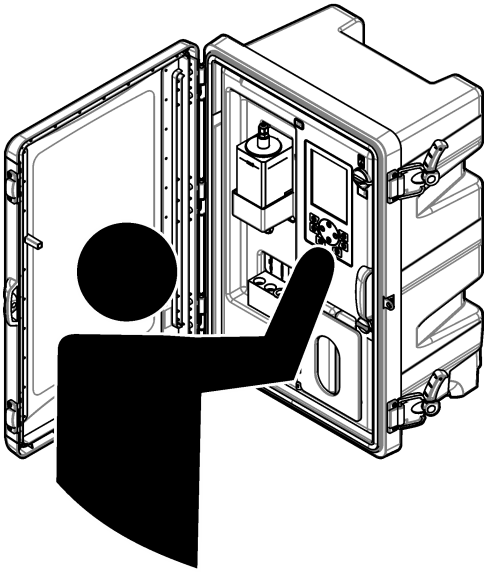
DOC023.97.80594

# Polymetron NA9600 sc $Na^+$

11/2018, Edition 1



**Operations**
**操作**

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## Safety information

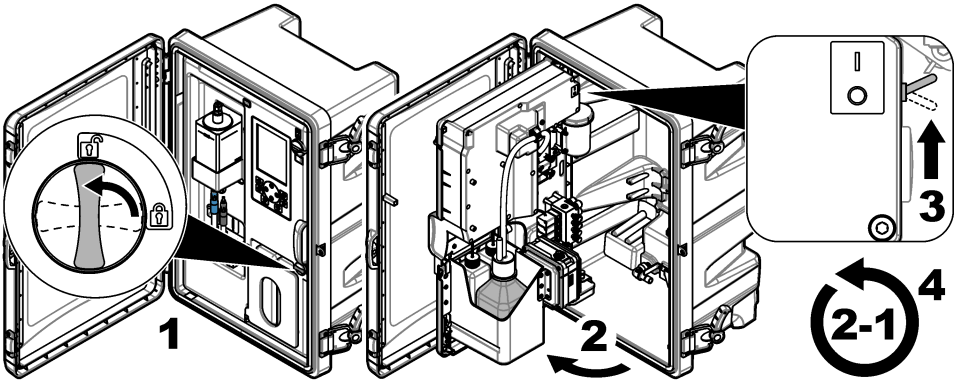
Refer to the installation user manual for general safety information, hazard descriptions and precautionary labels descriptions.

## Startup

Connect the power cord to an electrical outlet with protective earth ground.

## Set the power switch to on

Refer to the illustrated steps that follow.



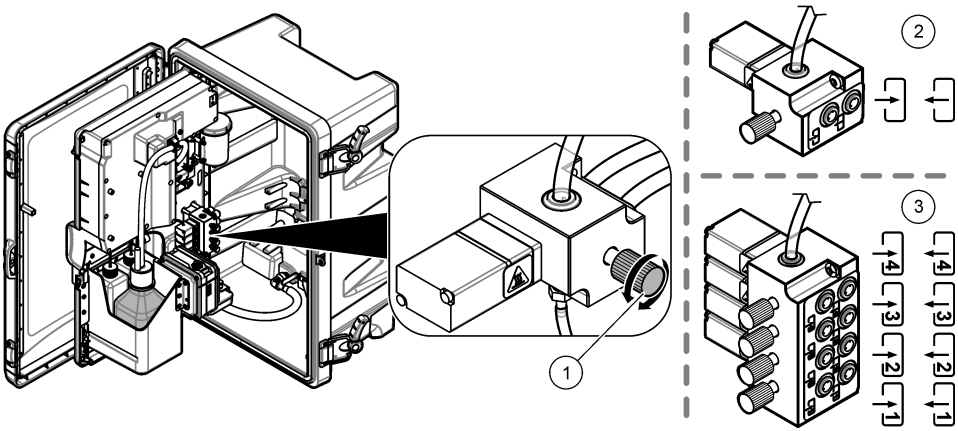

## Complete the startup wizard

1. If the startup wizard does not start automatically, push **menu** then select SETUP SYSTEM > STARTUP ANALYZER.
2. Follow the instructions on the display.

   - If prompted to set the channel sequence (measurement order), use the **UP** and **DOWN** arrows to select a row, then push the **LEFT** or **RIGHT** arrow to select the channel. S1 is the first channel measured followed by S2, S3 and S4.
     ***Note:*** *Do not select channels that contain the symbol "~" (e.g., 4-~SAMPLE4). Channels that contain the symbol "~" are not measured.*
   - When prompted to adjust the sample flow rate for a channel, turn the sample flow valve for the channel counter-clockwise to increase the flow rate or clockwise to decrease the flow rate. Refer to Figure 1.

   When the startup wizard is complete, the analyzer goes to measurement mode. The overflow vessel fills with sample water. Bubbles (conditioning gas) are seen in the right chamber of the measurement cell.
3. Become familiar with the keypad functions and the data shown on the measurement screen. Refer to User interface and navigation on page 5.
4. Configure the analyzer. Refer to Configuration on page 8.
5. Let the analyzer operate for 2 hours to become stable.
6. Do a calibration. Refer to Do a calibration on page 22.

**Figure 1 Sample flow valves**



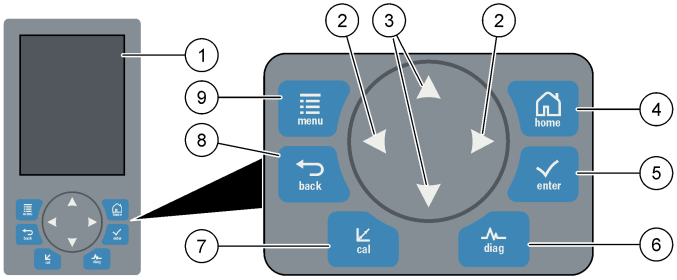

| | |
|---|---|
| **1** Sample flow valve | **3** Sample flow valves for 2- or 4-channel analyzer[1] |
| **2** Sample flow valve for 1-channel analyzer | |

# User interface and navigation

## Keypad description

Refer to Figure 2 for the keypad description and navigation information.

**Figure 2 Keypad description**




| | |
|---|---|
| **1** Display | **6** Diag: shows the Diag/Test Menu |
| **2** RIGHT and LEFT arrows: change the measurement screen and select options. Refer to Additional measurement screens on page 7. | **7** Cal: shows the Calibrate Menu |
| **3** UP and DOWN arrows: change the channel shown on the measurement screen, select options and enter values. | **8** Back: goes back to the previous screen |
| **4** Home: shows the measurement screen | **9** Menu: shows the main menu |
| **5** Enter | |

[1] A 2-channel analyzer only uses the bottom two valves.

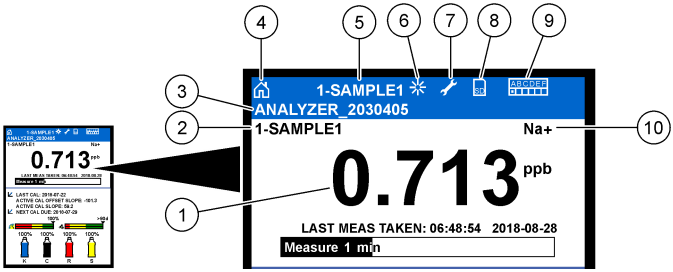
## Display description

Figure 3 shows the top half of the measurement screen. The top half of the measurement screen shows the status of the analyzer and the sodium concentration for one channel. To change the channel shown, push the **UP** or **DOWN** arrow. To show more than one channel, push the **RIGHT** arrow.

The background color of the display changes to show the status of the analyzer. Refer to Table 1. To show the active errors, warnings and reminders, push **diag** and select DIAGNOSTICS.

Figure 4 shows the bottom half of the measurement screen. The bottom half of the measurement screen shows the measurement quality, service status and solution levels.

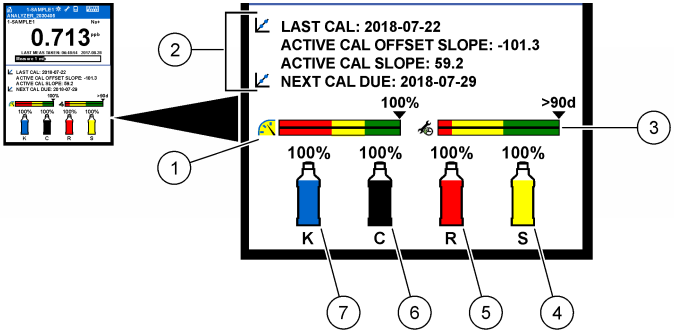
**Figure 3 Measurement screen—top**




| | |
|---|---|
| **1** Sodium concentration | **6** Activity (shown during a measurement or calibration process) |
| **2** Channel name[2] | **7** Reminder (maintenance is due) |
| **3** Analyzer name | **8** SD card (shown when a SD card is inserted) |
| **4** Home (measurement screen) | **9** Relays (active relays are white squares) |
| **5** Channel being measured | **10** Parameter measured ($Na^+$ = sodium) |

[2] For example, "1-SAMPLE1" is "Channel 1-SAMPLE1". SAMPLE1 is the default name for Channel 1. Channels that contain the symbol "~" are not measured (e.g., 4-~SAMPLE4).

**Figure 4 Measurement screen—bottom**




| | |
|---|---|
| **1** PROGNOSYS measurement quality indicator (refer to PROGNOSYS indicator bars on page 7) | **5** Reactivation solution level |
| **2** Calibration information | **6** Conditioning solution level |
| **3** PROGNOSYS service indicator (refer to PROGNOSYS indicator bars on page 7) | **7** KCl electrolyte level |
| **4** Calibration standard level[3] | |

**Table 1 Measurement screen—background colors**

| Color | Definition |
|---|---|
| White | The analyzer is in operation with no warnings, errors or reminders. |
| Yellow (warning or reminder) | The analyzer is in operation with active warnings. Wrench symbol shows on the display when the time for a maintenance task has passed. |
| Red (error) | The analyzer is not in operation due to an error condition. A serious problem has occurred. |

## PROGNOSYS indicator bars

The measurement quality indicator bar shows the overall measurement health of the analyzer (0 to 100%). The service indicator bar shows the number of days until a service task is necessary. Refer to Table 2.

To see the parameters that have an effect on the indicator bars, push **diag**, then select PROGNOSYS > MEASUREMENT INDICATOR or SERVICE INDICATOR.

**Table 2 PROGNOSYS color descriptions**

| Color | Measurement quality indicator bar | Service indicator bar |
|---|---|---|
| Green | The system is in good working condition and the health percentage is more than 75%. | There are at least 30 days until the next service task is necessary. |
| Yellow | The system needs attention to prevent a failure in the future. The health percentage is between 50 and 75%. | At least one service task is required in 1 to 30 days. |
| Red | The system needs immediate attention. The health percentage is below 50%. | One or more service tasks are required within 1 day. |

## Additional measurement screens

From the measurement screen, additional measurement screens are available:

- Single channel analyzers:

[3] Shows when the analyzer has the auto calibration option.

- Push the **LEFT** or **RIGHT** arrow to switch between the main display and a graphical display.

- Multi-channel analyzers:
  - Push the **UP** or **DOWN** arrow to change the channel shown and see the last measurement for the channel.
  - Push the **LEFT** or **RIGHT** arrow to show more channels and a graphical display.
  - In the graphical display, push the **UP** or **DOWN** arrow to show the graph for the previous or next channel. Refer to Graphical display on page 8 for additional options.

### Graphical display

The graphical display shows measurements for a maximum of four channels. The graph supplies easy monitoring of trends and shows changes in the process.

1. From the main measurement screen, push the **LEFT** arrow to show the graphical display.
   ***Note:*** *Push the **UP** or **DOWN** key to show the graph for the previous or next channel in sequence.*
2. Push **home** to change the graph settings.
3. Select an option.

| Option | Description |
|---|---|
| **MEASUREMENT VALUE** | Sets the measurement value range on the graph for the selected channel. Select between AUTO SCALE and MANUALLY SCALE. Enter the minimum and maximum ppb value in the MANUALLY SCALE menu. |
| **DATE & TIME RANGE** | Selects the date and time range to show on the graph: last day, last 48 hours, last week or last month. |

# Configuration

## Set the language

1. Push **menu**, then select SETUP SYSTEM > LANGUAGE.
2. Select the language that shows on the display and in the log files.

## Remove channels from the measurement screen (2- or 4-channel analyzers)

Remove the channels that are not measured (e.g., 4-~SAMPLE4) from the measurement screen. Change the order that the channels show on the measurement screen as necessary.

1. Remove the channels that are not measured (e.g., 4-~SAMPLE4) from the measurement screen as follows:
   a. Push **menu**, then select SETUP SYSTEM > DISPLAY SETUP > ADJUST ORDER > REMOVE MEASUREMENTS.
   b. Select the channels that contain the symbol "~" (e.g., 4-~SAMPLE4), then push **enter** two times.
      ***Note:*** *To add a channel to the measurement screen, select ADD MEASUREMENTS.*
2. To change the order that the channels show on the measurement screen, select an option.

| Option | Description |
|---|---|
| **SEE CURRENT ORDER** | Shows the order that channels show on the measurement screen. |
| **REORDER LIST** | Sets the order that channels show on the measurement screen. |
| **SEE DEFAULT ORDER** | Shows the default order that channels show on the measurement screen. |
| **SET TO DEFAULT** | Sets the order that channels show on the measurement screen to the default order. |

## Set the display brightness

1. Push **menu**, then select SETUP SYSTEM > DISPLAY SETUP > DISPLAY BACKLIGHT.
2. Enter a number from 1 to 9 (default: 5). Select a higher number to increase the brightness.

## Set the maximum rinsing time

Set the maximum time interval the analyzer rinses the measurement cell at startup and immediately after reactivation, grab sample measurement, calibration and prime reagents.

Rinsing removes the reactivation solution, grab sample or calibration standard from the measurement cell. The analyzer rinses the measurement cell with the sample from the next channel to be measured until the measurement is stable.

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > RINSE > MAX RINSE TIME.
2. Enter the maximum rinse time (10 to 100 minutes). The recommended setting is 45 minutes (default).

## Set the sample target pH (analyzer without cationic pump)

***Note:*** *This task only applies to analyzers without the optional cationic pump. Refer to Product overview in the installation manual to identify the cationic pump.*

Before the measurement, the analyzer increases the pH of the sample to between 10.7 and 11.4 with a conditioning solution to prevent ion interference. The analyzer automatically adjusts the quantity of the conditioning solution that is added to the sample to keep the sample pH constant.

Set the target sample pH as follows:

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > MEASUREMENT > PH TARGET.
2. Set the target pH (10.7 to 11.4). The recommended setting is pH 11.2 (default).

## Set the sample target pH (analyzer with cationic pump)

***Note:*** *This task only applies to analyzers with the optional cationic pump. Refer to Product overview in the installation manual to identify the cationic pump.*

Before the measurement, the analyzer increases the pH of the sample to between 11.2 and 11.4 with a conditioning solution to prevent ion interference. Set the ratio of the conditioning solution, which is added as a gas, and the sample for each channel (Tgas/Twater). The Tgas/Twater ratio is based on the pH of the unconditioned sample.

**Item to collect:** Calibrated pH sensor to put into the middle chamber of the measurement cell (or a pH test strip)

Set the Tgas/Twater ratio for each channel as follows:

1. Identify the pH of the sample for each channel before it goes into the analyzer.
2. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > MEASUREMENT > TGAS/TWATER.
3. Select the channels one at a time (e.g., TGAS/TWATER1 = Channel 1). Enter the applicable Tgas/Twater value from Table 3 (default: 20%).
4. Push **home**.
5. Let the analyzer operate for 1 hour to stabilize.
6. Identify if the conditioned sample pH is between 11.2 and 11.4 as follows:
   a. Remove the sodium electrode from the middle chamber of the measurement cell. Put the sodium electrode in deionized water to keep the electrode wet.
   b. Put a calibrated pH sensor in the middle chamber of the measurement cell.

