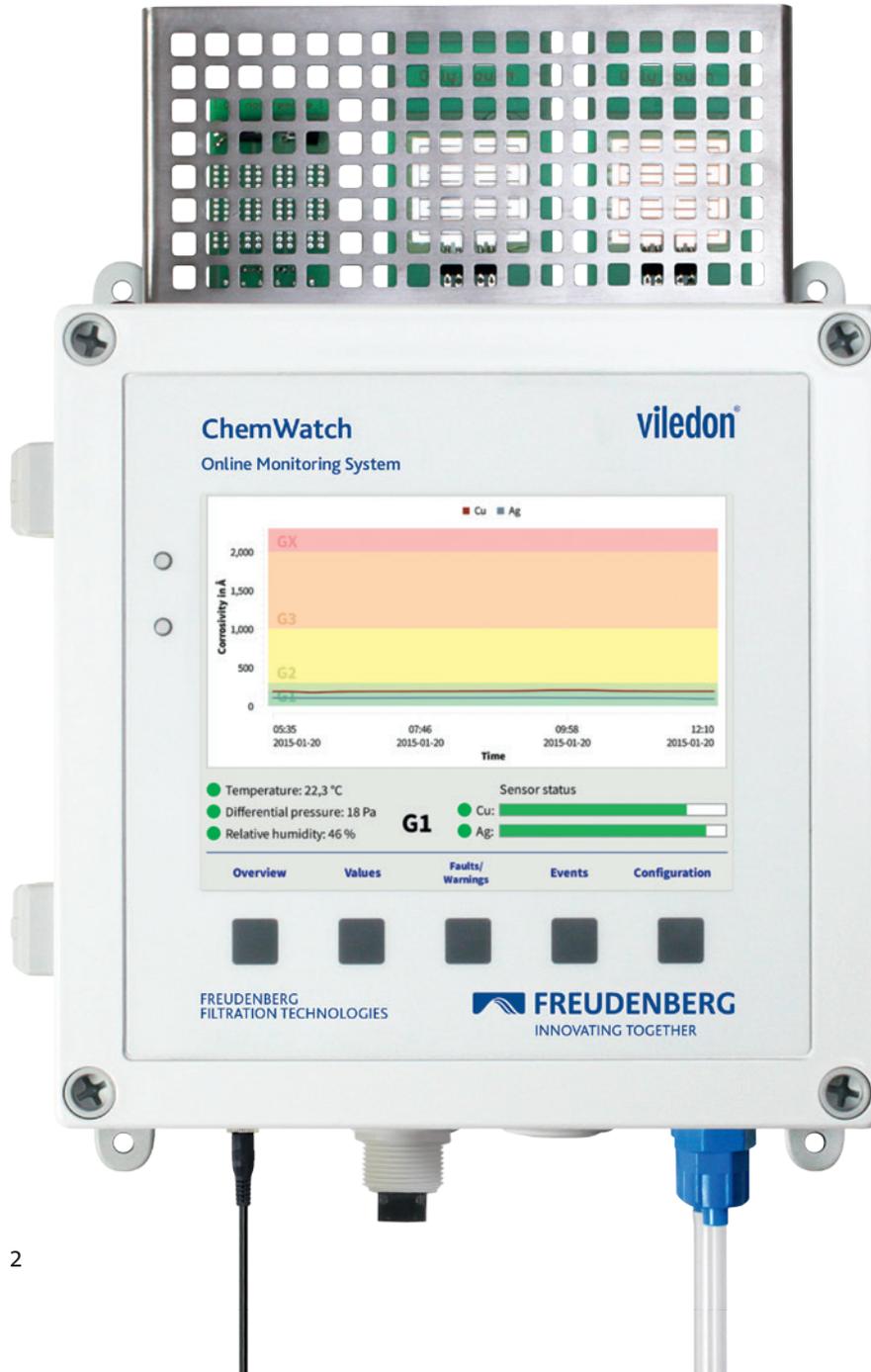




viledon®

## OPERATING MANUAL

### CHEMWATCH ONLINE MONITORING SYSTEM



MADE IN  
**GERMANY**

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# 1. GENERAL INFORMATION

**As a technology leader in the industrial filtration of air, gases and liquids, Freudenberg Filtration Technologies also provides reliable protection for gas phase filtration. In connection with the diverse filtration solutions, the ChemWatch Online Monitoring System allows you to promptly and reliably detect, observe and monitor corrosiveness.**

The ChemWatch operating manual describes the installation, operation and maintenance of the instrument. Read this manual carefully before installing and commissioning the instrument. Knowledge of all safety information and operating instructions contained in this manual is required for working safely and properly with the instrument.

## 1.1 EXPLANATION OF SYMBOLS

Important safety and instrument information is indicated in this manual by means of symbols.



This symbol refers to information that must be observed for efficient and fault-free operation of the instrument.



This symbol refers to safety information which, if not heeded, could threaten the safety of persons or result in damage to the instrument.

## 2. DESIGN AND FUNCTION

### 2.1 BRIEF DESCRIPTION

The ChemWatch Online Monitoring System is a corrosion measurement instrument for monitoring room air according to the standard ANSI/ISA 71.04-2013. The corrosion measurement is performed by replaceable copper and silver sensors developed specially for the instrument.

In addition to the corrosion measurement, other measurement variables are measured that are relevant to ensuring the quality of the room air, such as temperature, humidity and the differential pressure between two rooms (the room overpressure). The measurement data is saved to an SD card inserted into the instrument. The storage space on the SD card is sufficient for at least 18 months worth of measured data.

