REDZ
SMART COMMUNICATION

ZRSOFTWARE.CLOUD FOR WINDOWS

User Manual

Written for ZRSoftware.Cloud 1.1.0.

Contents

ZRSoftware.Cloud on the web: redzsoftware.com/zrsoftware-cloud/

1	Introduction	3
2	Installation and first start	6
3	Signing in and the window	14
4	First reading, step by step	22
5	Communication lines	30
6	Meters and groups	38
7	Reading meters	52
8	Analysis	62
9	Tariffs	78
10	Formulas & reports	83
11	Automatic reading	90
12	Export schedules	98
13	Jobs & events	107
14	Import	116
15	Users	124
16	Settings	131
17	Remote access and the mobile app	143
18	License	150
19	Support	162
20	Troubleshooting	171
A	Appendix: supported meters	201
B	Appendix: version history	202

1 Introduction

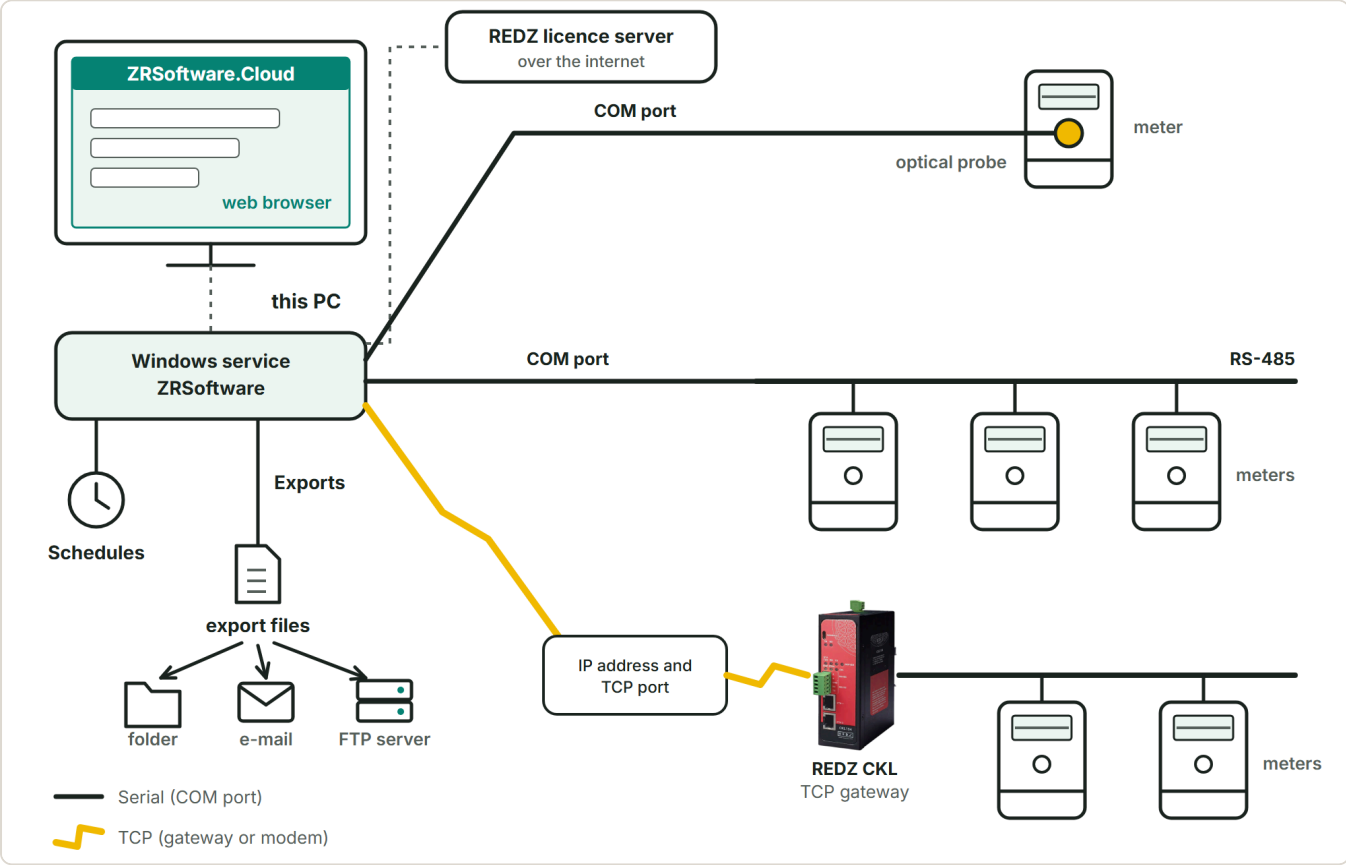
ZRSoftware.Cloud reads electricity meters and keeps their values on this PC. It runs as a Windows service (ZRSoftware.Cloud, service name ZRSoftware), and you work with it in a web browser on the same PC, at http://127.0.0.1:5080 or at the port chosen in the setup (see Installation and first start).

The service runs and reads the meters on its schedules also when nobody is signed in to Windows and no browser is open, as long as the licence allows it (License). When the trial or the licence ends, meters are not read and automatic exports do not run; your data stays, and you can still look at it and, as far as the licence includes these parts, analyse it and export it by hand. When the licence server says that the licence was withdrawn or moved, or that it does not know it on this PC, meters are still read for seven days and then stop; a copy of a virtual PC stops at once.

What you do with it

- Connect the meters through a communication line: an optical probe or an RS-232 / RS-485 connection on a COM port of this PC, or a TCP gateway or modem; for a TCP line an admin can look for REDZ devices on the network with **Scan REDZ devices** (Communication lines).
- Keep a list of the meters, sort them into groups and choose many of them at once (Meters and groups).
- Read a meter's registers and its load profile, and follow the bytes exchanged with the meter in the **Line log**, which an admin can hide on this installation (Reading meters, Settings).
- Look at the load profile in steps from 15 minutes to a day, split the energy into tariff zones, and combine meters in formulas and reports; save one month of a channel as a table of hours and days with **Monthly table** (Analysis, Tariffs, Formulas & reports).
- See day by day how complete each meter's stored load profile is, and read the missing intervals, on **Completeness**; watch the present power of chosen meters against a target for the hour on **Demand monitor** (Analysis).
- Let the service read the meters on schedules and, on its own, write export files into a folder, e-mail them or upload them to an FTP server (Automatic reading, Export schedules).
- Bring in meters and lists from an Excel file, or the meters, readings and lists of ZR Software 7 (Import).
- Keep the program up to date: the **Updates** card of **Settings** shows whether a new version is out and offers to download and install it, unless it came out after the licence's maintenance ended. An admin, or REDZ support during a support session, can download and install an update. The versions come from REDZ's licence server (see Settings).

- Let the users you allow work with the program from the ZRSoftware app on their phone when they are away from this network: the connection goes through a relay on the internet, and this PC only opens an outgoing connection. It needs a licence that includes **Remote access** and **Mobile app** (see Remote access and the mobile app).



`Figure 1.1` The Windows service on this PC reaches the meters through its communication lines: an optical probe or an RS-485 connection on a COM port, or TCP through a gateway such as the REDZ CKL. It reads them on its schedules and writes export files to a folder, e-mails them or uploads them to an FTP server; for the licence and for REDZ support it reaches the REDZ licence server over the internet. You work with it in a web browser on the same PC.

