BUENO ELECTRIC

# BE-6000 Series

## Remote I/O Module

# Chapter 1 Product Overview

## 1.1 Product Introduction (RS-6000M)

RS-6000M RS485-based data acquisition and control modules provide I/O, data acquisitions, and networking in one module to build a cost effective, distributed monitoring and control solution for a wide variety of applications. With RS485-based technology, RS-6000M series modules build up a cost-effective DA&C system for building automation, environmental monitoring, and manufacturing applications. Modbus RTU/ASCII has become a standard communication protocol, and is now the most commonly available means of connecting industrial. This makes the RS-6000M series perfect for integration with HMI, SCADA, PLC and other software systems.

## 1.1 Product Introduction (CAN-6000T)

CAN-6000T CAN-based data acquisition and control modules provide I/O, data acquisitions, and networking in one module to build a cost effective, distributed monitoring and control solution for a wide variety of applications. With CANBus-based technology, CAN-6000T series modules build up a cost-effective DA&C system for building automation, environmental monitoring, and manufacturing applications.

## 1.1 Product Introduction (NET-6000M)

NET-6000M Ethernet-based data acquisition and control modules provide I/O, data acquisitions, and networking in one module to build a cost effective, distributed monitoring and control solution for a wide variety of applications. With Ethernet-based technology, NET-6000M series modules build up a cost-effective DA&C system for building automation, environmental monitoring, and manufacturing applications. Modbus TCP has become a standard communication protocol, and is now the most commonly available means of connecting industrial. This makes the NET-6000M series perfect for integration with HMI, SCADA, PLC and other software systems.

## 1.2 Odering Information (RS-6000M)

| Model | Description |
|---|---|
| **Digital I/O** | |
| RS-6011M | RS485 Remote I/O Module with16-ch DI |
| RS-6012M | RS485 Remote I/O Module with16-ch DO |
| RS-6013M | RS485 Remote I/O Module with 8-ch DI and 8-ch DO |
| **Relay Output** | |
| RS-6014M | RS485 Remote I/O Module with 5-ch Relay(Form A) |
| RS-6015M | RS485 Remote I/O Module with 5-ch Relay(3-ch Form A, 2-ch Form C) |
| **Analog Input** | |
| RS-6021M | RS485 Remote I/O Module with 12bit 16-ch Single End AI or 8-ch differential AI |
| RS-6022M | RS485 Remote I/O Module with 16bit 16-ch Single End AI or 8-ch differential AI |
| **Analog Output** | |
| RS-6031M | RS485 Remote I/O Module with 12bit 4-ch AO |
| RS-6032M | RS485 Remote I/O Module with 16bit 4-ch AO |
| **RTD** | |
| RS-6041M | RS485 Remote I/O Module with 5-ch RTD |
| **Thermocouple** | |
| RS-6042M | RS485 Remote I/O Module with 5-ch TC |
| **Mixed** | |
| RS-6088 | RS485 Remote I/O Module with 16bit 8-ch Single End AI or 4-ch differential AI, 12bit 4-ch AO, 2-ch DI, 2-ch DO |

## 1.3 Ordering Information (CAN-6000T)

| Model | Description |
|---|---|
| **Digital I/O** | |
| CAN-6011T | CAN Remote I/O Module with16-ch DI |
| CAN-6012T | CAN Remote I/O Module with16-ch DO |
| CAN-6013T | CAN Remote I/O Module with 8-ch DI and 8-ch DO |
| **Relay Output** | |
| CAN-6014T | CAN Remote I/O Module with 5-ch Relay(Form A) |
| CAN-6015T | CAN Remote I/O Module with 5-ch Relay(3-ch Form A, 2-ch Form C) |
| **Analog Input** | |
| CAN-6021T | CAN Remote I/O Module with 12bit 16-ch Single End AI or 8-ch differential AI |
| CAN-6022T | CAN Remote I/O Module with 16bit 16-ch Single End AI or 8-ch differential AI |
| **Analog Output** | |
| CAN-6031T | CAN Remote I/O Module with 12bit 4-ch AO |
| CAN-6032T | CAN Remote I/O Module with 16bit 4-ch AO |
| **RTD** | |
| CAN-6041M | CAN Remote I/O Module with 5-ch RTD |
| **Thermocouple** | |
| CAN-6042M | CAN Remote I/O Module with 5-ch TC |
| **Mixed** | |
| CAN-6088 | CAN Remote I/O Module with 16bit 8-ch Single End AI or 4-ch differential AI, 12bit 4-ch AO, 2-ch DI, 2-ch DO |

## 1.4 Ordering Information (NET-6000M)

| Model | Description |
|---|---|
| **Digital I/O** | |
| NET-6011M | Ethernet Remote I/O Module with16-ch DI |
| NET-6012M | Ethernet Remote I/O Module with16-ch DO |
| NET-6013M | Ethernet Remote I/O Module with 8-ch DI and 8-ch DO |
| **Relay Output** | |
| NET-6014M | Ethernet Remote I/O Module with 5-ch Relay(Form A) |
| NET-6015M | Ethernet Remote I/O Module with 5-ch Relay(3-ch Form A, 2-ch Form C) |
| **Analog Input** | |
| NET-6021M | Ethernet Remote I/O Module with 12bit 16-ch Single End AI or 8-ch differential AI |
| NET-6022M | Ethernet Remote I/O Module with 16bit 16-ch Single End AI or 8-ch differential AI |
| **Analog Output** | |
| NET-6031M | Ethernet Remote I/O Module with 12bit 4-ch AO |
| NET-6032M | Ethernet Remote I/O Module with 16bit 4-ch AO |
| **RTD** | |
| NET-6041M | Ethernet Remote I/O Module with 5-ch RTD |
| **Thermocouple** | |
| NET-6042M | Ethernet Remote I/O Module with 5-ch TC |
| **Mixed** | |
| NET-6088 | Ethernet Remote I/O Module with 16bit 8-ch Single End AI or 4-ch differential AI, 12bit 4-ch AO, 2-ch DI, 2-ch DO |

# Chapter 2 Hardware Information

## 2.1 Specifications

### 2.1.1 System Specifications

| **System** | | | |
|---|---|---|---|
| CPU | 32-bit 120MIPS CPU | | |
| Operation System | Real-Time | | |
| Watchdog | Yes | | |
| **Communication** | RS-6000M | CAN-6000T | NET-6000M |
| | RS485 | CAN | Ethernet<br>10/100 Base-TX |
| **LED Display** | | | |
| Power Indicator | Red | | |
| Run Indicator | Green | | |
| Error Indicator | Red | | |
| Link Indicator | Green | | |
| Act Indicator | Yellow | | |
| **Mechanical** | | | |
| Dimensions<br>(W x H x D)(mm) | 140*110*40 | | |
| Installation | DIN-Rail mounting | | |
| **Environment** | | | |
| Operating Temperature | -20℃～+70℃ | | |
| Storage Temperature | -30℃～+80℃ | | |
| **Power Requirements** | | | |
| Power Input | +9V～30V DC | | |
| Power Consumption | <3W | | |

## 2.1.2 I/O Specifications

### 2.1.2.1 NET-6011M/NET-6012M/6013M

| Model | NET-6011M | | NET-6012M | NET-6013M | |
|---|---|---|---|---|---|
| **Digital Input** | | | | | |
| Input Channels | 16 | | | 8 | |
| Input Type | Dry Contact | Wet Contact | | Dry Contact | Wet Contact |
| On Voltage Level | Open to GND | 0V～1V DC | | Open to GND | 0V～1V DC |
| Off Voltage Level | Close | 3V～50V DC | | Close | 3V～50V DC |
| Overvoltage Protection | +70V | | | +70V | |
| Isolation | 3750Vrms | | | 3750Vrms | |
| **Digital Output** | | | | | |
| Output Channels | | | 16 | 8 | |
| Output Type | | | Sink, Open Collector(NPN) | Sink, Open Collector(NPN) | |
| Load Voltage | | | Max 50V DC | Max 50V DC | |
| Max Load Current | | | 500mA/channel | 500mA/channel | |
| Isolation | | | 3750Vrms | 3750Vrms | |

### 2.1.2.2 NET-6014M/NET-6015M

| Model | NET-6014M | NET-6015M |
|---|---|---|
| **Relay Output** | | |
| Output Channels | 5 | 5 |
| Output Type | Power Relay, Form A(SPST) | Power Relay, 3-ch Form A(SPST), 2-ch Form C(SPDT) |
| Output Voltage | $250V_{AC}$ /$30V_{DC}$ | |
| Max Load Current | 3.0A/channel | |
| Operate Time | 6ms | |
| Release Time | 3ms | |
| Electrical Life | At 30 $V_{DC}$ / 3 A Typical 1 x $10^5$ operations (Operating frequency 20 operations/minute) At 250 $V_{AC}$/ 3 A Typical 1 x $10^5$operations (Operating frequency 20 operations/minute) | |
| Mechanical Life | $2x10^7$ | |
| Isolation | 3750Vrms | |

### 2.1.2.3 NET-6021M/NET6022M

| Model | NET-6021M | NET-6022M |
|---|---|---|
| **Analog Input** | | |
| Input Channels | 16-ch Single End or 8-ch Differential | |
| Input Type | Single End or Differential | |
| Input Range | ±10V, ±5V, ±1.25V<br>0-20mA(External 250ohm Resistor Needed)<br>4-20 mA(External 250ohm Resistor Needed) | |
| Input Impedance | > 10M(voltage), 250 ohm (current) | |
| Resolution | 12-bit | 16-bit |
| Accuracy | ±0.1% | ±0.01% |
| Sampling Rate | All channels: 16 samples/sec<br>Per channel: 1 samples/sec | |
| Isolation | 2500V | |
| Protection | Built-in TVS/ESD Protection<br>±4 kV Contact for each terminal | |

### 2.1.2.4 NET-6031M/ NET-6032M

| Model | NET-6031M | NET-6032M |
|---|---|---|
| **Analog Output** | | |
| Output Channels | 4 | |
| Output Range | ±10V, ±5V, 0V～5V, 0V～10V<br>0～20mA(Built-in 250ohm Resistor)<br>4～20mA(Built-in 250ohm Resistor) | |
| Resolution | 12-bit | 16-bit |
| Accuracy | ±0.1% | ±0.01% |
| Max Current Load Resistance | Internal power +15 V: 500 Ω.<br>External power +24 V: 1000 Ω. | |
| Isolation | 2500V | |
| Protection | Built-in TVS/ESD Protection<br>±4 kV Contact for each terminal | |

### 2.1.2.5 NET-6041M

| Model | NET-6041M |
|---|---|
| **RTD Input** | |
| Input Channels | 5 |
| Input Connections | 2 or 3 wire |
| Input Type | PT100, PT200, PT500，PT1000（-200℃～+850℃）<br>Cu50，Cu100（-50℃～+150℃） |
| Input Impedance | 1.5M |
| ADC Resolution | 24-bit |
| Temperature Resolution | 0.1℃ |
| Accuracy | ±0.1% |
| Sampling Rate | All channels: 5 samples/sec<br>Per channel: 1samples/sec |
| Isolation | 2500V |
| Protection | Built-in TVS/ESD Protection<br>±4 kV Contact for each terminal |

### 2.1.2.6 NET-6042M

| Model | | NET-6042M |
|---|---|---|
| **Thermocouple Input** | | |
| Input Channels: | 5 | |
| Input Type | J | -210℃~1200℃ |
| | K | -200℃~1370℃ |
| | E | -100℃~1000℃ |
| | T | -200℃~400℃ |
| | N | -200℃~1300℃ |
| | B | 650℃~1800℃ |
| | R | 0℃~1750℃ |
| | S | 0℃~1760℃ |
| Input Impedance: | 1.5M | |
| ADC Resolution | 24-bit | |
| Temperature Resolution | 0.1℃ | |
| Accuracy: | ±0.1% or Better | |
| Sampling Rate: | All channels: 5 samples/sec<br>Per channel: 1samples/sec | |
| Isolation | 2500V | |
| Protection | Built-in TVS/ESD Protection<br>±4 kV Contact for each terminal | |

