

RS485

300S Submersible Level Sensor



Corrosion-Free
Instrumentation Equipment

Read the user's manual carefully before starting to use the unit.
Producer reserves the right to implement changes without prior notice.



Technical Parameters

| | |
|-------------------------|----------------------------------|
| Pressure Range | -0.1 - 60 MPa -14.5 - 8702 Psi |
| Accuracy | ±0.5% FS |
| Working Temperature | -30 - 80°C -22 - 176°F |
| Storage Temperature | -40 - 80°C -40 - 176°F |
| Power Supply | 7.5 - 36VDC |
| Current Consumption | ≤15mA |
| Communication Interface | RS485 |
| Communication Protocol | MODBUS-RTU |
| Default Address | 1 |
| Baud Rate | 9600 |
| Data Bit | 8 |
| Stop Bit | 1 |
| Parity Bit | None |
| Protection Level | IP68 |

Wiring

| Color | Description |
|--------|-------------|
| Yellow | RS485-A |
| Blue | RS485-B |
| Black | 24V- |
| Red | 24V+ |
| Green | PE |



Communication Command

MODBUS RTU Protocol communication command (Address 02)

1.1 Read [Pressure Value] single precision floating point number (Floating Point Format: ABCD)

| • Host Command: 02 03 00 00 00 02 C4 38 | | | |
|---|--------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2~3 | Starting Channel | 2 bytes | 00 00 |
| 4~5 | Number of Channels | 2 bytes | 00 02 |
| 6~7 | Check Code | 2 bytes | C4 38 |

| • Slave Response: 02 03 04 41 45 70 A4 E8 A1 | | | |
|--|----------------------|-----------------|--------------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2 | Number of Data bytes | 1 byte | 04 |
| 3~6 | Pressure Value | 4 bytes | 41 45 70 A4(12.34) |
| 7~8 | Check Code | 2 bytes | E8 A1 |

1.2 Read [Pressure Value] + [Temperature Value] single precision floating point number (Floating Point Format: ABCD)

| • Host Command: 02 03 00 00 00 04 44 3A | | | |
|---|--------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2~3 | Starting Channel | 2 bytes | 00 00 |
| 4~5 | Number of Channels | 2 bytes | 00 04 |
| 6~7 | Check Code | 2 bytes | 44 3A |

| • Slave Response: 02 03 08 41 45 70 A4 41 CD 5C 29 4C 5F | | | |
|--|------------------------|-----------------|--------------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2 | Number of Data bytes | 1 byte | 08 |
| 3~6 | Pressure Value | 4 bytes | 41 45 70 A4(12.34) |
| 7~10 | Temperature Value (°C) | 4 bytes | 41 CD 5C 29(25.67) |
| 11~12 | Check Code | 2 bytes | 4C 5F |

1.3 Read [Pressure Value] single precision floating point number (Floating Point Format: DCBA)

| • Host Command: 02 03 00 01 00 02 95 F8 | | | |
|---|--------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2~3 | Starting Channel | 2 bytes | 00 01 |
| 4~5 | Number of Channels | 2 bytes | 00 02 |
| 6~7 | Check Code | 2 bytes | 95 F8 |

| • Slave Response: 02 03 04 A4 70 45 41 19 78 | | | |
|--|----------------------|-----------------|--------------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2 | Number of Data bytes | 1 byte | 04 |
| 3~6 | Pressure Value | 4 bytes | A4 70 45 41(12.34) |
| 7~8 | Check Code | 2 bytes | 19 78 |

1.4 Read [Pressure Value] + [Temperature Value] single precision floating point number (Floating Point Format: DCBA)

• Host Command: 02 03 00 01 00 04 15 FA

| Sequence | Definiton | Number of bytes | Numerical Value |
|----------|--------------------|-----------------|-----------------|
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2~3 | Starting Channel | 2 bytes | 00 01 |
| 4~5 | Number of Channels | 2 bytes | 00 04 |
| 6~7 | Check Code | 2 bytes | 15 FA |

• Slave Response: 02 03 08 A4 70 45 41 29 5C CD 41 8E AB

| Sequence | Definiton | Number of bytes | Numerical Value |
|----------|------------------------|-----------------|--------------------|
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2 | Number of Data bytes | 1 byte | 08 |
| 3~6 | Pressure Value | 4 bytes | A4 70 45 41(12.34) |
| 7~10 | Temperature Value (°C) | 4 bytes | 29 5C CD 41(25.67) |
| 11~12 | Check Code | 2 bytes | 8E AB |