Appendix: supported meters lists the meter types that have been read on real meters with the program's meter drivers.

Who may do what depends on the user's role; Users describes the roles. An admin can also limit the meters a user who is not an admin sees to some groups of meters. What the pages offer also depends on the licence (License).

An admin activates the licence on the **License** page: online, with a licence key or a licence request sent to REDZ, or, on a PC without internet access, with a licence file from REDZ or your partner. On a virtual PC the licence is activated online only (see License).

When you need help, an admin can send a support bundle to REDZ support, or let REDZ support work in the program for 4, 12 or 24 hours, from the **Support** page (see Support). While a REDZ support session runs, a green window at the top right of every page says

until when REDZ support is connected; there an admin can chat with REDZ and end the session. REDZ support works with the rights of an Admin. It can add users and give a new one-time password to a user who has no remote sign-in. It cannot change its own account or the support session, give or change a user's e-mail address or remote sign-in, reset the password of a user who has remote sign-in, or reset the password of the last enabled Admin. It cannot change or test the mail settings on the **Mail** card or change the remote access settings on the **Remote access** card. Settings that are not set here can still come in during the session. Restoring a configuration backup adds the settings of the file that this program does not have yet: the mail and FTP settings without their passwords, the reactive ratio limits, the Line log choice and the number of days a phone stays trusted for remote sign-in. A restore needs an administrator only; it also works during a REDZ support session. An import of a ZR Software 7 database, also a copy that REDZ support uploads, can set that database's mail server, with user name and password, when none is set here and the licence includes Exports and e-mail. **Jobs & events** gets a row with the source REDZ support for each change REDZ support makes or tries to make, and for each file or reading trace it takes, also when it saves the chart as a picture or prints a page; a refused or failed change is a warning, and what was typed, for example a password, is not in the row. Pages that REDZ support only looks at leave no row. A reading trace is taken with **Trace** on the **Jobs** page of **Jobs & events** or, for a good registers reading, on the **Line log** tab of **Meter detail**, unless an admin has hidden the line log. REDZ support, working with the rights of an Admin, can show a hidden line log again; that change gets a row too.

This manual

This manual describes version 1.1.0. Names of buttons, boxes and pages are printed in bold as the pages show them. **Help** in the top bar of the program opens the manual on redzsoftware.com in a new browser tab; its first chapter names the version it describes.

2 Installation and first start

ZRSoftware.Cloud has two parts: a Windows service that reads the meters and keeps their data on this PC, and the pages you work with in a web browser on the same PC. The setup program installs the service and starts it; after that you open the pages at http://127.0.0.1:5080.

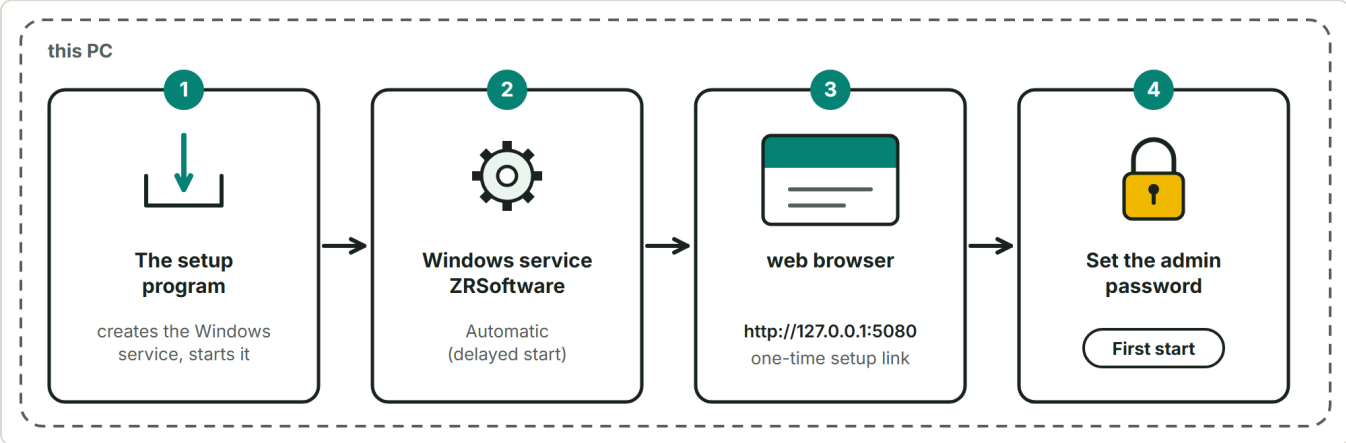


Figure 2.1 From the setup program to the first sign-in: the setup creates and starts the Windows service, the browser opens the pages on this PC, and you set the admin password.

What the PC needs

- A Windows version that .NET 10, which the program is built on, supports on x64 PCs: Windows 11 versions 24H2, 25H2 and 26H1; Windows 11 23H2 and Windows 10 versions 21H2, 1809 and 1607 only in the editions Microsoft's .NET 10 list names; Windows Server 2016, 2019, 2022, 23H2 and 2025, and Windows Server 2012 and 2012 R2 with Extended Security Updates.
- On a 32-bit Windows the setup stops with the message "ZRSoftware.Cloud needs 64-bit Windows."
- A Windows account with administrator rights to run the setup.
- Nothing else to install first: the runtime the program needs is inside the program file.
- A web browser on the same PC.

The setup program

Run ZRSoftware_Setup_1.1.0.exe. It shows four pages: a welcome page, Options, the installation itself with a list of what it does, and the Finish page.

> **NOTE**
> If Windows shows a warning when you start the setup program you downloaded from redzsoftware.com/zrsoftware-cloud/, confirm that you want to run it.

The setup does not ask for a folder. The program goes to C:\Program Files\REDZ\ZR Software. The data (database, backups, logs) goes to the folder REDZ\ZR Software in the ProgramData folder of Windows, which is C:\ProgramData\REDZ\ZR Software when Windows is on drive C. The Options page shows both folders.

On the Options page you can change the port the pages answer on. The default is 5080. A value outside 1 to 65535 is refused with "The port must be a number from 1 to 65535." If you change the port, use it in the address instead of 5080.

If ZR Software 7 is installed on the PC, the setup does not change or remove it. The setup looks for its database and, when it finds it, offers it later on the **Import** page and in the first start steps (see Import).

During the installation the setup creates the Windows service, starts it and waits up to 90 seconds for it to answer. If the service does not answer, the setup stops with a message that gives a code and points to the details list and the Windows event log.

If the installation fails for another reason, the setup takes back what it made and says that nothing is left installed. The data folder and the file setup.log in it stay.

