|  |  |  |  |
| --- | --- | --- | --- |
| **MERLINO elettronica**  **Controller**  **Manual**  **Edition 7.2014** | Index | [Contents](#Contents) |  |
| [Overview](#ProductOverview1) | | 1 |
| [Communication](#Communication2) | | 2 |
| [MERLINO Editor](#YottaEditorOverview3) | | 3 |
| [MERLINO Utility](#YottaUtilityOverview4) | | 4 |
|  | |  |
|  | |  |
|  | |  |

**Contents**

**[1.Product Overview..…………………………………………………………….4](#ProductOverview1)**

**[1.1](#InitialParameter11)****[Initial parameter..………………………………………………………………………….4](#InitialParameter11)**

**[1.2](#ControllerDescription12)****[Controller Description…………………………………………………………………..4](#ControllerDescription12)**

**[2.](#Communication2)****[Communication…………………………………………………………………5](#Communication2)**

**[2.1](#ControllerCommunicatesWithThePC21)****[Controller communicates with the PC..………………………………………….5](#ControllerCommunicatesWithThePC21)**

**[2.2](#A1seriesRemoteIOmoduleCommunicatesWithPC)****[PC-1 series Remote IO module communicates with the PC.…………..7](#A1seriesRemoteIOmoduleCommunicatesWithPC)**

[**3.** **MERLINO Editor overview….……….……..……………………………11**](#YottaEditorOverview3)

**[3.1 Main screen………………………………………………………………………………..11](#YottaEditorMainscreen31)**

**[3.2 Properties-General ……………………..………….…………………………………11](#YottaEditorPropertiesGeneral32)**

**[3.3 Properties-Parameter………………………….……………………………………..12](#YottaEditorPropertiesParameter33)**

**[3.4 Properties-Protect ……………………..……….…………………………………….13](#YottaEditorPropertiesProtect34)**

**[3.5 Properties-COM …………………..…………….………………………………………14](#YottaEditorPropertiesCOM35)**

**[3.6 Properties-Startup Bmp ………………………….…....…………………………..15](#YottaEditorPropertiesStartup36)**

[**3.7 Properties-Hardware ………………….…….……………………………………….15**](#YottaEditorPropertiesHardware37)

**[3.8 Communication Configuration…………………………….……………………..16](#YottaEditorCommunicationConfiguration38)**

**[3.9 PC->Device ……………………………………………………………….……………….16](#YottaEditorPCToDevice39)**

**[3.10 Device->PC………………………………………….…………………………………….16](#YottaEditorDeviceToPC310)**

[**3.11 RTC………………………………………..………………………………………………….17**](#YottaEditorRTC311)

**[3.12](#YottaEditorSummerTime312)****[Summer Time and Winter Time.………………………………………………..17](#YottaEditorSummerTime312)**

**[3.13](#YottaEditorClearUserProgram313)****[Clear User Program and Password…………………………………………....18](#YottaEditorClearUserProgram313)**

[**3.14** **Simulation…….………………………………………………………………….……….19**](#YottaEditorSimulation314)

**[3.15](#YottaEditorControllerAndIOSetting315)****[Controller and IO module’s IO setting………………………………………..20](#YottaEditorControllerAndIOSetting315)**

**[3.16](#YottaEditorRemoteIOModuleSetting316)****[Remote IO Module’s IO setting………………………………………………….21](#YottaEditorRemoteIOModuleSetting316)**

**[3.17](#YottaEditorMessageText317)****[Message Text..…………………………………………………………………….…….23](#YottaEditorMessageText317)**

**[3.18](#YottaEditorControllerDisplay318)****[Controller display and PCTP (text panel) menu structure…………..24](#YottaEditorControllerDisplay318)**

**[3.19](#YottaEditorControllerApplicationWiri319)****[Controller application wiring….………………………………………………….25](#YottaEditorControllerApplicationWiri319)**

**[3.20](#YottaEditorControllerPOWER320)****[Controller POWER/RUN LED indicator….……………………………………25](#YottaEditorControllerPOWER320)**

**[3.21](#YottaEditorControllerMemoryCard321)****[Controller memory card.……………………………………………………………26](#YottaEditorControllerMemoryCard321)**

[**3.22 Address Mapping………………………………………………………………………27**](#YottaEditorAddressMapping)

**[3.23](#YottaEditorExampleApplications323)****[Example applications………………………………………………………………..36](#YottaEditorExampleApplications323)**

**[3.23.1](#DualCounter3231)****[Dual counter…………….……………………………………………………………………………….36](#DualCounter3231)**

**[3.23.2](#SchooleBellSystem3232)****[School bell system……………….……………………………………………………………………36](#SchooleBellSystem3232)**

[**3.23.3 Redundant ……………………………….……………………………………………………………..37**](#Redundant3233)

**[4.](#YottaUtilityOverview4)****[MERLINO Utility Overview……….…………….………….……………38](#YottaUtilityOverview4)**

**[4.1 Main screen……………………………………………………………………………….38](#YottaUtilityMainscreen41)**

**[4.2 The controller communicates with the PC…..………………………………38](#YottaUtilityTheControllerCommunicates42)**

**[4.2.1 Initial mode..………………………………………………………………………………………………39](#YottaUtilityInitialMode421)**

[4.2.1.1 General setting.………..…………………………………………………………………………………39](#YottaUtilityGeneralSetting4211)

[4.2.1.2 Real Time Clock…..………………………………………………………………………………………40](#YottaUtilityRealTimeClock4212)

[4.2.1.3 More information….……………………………………………………………………………………40](#YottaUtilityMoreInformation4213)

[4.2.2 Normal mode…………………………………………………………………..……………………………40](#YottaUtilityNormalMode422)

[4.3 More Information………………………………………………………….………………………………..41](#YottaUtilityMoreInformation43)

**[4.3.1 Controller Information………………………………………………………………………………..41](#YottaUtilityControllerInformation431)**

[**4.3.2 System Info……………..………………………………………………………………………………….41**](#YottaUtilitySystemInfo432)

**[4.3.3 Tag Configuration ……………………………………………………………………………………….42](#YottaUtilityTagConfiguration433)**

[4.3.3.1 Category …………………………………………………………………………………………………….43](#YottaUtilityCategory4331)

[4.3.3.2 Tag ………….………………………………………………………………………………………………….44](#YottaUtilityTag4332)

**[4.3.4 Digital ………..………………………………………………………………………………………………45](#YottaUtilityDigital434)**

**[4.3.5 Analog ……………………………………………………………………………………………………….45](#YottaUtilityAnalog435)**

**[4.3.6 By Category ………..……………………………………………………………………………………..45](#YottaUtilityByCategory436)**

[**4.3.7 Function Block ……………..……………………………………………………………………………46**](#YottaUtilityFunctionBlock437)

**[4.4 Database ………….………………………………………………….……………………48](#YottaUtilityDatabase44)**

[**4.5 Historical Trends ………………………………………………….…………………….50**](#YottaUtilityHistoricalTrends45)

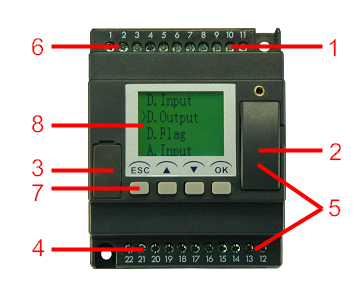
**[4.6 Realtime Trends ……………..………………………………….……………………..52](#YottaUtilityRealtimeTrends46)**

**1. Product Overview**

**1.1 Initial parameter**

MERLINO ME-1188/1189、ME-2188/2189、ME-5188/5189、ME-6188/6189 series Controller and ME-1 series Remote IO modules’ initial setting parameter are as below: MODBUS RTU, ID Address:01, Baud Rate:9600, Parity: None, Data Bit:8, Stop Bit:1。

**1.2 Controller Description**

****

|  |  |
| --- | --- |
| **Item** | **Description** |
| 1 | Inputs |
| 2 | Memory Card Slot |
| 3 | Indicator, Red: initial mode, Green: normal (run) mode, Spark: no program in controller PC-2188/2189 & PC-6188/6189: switch |
| 4 | Inputs |
| 5 | Communication Port (USB Port) |
| 6 | Incoming Power |
| 7 | Buttons |
| 8 | LCD display |
| 9 | Outputs |

**2. Communication**

When you got MERLINO ME-1188/1189、ME-2188/2189、ME-5188/5189、ME-6188/6189 series Controllers or ME-1 series Remote IO Modules, can via MERLINO Utility to realize device parameter.

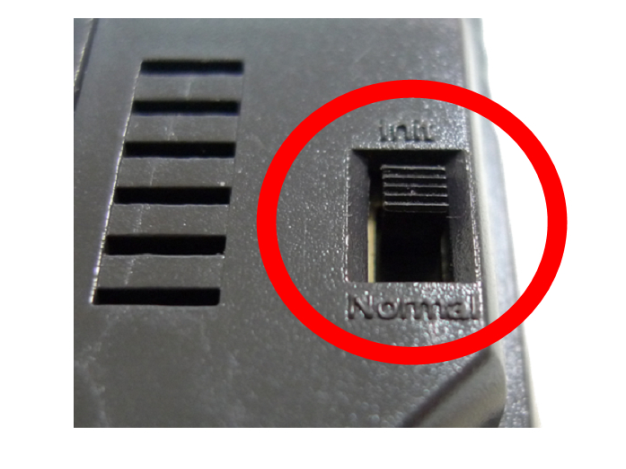
**2.1 Controller communicates with the PC**

PC series Controller can connect via cables to communicate with PC’s RS-232 port or USB port, or can via Converter to communicate with a PC.