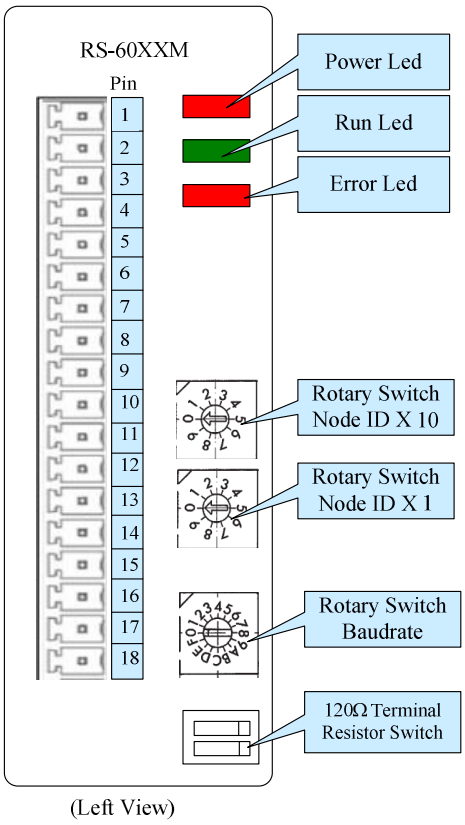
### 2.1.2.7 NET-6088M

| Model | NET-6088M | |
|---|---|---|
| **Analog Input** | | |
| Input Channels | 8-ch Single End or 4-ch Differential | |
| Input Type | Single End or Differential | |
| Input Range | ±10V, ±5V, ±1.25V<br>0-20mA(External 250ohm Resistor Needed)<br>4-20 mA(External 250ohm Resistor Needed) | |
| Input Impedance | > 10M(voltage), 250 ohm (current) | |
| Resolution | 16-bit | |
| Accuracy | ±0.01% | |
| Sampling Rate | All channels: 8 samples/sec<br>Per channel: 1samples/sec | |
| Isolation | 2500V | |
| Protection | Built-in TVS/ESD Protection<br>±4 kV Contact for each terminal | |
| **Analog Output** | | |
| Output Channels | 2 | |
| Output Range | ±10V, ±5V, 0V～5V, 0V～10V | |
| Resolution | 12-bit | |
| Accuracy | ±0.1% | |
| Isolation | 2500V | |
| Protection | Built-in TVS/ESD Protection<br>±4 kV Contact for each terminal | |
| **Digital Input** | | |
| Input Channels | 2 | |
| Input Type | Dry Contact | Wet Contact |
| On Voltage Level | Close to GND | 0V～1V DC |
| Off Voltage Level | Open | 3V～50V DC |
| Overvoltage Protection | +70V | |
| Isolation | 3750Vrms | |
| **Digital Output** | | |
| Output Channels | 2 | |
| Output Type | Sink, Open Collector(NPN) | |
| Load Voltage | Max 25V DC | |
| Max Load Current | 100mA/channel | |
| Isolation | 3750Vrms | |
| Input Channels | 8 | |

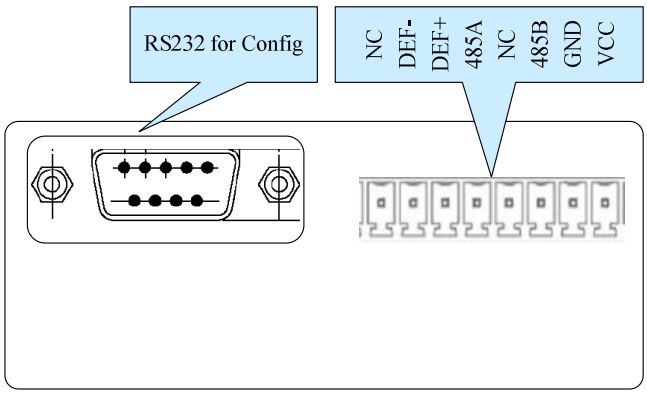
## 2.2 Pin Information

### 2.2.1 Structure

### RS-6000M




(Left View)

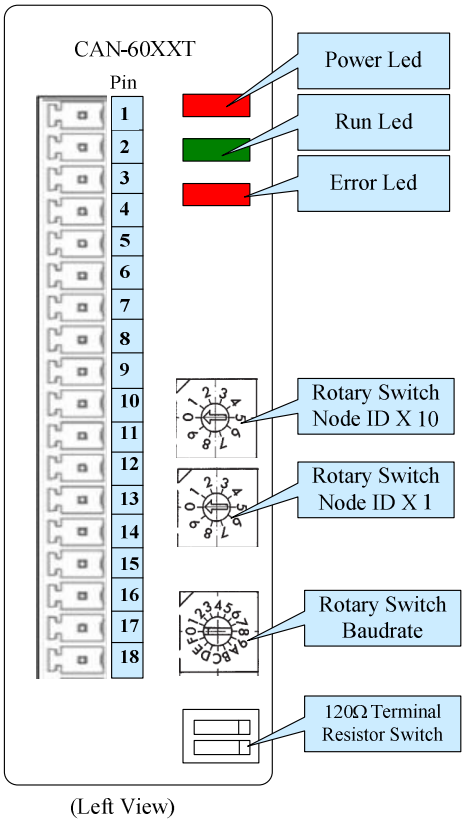



(Bottom View)

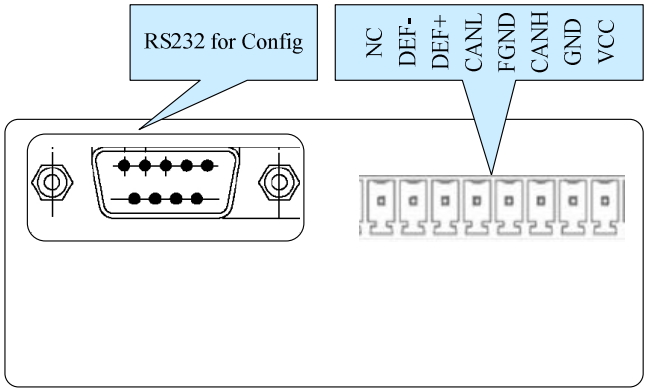
## Set up baud rate by rotary button:

| Rotary button code | RS485 baud rate |
|---|---|
| 8-F | For software configure |
| 7 | 1200bps |
| 6 | 2400bps |
| 5 | 4800bps |
| 4 | 9600bps |
| 3 | 19200bps |
| 2 | 38400bps |
| 1 | 57600bps |
| 0 | 115200bps |

# CAN-6000T




(Left View)

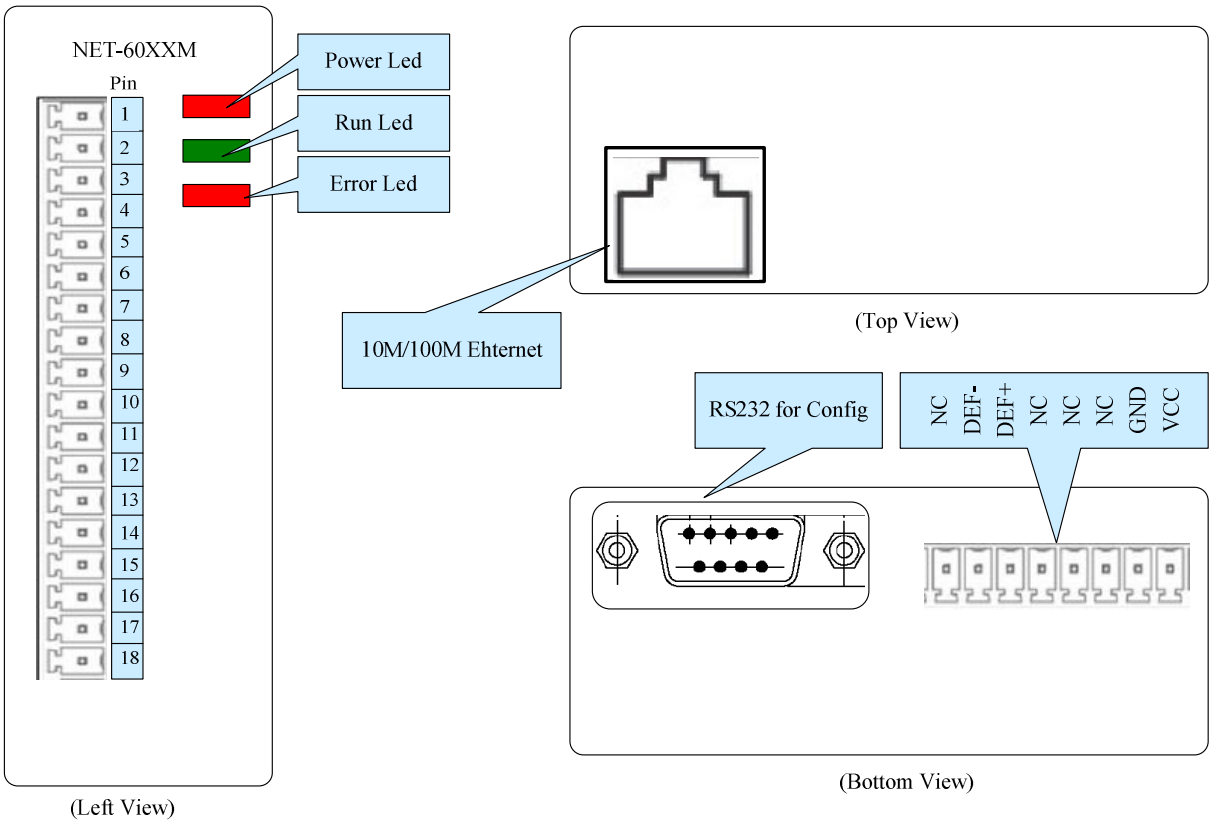



(Bottom View)

## Set up the CAN baud rate by rotary button:

| Rotary button code | CAN baud rate | BTR0(Timer 0) | BTR1(Timer 1) |
|---|---|---|---|
| F | Configure rate by software Depends on BTR0 and BTR1 | Configure by software | Configure by software |
| E | 5Kbps | 0xBF | 0xFF |
| D | 10Kbps | 0x31 | 0x1C |
| C | 20Kbps | 0x18 | 0x1C |
| B | 40Kbps | 0x87 | 0xFF |
| A | 50Kbps | 0x09 | 0x1C |
| 9 | 80Kbps | 0x83 | 0Xff |
| 8 | 100Kbps | 0x04 | 0x1C |
| 7 | 125Kbps | 0x03 | 0x1C |
| 6 | 200Kbps | 0x81 | 0xFA |
| 5 | 250Kbps | 0x01 | 0x1C |
| 4 | 400Kbps | 0x80 | 0xFA |
| 3 | 500Kbps | 0x00 | 0x1C |
| 2 | 666Kbps | 0x80 | 0xB6 |
| 1 | 800Kbps | 0x00 | 0x16 |
| 0 | 1000Kbps | 0x00 | 0x14 |

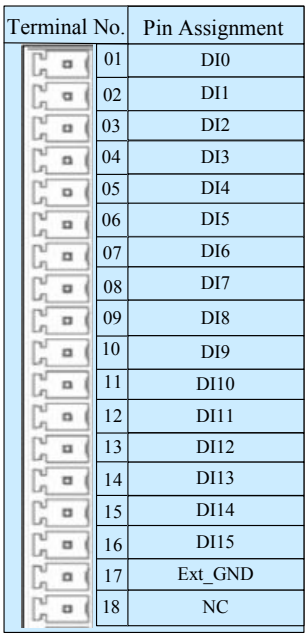
# NET-6000M


NET-60XXM
Pin
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
Power Led
Run Led
Error Led
(Left View)
10M/100M Ehternet
(Top View)
RS232 for Config
NC
DEF-
DEF+
NC
NC
NC
GND
VCC
(Bottom View)

