

BE-6000 Series

Remote I/O Modules



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 with 16-ch DI
RS-6012M	RS485 Remote I/O Module with 16-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 with 16-ch DI
CAN-6012T	CAN Remote I/O Module with 16-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 with 16-ch DI
NET-6012M	Ethernet Remote I/O Module with 16-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 10/100 Base-TX
LED Display			
Power Indicator	Red		
Run Indicator	Green		
Error Indicator	Red		
Link Indicator	Green		
Act Indicator	Yellow		
Mechanical			
Dimensions (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 0-20mA(External 250ohm Resistor Needed) 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 Per channel: 1 samples/sec	
Isolation	2500V	
Protection	Built-in TVS/ESD Protection ±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	$\pm 10\text{V}$, $\pm 5\text{V}$, $0\text{V} \sim 5\text{V}$, $0\text{V} \sim 10\text{V}$ $0 \sim 20\text{mA}$ (Built-in 250ohm Resistor) $4 \sim 20\text{mA}$ (Built-in 250ohm Resistor)	
Resolution	12-bit	16-bit
Accuracy	$\pm 0.1\%$	$\pm 0.01\%$
Max Current Load Resistance	Internal power +15 V: 500 Ω . External power +24 V: 1000 Ω .	
Isolation	2500V	
Protection	Built-in TVS/ESD Protection $\pm 4\text{ kV}$ 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 ($-200^{\circ}\text{C} \sim +850^{\circ}\text{C}$) Cu50, Cu100 ($-50^{\circ}\text{C} \sim +150^{\circ}\text{C}$)
Input Impedance	1.5M
ADC Resolution	24-bit
Temperature Resolution	0.1 $^{\circ}\text{C}$
Accuracy	$\pm 0.1\%$
Sampling Rate	All channels: 5 samples/sec Per channel: 1 samples/sec
Isolation	2500V
Protection	Built-in TVS/ESD Protection $\pm 4\text{ kV}$ Contact for each terminal

2.1.2.6 NET-6042M

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

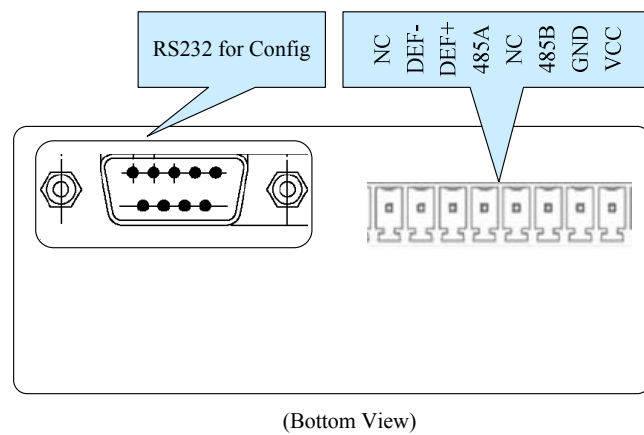
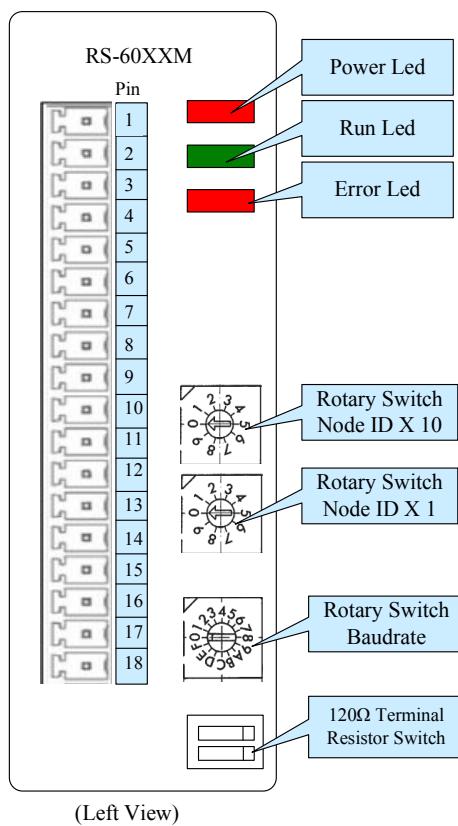
2.1.2.7 NET-6088M

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 0-20mA(External 250ohm Resistor Needed) 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 Per channel: 1samples/sec		
Isolation	2500V		
Protection	Built-in TVS/ESD Protection ±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 ±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

