Noah®

Mod-Bus MANUAL

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EUNHA MACHINERY INDUSTRIAL CO.,LTD

1. Notice

The Mod Bus Controller (less MBC) with an 8-bit microprocessor and a Mod Bus Controller Equipped to offer multiple communication capabilities, so normal and safe to use this manual Please familiarize yourself.

Power, input and * output signal, and electrical wiring state information, please be sure to check.

Before you put the power supply, please check.

By separating the power supply and signal wires for each line.

Twisted cable shield and use the signal line and ask to be one of the ground.

Please keep your termination check.

- Therefore, the wiring to five due to unexpected noise may be the cause of action.

2. Features

The MBC as the Controller Mod multiple communications only, using 8-bit microprocessor that is controlled remotely from the user by receiving a signal corresponding towns, stations and state-driven features have to provide confirmation.

- Actuator using user data to remote towns, stations running Open, Close of the semiconductor device using a semi -permanent life of output contacts.
- Mod actuator to determine the current status of the state information sent over the bus to determine the user provides the data.
- Has a transfer rate of 9600 Baud.
- Actuator to determine the current status of the lamp provides a 5.

  - P1: P1 status of the communication process
  - P2: P2 status of the communication process
  - Fault : Open, Close Over Torque Check
  - Close: Actuator's operating status (Closing, Closed)
  - Open: Actuator's operating status (Openning, Open)

