

## Offer description > SMART Digital CHEMPAIRING Suite 3.0 (SDCS 3.0)

Grundfos SMART Digital CHEMPAIRING SUITE 3.0 (SDCS) is a cloud-based Grundfos Digital Service (SaaS) tailored for remote monitoring and control of a single Grundfos DDA dosing pump (DDA dosing pump and SDCS CIU gateway to be bought separately).

Supported Dosing Pump Type:	DDA-AR/-FC/-FCM
Supported Dosing Pump Range:	DDA 7.5-16 up to DDA 30-4
Material Code:	All DDA material variants
DDA Firmware Number:	v.2.62.7915 or higher (as of production year 08/2021; please refer to the DDA info section for firmware number identification)
Supported Control Modes:	Manual dosing; Proportional dosing (Pulse) via a signal from a water meter/flow turbine (max. 100Hz input frequency)
Supported SDCS operating countries:	Germany, Austria, Switzerland, France, UK&I, Italy, Belgium, Netherlands, Poland, Italy, Spain, USA, Canada

SDCS offers different user roles within a company:

**Administrator:** Full access to the entire SDCS web portal and Grundfos GO App (including installer rights).

**Installer:** On-site visits using the Grundfos GO App to configure SDCS systems, register chemicals and update sensor data from flow sensors. Installers do not have access to the SDCS web platform.

DDA dosing pumps can be monitored or remote controlled (selectable) via the SDCS dashboard, which contains several dosing feature related dashboard overview tiles (concentration tile, pump status tile, chemical tank level tile, service reminder tile, installation information tile).

For documentation purposes, SDCS can deliver trend data and event data as a downloadable csv dosing reports of the last 3 month.

SDCS users of a company level can be assigned to alarm teams to ensure timely notifications via SMS or email for their respective SDCS systems at a customer. SDCS has pre-configured alarm templates to optimize notifications and ensure that alarms are only sent for relevant dosing issues, such as alarms and pre-empty and empty situations of the chemical container.

For seamless and secure system communication, SDCS utilizes a plug-and-play gateway, the SDCS-CIU Gateway, which exclusively communicates bidirectionally through the 2G/3G/4G mobile network and contains a X.509 security certificate. Data transmission costs are already included in the monthly SDCS subscription fees. Additional information about the gateway can be found at the end of this document.

The Grundfos DDA dosing pump, GO App, and SDCS Web Portal offer independent operation with both metric and US units, allowing users to adjust unit settings either on the dosing pump or within the SDCS Web Portal to suit their preferences.

## The Grundfos GO App for SDCS commissioning and on-site interaction

The Grundfos GO App is a versatile App for on-site interactions with the SMART Digital CHEMPAIRING Suite system. It's accessible on both iOS and Android devices and can be easily downloaded from their respective app stores.

Key features of the Grundfos GO App for SMART Digital CHEMPAIRING Suite include:

- Commissioning: Effortlessly set up a newly installed SDCS system on-site.
- Flow Sensor Data Update: On-site update of external flow sensor data for real-time process water calculation.
- Chemical Registration: Register a new connected chemical for sensor-less monitoring of chemical tank volume.

### SDCS Preparation Process (Administrator, Installer)

When setting up a new SDCS installation, the Grundfos GO App streamlines the preparation process. Notably, no login is necessary for Grundfos GO App users during SDCS preparation.

#### Step1: Dosing Pump Identification for communication profile upload

When scanning or manually entering the QR code label on the SDCS-CIU gateway lid, the Grundfos GO App identifies the connected SMART Digital dosing pump type. This identification enables the background upload of the correct SDCS-CIU communication profile after activating the SDCS subscription.

#### Step 2: Adding External Process Data

After identifying the dosing pump type, the GO App guides users to input data for the connected water meter or the pulse rate factor of the flow sensor connected to the DDA dosing pump. This information is used for volume/flow calculations of the dosed process water. Additionally, users have the option to select manual dosing, eliminating the necessity for entering specific flow sensor data.

#### Step 3: File Preparation and Submission

In the last step, the GO App will guide the user to complete the necessary details:

- Installer's Name: Input the name of the installer responsible for the setup.
- Admin Email Address: Email address of the Administrator who will get the SDCS activation email to start the SDCS subscription of the prepared system.
- Installation description: Enter a unique description of the prepared SDCS system for unique identification by the administrator for SDCS subscription activation.

