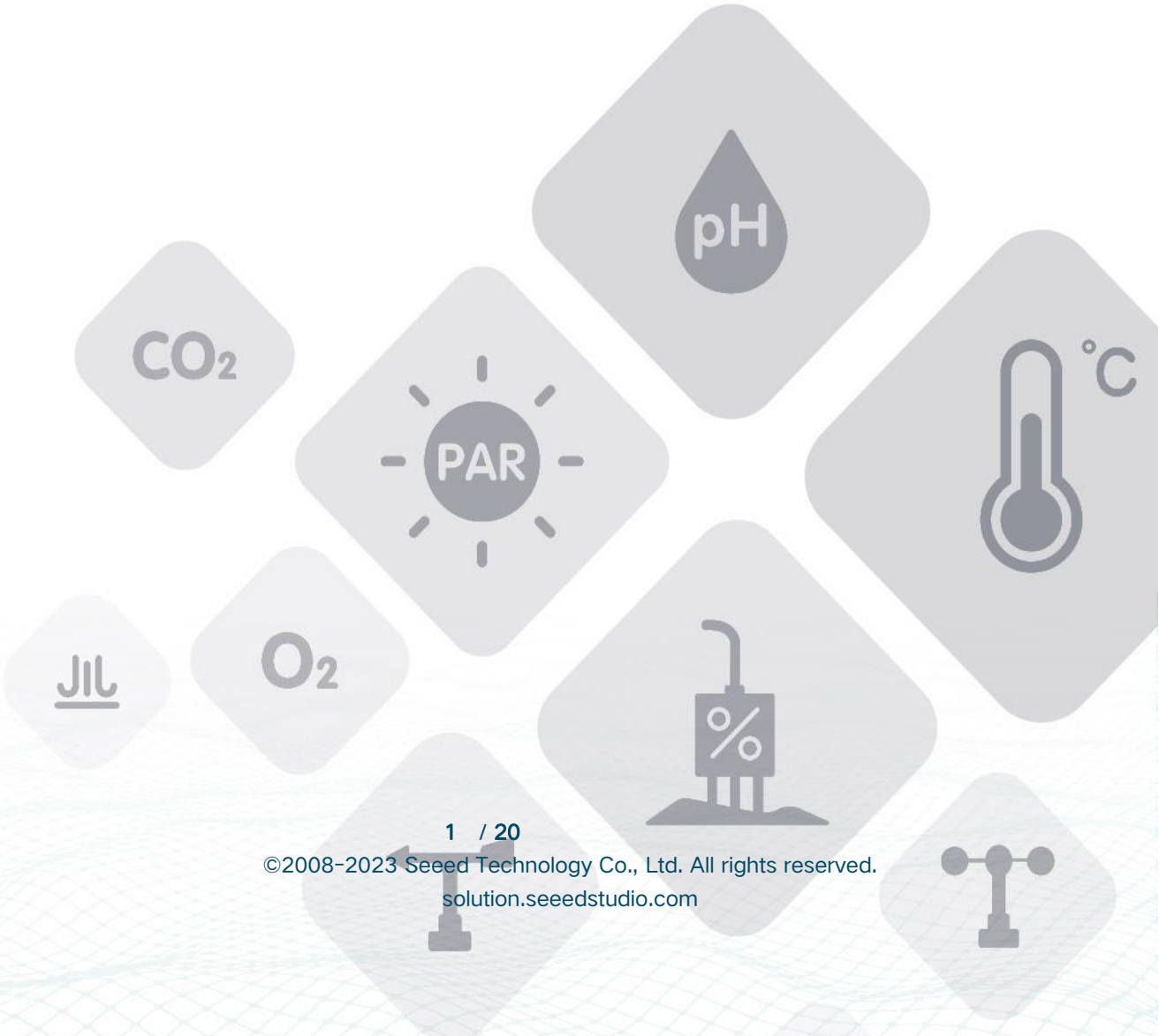
SENSECAP

pH Sensor Calibration

Version: V1.0



Content

1. Preparation

When performing the PH calibration, you should guarantee the temperature of the standard PH calibration solution is around 25°C. And wait a while for temperature and PH equilibrium after immersing the sensor into the standard solution. Please use PH=4.01, 7.00, 10.01 standard PH solution for calibration.