## 2.2.2 Pin Assignments

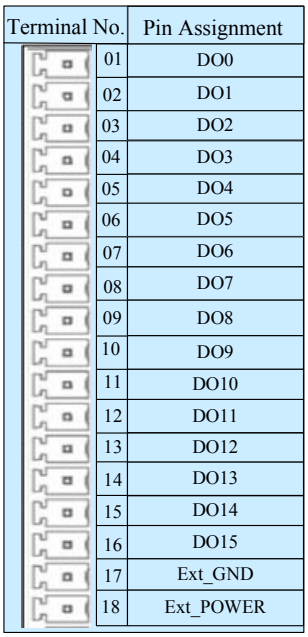
### 2.2.2.1 NET-6011M/NET-6012M/NET-6013M

**NET-6011M**



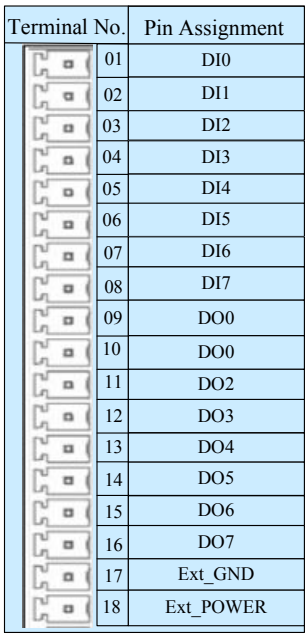
| Terminal No. | Pin Assignment |
|---|---|
| 01 | DI0 |
| 02 | DI1 |
| 03 | DI2 |
| 04 | DI3 |
| 05 | DI4 |
| 06 | DI5 |
| 07 | DI6 |
| 08 | DI7 |
| 09 | DI8 |
| 10 | DI9 |
| 11 | DI10 |
| 12 | DI11 |
| 13 | DI12 |
| 14 | DI13 |
| 15 | DI14 |
| 16 | DI15 |
| 17 | Ext_GND |
| 18 | NC |

**NET-6012M**



| Terminal No. | Pin Assignment |
|---|---|
| 01 | DO0 |
| 02 | DO1 |
| 03 | DO2 |
| 04 | DO3 |
| 05 | DO4 |
| 06 | DO5 |
| 07 | DO6 |
| 08 | DO7 |
| 09 | DO8 |
| 10 | DO9 |
| 11 | DO10 |
| 12 | DO11 |
| 13 | DO12 |
| 14 | DO13 |
| 15 | DO14 |
| 16 | DO15 |
| 17 | Ext_GND |
| 18 | Ext_POWER |

**NET-6013M**



| Terminal No. | Pin Assignment |
|---|---|
| 01 | DI0 |
| 02 | DI1 |
| 03 | DI2 |
| 04 | DI3 |
| 05 | DI4 |
| 06 | DI5 |
| 07 | DI6 |
| 08 | DI7 |
| 09 | DO0 |
| 10 | DO0 |
| 11 | DO2 |
| 12 | DO3 |
| 13 | DO4 |
| 14 | DO5 |
| 15 | DO6 |
| 16 | DO7 |
| 17 | Ext_GND |
| 18 | Ext_POWER |

## 2.2.2.2 NET-6014M/NET-6015M

**NET-6014M**

| Terminal No. | Pin Assignment |
|---|---|
| 01 | RL0 COM |
| 02 | RL0 NO |
| 03 | NC |
| 04 | NC |
| 05 | RL1 COM |
| 06 | RL1 NO |
| 07 | NC |
| 08 | NC |
| 09 | RL2 COM |
| 10 | RL2 NO |
| 11 | NC |
| 12 | NC |
| 13 | RL3 COM |
| 14 | RL3 NO |
| 15 | NC |
| 16 | NC |
| 17 | RL4 COM |
| 18 | RL4 NO |

**NET-6015M**

| Terminal No. | Pin Assignment |
|---|---|
| 01 | RL0 COM |
| 02 | RL0 NO |
| 03 | NC |
| 04 | NC |
| 05 | RL1 COM |
| 06 | RL1 NO |
| 07 | NC |
| 08 | NC |
| 09 | RL2 COM |
| 10 | RL2 NO |
| 11 | NC |
| 12 | RL3 COM |
| 13 | RL3 NC |
| 14 | RL3 NO |
| 15 | NC |
| 16 | RL4 COM |
| 17 | RL4 NC |
| 18 | RL4 NO |

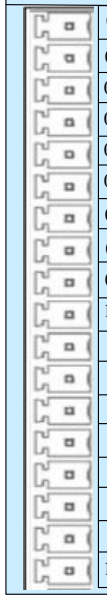
## 2.2.2.3 NET-6021M/NET-6022M

**NET-6021M/NET-6022M**

| Terminal No. | Pin Assignment |
|---|---|
| 01 | AI0 |
| 02 | AI1 |
| 03 | AI2 |
| 04 | AI3 |
| 05 | AI4 |
| 06 | AI5 |
| 07 | AI6 |
| 08 | AI7 |
| 09 | AI8 |
| 10 | AI9 |
| 11 | AI10 |
| 12 | AI11 |
| 13 | AI12 |
| 14 | AI13 |
| 15 | AI14 |
| 16 | AI15 |
| 17 | AGND |
| 18 | NC |

### 2.2.2.4 NET-6031M/NET-6032M

**NET-6031M/NET-6032M**



| Terminal No. | Pin Assignment |
|---|---|
| 01 | VOUT0 |
| 02 | AGND |
| 03 | IOUT0+ |
| 04 | IOUT0- |
| 05 | VOUT1 |
| 06 | AGND |
| 07 | IOUT1+ |
| 08 | IOUT1- |
| 09 | VOUT2 |
| 10 | AGND |
| 11 | IOUT2+ |
| 12 | IOUT2- |
| 13 | VOUT3 |
| 14 | AGND |
| 15 | IOUT3+ |
| 16 | IOUT3- |
| 17 | NC |
| 18 | NC |

## 2.2.2.5 NET-6041M/NET-6042M

**NET-6041M**

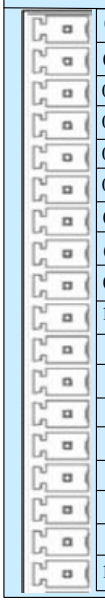
| Terminal No. | Pin Assignment |
|---|---|
| 01 | RTD0+ |
| 02 | RTD0- |
| 03 | COM |
| 04 | RTD1+ |
| 05 | RTD1- |
| 06 | COM |
| 07 | RTD2+ |
| 08 | RTD2- |
| 09 | COM |
| 10 | RTD3+ |
| 11 | RTD3+ |
| 12 | COM |
| 13 | RTD4+ |
| 14 | RTD4+ |
| 15 | COM |
| 16 | NC |
| 17 | NC |
| 18 | NC |

**NET-6042M**

| Terminal No. | Pin Assignment |
|---|---|
| 01 | TC0+ |
| 02 | TC0- |
| 03 | NC |
| 04 | TC1+ |
| 05 | TC1- |
| 06 | NC |
| 07 | TC2+ |
| 08 | TC2- |
| 09 | NC |
| 10 | TC3+ |
| 11 | TC3+ |
| 12 | NC |
| 13 | TC4+ |
| 14 | TC4+ |
| 15 | NC |
| 16 | NC |
| 17 | NC |
| 18 | NC |

