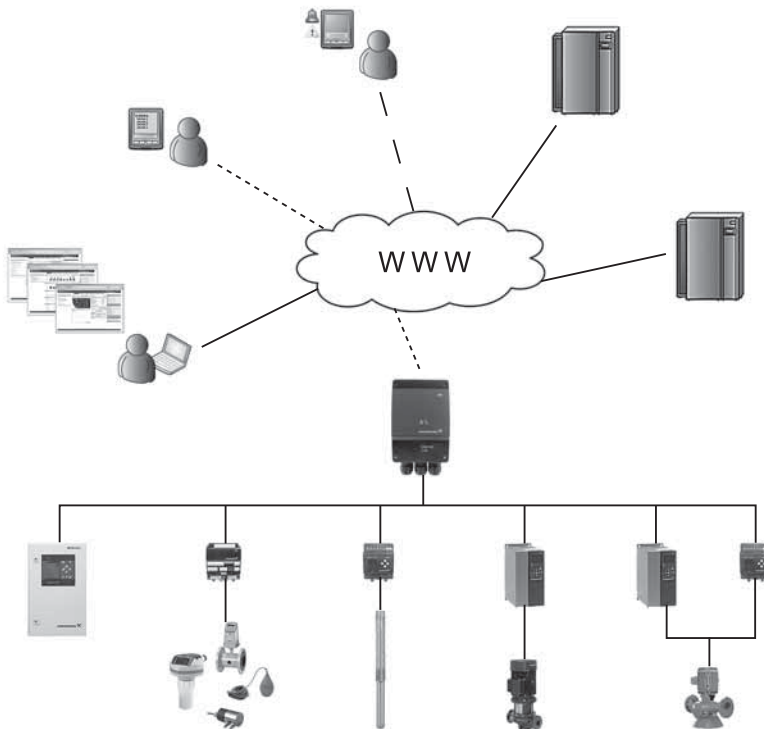


Grundfos Remote Management

CIM 270, 271, 272, 273

Installation and operating instructions



English (GB) Installation and operating instructions

Original installation and operating instructions

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1. Symbols used in this document



Warning

If these safety instructions are not observed, it may result in personal injury.



Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment.



Notes or instructions that make the job easier and ensure safe operation.

2. Definitions and abbreviations

CIM 270	Communication Interface Module (GPRS data logger).
CIU 27X	Communication Interface Unit.
GENibus	Proprietary Grundfos fieldbus standard.
GRM	Grundfos Remote Management.
GPRS	General Packet Radio Service.
GSM	Global System for Mobile communications.
IMEI	International Mobile Equipment Identity.
IO module	Multi-purpose IO module in CIU 27X unit.
LED	Light-Emitting Diode.
PIN	Personal Identification Number (SIM cards).
SIM	SIM card, Subscriber Identity Module.

3. Introduction

Grundfos Remote Management is an internet-based remote monitoring, management and reporting system for pump installations. It provides remote access to data from pumps, pump controllers and auxiliary equipment like sensors and meters. Data from pump installations is transferred to a central database and published to subscribers on a secure web server. Users have access to data from pump installations that are registered to their own Account.

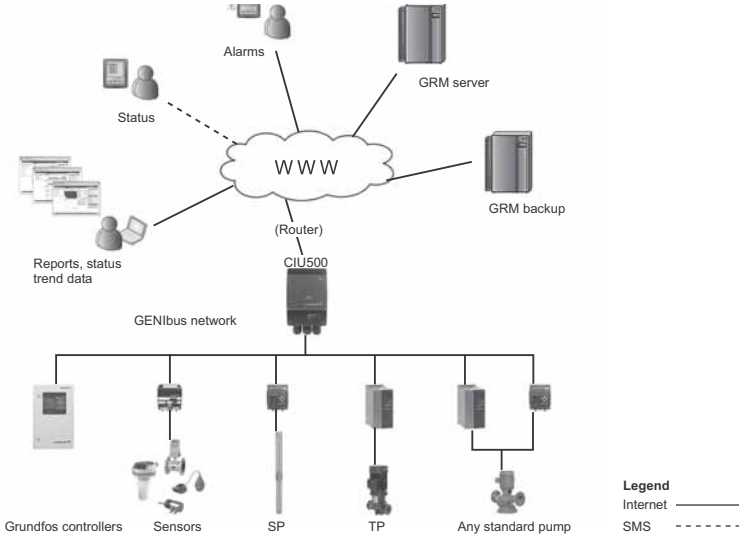
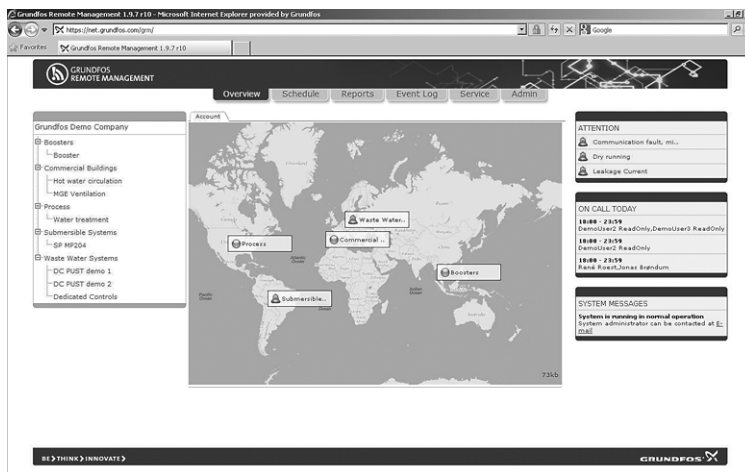