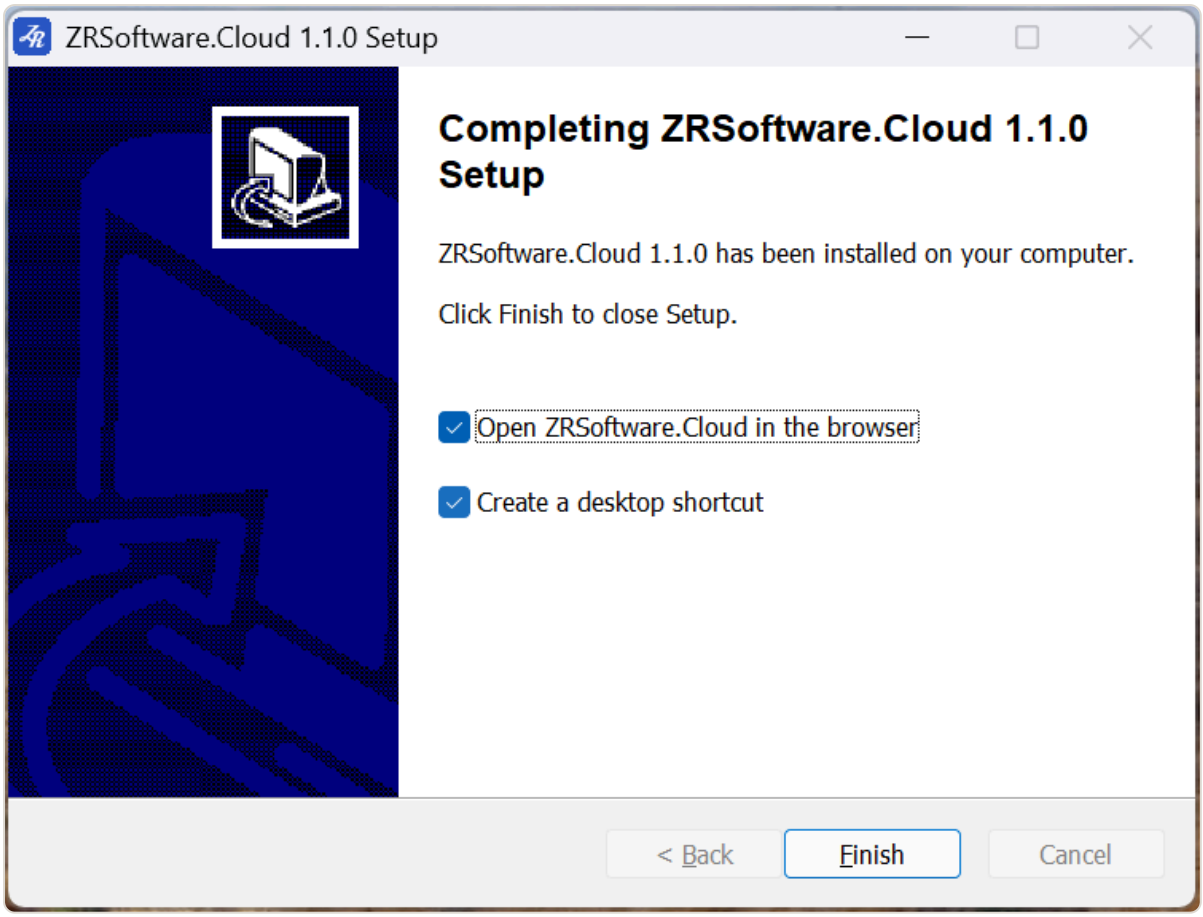
What the setup does with the service (creating, starting and stopping it, the update task, the folder rights, the database copy and the result) is also written to the file setup.log in the data folder.

The Finish page

The Finish page has two ticked boxes: "Open ZRSoftware.Cloud in the browser" and "Create a desktop shortcut". Leave them ticked unless you have a reason not to.

On a new installation the first box opens a one-time setup link in your default browser. With it you set the admin password at once, without looking up the one-time password. The link works once, for 15 minutes, and only on this PC. When there is no admin waiting for a password (for example after an upgrade), the box opens the plain address http://127.0.0.1:5080 instead.

The shortcut is placed on the desktop of every user of the PC, has the name ZRSoftware.Cloud and opens the pages in the browser.



`Figure 2.2` The setup's Finish page after a new installation on a clean Windows (Windows Sandbox): both boxes are ticked.

The Windows service

Item	Value
Service name	ZRSoftware
Display name	ZRSoftware.Cloud
Account	NT SERVICE\ZRSoftware (the service's own account)
Start	Automatic (delayed start)
After a crash	Windows starts it again after one minute for the first two crashes; the count starts again after a day without a crash

The pages open at http://127.0.0.1:5080, or at the port chosen on the Options page. The service runs and reads the meters on its schedules also when nobody is signed in to Windows.

The setup also adds the task REDZ\ZRSoftware Update to the Windows Task Scheduler. It runs every 5 minutes with the Windows account SYSTEM and does nothing until an update

is asked for on the **Updates** card in **Settings** (see Settings). An admin, or REDZ support during a support session, can download and install an update. A successful upgrade makes the task again, and removing the program deletes it.

The setup gives the data folder its own permissions, not the ones of the ProgramData folder. Only the service, Windows itself and programs started with administrator rights can open the data folder; other Windows users of the PC cannot.

First start

When the browser opens with the setup link, the page **Set the admin password** asks for the password of the user admin. Type it in **New password** and again in **New password again**, then click **Save and continue**. The password needs at least 10 characters and must not be the user name. You are signed in as admin, and from now on you sign in with this password.

Tick **Show the password** to see what you type in both boxes.

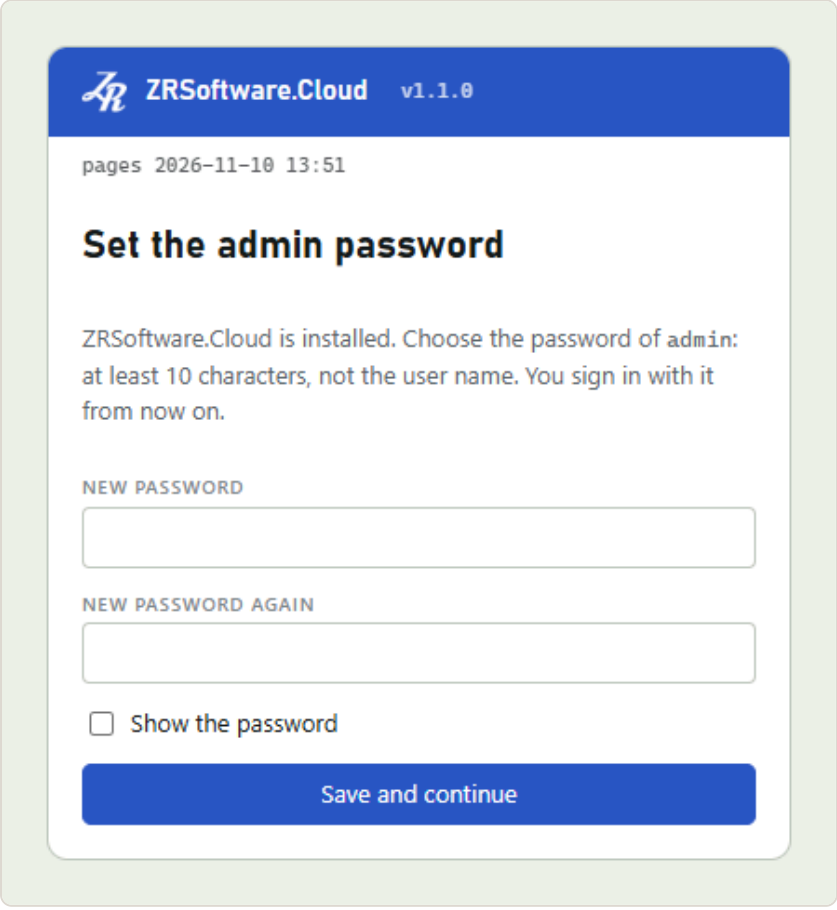


Figure 2.3 The page the setup link opens: choose the password of admin, type it twice and click Save and continue (sample installation).