### Chemical Registration with the Grundfos GO App (Administrator, Installer)

The Grundfos GO App presents a user-friendly solution for registering new chemicals to be used with the SMART Digital dosing pump, right at the installation site. These information are used for the sensor less chemical tank monitoring feature of SMART Digital CHEMPAIRING Suite. For this feature, Users are required to log into the app and must be affiliated with the relevant organization that owns the dosing pump.

#### Step 1: Dosing Pump Identification

With the GO app, users can easily identify the SMART digital dosing pump by either scanning the QR code label on the SDCS-CIU gateway or manually entering the information.

#### Step 2: Name of the connected chemical

Users can type in a custom name of the newly connected chemical.

#### Step 3: Total Connected Chemical Volume

The user can enter a total free volume of the newly connected chemical in liters or gallons, with units selectable in the app's user profile.

#### Step 4: Optional Pre-Empty Notification Volume

Users can specify a chemical volume in liters or gallons that triggers a "Chemical container pre-empty (calculated)" warning message, sent via SMS or email to the dosing pump's alert team. By default, the GO App selects 10% of the total connected volume, but users have the flexibility to override this volume setting, choosing any value between 0 and the total connected volume.

This feature is optional and can be skipped, so that the alert team will get no notification.

#### Step 5: File transmission

Once users have logged into the App and are affiliated with the dosing pump's organization, the app transmits the details about the newly registered chemical to the SDCS cloud. In case of a cellular absence, the App will attempt to send the file in the background. After a successful transmission, the SDCS web portal dashboard displays the following information:

- Date and time of chemical registration
- Elapsed days since chemical connection
- Email address of the chemical exchanger
- Name of the newly registered chemical
- Total volume of the newly connected chemical (in liters or gallons)
- Volume designated for low-level notification (in liters or gallons)

#### **Sensor data update (Administrator, Installer)**

In the event of replacing a faulty water meter or flow turbine with a different pulse factor than the previously installed one, users can utilize the GO app to update the pulse factor of the new water meter or flow turbine. This adjustment allows the SDCS cloud to accurately calculate the correct dosed process water based on the pulses received from the dosing pump. Updating the pulse factor does not impact historical data that has already been received.

#### Step 1: Dosing Pump Identification

With the GO app, users can easily identify the SMART digital dosing pump by either scanning the QR code label on the SDCS-CIU gateway or manually entering the information.

#### Step 2: Updating the water meter/flow turbine pulse rate

The pulse factor can be overwritten in the following units:

Water meter: Liters per pulse (l/pulse) or Gallons per pulse (gal/pulse)

Flow Turbine: Pulses per liter (pulses/L) or Pulses per Gallon (pulses/gallon)

### Step 3: File transmission

Once users have logged into the App and are affiliated with the dosing pump's organization, the app transmits data of the new connected water meter/flow turbine to the SDCS cloud. In case of a cellular absence, the App will attempt to send the file in the background.

## **The SMART Digital CHEMPAIRING Suite web solution**

The SMART Digital CHEMPAIRING Suite web solution serves as a central platform for monitoring and remote control of the connected SMART Digital dosing pumps. The multilingual user interface and responsive design enable use on both monitors and smartphones/tablets.

The SMART Digital CHEMPAIRING Suite web solution comprises the following key sections:

- The account switcher, if operating SDCS with more than one company
- Profile setting to switch between metric and US units
- The SDCS main page, providing an active alert overview of all SDCS systems
- The SDCS customer/installation name overview, with link to individual dosing systems.
- The SDCS dashboard for specific dosing pumps.
  - o Installation overview
  - o Alarm and warning tile
  - o Sensor less chemical tank monitoring
  - o Concentration overview tile (Manual or Pulse)
  - o Dosing pump status tile
  - o Dosing pump service reminder
  - o Last data synchronization time of the SDCS-CIU gateway
- Detailed data for specific dosing systems.
- The remote-control page for read or write dosing pump settings
- The dosing report section, enabling the export of CSV trend and event data

### **SDCS user profile (Administrator)**

User can select between European or US units.