**c.** For each channel, record the pH of the sample while the measurement status bar shows on the display.

**d.** If the pH of a sample(s) is not between 11.2 and 11.4, set the Tgas/Twater setting for the channel to a higher (or lower) percentage as necessary. Then, after 1 hour of operation, do step c again.

**e.** If the pH of a sample(s) is not between 11.2 and 11.4 when the Tgas/Twater is set to the maximum value, refer to "PH TOO LOW" in the troubleshooting table of the maintenance manual to identify the problem.

**7.** When the conditioned sample pH of each channel is between 11.2 and 11.4, install the sodium electrode back in the middle chamber of the measurement cell.

**Table 3 Tgas/Twater ratio**

| pH of sample | Tgas/Twater ratio | pH of sample | Tgas/Twater ratio |
|---|---|---|---|
| 2 | 200% | 2.9 | 30% |
| 2.3 | 80% | 3.5 | 21% |
| 2.6 | 50% | 4.0 | 18% |

## Set the measurement logging interval (1-channel analyzers)

Set the measurement logging interval. Measurements are saved to the data log at the measurement logging interval. In addition, the relays and analog outputs are updated at the measurement logging interval.

***Note:*** *This procedure applies to analyzers that can only be plumbed to one sample source. For analyzers that can be plumbed to more than one sample source, go to* Set the measurement logging interval (2- or 4-channel analyzers) *on page 11*.

**1.** Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > MEASUREMENT > SET MEASURE CYCLE > CYCLE TIME.

**2.** Enter the measurement logging interval (default: 10 minutes).

***Note:*** *The analyzer measures the sample continuously during the CYCLE TIME selected. The measurement shows on the display. At the end of the CYCLE TIME, the analyzer saves the average measurement for the last minute to the data log. In addition, the analyzer updates the relays and analog outputs so they represent the saved measurement.*

## Set the measurement logging interval (2- or 4-channel analyzers)

Set the measurement logging interval. Measurements are saved to the data log at the measurement logging interval. In addition, the relays and analog outputs are updated at the measurement logging interval.

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > MEASUREMENT > SET MEASURE CYCLE.
2. Select and configure each option. Select SEARCH STABILITY first.

| Option | Description |
|---|---|
| **SEARCH STABILITY** | Between channel measurements, the analyzer rinses the measurement cell with sample from the next channel to be measured for a set time interval (or until the measurement is stable).<br>**NO** (default)—Sets search stability to off. The analyzer rinses the measurement cell for a set time interval. As a result, the measurement logging interval is constant.<br>When SEARCH STABILITY is set to NO, the settings to configure are CYCLE TIME and ON LINE MEASURE time.<br>Measurement logging interval = CYCLE TIME<br>CYCLE TIME = ON LINE MEASURE time + Rinsing time (set value)<br>**YES**—Sets search stability to on. The analyzer rinses the measurement cell only until the measurement is stable, which minimizes the rinsing time. As a result, the measurement logging interval is variable.<br>When SEARCH STABILITY is set to YES, the settings to configure are MAX CYCLE TIME (maximum measurement logging interval) and ON LINE MEASURE time.<br>Measurement logging interval = ON LINE MEASURE time + Rinsing time (variable) |
| **ON LINE MEASURE** | Sets the amount of time the analyzer measures the channel (1 to 119 minutes, default: 10 minutes).<br>***Note:*** *The analyzer measures the channel continuously during the ON LINE MEASURE time. The measurement shows on the display. At the end of the ON LINE MEASURE time, the analyzer saves the average measurement for the last minute to the data log. In addition, the analyzer updates the relays and analog outputs so they represent the saved measurement.* |
| **MAX CYCLE TIME** | ***Note:*** *The MAX CYCLE TIME option only shows when SEARCH STABILITY is set to YES.*<br>Sets the maximum measurement logging interval (11 to 120 minutes, default: 45 minutes). Sets the maximum rinsing time. For example, if the MAX CYCLE TIME setting is 45 minutes and the ON LINE MEASURE setting is 10 minutes, the maximum rinsing time is 35 minutes. |
| **CYCLE TIME** | ***Note:*** *The CYCLE TIME option only shows when SEARCH STABILITY is set to NO.*<br>Sets the measurement logging interval (11 to 120 minutes, default: 45 minutes). Sets the rinsing time. For example, if the CYCLE TIME setting is 20 minutes and the ON LINE MEASURE setting is 10 minutes, the rinsing time is 10 minutes. |

## Set the reactivation schedule

With time, the sensitivity of the sodium electrode decreases because of the very low levels of sodium in the sample water. Auto reactivation adds a small quantity of reactivation solution to the measurement cell at regular intervals (e.g., 24 hours) to increase the sensitivity of the sodium electrode. Auto reactivation increases the accuracy of the analyzer measurements.

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > REACTIVATION > SET AUTO REACTIVATION.
2. Select an option.

| Option | Description |
|---|---|
| **ENABLE AUTO REACTIVATION** | **YES** (default)—Sets auto reactivation to on. **NO**—Sets auto reactivation to off.<br>***Note:*** *If reactivation is off, a reactivation is only done before a calibration.* |
| **TIME BASE** | **DAYS**—Sets auto reactivation to occur on selected days at a selected time (e.g., daily at 9:00 am). **HOURS** (default)—Sets a time interval between reactivations (e.g., 24 hours). |
| **WEEK DAY** | ***Note:*** *The WEEK DAY option only shows when TIME BASE is set to DAYS.*<br>Sets the days of the week that a reactivation is done. All of the days of the week are selected by default. The default setting is recommended. |
| **TIME** | ***Note:*** *The TIME option only shows when TIME BASE is set to DAYS.*<br>Sets the time a reactivation is done in 24-hour format (default: 12:00). |
| **SET INTERVAL** | ***Note:*** *The SET INTERVAL option only shows when TIME BASE is set to HOURS.*<br>Sets the time interval between reactivations (2 to 168 hours). The recommended time interval is 24 hours (default). |

## Set the measurement units

Set the measurement units that show on the measurement screen.

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > MEAS UNITS.
2. Select the measurement units (ppm, ppb, mg/L or µg/L).

## Set the signal average

Set the number of saved measurements the analyzer uses to calculate an average measurement (1–5). At the end of the measurement cycle, the analyzer saves the average measurement to the data log. In addition, the analyzer updates the relays and analog outputs so they represent the saved measurement. The signal average setting decreases variability in measurements.

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > SIGNAL AVERAGE.
2. Push the **UP** or **DOWN** arrow key to set the value. The default is 1 (no signal average used).

## Change the analyzer or channel names

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER.
2. Select an option.

| Option | Description |
|---|---|
| **EDIT ANALYZER NAME** | Changes the name of the analyzer. Enter a unique name, such as the analyzer location (16 characters maximum). The analyzer name shows on the measurement screen and the data logs. |
| **EDIT CHANNEL NAME** | Changes the name of the selected channel. Enter a unique name, such as the source of the sample water (10 characters maximum). The channel name(s) shows on the measurement screen and the data logs. |

## Start or stop measurements on a channel (2- or 4-channel analyzers)

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > CONFIGURE SEQUENCER > ACTIVATE CHANNELS.
2. Select a channel to start measurements. Unselect a channel to stop measurements. Push the **LEFT** arrow to select or unselect a checkbox.

## Change the channel measurement order (2- or 4-channel analyzers)

To change the order that the channels are measured, do the steps that follow:

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > CONFIGURE SEQUENCER > SEQUENCE CHANNELS.
2. Push the **UP** and **DOWN** arrows to select a row.

   ***Note:*** *S1 is the first channel measured, followed by S2, S3 and S4.*
3. Push the **LEFT** or **RIGHT** arrow to select a channel.
   ***Note:*** *Do not select channels that contain the symbol "~" (e.g., 4-~SAMPLE4). Channels that contain the symbol "~" are not measured.*

## Set the date and time

Set the date and time format and the date and time that show on the measurement screen and in the log files.

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > SET DATE/TIME.
2. Select an option.

| Option | Description |
|---|---|
| **DATE FORMAT** | Sets the date format (YYYY= year, MM=month and DD=day) and time format (12-hour or 24-hour). Default: YYYY-MM-DD 24 hours. |
| **DATE/TIME** | Sets the date and time. Use the arrow buttons to enter the date and time. |

## Configure the 4-20 mA analog outputs

If an analog output(s) in the analyzer is connected to an external device, select the channel represented at the analog output and the measurement range.

1. Enable an analog output as follows:
   a. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > SETUP OUTPUTS > 4-20 mA SETUP > [select an output].
   b. Select SELECT SOURCE > [analyzer name].
2. Select an option.

   ***Note:*** *Select SET PARAMETER first, then SET FUNCTION and then ACTIVATION.*

| Option | Description |
|---|---|
| **ACTIVATION** | The ACTIVATION options change based on the SET FUNCTION setting. Refer to the tables that follow to configure the analog output. |
| **SELECT SOURCE** | **NONE** (default)—Sets the analog output to disabled. **[analyzer name]**—Sets the analog output to enabled. |
| **SET PARAMETER** | Sets the channel represented at the analog output.<br>***Note:*** *Do not select a channel that contains the symbol "~" (e.g., 4-~SAMPLE4). Channels that contain the symbol "~" are not measured.* |

| Option | Description |
|---|---|
| **SET FUNCTION** | Sets the function of the analog output. Refer to the tables that follow for more information. **LINEAR CONTROL** (default)—The analog output is linearly dependent on the measurement value. **PID CONTROL**—The analog output operates as a PID (Proportional, Integral, Derivative) controller. **LOGARITHMIC**—The analog output is represented logarithmically within the measurement range. **BILINEAR**—The analog output is represented as two linear segments within the measurement range. |
| **SET TRANSFER** | Sets the value of the analog output when an error occurs if the ERROR HOLD MODE setting is set to TRANSFER OUTPUTS (0 to 25 mA, default: 4 mA). Refer to Set the error hold mode on page 21. |
| **SET FILTER** | Sets the amount of time for analog output averaging (0 to 999 seconds, default: 0 seconds). For example, if the value is set to 30 seconds, the value of the analog outputs is updated every 30 seconds and the value is the average of the analog output values during the previous 30 seconds. |
| **SCALE 0mA/4mA** | Sets the analog output value range to 0–20 mA or 4–20 mA (default). |

- **LINEAR CONTROL function**

| Option | Description |
|---|---|
| **SET LOW VALUE** | Sets the low measurement value that is represented as 0 or 4 mA at the analog output. |
| **SET HIGH VALUE** | Sets the high measurement value that is represented as 20 mA at the analog output. |

- **PID CONTROL function**

| Option | Description |
|---|---|
| **SET MODE** | **AUTO**—The analog value (mA) is automatically controlled by the algorithm when the analyzer uses proportional, integral and derivative inputs. **MANUAL**—The analog value (mA) is controlled by the user. To change the value manually, change the % value in MANUAL OUTPUT. |
| **PHASE** | **DIRECT**—The analog value increases as the measurement value increases. **REVERSE**—The analog value increases as the measurement value decreases. |
| **SET SETPOINT** | Sets a measurement value as the setpoint value. |
| **PROP BAND** | Sets a value for the difference between the measured value and the setpoint value. |
| **INTEGRAL** | Sets the time interval from the reagent injection point to the contact with the measuring device. |
| **DERIVATIVE** | Sets a value that adjusts for vacillation of the process. The majority of applications can be controlled without the use of the derivative setting. |
| **TRANSIT TIME** | Sets the value to stop the PID control for a selected period of time when the sample moves from the sample valve to the measurement electrode. |

- **LOGARITHMIC function**

| Option | Description |
|---|---|
| **SET 50% VALUE** | Sets the value corresponding to 50% of the process variable range. |
| **SET HIGH VALUE** | Sets the high endpoint (upper value) of the process variable range. |

- **BILINEAR function**

| Option | Description |
|---|---|
| **SET LOW VALUE** | Sets the low endpoint (lower value) of the process variable range. |
| **SET HIGH VALUE** | Sets the high endpoint (upper value) of the process variable range. |
| **SET KNEE POINT VALUE** | Sets the value at which the process variable range divides into another linear segment. |
| **SET KNEE POINT CURRENT** | Sets the value of the current at the knee point value. |

## Configure the relays

If a relay(s) in the analyzer is connected to an external device, select the triggers that set the relay to on (active). The relay status shows at the top-right corner of the measurement screen. Refer to Figure 3 on page 6.

***Note:*** *The Normally Open (NO) and Common (COM) relay contacts are connected when the relay is on. The Normally Closed (NC) and Common relay contacts are connected when an the relay is off.*

1. Enable a relay as follows:
   a. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > SETUP OUTPUTS > RELAY SETUP > [select a relay].
   b. Select SELECT SOURCE > [analyzer name].
2. Select an option.

   ***Note:*** *Select SET PARAMETER first, then SET FUNCTION and then ACTIVATION.*

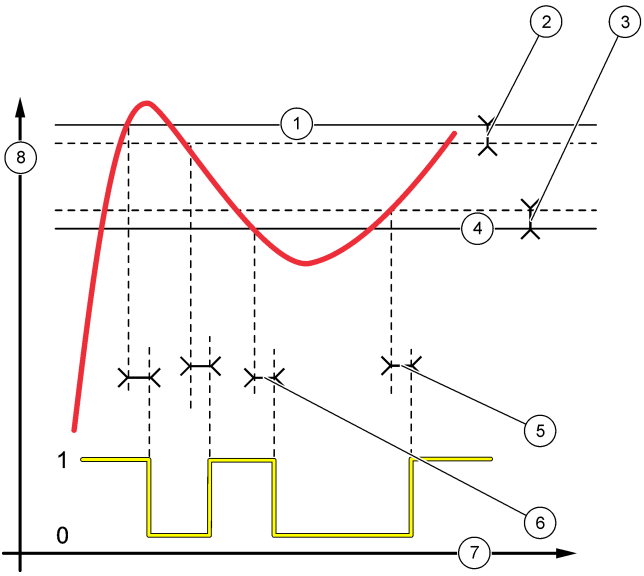
| Option | Description |
|---|---|
| **ACTIVATION** | The ACTIVATION options change based on the SET FUNCTION setting. Refer to the tables that follow to configure the relay. |
| **SELECT SOURCE** | **NONE**—Sets the relay to disabled. **[analyzer name]**—Sets the relay to enabled. |
| **SET PARAMETER** | Sets the channel represented at the relay.<br>***Note:*** *Do not select a channel that contains the symbol "~" (e.g., 4-~SAMPLE4). Channels that contain the symbol "~" are not measured.* |
| **SET FUNCTION** | **ALARM** (default)—Sets the relay to on when the measurement value is more than the high alarm value or less than the low alarm value. **FEEDER CONTROL**—Sets the relay to on if a measurement value is more (or less) than the setpoint value. **EVENT CONTROL**—The relay toggles if a process value reaches an upper or lower limit. **SCHEDULER**—Sets the relay to on at selected times regardless of the measurement value. **WARNING**—Sets the relay to on when there is a warning or error condition. **PROCESS EVENT**—Sets the relay to on when the analyzer does a selected operation. |
| **SET TRANSFER** | Sets the relay to active (on) or inactive (off) when an error occurs if the ERROR HOLD MODE setting is set to TRANSFER OUTPUTS. The default setting is INACTIVE (off). Refer to Set the error hold mode on page 21. |
| **FAIL SAFE** | **YES**—Sets the normal condition for the relays to be active (on). **NO**—Sets the normal condition for the relays to be inactive (off). |