### 2.2 SCOPE OF DELIVERY

Included in the scope of delivery are the following:

- Corrosion measurement instrument “ChemWatch Online Monitoring System”
- Copper sensor board
- Silver sensor board
- Board with sensors for temperature and relative humidity
- Pluggable power supply with five changeable adapters
- Set of fastening elements, consisting of 4 anchors and screws
- CD with operating manual and Excel tool for analyzing the data
- Operating manual



Corrosion measurement instrument “ChemWatch Online Monitoring System”



Pluggable power supply with changeable adapters



Copper sensor board

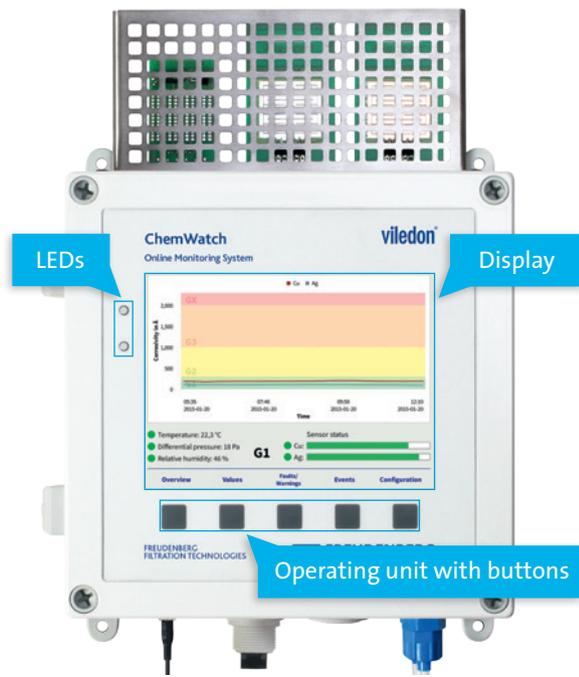


Silver sensor board



Board with sensors for temperature and relative humidity

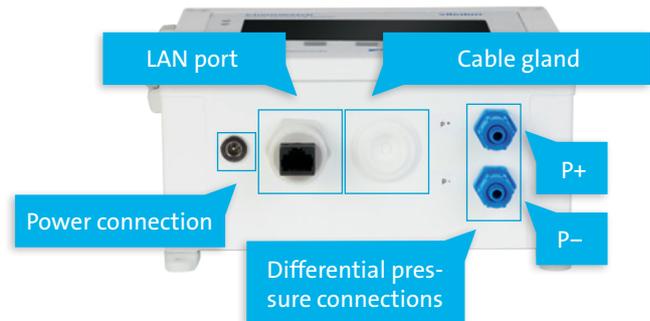
## 2.3 OVERVIEW OF THE INSTRUMENT ELEMENTS



Front view: Display, LED and operating elements



View from above: Slots for sensor boards



View from below: Power connection, LAN port, cable gland and differential pressure connections

# 3. INSTALLATION AND COMMISSIONING

## 3.1 BEFORE THE FIRST USE

### 3.1.1 Wall mounting

The “ChemWatch Online Monitoring System” is intended for permanent installation on a wall. Mounting holes are provided on the instrument for this purpose.

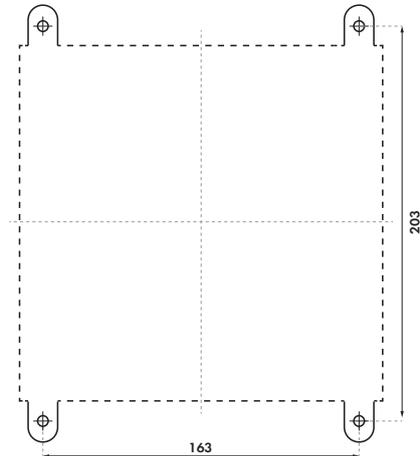
For secure mounting, fasten the instrument at all 4 mounting holes. The enclosed screws and anchors are suitable for typical wall materials (such as masonry or concrete). For other wall materials, you may need to supply suitable fastening elements.

Affix the instrument in an easily visible and accessible location at eye level in the room to be monitored.

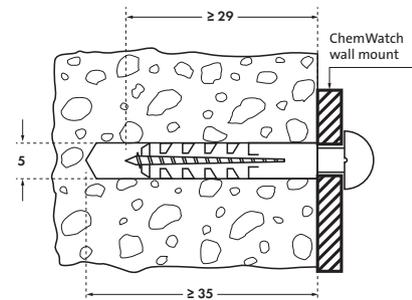
The diagrams on this page show how the holes should be made in the wall (values in mm).

**i** For installation and commissioning, the steps described must be carried out in the order given.

**!** Do not connect the instrument to the power network until all installation work is finished. During the installation of the instrument, bring the instrument to an unpowered state (unplug the power plug or switch off the supply of power).



Drilling pattern



Mounting method

Instructions for setting the language can be found in section 4.9.2 >

### 3.1.2 Connecting the differential pressure sensor

The instrument has a differential pressure sensor with which the overpressure in the room can be measured relative to a neighboring room. To do this, connect a pressure measurement tube to the rear blue measuring sensor (P-) and run this outside into the room to which the differential pressure should be measured. A positive pressure of 12.5 to 25 Pa is generally aimed for.

DESIGNATION	DESCRIPTION
P+	Positive differential pressure connection
P-	Reference pressure connection for differential pressure

**i** The instrument can also be used without the differential pressure sensor. In this case, the measurement should be deactivated in the instrument: [> Configuration > Threshold values](#).

