

ATEK ALFA EPD 26

MODBUS Communication Protocol

1. Communication Parameters

No.	Parameter	Range	Remark
1	Slave Address	1~247	Default value: 1
2	Baud Rate	1200/4800/9600/19200/38400/57600/11520	Default value: 9600
3	Data Bit	8 bit	Fixed
4	Stop Bit	1 bit	Fixed
5	Parity Bit	NONE, ODD, EVEN	Default value: NONE

2. Communication Commands

Example: Slave bus address: 01H

2.1 Read Sensor Data (Function Code 03H)

Pressure unit is configurable; refer to Table 4 for unit codes. Temperature unit is fixed as °C.

2.1.1 Read Single-Precision Floating-Point Value

Master transmit: 01 03 00 00 00 04 44 09

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	03 = read sensor data
2-3	Starting Address	2	00 00 = data start address
4-5	Quantity of Registers	2	00 04 = read 4 register locations
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 03 08 41 45 70 A4 41 CC 00 00 EA 05

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	03 = read sensor data
2	Byte Count	1	08 = 8 bytes of following data
3-6	Pressure Value	4	41 45 70 A4 single-precision float, decimal 12.34
7-10	Temperature Value	4	41 CC 00 00 single-precision float, decimal 25.5 (unit °C)
11-12	CRC Checksum	2	CRCL CRCH

You may read pressure or temperature individually by modifying starting address and register quantity.

Pressure starting address: 00 00, register quantity: 00 02

Temperature starting address: 00 02, register quantity: 00 02

Example: Read pressure only

Master send: 01 03 00 00 00 02 C4 0B

Slave response: 01 03 04 41 45 70 A4 DB A1

Example: Read temperature only

Master send: 01 03 00 02 00 02 65 CB

Slave response: 01 03 04 41 CC 00 00 2E 30

Complete data register mapping: see Table 1.

2.2 Write Slave Address, Baud Rate, Pressure Unit, Zero-Calibration (Function Code 06H)

2.2.1 Write Slave Address (Register Address 0x012A)

Master transmit: 01 06 01 2A 00 02 28 3F

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = current slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	01 2A = slave-address register
4-5	Data Value	2	00 02 = write value into register 0x012A
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 06 01 2A 00 02 28 3F

Index	Definition	Byte Count	Description
0	Slave Address	1	After command execution, slave address becomes 2
1	Function Code	1	06 = preset single register
2-3	Register Address	2	01 2A = slave-address register
4-5	Data Value	2	00 02 = write succeeded; new slave address 2
6-7	CRC Checksum	2	CRCL CRCH

Slave error response: 01 86 02 A2 61

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	86 = exception for function code 06
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

Valid slave-address range: 1 ~ 247.

2.2.2 Write Baud Rate (Register Address 0x012B)

Master transmit: 01 06 01 2B 00 02 79 FF

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	01 2B = baud-rate register
4-5	Data Value	2	00 02 = write value into register 0x012B
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 06 01 2B 00 02 79 FF

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	01 2B = baud-rate register
4-5	Data Value	2	00 02 = write succeeded; new baud rate 9600
6-7	CRC Checksum	2	CRCL CRCH

Slave error response: 01 86 02 A2 61

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	86 = exception for function code 06
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

2.2.3 Write Parity Bit (Register Address 0x012C)

Master transmit: 01 06 01 2C 00 02 C8 3E

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	01 2C = parity register
4-5	Data Value	2	00 02 = write value into register 0x012C
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 06 01 2C 00 02 79 FF

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	01 2C = parity register

Index	Definition	Byte Count	Description
4-5	Data Value	2	00 02 = write succeeded; parity set to EVEN
6-7	CRC Checksum	2	CRCL CRCH

Slave error response: 01 86 02 A2 61

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	86 = exception for function code 06
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

2.2.4 Write Pressure Unit

Master transmit: 01 06 00 17 00 0C 39 CB

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	00 17 = pressure-unit register
4-5	Data Value	2	00 0C = write value into register 0x0017
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 06 00 17 00 0C 09 CD

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	00 17 = pressure-unit register
4-5	Data Value	2	00 0C = write succeeded; unit set to kPa
6-7	CRC Checksum	2	CRCL CRCH

Slave error response: 01 86 02 A2 61

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	86 = exception for function code 06
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

Note: Function code 06 supports broadcast command with slave address 0.

2.2.5 Pressure Zero-Calibration (Offset Clear)

Master transmit: 01 06 00 10 00 00 88 0F

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	00 10 = pressure offset register
4-5	Data Value	2	00 00 = execute zero-clear operation
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 06 00 10 00 00 88 0F

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	06 = preset single register
2-3	Register Address	2	00 10 = pressure offset register
4-5	Data Value	2	00 00 = zero-clear succeeded
6-7	CRC Checksum	2	CRCL CRCH

Slave error response: 01 86 02 A2 61

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	86 = exception for function code 06
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

Note: Function code 06 supports broadcast command with slave address 0.

2.3 Read Slave Address, Baud Rate, Pressure Unit, Pressure Offset (Function Code 04H)

2.3.1 Read Slave Address (Register Address 0x012A)

Master transmit: 01 04 01 2A 00 01 11 FE

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2-3	Starting Address	2	01 2A = slave-address register
4-5	Register Quantity	2	00 01
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 04 02 00 01 78 F0

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2	Byte Count	1	02 = following 2 data bytes
3-4	Register Data	2	00 01 = slave address is 1
5-6	CRC Checksum	2	CRCL CRCH

Slave error response: 01 84 02 C2 C1

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	84 = exception for function code 04
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

Valid address range: 1 ~ 247.