2.1 Read [Pressure Value] double-byte signed integer (high byte first)

• Host Command: 04 00 00 00 02 71 F8

| Sequence | Definiton | Number of bytes | Numerical Value |
|----------|--------------------|-----------------|-----------------|
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 03 |
| 2~3 | Starting Channel | 2 bytes | 00 00 |
| 4~5 | Number of Channels | 2 bytes | 00 02 |
| 6~7 | Check Code | 2 bytes | 71 F8 |

| • Slave Response: 02 04 04 00 1B 27 10 A2 BF | | | |
|--|------------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2 | Number of Data bytes | 1 byte | 04 |
| 3~4 | Integer Pressure Value | 2 bytes | 00 1B(27) |
| 5~6 | Pressure Coefficient | 2 bytes | 27 10(10000) |
| 7~8 | Check Code | 2 bytes | A2 BF |

☑ Actual Pressure Value = Integer Pressure Value / Pressure Value Coefficient = 27 / 10000 = 0.0027

2.2 Read [Pressure Value] double-byte signed integer (low byte first)

| • Host Command: 02 04 00 01 00 02 20 38 | | | |
|---|--------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2~3 | Starting Channel | 2 bytes | 00 01 |
| 4~5 | Number of Channels | 2 bytes | 00 02 |
| 6~7 | Check Code | 2 bytes | 20 38 |

| • Slave Response: 02 04 04 18 00 10 27 83 FE | | | |
|--|------------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2 | Number of Data bytes | 1 byte | 04 |
| 3~4 | Integer Pressure Value | 2 bytes | 18 00(24) |
| 5~6 | Pressure Coefficient | 2 bytes | 10 27(10000) |
| 7~8 | Check Code | 2 bytes | 83 FE |

☑ Actual Pressure Value = Integer Pressure Value / Pressure Value Coefficient = 24 / 10000 = 0.0024

2.3 Read [Pressure Value] + [Temperature Value] double-byte signed integer (high byte first)

| • Host Command: 02 04 00 00 00 04 F1 FA | | | |
|---|--------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2~3 | Starting Channel | 2 bytes | 00 00 |
| 4~5 | Number of Channels | 2 bytes | 00 04 |
| 6~7 | Check Code | 2 bytes | F1 FA |

| • Slave Response: 02 04 08 00 1B 27 10 41 FB 03 E8 22 2F | | | |
|--|---------------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2 | Number of Data bytes | 1 byte | 08 |
| 3~4 | Integer Pressure Value | 2 bytes | 00 1B(27) |
| 5~6 | Pressure Coefficient | 2 bytes | 27 10(10000) |
| 7~8 | Integer Temperature Value | 2 bytes | 41 FB(16891) |
| 9~10 | Temperature Coefficient | 2 bytes | 03 E8(1000) |
| 11~12 | Check Code | 2 bytes | 83 FE |

- ⊕ Actual Pressure Value = Integer Pressure Value / Pressure Value Coefficient = 27 / 10000 = 0.0027
- ⊕ Actual Temperature Value = Integer Temperature Value / Temperature Value Coefficient = 16891/1000 =16.891°C

2.4 Read [Pressure Value] + [Temperature Value] double-byte signed integer (low byte first)

| • Host Command: 02 04 00 01 00 04 A0 3A | | | |
|---|--------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2~3 | Starting Channel | 2 bytes | 00 01 |
| 4~5 | Number of Channels | 2 bytes | 00 04 |
| 6~7 | Check Code | 2 bytes | A0 3A |

| • Slave Response: 02 04 08 1B 00 10 27 A8 46 E8 03 92 D5 | | | |
|--|---------------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2 | Number of Data bytes | 1 byte | 08 |
| 3~4 | Integer Pressure Value | 2 bytes | 1B 00(27) |
| 5~6 | Pressure Coefficient | 2 bytes | 10 27(10000) |
| 7~8 | Integer Temperature Value | 2 bytes | A8 46(18088) |
| 9~10 | Temperature Coefficient | 2 bytes | E8 03(1000) |
| 11~12 | Check Code | 2 bytes | 92 D5 |

- ⊗ Actual Pressure Value = Integer Pressure Value / Pressure Value Coefficient = 27 / 10000 = 0.0027
- ⊗ Actual Temperature Value = Integer Temperature Value / Temperature Value Coefficient = 18088/1000 =18.08°C

