

## **EX9060-M Quick Start**

- 1. The default setting is MODBUS mode after Power On.**
- 2. Using INIT pin to contact with GND pin then Power On will enter Normal mode.**
- 3. Command: \$00P0 is set Ex9060-M to Normal mode after Repower On. On normal mode, user can set other setting like address, Baudrate, ..... (Please check the Ex9000 user manual).**
- 4. Command: \$AAP1 is set to MODBUS mode after Repower On.**
- 5. Under Normal mode that Command: \$AAP can check which mode it is after Repower On.**

**Response:**

**!AA10=Normal**

**!AA11=MODBUS**

**The Modbus protocol was originally developed for Modicon controllers by Modicon Inc. Detailed information can be found at <http://www.modicon.com/techpubs/toc7.html>. Visit <http://www.modbus.org> to find more valuable information.**

**9000M series modules support the Modbus RTU protocol. The communication Baud Rates range from 1200bps to 115200bps. The parity, data bits and stop bits are fixed as no parity, 8 data bits and 1stop bit. The following Modbus functions are supported.**

## 01(0x01) Read Digital Input/Output Value

### Request

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x01
02~03	Starting channel	2 Bytes	0x0000~0x0003 for DO readback value 0x0020~0x0023 for DI readback value 0x0044~0x0047 for DO Latch high value 0x0064~0x0067 for DO Latch low value 0x0040~0x0043 for DI Latch high value 0x0060~0x0063 for DI Latch low value
04~05	Output channel numbers	2 Bytes	0x0001~0x0004

### Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x01
02	Byte count	1 Byte	1
03	Input/Output channel readback value	1 Byte	0x00~0x0F A bit corresponds to a channel. When the bit is 1 it denotes that the value of the channel that was set is ON. if the bit is 0 it denotes that the value of the channel that was set is OFF.

### Error Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x81
02	Exception code	1 Byte	Refer to the Modbus standard for more details.

## 02(0x02) Read Digital Input Value

### Request

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x02
02~03	Starting channel	2 Bytes	0x0000~0x0003
04~05	Input channel numbers	2 Bytes	0x0001~0x0004

### Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x02
02	Byte count	1 Byte	1
03	Input channel readback value	1 Byte	0x00~0x0F A bit corresponds to a channel. When the bit is 1 it denotes that the value of the channel that was Input response. if the bit is 0 it denotes that the value of the channel that was no Input response .

### Error Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x82
02	Exception code	1 Byte	Refer to the Modbus standard for more details.

### 03(0x03) Read Digital Input Count Value

#### Request

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x03
02~03	Starting channel	2 Bytes	0x0000~0x0003
04~05	Input channel numbers	2 Bytes	0x0001~0x0004

#### Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x03
02	Byte count	1 Byte	1
03~	Input channel count value	N* x 2 Byte	Each channel can record a maximum count value up to 65535(0xFFFF).

N\*=Number of input channels

#### Error Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x83
02	Exception code	1 Byte	Refer to the Modbus standard for more details.

## 04(0x04) Read Digital Input Count Value

### Request

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x04
02~03	Starting channel	2 Bytes	0x0000~0x0003
04~05	Input channel numbers	2 Bytes	0x0001~0x0004

### Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x04
02	Byte count	1 Byte	1
03~	Input channel count value	N* x 2 Byte	Each channel can record a maximum count value up to 65535(0xFFFF).

N\*=Number of input channels

### Error Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x84
02	Exception code	1 Byte	Refer to the Modbus standard for more details.

## 05(0x05) Write Digital Output/Clear DI count Value (Single channel)

### Request

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x05
02~03	Output channel number	2 Bytes	0x0000~0x0003 0x0100 to clear the latch value 0x0101~0x0104 or 0x2000~0x2003 to clear the DI count value
04~05	Output value	2 Bytes	A value of 0xFF00 sets the output to ON. A value of 0x0000 set it to OFF. All other values are illegal and won't affect the coil.

### Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x05
02~03	Output channel numbers	2 Bytes	The value is the same as byte 02 and 03 of the Request
04~05	Output value	2 Bytes	The value is the same as byte 04 and 05 of the Request

### Error Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x85
02	Exception code	1 Byte	Refer to the Modbus standard for more details.

## 15(0x0F) Write Digital Output/Clear DI count Value (Multi channel)

### Request

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x0F
02~03	Starting channel	2 Bytes	0x0000~0x0003 for DO output 0x0101~0x0104 or 0x2000~0x2003 to clear the DI count value
04~05	Output channel numbers	2 Bytes	0x0001~0x0010
06	Byte count	1 Byte	1
07	Output value	1 Byte	0x00~0xFF A bit corresponds to a channel. When the bit is 1 it denotes that the value of the channel that was set is ON. if the bit is 0 it denotes that the value of the channel that was set is OFF.

### Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x0F
02~03	Starting channel	2 Bytes	The value is the same as byte 02 and 03 of the Request
04~05	Output channel numbers	2 Bytes	The value is the same as byte 04 and 05 of the Request

### Error Response

00	Address	1 Byte	1-247
01	Function code	1 Byte	0x8F
02	Exception code	1 Byte	Refer to the Modbus standard for more details.

## Address Mapping

9000-M DIO function			
Address	Channel	Content	Attribute
00001~00032	0~31	Digital Output	Read/Write
00033~00048	0~31	Digital Input	Read
30001~30032	0~31	Digital Input counter	Read
08193~08224	0~31	Clear Digital Input counter value (0xFF00)-clear	Write