1. Prepare Controller and Converter or DSCAB connect cable

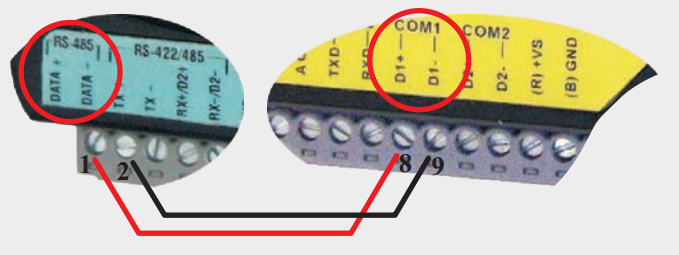


1. Turn the Controller’s switch to ‘Init’ status



1. Link Controller to Converter via twisted pair cable





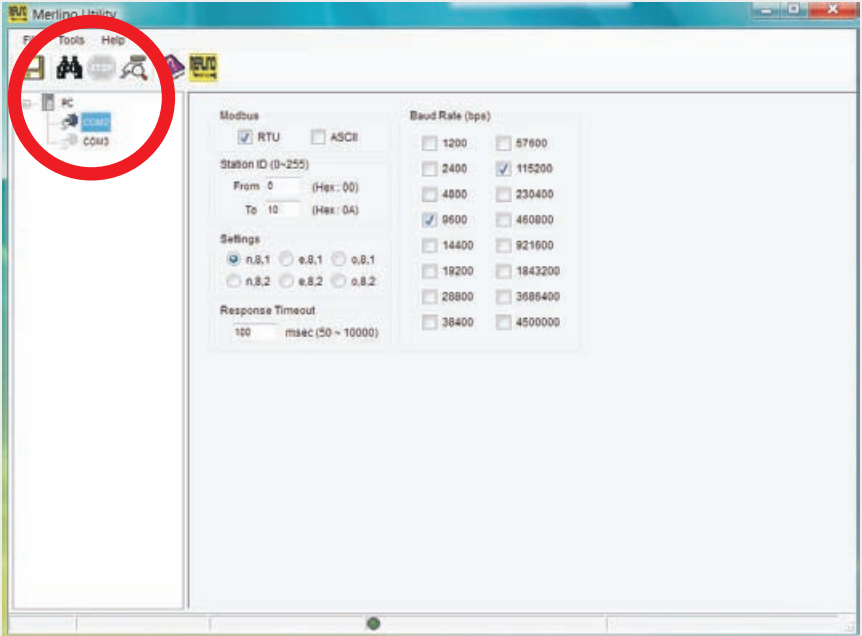
1. Or linked DSCAB connect cable



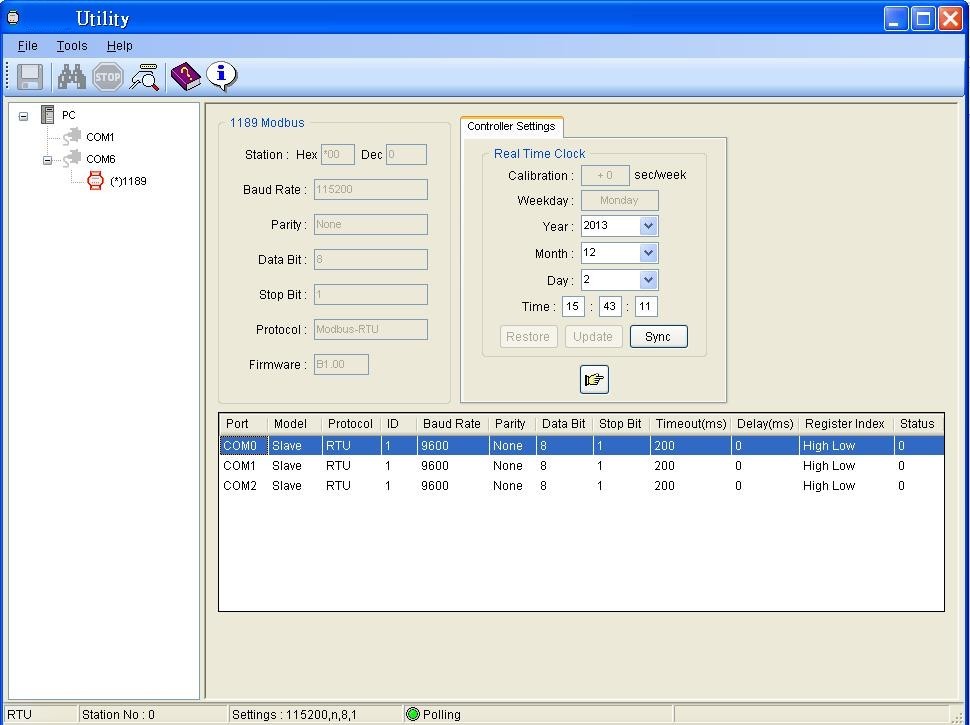
1. Turn on the Controller’s power



1. Open MERLINO Utility and click **Refresh COM ports** to check PC’s COM ports, then choose Controller’s COM port. And click **Search for modules** to search Controller

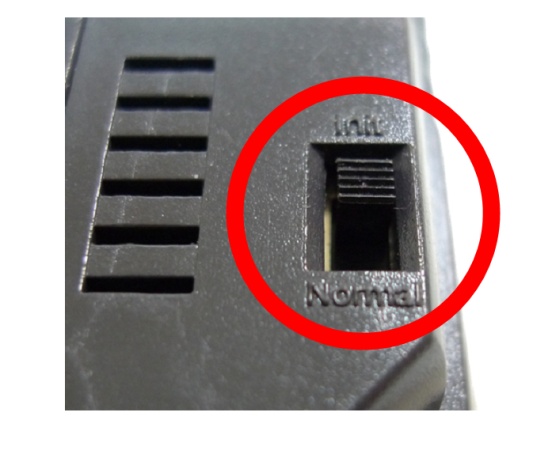


1. When correct to search Controller, MERLINO Utility will show below figure. We can detect the Controller’s all COM ports’ parameters.

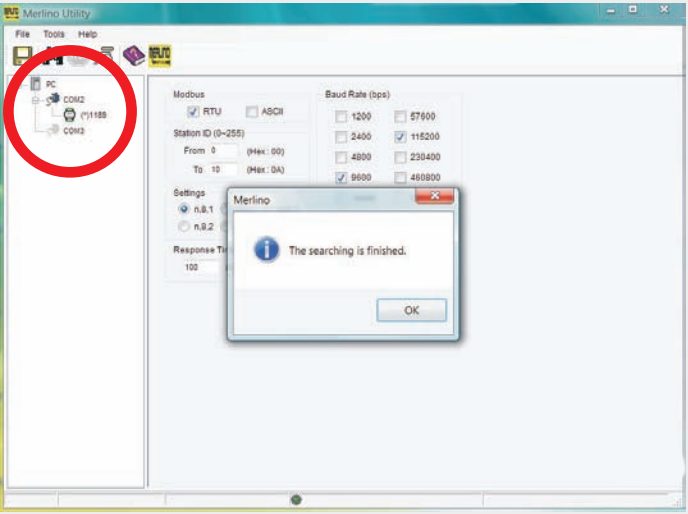


**2.2 PC series Remote IO module communicates with the PC**

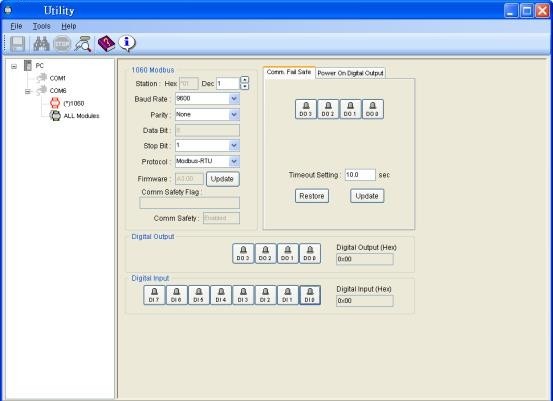
1. PC series Remote IO module build-in MODBUS RS-485 port, can via Converter to connect to PC. (Device DATA+ connect to Converter DATA+, device DATA- connect to Converter DATA-)
2. Turn the Remote IO Module’s switch to ‘Init’ status.



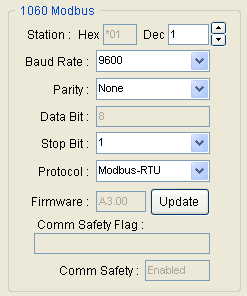
1. Power on the Remote IO Module
2. Open MERLINO Utility and click **Refresh COM ports** to refresh PC COM port, and choose Remote IO Module’s COM port. Then click **Search for modules** to search device.



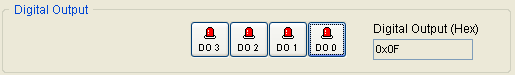
1. When correct to search Controller, MERLINO Utility will show below figure. We can detect the Remote IO Module’s parameters.



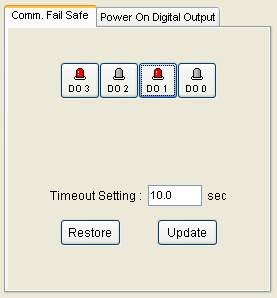
1. We can set the communication parameter as below figure. For example, **DEC** (ID Address) range is 1-255. When finish the parameter setting, can press **Update** to save the setting.

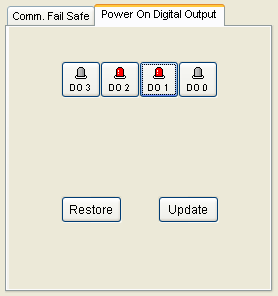


1. Or can click **Digital Output** to test device hardware’s LED indicator.



1. Remote IO Module via MODBUS RS-485 to communicate to other devices (PLC, HMI, Data Logger, etc.). To communicate fail warning, we can set related notify in Comm. Fail Safe. When finish it, press **Update** to save. Or can click **Restore** to restore device’s current data.



1. When turn on the Remote IO Module’s power, can set the power on output indicator via **Power On Digital Output**. When finish it, press Update to save. Or can click Restore to restore device’s current data.
2. When complete above setting steps, turn the Remote IO Module’s switch to ‘Normal’ status and re-turn on the power can finish the setting.

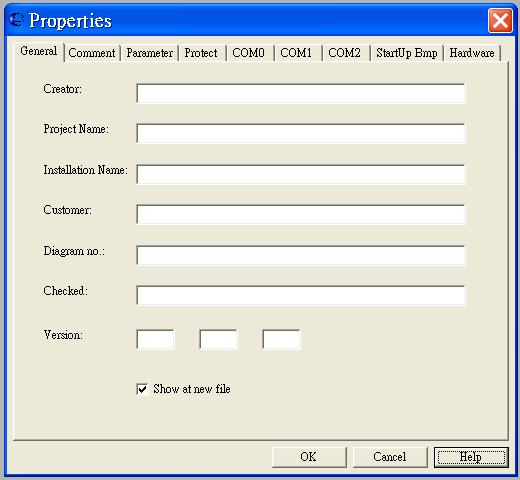


**3. MERLINO Editor overview**

**3.1 Main screen**

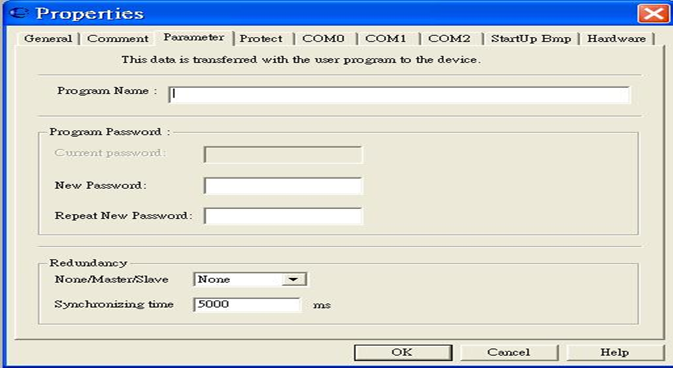
|  |  |  |
| --- | --- | --- |
| Item | Description |  |
| 1 | Menu bar |
| 2 | Standard toolbar |
| 3 | Programming interface |
| 4 | Information window |
| 5 | Status bar |
| 6 | Constants and connectors  Basic functions  Special functions |

* 1. **Properties-General**



In this tab, you can enter detailed information of a circuit program

* 1. **Properties-Parameter**



**Program Name**

A program name with up to 16 characters can be entered in the circuit program.

**Program Password**

A program password with up to 8 alphabetical characters can be assigned to protect the circuit program on the controller. Enter 2 identical passwords in the New Password and Repeat New Password text boxes separately to assign a new password for your circuit program. You can delete the assigned password by leaving New Password and Repeat New Password text boxes empty.

You can open or edit the circuit program from MERLINOEditor at any time no matter if the program is password-protected or not. For password-protected circuit programs, you have to enter the password to view or modify the program on the controller, or to load the circuit program from controller to MERLINOEditor.

**Redundancy**

The controller provides redundancy to help you build a robust system. In case the server is going down there is a backup server that can take over the job.

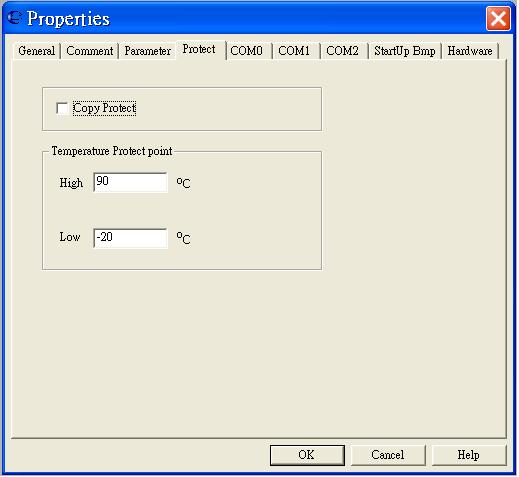
There are 3 types for you to choose.