Fig. 1 Grundfos Remote Management

TM04 7279 2410

A fully configured system Account contains maps and system drawings that provide an overview of your pump installations. It also has a Schedule to direct alarms to users when they are on duty, and it contains a Service log for all your pumps. This user manual guides you through the process of configuring your Account and connecting pump installations to your Account.

A fully configured Grundfos Remote Management system appears from fig. 2.



TM04 7280 2410

Fig. 2 Example of an Account in Grundfos Remote Management

In the following, the tabs at the top of the user interface will be described in the order that the system is to be set up.

To get started using the system, we recommend you to read these instructions and carefully follow the setup procedure.

Other relevant documentation

Separate installation and operating instructions are available for the hardware:

- CIM 2XX GSM module (CIM 270)
- CIU - Communication Interface Unit (CIU 27X)
- Multi-purpose IO module in CIU 27X.
- CIM 500 Ethernet module

Note

We recommend you not to use Grundfos Remote Management as the only means of monitoring and control in systems where malfunction for a short period of time has severe consequences. The system is never more reliable than the GSM network used for data communication.

The functionality of Grundfos Remote Management is continually improved and enhanced. Information about new features is found online in the system.

This manual contains all the information you need for initial setup of your user Account in Grundfos Remote Management.

4. Quick start-up

The fast way to bring a new installation online is to follow the steps below:

1. Insert your SIM card into a mobile phone, and set the PIN code to 4321.
2. Make sure that the SIM card is able to acquire a signal from the network operator you expect it to use.
3. Be sure that you have noted the following:
 - Mobile phone number of the SIM card.
 - IMEI number of the CIM 270.
The number appears from a silvery sticker inside and on the outside of the box the CIU 27X or CIM 270 was delivered in.
4. If you use a CIU 27X, connect the GENibus network and the power supply.
 - See installation and operating instructions for the CIU - Communication Interface Unit and the quick guide for the CIU unit.
5. If any sensors or meters are used and are to be monitored using the built-in multi-purpose IO module, see installation and operating instructions for Multi-purpose IO module in CIU 27X.
6. Insert the SIM card into the CIM 270, and switch on the power supply.
7. Check that the CIM 270 has acquired a network.
 - See section [5.1 Preparing the SIM card](#).
 - The yellow LED to the left will first flash rapidly (1-second intervals). Once a network has been acquired, the LED will flash slowly (3-second intervals).
8. Log on to the GRM server, and complete the four-step installation wizard.
 - See section [6. Log-on to the GRM](#).
9. Check that the GENibus network is configured correctly. When the installation wizard is completed successfully, the LED to the right will change from permanently red to permanently green.
10. If you use a CIM 500
 - See installation and operating instruction for CIM 500 Ethernet module.
 - When using a 3G/4G Router add the SIMcard into the Router (related to Router description) and connect the Router via an Ethernet cable to the CIM 500.
 - Setup the Router. Logon to the GRM server, and complete the installation wizard.

5. Preparing the hardware for installation

Guide to the electrical installation of the following hardware:

- CIM 270 (GPRS data logger).
 - See installation and operating instructions for the CIM 2XX GSM module.
- CIM 500 (Ethernet module)
 - See Installation and operating instructions for the CIM 500 Ethernet module
- CIU 27X/50X with multi-purpose IO module.
 - See installation and operating instructions for Multi-purpose IO module in CIU 27X and the quick guide for the CIU unit.

