066	625	271
498	498	0	498	7	5528	1598	5535	159F	2546	2546	0	2546	7	5528	1598	5535	159F	2020	626	272	4068	626	272
499	499	0	499	7	5536	15A0	5543	15A7	2547	2547	0	2547	7	5536	15A0	5543	15A7	2022	627	273	4070	627	273
500	500	0	500	7	5544	15A8	5551	15AF	2548	2548	0	2548	7	5544	15A8	5551	15AF	2024	628	274	4072	628	274
501	501	0	501	7	5552	15B0	5559	15B7	2549	2549	0	2549	7	5552	15B0	5559	15B7	2026	629	275	4074	629	275
502	502	0	502	7	5560	15B8	5567	15BF	2550	2550	0	2550	7	5560	15B8	5567	15BF	2028	630	276	4076	630	276
503	503	0	503	7	5568	15C0	5575	15C7	2551	2551	0	2551	7	5568	15C0	5575	15C7	2030	631	277	4078	631	277
504	504	0	504	7	5576	15C8	5583	15CF	2552	2552	0	2552	7	5576	15C8	5583	15CF	2032	632	278	4080	632	278
505	505	0	505	7	5584	15D0	5591	15D7	2553	2553	0	2553	7	5584	15D0	5591	15D7	2034	633	279	4082	633	279
506	506	0	506	7	5592	15D8	5599	15DF	2554	2554	0	2554	7	5592	15D8	5599	15DF	2036	634	27A	4084	634	27A
507	507	0	507	7	5600	15E0	5607	15E7	2555	2555	0	2555	7	5600	15E0	5607	15E7	2038	635	27B	4086	635	27B
508	508	0	508	7	5608	15E8	5615	15EF	2556	2556	0	2556	7	5608	15E8	5615	15EF	2040	636	27C	4088	636	27C
509	509	0	509	7	5616	15F0	5623	15F7	2557	2557	0	2557	7	5616	15F0	5623	15F7	2042	637	27D	4090	637	27D
510	510	0	510	7	5624	15F8	5631	15FF	2558	2558	0	2558	7	5624	15F8	5631	15FF	2044	638	27E	4092	638	27E
511	511	0	511	7	5632	1600	5639	1607	2559	2559	0	2559	7	5632	1600	5639	1607	2046	639	27F	4094	639	27F
512	512	0	512	7	5640	1608	5647	160F	2560	2560	0	2560	7	5640	1608	5647	160F						

Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
513	513	0	513	7	5648	1610	5655	1617	2561	2561	0	2561	7	5648	1610	5655	1617						
514	514	0	514	7	5656	1618	5663	161F	2562	2562	0	2562	7	5656	1618	5663	161F						
515	515	0	515	7	5664	1620	5671	1627	2563	2563	0	2563	7	5664	1620	5671	1627						
516	516	0	516	7	5672	1628	5679	162F	2564	2564	0	2564	7	5672	1628	5679	162F						
517	517	0	517	7	5680	1630	5687	1637	2565	2565	0	2565	7	5680	1630	5687	1637						
518	518	0	518	7	5688	1638	5695	163F	2566	2566	0	2566	7	5688	1638	5695	163F						
519	519	0	519	7	5696	1640	5703	1647	2567	2567	0	2567	7	5696	1640	5703	1647						
520	520	0	520	7	5704	1648	5711	164F	2568	2568	0	2568	7	5704	1648	5711	164F						
521	521	0	521	7	5712	1650	5719	1657	2569	2569	0	2569	7	5712	1650	5719	1657						
522	522	0	522	7	5720	1658	5727	165F	2570	2570	0	2570	7	5720	1658	5727	165F						
523	523	0	523	7	5728	1660	5735	1667	2571	2571	0	2571	7	5728	1660	5735	1667						
524	524	0	524	7	5736	1668	5743	166F	2572	2572	0	2572	7	5736	1668	5743	166F						
525	525	0	525	7	5744	1670	5751	1677	2573	2573	0	2573	7	5744	1670	5751	1677						
526	526	0	526	7	5752	1678	5759	167F	2574	2574	0	2574	7	5752	1678	5759	167F						
527	527	0	527	7	5760	1680	5767	1687	2575	2575	0	2575	7	5760	1680	5767	1687						
528	528	0	528	7	5768	1688	5775	168F	2576	2576	0	2576	7	5768	1688	5775	168F						
529	529	0	529	7	5776	1690	5783	1697	2577	2577	0	2577	7	5776	1690	5783	1697						
530	530	0	530	7	5784	1698	5791	169F	2578	2578	0	2578	7	5784	1698	5791	169F						
531	531	0	531	7	5792	16A0	5799	16A7	2579	2579	0	2579	7	5792	16A0	5799	16A7						
532	532	0	532	7	5800	16A8	5807	16AF	2580	2580	0	2580	7	5800	16A8	5807	16AF						
533	533	0	533	7	5808	16B0	5815	16B7	2581	2581	0	2581	7	5808	16B0	5815	16B7						
534	534	0	534	7	5816	16B8	5823	16BF	2582	2582	0	2582	7	5816	16B8	5823	16BF						
535	535	0	535	7	5824	16C0	5831	16C7	2583	2583	0	2583	7	5824	16C0	5831	16C7						
536	536	0	536	7	5832	16C8	5839	16CF	2584	2584	0	2584	7	5832	16C8	5839	16CF						
537	537	0	537	7	5840	16D0	5847	16D7	2585	2585	0	2585	7	5840	16D0	5847	16D7						
538	538	0	538	7	5848	16D8	5855	16DF	2586	2586	0	2586	7	5848	16D8	5855	16DF						
539	539	0	539	7	5856	16E0	5863	16E7	2587	2587	0	2587	7	5856	16E0	5863	16E7						
540	540	0	540	7	5864	16E8	5871	16EF	2588	2588	0	2588	7	5864	16E8	5871	16EF						
541	541	0	541	7	5872	16F0	5879	16F7	2589	2589	0	2589	7	5872	16F0	5879	16F7						
542	542	0	542	7	5880	16F8	5887	16FF	2590	2590	0	2590	7	5880	16F8	5887	16FF						
543	543	0	543	7	5888	1700	5895	1707	2591	2591	0	2591	7	5888	1700	5895	1707						
544	544	0	544	7	5896	1708	5903	170F	2592	2592	0	2592	7	5896	1708	5903	170F						
545	545	0	545	7	5904	1710	5911	1717	2593	2593	0	2593	7	5904	1710	5911	1717						
546	546	0	546	7	5912	1718	5919	171F	2594	2594	0	2594	7	5912	1718	5919	171F						
547	547	0	547	7	5920	1720	5927	1727	2595	2595	0	2595	7	5920	1720	5927	1727						
548	548	0	548	7	5928	1728	5935	172F	2596	2596	0	2596	7	5928	1728	5935	172F						
549	549	0	549	7	5936	1730	5943	1737	2597	2597	0	2597	7	5936	1730	5943	1737						
550	550	0	550	7	5944	1738	5951	173F	2598	2598	0	2598	7	5944	1738	5951	173F						
551	551	0	551	7	5952	1740	5959	1747	2599	2599	0	2599	7	5952	1740	5959	1747						
552	552	0	552	7	5960	1748	5967	174F	2600	2600	0	2600	7	5960	1748	5967	174F						
553	553	0	553	7	5968	1750	5975	1757	2601	2601	0	2601	7	5968	1750	5975	1757						
554	554	0	554	7	5976	1758	5983	175F	2602	2602	0	2602	7	5976	1758	5983	175F						
555	555	0	555	7	5984	1760	5991	1767	2603	2603	0	2603	7	5984	1760	5991	1767						
556	556	0	556	7	5992	1768	5999	176F	2604	2604	0	2604	7	5992	1768	5999	176F						
557	557	0	557	7	6000	1770	6007	1777	2605	2605	0	2605	7	6000	1770	6007	1777						
558	558	0	558	7	6008	1778	6015	177F	2606	2606	0	2606	7	6008	1778	6015	177F						
559	559	0	559	7	6016	1780	6023	1787	2607	2607	0	2607	7	6016	1780	6023	1787						
560	560	0	560	7	6024	1788	6031	178F	2608	2608	0	2608	7	6024	1788	6031	178F						
561	561	0	561	7	6032	1790	6039	1797	2609	2609	0	2609	7	6032	1790	6039	1797						
562	562	0	562	7	6040	1798	6047	179F	2610	2610	0	2610	7	6040	1798	6047	179F						
563	563	0	563	7	6048	17A0	6055	17A7	2611	2611	0	2611	7	6048	17A0	6055	17A7						
564	564	0	564	7	6056	17A8	6063	17AF	2612	2612	0	2612	7	6056	17A8	6063	17AF						
565	565	0	565	7	6064	17B0	6071	17B7	2613	2613	0	2613	7	6064	17B0	6071	17B7						
566	566	0	566	7	6072	17B8	6079	17BF	2614	2614	0	2614	7	6072	17B8	6079	17BF						
567	567	0	567	7	6080	17C0	6087	17C7	2615	2615	0	2615	7	6080	17C0	6087	17C7						
568	568	0	568	7	6088	17C8	6095	17CF	2616	2616	0	2616	7	6088	17C8	6095	17CF						
569	569	0	569	7	6096	17D0	6103	17D7	2617	2617	0	2617	7	6096	17D0	6103	17D7						

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
570	570	0	570	7	6104	17D8	6111	17DF	2618	2618	0	2618	7	6104	17D8	6111	17DF						
571	571	0	571	7	6112	17E0	6119	17E7	2619	2619	0	2619	7	6112	17E0	6119	17E7						
572	572	0	572	7	6120	17E8	6127	17EF	2620	2620	0	2620	7	6120	17E8	6127	17EF						
573	573	0	573	7	6128	17F0	6135	17F7	2621	2621	0	2621	7	6128	17F0	6135	17F7						
574	574	0	574	7	6136	17F8	6143	17FF	2622	2622	0	2622	7	6136	17F8	6143	17FF						
575	575	0	575	7	6144	1800	6151	1807	2623	2623	0	2623	7	6144	1800	6151	1807						
576	576	0	576	7	6152	1808	6159	180F	2624	2624	0	2624	7	6152	1808	6159	180F						
577	577	0	577	7	6160	1810	6167	1817	2625	2625	0	2625	7	6160	1810	6167	1817						
578	578	0	578	7	6168	1818	6175	181F	2626	2626	0	2626	7	6168	1818	6175	181F						
579	579	0	579	7	6176	1820	6183	1827	2627	2627	0	2627	7	6176	1820	6183	1827						
580	580	0	580	7	6184	1828	6191	182F	2628	2628	0	2628	7	6184	1828	6191	182F						
581	581	0	581	7	6192	1830	6199	1837	2629	2629	0	2629	7	6192	1830	6199	1837						
582	582	0	582	7	6200	1838	6207	183F	2630	2630	0	2630	7	6200	1838	6207	183F						
583	583	0	583	7	6208	1840	6215	1847	2631	2631	0	2631	7	6208	1840	6215	1847						
584	584	0	584	7	6216	1848	6223	184F	2632	2632	0	2632	7	6216	1848	6223	184F						
585	585	0	585	7	6224	1850	6231	1857	2633	2633	0	2633	7	6224	1850	6231	1857						
586	586	0	586	7	6232	1858	6239	185F	2634	2634	0	2634	7	6232	1858	6239	185F						
587	587	0	587	7	6240	1860	6247	1867	2635	2635	0	2635	7	6240	1860	6247	1867						
588	588	0	588	7	6248	1868	6255	186F	2636	2636	0	2636	7	6248	1868	6255	186F						
589	589	0	589	7	6256	1870	6263	1877	2637	2637	0	2637	7	6256	1870	6263	1877						
590	590	0	590	7	6264	1878	6271	187F	2638	2638	0	2638	7	6264	1878	6271	187F						
591	591	0	591	7	6272	1880	6279	1887	2639	2639	0	2639	7	6272	1880	6279	1887						
592	592	0	592	7	6280	1888	6287	188F	2640	2640	0	2640	7	6280	1888	6287	188F						
593	593	0	593	7	6288	1890	6295	1897	2641	2641	0	2641	7	6288	1890	6295	1897						
594	594	0	594	7	6296	1898	6303	189F	2642	2642	0	2642	7	6296	1898	6303	189F						
595	595	0	595	7	6304	18A0	6311	18A7	2643	2643	0	2643	7	6304	18A0	6311	18A7						
596	596	0	596	7	6312	18A8	6319	18AF	2644	2644	0	2644	7	6312	18A8	6319	18AF						
597	597	0	597	7	6320	18B0	6327	18B7	2645	2645	0	2645	7	6320	18B0	6327	18B7						
598	598	0	598	7	6328	18B8	6335	18BF	2646	2646	0	2646	7	6328	18B8	6335	18BF						
599	599	0	599	7	6336	18C0	6343	18C7	2647	2647	0	2647	7	6336	18C0	6343	18C7						
600	600	0	600	7	6344	18C8	6351	18CF	2648	2648	0	2648	7	6344	18C8	6351	18CF						
601	601	0	601	7	6352	18D0	6359	18D7	2649	2649	0	2649	7	6352	18D0	6359	18D7						
602	602	0	602	7	6360	18D8	6367	18DF	2650	2650	0	2650	7	6360	18D8	6367	18DF						
603	603	0	603	7	6368	18E0	6375	18E7	2651	2651	0	2651	7	6368	18E0	6375	18E7						
604	604	0	604	7	6376	18E8	6383	18EF	2652	2652	0	2652	7	6376	18E8	6383	18EF						
605	605	0	605	7	6384	18F0	6391	18F7	2653	2653	0	2653	7	6384	18F0	6391	18F7						
606	606	0	606	7	6392	18F8	6399	18FF	2654	2654	0	2654	7	6392	18F8	6399	18FF						
607	607	0	607	7	6400	1900	6407	1907	2655	2655	0	2655	7	6400	1900	6407	1907						
608	608	0	608	7	6408	1908	6415	190F	2656	2656	0	2656	7	6408	1908	6415	190F						
609	609	0	609	7	6416	1910	6423	1917	2657	2657	0	2657	7	6416	1910	6423	1917						
610	610	0	610	7	6424	1918	6431	191F	2658	2658	0	2658	7	6424	1918	6431	191F						
611	611	0	611	7	6432	1920	6439	1927	2659	2659	0	2659	7	6432	1920	6439	1927						
612	612	0	612	7	6440	1928	6447	192F	2660	2660	0	2660	7	6440	1928	6447	192F						
613	613	0	613	7	6448	1930	6455	1937	2661	2661	0	2661	7	6448	1930	6455	1937						
614	614	0	614	7	6456	1938	6463	193F	2662	2662	0	2662	7	6456	1938	6463	193F						
615	615	0	615	7	6464	1940	6471	1947	2663	2663	0	2663	7	6464	1940	6471	1947						
616	616	0	616	7	6472	1948	6479	194F	2664	2664	0	2664	7	6472	1948	6479	194F						
617	617	0	617	7	6480	1950	6487	1957	2665	2665	0	2665	7	6480	1950	6487	1957						
618	618	0	618	7	6488	1958	6495	195F	2666	2666	0	2666	7	6488	1958	6495	195F						
619	619	0	619	7	6496	1960	6503	1967	2667	2667	0	2667	7	6496	1960	6503	1967						
620	620	0	620	7	6504	1968	6511	196F	2668	2668	0	2668	7	6504	1968	6511	196F						
621	621	0	621	7	6512	1970	6519	1977	2669	2669	0	2669	7	6512	1970	6519	1977						
622	622	0	622	7	6520	1978	6527	197F	2670	2670	0	2670	7	6520	1978	6527	197F						
623	623	0	623	7	6528	1980	6535	1987	2671	2671	0	2671	7	6528	1980	6535	1987						
624	624	0	624	7	6536	1988	6543	198F	2672	2672	0	2672	7	6536	1988	6543	198F						
625	625	0	625	7	6544	1990	6551	1997	2673	2673	0	2673	7	6544	1990	6551	1997						
626	626	0	626	7	6552	1998	6559	199F	2674	2674	0	2674	7	6552	1998	6559	199F						

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
627	627	0	627	7	6560	19A0	6567	19A7	2675	2675	0	2675	7	6560	19A0	6567	19A7						
628	628	0	628	7	6568	19A8	6575	19AF	2676	2676	0	2676	7	6568	19A8	6575	19AF						
629	629	0	629	7	6576	19B0	6583	19B7	2677	2677	0	2677	7	6576	19B0	6583	19B7						
630	630	0	630	7	6584	19B8	6591	19BF	2678	2678	0	2678	7	6584	19B8	6591	19BF						
631	631	0	631	7	6592	19C0	6599	19C7	2679	2679	0	2679	7	6592	19C0	6599	19C7						
632	632	0	632	7	6600	19C8	6607	19CF	2680	2680	0	2680	7	6600	19C8	6607	19CF						
633	633	0	633	7	6608	19D0	6615	19D7	2681	2681	0	2681	7	6608	19D0	6615	19D7						
634	634	0	634	7	6616	19D8	6623	19DF	2682	2682	0	2682	7	6616	19D8	6623	19DF						
635	635	0	635	7	6624	19E0	6631	19E7	2683	2683	0	2683	7	6624	19E0	6631	19E7						
636	636	0	636	7	6632	19E8	6639	19EF	2684	2684	0	2684	7	6632	19E8	6639	19EF						
637	637	0	637	7	6640	19F0	6647	19F7	2685	2685	0	2685	7	6640	19F0	6647	19F7						
638	638	0	638	7	6648	19F8	6655	19FF	2686	2686	0	2686	7	6648	19F8	6655	19FF						
639	639	0	639	7	6656	1A00	6663	1A07	2687	2687	0	2687	7	6656	1A00	6663	1A07						
640	640	0	640	7	6664	1A08	6671	1A0F	2688	2688	0	2688	7	6664	1A08	6671	1A0F						
641	641	0	641	7	6672	1A10	6679	1A17	2689	2689	0	2689	7	6672	1A10	6679	1A17						
642	642	0	642	7	6680	1A18	6687	1A1F	2690	2690	0	2690	7	6680	1A18	6687	1A1F						
643	643	0	643	7	6688	1A20	6695	1A27	2691	2691	0	2691	7	6688	1A20	6695	1A27						
644	644	0	644	7	6696	1A28	6703	1A2F	2692	2692	0	2692	7	6696	1A28	6703	1A2F						
645	645	0	645	7	6704	1A30	6711	1A37	2693	2693	0	2693	7	6704	1A30	6711	1A37						
646	646	0	646	7	6712	1A38	6719	1A3F	2694	2694	0	2694	7	6712	1A38	6719	1A3F						
647	647	0	647	7	6720	1A40	6727	1A47	2695	2695	0	2695	7	6720	1A40	6727	1A47						
648	648	0	648	7	6728	1A48	6735	1A4F	2696	2696	0	2696	7	6728	1A48	6735	1A4F						
649	649	0	649	7	6736	1A50	6743	1A57	2697	2697	0	2697	7	6736	1A50	6743	1A57						
650	650	0	650	7	6744	1A58	6751	1A5F	2698	2698	0	2698	7	6744	1A58	6751	1A5F						
651	651	0	651	7	6752	1A60	6759	1A67	2699	2699	0	2699	7	6752	1A60	6759	1A67						
652	652	0	652	7	6760	1A68	6767	1A6F	2700	2700	0	2700	7	6760	1A68	6767	1A6F						
653	653	0	653	7	6768	1A70	6775	1A77	2701	2701	0	2701	7	6768	1A70	6775	1A77						
654	654	0	654	7	6776	1A78	6783	1A7F	2702	2702	0	2702	7	6776	1A78	6783	1A7F						
655	655	0	655	7	6784	1A80	6791	1A87	2703	2703	0	2703	7	6784	1A80	6791	1A87						
656	656	0	656	7	6792	1A88	6799	1A8F	2704	2704	0	2704	7	6792	1A88	6799	1A8F						
657	657	0	657	7	6800	1A90	6807	1A97	2705	2705	0	2705	7	6800	1A90	6807	1A97						
658	658	0	658	7	6808	1A98	6815	1A9F	2706	2706	0	2706	7	6808	1A98	6815	1A9F						
659	659	0	659	7	6816	1AA0	6823	1AA7	2707	2707	0	2707	7	6816	1AA0	6823	1AA7						
660	660	0	660	7	6824	1AA8	6831	1AAF	2708	2708	0	2708	7	6824	1AA8	6831	1AAF						
661	661	0	661	7	6832	1AB0	6839	1AB7	2709	2709	0	2709	7	6832	1AB0	6839	1AB7						
662	662	0	662	7	6840	1AB8	6847	1ABF	2710	2710	0	2710	7	6840	1AB8	6847	1ABF						
663	663	0	663	7	6848	1AC0	6855	1AC7	2711	2711	0	2711	7	6848	1AC0	6855	1AC7						
664	664	0	664	7	6856	1AC8	6863	1ACF	2712	2712	0	2712	7	6856	1AC8	6863	1ACF						
665	665	0	665	7	6864	1AD0	6871	1AD7	2713	2713	0	2713	7	6864	1AD0	6871	1AD7						
666	666	0	666	7	6872	1AD8	6879	1ADF	2714	2714	0	2714	7	6872	1AD8	6879	1ADF						
667	667	0	667	7	6880	1AE0	6887	1AE7	2715	2715	0	2715	7	6880	1AE0	6887	1AE7						
668	668	0	668	7	6888	1AE8	6895	1AEF	2716	2716	0	2716	7	6888	1AE8	6895	1AEF						
669	669	0	669	7	6896	1AF0	6903	1AF7	2717	2717	0	2717	7	6896	1AF0	6903	1AF7						
670	670	0	670	7	6904	1AF8	6911	1AFF	2718	2718	0	2718	7	6904	1AF8	6911	1AFF						
671	671	0	671	7	6912	1B00	6919	1B07	2719	2719	0	2719	7	6912	1B00	6919	1B07						
672	672	0	672	7	6920	1B08	6927	1B0F	2720	2720	0	2720	7	6920	1B08	6927	1B0F						
673	673	0	673	7	6928	1B10	6935	1B17	2721	2721	0	2721	7	6928	1B10	6935	1B17						
674	674	0	674	7	6936	1B18	6943	1B1F	2722	2722	0	2722	7	6936	1B18	6943	1B1F						
675	675	0	675	7	6944	1B20	6951	1B27	2723	2723	0	2723	7	6944	1B20	6951	1B27						
676	676	0	676	7	6952	1B28	6959	1B2F	2724	2724	0	2724	7	6952	1B28	6959	1B2F						
677	677	0	677	7	6960	1B30	6967	1B37	2725	2725	0	2725	7	6960	1B30	6967	1B37						
678	678	0	678	7	6968	1B38	6975	1B3F	2726	2726	0	2726	7	6968	1B38	6975	1B3F						
679	679	0	679	7	6976	1B40	6983	1B47	2727	2727	0	2727	7	6976	1B40	6983	1B47						
680	680	0	680	7	6984	1B48	6991	1B4F	2728	2728	0	2728	7	6984	1B48	6991	1B4F						
681	681	0	681	7	6992	1B50	6999	1B57	2729	2729	0	2729	7	6992	1B50	6999	1B57						
682	682	0	682	7	7000	1B58	7007	1B5F	2730	2730	0	2730	7	7000	1B58	7007	1B5F						
683	683	0	683	7	7008	1B60	7015	1B67	2731	2731	0	2731	7	7008	1B60	7015	1B67						

Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
684	684	0	684	7	7016	1B68	7023	1B6F	2732	2732	0	2732	7	7016	1B68	7023	1B6F						
685	685	0	685	7	7024	1B70	7031	1B77	2733	2733	0	2733	7	7024	1B70	7031	1B77						
686	686	0	686	7	7032	1B78	7039	1B7F	2734	2734	0	2734	7	7032	1B78	7039	1B7F						
687	687	0	687	7	7040	1B80	7047	1B87	2735	2735	0	2735	7	7040	1B80	7047	1B87						
688	688	0	688	7	7048	1B88	7055	1B8F	2736	2736	0	2736	7	7048	1B88	7055	1B8F						
689	689	0	689	7	7056	1B90	7063	1B97	2737	2737	0	2737	7	7056	1B90	7063	1B97						
690	690	0	690	7	7064	1B98	7071	1B9F	2738	2738	0	2738	7	7064	1B98	7071	1B9F						
691	691	0	691	7	7072	1BA0	7079	1BA7	2739	2739	0	2739	7	7072	1BA0	7079	1BA7						
692	692	0	692	7	7080	1BA8	7087	1BAF	2740	2740	0	2740	7	7080	1BA8	7087	1BAF						
693	693	0	693	7	7088	1BB0	7095	1BB7	2741	2741	0	2741	7	7088	1BB0	7095	1BB7						
694	694	0	694	7	7096	1BB8	7103	1BBF	2742	2742	0	2742	7	7096	1BB8	7103	1BBF						
695	695	0	695	7	7104	1BC0	7111	1BC7	2743	2743	0	2743	7	7104	1BC0	7111	1BC7						
696	696	0	696	7	7112	1BC8	7119	1BCF	2744	2744	0	2744	7	7112	1BC8	7119	1BCF						
697	697	0	697	7	7120	1BD0	7127	1BD7	2745	2745	0	2745	7	7120	1BD0	7127	1BD7						
698	698	0	698	7	7128	1BD8	7135	1BDF	2746	2746	0	2746	7	7128	1BD8	7135	1BDF						
699	699	0	699	7	7136	1BE0	7143	1BE7	2747	2747	0	2747	7	7136	1BE0	7143	1BE7						
700	700	0	700	7	7144	1BE8	7151	1BEF	2748	2748	0	2748	7	7144	1BE8	7151	1BEF						
701	701	0	701	7	7152	1BF0	7159	1BF7	2749	2749	0	2749	7	7152	1BF0	7159	1BF7						
702	702	0	702	7	7160	1BF8	7167	1BFF	2750	2750	0	2750	7	7160	1BF8	7167	1BFF						
703	703	0	703	7	7168	1C00	7175	1C07	2751	2751	0	2751	7	7168	1C00	7175	1C07						
704	704	0	704	7	7176	1C08	7183	1C0F	2752	2752	0	2752	7	7176	1C08	7183	1C0F						
705	705	0	705	7	7184	1C10	7191	1C17	2753	2753	0	2753	7	7184	1C10	7191	1C17						
706	706	0	706	7	7192	1C18	7199	1C1F	2754	2754	0	2754	7	7192	1C18	7199	1C1F						
707	707	0	707	7	7200	1C20	7207	1C27	2755	2755	0	2755	7	7200	1C20	7207	1C27						
708	708	0	708	7	7208	1C28	7215	1C2F	2756	2756	0	2756	7	7208	1C28	7215	1C2F						
709	709	0	709	7	7216	1C30	7223	1C37	2757	2757	0	2757	7	7216	1C30	7223	1C37						
710	710	0	710	7	7224	1C38	7231	1C3F	2758	2758	0	2758	7	7224	1C38	7231	1C3F						
711	711	0	711	7	7232	1C40	7239	1C47	2759	2759	0	2759	7	7232	1C40	7239	1C47						
712	712	0	712	7	7240	1C48	7247	1C4F	2760	2760	0	2760	7	7240	1C48	7247	1C4F						
713	713	0	713	7	7248	1C50	7255	1C57	2761	2761	0	2761	7	7248	1C50	7255	1C57						
714	714	0	714	7	7256	1C58	7263	1C5F	2762	2762	0	2762	7	7256	1C58	7263	1C5F						
715	715	0	715	7	7264	1C60	7271	1C67	2763	2763	0	2763	7	7264	1C60	7271	1C67						
716	716	0	716	7	7272	1C68	7279	1C6F	2764	2764	0	2764	7	7272	1C68	7279	1C6F						
717	717	0	717	7	7280	1C70	7287	1C77	2765	2765	0	2765	7	7280	1C70	7287	1C77						
718	718	0	718	7	7288	1C78	7295	1C7F	2766	2766	0	2766	7	7288	1C78	7295	1C7F						
719	719	0	719	7	7296	1C80	7303	1C87	2767	2767	0	2767	7	7296	1C80	7303	1C87						
720	720	0	720	7	7304	1C88	7311	1C8F	2768	2768	0	2768	7	7304	1C88	7311	1C8F						
721	721	0	721	7	7312	1C90	7319	1C97	2769	2769	0	2769	7	7312	1C90	7319	1C97						
722	722	0	722	7	7320	1C98	7327	1C9F	2770	2770	0	2770	7	7320	1C98	7327	1C9F						
723	723	0	723	7	7328	1CA0	7335	1CA7	2771	2771	0	2771	7	7328	1CA0	7335	1CA7						
724	724	0	724	7	7336	1CA8	7343	1CAF	2772	2772	0	2772	7	7336	1CA8	7343	1CAF						
725	725	0	725	7	7344	1CB0	7351	1CB7	2773	2773	0	2773	7	7344	1CB0	7351	1CB7						
726	726	0	726	7	7352	1CB8	7359	1CBF	2774	2774	0	2774	7	7352	1CB8	7359	1CBF						
727	727	0	727	7	7360	1CC0	7367	1CC7	2775	2775	0	2775	7	7360	1CC0	7367	1CC7						
728	728	0	728	7	7368	1CC8	7375	1CCF	2776	2776	0	2776	7	7368	1CC8	7375	1CCF						
729	729	0	729	7	7376	1CD0	7383	1CD7	2777	2777	0	2777	7	7376	1CD0	7383	1CD7						
730	730	0	730	7	7384	1CD8	7391	1CDF	2778	2778	0	2778	7	7384	1CD8	7391	1CDF						
731	731	0	731	7	7392	1CE0	7399	1CE7	2779	2779	0	2779	7	7392	1CE0	7399	1CE7						
732	732	0	732	7	7400	1CE8	7407	1CEF	2780	2780	0	2780	7	7400	1CE8	7407	1CEF						
733	733	0	733	7	7408	1CF0	7415	1CF7	2781	2781	0	2781	7	7408	1CF0	7415	1CF7						
734	734	0	734	7	7416	1CF8	7423	1CFF	2782	2782	0	2782	7	7416	1CF8	7423	1CFF						
735	735	0	735	7	7424	1D00	7431	1D07	2783	2783	0	2783	7	7424	1D00	7431	1D07						
736	736	0	736	7	7432	1D08	7439	1D0F	2784	2784	0	2784	7	7432	1D08	7439	1D0F						
737	737	0	737	7	7440	1D10	7447	1D17	2785	2785	0	2785	7	7440	1D10	7447	1D17						
738	738	0	738	7	7448	1D18	7455	1D1F	2786	2786	0	2786	7	7448	1D18	7455	1D1F						
739	739	0	739	7	7456	1D20	7463	1D27	2787	2787	0	2787	7	7456	1D20	7463	1D27						
740	740	0	740	7	7464	1D28	7471	1D2F	2788	2788	0	2788	7	7464	1D28	7471	1D2F						

Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
741	741	0	741	7	7472	1D30	7479	1D37	2789	2789	0	2789	7	7472	1D30	7479	1D37						
742	742	0	742	7	7480	1D38	7487	1D3F	2790	2790	0	2790	7	7480	1D38	7487	1D3F						
743	743	0	743	7	7488	1D40	7495	1D47	2791	2791	0	2791	7	7488	1D40	7495	1D47						
744	744	0	744	7	7496	1D48	7503	1D4F	2792	2792	0	2792	7	7496	1D48	7503	1D4F						
745	745	0	745	7	7504	1D50	7511	1D57	2793	2793	0	2793	7	7504	1D50	7511	1D57						
746	746	0	746	7	7512	1D58	7519	1D5F	2794	2794	0	2794	7	7512	1D58	7519	1D5F						
747	747	0	747	7	7520	1D60	7527	1D67	2795	2795	0	2795	7	7520	1D60	7527	1D67						
748	748	0	748	7	7528	1D68	7535	1D6F	2796	2796	0	2796	7	7528	1D68	7535	1D6F						
749	749	0	749	7	7536	1D70	7543	1D77	2797	2797	0	2797	7	7536	1D70	7543	1D77						
750	750	0	750	7	7544	1D78	7551	1D7F	2798	2798	0	2798	7	7544	1D78	7551	1D7F						
751	751	0	751	7	7552	1D80	7559	1D87	2799	2799	0	2799	7	7552	1D80	7559	1D87						
752	752	0	752	7	7560	1D88	7567	1D8F	2800	2800	0	2800	7	7560	1D88	7567	1D8F						
753	753	0	753	7	7568	1D90	7575	1D97	2801	2801	0	2801	7	7568	1D90	7575	1D97						
754	754	0	754	7	7576	1D98	7583	1D9F	2802	2802	0	2802	7	7576	1D98	7583	1D9F						
755	755	0	755	7	7584	1DA0	7591	1DA7	2803	2803	0	2803	7	7584	1DA0	7591	1DA7						
756	756	0	756	7	7592	1DA8	7599	1DAF	2804	2804	0	2804	7	7592	1DA8	7599	1DAF						
757	757	0	757	7	7600	1DB0	7607	1DB7	2805	2805	0	2805	7	7600	1DB0	7607	1DB7						
758	758	0	758	7	7608	1DB8	7615	1DBF	2806	2806	0	2806	7	7608	1DB8	7615	1DBF						
759	759	0	759	7	7616	1DC0	7623	1DC7	2807	2807	0	2807	7	7616	1DC0	7623	1DC7						
760	760	0	760	7	7624	1DC8	7631	1DCF	2808	2808	0	2808	7	7624	1DC8	7631	1DCF						
761	761	0	761	7	7632	1DD0	7639	1DD7	2809	2809	0	2809	7	7632	1DD0	7639	1DD7						
762	762	0	762	7	7640	1DD8	7647	1DDF	2810	2810	0	2810	7	7640	1DD8	7647	1DDF						
763	763	0	763	7	7648	1DE0	7655	1DE7	2811	2811	0	2811	7	7648	1DE0	7655	1DE7						
764	764	0	764	7	7656	1DE8	7663	1DEF	2812	2812	0	2812	7	7656	1DE8	7663	1DEF						
765	765	0	765	7	7664	1DF0	7671	1DF7	2813	2813	0	2813	7	7664	1DF0	7671	1DF7						
766	766	0	766	7	7672	1DF8	7679	1DFF	2814	2814	0	2814	7	7672	1DF8	7679	1DFF						
767	767	0	767	7	7680	1E00	7687	1E07	2815	2815	0	2815	7	7680	1E00	7687	1E07						
768	768	0	768	7	7688	1E08	7695	1E0F	2816	2816	0	2816	7	7688	1E08	7695	1E0F						
769	769	0	769	7	7696	1E10	7703	1E17	2817	2817	0	2817	7	7696	1E10	7703	1E17						
770	770	0	770	7	7704	1E18	7711	1E1F	2818	2818	0	2818	7	7704	1E18	7711	1E1F						
771	771	0	771	7	7712	1E20	7719	1E27	2819	2819	0	2819	7	7712	1E20	7719	1E27						
772	772	0	772	7	7720	1E28	7727	1E2F	2820	2820	0	2820	7	7720	1E28	7727	1E2F						
773	773	0	773	7	7728	1E30	7735	1E37	2821	2821	0	2821	7	7728	1E30	7735	1E37						
774	774	0	774	7	7736	1E38	7743	1E3F	2822	2822	0	2822	7	7736	1E38	7743	1E3F						
775	775	0	775	7	7744	1E40	7751	1E47	2823	2823	0	2823	7	7744	1E40	7751	1E47						
776	776	0	776	7	7752	1E48	7759	1E4F	2824	2824	0	2824	7	7752	1E48	7759	1E4F						
777	777	0	777	7	7760	1E50	7767	1E57	2825	2825	0	2825	7	7760	1E50	7767	1E57						
778	778	0	778	7	7768	1E58	7775	1E5F	2826	2826	0	2826	7	7768	1E58	7775	1E5F						
779	779	0	779	7	7776	1E60	7783	1E67	2827	2827	0	2827	7	7776	1E60	7783	1E67						
780	780	0	780	7	7784	1E68	7791	1E6F	2828	2828	0	2828	7	7784	1E68	7791	1E6F						
781	781	0	781	7	7792	1E70	7799	1E77	2829	2829	0	2829	7	7792	1E70	7799	1E77						
782	782	0	782	7	7800	1E78	7807	1E7F	2830	2830	0	2830	7	7800	1E78	7807	1E7F						
783	783	0	783	7	7808	1E80	7815	1E87	2831	2831	0	2831	7	7808	1E80	7815	1E87						
784	784	0	784	7	7816	1E88	7823	1E8F	2832	2832	0	2832	7	7816	1E88	7823	1E8F						
785	785	0	785	7	7824	1E90	7831	1E97	2833	2833	0	2833	7	7824	1E90	7831	1E97						
786	786	0	786	7	7832	1E98	7839	1E9F	2834	2834	0	2834	7	7832	1E98	7839	1E9F						
787	787	0	787	7	7840	1EA0	7847	1EA7	2835	2835	0	2835	7	7840	1EA0	7847	1EA7						
788	788	0	788	7	7848	1EA8	7855	1EAF	2836	2836	0	2836	7	7848	1EA8	7855	1EAF						
789	789	0	789	7	7856	1EB0	7863	1EB7	2837	2837	0	2837	7	7856	1EB0	7863	1EB7						
790	790	0	790	7	7864	1EB8	7871	1EBF	2838	2838	0	2838	7	7864	1EB8	7871	1EBF						
791	791	0	791	7	7872	1EC0	7879	1EC7	2839	2839	0	2839	7	7872	1EC0	7879	1EC7						
792	792	0	792	7	7880	1EC8	7887	1ECF	2840	2840	0	2840	7	7880	1EC8	7887	1ECF						
793	793	0	793	7	7888	1ED0	7895	1ED7	2841	2841	0	2841	7	7888	1ED0	7895	1ED7						
794	794	0	794	7	7896	1ED8	7903	1EDF	2842	2842	0	2842	7	7896	1ED8	7903	1EDF						
795	795	0	795	7	7904	1EE0	7911	1EE7	2843	2843	0	2843	7	7904	1EE0	7911	1EE7						
796	796	0	796	7	7912	1EE8	7919	1EEF	2844	2844	0	2844	7	7912	1EE8	7919	1EEF						
797	797	0	797	7	7920	1EF0	7927	1EF7	2845	2845	0	2845	7	7920	1EF0	7927	1EF7						

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
798	798	0	798	7	7928	1EF8	7935	1EFF	2846	2846	0	2846	7	7928	1EF8	7935	1EFF						
799	799	0	799	7	7936	1F00	7943	1F07	2847	2847	0	2847	7	7936	1F00	7943	1F07						
800	800	0	800	7	7944	1F08	7951	1F0F	2848	2848	0	2848	7	7944	1F08	7951	1F0F						
801	801	0	801	7	7952	1F10	7959	1F17	2849	2849	0	2849	7	7952	1F10	7959	1F17						
802	802	0	802	7	7960	1F18	7967	1F1F	2850	2850	0	2850	7	7960	1F18	7967	1F1F						
803	803	0	803	7	7968	1F20	7975	1F27	2851	2851	0	2851	7	7968	1F20	7975	1F27						
804	804	0	804	7	7976	1F28	7983	1F2F	2852	2852	0	2852	7	7976	1F28	7983	1F2F						
805	805	0	805	7	7984	1F30	7991	1F37	2853	2853	0	2853	7	7984	1F30	7991	1F37						
806	806	0	806	7	7992	1F38	7999	1F3F	2854	2854	0	2854	7	7992	1F38	7999	1F3F						
807	807	0	807	7	8000	1F40	8007	1F47	2855	2855	0	2855	7	8000	1F40	8007	1F47						
808	808	0	808	7	8008	1F48	8015	1F4F	2856	2856	0	2856	7	8008	1F48	8015	1F4F						
809	809	0	809	7	8016	1F50	8023	1F57	2857	2857	0	2857	7	8016	1F50	8023	1F57						
810	810	0	810	7	8024	1F58	8031	1F5F	2858	2858	0	2858	7	8024	1F58	8031	1F5F						
811	811	0	811	7	8032	1F60	8039	1F67	2859	2859	0	2859	7	8032	1F60	8039	1F67						
812	812	0	812	7	8040	1F68	8047	1F6F	2860	2860	0	2860	7	8040	1F68	8047	1F6F						
813	813	0	813	7	8048	1F70	8055	1F77	2861	2861	0	2861	7	8048	1F70	8055	1F77						
814	814	0	814	7	8056	1F78	8063	1F7F	2862	2862	0	2862	7	8056	1F78	8063	1F7F						
815	815	0	815	7	8064	1F80	8071	1F87	2863	2863	0	2863	7	8064	1F80	8071	1F87						
816	816	0	816	7	8072	1F88	8079	1F8F	2864	2864	0	2864	7	8072	1F88	8079	1F8F						
817	817	0	817	7	8080	1F90	8087	1F97	2865	2865	0	2865	7	8080	1F90	8087	1F97						
818	818	0	818	7	8088	1F98	8095	1F9F	2866	2866	0	2866	7	8088	1F98	8095	1F9F						
819	819	0	819	7	8096	1FA0	8103	1FA7	2867	2867	0	2867	7	8096	1FA0	8103	1FA7						
820	820	0	820	7	8104	1FA8	8111	1FAF	2868	2868	0	2868	7	8104	1FA8	8111	1FAF						
821	821	0	821	7	8112	1FB0	8119	1FB7	2869	2869	0	2869	7	8112	1FB0	8119	1FB7						
822	822	0	822	7	8120	1FB8	8127	1FBF	2870	2870	0	2870	7	8120	1FB8	8127	1FBF						
823	823	0	823	7	8128	1FC0	8135	1FC7	2871	2871	0	2871	7	8128	1FC0	8135	1FC7						
824	824	0	824	7	8136	1FC8	8143	1FCF	2872	2872	0	2872	7	8136	1FC8	8143	1FCF						
825	825	0	825	7	8144	1FD0	8151	1FD7	2873	2873	0	2873	7	8144	1FD0	8151	1FD7						
826	826	0	826	7	8152	1FD8	8159	1FDF	2874	2874	0	2874	7	8152	1FD8	8159	1FDF						
827	827	0	827	7	8160	1FE0	8167	1FE7	2875	2875	0	2875	7	8160	1FE0	8167	1FE7						
828	828	0	828	7	8168	1FE8	8175	1FEF	2876	2876	0	2876	7	8168	1FE8	8175	1FEF						
829	829	0	829	7	8176	1FF0	8183	1FF7	2877	2877	0	2877	7	8176	1FF0	8183	1FF7						
830	830	0	830	7	8184	1FF8	8191	1FFF	2878	2878	0	2878	7	8184	1FF8	8191	1FFF						
831	831	0	831	7	8192	2000	8199	2007	2879	2879	0	2879	7	8192	2000	8199	2007						
832	832	0	832	7	8200	2008	8207	200F	2880	2880	0	2880	7	8200	2008	8207	200F						
833	833	0	833	7	8208	2010	8215	2017	2881	2881	0	2881	7	8208	2010	8215	2017						
834	834	0	834	7	8216	2018	8223	201F	2882	2882	0	2882	7	8216	2018	8223	201F						
835	835	0	835	7	8224	2020	8231	2027	2883	2883	0	2883	7	8224	2020	8231	2027						
836	836	0	836	7	8232	2028	8239	202F	2884	2884	0	2884	7	8232	2028	8239	202F						
837	837	0	837	7	8240	2030	8247	2037	2885	2885	0	2885	7	8240	2030	8247	2037						
838	838	0	838	7	8248	2038	8255	203F	2886	2886	0	2886	7	8248	2038	8255	203F						
839	839	0	839	7	8256	2040	8263	2047	2887	2887	0	2887	7	8256	2040	8263	2047						
840	840	0	840	7	8264	2048	8271	204F	2888	2888	0	2888	7	8264	2048	8271	204F						
841	841	0	841	7	8272	2050	8279	2057	2889	2889	0	2889	7	8272	2050	8279	2057						
842	842	0	842	7	8280	2058	8287	205F	2890	2890	0	2890	7	8280	2058	8287	205F						
843	843	0	843	7	8288	2060	8295	2067	2891	2891	0	2891	7	8288	2060	8295	2067						
844	844	0	844	7	8296	2068	8303	206F	2892	2892	0	2892	7	8296	2068	8303	206F						
845	845	0	845	7	8304	2070	8311	2077	2893	2893	0	2893	7	8304	2070	8311	2077						
846	846	0	846	7	8312	2078	8319	207F	2894	2894	0	2894	7	8312	2078	8319	207F						
847	847	0	847	7	8320	2080	8327	2087	2895	2895	0	2895	7	8320	2080	8327	2087						
848	848	0	848	7	8328	2088	8335	208F	2896	2896	0	2896	7	8328	2088	8335	208F						
849	849	0	849	7	8336	2090	8343	2097	2897	2897	0	2897	7	8336	2090	8343	2097						
850	850	0	850	7	8344	2098	8351	209F	2898	2898	0	2898	7	8344	2098	8351	209F						
851	851	0	851	7	8352	20A0	8359	20A7	2899	2899	0	2899	7	8352	20A0	8359	20A7						
852	852	0	852	7	8360	20A8	8367	20AF	2900	2900	0	2900	7	8360	20A8	8367	20AF						
853	853	0	853	7	8368	20B0	8375	20B7	2901	2901	0	2901	7	8368	20B0	8375	20B7						
854	854	0	854	7	8376	20B8	8383	20BF	2902	2902	0	2902	7	8376	20B8	8383	20BF						

