Table Of Contents

Chapter 1 Major Features

1.1 Ethernet-enabled DA&C I/O Modules

EDAM-9000 is based on the popular Ethernet networking standards used today in most business environments. Users can easily add EDAM-9000 I/O modules to existing Ethernet networks or use EDAM-9000 modules in new Ethernet-enabled Manufacturing networks. EDAM-9000 module features a 10/100 Mbps Ethernet chip and supports industrial popular Modus/TCP protocol over TCP/IP for data connection. EDAM-9000 also supports UDP protocol over Ethernet networking. With UDP/IP, EDAM-9000 I/O modules can actively send I/O data stream to 8 Ethernet nodes. Through Ethernet networking HMI/SCADA system and controller can access or gather real-time data from EDAM-9000 Ethernet enabled DA&C modules. And, these real-time data can be integrated with business system to create valuable, competitive business information immediately.

1.2 Intelligent I/O Modules

Enhancing from traditional I/O modules, EDAM-9000 I/O modules have pre-built intelligent mathematic functions to empower the system capacity. The Digital Input modules provide Counter, Totalizer functions; the Digital Output modules provide pulse output, delay output functions; the Analog Input modules provide the Max./Min./Average data calculation; the Analog Output modules provide the PID loop control function.

1.3 Mixed I/O in One Module to fit all applications

EDAM-9000 mixed I/O module design concept provides the most cost-effective I/O usage for application system. The most common used I/O type for single function unit are collected in ONE module. This design concept not only save I/O usage and spare modules cost but also speed up I/O relative operations. For small DA&C system or standalone control unit in a middle or large scale, EDAM-9000 mixed I/O design can easily fit application needs by one or two modules only. With additional embedded control modules, EDAM-9000 can easily create a localized, less complex, and more distributed I/O architecture.

1.4 Industrial standard Modbus/TCP protocol supported for open connectivity

EDAM-9000 modules support the popular industrial standard, Modbus/TCP protocol, to connect with Ethernet Controller or HMI/SCADA software built with Modbus/TCP driver. Inlog also provides OPC server for Modbus/TCP to integrate EDAM-9000 I/O real-time data value with OPC client enabled software. Users don't need to take care of special driver's development.

1.5 Software Support

Based on the Modbus/TCP standard, the EDAM-9000 firmware is a built-in Modbus/TCP server. Therefore, Inlog provides the necessary DLL drivers, and Windows Utility for users for client data for the EDAM-9000. Users can configure this DA&C system via Windows Utility; integrate with HMI software package via Modbus/TCP driver or Modbus/TCP OPC Server. Even more, you can use the DLL driver and ActiveX to develop your own applications.

1.6 Common technical specification of EDAM-9000

- Ethernet: 10 BASE-T IEEE 802.3 100 BASE-TX IEEE 802.3u
- Wiring: UTP, category 5 or greater
- Bus Connection: RJ45 modular jack
- Comm. Protocol: Modbus/TCP on TCP/IP and UDP
- Data Transfer Rate: Up to 100 Mbps
- Unregulated 10 to 30VDC
- Protection: Over-voltage and power reversal
- Ethernet Communication: 1500 V DC
- I/O Module: 3000 V DC
- Status Indicator: Power, CPU, Communication (Link, Collide, 10/100 Mbps, Tx, Rx)
- Case: ABS with captive mounting hardware
- Plug-in Screw Terminal Block: Accepts 0.5 mm 2 to 2.5 mm 2 , 1 - #12 or 2 - #14 to #22 AWG
- Operating Temperature: - 10 to 70º C (14 to 158º F)
- Storage Temperature: - 25 to 85º C (-13 to 185º F)
- Humidity: 5 to 95%, non-condensing
- Atmosphere: No corrosive gases

NOTE: Equipment will operate below 30% humidity. However, static electricity problems occur much more frequently at lower humidity levels. Make sure you take adequate precautions when you touch the equipment. Consider using ground straps, anti-static floor coverings, etc. if you use the equipment in low humidity environments.

1.7 Dimensions

The following diagrams show the dimensions of the EDAM-9000 I/O module in millimeters.

LED Status of EDAM-9000 I/O Modules

There are two LEDs on the EDAM-9000 I/O Modules front panel. Each LEDs built with two indicators to represent the EDAM-9000 system status, as explained below

- Full: Red indicator. This LED is blanking when EDAM-9000 module is running.
- Link: Red indicator. This LED is normal on whenever the EDAM-9000 module's Ethernet wiring is connected.

1.8 System Requirements

Host computer

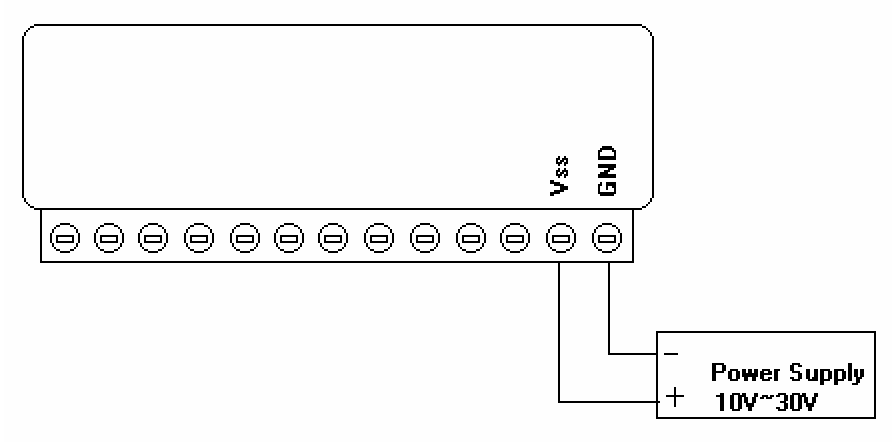
- IBM PC compatible computer with 486 CPU (Pentium is recommended)
- Microsoft 95/98/2000/NT 4.0 (SP3 or SP4)/XP or higher versions
- At least 32 MB RAM
- 20 MB of hard disk space available
- VGA color monitor
- 2x or higher speed CD-ROM
- Mouse or other pointing devices
- 10 or 100 Mbps Ethernet Card
- 10 or 100 Mbps Ethernet Hub (at least 2 ports)
- Two Ethernet Cable with RJ-45 connector
- Power supply for EDAM-9000 (+10 to +30 V unregulated)

1.9 Wiring and Connections

This section provides basic information on wiring the power supply, I/O units, and network connection.

1.10 Power supply wiring

Although the EDAM-9000/TCP systems are designed for a standard industrial unregulated 24 V DC power supply, they accept any power unit that supplies within the range of +10 to +30 V_{DC}. The power supply ripple must be limited to 200 mV peak-to-peak, and the immediate ripple voltage should be maintained between +10 and +30 V_{DC}. Screw terminals +Vs and GND are for power supply wiring.



Note: The wires used should be sized at least 2 mm.

1.11 I/O modules wiring

The system uses a plug-in screw terminal block for the interface between I/O modules and field devices. The following information must be considered when connecting electrical devices to I/O modules.

- The terminal block accepts wires from 0.5 mm to 2.5 mm.
- Always use a continuous length of wire. Do not combine wires to make them longer.
- Use the shortest possible wire length.
- Use wire trays for routing where possible.
- Avoid running wires near high-energy wiring.
- Avoid running input wiring in close proximity to output wiring where possible.
- Avoid creating sharp bends in the wires.

Chapter 2 Specification and wiring

Analog input modules use an A/D converter to convert sensor voltage, current, thermocouple or RTD signals into digital data. The digital data is then translated into engineering units. When prompted by the host computer, the data is sent through a standard 10/100 based-T Ethernet interface. Users would able to read the current status via pre-built web page or any HMI software package supported Modbus/TCP protocol. The analog input modules protect your equipment from ground loops and power surges by providing opto-isolation of the A/D input and trans-former based isolation up to 3,000 V_{DC} .

2.1 EDAM-9015 7-channel RTD Input Module

The EDAM-9015 is a 16-bit, 7-channel RTD input module that provides programmable input ranges on all channels. It accepts Various RTD inputs (PT100, PT1000, Balco 500 & Ni) and provides data to the host computer in engineering units (°C). In order to satisfy various temperature requirements in one module, each analog channel is allowed to configure an individual range for several applications.

EDAM-9015 Specification

Analog Input:

- Effective resolution: 16-bit
- Channels: 7
- Input type: PT100, PT1000, Balco 500 & Ni
- Input range:

  PT100 -50 ~ 150°C ,0 ~ 100°C ,0 ~ 200°C ,0 ~ 400°C ,-200 ~ 200°C ,

  PT1000 -40 ~ 160°C

  Balco 500 -30 ~ 120°C

  Ni -80 ~ 100°C ,0 ~ 100°C
- Isolation voltage: 2000
- Sampling rate: 12 samples/sec.
- Input impedance: 10 W
- Accuracy: ±0.05% or better
- Zero drift: ±3 μV/° C
- Span drift: ±25 ppm/° C
- CMR @ 50/60 Hz: 150 dB

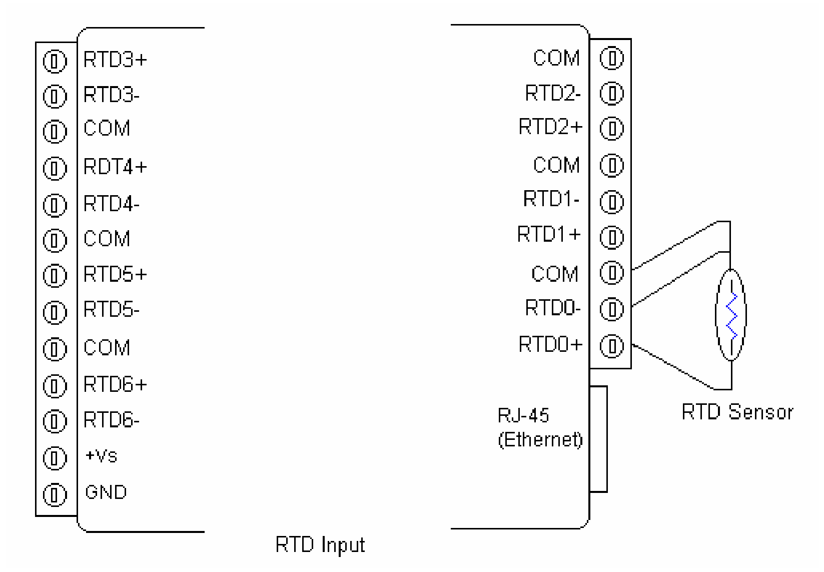
NMR @ 50/60 Hz: 100 dB

Built-in Watchdog Timer

Power requirements: Unregulated +10 ~ +30 VDC

Power consumption: 2W

Application Wiring



Assigning ModBus address

Based on the Modbus/TCP standard, the addresses of the I/O channels in EDAM-9000 modules you place in the system are defined by a simple rule. Please refer to 6.5to map the I/O address.

2.2 EDAM-9017 8-channel Analog Input with 2/DO Module

The EDAM-9017 is a 16-bit, 8-channel analog differential input module that provides programmable input ranges on all channels. It accepts millivoltage inputs (±100mV, ±500mV), voltage inputs (±1V, ±5V and ±10V) and current input (±20 mA, 4~20 mA) and provides data to the host computer in engineering units (mV, V or mA). In order to satisfy all plant needs in one module, EDAM-9017 has designed with 8 analog inputs and 2 digital outputs. Each analog channel is allowed to configure an individual range for variety of applications.

EDAM-9017 Specification

Analog Input:

- Effective resolution: 16-bit
- Channels: 8 differential
- Input type: mV, V, mA
- Input range: ±150 mV, ±500 mV, 0-5 V, ±10 V, 0-20 mA, 4-20 mA
- Isolation voltage: 3000 V_{DC}
- Fault and overvoltage protection: Withstands overvoltage up to ±35 V
- Sampling rate: 10 samples/sec.
- Input impedance: 20 MW
- Bandwidth: 13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- Accuracy: ±0.1% or better
- Zero drift: ±6 μV/¢X C
- Span drift: ±25 ppm/° C
- CMR @ 50/60 Hz: 92 dB min.

Digital Output:

- Channel: 2
- Open Collector to 30 V, 200 mA max. load
- Optical Isolation: 5000VRMS

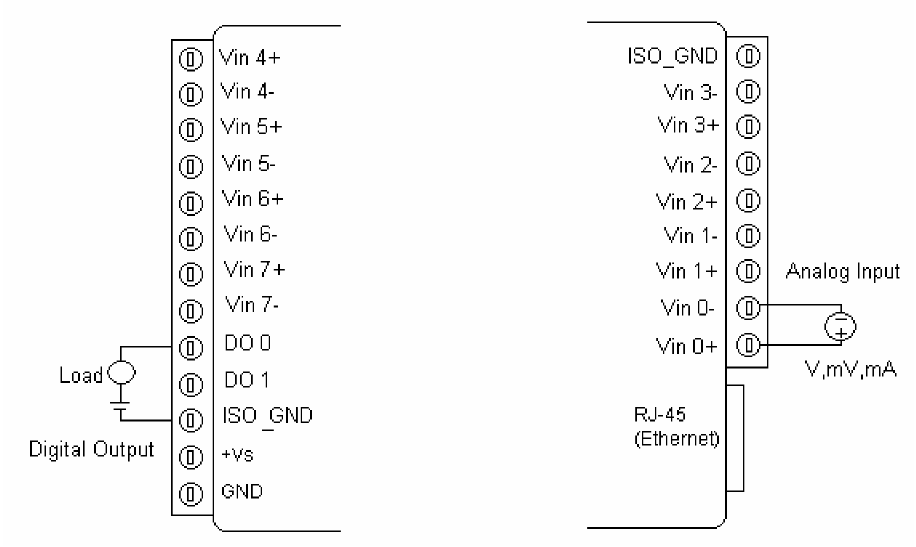
Built-in Watchdog Timer

Power requirements: Unregulated +10 ~ +30 VDC

Power consumption: 2 W

Application Wiring

EDAM-9017 has built with a 120 Ω resistor in each channel; users do not have to add any resistors in addition for current input measurement. Just adjust the jumper setting to choose the specific input type you need. Refer to Fig 2-1, each analog input channel has built-in a jumper on the PCB for users to set as a voltage mode or current mode.



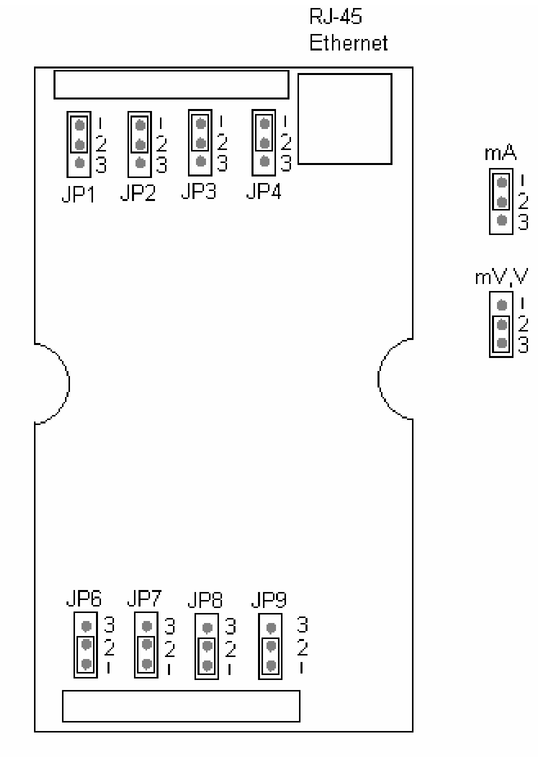


Fig 2-1

Assigning ModBus address

Basing on Modbus/TCP standard, the addresses of the I/O channels in EDAM-9000 modules you place in the system are defined by a simple rule. Please refer the 6.5to map the I/O address.

2.3 EDAM-9019 8-channel T/C Input with 2/DO Module

The EDAM-9019 is a 16-bit, 8-channel Thermocouple input module that provides programmable input ranges on all channels. It accepts Various Thermocouple inputs (Type J, K, T, E, R, S, B) and provides data to the host computer in engineering units (o C). In order to satisfy various temperature requirements in one module, each analog channel is allowed to configure an individual range for several applications.

EDAM-9019 Specification

Analog Input:

- Effective resolution: 16-bit
- Channels: 8
- Input type: J, K, T, E, R, S, B
- Input range:

  J type: 0 ~ 760 o C

  K type: 0 ~ 1370 o C

  T type:-100 ~ 400 o C

  E type: 0 ~ 1000 o C

  R type:500 ~ 1750 o C

  S type:500 ~ 1750 o C

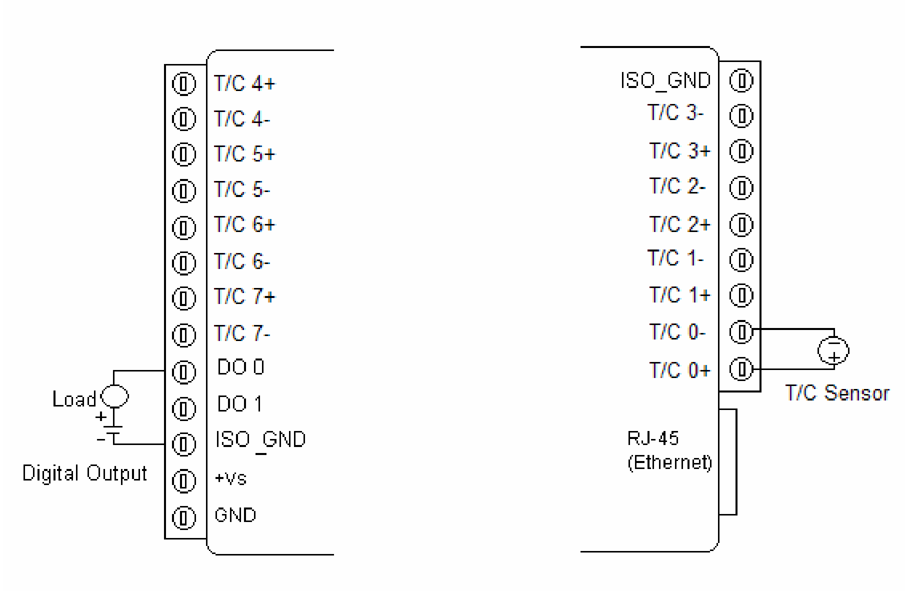
  B type:500 ~ 1800 o C
- Output Type: 8 channels, Open Collect to 30Vdc/100mA(max), 400mA(max) for all DO
- Isolation voltage: 2000 VDC
- Sampling rate: 10 samples/sec.
- Input impedance: 10 W
- Accuracy: ±0.15% or better
- Zero drift: ±6 µV/° C
- Span drift: ±25 ppm/° C
- CMR @ 50/60 Hz: 92 dB

Built-in Watchdog Timer

Power requirements: Unregulated +10 ~ +30 VDC

Power consumption: 2 W/Typical, 3W/max

Application Wiring



Assigning ModBus addresses

Based on the Modbus/TCP standard, the addresses of the I/O channels in EDAM-9000 modules you place in the system are defined by a simple rule. Please refer to6.5to map the I/O address.

2.4 EDAM-9050 18-channel Digital I/O Module

The EDAM-9050 is a high-density I/O module built-in a 10/100 based-T interface for seamless Ethernet connectivity. It provides 12 digital input and 6 digital output channels with 5000V$_{RMS}$ Isolating protection. All of the Digital Input channels support input latch function for important signal handling. Mean while, these DI channels allow to be used as 1 KHz counter. Opposite to the intelligent DI functions, the Digital Output channels also support pulse output function.

EDAM-9050 Specification

Digital input:

- Channel: 12
- I/O type: 12 DI & 6 DO
- Digital Input: Dry Contact:

  Logic level 0: Close to GND

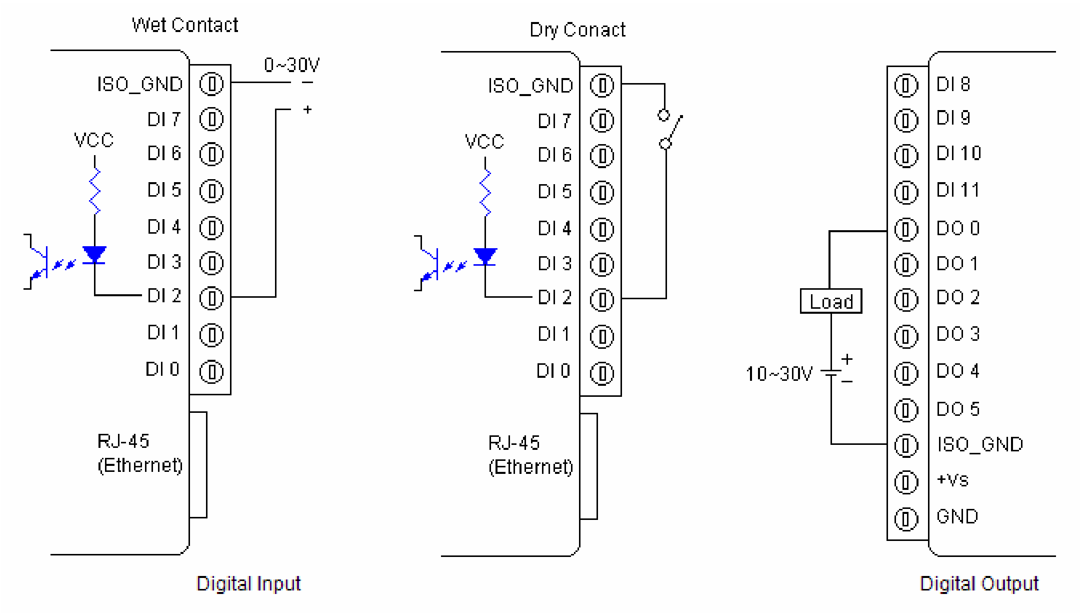
  Logic level 1: Open (Logic level status can be inversed by Utility)

Digital Output:

- Channel: 6
- Open Collector to 30 V 200 mA max. load
- Optical Isolation: 5000V$_{RMS}$

Power Consumption: 2 W (Typical)

Application Wiring



Assigning ModBus address

Basing on Modbus/TCP standard, the addresses of the I/O channels in EDAM-9000 modules you place in the system are defined by a simple rule. Please refer the6.5. All Digital Input channels in EDAM-9050 are allowed to use as 32-bit counters (Each counter is consisted of two addresses, Low word and High word).

2.5 EDAM-9051 18-channel Digital I/O Module

The EDAM-9051 is a high-density I/O module built-in a 10/100 based-T interface for seamless Ethernet connectivity. It provides 12 digital input, 2 digital output, and 2 counter (10 KHz) channels with 5000V_{RMS} Isolating protection. All of the Digital Input channels support input latch function for important signal handling. Mean while, these DI channels allow to be used as 1 KHz counter. Opposite to the intelligent DI functions, the Digital Output channels also support pulse output function.

EDAM-9051 Specification

Channel: 16

- I/O type: 12DI / 2DO / 2Counter

Digital Input:

- Dry Contact: Logic level 0: Close to GND
- Logic level 1: Open (Logic level status can be inversed by Utility)

Digital Output:

- Open Collector to 30 V 200 mA max. load
- Optical Isolation: 5000V_{RMS}

Counter:

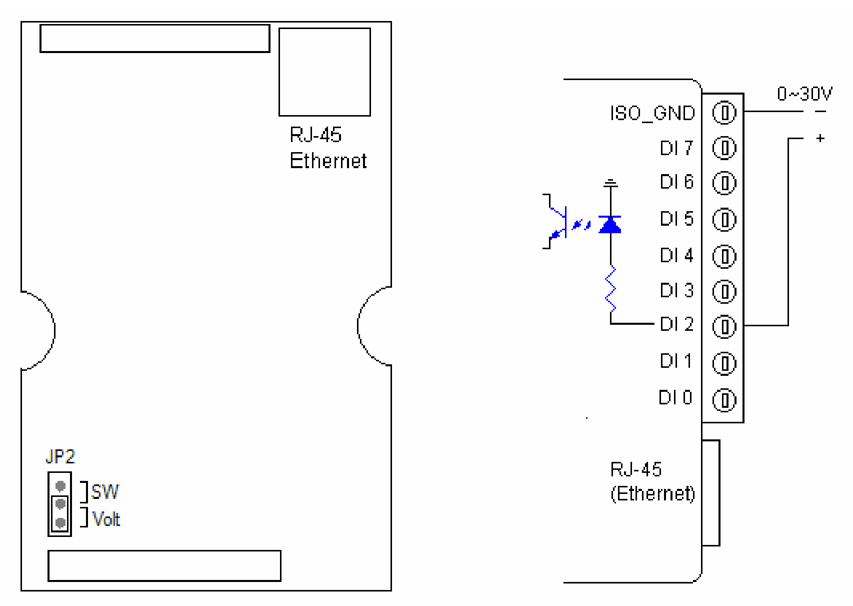
- Maximum Count: 4,294,967,285(32 bit)
- Input frequency: 0.3 ~ 1000 Hz max. (frequency mode) 5000 Hz max. (counter mode)
- Isolation voltage: 2500 V_{RMS}
- Mode: Counter (Up/Down, Bi-direction), Frequency

Power Consumption: 2 W (Typical)

Application Wiring

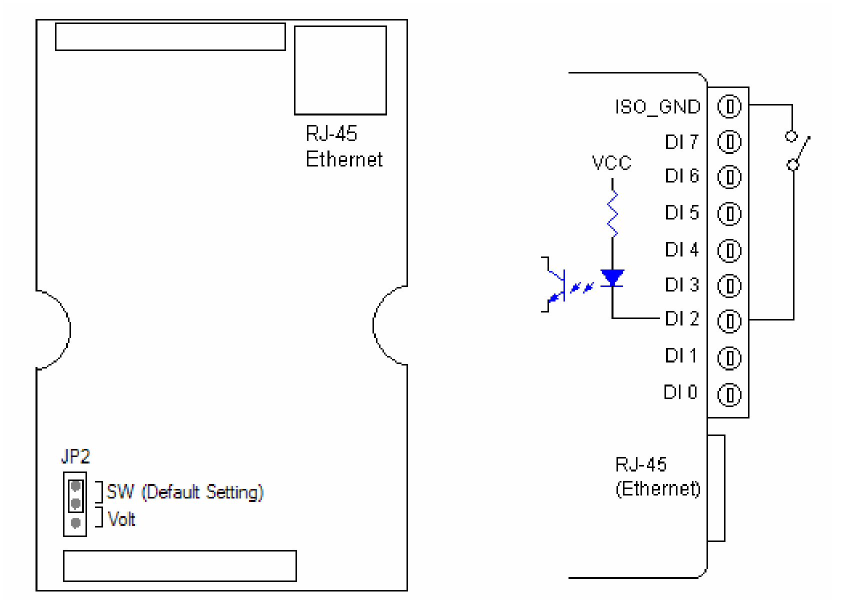
User need to adjust the jumper (JP2) setting to choose the input type as shown bwlows:

1. Voltage Input(Wet Contact) type:



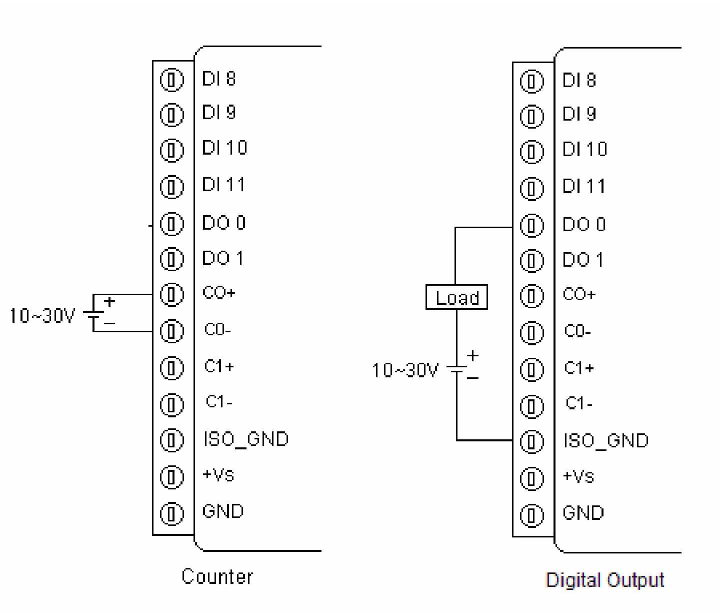
Digital Input (Voltage Input)

2. Switch Input(Dry Contact) type:



Digital Input (Switch Input)

3. Digital Counter and Output type:



Assigning ModBus address

Basing on Modbus/TCP standard, the addresses of the I/O channels in EDAM-9000 modules you place in the system are defined by a simple rule. Please refer the 6.5to map the I/O address

All Digital Input channels in EDAM-9051 are allowed to use as 32-bit counters (Each counter is consisted of two addresses, Low word and High word). Users could configure the specific DI channels to be counters via Windows Utility. The I/O address will be mapped as Figures

2.6 EDAM-9052 18-channel Digital I/O Module

The EDAM-9052 is a high-density digital I/O module designed with a 10/100 based-T interface for seamless Ethernet connectivity. It provides 8 digital input channels, and 8 digital output channels. All of the digital input channels support the input latch function for important signal handling. The digital output channels support source type output.

EDAM-9052 Specification

I/O Type: 8 DI/ 8 DO

Digital Input:

- Dry Contact :

  Logic level 0 : Close to GND

  Logic level 1 : Open

- Wet Contact :

  Logic level 0 : +3 Vmax

  Logic level 1 : +10 to 30 Vdc

Digital Output:

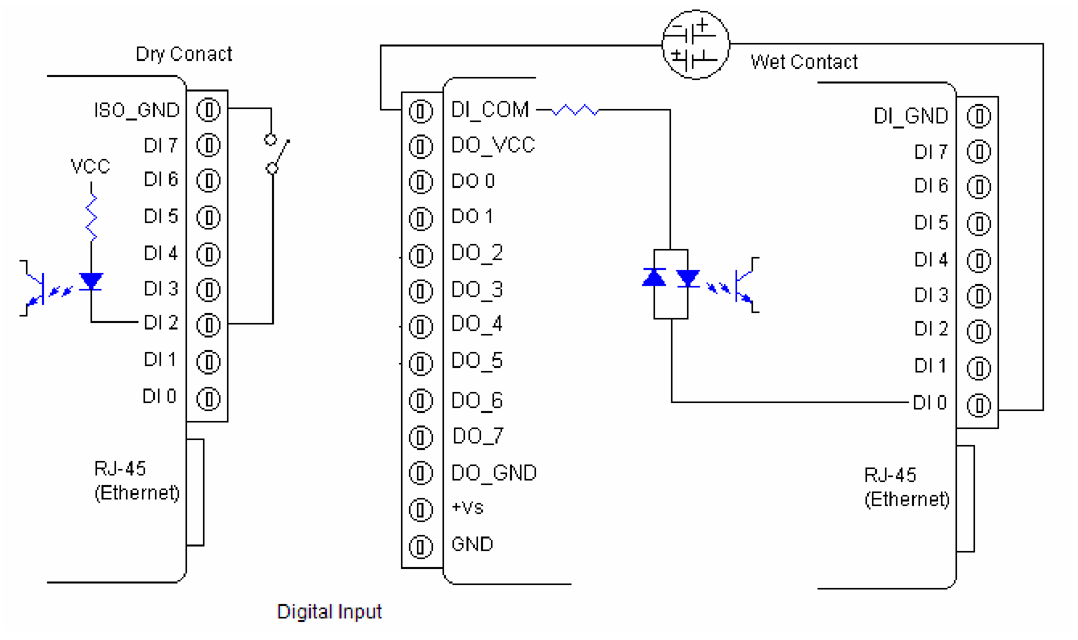
- Source Type : 24Vdc, 1 A

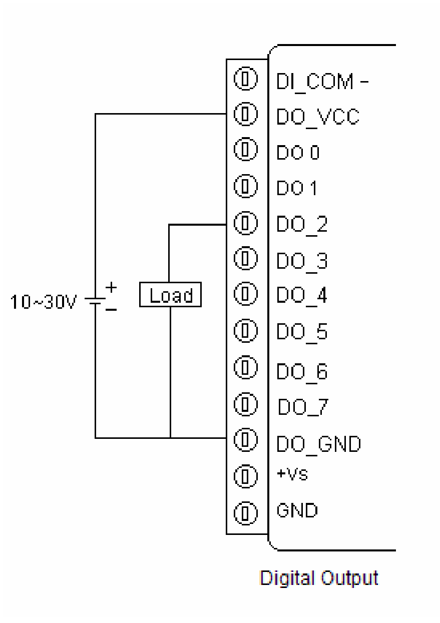
Optical Isolation: 2000 VDC

Power requirements: Unregulated +10 ~ +30 VDC

Power consumption: 2 W

Application Wiring





Assigning ModBus addresses

Based on Modbus/TCP, the addresses of the I/O channels in EDAM-9000 modules are defined by a simple rule. Please refer to 6.5to map the I/O address. All digital input channels in EDAM-6052 are allowed to use as 32-bit counters (Each counter is consisted of two addresses, Low word and High word). Users could configure the specific DI channels to be counters via Windows Utility. (Refer to Section 5.3)

Chapter 3 EDAM-9000 Utility Guide

In order to properly configure EDAM series. You will need following items to complete your system hardware configuration.

3.1 System Requirement

Host computer

- IBM PC compatible computer with 486 CPU (Pentium is recommended)
- Microsoft 95/98/2000/NT 4.0 (SP3 or SP4) or higher versions
- At least 32 MB RAM
- 20 MB of hard disk space available
- VGA color monitor
- 2x or higher speed CD-ROM
- Mouse or other pointing devices
- 10 or 100 Mbps Ethernet Card
- 10 or 100 Mbps Ethernet Hub (at least 2 ports)
- Two Ethernet Cable with RJ-45 connector
- Power supply for EDAM-9000 (+10 to +30 V unregulated)
- Make sure to prepare all of the items above, then connect the power and network wiring as Figure 3-1 Power wiring.

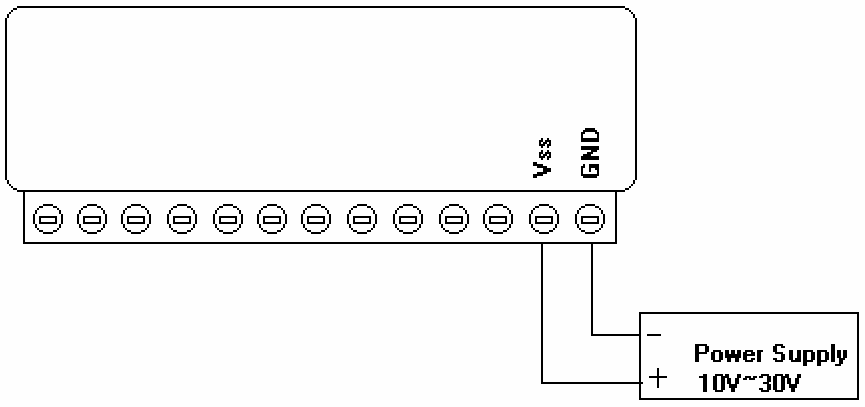


Figure 3-1 Power wiring

3.2 Install Utility Software on Host PC

Inlog provide free download Manual and Utility software for EDAM-9000 modules' operation and configuration. Link to the web site: www.inlog.com.tw and click into the "Download Area" to get the latest version EDAM-9000 manual and Ethernet I/O Utility. Once you download and setup the Utility software, there will be a shortcut of the Utility executive program on Windows' desktop after completing the installation.

3.3 EDAM Ethernet I/O Utility Overview

The Utility software offers a graphical interface that helps you configure the EDAM-9000 modules. It is also very convenient to test and monitor your remote DAQ system. The following guidelines will give you some brief instructions on how to use this Utility.

- Main Menu
- Network Setting
- Adding Remote Station
- Security setting
- I/O Module Configuration
- Alarm Setting
- I/O Module Calibration
- Security Setting
- Terminal emulation
- Data/Event Stream

3.4 Main Menu

Double Click the icon of EDAM Ethernet I/O Utility shortcut, the Operation screen will pop up as Figure3-2.

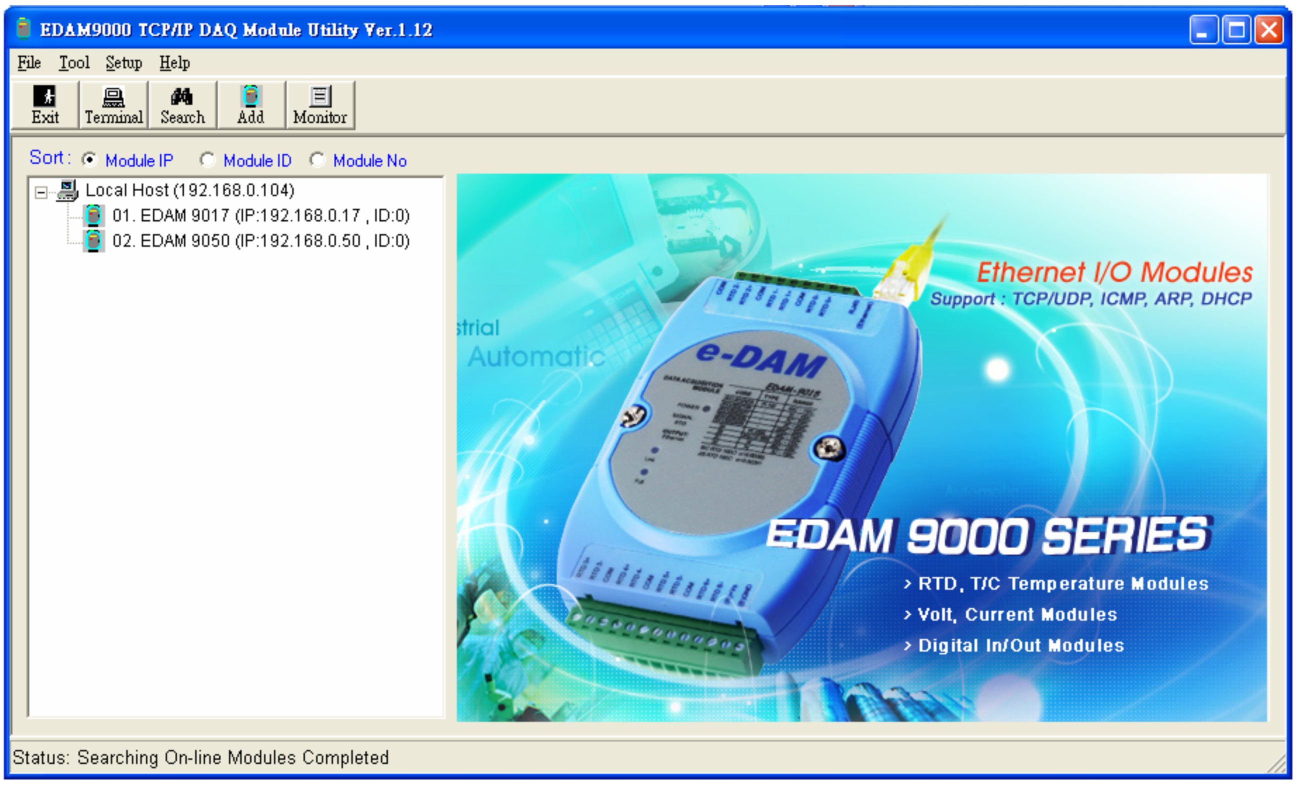

EDAM9000 TCP/IP DAQ Module Utility Ver.1.12
File Tool Setup Help
Exit Terminal Search Add Monitor
Sort: Module IP Module ID Module No
Local Host (192.168.0.104)
01. EDAM 9017 (IP:192.168.0.17 , ID:0)
02. EDAM 9050 (IP:192.168.0.50 , ID:0)
Ethernet I/O Modules
Support : TCP/UDP, ICMP, ARP, DHCP
EDAM 9000 SERIES
› RTD, T/C Temperature Modules
› Volt, Current Modules
› Digital In/Out Modules
Status: Searching On-line Modules Completed

Figure3-2 main window

The top of the operation screen consists of a function menu and a tool bar for user's commonly operating functions.