**!** To prevent damage to the instrument electronics, the maximum differential pressure of 25 kPa (250 mbar) must not be exceeded. For example, never blow air into the measuring sensor.

Proceed as follows to connect the differential pressure sensor:

1. Remove the blue sleeve nut.
2. Slide the sleeve nut over the tube.
3. Slide the tube over the connection on the instrument.
4. Affix the tube in place by tightening the sleeve nuts.



Installing the pressure measurement tube

### 3.1.3 Installing the sensor boards

 Hold the sensor boards only on the edge or in the designated areas (“touch in this area only”) and avoid touching the surface of the corrosion sensors (fingerprints make the sensors unusable). Liquid or solid materials may not come into contact with the surface of the sensors.

 The sensor boards are packaged under an inert atmosphere and should only be removed from the packaging immediately before commissioning on site.

Proceed as follows to install the sensor boards:

1. Make certain that the instrument is disconnected from the supply of power.

 Applies only for the initial commissioning of a new instrument. When replacing the sensor boards, do not disconnect the instrument from power. Please read the section “Changing the sensor boards”.

2. Remove the sensor boards from the packaging.
3. Insert the sensor boards with light pressure into the slots intended: the corrosion sensor boards go into S2 and S3, the board with the sensors for temperature and relative humidity into S1. Be sure to insert the sensor boards all the way.

 The slots and boards are mechanically designed to prevent being inserted incorrectly.

 After the initial installation of the corrosion sensor boards, these are automatically calibrated after the instrument is switched on.

## 3.2 SWITCHING ON THE INSTRUMENT

Connect the power supply to the socket on the bottom side of the instrument housing.

After connecting the power plug to the power network, the instrument automatically starts operation. When the boot process is finished, the display automatically switches to the main screen. The internal calibration steps that follow can take several minutes. Then the instrument begins collecting and displaying the measured data.

 The instrument must be protected against excess current by suitable measures.

 In the first 24 hours, the measured data exhibits lower than usual accuracy.

## 4. OPERATION AND FUNCTIONING PRINCIPLES

### 4.1 GENERAL INFORMATION

The instrument has a 5.7 inch TFT color display, an operating unit consisting of five buttons and two status LEDs. With the operating unit, you can navigate through the menus and input values. The buttons have different functions in each menu. The current function of a button is shown in the display directly above the button.

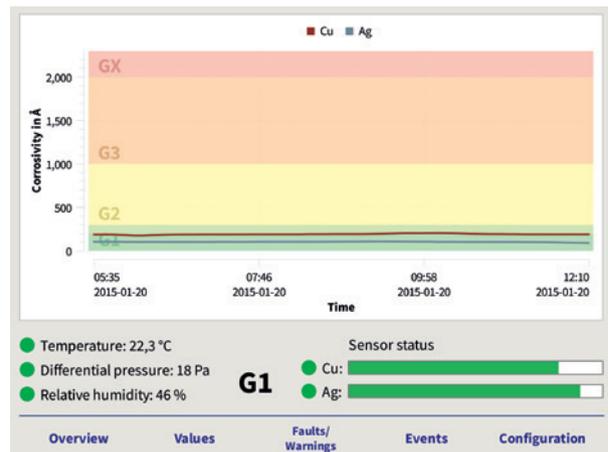
The ChemWatch Online Monitoring System is equipped with an intuitive user interface. While in a submenu, you can return at any time to the main menu with the button [>Main menu](#). The button [>Back](#) always navigates back to the previous menu.

The two status LEDs indicate the operating state of the instrument: The lower LED indicates that the instrument is ready for operation with a green color. The upper LED provides information about faults in the instrument with a red color. For more information on faults and alarm classes, see sections 4.8 and 4.9.1.

### 4.2 MAIN SCREEN

The main screen offers information about:

- Current measurement values
  - Temperature
  - Relative humidity
  - Differential pressure (room overpressure)
  - Corrosivity according to ANSI/ISA 71.04-2013
- Status of the corrosion sensors
- Any threshold values exceeded



[View of main menu](#)

### 4.3 MEASURED DATA

The measured corrosion data of the sensor boards is graphically displayed in the main menu in a range from 0 Å to 2,300 Å (higher values are displayed as 2,300 Å). The currently measured corrosivity values are converted according to the standard ANSI/ISA 71.04-2013 into a value that corresponds to the estimated corrosion under 30 days of constant conditions. The measured corrosion data for the installed sensors is displayed separately for each sensor. The colored differentiation of the diagram is preset according to the corrosion classes G 1, G 2, G 3 and GX according to ANSI/ISA 71.04-2013. For corrosion class G 1, please note the different class thresholds for copper and silver. The current ISA class derived from the measured corrosivity data is shown in the center below the diagram.

Under the item [> Overview](#), all measured variables (temperature, humidity, differential pressure and corrosivity) are displayed over time as an X-Y graph. You can zoom in and out on the graph by pressing the corresponding buttons.

Individual values for the measured variables can be viewed under [> Values](#). In the overview table of the measured data, a status indicator (red / green) is shown before each value to indicate whether or not the current value is within the defined limits. For the corrosivity of copper and silver, the average value of the measured rates over the last 30 days is also displayed. Pressing the button [> Details](#) shows the time progression of the measured data for the currently selected variable.

### 4.4 THRESHOLD VALUES

The threshold values are indicated in the main menu by a green dot (threshold met) or red dot (threshold exceeded) in front of the corresponding variable.

The preset threshold values for temperature, humidity, differential pressure and corrosivity can be modified in the configuration settings ([> Configuration > Threshold values](#)). The values for temperature range between 0 °C and 50 °C, for humidity between 10% and 95% and for differential pressure between 0 Pa and 50 Pa. For the corrosion sensors, the respective corrosion classes G 1, G 2, G 3 and GX can be selected as threshold values.