Virtual																							
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
855	855	0	855	7	8384	20C0	8391	20C7	2903	2903	0	2903	7	8384	20C0	8391	20C7						
856	856	0	856	7	8392	20C8	8399	20CF	2904	2904	0	2904	7	8392	20C8	8399	20CF						
857	857	0	857	7	8400	20D0	8407	20D7	2905	2905	0	2905	7	8400	20D0	8407	20D7						
858	858	0	858	7	8408	20D8	8415	20DF	2906	2906	0	2906	7	8408	20D8	8415	20DF						
859	859	0	859	7	8416	20E0	8423	20E7	2907	2907	0	2907	7	8416	20E0	8423	20E7						
860	860	0	860	7	8424	20E8	8431	20EF	2908	2908	0	2908	7	8424	20E8	8431	20EF						
861	861	0	861	7	8432	20F0	8439	20F7	2909	2909	0	2909	7	8432	20F0	8439	20F7						
862	862	0	862	7	8440	20F8	8447	20FF	2910	2910	0	2910	7	8440	20F8	8447	20FF						
863	863	0	863	7	8448	2100	8455	2107	2911	2911	0	2911	7	8448	2100	8455	2107						
864	864	0	864	7	8456	2108	8463	210F	2912	2912	0	2912	7	8456	2108	8463	210F						
865	865	0	865	7	8464	2110	8471	2117	2913	2913	0	2913	7	8464	2110	8471	2117						
866	866	0	866	7	8472	2118	8479	211F	2914	2914	0	2914	7	8472	2118	8479	211F						
867	867	0	867	7	8480	2120	8487	2127	2915	2915	0	2915	7	8480	2120	8487	2127						
868	868	0	868	7	8488	2128	8495	212F	2916	2916	0	2916	7	8488	2128	8495	212F						
869	869	0	869	7	8496	2130	8503	2137	2917	2917	0	2917	7	8496	2130	8503	2137						
870	870	0	870	7	8504	2138	8511	213F	2918	2918	0	2918	7	8504	2138	8511	213F						
871	871	0	871	7	8512	2140	8519	2147	2919	2919	0	2919	7	8512	2140	8519	2147						
872	872	0	872	7	8520	2148	8527	214F	2920	2920	0	2920	7	8520	2148	8527	214F						
873	873	0	873	7	8528	2150	8535	2157	2921	2921	0	2921	7	8528	2150	8535	2157						
874	874	0	874	7	8536	2158	8543	215F	2922	2922	0	2922	7	8536	2158	8543	215F						
875	875	0	875	7	8544	2160	8551	2167	2923	2923	0	2923	7	8544	2160	8551	2167						
876	876	0	876	7	8552	2168	8559	216F	2924	2924	0	2924	7	8552	2168	8559	216F						
877	877	0	877	7	8560	2170	8567	2177	2925	2925	0	2925	7	8560	2170	8567	2177						
878	878	0	878	7	8568	2178	8575	217F	2926	2926	0	2926	7	8568	2178	8575	217F						
879	879	0	879	7	8576	2180	8583	2187	2927	2927	0	2927	7	8576	2180	8583	2187						
880	880	0	880	7	8584	2188	8591	218F	2928	2928	0	2928	7	8584	2188	8591	218F						
881	881	0	881	7	8592	2190	8599	2197	2929	2929	0	2929	7	8592	2190	8599	2197						
882	882	0	882	7	8600	2198	8607	219F	2930	2930	0	2930	7	8600	2198	8607	219F						
883	883	0	883	7	8608	21A0	8615	21A7	2931	2931	0	2931	7	8608	21A0	8615	21A7						
884	884	0	884	7	8616	21A8	8623	21AF	2932	2932	0	2932	7	8616	21A8	8623	21AF						
885	885	0	885	7	8624	21B0	8631	21B7	2933	2933	0	2933	7	8624	21B0	8631	21B7						
886	886	0	886	7	8632	21B8	8639	21BF	2934	2934	0	2934	7	8632	21B8	8639	21BF						
887	887	0	887	7	8640	21C0	8647	21C7	2935	2935	0	2935	7	8640	21C0	8647	21C7						
888	888	0	888	7	8648	21C8	8655	21CF	2936	2936	0	2936	7	8648	21C8	8655	21CF						
889	889	0	889	7	8656	21D0	8663	21D7	2937	2937	0	2937	7	8656	21D0	8663	21D7						
890	890	0	890	7	8664	21D8	8671	21DF	2938	2938	0	2938	7	8664	21D8	8671	21DF						
891	891	0	891	7	8672	21E0	8679	21E7	2939	2939	0	2939	7	8672	21E0	8679	21E7						
892	892	0	892	7	8680	21E8	8687	21EF	2940	2940	0	2940	7	8680	21E8	8687	21EF						
893	893	0	893	7	8688	21F0	8695	21F7	2941	2941	0	2941	7	8688	21F0	8695	21F7						
894	894	0	894	7	8696	21F8	8703	21FF	2942	2942	0	2942	7	8696	21F8	8703	21FF						
895	895	0	895	7	8704	2200	8711	2207	2943	2943	0	2943	7	8704	2200	8711	2207						
896	896	0	896	7	8712	2208	8719	220F	2944	2944	0	2944	7	8712	2208	8719	220F						
897	897	0	897	7	8720	2210	8727	2217	2945	2945	0	2945	7	8720	2210	8727	2217						
898	898	0	898	7	8728	2218	8735	221F	2946	2946	0	2946	7	8728	2218	8735	221F						
899	899	0	899	7	8736	2220	8743	2227	2947	2947	0	2947	7	8736	2220	8743	2227						
900	900	0	900	7	8744	2228	8751	222F	2948	2948	0	2948	7	8744	2228	8751	222F						
901	901	0	901	7	8752	2230	8759	2237	2949	2949	0	2949	7	8752	2230	8759	2237						
902	902	0	902	7	8760	2238	8767	223F	2950	2950	0	2950	7	8760	2238	8767	223F						
903	903	0	903	7	8768	2240	8775	2247	2951	2951	0	2951	7	8768	2240	8775	2247						
904	904	0	904	7	8776	2248	8783	224F	2952	2952	0	2952	7	8776	2248	8783	224F						
905	905	0	905	7	8784	2250	8791	2257	2953	2953	0	2953	7	8784	2250	8791	2257						
906	906	0	906	7	8792	2258	8799	225F	2954	2954	0	2954	7	8792	2258	8799	225F						
907	907	0	907	7	8800	2260	8807	2267	2955	2955	0	2955	7	8800	2260	8807	2267						
908	908	0	908	7	8808	2268	8815	226F	2956	2956	0	2956	7	8808	2268	8815	226F						
909	909	0	909	7	8816	2270	8823	2277	2957	2957	0	2957	7	8816	2270	8823	2277						
910	910	0	910	7	8824	2278	8831	227F	2958	2958	0	2958	7	8824	2278	8831	227F						
911	911	0	911	7	8832	2280	8839	2287	2959	2959	0	2959	7	8832	2280	8839	2287						

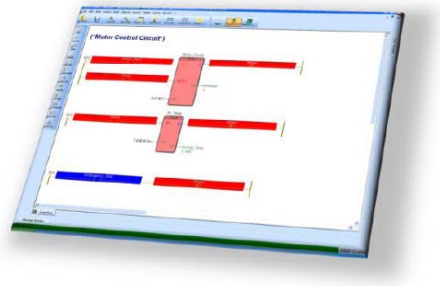
Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
912	912	0	912	7	8840	2288	8847	228F	2960	2960	0	2960	7	8840	2288	8847	228F						
913	913	0	913	7	8848	2290	8855	2297	2961	2961	0	2961	7	8848	2290	8855	2297						
914	914	0	914	7	8856	2298	8863	229F	2962	2962	0	2962	7	8856	2298	8863	229F						
915	915	0	915	7	8864	22A0	8871	22A7	2963	2963	0	2963	7	8864	22A0	8871	22A7						
916	916	0	916	7	8872	22A8	8879	22AF	2964	2964	0	2964	7	8872	22A8	8879	22AF						
917	917	0	917	7	8880	22B0	8887	22B7	2965	2965	0	2965	7	8880	22B0	8887	22B7						
918	918	0	918	7	8888	22B8	8895	22BF	2966	2966	0	2966	7	8888	22B8	8895	22BF						
919	919	0	919	7	8896	22C0	8903	22C7	2967	2967	0	2967	7	8896	22C0	8903	22C7						
920	920	0	920	7	8904	22C8	8911	22CF	2968	2968	0	2968	7	8904	22C8	8911	22CF						
921	921	0	921	7	8912	22D0	8919	22D7	2969	2969	0	2969	7	8912	22D0	8919	22D7						
922	922	0	922	7	8920	22D8	8927	22DF	2970	2970	0	2970	7	8920	22D8	8927	22DF						
923	923	0	923	7	8928	22E0	8935	22E7	2971	2971	0	2971	7	8928	22E0	8935	22E7						
924	924	0	924	7	8936	22E8	8943	22EF	2972	2972	0	2972	7	8936	22E8	8943	22EF						
925	925	0	925	7	8944	22F0	8951	22F7	2973	2973	0	2973	7	8944	22F0	8951	22F7						
926	926	0	926	7	8952	22F8	8959	22FF	2974	2974	0	2974	7	8952	22F8	8959	22FF						
927	927	0	927	7	8960	2300	8967	2307	2975	2975	0	2975	7	8960	2300	8967	2307						
928	928	0	928	7	8968	2308	8975	230F	2976	2976	0	2976	7	8968	2308	8975	230F						
929	929	0	929	7	8976	2310	8983	2317	2977	2977	0	2977	7	8976	2310	8983	2317						
930	930	0	930	7	8984	2318	8991	231F	2978	2978	0	2978	7	8984	2318	8991	231F						
931	931	0	931	7	8992	2320	8999	2327	2979	2979	0	2979	7	8992	2320	8999	2327						
932	932	0	932	7	9000	2328	9007	232F	2980	2980	0	2980	7	9000	2328	9007	232F						
933	933	0	933	7	9008	2330	9015	2337	2981	2981	0	2981	7	9008	2330	9015	2337						
934	934	0	934	7	9016	2338	9023	233F	2982	2982	0	2982	7	9016	2338	9023	233F						
935	935	0	935	7	9024	2340	9031	2347	2983	2983	0	2983	7	9024	2340	9031	2347						
936	936	0	936	7	9032	2348	9039	234F	2984	2984	0	2984	7	9032	2348	9039	234F						
937	937	0	937	7	9040	2350	9047	2357	2985	2985	0	2985	7	9040	2350	9047	2357						
938	938	0	938	7	9048	2358	9055	235F	2986	2986	0	2986	7	9048	2358	9055	235F						
939	939	0	939	7	9056	2360	9063	2367	2987	2987	0	2987	7	9056	2360	9063	2367						
940	940	0	940	7	9064	2368	9071	236F	2988	2988	0	2988	7	9064	2368	9071	236F						
941	941	0	941	7	9072	2370	9079	2377	2989	2989	0	2989	7	9072	2370	9079	2377						
942	942	0	942	7	9080	2378	9087	237F	2990	2990	0	2990	7	9080	2378	9087	237F						
943	943	0	943	7	9088	2380	9095	2387	2991	2991	0	2991	7	9088	2380	9095	2387						
944	944	0	944	7	9096	2388	9103	238F	2992	2992	0	2992	7	9096	2388	9103	238F						
945	945	0	945	7	9104	2390	9111	2397	2993	2993	0	2993	7	9104	2390	9111	2397						
946	946	0	946	7	9112	2398	9119	239F	2994	2994	0	2994	7	9112	2398	9119	239F						
947	947	0	947	7	9120	23A0	9127	23A7	2995	2995	0	2995	7	9120	23A0	9127	23A7						
948	948	0	948	7	9128	23A8	9135	23AF	2996	2996	0	2996	7	9128	23A8	9135	23AF						
949	949	0	949	7	9136	23B0	9143	23B7	2997	2997	0	2997	7	9136	23B0	9143	23B7						
950	950	0	950	7	9144	23B8	9151	23BF	2998	2998	0	2998	7	9144	23B8	9151	23BF						
951	951	0	951	7	9152	23C0	9159	23C7	2999	2999	0	2999	7	9152	23C0	9159	23C7						
952	952	0	952	7	9160	23C8	9167	23CF	3000	3000	0	3000	7	9160	23C8	9167	23CF						
953	953	0	953	7	9168	23D0	9175	23D7	3001	3001	0	3001	7	9168	23D0	9175	23D7						
954	954	0	954	7	9176	23D8	9183	23DF	3002	3002	0	3002	7	9176	23D8	9183	23DF						
955	955	0	955	7	9184	23E0	9191	23E7	3003	3003	0	3003	7	9184	23E0	9191	23E7						
956	956	0	956	7	9192	23E8	9199	23EF	3004	3004	0	3004	7	9192	23E8	9199	23EF						
957	957	0	957	7	9200	23F0	9207	23F7	3005	3005	0	3005	7	9200	23F0	9207	23F7						
958	958	0	958	7	9208	23F8	9215	23FF	3006	3006	0	3006	7	9208	23F8	9215	23FF						
959	959	0	959	7	9216	2400	9223	2407	3007	3007	0	3007	7	9216	2400	9223	2407						
960	960	0	960	7	9224	2408	9231	240F	3008	3008	0	3008	7	9224	2408	9231	240F						
961	961	0	961	7	9232	2410	9239	2417	3009	3009	0	3009	7	9232	2410	9239	2417						
962	962	0	962	7	9240	2418	9247	241F	3010	3010	0	3010	7	9240	2418	9247	241F						
963	963	0	963	7	9248	2420	9255	2427	3011	3011	0	3011	7	9248	2420	9255	2427						
964	964	0	964	7	9256	2428	9263	242F	3012	3012	0	3012	7	9256	2428	9263	242F						
965	965	0	965	7	9264	2430	9271	2437	3013	3013	0	3013	7	9264	2430	9271	2437						
966	966	0	966	7	9272	2438	9279	243F	3014	3014	0	3014	7	9272	2438	9279	243F						
967	967	0	967	7	9280	2440	9287	2447	3015	3015	0	3015	7	9280	2440	9287	2447						
968	968	0	968	7	9288	2448	9295	244F	3016	3016	0	3016	7	9288	2448	9295	244F						

Virtual																								
%M	%M				MODBUS Coil				%M	%M				MODBUS Discrete Input				%M	MODBUS Holding Registers		%M	MODBUS Input Registers	
	Begin		End		Begin		End			Begin		End		Begin		End							
					DEC	HEX	DEC	HEX						DEC	HEX	DEC	HEX		DEC	HEX		DEC	HEX
B 3.	X 3.								B 3.	X 3.								W 3.			W 3.		
969	969	0	969	7	9296	2450	9303	2457	3017	3017	0	3017	7	9296	2450	9303	2457						
970	970	0	970	7	9304	2458	9311	245F	3018	3018	0	3018	7	9304	2458	9311	245F						
971	971	0	971	7	9312	2460	9319	2467	3019	3019	0	3019	7	9312	2460	9319	2467						
972	972	0	972	7	9320	2468	9327	246F	3020	3020	0	3020	7	9320	2468	9327	246F						
973	973	0	973	7	9328	2470	9335	2477	3021	3021	0	3021	7	9328	2470	9335	2477						
974	974	0	974	7	9336	2478	9343	247F	3022	3022	0	3022	7	9336	2478	9343	247F						
975	975	0	975	7	9344	2480	9351	2487	3023	3023	0	3023	7	9344	2480	9351	2487						
976	976	0	976	7	9352	2488	9359	248F	3024	3024	0	3024	7	9352	2488	9359	248F						
977	977	0	977	7	9360	2490	9367	2497	3025	3025	0	3025	7	9360	2490	9367	2497						
978	978	0	978	7	9368	2498	9375	249F	3026	3026	0	3026	7	9368	2498	9375	249F						
979	979	0	979	7	9376	24A0	9383	24A7	3027	3027	0	3027	7	9376	24A0	9383	24A7						
980	980	0	980	7	9384	24A8	9391	24AF	3028	3028	0	3028	7	9384	24A8	9391	24AF						
981	981	0	981	7	9392	24B0	9399	24B7	3029	3029	0	3029	7	9392	24B0	9399	24B7						
982	982	0	982	7	9400	24B8	9407	24BF	3030	3030	0	3030	7	9400	24B8	9407	24BF						
983	983	0	983	7	9408	24C0	9415	24C7	3031	3031	0	3031	7	9408	24C0	9415	24C7						
984	984	0	984	7	9416	24C8	9423	24CF	3032	3032	0	3032	7	9416	24C8	9423	24CF						
985	985	0	985	7	9424	24D0	9431	24D7	3033	3033	0	3033	7	9424	24D0	9431	24D7						
986	986	0	986	7	9432	24D8	9439	24DF	3034	3034	0	3034	7	9432	24D8	9439	24DF						
987	987	0	987	7	9440	24E0	9447	24E7	3035	3035	0	3035	7	9440	24E0	9447	24E7						
988	988	0	988	7	9448	24E8	9455	24EF	3036	3036	0	3036	7	9448	24E8	9455	24EF						
989	989	0	989	7	9456	24F0	9463	24F7	3037	3037	0	3037	7	9456	24F0	9463	24F7						
990	990	0	990	7	9464	24F8	9471	24FF	3038	3038	0	3038	7	9464	24F8	9471	24FF						
991	991	0	991	7	9472	2500	9479	2507	3039	3039	0	3039	7	9472	2500	9479	2507						
992	992	0	992	7	9480	2508	9487	250F	3040	3040	0	3040	7	9480	2508	9487	250F						
993	993	0	993	7	9488	2510	9495	2517	3041	3041	0	3041	7	9488	2510	9495	2517						
994	994	0	994	7	9496	2518	9503	251F	3042	3042	0	3042	7	9496	2518	9503	251F						
995	995	0	995	7	9504	2520	9511	2527	3043	3043	0	3043	7	9504	2520	9511	2527						
996	996	0	996	7	9512	2528	9519	252F	3044	3044	0	3044	7	9512	2528	9519	252F						
997	997	0	997	7	9520	2530	9527	2537	3045	3045	0	3045	7	9520	2530	9527	2537						
998	998	0	998	7	9528	2538	9535	253F	3046	3046	0	3046	7	9528	2538	9535	253F						
999	999	0	999	7	9536	2540	9543	2547	3047	3047	0	3047	7	9536	2540	9543	2547						
1000	1000	0	1000	7	9544	2548	9551	254F	3048	3048	0	3048	7	9544	2548	9551	254F						
1001	1001	0	1001	7	9552	2550	9559	2557	3049	3049	0	3049	7	9552	2550	9559	2557						
1002	1002	0	1002	7	9560	2558	9567	255F	3050	3050	0	3050	7	9560	2558	9567	255F						
1003	1003	0	1003	7	9568	2560	9575	2567	3051	3051	0	3051	7	9568	2560	9575	2567						
1004	1004	0	1004	7	9576	2568	9583	256F	3052	3052	0	3052	7	9576	2568	9583	256F						
1005	1005	0	1005	7	9584	2570	9591	2577	3053	3053	0	3053	7	9584	2570	9591	2577						
1006	1006	0	1006	7	9592	2578	9599	257F	3054	3054	0	3054	7	9592	2578	9599	257F						
1007	1007	0	1007	7	9600	2580	9607	2587	3055	3055	0	3055	7	9600	2580	9607	2587						
1008	1008	0	1008	7	9608	2588	9615	258F	3056	3056	0	3056	7	9608	2588	9615	258F						
1009	1009	0	1009	7	9616	2590	9623	2597	3057	3057	0	3057	7	9616	2590	9623	2597						
1010	1010	0	1010	7	9624	2598	9631	259F	3058	3058	0	3058	7	9624	2598	9631	259F						
1011	1011	0	1011	7	9632	25A0	9639	25A7	3059	3059	0	3059	7	9632	25A0	9639	25A7						
1012	1012	0	1012	7	9640	25A8	9647	25AF	3060	3060	0	3060	7	9640	25A8	9647	25AF						
1013	1013	0	1013	7	9648	25B0	9655	25B7	3061	3061	0	3061	7	9648	25B0	9655	25B7						
1014	1014	0	1014	7	9656	25B8	9663	25BF	3062	3062	0	3062	7	9656	25B8	9663	25BF						
1015	1015	0	1015	7	9664	25C0	9671	25C7	3063	3063	0	3063	7	9664	25C0	9671	25C7						
1016	1016	0	1016	7	9672	25C8	9679	25CF	3064	3064	0	3064	7	9672	25C8	9679	25CF						
1017	1017	0	1017	7	9680	25D0	9687	25D7	3065	3065	0	3065	7	9680	25D0	9687	25D7						
1018	1018	0	1018	7	9688	25D8	9695	25DF	3066	3066	0	3066	7	9688	25D8	9695	25DF						
1019	1019	0	1019	7	9696	25E0	9703	25E7	3067	3067	0	3067	7	9696	25E0	9703	25E7						
1020	1020	0	1020	7	9704	25E8	9711	25EF	3068	3068	0	3068	7	9704	25E8	9711	25EF						
1021	1021	0	1021	7	9712	25F0	9719	25F7	3069	3069	0	3069	7	9712	25F0	9719	25F7						
1022	1022	0	1022	7	9720	25F8	9727	25FF	3070	3070	0	3070	7	9720	25F8	9727	25FF						
1023	1023	0	1023	7	9728	2600	9735	2607	3071	3071	0	3071	7	9728	2600	9735	2607						

5. MULTIPROG Introductions

MULTIPROG is an IEC-61131 Programming System developed by KW and **MULTIPROG Express 5.35** is a compact version to be used with EasyPAC. The main features of MP Express 5.35 are

No. of IO per project	128 KB
No. of User Task	5
No. of POU's	256
Global Variables	5000
Local Variables per POU	1500
Languages Support	5



IEC 61131-PROGRAMMIERSYSTEM

MULTIPROG®

EXPRESS 5.35

MP Express 5.35 supports the following languages:

Textual Language

- Instruction List (IL)
- Structured Text (ST)

Graphical Language

- Function Block Diagram (FBD)
- Ladder Diagram (LD)
- Sequential Function Chart (SFC)

MP Express 5.35 supports the following data types:

X is bit operation

B is byte operation

W is word operation

D is double word operation

%I is Input symbol

%Q is Output symbol

%M is Virtual symbol

Example

%IX1.7	The 7th bit in 1st Byte at input data, must be BOOL type
%IB100	The 100th Byte at input data, must be SINT / USINT / BYTE type
%QW201	The 201th, 202th Bytes at output data, must be INT / UINT / WORD type
%QL100	The 100th to 107th Bytes at output data, must be LREAL type
%MD3.1024	The 1024th to 1027th Bytes at virtual memory Must be DINT / UDINT / REAL / TIME / DWORD type

5.1. MPExpress5.35 installation

Recommended Hardware Requirement

PC Hardware: PC or laptop with Intel Centrino up CPU

Memory: 1GB RAM

OS: Windows 2000/XP/Win7 (32, 64)

LAN card: RJ-45 10/100/1000 Mbps

Software Installation

Install EasyPAC software and tools

Install MULTIPROG 5.35.252 Express

Install MULTIPROG Patch Files

Software Version

Run the successfully installed MULTIPROG 5.35 Express as shown below

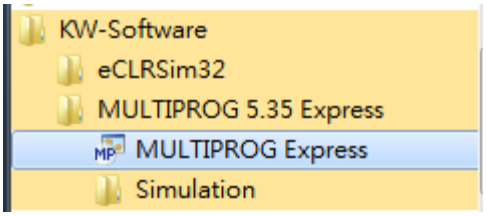


Figure 5-1: installed MULTIPROG Express

Make sure the software version by the following figure illustrates.

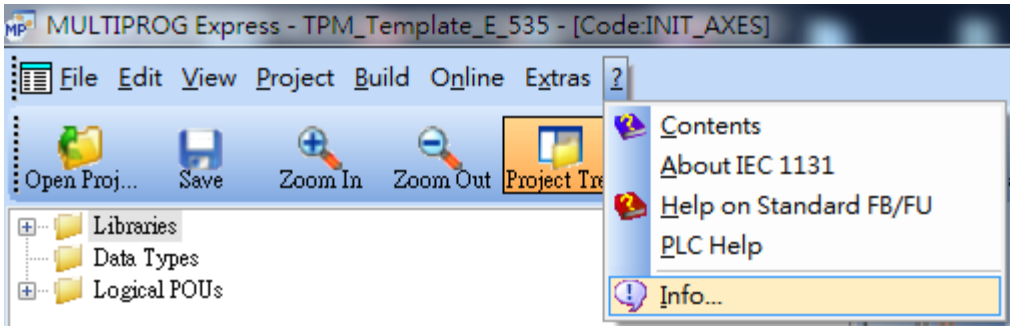


Figure 5-2: figure out the software version info

If the software version is not 5.35 Build 252, please install the correct version.

Figure 5-3: the software version window

There is a CD that is shipped together with the EasyPAC. Please follow these steps below to finish the installation. Insert the CD into your PC and you will be asked to permit auto-installation. Please enter YES to allow auto-installation as shown.

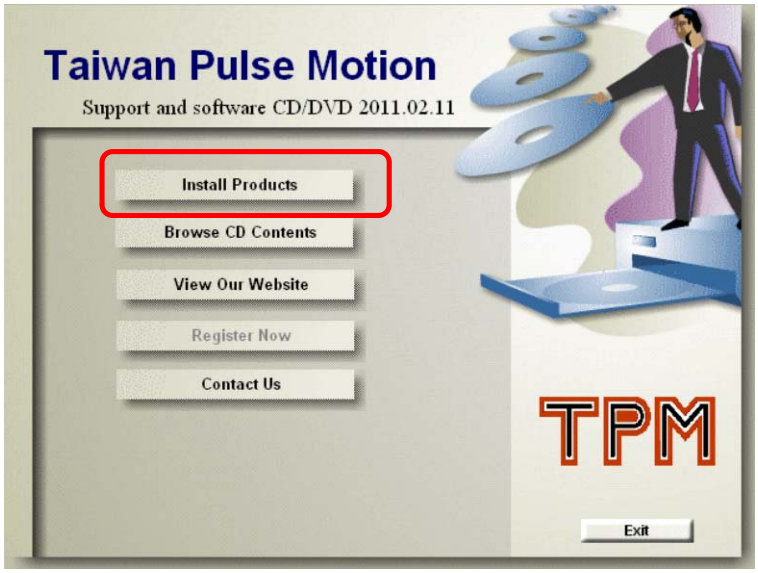


Figure 5-4: install product CD

If the auto-installation does not work, please try it manually. Please go to Program Manager and run the Auto.exe in the CD to start installation manually. Users could click on “Install Products” as shown below to setup EasyPAC.

Figure 5-5: procedure to setup EasyPAC

Depending on the operating system, users could select the right version of software and utilities. The Win32 version is for Windows XP and Windows 7 32bit and Win64 version is for Windows 7 64bit operating system.

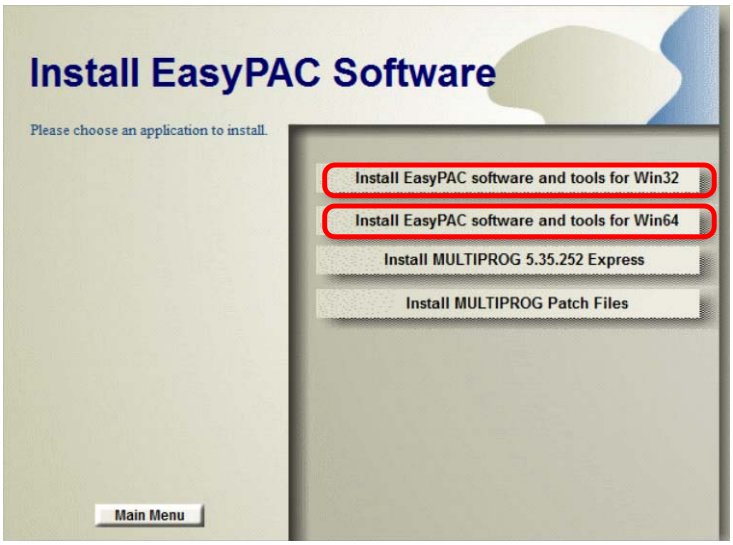


Figure 5-6: install the correct utilities for EasyPAC

5.1.1. Install EasyPAC Software and Tools

The default installation location is C:\TPM\EasyPAC. It is easy to complete the installation by click on the “Finish” button as shown below.

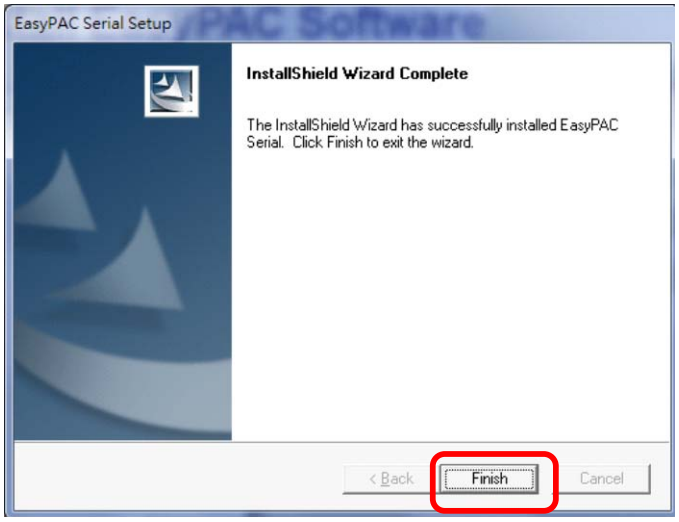


Figure 5-7: click Finish button to complete the installation

5.1.2. Install MULTIPROG 5.35.252 Express

Please press the “Install MULTIPROG 5.35.252 Express” button to install the software.

Figure 5-8: install MULTIPROG

The installation procedure leads to install the relative libraries of MULTIPROG 5.35.252 Express and software development kit for KW applications. The default location for the installation is C:\Program Files\KW-Software. If the operating system is Windows 7 64bit, the location would be C:\Program Files (86)\KW-Software. The installation procedure installs the following software in sequence.
MICROSOFT Visual C++ 2005 runtime libraries
MICROSOFT Visual C++ 2008 runtime libraries
MULTIPROG 5.35.252 Express Build 252
MULTIPROG ProConOS AddOn

The first step of the installation is a prompt of installation of MICROSOFT Visual C++ 2005/2008 runtime libraries. Please select “Install” to start the installation.

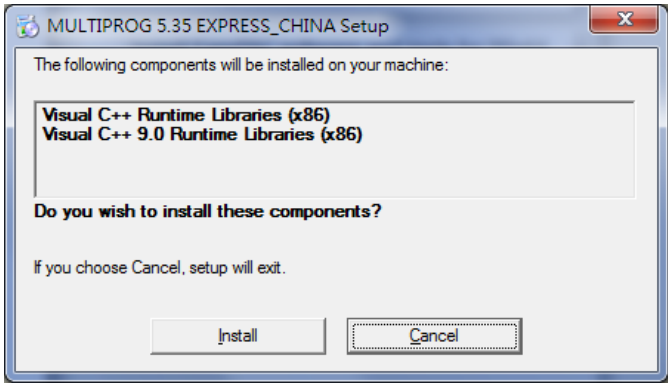


Figure 5-9: installation of MICROSOFT Visual C++ 2005/2008 runtime libraries

The setup wizard will lead users to complete the rest of the installation.

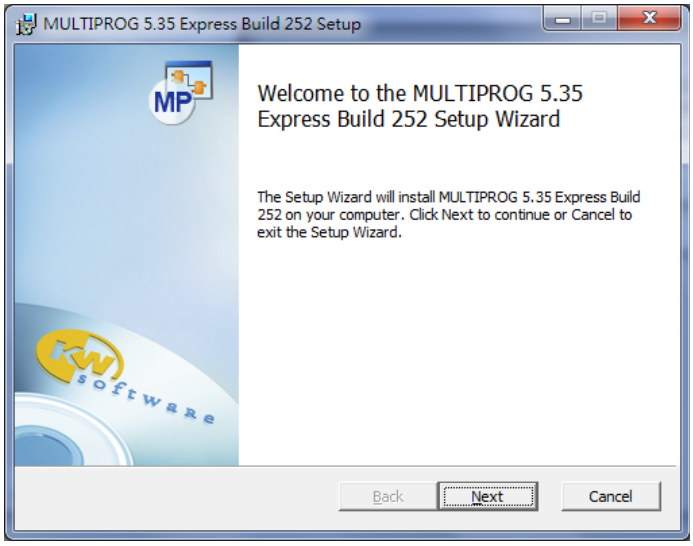


Figure 5-10: screenshot of the setup wizard

Please check the “I accept the terms of …” option to carry on.

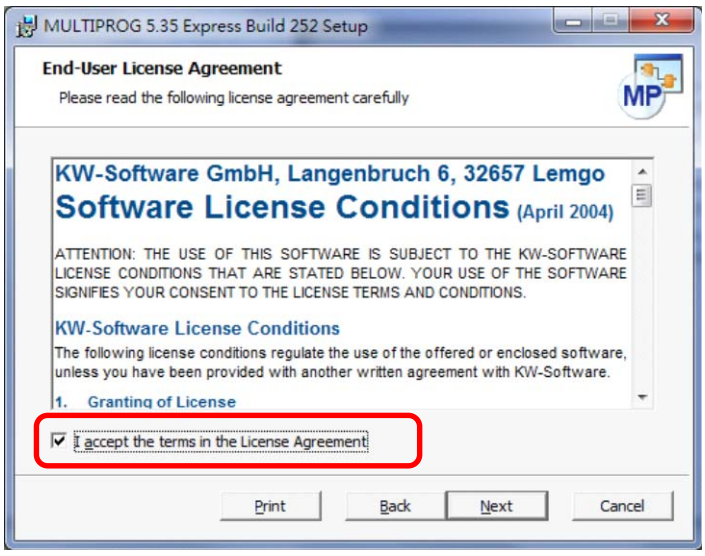


Figure 5-11: accept the license agreement

Please leave the installation path as the default one and press “Next” to continue.

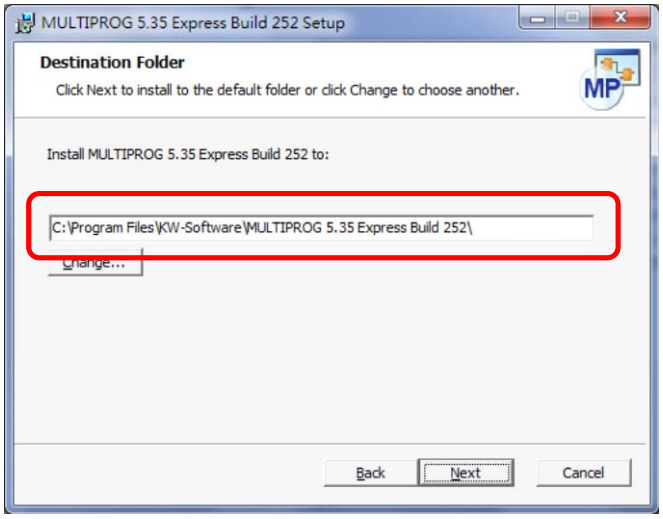


Figure 5-12: leave the default path unchanged

Please press “Finish” to finish the installation.

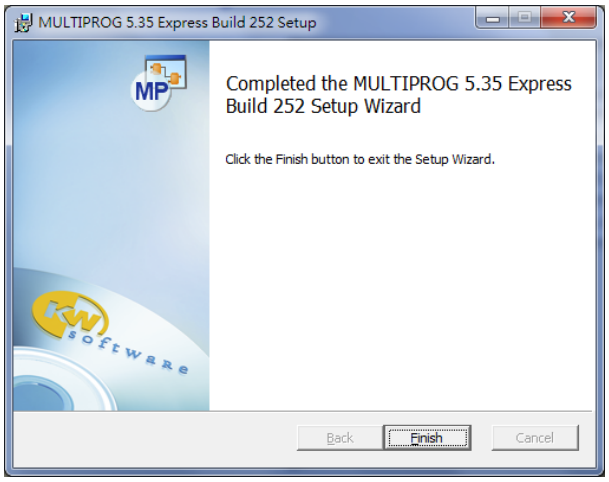


Figure 5-13: installation finish

Then the wizard would lead to install MULTIPROG ProConOS AddOn automatically.

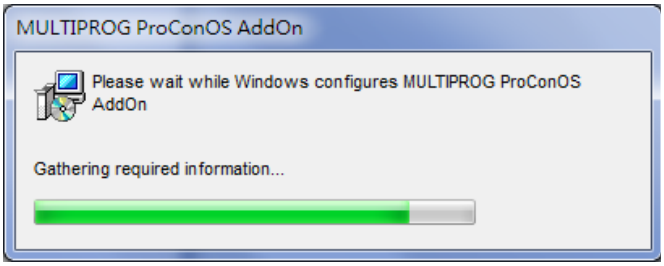


Figure 5-14: installation of MULTIPROG ProConOS AddOn

After finishing this step, all the KW development environment setup is completed.

5.1.3. Install MULTIPROG Patch Files

When MULTIPOROG completes its installation, select “Install MULTIPROG Patch Files” at the main menu of the installation wizard.

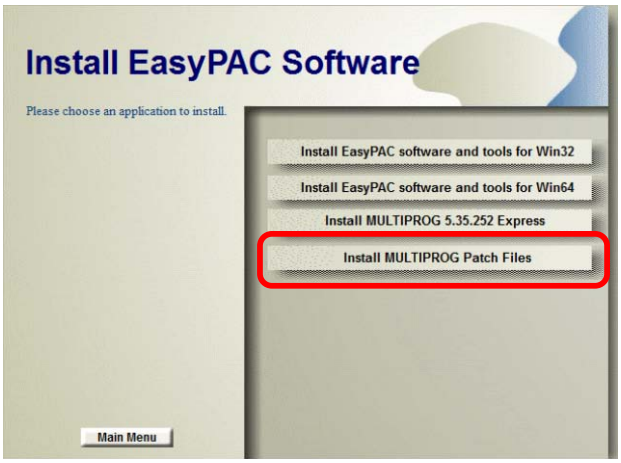


Figure 5-15: install MULTIPROG patch file

When the completion screen is shown means the patch file is successfully installed in the system. Please take out the CD and keep it properly.

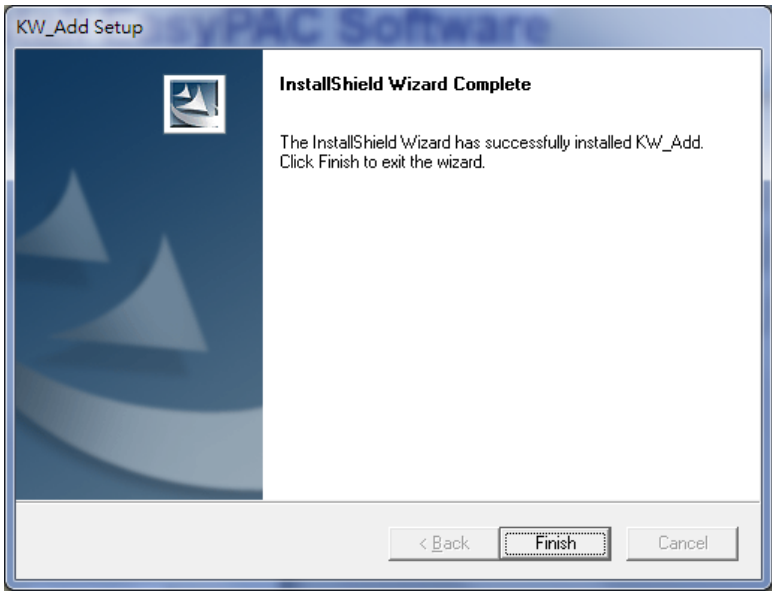


Figure 5-16: completion of installation of the patch file

5.2. The First MULTIPROG Project

5.2.1. Create a New Project

The following figure shows how to create a project from a TPM template.