3.5 Function Menu

- **File** contents "Exit" Function, using to exit this Utility program.
- **Tool** contents functions as below:

  Search for Ethernet Device Search all EDAM-9000 units in the specific Ethernet domination. (The same with host PC's Ethernet domination)

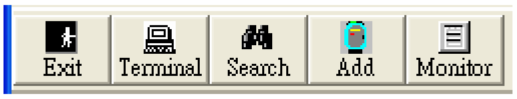
  Add Remote Ethernet Device: Create a new EDAM-9000 module located in other Ethernet domination, both available to local LAN and Internet application.

  Monitor Stream/Event Data: comes from the remote I/O module

  Terminal: Call up the operation screen of Terminal emulation to do the request / response command execution.
- **Setup:** Contents Timeout and Scan Rate setting functions. Please be aware of the time setting for other Ethernet domination usually longer than local network.
- **Help:** Contents on-line help function as user's operation guide; the item **About** contents information about software version, released date, and support modules.

3.6 Tool Bar

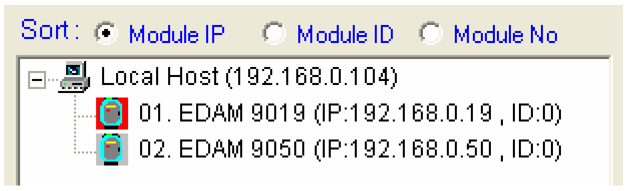
There are five push buttons in the tool bar.



- **Exit:** Exit utility program
- **Terminal:** Terminal emulation
- **Search:** Search EDAM module
- **Add:** Add remote EDAM I/O module
- **Monitor:** Monitor the Stream/Event Data
-

3.7 List Sort

The searched units will be listed in the tree-structure display area in order by "**Sort**" selection



Sort: [✓ Module IP] Module ID Module No

Local Host (192.168.0.104)
01. EDAM 9019 (IP:192.168.0.19 , ID:0)
02. EDAM 9050 (IP:192.168.0.50 , ID:0)

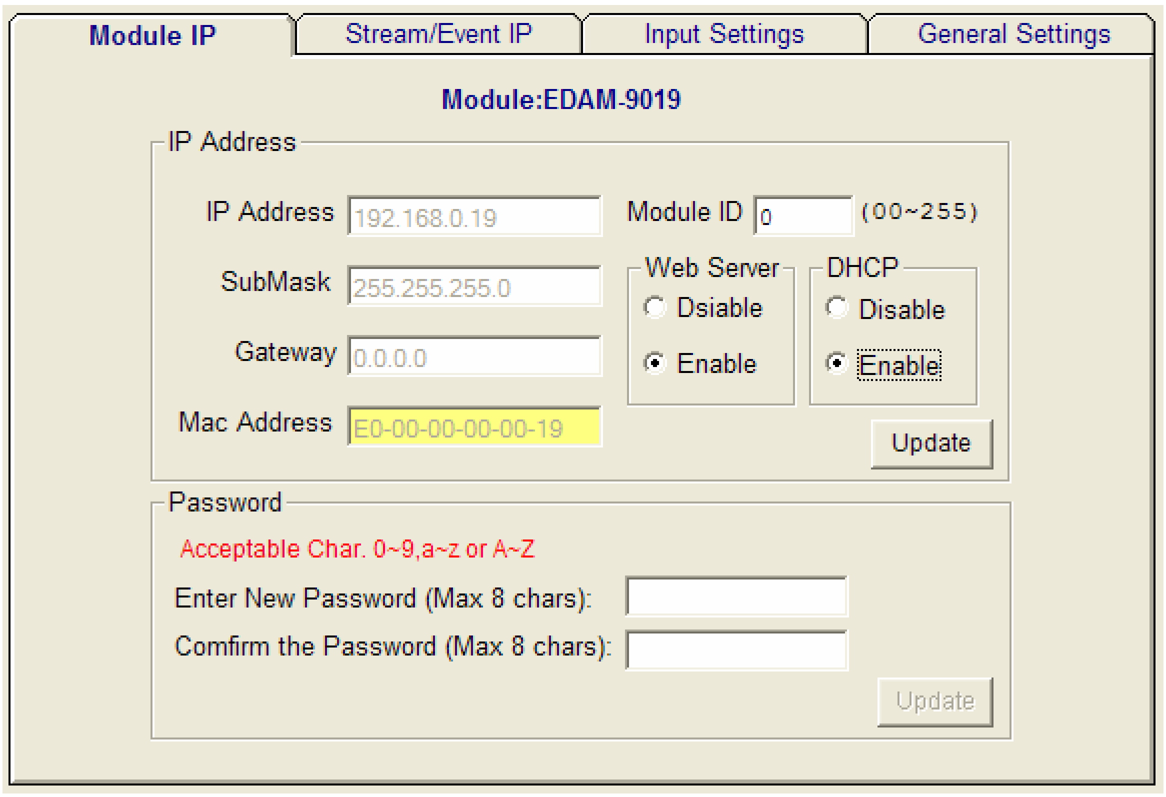
- **Moudle IP:** Sort by moudle IP
- **Module ID:** Sort by module ID
- **Module No:** Sort by module name

3.8 Network Setting

As the moment you start up this Windows Utility, it will search all EDAM-9000 I/O modules on the host PC's domination Ethernet network automatically. Then the tree-structure display area will appeal with the searched units and the relative IP address.

Since Utility software detects the EDAM-9000 on the network, user can begin to setup each unit.

Choose any one I/O module listed on the tree-structure display area and entry the correct password. The module basic configuration table is listed as shown in for setting



Module:EDAM-9019

IP Address

IP Address 192.168.0.19

SubMask 255.255.255.0

Gateway 0.0.0.0

Mac Address E0-00-00-00-00-19

Module ID 0 (00~255)

Web Server: Dsiable [✓ Enable]

DHCP: Disable [✓ Enable]

Password

Acceptable Char. 0~9,a~z or A~Z

Enter New Password (Max 8 chars):

Comfirm the Password (Max 8 chars):

Figure 3-3

3.8.1 Module IP

MAC Address:

This is also called Ethernet address and needs no further configuration.

IP Address, Subnet Mask, and Default Gateway: (default 10.0.0.1, 255.0.0.0 and 0.0.0.0)

The IP address identifies your EDAM-9000 devices on the global network. Each EDAM-9000 has same default IP address **10.0.0.1**. Therefore, *please do not initial many EDAM-9000 at the same time to avoid the Ethernet collision*. If you want to configure the EDAM-9000 in the host PC's dominating network, only the IP address and Subnet Mask will need to set (The host PC and EDAM Ethernet I/O must belong to same subnet Mask).

If you want to configure the EDAM-9000 via Internet or other network domination, you have to ask your network administrator to obtain a specific IP and Gateway addresses, and then configure each EDAM-9000 with the individual setting.

DHCP: (default Enabled)

Allow you to get IP address from the DHCP servo without setting IP address by manual. ***DHCP is default enabled***

Web Server: (default Enabled)

Allow you monitor and control I/O status on EDAM-9000 modules remotely through web browser.

Module ID: (default 00)

Each module must has a unique ID number to be identified when the DHCP enabled, because you would not know the module IP address when DHCP enabled, but if with the different ID number. You can call provided function call(TCP_GetIPFromID) to get correct IP address for each ID number

Password: (default 00000000)

Allow you to change the password of the module

3.8.2 Stream/Event IP

Stream/Event Enable Setting: (default all disabled)

Set Stream /Event data Destination IP

Avtive Stream time inetval: (default 1 sec)

set time interval for sending stream data

3.8.3 Input or Output Settings:

Configure Input or output channel type

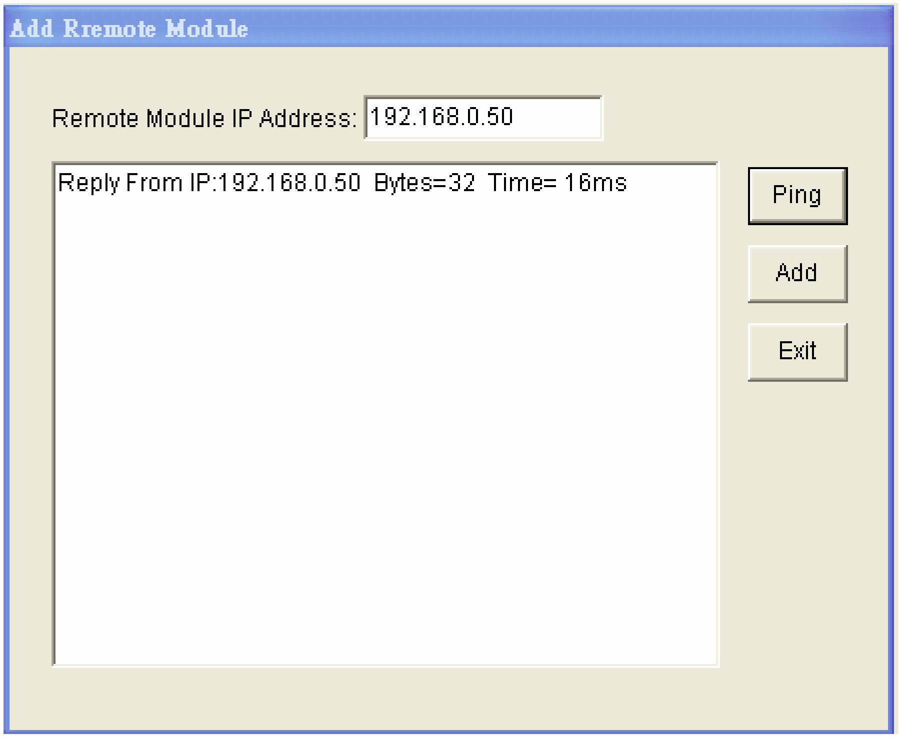
3.8.4 General Settings:

Misc. settings and status (value) display

3.9 Add Remote Stations

To meet the remote monitoring and maintenance requirements, The EDAM-9000 system does not only available to operate in local LAN, but also allowed to access from Internet or Intranet. Thus users would able to configure an EDAM-9000 easily no matter how far it is.

Select item **Tool**\Add Remote Ethernet I/O in function menu or click the button, the adding station screen will pop up as Figure3-4. Then key-in the specific IP address and click the **"Ping"** button. If the communication success, click **"Add"** to add EDAM Ethernet I/O unit into the tree-structure display area.



Reply From IP:192.168.0.50 Bytes=32 Time= 16ms

Figure3-4 Add remote module

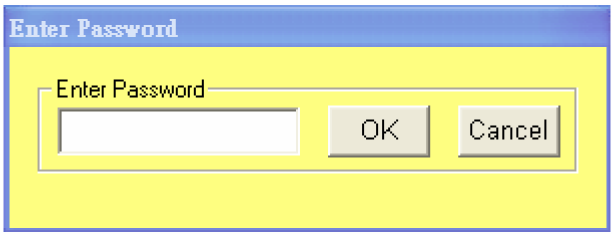
Note:

There is several conditions need to be sure before adding a remote EDAM-9000 system in the windows Utility.

- Be sure the specific IP is existed and available.
- Be sure to complete the network linkage for both sides.
- Be sure to adjust the best timing of timeout setting.
- Even you are not sure whether the communication is workable or not, there is also a **"Ping"** function for testing the network connection.

3.10 Security Setting

Though the technology of Ethernet discovered with great benefits in speed and integration, there also exist risk about network invading form anywhere. For the reason, the security protection design has built-in EDAM-9000 I/O modules. Once user setting the password into the EDAM-9000 firmware, the important system configurations (Network, Firmware, Password) are only allowed to be changed by password verification.



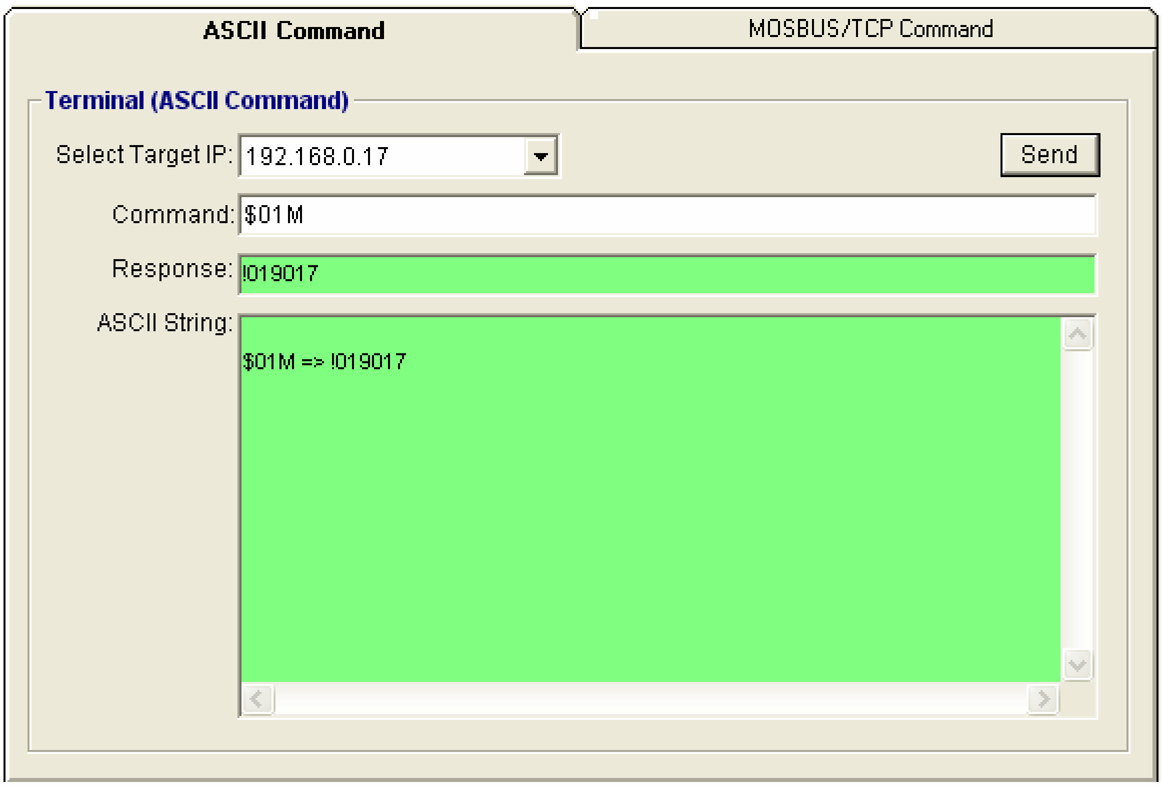
Note:

The default password of EDAM-9000 is "**00000000**". Please make sure to keep the correct password by yourself. If you lose it, please contact to Inlog's technical support center for help.

3.11 Terminal Emulations

You can issue commands and receive response by clicking the Terminal button on the tool bar. There are two kinds of command format supported by this emulating function. Users can choose ASCII or ModBus Hexadecimal mode as their communication base. If the ASCII mode has been selected, the Windows Utility will translate the request and response string in ASCII format.

ASCII Command mode: shown as Figure 3-5.



Select Target IP: 192.168.0.17

Command: $01M

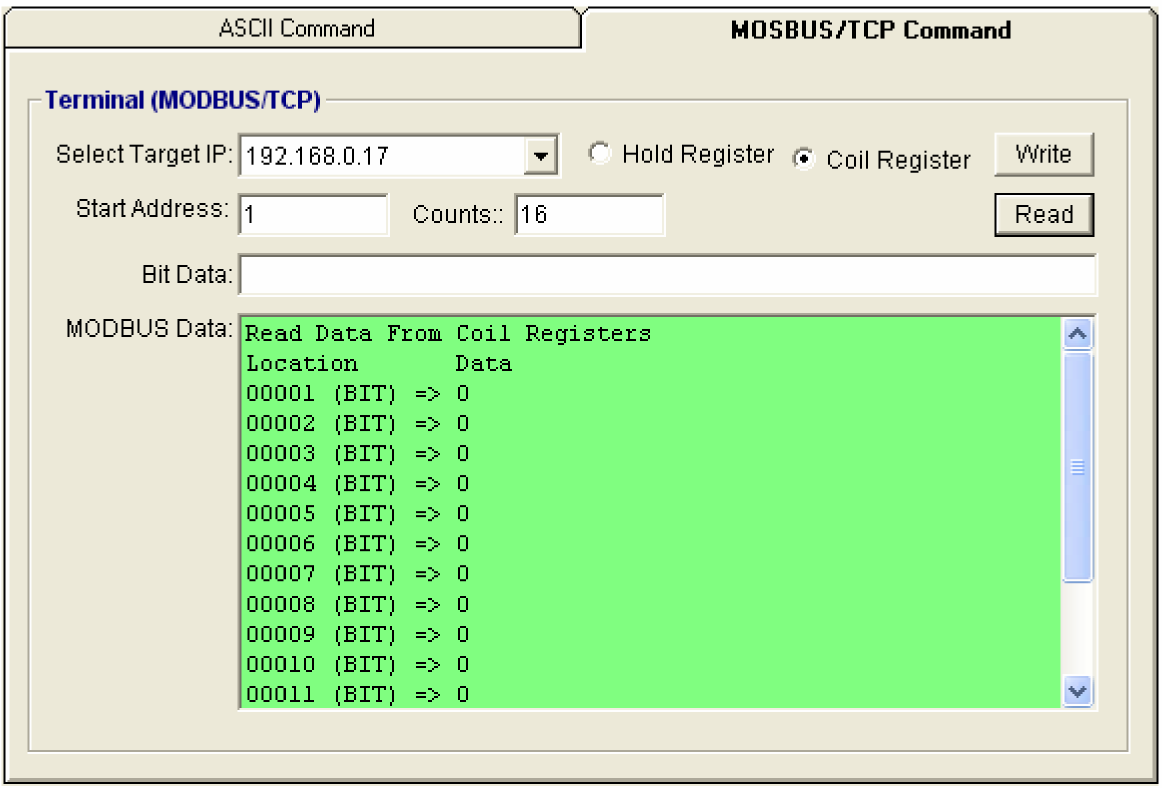
Response: !019017

ASCII String:

```
$01M => !019017
```

Figure 3-5 ASCII Command Terminal

ModBus Hexadecimal mode: shown as Figure 3-6.



Select Target IP: 192.168.0.17

Hold Register [✓ Coil Register]

Start Address: 1

Counts:: 16

Bit Data:

MODBUS Data:

```
Read Data From Coil Registers
Location       Data
00001 (BIT) => 0
00002 (BIT) => 0
00003 (BIT) => 0
00004 (BIT) => 0
00005 (BIT) => 0
00006 (BIT) => 0
00007 (BIT) => 0
00008 (BIT) => 0
00009 (BIT) => 0
00010 (BIT) => 0
00011 (BIT) => 0
```

Figure 3-6 ModBus Terminal

3.12 Data /Event Stream

Data Stream Configuration

In addition to TCP/IP communication protocol, EDAM-9000 supports UDP communication protocol to regularly broadcast data to specific host PCs. Click the tab of Data Stream, then configure the broadcasting interval and the specific IP addresses which need to receive data from the specific EDAM-9000 I/O module. This UDP Data Stream function broadcasts up to 8 host PCs simultaneously, and the interval is user-defined from 50ms to 7 Days.

Event Stream Configuration

In addition to TCP/IP communication protocol, EDAM-9000 supports UDP communication protocol to regularly broadcast data to specific host PCs. Click the tab of Data Stream, then configure the broadcasting interval and the specific IP addresses which need to receive data from the specific EDAM-9000 I/O module. This UDP Data Stream function broadcasts up to 8 host PCs simultaneously, and the interval is user-defined from 50ms to 7 Days.

Data Stream Monitoring

After finishing the configuration of Data Stream, you can select the tab "Stream Monitor" in the function bar or click icon to call up operation display as Figure 3-7 Stream display.

Select the IP address of the EDAM-9000 you want to read data, then click "**Start** " button. The Utility software will begin to receive the stream data on this operation display.

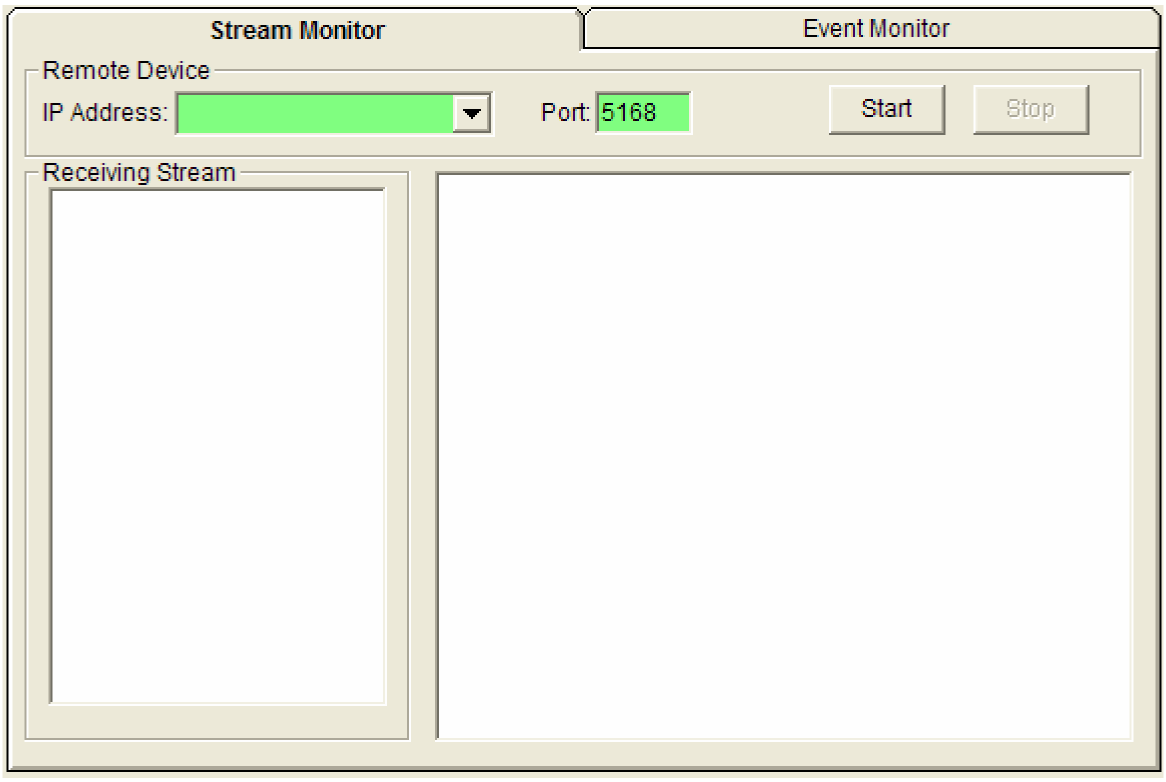


Figure 3-7 Stream display

Data Event Monitoring

After finishing the configuration of Data Event, you can select the tab "Event Monitor" in the function bar or click icon to call up operation display as Figure 3-8 Event display.

Select the IP address of the EDAM-9000 you want to read data, then click "**Start**" button. The Utility software will begin to receive the stream data on this operation display.

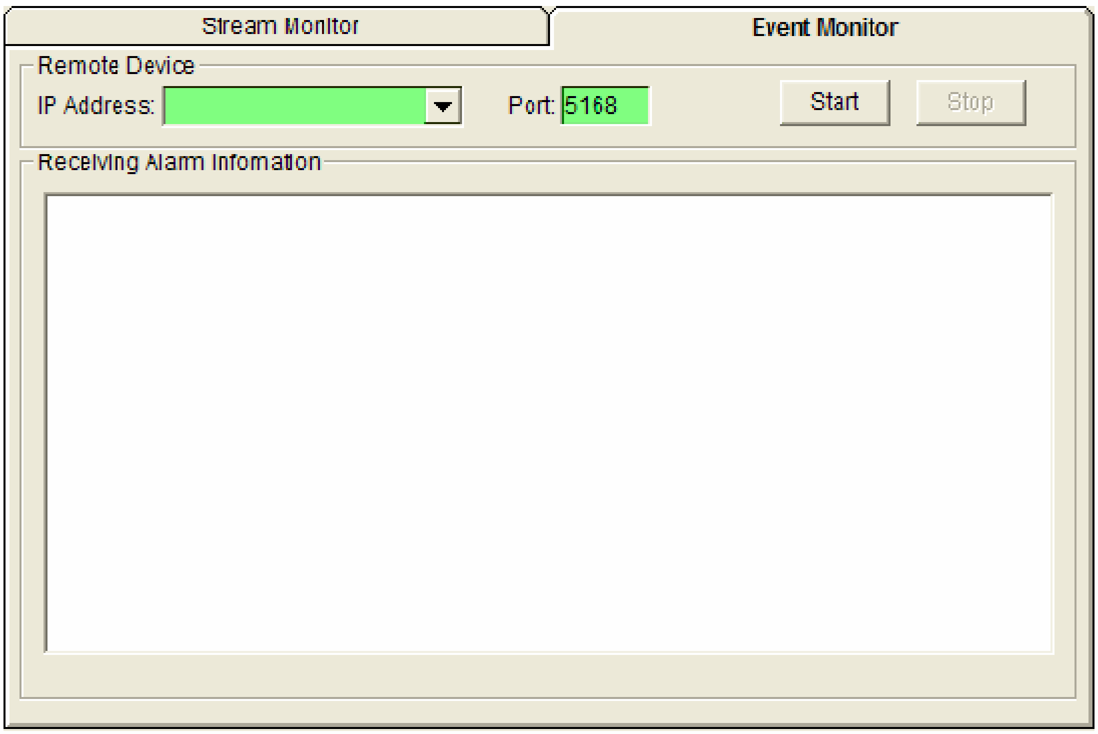
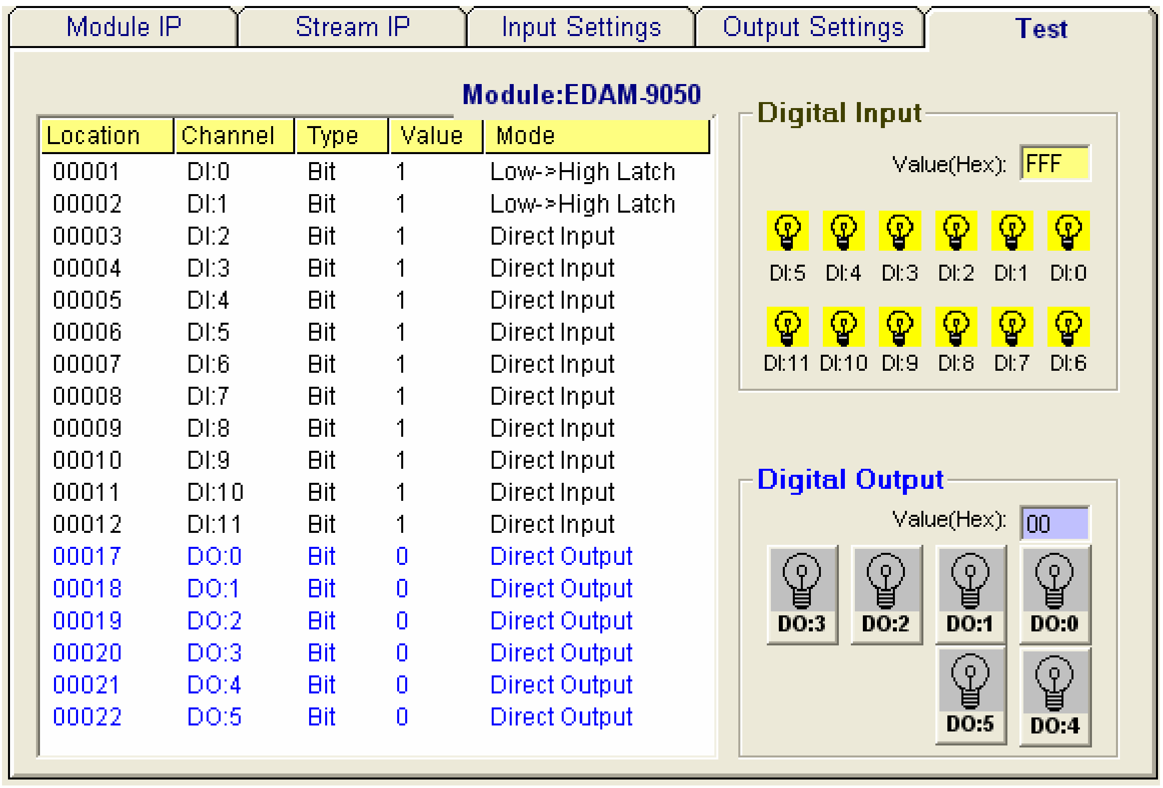


Figure 3-8 Event display

3.13 I/O Module Configurations

3.13.1 Digital Input/Output Module

Selecting EDAM-9000 Digital Modules and select "**Test**" tab, user can read following information from the Utility.



Module:EDAM-9050

Location	Channel	Type	Value	Mode
00001	DI:0	Bit	1	Low->High Latch
00002	DI:1	Bit	1	Low->High Latch
00003	DI:2	Bit	1	Direct Input
00004	DI:3	Bit	1	Direct Input
00005	DI:4	Bit	1	Direct Input
00006	DI:5	Bit	1	Direct Input
00007	DI:6	Bit	1	Direct Input
00008	DI:7	Bit	1	Direct Input
00009	DI:8	Bit	1	Direct Input
00010	DI:9	Bit	1	Direct Input
00011	DI:10	Bit	1	Direct Input
00012	DI:11	Bit	1	Direct Input
00017	DO:0	Bit	0	Direct Output
00018	DO:1	Bit	0	Direct Output
00019	DO:2	Bit	0	Direct Output
00020	DO:3	Bit	0	Direct Output
00021	DO:4	Bit	0	Direct Output
00022	DO:5	Bit	0	Direct Output

Digital Input Value(Hex): FFF

Digital Output Value(Hex): 00

Figure 3-9 ModBus location and I/O status

Digital I/O Module Configuration

Location: Standard Modbus address. EDAM Ethernet I/O Utility shows the Modbus mapping address of each I/O channel. (Please refer to E9K_Modbus.pdf file) And the addresses will be the indexes for applying into the database of HMI or OPC Server.

Channel: Indicate the channel number of digital I/O module

Type: Data Type of the I/O channel. The data type of Digital I/O modules is always "Bit".

Value: The current status on each channel of I/O Module. The value of digital I/O modules could be "0" (OFF) or "1" (ON).

Mode: Describes the I/O types of the specific module. In addition to monitor the current DI/DO status, the Windows Utility offers a graphical operating interface as Figure3-10. You can read the Digital input status through the change of the indicator icons. Oppositely, you can write the digital output status through clicking the indicator icons.

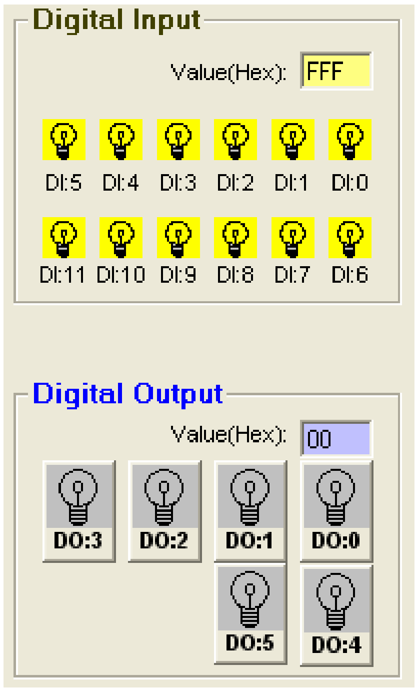


Figure3-10 DI/O status display

The digital input channels support counter and signal latch functions. Click the specific channel, there will be four working modes for choosing.

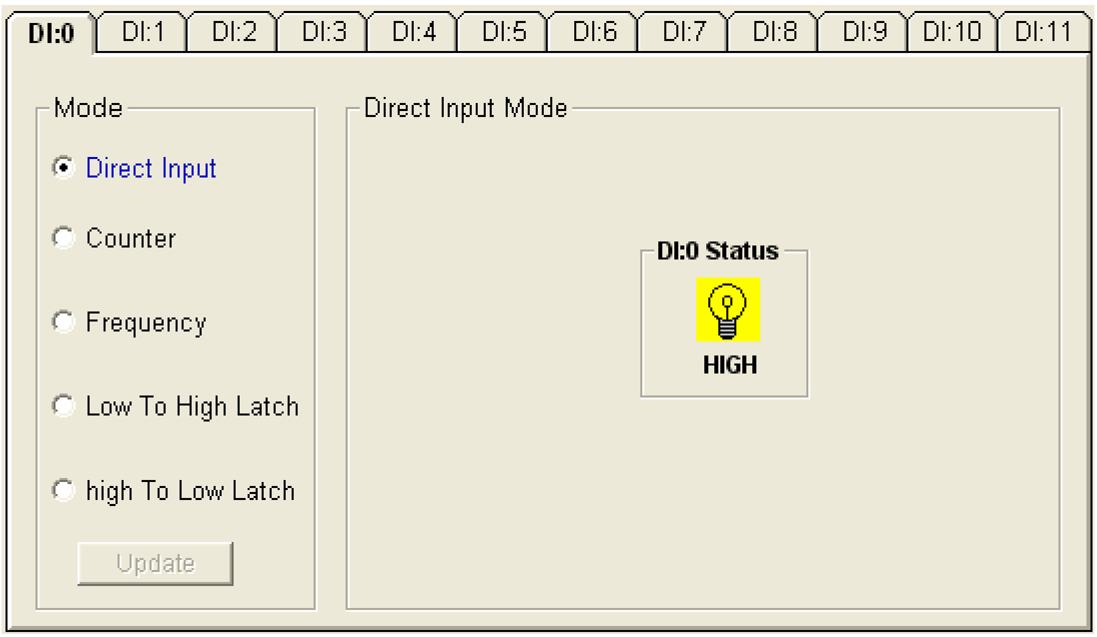
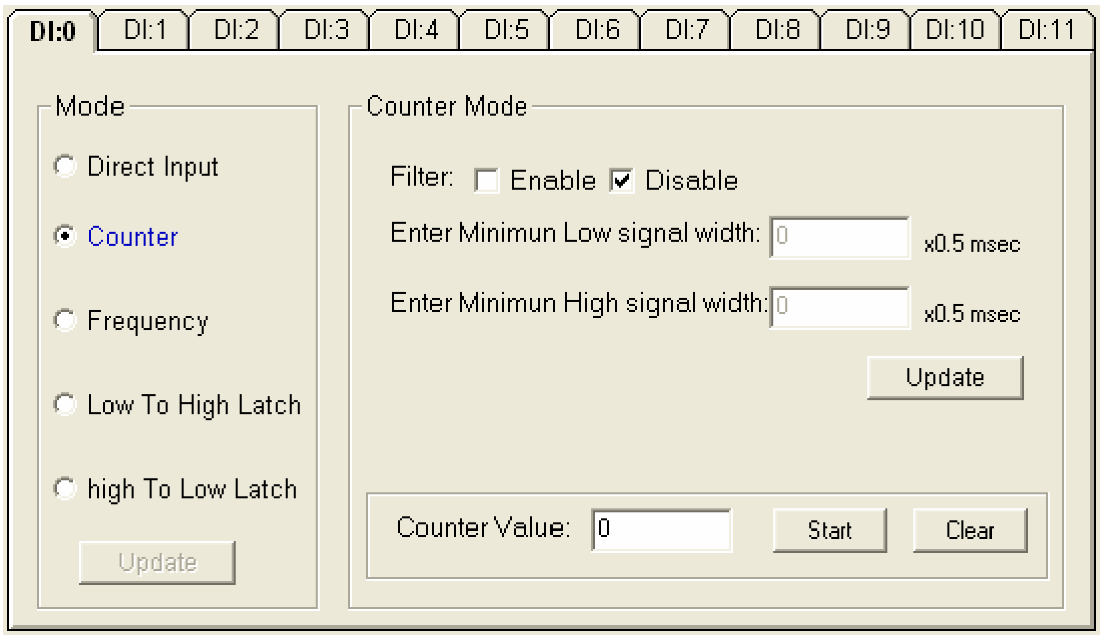


Figure 3-11 Direct input mode



Mode: Direct Input [✓ Counter] Frequency Low To High Latch high To Low Latch

Counter Mode

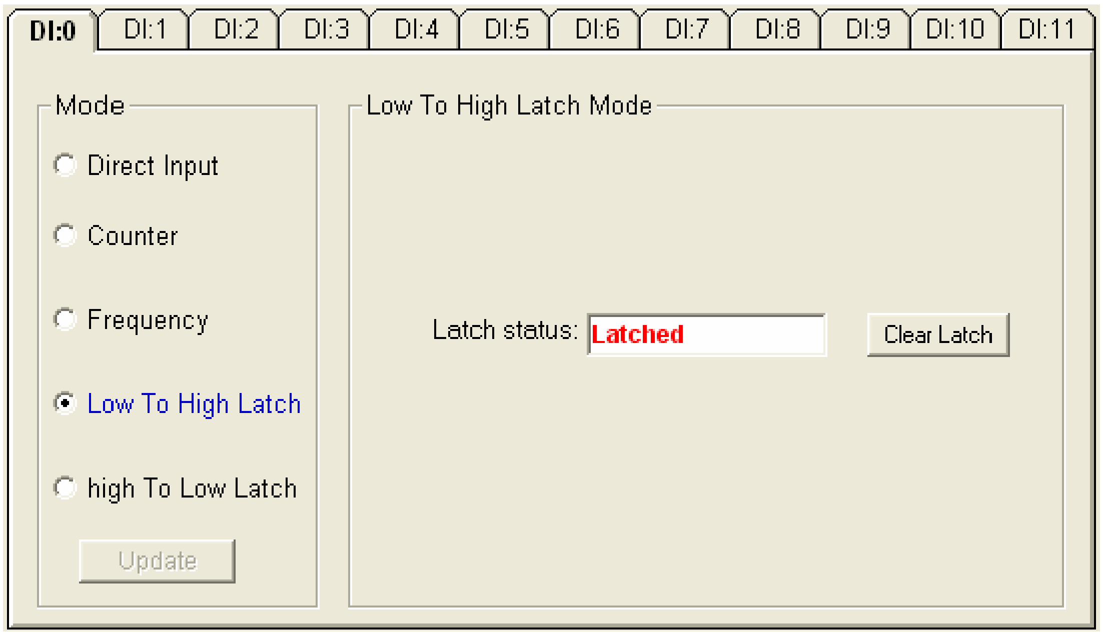
Filter: Enable [✓ Disable]

Enter Minimun Low signal width: 0 x0.5 msec

Enter Minimun High signal width: 0 x0.5 msec

Counter Value: 0

Figure 3-12 Counter setting



Mode: Direct Input Counter Frequency [✓ Low To High Latch] high To Low Latch

Low To High Latch Mode

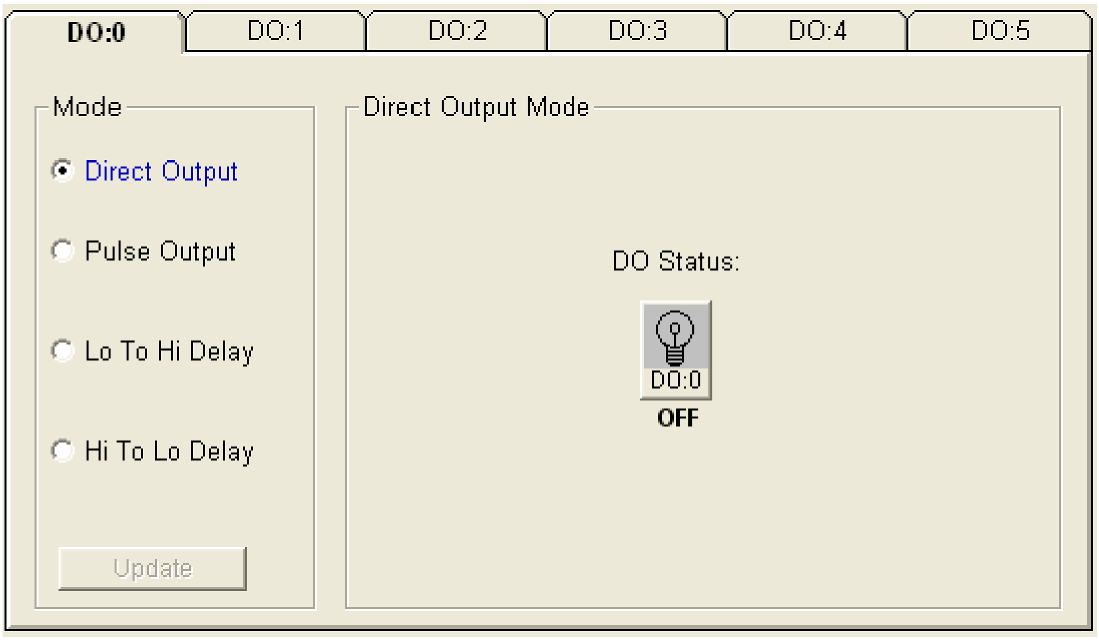
Latch status: Latched

Figure 3-13 Input latch setting

Note:

1. The new working mode setting will take effective after click the "Update" button.
2. If necessary, users could invert the original single for flexible operation needs.