### 2.2.2.6 NET-6088M

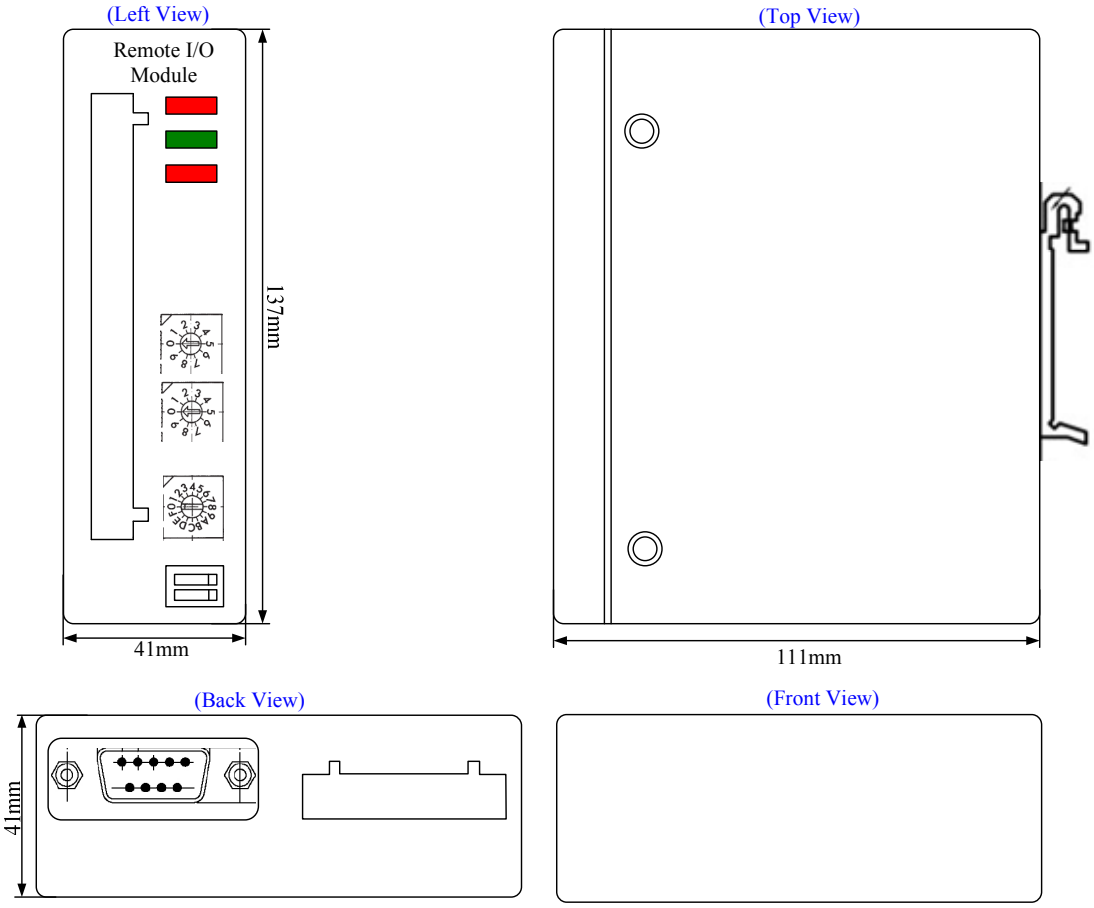
**NET-6088M**



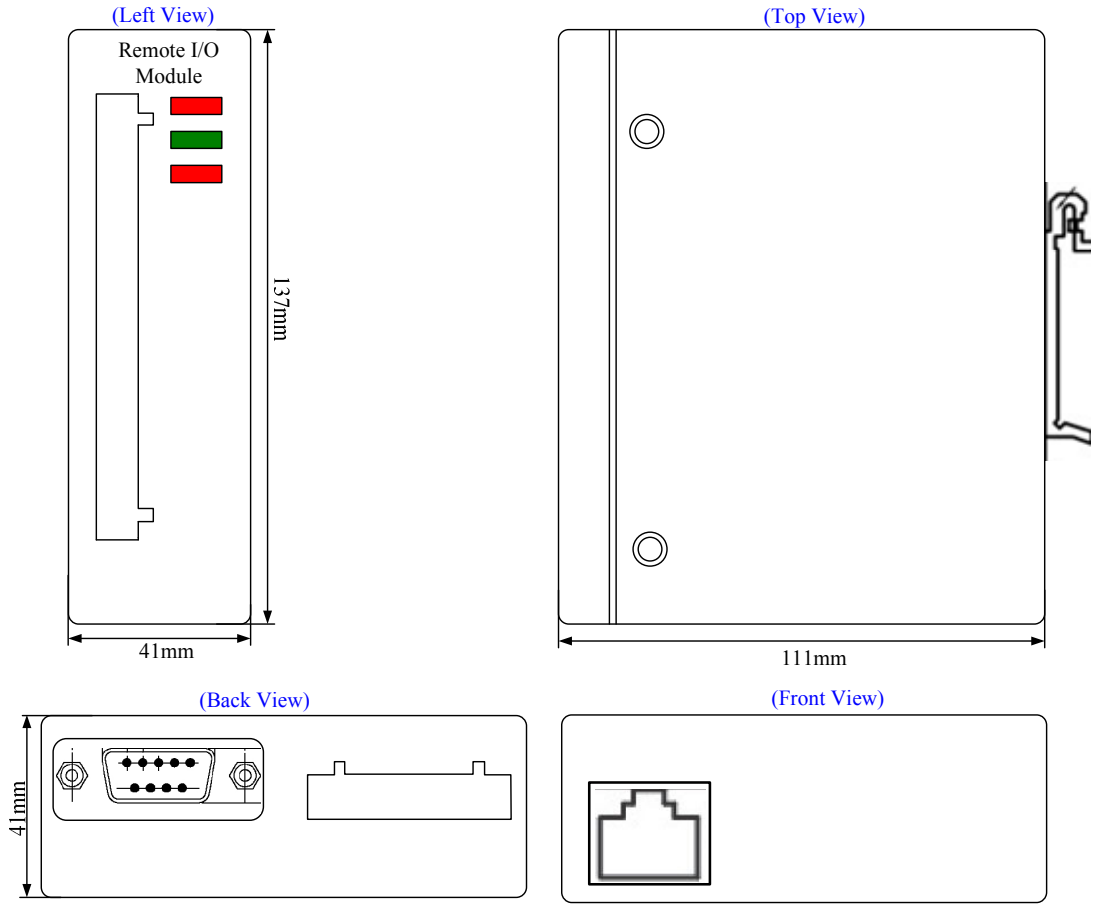
| Terminal No. | Pin Assignment |
|---|---|
| 01 | AI0 |
| 02 | AI1 |
| 03 | AI2 |
| 04 | AI3 |
| 05 | AI4 |
| 06 | AI5 |
| 07 | AI6 |
| 08 | AI7 |
| 09 | AGND |
| 10 | AO0 |
| 11 | AO1 |
| 12 | AGND |
| 13 | DI0 |
| 14 | DI1 |
| 15 | DO0 |
| 16 | DO1 |
| 17 | DGND |
| 18 | NC |

## 2.2 Dimensions:

RS6000M CAN6000T

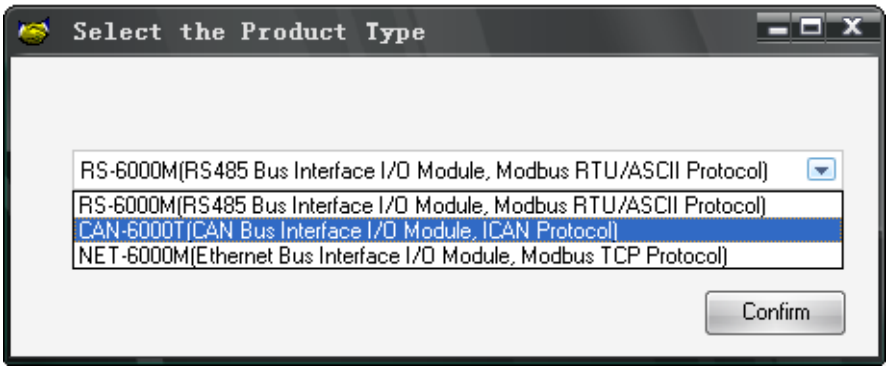


# NET6000M


(Left View)
Remote I/O Module
137mm
41mm
(Top View)
111mm
(Back View)
41mm
(Front View)

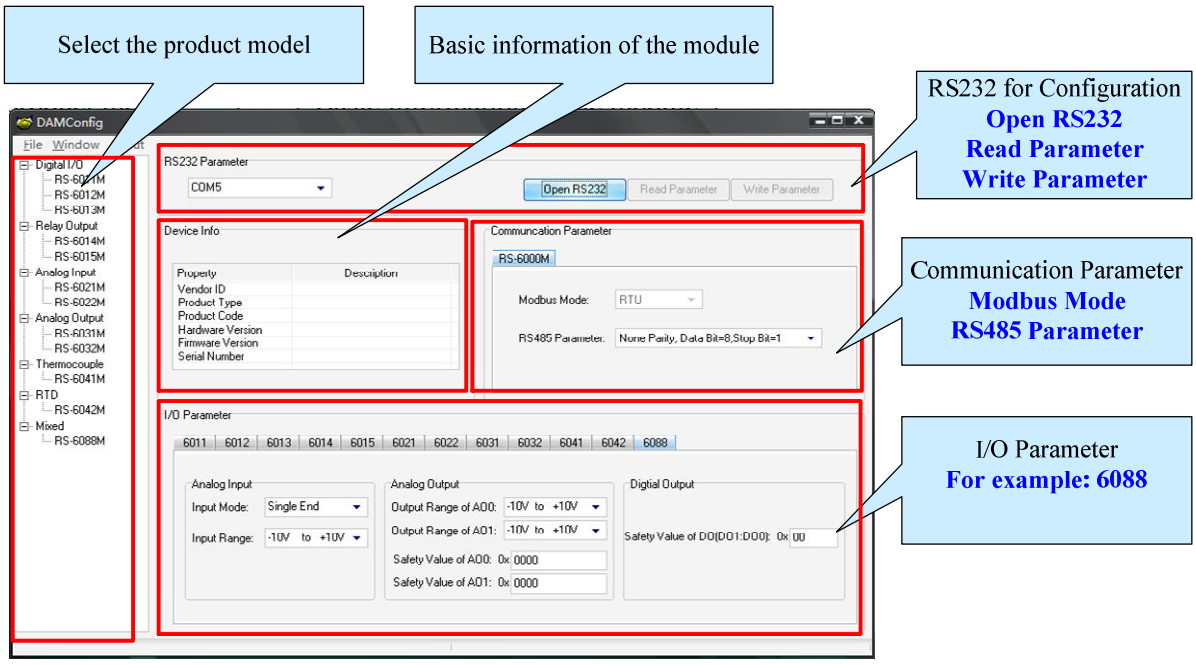
# Chapter 3 Parameter Configuration

## 3.1 Start Page

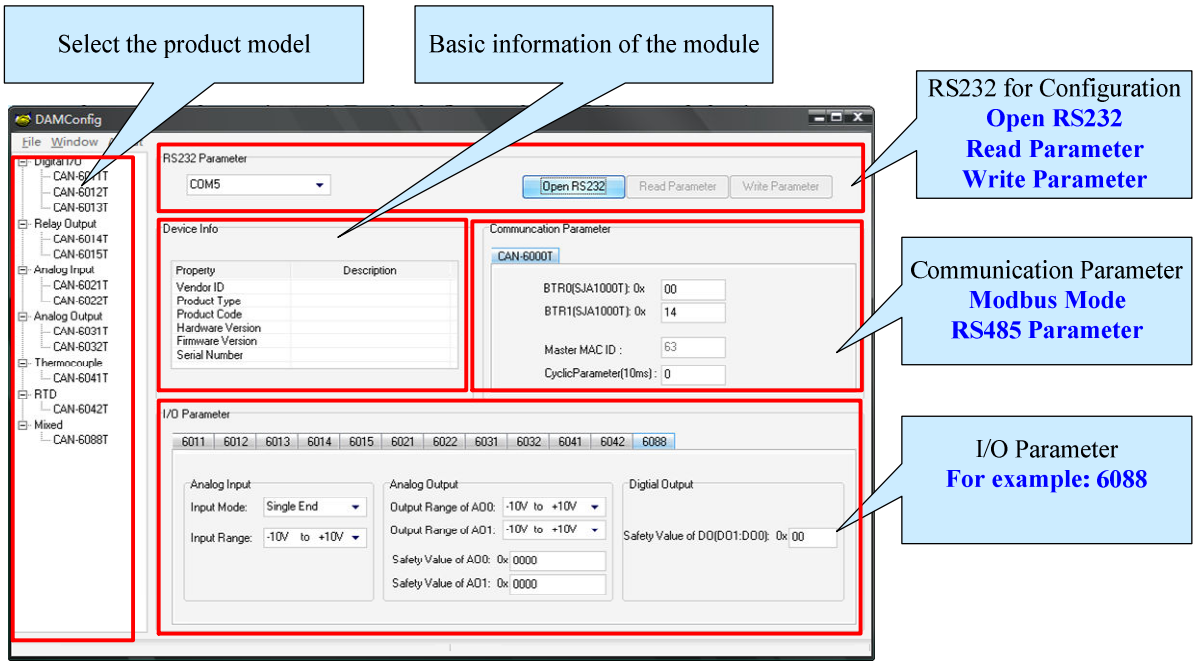



## 3.2 Home Page

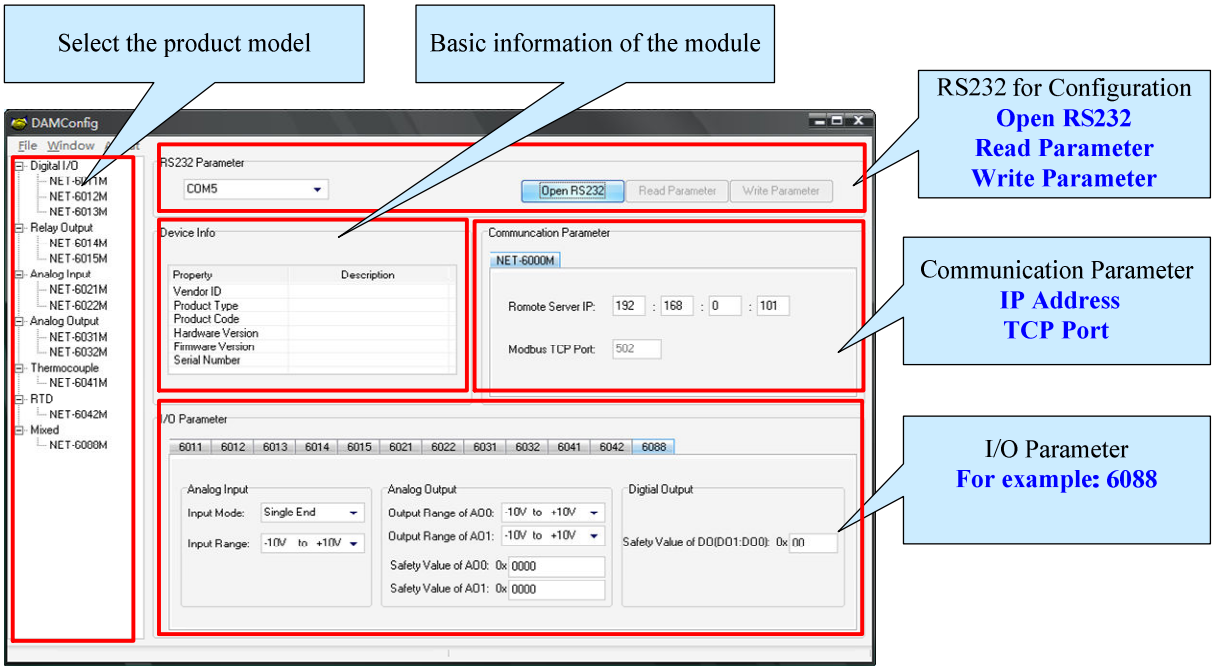
## RS-6000M



# CAN6000T

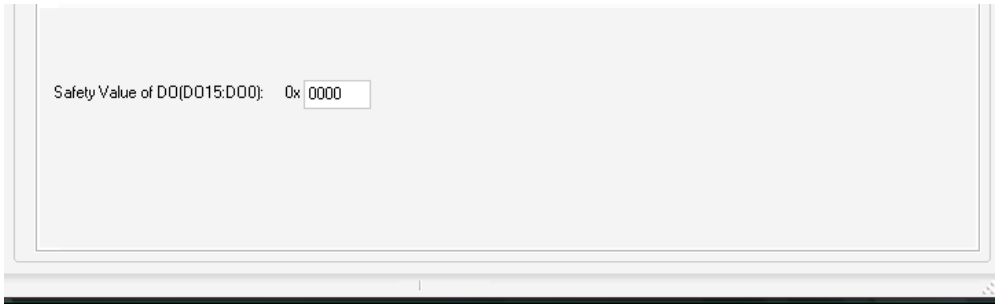
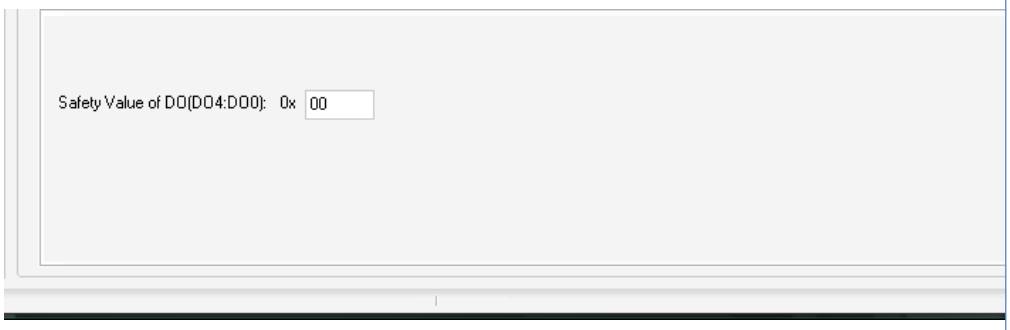