The threshold values are indicated in the measured data diagrams by means of a colored background. When threshold values are exceeded, this is logged and an alarm can be output.

 Changes to the threshold values are only permanently applied after pressing of the button [> Save](#).

## 4.5 SENSOR STATUS

The corrosion sensors are consumed over time. Their service life varies depending on the corrosivity of the surrounding medium. The remaining service life of the corrosion sensors is calculated by the instrument and indicated as a status bar in the main menu. The length of the bar decreases as the sensors are increasingly consumed.

-  If the status bar is green, the sensors still have sufficient life left. When the remaining layer thickness is reduced to approximately 400 Å, the bar turns yellow. The display switches to red when the corresponding sensor must be replaced within roughly 2 weeks. The color change is stored in the instrument with the date.
-  To avoid system downtime, we recommend ordering new sensors as soon as the color of the displayed bar changes to yellow.
-  It is possible to configure an alarm for sensor consumption based on the currently prevailing corrosivity – see section 4.9.1.

## 4.6 SAMPLING AND DISPLAY INTERVAL

The ChemWatch Online Monitoring System is programmed such that all measured variables are determined regularly in the background. The values determined within the selected sampling interval are combined and output as a sliding average.

With the factory settings, the instrument is preconfigured for a sampling interval of 6 hours. This time period can be changed under [>Configuration >Sampling interval](#). The following settings are available: 6 h, 12 h and 24 h. The accuracy increases with the interval length.

The calculated sliding averages are output every minute. This allows the SD card to record measured data for a period of approximately 18 months. After this time, the oldest measured data is overwritten.

-  Changes to the sampling and display intervals are only permanently applied after pressing of the button [>Save](#).

## 4.7 EVENTS

Events consist of messages generated by the instrument that indicate changes to settings or interface connections as well as warnings and maintenance messages. In addition, you can also enter information relating to the ventilation system, for example.

A chronological list of all messages can be found under [> Events](#). In addition, a mark is inserted in the single values graphs under [> Values](#).

The following messages are preconfigured for manual entry ([> Events > New event](#)):

- Pellet replacement
- Malfunction of air handling unit
- Service completed
- Production stop
- General problem/emergency
- Miscellaneous
- User defined event

Under the entry [> User defined event](#), it is possible to enter a custom message in the lower input field via remote access (see section 4.10.6). Clicking on [> Save](#) then opens the submenu in which you can enter the exact time of the event and complete the saving with [> OK](#).



Once events have been saved in the event list, they can no longer be deleted. Events generated on the instrument can be assigned custom texts via remote access.

## 4.8 FAULTS AND WARNINGS

Under the menu item [> Faults/Warnings](#), current faults and warnings are listed in chronological order. As long as the list contains at least one message, the button [> Faults/Warnings](#) has an orange background in the main menu. You can select the messages with the arrow buttons and acknowledge them with the button [> Acknowledge](#). Acknowledged entries are marked with a ✓ and will be moved to the [> Record](#) list upon leaving the menu. You can also undo this action.

The software differentiates between warnings ⓘ and faults ⚠.

ALERT CLASS	INSTRUMENT ACTION
HIGH	Rapid flashing, alert indication via the display, sending of an email to the configured address (configuration required, see <a href="#">&gt; Network &gt; E-Mail settings</a> )
MEDIUM	Slow flashing, alert indication via the display
LOW	Slow flashing, no alert indication in the display
ZERO	No alert function active

## 4.9 SETTINGS

In the menu [> Configuration](#), you can set the threshold values, the sampling interval (see sections 4.4 and 4.6) and the following additional settings:

### 4.9.1 Alarm classes

Faults are indicated by the instrument using the upper of the two LEDs. The faults can be assigned to 4 different alert classes: “HIGH”, “MEDIUM”, “LOW” and “ZERO”.

The table on the left provides information about the available alert functions:

The menu [> Alarm classes](#) ([> Configuration > Alarm classes](#)) allows you to assign defined instrument actions to the various faults. Pressing the button [> Save](#) saves the current selections. The following faults can be assigned to alert classes:

- Temperature exceeded
- Relative humidity exceeded
- Not sufficient positive pressure
- Corrosion severity class exceeded
- No SD card installed
- No sensors installed
- Sensor nearing end of life
- Sensor to be replaced

An alert is triggered by measured data if the average of the measured data over the last 30 minutes exceeds the configured threshold value. The alert “Sensor nearing end of life” means that under constant conditions, the current corrosivity would result in consumption of the sensor within the next 8 weeks.

#### 4.9.2 Language

In the configuration dialog [> Language](#), the language of the user interface can be selected. This selection is applied and saved with the button [> Save](#). The available languages are Chinese, English, French, German, Italian, Japanese, Portuguese and Spanish. For other language versions, please contact your customer representative at Freudenberg.

#### 4.9.3 Time zone

In the configuration dialog [> Time zone](#), you can set the time zone in which the instrument is operated. First you must select the region and then the desired time zone. The local time of the selected time zone is shown under “Current local time”. You can apply and save the time zone with the button [> Save](#).

#### 4.9.4 Units

In the configuration dialog [> Units](#), you can choose between metric and imperial units. This setting is applied and saved with the button [> Save](#).