**None**: Redundancy is not available for this type.

**Master**: Connected controller is the main controller of the whole system. It communicates with Slave continuously.

**Slave**: Connected controller becomes Master automatically, if it doesn't receive signals from the Master over a period of time which is defined in the Synchronizing time text box in milliseconds.

* 1. **Properties-Protect**



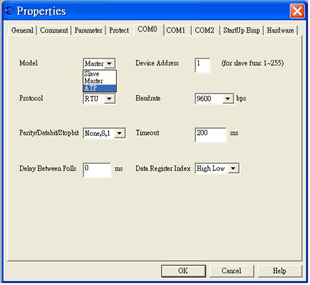
**Copy Protect**

When select this function, can protect program illegal download without the correct password.

**Temperature Protect point**

Set the temperature range. If work temperature surpasses the range, memory will record.

* 1. **Properties-COM**



You can set the following parameters.

Model: Master, Slave, ATP (A series text panel)

Device address: From 1 to 255 (for slave only)

Protocol: Modbus-RTU, Modbus-ASCII

Baud rate: 1200, 2400, 4800, 9600, 14.4K, 19.2K, 28.8K, 38.4K, 57.6K, 115.2K, 230.4K (bps)

Parity/Data bit/ Stop bit: None, 8, 1/None, 8, 2/Odd, 8, 1/Odd, 8, 2/Even, 8, 1/Even , 8, 2

Timeout: In millisecond

Delay between polls: In millisecond

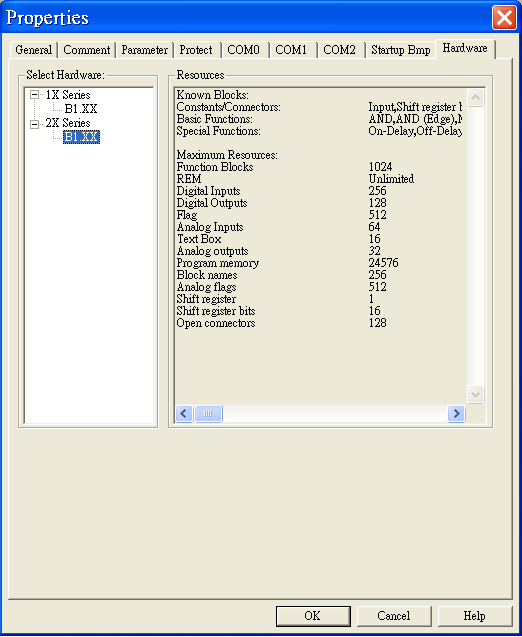
Data register index: High Low, Low High

* 1. **Properties-Startup Bmp**



You can place any image into the controller in \*.bmp format (108\*64).

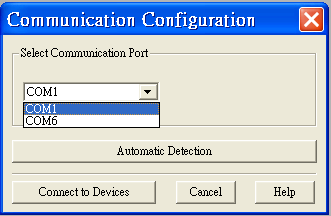
* 1. **Properties-Hardware**



The device selection dialogue shows you which blocks and memory resources are available to you. **Please choose correct Controller type in this dialogue.**

* 1. **Communication Configuration**

Choose a COM port from the list, if you know exactly which one connects to the controller. If you are not sure which COM port connects to the controller, you can let MERLINOEditor automatically detect the COM port.



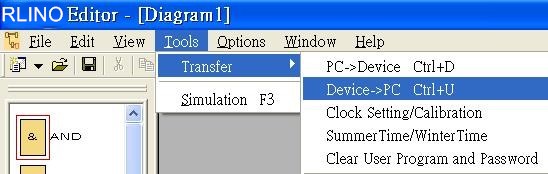
* 1. **PC->Device**

When complete the program, operate **Tools -> Transfer -> PC->Device** to download program into the controller. Or press Ctrl+D



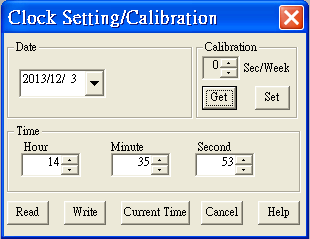
* 1. **Device->PC**

If you would like upload controller program to controller, operate **Tools -> Transfer -> Device->PC**. Or press Ctrl+U

****

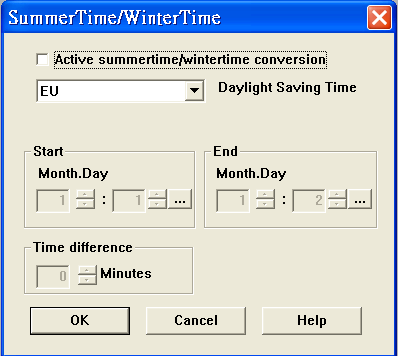
* 1. **RTC**

This command can be used to read and set the date and time of connected controller, operate **Tools -> Transfer -> Clock Setting/Calibration**



|  |  |
| --- | --- |
| Calibration (Sec/week) | **Get** : Read controller calibration value |
| **Set** : Save calibration value into the controller |
| Clock Setting | **Read** : Read controller RTC date and time |
| **Write** : Save RTC date and time into controller |
| **Current Time** : Read PC’s current time and date |

* 1. **Summer Time and Winter Time**

This menu command lets you set an automatic conversion of the summer and winter time for the controller’s clock.

When you enable summer/winter time conversion, you can specify a country-specific time conversion:

\*EU: European Union

\*UK: United Kingdom of Great Britain and Northern Ireland

\*US: United States of America

\*Australia

\*Tasmania

\*New Zealand

\*Freely adjustable: customized switchover dates and times

For the "Freely adjustable" selection, you specify the month and the day of the switchover. The start time of summertime is 02:00 + the entered time difference; the end time is 03:00 – the entered time difference.

Note: The United States of America redefined the daylight saving time (summer time) / standard time (winter time) switchover dates in 2007. Controller, however, uses the switchover dates as they were prior to 2007. To use the new U.S. switchover times, you must configure a “Freely adjustable” setting that corresponds to the new rule where Daylight Saving Time is in effect from 2:00 a.m. On the second Sunday in March until 2:00 a.m. On the first Sunday in November according to the local time zone.

* 1. **Clear User Program and Password**

In [**3.3 Properties-Parameter**](#YottaEditorPropertiesParameter33)mention about password protection. If you would like to clear the program and password can use this function. **Tools -> Transfer -> Clear User Program and Password**



* 1. **Simulation**

Click on the **Tools -> Simulation**, or press F3 or click

**Simulation Toolbar**

The simulation toolbar, which is shown as follows, is active when the program is in simulation mode. Use this tool to perform the simulation

**Simulation Control Icons**

|  |  |
| --- | --- |
|  | Simulate a power failure |
|  | Start the simulation |
|  | Stop simulation |
|  | Suspend simulation. The Circuit program switches into suspend mode. Resume simulation |

**Time Control**

For a time-sensitive circuit program, you can use the time control to observe the processes of the circuit program. This is a simple but effective way to predict the result of the program operation.

|  |  |
| --- | --- |
|  | Start/stop the simulation in stepping mode. It's available in suspend mode. |
|  | Set a specific period of time or set a specific number of cycles. Depends on the below control. |
|  | Choose one of the four modes: cycle, second, minute and hour. |
|  | Current time |
|  | Modify the current time |

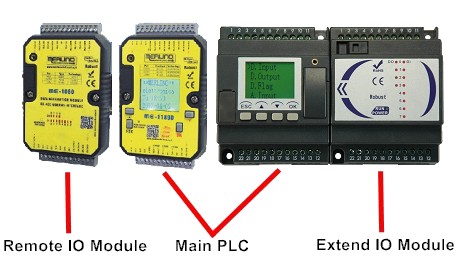
**Status Display**

The value of the signal and corresponding connecting line is as follows:

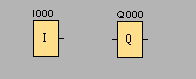
|  |  |  |
| --- | --- | --- |
| The value of signal | The colour of corresponding connecting line |  |
| 1 | Red |
| 0 | Blue |

* 1. **Controller and IO module’s IO setting**

PC-1188/1189、PC-2188/2189、PC-5188/5189、PC-6188/6189 series controller offer plenty extend IO modules selection.



In MERLINO Editor, we can choose Input or Output to set Main controller or Extend IO module. ME-2188/2189、ME-6188/6189 series controller can connect 7 units Extend IO modules.

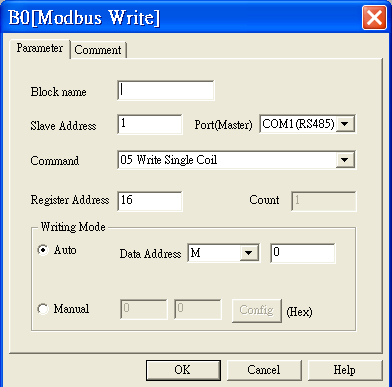
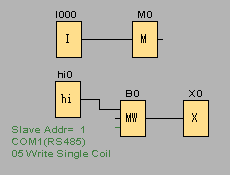


|  |  |  |
| --- | --- | --- |
| **Module** | **Input Number** | Output Number |
| Main (controller) | I000 ~ I015 | Q000 ~ Q007 |
| Ext.1 IO (Extend) | I100 ~ I115 | Q100 ~ Q107 |
| Ext.2 IO (Extend) | I200 ~ I215 | Q200 ~ Q207 |
| Ext.3 IO (Extend) | I300 ~ I315 | Q300 ~ Q307 |
| Ext.4 IO (Extend) | I400 ~ I415 | Q400 ~ Q407 |
| Ext.5 IO (Extend) | I500 ~ I515 | Q500 ~ Q507 |
| Ext.6 IO (Extend) | I600 ~ I615 | Q600 ~ Q607 |
| Ext.7 IO (Extend) | I700 ~ I715 | Q700 ~ Q707 |

* 1. **Remote IO Module’s IO setting**

PC series Remote IO Module via MODBUS to communicate with controller, related IO setting is as below:

1. Controller to control Remote IO Module’s output

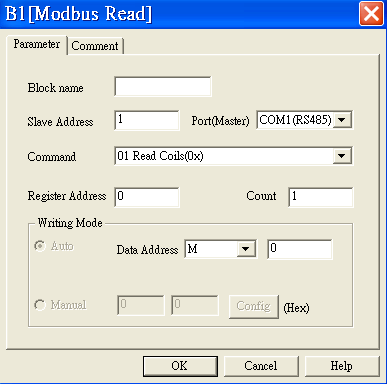
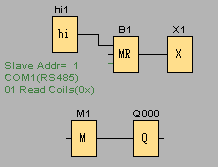


1. For example, controller to control PC-1060’s output (8DI,4DO)
2. Controller I0 input data will store to M0 Flag block
3. Hi0 block will enable B0 Modbus Write block (MW)
4. B0 block will control PC-1060’s output, related parameter setting as below:
5. Slave Address: 1, All of MERLINO products’ initial ID Address is 1. Controller’s RS-485 port can connect to 255 units MODBUS devices. If you would like to connect more than 2 units devices at the same port, please set the different ID address for each device.
6. Port: COM1, set which com port would like to connect to other MODBUS device.
7. Command: 05 Write Single Coil, choose single or multiple coil/register.
8. Register Address: 16, fill in Remote IO Module’s output address. (Note, A series Remote IO Module output address starts from 16)
9. Count: 1, fill in quantity of output control. If Command chooses Single, the value will disable.
10. Data Address: M0, controller I0 data will store on M0 block, and transfer data to B0 block to control Remote IO Module’s output.

Note: For program rule, B0 block must connect a block, so place X0

Open connector behind B0 count block.