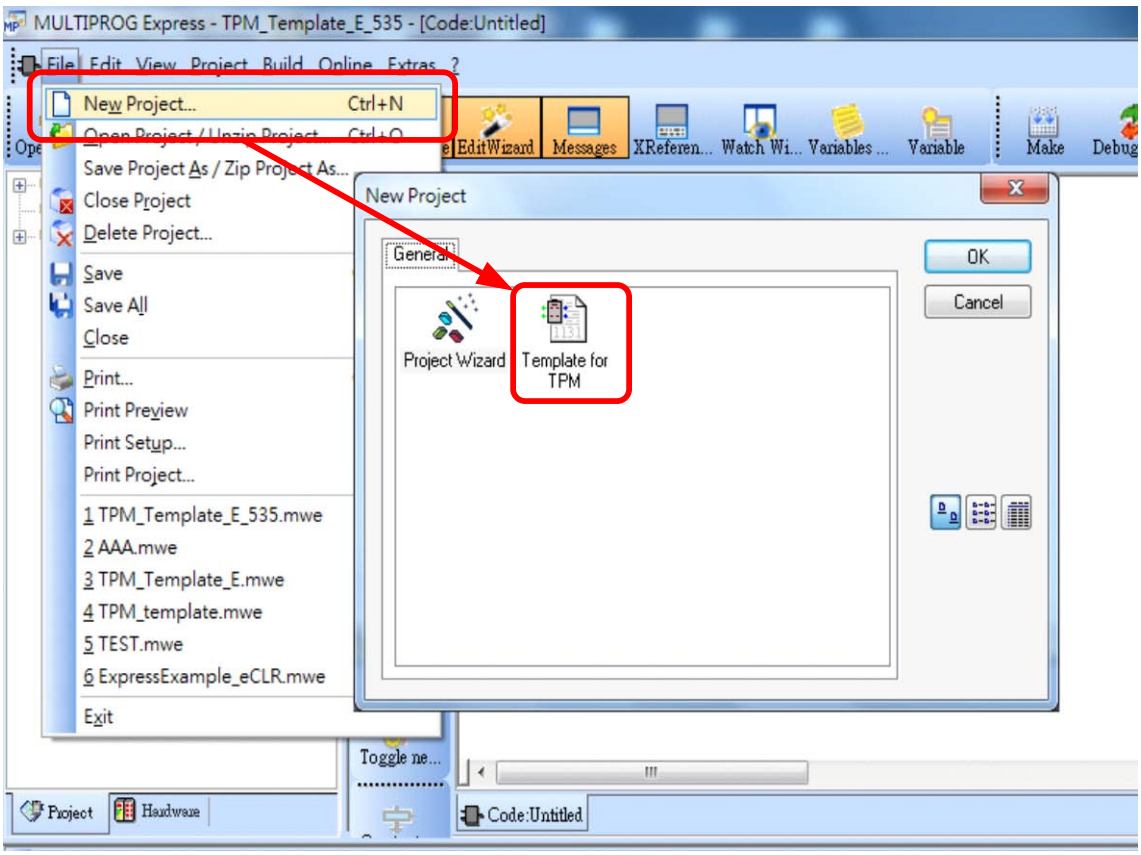


Figure 5-17: create a new project

5.2.2. DI Test

Set V000 ~ V003 as shown below:

V000 I/O address %IB 1 (IP0: DI port1 input)

V001 I/O address Blank

V002 I/O address %IB 2 (IP0: DI port2 input)

V003 I/O address Blank

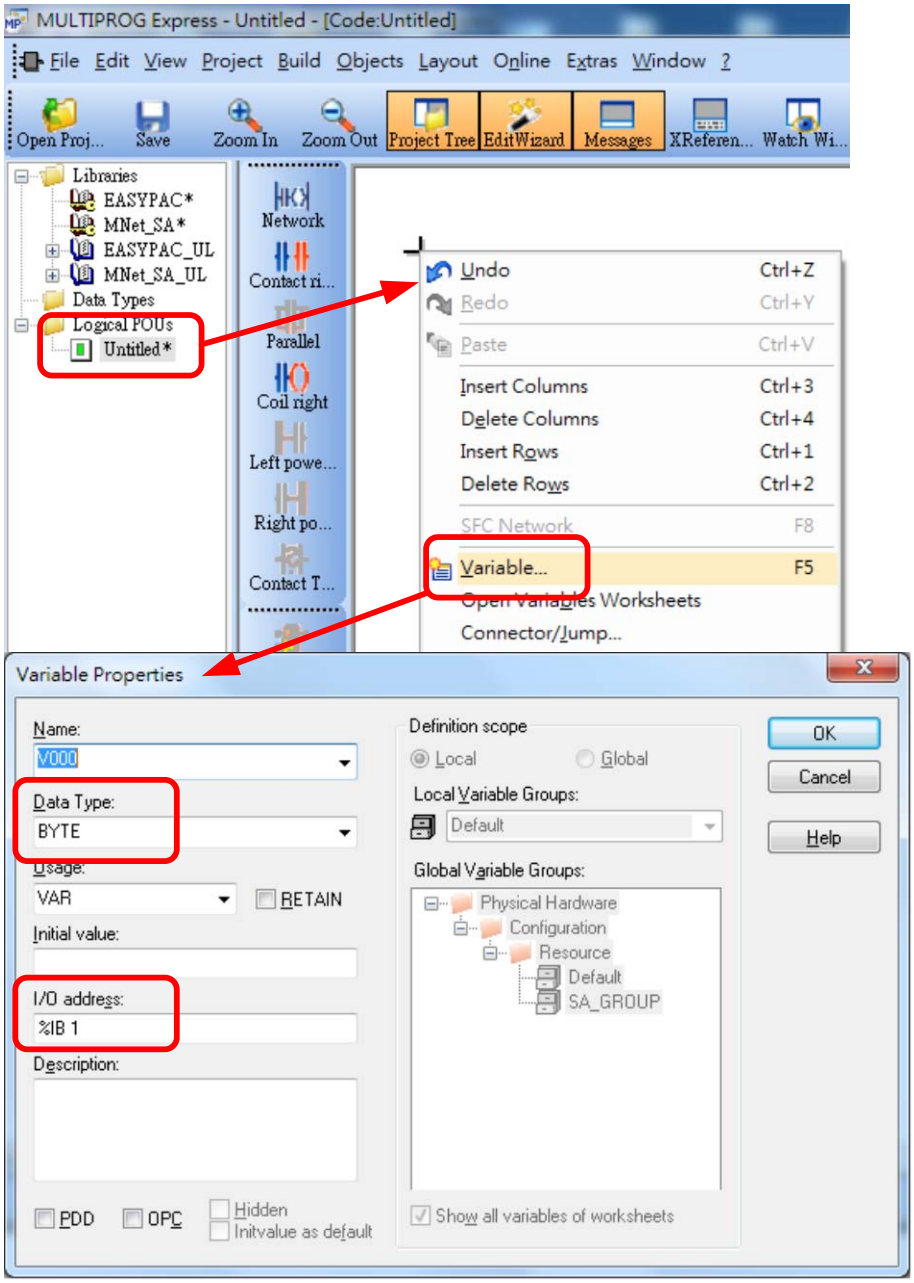


Figure 5-18: edit a variable in MULTIPROG

5.2.3. Compile

Click on the “Make” button to compile the project.

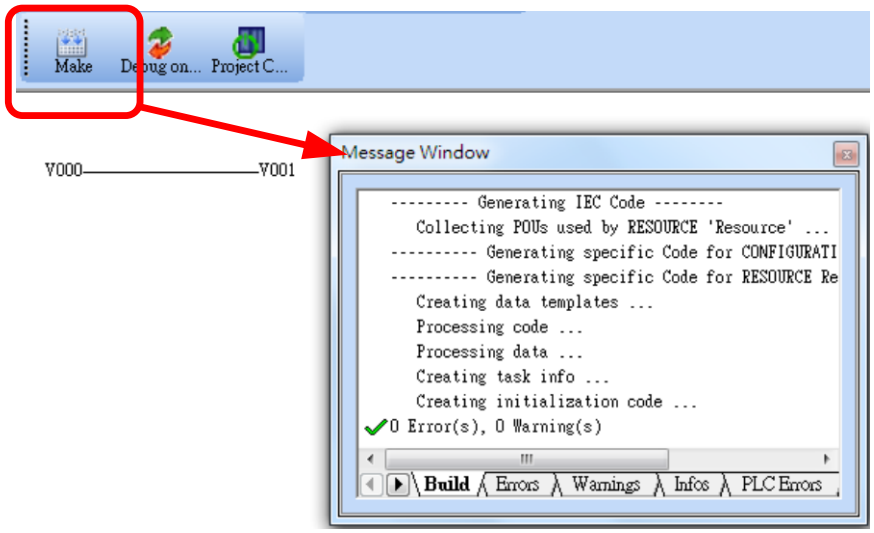


Figure 5-19: making a project

5.2.4. Download

Please left-click on Project Control to download the compiled file to EasyPAC as shown below.

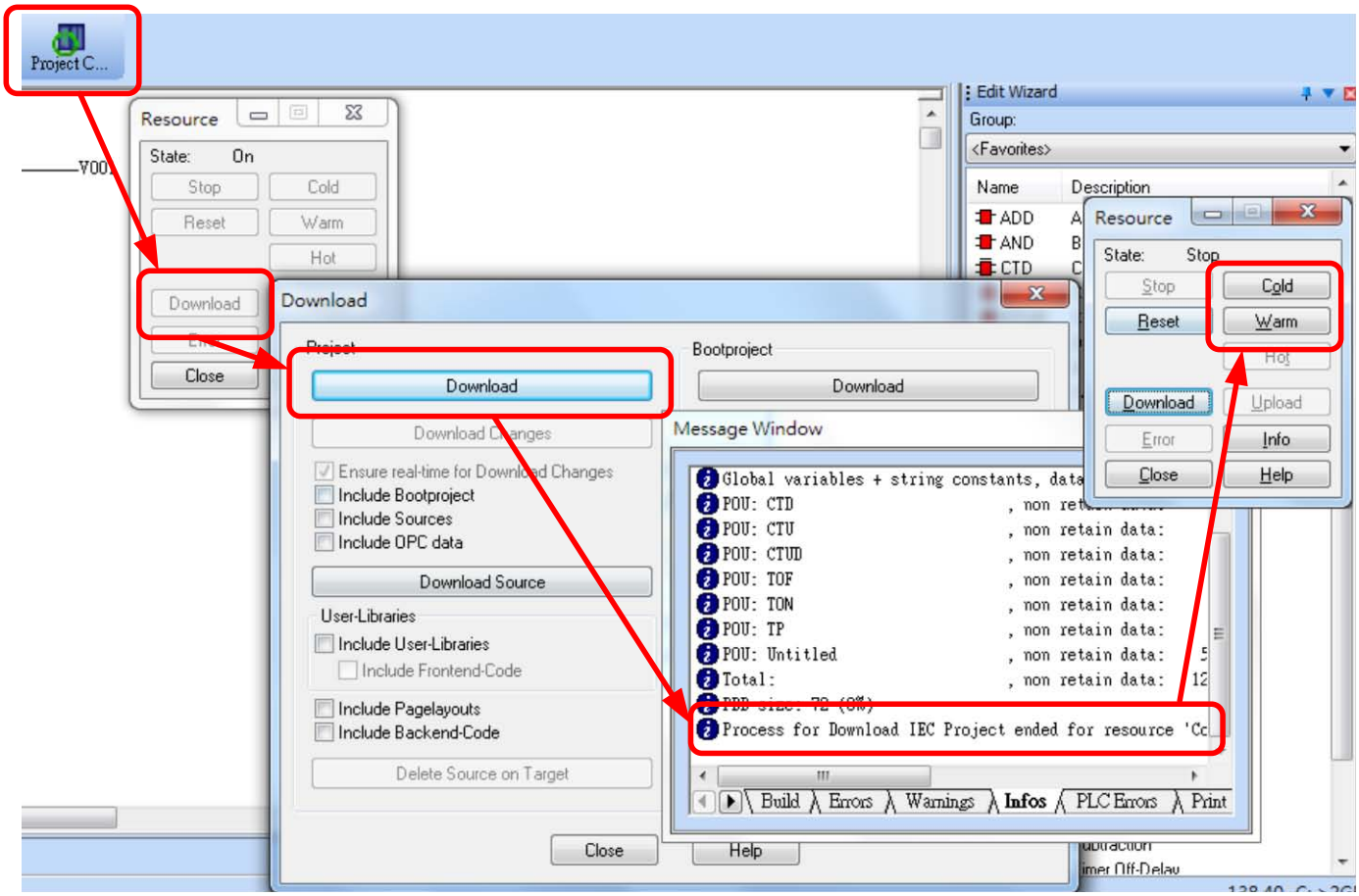


Figure 5-20: download sequence

5.2.5. Debug

Click the “Debug on” to activate the debug mode.

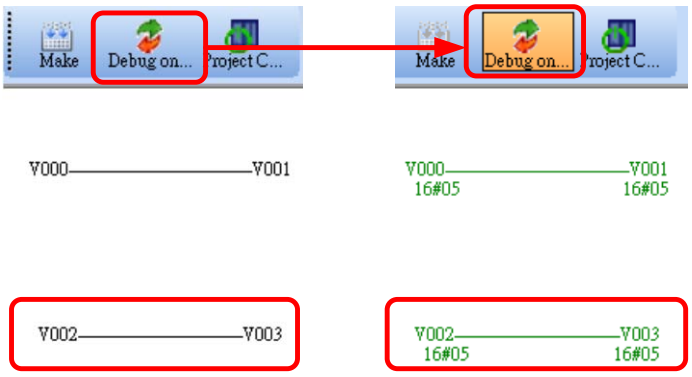


Figure 5-21: enable the debug mode

5.3. Interface Description

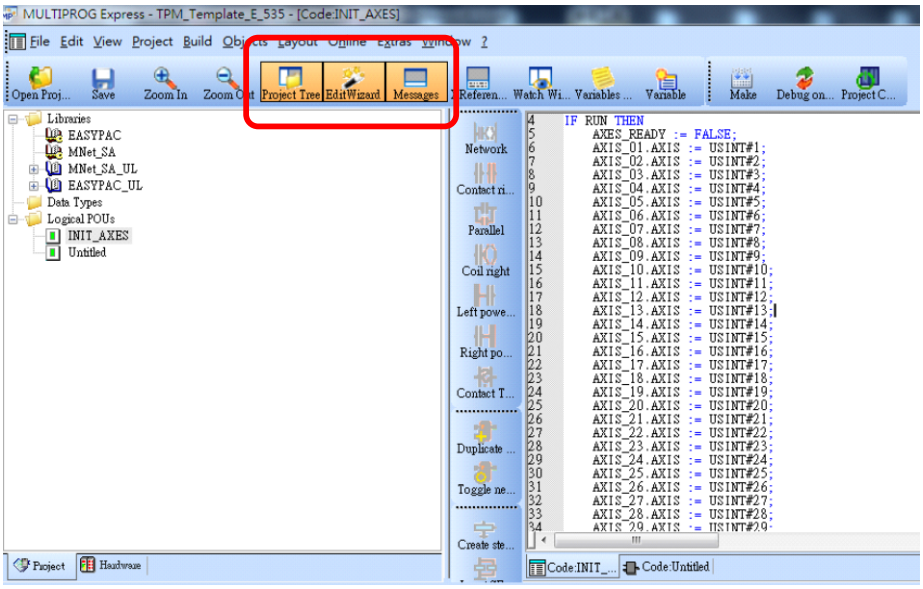


Figure 5-22: MULTIPROG main window with 3 icons activated

There are 3 icons highlighted in the above from left to right are individually:

1. Project Tree: Project Tree Window can display the project in a tree structure.
2. Edit Wizard: Edit Wizard provides the edition of instruction and FB.
3. Message: Message Windows displays the information about PLC.

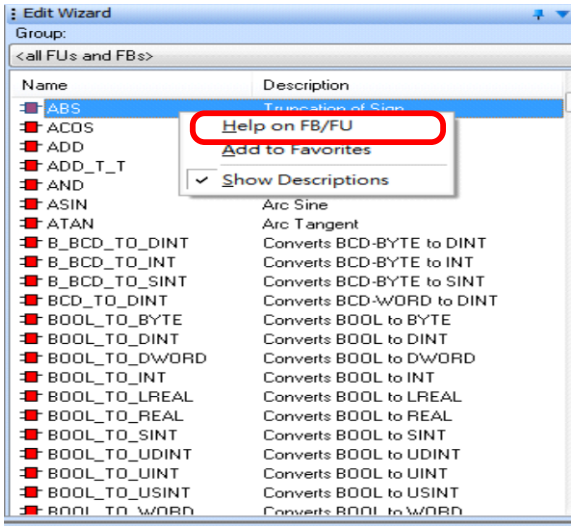


Figure 5-23: approach to check FB

FBs can be selected after the Edit Wizard is activated.

5.4. Create and Edit a Project

Users could create a new project from "**File → New Project**…" as shown below.

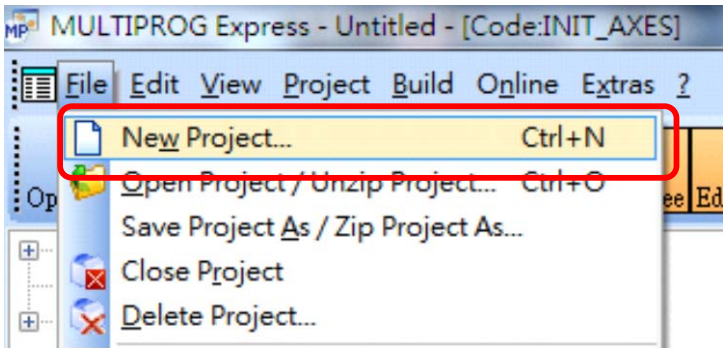


Figure 5-24: create a new project

Please select "TPM Template" as the basic framework.

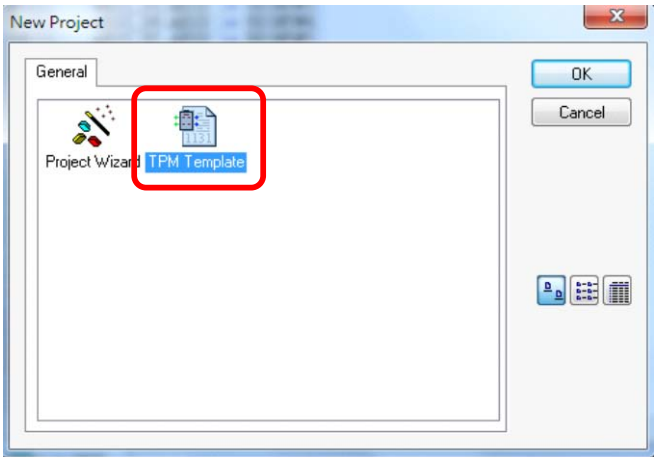


Figure 5-25: TPM Template in creation of a new project

Press OK then the following window will be popped up as below.

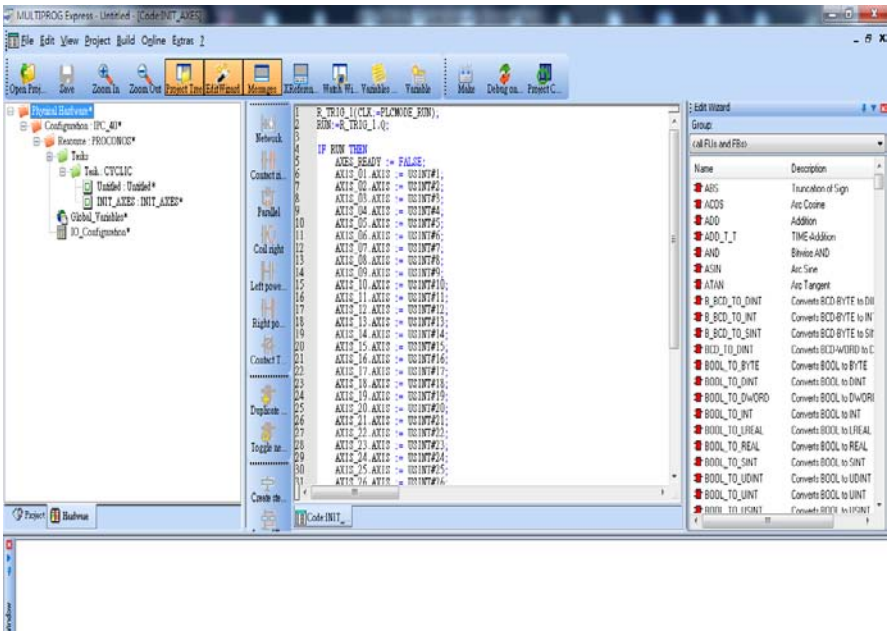


Figure 5-26: main window of MULTIPROG

Project Tree Window and Edit Wizard are shown in the above picture. Double-click on INIT_AXES in the Project Tree Window to open the edit window as shown above. There are 5 programming languages available in the MULTIPROG Express 5.35 tool. The sample program with LD will be explained in the next section.

- (1. LD **Ladder diagram**)
- (2. SFC **Sequential Function Charts**)
- (3. FBD **Function Block Diagram**)
- (4. ST **Structured Text**)
- (5. IL **Instruction List**)

5.4.1. Edit with LD

Open a project with LD programming language as shown below:

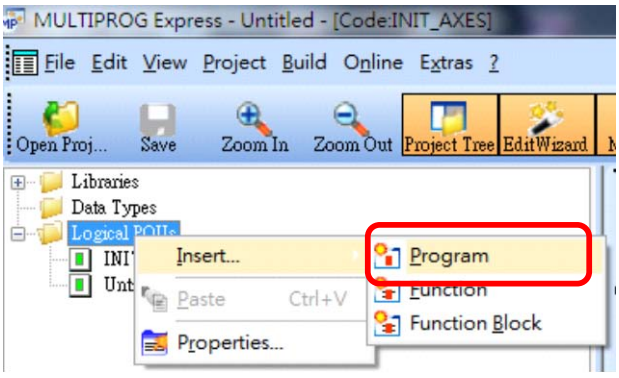


Figure 5-27: sequence to edit program

Right-click on the "Logical POUs" and select "Insert → Program" and the following window will pop-up. Enter the file name in the Name text area, select Type with "Program" and Select LD as the programming language.

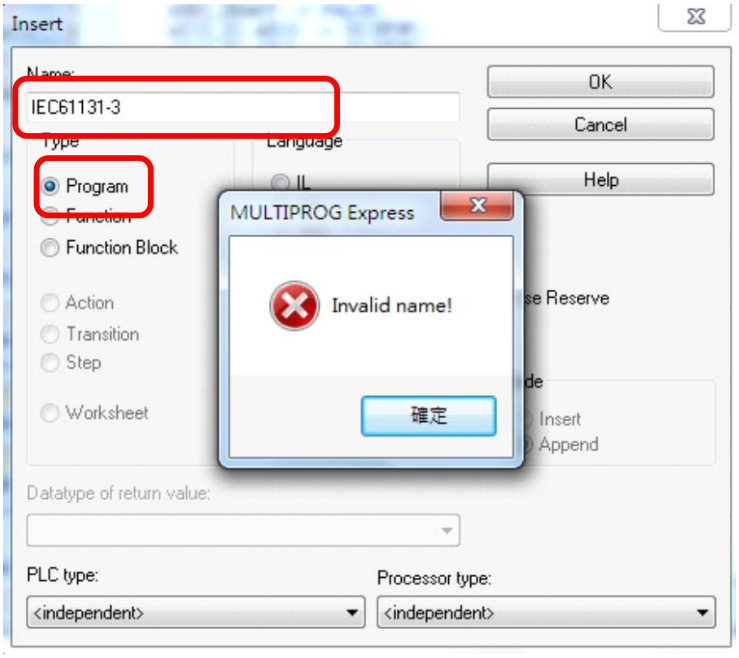


Figure 5-28: insert a new program

A pop-up window shows “Invalid name!” in this example. All the symbols including space are not allowed to input as the name and the first character could not be a number. The following example is an example with legal name.

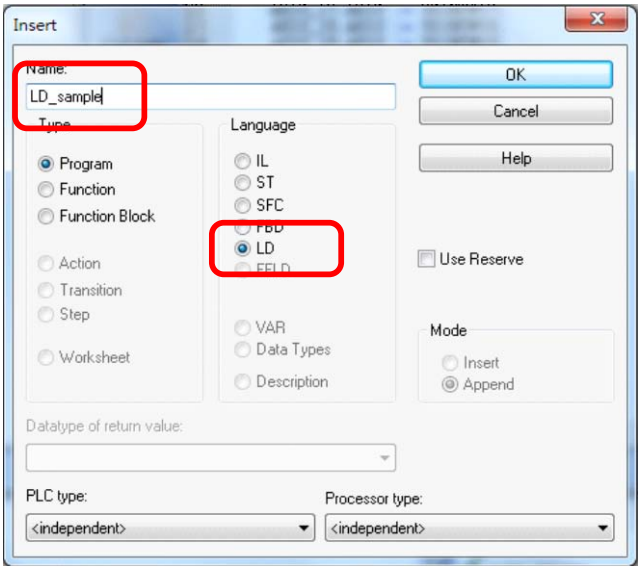


Figure 5-29: input name and select LD language

Click OK and then users could start editing the program.

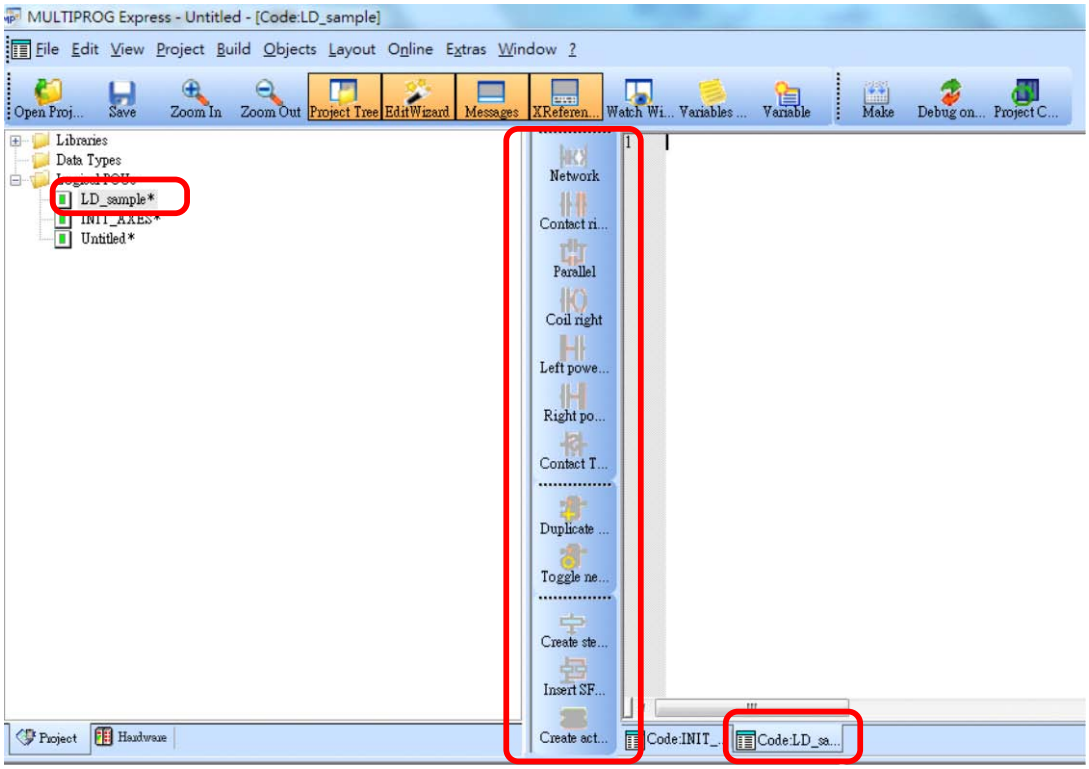


Figure 5-30: edit program window

Click on the “Code: LD_sample” tab so the LD editor will show up. The function icons listed on the left including Network, Contact right, Parallel, Coil right, etc. Left-click on the space area and click on the “Coil right” button after the symbol “+” showing up, then a “Contact” will be created as shown below:

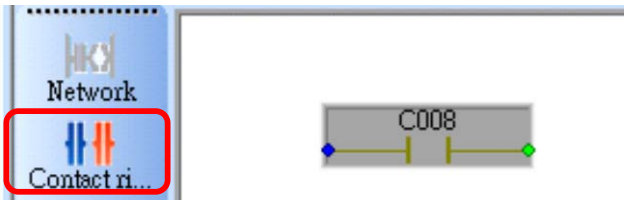


Figure 5-31: make a Contact right for instance

Mouse-click on the gray area and bring up the functions by right clicking on it.

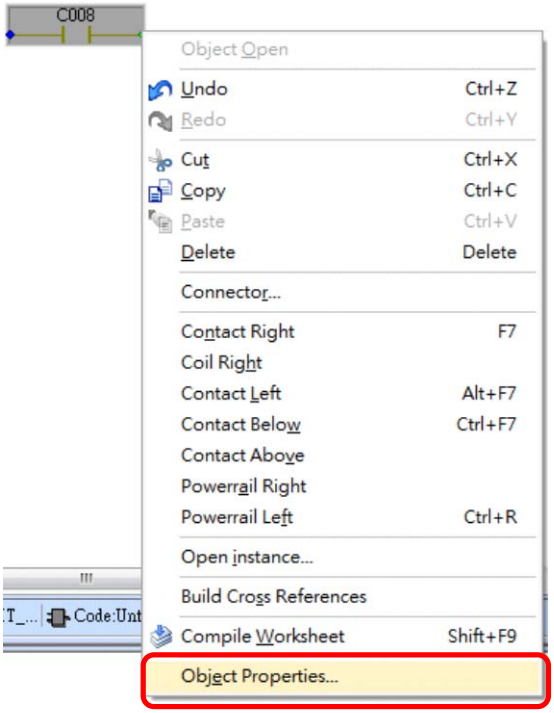


Figure 5-32: functions of the contact

After selecting the “Object Properties…” the following window will show up.

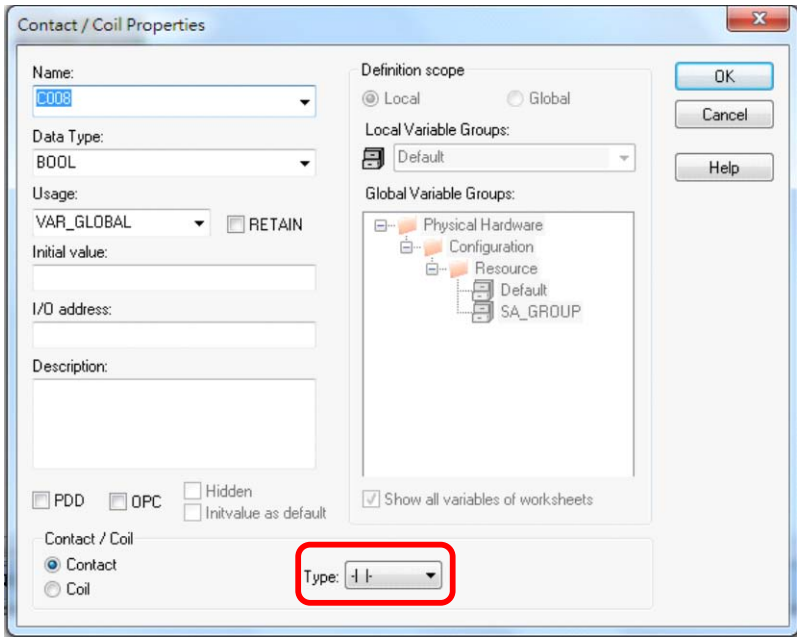


Figure 5-33: contact/coil properties window

Please enter the name in the “Name:” field and select BOOL as the data type. Enter either VAR or VAR_GLOBAL in the “Usage” field. Note that VAR indicates that it will be used only by this POU and VAR_GLOBAL indicates that it can be accessed by other POU. In the bottom, users can select A or B type contact or coil. Please follow the following diagram.

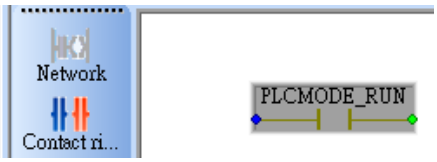


Figure 5-34: newly created contact named PLCMODE_RUN

Name: PLCMODE_RUN. Data Type: BOOL. Usage: VAR_GLOBAL. In this example, the IO address will mapped as %MX1.0.1.

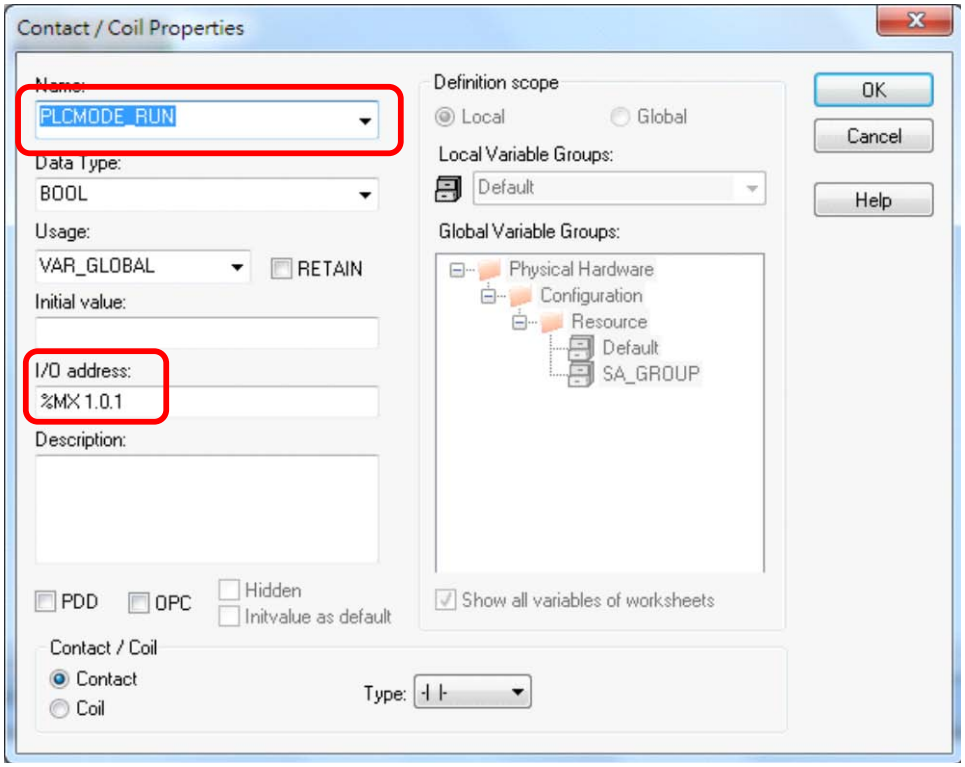


Figure 5-35: the contact / coil properties

Add a B type contact by selecting Contact right and modify the name as shown below.

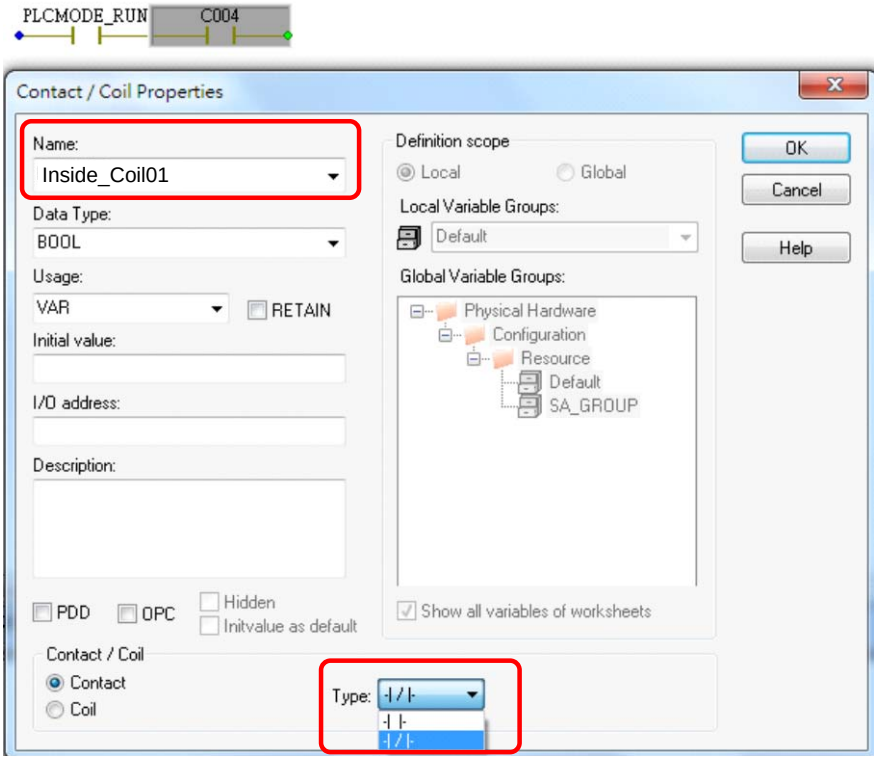


Figure 5-36: change type of the Inside_coil01

Please change the name as “Inside_coil01” and select BOOL, VAR and B Type contact then click OK to finish. The IO address is not assigned automatically and will be done later. The use of FB’s or FU’s will be introduced in the next section.

5.4.2. Function Block (FB) and LD

A timer will be added to the above mentioned example. Select TON (Timer On-Delay) in the Edit Wizard by double-clicks on it.

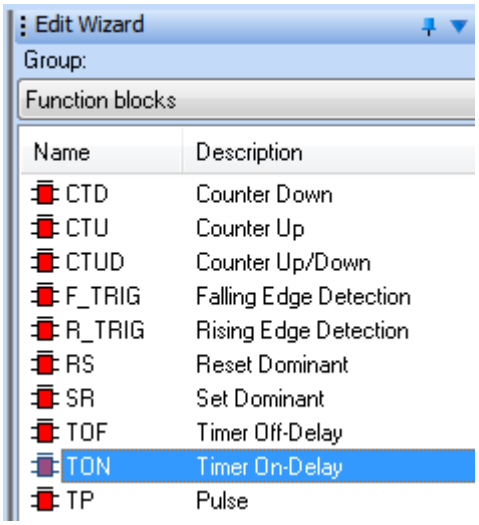


Figure 5-37: select timer on-delay of the FB

The parameter setting window brought up by double clicks is like the following figure.

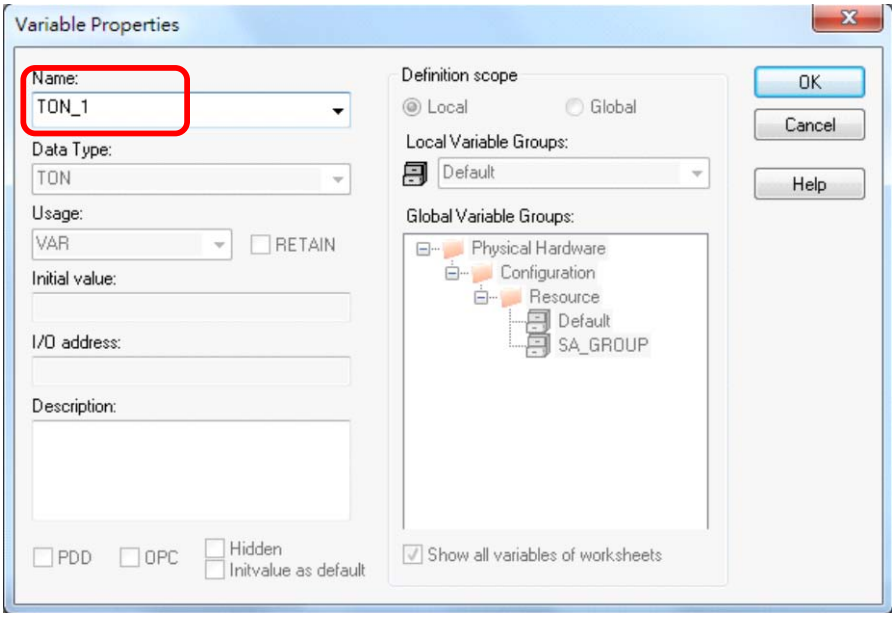


Figure 5-38: parameters of the TON

Right-click on the FB/FU the assistance document will be popped up.

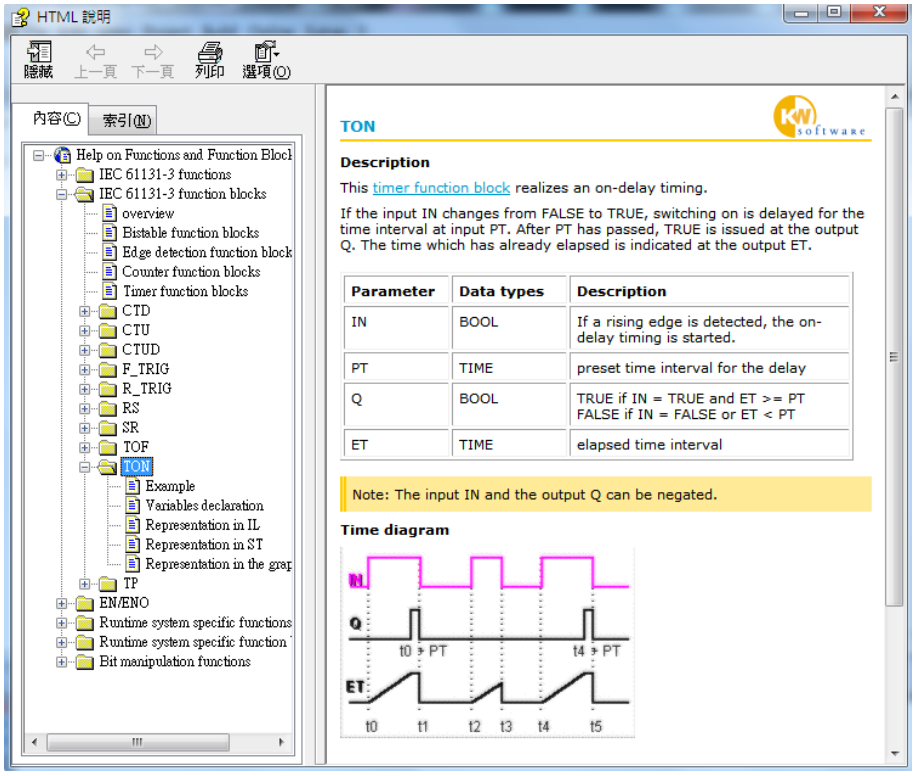


Figure 5-39: the help file

The sample of TON is illustrated and the IL/ST related information is also available. FB can be moved behind the contact and connect it with direct wiring as shown below.

