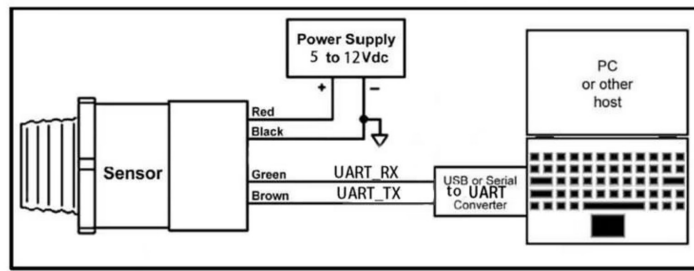
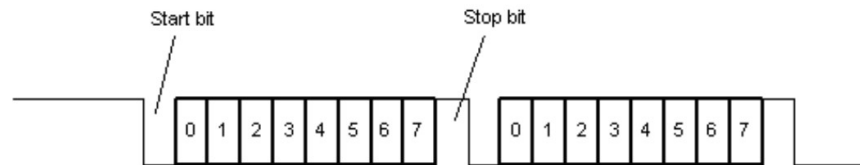


Ultrasonic level meter communication protocol

The hardware uses UART TTL/RS485.



Data exchange between the sensor and the user's equipment is provided by messages of a standard format . The messages are sent by bytes. Transmission of each byte starts with a START bite and finished with a STOP bite. Data frame 10 bits, 1 start bit, 8 data bits, 1 stop bit, no parity. The data is to be sent by low byte ahead.



Number of field	Name of field	Size of field, byte	Description
1	Prefix	1	Marker of the beginning of the message. Incoming message should have the prefix 6Ah and outgoing message should have the prefix 6Fh.
2	Net address	1	The field has:
3	Operation code	1	The field has:

4	Data	Depends on the operation	Content and format of the data depends on the operation.
5	Verification Check	1	The field is used to verify that the data in the message wasn't corrupt during transmission. Calculation algorithm is below.

One-time data reading (command 06h)

The command is used for one-time reading the current data: address, temperature, distance and Baud rate.

Format of the command:

Shift, byte	Size of the field, byte	Value	Description
0	1	6Fh	Prefix
+1	1	00h..FFh	Net address of the receiver
+2	1	06h	Operation code
+3	1	00h..FFh	Verification sum

Example: read command with address 01h :6F 01 06 E3

Format of the response:

Shift, byte	Size of the field, byte	Value	Description
0	1	6Ah	Prefix
+1	1	00h..FFh	Net address of the sender (0x0A)
+2	1	06h	Operation code
+3	1	00h..FFh	Temperature in Celsius degrees (-128...127)
+4	2	0000h..C012h	Distance (mm)
+6	1	01h...03h	baud rate
			Baud rate: 01- 9600 02- 19200 03- 115200
+7	1	00...64h	Liquid type (01 water, 02 diesel 03 gasoline)
+8	1	00h..FFh	Verification sum

Example: 6A 01 06 **1B** **0A F0** 11 00 70 means 01 address, temperature 27°C

(1B), distance 2800mm(0AF0)

Setting parameters (command 07h)

By this command you can set the sensor's parameter of address and Baud rate.

Format of the command:

Shift, byte	Size of the field, byte	Value	Description
0	1	6Fh	Prefix
+1	1	07h	Operation code
+2	1	01h	Set the baud rate
+3	1	01...03h	Corresponding baud rate 01- 9600 02- 19200 03- 115200

For example:send 6F 07 01 03 Set the baud rate to 115200

For example:send 6F 07 03 02 Set the Liquid type to diesel

Send Mode set

Shift, byte	Size of the field, byte	Value	Description
0	1	6Fh	Prefix
+1	1	07h	Operation code
+2	1	06h	Set the send mode