### **SDCS main page with All Alerts overview (Administrator)**

The SDCS main page provides a quick overview of active alerts (alarm and warnings) for all installed SDCS systems with customer/installation name, alarm initiator and local event time. A link leads directly to the dashboard of the affected SDCS dosing system. If no alarms are present, a green tick symbolizes a faultless system status of all systems.

The following categories of alerts are discernible:

- Overpressure (Alarm)
- Min. Pressure (Warning or Alarm)
- Air bubbles (Warning)
- Cavitation (Warning)
- Suction valve leakage (Warning)
- Pressure valve leakage (Warning)

- Service soon (Warning)
- Service now (Warning)
- Target flow deviation (Warning)
- Pre-empty chemical container/Float switch (Warning)
- Pre-empty chemical container / Calculated (Warning)
- Empty chemical container / Float switch (Alarm)
- Motor blocked (Alarm)
- Change of containers

### SDCS Asset overview page (Administrator)

A slide-out area displays a list of customer names. Clicking on a customer name takes the user to a separate page listing all SDCS dosing systems of the selected customer. Each dosing system listed provides a direct link to its respective SDCS dashboard.

### SDCS Dashboard > Installation information (Administrator)

This section contains all relevant information about the installed SDCS installation. These info's are directly read out of the dosing pump or can be added during the commissioning process.

#### General information

- Customer name: The customer's name (2\*)
- Installation name: The name of the SDCS installation at a customer (2\*)
- Address: The location of customer (2\*)
- Geo location: SDCS geolocation of the installation (2\*)
- On site contact person: On site contact person to contact for onsite visits (3\*)

#### Dosing pump information

- DDA type key: Type key of the installed DDA dosing pump (1\*)
- DDA product number: Order number of the installed DDA pump (1\*)
- DDA serial number: Serial number of the DDA pump (1\*)
- DDA firmware number: Software number for DDA feature identification (1\*)

#### Commissioning information

- Commissioning date: Date/Time when the SDCS system was prepared (2\*)
- Commissioning engineer: Name of the installer who prepared the system (2\*)
- Installation description: A clear identification of the system (2\*)
- Gateway IMEI: The unique SDCS system ID (1\*)
- Gateway QR code: For offsite interaction with the GO App (1\*)

1\* This data is read out automatically via the SDCS-CIU gateway.

2\* This data comes from the commissioning process

3\* This data can be added manually in the SCS dashboard

### SDCS Dashboard > Alerts (Administrator)

This overview includes SDCS alerts that originate from the DDA dosing pump and those that are generated via the SDCS web portal and are permanently defined as either warnings or alarms. Alerts are immediately forwarded to the SDCS web portal and, if enabled, to the SMS or email alarm teams. These alerts are displayed in various places in the SDCS platform:

#### All Alerts overview page:

Provides a quick overview of active alerts (alarm and warnings) for all installed SDCS systems with customer/installation name, alarm initiator and local event time. A link leads directly to the dashboard of the affected SDCS dosing system. If no alarms are present, a green tick symbolizes a faultless system status of all systems.

#### Alert Tile in the SDCS Dashboard:

Presents detailed alert descriptions accompanied by alert signal indicators and link to the dedicated SDCS system. In the case of a simultaneous alarm and warning, the alarm is prioritized.

#### All Alerts:

List of alerts spanning the last 3 months within a dedicated SDCS system. Information includes alert types, local date and time, customer and installation name, alert initiator, and link to the SDCS system dashboard.

#### CSV Event Report:

Provides a downloadable CSV report encompassing the preceding 3 months. The report includes pertinent details such as alert types, local and UTC date and time, customer and installation names, alert initiators, and dedicated SDCS system links.

#### SMS/Email Notifications:

Users who belong to an alarm team with a registered SMS and email address will receive SMS and/or email notifications after alarm (no warnings) events and chemical tank pre-empty-empty situations (e.g. activation of the float switch or calculated conditions). These notifications include alert descriptions, timestamps, dates, and links to the specified SDCS system.

### **SDCS Dashboard > Remote control (Administrator)**

The DDA dosing pump provides two modes of remote interaction: monitoring (read-only) and control (read and write commands). The selection between these modes is made on-site at the dosing pump by enabling or disabling the DDA BUS feature.