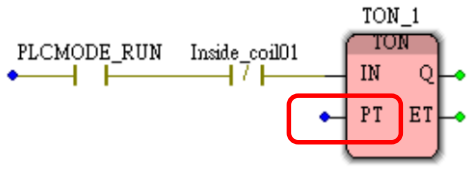


Figure 5-40: TON FB example with timer input PT

Double-click on the blue point of PT to enter the desired timer value. In this example the name is given with T#1s or T#1000ms as shown below.

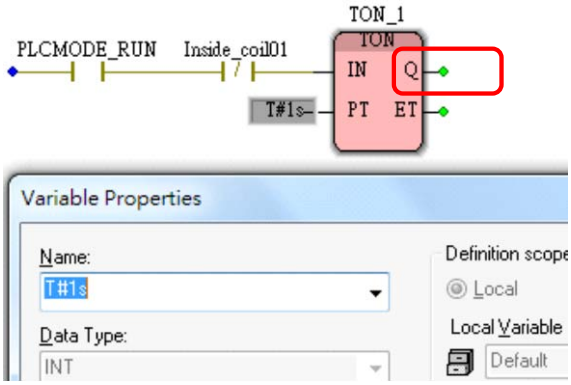


Figure 5-41: TON FB example with coil output Q

Double-click on the green point of Q to set the coil output as shown below.

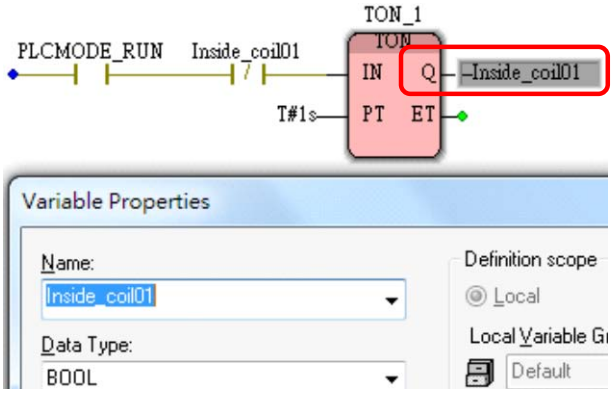


Figure 5-42: TON FB example with coil output Q specified

After setting name, data type and usage, users could select R_TRIG in the “Edit Wizard” and double click on it to name it as “R_TRIG_1” and press OK. Please then left-click on the blue point of CLK to make it blue as shown below.

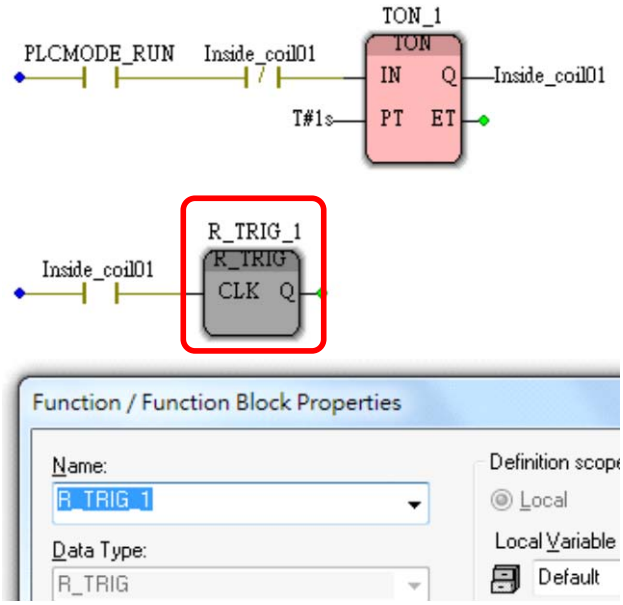


Figure 5-43: TON FB example with rising edge trigger properties set

Click on the Contact icon to add a new a type contact and enter the name with “Inside_coil01”. Then add a coil on the Q position by selecting Coil right icon and name it as Rising_Edge as shown below.

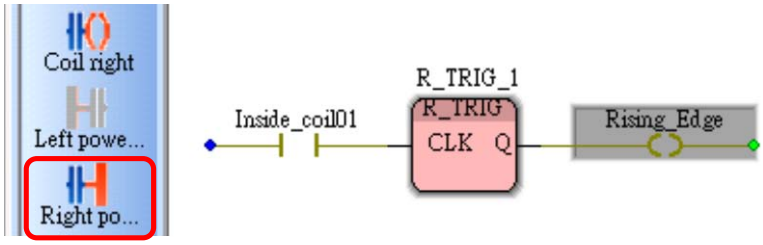


Figure 5-44: add a right powerrail attached to Q

Add an ending on the right-end by click the Right powerrail icon as shown below.

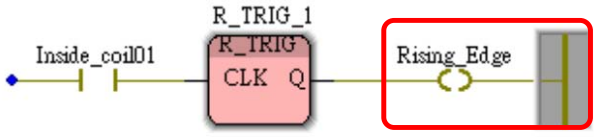


Figure 5-45: add an ending on the end

Use Connect  to connect all nodes and powerrail as shown below.

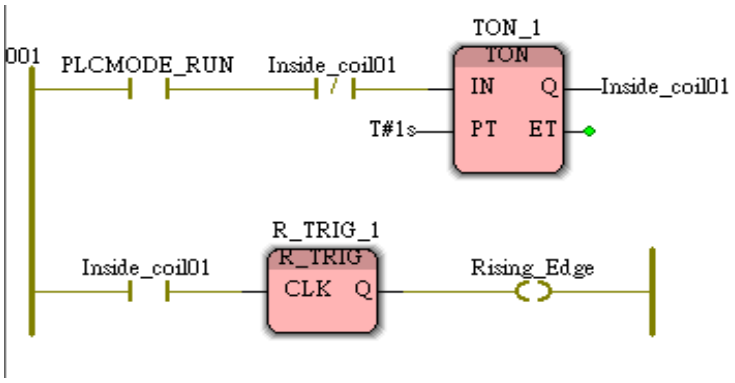


Figure 5-46: all nodes are connected by "Connect"

The program flow control will be illustrated in the following part. This is similar to “if …then…else” in C language. Open a B contact named as Rising_Edge and add jump behind it and double-click connector/Jump and enter the name with jump00 as shown below

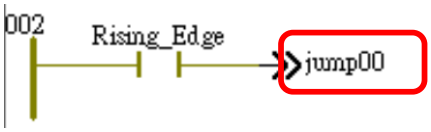


Figure 5-47: add a jump named jump00

Then add a multiplier MUL

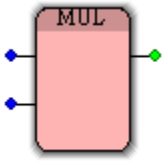


Figure 5-48: multiplier

The help file of MUL can be accessed as shown below:

MUL

Description

This arithmetic function multiplicates the operands connected to the input parameters.

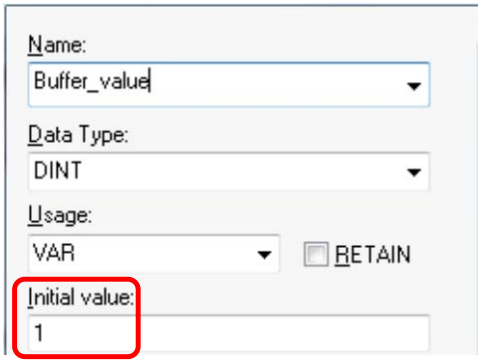
Parameter	Data types	Description
IN1	ANY_NUM	first input value
IN2	ANY_NUM	second input value
OUT	ANY_NUM	output value

Note: The input IN2 can be duplicated.

Note: All parameters must have the same data type.

Figure 5-49: help file for MUL

Set the parameter initial value to 1.



These data types SINT, INT, DINT, USINT, UINT and UDINT can be set. The reference table is listed below.

SINT	Short Integer	8Bit	-128~127
INT	Integer	16Bit	-32768~32767
DINT	Double Integer	32Bit	-2,147,483,648~2,147,483,647
UDINT	Unsigned DINT	32Bit	0~4,294,967,295
UINT	Unsigned INT	16Bit	0~65535
USINT	Unsigned SINT	8Bit	0~255

Table 5-1: data types could be set

Note that the IN1、IN2、OUT 3 of a MUL must be set with the same data type. In this example, users need to enter the name and value.

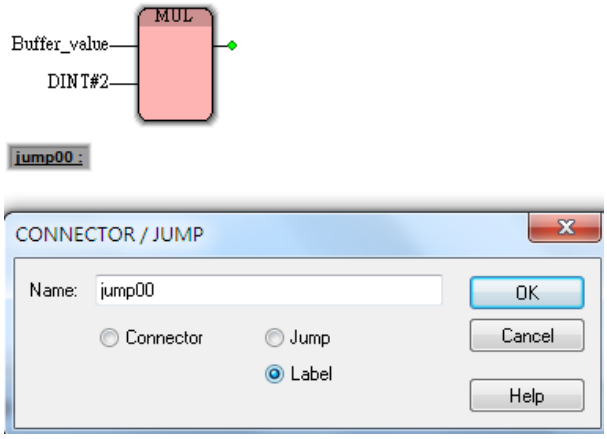


Figure 5-50: specify the name and value for the MUL

Enter jump00 as the Name and select Label and then click OK. Complete the sample program and add a new GE FB as shown below.

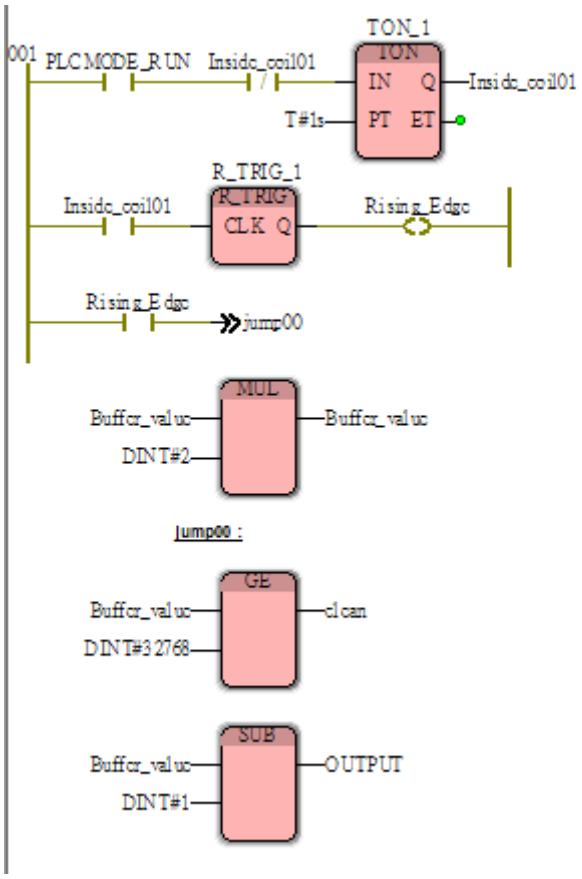


Figure 5-51: consolidate all function blocks with SUB FB added

Add a new MOVE with Label jump01 as shown below. Select DINT_TO_WORD FB and add it on.

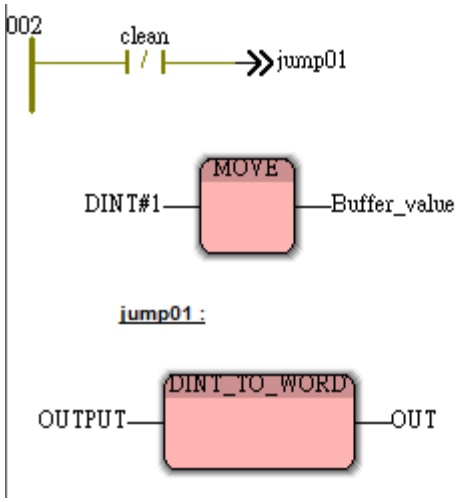
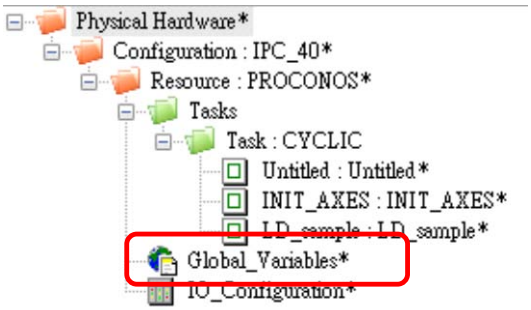


Figure 5-52: MOVE with label "jump01"

5.4.3. Settings of Register and I/O

The hardware settings have VAR and VAR_GLOBAL types. With GLOBAL means the I/O could be shared.



IO_Configuration circled by red rectangular shown above is used for I/O address configuration. Please refer to the following table.

Name	Type	Usage	Description	Address	Init	Retain	PI
AXIS_24	AXIS_REF	VAR_GLO...					
AXIS_25	AXIS_REF	VAR_GLO...					
AXIS_26	AXIS_REF	VAR_GLO...					
AXIS_27	AXIS_REF	VAR_GLO...					
AXIS_28	AXIS_REF	VAR_GLO...					
AXIS_29	AXIS_REF	VAR_GLO...					
AXIS_30	AXIS_REF	VAR_GLO...					
AXIS_31	AXIS_REF	VAR_GLO...					
AXIS_32	AXIS_REF	VAR_GLO...					
G1	AXES_GROUP_R...	VAR_GLO...					
G2	AXES_GROUP_R...	VAR_GLO...					
G3	AXES_GROUP_R...	VAR_GLO...					
G4	AXES_GROUP_R...	VAR_GLO...					
G5	AXES_GROUP_R...	VAR_GLO...					
G6	AXES_GROUP_R...	VAR_GLO...					
G7	AXES_GROUP_R...	VAR_GLO...					
AXES_READY	BOOL	VAR_GLO...					
Default							
PLCMODE_ON	BOOL	VAR_GLO...	Here you ...	%MX 1.0.0			
PLCMODE_RUN	BOOL	VAR_GLO...		%MX 1.0.1			
PLCMODE_STOP	BOOL	VAR_GLO...		%MX 1.0.2			
PLCMODE_HALT	BOOL	VAR_GLO...		%MX 1.0.3			
PLCDEBUG_BPSET	BOOL	VAR_GLO...		%MX 1.1.4			
PLCDEBUG_FORCE	BOOL	VAR_GLO...		%MX 1.2.0			
PLCDEBUG_POWER...	BOOL	VAR_GLO...		%MX 1.2.3			
PLC_TICKS_PER_SEC	INT	VAR_GLO...		%MW 1.44			
PLC_SYS_TICK_CNT	DINT	VAR_GLO...		%MD 1.52			

Table 5-2: available I/O table with the corresponding options

1. Name: Name can be English or Chinese characters. The first character cannot be a number.
2. Type: Several data types including BOOL/BYTE/WORD etc. are supported.
3. Usage: Can be local – VAR or global variable – VAR_GLOBAL.
4. Description: Comments can be entered here.
5. Address: 3 types of address are I for input / Q for Output / M for virtual.
6. Init: Initial value before PLC start up.

The sample project is opened with default setting as shown below.

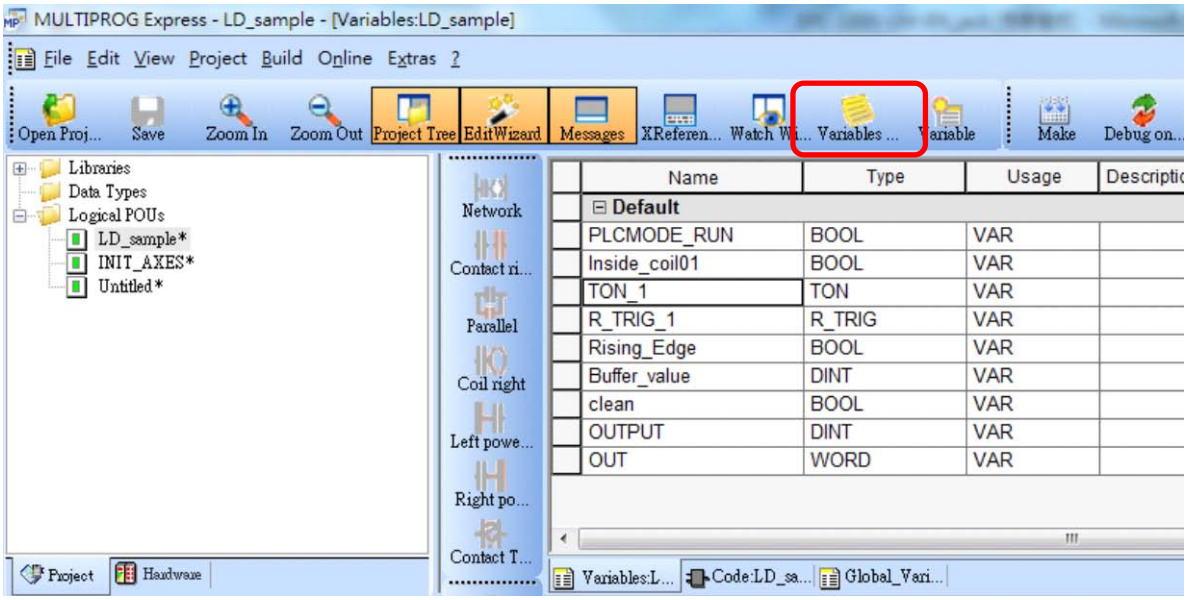


Figure 5-53: the FBs dumped under Variables...

Double click on the “LD_sample” and the following window will pop up.

	Name	Type	Usage	Description	Address	Init
	Default					
	PLCMODE_RUN	BOOL	VAR			
	Inside_coil01	BOOL	VAR		%MX 3.10000.0	
	TON_1	TON	VAR			
	R_TRIG_1	R_TRIG	VAR			
	Rising_Edge	BOOL	VAR		%MX 3.10000.1	
	Buffer_value	DINT	VAR		%MD 3.10008	1
	clean	BOOL	VAR		%MX 3.10000.3	
	OUTPUT	DINT	VAR		%MD 3.10012	
	OUT	WORD	VAR		%QW 1	

Figure 5-54: the FB details

“Inside_coil01” could be used in other programs in the same project. The usage must be set as VAR_GLOBAL.

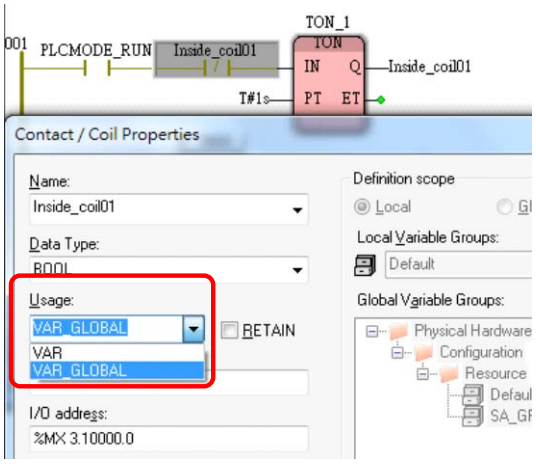


Figure 5-55: set the usage as VAR_GLOBAL for sharing with other programs

5.4.4. I/O Configurations

Double-click on IO_Configuration and the following window will pop up.

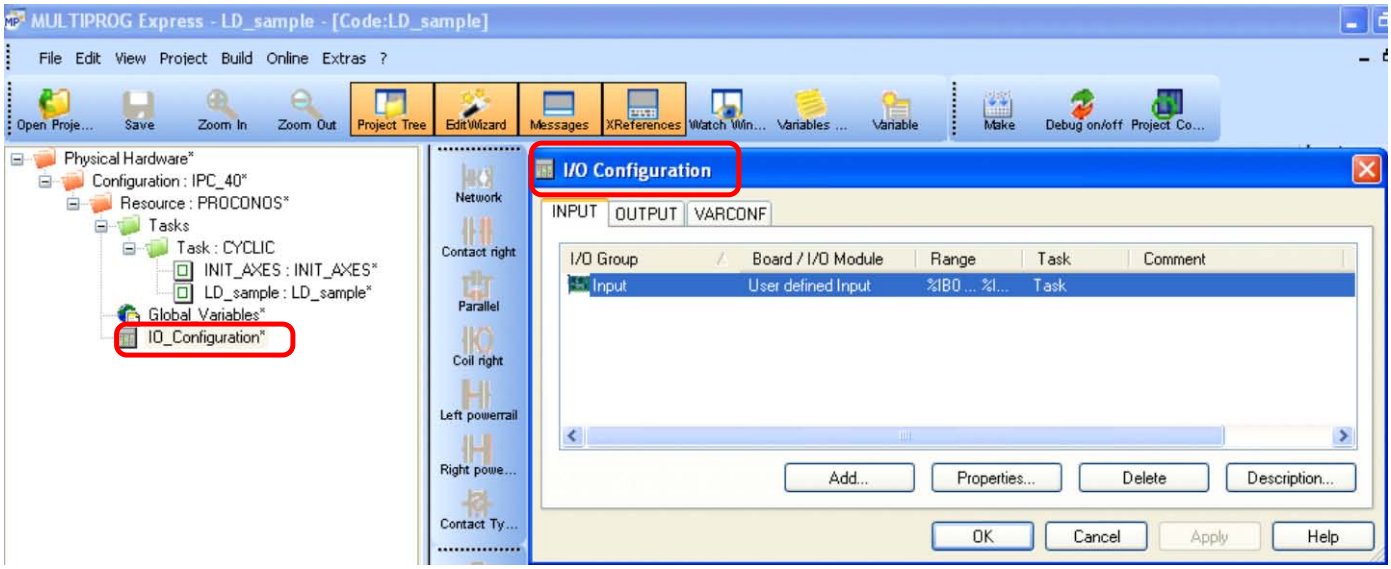


Figure 5-56: the IO configuration window

Select the designated input/output and then hit the “Properties” button to check the properties.

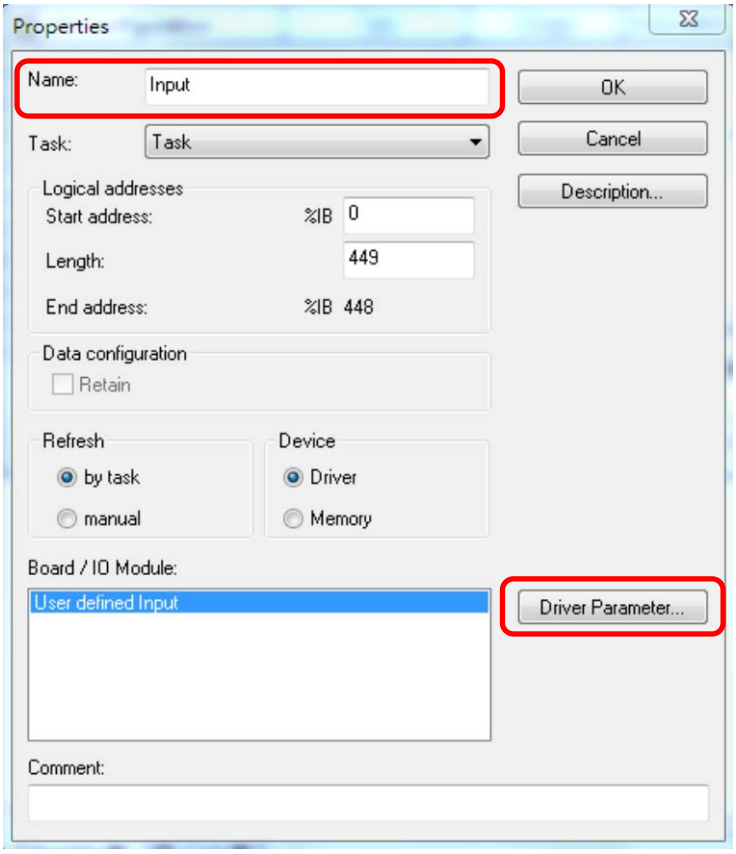


Figure 5-57: check input/output parameters

Name: Enter the name here.

Task: Select the task type.

Start address:	Set the start address as %IB 0, i.e. Byte 0.
Length:	Enter the total length of input as 449.
End address:	Set the end address as %IB 448, i.e. the last bye is 448.
Comment:	Can be skipped if no comments are needed.

If the “Driver Parameters…” button is pressed, the driver information window would come up.

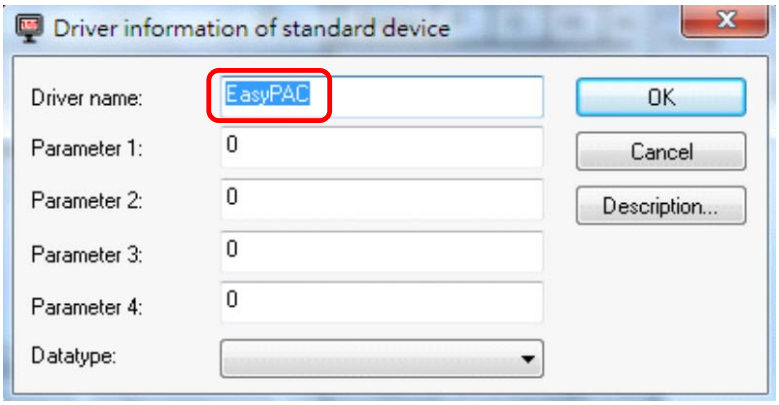


Figure 5-58: the driver information window

Note that the only valid driver name is EasyPAC. Any others will not be accepted. The “Datatype” field could be left default.

5.5. Downloading and Debugging

Connect an EasyPAC correctly and turn the power on. Use MyConfig to confirm the following setting.

Figure 5-59: EasyPAC information shown by MyConfig

The default IP of EasyPAC is 192.168.1.100. Check the setting in the MULTIPROG with resource **ProConOS → Settings**.

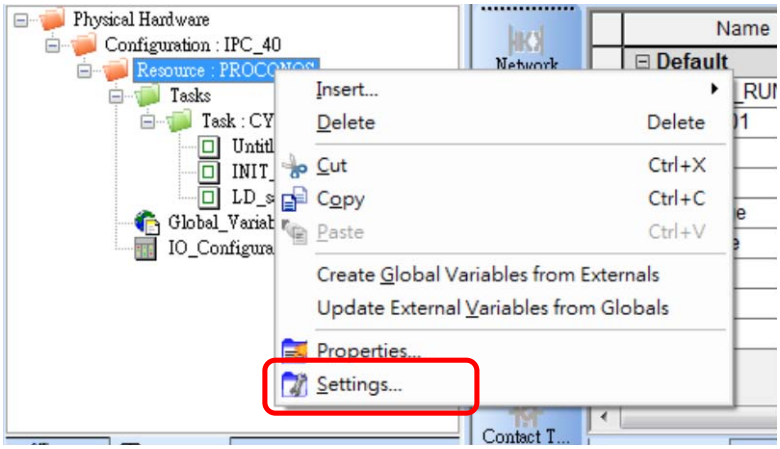


Figure 5-60: get EasyPAC information from ProConOS → Settings...

Please set the parameter as shown below and click OK.

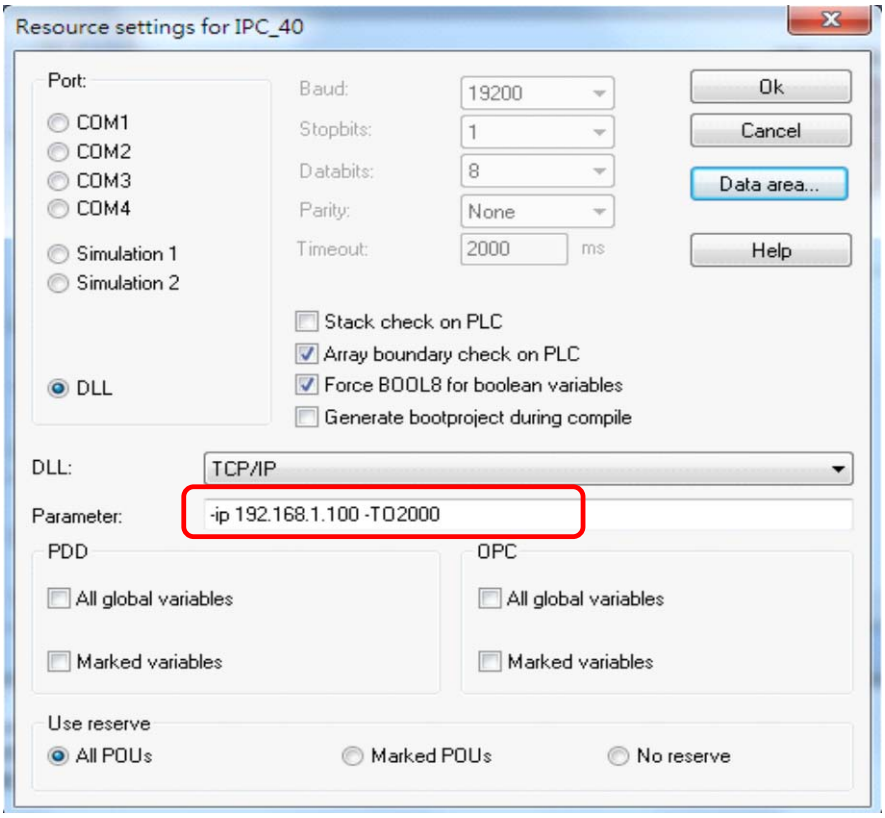


Figure 5-61: set the IP parameter

Then click on “Project Control” icon.

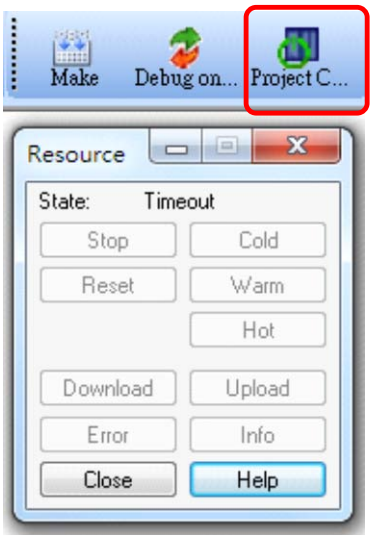


Figure 5-62: the project control option

Click on “Download” to download the program. When users download the project, please check the “Include Bootproject”.

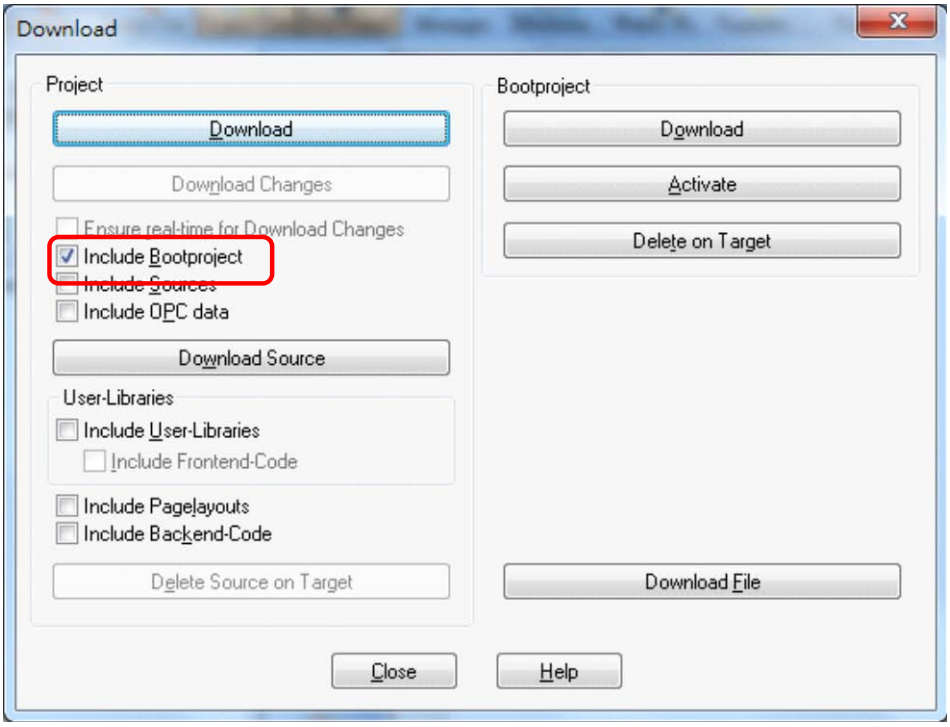


Figure 5-63: include the Bootproject into the project to be downloaded

PLC Run Mode is described in the following

- Cold:

  All data will be reset:

  - Including retain and non-retain.
  - SPG 1 (is executed if a cold start is done)

- I/O driver function
- Shared Memory (Input、Output、Var)

- Warm:

  The following data will be initialized
  - Non-retain
  - SPG 0 (is executed if a warm start is done)
  - I/O driver function
  - Shared Memory (Input、Output、Var)
- Stop:

  The following states will happen
  - All user defined tasks
  - ProConOS calls the program
  - SPG 2 (is executed if the program is stopped)
  - I/O driver function

EasyPAC (ProConOS) Boot

The EasyPAC run mode depends on Rotary Switch 1 setting as shown below:

0:	Default IP address + MyConfigSvr			
1:	MyConfigSvr			
2:	MyLinkSvr			
7 ~ 9:	ProConOS + Modbus RTU Server.	7: Cold Start,	8: Stop	9: Warm Start
A ~ C:	ProConOS + Modbus TCP Server	A: Cold Start,	B: Stop	C: Warm Start
D ~ F:	ProConOS	D: Cold Start	E: Stop	F: Warm Start

Click on Debug on/off icon

Figure 5-64: the debug toggle button

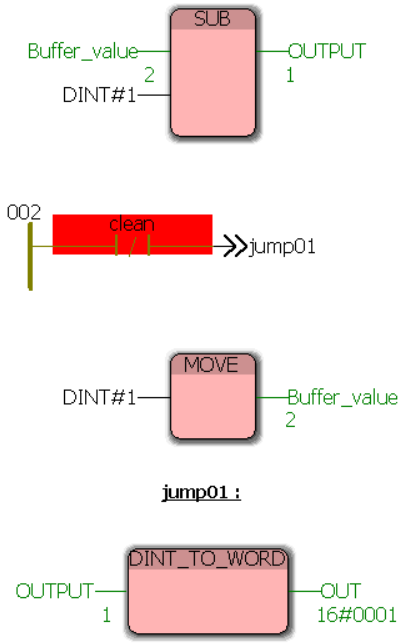


Figure 5-65: FB with debug function turned on

Jump is used to avoid fast continuous execution of Add. GE means Great/Equal. MUL will be activated once after 1 sec.

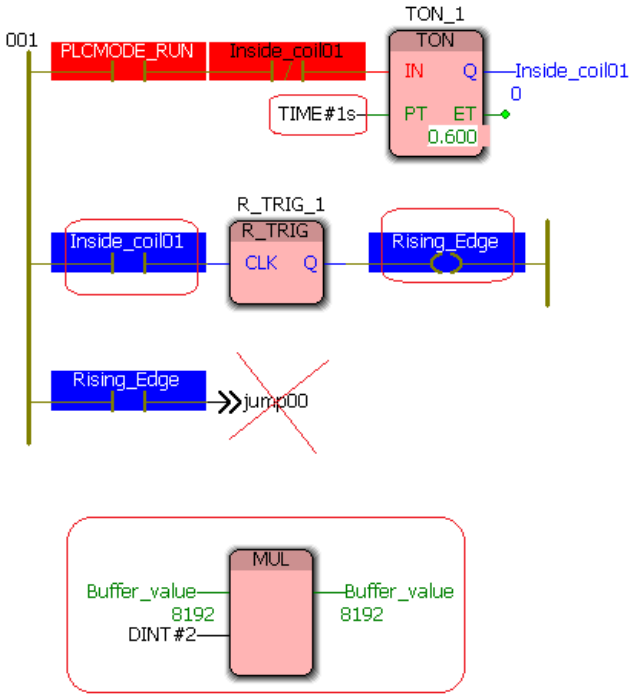


Figure 5-66: FB with debug function turned on

This program is similar to binary output as shown below:

1,2,4,8,16,32,64,128,256,512,1024,2048,4096…

The output of SUB is in the following: 0, 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023, 2047 and 4095

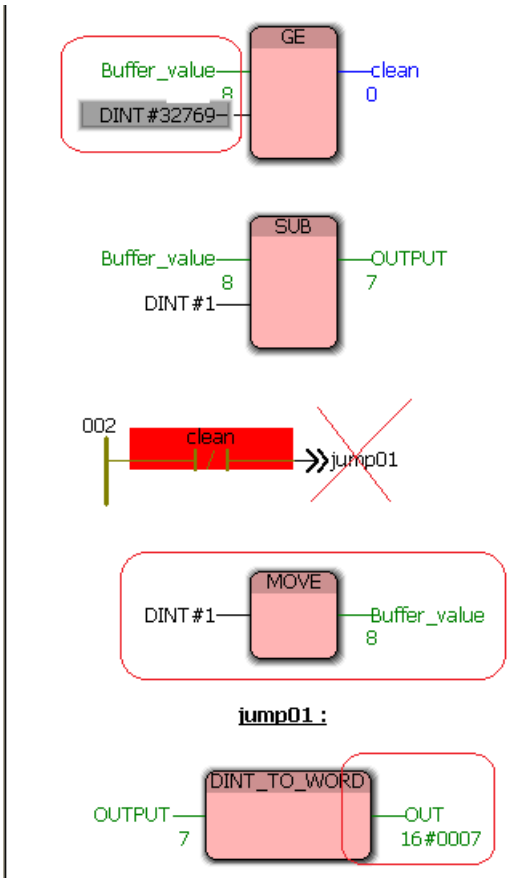


Figure 5-67: FB with debug function turned on

The “OUT (0x1FFF)” will be outputted from the DO module of IP 0, because the “OUT” was set to %QW 1.

5.6. Function Block

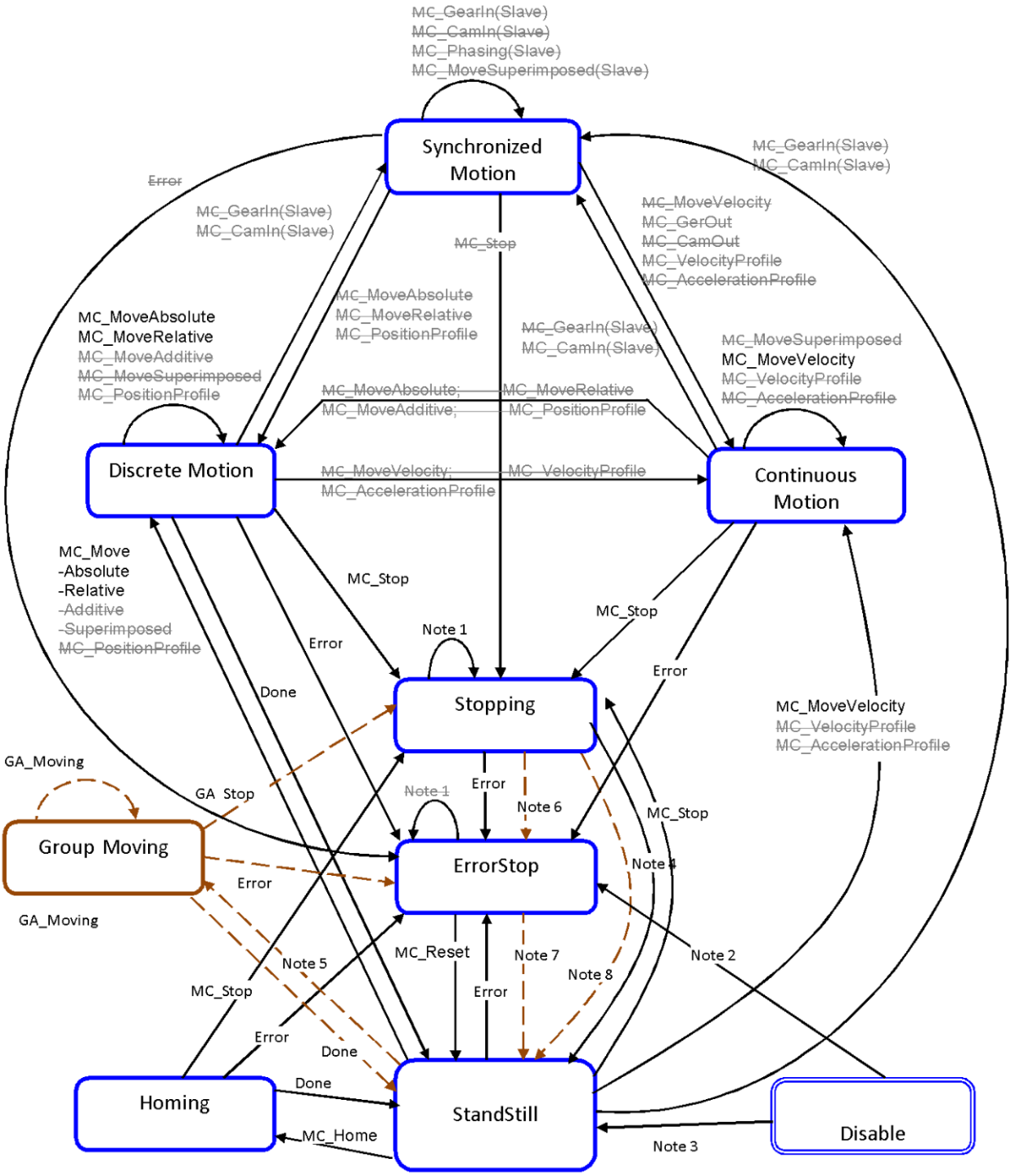
This part is adopted from the PLCopen for motion control specification, and includes additional information for functionality with TPM and other components. Each function block is listed in alphabetical order, and is also linked to the feature or function from the software environment. A comprehensive list of axis parameters and error codes is at the back of the manual. A subset of specific errors that each function block may generate is included under each function block description. The other main concepts covered in this manual are the Motion State Diagram, and documentation concerning the Data Types supplied with the Firmware Library.