+3	1	00...01h	Send mode 00- demand 01- automatic
----	---	----------	--

6F 07 06 00 Demand MODE

6F 07 06 01 Automatic MODE

Algorithm of calculation of the 8-bit verification sum

Use for all Commandx if another was not indicated

```
const unsigned char Crc8Table[256] = {  
  
0x00, 0x5e, 0xbc, 0xe2, 0x61, 0x3f, 0xdd, 0x83,  
  
0xc2, 0x9c, 0x7e, 0x20, 0xa3, 0xfd, 0x1f, 0x41,  
  
0x9d, 0xc3, 0x21, 0x7f, 0xfc, 0xa2, 0x40, 0x1e,  
  
0x5f, 0x01, 0xe3, 0xbd, 0x3e, 0x60, 0x82, 0xdc,  
  
0x23, 0x7d, 0x9f, 0xc1, 0x42, 0x1c, 0xfe, 0xa0,  
  
0xe1, 0xbf, 0x5d, 0x03, 0x80, 0xde, 0x3c, 0x62,  
  
0xbe, 0xe0, 0x02, 0x5c, 0xdf, 0x81, 0x63, 0x3d,  
  
0x7c, 0x22, 0xc0, 0x9e, 0x1d, 0x43, 0xa1, 0xff,  
  
0x46, 0x18, 0xfa, 0xa4, 0x27, 0x79, 0x9b, 0xc5,
```

0x84, 0xda, 0x38, 0x66, 0xe5, 0xbb, 0x59, 0x07,

0xdb, 0x85, 0x67, 0x39, 0xba, 0xe4, 0x06, 0x58,

0x19, 0x47, 0xa5, 0xfb, 0x78, 0x26, 0xc4, 0x9a,

0x65, 0x3b, 0xd9, 0x87, 0x04, 0x5a, 0xb8, 0xe6,

0xa7, 0xf9, 0x1b, 0x45, 0xc6, 0x98, 0x7a, 0x24,

0xf8, 0xa6, 0x44, 0x1a, 0x99, 0xc7, 0x25, 0x7b,

0x3a, 0x64, 0x86, 0xd8, 0x5b, 0x05, 0xe7, 0xb9,

0x8c, 0xd2, 0x30, 0x6e, 0xed, 0xb3, 0x51, 0x0f,

0x4e, 0x10, 0xf2, 0xac, 0x2f, 0x71, 0x93, 0xcd,

0x11, 0x4f, 0xad, 0xf3, 0x70, 0x2e, 0xcc, 0x92,

0xd3, 0x8d, 0x6f, 0x31, 0xb2, 0xec, 0x0e, 0x50,

0xaf, 0xf1, 0x13, 0x4d, 0xce, 0x90, 0x72, 0x2c,

0x6d, 0x33, 0xd1, 0x8f, 0x0c, 0x52, 0xb0, 0xee,

0x32, 0x6c, 0x8e, 0xd0, 0x53, 0x0d, 0xef, 0xb1,

0xf0, 0xae, 0x4c, 0x12, 0x91, 0xcf, 0x2d, 0x73,

0xca, 0x94, 0x76, 0x28, 0xab, 0xf5, 0x17, 0x49,

0x08, 0x56, 0xb4, 0xea, 0x69, 0x37, 0xd5, 0x8b,

0x57, 0x09, 0xeb, 0xb5, 0x36, 0x68, 0x8a, 0xd4,

0x95, 0xcb, 0x29, 0x77, 0xf4, 0xaa, 0x48, 0x16,

0xe9, 0xb7, 0x55, 0x0b, 0x88, 0xd6, 0x34, 0x6a,

0x2b, 0x75, 0x97, 0xc9, 0x4a, 0x14, 0xf6, 0xa8,

```
0x74, 0x2a, 0xc8, 0x96, 0x15, 0x4b, 0xa9, 0xf7,
```

```
0xb6, 0xe8, 0x0a, 0x54, 0xd7, 0x89, 0x6b, 0x35
```

```
};
```

```
unsigned char Crc8(unsigned char *pcBlock, unsigned char len)
```

```
{
```

```
    unsigned char crc = 0x00;
```

```
    while(len--)
```

```
        crc = Crc8Table[crc ^ *pcBlock++];
```

```
    return crc;
```

```
}
```

Examples of the commands

Prefix	Address	Command	CRC
0x6F	0x00	0x06	0X27
0x6F	0x01	0x06	0XE3
0x6F	0x02	0x06	0XB6
0x6F	0x03	0x06	0x72
0x6F	0x04	0x06	0x1C