- **ALARM function** (refer to Figure 5)

| Option | Description |
|---|---|
| **LOW ALARM** | Sets the value where the relay is set to on in response to decreasing measured value. For example, if the low alarm is set for 1.0 and the measured value drops to 0.9, the relay activates. |
| **HIGH ALARM** | Sets the value where the relay is set to on in response to increasing measured value. For example, if the high alarm is set for 1.0 and the measured value increases to 1.1, the relay activates. |

| Option | Description |
|---|---|
| **LOW DEADBAND** | Sets the range where the relay stays on after the measured value increases above the low alarm value. For example, if the low alarm is set for 1.0 and the low deadband is set for 0.5, the relay stays on between 1.0 and 1.5. |
| **HIGH DEADBAND** | Sets the range where the relay stays on after the measured value decreases below the high alarm value. For example, if the high alarm is set for 4.0 and the high deadband is set for 0.5, the relay stays on between 3.5 and 4.0. |
| **OFF DELAY** | Sets a delay time for the relay to be set to off. |
| **ON DELAY** | Sets a delay time for the relay to be set to on. |

**Figure 5 Alarm function**



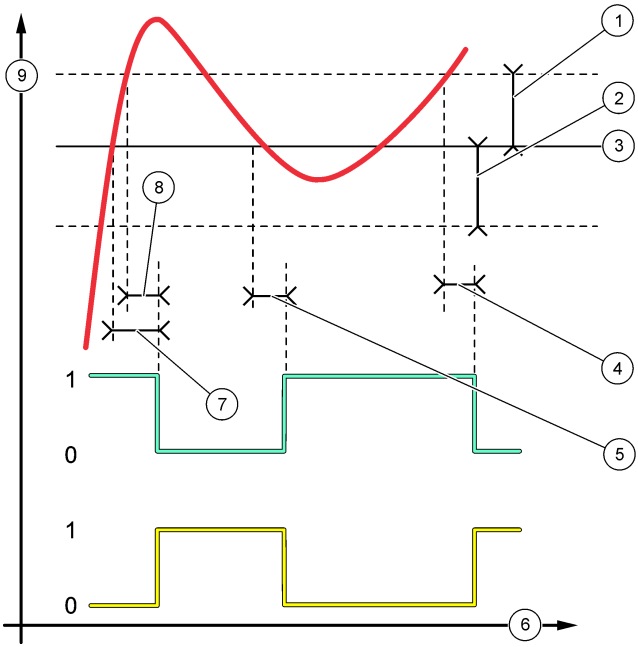

| | | |
|---|---|---|
| **1** High alarm | **4** Low alarm | **7** Time (x-axis) |
| **2** High deadband | **5** ON delay | **8** Source (y-axis) |
| **3** Low deadband | **6** OFF delay | |

- **FEEDER CONTROL function** (refer to Figure 6 and Figure 7)

| Option | Description |
|---|---|
| **PHASE** | **HIGH**—Sets the relay to on when the measured value is more than the setpoint value.<br>**LOW**—Sets the relay to on when the measured value is less than the setpoint value. |
| **SET SETPOINT** | Sets a measurement value as the setpoint value. |
| **DEADBAND** | Sets the deadband value for the relay. If PHASE is set to LOW, the relay stays on until the measurement value increases to more than the setpoint value plus the deadband value. If PHASE is set to HIGH, the relay stays on until the measurement value decreases to less than the setpoint value minus the deadband value. |
| **OVERFEED TIMER** | Sets a time limit for how long the relay can stay on. Once an overfeed alarm is present, it must be manually reset. Refer to Reset the overfeed timer for relays on page 21. |

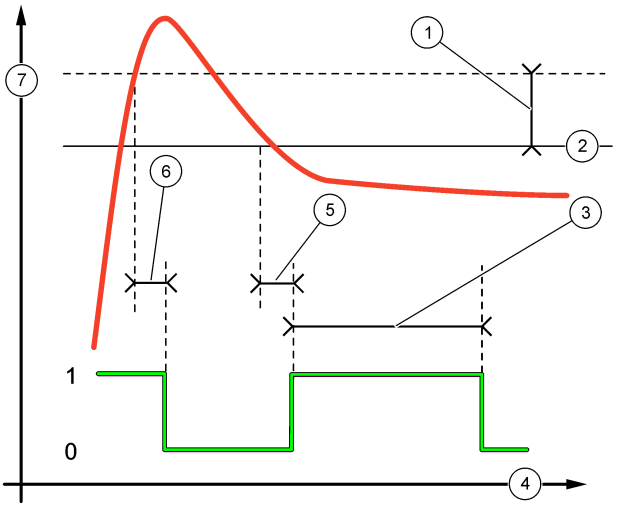
| Option | Description |
|---|---|
| **OFF DELAY** | Sets a delay time before the relay is set to off. |
| **ON DELAY** | Sets a delay time before the relay is set to on. |

**Figure 6 Feeder control function**




| | | |
|---|---|---|
| **1** Deadband (Phase = Low) | **4** OFF delay (phase set high) | **7** ON delay (phase set high) |
| **2** Deadband (Phase = High) | **5** ON delay (phase set low) | **8** OFF delay (phase set low) |
| **3** Setpoint | **6** Time (x-axis) | **9** Source (y-axis) |

**Figure 7 Feeder control function (phase low, overfeed timer)**

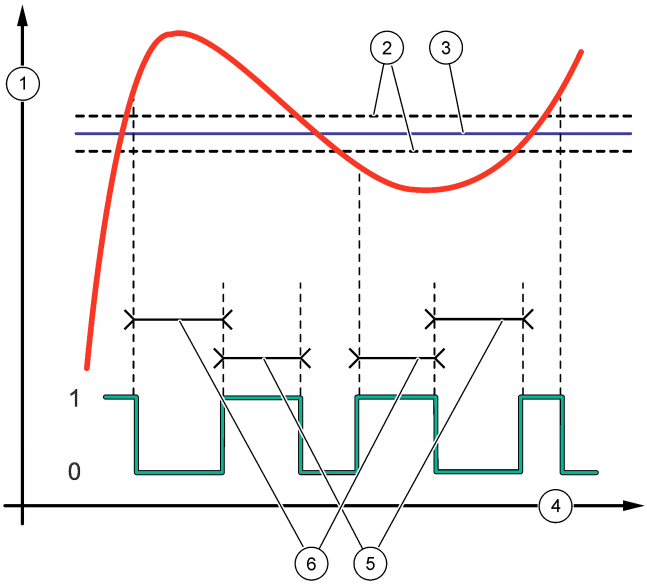



| | | |
|---|---|---|
| **1** Deadband | **4** Time (x-axis) | **7** Source (y-axis) |
| **2** Setpoint | **5** ON delay | |
| **3** Overfeed timer | **6** OFF delay | |

- **EVENT CONTROL function** (refer to Figure 8 and Figure 9)

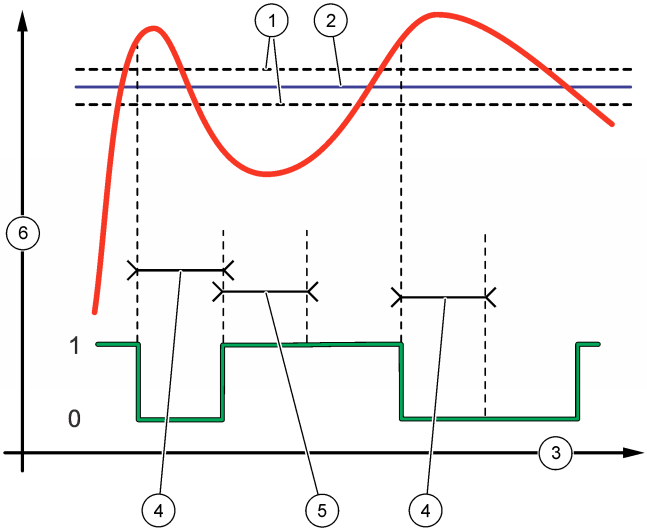
| Option | Description |
|---|---|
| **SET SETPOINT** | Sets a measurement value where the relay is set to on. |
| **DEADBAND** | Sets a hysteresis so the relay will not swing unregulated when the measurement value converges to the setpoint. |
| **OnMax TIMER** | Sets the maximum time the relay can stay on independent from the measured value. |
| **OffMax TIMER** | Sets the maximum time the relay can stay off independent from the measured value. |
| **OnMin TIMER** | Sets the minimum time the relay can stay on independent from the measured value. |
| **OffMin TIMER** | Sets the minimum time the relay can stay off independent from the measured value. |

**Figure 8 Event control function (no delay)**




| | | |
|---|---|---|
| **1** Source (y-axis) | **3** Setpoint | **5** OnMax-time |
| **2** Deadband | **4** Time (x-axis) | **6** OffMax-time |

**Figure 9 Event control function (OnMin timer, OffMin timer)**

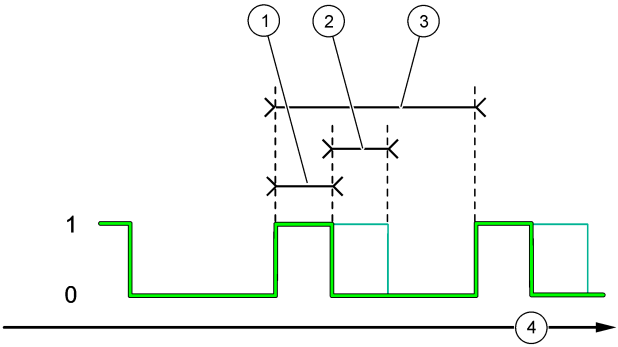



| | | |
|---|---|---|
| **1** Deadband | **3** Time (x-axis) | **5** OnMin timer |
| **2** Setpoint | **4** OffMin timer | **6** Source (y-axis) |

- **SCHEDULER function** (refer to Figure 10)

| Option | Description |
|---|---|
| **HOLD OUTPUTS** | Holds or transfers outputs for the selected channels. |
| **RUN DAYS** | Sets the days that the relay operates. |
| **START TIME** | Sets the start time. |
| **INTERVAL** | Sets the time between activation cycles (0 to 999 seconds, default: 0). |
| **DURATION** | Sets the period of time the relay is energized (0 to 999 seconds, default: 0). |
| **OFF DELAY** | Sets the time for additional hold/output time after the relay has been turned off (0 to 999 seconds, default: 0). |

**Figure 10 Scheduler function**




| | |
|---|---|
| **1** Duration | **3** Interval |
| **2** OFF delay | **4** Time (x-axis) |

- **WARNING function**

| Option | Description |
|---|---|
| **WARNING LEVEL** | Sets the relay to on when the selected warning(s) occurs. Push the **LEFT** arrow to select or unselect a checkbox. |

- **PROCESS EVENT function**

| Option | Description |
|---|---|
| **SELECT EVENTS** | Sets the relay to on when the selected process event(s) occurs. Push the **LEFT** arrow to select or unselect a checkbox.<br>**MEASURING 1, 2, 3 or 4**—Sets the relay to on during the measurement cycle of Channel 1, 2, 3 or 4.<br>**CALIBRATE**—Sets the relay to on during calibration.<br>**SHUTDOWN**—Sets the relay to on when in shutdown mode.<br>**STARTUP**—Sets the relay to on during the startup cycle.<br>**GRAB SAMPLE**—Sets the relay to on during grab sample measurement.<br>**MARK END OF MEASURE**—Sets the relay to on for 1 second at the end of each measurement cycle. |

### Reset the overfeed timer for relays

The overfeed timer setting for the relays prevents a condition that keeps the measurement value higher than the setpoint or deadband setting (e.g., damaged electrode or a process upset) from keeping a relay switched on continuously. The overfeed timer limits how long the relays and their connected control element stay on independent of the conditions.

When the select time interval for the overfeed timer expires, the relay status flashes on the top-right corner of the measurement screen until the overfeed timer is reset. Push **diag**, then select OVERFEED RESET to reset the overfeed timer.

## Set the error hold mode

If an analog output or relay in the analyzer is connected to an external device, select the error hold mode.

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > SETUP OUTPUTS > ERROR HOLD MODE.
2. Select an option.

| Option | Description |
|---|---|
| **HOLD OUTPUTS (default)** | Holds the relays and analog outputs at the last known value when an error occurs or measurements are stopped (e.g., calibration, rinse, reactivation or grab sample measurement). |
| **TRANSFER OUTPUTS** | Sets the relays and analog outputs to the transfer value set in the analog output and relay settings when an error occurs or measurements are stopped (e.g., calibration, rinse, reactivation or grab sample measurement). |

## Set the security settings

Enable passcode protection as necessary. Select the menu options that are passcode protected.

***Note:*** *Passcode protection is disabled by default.*

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > SECURITY SETUP.
2. Select an option.

| Option | Description |
|---|---|
| **SET PASS CODE** | **DISABLED** (default)—Sets the passcode protection to off. **ENABLED**—Sets the passcode protection to on. Enter the default passcode (HACH55). |
| **EDIT PASS CODE** | Changes the passcode (6 characters maximum). |
| **PROTECT FEATURES** | Selects the menu options that are passcode protected. The menu options that are selected are passcode protected. Push the **LEFT** arrow to select or unselect a checkbox. |

## Adjust the water level of the overflow vessel

***Note:*** *Only do this task if the analyzer has a calibration bottle. Refer to Product overview in the installation manual to identify the calibration bottle.*

The water level of the overflow vessel is important for accurate auto calibration. Before an auto calibration is done, adjust the water level so that the water is between the top mark (+) and the bottom mark (–). Make sure that the analyzer is level from front to back and side to side.

1. Wait until the overflow vessel is full of water.
2. If the water is higher than the top mark (+) or lower than the bottom mark (–) on the overflow vessel, do the steps that follow:

   **a.** Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > OVERFLOW COMPENSATION.

**b.** Select an option.

| Option | Description |
|---|---|
| **+** | Select when the water is higher than the top mark (+). |
| **0** | Select when the water is between the top mark (+) and than the bottom mark (–). |
| **–** | Select when the water is lower than the bottom mark (–). |

# Calibration

**⚠ CAUTION**

Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Read the safety data sheet from the supplier before bottles are filled or reagents are prepared. For laboratory use only. Make the hazard information known in accordance with the local regulations of the user.

## Set the auto calibration settings

***Note:*** *Only do this task if the analyzer has a calibration bottle. Refer to Product overview in the installation manual to identify the calibration bottle.*

Set the auto calibration schedule and select the channel used for calibrations. The manufacturer recommends that the analyzer is calibrated at 7-day intervals (weekly).

1. Push **cal**, then select SET AUTO CALIBRATION.
2. Select and configure each option.

| Option | Description |
|---|---|
| **ENABLE AUTO CAL** | **NO**—Sets auto calibration to off. **YES** (default)—Sets auto calibration to on. |
| **STD SOLUTION** | Sets the concentration of the calibration standard that is in the analyzer bottle (default: 10,000 ppb = 10 ppm).<br>***Note:*** *If the concentration of the calibration standard is 100 ppm or higher, set the measurement units setting to ppm.* |
| **TIME BASE** | **DAYS** (default)—Sets calibration to occur on selected days at a selected time (e.g., daily at 9:00 am). **HOURS**—Sets a time interval between calibrations (e.g., 168 hours = 7 days). |
| **WEEK DAY** | ***Note:*** *The WEEK DAY option only shows when TIME BASE is set to DAYS.*<br>Sets the days a calibration is done. An auto calibration is done weekly on Sunday by default. The recommended time interval between calibrations is 7 days. |
| **TIME** | ***Note:*** *The TIME option only shows when TIME BASE is set to DAYS.*<br>Sets the time a calibration is done (default: 02:00 = 2:00 am). |
| **SET INTERVAL** | ***Note:*** *The SET INTERVAL option only shows when TIME BASE is set to HOURS.*<br>Sets the time interval between calibrations. Options: 2 to 255 hours (default: 168 hours = 7 days). The recommended time interval between calibrations is 7 days. |
| **SELECT CAL CHANNEL** | Selects the channel used for calibrations (default: Channel 1).<br>***Note:*** *Do not select a channel that contains the symbol "~" (e.g., 4-~SAMPLE4). Channels that contain the symbol "~" are not measured.* |

## Do a calibration

Let the analyzer operate for 2 hours after initial startup (or storage) to become stable, then do a calibration.