3.1 Read [Pressure Value] double-byte unsigned number [0-50000] proportional output

| • Host Command: 02 04 00 02 00 02 D0 38 | | | |
|---|--------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2~3 | Starting Channel | 2 bytes | 00 02 |
| 4~5 | Number of Channels | 2 bytes | 00 02 |
| 6~7 | Check Code | 2 bytes | D0 38 |

| • Slave Response: 02 04 04 00 3D 3D 00 49 D8 | | | |
|--|--------------------------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2 | Number of Data bytes | 1 byte | 04 |
| 3~4 | Pressure Ratio Value [High First] | 2 bytes | 00 3D(61) |
| 5~6 | Pressure Ratio Value [Low First] | 2 bytes | 3D 00 |
| 7~8 | Check Code | 2 bytes | 49 D8 |

- ⊗ Actual Pressure Value = Lower Range Limit +(Pressure Ratio Value/50000) x (Range Upper Limit - Range Lower Limit)

3.2 Read [Pressure Value] + [Temperature Value] double-byte unsigned number [0-50000] proportional output

| • Host Command: 02 04 00 02 00 04 50 3A | | | |
|---|--------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2~3 | Starting Channel | 2 bytes | 00 02 |
| 4~5 | Number of Channels | 2 bytes | 00 04 |
| 6~7 | Check Code | 2 bytes | 50 3A |

| • Slave Response: 02 04 08 00 68 68 00 42 E7 E7 42 A5 E9 | | | |
|--|--------------------------------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 04 |
| 2 | Number of Data bytes | 1 byte | 08 |
| 3~4 | Pressure Ratio Value [High First] | 2 bytes | 00 68(104) |
| 5~6 | Pressure Ratio Value [Low First] | 2 bytes | 68 00 |
| 7~8 | Temperature Ratio Value [High First] | 2 bytes | 42 E7(17127) |
| 9~10 | Temperature Ratio Value [Low First] | 2 bytes | E7 42 |
| 11~12 | Check Code | 2 bytes | A5 E9 |

- ⊗ Actual Pressure Value = Lower Range Limit + (Pressure Ratio Value/50000) x (Range Upper Limit - Range Lower Limit)
- ⊗ Actual Temperature Value = (Temperature Ratio Value/50000) x (200) - 50

3.3 Set the bus address [Range 1~247] (Original Address: 02 | New Address 03)

| • Host Command: 02 06 00 01 00 03 98 38 | | | |
|---|---------------|-----------------|-----------------|
| Sequence | Definiton | Number of bytes | Numerical Value |
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 06 |
| 2~3 | Aisle | 2 bytes | 00 01 |
| 4~5 | New Address | 2 bytes | 00 03 |
| 6~7 | Check Code | 2 bytes | 98 38 |

• **Successful Response from the Slave: 02 06 00 01 00 03 98 38**

| Sequence | Definiton | Number of bytes | Numerical Value |
|----------|---------------|-----------------|-----------------|
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 06 |
| 2 | Aisle | 2 bytes | 00 01 |
| 3~4 | New Address | 2 bytes | 00 03 |
| 5~6 | Check Code | 2 bytes | 98 38 |

3.4 Set Pressure Unit

• **Host Command: 02 06 00 02 00 05 E8 3A**

| Sequence | Definiton | Number of bytes | Numerical Value |
|----------|-------------------|-----------------|-----------------|
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 06 |
| 2~3 | Aisle | 2 bytes | 00 02 |
| 4~5 | New Pressure Unit | 2 bytes | 00 05(MPa) |
| 6~7 | Check Code | 2 bytes | E8 3A |

• **Successful Response from the Slave: 02 06 00 02 00 05 E8 3A**

| Sequence | Definiton | Number of bytes | Numerical Value |
|----------|-------------------|-----------------|-----------------|
| 0 | Slave Address | 1 byte | 02 |
| 1 | Function Code | 1 byte | 06 |
| 2 | Aisle | 2 bytes | 00 02 |
| 3~4 | New Pressure Unit | 2 bytes | 00 05 |
| 5~6 | Check Code | 2 bytes | E8 3A |

| Pressure Unit | |
|---------------|-----------|
| Unit Name | Unit Code |
| psi | 0 |
| bar | 1 |
| mbar | 2 |
| Pa | 3 |
| kPa | 4 |
| MPa | 5 |
| mm | 6 |
| cm | 7 |
| m | 8 |