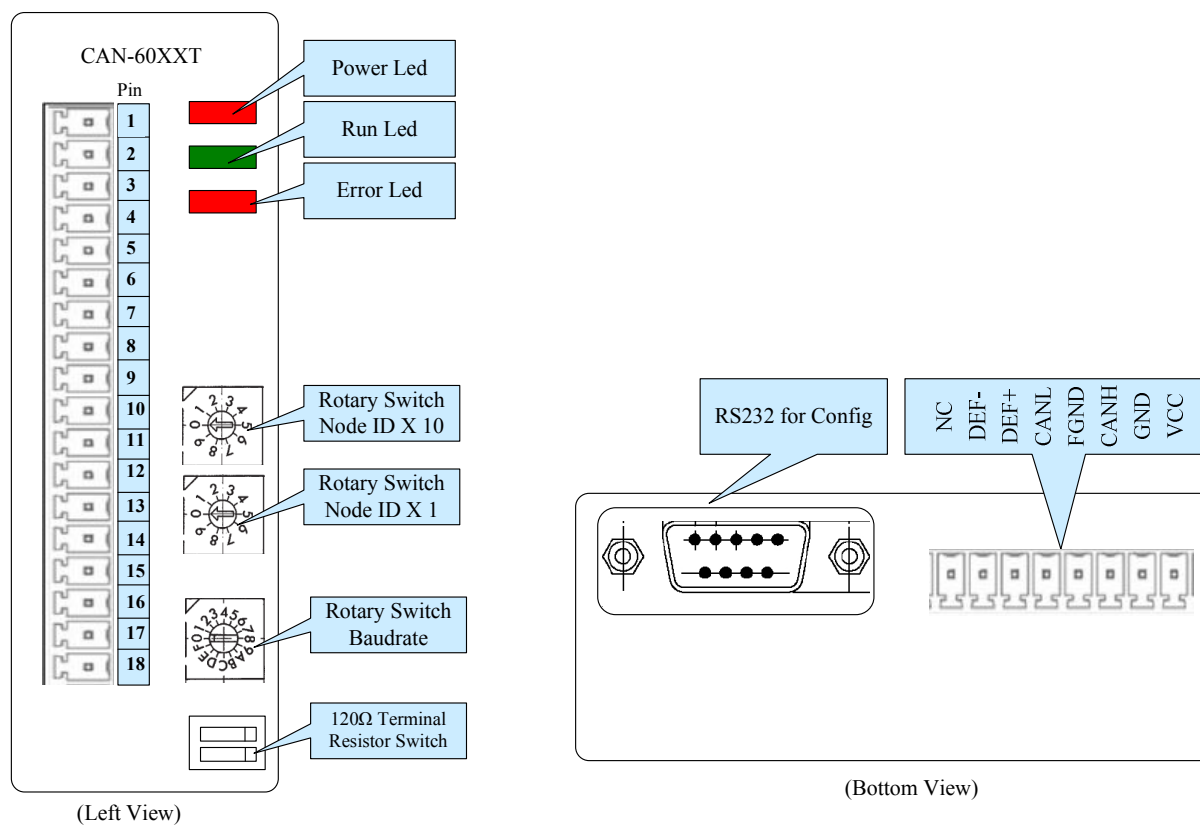
RS-6000M



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

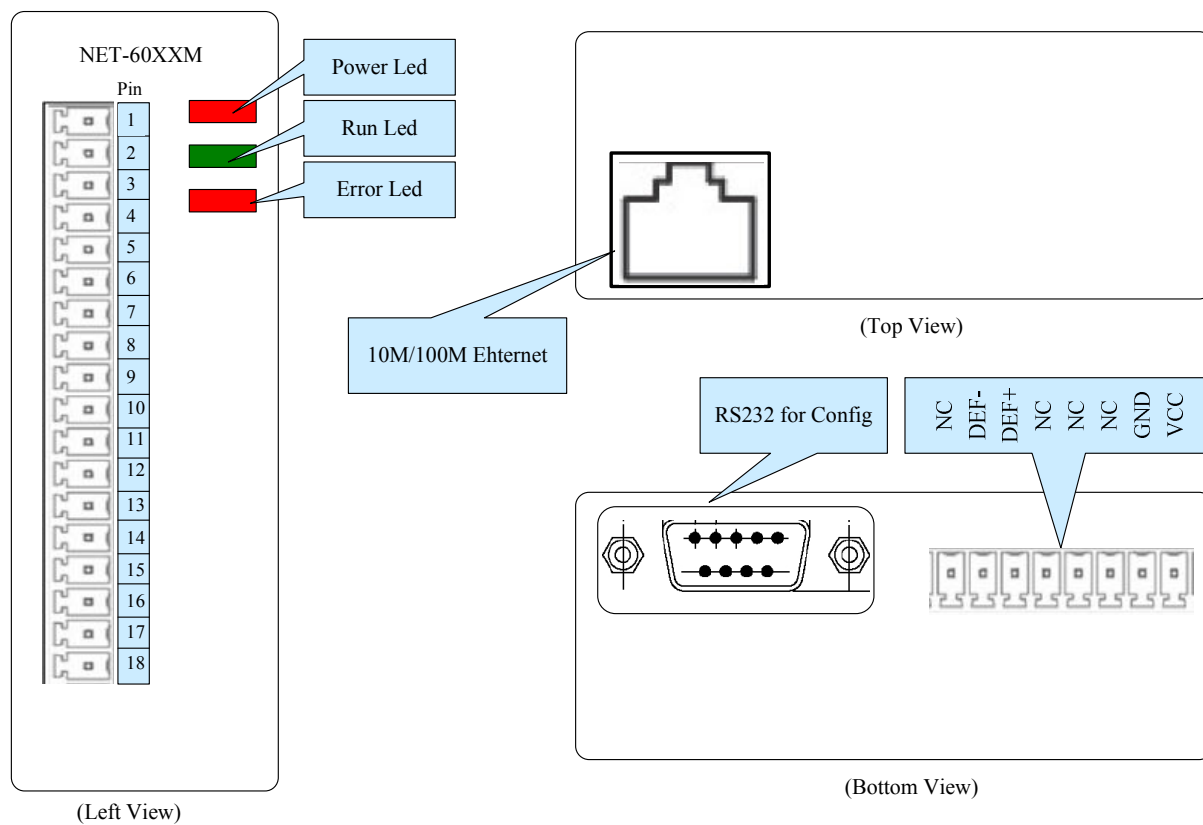
CAN-6000T



Set up the CAN baud rate by rotary button:

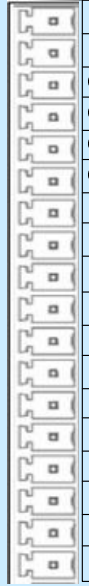
Rotary button code	CAN baud rate	BTR0(Timer 0)	BTR1(Timer 1)
F	Configure rate by software Depends on BTR0 and BTR1	Configure by software	Configure by software
E	5Kbps	0xBF	0xFF
D	10Kbps	0x31	0x1C
C	20Kbps	0x18	0x1C
B	40Kbps	0x87	0xFF
A	50Kbps	0x09	0x1C
9	80Kbps	0x83	0Xff
8	100Kbps	0x04	0x1C
7	125Kbps	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