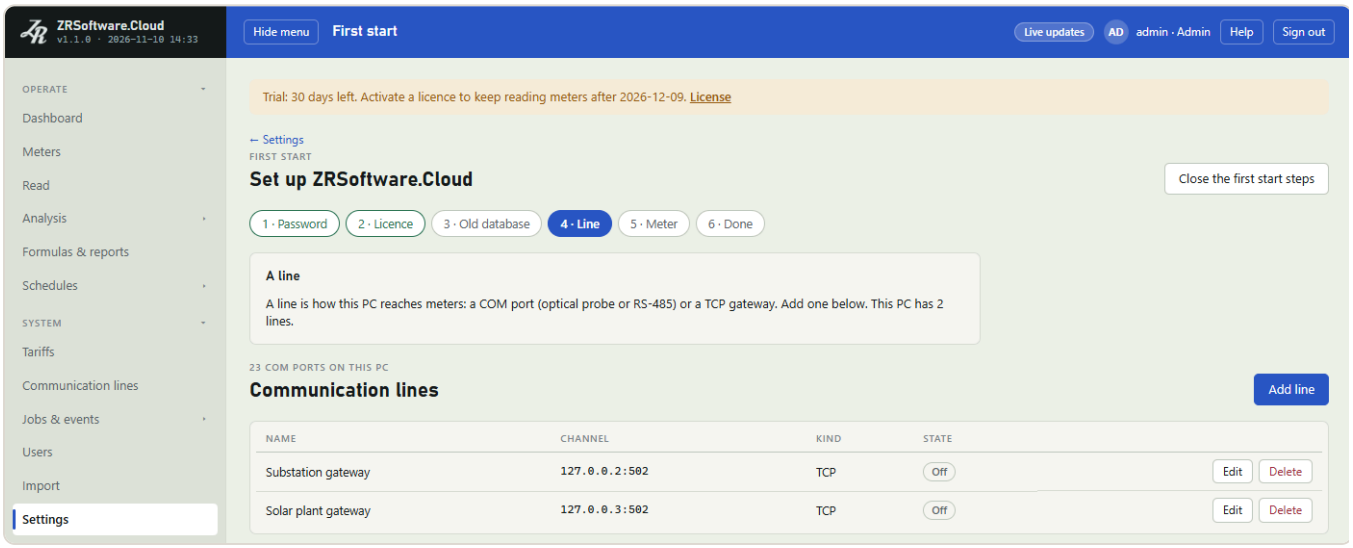
If the link was already used or is older than 15 minutes, the page says "The setup link is used or expired. Sign in as admin with the one-time password." How to do that is described in Signing in and the window.

After the password, the page **First start** opens with the first start steps. It opens by itself when an admin signs in, as long as there is no communication line and the steps were not closed.

Step	What you do
Password	Nothing more: your admin password is set. Other users are added on the **Users** page.
Licence	From the first start on this PC the program runs as a 30-day trial until a licence is loaded or activated. The **License** page is shown below the step (see License).
Old database	Only when ZR Software 7 was found. The **Import** page for its database is shown below the step (see Import).
Line	Add the line through which this PC reaches the meters (see Communication lines).
Meter	Add a meter on that line, then read it once on the **Read** page (see Meters and groups).
Done	Shows how many lines and meters there are and the licence state.

Move with **Next** and **Back**, or click a step at the top. Every step can be skipped. A step is marked in green when it is not the open one: **Password** always, **Licence** once the trial has started (also after it has ended) or a licence is there, **Line** and **Meter** once one exists.

Save a line or a meter before you move to another step: a form that is still open closes without asking.



`Figure 2.4` The first start steps with the Line step open, the steps already done marked in green and the sample lines listed below.

Close the first start steps or, on the last step, **Go to the dashboard** closes the steps and opens the **Dashboard**. After that they no longer open by themselves.

To see the steps again, open **Settings** and click **Open the first start steps**. The link **Settings** above the title of the steps page leads back to the Settings page.

Silent installation

The setup can run without pages, for example from a deployment tool. Run it from an elevated command prompt with these switches:

Switch	Meaning
/S	Install without pages. No browser is opened.
/PORT=5080	The port of the pages. Used on a new installation only; an upgrade keeps the port.
/SHORTCUT=1	Make the desktop shortcut. Without it, a silent setup makes none.

The exit code of the setup tells the result:

Exit code	Result
0	Done.
2	The upgrade failed; the previous version and its database are back and running.
3	The service is already installed.
4	The service was installed but did not answer.
5	Wrong switches (also a /PORT outside 1 to 65535), or the Windows is not 64-bit. On a new installation nothing is left installed.
6	The setup failed with an unexpected error, or an upgrade could not start the previous version again. On a new installation nothing is left installed; after an upgrade the service ZRSoftware may be left stopped, so meters are not read until it is started again. See setup.log.
7	This version was not installed because the licence in the data folder has a maintenance that ended before this version was built. On an upgrade nothing was changed and the installed version stays as it was; on a new installation nothing is left installed (see Upgrading).

> **NOTE**
> Give /PORT a number from 1 to 65535 in plain digits without a leading zero, or leave the switch out. A number outside that range, also an empty value, stops the setup at once with exit code 5, before anything is installed.

Upgrading

To upgrade, run the setup of the new version on the PC. It finds the installed version, skips the Options page and keeps the folder and the port.

> **NOTE**
> With a licence that has an end of maintenance (see **Maintenance until** on the **License** page or on the **Updates** card), the setup does not upgrade to a version built after that day, because it would not read meters with that licence. It stops before it changes anything and ends with exit code 7; a setup with pages first shows "This version is not covered by the maintenance of the installed licence, so it would not read meters. Nothing was changed: the installed version keeps reading. See the details." The installed version stays as it was. The details list and setup.log name the day the version was built, the licence and the last day of its maintenance: install a version released by that day, or ask REDZ to extend the maintenance (see License). Removing the program and installing the new version does not get round this: the licence stays in the data folder, and a new installation into that folder checks it too. It also ends with exit code 7 and leaves nothing installed; a setup with pages first shows "This version is not covered by the maintenance of the licence in the data folder, so it would not read meters. Nothing was installed. See the details."

An upgrade can also start from the **Updates** card in **Settings**: the update task then runs the setup of the new version, and the setup upgrades in the same steps (see Settings). An admin, or REDZ support during a support session, can download and install an update. An update installed from the Updates card runs the setup without its pages; what it reports is in setup.log. REDZ has tried this with its licence server: a PC with version 1.0.1 updated itself from the licence server to version 1.1.0 and then ran version 1.1.0.