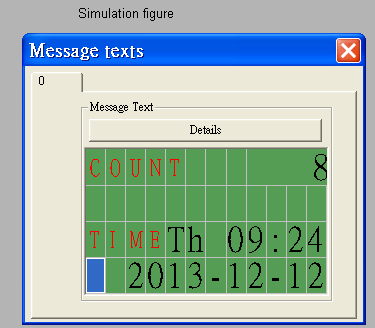
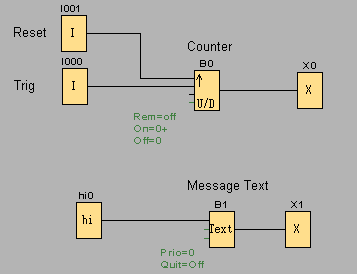
1. Controller to receive Remote IO Module’s input



1. For example, controller receive PC-1060’s input (8DI,4DO)
2. hi1 block will enable B1 MR block, and transfer PC-1060’s input data to the controller
3. The MR block parameter setting as below:
4. Slave Address: 1, All of MERLINO products’ initial ID Address is 1. Controller’s RS-485 port can connect to 255 units MODBUS devices. If you would like to connect more than 2 units devices at the same port, please set the different ID address for each device.
5. Port: COM1, set which com port would like to connect to other MODBUS device.
6. Command: 01 Read Coils, setting input command.
7. Register Address: 0, fill in Remote IO Module’s input address. (Note, A series Remote IO Module input address start from 0)
8. Count: 1, fill in quantity of input control
9. Data Address: M1, M1 block will store Remote IO Module’s input data, the controller will via MR block to read M1 data.
   1. **Message Text**

PC series Controller can via display or PCTP (PC series Text Panel) to monitor real-time value

Example: design a counter program and via PCTP to display the current count value and the current time.



Indication:

1. If PCTP via COM1 to connect Controller, please set COM1 as PCTP as below:

a. Options -> Properties -> COM1

b. Choose Model as PCTP

c. Click OK

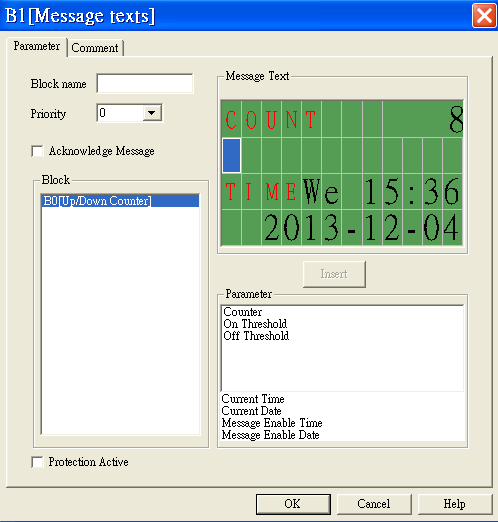
2. This example is for Counter application, so place B0 counter block in the

program

3. I0 is for trig counter, I1 is for reset counter

4. For program rule, B0 block must connect a block, so place X0 open connector behind B0 count block

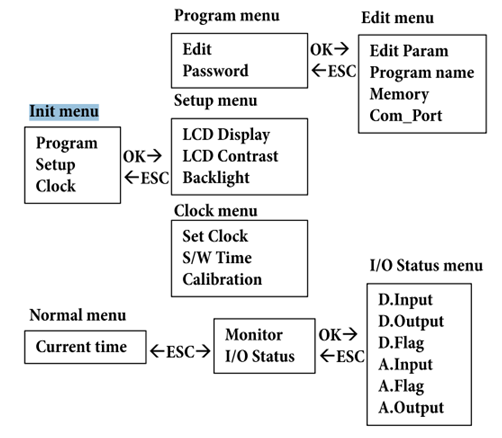
5. hi0 block for trig B1 Message Text block, B1 block’s parameter setting as below figure



* 1. **Controller display and PCTP (text panel) menu structure**

Depend on controller’s switch status (Init/Normal), the display will show below figure, and can via button to complete below setting.

Note: at Init mode, press ESC more than 3 Sec can modify the parameter, when complete press OK more than 3 Sec to store the setting.



If would like to modify the program parameter

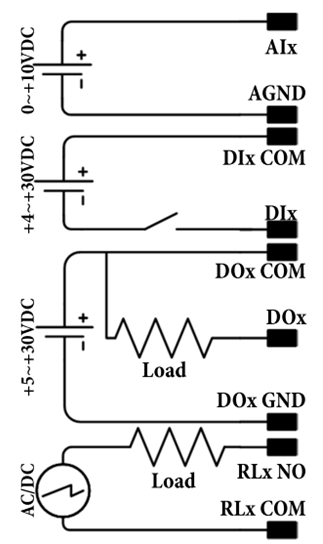
1. Turn controller switch to Init mode.
2. Choose Program -> Edit -> Edit Param
3. Display will show related block parameter, can use UP DOWN button to select the block, and press OK more than 3 Sec to modify.
4. When complete press OK more than 3 Sec to store the setting.

If would like to monitor controller’s IO status

1. Turn controller switch to Normal mode.
2. Display will show current time. Press ESC.
3. If choosing Monitor, can monitor all blocks’ status and parameters.

If choosing I/O status, can monitor Input, Output and Flag’s status. In the figure, D is mean Digital, A is mean Analog.

* 1. **Controller application wiring**



* 1. **Controller POWER/RUN LED indicator**

1. Red: Initial mode
2. Green: Normal (run) mode
3. Spark: no program in controller
   1. **Controller memory card**

****

PCMB is the memory card of PC series Controller, not only offer convenience function, but also offer stable protection.

1. If would like download PC program into an PCMB memory card, can refer [**3.9 PC->Device**](#YottaEditorPCToDevice39)
2. If would like upload PCMB memory card program to PC, can refer [**3.10 Device->PC**](#YottaEditorDeviceToPC310)
3. Plug PCMB memory card which has program on the empty program Controller’s slot, then press PCMB DOWNLOAD more than 3 Sec, can download the PCMB program to the Controller.
4. Plug empty program PCMB on the Controller slot which has program, then press UPLOAD more than 3 Sec, can upload the Controller program to the PCMB.
5. If would like to use PCMB protection function, and when un-plug the PCMB cause the Controller will out of work (empty program). Before download the program into to PCMB, can refer [**3.3 Properties-Parameter**](#YottaEditorPropertiesParameter33) to keyin the password, and refer [**3.4 Properties-Protect**](#YottaEditorPropertiesProtect34)to choose Copy Protect.
6. PCMB memory card LED indicator,
7. ERR：When program failed or upload process, ERR will spark.
8. PRG：When PCMB have program will display Green, if the program have copy protection will display Red.
9. PWR：When power on the PCMB, will display Green.
   1. **Address Mapping**

**Supported Modbus Code: 01/02/05/15 (Readable & Writable in Normal Mode)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Address** | **Description** | **R/W** | **Note** |
| 00001 ~ 00032 | Main Digital Input Value ( I000 ~ I031) | R | (0/1) |
| 00033 ~ 00064 | Ext1 Digital Input Value ( I100 ~ I131) | R | (0/1) |
| 00065 ~ 00096 | Ext2 Digital Input Value ( I200 ~ I231) | R | (0/1) |
| 00097 ~ 00128 | Ext3 Digital Input Value ( I300 ~ I331) | R | (0/1) |
| 00129 ~ 00160 | Ext4 Digital Input Value ( I400 ~ I431) | R | (0/1) |
| 00161 ~ 00192 | Ext5 Digital Input Value ( I500 ~ I531) | R | (0/1) |
| 00193 ~ 00224 | Ext6 Digital Input Value ( I600 ~ I631) | R | (0/1) |
| 00225 ~ 00256 | Ext7 Digital Input Value ( I700 ~ I731) | R | (0/1) |
| 00257 ~ 00272 | Main Digital Output Value ( Q000 ~ Q016) | R | (0/1) |
| 00273 ~ 00288 | EXT1 Digital Output Value ( Q100 ~ Q116) | R | (0/1) |
| 00289 ~ 00304 | EXT2 Digital Output Value ( Q200 ~ Q216) | R | (0/1) |
| 00305 ~ 00320 | EXT3 Digital Output Value ( Q300 ~ Q316) | R | (0/1) |
| 00321 ~ 00336 | EXT4 Digital Output Value ( Q400 ~ Q416) | R | (0/1) |
| 00337 ~ 00352 | EXT5 Digital Output Value ( Q500 ~ Q516) | R | (0/1) |
| 00353 ~ 00368 | EXT6 Digital Output Value ( Q600 ~ Q616) | R | (0/1) |
| 00369 ~ 00384 | EXT7 Digital Output Value ( Q700 ~ Q716) | R | (0/1) |
| 00385 ~ 00896 | 0~511 Digital Flag (M0 ~ M511) | R | (0/1) |
| 00897 ~ 00912 | 0~15 Shift register bit (S0 ~ S15 ) | R | (0/1) |
| 00913 | Flag of SCAN Time | R | (0/1) |
| 01025 ~ 01056 | Main Digital Input Force ON ( I000 ~ I031) | R/W | (0/1) |
| 01057 ~ 01088 | Ext1 Digital Input Force ON ( I100 ~ I131) | R/W | (0/1) |
| 01089 ~ 01120 | Ext2 Digital Input Force ON ( I200 ~ I231) | R/W | (0/1) |
| 01121 ~ 01152 | Ext3 Digital Input Force ON ( I300 ~ I331) | R/W | (0/1) |
| 01153 ~ 01184 | Ext4 Digital Input Force ON ( I400 ~ I431) | R/W | (0/1) |
| 01185 ~ 01216 | Ext5 Digital Input Force ON ( I500 ~ I531) | R/W | (0/1) |
| 01217 ~ 01248 | Ext6 Digital Input Force ON ( I600 ~ I631) | R/W | (0/1) |
| 01249 ~ 01280 | Ext7 Digital Input Force ON ( I700 ~ I731) | R/W | (0/1) |
| 01281 ~ 01312 | Main Digital Input Force OFF ( I000 ~ I031) | R/W | (0/1) |
| 01313 ~ 01344 | Ext1 Digital Input Force OFF ( I100 ~ I131) | R/W | (0/1) |
| 01345 ~ 01376 | Ext2 Digital Input Force OFF ( I200 ~ I231) | R/W | (0/1) |
| 01377 ~ 01408 | Ext3 Digital Input Force OFF ( I300 ~ I331) | R/W | (0/1) |
| 01409 ~ 01440 | Ext4 Digital Input Force OFF ( I400 ~ I431) | R/W | (0/1) |
| 01441 ~ 01472 | Ext5 Digital Input Force OFF ( I500 ~ I531) | R/W | (0/1) |
| 01473 ~ 01504 | Ext6 Digital Input Force OFF ( I600 ~ I631) | R/W | (0/1) |
| 01505 ~ 01536 | Ext7 Digital Input Force OFF ( I700 ~ I731) | R/W | (0/1) |

**Supported Modbus Code: 01/02 (Readable in Normal Mode)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Address** | **Description** | **R/W** | **Note** |
| 02001~02004 | Status of Function Block B0 | R |  |
| 02005~02008 | Status of Function Block B1 | R |  |
| 02009~02012 | Status of Function Block B2 | R |  |
| ......................................... | | | |
| 06093~06096 | Status of Function Block B1023 | R |  |