Over time readings can drift to higher or lower than they should be. For the best accuracy, calibrate the analyzer at 7-day intervals (weekly).

1. Push **cal**, then select START CALIBRATION.
2. Select an option.

| Option | Description |
|---|---|
| **AUTO CAL MANUAL START** | ***Note:*** *This option is only available if the analyzer has the auto calibration option.*<br>Manually starts an auto calibration.<br>**Important:** Before an auto calibration is done, do the steps in Adjust the water level of the overflow vessel on page 21. |
| **MAN OFFSET CAL** | Starts a 1-point manual calibration. When prompted, add 200 mL of the calibration standard to the overflow vessel. The recommended standard is 100 ppb or 1000 ppb.<br>***Note:*** *Do not use a standard solution that is less than 100 ppb because it can quickly become contaminated, which changes the concentration.* |
| **MAN OFFSET +SLOPE CAL** | Starts a 2-point manual calibration. When prompted, add 200 mL of each calibration standard to the overflow vessel. The recommended standards are 100 ppb and 1000 ppb.<br>**Important:** The difference in temperature of the two calibration standards must not be more than ± 5 °C (9 °F). The second calibration standard must have a sodium concentration that is 5 to 10 times more than the first calibration standard (e.g., 100 ppb and 1000 ppb). A large difference between the sodium concentration of the calibration standards is necessary to get an accurate calibration.<br>***Note:*** *Do not use a standard solution that is less than 100 ppb because it can quickly become contaminated, which changes the concentration.* |

### Prepare calibration standards

To prepare a 100-ppb Na standard and a 1000-ppb Na standard to do a manual calibration, do the steps that follow. All volumes and quantities used to prepare the calibration standard must be precise.

**Items supplied by the user:**

- Volumetric flask (4x), 500 mL, Class A
- NaCl, 1.272 g
- Ultra pure water, 500 mL
- 1–10 mL TenSette pipet and tips

1. Prepare 500 mL of 1-g/L Na calibration standard as follows:
   a. Rinse the volumetric flask with ultra pure water three times.
   b. Add 1.272 g NaCl to the volumetric flask.
   c. Add 100 mL of ultra pure water to the volumetric flask.
   d. Shake the volumetric flask until the powder is fully dissolved.
   e. Add ultra pure water to the 500-mL mark.
   f. Shake the volumetric flask to fully mix the solution.
2. Prepare 500 mL of 100-ppm Na calibration standard as follows:
   a. Rinse the other volumetric flask with ultra pure water three times.
   b. Use a pipet to add 5 mL of the 1-g/L Na standard to the volumetric flask. Put the pipet in the flask to add the solution.
   c. Add ultra pure water to the 500-mL mark.
   d. Shake the volumetric flask to fully mix the solution.
3. Prepare 500 mL of 100-ppb Na calibration standard as follows:
   a. Rinse the other volumetric flask with ultra pure water three times.
   b. Use a pipet to add 5 mL of the 100-ppm Na standard to the volumetric flask. Put the pipet in the flask to add the solution.
   c. Add ultra pure water to the 500-mL mark.
   d. Shake the volumetric flask to fully mix the solution.

4. Prepare 500 mL of 1000-ppb Na calibration standard as follows:
   a. Rinse the other volumetric flask with ultra pure water three times.
   b. Use a pipet to add 50 mL of the 100-ppm Na standard to the volumetric flask. Put the pipet in the flask to add the solution.
   c. Add ultra pure water to the 500-mL mark.
   d. Shake the volumetric flask to fully mix the solution.
5. Keep the solutions that are not used in a clean plastic bottle. Rinse the bottle with ultra-pure water and then with a small amount of the calibration standard. Put a label on the bottle that identifies the solution and the date it was made.

## Show the calibration data

To see the results of the last calibration, push **cal** and select CALIBRATION DATA.

To see the results of the last ten calibrations, push **menu** and select VIEW DATA > LOG DATA > VIEW CALIBRATION LOG.

## Do a calibration verification

Do a calibration verification to identify if the analyzer is still calibrated.

1. Push **menu**, then select GRAB SAMPLE/VERIFICATION.
2. Select VERIFICATION, then push enter.
3. Follow the instructions on the display.
4. When prompted, add 200 mL of the calibration standard to the overflow vessel. The recommended standard is 100 ppb.

   ***Note:*** *Do not use a standard solution that is less than 100 ppb because it can quickly become contaminated, which changes the concentration.*

   **Important:** The temperature of the calibration standard must not be more than ± 5 °C (9 °F) different than the calibration standard that was used to calibrate the analyzer.
5. When the calibration verification is completed, do a calibration immediately if "FAIL" shows. If "PASS" shows, no action is necessary.

## Do a temperature calibration

Make sure that the temperature reading is accurate as necessary.

1. Remove the sodium electrode from the middle chamber of the measurement cell.
2. Put the sodium electrode in deionized water to keep it wet.
3. Put a calibrated temperature sensor in the middle chamber of the measurement cell.
4. Record the temperature reading.
5. Push **cal**, then select TEMPERATURE CAL.
   The sample temperature shows on the display.
6. Push **enter**.
7. If the recorded temperature and the temperature on the display are not the same, enter a temperature offset.
   For example, if the recorded temperature is 23 °C and the temperature on the display is 25 °C, then enter –2 °C.
8. Install the sodium electrode in the middle chamber of the measurement cell.

## Do a flow rate calibration

Make sure that the flow rate reading is accurate as necessary.

1. Push **menu**, then select STOP ANALYZER.
   ***Note:*** *If START ANALYZER shows, the analyzer is already in standby mode.*
2. Push **cal**, then select FLOW RATE CAL.
3. Wait for the calibration to complete (approximately 5 minutes).
4. Push **enter** to go to the measurement screen.
5. Push **menu**, then select START ANALYZER.

### Calibrate the 4-20 mA analog outputs

If an analog output in the analyzer is connected to an external devices, calibrate the analog output as necessary. The analog outputs are factory-calibrated. The adjustment range for analog output calibration is ± 2 mA.
***Note:*** *If an analog output is configured to be 0–20 mA, 4 mA and 20 mA are calibrated.*

1. Push **menu**, then select SETUP SYSTEM > CONFIGURE ANALYZER > SETUP OUTPUTS > OUTPUT CALIBRATION > [select an output].
2. Select an option.

| Option | Description |
|---|---|
| **CAL 4mA** | With a calibrated digital multimeter, measure the actual value supplied at the analog output. Adjust the value shown until the signal at the analog output is 4.00 mA. |
| **CAL 20mA** | With a calibrated digital multimeter, measure the actual value supplied at the analog output. Adjust the value shown until the signal at the analog output is 20.00 mA. |

## Operation

### Show the details of the current and the last measurement

Push **menu** and select VIEW DATA > MEASUREMENT DATA. Refer to Table 4.

**Table 4 Measurement data descriptions**

| Item | Description |
|---|---|
| LAST MEAS TIME | The time the last measurement was completed. |
| LAST MEAS CHANNEL | The last channel measured. |
| NEXT MEAS TIME | The time the next measurement will be completed. |
| NEXT MEAS CHANNEL | The next channel to be measured. |
| SAMPLE TEMPERATURE | The temperature of the channel in use. |
| FLOW RATE | The flow rate of the channel in use. |
| LAST CONC | The sodium concentration of the last channel measured. |
| CONCENTRATION | The sodium concentration of the channel in use. |
| RAW POTENTIAL | The real time mV signal. The potential between the two electrodes. |
| AVERAGE POTENTIAL | The six second average (approximately) of the mV signal. |
| COMPENSATED POTENTIAL | The temperature compensated mV value (potential) at 25 °C. |
| MEAS STABLE | Identifies if the measurement is stable (0 to 100). The larger the value, the more stable the measurement. |
| pH[4] | The adjusted pH of the channel in use. |

[4] The pH value does not show if the optional cationic pump is installed.

**Table 4 Measurement data descriptions (continued)**

| Item | Description |
|---|---|
| CONDUCTIVITY | The conductivity of the channel in use. |
| TGAS | The time for gas (conditioning solution) during pH conditioning. |
| TWATER | The time for water (sample) during pH conditioning. |

## Measure a grab sample

The analyzer can measure a water sample that is added to the overflow vessel. Make sure that the specifications of the water sample are as follows:

- **Sodium concentration**[5]—Analyzer **without** a cationic pump: 20 to 10,000 ppb; Analyzer **with** a cationic pump: 20 ppb to 200 ppm.
- **pH**—Analyzers without cationic pump: 6 to 10 pH; Analyzers with cationic pump: 2 to 10 pH
- **Temperature**[6]—5 to 45 °C (41 to 113 °F)
- **Acidity** (equivalent $CaCO_3$)—Analyzer **without** a cationic pump: less than 50 ppm; Analyzer **with** a cationic pump: less than 250 ppm
- **Suspended solids**—Less than 2 NTU with no oil or grease

Measure a water sample as follows:

1. Collect a minimum of 200 mL of a water sample in a clean container.
2. Push **menu**, then select GRAB SAMPLE/VERIFICATION.
3. Select GRAB SAMPLE, then push enter.
4. Follow the instructions on the display.
5. When prompted, add the water sample to the overflow vessel until the water level is between the top mark (+) and the bottom mark (-). Push **enter**.
   When the measurement is done, the results show on the display.

## Show the measurement, calibration and event logs

***Note:*** *The analyzer stores a maximum of 18,000 data points. After 18,000 data points are stored, the oldest data points are overwritten with new data.*

1. Push **menu** and select VIEW DATA > LOG DATA.
2. Select an option.

| Option | Description |
|---|---|
| **VIEW DATA LOG** | Shows the saved measurements. |
| **VIEW EVENT LOG** | Shows the events that have occurred. |
| **VIEW CALIBRATION LOG** | Shows the saved calibrations. |
| **VIEW GRAB SAMPLE LOG** | Shows the saved grab sample measurements. |

3. Select an option.

| Option | Description |
|---|---|
| **START TIME** | Shows the data recorded after the selected date and time. |

[5] A grab sample that has a sodium concentration of less than 20 ppb is not recommended.
[6] For the best accuracy (± 5% from 20 ppb to 10 ppm), make sure that the grab sample is at the same temperature (± 5 °C) as the calibration standard used for calibration.

| Option | Description |
|---|---|
| **NUMBER OF HOURS** | Shows the data recorded within the selected number of hours before now. |
| **NUMBER OF READINGS** | Shows the selected number of data points. |

## Save data or settings to an SD card

Save the data logs to an SD card to use the data on a PC as necessary. Save the analyzer settings to an SD card so the settings can be restored later or copied to another analyzer as necessary.

**Items to collect:**

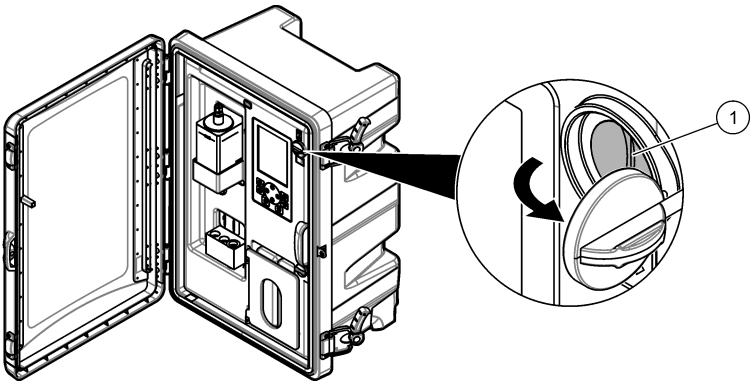
- SD card (2 GB or more)
- PC with SD card slot

1. Put an SD card in the SD card slot (2 GB minimum). Refer to Figure 11.
2. Push **menu**, then select SD CARD SETUP.
3. Select an option.

| Option | Description |
|---|---|
| **UPGRADE SOFTWARE** | ***Note:*** *The UPGRADE SOFTWARE option only shows when a software update file is on the SD card.*<br>Installs the software update file that is on the SD card. Refer to Install the latest software version on page 28. |
| **SAVE LOGS** | Saves the data log file to the HACH/Logs/ANALYZER_xxxx folder on the SD card. Open the data log file, ANALYZER_NAME_DL.xml, with Internet Explorer or Excel.<br>Saves the event log file to the HACH/Logs/ANALYZER_xxxx folder on the SD card in CSV (comma-separated value) file format. Open the event log file, ANALYZER_NAME_EL.csv, with Excel.<br>Options: LAST DAY, LAST WEEK, LAST MONTH, ALL or NEW.<br>***Note:*** *To save the other logs files to the SD card, refer to the WORK WITH DEVICES option.* |
| **MANAGE CONFIGURATION** | **BACKUP SETTINGS**—Saves the analyzer settings to the SD card. **TRANSFER SETTINGS**—Installs the analyzer setting saved to the SD card on the analyzer. |
| **WORK WITH DEVICES** | **READ DEVICE FILES**—Saves the selected device data to the HACH/Devices folder on the SD card in CSV file format. Options: GRAB SAMPLE DATA, CAL HISTORY, SENSOR DIAG, MEASUREMENT DATA (curve data for calibrations and grab sample measurements) and SERVICE HISTORY. **WRITE DEVICE FILE**—Installs a new version of the measurement cycle script.<br>***Note:*** *The WRITE DEVICE FILE option only shows when a new version of the measurement cycle script is on the SD card.* |

4. When done, remove the SD card from the analyzer.
5. Install the cover for the SD card slot to keep the environmental rating of the enclosure.

**Figure 11 SD card slot location**




| | |
|---|---|
| **1** | SD card slot |

## Install the latest software version

Install the latest software version on the analyzer. The analyzer settings do not change when a new software version is installed. Data saved to the analyzer is not deleted when a new software version is installed.

***Note:*** *To identify the software version that is installed on the analyzer, push* ***menu*** *and select VIEW DATA > ANALYZER DATA. Look for "SOFTWARE VERS".*

**Items to collect:**

- SD card (2 GB or more)
- PC with SD card slot and internet access

1. Put the SD card in the PC.
2. Download the latest software as follows:
   a. Go to http://www.hach.com.
   b. Search for "Polymetron NA9600sc analyzer".
   c. Select the "Downloads" tab. Scroll down to "Software/Firmware".
   d. Click the link for the software download. Select **Open**. A Hach folder shows.
3. Copy the HACH folder to the SD card.
4. Remove the SD card from the PC.
5. Hold the SD card so that the label points to the right. Put the SD card in the SD card slot on the analyzer. Refer to Figure 11 on page 28.
6. Push **menu**, then select SD CARD SETUP > UPGRADE SOFTWARE.
7. When the installation is complete, push **enter** to reboot the analyzer.
8. Install the new measurement cycle script as follows:
   a. Push **menu**, then select SD CARD SETUP > WORK WITH DEVICES > WRITE DEVICE FILE.
   b. When the installation is complete. set the power switch to off (down). Refer to Startup on page 3.
   c. Wait 10 seconds, then set the power switch to on (up).
9. Remove the SD card from the analyzer.
10. Install the cover for the SD card slot to keep the environmental rating of the enclosure.

## Install the latest HART module firmware

Install the latest HART module firmware on the analyzer.