1. The setup stops the service. If it does not stop within 60 seconds, nothing is changed and the old version is started again.
2. It waits up to 60 seconds until no other program holds the program file. If one still does, nothing is changed and the old version is started again.
3. It copies the database to the Backups folder in the data folder. The file name contains the old version number. If the copy cannot be made, nothing is changed and the old version is started again.
4. It keeps the old program file in the folder previous in the program folder and puts the new one in place.
5. It starts the service and waits up to 90 seconds for it to answer.
6. When the new version answers, the upgrade is done. An upgrade gives an older installation's data folder the same permissions as a new installation. If it cannot, the setup still ends as done and goes on to its Finish page; the last lines of setup.log are a warning that names the data folder and asks you to run the setup again, with the reason.

While the service is stopping and stopped, the pages in the browser do not work: an action fails, at first with a message that starts with 503 (see Signing in and the window). They work again once the service runs.

If the new version does not start, the setup puts the old program file and the database copy back and starts the old version. It then says "The upgrade failed; the previous

version and its database are back and running. See the details above."

If the setup finds the program folder of an earlier setup but no ZRSoftware.Cloud service, it installs the program anew in that folder.

When a new version changes the layout of the database, it makes one more copy in the Backups folder at its first start. The Backups folder keeps the five newest copies and deletes older ones.

> **NOTE**
> These copies of the whole database are not the configuration backup of the **Settings** page: that is a file of the set-up only, without readings, which an admin downloads (see Settings).

Removing the program

Remove the program in the Windows list of installed apps, where it is listed as ZRSoftware.Cloud by REDZ.

The uninstaller stops and removes the service, deletes the update task, the program's Windows Firewall rules, the program files and the desktop shortcut.

> **WARNING**
> The data folder is not deleted: the database, its backups, the logs and a downloaded update setup stay in C:\ProgramData\REDZ\ZR Software. The record of the trial period and of the licence state also stays on the PC, so installing again neither starts a new trial nor clears a state such as **Clock behind** or **Withdrawn**.

If you install the program again later, it uses the data that stayed: the users and their passwords are the same as before, and no new one-time password is made. The licence in the data folder stays too (see Upgrading).

If the data folder is put back from an earlier copy and the licence is checked online, the licence server may count this PC as a copy (see License).

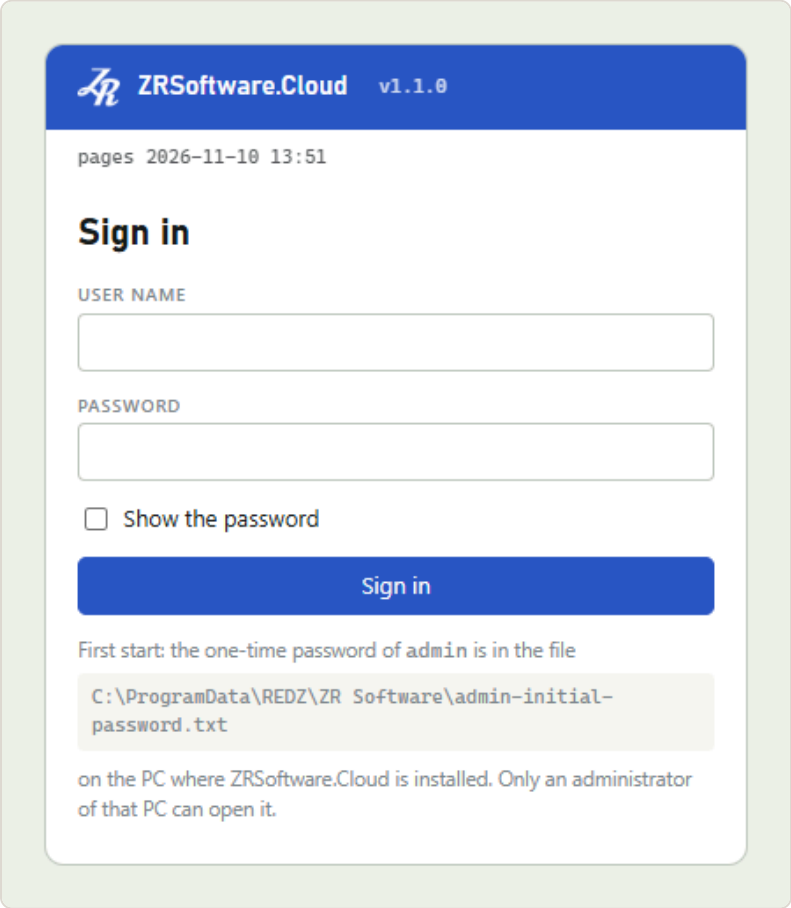
3 Signing in and the window

The pages ask you to sign in before they show anything. This chapter describes the sign-in page, the window you see after it, your own password and the Dashboard.

Signing in

Open http://127.0.0.1:5080 in the browser, or double-click the desktop shortcut ZRSoftware.Cloud. The page **Sign in** shows the program name and version. Type your **User name** and **Password** and click **Sign in**.

Tick **Show the password** to see the password you type.



`Figure 3.1` The Sign in page with empty User name and Password boxes and the note with the full path of the first-start password file, as on a sample installation.

Every user has one of three roles: Admin, Operator or Viewer. An Operator reads meters; a Viewer only looks at the data. An admin adds users and sets their roles (see Users).

An admin can also limit a Viewer or an Operator to the meters of some meter groups; that user then sees only those meters and their data (see Users).

A wrong user name or password gives the message "Wrong user name or password"; for an existing user name the message adds how many attempts are left before a 15-minute

lock. After five wrong passwords in a row the account is locked for 15 minutes; the page then says how many minutes are left. A wrong sign-in code in the phone app counts as a wrong password (see Remote access and the mobile app). An account an admin has disabled gets "The account is disabled" once the right password is typed; a wrong password counts towards the lock as for any account.

Every sign-in with a user name and password is written to the event list, and so is a lock after wrong passwords (see Jobs & events). When you sign in by setting a new password, on **Set your password** or with the setup link, the event list shows that the password was set instead of a sign-in; the password itself is not written.

A user who has an e-mail address in **Users** also gets an e-mail when the account is locked or its password is changed (see Users).

Users whom an admin allows can also sign in from outside the local network, with the ZRSoftware phone app, when remote access is set up and the licence includes **Mobile app** (see Remote access and the mobile app). The rest of this chapter is about the pages in a browser on this PC.

A one-time password

If the setup link was not used, the first admin signs in with a one-time password. The sign-in page says where it is: "First start: the one-time password of admin is in the file C:\ProgramData\REDZ\ZR Software\admin-initial-password.txt on the PC where ZRSoftware.Cloud is installed. Only an administrator of that PC can open it."

The file is in the data folder of the program. The page names that folder for Windows on drive C; on another drive it is the same folder in the ProgramData folder of Windows (see Installation and first start). Only the service, Windows itself and programs started with administrator rights can open the data folder; other Windows users of the PC cannot. To read the file:

1. Open Windows PowerShell started as administrator: right-click it and choose Run as administrator.
2. Type Get-Content "C:\ProgramData\REDZ\ZR Software\admin-initial-password.txt" (the data folder when Windows is on drive C) and press Enter. The window shows the user name and the one-time password; the file is deleted when you change the password at the first sign-in.
3. Sign in with the user name admin and the password from the file.

