Communication Protocol V1.0 for Grating Displacement Sensor

1. Communication parameters

It adopts MODBUS/RTU mode and CRC16/Modbus x16 +x15 +x2 +1.

Default serial port configuration: baud rate 3840, one start bit, eight data bit, no parity check, two stop bit

Default equipment address: 01H

2. Communication protocol

1) Read displacement sensor data protocol

<table>
<tr><td colspan="2">Host command 01 03 00 00 00 02 C4 0B</td><td colspan="4">Displacement sensor response 01 03 04 01 00 12 39 37 7D</td></tr>
<tr><td>Address code</td><td>01H</td><td>Address code</td><td colspan="3">01H</td></tr>
<tr><td>Function code</td><td>03H</td><td>Function code</td><td colspan="3">03H</td></tr>
<tr><td rowspan="2">Head address for storage</td><td>00H</td><td>Data word length</td><td colspan="3">04H</td></tr>
<tr><td>00H</td><td>Data word 1 high 8 bits</td><td>01H</td><td rowspan="4">Displacement sensor data</td><td>Sign symbol</td></tr>
<tr><td rowspan="2">Data word length</td><td>00H</td><td>Data word 1 low 8 bits</td><td>00H</td><td rowspan="3">Data measurement(16-base)</td></tr>
<tr><td>02H</td><td>Data word 2 high 8 bits</td><td>12H</td></tr>
<tr><td>CRC(low 8 bits)</td><td>C4H</td><td>Data word 2 low 8 bits</td><td>39H</td></tr>
<tr><td>CRC(high 8 bits)</td><td>0BH</td><td>CRC(low 8 bits)</td><td colspan="3">37H</td></tr>
<tr><td></td><td></td><td>CRC(high 8 bits)</td><td colspan="3">7DH</td></tr>
</table>

Instruction

1. The measured date is 4 bytes and the first byte is sign bit. 01H represents negative sign while 00H presents positive sign. The 2-4 byte are measured date of 16-base.

2.The measured date（1239H） in the case is converted into 10-base 4665. The sign bit 01H is negative number. The high precision dimi displacement sensor and the actual displacement length of the dimi displacement sensor is -0.4665mm. The high precision percentile displacement sensor and the actual displacement length of the percentile displacement sensor is -4.665mm.

2) Setting of displacement sensor function protocol

<table>
<tr><td colspan="2">Host command 01 06 08 00 AB 56 74 A4</td><td colspan="2">Displacement sensor response 01 06 08 00 AB 56 74 A4</td></tr>
<tr><td>Address code</td><td>01H</td><td>Address code</td><td>01H</td></tr>
<tr><td>Function code</td><td>06H</td><td>Function code</td><td>06H</td></tr>
<tr><td>Head address</td><td>08H</td><td>Head address</td><td>08H</td></tr>
</table>

for storage	00H	for storage	00H
Write data	ABH	Write data	ABH
	56H		56H
CRC(low 8 bits)	74H	CRC(low 8 bits)	74H
CRC(high 8 bits)	A4H	CRC(high 8 bits)	A4H

Instruction：

1.It means data zero clearing function when writing data ABH and 56H.

3)Modify equipment address protocol

Host command 01 06 02 00 00 02 09 B3		Displacement sensor response 01 06 02 00 00 02 09 B3	
Address code	01H	Address code	01H
Function code	06H	Function code	06H
Head address for storage	02H	Head address for storage	02H
	00H		00H
Write data	00H	Write data	00H
	02H		02H
CRC(low 8 bits)	09H	CRC(low 8 bits)	09H
CRC(high 8 bits)	B3H	CRC(high 8 bits)	B3H

Instruction: User should write storage address 0200H and write data 0002H in the case. It shows the modification of the equipment address to 02(set range base 1-254).

4)Modify baud rate protocol

Host command 01 06 02 01 00 02 18 72		Displacement sensor response 01 06 02 00 00 02 18 72	
Address code	01H	Address code	01H
Function code	06H	Function code	06H
Head address for storage	02H	Head address for storage	02H
	01H		01H
Write data	00H	Write data	00H
	02H		02H
CRC(low 8 bits)	18H	CRC(low 8 bits)	18H
CRC(high 8 bits)	72H	CRC(high 8 bits)	72H

Instruction：

1.User should write data 0002H in the case and modify Baud rate 38400.

2.User should write 0001H and modify Baud rate 19200.

3.User should write data 0000H and modify Baud rate 9600.

4.User should write storage address 0201H.

5) Modify check stop bit protocol

Host command 01 06 02 02 00 02 A8 73		Displacement sensor response 01 06 02 00 00 02 A8 73	
Address code	01H	Address code	01H
Function code	06H	Function code	06H
Head address for storage	02H	Head address for storage	02H
	02H		02H
Write data	00H	Write data	00H
	02H		02H
CRC(low 8 bits)	A8H	CRC(low 8 bits)	A8H
CRC(high 8 bits)	73H	CRC(high 8 bits)	73H

Instruction：

1.User should write data 0002H. It means even parity and one stop bit.

2.User should write 0001H. It means odd parity and one stop bit.

3.User should write 0000H. It means no parity and two stop bits.

4.User should write storage address 0202H.

6） Read internal parameter protocol

Host command 01 03 02 00 00 04 45 B1		Displacement sensor response 01 03 08 00 80 00 02 00 00 00 10 FD 14	
Address code	01H	Address code	01H
Function code	03H	Function code	03H
Head address for storage	02H	Data word length	08H
	00H	Data byte one high 8 bits	00H
Data word length	00H	Data byte one low 8 bits	01H
	04H	Data byte two low 8 bits	00H
CRC(low 8 bits)	45H	Data byte two low 8 bits	02H
CRC(high 8 bits)	B1H	Data byte three high 8 bits	00H
		Data byte three low 8 bits	00H
		Data byte four high 8 bits	00H
		Data byte four low 8 bits	04H
		CRC(low 8 bits)	FDH

		CRC(high 8 bits)	14H

Instruction：

1.0001H in data byte 1 means equipment address 01.

2.0002H in data byte 2 means baud rate 38400（0000H means 9600 while 0001H means 19200）.

3.0000H in data byte 3 means no parity, two stop bit(0001H odd parity, one stop bit. 0002H means even parity and one stop bit).