**Items to collect:**

- SD card (2 GB or more)
- PC with SD card slot and internet access

1. Put the SD card in the PC.
2. Download the latest HART firmware as follows:
   a. Go to http://www.hach.com.
   b. Search for "Polymetron NA9600sc analyzer".
   c. Select the "Downloads" tab. Scroll down to "Software/Firmware".
   d. Click the link for the HART module firmware download. Select **Open**. A Hach folder shows.
3. Copy the HACH folder to the SD card.
   ***Note:*** *The HART module firmware is the bin file in \HACH\Firmware\HART 0_32768.*
4. Remove the SD card from the PC.
5. Hold the SD card so that the label points to the right. Put the SD card in the SD card slot on the analyzer. Refer to Figure 11 on page 28.
6. Push **menu**, then select SD CARD SETUP > UPGRADE SOFTWARE > NETWORK CARD.
7. When the installation is complete, push **enter** to reboot the analyzer.
8. Remove the SD card from the analyzer.
9. Install the cover for the SD card slot to keep the environmental rating of the enclosure.

# 目录



# 安全信息

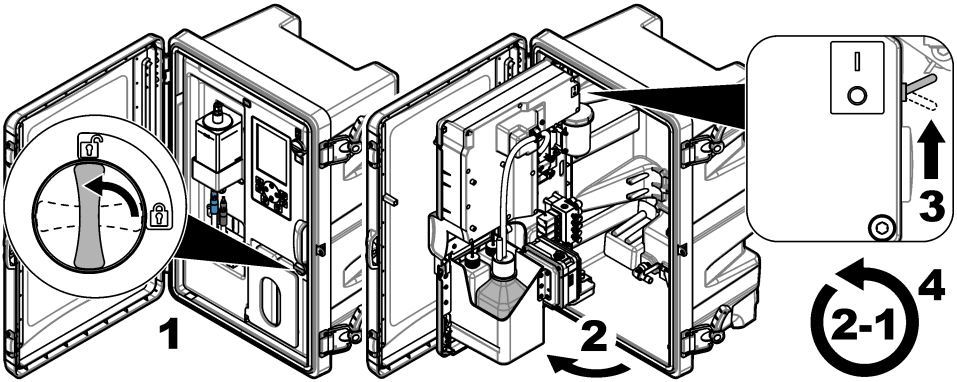
请参阅用户安装手册，了解一般性安全信息、危险说明和警告标签说明。

# 启动

将电源线连接至带保护接地的电源插座。

## 将电源开关设置为开

请参阅以下图示步骤。

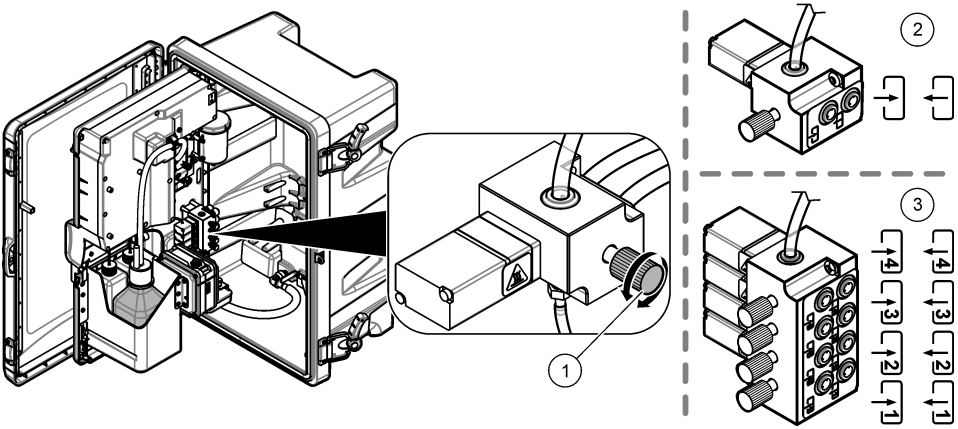



## 完成启动向导

1. 如果启动向导未自动开始，则按 **menu（菜单）**，然后选择“设置系统 > 启动分析仪”。
2. 请按显示屏上的指示操作。
   - 如果提示您设置通道顺序（测量顺序），则按**向上**和**向下**箭头选择一行，然后按**向左**或**向右**箭头选择通道。S1 是首个被测量的通道，然后是 S2、S3 和 S4。
     ***注：*** *不要选择含有符号“~”（例如 4-~SAMPLE4）的通道。含有符号“~”的通道不会被测量。*
   - 当提示调节通道的水样流速时，可逆时针或顺时针转动相应通道的水样流量阀以增大或减小流量。请参见图 1。

   启动向导结束后，分析仪进入测量模式。溢流池加有水样。在测量池的右侧孔位中可以看到气泡（调节气体）。
3. 熟悉键盘功能和测量屏幕上显示的数据。请参见用户界面及导航 第 32 页。
4. 配置分析仪。请参见配置 第 35 页。
5. 让分析仪工作 2 小时以达到稳定状态。
6. 执行校准。请参见执行校准 第 47 页。

**图 1 水样流量阀**



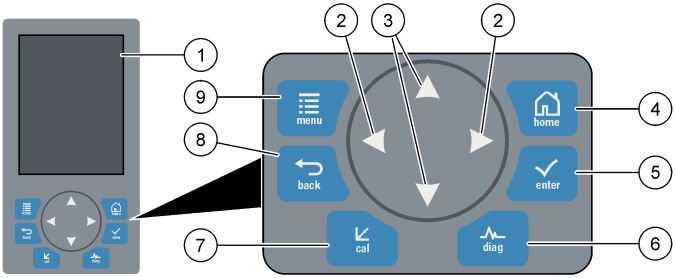

| | |
|---|---|
| **1** 水样流量阀 | **3** 2 或 4 通道分析仪的水样流量阀 [1] |
| **2** 1 通道分析仪的水样流量阀 | |

# 用户界面及导航

## 键盘说明

有关键盘说明和导航信息，请参阅图 2。

**图 2 键盘说明**




| | |
|---|---|
| **1** 显示屏 | **6** Diag（诊断）：显示诊断/测试菜单 |
| **2** 向右和向左箭头：更改测量屏幕和选择选项。请参阅附加测量屏幕 第 34 页。 | **7** Cal（校准）：显示校准菜单 |
| **3** 向上和向下箭头：更改测量屏幕上显示的通道、选择选项和输入值。 | **8** Back（返回）：返回上一屏幕 |
| **4** Home（主页）：显示测量屏幕 | **9** Menu（菜单）：显示主菜单 |
| **5** Enter（输入） | |

## 显示描述

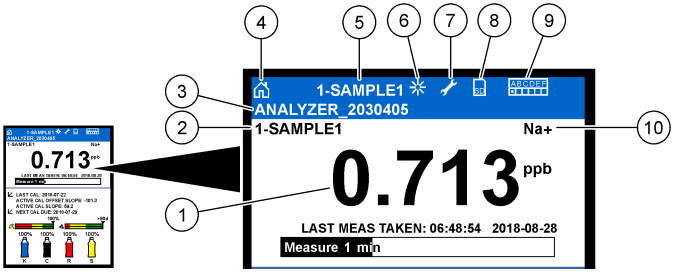
图 3 显示了测量屏幕的上半部分。测量屏幕的上半部分显示分析仪的状态和一个通道的钠离子浓度。要更改所示通道，请按**向上**或**向下**箭头。要显示多个通道，按**向右**箭头。

[1] 2 通道分析仪仅使用底部的两个阀门。

分析仪的状态通过显示屏的背景颜色变化来显示。请参见表 1。要显示活跃的错误、警告和提醒，按 **diag（诊断）**，然后选择诊断。

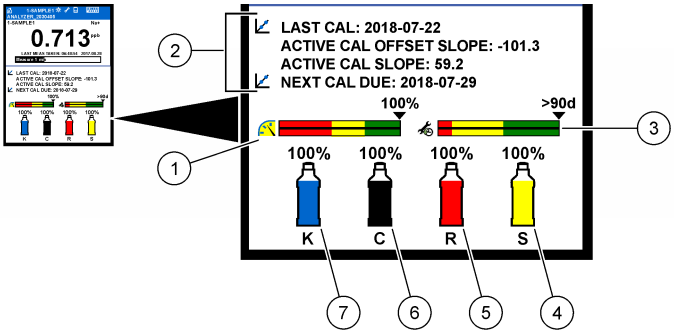
图 4 显示了测量屏幕的下半部分。测量屏幕的下半部分显示测量质量、维护状态和溶液液位。

**图 3 测量屏幕—上部**




| | |
|---|---|
| **1** 钠离子浓度 | **6** 活动（在测量或校准过程中显示） |
| **2** 通道名称 [2] | **7** 提醒（维护到期） |
| **3** 分析仪名称 | **8** SD 卡（插入 SD 卡时显示） |
| **4** Home（主屏幕）（测量屏幕） | **9** 继电器（启用的继电器对应显示白色方块） |
| **5** 当前测量通道 | **10** 测量的参数（$Na^+$ = 钠离子浓度） |

**图 4 测量屏幕—下部**




| | |
|---|---|
| **1** PROGNOSYS 测量质量指示条（请参阅 PROGNOSYS 指示栏 第 34 页） | **5** 活化液液位 |
| **2** 校准信息 | **6** 调节试剂液位 |
| **3** PROGNOSYS 维护指示条（请参阅 PROGNOSYS 指示栏 第 34 页） | **7** 氯化钾电解液液位 |
| **4** 校准溶液液位 [3] | |

[2] 例如，“1-SAMPLE1”表示“通道 1-SAMPLE1”。SAMPLE1 是通道 1 的默认名称。含有符号“~”的通道（例如 4-~SAMPLE4）不会被测量。

[3] 当分析仪具有自动校准选项时显示。

**表 1 测量屏幕—背景颜色**

| 颜色 | 定义 |
|---|---|
| 白色 | 分析仪正在运行，无警告、错误或提醒。 |
| 黄色（有警告或提醒） | 分析仪正在运行，有活跃警告。如果超过了应当执行维护任务的时间，显示屏上会显示扳手符号。 |
| 红色（错误） | 分析仪未在运行，因为出现错误状况。发生了一个严重问题。 |

## PROGNOSYS 指示栏

测量质量指示条显示分析仪的整体测量健康状况（0 至 100%）。维护指示条显示距离需要执行维护任务还有多少天。请参见表 2。

要查看影响指示条的参数，请按 **diag（诊断）**，然后选择“PROGNOSYS > 测量指示灯”或“维护指示灯”。

**表 2 PROGNOSYS 颜色说明**

| 颜色 | 测量质量指示条 | 维护指示条 |
|---|---|---|
| 绿色 | 系统运行状况良好，健康百分比超过 75%。 | 还有至少 30 天才需要执行下一次维护任务。 |
| 黄色 | 需要注意系统，防止以后出现故障。健康百分比介于 50%～75% 之间。 | 在 1 至 30 天内至少需要执行一次维护任务。 |
| 红色 | 系统需要立即引起注意。健康百分比低于 50%。 | 在 1 天内需要执行一次或多次维护任务。 |

## 附加测量屏幕

测量屏幕中提供了附加测量屏幕：

- 单通道分析仪：
  - 按**向左**或**向右**箭头可在主显示与图形显示之间切换。
- 多通道分析仪：
  - 按**向上**或**向下**箭头可更改显示的通道和查看通道的上次测量值。
  - 按**向左**或**向右**箭头可显示更多通道和图形显示。
  - 在图形显示中，按**向上**或**向下**箭头可显示上一个或下一个通道的图形。请参阅 图形显示 第 34 页 更多选项。

## 图形显示

图形显示功能最多显示四个通道的测量值。图形易于监控趋势，并会显示过程的变化。

1. 在主测量屏幕中按 **LEFT（向左）**箭头显示图形显示。
   ***注：** 按 **UP（向上）**或 **DOWN（向下）**键按序显示前一或下一通道的图形。*
2. 按 **home（主屏幕）**更改图形设置。
3. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **测量数据值** | 为选定的通道设置图形上的测量值范围。在自动定标与手动定标之间进行选择。在“手动定标”菜单中输入最大和最小 ppb 值。 |
| **日期时间范围** | 选择图形上显示的日期和时间范围：前一天、最近 48 小时、上一周或上一月。 |

# 配置

## 设置语言

1. 按 **menu（菜单）**，然后选择“设置系统 > 语言”。
2. 选择显示屏上以及日志文件中的显示语言。

## 删除测量屏幕 上的通道（2 通道或 4 通道分析仪）

从测量屏幕中删除不用测量的通道（例如 4-~SAMPLE4）。根据需要更改通道在测量屏幕上的显示顺序。

1. 按如下步骤从测量屏幕中删除不用测量的通道（例如 4-~SAMPLE4）：
   a. 按 **menu（菜单）**，然后依次选择“设置系统 > 显示设置 > 调整顺序 > 删除测量数据”。
   b. 选择含有符号“~”的通道（例如 4-~SAMPLE4），然后按 **enter（回车）** 两次。
   ***注：*** *要添加一个通道到测量屏幕上，选择添加测量数据。*
2. 要更改通道在测量屏幕上的显示顺序，请选择一个选项。

| 选项 | 说明 |
|---|---|
| **查看当前顺序** | 显示通道在测量屏幕上的显示顺序。 |
| **列表重新排序** | 设置通道在测量屏幕上的显示顺序。 |
| **查看默认顺序** | 显示通道在测量屏幕上的默认显示顺序。 |
| **设置为默认** | 将通道在测量屏幕上的显示顺序设为默认顺序。 |

## 设置显示屏亮度

1. 按 **menu（菜单）**，然后选择“设置系统 > 显示设置 > 显示屏背光”。
2. 输入 1 ～ 9 之间的一个数字（默认：5）。选择较大的数字可增加亮度。

## 设置最长冲洗时间

设置分析仪在启动时以及在活化、抓样测量、校准和灌注试剂之后冲洗测量池的最长时间间隔。

冲洗操作的目的是清除测量池中残留的活化溶液、抓样或校准标准液。分析仪使用下一个待测通道的样品冲洗测量池，直到测量数据稳定为止。

1. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 冲洗 > 最长冲洗时间”。
2. 输入最长冲洗时间（10 - 100 分钟）。推荐设置为 45 分钟（默认值）。

## 设置样品的目标 pH 值（未配备阳床泵的分析仪）

***注：*** *只有未选配阳床泵的分析仪需要完成此任务。要识别阳床泵，请参阅安装手册中的产品概览部分。*

测量之前，分析仪会用调节溶液将样品的 pH 值调高至 10.7 和 11.4 之间，以防受到离子干扰。分析仪会自动调节添加至样品中的调节溶液的份量，以保持样品 pH 值恒定。

按照以下步骤设置水样的目标 pH 值：

1. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 测量 > 目标 PH”。
2. 设置目标 pH（10.7 至 11.4）。推荐设置为 pH 11.2（默认值）。

## 设置样品的目标 pH 值（配备阳床泵的分析仪）

***注：*** *只有选配了阳床泵的分析仪需要完成此任务。要识别阳床泵，请参阅安装手册中的产品概览部分。*

测量之前，分析仪会用调节溶液将样品的 pH 值调高至 11.2 和 11.4 之间，以防受到离子干扰。设置每个通道的调节溶液（以气态形式添加）和样品的比率（气水比率）。气水比率是基于未调节样品的 pH 值。

**需准备的物品：**经过校准的 pH 传感器（或 pH 试纸条），将其放入测量池的中间孔位中

按照以下步骤为每个通道设置气水比率：

1. 确定每个通道的水样在加入分析仪之前的 pH 值。
2. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 测量 > 气水比率”。
3. 一次选择一个通道（例如，水汽比 1 1 = 通道 1）。根据 表 3 输入适用的气水比率值（默认值：20%）。
4. 按 **home（主屏幕）**。
5. 让分析仪工作 1 小时以达到稳定状态。
6. 按照以下步骤确定调节后的样品 pH 值是否介于 11.2 和 11.4 之间：
   a. 从测量池的中间孔位中取出钠电极。将钠电极放入去离子水中以保持电极湿润。
   b. 将已校准的 pH 传感器放入测量池的中间孔位。
   c. 对于每个通道，当显示屏上显示测量状态条时记录水样的 pH 值。
   d. 如果水样的 pH 值未介于 11.2 和 11.4 之间，则根据需要将通道的气水比率设置为更高（或更低）的百分比。然后在工作 1 小时后，再次执行步骤 c。
   e. 当气水比率设为最大值时，如果样品的 pH 值未介于 11.2 和 11.4 之间，请参阅维护手册的故障排除表中的“PH 值太低”部分来查找问题。
7. 当每个通道的调节后水样 pH 值介于 11.2 和 11.4 之间时，将钠电极装回测量池的中间孔位中。