> **NOTE**
> Run PowerShell as administrator; otherwise the file cannot be read.

A one-time password does not open the pages: after **Sign in** the page **Set your password** opens. Type your own password in **New password** and **New password again** and click

Save and sign in. The password needs at least 10 characters, must not be the user name and must differ from the one-time password. The same page opens when an admin has given you a one-time password.

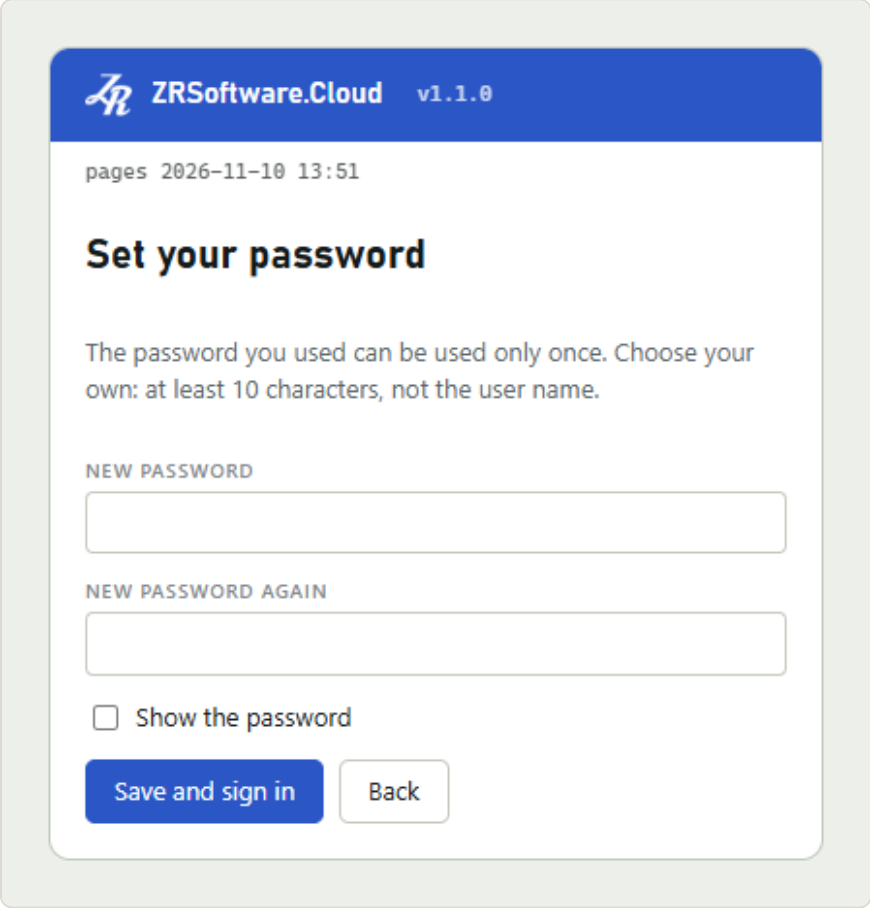


Figure 3.2 The Set your password page that opens after signing in with a one-time password (sample user).

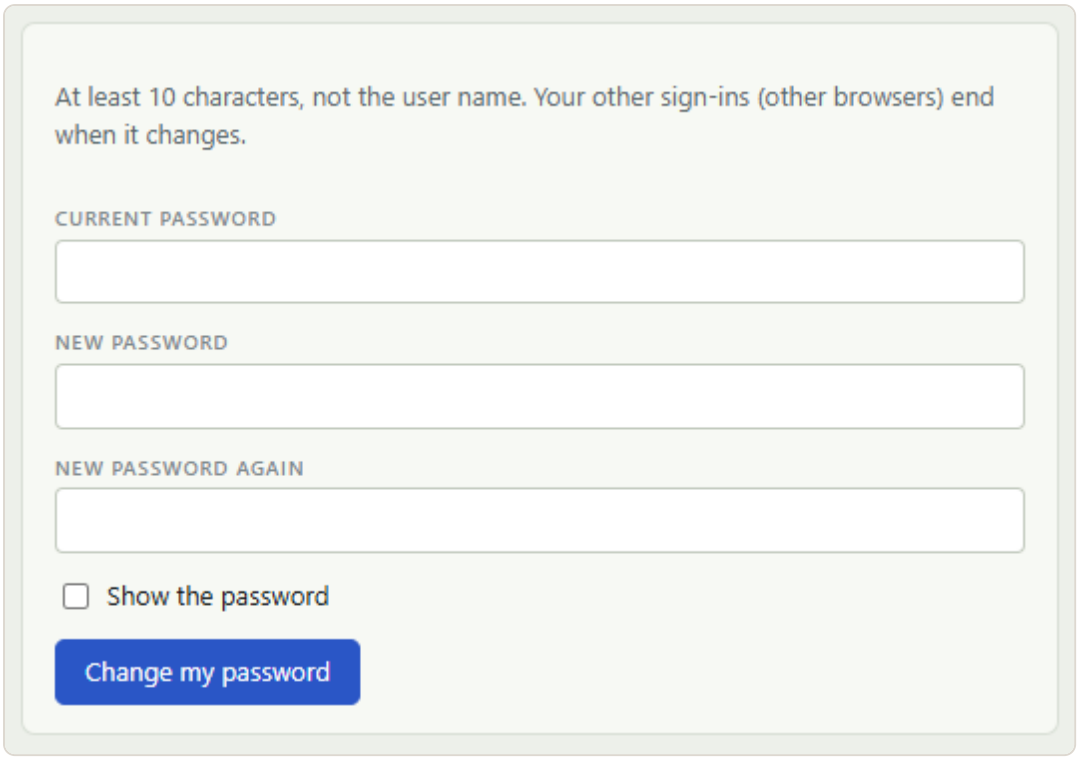
When the admin has set an own password, the program deletes the file admin-initial-password.txt.

When no admin can sign in, see Troubleshooting.

Your own password

Every user can change their own password. Click your user name at the top right; in a narrow window only your initials are shown there, click them. The page **My password** opens, and the menu marks **Settings** while it is open. The link **Settings** above the title leads to the Settings page.

1. Type your **Current password**.
2. Type the new password in **New password** and again in **New password again**. It needs at least 10 characters, must not be the user name and must differ from the current password.
3. Click **Change my password**.



`Figure 3.3` The My password page of the sample user demo: the note, the three password boxes and Change my password.

The page says "Your password is changed. Other sign-ins of this user end." You stay signed in in this browser tab. The service refuses your user's sessions in other tabs and browsers at once and ends their live updates; their pages go back to the sign-in page at their next request to the service, within 10 minutes at the latest. The change is written to the event list (see Jobs & events).

If the two new passwords differ, the page says "The two new passwords are not the same." A wrong current password gives "wrong user name or password" and counts towards the 15-minute lock like a wrong password at sign-in; the lock is written to the event list.

The session and signing out

A session lasts 8 hours and belongs to the browser tab: if you close the tab, you sign in again next time. When the session has ended, the sign-in page comes back at the next request the page makes to the service, at the latest at your next action, and says "The session has ended. Sign in again."