5.6.1. The State Diagram

The state diagram shown defines the behavior of the axis at a high level when motion control function blocks are "simultaneously" activated. This combination of motion profiles is useful in building a more complicated profile or to treat exceptions within a program.
The basic rule is that motion commands are always taken sequentially. These commands act on the axis' state diagram. The axis is always in one of the following defined states:

1. Disable (Initial)
2. Standstill (no movement)
3. Homing (movement to reference position)
4. Discrete Motion (movement towards target position)
5. Continuous Motion (jogging)
6. Stopping (axis is stopped)
7. ErrorStop (axis error occurred)
8. Group Moving (movement towards target position of multiple axis)

Any motion command is a transition that changes the state of the axis and, as a consequence, modifies the way the current motion is computed. A normal procedure would start in Standstill. In this state, the power can be switched on per axis (via the Power command). Also, one can access the Homing state (via the issue of the Home command per axis), which after normal completion returns to Standstill. From here, one can transfer an axis to either Discrete Motion or Continuous Motion. Via the Stopping state, one can return to Standstill. ErrorStop is a state to which the axis transfers in case of an error. Via a Reset command, one can return to “Standstill” from which the machine can be moved to an operational state again. Please note that the states define the functionality of the Function Blocks.
The diagram is focused on the states of a single axis. The multiple axis function blocks such as GA_Moving change the state whereas these axes can have specific states.

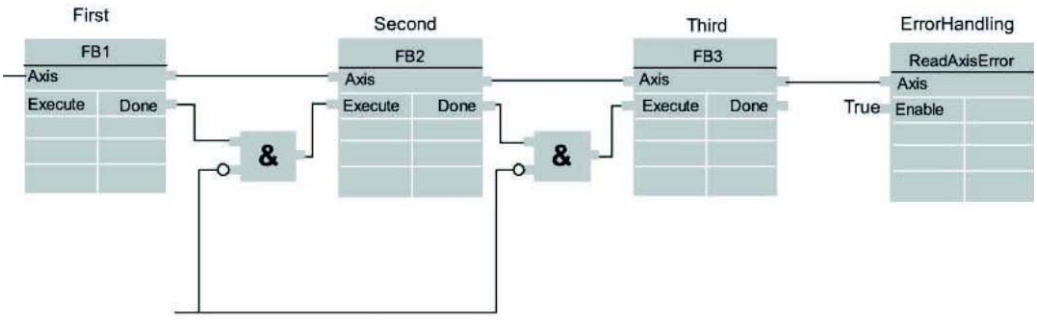


Note 1: MC_Stop = TRUE.
Note 2: Power.Enable = TRUE and there is an error in the Axis.
Note 3: Power.Enable = TRUE and there is no error in the Axis.
Note 4: MC_Stop.Done and not MC_Stop.Execute.
Note 5: Group axes is StandStill.
Note 6: Group axes is ErrorStop.
Note 7: GA_Reset = TRUE.
Note 8: GA_Stop.Done and not GA_Stop.Execute.

5.6.2. Error Handling

All access to the drive/motion control is via Function Blocks. Internally these Function Blocks provide basic error checking on the input data.

Function Blocks with centralized error handling



Function blocks with decentralized error handling

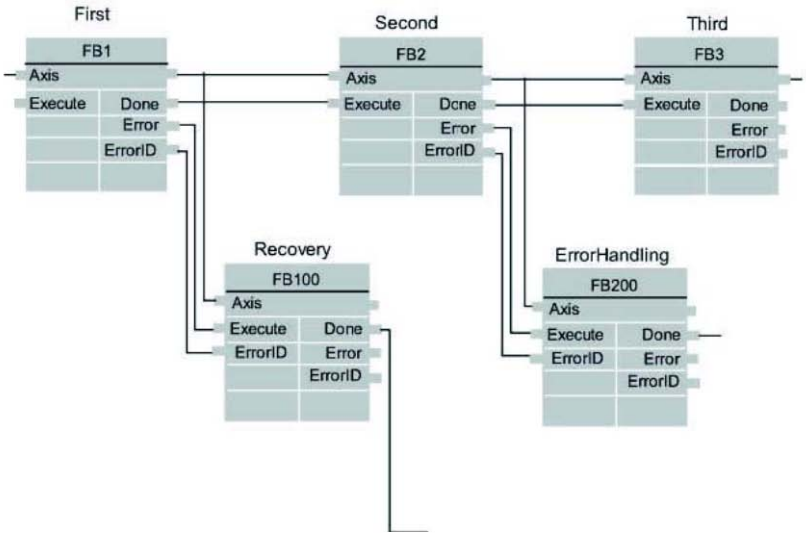


Figure 5-68: function blocks with error handling

5.6.3. Function Block Interface

General rules

The following table provides general rules about the interface of the Motion Control function blocks.

Output exclusivity

When 'Execute' is true, the outputs ‘Busy’, ‘Done’, ‘Error’ and ‘CommandAborted’ are mutually exclusive.

Output status

The 'Done', InVelocity, 'Error', 'ErrorID' and 'CommandAborted' outputs are reset with the falling edge of 'Execute'. However, the falling edge of 'Execute' does not stop or even influence the execution of the actual FB. The corresponding outputs are set for at least one cycle if the situation occurs, even if execute was reset before the FB completed. If an instance of a FB receives a new 'Execute' before it finishes (as a series of commands

on the same instance), the FB won't return any feedback, like 'Done' or 'CommandAborted', for the previous action.

Input parameters

The parameters are read at the rising edge of the 'Execute' input. To modify any parameter, it is necessary to change the input parameter(s) and trigger the 'Execute' again.

Missing input parameters

According to IEC 61131-3, if any parameter of a function block input is missing ("open") then the value from the previous invocation of this instance will be used. In the first invocation the default value is applied.

Position versus distance

'Position' is a value defined within a coordinate system. 'Distance' is a relative measure, the difference between two positions.

Sign rules

The 'Velocity', 'Acceleration', 'Deceleration' and 'Jerk' are always positive values. 'Position' and 'Distance' can be positive or negative.

Error Handling Behavior

All blocks have two outputs, which deal with errors that can occur while executing that Function Block. These outputs are defined as follow:

Error: Rising edge of 'Error' indicates that an error occurred during the execution of the Function Block.

ErrorID: Error number - see the Error Code List at the end of the manual.

'Done', 'InVelocity', indicate successful completion, so these signals are logically exclusive to "Error". Types of errors:

- Function Block Error (e.g. parameters out of range, state machine violation attempted)
- Communication Error
- Amplifier/Axis Error: Instance errors do not always result in an axis error (forcing the axis to 'StandStill'). The error outputs of the relevant FB are reset with falling edge of 'Execute'.

Behavior of Done output

The "Done" output is set when the commanded action has been completed successfully. With multiple Function Blocks working on the same axis in a sequence, the following applies: When one movement on an axis is interrupted with another movement on the same axis without having reached the final goal, 'Done' of the first FB will not be set.

Behavior of CommandAborted output

'CommandAborted' is set when a commanded motion is interrupted by another motion command. The reset-behavior of 'CommandAborted' is like that of 'Done'. When 'CommandAborted' occurs, the other output-signals such as 'InVelocity' are reset.

Inputs exceeding application limits

If a FB is commanded with parameters which result in a violation of application limits, the instance of the FB generates an error. The consequences of this error for the axis are application specific and thus should be handled by the application program.

Behavior of Busy output

'Busy' output indicates that the FB is not finished. 'Busy' is SET at the rising edge of 'Execute' and RESET when one of the outputs 'Done', 'Aborted', or 'Error' is set. It is recommended that this FB should be kept in the active loop of the application program for at least as long as 'Busy' is true, because the outputs may still change. For one axis, several Function Blocks might be busy, but only one can be active at a time.

Output 'Active'

The 'Active' output is available on Function Blocks with buffering capabilities. This output is set at the moment the function block takes control of the axis. For unbuffered mode the outputs "Active" and "Busy" can have the same value.

Enable and Valid / Status

The 'Enable' input is coupled to a 'Valid' output. 'Enable' is level sensitive, and 'Valid' shows that a valid set of outputs is available at the FB. The 'Valid' output is TRUE as long as a valid output value is available and the 'Enable' input is TRUE. The relevant output values are refreshed while the input 'Enable' is TRUE. If there is a FB error, the output is not valid ("Valid" set to FALSE). When the error condition disappears, the values will reappear and 'Valid' output will be set again.

The behavior of the "Execute" / "Done" style FBs is as follows:

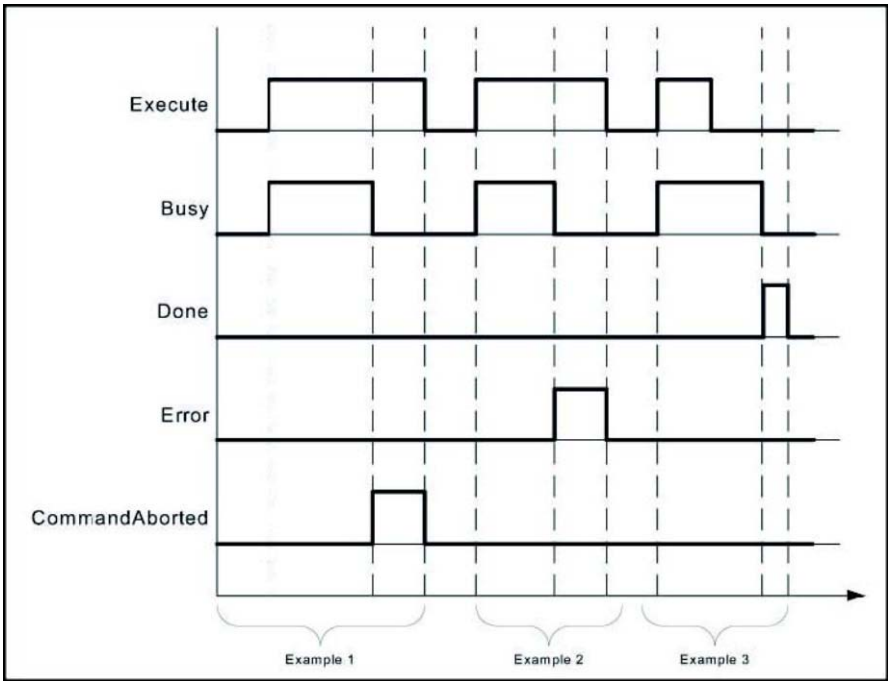


Figure 5-69: the FB behavior

5.6.4. Why the Command Input Is Edge Sensitive

The "Execute" input always triggers the function with its rising edge. New input values may be commanded during execution of a previous command because the inputs are only read once. The 'Done' output can be used to trigger the next part of the movement. The example given below is intended to explain the behavior of the Function Block execution.

The figure illustrates the sequence of three Function Blocks, 'First', 'Second' and 'Third', controlling the same axis. These three Function Blocks could be for instance various absolute or relative move commands. When

“First” has completed, the output 'First.Done' triggers 'Second.Execute'. The output 'Second.Done' AND “In13” trigger 'Third.Execute'.

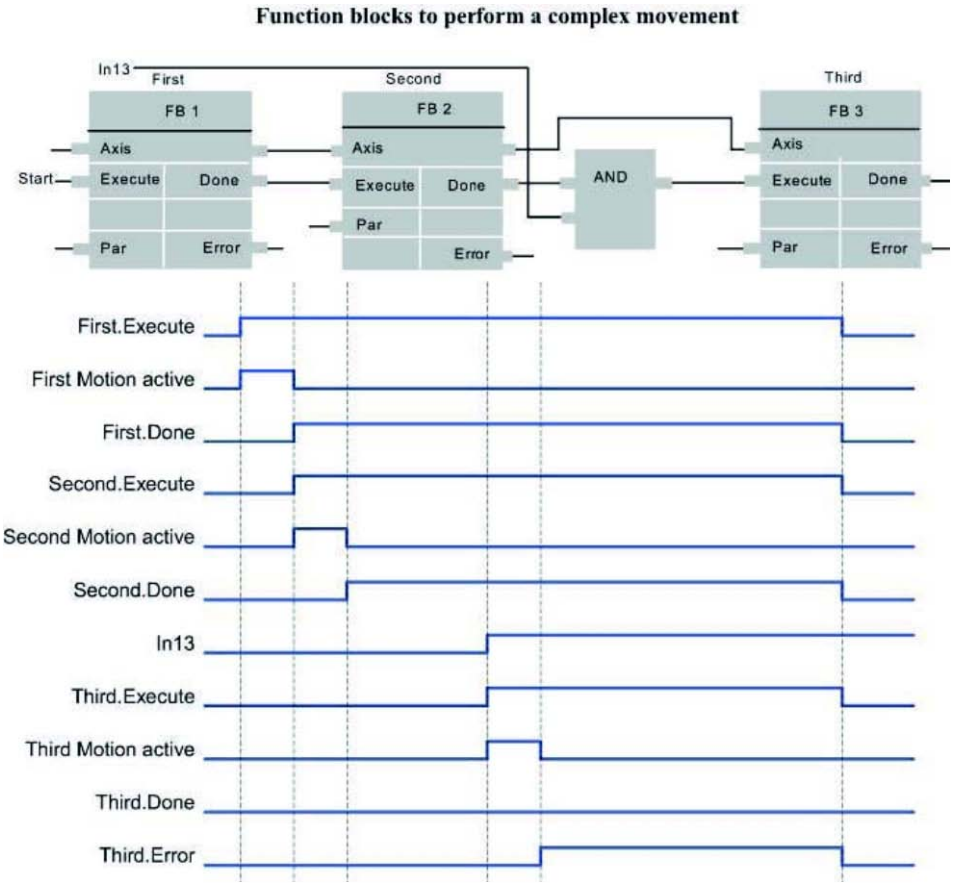
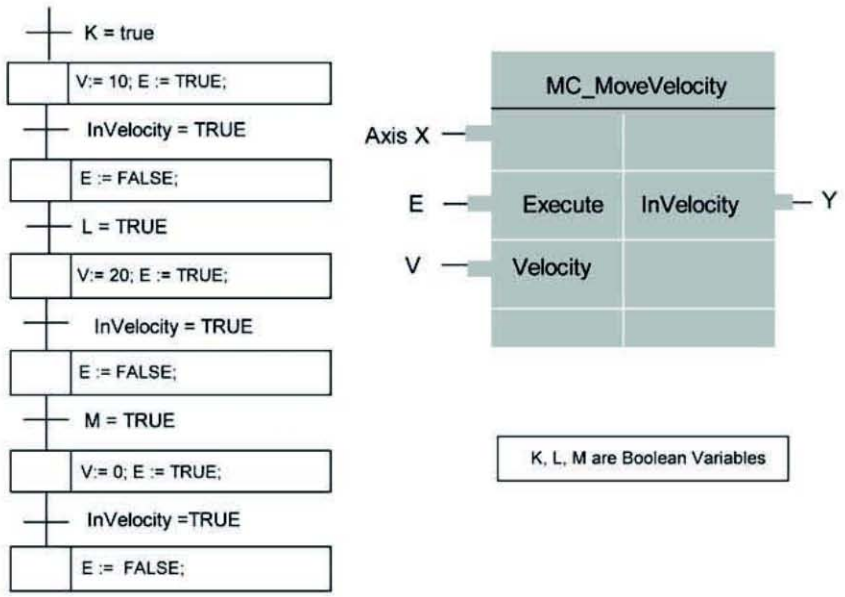


Figure 5-70: function blocks sequence

Example 1: Same Function Block instance controls different motions of an axis

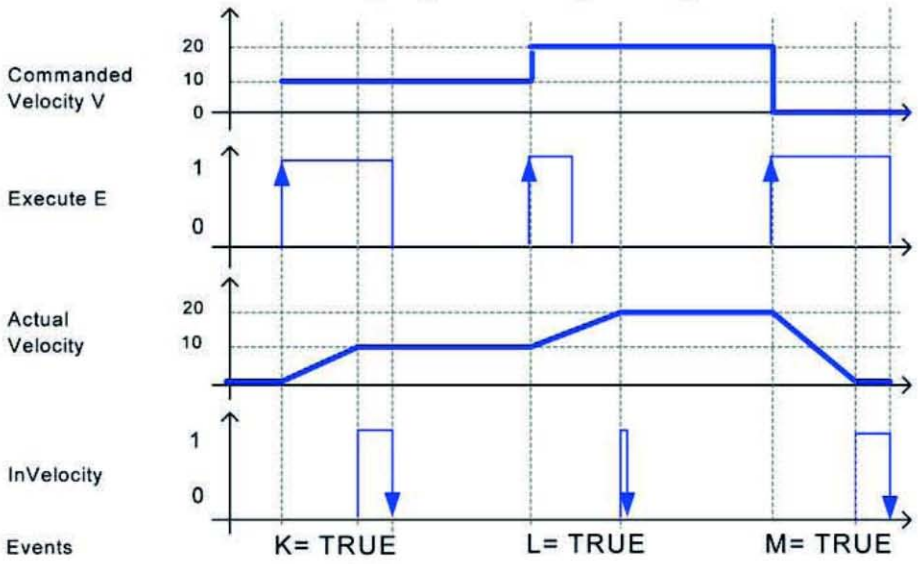
The figure below shows an example where the Function Block FB1 is used to control "AxisX" with three different values of Velocity. In a Sequential Function Chart (SFC) the velocity 10, 20, and 0 is assigned to V. To trigger the Execute input with a rising edge the variable E is stepwise set and reset.

Single FB usage with a SFC



The following timing diagram explains how it works.

Timing diagram for a usage of a single FB

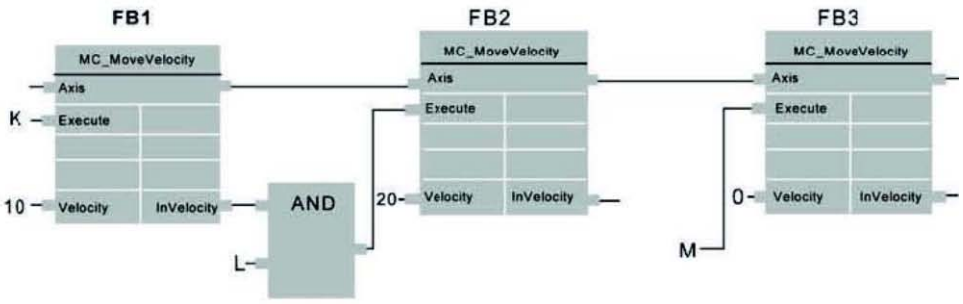


Note: The second InVelocity is set for only one cycle because the Execute has gone low before the Actual Velocity equals Commanded Velocity.

Example 2: Different FB instances control the motions of an axis

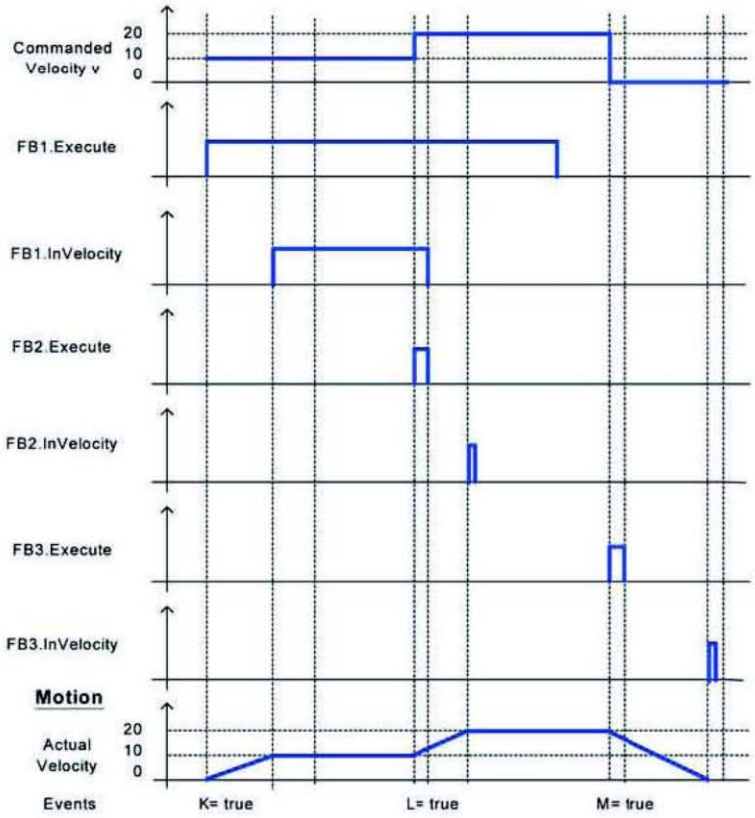
Different instances related to the same axis can control the motions on an axis. Each instance will then be responsible for one part of the global profile.

Cascaded Function Blocks



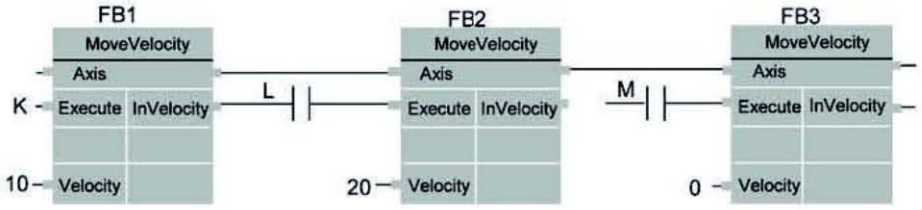
The timing diagram:

Cascaded Function Blocks timing diagram



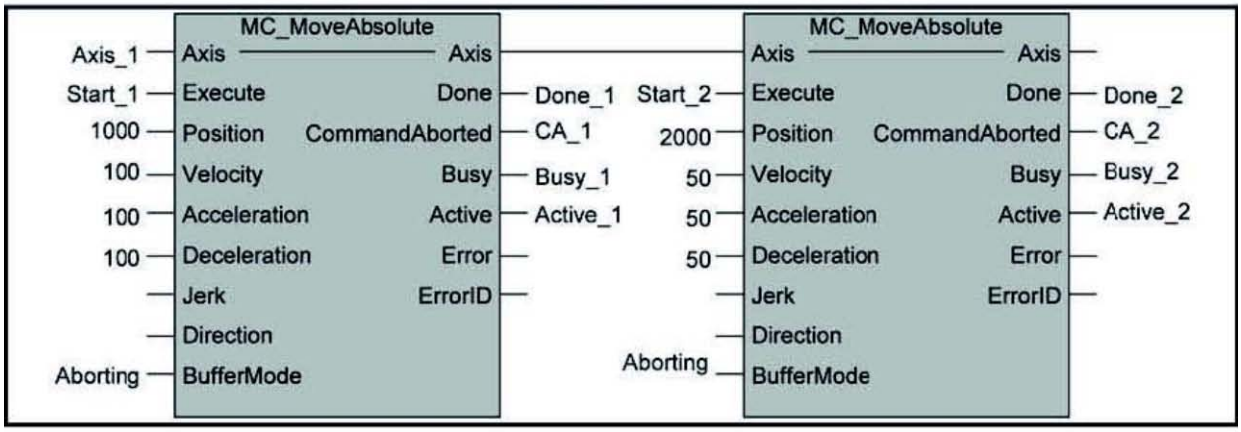
A corresponding solution written in LD looks like:

Cascaded Function Blocks with LD

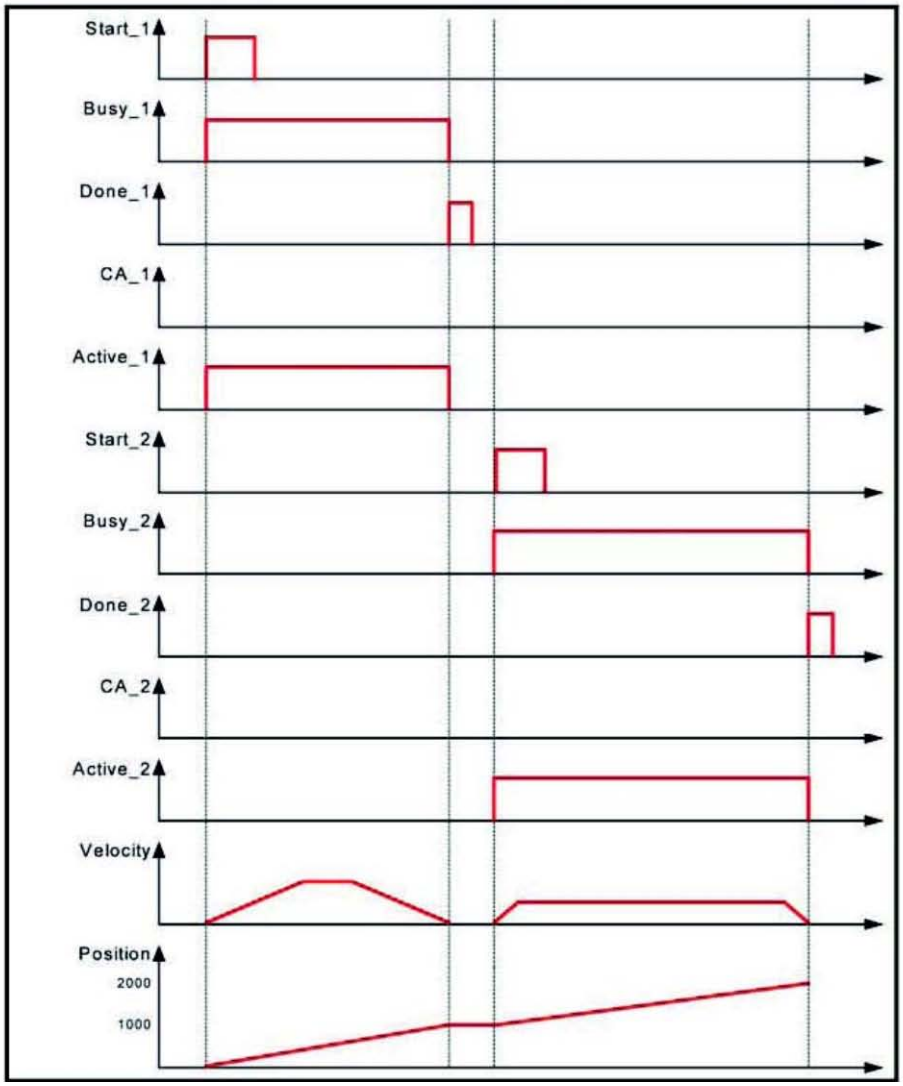


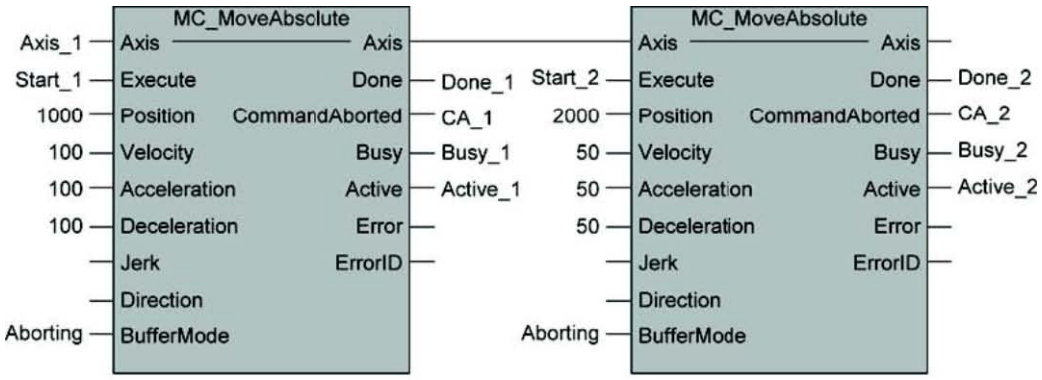
Standard behavior of 2 following absolute movements

Basic example with two MC_MoveAbsolute on same axis

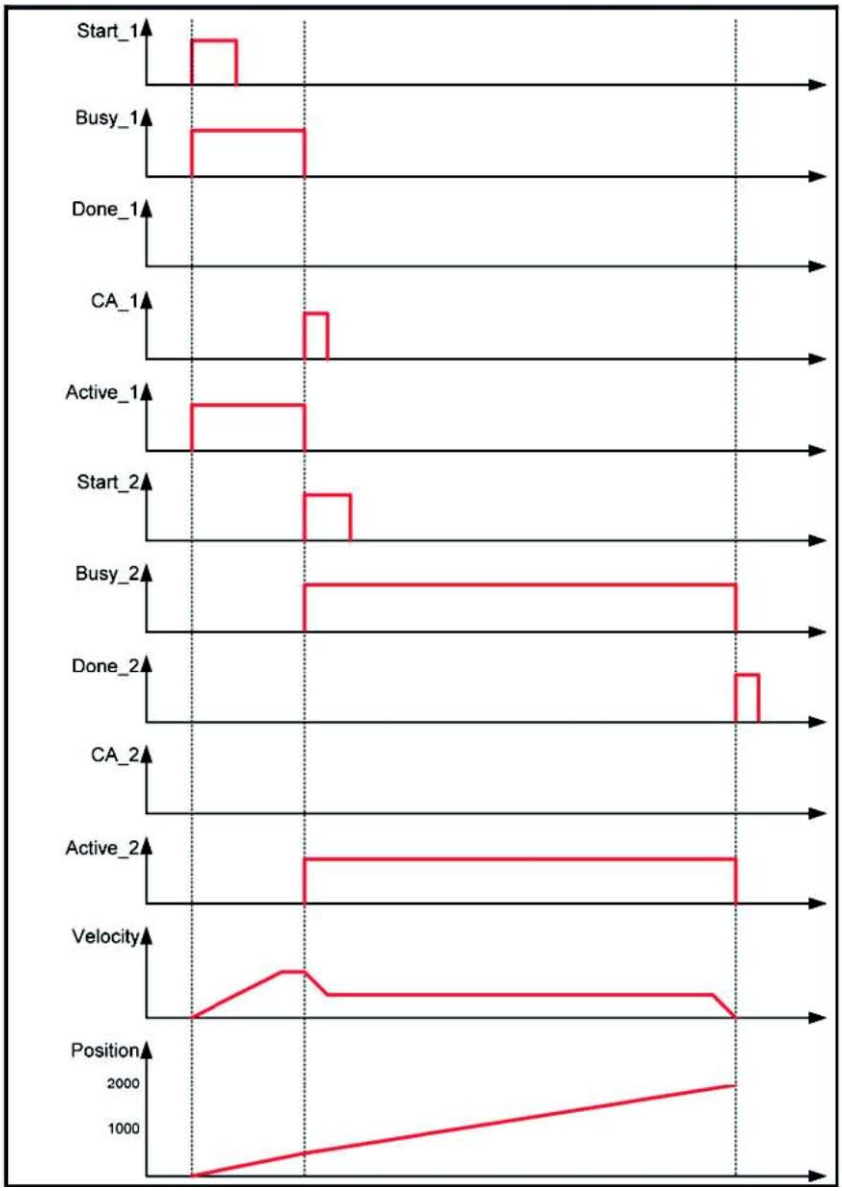


Timing diagram for example above without interference between FB1 and FB2 (Aborting Mode)





Timing diagram for example above with FB2 interrupting FB1 (Aborting Mode)



Rules for the definition of Motion Control function blocks according to PLCopen

The input/output variables of the function blocks mandatory according to the PLCopen Standard are marked with the letter 'B' in the defined tables in the definition of the function blocks.

Input/output variables marked with the letter 'E' are optional, i.e. they can be implemented but are not mandatory.

Vendor specific input / output variables, i.e. added by the vendor, are marked with the letter 'V'.

According to the IEC 61131-3 specification, the input variables may be unconnected or not parameterized by the user. In this case, the function block will use the value from the previous invocation of the function block instance, or in case of the first invocation, the initial value will be used.

5.6.5. Motion Function Block List

Name Rule

FB's with MC_ prefix are developed according to the PLCopen standard. FB's with SA_ , GA_ or EP_ prefix are developed by TPM.

Execution Logic

The execution can be activated either by rising-edge or falling-edge and the data type is BOOL. In the case of rising-edge Execute will be used as the parameter. In the case of level-trigger Enable is used as the parameter. When level is HIGH, it will be executed repeatedly until the level becomes LOW.

Status Logic

The standard output includes Valid, Done, Busy, Active, CommandAborted, Error and ErrorID. The corresponding data type is BOOL except that ErrorID is INT.

Valid represents that FB is executable, R/W of parameter is successful when Valid is TRUE and is failed when Valid is FALSE. "Done" represents that FB is executed. Busy and Active represent that FB is being executed. CommandAborted represents that FB is interrupted while being executed and is aborted therefore. Error represents that the execution of FB is not correct. ErrorID can be used to check. Valid/Done, Busy/ Active, CommandAborted and Error are mutually incompatible. When "Error" is TRUE, ErrorID is not 0.

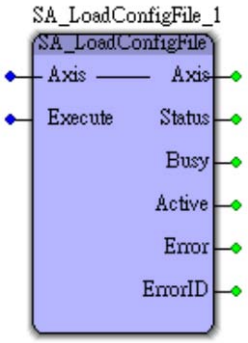
The available Motion FB of EasyPAC is listed in the following table:

Index	Motion FB Name	Description	Comment
5.6.5.1	SA_LoadConfigFile	Load Single Axis configuration file	
5.6.5.2	MC_Power	Enable Servo/Step Driver for IP1~IP32 (AXIS_01~AXIS_32)	
5.6.5.3	MC_Home	Do homing of the axis	
5.6.5.4	MC_MoveAbsolute	Absolute move with T or S curve	
5.6.5.5	MC_MoveRelative	Relative Move with T or S curve	
5.6.5.6	MC_Velocity	Velocity Move with T or S curve	
5.6.5.7	MC_Reset	Reset the axis to standstill status	
5.6.5.8	MC_Stop	Stop the motion of the assigned axis	
5.6.5.9	SA_ErrorJog	Move the axis when limit switch is activated by jogging	
5.6.5.10	SA_GetSensor	Get the hardware sensor signal	
5.6.5.11	MC_ReadStatus	Read the status of the axis	
5.6.5.12	MC_ActualPosition	Get the axis actual position from encoder	
5.6.5.13	MC_ReadBoolParameter	Get BOOL type data	
5.6.5.14	SA_ReadByteParameter	Get Byte type data	
5.6.5.15	SA_ReadIntParameter	Get integer type data	
5.6.5.16	SA_ReadUsintParameter	Get unsigned integer type data	
5.6.5.17	SA_ReadDintParameter	Get double integer type data	

Index	Motion FB Name	Description	Comment
5.6.5.18	MC_ReadParameter	Get unsigned double integer type data	
5.6.5.19	SA_ReadDwordParameter	Get double word type data	
5.6.5.20	MC_WriteBoolParameter	Set BOOL type data	
5.6.5.21	SA_WriteByteParameter	Set byte type data	
5.6.5.22	SA_WriteIntParameter	Set integer type data	
5.6.5.23	SA_WriteUsintParameter	Set unsigned integer type data	
5.6.5.24	SA_WriteDintParameter	Set double integer type data	
5.6.5.25	MC_WriteParameter	Set unsigned double integer type data	
5.6.5.26	SA_WriteDwordParameter	Set double word type data	
5.6.5.27	GA_GroupEnable	Enable the grouped motion function	
5.6.5.28	GA_GroupDisable	Disable the grouped motion function	
5.6.5.29	GA_MoveLinearAbsolute	Grouped absolute linear motion with T or S curve	
5.6.5.30	GA_MoveLinearRelative	Grouped relative linear motion with T or S curve	
5.6.5.31	GA_MoveCircularAbsolute	Grouped absolute circular motion with T or S curve	
5.6.5.32	GA_MoveCircularRelative	Grouped relative circular motion with T or S curve	
5.6.5.33	GA_PathSelect	Select and download the continuous path from xxxx.kwpts	
5.6.5.34	GA_MovePath	Continuous motion with multiple segments	
5.6.5.35	GA_GroupReset	Reset grouped axes to Standstill	
5.6.5.36	GA_GroupStop	Grouped axes stop	

Table 5-3: available motion function blocks

5.6.5.1 SA_LoadConfigFile



Function: **Download the axis parameter from xxxx.pccfg**

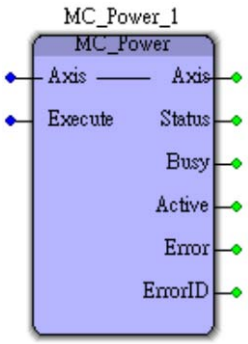
Input Parameter: **Axis**
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

Output Parameter: **Axis**
Data Type: AXIS_REF

Status
Busy
Active
Error
ErrorID
Please refer to the Status Logic

5.6.5.2 MC_Power



Function: **Enable Servo/Step Driver for IP1~IP32 (AXIS_01~AXIS_32)**

Input Parameter:

Axis
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

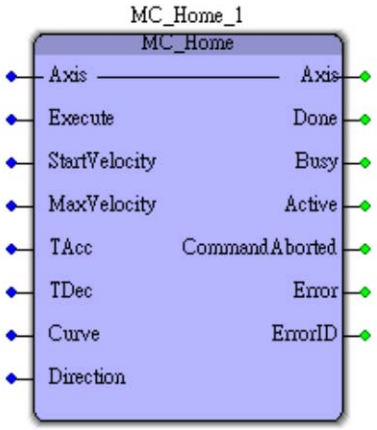
AxisIP
Data Type: USINT

Output Parameter:

Axis
Data Type: AXIS_REF

Status
Busy
Active
Error
ErrorID
Please refer to the Status Logic

5.6.5.3 MC_Home



Function: **Do homing of the axis**

Input Parameter:

Axis
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

StartVelocity
Data Type: DWORD
Start Velocity

MaxVelocity
Data Type: DWORD
Maximum Velocity

TAcc
Data Type: REAL
Acceleration Time in the unit of second

TDec
Data Type: REAL
Deceleration Time in the unit of second

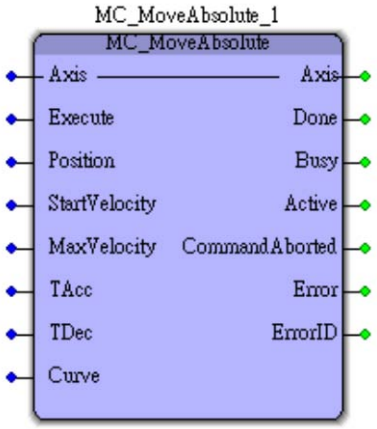
Curve
Data Type: BYTE
Velocity Profile: 0 for T-Curve, 1 for S-Curve

Direction
Data Type: USINT
0 for Positive Direction, 1 for Negative Direction

Output Parameter: **Axis**
Data Type: AXIS_REF

Done
Busy
Active
CommandAborted
Error
ErrorID
Please refer to the Status Logic

5.6.5.4 MC_MoveAbsolute



Function: **Absolute move with T or S curve**

Input Parameter:

Axis
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

Position
Data Type: DINT (-134217728 ~ +134217728)
Absolute Position

StartVelocity
Data Type: DWORD
Start Velocity

MaxVelocity
Data Type: DWORD
Maximum Velocity

TAcc
Data Type: REAL
Acceleration Time in the unit of second

TDec
Data Type: REAL
Deceleration Time in the unit of second

Curve
Data Type: BYTE
Velocity Profile: 0 for T-Curve, 1 for S-Curve

Output Parameter:

Axis
Data Type: AXIS_REF

Done

Busy

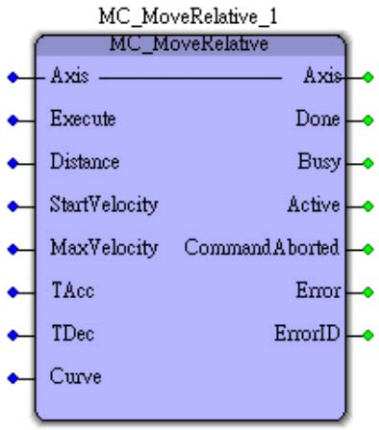
Active

CommandAborted

Error

ErrorID
Please refer to the Status Logic

5.6.5.5 MC_MoveRelative



Function: **Relative Move with T or S curve**

Input Parameter:

Axis
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

Distance
Data Type: DINT (-134217728 ~ +134217728)
Relative Position

StartVelocity
Data Type: DWORD
Start Velocity

MaxVelocity
Data Type: DWORD
Maximum Velocity

TAcc
Data Type: REAL
Acceleration Time in the unit of second

TDec
Data Type: REAL
Deceleration Time in the unit of second

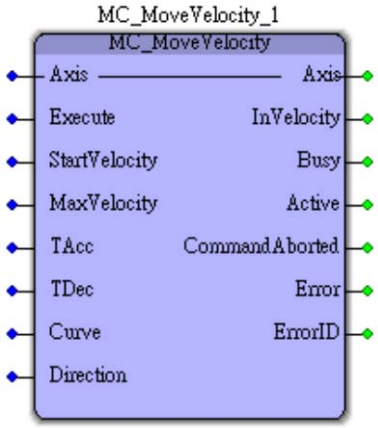
Curve
Data Type: BYTE
Velocity Profile: 0 for T-Curve, 1 for S-Curve

Output Parameter:

Axis
Data Type: AXIS_REF

Done
Busy
Active
CommandAborted
Error
ErrorID
Please refer to the Status Logic

5.6.5.6 MC_MoveVelocity



Function: **Velocity Move with T or S curve**

Input Parameter:

Axis
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

StartVelocity
Data Type: DWORD
Start Velocity

MaxVelocity
Data Type: DWORD
Maximum Velocity

TAcc
Data Type: REAL
Acceleration Time in the unit of second

TDec
Data Type: REAL
Deceleration Time in the unit of second

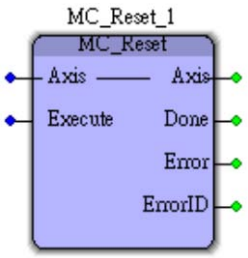
Curve
Data Type: BYTE
Velocity Profile: 0 for T-Curve, 1 for S-Curve

Direction
Data Type: USINT
0 for Positive, 1 for Negative

Output Parameter: **Axis**
Data Type: AXIS_REF

Done
Busy
Active
CommandAborted
Error
ErrorID
Please refer to the Status Logic

5.6.5.7 MC_Reset



Function: **Reset the axis to standstill status**

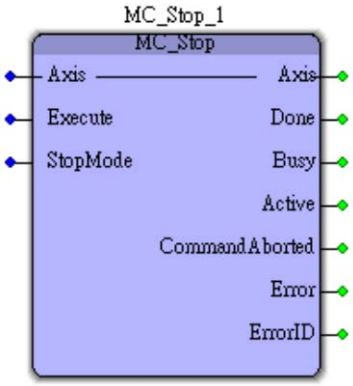
Input Parameter: **Axis**
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

Output Parameter: **Axis**
Data Type: AXIS_REF

Done
Error
ErrorID
Please refer to the Status Logic

5.6.5.8 MC_Stop



Function: **Stop the motion of the assigned axis**

Input Parameter: **Axis**
Data Type: AXIS_REF

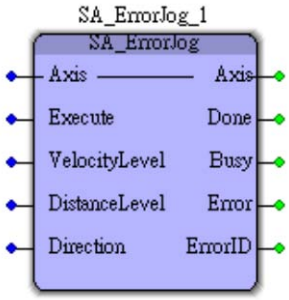
Execute
If “Execute” were TRUE，Status is always “Stopping”. If “Execute” changes from TRUE to FALSE, status is “Stopping” while the axis is still moving, status will change to “StandStill” after the axis stops.