2.2.2 Pin Assignments

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

NET-6011M		NET-6012M		NET-6013M	
Terminal No.	Pin Assignment	Terminal No.	Pin Assignment	Terminal No.	Pin Assignment
	01 DI0		01 DO0		01 DI0
	02 DI1		02 DO1		02 DI1
	03 DI2		03 DO2		03 DI2
	04 DI3		04 DO3		04 DI3
	05 DI4		05 DO4		05 DI4
	06 DI5		06 DO5		06 DI5
	07 DI6		07 DO6		07 DI6
	08 DI7		08 DO7		08 DI7
	09 DI8		09 DO8		09 DO0
	10 DI9		10 DO9		10 DO0
	11 DI10		11 DO10		11 DO2
	12 DI11		12 DO11		12 DO3
	13 DI12		13 DO12		13 DO4
	14 DI13		14 DO13		14 DO5
	15 DI14		15 DO14		15 DO6
	16 DI15		16 DO15		16 DO7
	17 Ext_GND		17 Ext_GND		17 Ext_GND
	18 NC		18 Ext_POWER		18 Ext_POWER

2.2.2.2 NET-6014M/NET-6015M

NET-6014M			NET-6015M		
Terminal No.	Pin Assignment		Terminal No.	Pin Assignment	
	01	RL0 COM		01	RL0 COM
	02	RL0 NO		02	RL0 NO
	03	NC		03	NC
	04	NC		04	NC
	05	RL1 COM		05	RL1 COM
	06	RL1 NO		06	RL1 NO
	07	NC		07	NC
	08	NC		08	NC
	09	RL2 COM		09	RL2 COM
	10	RL2 NO		10	RL2 NO
	11	NC		11	NC
	12	NC		12	RL3 COM
	13	RL3 COM		13	RL3 NC
	14	RL3 NO		14	RL3 NO
	15	NC		15	NC
	16	NC		16	RL4 COM
	17	RL4 COM		17	RL4 NC
	18	RL4 NO		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

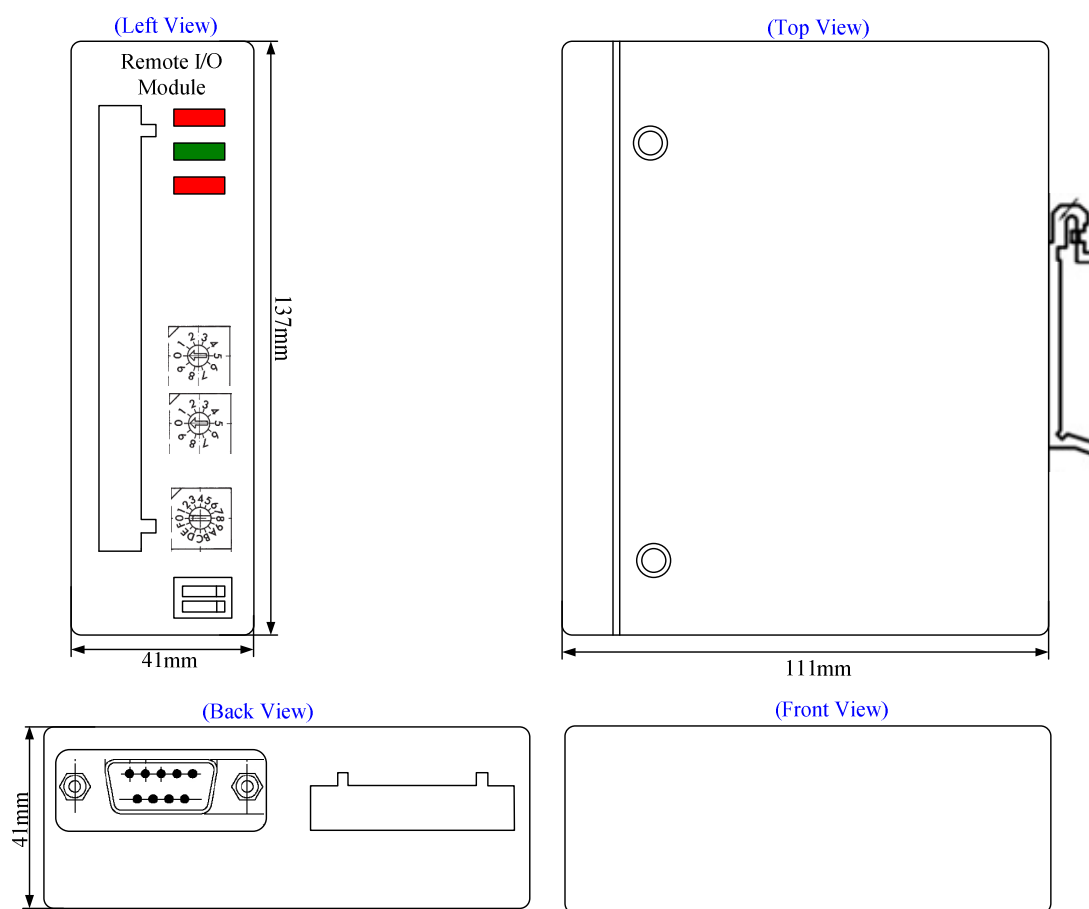
NET-6041M			NET-6042M		
Terminal No.	Pin Assignment		Terminal No.	Pin Assignment	
	01	RTD0+		01	TC0+
	02	RTD0-		02	TC0-
	03	COM		03	NC
	04	RTD1+		04	TC1+
	05	RTD1-		05	TC1-
	06	COM		06	NC
	07	RTD2+		07	TC2+
	08	RTD2-		08	TC2-
	09	COM		09	NC
	10	RTD3+		10	TC3+
	11	RTD3-		11	TC3-
	12	COM		12	NC
	13	RTD4+		13	TC4+
	14	RTD4-		14	TC4-
	15	COM		15	NC
	16	NC		16	NC
	17	NC		17	NC
	18	NC		18	NC