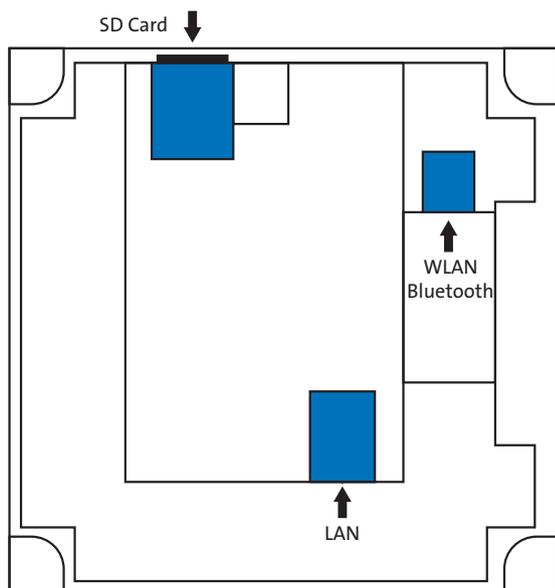
#### 4.9.5 Configuration management

After commissioning, the modified settings should be saved as the default configuration. ([> Configuration > Configuration management > Save current configuration as default](#)) In the event that the instrument is subsequently misconfigured, you can then load this default configuration again. ([> Configuration > Configuration management > Load customized default configuration](#)) It is also possible to reset the instrument to the factory settings. ([> Configuration > Configuration management > Reset to factory configuration](#)) This resets only the settings relating to the user interface. All measured data is retained. The instrument then automatically performs a restart.

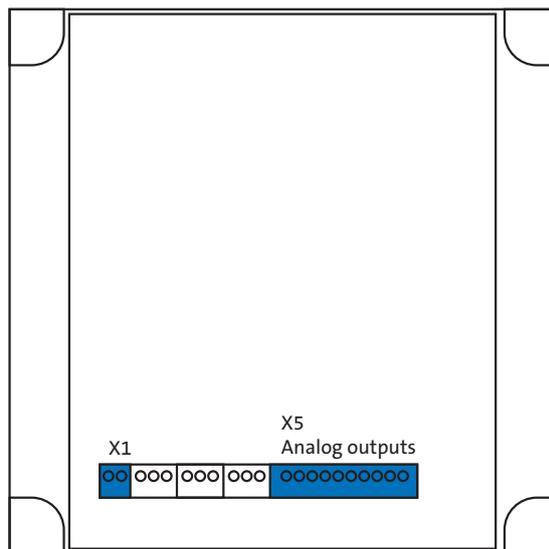
## 4.10 DATA TRANSMISSION AND REMOTE ACCESS

Various options are available for transmission of the measured data and for remote access to the instrument:

Cover



Body



Positioning of the terminal strips and ports in the ChemWatch Online Monitoring System

#### 4.10.1 Reading the SD card

All measured data and messages are saved by the instrument to the SD card, divided up by calendar weeks and extending back for a period of at least 18 months.

After opening the instrument (see description in section 5.1), you can remove the SD card and transfer the data with a card reader (e.g. on a computer or notebook).

#### 4.10.2 LAN cable network connection

The instrument has a port for a LAN network cable connection. The LAN connection is designed as a standard Ethernet connection for integration into a local network. Over this connection, the ChemWatch Online Monitoring System can be configured or the measured data can be read.

The cable network connection can be activated via the configuration menu (> [Configuration](#) > [Network/Outputs](#) > [Cable network settings](#) > [Activate](#)). In this case, the instrument receives an IP address from the network and can be addressed and operated by remote control with a web browser. This setting can be saved with the button > [Save](#). The IP address assigned to the instrument is constantly shown in this dialog window.

#### 4.10.3 Direct LAN cable connection

If you do not wish to connect it to a network, the ChemWatch Online Monitoring System can also be connected directly to a computer or notebook via the LAN cable connection. In this case, the instrument itself functions as DHCP server. To configure this connection, first connect the instrument to the computer/notebook, then select > [Start DHCP server](#) (> [Configuration](#) > [Network/Outputs](#) > [Cable network settings](#) > [Start DHCP server](#)). The instrument can now be accessed via the IP address 192.168.0.1 in the Web browser of the computer/notebook. For security reasons, the DHCP server mode is automatically terminated once the connection via the network cable has been disconnected.

Depending on the security settings (firewall), it may be necessary to enable the connection (e.g. via > [Register to Hotspot](#)). To test the connection on the computer, switch to the Windows program > [Command Prompt](#) (> [Start](#) > [Run](#) > [Command: cmd](#) > [OK](#)) and enter the command: > [ipconfig/renew](#). The IP address assigned to the computer by the ChemWatch Online Monitoring System will be displayed (type 192.168.0.x (19 < x < 254)).

### 4.10.4 Wireless network

The instrument can be accessed via a WLAN connection. The following standards are supported: 802.11 b/g/n.

 The wireless network settings can only be modified via remote control in the Web browser. A functioning LAN connection is therefore required for configuring a wireless network connection.

The wireless network connection must first be activated with the button [>Activate](#) ([>Configuration](#) [>Network/Outputs](#) [>Wireless network settings](#) [>Activate](#)). All wireless networks detected by the instrument are then listed in the dropdown menu “SSID” (Service Set Identifier = wireless network name). After selection of the desired wireless network and entry of the network key (WPA2 PSK), you can establish the connection with the button [>Connect](#). When the connection has been established as desired, the settings can be saved with the button [>Save](#).

Over a functioning wireless network connection, you can operate the ChemWatch Online Monitoring System by remote control using a web browser, the same as over a cable network connection.

 The instrument may be operated only with WLAN USB sticks certified by the manufacturer. Such a stick is pre-installed in the instrument at the factory. Failure to observe this requirement will void the warranty.