# NET-6000T

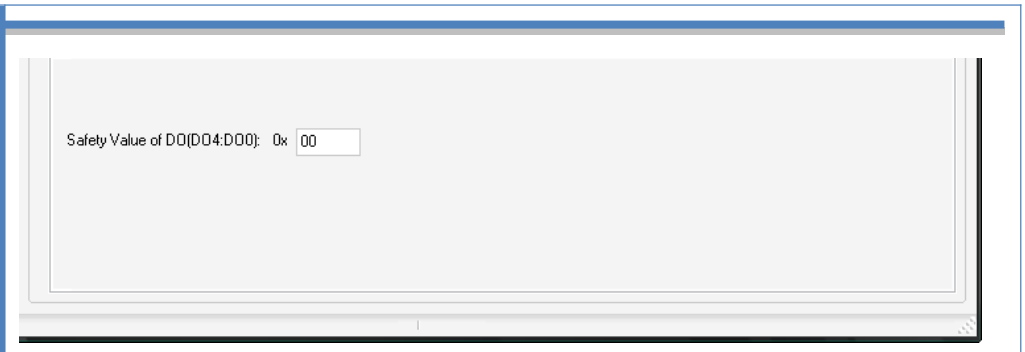


## 3.3 I/O Settings

### 3.3.1 NET-6012M/ NET-6013M/ NET-6014M/ NET-6015M

| | |
|---|---|
| **NET-6012M** |  |
| **NET-6013M** |  |
| **NET-6014M** |  |

**NET-6015M**

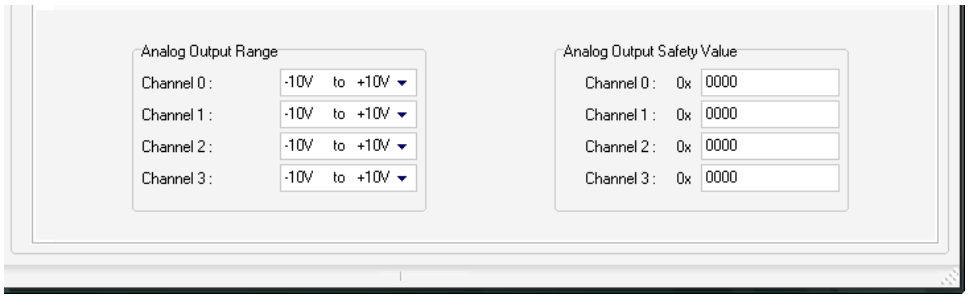



## 3.3.2 NET-6021M/ NET-6022M

**NET-6021M**
**NET-6022M**


## 3.3.3 NET-6031M/ NET-6032M

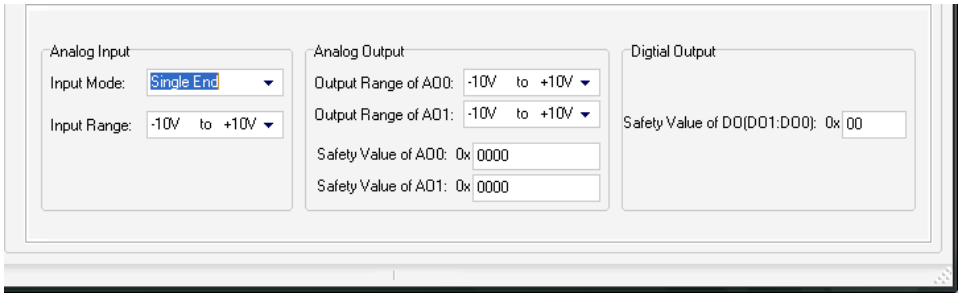
**NET-6031M**
**NET-6032M**



## 3.3.4 NET-6041M/ NET-6042M

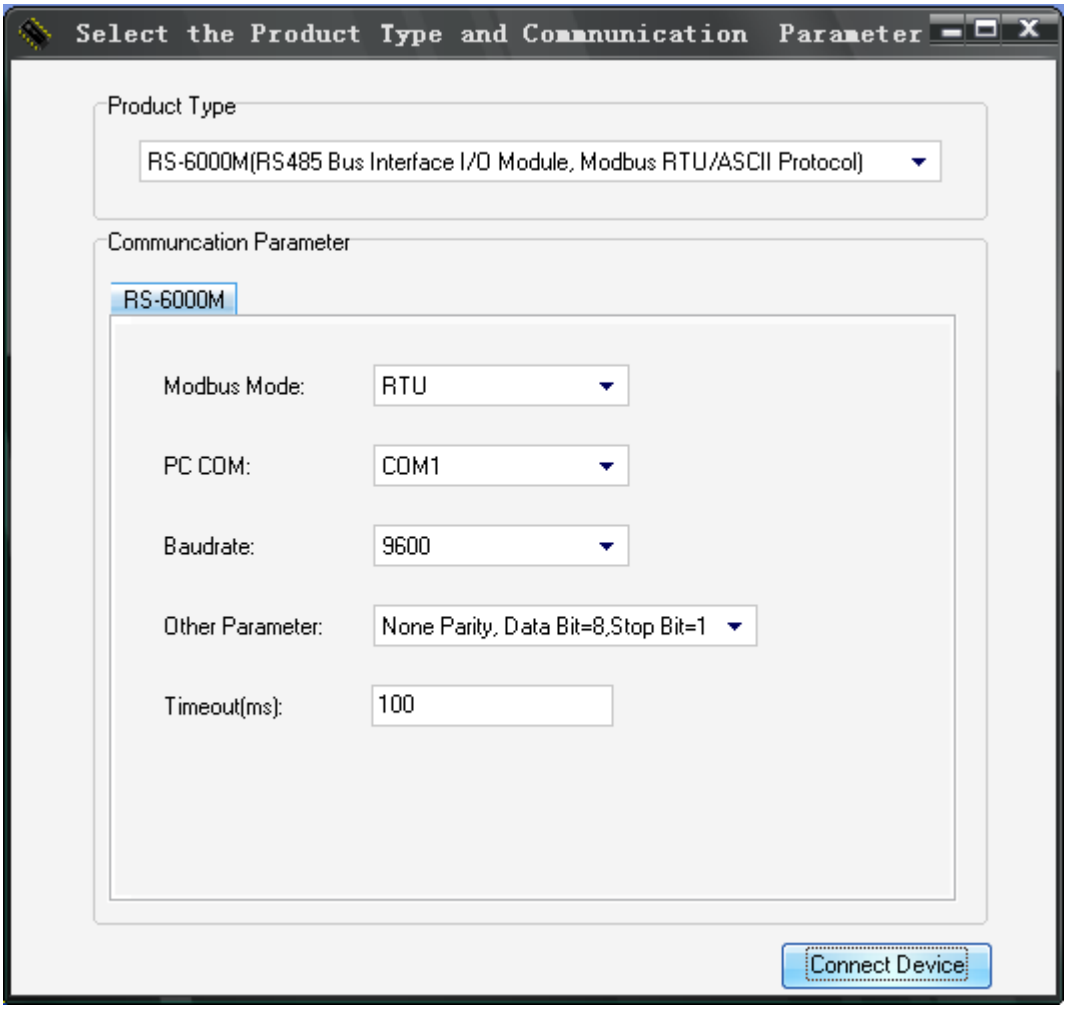
| | |
|---|---|
| **NET-6041M** |  |
| **NET-6042M** |  |