Get this things ready:

Picture	Type	Quantity
	pH Sensor	1
	pH Standard Solution	1
	Graduated Cylinder	1

1.2 Standard Solution

1. Prepare the standard solution and pour an appropriate amount of the solution into the graduated cylinder. Insert the probe electrode of the sensor into the solution in the graduated cylinder.

2. Calibration

1. Download the serial port tool.

2. Connect the pH sensor to the PC using the RS485-USB Converter and power up with the adapter.

Calibrate PH=4.01

1) Immerse the electrode into PH=4.01 solution and wait until the reading value being stable, then write 0x7FFF to modbus register 0x0030(PHCALIBRAWAD0 PH calibration point for PH=4.01).

2) Send "01 06 00 30 7F FF E9 B5" to calibrate 4.01, Example:
Request: 01 06 00 30 7F FF E9 B5
Response: 01 06 00 30 7F FF E9 B5

3) Send "01 03 00 01 00 01 D5 CA" to verify the returned PH value is around 4.01, Example:
Request: 01 03 00 01 00 01 D5 CA
Response: 01 03 02 01 8F F8 70
0x018F(HEX) is PH value 399(DECIMAL), PH=3.99

Calibrate PH=7.00

4) Immerse the electrode into PH=7.00 solution and wait until the reading value being stable, then write 0x7FFF to modbus register 0x0031(PHCALIBRAWAD1 PH calibration point for PH=7.00).

5) Send "01 06 00 31 7F FF B8 75" to calibrate 7.00, Example:
Request: 01 06 00 31 7F FF B8 75
Response: 01 06 00 31 7F FF B8 75

6) Send "01 03 00 01 00 01 D5 CA" to verify the returned PH value is around 7.00, Example:
Request: 01 03 00 01 00 01 D5 CA
Response: 01 03 02 02 BE 39 54
0x02BE(HEX) is PH value 702(DECIMAL), PH=7.02

Calibrate PH=10.01

7) Immerse the electrode into PH=10.01 solution and wait until the reading value being stable, then write 0x7FFF to modbus register 0x0032(PHCALIBRAWAD2 PH calibration point for PH=10.01).

8) Send "01 06 00 32 7F FF 48 75" to calibrate 10.01, Example:
Request: 01 06 00 32 7F FF 48 75
Response: 01 06 00 32 7F FF 48 75

9) Send "01 03 00 01 00 01 D5 CA" to verify the returned PH value is around 10.01, Example:
Request: 01 03 00 01 00 01 D5 CA
Response: 01 03 02 03 E9 79 3A
0x03E9(HEX) is PH value 1001(DECIMAL), PH=10.01

3.Maintenance

1. The electrode must be calibrated with a standard buffer solution of known pH value before measurement, and in order to improve the measurement accuracy, the buffer solution pH value should be reliable, and the closer to the measured value the better, generally not more than three pH values.
2. The sensitive glass bulb at the front of the electrode must not be in contact with hard objects, any breakage and wiping hair will make the electrode fail.
3. The electrode socket must be kept highly clean and dry, if there is tarnish, use medical cotton and anhydrous alcohol to clean and blow dry, absolutely prevent short-circuiting of the output terminals, otherwise it will cause measurement inaccuracy or failure.
4. Before measurement, the vapor bubble in the glass bubble should be shaken off, otherwise it will cause measurement error. During the measurement, the electrode should be stirred in the test solution and then placed at rest to speed up the response.
5. Clean the electrode with deionized water before and after measurement. To ensure the measurement accuracy, the electrodes should be washed with deionized water after the measurement in the viscous specimen. The electrodes should be washed with deionized water to remove the solvents.
6. The electrode will become passivated after a long period of use, which will result in a lower sensitivity gradient, slower response and inaccurate reading.

The lower bulb of the electrode can be soaked in 0.1MHCl solution for 24 hours (0.1M dilute hydrochloric acid preparation: 9ml of hydrochloric acid diluted with distilled water to 1000ml), and then soak it with 3Mkcl solution for several hours to restore its performance.)

7. Pollution of the glass bulb or blockage of the liquid contact surface will also make the electrode passivate.

For details, see the following table. (For reference)

Contaminants: Inorganic metal oxides
Organic grease
Resin polymers
Protein and blood cell precipitates

Cleaning agent: less than 1M dilute hydrochloric acid
Dilute detergent (weak alkaline)
Dilute alcohol. Acetone. Mirin
Acidic enzyme solution (such as pepsin, etc.)

4.Version

Version	Date	Description	Editor
V1.0		First edition	Yvonne