The CIM 270 GRM/500 Ethernet module is fitted in the CIU unit and is used to establish external communication to the GRM server.

Once the CIM 270/500 or CIU 27X/50X has been installed, the SIM card must be prepared for installation.

5.1 Preparing the SIM card

During initial setup of a new CIM 270, the PIN code of the SIM card must be set to 4321.

1. Insert the SIM card into a mobile phone, and find the function "Change PIN code" in the settings menu of your phone. The SIM card must have the PIN code 4321 at this point. Otherwise it will not be able to connect to a GSM network.

Note

During the online installation procedure, it is possible to set a new PIN code for the SIM card.

2. Check that a connection to the GSM network can be established.
3. Insert the SIM card into the CIM 270, and switch on the power supply. If you use a CIM/CIU 500 and a 3G/4G Router, please follow the instructions of the Router and I&O of the CIM 500
4. Observe the network indicator LED. See fig. 3. After a few moments, the flashing sequence should change from fast to slow. See section [16. GSM LED of the CIM 270 \(left\)](#).

No GSM network:

· * · * · * ·

Connection established:

... * ... * ... * ...



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Fig. 3 Flashing sequence

The phone and IMEI numbers have to be used later on in the installation process. Therefore, we recommend you to make a note of the phone number of the SIM card and the IMEI number of the CIM 270. You are now ready to register the CIM 270 on the GRM server and to set up the application you want to have monitored by the GRM system.

6. Log-on to the GRM

To log on to the GRM server system, go to <https://remotemanagement.grundfos.com>.

You will be prompted for user name and password.

Current users of the Grundfos Extranet can log on with their Extranet user name and password. New users will receive an e-mail with log-on details.

If you do not have a user name and a password, contact your local Grundfos company, or send an e-mail to

remote-management@grundfos.com.

When you log on for the first time, a navigation tree will appear. See fig. 4.

The basic steps in setting up an Account are described in the following section.

6.1 Navigation

To provide an overview of the installations monitored by the GRM system, a navigation tree is used.

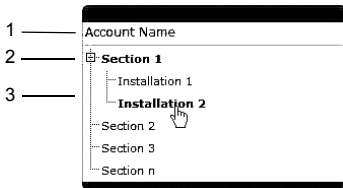


Fig. 4 Navigation tree

The navigation tree is divided into three levels:

Pos.	Level
1	Account
2	Section
3	Installation

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6.1.1 Account level

At the Account level, you will find the name and details of your Account.

6.1.2 Section level

At the Section level, it is possible to create several Sections. Sections are logical groups of one or more Installations.

At the Installation level, you will find the devices that are monitored. An Installation is defined by a modem monitoring one or more bus devices or sensors.

Sections could, for example, reflect a geographical segmentation of the entire monitored network or segmentation according to area of expertise or responsibility of a group of persons.

Note

Adding a Section

Right-click the Account name, and click Add to add a Section.

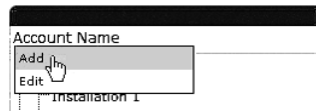


Fig. 5 Adding a Section

When the Section is created, you can add an Installation to the Section.

6.1.3 Installation level

An Installation is always added to a Section and consists of a modem and a number of monitored devices, normally a CIM 270 and at least one GENIbus device (Grundfos pump, pump controller or IO module).

Adding an Installation

Right-click the Section name, and click Add to add an Installation.

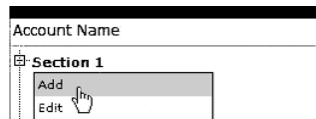


Fig. 6 Adding an Installation

The setup of an Installation is a four-step procedure:

1. Create Installation.
2. Set up Installation.
3. Configure and connect Installation.
4. Configure alarms and warnings.

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Step 1: Create Installation

- Enter the phone number of the SIM card (+ (country prefix) (phone number)).
- Enter the IMEI number of the CIM 270 (XXXXXXXXXXXXXXXXXX).
- Select the mobile data service provider.
- Enter an optional PIN code. This code will replace the default PIN code that was set during initial setup of the CIM 270.
- If you use a CIM/CIU 500, enter the MAC address of the used CIM 500 port.

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Fig. 7 Establishing connection

Click "Test connection". The test will take a few minutes. The server configures the CIM interface for use in the GRM system.