StopMode
Data Type: BOOL
0 for immediate stop, 1 for stop with SlowDone velocity

Output Parameter: **Axis**
Data Type: AXIS_REF

Done
Busy
Active
CommandAborted
Error
ErrorID
Please refer to the Status Logic

5.6.5.9 SA_ErrorJog



Function: **Move the axis when limit switch is activated by jogging**

Input Parameter:

Axis
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

Velocity_Level
Data Type: USINT
1/2/3 for 100/500/1000 in the unit of PPS

Distance_Level
Data Type: USINT
1/2/3 for 100/500/1000 in the unit of PULSE

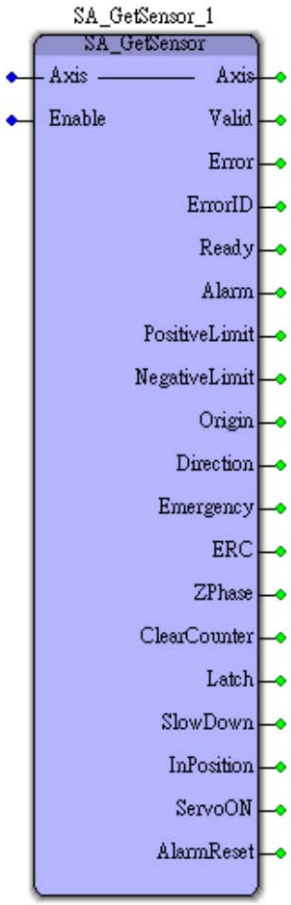
Direction
Data Type: USINT
0 for Positive direction, 1 for Negative direction, 2 for the last move direction

Output Parameter:

Axis
Data Type: AXIS_REF

Done
Busy
Error
ErrorID
Please refer to the Status Logic

5.6.5.10 SA_GetSensor



Function: **Get the hardware sensor signal**

Input Parameter: **Axis**
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

Output Parameter: **Axis**
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic
Ready
Data Type：BOOL

Axis is enabled when Ready is TRUE and is disabled when Ready is FALSE

Alarm

Data Type: BOOL

Driver alarm is enabled when Alarm is TRUE. MC_Reset is needed to reset the system

PositiveLimit

Data Type: BOOL

Axis is on the Positive Limit when PostiveLimi is TRUE， SA_ErrorJog is applicable to move the axis. MC_Reset is needed to reset the system

NegativeLimit

Data Type: BOOL

Axis is on the Negative Limit when NegativeLimi is TRUE. SA_ErrorJog is applicable to move the axis. MC_Reset is needed to reset the system

Origin

Data Type: BOOL

Axis reaches the origin sensor when Origin is TRUE

Direction

Data Type: BOOL

When Direction is TRUE, axis moves in positive direction. When FALSE, axis moves in negative direction

Emergency

Data Type: BOOL

Axis is in the emgerency stop status when Emergency is TRUE. MC_Reset is needed to reset the system

ERC

Data Type: BOOL

ERC out is HIGH when the value is TRUE and is LOW when is FALSE

ZPhase

Data Type: BOOL

Axis reaches the Zero phase when ZPhase is TRUE

ClearCounter

Data Type: BOOL

ClearCounter is activated when value is TRUE

Latch

Data Type: BOOL

Latch is activated when value is TRUE

SlowDone

Data Type: BOOL

SlowDone is activated when value is TRUE

InPosition

Data Type: BOOL

InPosition is activated when value is TRUE

ServoON

Data Type: BOOL

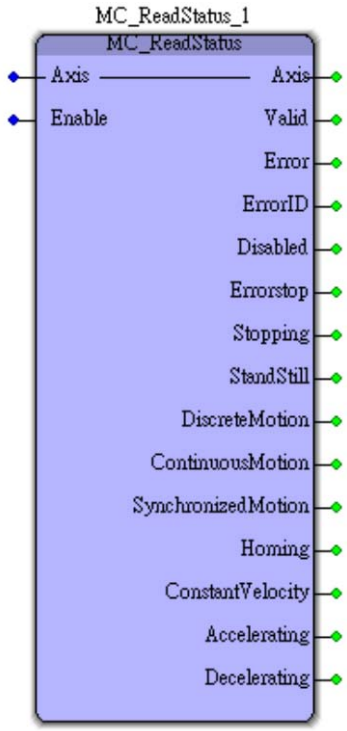
ServoON is activated when value is TRUE

AlarmReset

Data Type: BOOL

AlarmReset output is HIGH when value is TRUE. AlarmReset output is LOW when value is FALSE

5.6.5.11 MC_ReadStatus



Function: **Read the status of the axis**

Input Parameter: **Axis**
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

Output Parameter: **Axis**
Data Type: AXIS_REF
Valid
Error
ErrorID
Please refer to the Status Logic

Error_Stop
Data Type: BOOL
Axis is stopped with error when Error_Stop is TRUE

Disabled
Data Type: BOOL

Servo/Step driver is Disabled when value is TRUE

Stopping
Data Type: BOOL
Axis is decelerating to stop when Stopping is TRUE

StandStill
Data Type: BOOL
Axis is ready to execute motion command when StandStill is TRUE

DiscreteMotion
Data Type: BOOL
Axis is executing discrete motion when DiscreteMotion is TRUE

ContinuousMotion
Data Type: BOOL
Axis is executing continuous motion when Continuous_Motion is TRUE

SynchronizedMotion
Data Type: BOOL
Axis is executing synchronized motion when SynchronizedMotion is TRUE

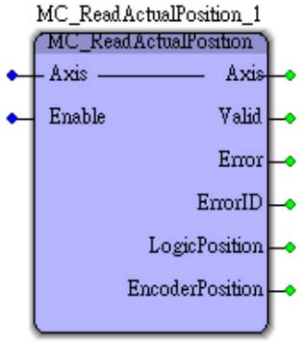
Homing
Data Type: BOOL
Axis is executing homing motion when Homing is TRUE

ConstantVelocity
Data Type: BOOL
Axis is executing constant velocity motion when ConstantVelocity is TRUE

Accelerating
Data Type: BOOL
Axis is accelerating when Accelerating is TRUE

Decelerating
Data Type: BOOL
Axis is decelerating when Decelerating is TRUE

5.6.5.12 MC_ReadActualPosition



Function: **Get the axis actual position from encoder**

Input Parameter: **Axis**
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

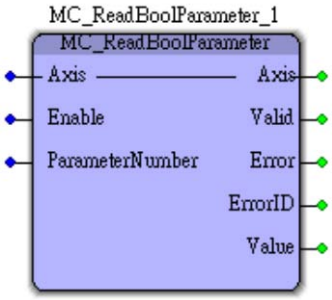
Output Parameter: **Axis**
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic

Logic_Position
Data Type: DINT
Logical / commanded position

Encoder_Position
Data Type：DINT
Encoder / actual position

5.6.5.13 MC_ReadBoolParameter



Function: **Get BOOL type data**

Input Parameter: **Axis**
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

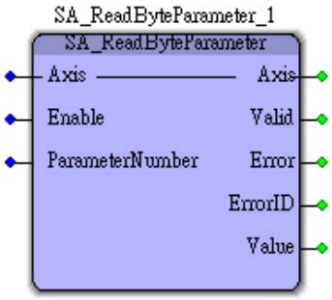
ParameterNumber
Data Type：INT
Please refer to Ch.5.6.7 for details

Output Parameter: **Axis**
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic

Value
Data Type: BOOL
Actual parameter value

5.6.5.14 SA_ReadByteParameter



Function: **Get Byte type data**

Input Parameter: **Axis**
Data Type：AXIS_REF

Enable
Please refer to the Execution Logic

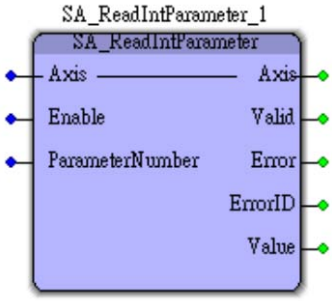
ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Output Parameter: **Axis**
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic

Value
Data Type: BYTE
Actual parameter value

5.6.5.15 SA_ReadIntParameter



Function: **Get integer type data**

Input Parameter: **Axis**
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

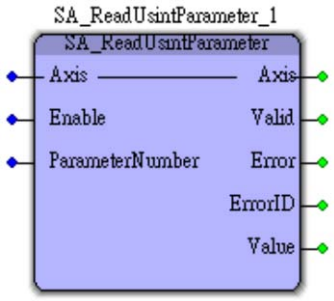
ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Output Parameter: **Axis**
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic

Value
Data Type: INT
Actual parameter value

5.6.5.16 SA_ReadUsintParameter



Function: **Get unsigned integer type data**

Input Parameter: **Axis**
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

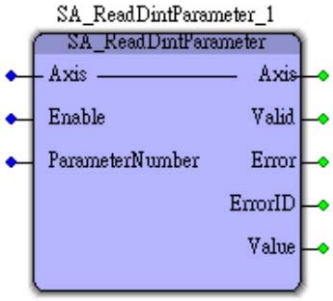
ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Output Parameter: **Axis**
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic

Value
Data Type: USINT
Actual parameter value

5.6.5.17 SA_ReadDintParameter



Function: **Get double integer type data**

Input Parameter: **Axis**
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

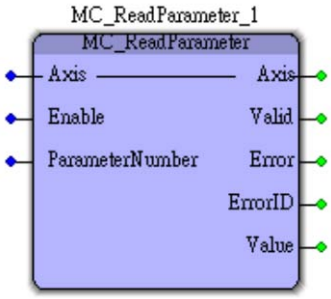
ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Output Parameter: **Axis**
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic

Value
Data Type: DINT
Actual parameter value

5.6.5.18 MC_ReadParameter



Function: **Get unsigned double integer type data**

Input Parameter:

Axis
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

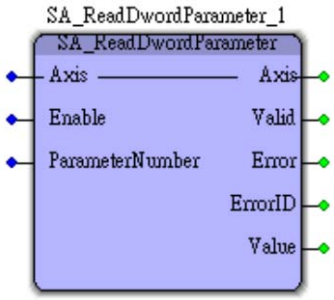
Output Parameter:

Axis
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic

Value
Data Type: UDINT
Actual parameter value

5.6.5.19 SA_ReadDwordParameter



Function: **Get double word type data**

Input Parameter:

Axis
Data Type: AXIS_REF

Enable
Please refer to the Execution Logic

ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

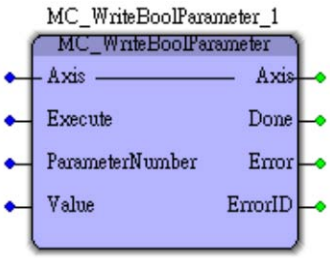
Output Parameter:

Axis
Data Type: AXIS_REF

Valid
Error
ErrorID
Please refer to the Status Logic

Value
Data Type: DWORD
Actual parameter value

5.6.5.20 MC_WriteBoolParameter



Function： **Set BOOL type data**

Input Parameter:

Axis
Data Type: AXIS_REF

Execute
Please refer to the Execution Logic

ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

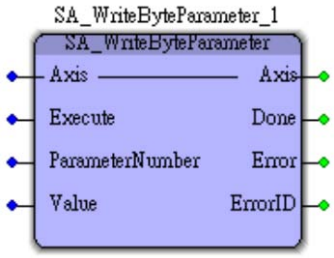
Value
Data Type: BOOL
Actual parameter value

Output Parameter:

Axis
Data Type: AXIS_REF

Done
Error
ErrorID
Please refer to theStatus Logic

5.6.5.21 SA_WriteByteParameter



Function: **Set byte type data**

Input Parameter: **Axis**
Data Type: AXIS_REF

Execute
Please refer to theExecution Logic

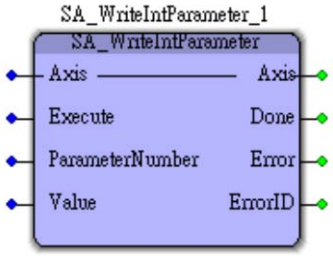
ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Value
Data Type: BYTE
The value to be set

Output Parameter: **Axis**
Data Type: AXIS_REF

Done
Error
ErrorID
Please refer to theStatus Logic

5.6.5.22 SA_WriteIntParameter



Function: **Set integer type data**

Input Parameter: **Axis**
Data Type: AXIS_REF

Execute
Please refer to theExecution Logic

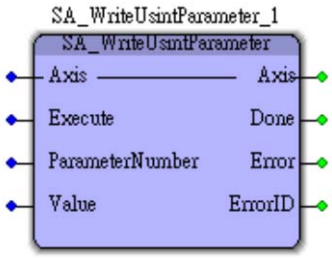
ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Value
Data Type: INT
The value to be set

Output Parameter: **Axis**
Data Type: AXIS_REF

Done
Error
ErrorID
Please refer to theStatus Logic

5.6.5.23 SA_WriteUsintParameter



Function: **Set unsigned integer type data**

Input Parameter: **Axis**
Data Type: AXIS_REF

Execute
Please refer to theExecution Logic

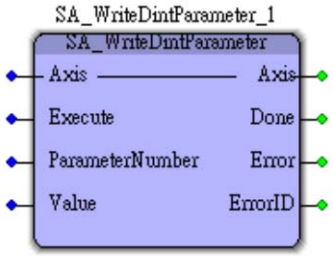
ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Value
Data Type: USINT
The data to be set

Output Parameter: **Axis**
Data Type: AXIS_REF

Done
Error
ErrorID
Please refer to theStatus Logic

5.6.5.24 SA_WriteDintParameter



Function: **Set double integer type data**

Input Parameter:

Axis
Data Type: AXIS_REF

Execute
Please refer to theExecution Logic

ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

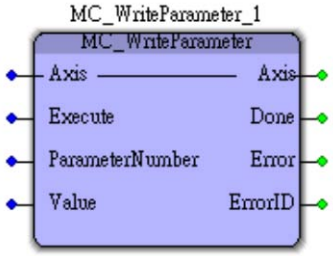
Value
Data Type: DINT
The data to be set

Output Parameter:

Axis
Data Type: AXIS_REF

Done
Error
ErrorID
Please refer to theStatus Logic

5.6.5.25 MC_WriteParameter



Function: **Set unsigned double integer type data**

Input Parameter:

Axis
Data Type：AXIS_REF

Execute
Please refer to theExecution Logic

ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Value
Data Type: UDINT
Actual parameter value

Output Parameter:

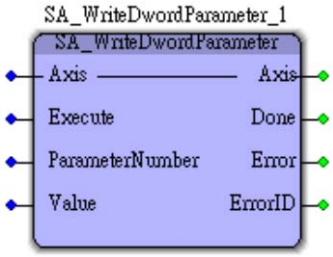
Axis
Data Type: AXIS_REF

Done

Error

ErrorID
Please refer to theStatus Logic

5.6.5.26 SA_WriteDwordParameter



Function: **Set double word type data**

Input Parameter: **Axis**
Data Type: AXIS_REF

Execute
Please refer to theExecution Logic

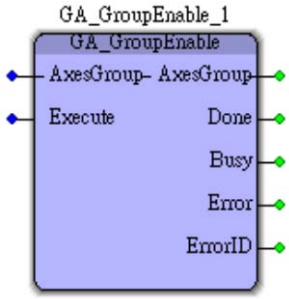
ParameterNumber
Data Type: INT
Please refer to Ch.5.6.7 for details

Value
Data Type: DWORD
The data to be set

Output Parameter: **Axis**
Data Type: AXIS_REF

Done
Error
ErrorID
Please refer to theStatus Logic

5.6.5.27 GA_GroupEnable



Function: **Enable the grouped motion function**

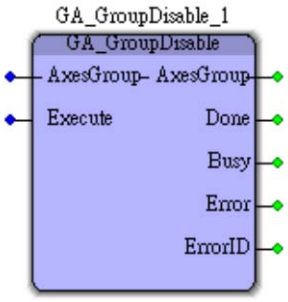
Input Parameter: **AxesGroup**
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

Output Parameter: **AxesGroup**
Data Type: AXIS_GROUP_REF

Done
Busy
Error
ErrorID
Please refer to theStatus Logic

5.6.5.28 GA_GroupDisable



Function: **Disable the grouped motion function**

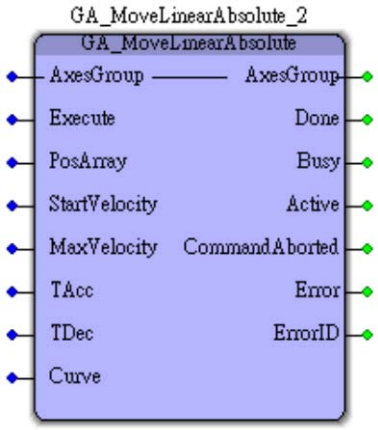
Input Parameter: **AxesGroup**
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

Output Parameter: **AxesGroup**
Data Type: AXIS_GROUP_REF

Done
Busy
Error
ErrorID
Please refer to theStatus Logic

5.6.5.29 GA_MoveLinearAbsolute



Function: **Grouped absolute linear motion with T or S curve**

Input Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

PosArray
Data Type: DISTARRAY (-134217728 ~ +134217728)
Absolute position

StartVelocity
Data Type: DWORD
Start Velocity

MaxVelocity
Data Type: DWORD
Maximum Velocity

TAcc
Data Type: REAL
Acceleration time in the unit of second

TDec
Data Type: REAL
Deceleration time in the unit of second

Curve
Data Type: BYTE
Velocity profile: 0 for T-Curve, 1 for S-Curve

Output Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Done

Busy

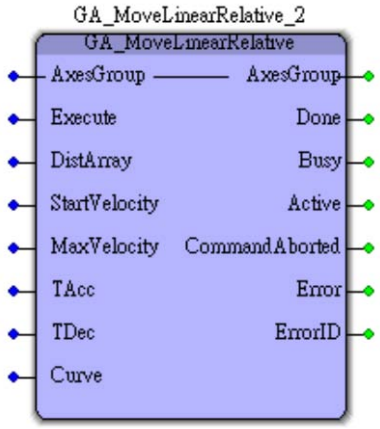
Active

CommandAborted

Error

ErrorID
Please refer to theStatus Logic

5.6.5.30 GA_MoveLinearRelative



Function: **Grouped relative linear motion with T or S curve**

Input Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

DisArray
Data Type: DISTARRAY (-134217728 ~ +134217728)
Relatvie position

StartVelocity
Data Type: DWORD
Start Velocity

MaxVelocity
Data Type: DWORD
Maximum Velocity

TAcc
Data Type REAL
Acceleration time in the unit of second

TDec
Data Type REAL
Deceleration time in the unit of second

Curve
Data Type: BYTE
Velocity profile: 0 for T-Curve, 1 for S-Curve

Output Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Done

Busy

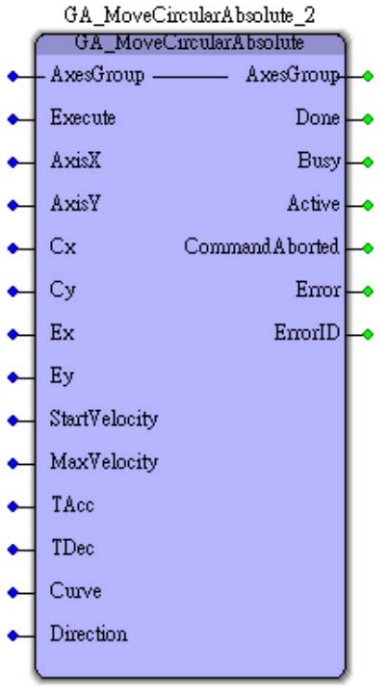
Active

CommandAborted

Error

ErrorID
Please refer to theStatus Logic

5.6.5.31 GA_MoveCircularAbsolute



Function: **Grouped absolute circular motion with T or S curve**

Input Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

AxisX
Data Type: AXIS_REF. X-axis

AxisY
Data Type: AXIS_REF. Y-axis

Cx
Data Type: DINT (-134217728 ~ +134217728)
Center position in X axis

Cy
Data Type: DINT (-134217728 ~ +134217728)
Center position in Y axis

Ex
Data Type: DINT (-134217728 ~ +134217728). End position in X axis

Ey
Data Type: DINT (-134217728 ~ +134217728). End position in Y axis

StartVelocity
Data Type: DWORD. Start Velocity

MaxVelocity
Data Type: DWORD. Maximum Velocity

Tacc
Data Type REAL. Acceleration time in the unit of second

Tdec
Data Type REAL. Deceleration time in the unit of second

Curve
Data Type: BYTE. Velocity profile: 0 for T-Curve, 1 for S-Curve

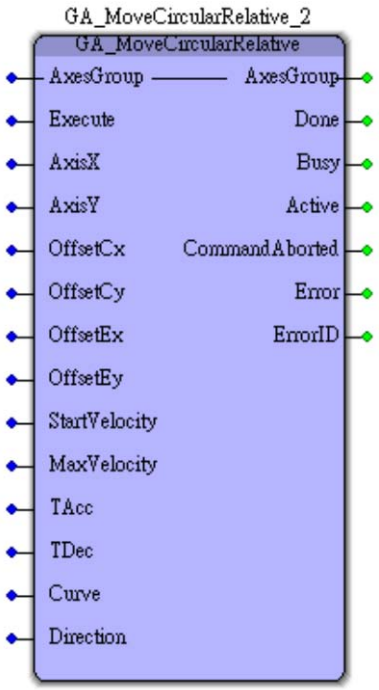
Direction
Data Type: USINT
0 for positive direction, 1 for negative direction

Output Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Done
Busy
Active
CommandAborted
Error
ErrorID
Please refer to theStatus Logic

5.6.5.32 GA_MoveCircularRelative



Function: **Grouped relative circular motion with T or S curve**

Input Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

AxisX
Data Type: AXIS_REF. X axis

AxisY
Data Type: AXIS_REF. Y axis

OffsetCx
Data Type: DINT (-134217728 ~ +134217728).
Relative center position in X axis

OffsetCy
Data Type: DINT (-134217728 ~ +134217728)
Relative center position in Y axis

OffsetEx
Data Type: DINT (-134217728 ~ +134217728)
Relative end position in X axis

OffsetEy
Data Type: DINT (-134217728 ~ +134217728)
Relative end position in Y axis

StartVelocity
Data Type: DWORD. Start Velocity

MaxVelocity
Data Type: DWORD. Maximum Velocity

TAcc
Data Type REAL. Acceleration time in the unit of second

TDec
Data Type REAL. Deceleration time in the unit of second

Curve
Data Type: BYTE
Velocity profile: 0 for T-Curve, 1 for S-Curve

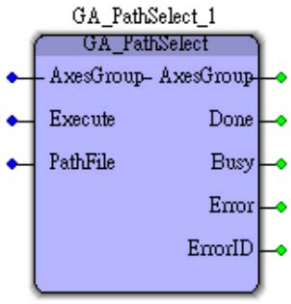
Direction
Data Type: USINT
0 for positive direction, 1 for negative direction

Output Parameter：

AxesGroup
Data Type: AXIS_GROUP_REF

Done
Busy
Active
CommandAborted
Error
ErrorID
Please refer to theStatus Logic

5.6.5.33 GA_PathSelect



Function: **Select and download the continuous path from xxxx.kwpts**

Input Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

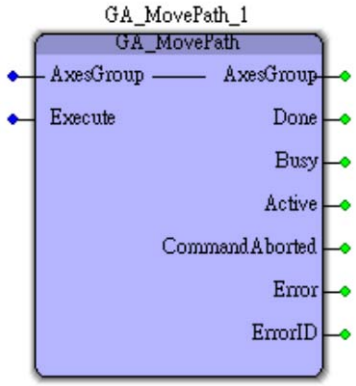
PathFile
Data Type: STRING

Output Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Done
Busy
Error
ErrorID
Please refer to theStatus Logic

5.6.5.34 GA_MovePath



Function: **Continuous motion with multiple segments**

Input Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

PathFile
Data Type: STRING

Output Parameter:

AxesGroup
Data Type: AXIS_GROUP_REF

Done
Busy
Active
CommandAborted
Error
ErrorID
Please refer to theStatus Logic

5.6.5.35 GA_GroupReset

Function: **Reset grouped axes to StandStill**

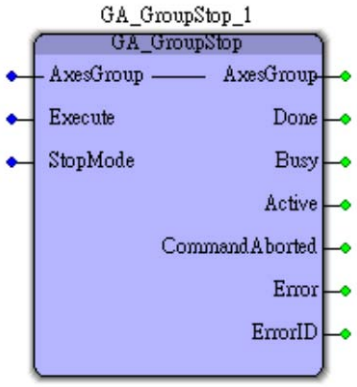
Input Parameter: **AxesGroup**
Data Type: AXIS_GROUP_REF

Execute
Please refer to theExecution Logic

Output Parameter: **AxesGroup**
Data Type: AXIS_GROUP_REF

Done
Busy
Error
ErrorID
Please refer to theStatus Logic

5.6.5.36 GA_GroupStop



Function: **Grouped axes stop**

Input Parameter: **AxesGroup**
Data Type：AXIS_GROUP_REF

Execute
If “Execute” were TRUE, Status is always “Stopping”. If “Execute” changes from TRUE to FALSE, status is “Stopping” while the axis is still moving. Status will change to StandStill after the axis stops

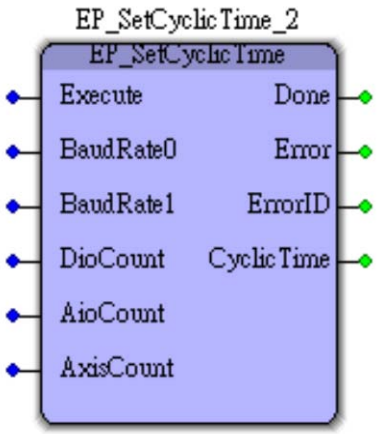
StopMode
Data Type: BOOL
0 for immediate stop, 1 for SlowDone stop

Output Parameter: **AxesGroup**
Data Type: AXIS_GROUP_REF

Done
Busy
Active
CommandAborted
Error
ErrorID
Please refer to theStatus Logic

5.6.6. EasyPAC Function Block List

5.6.6.1 EP_SetCyclicTime



Function: **Set the cycle time and baud rate according to the number of slave modules**

Input Parameter:

Execute
Please refer to theExecution Logic

BaudRate0
Data Type: USINT
Ring 0 baudrate: 0→2.5MBps, 1→5MBps, 2→10MBps, 3→20MBps

BaudRate1
Data Type：USINT
Ring 0 baudrate: 0→2.5MBps, 1→5MBps, 2→10MBps, 3->20MBps

DioCount
Data Type: USINT
No. of DIO salve module: 0 ~ 48

AioCount
Data Type: USINT
No. of AIO slave module: 0 ~ 16

AxisCount
Data Type: USINT
No. of Axis slave module: 0 ~ 32

Output Parameter:

Done

Error

ErrorID

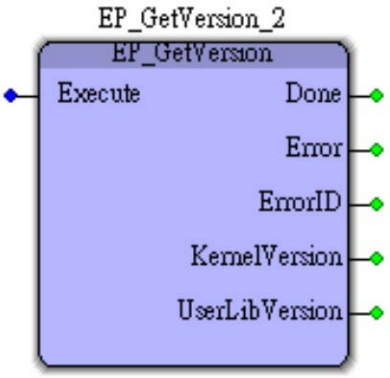
Please refer to theStatus Logic

CyclicTime

Data Type: USINT

Minimum cycle time in the unit of ms

5.6.6.2 EP_GetVersion



Function: **Get the system version**

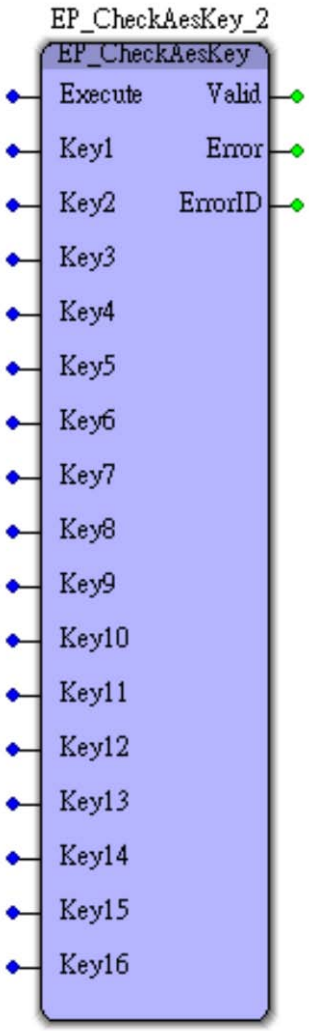
Input Parameter: **Execute**
Please refer to theExecution Logic

Output Parameter: **Done**
Error
ErrorID
Please refer to theStatus Logic

KernelVersion
Data Type: INT
Kernel version

KernelVersion
Data Type: INT
DLL version

5.6.6.3 EP_CheckAesKey



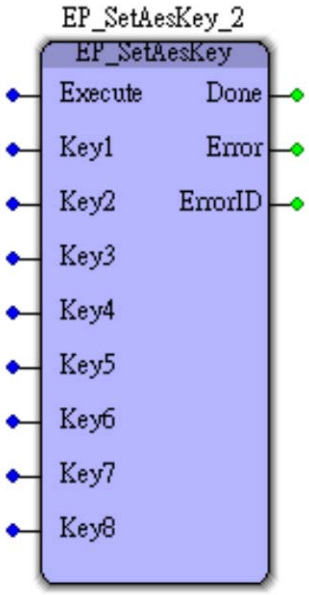
Function: **Check the AESkey set from EP_SetAesKey**, 0000000000000000~9999999999999999

Input Parameter: **Execute**
Please refer to theExecution Logic

Key1 ~ Key16
Data Type: INT
SI key, number from 0 to 9

Output Parameter: **Valid**
Error
ErrorID
Please refer to theStatus Logic

5.6.6.4 EP_SetAesKey



Function: **Set AES key**, the range 0x0000000000000000~0xFFFFFFFFFFFFFFFF

Input Parameter: **Execute**
Please refer to theExecution Logic

Key1 ~ Key8
Data Type: WORD
Set encrypted AesKey, key no. is from 0x0000 to 0xFFFF

Output Parameter: **Done**
Error
ErrorID
Please refer to theStatus Logic

5.6.7. Axis Parameter List

The following tables contain the axis parameters which can be read or written. This is a comprehensive list that contains parameters that may not be applicable for all types of axes. For each parameter the following information is available:

P N	Name	Data type	R/W	Comments
1	CommandedPosition	DINT	R	Commanded position
8	RALM	BOOL	R/W	Driver alarm reset output
9	MaxVelocityAppl	DWORD	R/W	Maximal allowed velocity of the axis in the application
10	ActualVelocity	DWORD	R	Actual velocity
11	CommandedVelocity	DWORD	R	Commanded velocity

Table 5-4: axis parameter list

PN (Parameter Number) – Parameter number applied to the input 'ParameterNumber' of the function blocks mentioned above.

Name – Parameter name.

Datatype – Datatype of the axis parameter.

R/W – Read/Write access (parameter can be read/written).

Comments – Short description of the parameter function

5.6.8. Function Block ErrorID List

Error Handle Number	Description
0	No error appear
7	The axis had been initialed already
9	The axis was not initialed before
11	Out of axis number
12	Illegal FB execute
14	Parameter number are not correctly
15	Data type not match
17	Parameter is read only
18	Out of function block type
19	Parameter is not enough or correctly
21	Hardware error
26	API Error
27	No Support
28	Group Not Enabled
29	Invalid Path
30	Axis count of the group less than 2

Table 5-5: function block error id list

Ring error message: if there is a beep sound and the 7 segment displays an “E”, please restart the EasyPAC by toggle the power switch.

5.7. Sample Programs

The sample program can be found in the following directory: C:\TPM\EasyPAC\sample

1. AIO
2. Counter
3. Single Axis
4. Grouped Axes
5. HMI_DIO

5.7.1. AI/O

Module wiring

106-A104-01 and 106-A180-01 are used in this example. The IP of 106-A104-01 is set as 61 and 106-A180-01 as 62. Make the wiring as shown below.
AOUT0 of 106-A104-01 is connected to the AIN0+ of 106-A180-01.
AGND of 106-A104-01 is connected to AIN0-/AGND of 106-A180-01.
And AIN4+/AIN4-/AGND of 106-A180-01 are connected together.

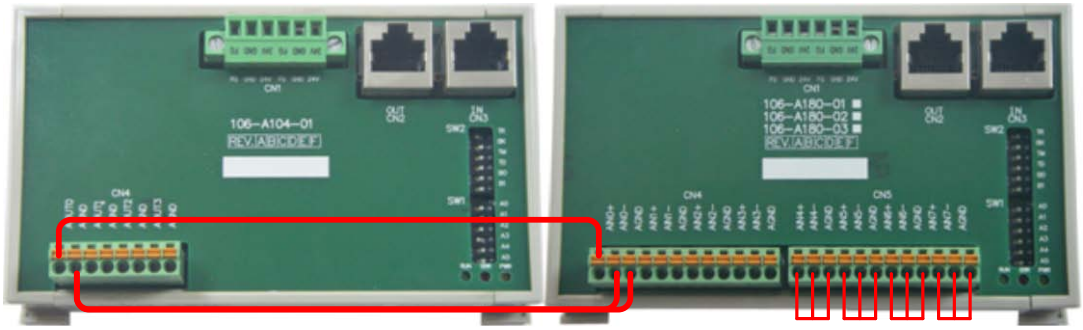


Figure 5-71: wiring for this example

106-A104-01	AOUT0	AGND	AGND	AOUT1	AGND	AGND	AOUT2	AGND	AGND	AOUT3	AGND	AGND
106-A180-01	AIN0+	AIN0-	AGND	AIN1+	AIN1-	AGND	AIN2+	AIN2-	AGND	AIN3+	AIN3-	AGND

106-A104-01												
106-A180-01	AIN4+	AIN4-	AGND	AIN5+	AIN5-	AGND	AIN6+	AIN6-	AGND	AIN7+	AIN7-	AGND

Table 5-6: the wiring table

Set the gain values of AI with MyLink

Set SW1 as 2 to activate MyLink server and power-on. Use MyLink to check the setting.

1. 106-A180-01 is set as shown below.

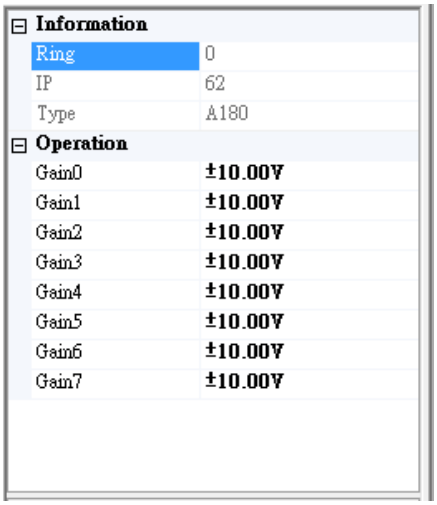


Figure 5-72: parameters setting of an AI module

2. Test display of 106-A104-01 and 106-A180-01

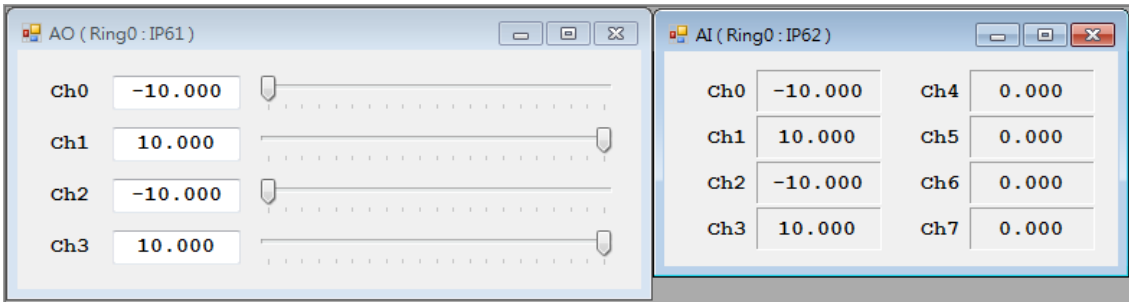


Figure 5-73: display of 106-A104-01 and 106-A180-01

Create a MULTIPROG project

Start MULTIPROG

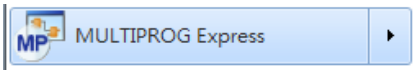


Figure 5-74: start MULTIPROG

Click on File→New Project

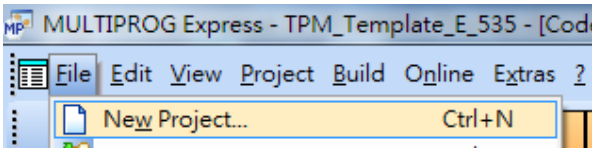


Figure 5-75: create a new project

Use TPM Template as shown below

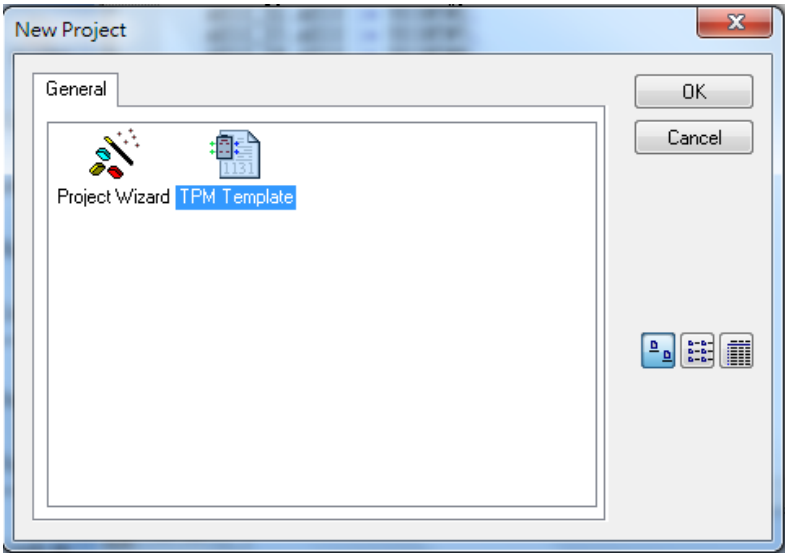


Figure 5-76: new project template

Click on “Untitled”

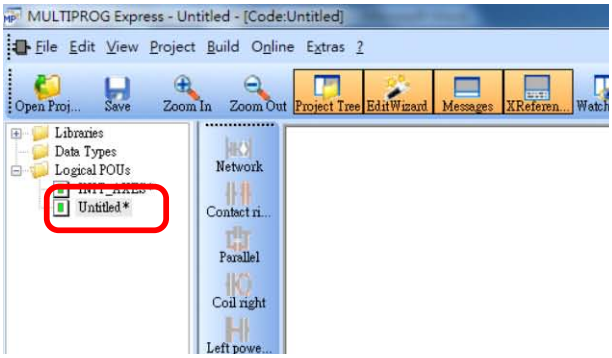
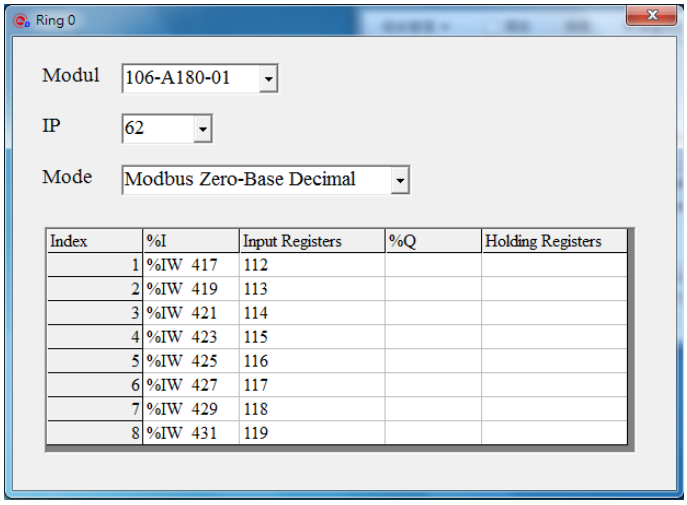


Figure 5-77: click on the Untitled*

Add new variable and set the I/O address

Check and set the I/O address with MyDataCheck

1. Use MyDataCheck for 106-A180-01



Index	%I	Input Registers	%Q	Holding Registers
1	%IW 417	112		
2	%IW 419	113		
3	%IW 421	114		
4	%IW 423	115		
5	%IW 425	116		
6	%IW 427	117		
7	%IW 429	118		
8	%IW 431	119		

Figure 5-78: configure I/O address of 106-A180-01

2. Use MyDataCheck for 106-A104-01

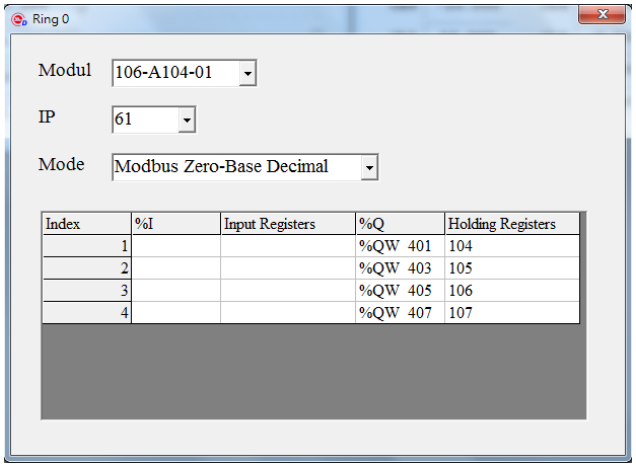


Figure 5-79: configure I/O address of 106-A104-01

3. Add a new variable and name it as AI_Channel_0 of 106-A180-01

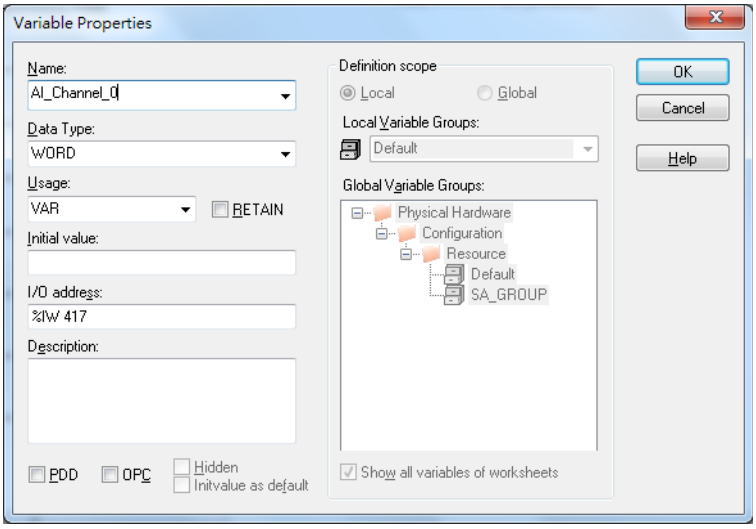


Figure 5-80: add a variable of 106-A180-01

4. Add a new variable and name it as AI_Channel_1 of 106-A180-01

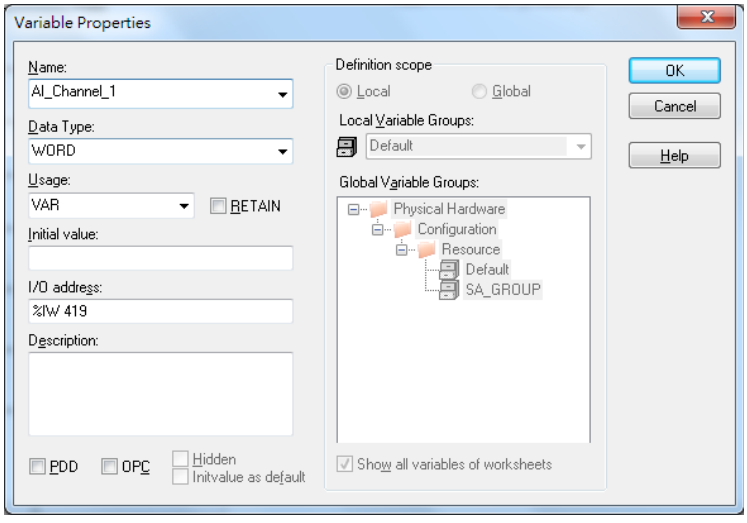


Figure 5-81: add a variable of 106-A180-01

5. Add a new variable and name it as AI_Channel_2 of 106-A180-01

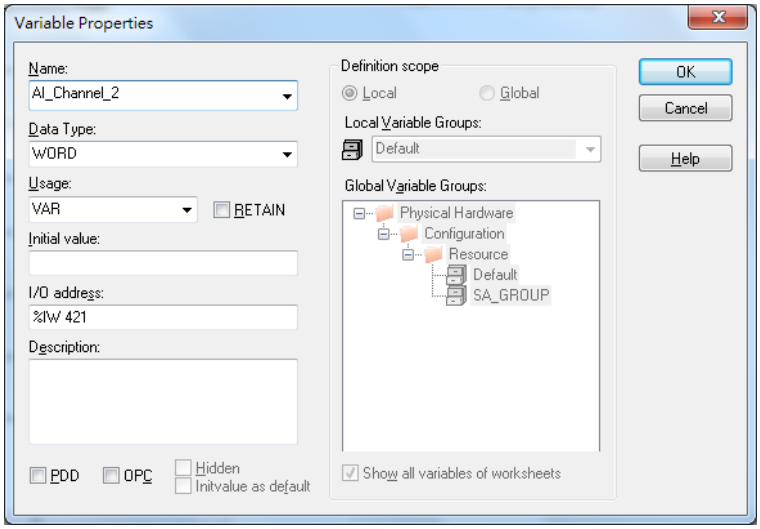


Figure 5-82: add a variable of 106-A180-01

6. Add variables AI_Channel_3, AI_Channel_4, AI_Channel_5, AI_Channel_6 and AI_Channel_7 of 106-A180-01 following the foregoing method. Also add variables AO_Channel_0, AO_Channel_1, AO_Channel_2 and AO_Channel_3 in the same way.