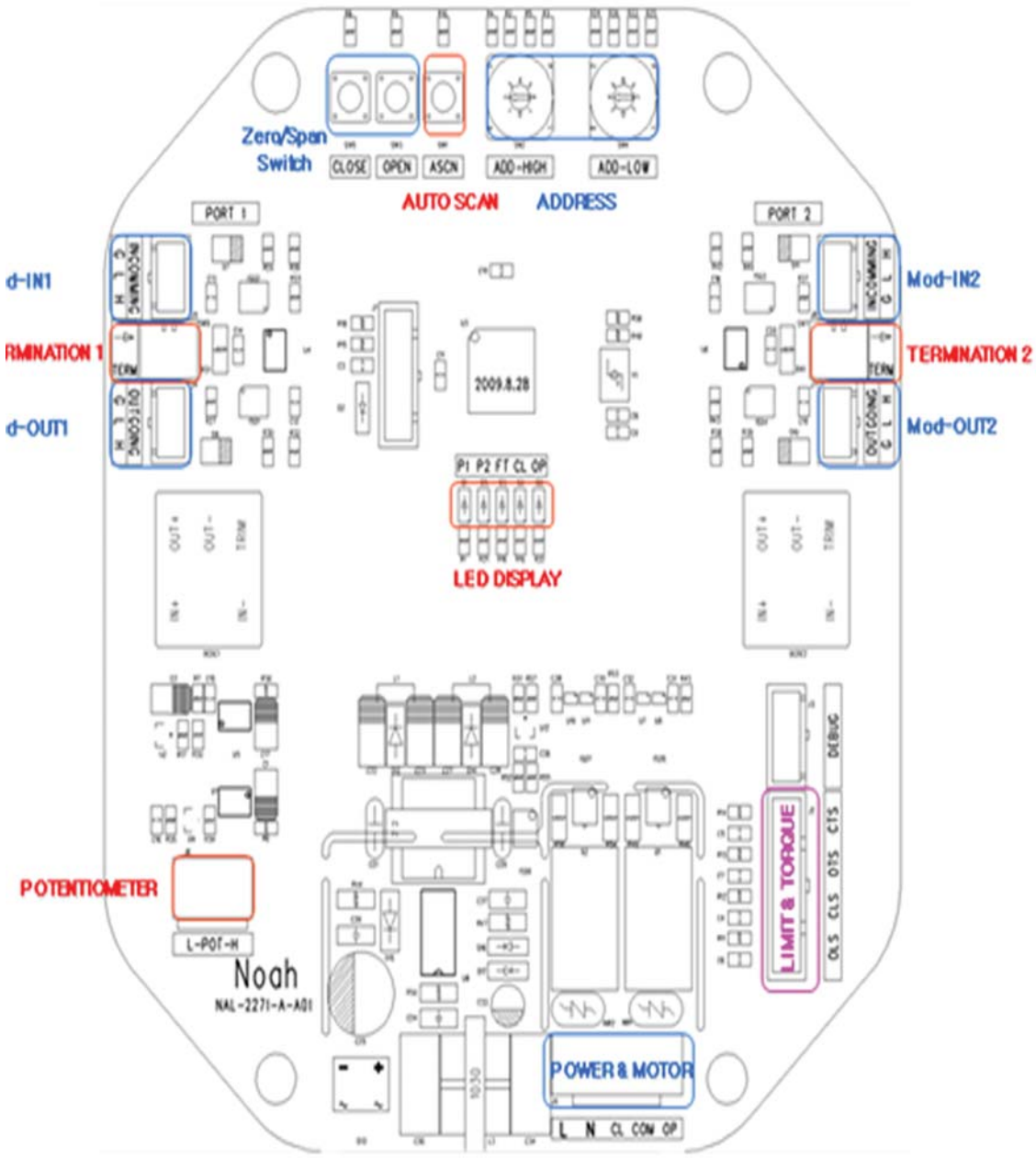
3. Application

The multi-remote control for AC Actuator

4. Specification

	Description	Unit
Input Power	87V ~ 270V AC 10% , 50/60Hz 2% 4VA MAX. Input Power must match Motor Ratings	V, A
Communication	Modbus Communication	
Max Range	1000	M
Bit Rate	9600	Baud
Wiring Terminals	SMW250-3P x 4 (Dual Input/Output Can bus) YW396-5P (Power and Motor operate contacts) SMW250-8P (CTS, OTS, CLS, OLS input contacts) SMW250-6P (Firmware Update connector) SMW250-4P (PC Connector)	
Visual Indicators	Power Blue LED x 2 Fault Yellow LED Motor Open Red LED Motor Close Green LED	
Control, Configuration	PC Software	
Output Contact	MOS Power FET 250V AC 10A MAX. (Inductive Load)	V
Ambient Temperature	-10℃ ~ +60℃	℃
Ambient Humidity	90% RH MAX. (Non-Condensing)	%

5. Interface


Zero/Span Switch
CLOSE
OPEN
ASCN
ADD-HIGH
ADD-LOW
AUTO SCAN
ADDRESS
PORT 1
PORT 2
d-IN1
RMINATION 1
d-OUT1
Mod-IN2
TERMINATION 2
Mod-OUT2
2009.8.28
P1 P2 FT CL OP
LED DISPLAY
POTENTIOMETER
L-POT-H
Noah
NAL-2271-A-A01
LIMIT & TORQUE
DEBUG
POWER & MOTOR
L N CL COM OP

6. Switch

▶ Address

Mod on a bus, all nodes are connected (Actuator) has a number of their own unique,This is referred Address.
Address the top 0-7, sub 0 ~ F can be specified up.

- Broadcast times to perform the 0 address is the address should not set a common node.

2 or more if you have the same address with the address of the node
Not communicate with the other nodes of the communications that may harm should be aware.

▶ AUTOSCAN (if done for Modulating, On / Off type its not)

Variable resistance point SPAN ZERO points and automatically switches to set.

- AUTOSCAN hold more than 2 seconds to enter mode, and
If you go during the more than 2 seconds then stop and go back to the previous mode.
- Entry into the remote AUTOSCAN modes are available, proceed to stop while the button is pressed for 2 seconds.

▶ Zero , Span

Two buttons simultaneously and hold around 2 seconds to enter manual mode, where the Zero Span button to close the actuator button forces driving directions are open.

▶ Termination

Mod Bus termination resistor on the last set.

- TERM is set in the direction OUT GOING termination resistance setting and makes the line disconnection.
Therefore, the data transmission to the next one will not.

7. Operating LEDs

▶ Operating LEDs

Displays the current operating conditions.

- Port Led (1, 2): Power is lit, and fixed at the top communications, communication can not blink at the port

- Fault Led: Lights In general, torque at detection (fixed light), the direction of the suspension

- Open, Close Led: Stop lights out, flashing the operating, fixed lights at the Limit

8. Connector

▶ Mod-IN, Mod-OUT

Mod bus lines are connected. GND, A, B consists of a line from the previous node in the direction of the IN COME, following the line of nodes is connected to the output OUT GOING.

- TERMINATION setting OUT GOING to go in the direction of the line is blocked.

▶ Potentiometer (only done for the Modulating Type, On / Off type if its not)

You are able to recognize the variable resistor is connected.

- Low, Signal, High Connect shall connect to the opposite occurs fault.

▶ Power & Motor

Connect power and motor lines.