If the server has connected successfully, you are notified and can proceed to [Step 2: Name and type](#).

If the server does not get a response from the CIM interface within two minutes, the attempt to connect will time out, and you will get a fault notification. See section [18. Fault finding](#).

Step 2: Name and type

Enter a name for your Installation, and select the application type that best characterises the Installation. This will provide the system with information on, for example, the type of report that is relevant for this Installation.

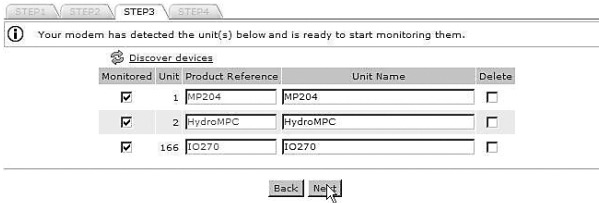
TM04 7286 2410

Fig. 8 Name and type of installation

Step 3: Configure and connect Installation

Click "Discover devices" to initiate a scan of the network of GENibus devices connected to the CIM 270.

Once the scan is completed, you will see a list of connected devices (pumps, controllers or modules) together with their address in the network.



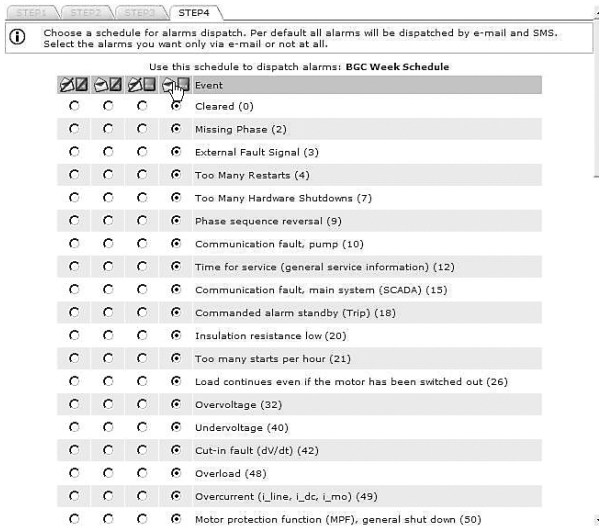
TM04 7287 2410

Fig. 9 Discovering GENibus devices

Step 4: Configure alarms and warnings

Alarms and warnings that can be received from each type of device on the monitored network will be listed. It is possible to select which alarms you want to receive and how they should be sent.

Icon	Description
	Both e-mail and SMS alarms have been disabled.
	An e-mail will be sent to the user when the alarm or warning is active.
	An SMS will be sent to the user when the alarm or warning is active.
	An e-mail and an SMS will be sent to the user when the alarm or warning is active.



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Fig. 10 Selecting dispatch mode for alarms and warnings

When you click [Finish], the server will transmit your monitoring configuration to the CIM 270, and the installation is completed.

7. GRM data communication

This section describes how data communication and data collection work in Grundfos Remote Management.

We distinguish between four different types of data:

- **Sample Data:** Data used to create trend curves.
- **Event Data:** Data that shows you what your installation is doing right now (actual status).
- **Alarm Data:** A special type of Event Data that is sent instantly in the event of an alarm.
- **Manage Commands:** Commands you send from the web user interface when you want to remote-control or -configure a GENIbus device.

The CIM 270 is able to send/receive data using both SMS and GPRS traffic. However, there are some built-in rules that govern the priority and type of data connection used.

Data type	Data connection	Description
Sample Data	GPRS	Sample Data is stored in the CIM and sent to the central server via GPRS at regular intervals. This data is the basis of trend curves and used in reports as well. The sample interval is normally 30 minutes.
Event Data	GPRS and SMS	Event Data is real-time data. This data tells you what is going on in the installation right now. Event Data is collected and displayed when you establish a connection to the installation. If a GPRS connection cannot be established, Event Data is sent via SMS.
Alarm Data	SMS and GPRS	Alarm Data is a special type of Event Data. When a CIM sends an alarm to the central server, it will also deliver a snapshot of Event Data present for that installation at the time the event occurred. If a GPRS connection cannot be established, Alarm Data is sent via SMS. The CIM will continue to attempt to send an alarm to the central server until it has received acknowledgement from the server.
Manage Commands	GPRS only	A device can only be remote-controlled when a GPRS connection is established. This gives the highest possible degree of certainty that the command issued is received and carried out when expected.