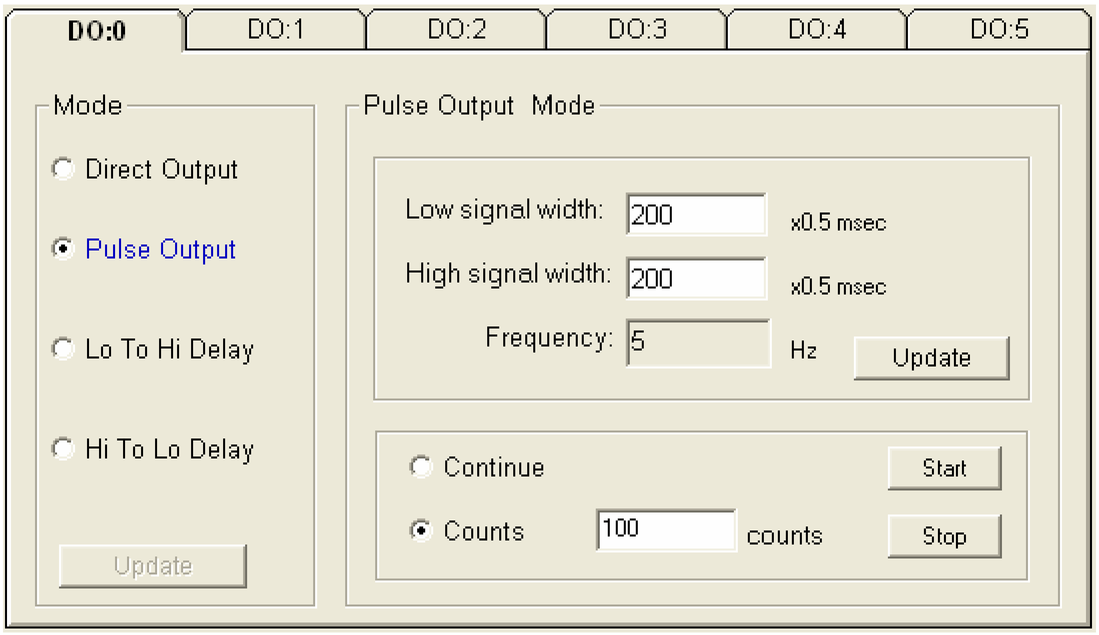
The digital output channels support pulse output and delay output functions. Click the specific channel, there will be four working modes for choosing.



Mode: [✓ Direct Output] Pulse Output Lo To Hi Delay Hi To Lo Delay

DO Status: OFF

Figure 3-14 riect output setting



Mode: Direct Output [✓ Pulse Output] Lo To Hi Delay Hi To Lo Delay

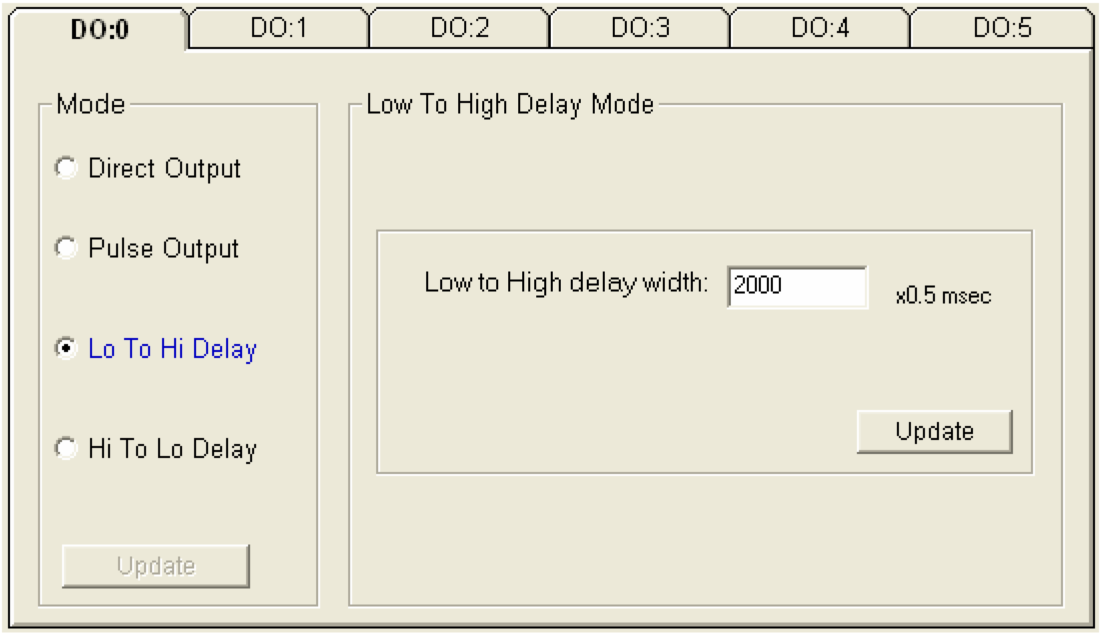
Low signal width: 200 x0.5 msec

High signal width: 200 x0.5 msec

Frequency: 5 Hz

Continue [✓ Counts] 100 counts

Figure 3-15 Pulse output setting



DO:0 | DO:1 | DO:2 | DO:3 | DO:4 | DO:5

Mode

- Direct Output
- Pulse Output
- [✓ Lo To Hi Delay]
- Hi To Lo Delay

Update

Low To High Delay Mode

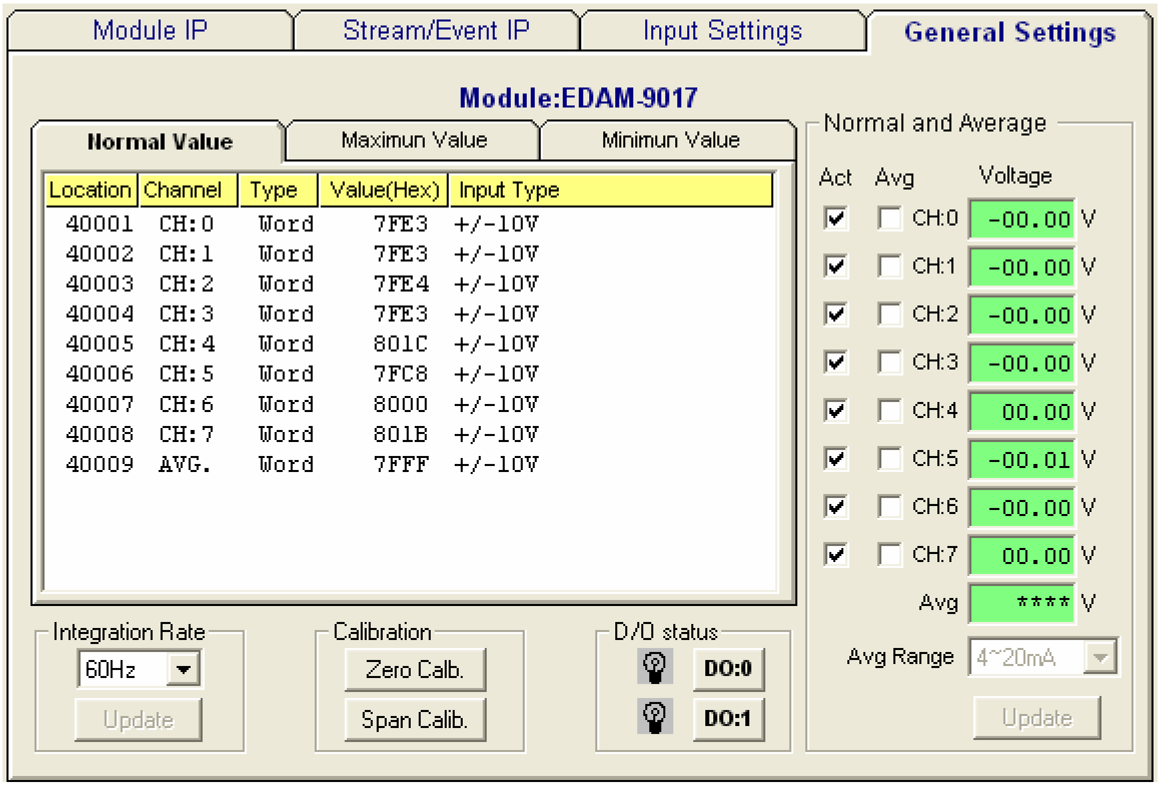
Low to High delay width: 2000 x0.5 msec

Update

Figure 3-16 Low to High Delay setting

3.13.2 Analog Input Module

Selecting EDAM-9000 analog input Modules includes EDAM-9017 and select "**General Settings"** tab, user can read following information from the Utility.



Module IP | Stream/Event IP | Input Settings | General Settings

Module:EDAM-9017

Normal Value | Maximun Value | Minimun Value

Location	Channel	Type	Value(Hex)	Input Type
40001	CH:0	Word	7FE3	+/-10V
40002	CH:1	Word	7FE3	+/-10V
40003	CH:2	Word	7FE4	+/-10V
40004	CH:3	Word	7FE3	+/-10V
40005	CH:4	Word	801C	+/-10V
40006	CH:5	Word	7FC8	+/-10V
40007	CH:6	Word	8000	+/-10V
40008	CH:7	Word	801B	+/-10V
40009	AVG.	Word	7FFF	+/-10V

Normal and Average

Act	Avg		Voltage	
✓		CH:0	-00.00	V
✓		CH:1	-00.00	V
✓		CH:2	-00.00	V
✓		CH:3	-00.00	V
✓		CH:4	00.00	V
✓		CH:5	-00.01	V
✓		CH:6	-00.00	V
✓		CH:7	00.00	V
		Avg	****	V

Avg Range: 4~20mA

Update

Integration Rate: 60Hz

Update

Calibration: Zero Calb. Span Calb.

D/O status: DO:0 DO:1

Figure 3-17 ModBus location and analog value

Location: Standard Modbus address. (Refer to Assigning address for I/O module in Chapter 4)

Channel: the channel number

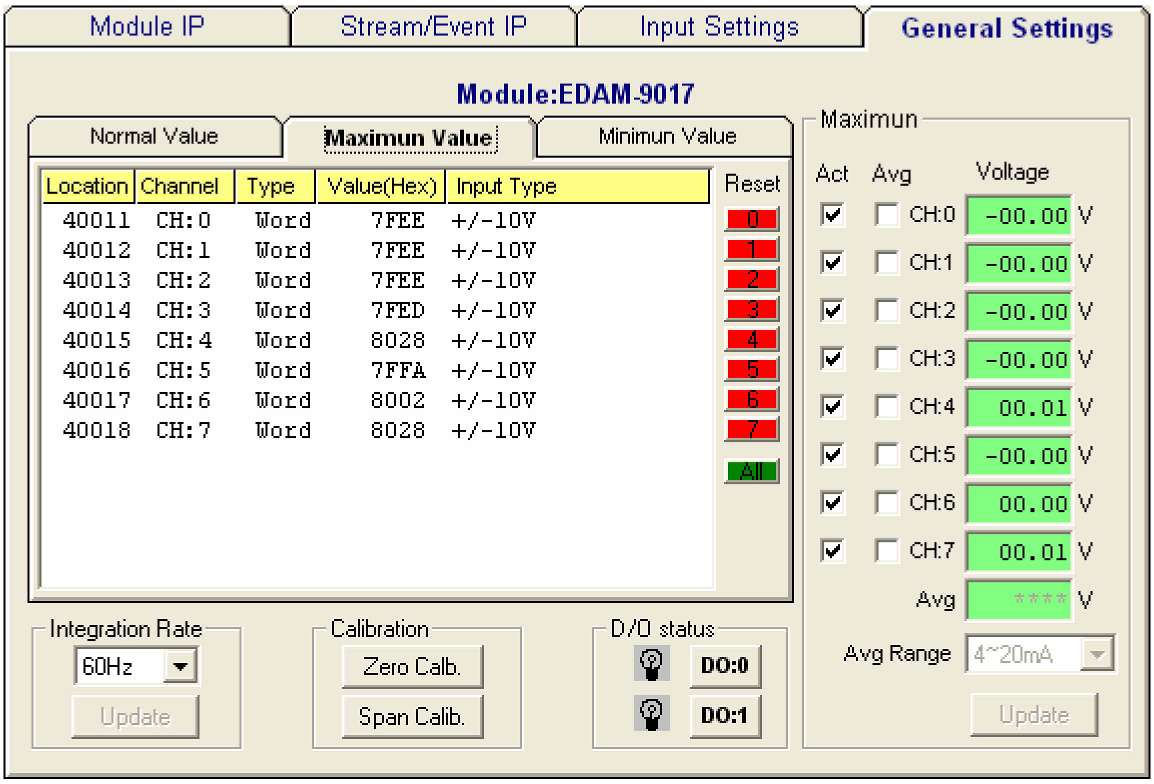
Type: Data type of the I/O channel. The data type of analog Input modules is always "word".

Value: The current status on each channel of I/O modules. Windows Utility provides both decimal and hexadecimal values used for different applications.

Input Type: Sensor types and measurement range of the specified module.

Before acquiring the current data of an analog input module, you have to select the input range and integration time. Then the input data will be scaled as the specified range with engineer unit.

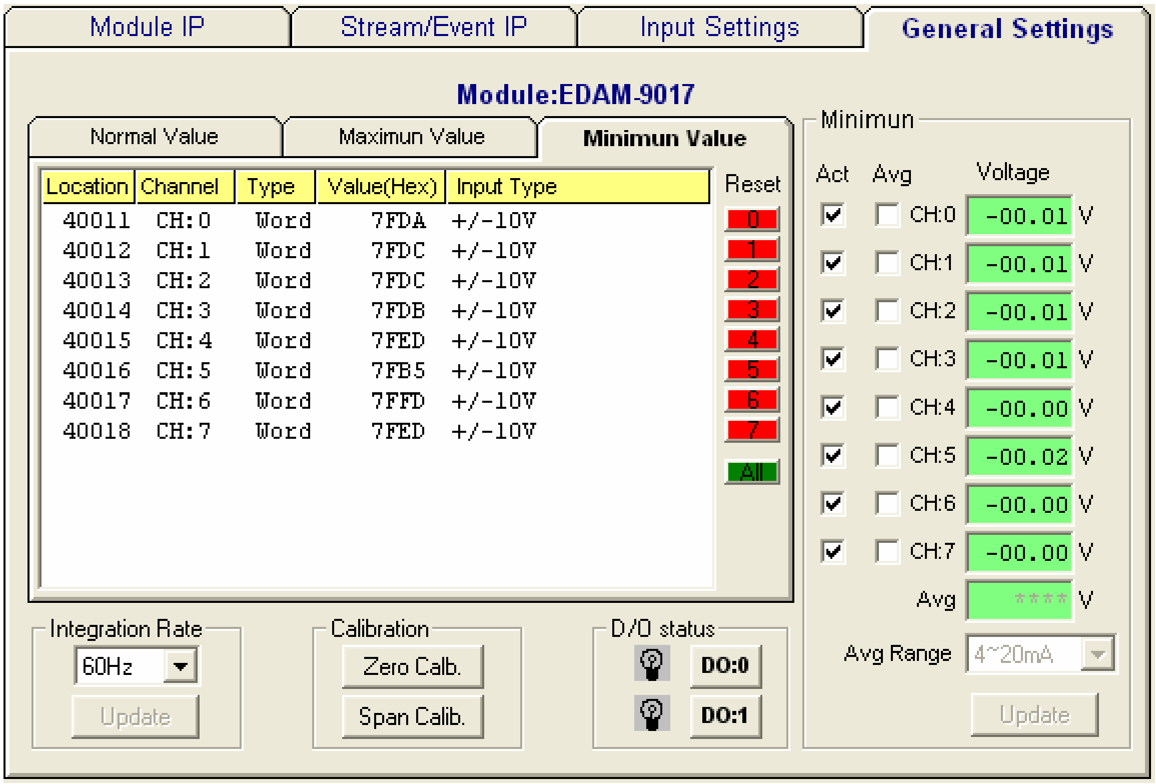
To provide users more valuable information, the EDAM-9000 analog modules have designed with calculation functions, includes Maximum, Minimum, and Average values of individual channels. Click the Maximum value tab, you will see the historical maximum values in each channel unless to press the against "Reset" buttons.



Location	Channel	Type	Value(Hex)	Input Type	Reset
40011	CH:0	Word	7FEE	+/-10V	0
40012	CH:1	Word	7FEE	+/-10V	1
40013	CH:2	Word	7FEE	+/-10V	2
40014	CH:3	Word	7FED	+/-10V	3
40015	CH:4	Word	8028	+/-10V	4
40016	CH:5	Word	7FFA	+/-10V	5
40017	CH:6	Word	8002	+/-10V	6
40018	CH:7	Word	8028	+/-10V	7
					All

Act	Avg		Voltage	
✓	☐	CH:0	-00.00	V
✓	☐	CH:1	-00.00	V
✓	☐	CH:2	-00.00	V
✓	☐	CH:3	-00.00	V
✓	☐	CH:4	00.01	V
✓	☐	CH:5	-00.00	V
✓	☐	CH:6	00.00	V
✓	☐	CH:7	00.01	V
		Avg	****	V

Click the Minimum value tab, you will see the historical minimum values in each channel unless to press the against "Reset" buttons.



Location	Channel	Type	Value(Hex)	Input Type	Reset
40011	CH:0	Word	7FDA	+/-10V	0
40012	CH:1	Word	7FDC	+/-10V	1
40013	CH:2	Word	7FDC	+/-10V	2
40014	CH:3	Word	7FDB	+/-10V	3
40015	CH:4	Word	7FED	+/-10V	4
40016	CH:5	Word	7FB5	+/-10V	5
40017	CH:6	Word	7FFD	+/-10V	6
40018	CH:7	Word	7FED	+/-10V	7
					All

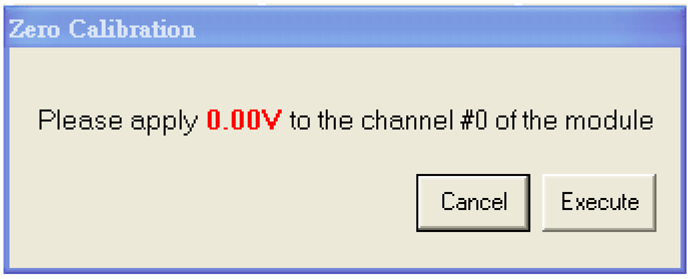
Act	Avg		Voltage	
✓	☐	CH:0	-00.01	V
✓	☐	CH:1	-00.01	V
✓	☐	CH:2	-00.01	V
✓	☐	CH:3	-00.01	V
✓	☐	CH:4	-00.00	V
✓	☐	CH:5	-00.02	V
✓	☐	CH:6	-00.00	V
✓	☐	CH:7	-00.00	V
		Avg	****	V

3.14 I/O Module Calibrations

Calibration is to adjust the accuracy of EDAM module. There are several modes for module's calibration: Zero calibration, Span calibration, CJC calibration, and Analog Output calibration. Only analog input and output modules can be calibrated, and the EDAM-9017 is the first released analog module.

Zero Calibration

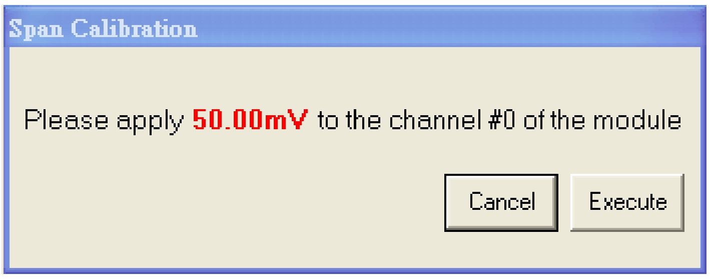
1. Apply power to the module and let it warm up for 30 minutes.
3. Make sure the module is correctly installed and properly configured for the input range you want to calibrate.
4. Short channel 0 to GND by wire as short as possible
5. Click the Execute button.


Zero Calibration

Please apply **0.00V** to the channel #0 of the module

Span Calibration

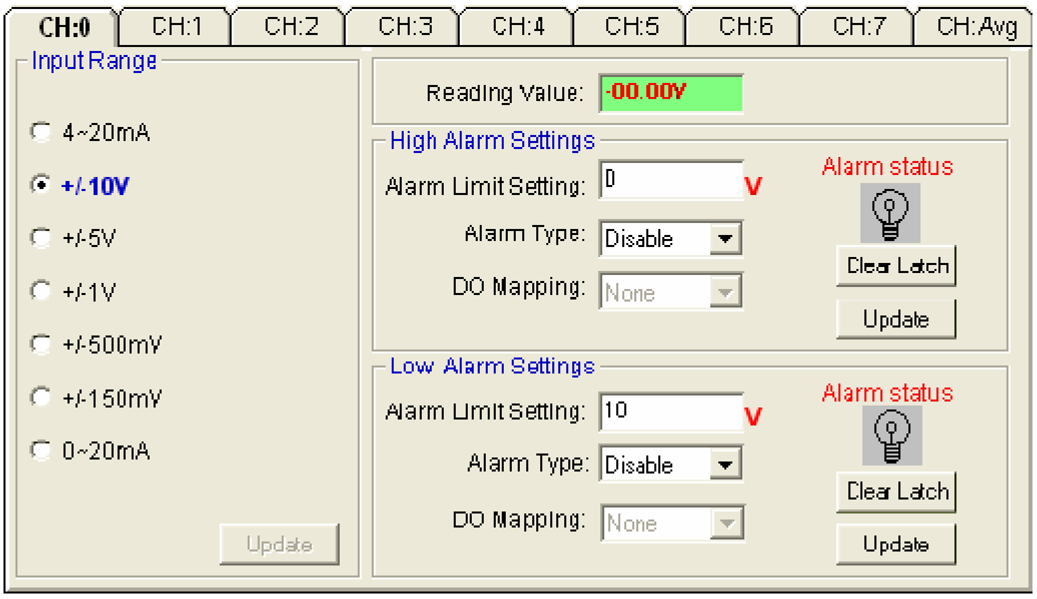
1. Follow the same procedure of zero calibration
2. Use a precision voltage source to apply a calibration voltage to the V+ and V- terminals of the EDAM-9017 module.
3. and click the Execute button.


Span Calibration

Please apply **50.00mV** to the channel #0 of the module

3.15 Input Type Settings

There is serval range of each channel of analog module. You should select properly type(range) before apply to the your applications



Input Range:
- 4~20mA
- [✓ +/-10V]
- +/-5V
- +/-1V
- +/-500mV
- +/-150mV
- 0~20mA

Reading Value: -00.00V

High Alarm Settings — Alarm Limit Setting: 0 V; Alarm Type: Disable; DO Mapping: None

Low Alarm Settings — Alarm Limit Setting: 10 V; Alarm Type: Disable; DO Mapping: None

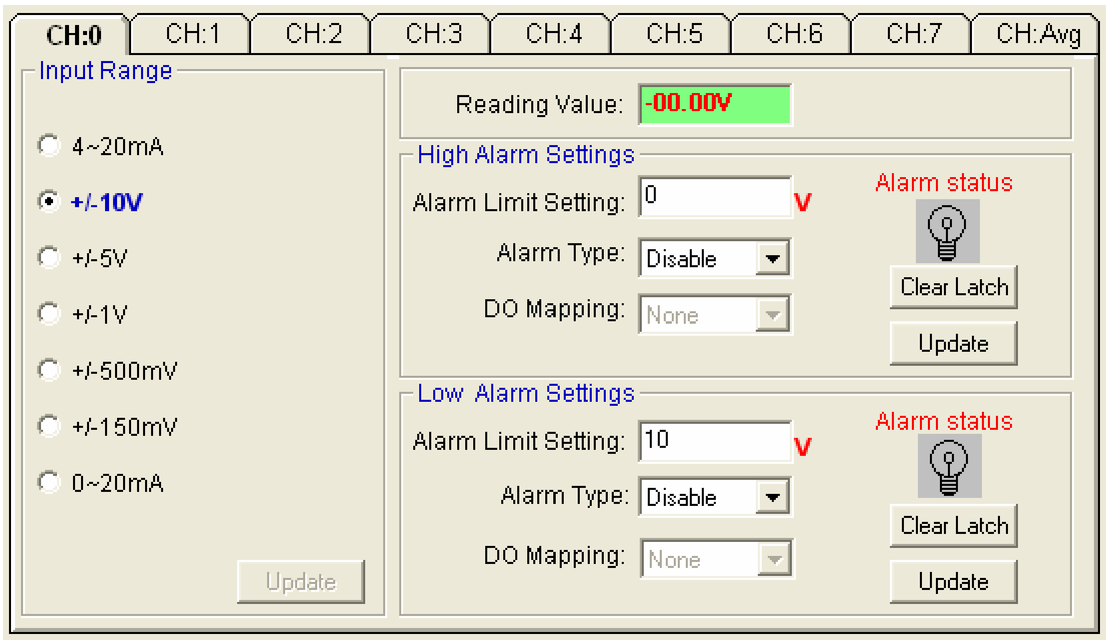
Figure 3-18 Input type setting

Note:

The new working mode setting will take effective after click the "Update" button.

3.16 Alarm Setting

Moreover, all of the analog channels are allowed to configure the High/Low limitation for alarm trigger function. Once the value of the specific channel over or under the limitation, the alarm status could trigger a digital output channel in the ADM-6017.



Input Range:
- 4~20mA
- [✓ +/-10V]
- +/-5V
- +/-1V
- +/-500mV
- +/-150mV
- 0~20mA

Reading Value: -00.00V

High Alarm Settings — Alarm Limit Setting: 0 V; Alarm Type: Disable; DO Mapping: None

Low Alarm Settings — Alarm Limit Setting: 10 V; Alarm Type: Disable; DO Mapping: None

Figure 3-19 Alarm Setting

Chapter 4 What is TCPDAQ ActiveX Control?

TCPDAQ.OCX is a collection of ActiveX controls for performing I/O operations within any compatible ActiveX control container, such as Visual Basic, Delphi, etc. You can easily perform the I/O operations through properties, events and methods. Specific information about the properties, methods, and events of the TCPDAQ ActiveX controls can be found later in this manual.

With TCPDAQ ActiveX Control, you can perform versatile I/O operations to control your Inlog EDAM-9000 module series.

The TCPDAQ ActiveX Control setup program installs TCPDAQ.OCX through a process that may take several minutes. Installing the necessary software to use the TCPDAQ.OCX in your application involves two main steps: Installing the TCPDAQ ActiveX Control

Using the Inlog EDAM-9000 utility to configure the modules that is attached to your computer.

You can use these ActiveX controls in any development tool that supports them, including Microsoft Visual C++, Microsoft Visual Basic, Borland C++ Builder, Borland Delphi

4.1 Installing the TCPDAQ ActiveX Controls

Before using the TCPDAQ ActiveX Control, you must install the TCPDAQ.OCX first

- Insert the TCPDAQ installation CD-ROM disc into your computer.
- The installation program should start automatically. If autorun is not enabled on your computer, use your Windows Explorer or the Windows Run command to execute Setup.exe on the TCPDAQ installation CD-ROM disc (assume "d" is the letter of your CD-ROM disc drive):

  D: \Setup.exe

4.2 Building TCPDAQ ActiveX Control with Various Tools

This chapter describes how you can use the TCPDAQ ActiveX Control with the following development tools:

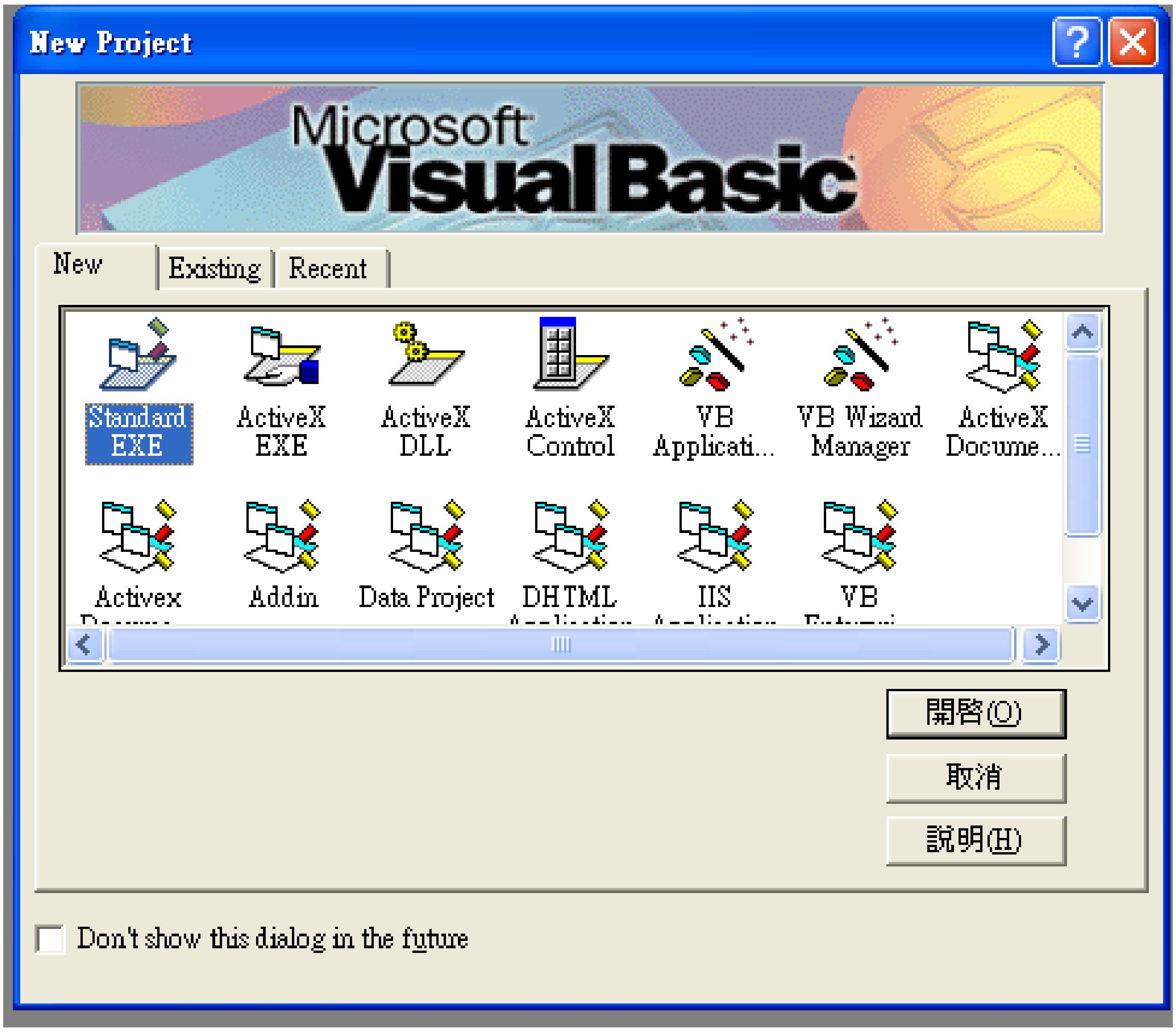
- Microsoft Visual C++ version 6.0 (SP5)
- Microsoft Visual Basic version 6.0 (SP5)
- Borland Delphi version 4.0 (with the Delphi 6 Update Pack fixes for ActiveX installed)
- Borland C++ Builder version 5.0

This chapter assumes that you are familiar with the basic concepts of using Visual Basic, Delphi, Borland C++ Builder, and Visual C++, including selecting the type of application, designing the form, placing the control on the form, configuring the properties of the control, creating the code (event handler routines) for this control.

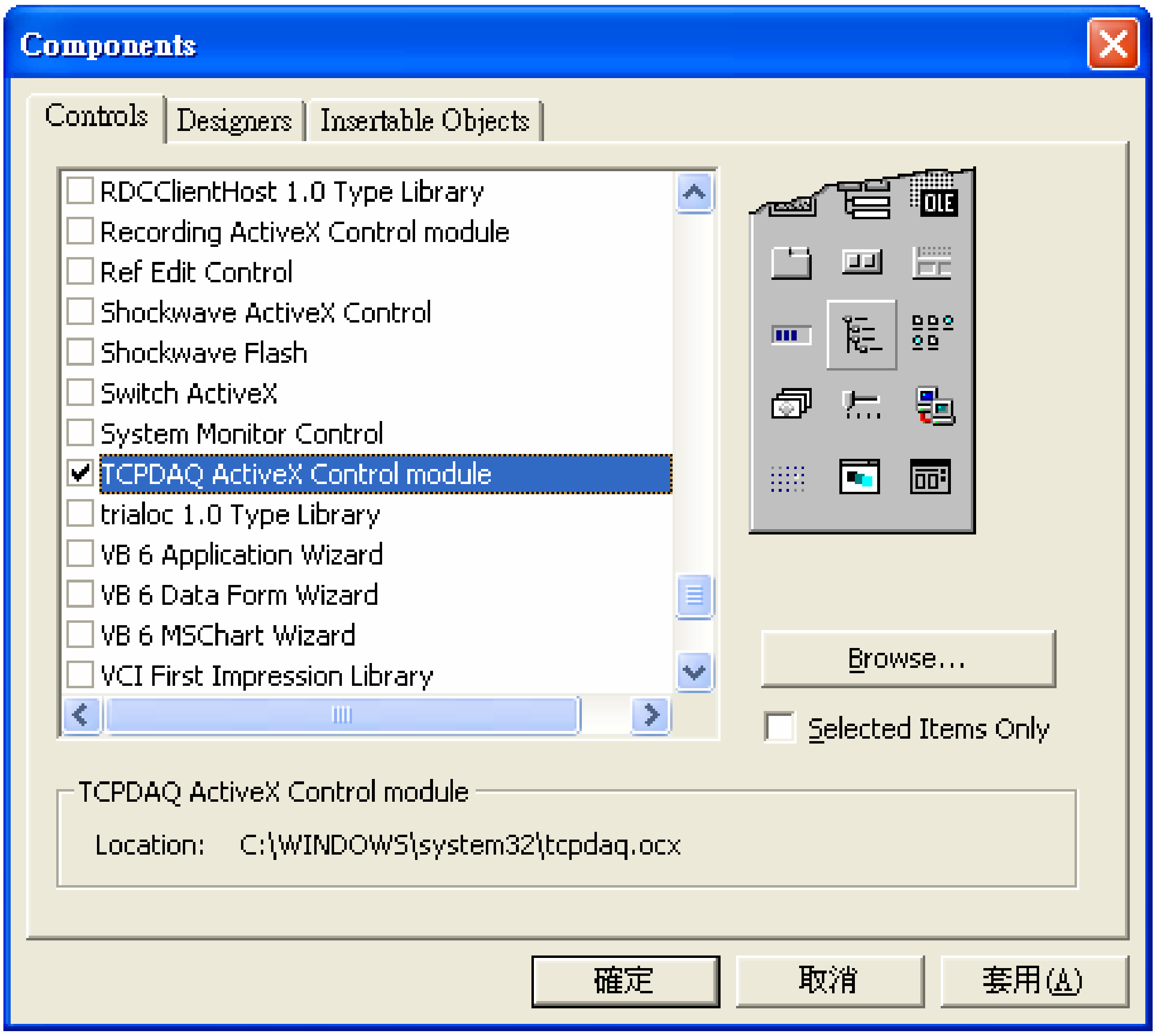
Note: For Borland Delphi 6, the Delphi 6 Update Pack fixes for ActiveX must be installed.