## 3.3.5 NET-6088M

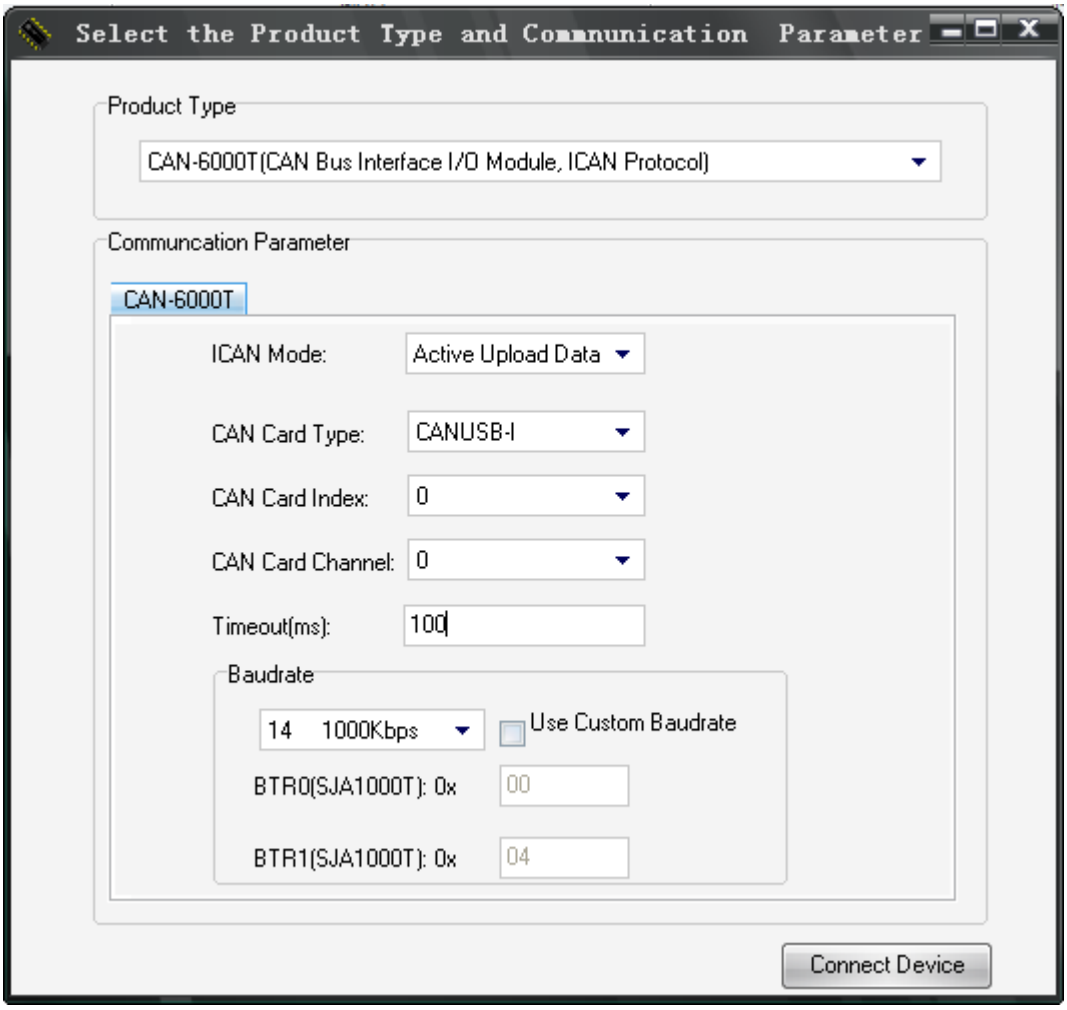
| | |
|---|---|
| **NET-6088M** |  |

# Chapter 4 Module Testing

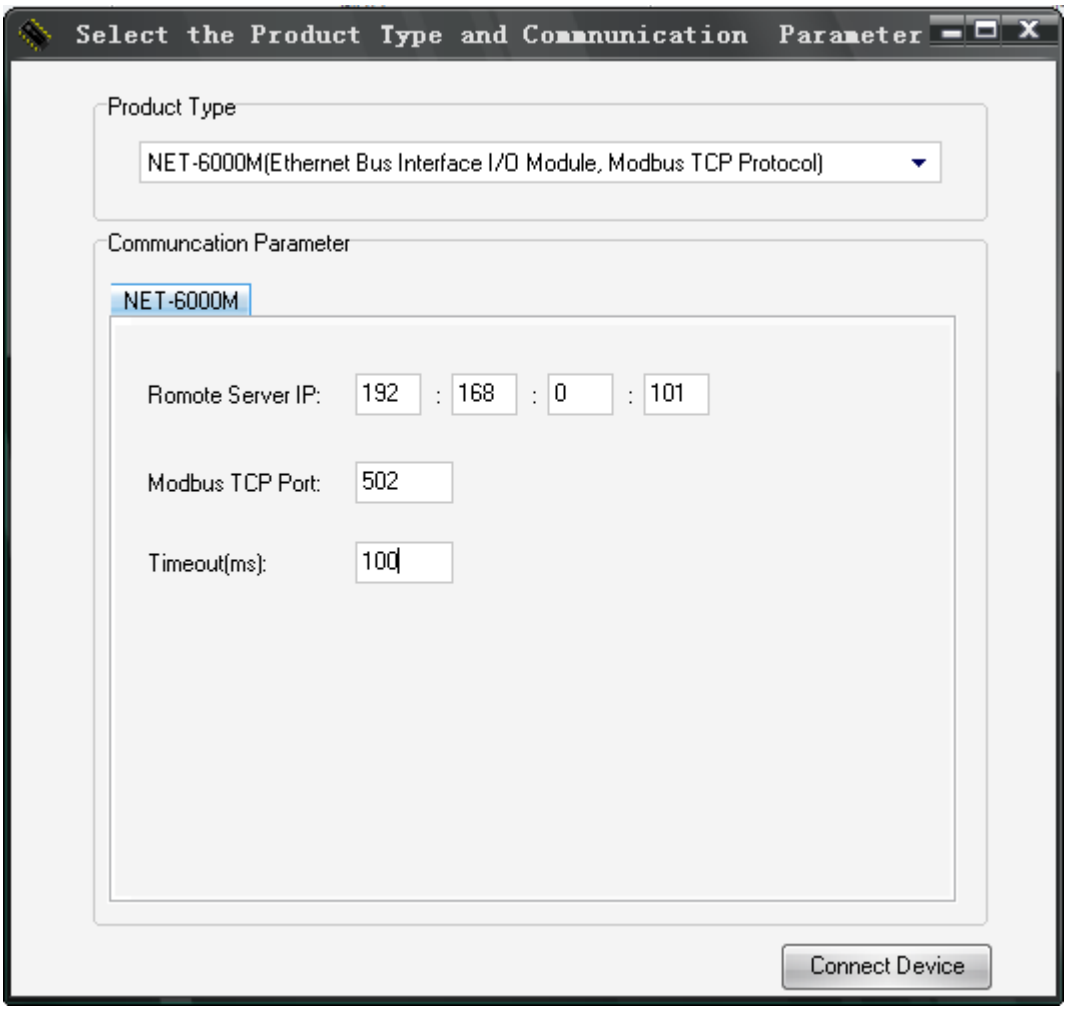
## 4.1 Start Page




## RS-6000M


Select the Product Type and Communication Parameter
Product Type
CAN-6000T(CAN Bus Interface I/O Module, ICAN Protocol)
Communcation Parameter
CAN-6000T
ICAN Mode:
Active Upload Data
CAN Card Type:
CANUSB-I
CAN Card Index:
0
CAN Card Channel:
0
Timeout(ms):
100
Baudrate
14 1000Kbps
Use Custom Baudrate
BTR0(SJA1000T): 0x
00
BTR1(SJA1000T): 0x
04
Connect Device

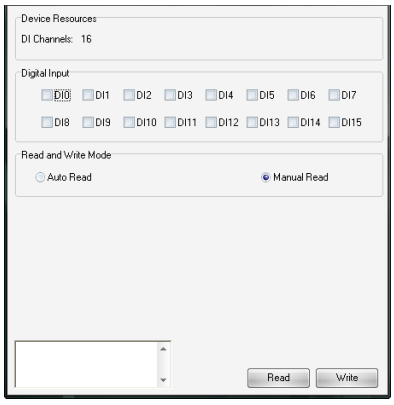
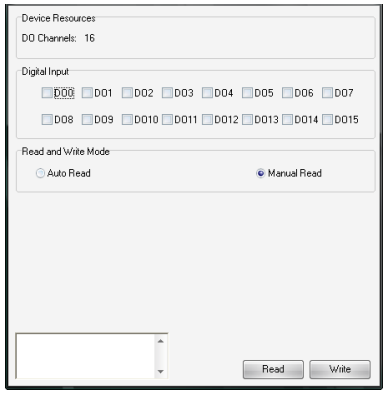
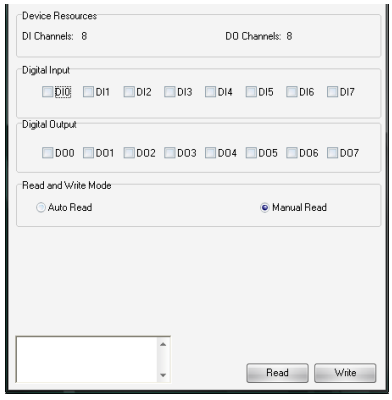
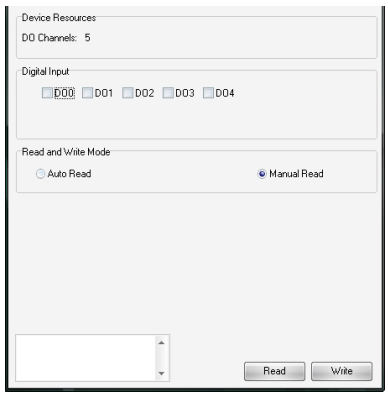
**CAN-6000T**


Select the Product Type and Communication Parameter
Product Type
NET-6000M(Ethernet Bus Interface I/O Module, Modbus TCP Protocol)
Communcation Parameter
NET-6000M
Romote Server IP:
192
168
0
101
Modbus TCP Port:
502
Timeout(ms):
100
Connect Device

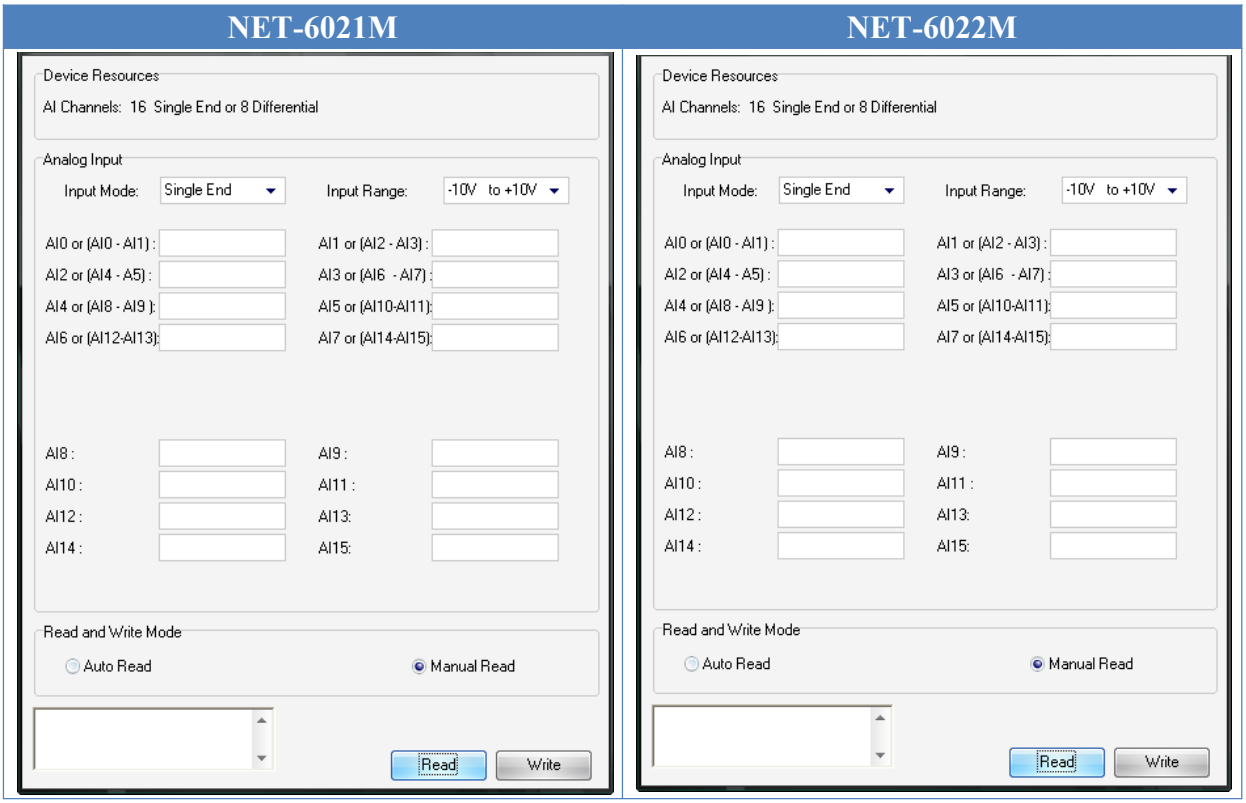
**NET-6000M**

## 4.2 I/O Testing

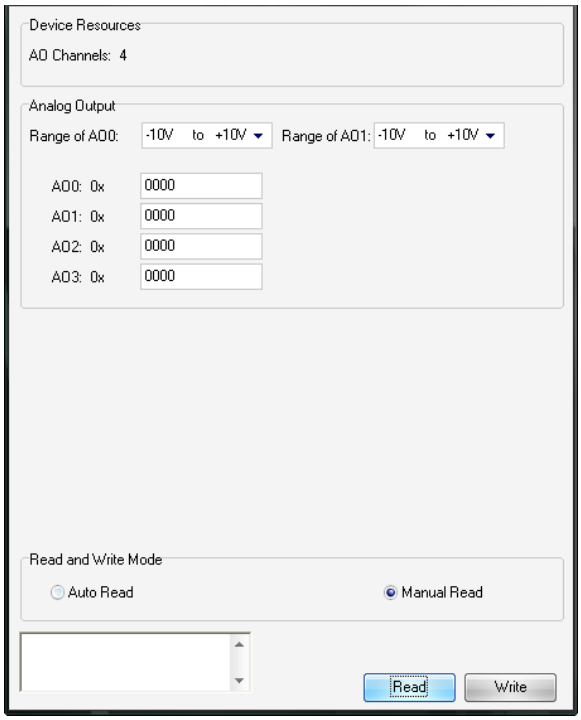
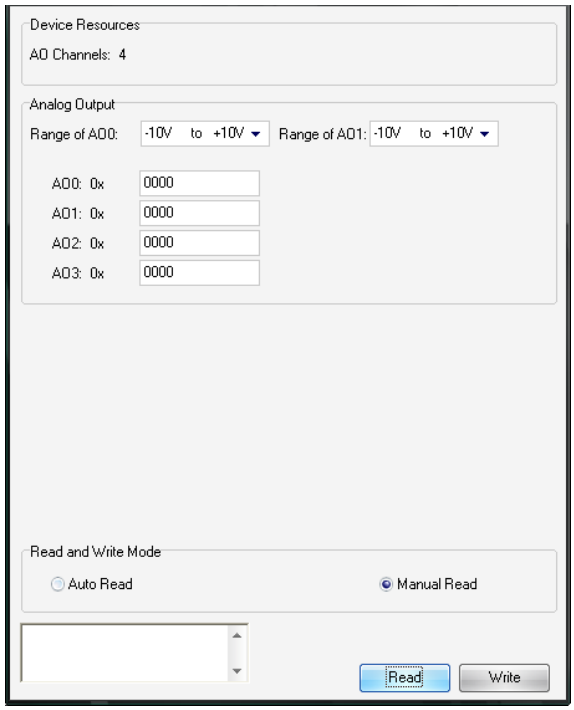
### 4.2.1 NET-6012M/ NET-6013M/ NET-6014M/ NET-6015M