**Supported Modbus Code: 03/04 (Readable in Normal Mode)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Address** | **Description** | **R/W** | **Note** |
| 40001 | Com0 model | R | 0x00 : Slave   0x01 : Master |
| 40002 | Com0 protocol | R | 0x00 : RTU     0x01 : ASCII |
| 40003 | Com0 device address | R | 1~255 |
| 40004 | Com0 baud rate | R | 0x00 : 1200     0x01 : 2400     0x02 : 4800 0x03 : 9600     0x04 : 14400   0x05 : 19200 0x06 : 28800   0x07 : 38400   0x08 : 57600 0x09 : 115200 |
| 40005 | Com0 parity | R | 0x00 : None   0x01 : Odd   0x02 : Even |
| 40006 | Com0 data bit | R | 0x00 : 7-bit    0x01 : 8-bit |
| 40007 | Com0 stop bit | R | 0x00 : 1-bit    0x01 : 2-bit |
| 40008 | Com0 timeout | R | 50 ~ 65535 ms |
| 40009 | Com0 delay between polls | R | 0 ~ 65535 ms |
| 40010 | Com0 data register index | R | 0x00 : High Low   0x01:Low High |
| 40011 | Com0 status flag | R |  |
| 40012 | Com1 model | R | 0x00 : Slave   0x01: Master |
| 40013 | Com1 protocol | R | 0x00 : RTU     0x01 : ASCII |
| 40014 | Com1 device address | R | 1~255 |
| 40015 | Com1 baud rate | R | 0x00 : 1200     0x01 : 2400     0x02 : 4800 0x03 : 9600     0x04 : 14400   0x05 : 19200 0x06 : 28800   0x07 : 38400   0x08 : 57600 0x09 : 115200 |
| 40016 | Com1 parity | R | 0x00 : None   0x01 : Odd   0x02 : Even |
| 40017 | Com1 data bit | R | 0x00 : 7-bit    0x01 : 8-bit |
| 40018 | Com1 stop bit | R | 0x00 : 1-bit    0x01 : 2-bit |
| 40019 | Com1 timeout | R | 50 ~ 65535 ms |
| 40020 | Com1 delay between polls | R | 0 ~ 65535 ms |
| 40021 | Com1 data register index | R | 0x00 : High Low   0x01:Low High |
| 40022 | Com1 status flag | R |  |
| 40023 | Com2 model | R | 0x00 : Slave   0x01 : Master |
| 40024 | Com2 protocol | R | 0x00 : RTU     0x01 : ASCII |
| 40025 | Com2 device address | R | 1~255 |
| 40026 | Com2 baud rate | R | 0x00 : 1200     0x01 : 2400     0x02 : 4800 0x03 : 9600     0x04 : 14400   0x05 : 19200 0x06 : 28800   0x07 : 38400   0x08 : 57600 0x09 : 115200 |
| 40027 | Com2 parity | R | 0x00 : None   0x01 : Odd   0x02 : Even |
| 40028 | Com2 data bit | R | 0x00 : 7-bit    0x01 : 8-bit |
| 40029 | Com2 stop bit | R | 0x00 : 1-bit    0x01 : 2-bit |
| 40030 | Com2 timeout | R | 50 ~ 65535 ms |
| 40031 | Com2 delay between polls | R | 0 ~ 65535 ms |
| 40032 | Com2 data register index | R | 0x00 : High Low   0x01:Low High |
| 40033 | Com2 status flag | R |  |

**Supported Modbus Code: 03/04 (Readable in Normal Mode)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Address** | **Description** | **R/W** | **Note** |
| 40211 | Module Name 1 | R | 118X   Ex:0x1188 |
| 40212 | Module Name 2 | R | 0x0000 |
| 40213 | Firmware Version 1 | R | A1.00   Ex:0xA100 |
| 40214 | Firmware Version 2 | R | 0x0000 |
| 40215 | Mac Serial Number 1 | R |  |
| 40216 | Mac Serial Number 2 | R |  |
| 40217 | Mac Serial Number 3 | R |  |
| 40218 | Mac Serial Number 4 | R |  |
| 40219 | Mac Serial Number 5 | R |  |
| 40220 | Mac Serial Number 6 | R |  |
| 40221 | Redundancy condition | R | 0x00: None   0x01:Master   0x02:Slave |
| 40222 | Redundancy operating time (low word) (ms) | R | 0x0000 ~ 0xFFFF |
| 40223 | Redundancy operating time (high word) (ms) | R | 0x0000 ~ 0xFFFF |
| 40224 | LCM Control Register | R |  |
| 40225 | Machine internal temperature (degree Celsius) | R | -32768 ~ 32767 |
| 40226 | Controller Fault Status | R |  |
| 40227 | System Status 1 | R |  |
| 40228 | System Status 2 | R |  |
| 40229 | Scan Cycle Time (ms) | R | 1 ~ 65535 |
| 40230 | Redundancy status | R | 0x00 : stop   0x01: standby   0x02: action |
| 40231 | Power On Hours (hr) | R | 0~65535 |
| 40232 | COM0 communication success rate (times/min) | R | 0~65535 |
| 40233 | COM0 communication error rate (times/min) | R | 0~65535 |
| 40234 | COM1 communication success rate (times/min) | R | 0~65535 |
| 40235 | COM1 communication error rate (times/min) | R | 0~65535 |
| 40236 | COM2 communication success rate (times/min) | R | 0~65535 |
| 40237 | COM2 communication error rate (times/min) | R | 0~65535 |
| 40238 | COM3 communication success rate (times/min) | R | 0~65535 |
| 40239 | COM3 communication error rate (times/min) | R | 0~65535 |
| 40240 | COM4 communication success rate (times/min) | R | 0~65535 |
| 40241 | COM4 communication error rate (times/min) | R | 0~65535 |
| 40242 | COM5 communication success rate (times/min) | R | 0~65535 |
| 40243 | COM5 communication error rate (times/min) | R | 0~65535 |
| 40244 | COM6 communication success rate (times/min) | R | 0~65535 |
| 40245 | COM6 communication error rate (times/min) | R | 0~65535 |
| 40246 | COM7 communication success rate (times/min) | R | 0~65535 |
| 40247 | COM7 communication error rate (times/min) | R | 0~65535 |
| 40248 | Downloading number of times | R | 0~65535 |
| 40249 | History Temperature\_min (degree Celsius) | R | -32768 ~ 32767 |
| 40250 | History Temperature\_max (degree Celsius) | R | -32768 ~ 32767 |
| 40251 | High temperature protection point | R | -32768 ~ 32767 |
| 40252 | Low temperature protection point | R | -32768 ~ 32767 |
| 40253 | Power On Count (low word) | R | 0x0000 ~ 0xFFFF |
| 40254 | Power On Count (high word) | R | 0x0000 ~ 0xFFFF |
| 40255 | DOWNLOAD\_STATUS | R | 0x00 : normal   0x01 : fail |
| 40256 | Last shutdown time -Week\_RTC | R | 0 ~ 6 |
| 40257 | Last shutdown time -Year\_RTC | R | 2010 ~ 2036 |
| 40258 | Last shutdown time -Month\_RTC | R | 1 ~ 12 |
| 40259 | Last shutdown time -Day\_RTC | R | 1 ~ 31 |
| 40260 | Last shutdown time -Hour\_RTC | R | 0 ~ 23 |
| 40261 | Last shutdown time -Min\_RTC | R | 0 ~ 59 |
| 40262 | Last shutdown time -Sec\_RTC | R | 0 ~ 59 |
| 40263 | RTC Calibrate sign | R | 0: plus   1: minus |
| 40264 | RTC Calibrate value | R | 0 ~ 30 (Sec/week) |

**Supported Modbus Code: 03/04 (Readable in Normal Mode)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Address** | **Description** | **R/W** | **Note** |
| 40301 | Week\_RTC | R | 0 ~ 6 |
| 40302 | Year\_RTC | R | 2010 ~ 2036 |
| 40303 | Month\_RTC | R | 1 ~ 12 |
| 40304 | Day\_RTC | R | 1 ~ 31 |
| 40305 | Hour\_RTC | R | 0 ~ 23 |
| 40306 | Min\_RTC | R | 0 ~ 59 |
| 40307 | Sec\_RTC | R | 0 ~ 59 |

**Supported Modbus Code: 03/04 (Readable in Normal Mode)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Address** | **Description** | **R/W** | **Note** |
| 40501 ~ 40508 | Main Analog Input Value ( AI000 ~ AI007 ) | R |  |
| 40509 ~ 40516 | EXT1 Analog Input Value ( AI100 ~ AI107 ) | R |  |
| 40517 ~ 40524 | EXT2 Analog Input Value ( AI200 ~ AI207 ) | R |  |
| 40525 ~ 40532 | EXT3 Analog Input Value ( AI300 ~ AI307 ) | R |  |
| 40533 ~ 40540 | EXT4 Analog Input Value ( AI400 ~ AI407 ) | R |  |
| 40541 ~ 40548 | EXT5 Analog Input Value ( AI500 ~ AI507 ) | R |  |
| 40549 ~ 40556 | EXT6 Analog Input Value ( AI600 ~ AI607 ) | R |  |
| 40557 ~ 40564 | EXT7 Analog Input Value ( AI700 ~ AI707 ) | R |  |
| 40565 ~ 40568 | Main Analog Output Value (AQ000 ~ AQ003) | R |  |
| 40569 ~ 40572 | EXT1 Analog Output Value (AQ100 ~ AQ103) | R |  |
| 40573 ~ 40576 | EXT2 Analog Output Value (AQ200 ~ AQ203) | R |  |
| 40577 ~ 40580 | EXT3 Analog Output Value (AQ300 ~ AQ303) | R |  |
| 40581 ~ 40584 | EXT4 Analog Output Value (AQ400 ~ AQ403) | R |  |
| 40585 ~ 40588 | EXT5 Analog Output Value (AQ500 ~ AQ503) | R |  |
| 40589 ~ 40592 | EXT6 Analog Output Value (AQ600 ~ AQ603) | R |  |
| 40593 ~ 40596 | EXT7 Analog Output Value (AQ700 ~ AQ703) | R |  |
| 40597 ~ 41108 | 0 ~ 511 Analog Flag Value ( AM0 ~ AM511) | R |  |

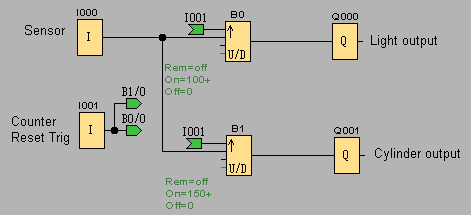
**Supported Modbus Code: 03/04 (Readable in Normal Mode)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Address** | **Description** | **R/W** | **Note** |
| 42001~42004 | Parameter of Function Block B0 | R |  |
| 42005~42008 | Parameter of Function Block B1 | R |  |
| 42009~42012 | Parameter of Function Block B2 | R |  |
| ......................................... | | | |
| 46093~46096 | Parameter of Function Block B1023 | R |  |

**More Information**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Block Type** | **Address 1** | **Address 2** | **Address 3** | **Address 4** |
| AND | Block Output (0xxxx) | X | X | X |
| AND (Edge) | Block Output (0xxxx) | X | X | X |
| NAND | Block Output (0xxxx) | X | X | X |
| NAND (Edge) | Block Output (0xxxx) | X | X | X |
| OR | Block Output (0xxxx) | X | X | X |
| NOR | Block Output (0xxxx) | X | X | X |
| XOR | Block Output (0xxxx) | X | X | X |
| NOT | Block Output (0xxxx) | X | X | X |
| On-Delay | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Off-Delay | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| On-/Off-Delay | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Retentive On-Delay | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Wiping relay (pulse output) | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Edge triggered wiping relay | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Asynchronous Pulse Generator | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Random Generator | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Stairway lighting switch | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Multiple function switch | Block Output (0xxxx) | X | Timer (4xxxx) | X |
| Weekly Timer | Block Output (0xxxx) | X | X | X |
| Yearly Timer | Block Output (0xxxx) | X | X | X |
| Up/Down counter | Block Output (0xxxx) | X | Count Value (l) (4xxxx) | Count Value (h) (4xxxx) |
| Hours Counter | Block Output (0xxxx) | X | MN Value (l) (4xxxx) | MN Value (h) (4xxxx) |
| Threshold trigger | Block Output (0xxxx) | X | Count Value (l) (4xxxx) | Count Value (h) (4xxxx) |
| Analog Comparator | Block Output (0xxxx) | X | Actual values(Ax-Ay) (l) (4xxxx) | Actual values(Ax-Ay) (h) (4xxxx) |
| Analog threshold trigger | Block Output (0xxxx) | X | Actual value Ax (l) (4xxxx) | Actual value Ax (h) (4xxxx) |
| Analog Amplifier | Block Output (4xxxx) | X | Actual value Ax (l) (4xxxx) | Actual value Ax (h) (4xxxx) |
| Analog watchdog | Block Output (0xxxx) | Actual value Aen (4xxxx) | Actual value Ax (l) (4xxxx) | Actual value Ax (h) (4xxxx) |
| Analog differential trigger | Block Output (0xxxx) | X | Actual value Ax (l) (4xxxx) | Actual value Ax (h) (4xxxx) |
| Latching Relay | Block Output (0xxxx) | X | X | X |
| Pulse Relay | Block Output (0xxxx) | X | X | X |
| Message texts | Block Output (0xxxx) | X | X | X |
| Shift register | Block Output (0xxxx) | X | Register Value (4xxxx) | X |
| Modbus Read | Block Output (0xxxx) | Count (4xxxx) | Data Address (4xxxx) | X |
| Modbus Write | Block Output (0xxxx) | Count (4xxxx) | Data1 (Manual) / Data Address (Auto) (4xxxx) | Data2 (Manual) (4xxxx) |