4.2.1 Building TCPDAQ Applications with Visual Basic

- Start Visual Basic.



- Select **Standard EXE** icon and press the **Open** button. A new project is created. Click on **Components...** from the **Project** menu. The Components dialog box is loaded as shown below:

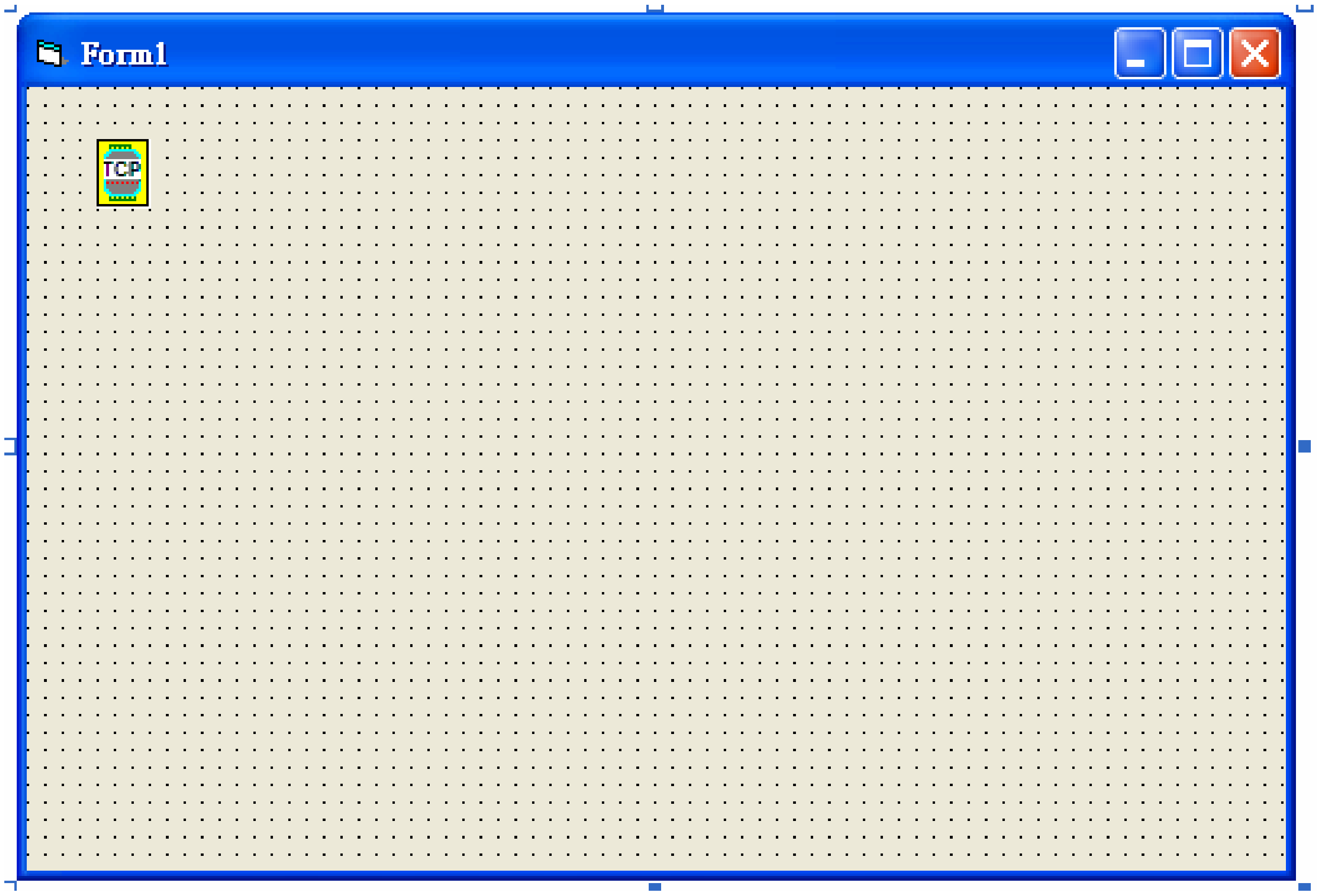


- [ ] RDCClientHost 1.0 Type Library
- [ ] Recording ActiveX Control module
- [ ] Ref Edit Control
- [ ] Shockwave ActiveX Control
- [ ] Shockwave Flash
- [ ] Switch ActiveX
- [ ] System Monitor Control
- [x] TCPDAQ ActiveX Control module
- [ ] trialoc 1.0 Type Library
- [ ] VB 6 Application Wizard
- [ ] VB 6 Data Form Wizard
- [ ] VB 6 MSChart Wizard
- [ ] VCI First Impression Library

☐ Selected Items Only

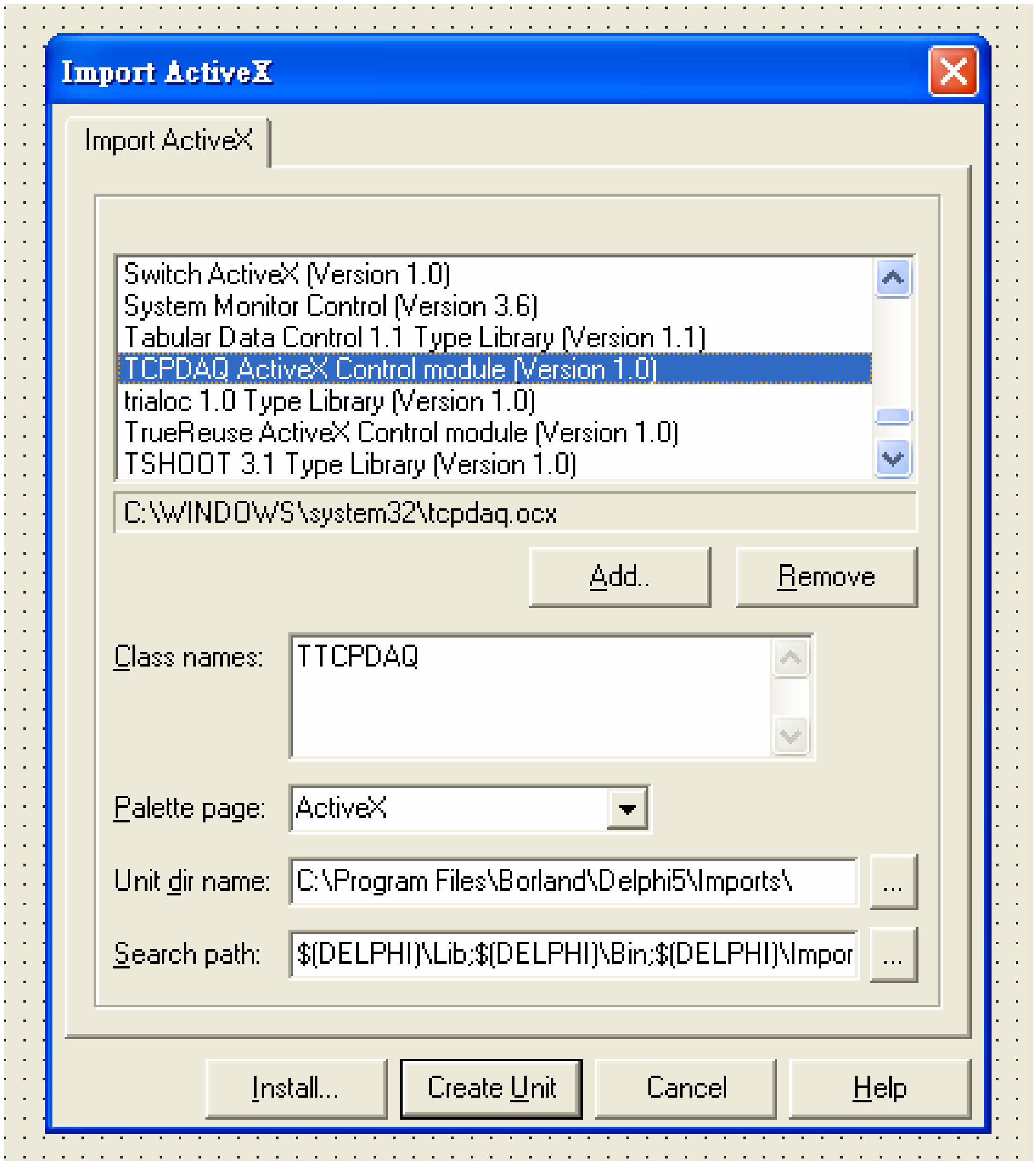
TCPDAQ ActiveX Control module
Location: C:\WINDOWS\system32\tcpdaq.ocx

- Place a TCPDAQ control from the Toolbox on the form. Use the default name.
- Your form should look similar to the one shown below:



4.2.2 Building TCPDAQ Applications with Delphi

- Start Delphi, Delphi will launch as shown below:
- Select **Import ActiveX Control...** from the **Component** menu. The Import ActiveX dialog box loads:
- Select the TCPDAQ ActiveX Control Module and press the **Install...** button. A dialog box is displayed as follows:


Import ActiveX

Import ActiveX

Switch ActiveX (Version 1.0)
System Monitor Control (Version 3.6)
Tabular Data Control 1.1 Type Library (Version 1.1)
TCPDAQ ActiveX Control module (Version 1.0)
trialoc 1.0 Type Library (Version 1.0)
TrueReuse ActiveX Control module (Version 1.0)
TSHOOT 3.1 Type Library (Version 1.0)

C:\WINDOWS\system32\tcpdaq.ocx

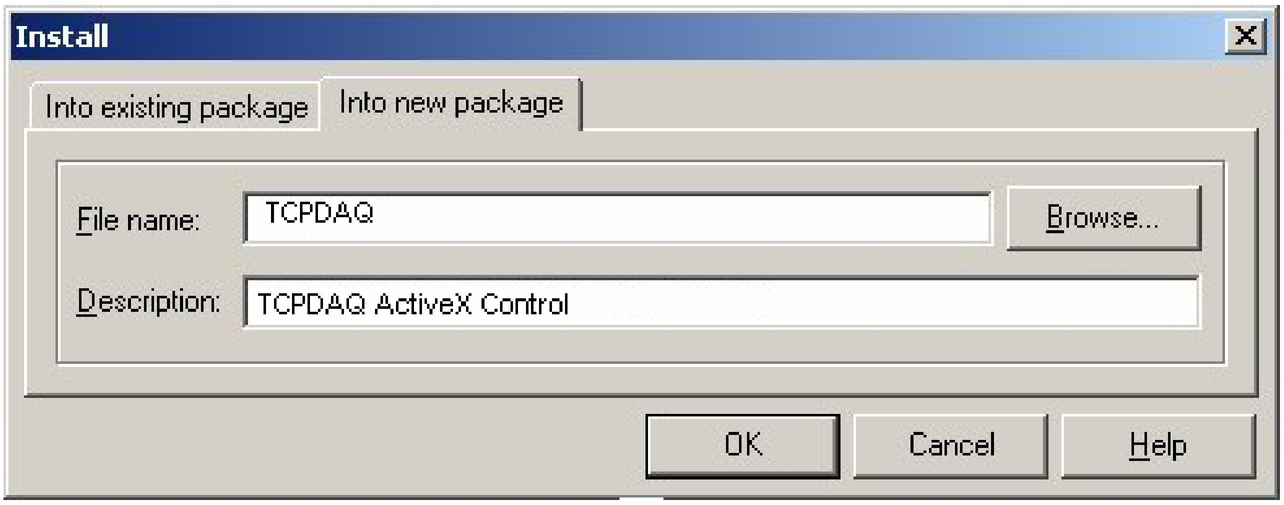
Class names: TTCPDAQ

Palette page: ActiveX

Unit dir name: C:\Program Files\Borland\Delphi5\Imports\

Search path: $(DELPHI)\Lib;$(DELPHI)\Bin;$(DELPHI)\Impor

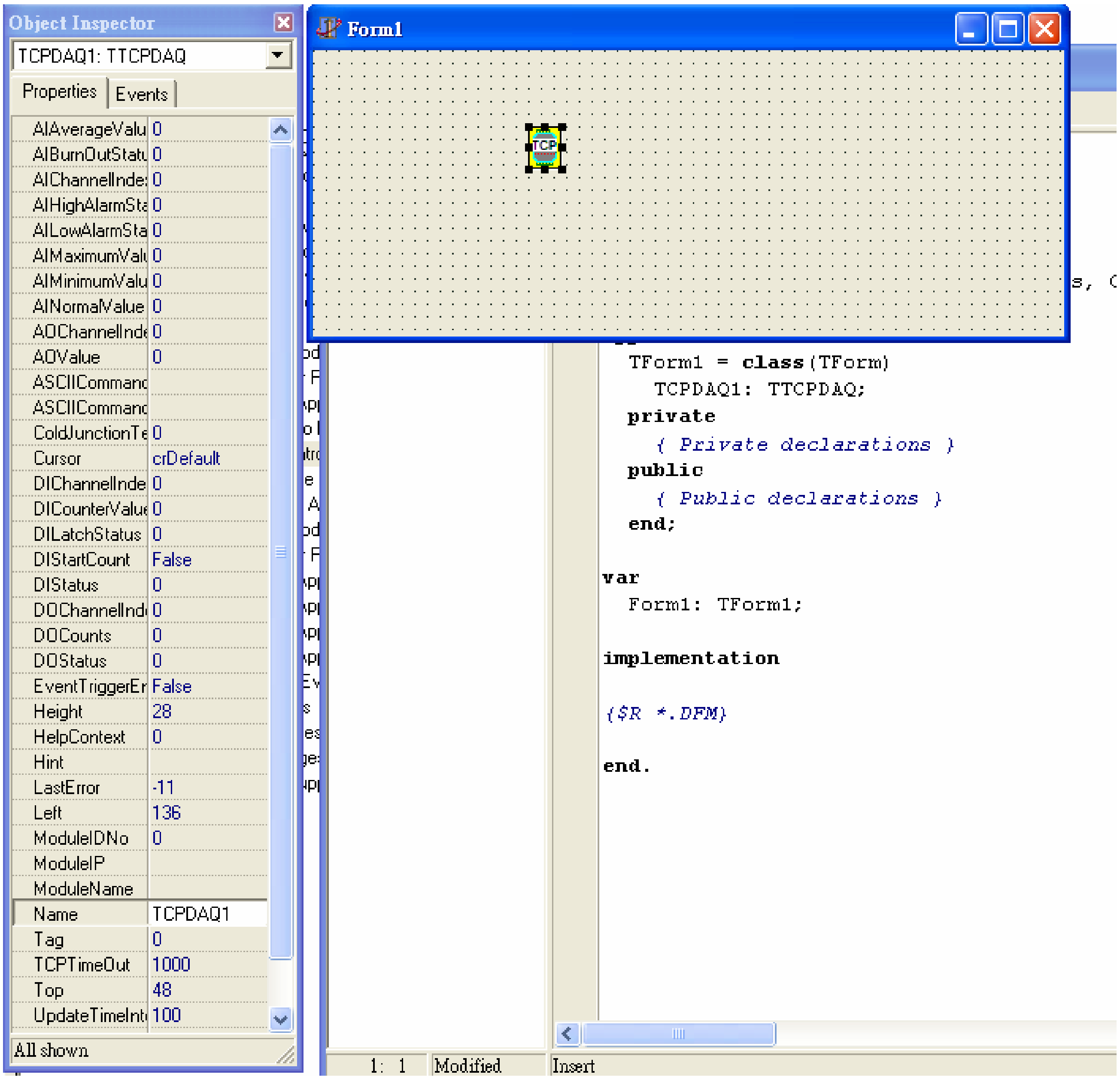
- The TCPDAQ control is loaded into the **Component Palette**. You can check it by clicking on **Install Package...** from the **Component** menu. A dialog box is shown as below.



File name: TCPDAQ

Description: TCPDAQ ActiveX Control

- Switch to the form and select the ActiveX tab from the **Component Palette**.
- Place a TCPDAQ control from the **Component Palette** on the form. Use the default names TCPDAQ1.
- Your form should look similar to the one shown below:



Object Inspector

TCPDAQ1: TTCPDAQ

Properties | Events

AIAverageValu	0
AIBurnOutStatu	0
AIChannelInde:	0
AIHighAlarmSta	0
AILowAlarmSta	0
AIMaximumValu	0
AIMinimumValu	0
AINormalValue	0
AOChannelInde	0
AOValue	0
ASCIICommand	
ASCIICommand	
ColdJunctionTe	0
Cursor	crDefault
DIChannelInde	0
DICounterValue	0
DILatchStatus	0
DIStartCount	False
DIStatus	0
DOChannelInde	0
DOCounts	0
DOStatus	0
EventTriggerEr	False
Height	28
HelpContext	0
Hint	
LastError	-11
Left	136
ModuleIDNo	0
ModuleIP	
ModuleName	
Name	TCPDAQ1
Tag	0
TCPTimeOut	1000
Top	48
UpdateTimeInt	100

All shown

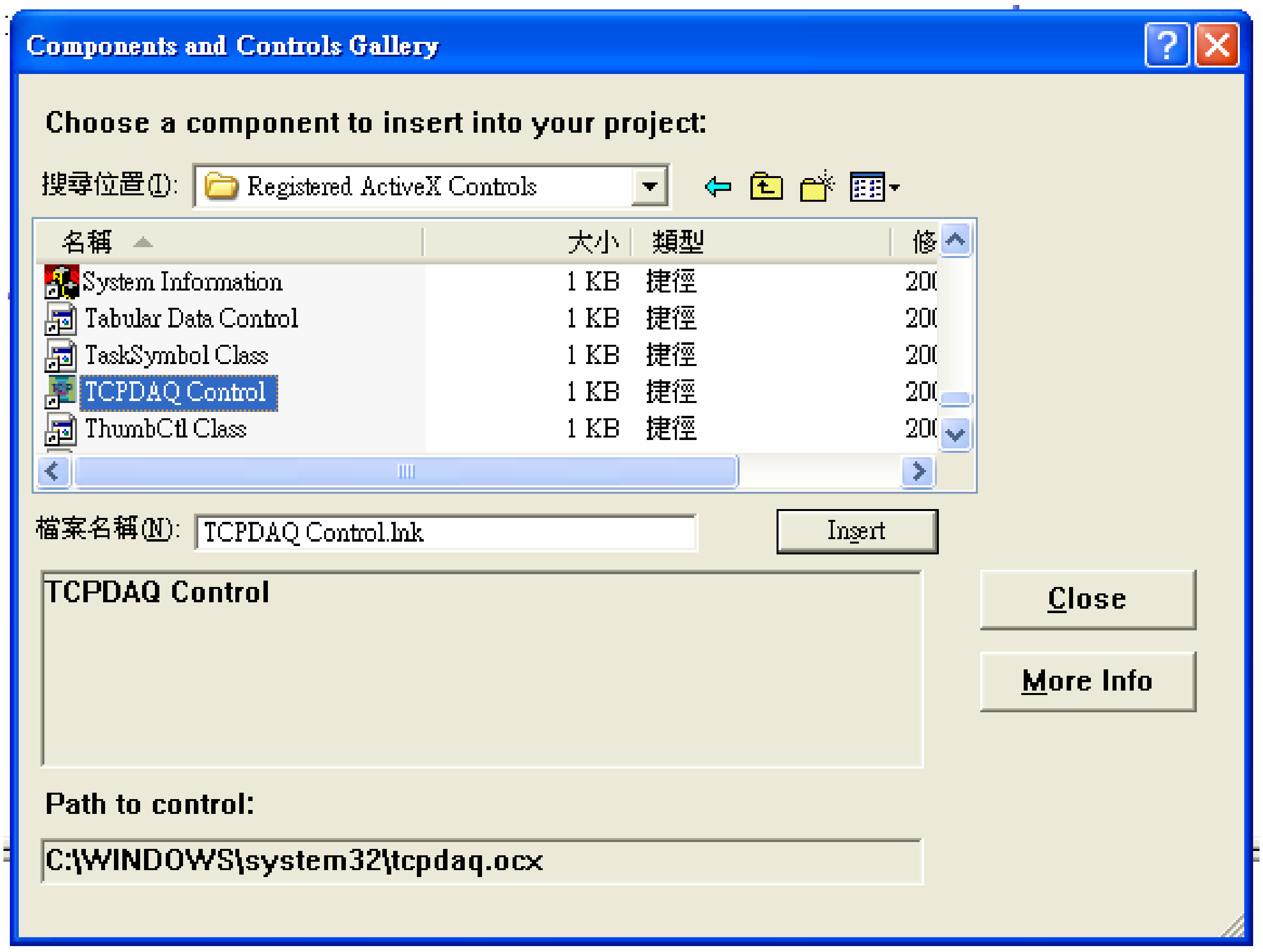
Form1

```
  TForm1 = class(TForm)
    TCPDAQ1: TTCPDAQ;
  private
    { Private declarations }
  public
    { Public declarations }
  end;

var
  Form1: TForm1;

implementation

{$R *.DFM}

end.
```

1: 1 Modified Insert

4.2.3 Building TCPDAQ Applications with Visual C++

- Start Visual C++ program.
- Select **Add to Project...** -> **Components and Controls** from the **Project** menu, and double-click on **Registered ActiveX Controls**. The result should be as below:


Components and Controls Gallery

Choose a component to insert into your project:

搜尋位置(I): Registered ActiveX Controls

名稱	大小	類型	修
System Information	1 KB	捷徑	20(
Tabular Data Control	1 KB	捷徑	20(
TaskSymbol Class	1 KB	捷徑	20(
TCPDAQ Control	1 KB	捷徑	20(
ThumbCtl Class	1 KB	捷徑	20(

檔案名稱(N): TCPDAQ Control.lnk

Insert

TCPDAQ Control

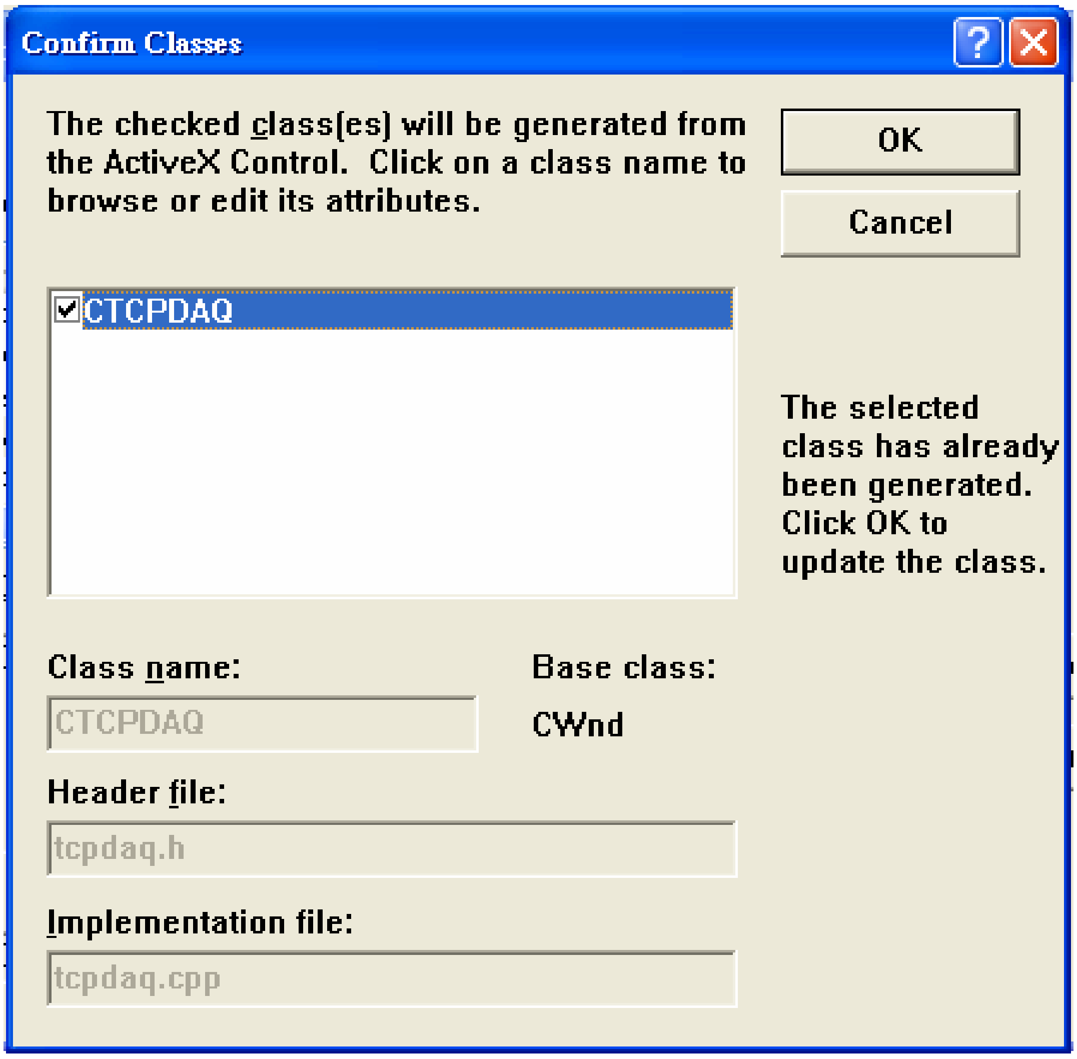
Close

More Info

Path to control:

C:\WINDOWS\system32\tcpdaq.ocx

- Scroll down to the TCPDAQ Control and press the **Insert** button. A Class Confirm dialog box is displayed, Press **OK** button.



Confirm Classes

The checked class(es) will be generated from the ActiveX Control. Click on a class name to browse or edit its attributes.

☑ CTCPDAQ

The selected class has already been generated. Click OK to update the class.

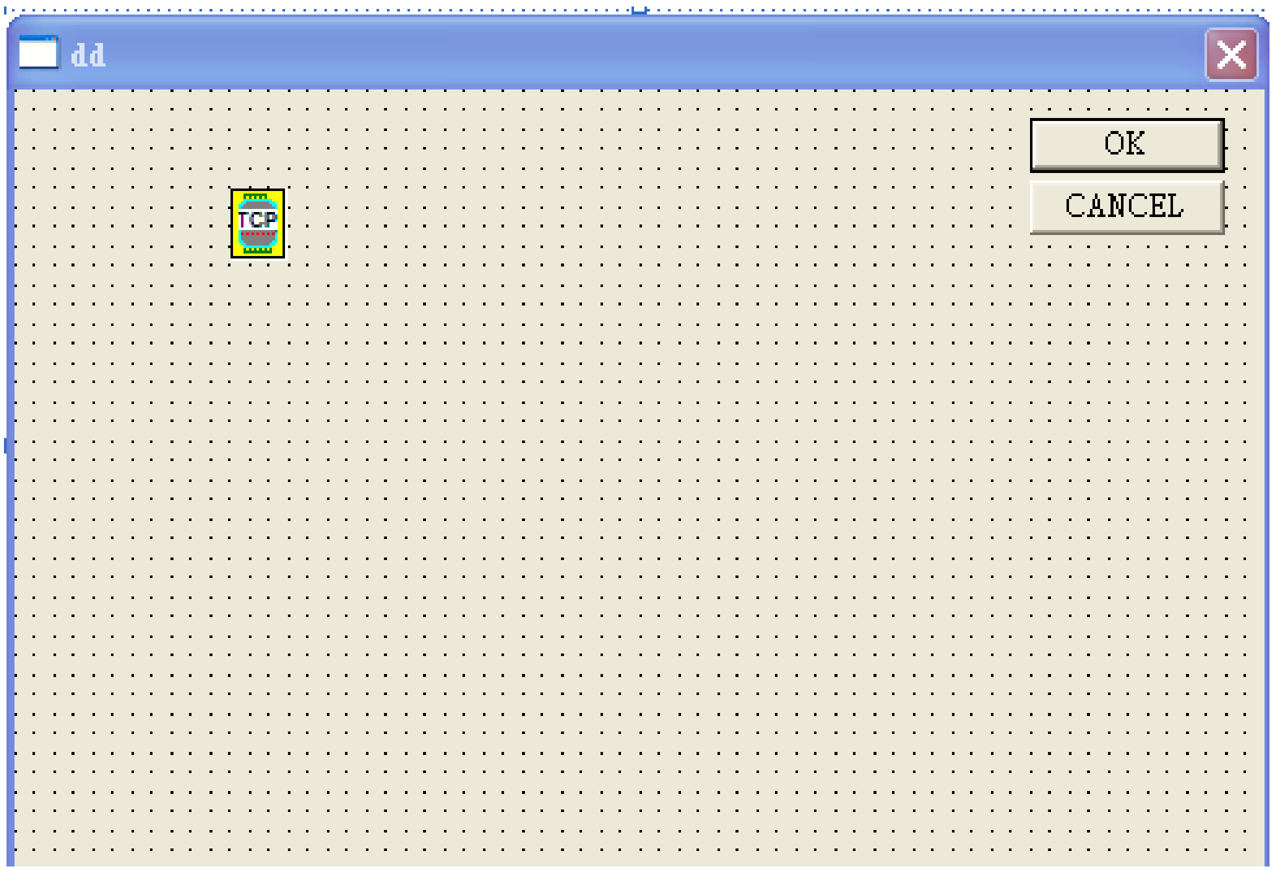
Class name: CTCPDAQ

Base class: CWnd

Header file: tcpdaq.h

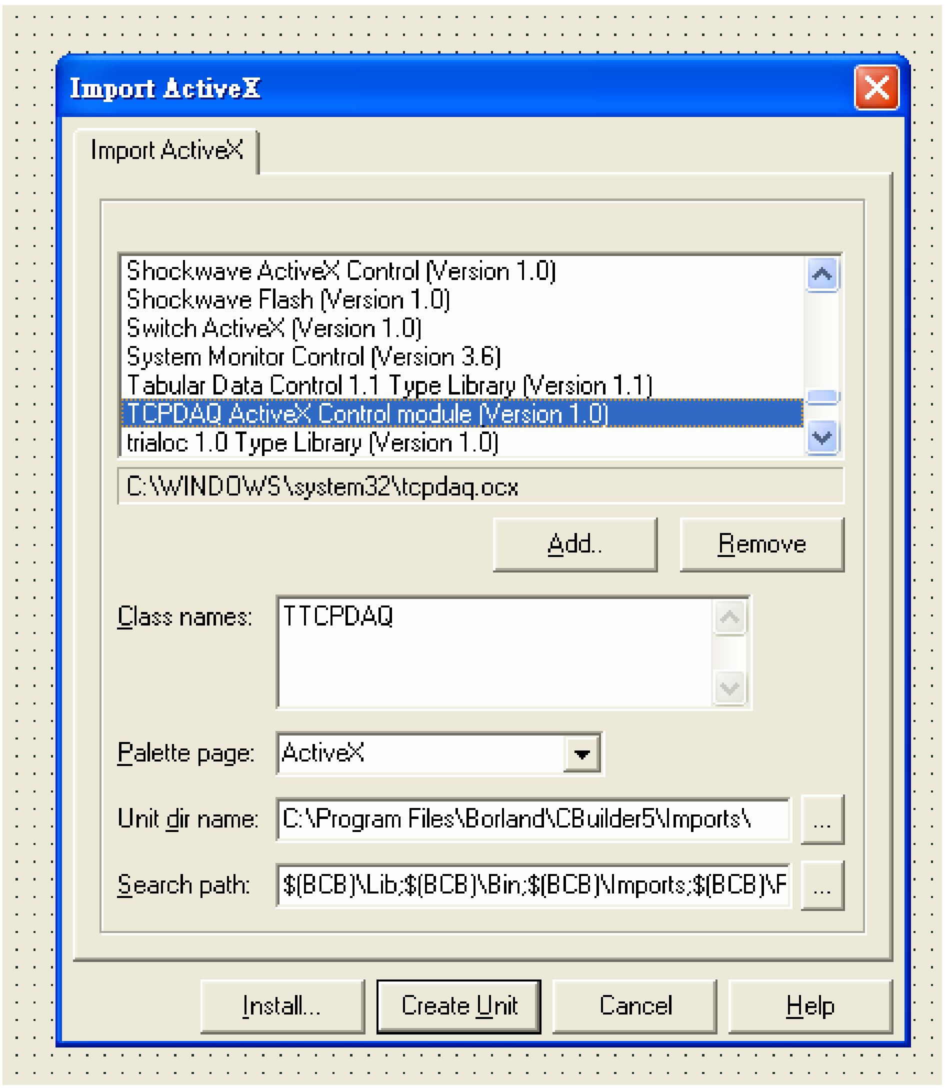
Implementation file: tcpdaq.cpp

- The TCPDAQ control will be showed in Visual C++ Toolbar.
- Place a TCPDAQ control from the Controls Toolbar on the dialog-based form.



4.2.4 Building TCPDAQ Applications with Borland C++ Builder

- Start Borland C++ Builder (BCB), BCB will launch as shown below:
- Select **Import ActiveX Control...** from the **Component** menu. The Import ActiveX dialog box loads:
- Select the TCPDAQ Control and press the **Install...** button. A dialog box is displayed as follows:

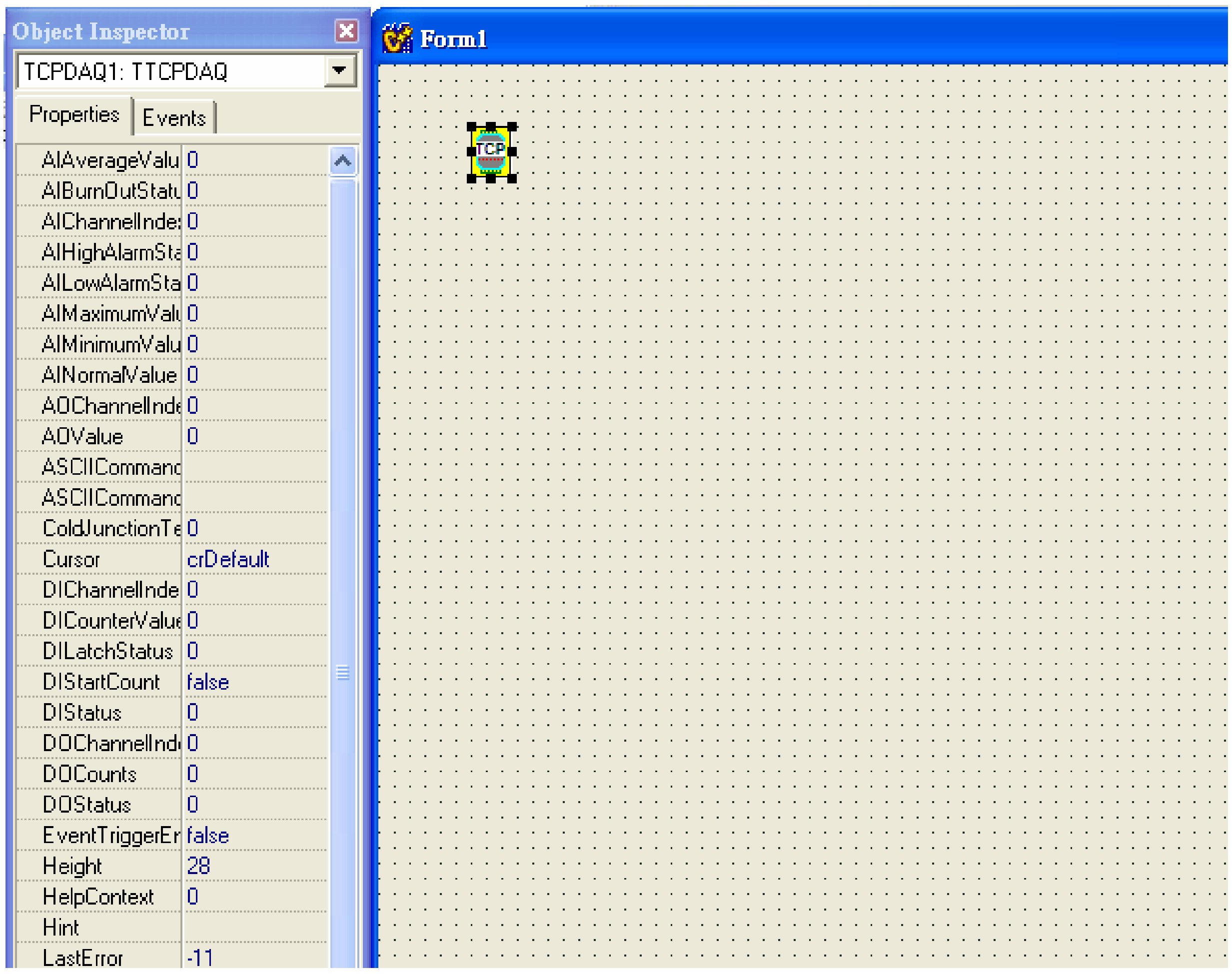

Import ActiveX

Shockwave ActiveX Control (Version 1.0)
Shockwave Flash (Version 1.0)
Switch ActiveX (Version 1.0)
System Monitor Control (Version 3.6)
Tabular Data Control 1.1 Type Library (Version 1.1)
TCPDAQ ActiveX Control module (Version 1.0)
trialoc 1.0 Type Library (Version 1.0)

C:\WINDOWS\system32\tcpdaq.ocx

Class names: TTCPDAQ
Palette page: ActiveX
Unit dir name: C:\Program Files\Borland\CBuilder5\Imports\
Search path: $(BCB)\Lib;$(BCB)\Bin;$(BCB)\Imports;$(BCB)\F

- Enter "TCPDAQ" into the File name field under the **Into new package** tab, and press **OK** button. A Confirm dialog box is displayed. press **Yes** button.
- The TCPDAQ control is loaded into the **Component Palette**. You can check it by clicking on **Install Package...** from the **Component** menu. A dialog box is shown as below.