Note

If you have received an alarm and want to analyse the cause of the alarm, do not click [Connect] until you have had a look at the Event Data at the time of the alarm.

8. Overview



Fig. 11 Overview

In this view, it is possible to insert images at Account and Section levels, for example maps and system drawings displaying the location and layout of pump installations.

Supported formats are *.png, *.jpg and *.gif. We recommend file sizes below 250 kb to optimise the performance of the web server. Largest permissible file size is 10 Mb.



Fig. 12 Uploading an image and placing Sections on the image

9. Schedule for alarm distribution



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English (GB)

Fig. 13 Schedule

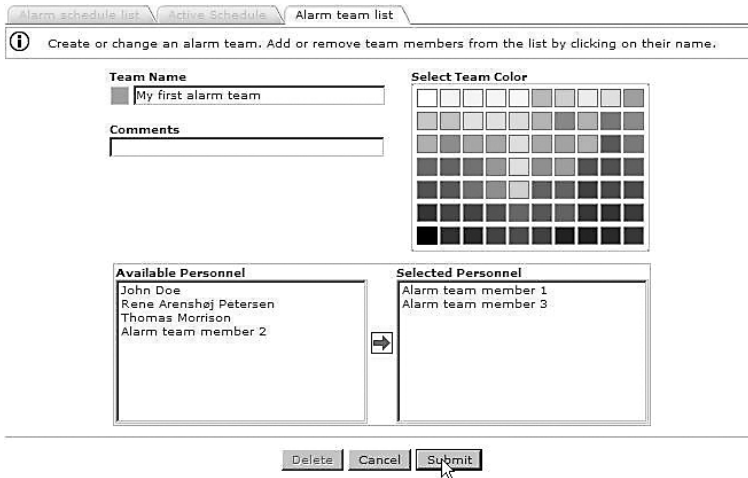
One of the key features of GRM is the ability to distribute alarms from monitored pumps and controllers according to a centrally maintained Schedule.

The distribution of alarms from the GRM server is based on Week Schedules and alarm teams. It is possible to create any number of Week Schedules in the system.

Note A Week Schedule is not active until it has been assigned to a Section.

Once the Week Schedule has been assigned to a Section, all alarms and warnings from Installations in that Section will be distributed to users according to the assigned Schedule.

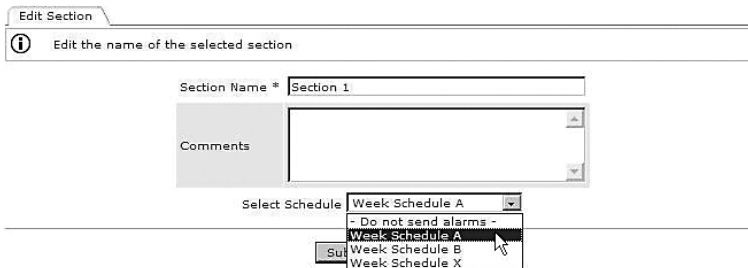
The first thing to do is to create your alarm team(s).



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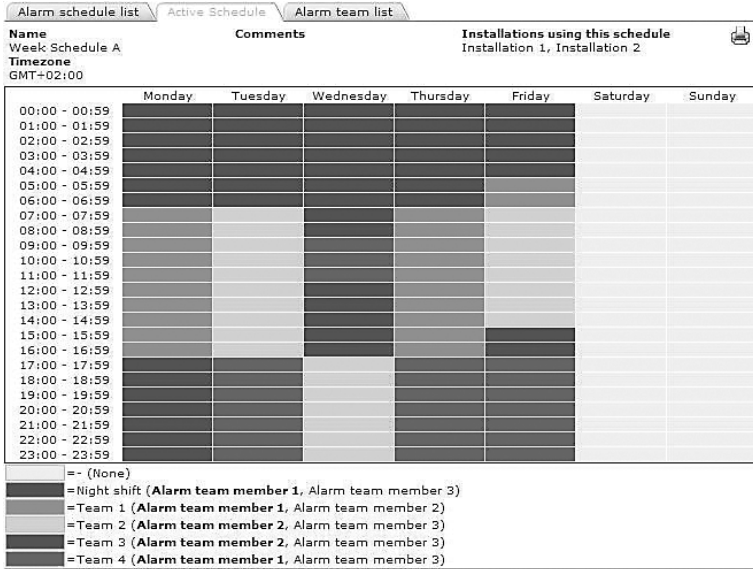
Fig. 14 Alarm team

To assign a Week Schedule to a Section, right-click the Section name, and select the Week Schedule from the drop-down list.