### 4.10.5 Bluetooth

With the use of an optionally available Bluetooth stick, it is possible to send screenshot images of the graphs to Bluetooth-capable devices.

After opening the instrument (see description in section 5.1), the WLAN stick can be removed and the Bluetooth stick inserted into the same port. In the dialog [>Bluetooth](#), other Bluetooth devices in the environment are displayed after pressing the button [>Discover devices](#) ([>Configuration](#) [>Network/Outputs](#) [>Bluetooth](#) [>Discover devices](#)). After selecting a device ([>Pair with selected device](#)), you can press the button [>Choose dialogs](#) to select various graphs for screenshots ([>Check](#)). The selected dialogs are then sent to the selected Bluetooth device with the button [>Send screenshots](#).

 The instrument may be operated only with Bluetooth USB sticks certified by the manufacturer. These sticks are available as an accessory. Failure to observe this requirement will void the warranty.

 The Bluetooth device to be used must support the OBEX-OPP profile (Object Exchange – Object Push). This requirement is met by devices based on the Android or Windows operating systems. Apple systems are not supported.

#### 4.10.6 Additional functions in network operation

##### E-Mail

The instrument can send an e-mail to a preconfigured address as an alert function. For the instrument to act as sender, an e-mail address must be assigned on the user's own e-mail server. We recommend assigning a unique address (e.g. in connection with a room number: Chem-Watch-R14.1).

Under [> Network/Outputs > Network configuration menu > E-Mail settings](#), enter the assigned sender address and recipient address in the upper area labeled "General". In the area "SMTP server", enter the data of the configured e-mail account (SMTP server = outgoing mail server name, the username and the password of the SMTP server).

After configuring the settings, you can test the sending of e-mail with the button [> Test](#). If all settings were configured correctly, the configured recipient will receive a test e-mail from the ChemWatch Online Monitoring System at the specified e-mail address.

The button [> Save](#) applies and saves the settings.

##### Remote access

You have the option of accessing the instrument via remote access (for example to enter user defined events on the instrument). Remote access is possible via the cable network (LAN) and the wireless network (WLAN).

 The function is supported by standard web browsers in versions as of 2010.

 In the remote access, the current screen display of the instrument is shown in the browser. If a black screen or the screensaver is displayed in the browser, press any key on the computer to activate the normal display.

The changing of data via remote access is secured with a PIN, which can be set in the password settings ([> Configuration > Network/Outputs > Remote access password](#)). The PIN must consist of at least 4 digits and no more than 20 digits.

 The PIN consists only of numbers.

 The factory preset PIN is: 000000.

### Reading the measured data via remote access – weekly

Via remote access, you can save the measured data on a PC in the form of CSV files. The link to the CSV files can be found in the upper left corner of the display and is designated with [>Weekly CSV-Files](#). After clicking the link, a list with the CSV files currently available for downloading appears. The files each contain the measured data for one week (Monday to Sunday) or the data of the current week, updated each day at midnight. The filename contains the number of the calendar week. Right-click and select [>Save link as](#) to start downloading the desired file. The data of the CSV files can be processed with all standard spreadsheet software.

### Reading the measured data via remote access – according to the sampling interval

In the remote access, a CSV file with the current data record is also available for automated download, e.g. for integration into a user-specific data monitoring system. This file with the name “ChemWatch-current.csv” can be accessed via a regular http request at the URL <http://<INSTRUMENT-IP-ADRESS-OR-HOSTNAME>/ChemWatch-current.csv>. Configuring this function requires IT personnel with administrator rights.

The CSV file is updated at the configured display interval of one minute.

### Time synchronization

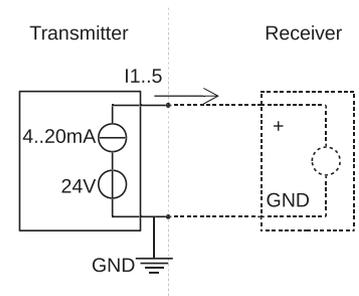
The system time can be synchronized via an NTP-compatible time server. After activating the function ([>Configuration >Network/Outputs >Time synchronization settings >Activate](#)), the system time is synchronized with the configured time server every 60 minutes. Via remote access, a user-defined NTP server, e.g. in the company network, can be configured in place of the preset NTP server pool. Pressing the button [>Save](#) applies the settings.

#### 4.10.7 Analog outputs

Five analog current outputs are available on the X5 terminal strip for transmitting the measured data. The outputs are designed as two-wire (N+N) power sources. The output signals can be enabled or disabled in the instrument software (> Configuration > Network / Outputs > Outputs > Enable/disable analog outputs). In the base settings, the analog output is assigned a static, constant signal of 4 mA. With a supply voltage of 24 VDC, the correct functioning of the outputs is ensured up to a load resistance of 800 Ω. In the menu indicated above, the transmitted value range for the corrosion values can be restricted in 4 stages in order to increase the precision. The connection assignment of the terminal strip for the analog outputs is shown in the table.