AIAverageValu	0
AIBurnOutStatu	0
AIChannelInde:	0
AIHighAlarmSta	0
AILowAlarmSta	0
AIMaximumValu	0
AIMinimumValu	0
AINormalValue	0
AOChannelInde	0
AOValue	0
ASCIICommanc	
ASCIICommanc	
ColdJunctionTe	0
Cursor	crDefault
DIChannelInde	0
DICounterValue	0
DILatchStatus	0
DIStartCount	false
DIStatus	0
DOChannelInd	0
DOCounts	0
DOStatus	0
EventTriggerEr	false
Height	28
HelpContext	0
Hint	
LastError	-11

4.3 Properties of TCPDAQ ActiveX Control

Name	Type	Description	Avaliable Model(s)
AIChannelIndex	short	Specifies the analog input channel to perform other AI properties read/write operation.	9015,9017,9019
AINrmalValue	double	Normal voltage of specifies the analog channel	9015,9017,9019
AIAveragevalue	double	Average voltage value of the channels that are in average	9015,9017,9019
AIMaximumValue	double	Maximal voltage of specifies the analog channel	9015,9017,9019
AIMinimumValue	double	Minimal voltage of specifies the analog channel	9015,9017,9019
AILowAlarmStatus	short	Return the low alarm status of specifies the analog channel (1=Alarm occurred, 0=No alarm)	9015,9017,9019
AIHighAlarmStatus	short	Return the high alarm status of specifies the analog channel (1=Alarm occurred, 0=No alarm)	9015,9017,9019
AIBurnOutStatus	short	Return the Burnout status of specifies the analog channel (1=open, 0=normal)	9015 and 9019
AOChannelIndex	short	Specifies the analog output channel to perform other properties read/write operation.	Reserved for Ver 1.0
AOValue	double	Set the analog output voltage	All models
ASCIICommandReceive	string	Return the ASCII response message from module	All models
ASCIICommandSend	string	Send the ASII command message to module	All models
ColdJunctionTemperature	double	Return the cold junction temperature	9019
DIChannelIndex	short	Specifies the digital input channel to perform other DI properties read/write operation.	9050,9051,9052
DIounterValue	long	Return the counting value for the specified DI channel which functions in “Count/Frequency mode”	9050,9051,9052
DILatchStatus	short	Return the latch status for the specified DI channel which functions in “Lo-Hi/Hi-Lo latch mode” (1=Latched, 0=No latched)	9050,9051,9052
DIStartCount	boolean	Start/stop counting for the specified DI channel which functions in “Count/Frequency mode” (True=Start, 0=Stop)	9050,9051,9052
DIStatus	short	Return the status for the specified DI channel which functions in “DI mode” (1=Active, 0=Inactive)	9050,9051,9052
DOChannelIndex	short	Specifies the digital output channel to perform other DO properties read/write	9017,9019,9050,9051,9052

		operation.	
DOCount	long	Set the output count value for the specified DO channel which functions in "Pulse output mode"	9050,9051,9052
DOStatus	short	Return/set the status for the specified DO channel which functions in "D/O mode" (1=Active, 0=Inactive)	9017,9019,9050,9051,9052
EventTriggerEnable	boolean	Enable/disable event trigger mode (True=Enable, False=Disable)	All models
LastError	short	Return the Error code of operation	All models
MoudleIDNo	short	Return the module ID number	All models
ModuleIP	string	Set the remote module IP address	All models
ModuelName	string	Return the module name	All models
TCPTimeOut	long	Return/set the TCP/IP Timeout (ms)	All models
UpdateTimeInterval	long	Return/set data update time interval(ms)	All models

4.4 Methods of TCPDAQ ActiveX Control

Name	Arguments	Returned type	Description
Open	None	None	Open TCPDAQ.OCX to start operation (Must be called before accessing properties at run time)
Close	None	None	Close TCPDAQ.OCX(Must be called before terminating the APP)
ModBusReadCoil	short Startaddress short Counts short coildata[]	None	Read coil data from remote module, and stored into coildata[] buffer
ModBusWriteCoil	shot StartAddress short Counts short coildata[]		Write coil data stored in coildata[] buffer to remote module
ModBusReadReg	short Startaddress short Counts short regdata[]	None	Read holding register data from remote module, and stored into regdata[] buffer
ModBusWriteReg	shot StartAddress short Counts short regdata[]		Write register data stored in regdata[] buffer to remote module

4.5 Events of TCPDAQ ActiveX Control

Name	Arguments	Returned type	Description
OnError	short ErrCode(out) string Errmsg(out)	None	be called when error occurred
EventDataArrival	string Datetime(out) short EventChannel(out) short EventType(out) short EventStatus(out) short EventValue(out)	None	be called when received an event data from the remote module **(*)**

(*): Please see *TCPDAQ_Data_Structure.pdf* file to understand the means of parameters

4.6 Building TCPDAQ ActiveX Applications with Various Development Tools

The demo programs of TCPDAQ AvtiveX control module are included in the provided DISC. The Installed folders include the demo programs for various development tools.

Chapter 5 TCPDAQ DLL API

5.1 Common Functions

1.	TCP_Open	: To initiate the TCPDAQ.dll to use.
2.	TCP_Close	: To terminates use of the TCPDAQ.dll.
3.	TCP_Connect	: To create a Window TCP socket then establishing a connection to a specific EDAM-9000
4.	TCP_Disconnect	: Disconnecting the Window TCP socket from all EDAM-9000 modules
5.	TCP_ModuleDisconnect	: Disconnecting the Window TCP socket from a specific EDAM-9000
6.	TCP_SendData	: Send data to a specific EDAM-9000 module
7.	TCP_RecvData	: Receive data to a specific EDAM-9000 module
8.	TCP_SendReceiveASCcmd	: To accept an ASCII format string as a command, and transform it to meet the Modbus/TCP's specification. Then sending it to EDAM-9000 and receiving the response from EDAM-9000
9.	UDP_Connect	: To create a Window UDP socket then establishing a connection to a specific EDAM-9000
10.	UDP_Disconnect	: Disconnecting the Window UDP socket from all EDAM-9000 modules
11.	UDP_ModuleDisconnect	: Disconnecting the Window UDP socket from a specific EDAM-9000
12.	UDP_SendData	: Send data to a specific EDAM-9000 module
13.	UDP_RecvData	: Receive data to a specific EDAM-9000 module
14.	UDP_SendReceiveASCcmd	: Direct send an ASCII format string as a command, and receive the response from EDAM-9000
15.	TCP_GetModuleIPinfo	: Return module IP information of a specific module
16.	TCP_GetModuleID	: Return module ID number of a specific module
17.	TCP_GetIPFromID	: Return IP address of a specific module ID number
18.	TCP_ScanOnLineModules	: Scan all on-line EDAM-9000 modules
19.	TCP_GetDLLVersion	: Return the DLL's version, that is the version of TCPDAQ.DLL
20.	TCP_GetModuleNo	: Return the module name of a specific IP address
21.	TCP_GetLastError	: Return the error code of the latest called function
22.	TCP_PingIP	: Ping to Remote IP address

5.2 Stream/Event Functions

TCP_StartStream	: To instruct the PC to start to receive stream data that coming from EDAM-9000
TCP_StopStream	: To instruct the PC to stop receiving stream data from all modules
TCP_ReadStreamData	: To receive stream data that coming from the specific EDAM-9000
TCP_StartEvent	: To instruct the PC to start to receive alarm event data that coming from EDAM-9000
TCP_StopEvent	: To instruct the PC to stop receiving alarm event data from all modules
TCP_ReadEventData	: To receive alarm event data that coming from the specific EDAM-9000

5.3 Digital I/O Functions

TCP_ReadDIOMode	: To read the type for every D/I & D/O channels of an EDAM-9000 module.
TCP_ReadDIO	: To read DI/DO's status for an EDAM-9000 module
TCP_ReadDISignalWidth	: To read the minimal high/low signal width of each D/I channel for an EDAM-9000 module
TCP_WriteDISignalWidth	: To set the minimal high/low signal width of each D/I channel for an EDAM-9000 module
TCP_ReadDICounter	: To read the counter value when a D/I channel function in 'Counter' mode
TCP_ClearDICounter	: To clear the counter value when a D/I channel function in 'Counter' mode
TCP_StartDICounter	: To start the counting when a D/I channel function in 'Counter' mode
TCP_StopDICounter	: To stop the counting when a D/I channel function in 'Counter' mode
TCP_ClearDILatch	: To clear the latch when a D/I channel function as 'Lo to Hi Latch' or 'Hi to Lo Latch'
TCP_ReadDILatch	: To read the counter value when a D/I channel function in 'Counter' mode
TCP_WriteDO	: To write some value to D/O channels for an EDAM-9000 module
TCP_WriteDOPulseCount	: To write the pulse output count for EDAM-9000 DIO modules during runtime
TCP_WriteDODelayWidth	: To set the pulse and delay signal widths to the specific EDAM-9000 DIO modules
TCP_ReadDODelayWidth	: To read the pulse and delay signal width from the specific EDAM-9000 DIO modules

5.4 Analog I/O Functions

TCP_ReadAIAlarmTypes	: To set all channel type
TCP_WriteAIAlarmType	: To set all channel alarm type
TCP_ReadAITypes	: To read type of all channels of a specific analog module
TCP_WriteAIChannelType	: To set type of individual channel of a specific analog module
TCP_ReadAIValue	: To read normal value of all channel
TCP_ReadAIMaxVal	: To read maximum value of all channel
TCP_ReadAIMinVal	: To read minimum value of all channel
TCP_ReadAIMultiplexChannel	: To read active status of all channel
TCP_WriteAIMultiplexChannel	: To set active status of all channel
TCP_ReadAIAverageChannel	: To read in average status of all channel
TCP_WriteAIAverageChannel	: To set/reset channels to be in average
TCP_ReadAIAlarmDOConnection	: To read alarm DO connection status
TCP_WriteAIAlarmDOConnection	: To set alarm DO connection
TCP_ReadAIAlarmStatus	: To read alarm status
TCP_ClearAILatchAlarm	: To clear alarm latch status when a A/I channel function in 'Alarm Latch mode' mode
TCP_ClearAIMaxVal	: To clear maximum value to zero
TCP_ClearAIMinVal	: To clear minimum value to zero
TCP_ReadAIBurnOutStatus	: To read AI burn out status(EDAM9015/9019 only)
TCP_ReadAIAlarmLimit	: To read channel high/low alarm limit value
TCP_WriteAIAlarmLimit	: To set channel high/low alarm limit value
TCP_StartAIAlarm	: To set channel alarm type of a specific analog module
TCP_StopAIAlarm	: To disable channel alarm of a specific analog module
TCP_WriteCJCOffset	: To set cold junction offset of a specific EDAM9019 module
TCP_ReadCJCOffset	: To read cold junction offset from a specific EDAM9019 module
TCP_ReadCJCTemperature	: To read cold junction temperature from a specific EDAM9019 module

5.5 MODBUS/TCP Functions

TCP_MODBUS_ReadCoil	: To read the coil values at a specific range described in parameters
TCP_MODBUS_WriteCoil	: To write the coil values at a specific range described in parameters.
TCP_MODBUS_ReadReg	: To read the holding register value at a specific range described in parameters
TCP_MODBUS_WriteReg	: To write values to the holding registers at a specific range described in parameters

5.6 Function Description

The TCPDAQ.DLL function declarations are all included in following files that are attached with the provided DISC.

TCPDAQ.h	: Include file for both VC++ and Borland C++ Builder
TCPDAQ.lib	: Library file for VC++
TCPDAQ_BC.lib	: Library file for Borland C++ Builder
TCPDAQ.bas	: Module file for Visual Basic
TCPDAQ.pas	: Module file for Delphi

You need to add the above file into your AP project before using TCPDAQ.DLL functions

5.6.1 TCP_Open

Description: To initiate the TCPDAQ.dll to use.

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Sub TCP_Open Lib "TCPDAQ.dll" Alias "_TCP_Open@0" ()

Borland C++ Builder: (see TCPDAQ.h)

int TCP_Open();

Delphi: (*see TCPDAQ.pas*)

function TCP_Open(); StdCal;

VC++: (*see TCPDAQ.h*)

int TCP_Open();

Parameters:

void

Return Code:

refer to the *Error code.*

5.6.2 TCP_Close

Description: To terminates use of the TCPDAQ.dll.

Syntax:

Visual Basic: *(see TCPDAQ.bas)*

Declare Sub TCP_Close Lib "TCPDAQ.dll" Alias "_TCP_Close@0" ()

Borland C++ Builder: (*see TCPDAQ.h*)

int TCP_ Close();

Delphi: *(see TCPDAQ.pas)*

function TCP_ Close(); StdCall;

VC++: *(see TCPDAQ.h)*

int TCP_ Close();

Parameters:

void

Return Code:

refer to the *Error code.*

5.6.3 TCP_Connect

Description: to create a Window TCP socket then establishing a connection to a specific EDAM-9000

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function TCP_Connect Lib "TCPDAQ.dll" Alias "_TCP_Connect@20"
                    ( ByVal szIP As String, ByVal port As Integer, ByVal ConnectionTimeout As Long,
                     ByVal SendTimeout As Long, ByVal ReceiveTimeout As Long) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int TCP_Connect(char szIP[],u_short port,int ConnectionTimeout, int SendTimeout,
                    int ReceiveTimeout);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_Connect (szIP: PChar; port: Integer; ConnectionTimeout: Longint;
           SendTimeout: Longint;ReceiveTimeout: Longint): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int TCP_Connect(char szIP[],u_short port,int ConnectionTimeout, int SendTimeout,
                    int ReceiveTimeout);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

port[in]: the TCP/IP port used by Modbus/TCP, it is 502

ConnectionTimeout[in]: Connection timeout value (msec)

SendTimeout[in]: Send timeout value (msec)

ReceiveTimeout[in]: Receive timeout value (msec)

Return Code:

refer to the *Error code.*

5.6.4 TCP_Disconnect

Description: disconnecting the Window TCP socket from all EDAM-9000 modules

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Sub TCP_Disconnect Lib "TCPDAQ.dll" Alias "_TCP_Disconnect@0" ()
```

Borland C++ Builder: (see TCPDAQ.h)

```
void  TCP_Disconnect(void);
```

Delphi: ***(see TCPDAQ.pas)***

```
procedure   TCP_Disconnect ; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
void  TCP_Disconnect(void);
```

Parameters:

void

Return Code:

none*.*

5.6.5 TCP_ModuleDisconnect

Description: disconnecting the Window TCP socket to a specific EDAM-9000

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function TCP_ModuleDisconnect Lib "TCPDAQ.dll" Alias "_TCP_ModuleDisconnect@4"
                    (ByVal szIP As String) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int    TCP_ModuleDisconnect(char szIP[]);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_ModuleDisconnect (szIP: PChar): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int    TCP_ModuleDisconnect(char szIP[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Return Code:

refer to the *Error code.*

5.6.6 TCP_SendData

Description: to send data to a specific EDAM-9000 module

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function TCP_SendData Lib "TCPDAQ.dll" Alias "_TCP_SendData@12"
                    ( ByVal szIP As String, ByRef pData As Byte, ByVal wDataLen As Integer) As
                    Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int       TCP_SendData(char szIP[],char *pData,u_short wDataLen);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function  TCP_SendData (szIP: PChar; pData: PByte; wDataLen: Integer): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int       TCP_SendData(char szIP[],char *pData,u_short wDataLen);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

pData[in]: 8 bit data array

wDataLen[in]: length of data be sent

Return Code:

refer to the *Error code.*

5.6.7 TCP_RecvData

Description: receive data to a specific EDAM-9000 module

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_RecvData Lib "TCPDAQ.dll" Alias "_TCP_RecvData@12"
(ByVal szIP As String, ByRef pData As Byte, ByVal wDataLen As Integer) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
Int	TCP_RecvData(char szIP[],char *pData,u_short wDataLen);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function  TCP_RecvData (szIP: PChar; pData: PByte; wDataLen: Integer): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int	TCP_RecvData(char szIP[],char *pData,u_short wDataLen);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

pData[out]: 8 bit data array

wDataLen [in]: length of data array

Return Code:

If return value >=0, it represents the length of received data

If return value<0, it represents *Error code.*

5.6.8 TCP_SendReceiveASCcmd

Description: to accept an ASCII format string as a command, and transform it to meet the Modbus/TCP's specification. Then sending it to EDAM-9000 and receiving the response from EDAM-9000

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_SendReceiveASCcmd Lib "TCPDAQ.dll" Alias
"_TCP_SendReceiveASCcmd@12" (ByVal szIP As String, ByVal Sendbuf As String, ByVal Recvbuf As String) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
Int	TCP_SendReceiveASCcmd(Char szIP[], char Sendbuf [], char Recvbuf []);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function  TCP_SendReceiveasCcmd (szIP: PChar; Sendbuf: PChar; Recvbuf: PChar): Longint;
          StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int	TCP_SendReceiveASCcmd(Char szIP[], char Sendbuf[], char Recvbuf[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Sendbuf [in]: 8 bit data array to be sent

Recvbuf [out]: 8 bit data array that stored the received data

Return Code:

refer to the *Error code.*

5.6.9 UDP_Connect

Description: to create a Window UDP socket then establishing a connection to a specific EDAM-9000

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function UDP_Connect Lib "TCPDAQ.dll" Alias "_UDP_Connect@24"
                    ( ByVal szIP As String, ByVal s_port As Integer, ByVal d_port As Integer, ByVal
                     ConnectionTimeout As Long, ByVal SendTimeout As Long, ByVal
                     ReceiveTimeout As Long) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int    UDP_Connect(char szIP[],u_short s_port,u_short d_port, int ConnectionTimeout,
                   int SendTimeout, int ReceiveTimeout);
```

Delphi: *(see TCPDAQ.pas)*

```
Function  UDP_Connect (szIP: PChar; s_port: word; d_port: word; ConnectionTimeout: Longint;
          SendTimeout: Longint; ReceiveTimeout: Longint): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int    UDP_Connect(char szIP[],u_short s_port,u_short d_port,int ConnectionTimeout,
                   int SendTimeout,int ReceiveTimeout);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

s_port: source port number

d_port: destination port number

ConnectionTimeout: timeout value for connection (msec)

SendTimeout: timeout value for sending (msec)

ReceiveTimeout: timeout value for receiving (msec)

Return Code:

refer to the *Error code*.

5.6.10 UDP_Disconnect

Description: disconnecting the Window UDP socket from all EDAM-9000 modules

Syntax:

Visual Basic: **(*see TCPDAQ.bas*)**

```
Declare Sub UDP_Disconnect Lib "TCPDAQ.dll" Alias "_UDP_Disconnect@0" ()
```

Borland C++ Builder: (see TCPDAQ.h)

```
void     UDP_Disconnect(void);
```

Delphi: *(see TCPDAQ.pas)*

```
procedure   UDP_Disconnect ; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
void     UDP_Disconnect(void);
```

Parameters:

void

Return Code:

none

5.6.11 UDP_ModuleDisconnect

Description: disconnecting the Window UDP socket from a specific EDAM-9000

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function UDP_ModuleDisconnect Lib "TCPDAQ.dll" Alias "_UDP_ModuleDisconnect@4"
                    (ByVal szIP As String) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     UDP_ModuleDisconnect(Char szIP[]);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   UDP_ModuleDisconnect (szIP: PChar): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int     UDP_ModuleDisconnect(char szIP[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be disconnected

Return Code:

refer to the *Error code.*

5.6.12 UDP_SendData

Description: send data to a specific EDAM-9000 module (Datagram)

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function UDP_SendData Lib "TCPDAQ.dll" Alias "_UDP_SendData@12"
                    (ByVal szIP As String, ByRef pData As Byte, ByVal wDataLen As Integer) As
                    Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     UDP_SendData(char szIP[],char *pData,u_short wDataLen);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function  UDP_SendData (szIP: PChar; pData: PByte; wDataLen: Integer): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int     UDP_SendData(char szIP[],char *pData,u_short wDataLen);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

pData[in]: points to data buffer

wDataLen[in]: length of data be sent

Return Code:

refer to the *Error code.*

5.6.13 UDP_RecvData

Description: receive data to a specific EDAM-9000 module (Datagram)

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function UDP_RecvData Lib "TCPDAQ.dll" Alias "_UDP_RecvData@12"
        (ByVal szIP As String, ByRef pData As Byte, ByVal wDataLen As Integer) As
        Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     UDP_RecvData(char szIP[],char *pData,u_short wDataLen);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function  UDP_RecvData (szIP: PChar; pData: PByte; wDataLen: Integer): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int     UDP_RecvData(char szIP[],char *pData,u_short wDataLen);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

pData[out]: 8 bit array that stored the received data

wDataLen [in]: length of received data

Return Code:

refer to the *Error code.*

5.6.14 UDP_SendReceiveASCcmd

Description: send an ASCII format string as a command to EDAM-9000 and receiving the response from EDAM-9000

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function UDP_SendReceiveASCcmd Lib "TCPDAQ.dll" Alias
        "_UDP_SendReceiveASCcmd@12"   (ByVal szIP As String, ByVal Txdata As _
        String, ByVal Rxdata As String) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     UDP_SendReceiveASCcmd(char szIP[],char Txdata [],char Rxdata []);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function     UDP_SendReceiveAsCcmd (szIP: PChar; Txdata:PChar;   Rxdata: PChar): Longint;
StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int     UDP_SendReceiveASCcmd(SOCKET UDPsock,char Txdata [],char Rxdata []);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Txdata [in]: 8 bit array that stored the data to be sent

Rxdata [out]: 8 bit array that stored the received data

Return Code:

refer to the *Error code.*

5.6.15 TCP_GetModuleIPinfo

Description: return module IP information of a specific module

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_GetModuleIPinfo Lib "TCPDAQ.dll" Alias "_TCP_GetModuleIPinfo@8" (ByVal szIP As String, ByRef ModuleIP As ModuleInfo) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int TCP_GetModuleIPinfo(char szIP[],struct ModuleInfo *ModuleIP);

Delphi: ***(see TCPDAQ.pas)***

Function TCP_GetModuleIPinfo (szIP: PChar; var ModuleIP: TModuleInfo): Longint; StdCall;

VC++: ***(see TCPDAQ.h)***

Int TCP_GetModuleIPinfo(char szIP[],struct ModuleInfo *ModuleIP);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

ModuleIP[out]: a structure array that stroes the module IP information

Return Code:

refer to the *Error code.*

5.6.16 TCP_GetModuleID

Description: return ID number of a specific module.

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_GetModuleID Lib "TCPDAQ.dll" Alias "_TCP_GetModuleID@8" (ByVal szIP As String, ByRef ModuleID As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int TCP_GetModuleID(char szIP[], char * ModuleID);

Delphi: ***(see TCPDAQ.pas)***

Function TCP_GetModuleID(szIP: PChar; ModuleID: PByte): Longint; StdCall;;

VC++: ***(see TCPDAQ.h)***

Int TCP_GetModuleID(char szIP[], char * ModuleID);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

ModuleID [in]: the ID number

Return Code:

refer to the *Error code.*

5.6.17 TCP_GetIPFromID

Description: get IP address for a specific module ID number. This function is helpful when the module is DHCP enabled

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_GetIPFromID Lib "TCPDAQ.dll" Alias "_TCP_GetIPFromID@8" (ByVal szID As Byte, ByRef szIP As String) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
Int     TCP_GetIPFromID(u_char szID ,char szIP[]);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function     TCP_GetIPFromID(szID: Byte; szIP: PChar): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int     TCP_GetIPFromID(u_char szID ,char szIP[]);
```

Parameters:

szID[in]: module ID number (0~255)

szIP[out]: 8 bit array that stored the IP address string(such as "192.168.0.2")

Return Code:

refer to the *Error code*.

5.6.18 TCP_ScanOnLineModules

Description: search on-line EDAM900 modules in the same subnet

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_ScanOnLineModules Lib "TCPDAQ.dll" Alias "_TCP_ScanOnLineModules@8" (ModuleIP As ModuleInfo, ByVal Sortkey As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
Int     TCP_ScanOnLineModules( struct ModuleInfo ModuleIP[], u_char SortKey);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function     Scan_OnLineModules (var ModuleIP: TModuleInfo; Sortkey: Byte): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int     TCP_ScanOnLineModules( struct ModuleInfo ModuleIP[], u_char SortKey);
```

Parameters:

ModuleIP[out]: points to ModuleInfo structure array

SortKey[in]: sortkey word (by IP address,by ID number, or by Module no)
=SORT_MODULE_IP ,sort by IP address
=SORT_MODULE_ID ,sort by ID number
=SORT_MODULE_NO ,sort by module number

Return Code:

refer to the *Error code*.

5.6.19 TCP_GetDLLVersion

Description: return the version number of TCPDAQ.dll

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_GetDLLVersion Lib "TCPDAQ.dll" Alias "_TCP_GetDLLVersion@0" () As Long

Borland C++ Builder: (see TCPDAQ.h)

Int   TCP_GetDLLVersion(void);

Delphi: ***(see TCPDAQ.pas)***

Function   TCP_GetDLLVersion: Longint; StdCall;

VC++: ***(see TCPDAQ.h)***

Int   TCP_GetDLLVersion(void);

Parameters:

void

Return Code:

the version number.

5.6.20 TCP_GetModuleNo

Description: return the module name of a specific IP address

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_GetModuleNo Lib "TCPDAQ.dll" Alias "_TCP_GetModuleNo@8" _
(ByVal szIP As String, ByRef Mname As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int   TCP_GetModuleNo(char szIP[], char   Mname[]);

Delphi: ***(see TCPDAQ.pas)***

Function   TCP_GetModuleNo (szIP: PChar; Mname: PByte): Longint; StdCall;

VC++: ***(see TCPDAQ.h)***

Int   TCP_GetModuleNo(char szIP[], char Mname[]);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Mname[out]: 8 bit array that stored the module name string

Return Code:

refer to the *Error code*.

5.6.21 TCP_GetLastError

Description: return the error code of the latest called function

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_GetLastError Lib "TCPDAQ.dll" Alias "_TCP_GetLastError@0" () As Long

Borland C++ Builder: (see TCPDAQ.h)

```
Int        TCP_GetLastError(void);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_GetLastError: Longint ; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int        TCP_GetLastError(void);
```

Parameters:

void

Return Code:

The error status for the last operation that failed.(refer to the *Error code***)**

5.6.22 TCP_PingIP

Description: ping to remote IP address

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_PingIP Lib "TCPDAQ.dll" Alias "_TCP_PingIP@8" (ByVal IPadr As String, ByVal PingTimes As Integer) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
int        TCP_PingIP(char szIP[],int PingTimes);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_PingIP(szIP: PChar;PingTimes: Integer): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int        TCP_PingIP(char szIP[],int PingTimes);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

PingTimes [in]:Timeout value

Return Code:

=-1, no response from remote IP

>0, response time from remote IP

5.6.23 TCP_StartStream

Description: to instruct the PC to start to receive stream data that coming from EDAM-9000

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_StartStream Lib "TCPDAQ.dll" Alias "_TCP_StartStream@8" (ByVal IP As String, ByVal EventFromApp As Long) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
int     TCP_StartStream(char szIP[],HANDLE EventFromApp);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_StartStream (szIP: PChar; EventFromApp: Longint): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int     TCP_StartStream(char szIP[],HANDLE EventFromApp);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

EventFromApp: event handle (be signaled, when stream data arrived)

Return Code:

refer to the *Error code*.

5.6.24 TCP_StopStream

Description: to instruct the PC to stop receiving stream data from all modules.

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_StopStream Lib "TCPDAQ.dll" Alias "_TCP_StopStream@0" () As Long

Borland C++ Builder: (see TCPDAQ.h)

int TCP_StopStream(void);

Delphi: ***(see TCPDAQ.pas)***

Function TCP_StopStream: Longint; StdCall;

VC++: ***(see TCPDAQ.h)***

int TCP_StopStream(void);

Parameters:

void

Return Code:

refer to the *Error code*.

5.6.25 TCP_ReadStreamData

Description: to read stream data that coming from the specific EDAM-9000

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

Declare Function TCP_ReadStreamData Lib "TCPDAQ.dll" Alias "_TCP_ReadStreamData@8" (ByVal szIP As String, ByRef lpData As StreamData) As Long

Borland C++ Builder: (see TCPDAQ.h)

int TCP_ReadStreamData (char szIP[], struct _StreamData *lpData);

Delphi: ***(see TCPDAQ.pas)***

Function TCP_ReadStreamData (szIP: PChar; Var lpData: TStreamData): integer; StdCall;

VC++: ***(see TCPDAQ.h)***

int TCP_ReadStreamData (char szIP[], struct _StreamData *lpData);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

lpData[out]: points to stream data structure that stored the stream data

Return Code:

refer to the *Error code*.

5.6.26 TCP_StartEvent

Description: to start listening the alarm event trigger

Syntax:

Visual Basic: *(see TCPDAQ.bas)*

Declare Function TCP_StartEvent Lib "TCPDAQ.dll" Alias "_TCP_StartEvent@8" (ByVal IPadr As String, ByVal EventFromApp As Long) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
int        TCP_StartEvent(char szIP[],HANDLE EventFromApp);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_StartEvent(szIP: PChar; EventFromApp: Longint): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int        TCP_StartEvent(char szIP[],HANDLE EventFromApp);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

EventFromApp: event handle (be signaled, when alarm event occured)

Return Code:

refer to the *Error code.*

5.6.27 TCP_StopEvent

Description: to stop listening the alarm event trigger from all module

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function TCP_StopEvent Lib "TCPDAQ.dll" Alias "_TCP_StopEvent@0" () As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int      TCP_StopEvent(void);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_StopEvent: Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int      TCP_StopEvent(void);
```

Parameters:

void

Return Code:

refer to the *Error code*.

5.6.28 TCP_ReadEventData

Description: to read triggered alarm event message

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadEventData Lib "TCPDAQ.dll" Alias "_TCP_ReadEventData@8"
                    (ByVal szIP As String, ByRef lpData As AlarmData) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_ReadEventData (char szIP[], struct _AlarmInfo *lpData);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_ReadEventData (SzIP: PChar; Var lpData: TEventInfo): integer; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int      TCP_ReadEventData (char szIP[], struct _AlarmInfo *lpData);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

lpData[out]: points to alarm event data structure that stored event message (ref. to TCPDAQ.H)

Return Code:

refer to the *Error code*.

5.6.29 TCP_ReadAllDataFromModule

Description: to read all data from a specific module

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function TCP_ReadAllDataFromModule Lib "TCPDAQ.dll" Alias
                    "_TCP_ReadAllDataFromModule@8" (ByVal szIP As String, _
                    ByRef ModuleData As ModuleData) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_ReadAllDataFromModule(char szIP[],struct ModuleData *ModuleData);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_ReadAllDataFromModule(SzIP: PChar; Var ModuleData: TModuleData);
```

VC++: ***(see TCPDAQ.h)***

```
int      TCP_ReadAllDataFromModule(char szIP[],struct ModuleData *ModuleData);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

ModuleData [out]: points to ModuleData structure that stored module data (ref. to TCPDAQ.H)

Return Code:

refer to the *Error code*.

5.6.30 TCP_ReadDIOMode

Description: to read the mode of D/I & D/O channels of an EDAM-9000 module.

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function TCP_ReadDIOMode Lib "TCPDAQ.dll" Alias "_TCP_ReadDIOMode@12" _
                   (ByVal szIP As String, ByRef DImode As Byte, ByRef DOmode As Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int      TCP_ReadDIOMode(char szIP[],u_char DImode[],u_char DOmode[]);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function      TCP_ReadDIOMode (szIP: PChar; DImode: PByte; DOmode: PByte): Longint;
              StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int      TCP_ReadDIOMode(char szIP[],u_char DImode[],u_char DOmode[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

DImode[out]: an 8 bit array that stored the DI channel mode

DOmode[out]: an 8 bit array that stored the DO channel mode

Return Code:

refer to the *Error code*.

5.6.31 TCP_ReadDIO

Description: to read DI/DO's status for an EDAM-9000 module

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function TCP_ReadDIO Lib "TCPDAQ.dll" Alias "_TCP_ReadDIO@12" _
                (ByVal szIP As String, ByRef ByDi As Byte, ByRef ByDo As Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int     TCP_ReadDIO(char szIP[],u_char byDI[],u_char byDO[] );
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_ReadDIO (szIP: PChar;   ByDi: PByte;   ByDo: PByte): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int     TCP_ReadDIO(char szIP[],u_char u_byDI[],u_char byDO[] );
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

byDI[out]: an 8 bit array that stored the DI channel status

byDO[out]: an 8 bit array that stored the DO channel status

Return Code:

refer to the *Error code.*

5.6.32 TCP_ReadDISignalWidth

Description: to read the minimal high/low signal width of all D/I channels

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadDISignalWidth Lib "TCPDAQ.dll" Alias
                "_TCP_ReadDISignalWidth@12" (ByVal szIP As String, ByRef ulLoWidth As
                Long, ByRef ulHiWidth As Long) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int     TCP_ReadDISignalWidth(char szIP[],u_long ulLoWidth[],u_long ulHiWidth[]);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function     TCP_ReadDISignalWidth (szIP: PChar; var ulLoWidth:array of Longword; var
             ulHiWidth:array of Longword): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
Int     TCP_ReadDISignalWidth(char szIP[],u_long ulLoWidth[],u_long ulHiWidth[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

ulLoWidth[out]: an 32 bit array that stored channel low width value

ulHiWidth[out]: an 32 bit array that stored channel high width value

Return Code:

refer to the *Error code.*

5.6.33 TCP_WriteDISignalWidth

Description: to set the minimal high/low signal width of all D/I channels

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_WriteDISignalWidth Lib "TCPDAQ.dll" Alias "_TCP_WriteDISignalWidth@12" (ByVal szIP As String, ByRef ulLoWidth As Long, ByRef ulHiWidth As Long) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int TCP_WriteDISignalWidth(char szIP[],u_long ulLoWidth[],u_long ulHiWidth[]);

Delphi: *(see TCPDAQ.pas)*

Function TCP_WriteDISignalWidth(szIP: PChar; var ulLoWidth:array of Longword; var ulHiWidth:array of Longword): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

Int TCP_WriteDISignalWidth(char szIP[],u_long ulLoWidth[],u_long ulHiWidth[]);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

ulLoWidth[in]: an unsigned 32 bits array that stored the minimal low signal width for each D/I channel. The unit is 0.5 mSec

ulHiWidth[in]: an unsigned 32 bits array that stored the minimal high signal width for each D/I channel. The unit is 0.5 mSec

Return Code:

refer to the *Error code*.

5.6.34 TCP_ReadDICounter

Description: to read the counter value of all D/I channels (the counter value is available only for channel that functions in 'Counter' mode

Syntax:

Visual Basic: *(see TCPDAQ.bas)*

Declare Function TCP_ReadDICounter Lib "TCPDAQ.dll" Alias "_TCP_ReadDICounter@8" (ByVal szIP As String, ByRef ulCounterValue As Long) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int TCP_ReadDICounter(Char szIP[],u_long ulCounterValue[]);

Delphi: *(see TCPDAQ.pas)*

Function TCP_ReadDICounter (szIP: PChar; var ulCounterValue:array of Longword): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

Int TCP_ReadDICounter(Char szIP[],u_long ulCounterValue[]);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

ulCounterValue[out]:an unsigned 32 bits array that stored the counter value for each D/I channel

Return Code:

refer to the *Error code*.

5.6.35 TCP_ClearDICounter

Description: to clear the counter value when a D/I channel function in 'Counter' mode

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ClearDICounter Lib "TCPDAQ.dll" Alias "_TCP_ClearDICounter@8"
                    (ByVal szIP As String, ByVal wChno As Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int       TCP_ClearDICounter(char szIP[],u_short wChNo);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ClearDICounter (szIP: PChar; wChno: Integer): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int       TCP_ClearDICounter(char szIP[],u_short wChNo);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wChNo[in]: the D/I channel to be cleared.

Return Code:

refer to the *Error code*.

5.6.36 TCP_StartDICounter

Description: to start the counting when a D/I channel function as 'Counter' mode

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_StartDICounter Lib "TCPDAQ.dll" Alias "_TCP_StartDICounter@8"
                    (ByVal szIP As String, ByVal wChno As Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int       TCP_StartDICounter(Char szIP[],u_short   wChNo);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_StartDICounter (szIP: PChar; wChno: Integer): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int       TCP_StartDICounter(Char szIP[],u_short wChNo);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wChNo[in]: the channel number that is enabled to count

Return Code:

refer to the *Error code*.

5.6.37 TCP_StopDICounter

Description: to stop the counting when a D/I channel function as 'Counter' mode

Syntax:

Visual Basic: ***(see TCPDAQ.bas)***

```
Declare Function TCP_StopDICounter Lib "TCPDAQ.dll" Alias "_TCP_StopDICounter@8"
                    (ByVal szIP As String, ByVal wChno As Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     TCP_StopDICounter(char szIP[],u_short   wChNo);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_StopDICounter   (szIP: PChar; wChno: Integer): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h)***

```
int     TCP_StopDICounter(char szIP[],u_short   wChNo);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wChNo[in]: the channel number that is disabled to count

Return Code:

refer to the *Error code.*

5.6.38 TCP_ClearDILatch

Description: to clear the latch when a D/I channel function as 'Lo to Hi Latch' or 'Hi to Lo Latch'

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ClearDILatch Lib "TCPDAQ.dll" Alias "_TCP_ClearDILatch@8"
                    (ByVal szIP As String, ByVal wChno As Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     TCP_ClearDILatch(char szIP[],u_short wChNo);
```

Delphi: ***(see TCPDAQ.pas)***

```
Function   TCP_ClearDILatch(szIP: PChar;   wChno: Integer): Longint; StdCall;
```

VC++: ***(see TCPDAQ.h*)**

```
int     TCP_ClearDILatch(char szIP[],u_short wChNo);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wChNo[in]: the channel number that latch status is cleared

Return Code:

refer to the *Error code*.

5.6.39 TCP_ReadDILatch

Description: to read the DI latch status when a D/I channel function in 'Lo to Hi Latch' or 'Hi to Lo Latch'

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadDILatch Lib "TCPDAQ.dll" Alias "_TCP_ReadDILatch@8"
                    (ByVal szIP As String, ByRef wLatch As Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_ReadDILatch(char szIP[],u_char wLatch[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ReadDILatch (szIP: PChar; wLatch: PByte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int      TCP_ReadDILatch(char szIP[],u_char wLatch[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wLatch[out]: an unsigned 8 bits array that stored the latch stsatus for each D/I channel

Return Code:

refer to the *Error code.*

5.6.40 TCP_WriteDO

Description: to write some value to D/O channels for an EDAM-6000 module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_WriteDO Lib "TCPDAQ.dll" Alias "_TCP_WriteDO@16" _
                    (ByVal szIP As String, ByVal wStartDO As Integer, ByVal wCount As Integer,
                    ByRef ByDo As Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_WriteDO(Char szIP[], u_short wStartDO, u_short wCount,u_char byDO[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function      TCP_WriteDO(szIP: PChar; wStartDO: Integer; wCount: Integer;ByDo: PByte):
              Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int      TCP_WriteDO(Char szIP[], u_short wStartDO, u_short wCount,u_char byDO[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wStartDO[in]: the starting channel that to be written.

wCount[in]: how many channels to be written.

byDO[in]: an 8 bit array that stored the values that written to the connected EDAM-9000

Return Code:

refer to the *Error code.*

5.6.41 TCP_WriteDOPulseCount

Description: to write the pulse output count for EDAM-9000 DIO modules during runtime

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_WriteDOPulseCount Lib "TCPDAQ.dll" Alias _
                    "_TCP_WriteDOPulseCount@12" (ByVal szIP As String, _
                    ByVal wDoChannel As Integer, ByVal ulPulseCount As Long) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     TCP_WriteDOPulseCount(char szIP[],u_short wDoChannel,u_long ulPulseCount);
```

Delphi: *(see TCPDAQ.pas)*

```
Function     TCP_WriteDOPulseCount(szIP: PChar; wDoChannel: Integer; ulPulseCount:
              Longint): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int     TCP_WriteDOPulseCount(char szIP[],u_short wDoChannel,u_long ulPulseCount);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wDoChannel[in]: the channel index for writing

ulPulseCount[in]: the pulse output count.