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Fig. 15 Assigning a Week Schedule



TM04 7296 2410

Fig. 16 Example of Week Schedule

All GRM users are potential members of an alarm team. Users that have entered a mobile phone number on their Account details are able to receive alarms via SMS.

If there is no mobile phone number registered for a user, the e-mail address is the only way of delivering alarms.

You can make as many Week Schedules as you like. They are not activated until you assign them to a Section.

Note

Different Sections may operate on different Week Schedules.

10. Reports



Fig. 17 Reports

The system contains a report engine that will automatically generate summation reports. The contents of the reports depend on the application. The reports will typically run on a monthly basis and deliver an output which can be downloaded to a spreadsheet.

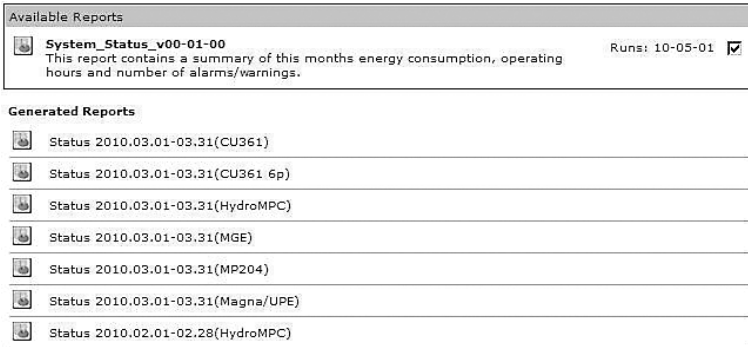


Fig. 18 Example of generated reports

11. Event log



Fig. 19 Event log

The Event log provides a full history of events and interactions related to each monitored device. The Event log provides a record of the following:

- alarms
- warnings
- cleared alarms and warnings
- user acknowledgement of alarms and warnings
- remote-control commands issued by a user
- service warnings
- comments entered manually by a user.

All events are time-stamped when they are received by the server, and user-initiated events are stamped with the user's system ID. The Event log can be downloaded to a spreadsheet.

 The screenshot shows the 'Event Log' interface. At the top, there is a search filter for 'Event Log' and an 'Add entry' button. Below this is a date range selector: 'From 2010-03-18 To 2010-04-17' with a 'Submit' button. The main content is a table with columns: Date, Event, Section, Installation, and Unit. The table contains six rows of event data. At the bottom, it says 'Now showing 21-26 of 26 hits' with 'Previous' and 'Next' links.

Date [+]	Event	Section	Installation	Unit
2010-03-23 13:48:36 Cleared 2010-03-23 13:48:43	Motor bearing temperature high (PT100), drive-end (DE) (Pump 2)	Waste Water Systems	DC PUST demo 1	CU361
2010-03-22 23:31:26 Cleared 2010-03-23 09:23:20	Communication fault, missing heartbeat	Waste Water Systems	DC PUST demo 1	CU361
2010-03-22 15:28:42 User 35033	Timeout waiting for connection, please try again and/or inspect GSM connection	Waste Water Systems	DC PUST demo 1	CU361
2010-03-22 05:31:26 Cleared 2010-03-22 09:26:42	Communication fault, missing heartbeat	Waste Water Systems	DC PUST demo 1	CU361
2010-03-21 20:22:12 Cleared 2010-03-22 12:44:41	Phase sequence reversal (Pump 1)	Waste Water Systems	DC PUST demo 1	CU361
2010-03-21 20:22:12 Cleared 2010-03-22 12:44:41	Phase sequence reversal (Pump 2)	Waste Water Systems	DC PUST demo 1	CU361

Now showing 21-26 of 26 hits
[Previous](#) page 3 of 3 [Next](#)

Fig. 20 Event log

12. Service



Fig. 21 Service

The Service tab provides a tool to manage service of pump installations. The basic functionality keeps track of the total number of operating hours for each of the pumps monitored by the system. For some products, the number of starts is also monitored.

You can set thresholds for each service parameter and be notified automatically via e-mail when a threshold is met. It is also possible to set a date on which you want to be notified if your service strategy is based on a time interval.

When a new pump is detected by the CIM interface, an entry for that pump is automatically created under the Service tab.

If you enter the product number of the monitored Grundfos pump, you will have direct online access to documentation, including service videos, pump curves, etc.

