KIO22

ANALOG INPUT OUTPUT MODULE

COMMUNICATION PROTOCOL

SmartGen

SMARTGEN (ZHENGZHOU) TECHNOLOGY CO., LTD.

Chinese trademark

SmartGen English trademark

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Table 1 – Software Version

Date	Version	Content
2021-07-17	V1.0	Original release.

CONTENT

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1. DESCRIPTION

This protocol describes read and write command format of LINK serial port communication and definition of internal information data for the third-party to develop and use.

This module is used as a slave, using Modbus-RTU protocol, and does not support other protocols such as Modbus-ASCII.

Communication address: 1~254 (default: 1)
Baud rate: 9600bps
Start bit: 1-bit
Data bit: 8-bit
Parity bit: No Parity
Stop bit: 1-bit

Supported function code: 03H. Function code 03H is used for reading module alarm and analog (input, output) data.

Data check mode: CRC16.

Internal registers of controller are in the unit of “word (double bytes)”.

2. WIRING DIAGRAM

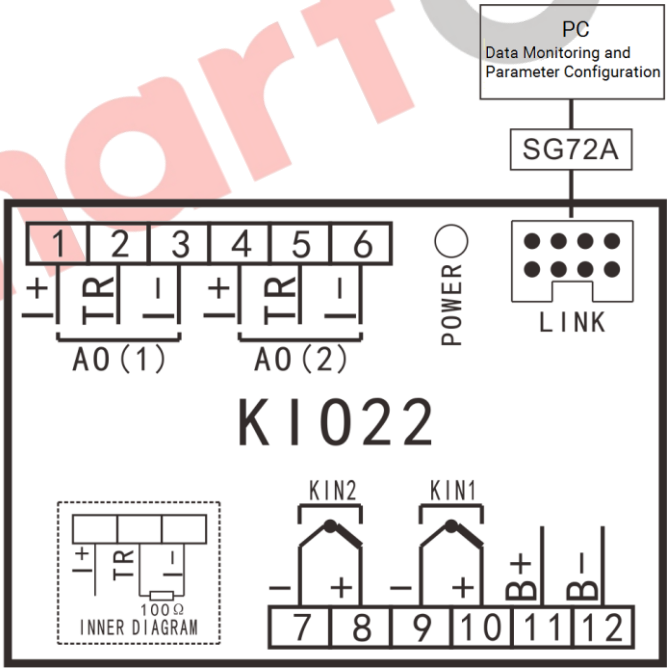

Fig.1 Communication Wiring Diagram

NOTE1: Our company’s SG72A communication conversion module can be selected to realize the communication of KIO22 module and PC.

3. DATA FIELD CORRESPONDING TO FUNCTION CODE 03H

Table 2 – Data Field Corresponding to Function Code 03H

Modbus Address	Name	Range (Decimal)	Ratio	Unit	Description	Remark
0000	Sensor 1 Open	(0-1)	/	/	1 for active (LSB)	
	Sensor 2 Open	(0-1)	/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active	
	Reserved		/	/	1 for active (MSB)	
0001	Module ID	(0-254)	/	/	16-bit Unsigned	
0002	Analog Input 1 Detection Voltage Value	/	1	mV	16-bit Signed	
0003	Analog Input 2 Detection Voltage Value	/	1	mV	16-bit Signed	
0004	Analog Input 1 Temp. Value	(0-10000)	0.1	°C	16-bit Signed	
0005	Analog Input 2 Temp. Value	(0-10000)	0.1	°C	16-bit Signed	
0006	Analog Output 1 Output Current Value	(400-2000)	0.01	mA	16-bit Unsigned	
0007	Analog Output 2 Output Current Value	(400-2000)	0.01	mA	16-bit Unsigned	
0008	Chip Temperature	(0-1000)	0.1	°C	16-bit Signed	
0009	Software Version	/	/	/	16-bit Unsigned	
0010	Hardware Version	/	/	/	16-bit Unsigned	
0011	Issue Year	/	/	/	16-bit Unsigned	
0012	Issue Month	/	/	/	16-bit Unsigned	
0013	Issue Day	/	/	/	16-bit Unsigned	

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Example:

Read "Chip Temperature", firstly get its corresponding address is 0008 by checking the table, it is known that you need to read 1 word's data.

Assume the slave address is 01, "Chip Temperature" is 32°C, the master request command is as following:

Table 3 – Master Request Command

Slave Address	Function Code	Starting Address (0008)		Data Qty. (1)		CRC 16 Calibration	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**03**	**00**	**08**	**00**	**01**	**05**	**C8**

Slave response command is as following:

Table 4 – Slave Response Command

Slave Address	Function Code	Data Qty. (Bytes)	Data		CRC 16 Calibration	
			Data MSB of Address 0008	Data LSB of Address 0008	LSB	MSB
01	**03**	**02**	**00**	**20**	**B9**	**9C**

Table 5 – Data Analysis

Address	Received Data (Hex)	Combination (Hex)	Chip Temp. (Decimal)
0008	00 (hex high 8-bit)	0020	32
0008	20 (hex low 8-bit)		

4. PARAMETER VIEW AND CONFIGURATION

Due to KIO22 module has no display screen and keys, its parameter information can be viewed and configured via supporting PC or automatically obtained by users via Modbus-RTU protocol.

5. FAQ

5.1 LINK TO USB COMMUNICATION ADAPTOR

PC can communicate with SG72A module produced by our company.

5.2 COMMON SOLUTIONS OF COMMUNICATION FAILURE

1) Check whether the module LINK connection line is correctly connected;
2) Check whether the communication parameter setting in parameter setting is correct;
3) Check whether the LINK converter (if configured) is normal;
4) It is recommended to download third-party communication software such as modscan32, modbus poll to check whether communication is normal.

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