| NET-6011M | NET-6012M | NET-6013M |
|---|---|---|
|  |  |  |
| **NET-6014M** | **NET-6015M** | |
|  |  | |

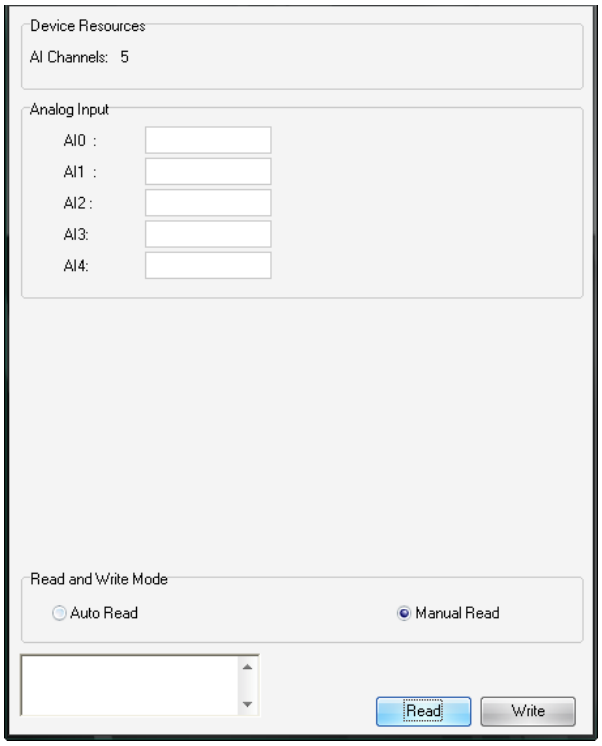
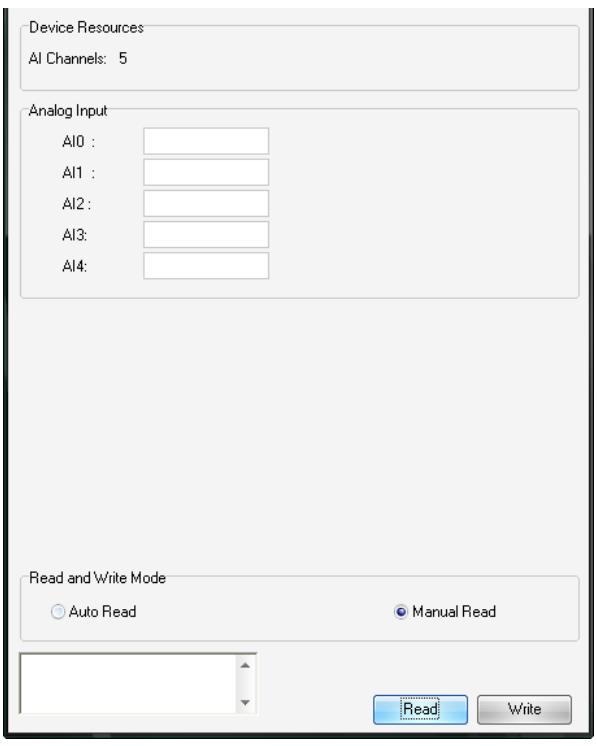
## 4.2.2 NET-6021M/ NET-6022M



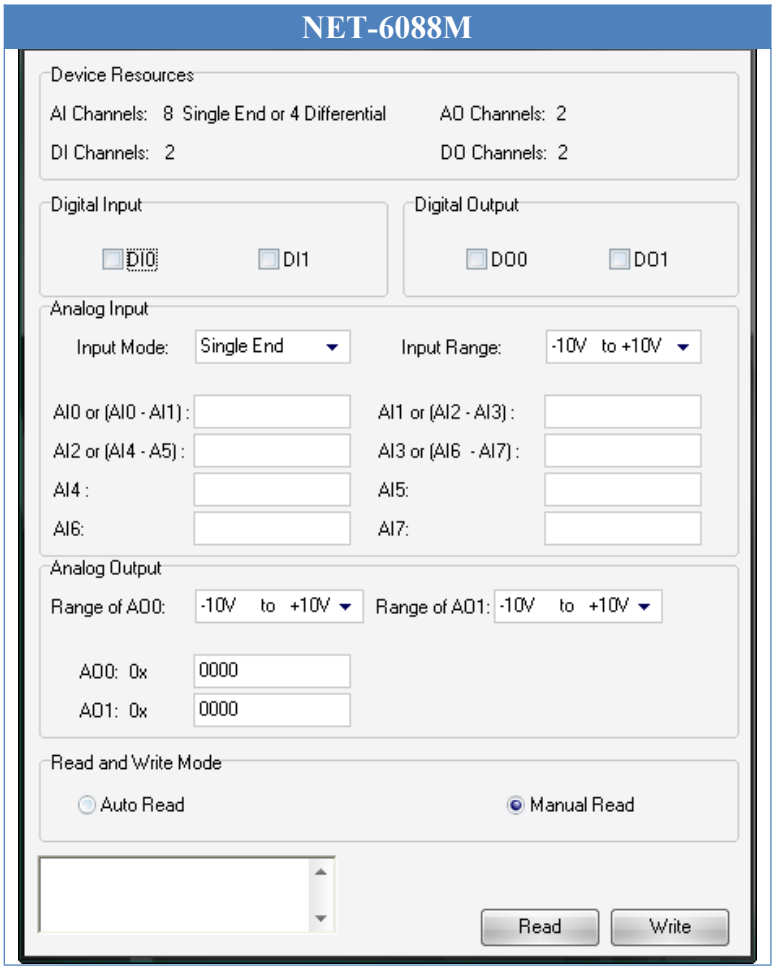
## 4.2.2 NET-6031M/ NET-6032M

| NET-6021M | NET-6022M |
| --- | --- |
|  |  |

## 4.2.2 NET-6041M/ NET-6042M

| NET-6041M | NET-6042M |
| --- | --- |
|  |  |

## 4.3.2 NET-6088M



# Chapter 5 Software Development Kit

If users intend to make a program for their own application, they need to read following descriptions very carefully, and refer the demo source code.

Develop files include BE6000.h，BE6000.lib（For VC），BE6000bc.lib (For BC), BE6000.dll.

We provides examples for **VB, VB2003, VC, C++Builder, Delphi, Labview** which make it convenient for user to develop programs.

## 5.1 Data Structure of Library

### 5.1.1 RS6000M_COM_PARA

```
//RS6000M Commnunication Parameter
typedef struct _RS6000M_COM_PARA
{
   DWORD WorkMode;          //Work Mode of Modbus
   DWORD ComPort;           //COM Port
   DWORD ComBaudrate;       //COM Buadrate
   DWORD ComPara;           //COM Para
   DWORD   WaitTime;
} RS6000M_COM_PARA,*P_RS6000M_COM_PARA;
```

| Parameter | Description |
|---|---|
| WorkMode | RTU：0，ASCII：1 |
| ComPort | COM0：0，COM1：1，COM2：2 |
| ComBaudrate | 1200：0，2400：1，4800：2 |
| ComPara | 0x00：N81；0x01：N82；0x02：O81；0x03：E81 |
| WaitTime | WaitTime of Read and Write |

### 5.1.2 CAN6000T_COM_PARA

```
//CAN6000T Communication Parameter
typedef struct _CAN6000T_COM_PARA
{
    DWORD WorkMode;          //WorkMode of ICAN
    DWORD DevType;           //CAN Card Type
    DWORD DevIndex;          //CAN Card Index
    DWORD DevChannel;        //CAN Card Channel
    DWORD Timing0;           //BTR0 of SJA1000T
    DWORD Timing1;           //BTR1 of SJA1000T
    DWORD   WaitTime;
} CAN6000T_COM_PARA,*P_CAN6000T_COM_PARA;
```

| Parameter | Description |
|---|---|
| DevType | PC CAN Interface Card Type:<br>#define CAN_Card_CANUSB_I 3<br>#define CAN_Card_CANUSB_II 4<br>#define CAN_Card_PCI5810I 2<br>#define CAN_Card_PCI5820I 5 |
| WorkMode | Work Mode of the ICAN<br>0: Active Upload the Data<br>1: Passive Upload the Data |
| DevIndex | CAN Card Device index<br>0: The first device<br>1: The second device |
| DevChannel | Channel Index of the CAN Card<br>0: The first channel<br>1: The second channel |
| Timing0 | BTR0 of SJA1000T, See Below Table. |
| Timing1 | BTR1 of SJA1000T, See Below Table. |
| WaitTime | WaitTime of Read and Write |

**Standard Time0 and Timer1 value for SJA100T**

| CAN Baud rate | Timer0 | Timer1 |
|---|---|---|
| 5Kbps | 0xBF | 0xFF |
| 10Kbps | 0x31 | 0x1C |
| 20Kbps | 0x18 | 0x1C |
| 40Kbps | 0x87 | 0xFF |
| 50Kbps | 0x09 | 0x1C |
| 80Kbps | 0x83 | 0Xff |
| 100Kbps | 0x04 | 0x1C |
| 125Kbps | 0x03 | 0x1C |
| 200Kbps | 0x81 | 0xFA |
| 250Kbps | 0x01 | 0x1C |
| 400Kbps | 0x80 | 0xFA |
| 500Kbps | 0x00 | 0x1C |
| 666Kbps | 0x80 | 0xB6 |
| 800Kbps | 0x00 | 0x16 |
| 1000Kbps | 0x00 | 0x14 |

### 5.1.3 NET6000M_COM_PARA

```
//NET6000M Commnunication Parameter
typedef struct _NET6000M_COM_PARA
{
   BYTE DevIP[4];          //IP Address of Server
   DWORD DevPort;          //IP Port of Server
   DWORD WaitTime;
} NET6000M_COM_PARA,*P_NET6000M_COM_PARA;
```

| Parameter | Description |
|---|---|
| DevIP[4] | IP Address of the Module |
| DevPort | TCP Port of the Module |
| WaitTime | Wait Time of Read and Write |

## 5.2 API description

[1] Connect the Module

HANDLE __stdcall BE6000_ConnectDevice(DWORD ModuleType, void *ModuleComPara);

| Parameter | Description |
|---|---|
| **ModuleType** | Module Type<br>0x00：RS6000M<br>0x01：CAN6000I<br>0x04：NET6000M |
| **ModuleComPara** | Communication Parameter Structure(See 5.1)<br>RS6000M_COM_PARA: RS6000M Series<br>CAN6000I_COM_PARA: CAN6000I Series<br>NET6000M_COM_PARA: NET6000M Series |
| **Return value** | !NULL: Success<br>Others: Fail |