**表 3 气水比率**

| 水样的 pH 值 | 气水比率 | 水样的 pH 值 | 气水比率 |
|---|---|---|---|
| 2 | 200% | 2.9 | 30% |
| 2.3 | 80% | 3.5 | 21% |
| 2.6 | 50% | 4.0 | 18% |

## 设置测量记录间隔（单通道分析仪）

设置测量记录间隔。测量值将按测量记录间隔保存到数据日志中。此外，继电器和模拟输出也会按测量记录间隔进行更新。

***注：*** *此程序适用于只能连接一个样品源的分析仪。对于可连接多个样品源的分析仪，请转到*设置测量记录间隔（2 或 4 通道分析仪） *第 37 页**。*

1. 先按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 测量 > 设置测量周期 > 周期时间”。
2. 输入测量记录间隔（默认：10 分钟）。

   ***注：*** *分析仪在所选周期时间内连续测量样品。显示屏上显示测量结果。当周期时间结束时，分析仪将最后一分钟的平均测量值保存到数据日志中。此外，分析仪还会更新继电器和模拟输出，使它们反映已保存的测量值。*

## 设置测量记录间隔（2 或 4 通道分析仪）

设置测量记录间隔。测量值将按测量记录间隔保存到数据日志中。此外，继电器和模拟输出也会按测量记录间隔进行更新。

1. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 测量 > 设置测量周期”。
2. 选择并配置各个选项。首先选择搜索稳定性。

| 选项 | 说明 |
|---|---|
| **搜索稳定性** | 在两次通道测量之间，分析仪使用下一个待测通道的样品冲洗测量池一段设定的时间（或直到测量数据稳定为止）。<br>**否**（默认）—将搜索稳定性设置为关闭。分析仪冲洗测量池一段设定的时间。因此，测量记录间隔保持恒定。<br>当搜索稳定性设为否时，要配置的设置是周期时间和在线测量时间。<br>测量记录间隔 = 周期时间<br>周期时间 = 在线测量时间 + 冲洗时间（固定值）<br>**是**—将搜索稳定性设置为打开。当测量数据稳定，分析仪会提前退出冲洗过程，从而最大限度地减少冲洗时间。因此，测量记录间隔是变动的。<br>当搜索稳定性设为是时，要配置的设置是最长周期时间（最长测量记录间隔）和在线测量时间。<br>测量记录间隔 = 在线测量时间 + 冲洗时间（可变） |
| **在线测量** | 设置分析仪测量通道所需的时间（1 - 119 分钟，默认：10 分钟）。<br>***注：*** *分析仪在在线测量期间连续测量通道。显示屏上显示测量结果。当在线测量时间结束时，分析仪将最后一分钟的平均测量值保存到数据日志中。此外，分析仪还会更新继电器和模拟输出，使它们反映已保存的测量值。* |
| **最长周期时间** | ***注：*** *仅当“最长周期时间”设为“搜索稳定性”时，才会显示“是”选项。*<br>设置最长测量记录间隔（11 - 120 分钟，默认：45 分钟）。设置最长冲洗时间。例如，如果最长周期时间设为 45 分钟，并且在线测量设为 10 分钟，则最长冲洗时间为 35 分钟。 |
| **周期时间** | ***注：*** *仅当“搜索稳定性”设为“否”时，才会显示“周期时间”选项。*<br>设置测量记录间隔（11 - 120 分钟，默认：45 分钟）。设置冲洗时间。例如，如果周期时间设为 20 分钟，并且在线测量设为 10 分钟，则冲洗时间为 10 分钟。 |

## 设置活化计划

由于水样中钠的含量极低，钠电极的灵敏度会随着使用时间的增加而降低。自动活化可定期（例如，24 小时）将少量活化液加入测量池，以提高钠电极的灵敏度。自动活化可提升分析仪测量的准确度。

1. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 活化 > 设置自动活化”。
2. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **启用自动活化** | **是**（默认）—将自动活化设置为开启。**否**—将自动活化设置为关闭。<br>***注：*** *如果活化关闭，则仅在校准前完成活化。* |
| **时间基准** | **天数**—将自动活化设置为在选定天数后的选定时间进行（例如，每天 9:00 am）。**小时数**（默认）—设置两次活化之间相隔的时间（例如，24 小时）。 |
| **工作日** | ***注：*** *仅当“时间基准”设置为“天数”时，才会显示“工作日”选项。*<br>设置在星期几进行活化。默认情况下，会选中一周中的每一天。推荐使用默认设置。 |

| 选项 | 说明 |
| --- | --- |
| **时间** | ***注：*** *仅当"时间基准"设置为"天数"时，才会显示"时间"选项。*<br>设置进行活化的时间（24 小时制）（默认时间：12:00）。 |
| **设置间歇** | ***注：*** *仅当"时间基准"设置为"小时数"时，才会显示"设置间歇"选项。*<br>设置两次活化的间隔时间（2 - 168 小时）。推荐的间隔时间为 24 小时（默认值）。 |

## 设置测量单位

设置测量屏幕上显示的测量单位。

1. 按 **menu（菜单）**，然后依次选择"设置系统 > 分析仪配置 > 测量单位"。
2. 选择测量单位（ppm、ppb、mg/L 或 µg/L）。

## 设置信号平均值

设置分析仪用于计算平均测量值的测量次数 (1–5)。在测量周期结束时，分析仪将平均测量值保存到数据日志中。此外，分析仪还会更新继电器和模拟输出，使它们反映已保存的测量值。信号平均值设置可减少测量变动性。

1. 按 **menu（菜单）**，然后依次选择"设置系统 > 分析仪配置 > 信号平均值"。
2. 按**向上**或**向下**箭头键可设置该值。默认值为 1（未使用信号平均值）。

## 更改分析仪或通道的名称

1. 按 **menu（菜单）**，然后选择"设置系统 > 分析仪配置"。
2. 选择一个选项。

| 选项 | 说明 |
| --- | --- |
| **编辑分析仪名称** | 更改分析仪名称。输入唯一名称，例如分析仪所在位置（最多 16 个字符）。分析仪名称会显示在测量屏幕上和数据日志中。 |
| **编辑通道名称** | 更改所选通道的名称。输入唯一名称，例如水样来源（最多 10 个字符）。通道名称会显示在测量屏幕上和数据日志中。 |

## 开始或停止通道上的测量（2 通道或 4 通道分析仪）

1. 按 **menu（菜单）**，然后依次选择"设置系统 > 分析仪配置 > 配置排序器 > 启用通道"。
2. 选择一个通道即可开始测量。取消选择一个通道可停止测量。按**向左**箭头可选中或取消选中复选框。

## 更改通道测量顺序（2 通道或 4 通道分析仪）

要更改通道的测量顺序，请执行以下步骤：

1. 按 **menu（菜单）**，然后依次选择设置系统 > 分析仪配置 > 配置排序器 > 通道排序。
2. 按**向上**和**向下**箭头选择一行。
   ***注：*** *S1 是首个被测量的通道，然后是 S2、S3 和 S4。*
3. 按**向左**或**向右**箭头选择一个通道。
   ***注：*** *不要选择含有符号"~"（例如 4-~SAMPLE4）的通道。含有符号"~"的通道不会被测量。*

## 设置日期和时间

设置测量屏幕上以及日志文件中显示的日期和时间格式以及日期和时间。

1. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 设置日期/时间”。
2. 选择一个选项。

| 选项 | 说明 |
| --- | --- |
| **日期格式** | 设置日期格式（YYYY = 年，MM = 月，DD = 日）和时间格式（12 小时制或 24 小时制）。默认格式：YYYY-MM-DD 24 小时。 |
| **日期/时间** | 设置日期和时间。用箭头按钮输入日期和时间。 |

## 配置 4-20 mA 模拟输出

如果分析仪中的模拟输出已连接至外部设备，则选择模拟输出端代表的通道及测量范围。

1. 按照以下步骤启用模拟输出：
   a. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 设置输出 > 4-20mA 设置 > [选择输出]”。
   b. 选择“选择来源 > [分析仪名称]”。
2. 选择一个选项。

   ***注：*** *首先选择“设置参数”，然后选择“设置功能”，之后选择“启用”。*

| 选项 | 说明 |
| --- | --- |
| **启用** | “启用”选项随“设置功能”设置的不同而异。请参阅下表配置模拟输出。 |
| **选择来源** | **没有**（默认）—将模拟输出设置为禁用。**[分析仪名称]**—将模拟输出设置为启用。 |
| **设置参数** | 设置模拟输出端代表的通道。<br>***注：*** *不要选择含有符号“~”（例如 4-~SAMPLE4）的通道。含有符号“~”的通道不会被测量。* |
| **设置功能** | 设置模拟输出的功能。有关更多信息，请参阅下表。**线性控制**（默认）—模拟输出与测量值线性相关。**PID 控制**—模拟输出作为 PID（比例、积分、微分）控制器。**对数**—模拟输出在测量范围内以对数方式表示。**双线性**—模拟输出在测量范围内表示为两个线性段。 |
| **设置转换** | 如果将“错误保持模式”设置为“转换输出”，则在出现错误时设置模拟输出的值（0 - 25 mA，默认值：4 mA）。请参见设置错误保持模式 第 46 页。 |
| **设置过滤器** | 设置模拟输出平均值的时间量（0 - 999 秒，默认值：0 秒）。比如，如果该值设为 30 秒，则模拟输出值每 30 秒更新一次，并且该值是前 30 秒内模拟输出平均值。 |
| **范围 0 毫安/4 毫安** | 将模拟输出值范围设置为 0–20 mA 或 4–20 mA（默认）。 |

- **线性控制功能**

| 选项 | 说明 |
| --- | --- |
| **设置低限值** | 设置在模拟输出端表示为 0 或 4 mA 的低测量限值。 |
| **设置高限值** | 设置在模拟输出端表示为 20 mA 的高测量限值。 |

- **PID 控制功能**

| 选项 | 说明 |
| --- | --- |
| **设置模式** | **自动**—当分析仪使用比例、积分、微分输入时，模拟值 (mA) 由算法自动控制。**手动**—模拟值 (mA) 由用户控制。要手动更改该值，请更改“手动输出”中的百分比 (%) 值。 |
| **相位** | **直接**—模拟值随着测量值的增大而增大。**反向**—模拟值随着测量值的减小而增大。 |
| **设定点** | 将测量值设置为设定值。 |
| **比例带** | 设置测量值和设定值之间的差值。 |
| **积分** | 设置从试剂注入点到接触测量设备之间的间隔时间。 |

| 选项 | 说明 |
| --- | --- |
| **微分** | 设置过程漂移调整值。无需使用微分设置，即可控制大多数应用程序。 |
| **传送时间** | 当水样从取样阀移动至测量电极时，为选定的时段设置 PID 控制停止值。 |

- **对数功能**

| 选项 | 说明 |
| --- | --- |
| **设置 50% 值** | 设置过程变量范围对应 50% 的值。 |
| **设置高限值** | 设置过程变量范围的高端值（高限值）。 |

- **双线性功能**

| 选项 | 说明 |
| --- | --- |
| **设置低限值** | 设置过程变量范围的低端点（下限值）。 |
| **设置高限值** | 设置过程变量范围的高端值（高限值）。 |
| **设置拐点值** | 设置过程变量范围被拆分出另一个线性段的值。 |
| **设置拐点电流** | 设置拐点值对应的电流值。 |

## 配置继电器

如果分析仪中的继电器已连接外部设备，请选择将继电器设置为启用（激活）的触发条件。继电器状态显示在测量屏幕的右上角。请参见图 3 第 33 页。

***注：*** *继电器启用（通电）时，会连接常开 (NO) 和公共 (COM) 继电器触点。继电器停用（不通电）时，会连接常闭 (NC) 和公共继电器触点。*

1. 按照以下步骤开启继电器功能：
   a. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 设置输出 > 继电器设置 > [选择继电器]”。
   b. 选择“选择来源 > [分析仪名称]”。
2. 选择一个选项。

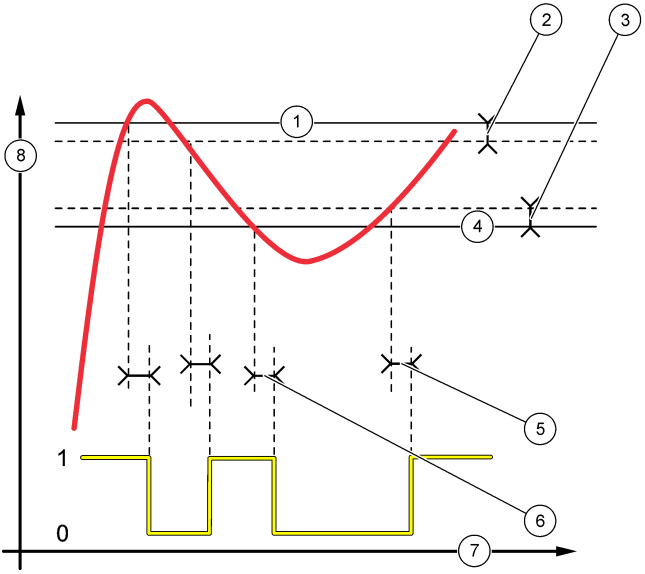
***注：*** *首先选择“设置参数”，然后选择“设置功能”，之后选择“启用”。*

| 选项 | 说明 |
| --- | --- |
| **启用** | “启用”选项随“设置功能”设置的不同而异。请参阅下表配置继电器。 |
| **选择来源** | **没有—**将继电器设置为禁用。**[分析仪名称]—**将继电器设置为启用。 |
| **设置参数** | 设置继电器端代表的通道。<br>***注：*** *不要选择含有符号“~”（例如 4-~SAMPLE4）的通道。含有符号“~”的通道不会被测量。* |
| **设置功能** | **报警**（默认）—当测量值高于高限警报值或低于低限警报值时继电器启用。**进给控制—**当测量值高于（或低于）设定值时继电器启用。**事件控制—**当过程值达到上限或下限时继电器启用。**预定时间—**继电器在选定的时间启用，不受测量值影响。**警告—**继电器在出现警告或错误条件时启用。**过程事件—**继电器在分析仪执行选定的操作时启用。 |
| **设置转换** | 如果将“错误保持模式”设置为“转换输出”，则在出现错误时将继电器设为激活（启用）或非激活（关闭）。默认设置为“非激活”（关闭）。请参见设置错误保持模式 第 46 页。 |
| **失效安全** | **是—**设置激活（启用）继电器的正常条件。**否—**设置停用（关闭）继电器的正常条件。 |

- **报警功能**（请参见图 5）

| 选项 | 说明 |
|---|---|
| **低限警报** | 设置该值，当不断减小的测量值达到该值时继电器启用。例如，如果低位警报设为·1.0，且测量值降到 0.9 时，继电器激活。 |
| **高限警报** | 设置该值，当不断增大的测量值达到该值时继电器启用。例如，如果高位警报设为 1.0，且测量值增至 1.1 时，继电器激活。 |
| **低限死区** | 设置继电器在测量值高于低限警报值之后保持启用的范围。例如，如果警报下限值设为 1.0 且低位保持范围设为 0.5，则继电器在 1.0 至 1.5 之间保持启用。 |
| **高限死区** | 设置继电器在测量值低于高限警报值之后保持启用的范围。例如，如果警报上限值设为 4.0 且高位保持范围设为 0.5，则继电器在 3.5 至 4.0 之间保持启用。 |
| **关闭延时** | 设置将继电器设置为停用的延时时间。 |
| **开启延迟** | 设置将继电器设置为启用的延时时间。 |