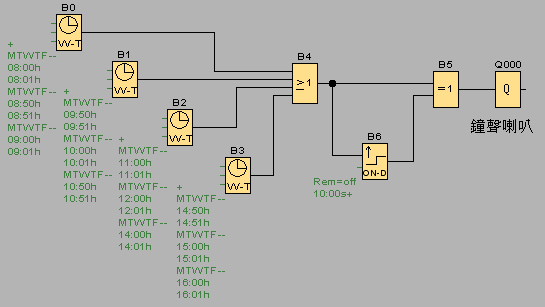
* 1. **Example applications**
     1. **Dual counter**

****

Process describing:

For example, the sensor use for receiving data and count, when the counter value is 100, the light output. When counter value is 150, the cylinder output.

* + 1. **School bell system**

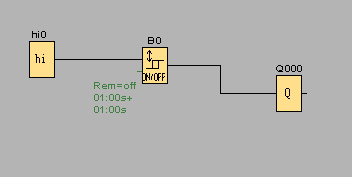
****

Process describing:

When school begins, break and end, the bell will ring 10 seconds on setting time. Bell time is set on Monday to Friday at 8:00, 8:50, 9:00, 9:50, 10:00, 10:50, 11:00, 12:00, 14:00, 14:50, 15:00 and 16:00.

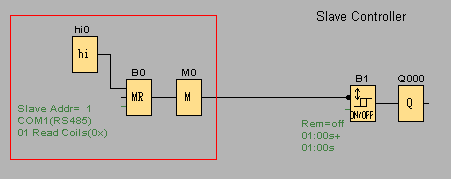
* + 1. **Redundant (Master and Slave controller)**

In some special application or territory, we don’t allow the controller out of work. We can via Redundant function to solve this problem. When Master Controller out of work, Slave Controller will instead Master. If Master Controller reinstate, will still operate and Slave Controller stand by.

****

For example, the Master Controller program is as above figure.

This application is control DO 0: ON 1 Sec, OFF 1 Sec. Via COM1 to communicate with Slave PLC. So set the COM1 as Slave.



Slave PLC

You can copy all the program from the Master, and paste here. Via COM1 to communicate with Master Controller. Now should edit some program from Master Controller.

It adds hi0, B0 and M0 blocks

B0 block parameter please refer this block

B1 Timer block's input must use invert, you can detect there is a black point ahead the block

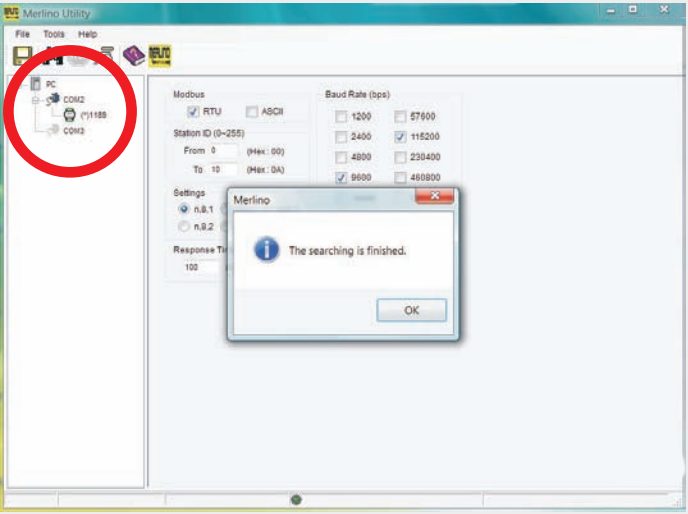
B0 output conditional is as below:

Q is set or reset depending on the communication status.

Q=1, if the communication is successful

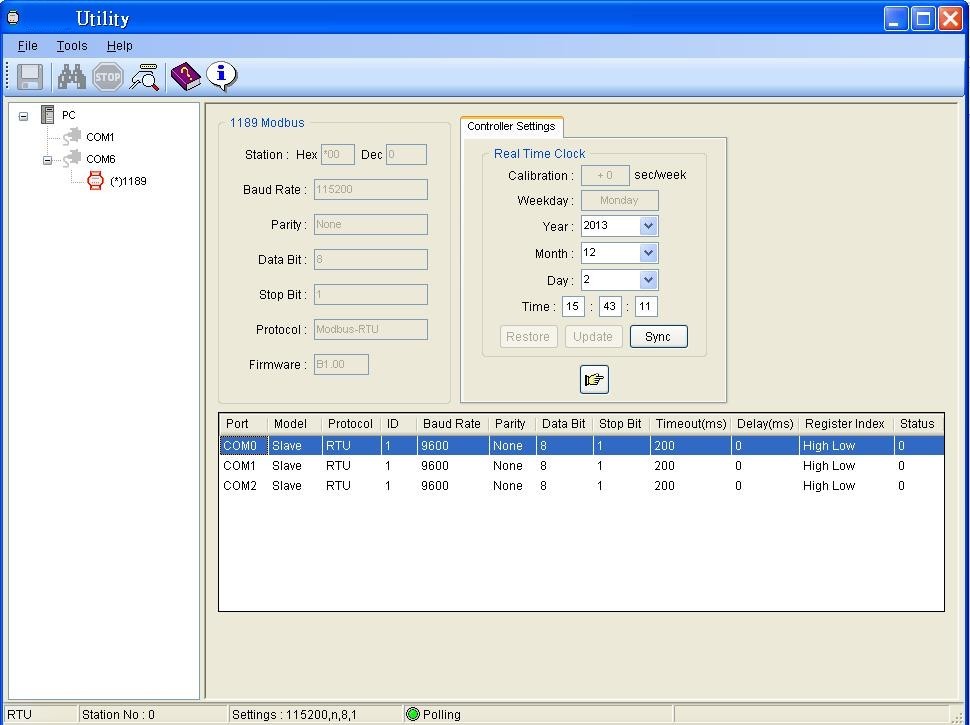
Q=0, if the communication is failed

1. **. MERLINO Utility overview**
   1. **Main screen**

****

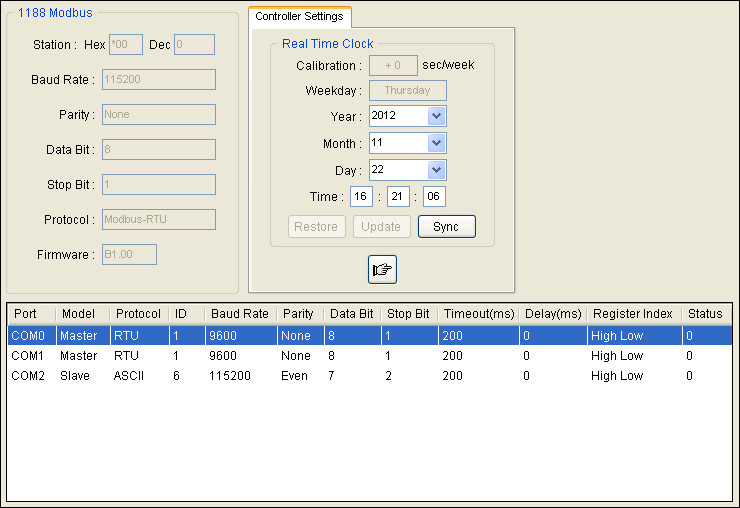
* 1. **The controller communicates with the PC**

We can refer [**2.1** **Controller communicate to PC**](#ControllerCommunicatesWithThePC21)to complete it.

****

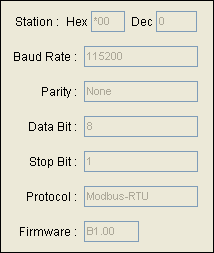
* + 1. **Initial mode**

When turn the controller switch to Init mode, you can see the following figure.

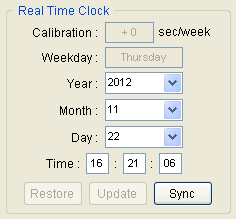


* + - 1. **General setting**

The general settings are read only.



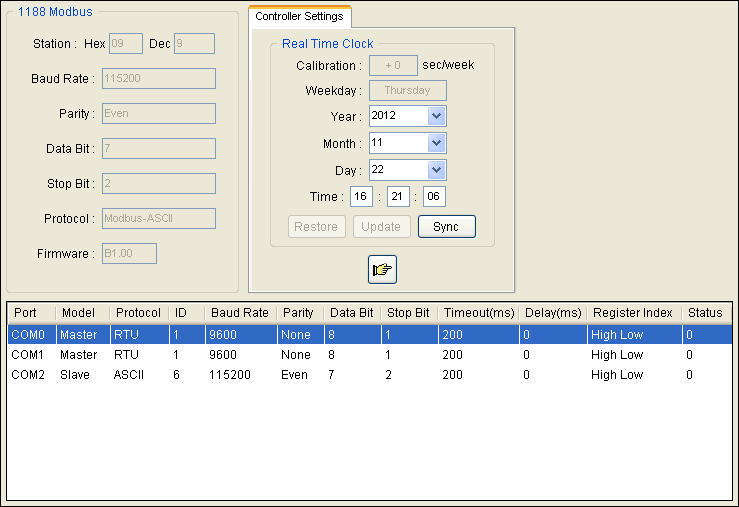
* + - 1. **Real Time Clock**



* \*Calibration and Weekday are read only.
* \*You can set Year, Month, Day and Time. Press the Update button to store the changed values.
* \*Press the Restore button to restore the RTC value from the controller's memory.
* \*The Update and Restore buttons are available when the Weekday or Time values are changed.
* \*Press the Sync button to synchronize the RTC time with a PC.
  + - 1. **More information**

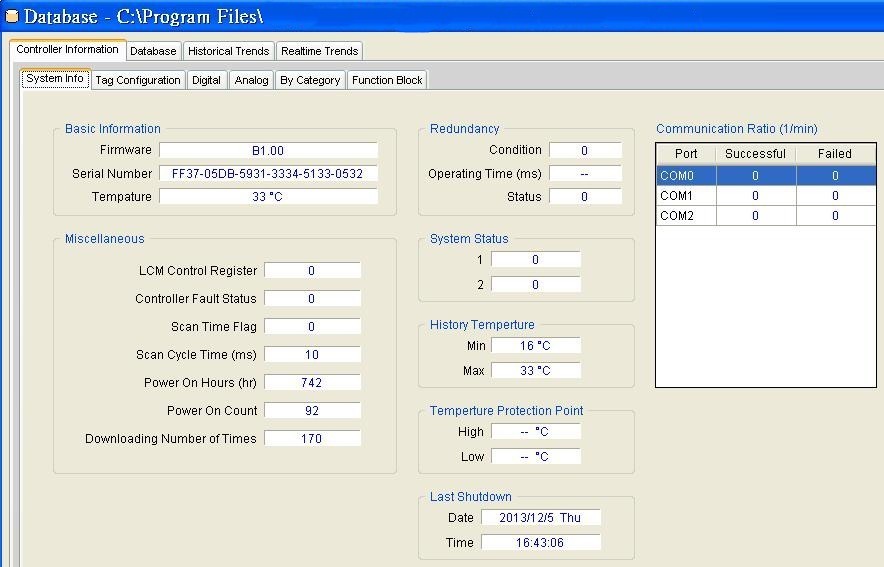
Can pressC:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_More.gif to realize more controller information.

