# EX9043-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 Ex9043-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.orq 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 Output Value

**Request**

| | | | |
|---|---|---|---|
| 00 | Address | 1 Byte | 1-247 |
| 01 | Function code | 1 Byte | 0x01 |
| 02~03 | Starting channel | 2 Bytes | 0x0000~0x000F for DO readback value<br>0x0040~0x004F for DO Latch high value<br>0x0060~0x006F for DO Latch Low value |
| 04~05 | Output channel numbers | 2 Bytes | 0x0001~0x0010 |

**Response**

| | | | |
|---|---|---|---|
| 00 | Address | 1 Byte | 1-247 |
| 01 | Function code | 1 Byte | 0x01 |
| 02 | Byte count | 1 Byte | 2 |
| 03~04 | Output channel readback value | 2 Byte | 0x0000~0xFFFF<br>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. |

## 05(0x05) Digital Output Value (Single channel)

**Request**

| | | | |
|---|---|---|---|
| 00 | Address | 1 Byte | 1-247 |
| 01 | Function code | 1 Byte | 0x05 |
| 02~03 | Output channel numbers | 2 Bytes | 0x0000~0x000F<br>0x0100 to clear the DO latch 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 Value (Multi channel)

**Request**

| | | | |
|---|---|---|---|
| 00 | Address | 1 Byte | 1-247 |
| 01 | Function code | 1 Byte | 0x0F |
| 02~03 | Starting channel | 2 Bytes | 0x0000~0x000F |
| 04~05 | Output channel numbers | 2 Bytes | 0x0001~0x0010 |
| 06 | Byte count | 1 Byte | 2 |
| 07~08 | Output value | 2 Bytes | 0x0000~0xFFFF<br>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 |