**图 5 报警功能**



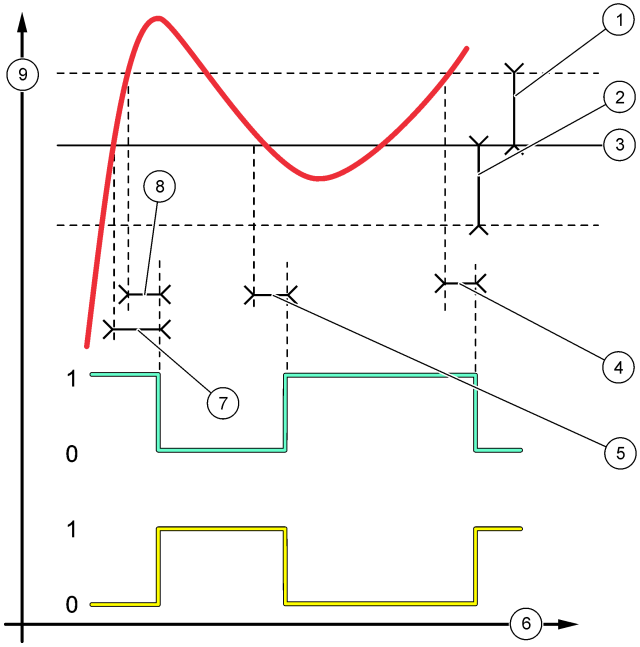

| | | |
|---|---|---|
| **1** 高限警报 | **4** 低限警报 | **7** 时间（x 轴） |
| **2** 高限死区 | **5** 开启延时 | **8** 来源（y 轴） |
| **3** 低限死区 | **6** 关闭延时 | |

- **进给控制功能**（请参见图 6 和图 7）

| 选项 | 说明 |
|---|---|
| **相位** | **高**—当测量值大于设定值时继电器启用。**低**—当测量值小于设定值时继电器启用。 |
| **设定点** | 将测量值设置为设定值。 |
| **死区** | 设置延时的保持范围值。如果“相位”设置为“低”，在测量值增至大于设定值与死区值之和以前，继电器都将保持启用。如果“相位”设置为“高”，在测量值降至小于设定值与死区值之差以前，继电器都将保持启用。 |

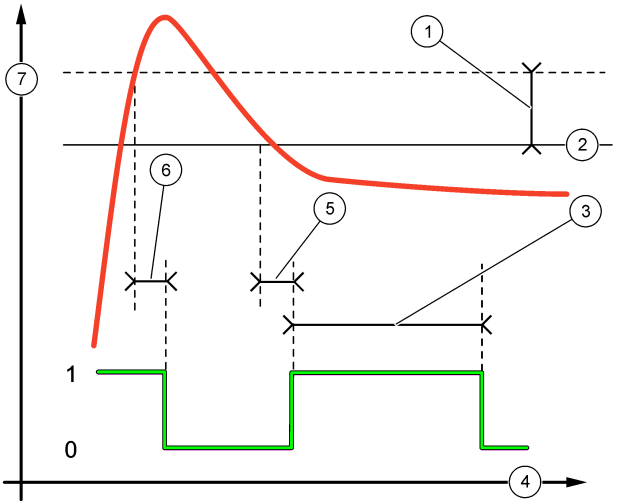
| 选项 | 说明 |
| --- | --- |
| **过量定时** | 设置继电器保持启用的时限。如果存在过量警报，则必须手动重置。请参见重置继电器的过量定时器 第 45 页。 |
| **关闭延时** | 设置将继电器设置为停用之前的延时时间。 |
| **开启延迟** | 设置将继电器设置为启用之前的延时时间。 |

**图 6 进给控制功能**




| | | |
| --- | --- | --- |
| **1** 死区（相位 = 低位） | **4** 关闭延时（相位设为高位） | **7** 开启延时（相位设为高位） |
| **2** 死区（相位 = 高位） | **5** 开启延时（相位设为低位） | **8** 关闭延时（相位设为低位） |
| **3** 设定点 | **6** 时间（x 轴） | **9** 来源（y 轴） |

**图 7 进给控制功能（相位值低，过量定时器）**

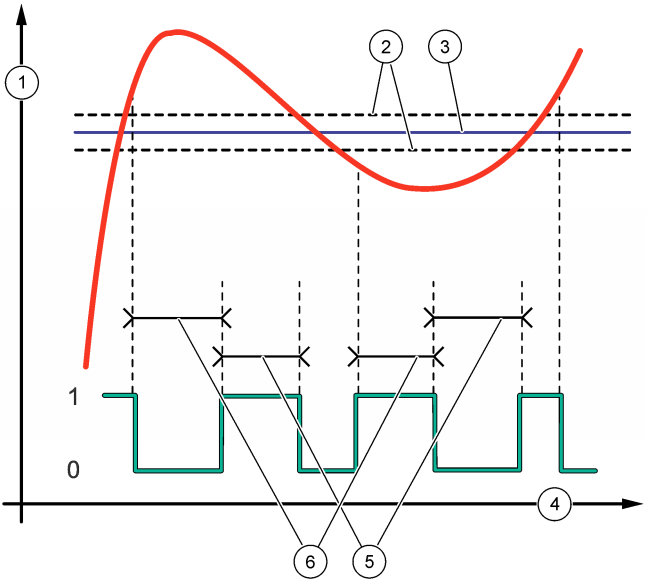



| | | |
|---|---|---|
| **1** 死区 | **4** 时间（x 轴） | **7** 来源（y 轴） |
| **2** 设定点 | **5** 开启延时 | |
| **3** 过量定时 | **6** 关闭延时 | |

- **事件控制功能**（请参见图 8 和图 9）

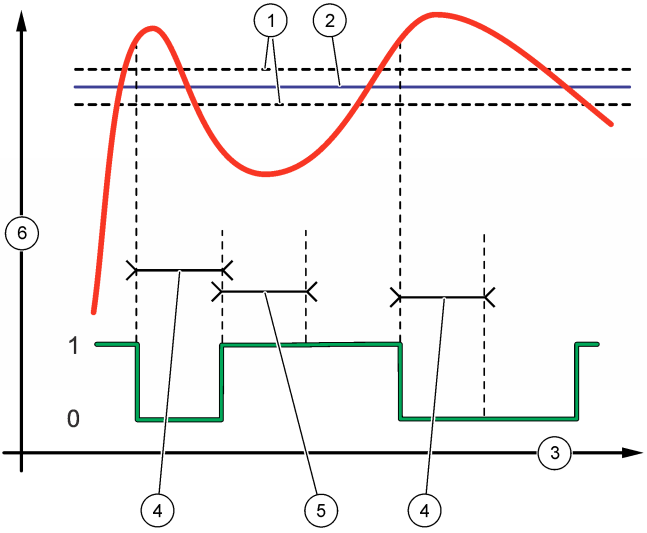
| 选项 | 说明 |
|---|---|
| **设定点** | 设置将继电器设置为启用的测量值。 |
| **死区** | 设定一个滞后值，这样当测量值接近设定值时继电器不会发生无序启停。 |
| **OnMax 定时器** | 设置继电器可以保持启用而不受测量值影响的最长时间。 |
| **OffMax 定时器** | 设置继电器可以保持停用而不受测量值影响的最长时间。 |
| **OnMin 定时器** | 设置继电器可以保持启用而不受测量值影响的最短时间。 |
| **OffMin 定时器** | 设置继电器可以保持停用而不受测量值影响的最短时间。 |

**图 8 事件控制功能（无延时）**




| | | |
|---|---|---|
| **1** 来源（y 轴） | **3** 设定点 | **5** OnMax 时间 |
| **2** 死区 | **4** 时间（x 轴） | **6** OffMax 时间 |

**图 9 事件控制功能（OnMin 定时器，OffMin 定时器）**

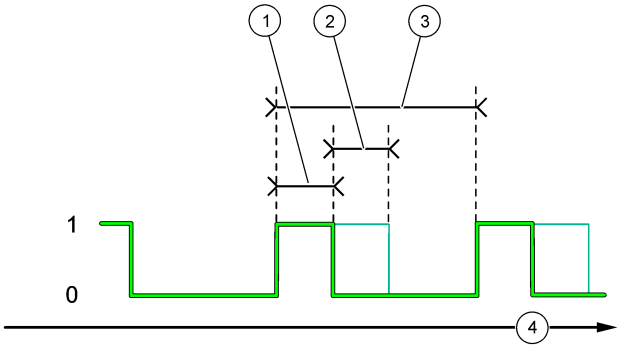



| | | |
|---|---|---|
| **1** 死区 | **3** 时间（x 轴） | **5** OnMin 定时器 |
| **2** 设定点 | **4** OffMin 定时器 | **6** 来源（y 轴） |

- **预定时间功能**（请参见图 10）

| 选项 | 说明 |
|---|---|
| **保持输出** | 为所选通道保持或转换输出。 |
| **运行天数** | 设定继电器的工作天数。 |
| **开始时间** | 设置开始时间。 |
| **间隔** | 设置启用周期的间隔时间（0 - 999 秒，默认：0）。 |
| **持续时间** | 设置继电器通电的时间长度（0 - 999 秒，默认：0）。 |
| **关闭延时** | 设置继电器关闭后额外的保持/输出时间（0 - 999 秒，默认：0）。 |

**图 10 预定时间功能**




| | |
|---|---|
| **1** 持续时间 | **3** 间隔 |
| **2** 关闭延时 | **4** 时间（x 轴） |

- **警告功能**

| 选项 | 说明 |
|---|---|
| **警告级别** | 继电器在发生选定的警告时启用。按**向左**箭头键可选中或取消选中复选框。 |

- **过程事件功能**

| 选项 | 说明 |
|---|---|
| **选择事件** | 继电器在发生选定的过程事件时启用。按**向左**箭头键可选中或取消选中复选框。<br>**测量 1、2、3 或 4**—将继电器设置为在通道 1、2、3 或 4 的测量周期期间启用。<br>**校准**—将继电器设置为在校准期间启用。<br>**关闭**—将继电器设置为在关闭模式下启用。<br>**启动**—将继电器设置为在启动过程中启用。<br>**其他样本**—将继电器设置为在抓样测量期间启用。<br>**测量结束标志**—将继电器设置为在每个测量周期结束时启用 1 秒钟。 |

## 重置继电器的过量定时器

继电器的过量定时器设置用于防止出现当测量值一直高于设定值或死区设置（例如，因为电极损坏或工艺扰动）的情况发生时，使继电器能够一直接通。过量定时器可限制继电器及其所连控制元件保持接通的时间，不受条件影响。

当超出过量定时器上选择的时间间隔时，继电器状态会在测量屏幕右上角闪烁，直到过量定时器被重置。按 **diag（诊断）**，然后选择过量重置即可重置过量定时器。

## 设置错误保持模式

如果模拟输出或分析仪中的继电器已连接外部设备，则选择“错误保持模式”。

1. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 设置输出 > 错误保持模式”。
2. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **保持输出（默认）** | 当发生错误或测量停止时（例如，校准、冲洗、活化或抓样测量），将继电器和模拟输出保持在最后一个已知值。 |
| **转换输出** | 当发生错误或测量停止时（例如，校准、冲洗、活化或抓样测量），将继电器和模拟输出设置为在模拟输出和继电器设置中设置的转换值。 |

## 安全设置

根据需要启用密码保护。选择受到密码保护的菜单选项。

***注：*** *默认情况下禁用密码保护。*

1. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 安全设置”。
2. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **设置密码** | **禁用**（默认）—将密码保护设置为关。**有效—**将密码保护设置为开。输入默认密码 (HACH55)。 |
| **编辑密码** | 更改密码（最多 6 个字符）。 |
| **保护功能** | 选择使用密码保护的菜单选项。选中的菜单选项将受到密码保护。按**向左**箭头键可选中或取消选中复选框。 |

## 调整溢流池水位

***注：*** *仅当分析仪配备了校准瓶时才需要执行此任务。要识别校准瓶，请参阅安装手册中的产品概览部分。*

溢流池的水位对于精确地执行自动校准很重要。在自动校准之前，调整水位使之介于顶标 (+) 和底标 (–) 之间。确保分析仪前后、左右均保持水平。

1. 等待溢流池充满水。
2. 如果溢流池中的水位高于顶标 (+) 或低于底标 (–)，请执行以下步骤：
   a. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 溢流池补偿”。
   b. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **+** | 当水位高于顶标 (+) 时选择。 |
| **0** | 当水位介于顶标 (+) 和底标 (–) 之间时选择。 |
| **–** | 当水位低于底标 (–) 时选择。 |

# 校准

**⚠ 警 告**

化学品暴露危险。遵守实验室安全规程，穿戴适用于所处理化学品的所有个人防护装备。在加注瓶子或制备试剂之前，请阅读供应商提供的安全数据表。仅限实验室使用。根据用户当地的法规发布危险警告信息。

## 设置自动校准设置

***注：*** *仅当分析仪配备了校准瓶时才需要执行此任务。要识别校准瓶，请参阅安装手册中的产品概览部分。*

设置自动校准时间表并选择要校准的通道。制造商建议分析仪每隔 7 天（每周）校准一次。

1. 按 **cal（校准）**，然后选择“设置自动校准”。
2. 选择并配置各个选项。

| 选项 | 说明 |
|---|---|
| **启动自动校准** | **否**—关闭自动校准。**是**（默认）—打开自动校准。 |
| **标准液** | 设置分析仪使用的校准溶液的浓度（默认值：10000 ppb = 10 ppm）。<br>***注：*** *如果校准溶液的浓度为 100 ppm 或更高，请将测量单位设置为 ppm。* |
| **时间基准** | **天数**（默认）—将校准设置为在选定天数后的选定时间进行（例如，每天 9:00 am）。**小时数**—设置两次校准之间相隔的时间（例如，168 小时 = 7 天）。 |
| **工作日** | ***注：*** *仅当“时间基准”设置为“天数”时，才会显示“工作日”选项。*<br>设置在星期几进行校准。默认情况下，在每周的星期日进行自动校准。推荐的校准间隔时间为 7 天。 |
| **时间** | ***注：*** *仅当“时间基准”设置为“天数”时，才会显示“时间”选项。*<br>设置进行校准的时间（默认时间：02:00 = 2:00 am）。 |
| **设置间歇** | ***注：*** *仅当“时间基准”设置为“小时数”时，才会显示“设置间歇”选项。*<br>设置两次校准的间隔时间。选项：2 至 255 小时（默认时间：168 小时 = 7 天）。推荐的校准间隔时间为 7 天。 |
| **选择校准通道** | 选择要校准的通道（默认：通道 1）。<br>***注：*** *不要选择含有符号“~”（例如 4-~SAMPLE4）的通道。含有符号“~”的通道不会被测量。* |