[2] Disconnect the Module

BOOL __stdcall BE6000_DisconnectDevice (HANDLE ModuleHandle);

| Parameter | Description |
|---|---|
| **ModuleHandle** | Module Handle Get by the Function of BE6000_ConnectDevice |
| **Return value** | 1: Success<br>0: Fail |

[3] Read the Analog Input

BOOL __stdcall BE6000_ReadDeviceAD(HANDLE ModuleHandle, DWORD ModuleID, WORD * ADValue, DWORD FirstChannel, DWORD ChannelCount)

| Parameter | Description |
|---|---|
| **ModuleHandle** | Module Handle Get by the Function of BE6000_ConnectDevice |
| **ModuleID** | Module ID |
| **ADValue** | Pointer of the Buffer |
| **FirstChannel** | Start Channel |
| **ChannelCount** | Channel Count |
| **Return value** | 1: Success<br>0: Fail |

[4] Read the Analog Output

BOOL __stdcall BE6000_ReadDeviceDA (HANDLE ModuleHandle, DWORD ModuleID, WORD * DAValue, DWORD FirstChannel, DWORD ChannelCount)

| Parameter | Description |
|---|---|
| **ModuleHandle** | Module Handle Get by the Function of BE6000_ConnectDevice |
| **ModuleID** | Module ID |
| **DAValue** | Pointer of the Buffer |
| **FirstChannel** | Start Channel |
| **ChannelCount** | Channel Count |
| **Return value** | 1: Success<br>0: Fail |

[5] Write the Analog Output

BOOL __stdcall BE6000_WriteDeviceDA(HANDLE ModuleHandle, DWORD ModuleID, WORD * DAValue, DWORD FirstChannel, DWORD ChannelCount)

| Parameter | Description |
|---|---|
| **ModuleHandle** | Module Handle Get by the Function of BE6000_ConnectDevice |
| **ModuleID** | Module ID |
| **DAValue** | Pointer of the Buffer |
| **FirstChannel** | Start Channel |
| **ChannelCount** | Channel Count |
| **Return value** | 1: Success<br>0: Fail |

[6] Read the Digital Input

BOOL __stdcall BE6000_GetDeviceDI(HANDLE ModuleHandle, DWORD ModuleID, BYTE * IOValue, DWORD FirstChannel, DWORD ChannelCount);

| Parameter | Description |
|---|---|
| **ModuleHandle** | Module Handle Get by the Function of BE6000_ConnectDevice |
| **ModuleID** | Module ID |
| **IOValue** | Pointer of the Buffer |
| **FirstChannel** | Start Channel |
| **ChannelCount** | Channel Count |
| **Return value** | 1: Success<br>0: Fail |

[7] Read the Digital Output

BOOL __stdcall BE6000_GetDeviceDO(HANDLE ModuleHandle, DWORD ModuleID, BYTE * IOValue, DWORD FirstChannel, DWORD ChannelCount);

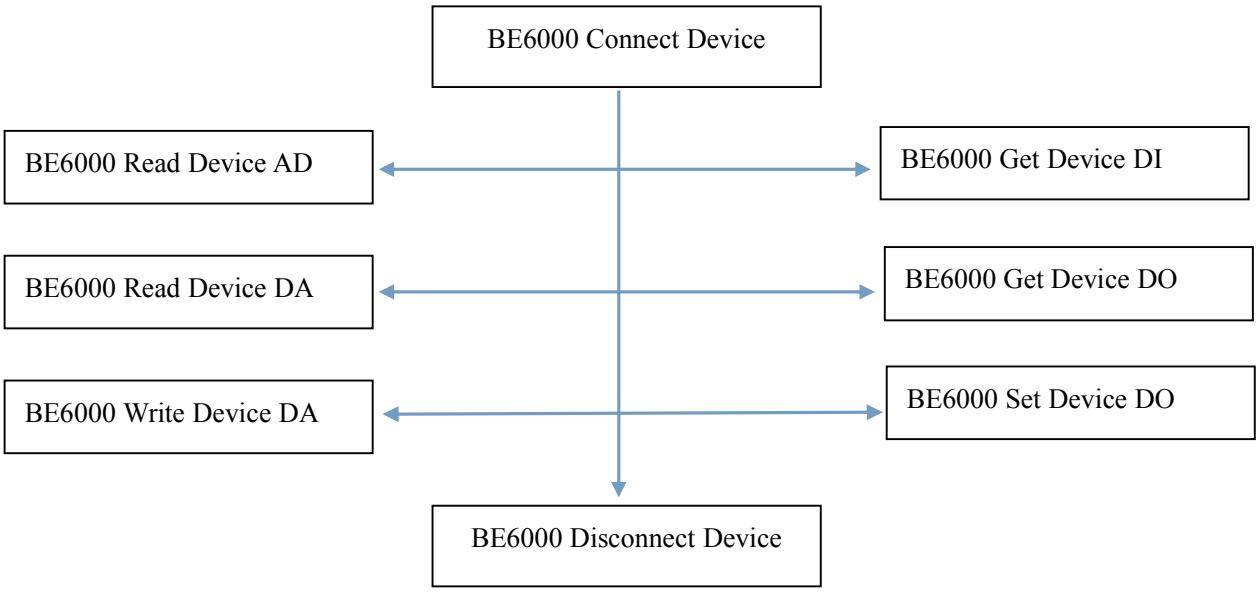
| Parameter | Description |
|---|---|
| **ModuleHandle** | Module Handle Get by the Function of BE6000_ConnectDevice |
| **ModuleID** | Module ID |
| **IOValue** | Pointer of the Buffer |
| **FirstChannel** | Start Channel |
| **ChannelCount** | Channel Count |
| **Return value** | 1: Success<br>0: Fail |

[8] Write the Digital Output

BOOL __stdcall BE6000_SetDeviceDO(HANDLE ModuleHandle, DWORD ModuleID, BYTE * IOValue, DWORD FirstChannel, DWORD ChannelCount);

| Parameter | Description |
|---|---|
| **ModuleHandle** | Module Handle Get by the Function of BE6000_ConnectDevice |
| **ModuleID** | Module ID |
| **IOValue** | Pointer of the Buffer |
| **FirstChannel** | Start Channel |
| **ChannelCount** | Channel Count |
| **Return value** | 1: Success<br>0: Fail |

## 5.3 Interface library function using flow




Calling flow of the BE6000 interface function

# Appendix A: BE-6000 I/O Modbus Address Mapping Table

## Function Code

| Code | Function |
|---|---|
| **01(0x01)** | Read the Status of the Coils (Read DOs) |
| **02(0x02)** | Read the Status of the Inputs(Read DIs) |
| **03(0x03)** | Read the Holding Registers(Read AOs) |
| **04(0x04)** | Read the Input Registers(Read AIs) |
| **05(0x05)** | Force a Single Coil(Write DO) |
| **06(0x06)** | Preset a Single Register(Write AO) |
| **15(0x0F)** | Force Multiple Coils(Write DOs) |
| **16(0x10)** | Preset Multiple Registers(Write AOs) |

## NET-6012M/ NET-6013M/ NET-6014M/ NET-6015M

| Model | Address | Data Type | Description | Access Type |
|---|---|---|---|---|
| **NET-6011M** | 0x0000-0x000F | 1 Bit | DI0-DI15,DI Value<br>0=OFF, 1=ON<br>**Function Code(0x02)** | R |
| **NET-6012M** | 0x0020-0x002F | 1 Bit | DO0-DOI15, DO Value<br>0=OFF, 1=ON<br>**Function Code(0x01,0x05,0x0F)** | R/W |
| **NET-6013M** | 0x0000-0x0007 | 1 Bit | DI0-DI7,DI Value<br>0=OFF, 1=ON<br>**Function Code(0x02)** | R |
| | 0x0020-0x0027 | 1 Bit | DO0-DO7, DO Value<br>0=OFF, 1=ON<br>**Function Code(0x01,0x05,0x0F)** | R/W |
| **NET-6014M**<br>**NET-6015M** | 0x0020-0x0024 | 1 Bit | DO0-DOI4, DO Value<br>0=OFF, 1=ON<br>**Function Code(0x01,0x05,0x0F)** | R/W |

## NET-6021M/ NET-6022M

| Model | Address | Data Type | Description | Access Type |
|---|---|---|---|---|
| **NET-6021M** | 0x0040-0x004F | 1 Word | AI0-AI15,AI Value<br>**Function Code(0x04)** | R |
| **NET-6022M** | 0x0040-0x004F | 1 Word | AI0-AI15, AI Value<br>**Function Code(0x04)** | R |

## NET-6031M/ NET-6032M

| Model | Address | Data Type | Description | Access Type |
|---|---|---|---|---|
| **NET-6031M** | 0x0060-0x0063 | 1 Word | AO0-AO3,AO Value<br>**Function Code(0x03,0x06,0x10)** | R/W |
| **NET-6032M** | 0x0060-0x0063 | 1 Word | AO0-AO3, AO Value<br>**Function Code(0x03,0x06,0x10)** | R/W |

## NET-6041M/ NET-6042M

| Model | Address | Data Type | Description | Access Type |
|---|---|---|---|---|
| **NET-6041M** | 0x0040-0x0044 | 1 Word | AI0-AI4,AI Value(RTD)<br>**Function Code(0x04)** | R |
| **NET-6042M** | 0x0040-0x0044 | 1 Word | AI0-AI4, AI Value(TC)<br>**Function Code(0x04)** | R |

## NET-6088M

| Model | Address | Data Type | Description | Access Type |
|---|---|---|---|---|
| **NET-6088M** | 0x0040-0x0047 | 1 Word | AI0-AI7,AI Value<br>**Function Code(0x04)** | R |
| | 0x0060-0x0061 | 1 Word | AO0-AO1, AO Value<br>**Function Code(0x03,0x06,0x10)** | R/W |
| | 0x0000-0x0001 | 1 Bit | DI0-DI1,DI Value<br>0=OFF, 1=ON<br>**Function Code(0x02)** | R |
| | 0x0020-0x0021 | 1 Bit | DO0-DOI1, DO Value<br>0=OFF, 1=ON<br>**Function Code(0x01,0x05,0x0F)** | R/W |

# Appendix B: Data Formats and I/O Ranges

## 6021/ 6022

| Model | Input Range | Data Formats | -Full Scale | +Full Scale |
|---|---|---|---|---|
| **6021** | ±10 V<br>±5 V<br>±2.5 V<br>±1.25 V | Straight Binary | **0x0000** | **0x0FFF** |
| **6022** | ±10 V<br>±5 V<br>±2.5 V<br>±1.25 V | Straight Binary | **0x0000** | **0xFFFF** |

## 6031/ 6032

| Model | Output Range | Data Formats | -Full Scale | +Full Scale |
|---|---|---|---|---|
| **6031** | ±10 V<br>±5 V<br>0 V-10V<br>0V-5V（0-20mA, **I=V/250**） | Straight Binary | **0x0000** | **0x0FFF** |
| **6032** | ±10 V<br>±5 V<br>0 V-10V<br>0V-5V（0-20mA, **I=V/250**） | Straight Binary | **0x0000** | **0xFFFF** |

## 6041/ 6042

| Model | Input Range | | Data Formats |
|---|---|---|---|
| **6041** | PT100, PT200, PT500, PT1000 （-200℃～+850℃） Cu50，Cu100（-50℃～+150℃） | | |
| **6042** | J | -210℃~1200℃ | **Bit15=0,** |
| | K | -200℃~1370℃ | |
| | E | -100℃~1000℃ | |
| | T | -200℃~400℃ | **Bit15=1,** |
| | N | -200℃~1300℃ | |
| | B | 650℃~1800℃ | |
| | R | 0℃~1750℃ | |
| | S | 0℃~1760℃ | |

## 6088

| Model | Input Range | Data Formats | -Full Scale | +Full Scale |
|---|---|---|---|---|
| **6088** | ±10 V<br>±5 V<br>±2.5 V<br>±1.25 V | Straight Binary | **0x0000** | **0x0FFF** |