Return Code:

refer to the *Error code*.

5.6.42 TCP_WriteDODelayWidth

Description: to set the pulse and delay signal widths to specific EDAM-9000 DIO modules

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_WriteDODelayWidth Lib "TCPDAQ.dll" Alias
                    "_TCP_WriteDODelayWidth@24" (ByVal szIP As String, ByVal wChno As
                    Integer, ByVal ulLoPulseWidth As Long, ByVal ulHiPulseWidth As Long, _
                    ByVal ulLoDelayWidth As Long, ByVal ulHiDelayWidth As Long) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     TCP_WriteDODelayWidth(Char szIP[], u_short wChno,
                              u_long ulLoPulseWidth,u_long ulHiPulseWidth,
                              u_long ulLoDelayWidth,u_long ulHiDelayWidth);
```

Delphi: *(see TCPDAQ.pas)*

```
Function    TCP_WriteDODelayWidth (szIP: PChar;   wChno: Integer; ulLoPulseWidth: Longint;
            ulHiPulseWidth: Longint;ulLoDelayWidth: Longint;   ulHiDelayWidth: Longint):
            Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int     TCP_WriteDODelayWidth(char szIP[], u_short wChno,
                             u_long ulLoPulseWidth, u_long ulHiPulseWidth,
                             u_long ulLoDelayWidth, u_long ulHiDelayWidth);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wChno[in]: the channel index for writing

ulLoPulseWidth[in]: the output pulse signal width at low level.

ulHiPulseWidth[in]: the output pulse signal width at high level.

ulLoDelayWidth[in]: the output signal delay width when set DO from high to low level.

ulHiDelayWidth[in]: the output signal delay width when set DO from low to high level.

Return Code:

refer to the *Error code.*

5.6.43 TCP_ReadDODelayWidth

Description: to read the pulse and delay signal widths from specific EDAM-6000 DIO modules

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadDODelayWidth Lib "TCPDAQ.dll" Alias
                 "_TCP_ReadDODelayWidth@24" (ByVal szIP As String, ByVal wChno As
                 Integer, ByRef ulLoPulseWidth As Long, ByRef ulHiPulseWidth As Long,
                 ByRef ulLoDelayWidth As Long, ByRef ulHiDelayWidth As Long) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int    TCP_ReadDODelayWidth(char szIP[],u_short wChno,
                            u_long *ulLoPulseWidth,u_long *ulHiPulseWidth,
                            u_long *ulLoDelayWidth,u_long *ulHiDelayWidth);
```

Delphi: (see TCPDAQ.pas)

```
Function    TCP_ReadDODelayWidth (szIP: PChar;   wChno: Integer; ulLoPulseWidth: Longint;
            ulHiPulseWidth: Longint;ulLoDelayWidth: Longint;   ulHiDelayWidth: Longint):
            Longint; StdCall;
```

VC++: (see TCPDAQ.h)

```
int    TCP_ReadDODelayWidth(char szIP[],u_short wChno,
                            u_long *ulLoPulseWidth,lu_long *ulHiPulseWidth,
                            u_long *ulLoDelayWidth,u_long *ulHiDelayWidth);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wChno[in]: the channel index for reading

ulLoPulseWidth[out]: the pulse output signal width at low level

ulHiPulseWidth[out]: the pulse output signal width at high level

ulLoDelayWidth[out]: the delay output signal width at low level

ulHiDelayWidth) [out]: the delay output signal width at high level

Return Code:

refer to the *Error code.*

5.6.44 TCP_ReadAIValue

Description: to read all channel input value of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadAIValue Lib "TCPDAQ.dll" Alias "_TCP_ReadAIValue@8"
                    (ByVal szIP As String, ByRef dlValue As Double) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_ReadAIValue(char szIP[],double dlValue[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function     TCP_ReadAIValue (szIP: PChar; dlValue: PDouble): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int      TCP_ReadAIValue(char szIP[],double dlValue[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

dlValue[out]: an array that stored the analog values that reading from A/I channels.

Return Code:

refer to the *Error code.*

5.6.45 TCP_ReadAITypes

Description: to read all channel type of a specific ananlog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadAITypes Lib "TCPDAQ.dll" Alias "_TCP_ReadAITypes@8"
                    (ByVal szIP As String, ByRef szRange As Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_ReadAITypes(char szIP[],u_char szTypes[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function     TCP_ReadAITypes (szIP: PChar; szRange: PByte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int      TCP_ReadAITypes(char szIP[],u_char szTypes[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

szTypes[out]: an array that stored the types of all A/I channels

Return Code:

refer to the *Error code*.

5.6.46 TCP_ReadAIMaxVal

Description: to read all channel maxmal value of a specific ananlog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadAIMaxVal Lib "TCPDAQ.dll" Alias "_TCP_ReadAIMaxVal@8"
                    (ByVal szIP As String, ByRef dMaxValue As Double) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_ReadAIMaxVal(char szIP[],double dMaxValue[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function    TCP_ReadAIMaxVal (szIP: PChar; dMaxValue: PDouble): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int      TCP_ReadAIMaxVal(char szIP[],double dMaxValue[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

dMaxValue[out]: an array that stored the maximal analog values of all A/I channels

Return Code:

refer to the *Error code.*

5.6.47 TCP_ReadAIMinVal

Description: to read all channel minimal value of a specific ananlog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadAIMinVal Lib "TCPDAQ.dll" Alias "_TCP_ReadAIMinVal@8"
                    (ByVal szIP As String, ByRef dMinValue As Double) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_ReadAIMinVal(char szIP[],double dMinValue[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ReadAIMinVal (szIP: PChar; dMinValue: PDouble): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int      TCP_ReadAIMinVal(char szIP[],double dMinValue[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

dMinValue[out]: an array that stored the minimal analog values of all A/I channels

Return Code:

refer to the *Error code.*

5.6.48 TCP_WriteAIMultiplexChannel

Description: to enable/disable channel activation of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_WriteAIMultiplexChannel Lib "TCPDAQ.dll" Alias
        "_TCP_WriteAIMultiplexChannel@8" (ByVal szIP As String, ByRef szchno As
        Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_WriteAIMultiplexChannel(char szIP[],u_char szChno[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_WriteAIMultiplexChannel(szIP: PChar; szchstatus: PByte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int      TCP_WriteAIMultiplexChannel(char szIP[],u_char szChno[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

szChno[in]: an 8 bit array that stored the AI channel which represent in numeric.
The meanning for a value in an entity as follow:
szChno[n]:0 disable channel #n for multiplexing
szChno[n]:1 Enable channel #n for multiplexing

Return Code:

refer to the *Error code*.

5.6.49 TCP_ReadAIMultiplexChannel

Description: to read all channel activation status of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadAIMultiplexChannel Lib "TCPDAQ.dll" Alias
        "_TCP_ReadAIMultiplexChannel@8" (ByVal szIP As String, ByRef szchno As
        Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int      TCP_ReadAIMultiplexChannel(char szIP[],u_char szChno[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ReadAIMultiplexChannel(szIP: PChar; szchstatus: PByte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int      TCP_ReadAIMultiplexChannel(char szIP[],u_char szChno[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

szChno[in]: an 8 bit array that stored the AI channel which represent in numeric.
The meanning for a value in an entity as follow:
szChno[n]:0 disable channel #n for multiplexing
szChno[n]:1 Enable channel #n for multiplexing

Return Code:

refer to the *Error code*.

5.6.50 TCP_ReadAIAverageChannel

Description: to read all channels in-average status of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_ReadAIAverageChannel Lib "TCPDAQ.dll" Alias "_TCP_ReadAIAverageChannel@8" (ByVal szIP As String, ByRef avgch As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
int        TCP_ReadAIAverageChannel(char szIP[],u_char avgch[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ReadAIAverageChannel(szIP: PChar; avgch: PByte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int        TCP_ReadAIAverageChannel(char szIP[],u_char avgch[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

avgch[in]: an 8 bit array that stored the AI channel which represent in numeric.
The meanning for a value in an entity as follow:
avgch [n]:0 the channel #n is in average
avgch [n]:1 the channel #n is not in average

Return Code:

refer to the *Error code*.

5.6.51 TCP_WriteAIAverageChannel

Description: to set all channels to be in-average or not of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_WriteAIAverageChannel Lib "TCPDAQ.dll" Alias
"_TCP_WriteAIAverageChannel@8" (ByVal szIP As String, ByRef avgch As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
int        TCP_WriteAIAverageChannel(char szIP[],u_char avgch[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_WriteAIAverageChannel(szIP: PChar; avgch: PByte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int        TCP_WriteAIAverageChannel(cChar szIP[],u_char avgch[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

avgch[in]: an 8 bit array that stored the AI channel which represent in numeric.
The meanning for a value in an entity as follow:
avgch [n]:0 disable channel #n to be in average
avgch [n]:1 enable channel #n to be in average

Return Code:

refer to the *Error code*.

5.6.52 TCP_ReadAIAlarmTypes

Description: to read channel alarm type of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadAIAlarmTypes Lib "TCPDAQ.dll" Alias
                    "_TCP_ReadAIAlarmTypes@16" (ByVal szIP As String, ByVal AIchno As Integer,
                    ByRef HiAlarmType As Byte, ByRef LoAlarmType As Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int     TCP_ReadAIAlarmTypes(char szIP[],u_short AIchno,u_char *AIHialarmtype,
                             u_char *AILoalarmtype);
```

Delphi: (see TCPDAQ.pas)

```
Function     TCP_ReadAIAlarmTypes(szIP: PChar; AIchno: Integer; HiAlarmType: PByte;
             LoAlarmType: PByte): Longint; StdCall;
```

VC++: (see TCPDAQ.h)

```
Int     TCP_ReadAIAlarmTypes(char szIP[],u_short AIchno, u_char *AIHialarmtype,
                             u_char *AILoalarmtype);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

AIchno[in]: the channel index for reading

AIHialarmtype[in]: high alarm type(=0 momemtary_alarm,=1 latch_alarm,=2 disable_alarm)

AILoalarmtype[in]: low alarm type(=0 momemtary_alarm,=1 latch_alarm,=2 disable_alarm)

Return Code:

refer to the *Error code*.

5.6.53 TCP_WriteAIAlarmType

Description: to set channel alarm type of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_WriteAIAlarmType Lib "TCPDAQ.dll" Alias "_TCP_WriteAIAlarmType@16" (ByVal szIP As String, ByVal Chno As Integer, ByVal HiLoAlarm As Byte, ByVal AlarmType As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int TCP_WriteAIAlarmType(char szIP[],u_short AIchno,u_char HiorLow,u_char Alarmtype);

Delphi: *(see TCPDAQ.pas)*

Function TCP_WriteAIAlarmType (szIP: PChar; Chno: Integer; HiLoAlarm: Byte; AlarmType: Byte): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

Int TCP_WriteAIAlarmType(char szIP[],u_short AIchno, u_char HiorLow,u_char Alarmtype);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

AIchno[in]: the channel index for reading

HiorLow[in]: set high or low alarm(=0 low alarm, =1 high alarm)

Alarmtype[in]: alarm type (0=momemtary_alarm, 1=latch_alarm)

Return Code:

refer to the *Error code*.

5.6.54 TCP_ReadAIAlarmDOConnection

Description: to read alarm channel DO connection of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadAIAlarmDOConnection Lib "TCPDAQ.dll" Alias
            "_TCP_ReadAIAlarmDOConnection@16" (ByVal szIP As String, ByVal AIchno
            As Integer, ByRef AIHiAlarmDOchn As Integer, ByRef AILoAlarmDOchn As
            Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int    TCP_ReadAIAlarmDOConnection(char szIP[],u_short AIchno, u_short *AIHiAlarmDOchn,
                                   u_short *AILoAlarmDOchn);
```

Delphi: (see TCPDAQ.pas)

```
Function    TCP_ReadAIAlarmDOConnection(szIP: PChar; AIchno: Integer; AIHiAlarmDOchn:
            PWORD;   AILoAlarmDOchn: PWORD): Longint; StdCall;
```

VC++: (see TCPDAQ.h)

```
int    TCP_ReadAIAlarmDOConnection(char szIP[],u_short AIchno,u_short *AIHiAlarmDOchn,
                                   u_short *AILoAlarmDOchn);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

AIchno[in]: the channel index for reading

AIHiAlarmDOchn[out]: D/O channel number be connected to high alarm

AILoAlarmDOchn[out]: D/O channel number be connected to low alarm

Return Code:

refer to the *Error code.*

5.6.55 TCP_WriteAIAlarmDOConnection

Description: to set alarm channel DO connection of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_WriteAIAlarmDOConnection Lib "TCPDAQ.dll" Alias "_TCP_WriteAIAlarmDOConnection@16" (ByVal szIP As String, ByVal AIchno As Integer, ByVal HiAlarmDOchn As Integer, ByVal LoAlarmDOchn As Integer) As Long

Borland C++ Builder: (see TCPDAQ.h)

int TCP_WriteAIAlarmDOConnection(char szIP[],u_short AIchno,u_short HiAlarmDOchn, u_short LoAlarmDOchn);

Delphi: *(see TCPDAQ.pas)*

Function TCP_WriteAIAlarmDOConnection (szIP: PChar; AIchno: Integer; HiAlarmDOchn: PWORD; LoAlarmDOchn: PWORD): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

int TCP_WriteAIAlarmDOConnection(char szIP[],u_short AIchno, u_short HiAlarmDOchn, u_short LoAlarmDOchn);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

AIchno[in]: the channel index for reading

AIHiAlarmDOchn[in] D/O channel number be connected to high alarm

AILoAlarmDOchn[in]: D/O channel number be connected to low alarm

Return Code:

refer to the *Error code*.

5.6.56 TCP_ReadAIBurnOutStatus

Description: to read all channel burn-out status of a specific analog module (EDAM-9015, 9019 only)

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_ReadAIBurnOutStatus Lib "TCPDAQ.dll" Alias "_TCP_ReadAIBurnOutStatus@8" (ByVal szIP As String, ByRef dlBurnout As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

int TCP_ReadAIBurnOutStatus(char szIP[],u_char dlBurnout[]);

Delphi: *(see TCPDAQ.pas)*

Function TCP_ReadAIBurnOutStatus (szIP: PChar; dlBurnout: PByte): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

int TCP_ReadAIBurnOutStatus(char szIP[],u_char dlBurnout[]);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

dlBurnout[out]: an 8 bit array that stored the burn-out status of EDAM-9019,9015 module (=0 normal, =1 burn-out)

Return Code:

refer to the *Error code*.

5.6.57 TCP_ReadAIAlarmStatus

Description: to read a channel alarm status of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_ReadAIAlarmStatus Lib "TCPDAQ.dll" Alias "_TCP_ReadAIAlarmStatus@16" (ByVal szIP As String, ByVal Chno As Integer, ByRef szHighAlarm As Byte, ByRef szLowAlarm As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

int TCP_ReadAIAlarmStatus(char szIP[],u_short Chno,u_char *szHighAlarm, u_char *szLowAlarm);

Delphi: *(see TCPDAQ.pas)*

Function TCP_ReadAIAlarmStatus (szIP: PChar; Chno: Integer; szHighAlarm: PByte; szLowAlarm: PByte): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

int TCP_ReadAIAlarmStatus(char szIP[],u_short Chno,u_char *szHighAlarm, u_char *szLowAlarm);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Chno[in]: the channel index for reading

szHighAlarm: high alarm status (1=alarm occurred, 0=no alarm)

szLowAlarm: low alarm status (1=alarm occurred, 0=no alarm)

Return Code:

refer to the *Error code*.

5.6.58 TCP_ClearAILatchAlarm

Description: to clear channel latch status when A/I channel function in "Latch alarm" mode

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_ClearAILatchAlarm Lib "TCPDAQ.dll" Alias "_TCP_ClearAILatchAlarm@12" (ByVal szIP As String, ByVal Chno As Integer, ByVal alarmlevel As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int TCP_ClearAILatchAlarm(char szIP[],u_short Chno,u_char Alarmlevel);

Delphi: *(see TCPDAQ.pas)*

Function TCP_ClearAILatchAlarm(szIP: PChar; Chno: Integer; alarmlevel: Byte): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

Int TCP_ClearAILatchAlarm(char szIP[],u_short Chno,u_char Alarmlevel);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Chno[in]: the channel index for writing

Alarmlevel[in]: alarm latch be cleared (0=low alarm latch , 1=high lalarm latch)

Return Code:

refer to the *Error code*.

5.6.59 TCP_ClearAIMaxVal

Description: to clear channel maxmal value of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ClearAIMaxVal Lib "TCPDAQ.dll" Alias "_TCP_ClearAIMaxVal@8"
                    (ByVal szIP As String, ByVal Chno As Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int      TCP_ClearAIMaxVal(char szIP[],u_short Chno);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ClearAIMaxVal (szIP: PChar; Chno: Integer): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int      TCP_ClearAIMaxVal(char szIP[],u_short Chno);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Chno[in]: the channel index for clearing

Return Code:

refer to the *Error code.*

5.6.60 TCP_ClearAIMinVal

Description: to clear channel minimal value of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ClearAIMinVal Lib "TCPDAQ.dll" Alias "_TCP_ClearAIMinVal@8"
                   (ByVal szIP As String, ByVal Chno As Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int      TCP_ClearAIMinVal(char szIP[],u_short Chno);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ClearAIMinVal (szIP: PChar; Chno: Integer): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int      TCP_ClearAIMinVal(char szIP[],u_short Chno);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Chno[in]: the channel index for clearing

Return Code:

refer to the *Error code.*

5.6.61 TCP_WriteAIAlarmLimit

Description: to set every channel high/low alarm limit value

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_WriteAIAlarmLimit Lib "TCPDAQ.dll" Alias "_TCP_WriteAIAlarmLimit@24"
                   (ByVal szIP As String, ByVal Chno As Integer, ByVal dHighLimit As Double,
                   ByVal dLowLimit As Double) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int      TCP_WriteAIAlarmLimit(char szIP[],u_short Chno, double dHighLimit,
                               double dLowLimit);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_WriteAIAlarmLimit (szIP: PChar; Chno: Integer;   dHighLimit: Double;
           dLowLimit: Double): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int      TCP_WriteAIAlarmLimit(char szIP[],u_short Chno, double dHighLimit, double dLowLimit);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Chno[in]: the channel index for writing

dHighLimit[in]: high larm limit value (such as 2.321 or -2.321)

dLowLimit[in]: high larm limit value

Return Code:

refer to the *Error code.*

5.6.62 TCP_ReadAIAlarmLimit

Description: to read all channel high/low alarm limit value

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_ReadAIAlarmLimit Lib "TCPDAQ.dll" Alias "_TCP_ReadAIAlarmLimit@16"
        (ByVal szIP As String, ByVal Chno As Integer, ByRef dHighLimit As Double,
        ByRef dLowLimit As Double) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     TCP_ReadAIAlarmLimit(char szIP[],u_short Chno, double dHighLimit[],
                             double dLowLimit[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ReadAIAlarmLimit(szIP: PChar; Chno: Integer; dHighLimit: PDouble; dLowLimit:
           PDouble): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int     TCP_ReadAIAlarmLimit(char szIP[],u_short Chno, double dHighLimit[],
                             double dLowLimit[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Chno[in]: the channel index for reading

dHighLimit[out]: 32 bit array that stored the high larm limit value

dLowLimit[out]: 32 bit array that stored the low larm limit value

Return Code:

refer to the *Error code*.

5.6.63 TCP_StartAIAlarm

Description: to start channel alarm of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_StartAIAlarm Lib "TCPDAQ.dll" Alias "_TCP_StartAIAlarm@12"
        (ByVal szIP As String, ByVal Chno As Integer, ByVal alarmlevel As Byte) As
        Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     TCP_StartAIAlarm(char szIP[],u_short Chno,u_char alarmLevel);
```

Delphi: *(see TCPDAQ.pas)*

```
Function     TCP_StartAIAlarm (szIP: PChar; Chno: Integer; alarmlevel: Byte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int     TCP_StartAIAlarm(char szIP[],u_short Chno,u_char alarmLevel);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Chno[in]: the channel index for starting alarm

alarmLevel[in]: =0 start low alarm, =1 start high larm

Return Code:

refer to the *Error code*.

5.6.64 TCP_StopAIAlarm

Description: to disable channel alarm of a specific analog module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_StopAIAlarm Lib "TCPDAQ.dll" Alias "_TCP_StopAIAlarm@12" (ByVal szIP As String, ByVal Chno As Integer, ByVal alarmlevel As Byte) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int TCP_StopAIAlarm(char szIP[],u_short Chno,u_char alarmlevel);

Delphi: *(see TCPDAQ.pas)*

Function TCP_StopAIAlarm (szIP: PChar; Chno: Integer; alarmlevel: Byte): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

Int TCP_StopAIAlarm(char szIP[],u_short Chno,u_char alarmlevel);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

Chno[in]: the channel index for writing

alarmlevel[in]: 0= disable low alarm , 1=disable high larm

Return Code:

refer to the *Error code*.

Notice: call this function will disable channel alarm forever.You should call TCP_WriteAIAlarmType to set alarm type and then call TCP_StartAlarm functions to re-start alarm

5.6.65 TCP_WriteCJCOffset

Description: to set cold junction offset of a specific EDAM9019 module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_WriteCJCOffset Lib "TCPDAQ.dll" Alias "_TCP_WriteCJCOffset@12" (ByVal szIP As String, ByVal CJoffset As Double) As Long

Borland C++ Builder: (see TCPDAQ.h)

Int TCP_WriteCJCOffset(char szIP[],double CJoffset);

Delphi: *(see TCPDAQ.pas)*

Function TCP_WriteCJCOffset (szIP: PChar; CJoffset: Double): Longint; StdCall;

VC++: *(see TCPDAQ.h)*

Int TCP_WriteCJCOffset(char szIP[],double CJoffset);

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

CJoffset[in]: cold junction temperature offset

Return Code:

refer to the *Error code*.

5.6.66 TCP_ReadCJCOffset

Description: to read cold junction offset from a specific EDAM9019 module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_ReadCJCOffset Lib "TCPDAQ.dll" Alias "_TCP_ReadCJCOffset@8" (ByVal szIP As String, ByRef CJoffset As Double) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
Int       TCP_ReadCJCOffset(char szIP[],double *CJoffset);
```

Delphi: *(see TCPDAQ.pas)*

```
Function   TCP_ReadCJCOffset (szIP: PChar; CJoffset: Double): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int       TCP_ReadCJCOffset(char szIP[],double *CJoffset);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

CJoffset[out]: cold junction offset

Return Code:

refer to the *Error code.*

5.6.67 TCP_ReadCJCTemperature

Description: to read cold junction temperature from a specific EDAM9019 module

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

Declare Function TCP_ReadCJCTemperature Lib "TCPDAQ.dll" Alias "_TCP_ReadCJCTemperature@8" (ByVal szIP As String, ByRef CJTemp As Double) As Long

Borland C++ Builder: (see TCPDAQ.h)

```
Int       TCP_ReadCJCTemperature(char szIP[],double *CJTemp);
```

Delphi: *(see TCPDAQ.pas)*

```
Function     TCP_ReadCJCTemperature (szIP: PChar; CJTemp: PDouble): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int       TCP_ReadCJCTemperature(char szIP[],double *CJTemp);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

CJTemp[out]: cold junction temperature

Return Code:

refer to the *Error code.*

5.6.68 TCP_MODBUS_ReadCoil

Description: to read the coil values at a specific range described in parameters

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_MODBUS_ReadCoil Lib "TCPDAQ.dll" Alias
                 "_TCP_MODBUS_ReadCoil@16" (ByVal szIP As String, ByVal wStartAddress
                 As Integer, ByVal wCount As Integer, ByRef DATA As Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int     TCP_MODBUS_ReadCoil(char szIP[],u_short wStartaddress,u_short wCount,
                            u_char byData[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function    TCP_MODBUS_ReadCoil (szIP: PChar; wStartAddress: Integer; wCount: Integer;
            Data: PByte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int     TCP_MODBUS_ReadCoil(char szIP[],u_short wStartAddress,u_short wCount,
                            u_char byData[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wStartAddress[in]: start address of coil registers (1 ~ 255)

wCount[in]: the count that coil data be read

byData[in]: the 8 bit array that stored the coil data (0=set, 1=reset)

Return Code:

refer to the *Error code*.

5.6.69 TCP_MODBUS_WriteCoil

Description: to write the coil values at a specific range described in parameters.

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_MODBUS_WriteCoil Lib "TCPDAQ.dll" Alias
            "_TCP_MODBUS_WriteCoil@16" (ByVal szIP As String, ByVal wStartAddress
            As Integer, ByVal wCount As Integer, ByRef DATA As Byte) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
int     TCP_MODBUS_WriteCoil(char szIP[],u_short wStartAddress,u_short wCount,
                    u_char byData[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function    TCP_MODBUS_WriteCoil(szIP: PChar; wStartAddress: Integer; wCount: Integer;
            Data: PByte): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
int     TCP_MODBUS_WriteCoil(char szIP[],u_short wStartAddress,u_short wCount,
                    u_char byData[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wStartAddress[in]: start address of coil registers (1 ~ 255)

wCount[in]: the count that coil data be written

byData[in]: the 8 bit array that stored the coil data (0=set, 1=reset)

Return Code:

refer to the *Error code*.

5.6.70 TCP_MODBUS_ReadReg

Description: to read the holding register value at a specific range described in parameters

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_MODBUS_ReadReg Lib "TCPDAQ.dll" Alias
            "_TCP_MODBUS_ReadReg@16" (ByVal szIP As String, ByVal wStartAddress
            As Integer, ByVal wCount As Integer, ByRef DATA As Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int     TCP_MODBUS_ReadReg(char szIP[],u_short wStartAddress,u_short wCount,
                           u_short wData[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function    TCP_MODBUS_ReadReg (szIP: PChar; wStartAddress: Integer; wCount: Integer;
             Data: PWord): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int     TCP_MODBUS_ReadReg(char szIP[],u_short wStartAddress,u_short wCount,
                           u_short wData[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wStartAddress[in]: start address of holding registers (1 ~ 255)

wCount[in]: the count that holding data be read

byData[in]: the 16 bit array that stored the holding data

Return Code:

refer to the *Error code*.

5.6.71 TCP_MODBUS_WriteReg

Description: to write values to the holding registers at a specific range described in parameters

Syntax:

Visual Basic: (*see TCPDAQ.bas*)

```
Declare Function TCP_MODBUS_WriteReg Lib "TCPDAQ.dll" Alias
            "_TCP_MODBUS_WriteReg@16" (ByVal szIP As String, ByVal wStartAddress
            As Integer, ByVal wCount As Integer, ByRef DATA As Integer) As Long
```

Borland C++ Builder: (see TCPDAQ.h)

```
Int     TCP_MODBUS_WriteReg(char szIP[],u_short wStartAddress,u_short wCount,
                         u_short wData[]);
```

Delphi: *(see TCPDAQ.pas)*

```
Function    TCP_MODBUS_WriteReg(szIP: PChar; wStartAddress: Integer; wCount: Integer;
            Data: PWord): Longint; StdCall;
```

VC++: *(see TCPDAQ.h)*