## 执行校准

首次启动（或存放）后让分析仪工作 2 小时以达到稳定状态，然后进行校准。

随着使用时间的增加，读数可能会渐渐高于或低于实际读数。为了获得最准确的读数，需要每隔 7 天（每周）校准一次分析仪。

1. 按 **cal（校准）**，然后选择“开始校准”。
2. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **启动一次自动校准** | ***注：*** *仅当分析仪具有自动校准选项时才会显示该选项。*<br>手动开始自动校准。<br>**重要信息：**在自动校准之前，请执行调整溢流池水位 第 46 页中的步骤。 |
| **手动偏移校准** | 开始 1 点手动校准。出现提示时，向溢流池中添加 200 mL 校准溶液。推荐的校准溶液为 100 ppb 或 1000 ppb。<br>***注：*** *请勿使用浓度低于 100 ppb 的校准溶液，因为其很快会被污染，这会改变其浓度。* |
| **手动偏移 + 斜率校准** | 开始 2 点手动校准。出现提示时，向溢流池中添加校准溶液（每种校准溶液 200 mL）。推荐的校准溶液为 100 ppb 和 1000 ppb。<br>**重要说明：**两种校准溶液的温差不得大于 ± 5 °C (± 41 °F)。第二种校准溶液的钠离子浓度必须比第一种校准溶液的钠离子浓度高 5 至 10 倍（例如，100 ppb 和 1000 ppb）。为获得精确校准，校准溶液的钠离子浓度之间必须具有很大的差异。<br>***注：*** *请勿使用浓度低于 100 ppb 的校准溶液，因为其很快会被污染，这会改变其浓度。* |

### 制备校准溶液

要制备 100 ppb 钠标准液和 1000 ppb 钠标准液以用于手动校准，请执行以下步骤。用于制备校准溶液的所有容量和数量必须精确。

**用户提供的物品：**

- 容量瓶 (4x)，500 mL，A 级
- NaCl，1.272 g
- 超纯水，500 mL
- 1–10 mL TenSette 移液管和吸头

1. 按照以下步骤制备 500 mL 1 g/L 钠校准溶液：
   a. 用超纯水冲洗容量瓶三次。
   b. 向容量瓶中加入 1.272 g NaCl。
   c. 向容量瓶中加入 100 mL 超纯水。
   d. 摇晃容量瓶，直到粉末完全溶解。
   e. 添加超纯水至 500 mL 标记处。
   f. 摇晃容量瓶，使溶液混合均匀。
2. 按照以下步骤制备 500 mL 100 ppm 钠校准溶液：
   a. 用超纯水冲洗另一个容量瓶三次。
   b. 用移液管将 5 mL 1 g/L 钠校准溶液加入容量瓶中。将移液管放入容量瓶中以添加溶液。
   c. 添加超纯水至 500 mL 标记处。
   d. 摇晃容量瓶，使溶液混合均匀。
3. 按照以下步骤制备 500 mL 100 ppb 钠校准溶液：
   a. 用超纯水冲洗另一个容量瓶三次。
   b. 用移液管将 5 mL 100 ppm 钠校准溶液加入容量瓶中。将移液管放入容量瓶中以添加溶液。
   c. 添加超纯水至 500 mL 标记处。
   d. 摇晃容量瓶，使溶液混合均匀。
4. 按照以下步骤制备 500 mL 1000 ppb 钠校准溶液：
   a. 用超纯水冲洗另一个容量瓶三次。
   b. 用移液管将 50 mL 100 ppm 钠校准溶液加入容量瓶中。将移液管放入容量瓶中以添加溶液。
   c. 添加超纯水至 500 mL 标记处。
   d. 摇晃容量瓶，使溶液混合均匀。
5. 将未使用的溶液保存在洁净的塑料瓶中。先用超纯水冲洗瓶子，然后再用少量校准溶液冲洗瓶子。在瓶子上粘贴标签，以便识别溶液及其制备日期。

## 显示校准数据

要查看上次校准的结果，请按 **cal（校准）**，然后选择“校准数据”。

要查看最近十次校准的结果，请按 **menu（菜单）**，然后依次选择“查看数据 > 日志数据 > 查看校准日志”。

## 执行校准验证

执行校准验证，以确定分析仪是否得到了校准。

1. 按 **menu（菜单）**，然后选择“取样/验证”。
2. 选择“标准样本”，然后按 enter（回车）。
3. 请按显示屏上的指示操作。
4. 出现提示时，向溢流池中添加 200 mL 校准溶液。推荐的校准溶液为 100 ppb。
   ***注：*** *请勿使用浓度低于 100 ppb 的校准溶液，因为其很快会被污染，这会改变其浓度。*

**重要说明：**校准溶液的温度与用于校准分析仪的校准溶液的温度之差不得超过 ± 5 °C (± 41 °F)。

5. 校准验证完成后，如果显示“出错”，需要重新进行一次校准。如果显示“通过”，则不必采取任何操作。

## 进行温度校准

必要时，验证温度读数是否准确。

1. 从测量池的中间孔位中取出钠电极。
2. 将钠电极放入去离子水中以保持电极湿润。
3. 将已校准的温度传感器放入测量池的中间孔位中。
4. 记录温度读数。
5. 按 **cal（校准）**，然后选择“温度校准”。
   显示屏上会显示水样温度。
6. 按 **enter（回车）**。
7. 如果记录的温度与显示屏上的温度不同，请输入温度偏差值。
   例如，如果记录的温度为 23 °C，而显示屏上的温度为 25 °C，则输入 –2 °C。
8. 将钠电极安装到测量池的中间孔位。

## 执行水样流速校准

必要时，验证水样流速读数是否准确。

1. 按 **menu（菜单）**，然后选择“停止分析仪”。
   ***注：*** *如果显示“启动分析仪”，表示分析仪已处于待机模式。*
2. 按 **cal（校准）**，随后选择“水样流速校准”。
3. 等待校准完成（约需 5 分钟）。
4. 按 **enter（回车）** 转到测量屏幕。
5. 按 **menu（菜单）**，然后选择“启动分析仪”。

## 校准 4-20 mA 模拟输出

如果分析仪的模拟输出连接至外部设备，则根据需要校准模拟输出。模拟输出经过出厂校准。模拟输出校准值的调整范围为 ±2 mA。
***注：*** *如果模拟输出配置为 0–20 mA，则对 4 mA 和 20 mA 进行校准。*

1. 按 **menu（菜单）**，然后依次选择“设置系统 > 分析仪配置 > 设置输出 > 输出校准 > [选择输出]”。
2. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **校准 4mA** | 使用已校准的数字万用表，测量模拟输出提供的实际值。调整显示值，直至模拟输出信号为 4.00 mA。 |
| **校准 20mA** | 使用已校准的数字万用表，测量模拟输出提供的实际值。调整显示值，直至模拟输出信号为 20.00 mA。 |

# 操作

## 显示当前和上次测量的详情

按 **menu（菜单）**，然后选择“查看数据 > 测量数据”。请参见表 4。

**表 4 测量数据说明**

| 项目 | 说明 |
|---|---|
| 上次测量时间 | 完成上次测量的时间。 |
| 上次测量通道 | 上次测量的通道。 |
| 下次测量时间 | 将完成下次测量的时间。 |
| 下一个测量通道 | 要测量的下一个通道。 |
| 水样温度 | 正在使用的通道中的水样温度。 |
| 水样流速 | 正在使用的通道中的水样流速。 |
| 上次浓度 | 上次测量的通道中的钠离子浓度。 |
| 浓度 | 正在使用的通道中的钠离子浓度。 |
| 原始电压值 | 实时毫伏信号。两个电极之间的电压值。 |
| 平均电压值 | 毫伏信号的六秒平均值（近似值）。 |
| 补偿后电压值 | 25 °C 温度补偿后毫伏值（电压值）。 |
| 测量稳定性 | 确认测量是否稳定（0 至 100）。值越大，测量就越稳定。 |
| pH[4] | 所用通道经过调节的 pH 值。 |
| 电导率 | 正在使用的通道的电导率。 |
| TGAS | pH 调节期间的进气（调节试剂）时间。 |
| TWATER | pH 调节期间的进水（水样）时间。 |

## 测量取样样品

分析仪可测量加入溢流池的水样。确保水样的参数如下：

- **钠浓度**[5]**—未配备**阳床泵的分析仪：20 - 10,000 ppb；**配备**阳床泵的分析仪：20 ppb - 200 ppm。
- **pH—**未配备阳床泵的分析仪：pH 6 - 10；配备阳床泵的分析仪：pH 2 - 10
- **温度**[6]**—**5 至 45 °C (41 至 113 °F)
- **酸度**（以 $CaCO_3$ 计）**—未配备**阳床泵的分析仪：低于 50 ppm；**配备**阳床泵的分析仪：低于 250 ppm
- **悬浮固体—**低于 2 NTU，无油脂

按照以下步骤测量水样：

1. 至少采集 200 mL 水样，装入清洁容器中。
2. 按 **menu（菜单）**，然后选择“取样/验证”。
3. 选择“其他样本”，然后按 enter（回车）。
4. 请按显示屏上的指示操作。
5. 出现提示时，将水样加入溢流池中，直至水位介于顶标 (+) 和底标 (–) 之间。按 **enter（回车）**。测量完成后，结果显示在显示屏上。

[4] 如果选装了阳床泵，则不会显示 pH 值。
[5] 建议抓样的钠离子浓度不要低于 20 ppb。
[6] 为获得最佳精度（20 ppb - 10 ppm 为 ± 5%），确保抓样水样与校准时标样具有相同的温度（相差不超过 ± 5 °C）。

## 显示测量、校准和事件日志

***注：*** *分析仪最多存储 18000 个数据点。储存的数据点达 18000 之后，最旧的数据点将被新的数据覆盖。*

1. 按 **menu（菜单）**，然后选择“查看数据 > 日志数据”。
2. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **查看数据日志** | 显示已保存的测量。 |
| **查看事件日志** | 显示已发生的事件。 |
| **查看校准日志** | 显示已保存的校准。 |
| **查看抓样日志** | 显示已保存的抓样测量。 |

3. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **开始时间** | 显示在选定的日期和时间之后记录的数据。 |
| **小时数** | 显示在过去的选定小时数内记录的数据。 |
| **读数数量** | 显示选定的数据点数量。 |

## 将数据或设置保存至 SD 卡

将数据日志保存至 SD 卡以根据需要在 PC 上使用该数据。将分析仪设置保存至 SD 卡，以根据需要在以后用于恢复设置或将其复制到其他分析仪上。

**需准备的物品：**

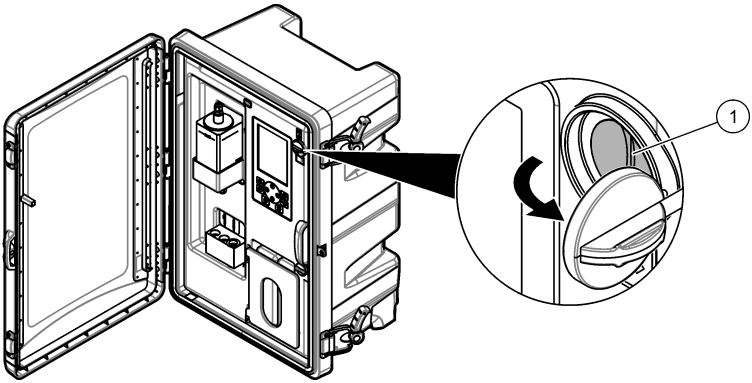
- SD 卡（2 GB 或更大容量）
- 带 SD 卡槽的 PC

1. 将 SD 卡插入 SD 卡槽（至少为 2 GB 容量）。请参见图 11。
2. 按 **menu（菜单）**，然后选择“SD 卡设置”。
3. 选择一个选项。

| 选项 | 说明 |
|---|---|
| **升级软件** | ***注：*** *仅当 SD 卡上存在软件更新文件时，才会显示“升级软件”选项。*<br>安装存储在 SD 卡上的软件更新文件。请参见安装最新的软件版本 第 52 页。 |
| **保存日志** | 将数据日志文件保存到 SD 卡上的 HACH/Logs/ANALYZER_xxxx 文件夹中。使用 Internet Explorer 或 Excel 打开数据日志文件 ANALYZER_NAME_DL.xml。<br>将事件日志文件以 CSV（逗号分隔值）文件格式保存到 SD 卡上的 HACH/Logs/ANALYZER_xxxx 文件夹中。使用 Excel 打开事件日志文件 ANALYZER_NAME_EL.csv。<br>选项：前一天、上周、上个月、全部或最近数据。<br>***注：*** *要将其他的日志文件保存到 SD 卡，请参阅处理设备选项。* |
| **管理配置** | **备份设置**—将分析仪设置保存至 SD 卡。**传输设置**—将 SD 卡上保存的分析仪设置安装至分析仪。 |
| **处理设备** | **读取设备文件**—将选定的设备数据以 CSV 文件格式保存到 SD 卡上的 HACH/Devices 文件夹中。选项：抓样数据、校准记录、传感器诊断、测量数据（校准和抓样测量的曲线数据）和维护历史记录。<br>**写入设备文件**—安装新版测量周期脚本。<br>***注：*** *仅当 SD 卡上存在新版测量周期脚本时，才会显示“写入设备文件”选项。* |

4. 完成后，将 SD 卡从分析仪中取出。
5. 安装 SD 卡槽保护盖，以保持外壳的环境防护等级。

**图 11 SD 卡槽位置**




| | |
|---|---|
| **1** | SD 卡槽 |

## 安装最新的软件版本

在分析仪上安装最新版本软件。安装新版本软件不会改变分析仪的设置。安装新版本软件不会删除分析仪上保存的数据。

***注：*** *要查看分析仪上安装的软件版本，请按* ***menu（菜单）****，然后选择“查看数据 > 分析仪数据”。查找“软件版本号”。*

**需准备的物品：**

- SD 卡（2 GB 或更大容量）
- 配有 SD 卡槽且可上网的 PC

1. 将 SD 卡插入 PC。
2. 按照以下步骤下载最新版本软件：
   a. 请转到 http://www.hach.com。
   b. 搜索“Polymetron NA9600sc 分析仪”。
   c. 选择“下载”选项卡。向下滚动浏览至“软件/固件”。
   d. 单击软件下载链接。选择**打开**。随后将显示一个 Hach 文件夹。
3. 将 HACH 文件夹复制至 SD 卡。
4. 将 SD 卡从 PC 中取出。
5. 手持 SD 卡时使标签朝右。将 SD 卡插入分析仪上的 SD 卡槽。请参见图 11 第 52 页。
6. 按 **menu（菜单）**，然后选择“SD 卡设置 > 升级软件”。
7. 安装完成后，按 **enter（回车）** 重启分析仪。
8. 按照以下步骤安装新的测量周期脚本：
   a. 按 **menu（菜单）**，然后依次选择“SD 卡设置 > 处理设备 > 写入设备文件”。
   b. 完成安装后，将电源开关设置为关（向下）。请参见启动 第 30 页。
   c. 等待 10 秒钟，然后将电源开关设置为开启（向上）。
9. 将 SD 卡从分析仪中取出。
10. 安装 SD 卡槽保护盖，以保持外壳的环境防护等级。

## 安装最新的 HART 模块固件

为分析仪安装最新的 HART 模块固件。

**需准备的物品：**

- SD 卡（2 GB 或更大容量）
- 配有 SD 卡槽且可上网的 PC

1. 将 SD 卡插入 PC。
2. 按照以下步骤下载最新的 HART 固件：
   a. 请转到 http://www.hach.com。
   b. 搜索“Polymetron NA9600sc 分析仪”。
   c. 选择“下载”选项卡。向下滚动浏览至“软件/固件”。
   d. 点击 HART 模块固件的下载链接。选择**打开**。随后将显示一个 Hach 文件夹。
3. 将 HACH 文件夹复制至 SD 卡。
   ***注：*** *HART 模块固件是一个 BIN 文件，保存路径为 \HACH\Firmware\HART 0_32768。*
4. 将 SD 卡从 PC 中取出。
5. 手持 SD 卡时使标签朝右。将 SD 卡插入分析仪上的 SD 卡槽。请参见图 11 第 52 页。
6. 按 **menu（菜单）**，然后选择“SD 卡设置 > 升级软件 > 网卡”。
7. 安装完成后，按 **enter（回车）** 重启分析仪。
8. 将 SD 卡从分析仪中取出。
9. 安装 SD 卡槽保护盖，以保持外壳的环境防护等级。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