The service also refuses a session at once when your password is changed by an admin, your account is disabled, or your role or the meters you see are changed, and its live updates end; the page goes back to the sign-in page at its next request.

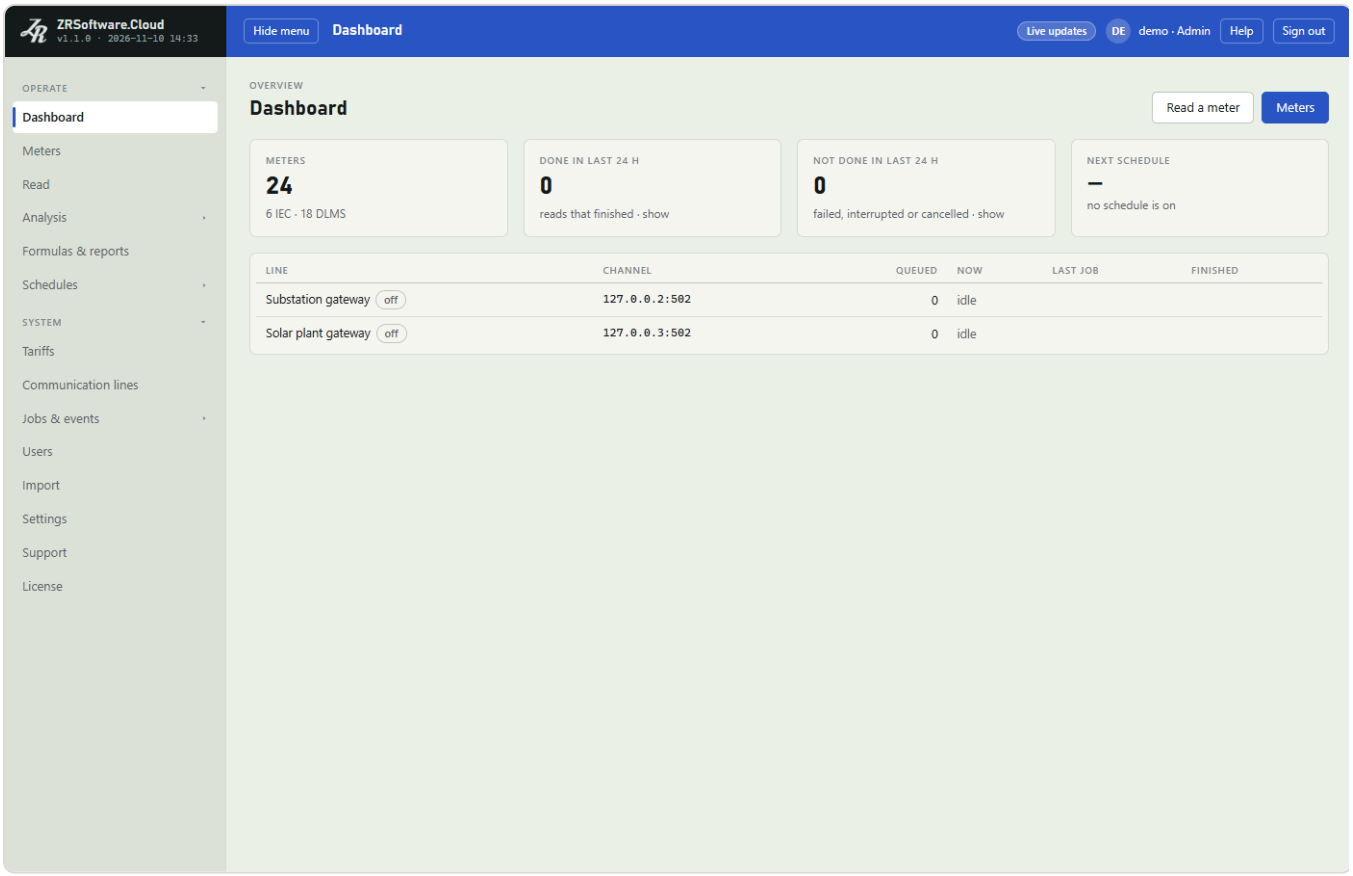
While the service is stopping, for example during an update, it answers every request with the code 503 and no text. An action you take in that moment fails with a message that starts with 503; do it again once the service runs again.

To sign out, click **Sign out** at the top right.

The window

After signing in you see a top bar, the menu on the left and the page on the right. The top bar shows the program name and version, the name of the open page, the live update mark, your user name with your role, **Help** and **Sign out**.

Help opens this manual on redzsoftware.com in a new browser tab, for every user. The manual on the website can describe a version newer than the one installed, and the PC needs internet access for it.



`Figure 3.4` The window after signing in: the top bar with Live updates and Help, the menu on the left and the Dashboard on the right (sample meters and lines).

The menu has two groups, **Operate** and **System**. Three entries are sections that hold several pages: **Analysis** holds **Profile**, **Completeness** and **Demand monitor**; **Schedules** holds **Automatic reading** and **Export schedules**; **Jobs & events** holds **Jobs**, **Event log** and **Communication log**. Click a section to open or close its pages. The table lists every menu entry and who sees it:

Group	Menu entry	Shown to
Operate	Dashboard	Everyone

Group	Menu entry	Shown to
Operate	Meters	Everyone
Operate	Read	Everyone
Operate	Analysis > Profile	Everyone
Operate	Analysis > Completeness	Everyone
Operate	Analysis > Demand monitor	Everyone
Operate	Formulas & reports	Everyone
Operate	Schedules > Automatic reading	Everyone
Operate	Schedules > Export schedules	Everyone
System	Tariffs	Everyone
System	Communication lines	Everyone
System	Jobs & events > Jobs	Everyone
System	Jobs & events > Event log	Everyone
System	Jobs & events > Communication log	Everyone
System	Users	Administrators
System	Import	Administrators
System	Settings	Everyone
System	Support	Administrators
System	License	Everyone

A page that your licence does not include is not in the menu. This applies to the three pages of **Analysis**, **Formulas & reports**, **Automatic reading**, **Export schedules**, **Tariffs** and **Import** (see License). A section without any page left is not in the menu either.

When meters are not read, for example after the trial or the licence has ended, **Automatic reading** and **Import** are not in the menu either; the **Schedules** section keeps **Export schedules**, and **Analysis**, **Formulas & reports** and **Tariffs** stay.

Click a group name to close or open it. At first **System** is closed; the group of the open page is always open. The sections start closed; the section of the open page is always open and its name is marked. **Hide menu** in the top bar hides the menu to give the page more room, and **Show menu** brings it back. The browser remembers these choices.

In a narrow browser window the menu becomes a row above the page, without the group and section names, and the top bar hides the version and the name of the open page.

Live updates in the top bar means the pages change by themselves as the service reads and exports. **Not live** means there is no live connection to the service; the page then changes only when you act.

During the trial, when the licence has ended or cannot be used, when its maintenance has ended, and in the last days of reading before meters stop being read (for example after the licence server called the licence withdrawn, or when this PC has not reached the licence server for too long), a coloured strip above the page shows the licence message and a **License** link; in those last days the message names the last day on which meters are read. The License page itself does not show the strip. See License.