A screenshot of a web application interface showing a table of service log entries. The table has a header row with columns: Photo, Name, No., Product Number, Notes, and Next scheduled service. There are four data rows, each with a small pump icon in the Photo column. The first two rows show 'Change shaft seal' notes, and the last two show 'Inspect' notes. The dates in the 'Next scheduled service' column are 2012-11-12, 2012-08-06, 2012-08-06, and 2012-04-17.





Photo	Name	No.	Product Number	Notes	Next scheduled service
	Pump 1	1	96566095	Change shaft seal	2012-11-12
	Pump 1	1	96566095	Change shaft seal	2012-08-06
	Pump 2	2	96566095	Inspect	2012-08-06
	Pump 1	1	96566095	Inspect	2012-04-17

Fig. 22 Example of a Service log entry

13. Admin, user administration



Fig. 23 Admin

Under the Admin tab, you will find the functionality to create new users and to maintain the data of each registered user of the system.

To create a new user, fill in the following:

- name
- surname
- e-mail.

This is the minimum information required to create a new user in Grundfos Remote Management.

The field "Mobile" is optional. This number will be used to send SMS alarms to the user, if registered as an alarm recipient on a Schedule.

Account		Account Name
Name*	<input type="text"/>	John
Surname*	<input type="text"/>	Doe
Email*	<input type="text"/>	grm-demo@grundfos.com
Mobile	<input type="text"/>	+1 555 555 4321
User Level	<input type="text"/>	Read only
Language	<input type="text"/>	English
Timezone	<input type="text"/>	GMT+05:00

* Required Input

Fig. 24 Creating a new user

Now select the appropriate user access level. Users can be assigned different access levels, depending on their intended use of the system.

There are three different access levels:

- full access
- operator access
- read-only access.

Full access

A full-access user has access to all features of the system, for example to view the following:

- current status of the system
- trend curves
- reports
- event log
- service log.

A full-access user can operate the system via remote access, i.e.

- reset the system
- perform remote start/stop
- change settings
- manage administration rights.

A full-access user can create, change or delete a Section, an Installation, a user Account, etc.

We recommend you only to have one or two full-access users.

Operator access

An operator is able to remote-control installations, for example perform the following:

- remote resetting
- remote start/stop of a pump
- change of setpoint for system pressure.

Operators are users that you would normally also trust with physical access to the monitored systems.

Read-only access

Read-only users can view the following:

- current status of the system
- trend curves
- reports
- event log
- service log.

This group of users cannot change settings and affect the operation of an installation.

Read-only users would normally access the system in order to analyse the performance. Users who are intended to receive SMS alarms only, not to access the system, should be created as read-only users.

Language

Select the user's preferred language from the list of available languages.

Time zone

Enter the time zone in which an alarm schedule is used. This feature of the system makes it easy to work with alarm teams in different time zones.

Observe the following:

- Place Installations in the same time zone in the same folder.
- Set the right time zone for the alarm schedule you assign to the Section.

If you do not operate with service teams across different time zones, just use the default setting.

14. Alarms

By default the CIM interface will transmit alarms generated by a monitored GENIbus device to the central server. There are, however, also some other alarms available.

14.1 Heartbeat

The alarm text "Communication fault, missing heartbeat" is a server-generated alarm message that informs you that a CIM interface has failed to routinely contact the central server.

Recommended actions to take when this alarm is received:

1. Log on to the GRM, and attempt to connect to the Installation.
2. Check the status of the GPRS network in the area together with your telecommunication provider.
3. Check the power supply to the installation.

14.2 Power supply failure, operating on battery

If the CIM 270 has a backup battery fitted, it is able to report when it switches to battery operation. Once the CIM 270 is running on battery, it will stop sampling data and report a fault to the server. Once the power is restored, the CIM 270 will resume normal monitoring operation, and you will be notified that the power has returned.

15. Multi-purpose IO module

The multi-purpose IO module in the CIU 27X/50X is designed especially for use in Grundfos Remote Management.

Pumps without GENIbus connection are connected and monitored via the IO module. When a digital input is specified to monitor a pump during configuration of the IO module, a pump log will be created under the Service tab.

The IO module enables you to monitor sensors, meters, standard pumps, etc. and to remote-control a relay and an analog output (0-10 V) from your internet browser.