2.2.2.6 NET-6088M

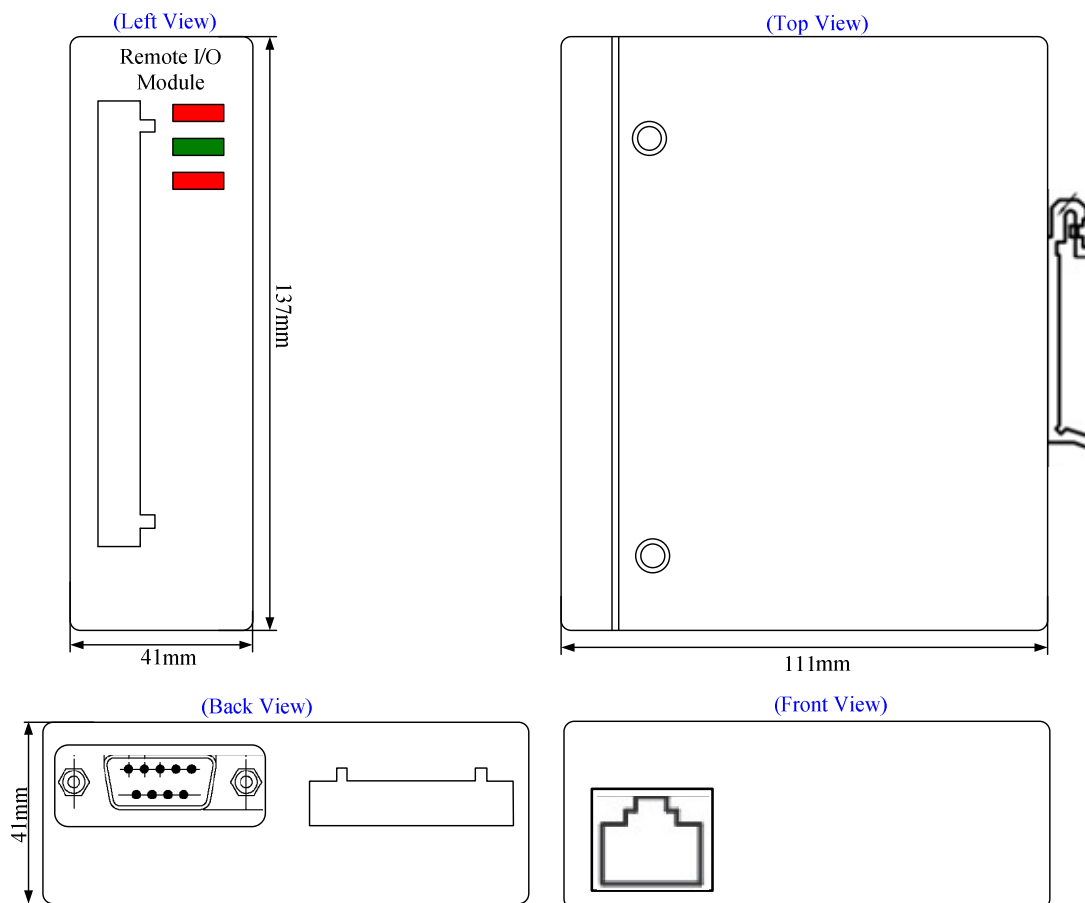
NET-6088M		
Terminal No.	Pin Assignment	
	01	AI0
	02	AI1
	03	AI2
	04	AI3
	05	AI4
	06	AI5
	07	AI6
	08	AI7
	09	AGND
	10	AO0
	11	AO1
	12	AGND
	13	DI0
	14	DI1
	15	DO0
	16	DO1
	17	DGND
	18	NC