2.3.2 Read Baud Rate (Register Address 0x012B)

Master transmit: 01 04 01 2B 00 01 40 3E

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2-3	Starting Address	2	01 2B = baud-rate register
4-5	Register Quantity	2	00 01
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 04 02 00 02 38 F1

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2-3	Register Data	2	00 02 = baud rate 9600
4-5	CRC Checksum	2	CRCL CRCH

Slave error response: 01 84 02 C2 C1

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	84 = exception for function code 04
2	Exception Code	2	02 fixed value

Index	Definition	Byte Count	Description
3-4	CRC Checksum	2	CRCL CRCH

2.3.3 Read Parity Bit (Register Address 0x012C)

Master transmit: 01 04 01 2C 00 01 F1 FF

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2-3	Starting Address	2	01 2C = parity register
4-5	Register Quantity	2	00 01
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 04 02 00 02 38 F1

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2-3	Register Data	2	00 02 = parity is EVEN
4-5	CRC Checksum	2	CRCL CRCH

Slave error response: 01 84 02 C2 C1

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	84 = exception for function code 04
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

2.3.4 Read Pressure Unit (Register Address 0x0017)

Master transmit: 01 04 00 17 00 01 81 CE

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2-3	Starting Address	2	00 17 = pressure- unit register
4-5	Register Quantity	2	00 01
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 04 02 00 0C B9 35

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1

Index	Definition	Byte Count	Description
1	Function Code	1	04 = read input register
2-3	Register Data	2	00 0C = pressure unit is kPa
4-5	CRC Checksum	2	CRCL CRCH

Slave error response: 01 84 02 C2 C1

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	84 = exception for function code 04
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

2.3.5 Read Pressure Offset Value (Register Address 0x0010)

Master transmit: 01 04 00 10 00 02 70 0E

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2-3	Starting Address	2	00 10 = pressure offset register
4-5	Register Quantity	2	00 02
6-7	CRC Checksum	2	CRCL CRCH

Positive slave response: 01 04 04 3F 99 99 9A CD 84

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	04 = read input register
2	Byte Count	1	04 = following 4 data bytes
3-6	Pressure Offset	4	3F 99 99 9A float value 1.2 kPa
7-8	CRC Checksum	2	CRCL CRCH

Slave error response: 01 84 02 C2 C1

Index	Definition	Byte Count	Description
0	Slave Address	1	01 = slave address 1
1	Function Code	1	84 = exception for function code 04
2	Exception Code	2	02 fixed value
3-4	CRC Checksum	2	CRCL CRCH

Factory default sensor data register offset: 40001 (Modbus 4x reference)

Table 1 Sensor Data Register Map

Name	Register Address	Read Length	Return Bytes	Format
Pressure / Main Process Variable (float)	0x0000	0x0002	4	Single-precision float
Reference Temperature (float, °C)	0x0002	0x0002	4	Single-precision float
Manufacturer debug use	0x0004	0x0002	4	Single-precision float
Manufacturer debug use	0x0006	0x0002	4	Single-precision float
Manufacturer debug use	0x0008	0x0002	4	Single-precision float
Manufacturer debug use	0x000A	0x0002	4	Single-precision float
Manufacturer debug use	0x000C	0x0002	4	Single-precision float
Manufacturer debug use	0x000E	0x0002	4	Single-precision float
Manufacturer debug use	0x0010	0x0002	4	Single-precision float
Manufacturer debug use	0x0012	0x0002	4	Single-precision float
Signed integer pressure Bytes 1-2: integer part Bytes 3-4: divisor factor	0x0014	0x0002	4	Signed integer Actual value = integer / divisor factor
Signed integer pressure	0x0016	0x0001	2	Signed integer Actual value = integer / 100

Note for Table 1: Divisor factor can only be: 1, 10, 100, 1000, 10000.

Table 2 Baud-Rate Definition

Baud Rate	Register Value (Hex)
1200	00 00
4800	00 01
9600	00 02
19200	00 03
38400	00 04
57600	00 05
115200	00 06

Table 3 Parity-Bit Definition

Parity Mode	Register Value (Hex)
NONE	00 00
ODD	00 01
EVEN	00 02

Table 4 Pressure Unit Code List

Unit	Hex Code	Equivalent kPa Value
inH ₂ O	00 01	0.249082 kPa
inHg	00 02	3.3863787 kPa
ftH ₂ O	00 03	2.9889841 kPa
mmH ₂ O	00 04	0.00980665 kPa
mmHg	00 05	0.133322 kPa
psi	00 06	6.8947591 kPa
bar	00 07	100.0 kPa
mbar	00 08	- 1.1 kPa
g/cm ²	00 09	0.0980665205 kPa
kg/cm ²	00 0A	98.0665205 kPa
Pa	00 0B	- 1.1 kPa
kPa	00 0C	1.0 kPa
Torr	00 0D	0.133322 kPa
atm	00 0E	101.325 kPa
MPa	00 ED	1000.0 kPa
mH ₂ O	00 AB	9.80665 kPa
mHg	00 B3	133.3220 kPa
m	00 2D	9.80665 kPa
mm	00 31	0.00980665 kPa
cm	00 30	0.0980665 kPa
°C	00 32	Only for JT3051TR temperature transmitter