#### Read-Only Mode (Bus Deactivated at DDA):

In this configuration, the remote page serves as an information hub, providing real-time data about the pump's current on site settings. Any configuration changes made to the DDA on-site will be promptly transmitted to the SDCS web portal.

#### Remote Control Mode (Bus Activated at DDA):

With the Bus activated at the DDA, the remote page allows for parameter adjustments via the SDCS web portal. Input values are checked in accordance with the connected DDA pump type. If the input values aren't supported by the connected DDA pump type, a pop-up note with the pumps supported value range is generated. The remote page dynamically presents only the features relevant to the connected DDA pump's control type. Check the DDA manual for the supported features of each DDA control type.

Upon selecting one or more commands, the SDCS web portal initiates transmission of these commands to the DDA pump via cellular network, awaiting a positive or negative acknowledgment from the DDA dosing pump. A pop-up window shows whether the dosing pump has accepted the commands sent.

The SDCS remote page supports following parameters (depending of the connected DDA control type):

Operation Mode:	Start or stop the DDA dosing pump.
Control Mode:	Choose between manual dosing or proportional dosing via pulse input with Pulse Memory.
Concentration Setting:	Manual dosing: The target manual dosing flow in l/h or gal/h Pulse: The ml/pulse value for the target volumetric concentration in ml/pulse
Auto Deaeration:	Enable or disable automatic deaeration for degassing chemicals.
Slow Mode:	Choose between Off, 50%, or 25% slower suction stroke velocity for high viscous or degassing chemicals.
FC Sensitivity and Delay:	Set sensitivity and delay for the integrated FlowControl dosing motoring feature.
AutoFlowAdapt:	Toggle automatic dosing flow adaptation on or off. It adjusts dosing flow if there is a deviation between the target and actual measured dosing flow.
Max Pressure:	Set the maximum pressure threshold for the dosing process. When reached, the DDA will halt with an alarm.
Min Pressure as Alarm:	Choose whether the DDA should issue a warning or halt with an alarm if the dosing head's pressure drops below 3 bar (e.g., due to a pipe break).

#### **SDCS Dashboard > Chemical tank monitoring (Administrator)**

SDCS features a sensor less patented function for calculating and displaying the remaining volume of chemicals in the on-site chemical container. Through the Grundfos GO App, users of an organization can register a chemical volume (in liters or gallons) along with the name of the newly connected chemical. The DDA dosing pump subtracts its measured dosing volume (DDA-FC/-FCM) from the registered connected total volume every hour.

In the GO App, users can also set a pre-empty volume at which SDCS should send a "Pre-empty container (Calculated)" warning to registered users of the alert team via SMS or email. The warning for the calculated pre-empty notification is also provided in all relevant areas (see "Alerts").

Information about the names of connected chemicals, the newly connected chemical's total volume, the volume for the pre-empty warning, the registered email of the chemical changer, and the local date/time of the chemical change are displayed in the SDCS web portal and are updated hourly.

#### **SDCS Dashboard > Pump status (Administrator)**

Delivers insights into the current status of the DDA dosing pump. Any adjustments made to the pump, whether on-site or remote, will be promptly reflected in the pump status tile.

Control Mode:	Indicates whether the pump is operating in Manual or Proportional dosing mode. If the pump will be operated in Analog or Batch mode, the system will indicate that this control mode is not supported.
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Setpoint:	Manual: Provides information about the target manual dosing flow in l/h or gal/h Pulse: Info about the ml/pulse setting for proportional dosing.
Pump Operation:	Offers feedback based on the DDA display colour (Standby, Operational, Warning, or Alarm).
Pump Status:	Provide information on the current pump status using written descriptions (Start; Stop; Standby; Service; Calibration).
Pump Running:	Indicates whether the pump is currently running or not.
Stopped By:	Specifies the source that caused the pump to stop (Display button, External stop relay, or Remote).
Remote Control:	Displays whether remote control is activated/deactivated at the DDA.

### **SDCS Dashboard > Concentrations information tile (Administrator)**

The Concentration Tile provides a visual overview of the historical dosing concentration quality for manual or proportional dosing. The data in the Concentration Tile is updated hourly and varies based on the selected control mode.