Download and monitor

You can monitor the variables after the program was successfully downloaded.

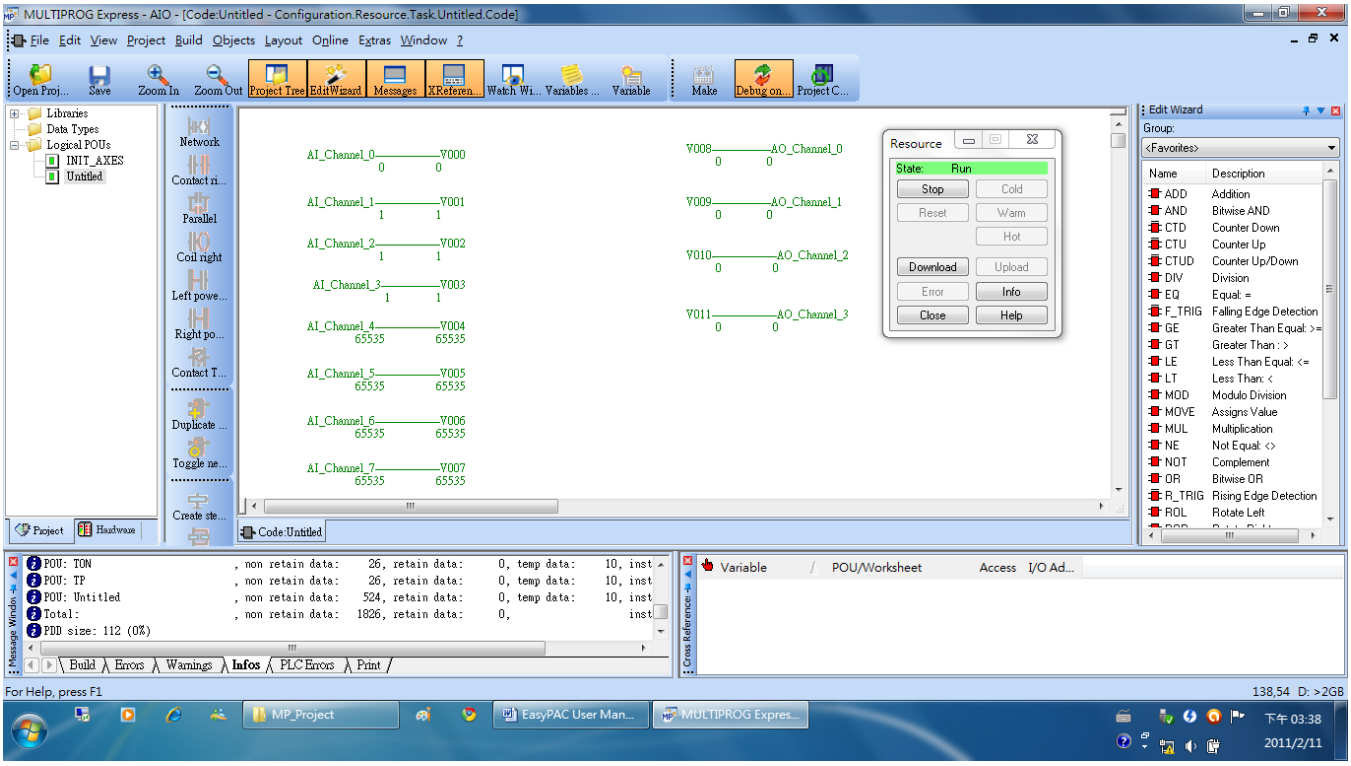


Figure 5-83: download and monitor the program

5.7.2. Counter

Module Wiring

108-P120 is used together with TTL encoder in this case. The wiring is shown below and the IP address is set to 63

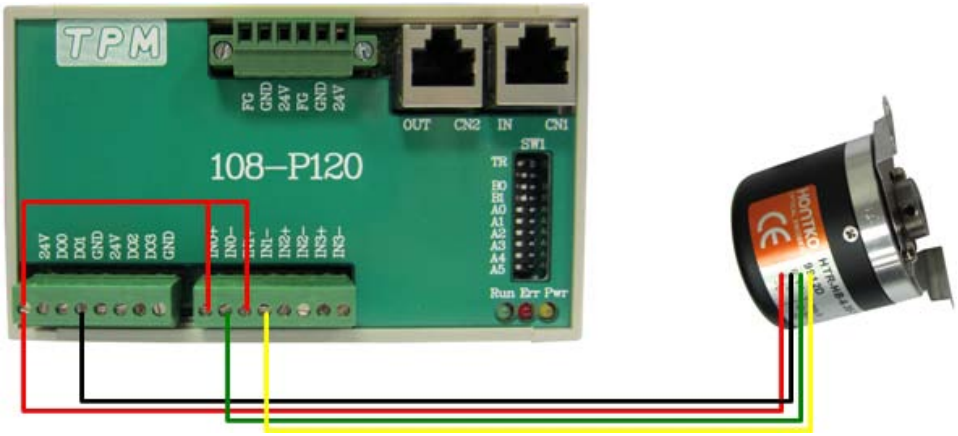


Figure 5-84: wiring of a counter module

Wiring table:

108-P120	Encoder
24V	24V
GND	GND
IN0+	connected to 24V
IN0-	A-phase (NPN Open Collector)
IN1+	connected to 24V
IN1-	B-phase (NPN Open Collector)

Table 5-7: counter module wiring table

Configure 108-P120 with MyLink

Set the EasyPAC mode to run MyLink and use MyLink to check the corresponding settings. The detailed information of 108-P120 can be found in the manual. The setting for this sample program is shown below.

1. Configuration of 108-P120

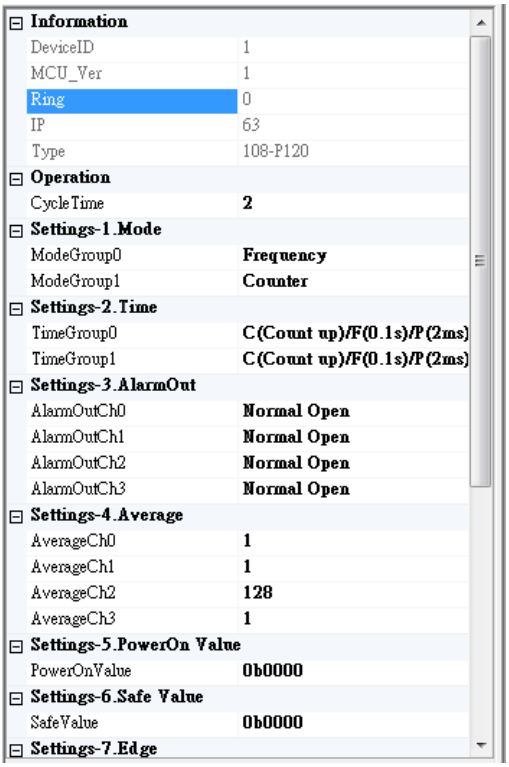


Figure 5-85: configuration of 108-P120

2. Test 108-P120 with MyLink

Set as shown above and click on Start to get the value as shown below:

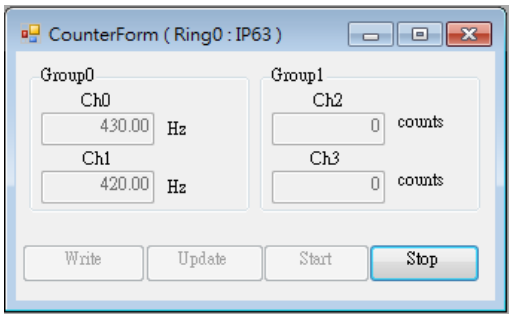


Figure 5-86: screenshot of MyLink testing counter module

Create a MULTIPROG project

Start MULTIPROG

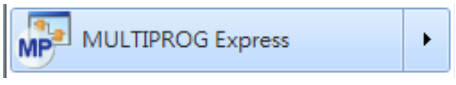


Figure 5-87: start MULTIPROG

Create with File→New Project

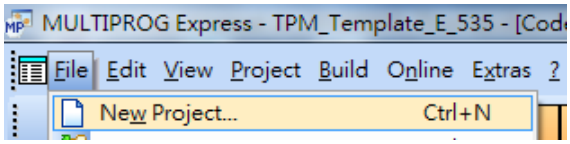


Figure 5-88: create a new project

Use with TPM Template

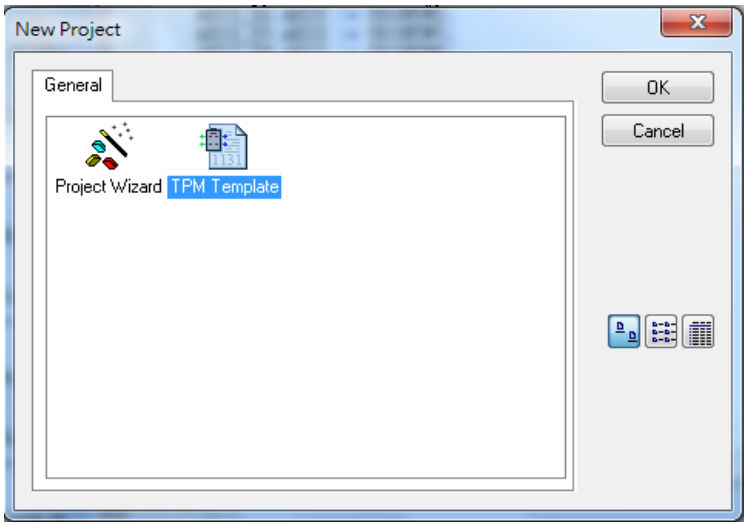


Figure 5-89: new project template

Double-click on Logical POUs / Untitled

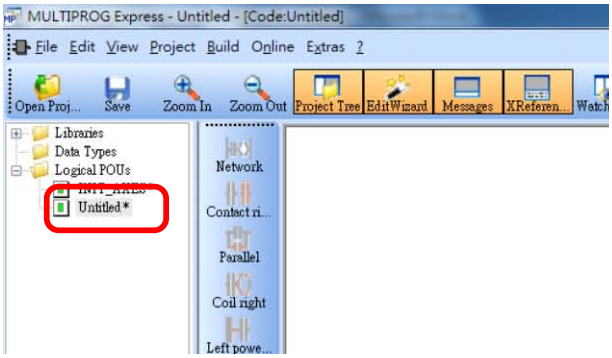


Figure 5-90: click on the Untitled*

Add new variable and set the I/O address

Use MyDataCheck to get the correct I/O address mapping as shown below.

1. Select 108-P120 and set IP as 63 as shown.

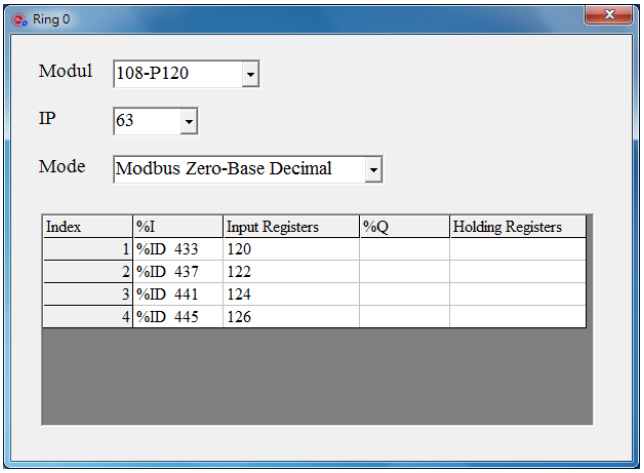


Figure 5-91: set IP of the counter module

2. Add a new variable and name it as Channel_0

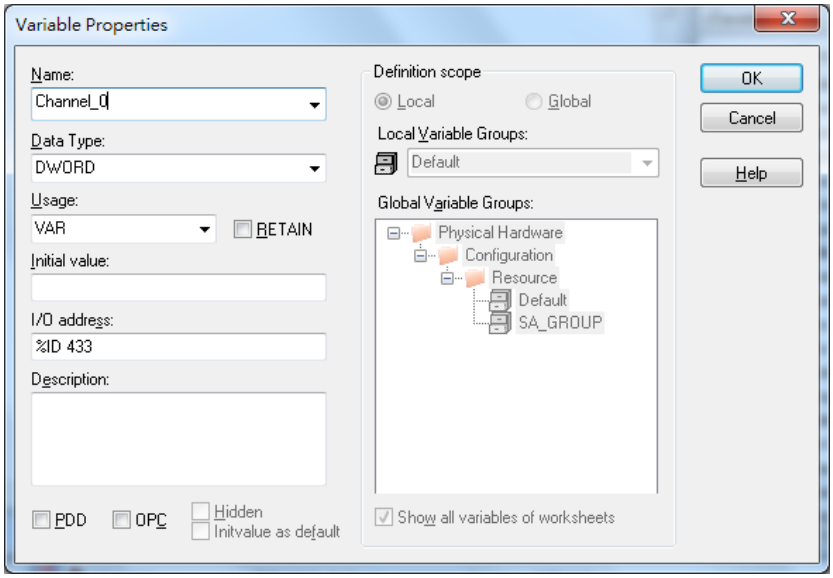


Figure 5-92: add a new variable of 108-P120

3. Add variables Channel_1, Channel_2 and Channel_3 following the foregoing method.

Download and monitor

You can monitor the variables after the program was successfully downloaded.

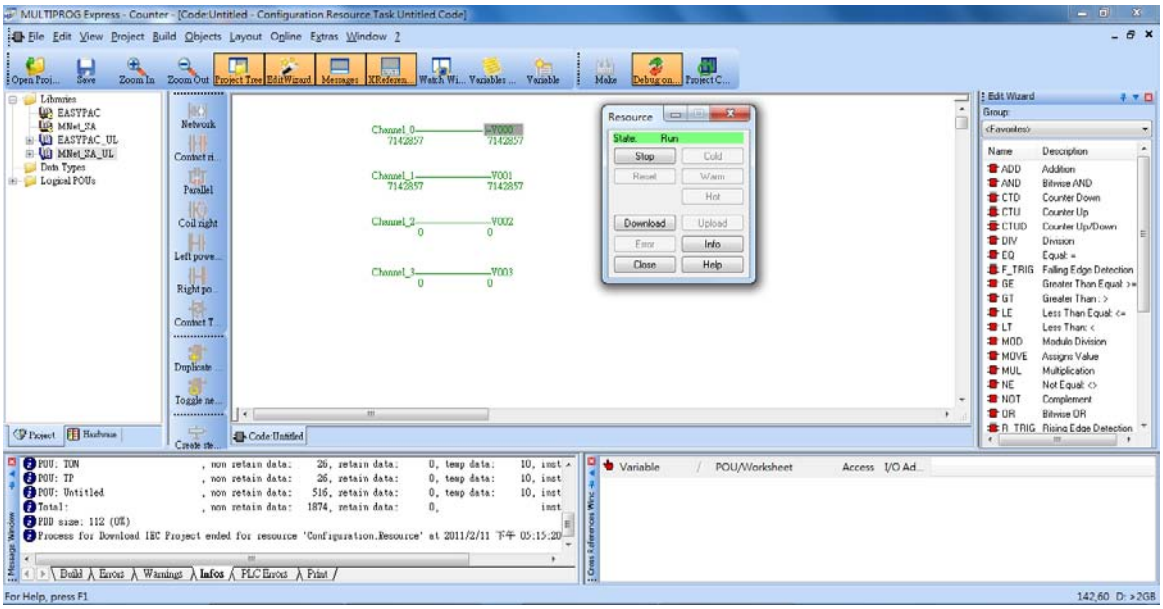


Figure 5-93: download and monitor the program

5.7.3. Single Axis

A single axis sample is illustrated in this section. The wiring method is described below.

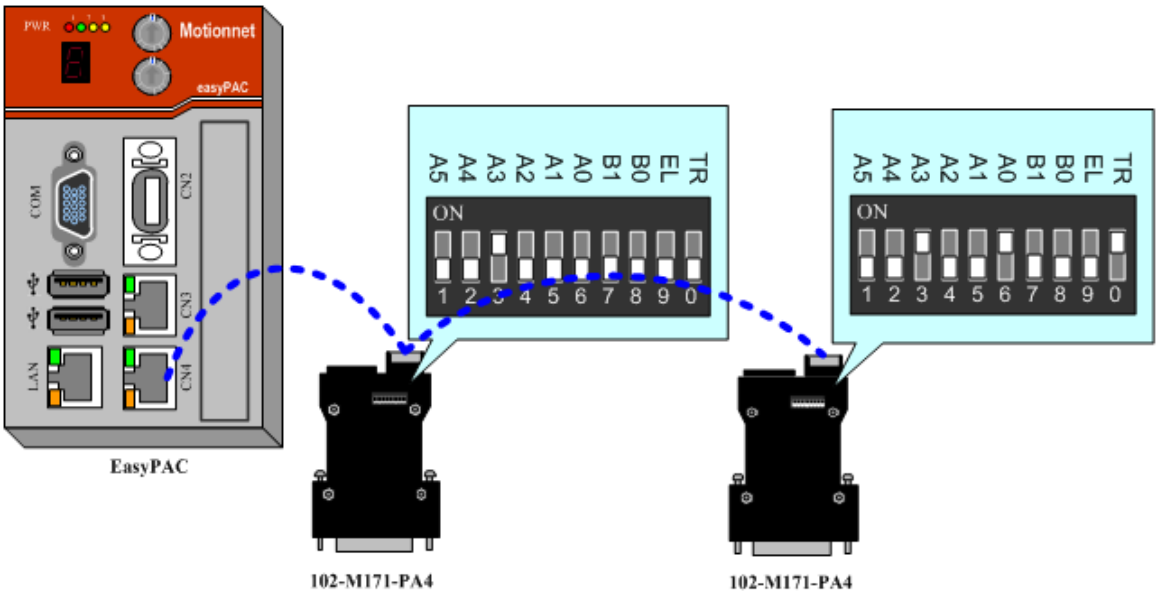


Figure 5-94: hardware configuration

Setup parameters using MyLink

1. Confirm that the module model is correct.

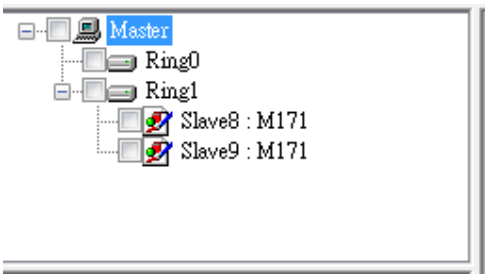


Figure 5-95: modules shown in MyLink

2. Click on the corresponding parameter column and set it correctly as shown below.

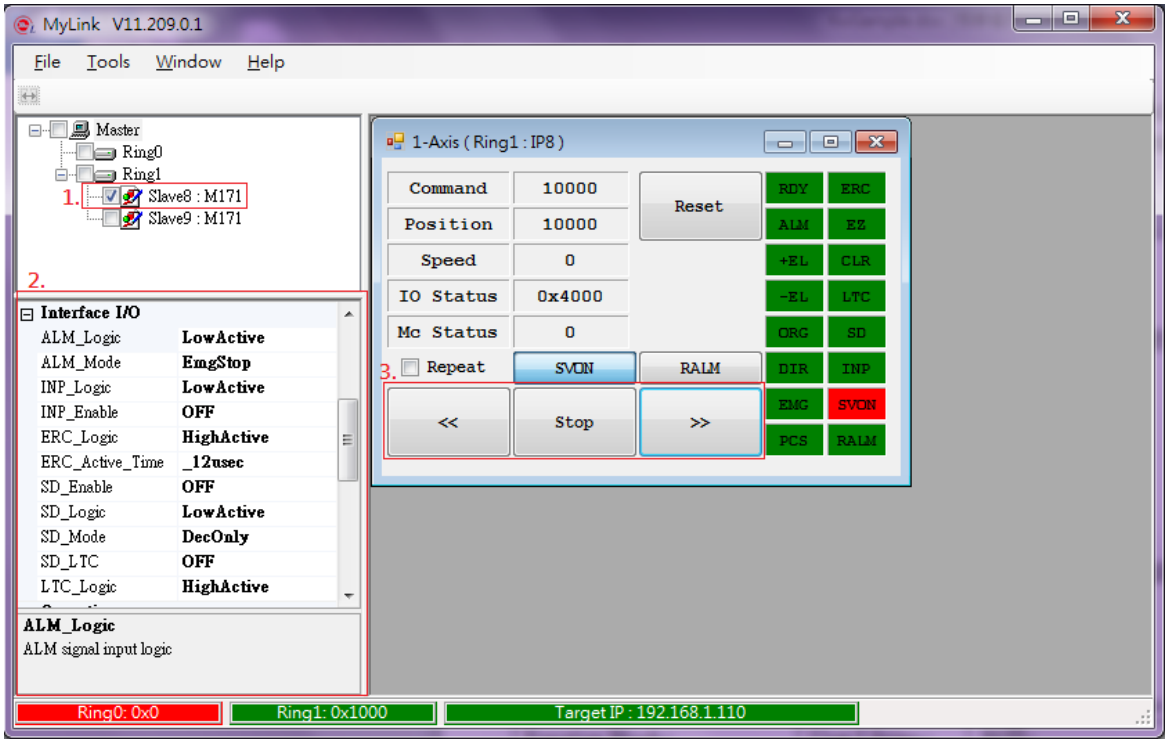


Figure 5-96: configure and test the axis module

3. Save the configuration setting into the EEPROM

Sample program description

Create a new project with TPM template as described in previous section and add the following FB's.

Function Block	User Library	Description
EP_SetCyclicTime	EASYPAC_UL	Set system CyclicTime
MC_Power	MNet_SA_UL	Enable Driver/Motor
SA_WriteDwordParameter	MNet_SA_UL	Set the limit of Max. velocity
MC_ReadStatus	MNet_SA_UL	Read Axis Status
MC_ReadActualPosition	MNet_SA_UL	Read Axis Position
MC_MoveRelative	MNet_SA_UL	Make relative move
MC_Stop	MNet_SA_UL	Stop the axis

Table 5-8: function blocks to be added

Detailed settings are shown below:

	MC_MoveRelative_1	MC_MoveRel...	VAR			
	Run	BOOL	VAR	A switch to issue a relative move command		
	Dist0	DINT	VAR	Distance		100000
	StrVel	DWORD	VAR	Start Velocity		100
	MaxVel	DWORD	VAR	Max Velocity		10000
	TAcc	REAL	VAR	Acc. Time		0.1
	TDec	REAL	VAR	Dec. Time		0.1
	Curve	BYTE	VAR	Vel. Curve (0: T-Curve, 1: S-Curve)		0
	Done1	BOOL	VAR			

Table 5-9: detailed settings of the parameters

Test sample program

Download and click on “Debug on/off” to activate debug mode.

Figure 5-97: activate debug mode by this button

1. Override Exec to TRUE

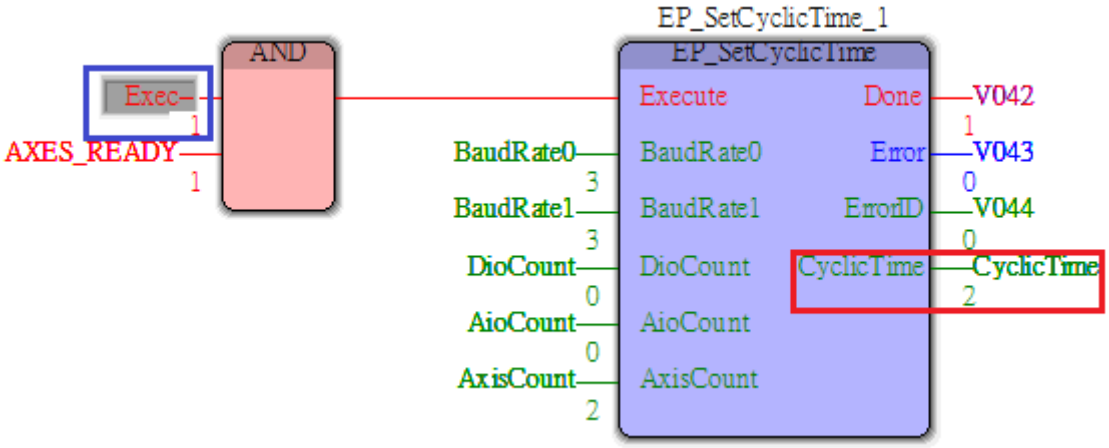


Figure 5-98: override Exec to true

The EP_SetCyclicTime_1 is calculated and set it 2ms in this case.

2. Override Init to TRUE

MC_Power_1 would initialize and enable the driver/motor. SA_WriteDwordParameter_1 will modify the maximum velocity limit as 5000000 pps then make “InitFlag” TRUE.

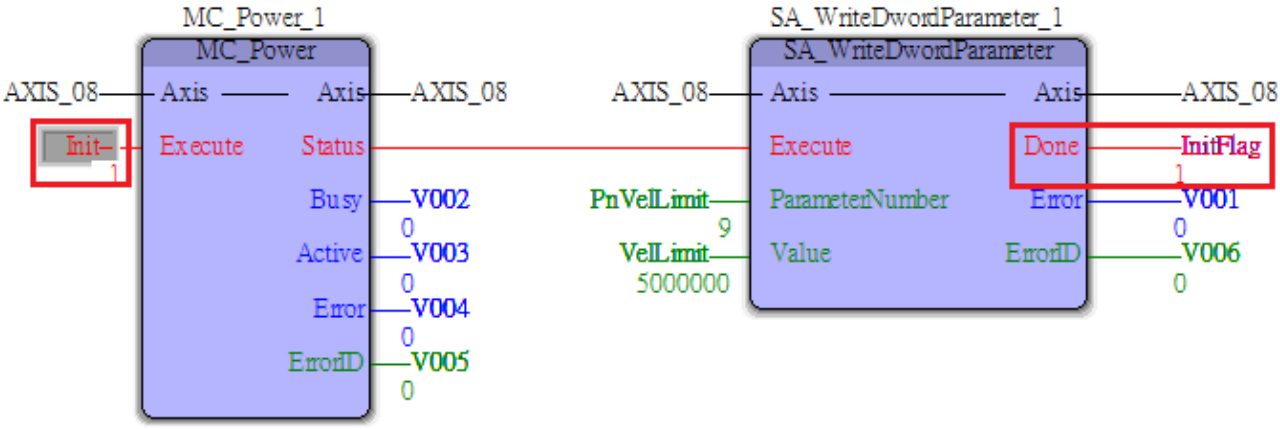


Figure 5-99: function block with debug mode activated

MC_ReadStatus_1 and MC_ReadActualPosition_1 will be executed when “InitFlag” is TRUE and are used to monitor the axis status. The axis is in the StandStill status as shown below.

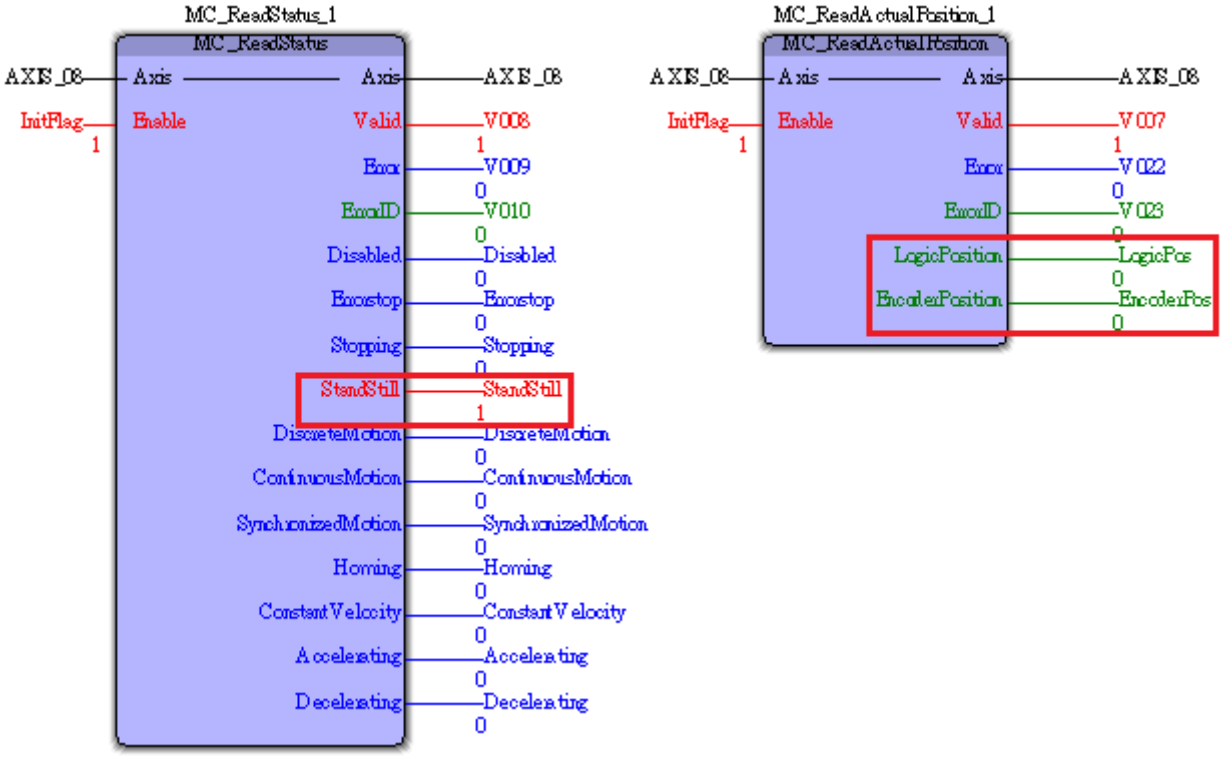


Figure 5-100: StandStill status is true of the Axis

3. Override Run to TRUE

MC_MoveRelative_1 will make the axis move 100000 pulses with velocity 10000pps. The status can be watched though MC_ReadStatus_1 and MC_ReadActualPosition_1.

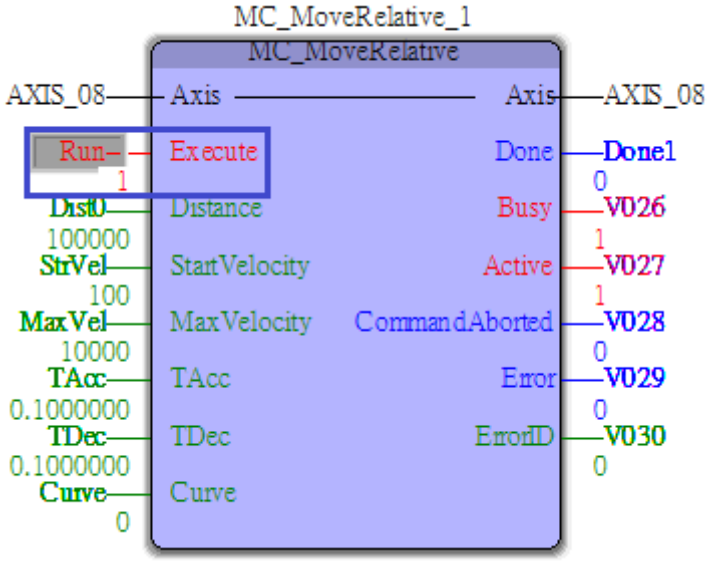


Figure 5-101: axis status with Run signal turned on

4. Override Stop to TRUE

MC_Stop_1 will stop the axis with deceleration. The status can be watched by MC_ReadStatus_1 and MC_ReadActualPosition_1.

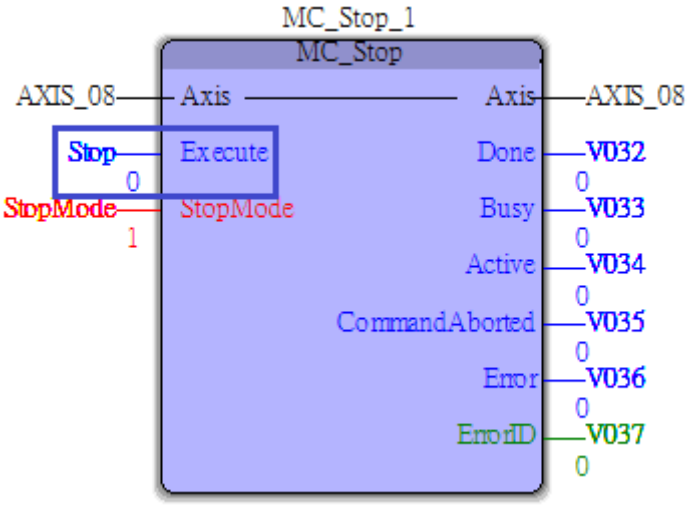


Figure 5-102: axis status with Stop signal turned on

5.7.4. Grouped Axes

Note that the hardware configurations are similar to a single axis in previous section. As other axes, users need to configure parameters using MyLink.

1. Confirm that the module models are correct
2. Click on the corresponding parameter column and set it correctly.
3. Add 2 axes on Ring_1 to Group2

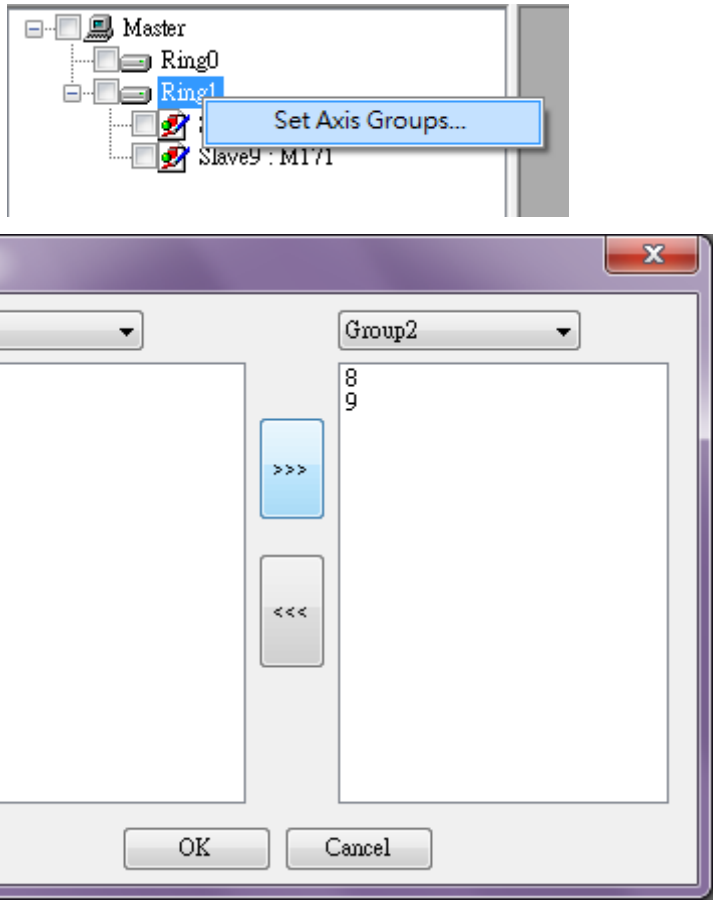


Figure 5-103: group up axes

5. Click on the Group window

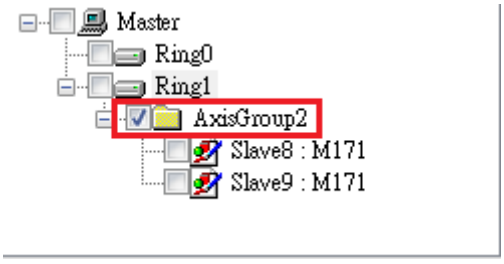


Figure 5-104: select group axes

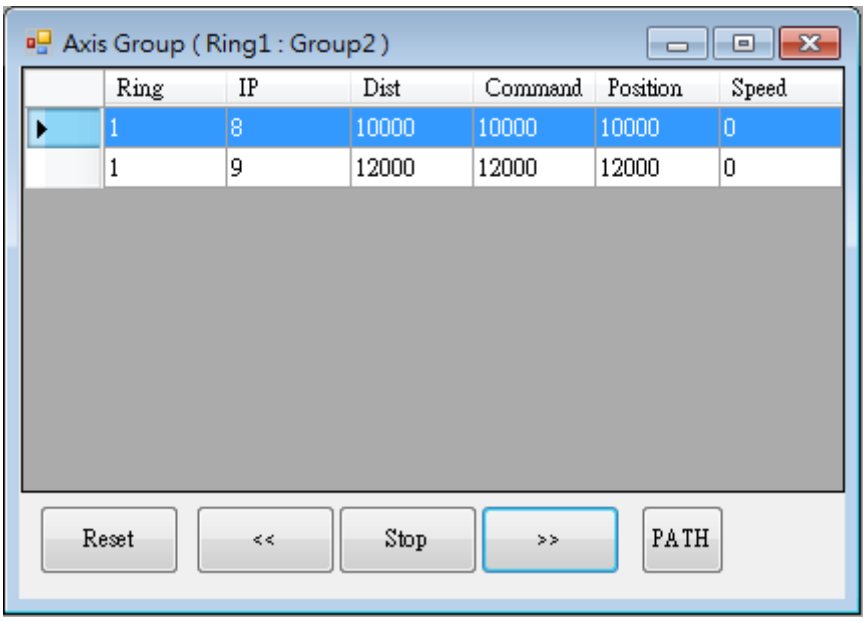


Figure 5-105: setting of group parameters

6. Save the settings to EEPROM
7. Send the path file “rect1.kwpts” to EasyPAC

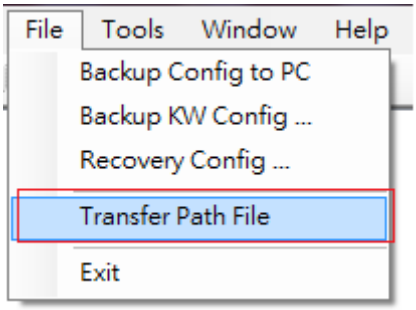


Figure 5-106: import the path file

Sample program description

1. Create a new project with TPM Template as in the previous section.
2. Follow the single axis sample program and add the following Grouped Axes FBs.

