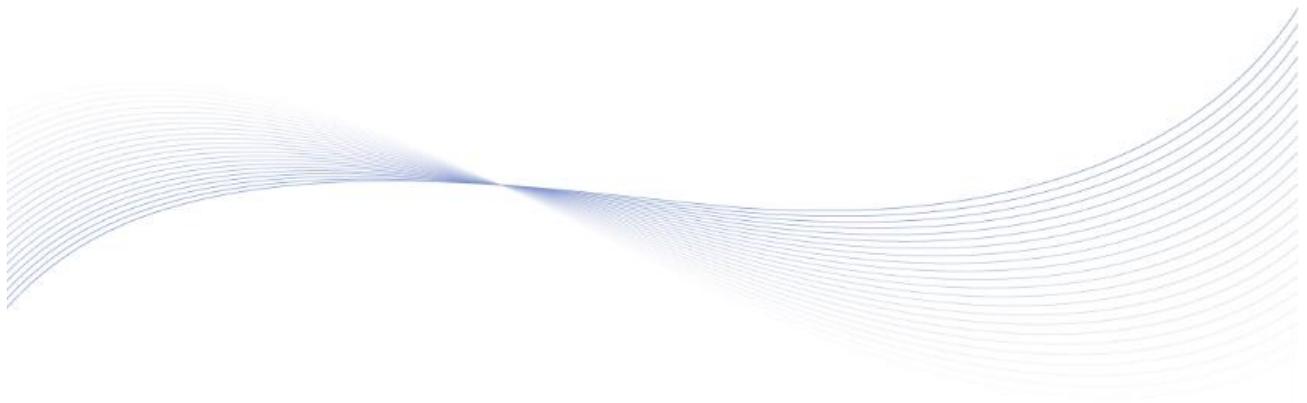




**HEP300Z**  
**ELECTRONIC POTENTIOMETER**  
**COMMUNICATION PROTOCOL**



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**Table 1 Software Version**

Date	Version	Content
2024-04-11	V1.0	Original release.

## 1 DESCRIPTION

This protocol describes the heater LINK port's read and write command format, and the definition of internal information & data for the third-party to develop and use.

The module works as a slave module, and uses Modbus-RTU protocol, but it doesn't support other protocols, such as Modbus-ASCII, etc.

Communication address: 1 (Unmodifiable)

Baud rate: 9600bps

Data bit: 8 bits

Parity bit: None

Stop bit: 2 bits

Function code supported: 03H. Function code 03H is used for reading status and various kinds of electric parameters.

Data checking method: CRC16.

The register data inside the module are packed as two bytes per register.

Communication timeout period: over 200ms.

## 2 CONTROLLER INTERNAL REGISTER ADDRESS AND DATA

### 2.1 FUNCTION CODE 03H MAPPING PARAMETERS OF DATA FIELD

Table 2 Parameters of Data Field

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remark
0000	40001	Voltage Output	-100~100	0.1	V		
0001	40002	Current Output	-200~200	0.1	mA		
0002	40003	PWM Output	0~1000	0.1	%		
0003	40004	DC Voltage Input		0.01	V		
0004	40005	Reserved					
0005	40006	Value of TIME Potentiometer	2.5~25	1	s		
0006	40007	Reserved					
0007	40008	Value of MULTIPLIER Potentiometer	4~20	1			
0008	40009	Reserved					
0009	40010	Value of PRESET/% Potentiometer	0~100	1	%		
0010	40011	Reserved					
0011	40012	Value of LIMIT/% Potentiometer	0~100	1	%		
0012	40013	Reserved					
0013	40014	Duty Cycle of Droop PWM Output	0~100	1	%		
0014	40015	Reserved					

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remark
0015	40016	Reserved					
0016	40017	Reserved					
0017	40018	Reserved					
0018	40019	Reserved					
0019	40020	Software Version		0.1			
0020	40021	Bit0: Reserved					
		Bit1: Status of DC Voltage Input Enable				1: Enable, 0: Disable	
		Bit2: Status of PRESET/% Enable				1: Enable, 0: Disable	
		Bit3: Status of DOWN					
		Bit4: Status of UP					
		Bit5: Reserved					
		Bit6: Reserved					

**NOTE 1:** Actual value = data received \* ratio. Take the Voltage Output as the example: if the data received is 50 (32H), ratio is 0.1V, then the actual voltage value is 5.0V (50\*0.1V).

**NOTE 2:** If there are 4 bytes in the data, the actual value = high order bits of data received \* 65536 + low order bits of data received.

**NOTE 3:** If data received is 32766, it means there is no normal data, and “###” will be shown.

**NOTE 4:** Definition of signed number: Take the data received “8000H” as the example, convert it to binary number “1000 0000 0000 0000b”. The MSB is 1, which means it is negative. The number minus 1 will get its 1’s complement, then inverting it will get the absolute value of the negative number. Finally convert the absolute value to decimal number -32768.

Example:

If “Voltage Output (current value is 2.4V)” needs to be read, check the table above and find its coil address is 0000, so it needs to read two bytes data.

Assuming the slave address is 01, the master request command is as following:

**Table 3 Master Request Command**

Slave Address	Function Code	Start Address (0000)		Request Data Length (1)		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	03	00	00	00	01	84	0A

The slave response command is as following:

**Table 4 Slave Response Command**

Slave Address	Function Code	Data Length (Bytes)	Data		CRC 16	
			Data of Address 0000 MSB	Data of Address 0000 LSB	LSB	MSB
01	03	02	00	18	B8	4E

### 3 VIEW THE COMMUNICATION PARAMETERS

Connect the LINK port of HEP300Z with PC via the SmartGen SG72 converter first. Then the current setting parameters can be viewed in the host PC of HEP300Z.

### 4 FAQ

**Table 5 FAQ**

Faults	Possible Solution
No response when the electronic potentiometer is powered on	Check the power supply; Check the power cable connection.
Connection failure between LINK port and PC	Check the wiring connection; Check whether the COM port setting is correct or not; Check whether the communication port of PC is normal or not.