Live, Nutral, Motor Close, Common, Motor Open to be connected.

- Live from the outside and connected to Common, Motor Common on the outside and are connected Nutral.

▶ Limit & Torque

Open / Close limit switch and the Open / Close torque switch is connected.

- Limit, Torque Normal Close the switch and the wiring should not be used to Fault occurs.

9. Setting

▶ Power and motor output connections

- 87V ~ 270V power connection is available freely.
- Check the motor connections and the contacts must be connected.

If you have connected in the opposite direction of motor rotation is opposite Actuator itself may be damaged.

▶ Mod Bus Connection

Mod Bus A and B are connected to two minutes. Checks must be well connected.

Conversely, if the connection, the entire nodes of the communication is not.

- If you connect multiple nodes to come in as input to other nodes connected to the output connections.
- Twisted pair cable and the cable is Sheld use.
- Cable length depends on transmission speed, up to 1000m are possible.

- This product has a communication speed of 9600 Baud.
- Use Repeater to extend the length of the cable can be.
- You can use the same cable, the maximum number of nodes is limited to 32. 32 Therefore, if you want to use more nodes must use the Repeater

10. Operating

The Mod Bus Controller Modbus regulations that follow, to confirm the status of the control and use the specified Mod Function Code to perform data communication, PCU's internal registers write and read operations performed to control the overall operation.

▶ PCU internal registers

Modbus address of the register to identify the type of decision, and that information is shown below.

Address	Content
0x0000 ~ 0x0FFF	Digital output is directly connected to the output or Coil for the read / write done
0x1000 ~ 0x2FFF	Directly connected to the Digital Input ON / OFF status of reading to perform a function on
0x3000 ~ 0x3FFF	Latest 16-bit value from an external source is to read the address
0x4000 ~ 0xFFFF	16-bit value stored in the registers of the processor performs both input and output.

- The controller registers to determine the overall behavior and uses the address below.

Address	Content
0x0000	Start / Stop Autoscanning 0 : Auto scan stop , 1 : Start auto scanning
0x4000	Mode register 0 : Normal mode, 1 : Fault mode, 2 : Auto scan mode, 3 : Manual mode 256 : Force stop mode
0x4001	Setting register Reserved for next version
0x4002	Fault register (Indicate each bit) 0x0000 : No fault 0x0001 : Lost potentiometer signal 0x0002 : Under potentiometer (position below zero limit) 0x0004 : Over potentiometer (position over span limit) 0x0008 : Plus potentiometer (disconnect potentiometer high line) 0x0010 : Minus Potentiometer (disconnect potentiometer low line) 0x0020 : Reverse Potentiometer (reverse connect potentiometer high & low line or motor open & close line) 0x0040 : Open torque (trip open torque switch) 0x0080 : Close torque (trip close torque switch) 0x0100 : Communication fault (disconnect all communication ports) 0x0400 : EEPROM fault (damaged eeprom data)
0x4003	Dead Band (0 to 1000 for 0% to 100%)
0x4004	Time Delay (0 to 100 for 0 sec to 10 sec)
0x4005	Limit & Torque switch status 0x01 : Open limit, 0x02 : Close limit 0x04 : Open Torque, 0x08 : Close Torque

Address	Content
0x4006	Motor status 0 : Normal stop 1 : Opening, 2 : Closing 3 : Full open, 4 : Full Close
0x4007	Set position : User control position data 0 to 10000 for 0% to 100% e.g. 7500 is 75.00%
0x4008	Potentiometer position : Actuator current position 0 to 10000 for 0% to 100% e.g. 6592 is 65.92%

▶ Modbus RTU (Remote Terminal Unit) mode

The Controller and the widespread use of modbus RTU mode, data communication is performed using. RTU mode, 8 bits of the message, two 4-bit (nibble) has 16 decimal data and messages are transmitted consecutively.

- 8-bit in the 0 ~ 9, A ~ F of the value of the two kinds of data include 4-bit 16 hex.
- 1 byte is 1 start bit + 8 data bits + 1 parity bit + 1 or 2 bits Stop bits are configured.
- For error detection CRC (Cyclical Redundancy Check) must contain.
- Master to transfer data from the frame structure also follows the same format, using the same slave master to transmit the response data.

Start	Address	Function	Data	CRC	End
t1, t2, t3, t4	8bits	8bits	Nx 8bits	16bits	t1, t2, t3, t4

- Here is the address used above is not the address of the register of the slave address is unique. 8-bit addressing can be 256 to 1 as 0x00 ~ 0x7F neunhadeuweeo this controller that can be used to 0-127.