* + 1. **Normal mode**

When turn the controller switch to Normal mode, you can see the following figure.

* 1. **More Information**

When the buttonC:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_More.gif is pressed, you can see the following figure. The below figure includes 4 tabs: [Controller Information](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#ControllerInfo), [Database](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#Database), [Historical Trends](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#HTrends) and [Realtime Trends](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#RTTrends).

****

* + 1. **Controller Information**

When the tab on the upper tabs is switched to C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_ControllerInfo.gif, you can see the figure below. The figure below includes 6 tabs: [System Info](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#SysInfo), [Tag , Configuration](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#TagConfiguration), [Digital](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#Digital), [Analog](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#Analog), [By Category](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#ByCategory) and [Function Block](file:///C:\Documents%20and%20Settings\Bertrand\Local%20Settings\temp\Help-01\Modules\AR_1188.htm#FBlock).

* + 1. **System Info**

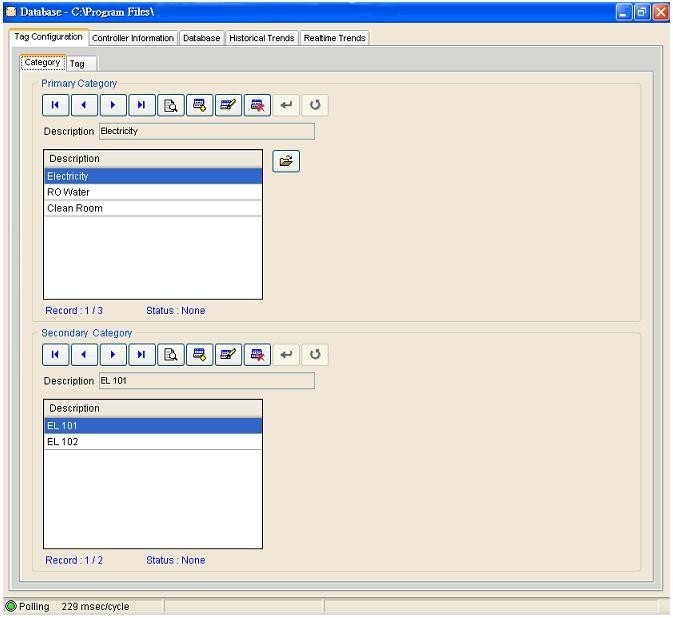
This page lets you get a deep view of the information and status of the controller. The data read from the controller provide the information and status. The label on the left side of each data indicates the meaning of each data.

* + 1. **Tag Configuration**

This tab contains 2 sub-tabs Category and Tag.

**The controller contains lots of digital/analog inputs/outputs and flags. This section introduces you how to give useful information for each I/O and flag. A factory or manufacturing plant usually consists of buildings and equipment. It's possible that workers in factory need to handle many facilities such as electricity, gas, water, clean room and so on.**

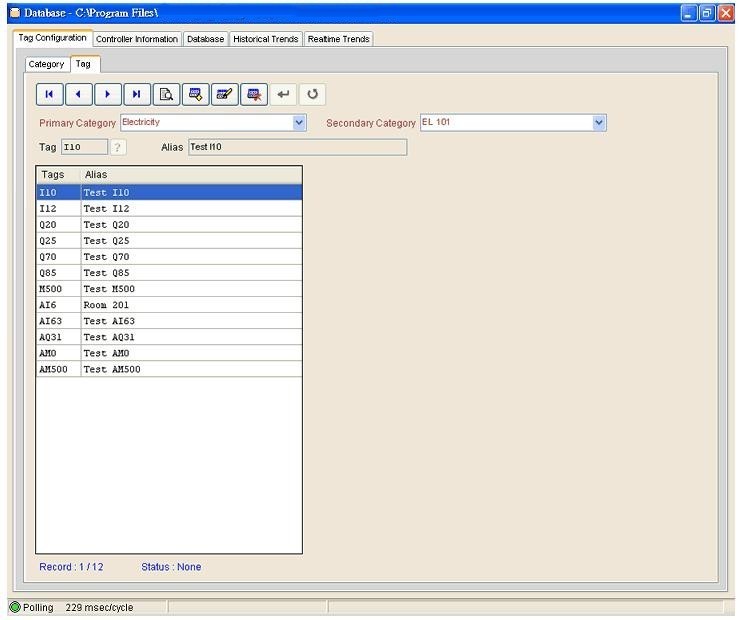
* + - 1. **Category**



Here is an example, electricity facility includes 2 electric panels : EL101 and EL102. Users can define them in Primary Category and Secondary Category respectively. By the same token, users can define RO water, clean room and other facilities etc.

|  |  |  |  |
| --- | --- | --- | --- |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_First.gif | Go to the first record. | C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Update.gif | Update a record. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Previous.gif | Go to the previous record. | C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Del.gif | Delete a record. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Next.gif | Go to the next record. | C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Confirm.gif | Confirm the operation. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Last.gif | Go to the last record. | C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Cancel.gif | Cancel the operation. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Query.gif | Query records. | C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Open.gif | Note : Users can use this button to import the following settings from an existing ARControllerYYMMDD.mdb file.  1. Primary / Secondary Category and Tags.  2. Historical Trends.  3. Realtime Trends. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Add.gif | Add a record. |

* + - 1. **Tag**

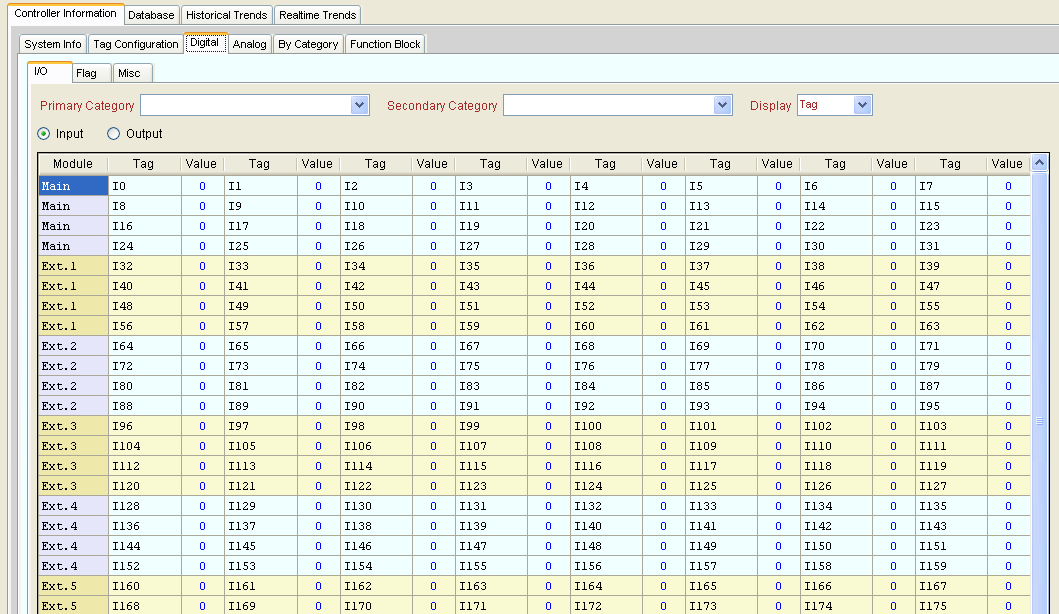


The instructions of field **Tag**, **Alias** and button C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_question.gif are as follows:

|  |  |
| --- | --- |
| Tag | Specify the I/O channel. |
| Alias | The detailed information of the tag. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_Question.gif | Show the formats of tags.  1. Digital Input : I0 ~ I255.  2. Digital Output : Q0 ~ Q127.  3. Digital Flag : M0 ~ M511.  4. Analog Input : AI0 ~ AI63.  5. Analog Output : AQ0 ~ AQ31.  6. Analog Flag : AM0 ~ AM511. |

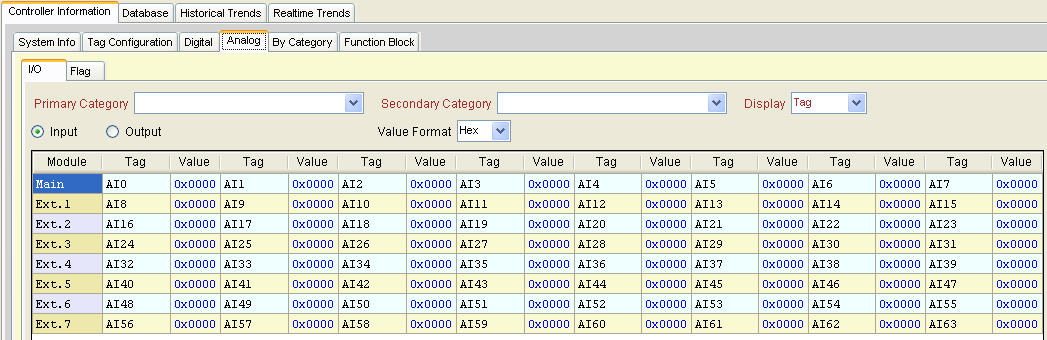
* + 1. **Digital**

This page provides the detailed information of digital signals, such as inputs, outputs, flags and shift registers.

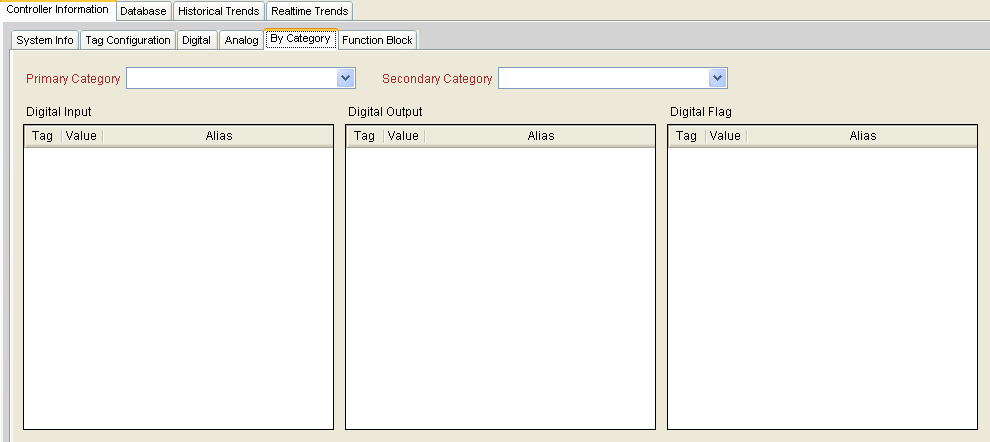
****

* + 1. **Analog**

This page provides the detailed information of analog signals, such as inputs, outputs and flags.