#### Connection assignment of the terminal strip for the analog outputs

PIN	DESIGNATION	DESCRIPTION
I1 GND	Temperature	Current I: 4–20 mA corresponds to 0–50 °C Calculation: $T[°C] = 25/8 \times (I-4)$
I2 GND	Differential pressure	Current I: 4–20 mA corresponds to –50–50 Pa Calculation: $\Delta p[Pa] = 25/4 \times (I-4) - 50$
I3 GND	Rel. humidity	Current I: 4–20 mA corresponds to 0–100% Calculation: $\varphi[\%] = 25/4 \times (I-4)$
I4 GND	Copper corrosivity	Current I: 4–20 mA corresponds to 0–x Å Calculation: $d_{Cu}[\text{Å}] = x/16 \times (I-4)$
I5 GND	Silver corrosivity	Current I: 4–20 mA corresponds to 0–x Å Calculation: $d_{Ag}[\text{Å}] = x/16 \times (I-4)$



Connection of the terminal strip

## 5. CONNECTION WORK WITHIN THE INSTRUMENT

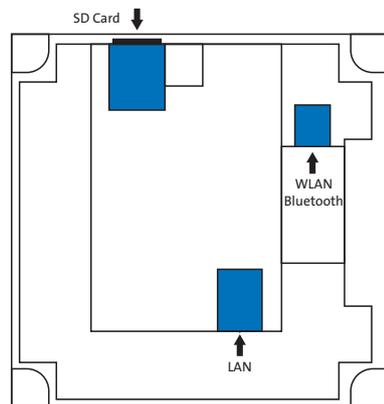
The SD card and all terminal strips and ports, with the exception of the LAN port and power socket, are located inside the instrument.

### 5.1 Opening the instrument

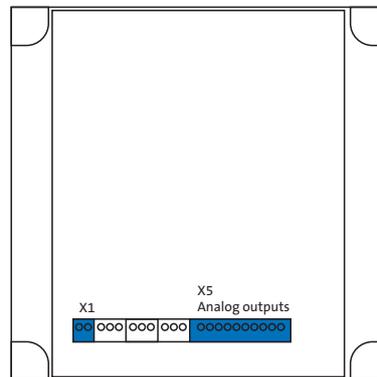
To open the instrument, proceed as follows:

1. Make certain that all power supplied to the instrument is deactivated, e.g. by unplugging the power plug.
2. Loosen and remove the 4 screws at the corners of the housing and carefully swing the cover to the side.

Cover



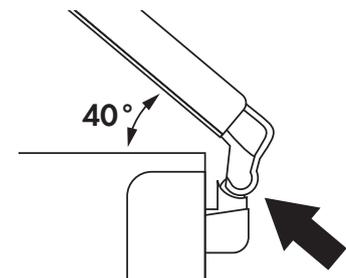
Body



Positioning of the terminal strips and ports in the instrument

 The operating elements and the display in the lid are connected to the circuit boards in the base of the housing via a ribbon cable. When opening and closing the cover, care must be taken not to damage or tear off this connection.

 When closing the instrument, ensure that the hinges snap correctly into place. If necessary, the cover must be pushed back into position with an opening angle of 40°.



Snapping in of the hinge

## 5.2 Cable gland

The cable glands into the inside of the instrument are intended for connecting to the analog outputs.

The use of the analog outputs is optional. The cable gland provided for this is closed upon delivery to ensure that the housing is tightly sealed.

To use the cable gland, it must be pressed out of the housing from the inside, e.g. with a finger, and then carefully punched through with a sharp object.

 The created hole should be significantly smaller than the diameter of the cable used in order to ensure a reliable seal.

The cable gland is then slid over the cable and returned to the housing opening with light pressure from the outside.

## 6. EVALUATING THE MEASURED DATA WITH MS EXCEL

When using MS Excel (version 2010 or newer), the downloaded measured data can be directly displayed graphically with the help of the software on the CD. Each file collects the data from up to 13 calendar weeks (e.g. one quarter). This requires activation of the macro functions in MS Excel.

To use it, first copy the analysis software from the CD to a folder created for it on a PC. The CSF files intended for analysis must also be saved to the same folder after downloading from the instrument.

After opening the software in MS Excel, press the button [>Insert Data](#) to read the data from a CSV selected from a list into the open worksheet. The measured data is displayed in both table and graph form. Each worksheet contains the data of one calendar week (one CSV file). An overview of all measured data read into the file (max. 13 calendar weeks) is created in the sheet [>Summary](#) when you press the button [>Combine Data](#).

## 7. SOFTWARE UPDATE

To update the software, remove the SD card from inside the instrument (see section 5.1) and use a card reader (e.g. on the computer or notebook) to save the new files in the directory “Updates”. Then insert the SD card back into the instrument, close it and put it back into operation.

Under the menu item [> Configuration > Software updates](#), the new software components (user interface, driver package or operating system) are listed with version number and file size. The installation for the currently selected component is started at the press of a button ([> Installation](#)). The successful installation is indicated after rebooting the instrument by a change in the version number in the upper area.



Recorded data is retained after a software update.



Disconnect the instrument from the power supply before opening.

### Storage location for software updates

The software updates are made available for downloading in a protected area of our Internet site:



[www.freudenberg-filter.com](http://www.freudenberg-filter.com)

## 8. INSTRUMENT INFORMATION

### 8.1 Instrument name

Under [> Configuration > Instrument information](#), general instrument information as well as the individual instrument name is displayed. This is used for sending e-mails as well as for the Bluetooth functionality and can be changed via network remote access, if necessary.

### 8.2 Screensaver

When no interactions with the instrument occur for a certain period of time, the instrument switches off the display, which can be reactivated by pressing any key. The screensaver function can be disabled under [> Instrument information](#).

## 9. CHANGING THE SENSOR BOARDS

### 9.1 Corrosion sensors



The corrosion sensor boards must be replaced for correct detection of the corrosivity during continued operation. Changing the sensors while the instrument is switched off results in a falsification of the measurement results.



Hold the sensor boards only on the edge or in the designated areas (“touch in this area only”) and avoid touching the surface of the corrosion sensors (fingerprints make the sensors unusable). Liquid or solid materials may not come into contact with the surface of the sensors.