#### Manual dosing:

If manual dosing is selected, the currently selected manual dosing flow rate is displayed in l/h or gal/h. There is also a visual display of the actual volume dosed over the last 24 hours in l per last hour or gal per last hour as a bar chart.

#### Proportional dosing:

When opting for proportional dosing, the tile presents a distribution bar curve of the current volumetric concentration. A 10% distribution chart is then generated based on the selected volumetric target concentration, showcasing hourly actual concentration measurements as a bar. Hourly measured concentrations outside the 10% distribution bar chart are displayed as plus 10% and minus 10% collection.

This procedure continues for up to 3 months of measured hourly data or if there's a change in the in the target concentration.

### **SDCS Dashboard > Service reminder (Administrator)**

Upon reaching 7500 and 8000 DDA motor operating hours, the dosing pump will send service reminder warnings to the SDCS web portal.

After 7500 motor operating hours:           Warning "Service Soon"

After 8000 motor operating hours:           Warning "Service Now"

Within the tile, a progress bar will visually represent the service credit hours of 8000h, along with the remaining motor operating time until "Service Soon" and "Service Now" warnings. Additionally, resetting the service counter on the DDA dosing pump will synchronize with the service counter on the SDCS web portal. Real-time updates to the data within the service reminder tile will occur on an hourly basis.



## **SDCS Dashboard > More Data section (Administrator)**

The "More Data" section on the SDCS web portal provides additional information that can be useful but may be overwhelming for a quick dashboard glance. This information includes:

### Concentration Information for Manual Dosing:

**Selected Dosing Volume:** The manually selected dosing volume in liters per hour (l/h) or gallons per hour (gph) at the DDA dosing pump.

**Dosed Volume Last Hour:** The dosed chemical volume during the last hour in l last hour or gallon per last hour.

### Concentration Information for Pulse Dosing:

**Target Volumetric Concentration:** The target volumetric concentration resulting from the water meter pulse factor and the DDA's ml/pulse setting.

**Actual Volumetric Concentration:** The actual volumetric concentration during the last hour in ml/m<sup>3</sup> or parts per million (ppm).

**Dosed Volume Last Hour:** The dosed chemical volume during the last hour in l per last hour or gallons per last hour.

**Flow Meter Pulse Rate:** The pulse rate (in liters per pulse or gallons per pulse) of the external water meter provided by the GO App for internal calculation of the process flow and volumetric concentration .

**DDA Volume ml/pulse:** The current ml/pulse setting of the DDA dosing pump, which determines the volume of chemical dosed per pulse.

### Chemical Information:

**Connected Chemical:** The name of the chemical connected via the GO App.

**Chemical Connection Date:** The date when the chemical was connected using the GO App.

**Connected By:** The email address of the person who exchanged the chemical.

**Connected Volume:** The total volume of the connected chemical in liters (l) or gallons (gal).

**Actual Volume:** The current amount of chemical remaining in the container, updated hourly, in liters (l) or gallons (gal).

**Calculated Pre-Empty Message:** The volume in liters (l) or gallons (gal) selected with the GO App at which a warning message is sent if the chemical is running low.

### Dosing Counter:

**Total Dosed Chemical Volume:** The accumulated quantity of chemical dosed since the system's commissioning, measured in liters (l) or gallons (gal). This value will be updated hourly.

**Total Process Liquid Volume:** The total volume of dosed process liquid (e.g., drinking water) since the system's commissioning, measured in liters (l) or gallons (gal). This value will be updated hourly.

### Operation:

**Motor Operating Hours:** The total number of hours during which the pump was actively dosing. This value will be updated hourly.

Operating Hours: The total number of hours during which the pump was connected to the electrical mains. This value will be updated hourly.

First System Startup: The date and time when the SDCS was initially commissioned.

### **SDCS Dashboard > Dosing report (Administrator)**

SDCS provides the option to download dosing reports for the last 3 months as CSV files. These reports are categorized for better clarity into two types: Alerts and Trend Data.