Function Block	User Library	Description
GA_GroupEnable	MNet_SA_UL	Enable the group function
GA_MoveLinearRelative	MNet_SA_UL	Make relative linear move
GA_PathSelect	MNet_SA_UL	Select the path file (xxxx.kwpts)
GA_MovePath	MNet_SA_UL	Execute the grouped motion with specified path file

Table 5-10: grouped axes function blocks to be added

Test sample program

Download and click on “Debug on/off” to activate debug mode.

Figure 5-107: activate debug mode by this button

1. Overwrite *Exec* to TRUE

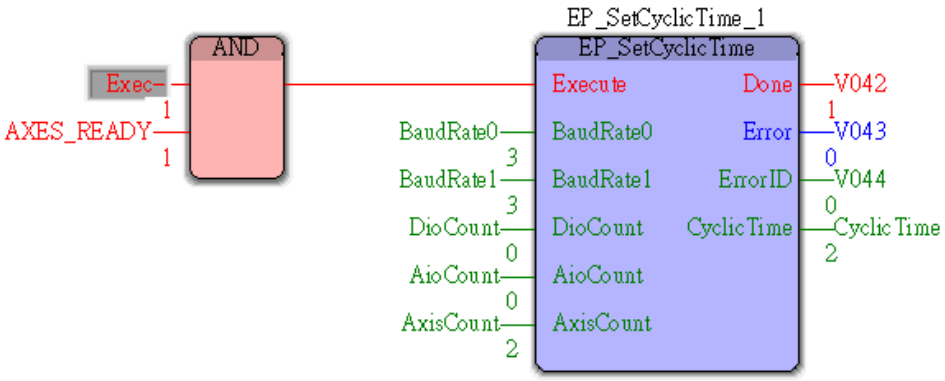


Figure 5-108: overwrite Exec to TRUE

2. Overwrite *InitX* to TRUE

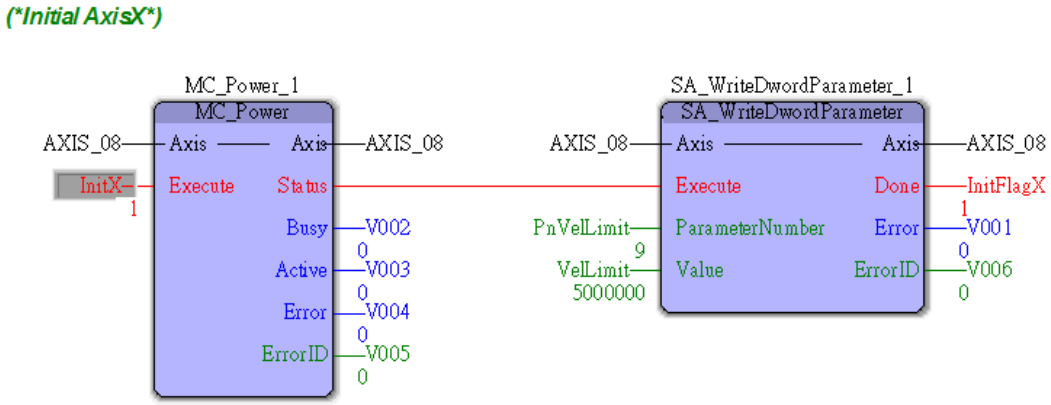


Figure 5-109: overwrite InitX to TRUE

3. Overwrite InitY to TRUE

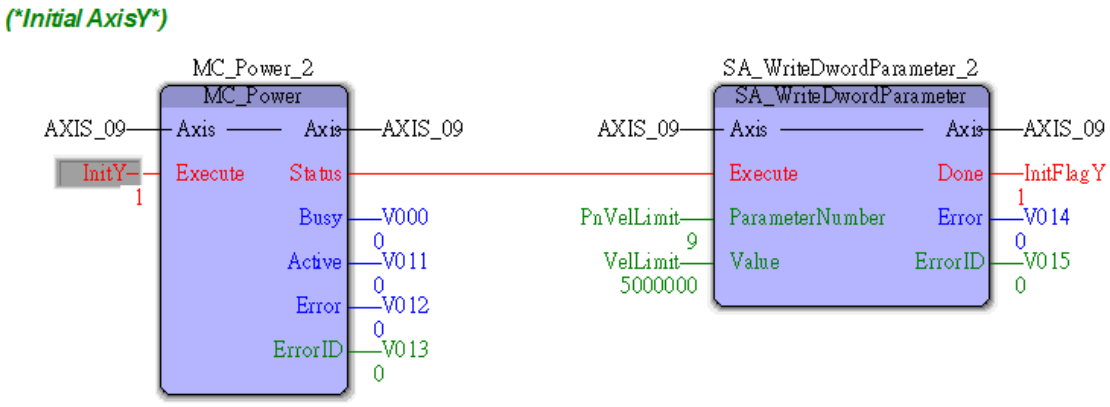


Figure 5-110: overwrite InitY to TRUE

4. The status of the grouped 2 axes can be monitored

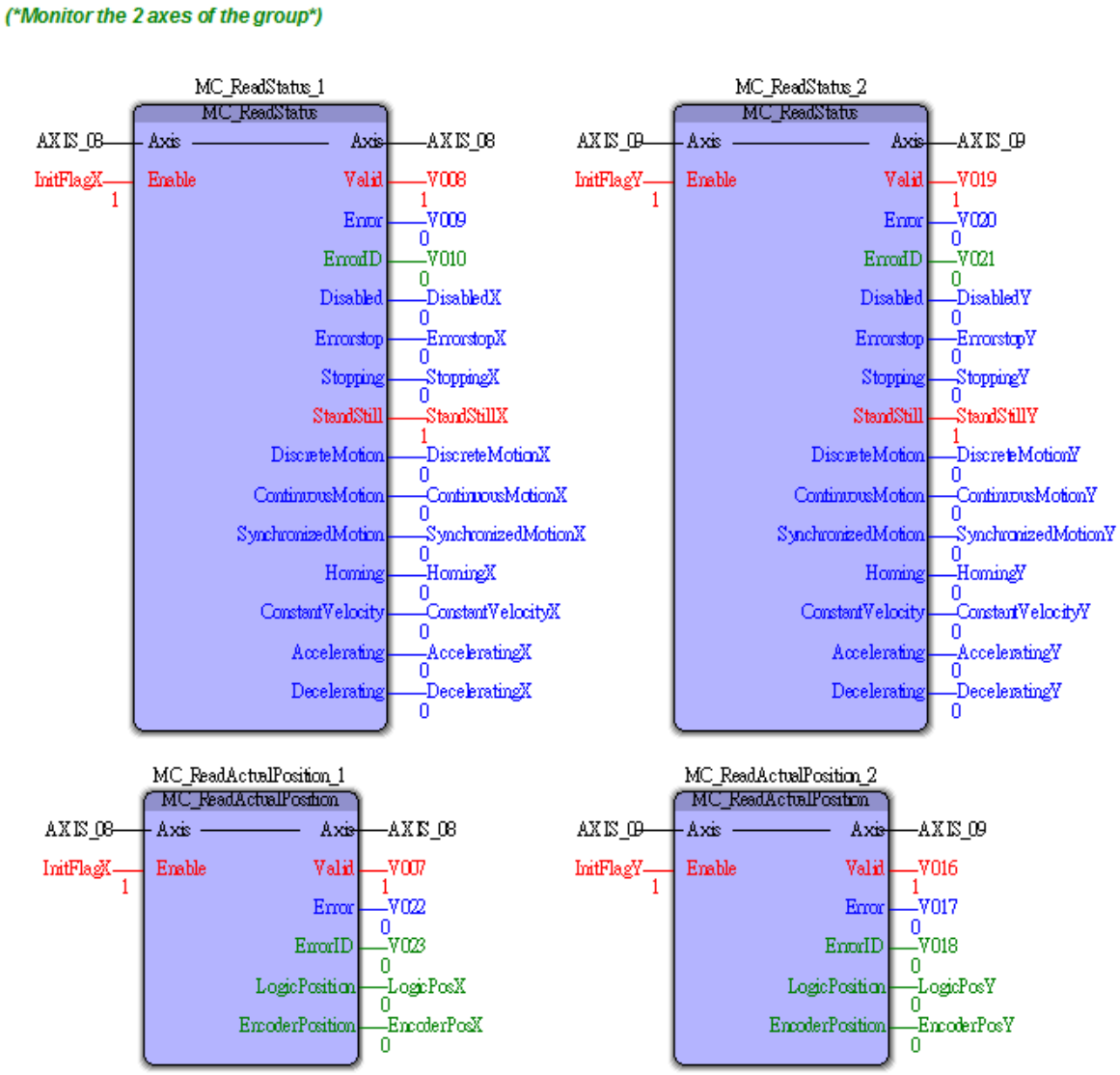


Figure 5-111: function blocks monitoring group axes

5. Overwrite *Group* to TRUE

GA_GroupEnable_1 will enable Group2.

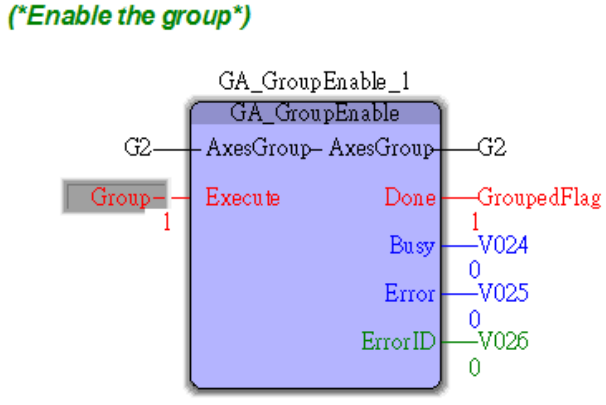


Figure 5-112: enable the group

6. Overwrite *Line2* to TRUE

GA_MoveLinearRelative_1 will make the axes move 100000 pulses in X and 120000 pulses in Y with velocity 10000 pps.

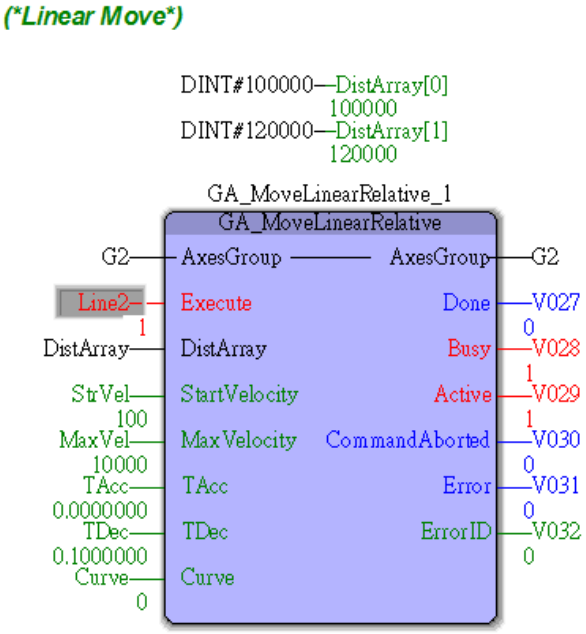


Figure 5-113: linear motion of a group

7. Overwrite *MovePath* to TRUE

GA_PathSelect_1 will read the path file from (rect1.kwpts) and GA_MovePath_1 will execute the grouped linear motion.

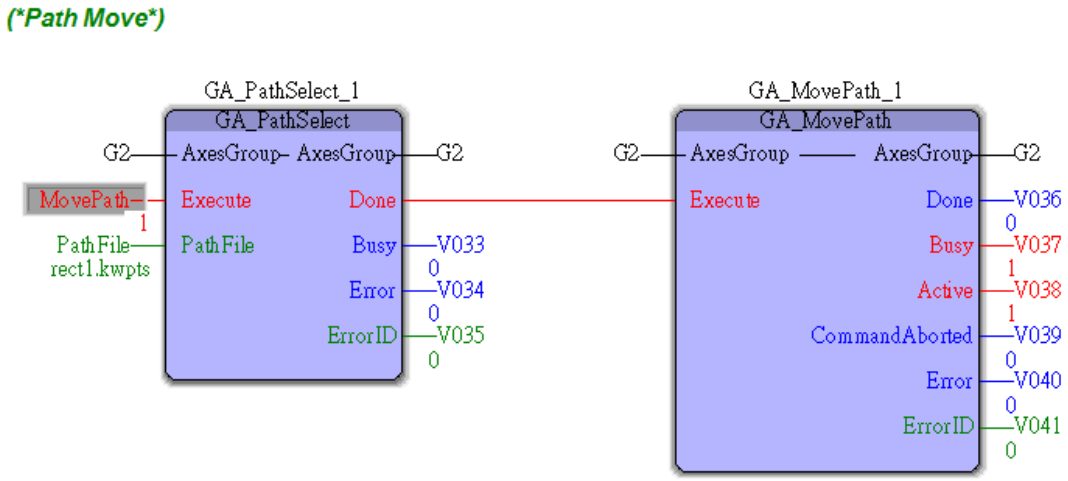


Figure 5-114: linear motion of a group

5.7.5. HMI_DIO

Module wiring

106-D422-NN is used in this case with IP 0. 00 is connected to 20 and 10 is connected to 30 as shown below.

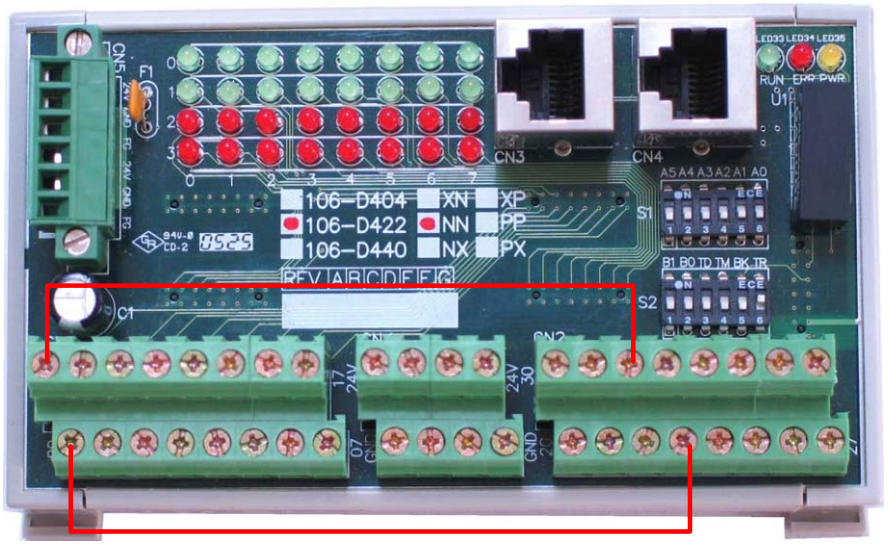


Figure 5-115: wiring of the module

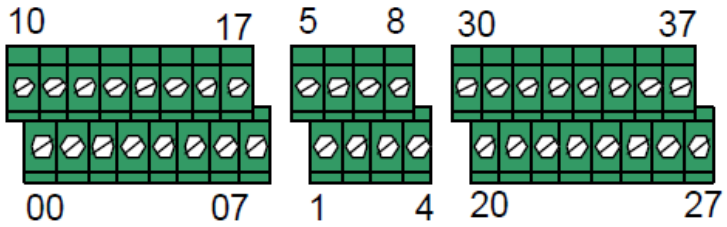


Figure 5-116: terminal definition

DI	DO	DI	DO
00	20	10	30
01	21	11	31
02	22	12	32
03	23	13	33
04	24	14	34
05	25	15	35
06	26	16	36
07	27	17	37

Table 5-11: the wiring table

Test with MyLink

Set SW1 as 2 to activate MyLink server and power-on and use MyLink to check the setting.

Figure 5-117: testing using MyLink

Set with MyConfig

Set SW1 to 1 to activate the MyConfig server on EasyPAC and power on and set the Modbus setting with MyConfig as shown below.

Modbus: TCP, Slave ID: 1, TCP Parameters Port: 502, TimeOut: 3000

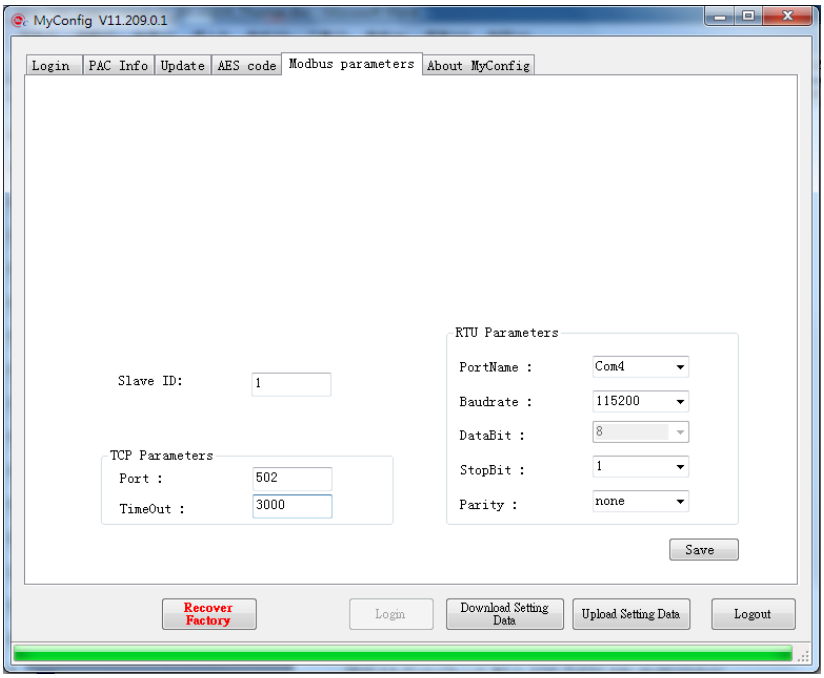


Figure 5-118: parameters setting using MyLink

5.7.5.1 HMI Project

Create a new project HMI

PT104 HMI is used in this case with Modbus TCP protocol. Create a new project in the PM Designer

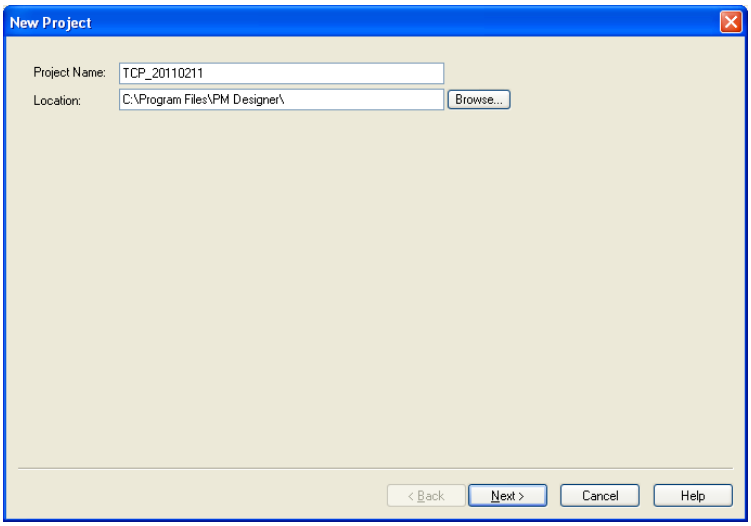


Figure 5-119: create a new project

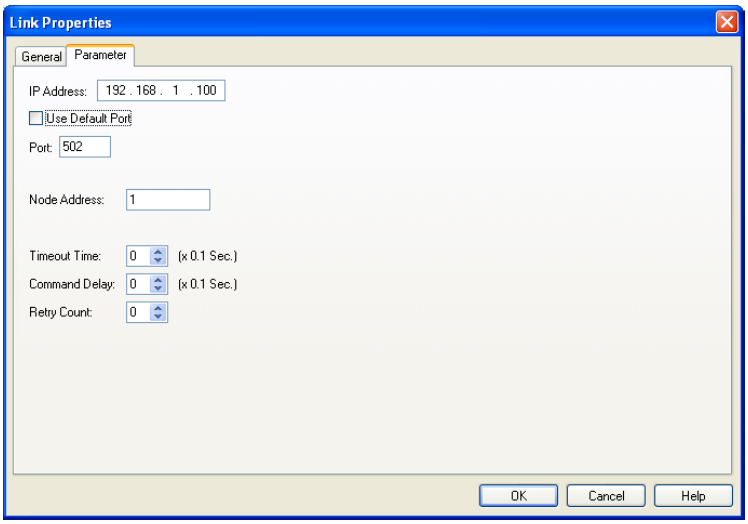


Figure 5-120: input communication parameters next

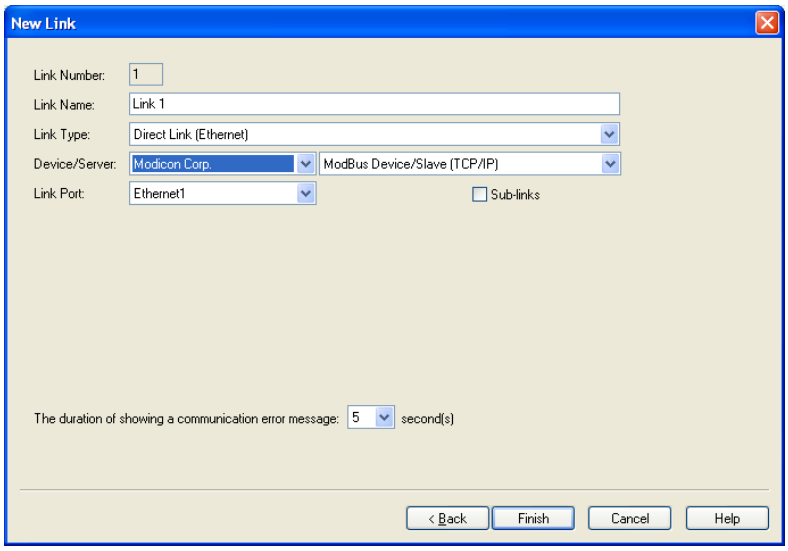


Figure 5-121: input parameters

Add LED object and set the Modbus address

Use MyDataCheck to check and set the corresponding I/O address of 106-D422-NN as shown below.

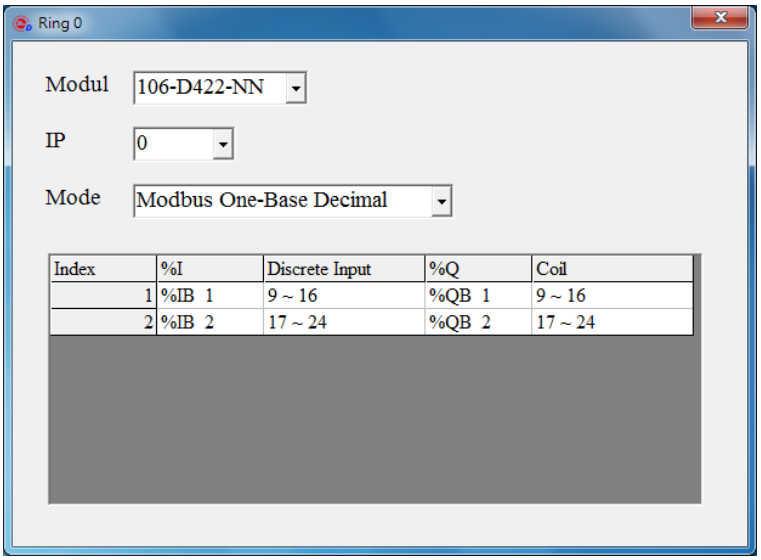


Figure 5-122: configure parameters using MyDataCheck

Add and set a new LED.

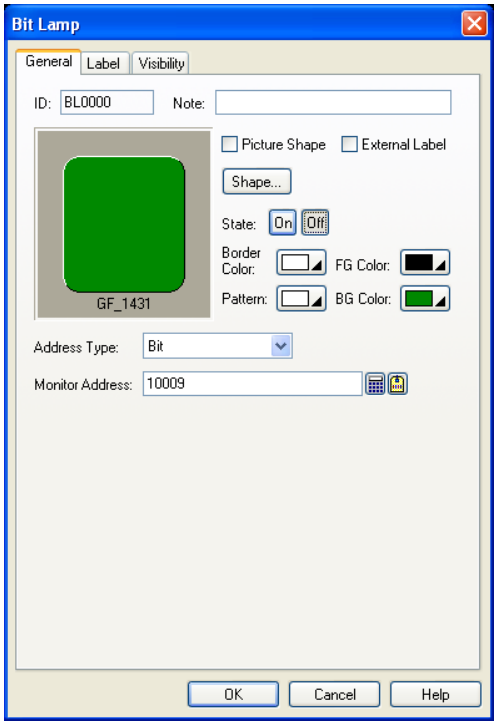


Figure 5-123: add a new led

Duplicate multiple LEDs.

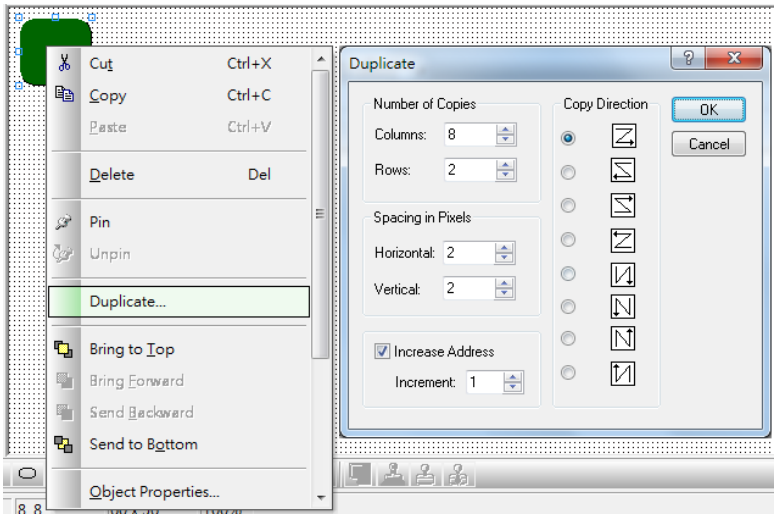


Figure 5-124: duplicate multiple LEDs

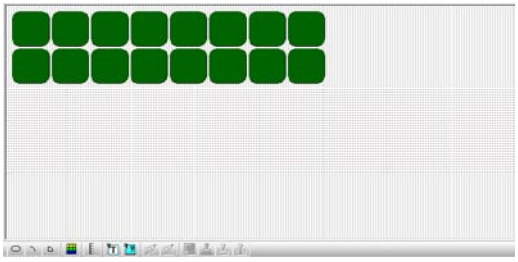


Figure 5-125: multiple LEDs created by MyDataCheck

Add Button objects and set the Modbus address

Check and set the I/O address of 106-D422 with MyDataCheck as shown below.

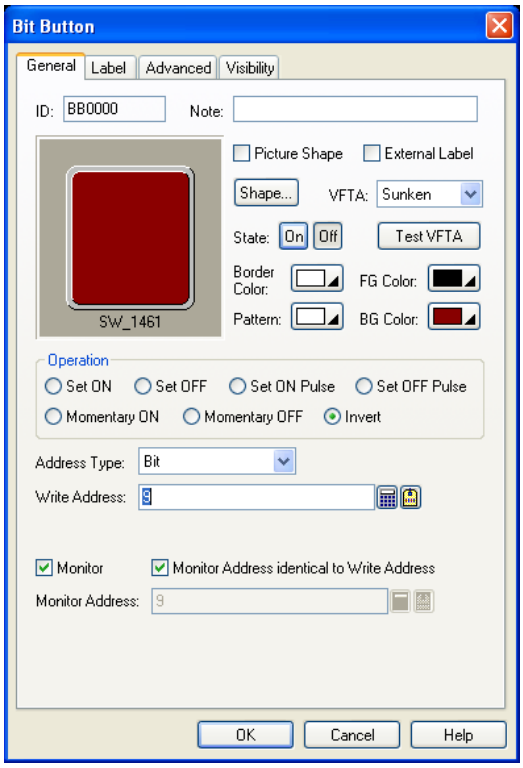


Figure 5-126: making of a button

Duplicate multiple buttons.

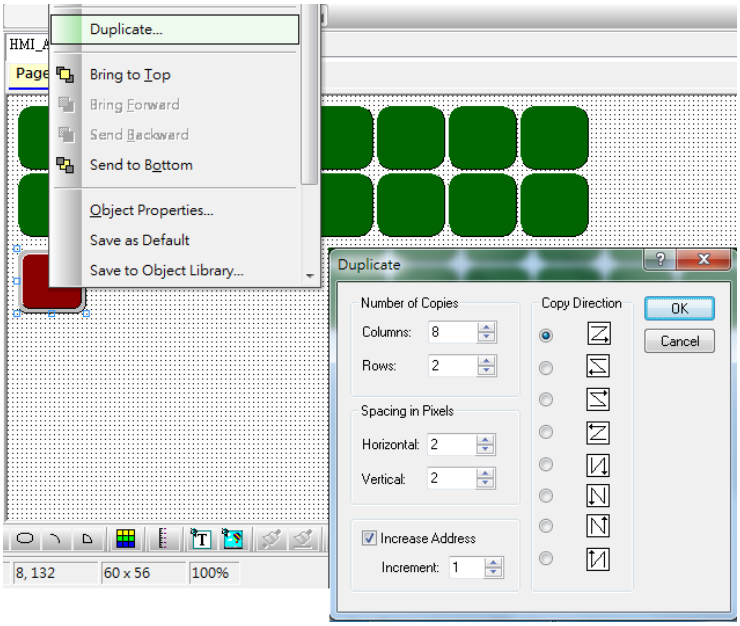


Figure 5-127: duplicate buttons

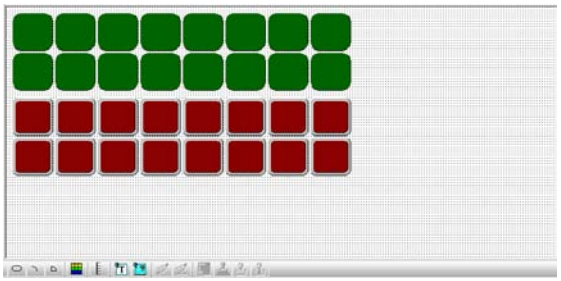


Figure 5-128: multiple buttons created

Download

The following menu will show up after successful download.

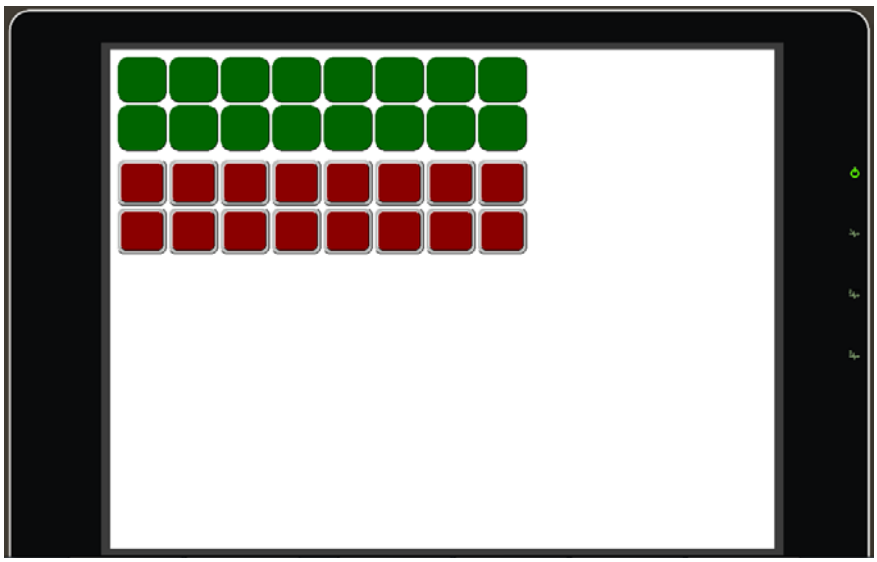


Figure 5-129: downloaded program

5.7.5.2 MULTIPROG Project

Create a new project with TPM template

Start MULTIPROG

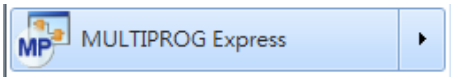


Figure 5-130: start MULTIPROG

Click on File→New Project

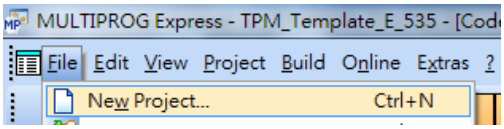


Figure 5-131: create a new project

Use TPM Template

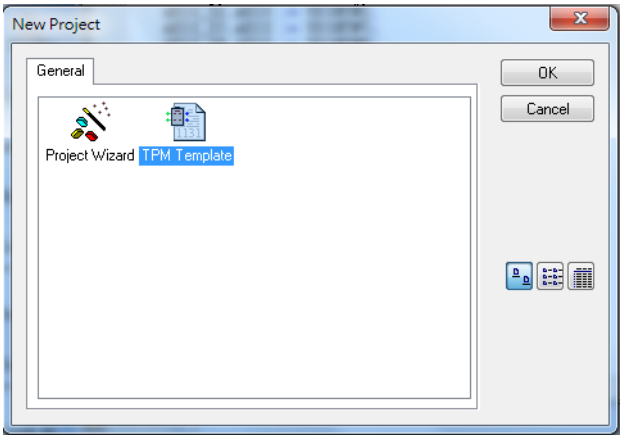


Figure 5-132: new project template

Click on “Untitled”

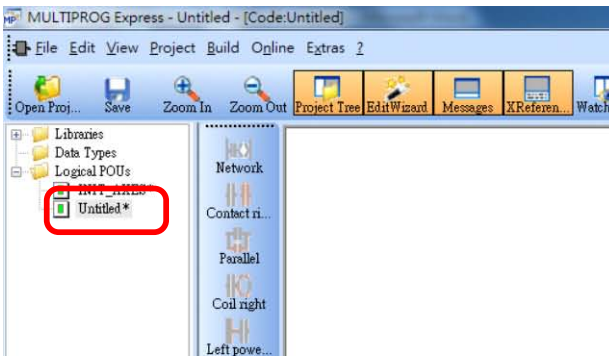


Figure 5-133: click on the Untitled*

Add new variable and set the I/O address

Check and set the I/O address of 106-D422-NN with MyDataCheck as shown below.

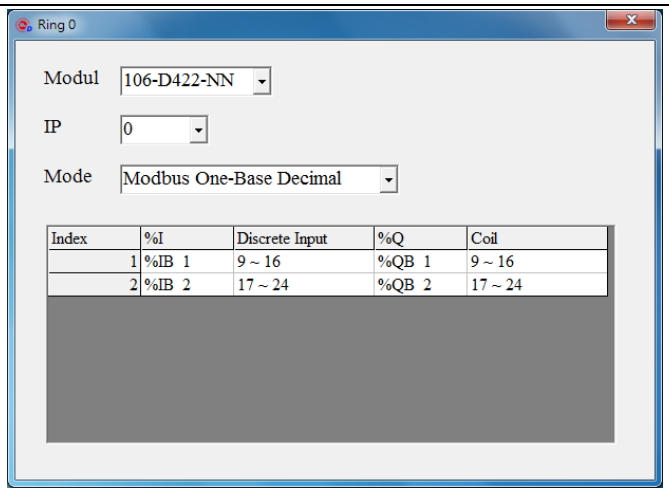


Figure 5-134: add parameters

Add new variables and name them as IN_Port_0 (Byte), IN_Bit_0 (Bool), IN_Bit_1 (Bool), IN_Bit_2 (Bool), IN_Bit_3 (Bool), IN_Bit_4 (Bool), IN_Bit_5 (Bool), IN_Bit_6 (Bool), IN_Bit_7 (Bool), Out_Port_0 (Byte), Out_Bit_0 (Bool), Out_Bit_1 (Bool), Out_Bit_2 (Bool), Out_Bit_3 (Bool), Out_Bit_4 (Bool), Out_Bit_5 (Bool), Out_Bit_6 (Bool) and Out_Bit_7 (Bool) correspondingly as the screenshot below.

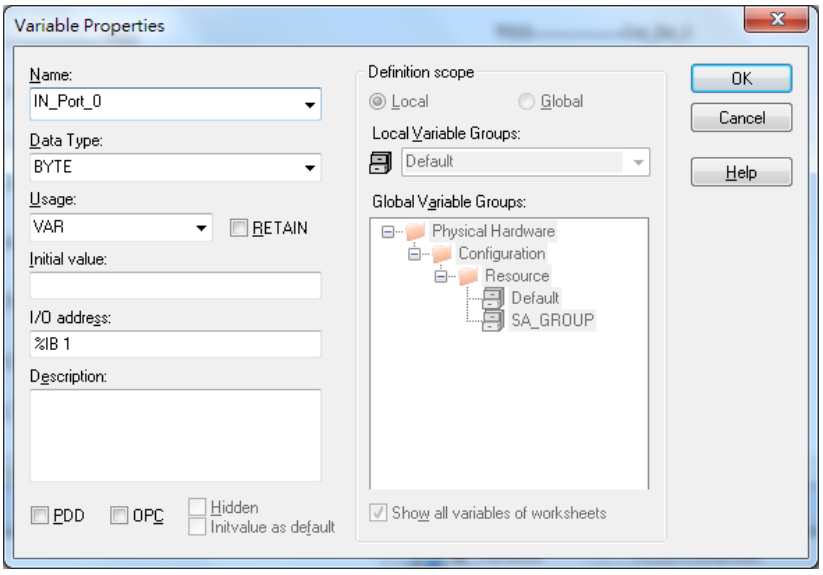


Figure 5-135: insert new parameters

Download and monitor

You can monitor the variable after successful download as shown below.

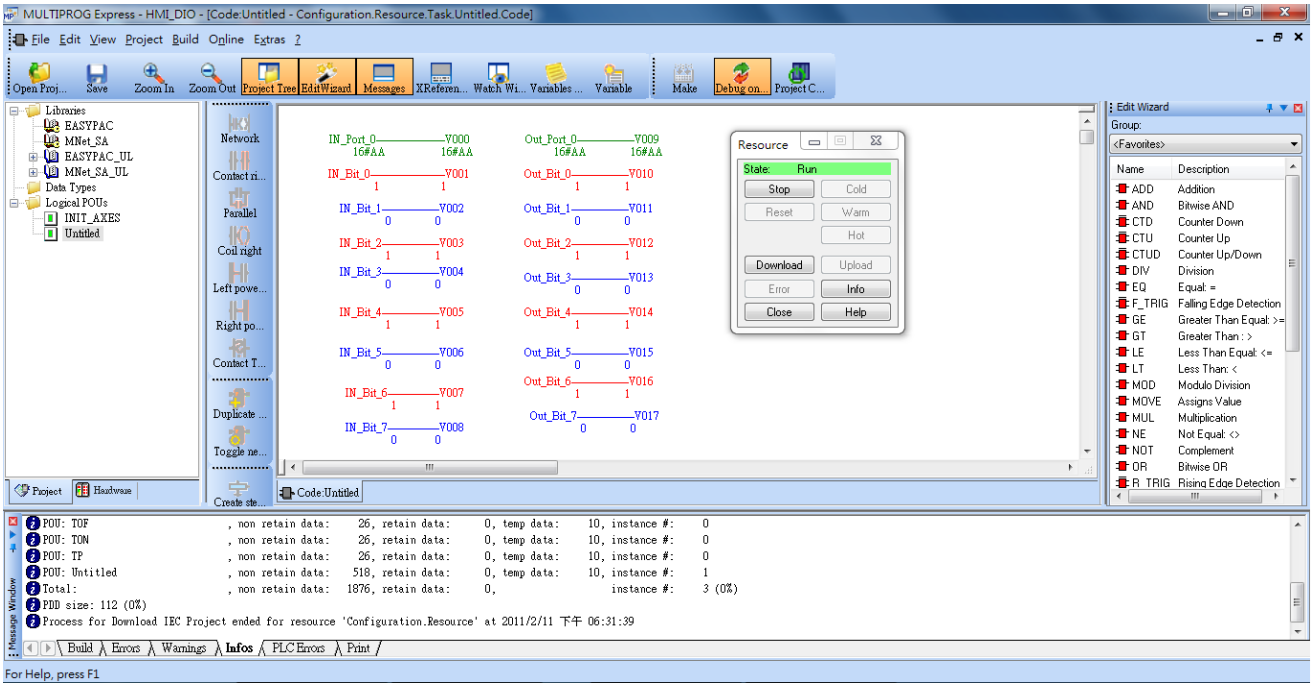


Figure 5-136: download and monitor the program

The HMI menu is shown below.

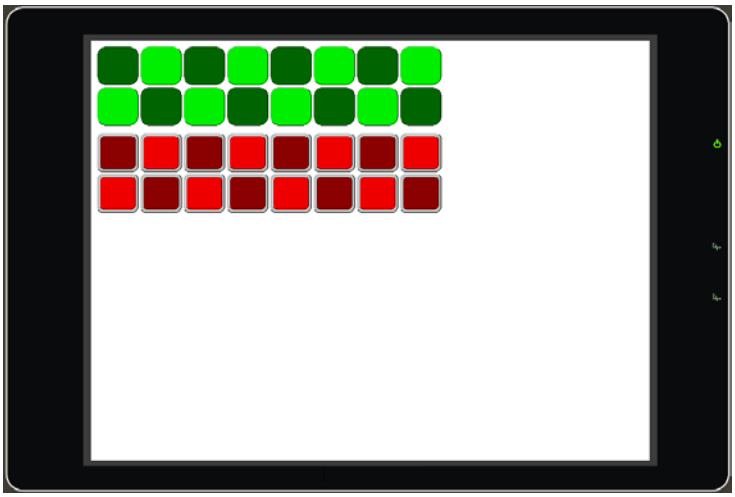


Figure 5-137: the HMI diagram