The sensor boards are packaged under an inert atmosphere and to prevent early corrosion should only be removed from the packaging immediately before commissioning on site.

Proceed as follows to change the copper and silver sensor boards:

1. Carefully pull the sensor board to be replaced out of the slot.
2. Remove the new sensor board from its packaging.
3. Insert the sensor board into the intended slot with light pressure. Be sure to insert the sensor board all the way.
4. After detecting the inserted sensor, the instrument asks whether it is a new sensor (rather than the previous sensor being reinserted). This question must be answered with the buttons [>Yes](#) / [>No](#).
5. New sensors are then calibrated by the instrument. This may take several minutes.

### 9.2 Boards with sensors for temperature and relative humidity



Changing the board with sensors for temperature and relative humidity may only be performed by an authorized service technician.

## 10. CLEANING

Never use aggressive cleaners or chemicals that attack paint or plastic to clean the instrument. Inappropriate cleaning agents can damage the housing surface and the display. If possible, use only a soft, lightly damp cloth with a small amount of dish soap.



The sensors may not be cleaned.

## 11. FIRST AID

In this section, you will find some information on procedures to follow if you encounter problems while using the ChemWatch Online Monitoring System. We recommend

that you first carry out the steps in this table before contacting customer service.

PROBLEM / FAULT	POSSIBLE REASON	SOLUTION
<b>The instrument displays nothing</b>	The power supply is not connected	Connect the power supply
	The power is not connected	Connect the power
	No SD card is inserted	Insert an SD card
	The instrument may be defective	Contact service
<b>The instrument constantly searches for corrosion sensors</b>	No corrosion sensors were detected / connected	(Re)connect the corrosion sensors
	The instrument may be defective	Contact service
<b>The instrument shows no / an incorrect value for temperature / humidity</b>	The temperature / humidity sensor is not inserted or is not detected	(Re)insert the temperature / humidity sensor
	The sensor may be defective	Contact service
<b>The instrument shows no / an incorrect differential pressure</b>	The differential pressure display is disabled	Switch on the differential pressure display (> <a href="#">Configuration</a> > <a href="#">Threshold values</a> )
	The differential pressure sensor was connected incorrectly	Reconnect the differential pressure sensor (see section "Connecting the differential pressure sensor")
	The sensor may be defective	Contact service

PROBLEM / FAULT	POSSIBLE REASON	SOLUTION
<b>The instrument cannot be reached via Ethernet or WLAN</b>	Incorrect configuration in the network settings	Check and, if necessary, change the settings for Ethernet /WLAN (> <a href="#">Configuration</a> > <a href="#">Network/Outputs</a> )
	The instrument may be defective	Contact service
<b>Bluetooth does not function</b>	Bluetooth is not enabled on the sender / receiver	Switch on Bluetooth (ChemWatch: (> <a href="#">Configuration</a> > <a href="#">Network/Outputs</a> > <a href="#">Bluetooth</a> )
	No devices are visible	Check that the distance is not too great
	The instrument may be defective	Contact service
<b>The instrument does not respond to inputs</b>		Disconnect the instrument from power for approximately 10 seconds.
	The instrument may be defective	Contact service

## 12. TECHNICAL DATA

TECHNICAL DATA		
Housing dimensions (W × H × D)	180 × 180 × 85 mm	
Total weight	1100 g	
Supply voltage	24 VDC; filtered	
Rated current	0.5 A; external protection	
Operating temperature	0 to 50 °C	
Storage temperature	-20 to 60 °C	
WLAN	802.11 b/g/n	
Display	5.7", resolution 640 × 480 pixels	
External pluggable power supply	Input voltage range	100–240 VAC
	Frequency range	50–60 Hz
	Max. current consumption	1.25 A
Corrosion sensor boards S2/S3	2500 Å layer thickness Cu/Ag	
Power socket X1	Permissible input voltage range	100–240 VAC
	Max. current consumption	1.25 A
Analog outputs X5	Output current	5 × 4–20 mA
	Maximum pressure	25 kPa
Differential pressure connections P+ and P-	Inside ø of connection tube	6 mm
	Outside ø of connection tube	8 mm

SENSORS	
Temperature	0–50 °C
Differential pressure	-50–+50 Pa
Rel. humidity	10–95%
Copper corrosivity	G1: ≤ 300 Å
	G2: > 300–1,000 Å
	G3: > 1,000–2,000 Å
	GX: > 2,000 Å
Silver corrosivity	G1: ≤ 200 Å
	G2: > 200–1,000 Å
	G3: > 1,000–2,000 Å
	GX: > 2,000 Å

 The electrical thresholds given here may not be exceeded. Use the supplied pluggable power supply.

## 13. WARRANTY PROVISIONS

Excluded from the warranty are all defects that result from improper handling, damage or repair attempts. This also applies to normal wear.



We reserve the right to make technical changes to the product in the interests of improving the instrument properties and further development.

## 14. DISPOSAL



If the instrument is to be taken out of service and disposed of after the end of its service life, contact your regional disposal organization on how to handle electrical scrap.

Do not throw the instrument in household waste. Proper disposal spares the environment in two ways.

To prevent undesired access by third parties to data stored on the instrument over its period of use, reset the instrument to the factory settings and remove the storage medium from the instrument before disposing of it.

Consumed sensor boards must also be disposed of as electrical scrap.



In case of questions, please contact your local customer representative at:

[www.freudenberg-filter.com](http://www.freudenberg-filter.com)  
> Contact > Viledon Global Contacts 

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