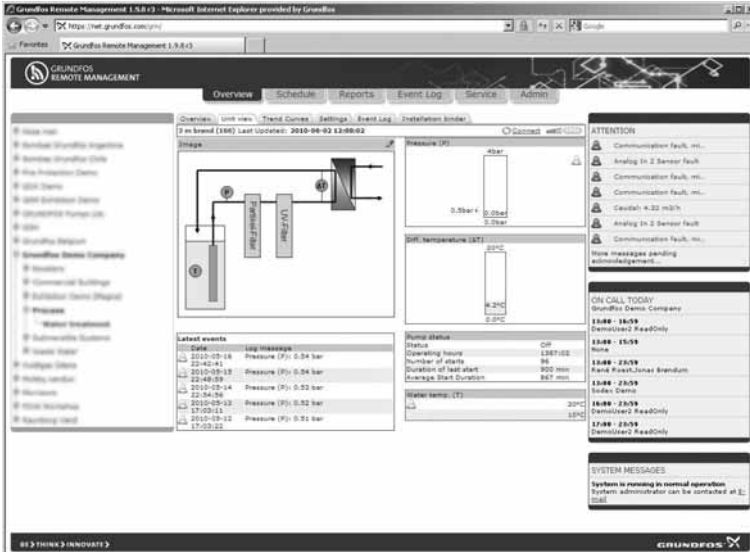


Fig. 25 Example of graphical display of monitored sensors

The IO module has two configurable inputs (analog/digital) set by use of jumpers.

The configurable inputs can be set as the following:

- digital signal
- analog signal (0-10 V)
- analog signal (4-20 mA)
- analog signal (0-20 mA).

The IO module has one Pt100/Pt1000 sensor input and one analog output.

For further information about the IO module, see installation and operating instructions for Multi-purpose IO module in CIU 27X.

Once you are online with your application, you can perform the following actions:

- Set up names for all input types.
- Scale information for the analog inputs.
- Set alarm thresholds for analog inputs.
- Define digital inputs for alarm detection.
- Define digital inputs to count pulse signals.
- Define digital inputs to monitor operations, i.e. log operating hours and number of starts of a connected pump.

On the basis of the above definitions, a graphical user interface is generated complete with the option of seeing trend data for the monitored I/O devices.







Fig. 26 Example of graphical display of data from monitored sensors




GENibus I/O modules are available from Grundfos if you should need additional I/O functionality.

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16. GSM LED of the CIM 270 (left)

LED status	Location	Description
<p>No GSM network. Yellow LED: · ✱ · ✱ · ✱ · (1-second intervals)</p>		<ul style="list-style-type: none"> • No SIM card in the CIM 270. • The PIN code of the SIM card is not known by the CIM 270. • No GSM coverage.
<p>Connection to GSM network established. Yellow LED: ... ✱ ... ✱ ... ✱ ... (3-second intervals)</p>		<p>The CIM 270 has successfully connected to the GSM network. Normal operation.</p>
<p>Sending or receiving an SMS. Permanently green LED.</p>		<p>This will typically be observed during the initial configuration of the CIM 270.</p>
<p>GPRS connection to central GRM server established. Green LED: ... ✱ ... ✱ ... ✱ ... (3-second intervals)</p>		<p>This can be observed when connecting to an installation.</p>

17. GENibus LED of the CIM 270/500 (right)

LED status	Location	Description
CIM 270 (factory default). Permanently red LED.		<ul style="list-style-type: none"> The CIM 270 has not been connected to any GENibus device yet.
The CIM 270 has loaded a GENibus device, but there is a problem on the GENibus network. Red LED: . ✱ . ✱ . ✱ . (1-second intervals)		<ul style="list-style-type: none"> A GENibus device expected by the CIM 270 has been removed, switched off or its address has been changed. There is a cable or connector problem on the GENibus network. The device detected is not supported by the CIM 270.
The GENibus network is configured correctly. Permanently green LED.		GENibus status OK.

18. Fault finding

Fault	Possible cause	Remedy
1. No response from the CIM 270.	a) The CIM 270 is not connected to the GSM network.	Check the GSM LED of the CIM 270. See section 5.1 Preparing the SIM card .
	b) You have not entered a correct combination of mobile phone number and IMEI number.	Check the phone and IMEI numbers.
	c) The SMS communication between the central server and the CIM 270 is delayed by the network operator.	Wait a few minutes and retry. You may experience a delay in the SMS service.

Note

During initial setup of a new CIM 270, the PIN code of the SIM card must be set to 4321. To avoid unwarranted use of the SIM card in case of theft, we recommend you to set a new PIN code for the SIM card during the configuration procedure.

Subject to alterations.

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