****

* + 1. **By Category**

This page provides the information of digital/analog inputs/outputs and flags by primary and secondary category.****

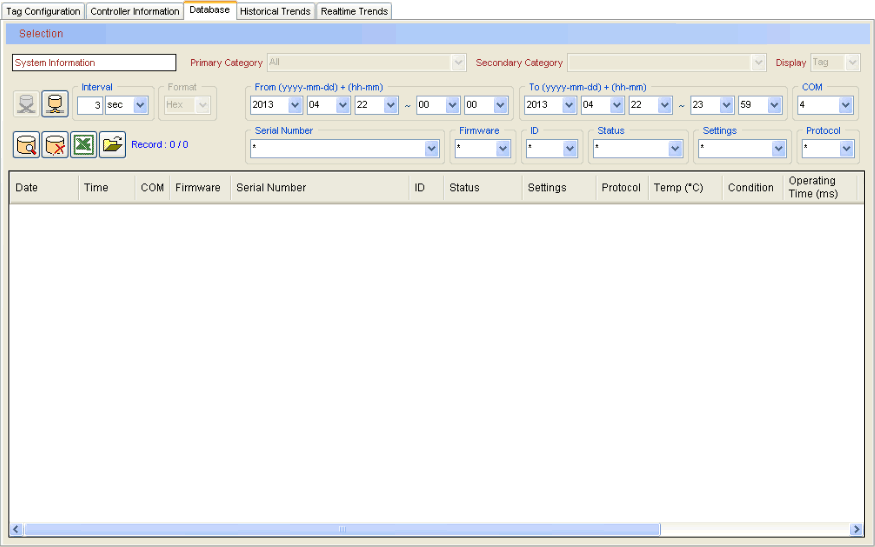
* + 1. **Function Block**

This page provides the detailed information of the function block. Please refer to the following table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Block Type | Addr\_ AIO (DIO) \_1 | Addr\_ AIO (DIO) \_2 | Addr\_ AIO (DIO) \_3 | Addr\_ AIO (DIO) \_4 |
| AND | Block Output (0xxxx) | X | X | X |
| AND (Edge) | Block Output (0xxxx) | X | X | X |
| NAND | Block Output (0xxxx) | X | X | X |
| NAND (Edge) | Block Output (0xxxx) | X | X | X |
| OR | Block Output (0xxxx) | X | X | X |
| NOR | Block Output (0xxxx) | X | X | X |
| XOR | Block Output (0xxxx) | X | X | X |
| NOT | Block Output (0xxxx) | X | X | X |
| On-Delay | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Off-Delay | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| On-/Off-Delay | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Retentive on-Delay | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Wiping relay (pulse output) | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Edge triggered wiping relay | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Asynchronous Pulse Generator | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Random Generator | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Stairway lighting switch | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Multiple function switch | Block Output (0xxxx) | X | TMR (4xxxx) | X |
| Weekly Timer | Block Output (0xxxx) | X | X | X |
| Yearly Timer | Block Output (0xxxx) | X | X | X |
| Up/Down counter | Block Output (0xxxx) | X | CNT (l) (4xxxx) (ref) | CNT (h) (4xxxx) (ref) |
| Hours Counter | Block Output (0xxxx) | X | MN (l) (4xxxx) | MN (h) (4xxxx) |
| Threshold trigger | Block Output (0xxxx) | X | CNT (l) (4xxxx) | CNT (h) (4xxxx) |
| Analog Comparator | Block Output (0xxxx) | X | Ad\_buf = (Ax-Ay)  (l) (4xxxx) (ref) | Ad\_buf = (Ax-Ay)  (h) (4xxxx) (ref) |
| Analog threshold trigger | Block Output (0xxxx) | X | Ad\_buf (l) (4xxxx) (ref) | Ad\_buf (h) (4xxxx) (ref) |
| Analog Amplifier | Block Output (4xxxx) | X | Ad\_buf (l) (4xxxx) (ref) (same as output) | Ad\_buf (h) (4xxxx) (ref) |
| Analog watchdog | Block Output (0xxxx) | Aen (4xxxx) | Ad\_buf (l) (4xxxx) | Ad\_buf (h) (4xxxx) |
| Analog differential trigger | Block Output (0xxxx) | X | Ad\_buf (l) (4xxxx) | Ad\_buf (h) (4xxxx) |
| Latching Relay | Block Output (0xxxx) | X | X | X |
| Pulse Relay | Block Output (0xxxx) | X | X | X |
| Message texts | Block Output (0xxxx) | X | X | X |
| Softkey | Block Output (0xxxx) | X | X | X |
| Shift register | Block Output (0xxxx) | X | X | X |
| Modbus Read | Block Output (0xxxx) | count (4xxxx) | Data\_Add (4xxxx) | X |
| Modbus Write | Block Output (0xxxx) | count (4xxxx) | Data1 / Data\_Add (4xxxx) | Data2 (4xxxx) |

* 1. **Database**

When the tab on the upper tabs is switched to C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_Database.gif, you can see the figure below.



We provide users with database functions. Users can store the values of selected modules into the database. These data can be retrieved from the database for further analysis in the future.  
  
**Note :** The database is a Microsoft Access file. The file name is app\_path\ARController.mdb.   
**Note :** The file backups automatically when its size exceeds 500 MB. The backup file name is ARControllerYYYYMMDD.mdb.   
**Note :** The file app\_path\ARControllerTemplate.mdb **should not be modified and deleted**.

The below instructions show you how to manipulate the database.

|  |  |
| --- | --- |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_DbButtonStop.gif | Stop inserting data into the database. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_DbButtonInsert.gif | Inserting data into the database. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\DbButtonInterval.gif | Specify the time interval for inserting data into the database. |

**How to Use the Database**

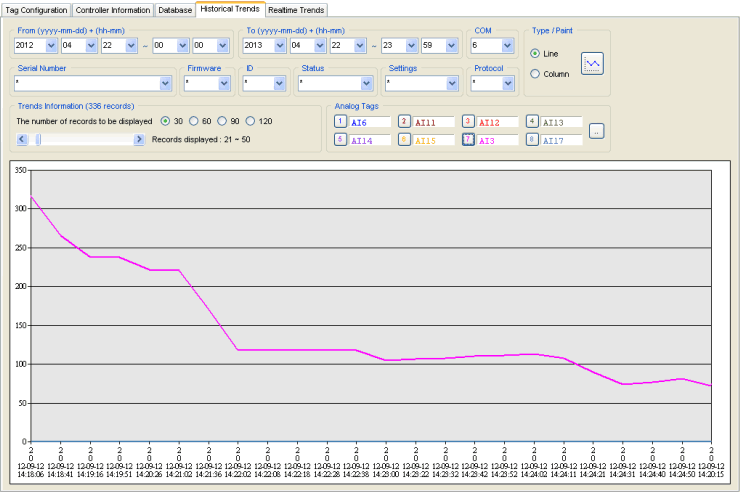
**In the previous figure, users can retrieve and delete data from the database. The combination of all drop-down boxes is the criteria for retrieving and deleting data.**

**Note :** The star sign (\*) in drop-down boxes means all.  
**Note :** If the number of retrieving data is more than 3000. You have to reset the selection criteria.

|  |  |
| --- | --- |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_DbButtonQuery.gif | Retrieve data from the database. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\1188_DbButtonDelete.gif | Delete data from the database. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\DbButtonExcel.gif | Export data to Excel. |
|  | Close the form. |

* 1. **Historical Trends**

When the tab on the upper tabs is switched to C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_HTrend.gif, you can see the figure below.



We provide users with historical trends. Users can analyse the data in the database to get useful information. The maximum number of the trends is 8.

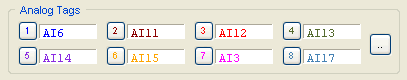
**How to Use the Historical Trends**

**In the previous figure, users can retrieve data shown in graphic from the database. The combination of all drop-down boxes is the criteria for retrieving data.**

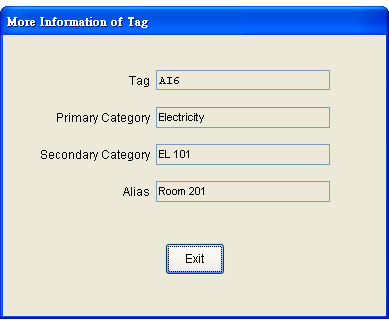
**Note :** The star sign (\*) in drop-down boxes means all.  
**Note :** If the number of retrieving data is more than 3000. You have to reset the selection criteria.

|  |  |  |
| --- | --- | --- |
| _Type | C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_Line.gif | Switch a bar chart to line chart. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_Column.gif | Switch a line chart to a bar chart. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_Paint.gif | Retrieve data from the database and then draw a line chart or bar chart. |

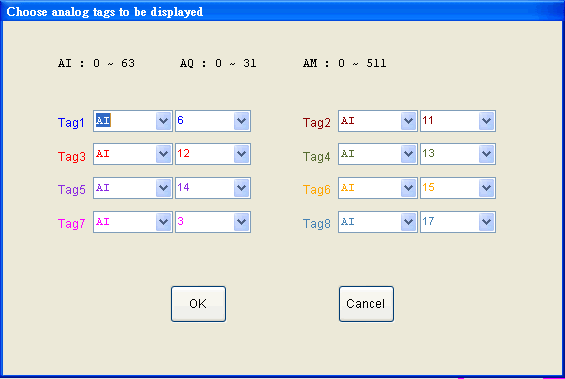
|  |
| --- |
| _HTrendInfo |
| 1. It tells users the total number of data displayed. |
| 2. Users can decide the number of records to be displayed. There are 4 options: 30, 60, 90, 120. |
| 3. It tells users the range of serial number of the data displayed. |



When any of the button C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_AnalogBtn1.gif ~ C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_AnalogBtn8.gif is pressed, you can see the following figure. It shows users the detailed information of the corresponding tag.

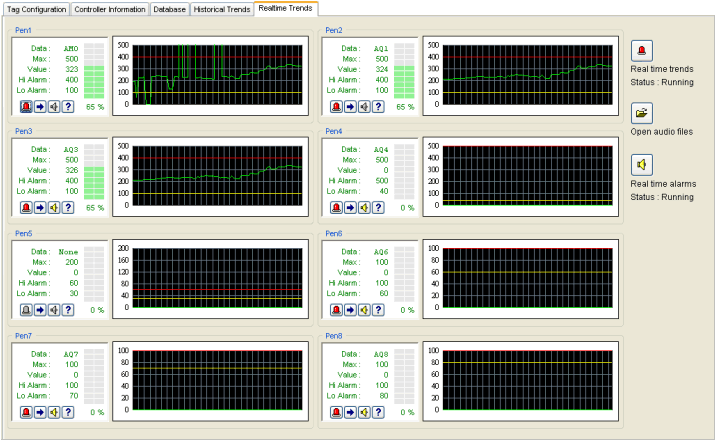


When the buttonC:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_AnalogDisplayedBtn.gif is pressed, you can see the following figure. Users can set Tag1 ~ Tag8.



* 1. **Realtime Trends**

When the tab on the upper tabs is switched toC:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTTrend.gif, you can see the figure below.



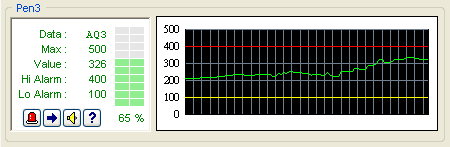
We provide users with realtime trends. Users can receive realtime information. The maximum number of the trends is 8.

**How to Use the Realtime Trends**

The below instructions show you more information.

|  |  |
| --- | --- |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTMainSwitch.gif | The main switch to start or stop the operation of realtime trends. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTOpenAudio.gif | Open an audio file for alarm. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTMainAlarm.gif | The main switch to start or stop the operation of alarm. |

**More Information about Individual Trend**



|  |  |
| --- | --- |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTSwitch.gif | The switch to start or stop the operation of individual realtime trends. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTSetting.gif | Settings for individual pen. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTAlarm.gif | The main switch to start or stop the operation of individual alarm. |
| C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTQuestion.gif | Show users the detailed information of the corresponding data. |

When the button C:\Documents and Settings\Bertrand\Local Settings\temp\Help-01\Picture\_RTSetting.gif is pressed, you can see the following figure. Users can set the individual pen.

