

Eddy Current Sensor Protocol Description

I . Data frame format

Mode: Modbus-RTU

Communication parameters and data frame (default): baud rate: 9600; parity bit: none; data bit: 8 bits; stop bit: 1 bit

Supported function codes: 03H 04H 06H

II. Function Code, Data Register Mapping Description

03H Holding Registers

Parametric	Modbus Holding Register Address (16 bit)
Displacement Data (IEEE754)	0000H
	0001H
Retention	0002H
Retention	0003H
Retention	0004H
Retention	0005H
Retention	0006H
Retention	0007H
Retention	0008H
Retention	0009H
Retention	000AH

04H Input Registers

Parametric	Modbus Holding Register Address (16 bit)
Displacement Data (IEEE754)	0000H
	0001H
Retention	0002H
Retention	0003H
Address (ID)	0004H
Baud	0005H
Calibration Method	0006H
Stop Bit	0007H
Retention	0008H
Retention	0009H
Retention	000AH

06H Prebuilt Individual Registers

Parametric	Modbus Holding Register Address (16 bit)	Clarification
Address (ID)	0000H	Reference address setting code
Baud	0001H	Reference baud rate setting code
Calibration Method	0002H	Reference check method setting code
Stop Bit	0003H	Reference stop bit setting code
Retention	0004H	Retention
Retention	0005H	Retention
Retention	0006H	Retention
Retention	0007H	Retention
Retention	0008H	Retention
Retention	0009H	Retention
Retention	000AH	Retention

1. Address Setting Code

Value (HEX)	Clarification
01H-FFH	Address range 1-255 (decimal)

2. Baud Rate Setting Code

Value (HEX)	Value (DEC)	Baud
0X00	00	2400bps
0X01	01	4800bps
0X02	02	9600bps (default value)
0X03	03	19200bps
0X04	04	38400bps
0X05	05	57600bps
0X06	06	115200bps

3. Calibration Method Setting Code

Value (HEX)	Calibration Method
00	No checksum (default)
01	Odd-calibrated
02	Even-calibrated

4. Stop Bit Setting Code

Value (HEX)	Calibration Method
01	Stop Bit 1Bit
02	Stop Bit 2Bit

III. Data Decode

1. Read Data, Function Code 03H

Host Enquiry Command (HEX)		Slave Response (HEX)	
Sensor Addresses	01	Sensor Addresses	01
Function Code	03	Function Code	03
Register Starting Address	00	Data Length	04
	00		40
No. of Registers	00	Date IEEE754	F5
	02		B4
CRC Low	C4		FC
CRC High	0B		CRC Low
		CRC High	80

Read Data Example (Function Code 03H)

Host Send (HEX)	01	03	00	00	00	02	C4	0B					
Slave Reply (HEX)	01	03	04	40	F5	B4	FC	88	80				

2. Read Data, Function Code 04H

Host Enquiry Command (HEX)		Slave Response (HEX)	
Sensor Addresses	01	Sensor Addresses	01
Function Code	04	Function Code	04
Register Starting Address	00	Data Length	04
	00		40
No. of Registers	00	Date IEEE754	F5
	02		B4
CRC Low	71		FC
CRC High	CB		CRC Low
		CRC High	37

Read Data Example (Function Code 04H)

Host Send (HEX)	01	04	00	00	00	02	71	CB					
Slave Reply (HEX)	01	04	04	40	F5	B4	FC	89	37				

Data decoding instructions:

The data occupies two data registers, 4 bytes in total, with the high bit in front and the low bit at the end to form a 32-bit data strong conversion to float type, single-precision floating-point number, following IEEE754.

40F5 B4FC — 7.678 (mm)

C0F5 B4FC — -7.678 (mm)

IV. Change Configuration

1. Change sensor address, function code 06H

Host write command (HEX)		Slave Response (HEX)	
Sensor Addresses	01	Sensor Addresses	01
Function Code	06	Function Code	06
Register Starting Address	00	Register Starting Address	00
	00		00
Address Setting	00	Address Setting	00
	02		02
CRC Low	08	CRC Low	08
CRC High	0B	CRC High	0B

Example of setting address: (change sensor address 01H to 02H)

Host Send (HEX)	01	06	00	00	00	02	08	0B					
Slave Reply (HEX)	01	06	00	00	00	02	08	0B					

2. Change baud rate

Host write command (HEX)		Slave Response (HEX)	
Sensor Addresses	01	Sensor Addresses	01
Function Code	06	Function Code	06
Register Starting Address	00	Register Starting Address	00
	01		01
Baud rate setting	00	Baud rate setting	00
	03		03
CRC Low	98	CRC Low	98
CRC High	0B	CRC High	0B

Example of setting the checksum method: (set the baud rate of the sensor at address 01H to 19200)

Host Send (HEX)	01	06	00	01	00	03	98	0B					
Slave Reply (HEX)	01	06	00	01	00	03	98	0B					

3. Changing the calibration method

Host write command (HEX)		Slave Response (HEX)	
Sensor Addresses	01	Sensor Addresses	01
Function Code	06	Function Code	06
Register Starting Address	00	Register Starting Address	00
	02		02
Calibration method setting	00	Calibration method setting	00
	02		02
CRC Low	A9	CRC Low	A9
CRC High	CB	CRC High	CB

Example of setting the checksum method: (Set the sensor at address 01H to even checksum)

Host Send (HEX)	01	06	00	02	00	02	A9	CB					
Slave Reply (HEX)	01	06	00	02	00	02	A9	CB					