```
Int     TCP_MODBUS_WriteReg(char szIP[],u_short wStartAddress,u_short wCount,
                         u_short wData[]);
```

Parameters:

szIP[in]: the IP address for an EDAM-9000 that to be connected

wStartAddress[in]: start address of holding registers (1 ~ 255)

wCount[in]: the count that holding data be read

byData[in]: the 16 bit array that stored the holding data

Return Code:

refer to the *Error code*.

Chapter 6 ASCII Commands for EDAM-9000 Modules

6.1 About ASCII Commands

For users do not familiar to Modbus protocol, Inlog offers a function library as a protocol translator, integrating ASCII command into Modbus/TCP structure. Therefore, users familiar to ASCII command can access EDAM-9000 easily. Before explaining the structure of ASCII command packed with Modbus/TCP format. Lets see how to use an ASCII command and how many are available for your program.

6.2 Syntax of ASCII

Command Syntax: [delimiter character][address][channel][command][data][checksum][carriage return] Every command begins with a delimiter character.

There are two valid characters: $ and # .The delimiter character is followed by a two-character address (hex-decimal) that specifies the target system. The two characters following the address specified the module and channel.

Depending on the command, an optional data segment may follow the command string. An optional two-character checksum may also be appended to the command string. Every command is terminated with a carriage return (cr).

The command set is divided into the following five categories:

- System Command Set
- Analog Input Command Set
- Analog Input Alarm Command Set
- Universal I/O Command Set
- Digital I/O Command Set

Every command set category starts with a command summary of the particular type of module, followed by datasheets that give detailed information about individual commands. Although commands in different subsections sometime share the same format, the effect they have on a certain module can be completely different than that of another. Therefore, the full command sets for each type of modules are listed along with a description of the effect the command has on the given module.

Note: All commands should be issued in UPPERCASE characters only!

6.3 ASCII Command Set

Command	Command Name	Description	Available Modules
Common commands			
$aaM	Read Module Name	Return the module name from a specified module	All modules
$aaF	Read Firmware Version	Return the firmware version from a specified module	All modules
$aaID	Read ID number	Return the ID number of the specified module	All modules
Analog commands			
#aan	Read Analog Input from Channel N	Return the input value from the specified analog input channel	9015/9017/9019
#aa	Read Analog Input from all channels	Return the input values from all analog input channels	9015/9017/9019
$aa0	Span Calibration	Calibrate the analog input module to correct the gain error	9015/9017/9019
$aa1	Offset Calibration	Calibrate the analog input module to correct the offset error	9015/9017/9019
$aa6	Read Channel Enable/Disable Status	Asks a specified module to return the Enable/Disable status of all analog input channels	9015/9017/9019
$aa5mm	Set Channel Enable/Disable Status	Set Enable/Disable status for analog input channels	9015/9017/9019
#aaMH	Read all Max. Data	Read the maximum data from all analog input channels	9015/9017/9019
#aaMHn	Read single Max. Data	Read the maximum date from a specified analog input channel	9015/9017/9019
#aaML	Read all Min. Data	Read the minimum data from all analog input channels	9015/9017/9019
#aaMLn	Read single Min. Data	Read the minimum data from a specified analog input channel	9015/9017/9019
$aaCjAhs	Set Alarm Mode	Set the High/Low alarm in either Momentary or Latching mode	9015/9017/9019
$aaCjAh	Read Alarm Mode	Returns the alarm mode for the specified channels	9015/9017/9019
$aaCjAhEs	Enable/Disable Alarm	Enables/Disables the high/low alarm of the specified channels	9015/9017/9019
$aaCjCh	Clear Latch Alarm	Resets a latched alarm	9015/9017/9019
$aaCjAhCCn	Set Alarm Connection	Connects the High/Low alarm of a specified input channel to interlock with a specified output channel	9017/9019
$aaCjRhC	Read Alarm Connection	Returns the alarm configuration of a specified input channel	9017/9019

$aaCjAhU	Set Alarm Limit	Sets the High/Low alarm limit value to a specified channel	9015/9017/9019
$aaCjRhU	Read Alarm Limit	Returns the High/Low alarm limit value of the specified channel	9015/9017/9019
$aaCjS	Read Alarm Status	Reads whether an alarm occurred in the specified Channel	9015/9017/9019
$aa3	Read cold junction	Return the Cold Junction temperature	9019
$aa9hhhhh	Set CJ offset	Set Cold Junction temperature offset	9019
$aa9	Read CJ offset	Return Cold Junction temperature offset	9019
$aaBhh	Read input range	Return the input mode of the specified analog channel	9015/9017/9019
Digital I/O commands			
$aa6	Read Channels Status	Asks a specified input module to return the status of all channels	9050/9051/9052
#aaDnd	Set Digital Output	Sets the status for the specified digital output channel	9050/9051/9052
#aabb	Write Digital Output	Writes specified values to either a single channel or all channels simultaneously	9050/9051/9052
#aa2hhhhhhhhh	Write DO pulse counts	Set output counts of the specified DO channel	9050/9051/9052

6.4 ASCII Command Description

6.4.1 $aaM Read Module Name

Description: Returns the module name from a specified module.

Syntax: $aaM(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

M is the Module Name command.

(cr) is the terminating character, carriage return (0Dh).

Response: !aa60bb(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error, communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was in-valid.

aa (range 00-FF) represents the 2-character hexadecimal address of an EDAM-9000 module.

bb (range 00-FF) represents the 2-character model numberof an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh).

Example:

command: $01M(cr)

Response: !016050(cr)

The command requests the system at address 01h to send its module name. The system at address 01h responds with module name 9050 indicating that there is an EDAM-9050 at address 01h.

6.4.2 $aaF Read Firmware Version

Description: Returns the firmware version from a specified module.

Syntax: $aaF(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

F is the Firmware Version command.

(cr) is the terminating character, carriage return (0Dh).

Response: !aa(version)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error, communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal address of an EDAM-9000 module.

(version) represents the firmware version of the module.

(cr) is the terminating character, carriage return (0Dh).

Example: command: $01F(cr)

response: !01 1.01(cr)

The command requests the system at address 01h to send its firmware version. The system responds with firmware version 1.01.

6.4.3 $aaID Read module ID number

Description: Returns the ID number from a specified module.

Syntax: $aaID(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

ID is the ID command.

(cr) is the terminating character, carriage return (0Dh).

Response: !aann(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error, communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal address of an EDAM-9000 module.

nn represents the ID number of the module.

(cr) is the terminating character, carriage return (0Dh).

Example: command: $01ID(cr)

response: !010A(cr)

The command requests the system at address 01h to send its ID number. The system responds with ID number 10(0AH).

6.4.4 #aan Read Analog Input from Channel N

Description: Returns the input data from a specified analog input channel in a specified module.

Syntax: #aan(cr)

# is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

n (range 0-8) represents the specific channel you want to read the input data.

(cr) is the terminating character, carriage return (0Dh).

Response: >(data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

(cr) is the terminating character, carriage return (0Dh).

Example: command: #012(cr)

response: >+10.000

Channel 2 of the EDAM-6000 analog module at address 01h responds with an input value +10.000.

6.4.5 #aa Read Analog Input from All Channels

Description: Returns the input data from all analog input channels in a specified module.

Syntax: #aa(cr)

# is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

(cr) is the terminating character, carriage return (0Dh).

Response: >(data)(data)(data)(data)(data)(data)(data)(data)(data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

(cr) is the terminating character, carriage return (0Dh).

Note: The latest data returned is the Average value of the preset channels in this module.

Example: command: #01(cr)

response: >+10.000+10.000+10.000+10.000+10.000+10.000+10.000+10.000+10.000

6.4.6 $aa0 Span Calibration

Description: Calibrates a specified module to correct for gain errors

Syntax: $aa0(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

0 represents the span calibration command.

(cr) is the terminating character, carriage return (0Dh)

Response: !aa(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh)

Note: In order to successfully calibrate an analog input module's input range, a proper calibration input signal should be connected to the analog input module before and during the calibration process.

6.4.7 $aa1 Zero Calibration

Description: Calibrates a specified module to correct for offset errors

Syntax: $aa1(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

1 represents the zero calibration command.

(cr) is the terminating character, carriage return (0Dh)

Response: !aa(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh)

Note: In order to successfully calibrate an analog input module's input range, a proper calibration input signal should be connected to the analog input module before and during the calibration process.

6.4.8 $aa6 Read Channel Enable/Disable Status

Description: Asks a specified module to return the Enable/Disable status of all analog input channels

Syntax: $aa6(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

6 is the read channels status command.

(cr) is the terminating character, carriage return (0Dh)

Response: !aamm(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

mm are two hexadecimal values. Each value is interpreted as 4 bits. The first 4-bit value represents the status of channels 7-4, the second 4 bits represents the status of channels 3-0. A value of 0 means the channel is disabled, while a value of 1 means the channel is enabled.

(cr) is the terminating character, carriage return (0Dh)

Example: command: $016(cr)

response: !01FF(cr)

The command asks the specific module at address 01h to send Enable/Disable status of all analog input channels. The analog input module responds that all its channels are enabled (FF equals 1111 and 1111).

6.4.9 $aa5mm Set Channel Enable/Disable Status

Description: Set Enable/Disable status for all analog input channels

Syntax: $aa5mm(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

5 identifies the enable/disable channels command.

mm (range 00-FF) are two hexadecimal characters. Each character is interpreted as 4 bits. The first 4-bit value represents the status of channels 7-4; the second 4-bit value represents the status of channels 3-0. A value of 0 means the channel is disabled, while a value of 1 means the channel is enabled.

(cr) is the terminating character, carriage return (0Dh)

Response: !aa(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-6000 module.

(cr) is the terminating character, carriage return (0Dh)

Example: command: $01581(cr)

response: !01(cr)

The command enables/disables channels of the analog input module at address 01h. Hexadecimal 8 equals binary 1000, which enables channel 7 and disables channels 4, 5 and 6. Hexadecimal 1 equals binary 0001, which enables channel 0 and disables channels 1, 2 and 3.

6.4.10 #aaMH Read Maximum Value

Description: Read the maximum values from all analog input channels in a specified analog module

Syntax: #aaMH(cr)

# is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

MH represents the read maximum value command.

(cr) is the terminating character, carriage return (0Dh)

Response: >(data)(data)(data)(data)(data)(data)(data)(data)(data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh)

Example: command: #01MH(cr)

response:>+10.000+10.000+10.000+10.000+10.000+10.000 +10.000+10.000+10.000

The command asks the specific module at address 01h to send historic maximum value from all analog input channels.

Note: The latest data returned is the Average value of the preset channels in this module.

6.4.11 #aaMHn Read Maximum Value from channel N

Description: Read the maximum value from a specific channel in a specified module

Syntax: #aaMHn(cr)

# is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

MH represents the read maximum value command.

n (range 0-8) represents the specific channel you want to read the input data.

(cr) is the terminating character, carriage return (0Dh)

Response: >(data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh)

Example: command: #01MH2(cr)

response: >+10.000

The command asks the specific module at address 01h to send historic maximum value from analog input channel 2.

6.4.12 #aaML Read Minimum Value

Description: Read the minimum values from all analog input channels in a specified module

Syntax #aaML(cr)

# is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

ML represents the read minimum value command.

(cr) is the terminating character, carriage return (0Dh)

Response: >(data)(data)(data)(data)(data)(data)(data)(data)(data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh)

Example: command: #01ML(cr)

response:>+10.000+10.000+10.000+10.000+10.000+10.000+10.000+10.000+10.000

The command asks the specific module at address 01h to send historic minimum value from all AI channels.

Note: The latest data returned is the Average value of the preset channels in this module.

6.4.13 #aaMLn Read Minimum Value from channel N

Description: Read the minimum value from a specific analog input channel in a specified module

Syntax: #aaMLn(cr)

# is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

ML represents the read minimum value command.

n (range 0-8) represents the specific channel you want to read the input data.

(cr) is the terminating character, carriage return (0Dh)

Response: >(data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh)

Example: command: #01ML3(cr)

response: >+10.000

The command asks the specific module at address 01h to send historic minimum value from analog input channel 3.

6.4.14 $aaCjAhs Set Alarm Mode

Description: Sets the High/Low alarm of the specified input channel in the addressed EDAM-9000 module to either Latching or Momentary mode.

Syntax: $aaCjAhs(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module(Always 01)

Cj identifies the desired channel j (j : 0 to 7).

A is the Set Alarm Mode command.

h indicates alarm types (H = High alarm, L = Low alarm)

s indicates alarm modes (M = Momentary mode,L = Latching mode)

(cr) represents terminating character, carriage return (0Dh)

Response: !aa(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal address of the corresponding EDAM-9000 module.

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1AHL(cr)

response: !01(cr)

Channel 1 of the EDAM-9000 module at address 01h is instructed to set its High alarm in Latching mode. The module confirms that the command has been received.

6.4.15 $aaCjAh Read Alarm Mode

Description: Returns the alarm mode for the specified channel in the specified EDAM-9000 module.

Syntax: $aaCjAh(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module(Always 01)

Cj identifies the desired channel j (j : 0 to 7).

A is the Read Alarm Mode command.

h indicates the alarm types (H = High alarm,L = Low alarm)

(cr) represents terminating character, carriage return (0Dh)

Response: !aas(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal address of the corresponding EDAM-9000 module.

s indicates alarm modes (M = Momentary mode, L = Latching mode)

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1AL(cr)

response: !01M(cr)

Channel 1 of the EDAM-9000 module at address 01h is instructed to return its Low alarm mode. The system responds that it is in Momentary mode.

6.4.16 $aaCjAhEs Enable/Disable Alarm

Description: Enables/Disables the High/Low alarm of the specified input channel in the addressed EDAM-9000 module

Syntax: $aaCjAhEs(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module(Always 01)

Cj identifies the desired channel j (j : 0 to 7).

AhEs is the Set Alarm Mode command.

h indicates alarm type (H = High alarm, L = Low alarm)

s indicates alarm enable/disable (E = Enable, D = Disable)

(cr) represents terminating character, carriage return (0Dh)

Response: !aa(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal address of the corresponding EDAM-9000 module.

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1ALEE(cr)

response: !01(cr)

Channel 1 of the EDAM-9000 module at address 01h is instructed to enable its Low alarm function. The module confirms that its Low alarm function has been enabled.

Note: An analog input module requires a maximum of 2 seconds after it receives an Enable/Disable Alarm command to let the setting take effect. During this interval, the module can not be addressed to perform any other actions.

6.4.17 $aaCjCh Clear Latch Alarm

Description: Sets the High/Low alarm to OFF (no alarm) for the specified input channel in the addressed EDAM-9000 module

Syntax: $aaCjCh(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module(Always 01)

Cj identifies the desired channel j (j : 0 to 7).

Ch is the Clear Latch Alarm command.

h indicates alarm type (H = High alarm, L = Low alarm)

(cr) represents terminating character, carriage return (0Dh)

Response: !aa(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal Modbus network address of the corresponding EDAM-9000 module

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1CL(cr)

response: !01(cr)

Channel 1 of the EDAM-9000 module at address 01h is instructed to set its Low alarm state to OFF. The system confirms it has done so accordingly.

6.4.18 $aaCjAhCCn Set Alarm Connection

Description: Connects the High/Low alarm of the specified input channel to interlock the specified digital output in the addressed EDAM-9000 module

Syntax: $aaCjAhCCn(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module(Always 01)

Cj identifies the desired analog input channel j (j : 0 to 7).

AhC is the Set Alarm Connection command.

h indicates alarm type (H = High alarm, L = Low alarm)

Cn identifies the desired digital output channel n (n : 0 to 1). To disconnect the digital output, n should be set as "*

(cr) represents terminating character, carriage return (0Dh)

Response: !aa(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal Modbus network address of the corresponding EDAM-9000 module.

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1ALCC0(cr)

response: !01(cr)

Channel 1 of the EDAM9000 module at address 01h is instructed to connect its Low alarm to the digital output of channel 0 in the specific module. The system confirms it has done so accordingly.

6.4.19 $aaCjRhC Read Alarm Connection

Description: Returns the High/Low alarm limit output connection of a specified input channel in the addressed module

Syntax: $aaCjRhC(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module. (Always 01)

Cj identifies the desired analog input channel j (j : 0 to 7).

RhC is the Read Alarm Connection command.

h indicates alarm type (H = High alarm, L = Low alarm)

(cr) represents terminating character, carriage return (0Dh)

Response: !aaCn(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal Modbus network address of the corresponding EDAM-9000 module.

Cn identifies the desired digital output channel n (n : 0 to 1) whether interlock with the alarm of the specific analog input channel. If the values of n are "*", the analog input has no connection with a digital output point.

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1RLC(cr)

response: !01C0(cr)

Channel 1 of the EDAM-9000 module at address 01h is instructed to read its Low alarm output connection. The system responds that the Low alarm output connects to the digital output at channel 0 in the specific module.

6.4.20 $aaCjAhU Set Alarm Limit

Description: Sets the High/Low alarm limit value for the specified input

channel of a specified EDAM-9000 module.

Syntax: $aaCjAhU(data)(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module(Always 01)

Cj identifies the desired analog input channel j (j : 0 to 7).

AhU is the Set Alarm Limit command.

h indicates alarm type (H = High alarm, L = Low alarm)

(data) represents the desired alarm limit setting. The format is always in engineering units.

(cr) represents terminating character, carriage return (0Dh)

Response: !aa(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal Modbus network address of the corresponding EDAM-9000 module.

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1AHU+080.00(cr)

response: !01(cr)

The high alarm limit of the channel 1 in the specific module at address 01h is been set +80. The system confirms the command has been received.

Note: An analog input module requires a maximum of 2 seconds after it receives a Set Alarm Limit command to let the settings take effect. During this interval, the module cannot be addressed to perform any other actions.

6.4.21 $aaCjRhU Read Alarm Limit

Description: Returns the High/Low alarm limit value for the specified input channel in the addressed EDAM-9000 module

Syntax: $aaCjRhU(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module(Always 01)

Cj identifies the desired analog input channel j (j : 0 to 7).

RhU is the Read Alarm Limit command.

h indicates alarm type (H = High alarm, L = Low alarm)

(cr) represents terminating character, carriage return (0Dh)

Response: !aa(data)(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal Modbus network address of the corresponding EDAM-9000 module.

(data) represents the desired alarm limit setting. The format is always in engineering units.

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1RHU(cr)

response: !01+2.0500(cr)

Channel 1 of the EDAM-9000 module at address 01h is configured to accept 5V input. The command instructs the system to return the High alarm limit value for that channel. The system responds that the High alarm limit value in the desired channel is 2.0500 V.

6.4.22 $aaCjS Read Alarm Status

Description: Reads whether an alarm occurred to the specified input channel in the specified EDAM-9000 module

Syntax: $aaCjS(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module(Always 01)

Cj identifies the desired analog input channel j (j : 0 to 7).

S is the Read Alarm Status command.

(cr) represents terminating character, carriage return (0Dh)

Response: !aahl(cr) if the command was valid

?aa(cr) if an invalid operation was entered.

There is no response if the system detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal address Modbus of the corresponding EDAM-9000 module.

h represents the status of High alarm. "1" means the High alarm occurred, '0" means it did not occur. l represents the status of Low alarm. ˜1" means the Low alarm occurred, ˜0" means it did not occur.

(cr) represents terminating character, carriage return (0Dh)

Example: command: $01C1S(cr)

response: !0101(cr)

The command asks the module at address 01h to return its alarm status for channel 1. The system responds that a High alarm has not occurred, but the Low alarm has occurred.

6.4.23 $aa3 Read cold junction temperature

Description: Return the Cold Junction temperature of EDAM-9019

Syntax: $aa3(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address (Always 01)

3 is the command to read cold junction temperature.

(cr) is the terminating character, carriage return (0Dh)

Response: >(data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

(data) a 8-character hexadecimal value representing the cold junction temperature.

(cr) is the terminating character, carriage return (0Dh)

Example: command: $013(cr)

response: >+00017.5(cr)

The command asks the specific module at address 01h to return the cold junction temperature of specified module. The response is +17.5C

6.4.24 $aa9hhhhh Set CJ offset

Description: Set Cold Junction temperature offset of EDAM-9019

Syntax: $aa19hhhhh(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address (Always 01)

9 is the command to set cold junction temperature offset.

hhhhh is the offset value times by 80 (5-character hexadecimal format)

(cr) terminating character, carriage return (0Dh)

Response: !aa(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

aa represents the 2-character hexadecimal address Modbus of the corresponding EDAM-9000 module.

? delimiter indicating the command was invalid.

(cr) is the terminating character, carriage return (0Dh)

Example: command: $019000A0(cr)

response: !01(cr)

This example need to set cold junction offset to 2C , then the actual ASCII value should be 2 *80=160 (hex=000A0). Hence the complete ASCII command string is $019000A0(cr)

6.4.25 $aa9 Read CJ offset

Description: Return Cold Junction temperature offset of EDAM-9019

Syntax: $aa9(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address (Always 01)

9 is the command to read cold junction temperature offset.

(cr) is the terminating character, carriage return (0Dh)

Response: >(data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

(data) a 8-character hexadecimal value representing the cold junction temperature offset.

(cr) is the terminating character, carriage return (0Dh)

Example: command: $019(cr)

response: >+00005.5(cr)

The command asks the specific module at address 01h to return the cold junction temperature offset of specified module. The response is +5.5C

6.4.26 $aaBhh Read analog input type

Description: Return the input type of the specified analog channel

Syntax: $aaBhh(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address (Always 01)

hh is the analog input channel number represents the 2-character in hexadecimal format.

(cr) is the terminating character, carriage return (0Dh)

Response: !aann(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (always 01) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module.

nn a 2-character hexadecimal value representing the type of the analog input channel.

(cr) is the terminating character, carriage return (0Dh)

Example: command: $01B01(cr)

response: !0108(cr)

The first 2-character portion of the response (exclude the "!" character) indicates the address of the EDAM-9000 module. The second 2-character portion of the response is the type of channel (For each analog module, the type number is different, ref to Figure 6-1 Analog input types)

Code(Hex)	Type
0x07	4-20mA
0x08	+/-10V
0x09	+/-5V
0x0a	+/-1V
0x0b	+/-500mV
0x0c	+/-150mV
0x0d	0-20mA
0x0e	J type -8824 uV ~ 69536 uV,
0x0f	K type -5891 uV ~ 54807 uV
0x10	T type -5603 uV ~ 20869 uV
0x11	E type -9835 uV ~ 76373 uV
0x12	R type -0000 uV ~ 21101 uV
0x13	S type -0000 uV ~ 18693 uV
0x14	B type -0000 uV ~ 13820 uV
0x20	IEC Pt100 -50C ~ 150C
0x21	IEC Pt100 0C ~ 100C
0x22	IEC Pt100 0C ~ 200C
0x23	IEC Pt100 0C ~ 400C
0x24	IEC Pt100 -200C ~ 200C
0x25	JIS Pt100 -50C ~ 150C
0x26	JIS Pt100 0C ~ 100C
0x27	JIS Pt100 0C ~ 200C
0x28	JIS Pt100 0C ~ 400C
0x29	JIS Pt100 -200C ~ 200C
0x2A	Pt1000 -40C ~ 160C
0x2B	BALCO500 -30C ~ 120C
0x2C	Ni -80C ~ 100C
0x2D	Ni 0C ~ 100C

Figure 6-1 Analog input types

6.5 $aa6 Read DI /DO Channel Status

Description: This command requests that the specified EDAM-9000 module return the status of its digital input and digital output channels

Syntax: $aa6(cr)

$ is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address (Always 01)

6 is the Digital Data In command.

(cr) is the terminating character, carriage return (0Dh)

Response: !aa0(Do data)(Di data)(Di data)(Di data)(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address of an EDAM-9000 module.

(D0 data)a 1-character hexadecimal value representing the values of the digital output module.

(Di data)a 2-character hexadecimal value representing the values of the digital input module.

(cr) is the terminating character, carriage return (0Dh)

Example: command: $016(cr)

response: !0100A35D(cr)

0A: the status of digital output channels.
0A=(00001010) DO channels 1/3 =ON, DO Channel 0/2/4/5/6/7=OFF

35D: the status of digital input channels.
35D=(001101011101) DI channels 0/2/3/4/6/8/9 =Active state, DI Channel 1/5/7=Inactive

6.6 $aa7 Read DI latch status

Description: Read DI latch status.

Syntax: $aa7(cr)

$ is a delimiter character.

aa (range 00-2D) represents the 2-character hexadecimal Modbus address (Always 01)

7 represents read DI latch status command.

(cr) is the terminating character, carriage return (0Dh)

Response: !aa(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

! delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh)

Example: command: $017(cr)

response: !010003

The command read DI latch status= 0003, DI #0 latched, DI #1 latched, and DI #2 ~ DI #15 no latched

6.7 #aa00dd Write All Digital Output

Description: This command sets all digital output channels to the specific EDAM-9000 module.

Syntax: #aa00nn(data)(cr)

# is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus network address (Always 01)

00 represents Writing to all channels (write a byte) command

dd represents the data be written to digital output

Response: >(cr) if the command was valid.

?aa(cr) if an invalid command has been issued.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

> delimiter indicating a valid command was received.

? delimiter indicating the command was invalid.

a (range 00-FF) represents the 2-character hexadecimal Modbus network address of a module that is responding.

(cr) is the terminating character, carriage return (0Dh)

Example:

command: #010033(cr)

response: >!(cr)

An output byte with value 33h (00110011) is sent to the digital output module at address 01h.
The Output channel 0/1/4/5 = ON ,Output channel 2/3/6/7 = OFF

6.8 #aa1n0d Set Single Digital Output Channel

Description: Set the digital output status of EDAM-9000 digital output module.

Syntax: #aa1n0d(cr)

# is a delimiter character.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address (Always 01)

n (range 0-F) represents the specific channel you want to set the output status.

d (range 0-1) represents the status you want to set to the specific channel

(cr) is the terminating character, carriage return (0Dh)

Response: !aa(cr) if the command is valid.

?aa(cr) if an invalid operation was entered.

There is no response if the module detects a syntax error or communication error or if the address does not exist.

! Delimiter indicating a valid command was received.

? Delimiter indicating the command was invalid.

aa (range 00-FF) represents the 2-character hexadecimal Modbus address of an EDAM-9000 module.

(cr) is the terminating character, carriage return (0Dh)

Example: command: #011201(cr)

response: !01

The command set digital channel 2 "ON" status for the specific module at address 01h.

Example: command: #011200(cr)

response: !01

The command set digital channel 2 "OFF" status for the specific module at address 01h.

Chapter 7 MODBUS/TCP Command structure

EDAM-9000 system accepts a command/response form with the host computer. When systems are not MODBUS/TCP Command structure

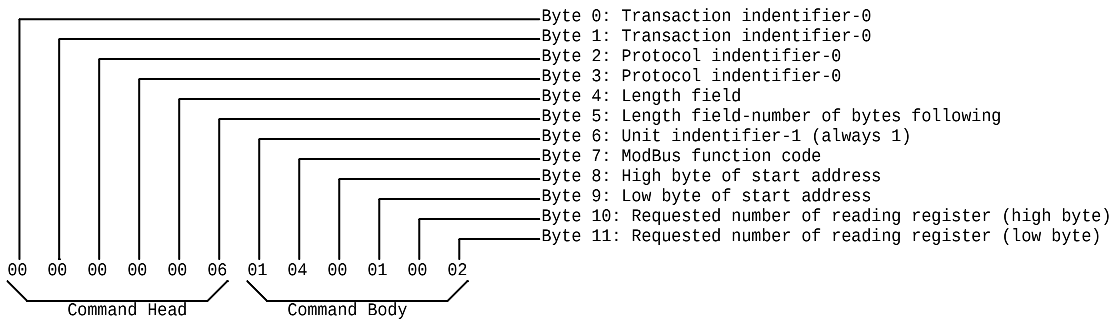
EDAM-9000 system accepts a command/response form with the host computer. When systems are not transmitting they are in listen mode. The host issues a command to a system with a specified address and waits a certain amount of time for the system to respond. If no response arrives, a time-out aborts the sequence and returns control to the host. This chapter explains the structure of the commands with Modbus/TCP protocol, and guides to use these command sets to implement user's programs.

7.1 Command Structure

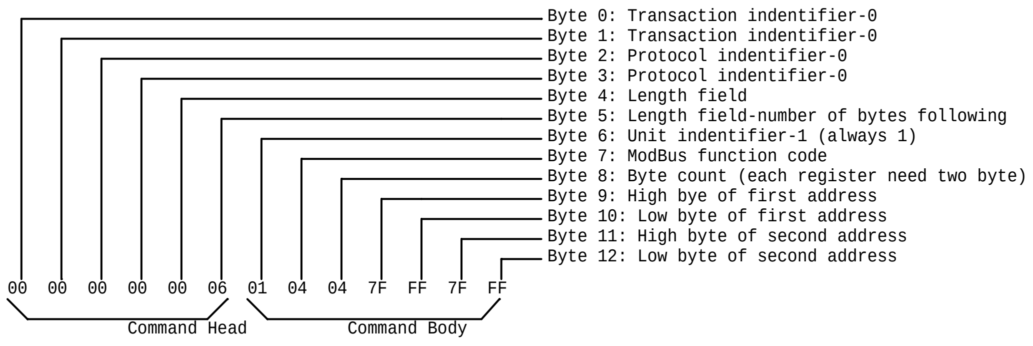
It is important to understand the encapsulation of a Modbus request or response carried on the Modbus/TCP network. A complete command is consisted of command head and command body. The command head is prefixed by six bytes and responded to pack Modbus format; the command body defines target device and requested action. Following example will help you to realize this structure quickly.

Example:

If you want to read the first two values of EADM-9017 (address: 40001~40002), the request command should be:


Byte 0: Transaction indentifier-0
Byte 1: Transaction indentifier-0
Byte 2: Protocol indentifier-0
Byte 3: Protocol indentifier-0
Byte 4: Length field
Byte 5: Length field-number of bytes following
Byte 6: Unit indentifier-1 (always 1)
Byte 7: ModBus function code
Byte 8: High byte of start address
Byte 9: Low byte of start address
Byte 10: Requested number of reading register (high byte)
Byte 11: Requested number of reading register (low byte)
00 00 00 00 00 06 01 04 00 01 00 02
Command Head
Command Body

And the response should be:


Byte 0: Transaction indentifier-0
Byte 1: Transaction indentifier-0
Byte 2: Protocol indentifier-0
Byte 3: Protocol indentifier-0
Byte 4: Length field
Byte 5: Length field-number of bytes following
Byte 6: Unit indentifier-1 (always 1)
Byte 7: ModBus function code
Byte 8: Byte count (each register need two byte)
Byte 9: High bye of first address
Byte 10: Low byte of first address
Byte 11: High byte of second address
Byte 12: Low byte of second address
00 00 00 00 00 06 01 04 04 7F FF 7F FF
Command Head
Command Body

7.2 ModBus Function code introductions

Code (Hex)	Name	Usage
01	Read Coil Status	Read Discrete Output Bit
02	Read Input Status	Read Discrete Input Bit
03	Read Holding Registers	Read 16-bit register. Used to read integer or floating point process data.
04	Read Input Registers	
05	Force Single Coil	Write data to force coil ON/OFF
06	Preset Single Register	Write data in 16-bit integer format
0F	Force Multiple Coils	Write multiple data to force coil ON/OFF
10	Preset Multiple Registers	Write multiple data in 16-bit integer format

7.3 EDAM-9050 12 Digital Input/6 Digital Output Module

7.3.1 Holding Register Address (Unit:16bits)

Where X=40000 for function 03, function 06, function 16

X=30000 for function 04

Address	Channel	Item
X+0001~X+0024	For Counter	12 Channels, 32 Bits
X+0025~X+0036	For Pulse Output L level, time Unit:0.1ms	6 Channels, 32 Bits
X+0037~X+0048	For Pulse Output H level, time Unit:0.1ms	6 Channels, 32 Bits
X+0049~X+0060	Set Absolute pulse (Set to 0=Continue mode)	6 Channels, 32 Bits
X+0061~X+0073	Set DO pulse value	Channels, 32 Bit

7.3.2 Bit Address (Unit:1Bit)

Where X=00000 for function 01, function 05

X=10000 for function 02

Address	Channel	Item
X+0001~X+0012	For DI	12 Channels, 1 Bit
X+0013~X+0018	For DO	6 Channels, 1 Bit
X+0032	Ch0 (For Counter Mode)	Start(1)/Stop(0)
X+0033	Ch0 (For Counter Mode)	Clear Counter(1)
X+0034	Ch0 (For Counter Mode)	Clear Overflow
X+0035	Ch0 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0036	Ch1 (For Counter Mode)	Start(1)/Stop(0)
X+0037	Ch1 (For Counter Mode)	Clear Counter(1)
X+0038	Ch1 (For Counter Mode)	Clear Overflow
X+0040	Ch1 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0041	Ch2 (For Counter Mode)	Start(1)/Stop(0)
X+0042	Ch2 (For Counter Mode)	Clear Counter(1)
X+0043	Ch2 (For Counter Mode)	Clear Overflow
X+0044	Ch2 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0045	Ch3 (For Counter Mode)	Start(1)/Stop(0)
X+0046	Ch3 (For Counter Mode)	Clear Counter(1)
X+0047	Ch3 (For Counter Mode)	Clear Overflow
X+0048	Ch3 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0049	Ch4 (For Counter Mode)	Start(1)/Stop(0)
X+0050	Ch4 (For Counter Mode)	Clear Counter(1)
X+0051	Ch4 (For Counter Mode)	Clear Overflow
X+0052	Ch4 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0053	Ch5 (For Counter Mode)	Start(1)/Stop(0)
X+0054	Ch5 (For Counter Mode)	Clear Counter(1)
X+0055	Ch5 (For Counter Mode)	Clear Overflow
X+0056	Ch5 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0057	Ch6 (For Counter Mode)	Start(1)/Stop(0)
X+0058	Ch6 (For Counter Mode)	Clear Counter(1)
X+0059	Ch6 (For Counter Mode)	Clear Overflow
X+0060	Ch6 (For Counter Mode)	Latch Status(read)/Clear Status(Write)

X+0061	Ch7 (For Counter Mode)	Start(1)/Stop(0)
X+0062	Ch7 (For Counter Mode)	Clear Counter(1)
X+0063	Ch7 (For Counter Mode)	Clear Overflow
X+0064	Ch7 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0065	Ch8 (For Counter Mode)	Start(1)/Stop(0)
X+0066	Ch8 (For Counter Mode)	Clear Counter(1)
X+0067	Ch8 (For Counter Mode)	Clear Overflow
X+0068	Ch8 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0069	Ch9 (For Counter Mode)	Start(1)/Stop(0)
X+0070	Ch9 (For Counter Mode)	Clear Counter(1)
X+0071	Ch9 (For Counter Mode)	Clear Overflow
X+0072	Ch9 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0073	Ch10 (For Counter Mode)	Start(1)/Stop(0)
X+0074	Ch10 (For Counter Mode)	Clear Counter(1)
X+0075	Ch10 (For Counter Mode)	Clear Overflow
X+0076	Ch10 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0077	Ch11 (For Counter Mode)	Start(1)/Stop(0)
X+0078	Ch11 (For Counter Mode)	Clear Counter(1)
X+0079	Ch11 (For Counter Mode)	Clear Overflow
X+0080	Ch11 (For Counter Mode)	Latch Status(read)/Clear Status(Write)

7.4 EDAM-9051 12 Digital Input/2 Counter/2 Output Module

7.4.1 Register Address (Unit:16bits)

Where X=40000 for function 03, function 06, function 16

X=30000 for function 04

Address	Channel	Item
X+0001~X+0028	For Counter	14 Channels, 32 Bits
X+0029~X+0032	For Pulse Output L level, time Unit:0.1ms	2 Channels, 32 Bits
X+0033~X+0036	For Pulse Output H level, time Unit:0.1ms	2 Channels, 32 Bits
X+0037~X+0040	Set Absolute pulse(Set to 0=Continue mode)	2 Channels, 32 Bits
X+0041~X+0044	Set DO pulse value	2 Channels, 32 Bits

7.4.2 bit Address (Unit:1Bit)

Where X=00000 for function 01, function 05

X=10000 for function 02

Address	Channel	Item
X+0001~X+0014	For DI 14 Channels, 1 Bit	
X+0017~X+0018	For DO 2 Channels, 1 Bit	
X+0033	Ch0 (For Counter Mode)	Start(1)/Stop(0)
X+0034	Ch0 (For Counter Mode)	Clear Counter(1)
X+0035	Ch0 (For Counter Mode)	Clear Overflow
X+0036	Ch0 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0037	Ch1 (For Counter Mode)	Start(1)/Stop(0)
X+0038	Ch1 (For Counter Mode)	Clear Counter(1)
X+0039	Ch1 (For Counter Mode)	Clear Overflow
X+0040	Ch1 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0041	Ch2 (For Counter Mode)	Start(1)/Stop(0)
X+0042	Ch2 (For Counter Mode)	Clear Counter(1)
X+0043	Ch2 (For Counter Mode)	Clear Overflow
X+0044	Ch2 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0045	Ch3 (For Counter Mode)	Start(1)/Stop(0)
X+0046	Ch3 (For Counter Mode)	Clear Counter(1)
X+0047	Ch3 (For Counter Mode)	Clear Overflow
X+0048	Ch3 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0049	Ch4 (For Counter Mode)	Start(1)/Stop(0)
X+0050	Ch4 (For Counter Mode)	Clear Counter(1)
X+0051	Ch4 (For Counter Mode)	Clear Overflow
X+0052	Ch4 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0053	Ch5 (For Counter Mode)	Start(1)/Stop(0)
X+0054	Ch5 (For Counter Mode)	Clear Counter(1)
X+0055	Ch5 (For Counter Mode)	Clear Overflow
X+0056	Ch5 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0057	Ch6 (For Counter Mode)	Start(1)/Stop(0)
X+0058	Ch6 (For Counter Mode)	Clear Counter(1)
X+0059	Ch6 (For Counter Mode)	Clear Overflow
X+0060	Ch6 (For Counter Mode)	Latch Status(read)/Clear Status(Write)

X+0061	Ch7 (For Counter Mode)	Start(1)/Stop(0)
X+0062	Ch7 (For Counter Mode)	Clear Counter(1)
X+0063	Ch7 (For Counter Mode)	Clear Overflow
X+0064	Ch7 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0065	Ch8 (For Counter Mode)	Start(1)/Stop(0)
X+0066	Ch8 (For Counter Mode)	Clear Counter(1)
X+0067	Ch8 (For Counter Mode)	Clear Overflow
X+0068	Ch8 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0069	Ch9 (For Counter Mode)	Start(1)/Stop(0)
X+0070	Ch9 (For Counter Mode)	Clear Counter(1)
X+0071	Ch9 (For Counter Mode)	Clear Overflow
X+0072	Ch9 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0073	Ch10 (For Counter Mode)	Start(1)/Stop(0)
X+0074	Ch10 (For Counter Mode)	Clear Counter(1)
X+0075	Ch10 (For Counter Mode)	Clear Overflow
X+0076	Ch10 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0077	Ch11 (For Counter Mode)	Start(1)/Stop(0)
X+0078	Ch11 (For Counter Mode)	Clear Counter(1)
X+0079	Ch11 (For Counter Mode)	Clear Overflow
X+0080	Ch11 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0081	Ch12 (For Counter Mode)	Start(1)/Stop(0)
X+0082	Ch12 (For Counter Mode)	Clear Counter(1)
X+0083	Ch12 (For Counter Mode)	Clear Overflow
X+0084	Ch12 (For Counter Mode)	Latch Status(read)/Clear Status(Write)
X+0085	Ch13 (For Counter Mode)	Start(1)/Stop(0)
X+0086	Ch13 (For Counter Mode)	Clear Counter(1)
X+0087	Ch13 (For Counter Mode)	Clear Overflow
X+0088	Ch13 (For Counter Mode)	Latch Status(read)/Clear Status(Writ

7.5 EDAM-9052 8 channel digital Input /digital out Module

7.5.1 Register Address (Unit: 16bits)

Where X=40000 for function 03, function 06, function 16

X=30000 for function 04

Address	Channel	Item	Type
X+0001~X+0016	For DI Counter (32 bits/channel)	8 Channels, 32 Bits	R
X+0017~X+0032	For Pulse Output L level, time Unit:0.1ms	8 Channels, 32 Bits	R/W
X+0033~X+0048	For Pulse Output H level, time Unit:0.1ms	8 Channels, 32 Bits	R/W
X+0049~X+0064	Set DO pulse value (Set to 0=Continue mode)	8 Channels, 32 Bits	R/W
X+0065	Digital input status	8 channel,16 Bits	R
X+0066	Digital output status	8 channel,16 Bits	R/W

7.5.2 Bit Address (Unit: 1Bit)

Where X=00000 for function 01, function 05

X=10000 for function 02

Address	Channel	Item	Type
X+0001~X+0008	For DI 8 Channels, 1 Bit/channel		R
X+0017~X+0024	For DO 8 Channels, 1 Bit/channel		R/W
X+0033	Ch0 (For Counter Mode)	Start(1)/Stop(0)	R/W
X+0034	Ch0 (For Counter Mode)	Clear Counter(1)	R/W
X+0035	Ch0 (For Counter Mode)	Clear Overflow	R/W
X+0036	Ch0 (For Counter Mode)	Latch Status(read)/Clear Status(Write)	R/W
X+0037	Ch1 (For Counter Mode)	Start(1)/Stop(0)	R/W
X+0038	Ch1 (For Counter Mode)	Clear Counter(1)	R/W
X+0039	Ch1 (For Counter Mode)	Clear Overflow	R/W
X+0040	Ch1 (For Counter Mode)	Latch Status(read)/Clear Status(Write)	R/W
X+0041	Ch2 (For Counter Mode)	Start(1)/Stop(0)	R/W
X+0042	Ch2 (For Counter Mode)	Clear Counter(1)	R/W
X+0043	Ch2 (For Counter Mode)	Clear Overflow	R/W
X+0044	Ch2 (For Counter Mode)	Latch Status(read)/Clear Status(Write)	R/W
X+0045	Ch3 (For Counter Mode)	Start(1)/Stop(0)	R/W
X+0046	Ch3 (For Counter Mode)	Clear Counter(1)	R/W
X+0047	Ch3 (For Counter Mode)	Clear Overflow	R/W
X+0048	Ch3 (For Counter Mode)	Latch Status(read)/Clear Status(Write)	R/W
X+0049	Ch4 (For Counter Mode)	Start(1)/Stop(0)	R/W
X+0050	Ch4 (For Counter Mode)	Clear Counter(1)	R/W
X+0051	Ch4 (For Counter Mode)	Clear Overflow	R/W
X+0052	Ch4 (For Counter Mode)	Latch Status(read)/Clear Status(Write)	R/W
X+0053	Ch5 (For Counter Mode)	Start(1)/Stop(0)	R/W
X+0054	Ch5 (For Counter Mode)	Clear Counter(1)	R/W
X+0055	Ch5 (For Counter Mode)	Clear Overflow	R/W
X+0056	Ch5 (For Counter Mode)	Latch Status(read)/Clear Status(Write)	R/W
X+0057	Ch6 (For Counter Mode)	Start(1)/Stop(0)	R/W
X+0058	Ch6 (For Counter Mode)	Clear Counter(1)	R/W
X+0059	Ch6 (For Counter Mode)	Clear Overflow	R/W
X+0060	Ch6 (For Counter Mode)	Latch Status(read)/Clear Status(Write)	R/W
X+0061	Ch7 (For Counter Mode)	Start(1)/Stop(0)	R/W
X+0062	Ch7 (For Counter Mode)	Clear Counter(1)	R/W
X+0063	Ch7 (For Counter Mode)	Clear Overflow	R/W
X+0064	Ch7 (For Counter Mode)	Latch Status(read)/Clear Status(Write)	R/W

7.6 EDAM-9015 7-Channel RTD Input Module

7.6.1 Register Address (unit:16 bits)

Where X=40000 for function 03, function 06, function 16

X=30000 for function 04

Address	**Channel**	**Item**	**Attribute**
X+0001	0	Current value	R
X+0002	1	Current value	R
X+0003	2	Current value	R
X+0004	3	Current value	R
X+0005	4	Current value	R
X+0006	5	Current value	R
X+0007	6	Current value	R
X+0008		Reserved	R
X+0009	8	Average ch0~ch6	R
X+0010	-	Reserved	R
X+0011	0	Max value	R
X+0012	1	Max value	R
X+0013	2	Max value	R
X+0014	3	Max value	R
X+0015	4	Max value	R
X+0016	5	Max value	R
X+0017	6	Max value	R
X+0018		Reserved	
X+0019~X+0020		Reserved	
X+0021	0	Min value	R
X+0022	1	Min value	R
X+0023	2	Min value	R
X+0024	3	Min value	R
X+0025	4	Min value	R
X+0026	5	Min value	R
X+0027	6	Min value	R
X+0028~X+0030		Reserved	

7.6.2 Bit Address (unit:1 bit)

Where X=00000 for function 01, function 05

X=10000 for function 02

Address	Channel	Item	Attribute
X+0101	0	Reset Max. value	R/W
X+0102	1	Reset Max. value	R/W
X+0103	2	Reset Max. value	R/W
X+0104	3	Reset Max. value	R/W
X+0105	4	Reset Max. value	R/W
X+0106	5	Reset Max. value	R/W
X+0107	6	Reset Max. value	R/W
X+0108~X+0110		Reserved	
X+0111	0	Reset Min. value	R/W
X+0112	1	Reset Min. value	R/W
X+0113	2	Reset Min. value	R/W
X+0114	3	Reset Min. value	R/W
X+0115	4	Reset Min. value	R/W
X+0116	5	Reset Min. value	R/W
X+0117	6	Reset Min. value	R/W
X+0118~X+0120	--	Reserved	
X+0121	0	Burnout flag	R
X+0122	1	Burnout flag	R
X+0123	2	Burnout flag	R
X+0124	3	Burnout flag	R
X+0125	4	Burnout flag	R
X+0126	5	Burnout flag	R
X+0127	6	Burnout flag	R
X+0128~X+0130	--	Reserved	
X+0131	0	High alarm flag	R
X+0132	1	High alarm flag	R
X+0133	2	High alarm flag	R
X+0134	3	High alarm flag	R
X+0135	4	High alarm flag	R
X+0136	5	High alarm flag	R
X+0137	6	High alarm flag	R
X+0138~X+0140	--	Reserved	
X+0141	0	Low alarm flag	R
X+0142	1	Low alarm flag	R
X+0143	2	Low alarm flag	R
X+0144	3	Low alarm flag	R
X+0145	4	Low alarm flag	R
X+0146	5	Low alarm flag	R
X+0147	6	Low alarm flag	R

7.7 EDAM-9017 8-Channel Voltage/Current Input Module

7.7.1 Register Address(unit:16 bits)

Where X=40000 for function 03, function 06, function 16

X=30000 for function 04

Address	Channel	Item	Attribute
X+0001	0	Current value	R
X+0002	1	Current value	R
X+0003	2	Current value	R
X+0004	3	Current value	R
X+0005	4	Current value	R
X+0006	5	Current value	R
X+0007	6	Current value	R
X+0008	7	Current Value	R
X+0009	8	Average ch0~ch7	R
X+0010	-	Reserved	R
X+0011	0	Max value	R
X+0012	1	Max value	R
X+0013	2	Max value	R
X+0014	3	Max value	R
X+0015	4	Max value	R
X+0016	5	Max value	R
X+0017	6	Max value	R
X+0018	7	Max value	R
X+0019~X+0020		Reserved	
X+0021	0	Min value	R
X+0022	1	Min value	R
X+0023	2	Min value	R
X+0024	3	Min value	R
X+0025	4	Min value	R
X+0026	5	Min value	R
X+0027	6	Min value	R
X+0028	7	Min value	R
X+0029 ~X+0030		Reserved	

7.7.2 Bit Address (unit:1 bit)

Where X=00000 for function 01, function 05

X=10000 for function 02

Address	Channel	Item	Attribute
X+0017	0	DO value	R/W
X+0018	1	DO value	R/W
X+0101	0	Reset Max. value	R/W
X+0102	1	Reset Max. value	R/W
X+0103	2	Reset Max. value	R/W
X+0104	3	Reset Max. value	R/W
X+0105	4	Reset Max. value	R/W
X+0106	5	Reset Max. value	R/W
X+0107	6	Reset Max. value	R/W
X+0108	7	Reset Max. value	R/W
X+0109~X+0110	8	Reserved	
X+0111	0	Reset Min. value	R/W
X+0112	1	Reset Min. value	R/W
X+0113	2	Reset Min. value	R/W
X+0114	3	Reset Min. value	R/W
X+0115	4	Reset Min. value	R/W
X+0116	5	Reset Min. value	R/W
X+0117	6	Reset Min. value	R/W
X+0118	7	Reset Min. value	R/W
X+0119~X+0130	--	Reserved	
X+0131	0	High alarm flag	R
X+0132	1	High alarm flag	R
X+0133	2	High alarm flag	R
X+0134	3	High alarm flag	R
X+0135	4	High alarm flag	R
X+0136	5	High alarm flag	R
X+0137	6	High alarm flag	R
X+0138	7	High alarm flag	R
X+0139~X+0140	--	Reserved	
X+0141	0	Low alarm flag	R
X+0142	1	Low alarm flag	R
X+0143	2	Low alarm flag	R
X+0144	3	Low alarm flag	R
X+0145	4	Low alarm flag	R
X+0146	5	Low alarm flag	R
X+0147	6	Low alarm flag	R
X+0148	7	Low alarm flag	R

7.8 EDAM-9019 8-Channel T/C Input Module

7.8.1 Register Address (unit:16 bits)

Where X=40000 for function 03, function 06, function 16

X=30000 for function 04

Address	Channel	Item	Attribute
X+0001	0	Current value	R
X+0002	1	Current value	R
X+0003	2	Current value	R
X+0004	3	Current value	R
X+0005	4	Current value	R
X+0006	5	Current value	R
X+0007	6	Current value	R
X+0008		Current value	R
X+0009	8	Average ch0~ch7	R
X+0010	-	Reserved	R
X+0011	0	Max value	R
X+0012	1	Max value	R
X+0013	2	Max value	R
X+0014	3	Max value	R
X+0015	4	Max value	R
X+0016	5	Max value	R
X+0017	6	Max value	R
X+0018	7	Max value	
X+0019~X+0020		Reserved	
X+0021	0	Min value	R
X+0022	1	Min value	R
X+0023	2	Min value	R
X+0024	3	Min value	R
X+0025	4	Min value	R
X+0026	5	Min value	R
X+0027	6	Min value	R
X+0028~X+0030		Reserved	

7.8.2 Bit Address (unit:1 bit)

Where X=00000 for function 01, function 05

X=10000 for function 02

Address	Channel	Item	Attribute
X+0017	0	DO value	R/W
X+0018	1	DO value	R/W
X+0101	0	Reset Max. value	R/W
X+0102	1	Reset Max. value	R/W
X+0103	2	Reset Max. value	R/W
X+0104	3	Reset Max. value	R/W
X+0105	4	Reset Max. value	R/W
X+0106	5	Reset Max. value	R/W
X+0107	6	Reset Max. value	R/W
X+0108	7	Reset Max. value	R/W
X+0109~X+0110		Reserved	
X+0111	0	Reset Min. value	R/W
X+0112	1	Reset Min. value	R/W
X+0113	2	Reset Min. value	R/W
X+0114	3	Reset Min. value	R/W
X+0115	4	Reset Min. value	R/W
X+0116	5	Reset Min. value	R/W
X+0117	6	Reset Min. value	R/W
X+0118	7	Reset Min. value	R/W
X+0119~X+0120	--	Reserved	
X+0121	0	Burnout flag	R
X+0122	1	Burnout flag	R
X+0123	2	Burnout flag	R
X+0124	3	Burnout flag	R
X+0125	4	Burnout flag	R
X+0126	5	Burnout flag	R
X+0127	6	Burnout flag	R
X+0128	7	Burnout flag	R
X+0129~X+0130	--	Reserved	
X+0131	0	High alarm flag	R
X+0132	1	High alarm flag	R
X+0133	2	High alarm flag	R
X+0134	3	High alarm flag	R
X+0135	4	High alarm flag	R
X+0136	5	High alarm flag	R
X+0137	6	High alarm flag	R
X+0138	7	High alarm flag	R
X+0139~X+0140	--	Reserved	
X+0141	0	Low alarm flag	R
X+0142	1	Low alarm flag	R
X+0143	2	Low alarm flag	R
X+0144	3	Low alarm flag	R
X+0145	4	Low alarm flag	R
X+0146	5	Low alarm flag	R

X+0147	6	Low alarm flag	R
X+0148	7	Low alarm flag	R

Chapter 8 TCPDAQ Data Structure