2.2 Dimensions:

RS6000M CAN6000T

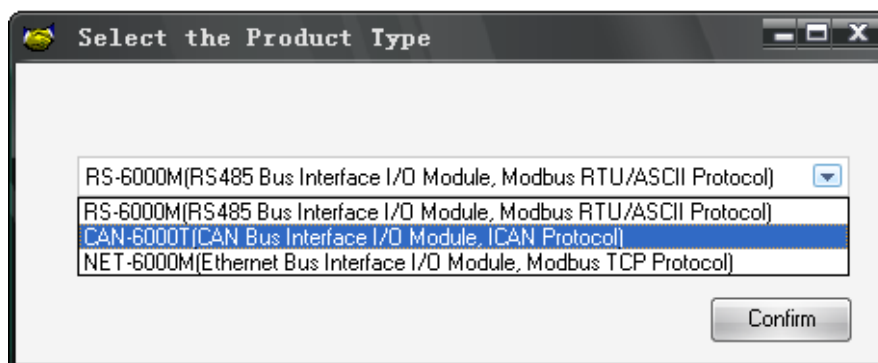


NET6000M



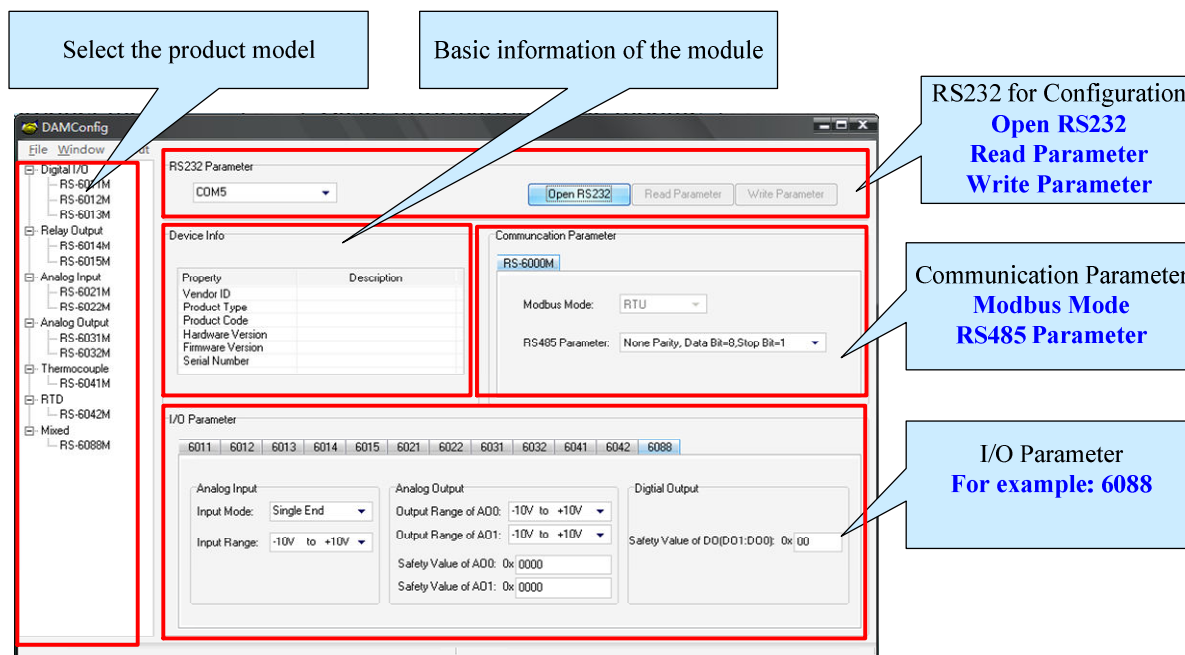
Chapter 3 Parameter Configuration

3.1 Start Page



3.2 Home Page

RS-6000M



CAN6000T

Select the product model

Basic information of the module

RS232 for Configuration
Open RS232
Read Parameter
Write Parameter

Communication Parameter
Modbus Mode
RS485 Parameter

I/O Parameter
For example: 6088

NET-6000T

Select the product model

Basic information of the module

RS232 for Configuration
Open RS232
Read Parameter
Write Parameter

Communication Parameter
IP Address
TCP Port

I/O Parameter
For example: 6088

3.3 I/O Settings

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

NET-6012M

Safety Value of DO(D015:D00): 0x 0000

NET-6013M

Safety Value of DO(D07:D00): 0x 00

NET-6014M

Safety Value of DO(D04:D00): 0x 00

NET-6015M

Safety Value of D0(D04:D00): 0x 00

3.3.2 NET-6021M/ NET-6022M

NET-6021M
NET-6022M

Input Mode: Single End ▼
Input Range: -10V to +10V ▼

3.3.3 NET-6031M/ NET-6032M

NET-6031M
NET-6032M

Analog Output Range

Channel 0 :	-10V to +10V ▼
Channel 1 :	-10V to +10V ▼
Channel 2 :	-10V to +10V ▼
Channel 3 :	-10V to +10V ▼

Analog Output Safety Value

Channel 0 :	0x 0000
Channel 1 :	0x 0000
Channel 2 :	0x 0000
Channel 3 :	0x 0000

3.3.4 NET-6041M/ NET-6042M

NET-6041M	Channel 0 RTD Type:	PT100
	Channel 1 RTD Type:	PT100
	Channel 2 RTD Type:	PT100
	Channel 3 RTD Type:	PT100
	Channel 4 RTD Type:	PT100
NET-6042M	Channel 0 Thermocouple Type:	J
	Channel 1 Thermocouple Type:	J
	Channel 2 Thermocouple Type:	J
	Channel 3 Thermocouple Type:	J
	Channel 4 Thermocouple Type:	J

3.3.5 NET-6088M

NET-6088M	Analog Input		
	Input Mode:	Single End	
	Input Range:	-10V to +10V	
	Analog Output		
	Output Range of AO0:	-10V to +10V	
	Output Range of AO1:	-10V to +10V	
	Safety Value of AO0:	0x 0000	
	Safety Value of AO1:	0x 0000	
	Digital Output		
Safety Value of DO(DO1:DO0): 0x 00			

Chapter 4 Module Testing

4.1 Start Page

Select the Product Type and Communication Parameter

Product Type

RS-6000M(RS485 Bus Interface I/O Module, Modbus RTU/ASCII Protocol)