▶ Modbus Functions

Modbus function code that would include an 8-bit data, and 1-255 of the code for the code, but we do not use the full range. The table below shows the Modbus function code available in the collection geotinde, this controller the code number of 0x05 (write single coil), 0x03 (read holding registers), 0x06 (write single register) is performed by using the function .

Code	Features	Reference address
0x01	Read Coil Status	0x0xxx
0x02	Read Input Status	0x1xxx
0x03	Read Holding Registers	0x4xxx
0x04	Read Input Registers	0x3xxx
0x05	Write Single Coil	0x0xxx
0x06	Write Single Register	0x4xxx
0x08	Reset Slave	Do not see the address
0x0F	Write Multiple Coils	0x0xxx
0x16	Write Multiple Registers	0x4xxx
0x11	Report Slave ID	Do not see the address

- Please specify the address to automatically see ohpeusetman is so. In other words, when you perform any operation code 0x06 on 0x4XXX Street address to automatically see 0x4XXX so that you do not, the transmission is put 0x0XXX.

- Write Single Coil (0x05) : ex) Start auto scanning (Slave address 0x07)

Field Name	Example
Slave Address	0x07
Function Code	0x05
Address High Order	0x00
Address Low Order	0x00
Data High Order	0xFF
Data Low Order	0x00
Error Check	Calculations

- Master to Slave Query -

Field Name	Example
Slave Address	0x07
Function Code	0x05
Address High Order	0x00
Address Low Order	0x00
Data High Order	0xFF
Data Low Order	0x00
Error Check	Calculations

- Slave Response -

- Write Single Register (0x06) : ex) Set position 25% (Slave address 0x07)

Field Name	Example
Slave Address	0x07
Function Code	0x06
Address High Order	0x00
Address Low Order	0x07
Data High Order	0x09
Data Low Order	0xC4
Error Check	Calculations

- Master to Slave Query -

Field Name	Example
Slave Address	0x07
Function Code	0x06
Address High Order	0x00
Address Low Order	0x07
Data High Order	0x09
Data Low Order	0xC4
Error Check	Calculations

- Slave Response -

- Read Holding Registers (0x03) : ex) Read PCU Status (Slave address 0x07)

Field Name	Example
Slave Address	0x07
Function Code	0x03
Address High Order	0x00
Address Low Order	0x00
Data High Order	0x00
Data Low Order	0x09
Error Check	Calculations

- Master to Slave Query -

- According to the data in response right now you can check the status of the PCU. 0x4000 ~ 0x4008 until the PCU represents the register, to confirm the contents of the registers are.
  The example of right-Mode (Fault), Setting (Don't care), Fault (Open Torque), Dead Band (1%),
  Time Delay (1.1sec), Limit & Trque (Open Trque),
  Motor Act (Stop), Set position (25%),
  Current Position (2.91%), identified as doeneunde,
  the overall look by combining information on the
  Zero position of the valve is directing the user to operate the valve 25% open the ghost points to 2.91% torque generated by the current state of the valves are stopped is unknown.

Field Name	Example
Slave Address	0x07
Function Code	0x03
Byte Count	0x00
Data High (0x4000)	0x00
Data Low (0x4000)	0x00
Data High (0x4001)	0x09
Data Low (0x4001)	0x09
Data High (0x4002)	0x07
Data Low (0x4002)	0x03
Data High (0x4003)	0x00
Data Low (0x4003)	0x00
Data High (0x4004)	0x00
Data Low (0x4004)	0x00
Data High (0x4005)	0x09
Data Low (0x4005)	0x09
Data High (0x4006)	0x00
Data Low (0x4006)	0x00
Data High (0x4007)	0x00
Data Low (0x4007)	0x00
Data High (0x4008)	0x09
Data Low (0x4008)	0x09
Error Check	Calculations

- Slave Response -

▶ Modbus Exceptions

The controller is not supported by user request function code hayeotgeona, do not support Register domain requests, or if unavailable, the data needs hayeoteul by sending an error message code indicates an error condition.

Code	Exception	Description
01	Illegal Function	The function code received in the query is not allowed or invalid.
02	Illegal Data Address	The data address received in the query is not an allowable address for the slave or is invalid.
03	Illegal Data Value	A value contained in the query data field is not an allowable value for the slave or is invalid.