```
typedef struct _AlarmInfo             //Alarm Event data structure
{
    u_cha       szIP[4];              //The IP address which cause the alarm change
    u_short     szDateTime[6];        //E.x 2001/09/23 10:12:34:567 (Year/Month/Day Hour:Minute:Second:mSecond)
    u_short     byChannel;            //The Channel of which cause the alarm change
    u_short     byAlarmType;          //0x00:AIO Low Alarm
                                      //0x01:AIO High Alarm
                                      //0x20:DIO Alarm
                                      //0xF0:Connection Alarm
    u_short     byAlarmStatus;        //0:Alarm ON to OFF, 1:Alarm OFF to ON
    u_short     wValue;               //Alarm value.For DIO, this value could be "0" or "1" means that "ON" or "OFF"
                                      //          For high or low alarm, this is the AIO value.
                                      //          For connection lost, this value is '0'.
} _AlarmInfo;
```

```
typedef struct _StreamData            //Stream Event data structure
{
    u_char      szIP[4];              //The IP address which send the stream datae
    u_short     szDateTime[6];        //E.x [2001]/[09]/[23] [10]:[12]:[34] (Year/Month/Day Hour:Minute:Second)
    u_short     DIN;                  //Digital input data (DI#0~DI#15)
    u_short     DOUT;                 //Digital output data (DO#0~DO#15)
    u_short     wData[32];            //Digital input Counter (Each channel occupies 4 Byte)
} _StreamData;
```

```
typedef struct ModuleInfo             // Used For Scan_Online_Modules(..)
{
    u_char      szIP[4];              //IP address
    u_char      szGate[4];            //Gateway
    u_char      szMask[4];            //Submask
    u_char      szDHCP;               //DHCP status 01=enable, 00=disable
    u_char      szID;                 //Module ID number
    u_char      szMacAddr[6];         //MAC address of module
    u_short     szModuleNo;           //Module name
    u_char      szBuffer[12];         //Buffer reserved for TCPDAQ.DLL
} ModuleInfo;
```

```
typedef struct ModuleData             //Used for function TCP_ReadAllDataFromModule (..)
{
    u_char      Din[16];              //Digital input data (DI#0~DI#15),avaliable for EDAM9050/51/52
    u_char      Dout[16];             //Digital output data (DO#0~DO#15),avaliable for EDAM9050/51/52/17/19
    u_char      DiLatch[16];          //Digital input latch status (DI#0~DI#15),avaliable for EDAM9050/51/52
    long        DiCounter[16];        //Digital input counter value (DI#0~DI#15),avaliable for EDAM9050/51/52
    double      AiNormalValue[16];    //Analog Input value(AI#0~AI#15),avaliable for EDAM9015/17/19
    double      AiMaxValue[16];       //Analog maximum value(AI#0~AI#15),avaliable for EDAM9015/17/19
    double      AiMinValue[16];       //Analog minimum value(AI#0~AI#15),avaliable for EDAM9015/17/19
    u_char      AiHighAlarm[16];      //Analog high alarm status(AI#0~AI#15),avaliable for EDAM9015/17/19
    u_char      AiLowAlarm[16];       //Analog low alarm status(AI#0~AI#15),avaliable for EDAM9015/17/19
    u_char      AiChannelType[16];    //Analog channel Type, avaliable for EDAM9015/17/19
    u_char      AiBurnOut[16] ;       //Analog channel burn out status,avaliable for EDAM9019/15 only
    double      CJCTemperature ;      //Cold junction temperature,avaliable for EDAM9019 only
} ModuleData;
```

Chapter 9 EDAM-9000 Web Server

9.1 What is TCPDAQ Web Server?

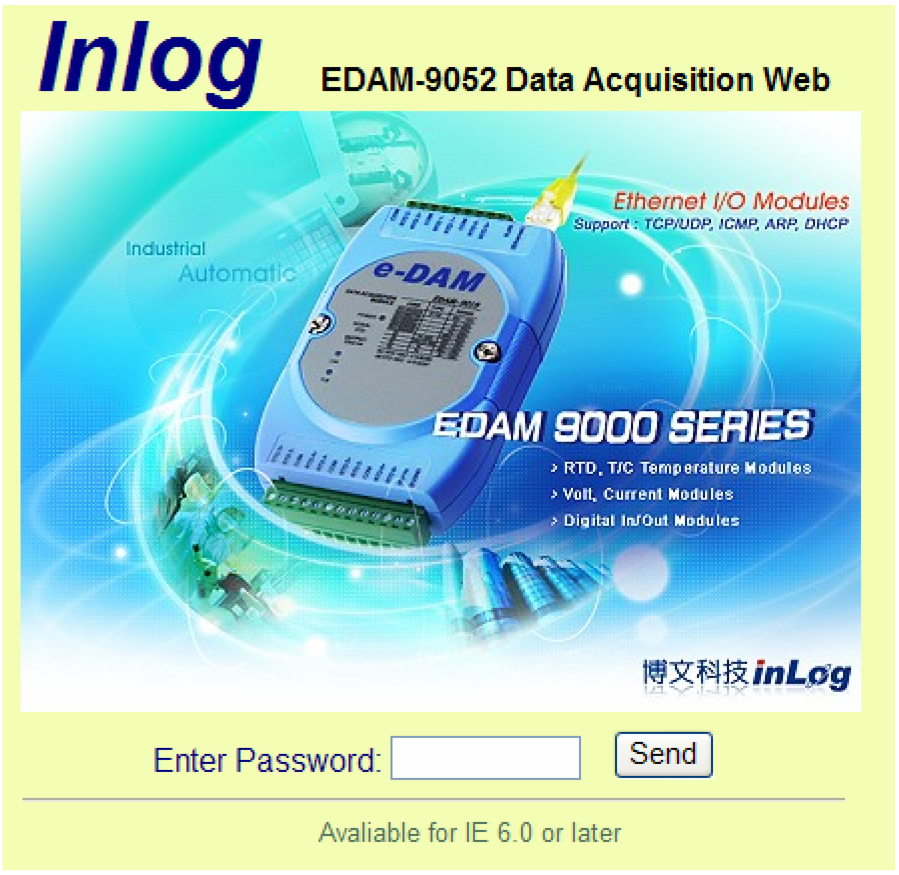
EDAM-9000 I/O modules all features built-in web server. Remote computer or devices can monitor and control I/O status on EDAM-9000 modules remotely through web browser. There is default built-in web page on EDAM-9000 modules.

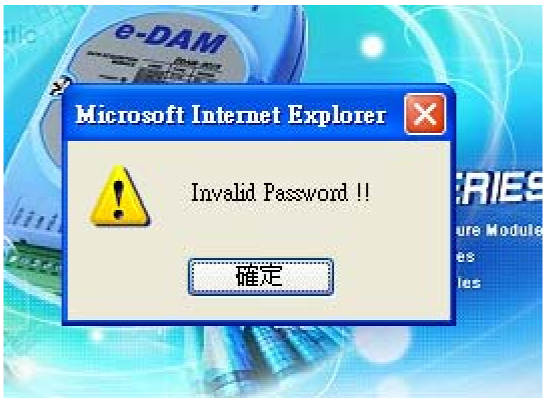
To use your computer to browse the web page on EDAM-9000 module, you can simply type the IP address to connect to your EDAM-9000 module in web browser. There will be one dialog window asking you to enter the password. After you have typed the correct password, you can start to monitor or control I/O on EDAM-9000 modules.

Notice: Please use Windows Internet Explorer 5.5 (IE 5.5 or later version)

9.2 Home Page

- Type the **IP address** in the web browser (example: http:\\192.168.0.51)
- The home page will pop-up in the browser window to ask you to enter the password

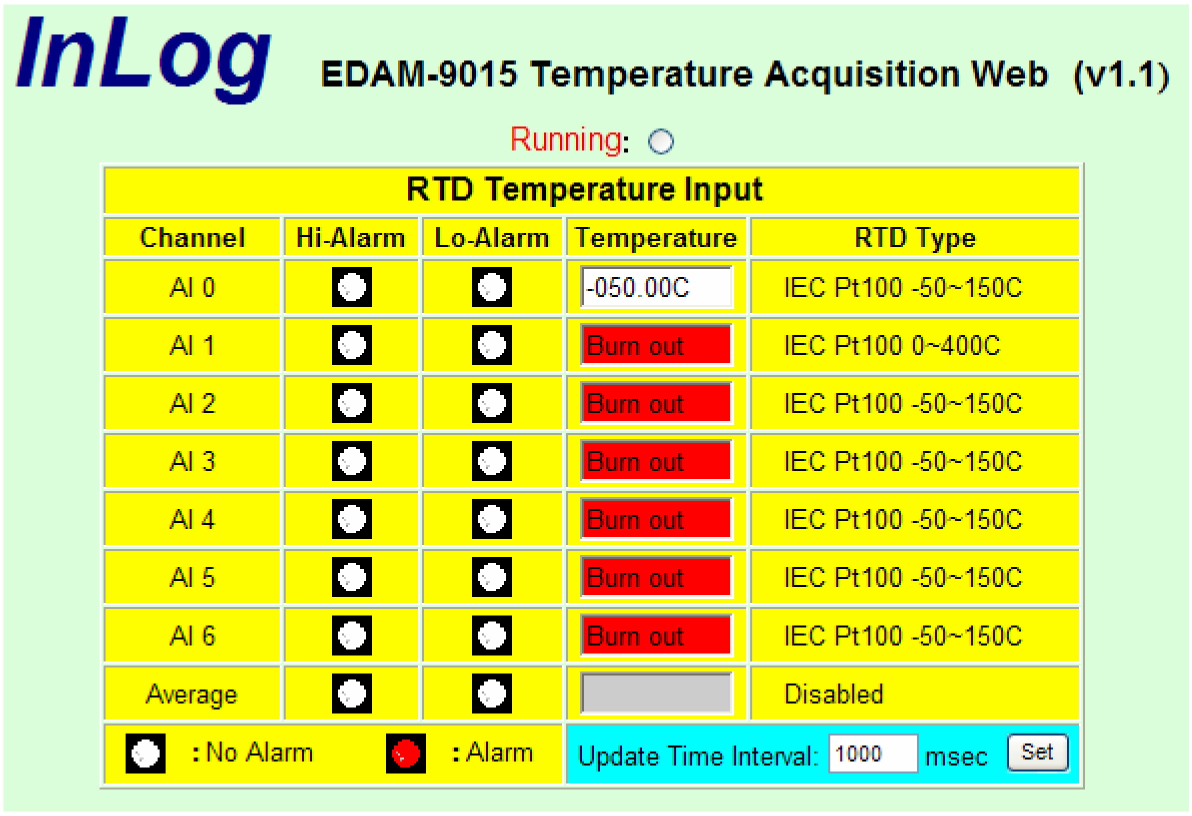


- Enter the correct password and click send button to verify the password. If the password is not correct, a warming message box will show up to remain you to reenter the password
- 
Microsoft Internet Explorer
Invalid Password !!

- If the password is correct, the module monitoring page will pop up in the web browser.

9.3 Module monitoring page

9.3.1 EDAM-9015 monitoring page


InLog EDAM-9015 Temperature Acquisition Web (v1.1)

Running: ○

RTD Temperature Input				
Channel	Hi-Alarm	Lo-Alarm	Temperature	RTD Type
AI 0	○	○	-050.00C	IEC Pt100 -50~150C
AI 1	○	○	Burn out	IEC Pt100 0~400C
AI 2	○	○	Burn out	IEC Pt100 -50~150C
AI 3	○	○	Burn out	IEC Pt100 -50~150C
AI 4	○	○	Burn out	IEC Pt100 -50~150C
AI 5	○	○	Burn out	IEC Pt100 -50~150C
AI 6	○	○	Burn out	IEC Pt100 -50~150C
Average	○	○		Disabled
○ : No Alarm	● : Alarm		Update Time Interval: 1000 msec	Set

Channel : Channel number of RTD input

Hi-Alarm : Analog channel High alarm status

Lo-Alarm : Analog channel low alarm status

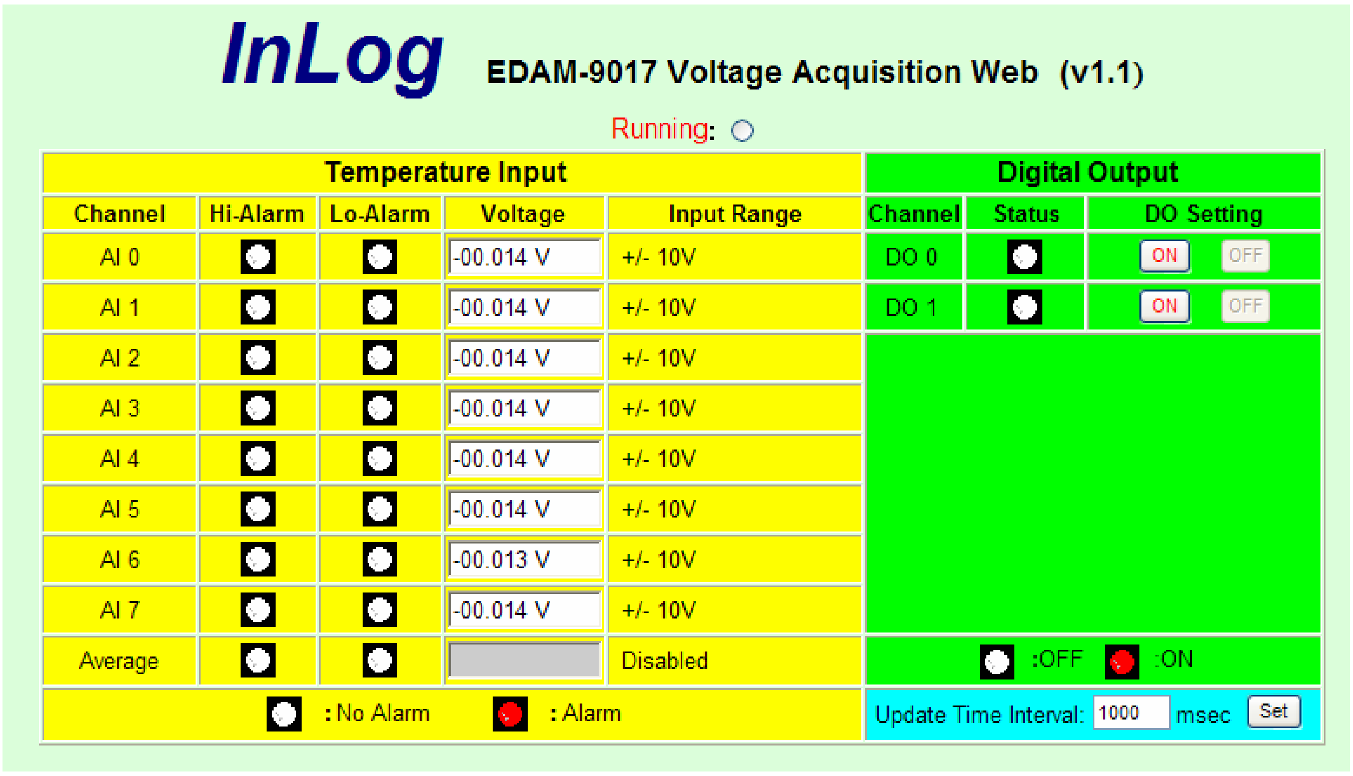
Temperature: Temperature value of RTD input channel

RTD type : RTD type of input channel

Average : Average value of channels which functions in average

Time interval: I/O status update time interval

9.3.2 EDAM-9017 monitoring page



InLog EDAM-9017 Voltage Acquisition Web (v1.1)

Running: ○

Temperature Input					Digital Output		
Channel	Hi-Alarm	Lo-Alarm	Voltage	Input Range	Channel	Status	DO Setting
AI 0	○	○	-00.014 V	+/- 10V	DO 0	○	ON OFF
AI 1	○	○	-00.014 V	+/- 10V	DO 1	○	ON OFF
AI 2	○	○	-00.014 V	+/- 10V			
AI 3	○	○	-00.014 V	+/- 10V			
AI 4	○	○	-00.014 V	+/- 10V			
AI 5	○	○	-00.014 V	+/- 10V			
AI 6	○	○	-00.013 V	+/- 10V			
AI 7	○	○	-00.014 V	+/- 10V			
Average	○	○		Disabled	○ :OFF ● :ON		
○ : No Alarm ● : Alarm					Update Time Interval: 1000 msec Set		

Channel : Channel number of analog input or digital output

Hi-Alarm : Analog channel High alarm status

Lo-Alarm : Analog channel low alarm status

Voltage : Voltage value of analog input channel

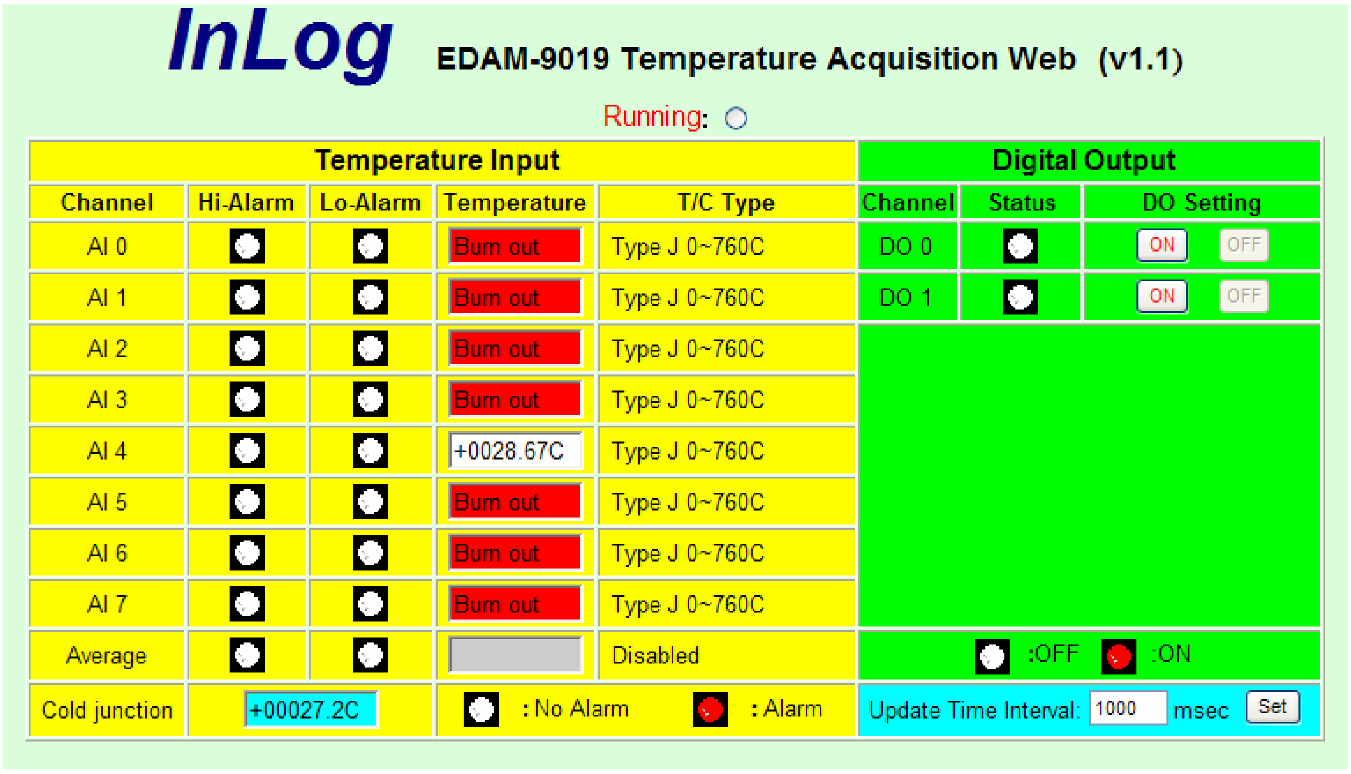
Input Range: Range of analog input channel

Status : Digital output status

DO Setting: Set digital output on or off

Time interval: I/O status update time interval

9.3.3 EDAM-9019 monitoring page



InLog EDAM-9019 Temperature Acquisition Web (v1.1)

Running: ○

Temperature Input					Digital Output		
Channel	Hi-Alarm	Lo-Alarm	Temperature	T/C Type	Channel	Status	DO Setting
AI 0	○	○	Burn out	Type J 0~760C	DO 0	○	ON OFF
AI 1	○	○	Burn out	Type J 0~760C	DO 1	○	ON OFF
AI 2	○	○	Burn out	Type J 0~760C			
AI 3	○	○	Burn out	Type J 0~760C			
AI 4	○	○	+0028.67C	Type J 0~760C			
AI 5	○	○	Burn out	Type J 0~760C			
AI 6	○	○	Burn out	Type J 0~760C			
AI 7	○	○	Burn out	Type J 0~760C			
Average	○	○		Disabled	○ :OFF ● :ON		
Cold junction	+00027.2C		○ : No Alarm ● : Alarm		Update Time Interval: 1000 msec Set		

Channel : Channel number of analog input or digital output

Hi-Alarm : Analog channel High alarm status

Lo-Alarm : Analog channel low alarm status

Temperature: Temperature value of T/C input channel

T/C type : Thermal Couple type of input channel

Cold junction: Temperature of T/C cold junction

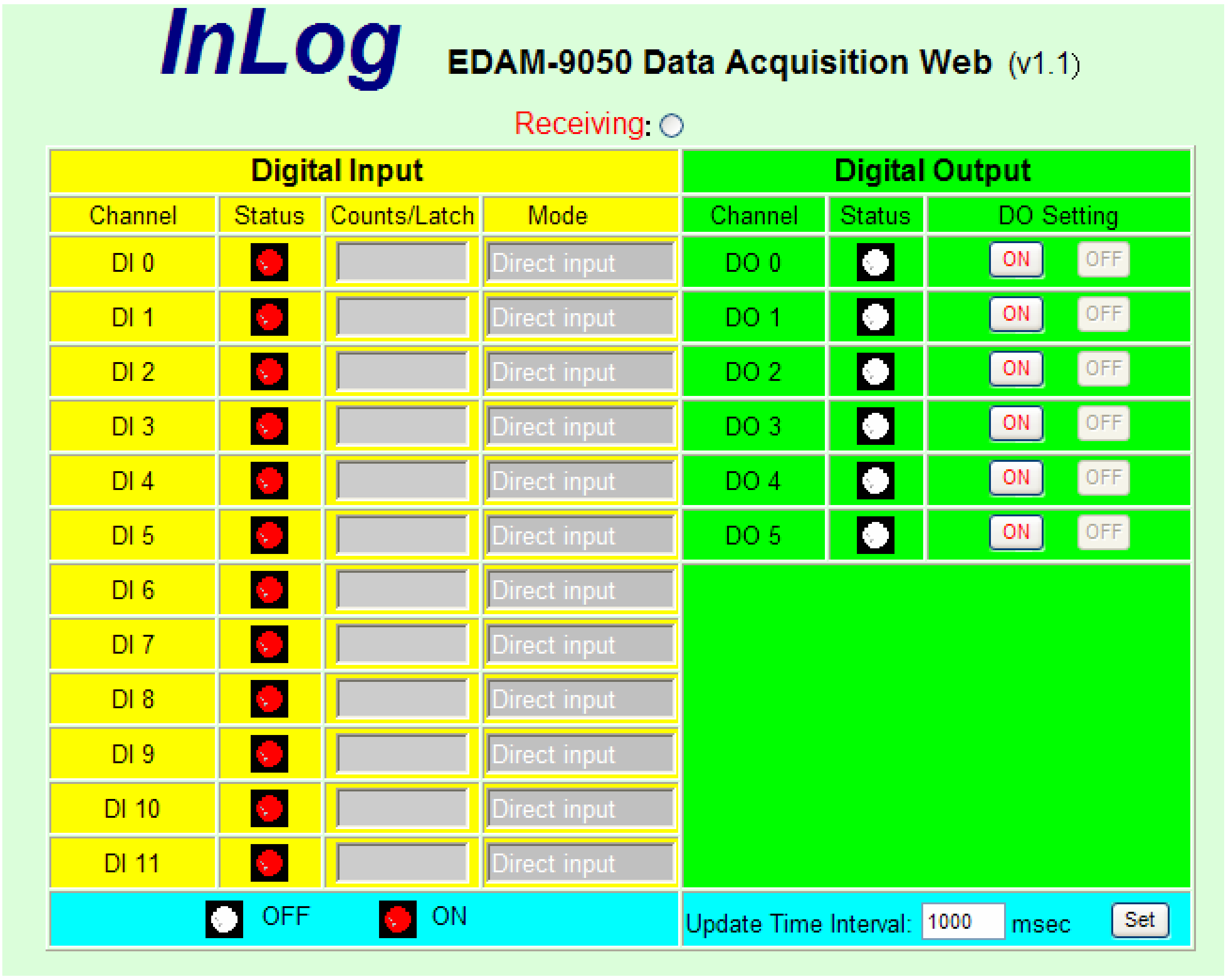
Average : Average value of channels which functions in average

Status : Digital output status

DO Setting: Set digital output on or off

Time interval: I/O status update time interval

9.3.4 EDAM-9050 monitoring page



InLog EDAM-9050 Data Acquisition Web (v1.1)

Receiving: ○

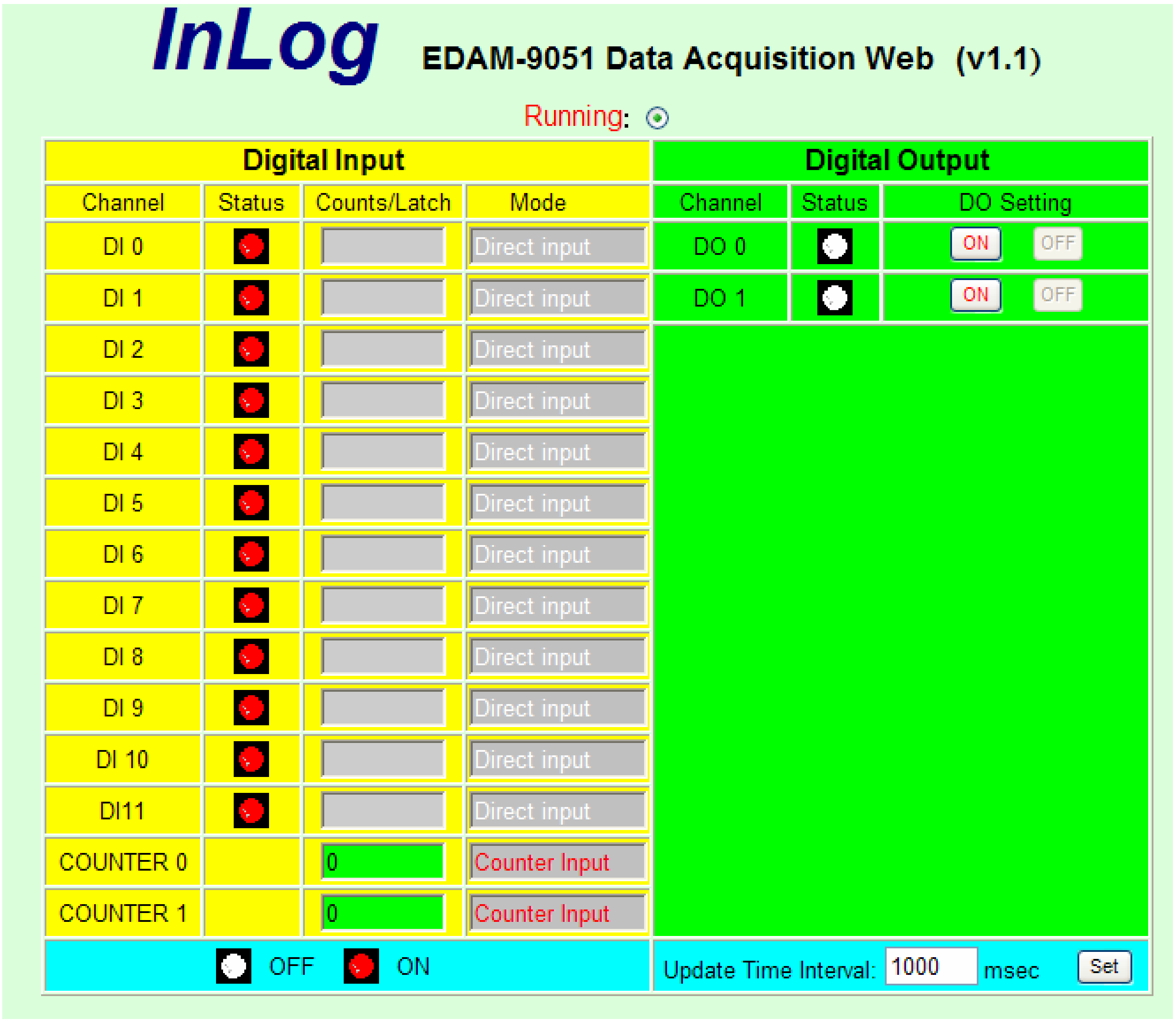
Digital Input				Digital Output		
Channel	Status	Counts/Latch	Mode	Channel	Status	DO Setting
DI 0	●		Direct input	DO 0	○	ON OFF
DI 1	●		Direct input	DO 1	○	ON OFF
DI 2	●		Direct input	DO 2	○	ON OFF
DI 3	●		Direct input	DO 3	○	ON OFF
DI 4	●		Direct input	DO 4	○	ON OFF
DI 5	●		Direct input	DO 5	○	ON OFF
DI 6	●		Direct input			
DI 7	●		Direct input			
DI 8	●		Direct input			
DI 9	●		Direct input			
DI 10	●		Direct input			
DI 11	●		Direct input			

○ OFF ● ON

Update Time Interval: 1000 msec Set

Channel	: Channel number of digital input or output
Status	: Current input or output status
Count/Latch	: Counter value or latch status of digital input which functions at "Counter" mode or "Latch" mode
Mode	: Channel operating mode
DO Setting	: Set digital output on or off
Time interval	: I/O status update time interval

9.3.5 EDAM-9051 monitoring page



InLog EDAM-9051 Data Acquisition Web (v1.1)

Running: ◉

Digital Input				Digital Output		
Channel	Status	Counts/Latch	Mode	Channel	Status	DO Setting
DI 0	●		Direct input	DO 0	○	ON OFF
DI 1	●		Direct input	DO 1	○	ON OFF
DI 2	●		Direct input			
DI 3	●		Direct input			
DI 4	●		Direct input			
DI 5	●		Direct input			
DI 6	●		Direct input			
DI 7	●		Direct input			
DI 8	●		Direct input			
DI 9	●		Direct input			
DI 10	●		Direct input			
DI11	●		Direct input			
COUNTER 0		0	Counter Input			
COUNTER 1		0	Counter Input			

○ OFF ● ON

Update Time Interval: 1000 msec Set

Channel : Channel number of digital input or output

Status : Current input or output status

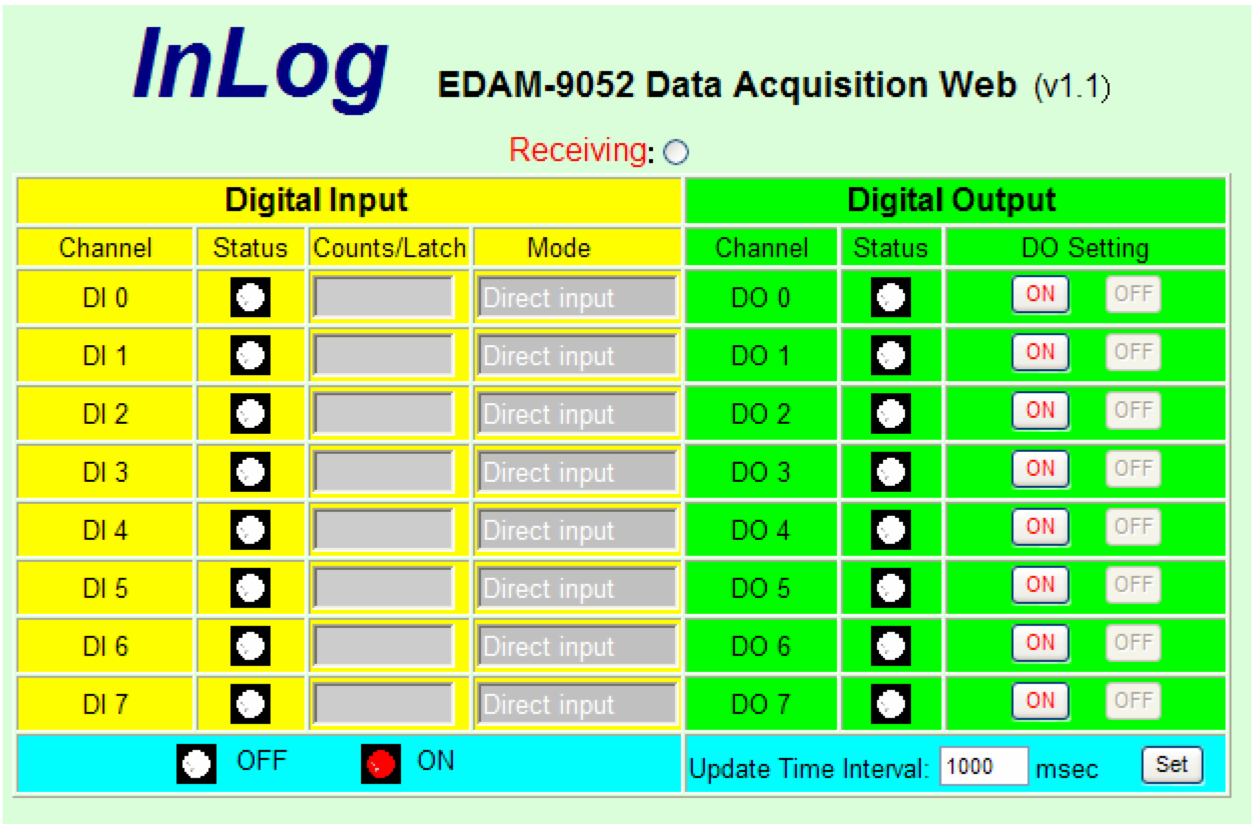
Count/Latch: Counter value or latch status of digital input which functions at "Counter" mode or "Latch" mode

Mode : Channel operating mode

DO Setting: Set digital output on or off

Time interval: I/O status update time interval

9.3.6 EDAM-9052 monitoring page



Digital Input				Digital Output			
Channel	Status	Counts/Latch	Mode	Channel	Status	DO Setting	
DI 0	○		Direct input	DO 0	○	ON	OFF
DI 1	○		Direct input	DO 1	○	ON	OFF
DI 2	○		Direct input	DO 2	○	ON	OFF
DI 3	○		Direct input	DO 3	○	ON	OFF
DI 4	○		Direct input	DO 4	○	ON	OFF
DI 5	○		Direct input	DO 5	○	ON	OFF
DI 6	○		Direct input	DO 6	○	ON	OFF
DI 7	○		Direct input	DO 7	○	ON	OFF
○ OFF	● ON			Update Time Interval:	1000	msec	Set

Channel : Channel number of digital input or output

Status : Current input or output status

Count/Latch: Counter value or latch status of digital input which functions at "Counter" mode or "Latch" mode

Mode : Channel operating mode

DO Setting: Set digital output on or off

Time interval: I/O status update time interval