Communication Parameter

RS-6000M

Modbus Mode: RTU

PC COM: COM1

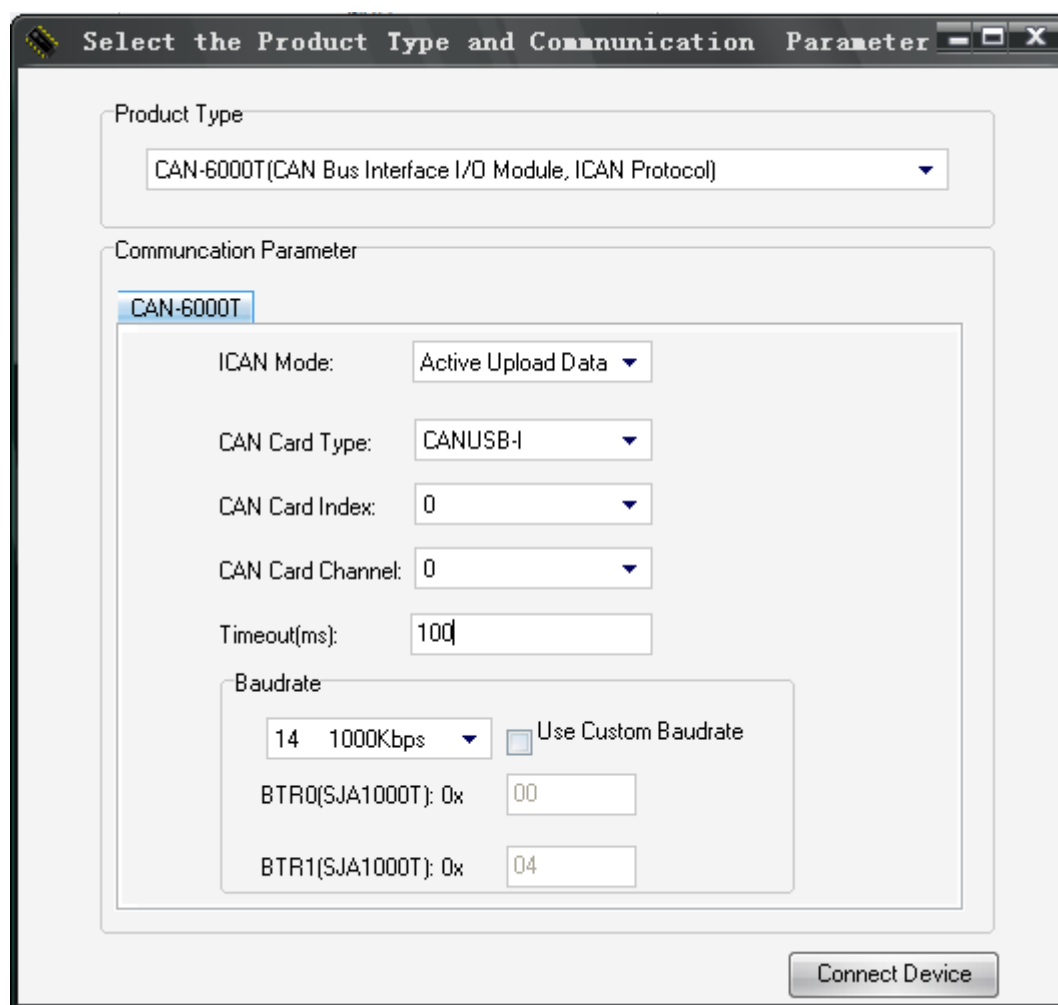
Baudrate: 9600

Other Parameter: None Parity, Data Bit=8, Stop Bit=1

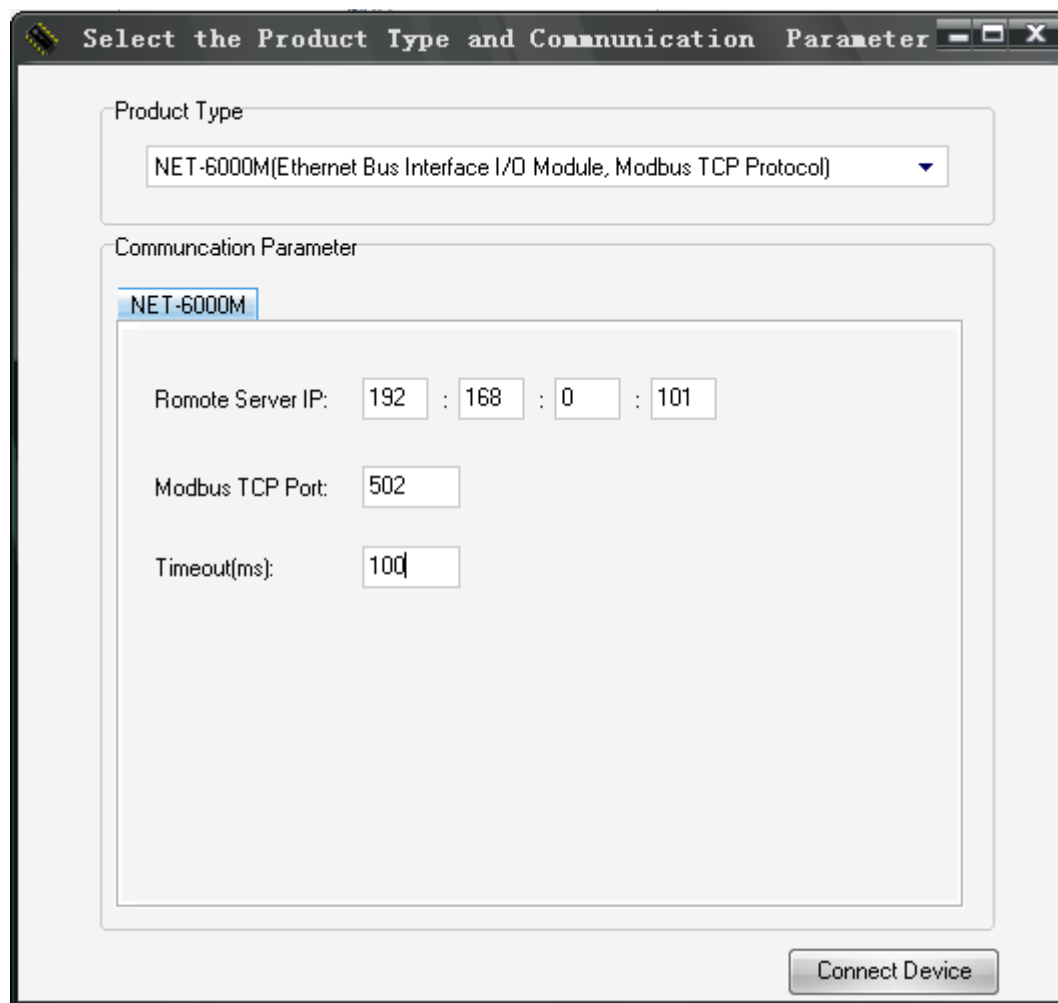
Timeout(ms): 100

Connect Device

RS-6000M



CAN-6000T



NET-6000M

4.2 I/O Testing

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

NET-6011M	NET-6012M	NET-6013M
Device Resources DI Channels: 16 Digital Input ☐ DI0 ☐ DI1 ☐ DI2 ☐ DI3 ☐ DI4 ☐ DI5 ☐ DI6 ☐ DI7 ☐ DI8 ☐ DI9 ☐ DI10 ☐ DI11 ☐ DI12 ☐ DI13 ☐ DI14 ☐ DI15 Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write	Device Resources DO Channels: 16 Digital Input ☐ DO0 ☐ DO1 ☐ DO2 ☐ DO3 ☐ DO4 ☐ DO5 ☐ DO6 ☐ DO7 ☐ DO8 ☐ DO9 ☐ DO10 ☐ DO11 ☐ DO12 ☐ DO13 ☐ DO14 ☐ DO15 Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write	Device Resources DI Channels: 8 DO Channels: 8 Digital Input ☐ DI0 ☐ DI1 ☐ DI2 ☐ DI3 ☐ DI4 ☐ DI5 ☐ DI6 ☐ DI7 Digital Output ☐ DO0 ☐ DO1 ☐ DO2 ☐ DO3 ☐ DO4 ☐ DO5 ☐ DO6 ☐ DO7 Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write
NET-6014M	NET-6015M	
Device Resources DO Channels: 5 Digital Input ☐ DO0 ☐ DO1 ☐ DO2 ☐ DO3 ☐ DO4 Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write	Device Resources DO Channels: 5 Digital Input ☐ DO0 ☐ DO1 ☐ DO2 ☐ DO3 ☐ DO4 Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write	

4.2.2 NET-6021M/ NET-6022M

NET-6021M	NET-6022M																																																
Device Resources AI Channels: 16 Single End or 8 Differential Analog Input Input Mode: Single End Input Range: -10V to +10V <table><tr><td>AI0 or (AI0 - AI1):</td><td>AI1 or (AI2 - AI3):</td></tr><tr><td>AI2 or (AI4 - A5):</td><td>AI3 or (AI6 - AI7):</td></tr><tr><td>AI4 or (AI8 - AI9):</td><td>AI5 or (AI10-AI11):</td></tr><tr><td>AI6 or (AI12-AI13):</td><td>AI7 or (AI14-AI15):</td></tr></table> <table><tr><td>AI8:</td><td> </td><td>AI9:</td><td> </td></tr><tr><td>AI10:</td><td> </td><td>AI11:</td><td> </td></tr><tr><td>AI12:</td><td> </td><td>AI13:</td><td> </td></tr><tr><td>AI14:</td><td> </td><td>AI15:</td><td> </td></tr></table> Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write	AI0 or (AI0 - AI1):	AI1 or (AI2 - AI3):	AI2 or (AI4 - A5):	AI3 or (AI6 - AI7):	AI4 or (AI8 - AI9):	AI5 or (AI10-AI11):	AI6 or (AI12-AI13):	AI7 or (AI14-AI15):	AI8:		AI9:		AI10:		AI11:		AI12:		AI13:		AI14:		AI15:		Device Resources AI Channels: 16 Single End or 8 Differential Analog Input Input Mode: Single End Input Range: -10V to +10V <table><tr><td>AI0 or (AI0 - AI1):</td><td>AI1 or (AI2 - AI3):</td></tr><tr><td>AI2 or (AI4 - A5):</td><td>AI3 or (AI6 - AI7):</td></tr><tr><td>AI4 or (AI8 - AI9):</td><td>AI5 or (AI10-AI11):</td></tr><tr><td>AI6 or (AI12-AI13):</td><td>AI7 or (AI14-AI15):</td></tr></table> <table><tr><td>AI8:</td><td> </td><td>AI9:</td><td> </td></tr><tr><td>AI10:</td><td> </td><td>AI11:</td><td> </td></tr><tr><td>AI12:</td><td> </td><td>AI13:</td><td> </td></tr><tr><td>AI14:</td><td> </td><td>AI15:</td><td> </td></tr></table> Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write	AI0 or (AI0 - AI1):	AI1 or (AI2 - AI3):	AI2 or (AI4 - A5):	AI3 or (AI6 - AI7):	AI4 or (AI8 - AI9):	AI5 or (AI10-AI11):	AI6 or (AI12-AI13):	AI7 or (AI14-AI15):	AI8:		AI9:		AI10:		AI11:		AI12:		AI13:		AI14:		AI15:	
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AI14:		AI15:																																															

4.2.2 NET-6031M/ NET-6032M

NET-6021M	NET-6022M
Device Resources AD Channels: 4 Analog Output Range of A00: -10V to +10V Range of A01: -10V to +10V A00: 0x 0000 A01: 0x 0000 A02: 0x 0000 A03: 0x 0000 Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write	Device Resources AD Channels: 4 Analog Output Range of A00: -10V to +10V Range of A01: -10V to +10V A00: 0x 0000 A01: 0x 0000 A02: 0x 0000 A03: 0x 0000 Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write

4.2.2 NET-6041M/ NET-6042M

NET-6041M	NET-6042M
Device Resources AI Channels: 5 Analog Input AI0 : AI1 : AI2 : AI3 : AI4 : Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write	Device Resources AI Channels: 5 Analog Input AI0 : AI1 : AI2 : AI3 : AI4 : Read and Write Mode ☐ Auto Read ☒ Manual Read Read Write

4.3.2 NET-6088M

NET-6088M

Device Resources

AI Channels: 8 Single End or 4 Differential AO Channels: 2
DI Channels: 2 DO Channels: 2

Digital Input

☐ DI0 ☐ DI1

Digital Output

☐ DO0 ☐ DO1

Analog Input

Input Mode: Single End Input Range: -10V to +10V
AI0 or (AI0 - AI1): AI1 or (AI2 - AI3):
AI2 or (AI4 - A5): AI3 or (AI6 - AI7):
AI4: AI5:
AI6: AI7:

Analog Output

Range of AO0: -10V to +10V Range of AO1: -10V to +10V
AO0: 0x 0000
AO1: 0x 0000

Read and Write Mode

☐ Auto Read ☒ Manual Read

Read Write

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: #define CAN_Card_CANUSB_I 3 #define CAN_Card_CANUSB_II 4 #define CAN_Card_PCI5810I 2 #define CAN_Card_PCI5820I 5
WorkMode	Work Mode of the ICAN 0: Active Upload the Data 1: Passive Upload the Data
DevIndex	CAN Card Device index 0: The first device 1: The second device
DevChannel	Channel Index of the CAN Card 0: The first channel 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 Communication 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 0x00: RS6000M 0x01: CAN6000I 0x04: NET6000M
ModuleComPara	Communication Parameter Structure(See 5.1) RS6000M_COM_PARA: RS6000M Series CAN6000I_COM_PARA: CAN6000I Series NET6000M_COM_PARA: NET6000M Series
Return value	!NULL: Success 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 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 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 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 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 0: Fail

[\[7\] Read the Digital Output](#)

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

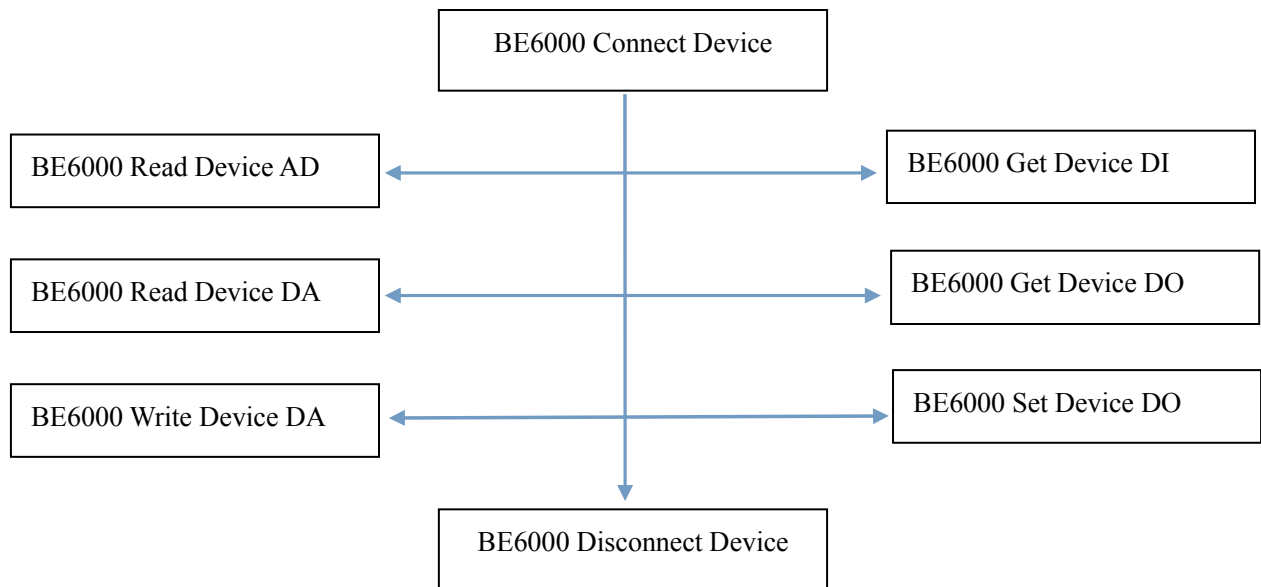
Parameter	Description
ModuleHandle	Module Handle Get by the Function of BE6000_ConnectDevice
ModuleID	Module ID
IOValue	Pointer of the Buffer
FirstChannel	Start Channel
ChannelCount	Channel Count
Return value	1: Success 0: Fail

[\[8\] 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 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 0=OFF, 1=ON Function Code(0x02)	R
NET-6012M	0x0020-0x002F	1 Bit	DO0-DO15, DO Value 0=OFF, 1=ON Function Code(0x01,0x05,0x0F)	R/W
NET-6013M	0x0000-0x0007	1 Bit	DI0-DI7, DI Value 0=OFF, 1=ON Function Code(0x02)	R
	0x0020-0x0027	1 Bit	DO0-DO7, DO Value 0=OFF, 1=ON Function Code(0x01,0x05,0x0F)	R/W
NET-6014M NET-6015M	0x0020-0x0024	1 Bit	DO0-DO4, DO Value 0=OFF, 1=ON 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 Function Code(0x04)	R
NET-6022M	0x0040-0x004F	1 Word	AI0-AI15, AI Value 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 Function Code(0x03,0x06,0x10)	R/W
NET-6032M	0x0060-0x0063	1 Word	AO0-AO3, AO Value 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) Function Code(0x04)	R
NET-6042M	0x0040-0x0044	1 Word	AI0-AI4, AI Value(TC) Function Code(0x04)	R

NET-6088M

Model	Address	Data Type	Description	Access Type
NET-6088M	0x0040-0x0047	1 Word	AI0-AI7, AI Value Function Code(0x04)	R
	0x0060-0x0061	1 Word	AO0-AO1, AO Value Function Code(0x03,0x06,0x10)	R/W
	0x0000-0x0001	1 Bit	DI0-DI1, DI Value 0=OFF, 1=ON Function Code(0x02)	R
	0x0020-0x0021	1 Bit	DO0-DO1, DO Value 0=OFF, 1=ON 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 ±5 V ±2.5 V ±1.25 V	Straight Binary	0x0000	0x0FFF
6022	±10 V ±5 V ±2.5 V ±1.25 V	Straight Binary	0x0000	0xFFFF

6031/ 6032

Model	Output Range	Data Formats	-Full Scale	+Full Scale
6031	±10 V ±5 V 0 V-10V 0V-5V (0-20mA, $I=V/250$)	Straight Binary	0x0000	0x0FFF
6032	±10 V ±5 V 0 V-10V 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℃)		Bit15=0, Bit15=1,
6042	J	-210℃~1200℃	
	K	-200℃~1370℃	
	E	-100℃~1000℃	
	T	-200℃~400℃	
	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 ±5 V ±2.5 V ±1.25 V	Straight Binary	0x0000	0x0FFF

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Contact: sales@bueno-electric.com