#### Event Report

The Event Report includes all alerts from the past 3 months with the following details:

- Gateway ID (IMEI): A unique system identification
- UTC date stamp: Date stamp of the alert in UTC date format
- UTC time stamp: Timestamp of the alert in UTC time format
- Customer name: Customer name of the installation
- Installation name: Name of the installation
- Signal word: Warning or Alarm
- Event: Clear description of the alert
- Initiator: The Source of the alert

#### Trend Data Report

The Trend Data Report contains hourly data and provides the following information:

- Gateway ID (IMEI): A unique system identification
- UTC date stamp: Date stamp of the trend data in UTC date format
- UTC time stamp: Timestamp of the trend data in UTC time format
- Customer name: Customer name of the installation
- Installation name: Name of the installation
- Control mode: Manual or Pulse dosing
- Actual concentration:
  - Manual: Dosed volume for this hour in liters or gallons
  - Pulse: Actual volume concentration in ml/m3 or ppm
- Total dosed volume: Cumulative dosed chemical volume in liters since installation start
- Total process water vol.: Cumulative added process water in m3 since installation start
- Chemical volume: Remaining chemical volume in the tank in liters
- Motor operating hours: Total motor operating hours in hours (cumulative)

- Operating hours: Total hours on the power grid in hours (cumulative)
- Time until the next service: Remaining hours until service in hours

## SDCS CIU Gateway

The SDCS-CIU gateway facilitates seamless bidirectional communication between the DDA dosing pump and the SDCS web portal through the cellular network. It connects to the DDA dosing pump via a 5m cable with an M12 plug. To expedite setup, the SDCS-CIU gateway features a 3m power cable with a Schuko or US plug. Additionally, a magnetic foot antenna is attached to the gateway via a 3m shielded cable for optimal performance.

The SDCS-CIU gateway is designed for effortless plug-and-play installation, ensuring swift on-site setup without the need for costly or time-consuming installation procedures.

To facilitate quick and hassle-free installation, the SDCS-CIU gateway features a stainless-steel metal plate with built-in hook support on the back, enabling rapid mounting without the need for extensive preparations.

A QR code sticker on the gateway's lid allows for easy identification using the Grundfos GO App, enabling the following interactions:

- System commissioning
- Chemical registration
- External flow sensor updates

The SDCS-CIU gateway comes with an integrated SIM card featuring preconfigured roaming contracts, making it ready for use in the following operating countries:

- Germany, Austria, Switzerland, France, Poland, UK&I, Netherlands, Belgium, Italy, Spain, USA, Canada

The cost of data transmission remains inclusive within the monthly SDCS subscription fee.

If the GO App is not already installed on the smartphone, scanning the QR code on the gateway lid will prompt the download of the GO App from the respective app stores.

Gateway name:	SDCS CIU (EU) and SDCS-CIU (US)	
Variants:	92757356	SDCS CIU Gateway cpl. packed (Europe)
	92757354	SDCS CIU Gateway cpl. packed (USA/Canada)
Carrier signal:	3G/4G (coverage), 2G fall back	
SIM:	Preinstalled	
IP:	IP54/Class3	
Power cable:	92757356	3m connected power cable with Schuko (CEE 7/7 ) plug
	92757354	3m connected power cable with Type B (NEMA 5-15) plug
Bus cable:	5 m connected cable with M12 plug (Gateway><DDA)	

Antenna: Magnetic foot antenna with 3m connected cable  
Sticker: 1 QR code sticker to identify the SDCS unit with GrundfosGO  
2 spare QR code stickers

### SDCS 3.0 Subscription plan

Subscription Plan: SMART Digital CHEMPAIRING Suite 3.0 (99797698)  
Price: 360€ per year (DACH, Italy, France, Benelux, Spain)  
360\$ per year (USA/Canada)  
300£ per year (UK&I)  
1.800 zł per year (Poland)  
Subscription Period: One year  
Subscription start date: With the first day of the next month  
Notice period: One month

Included in the SDCS 3.0 Subscription Plan:

- Unlimited number of users
- Connectivity of one SDCS\_CIU gateway with one DDA dosing pump
- Remote control and monitoring of a DDA dosing pump in manual or pulse mode
- SIM card and data gateway transfer costs included
- 3 months of data backup
- Downloadable CSV trend and event data report
- Sensor less tank volume monitoring
- Access to the Grundfos GO App for point of use activities
- Notifications through SMS or email