While a REDZ support session runs, a small green window at the top right of every page says so, for every user (see Support).

The Dashboard

Without a page in the address the **Dashboard** opens; an admin may first see the first start steps (see Installation and first start). **Read a meter** and **Meters** at the top open those pages.

Tile	What it shows
Meters	The number of active meters, split into IEC and DLMS meters.
Done in last 24 h	Reads that finished successfully in the last 24 hours.
Not done in last 24 h	Reads that failed, were interrupted or were cancelled in the last 24 hours. The tile is marked when the number is above zero.
Next schedule	When the next schedule that is on runs, and its name. The year is shown only when the run is in another year.

The tiles **Done in last 24 h** and **Not done in last 24 h** are links: each opens **Jobs & events** > **Jobs** with its jobs, filtered by that state and by the last 24 hours (see Jobs & events).

When the last good registers reading of a meter is over a reactive limit, the card **Over the reactive limit** lists the meter, the ratio, its value and the limit. The **limits** link opens **Settings**, where an admin sets them (see Settings).

The table lists every communication line: its **Channel**, how many jobs are **Queued**, what it does **Now** (the running job, or **idle**), the **Last job** with its result, and when it **Finished**. A line that is switched off is marked **off**. Without lines the table says "No line yet. An admin adds one under Communication lines."

While the top bar shows **Live updates**, the Dashboard refreshes by itself when a job is queued, starts or ends.

For a user who sees only some meters, the tiles count only those meters and their reads, and **Next schedule** shows only a schedule all of whose meters the user sees. The line table still lists every line, but its jobs are only those of the user's meters, so a line can show **idle** while it reads another meter. The live refresh, too, comes only from jobs of the meters the user saw when the page connected; for a change of the groups on the **Meters** page see Users.

4 First reading, step by step

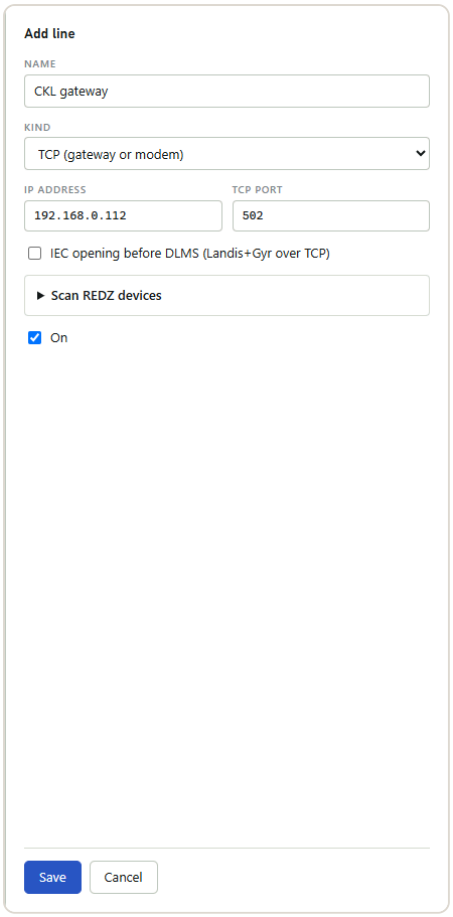
This chapter takes one meter from nothing to its first values: a line to a TCP gateway, an EMH meter behind it, a read of its registers, the **Meter detail** page, a read of its load profile and the **Analysis** page. Each step names the pages and buttons; the chapters after this one describe every field and message.

The example is an EMH meter on the serial side of a TCP gateway such as the REDZ CKL. The program opens a TCP connection to the gateway's address and port; the serial speed and framing on the meter's side are the gateway's settings, not this program's.

> **NOTE**
> Steps 1 and 2 need an administrator. Reading (steps 3 and 5) needs an Operator or an administrator.

Step 1: add the line

1. If the **System** group of the menu is closed, click **System** to open it; then open **Communication lines** and click **Add line**.
2. Type a **Name** for the line.
3. Set **Kind** to **TCP (gateway or modem)**.
4. Type the gateway's **IP address** (an IPv4 address such as 192.168.1.20) and its **TCP port** (1 to 65535). If you do not know the address, **Scan REDZ devices** in the form can look for REDZ gateways on the network and fill in the address and port of the one you choose (see Communication lines).
5. Leave **IEC opening before DLMS (Landis+Gyr over TCP)** unticked: it changes only DLMS reads, and an EMH meter is read with IEC 62056-21.
6. Leave **On** ticked and click **Save**.



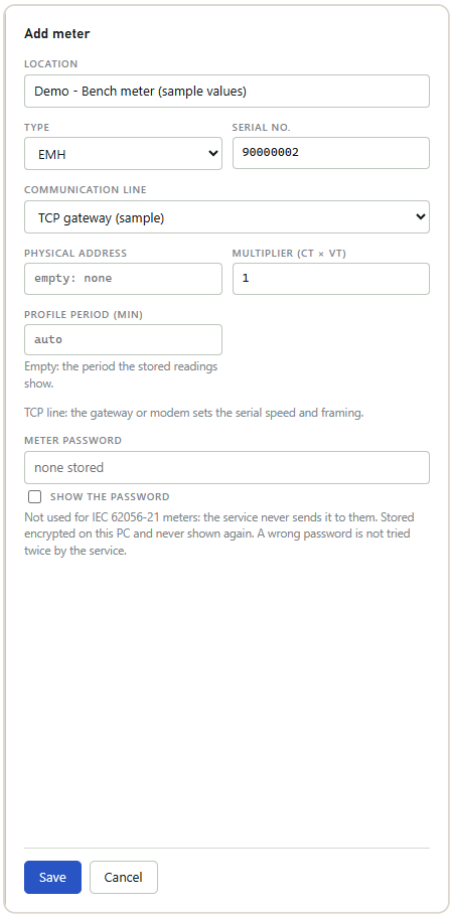
`Figure 4.1` The line of a REDZ CKL gateway in the REDZ laboratory in the Add line form, before Save.

The line appears in the list with its address and port under **Channel** and **On** under **State**. If the service refuses the line, the form stays open and shows the reason under the fields. See Communication lines.

Step 2: add the meter

1. Under **Operate**, open **Meters** and click **Add meter**.
2. **Type** starts with EMH once a line exists; keep it.
3. Type the meter's **Serial no.** and, if you like, a **Location** such as the site or feeder.
4. **Communication line** starts with the first line; choose the line of step 1.
5. Leave **Physical address** empty when the meter needs no address; with an empty field the sign-on carries no address.
6. Click **Save**.

The form has no **Initial baud rate** for a meter on a TCP line: it says "TCP line: the gateway or modem sets the serial speed and framing." The **Meter password** is not used for IEC 62056-21 meters such as EMH; leave it empty.



`Figure 4.2` Add meter for an EMH meter on the TCP line, before Save (sample values).

The meter appears in the list with a **Read** button in its row. See Meters and groups.

Step 3: read the registers

1. Click **Read** in the meter's row. The page **Read** opens with the meter chosen and **Registers** chosen under **What**.
2. To see the values on this page, untick **Open the result when the read is good**. While it is ticked, as it is at first, **Meter detail** opens by itself after a good read (step 4); the page remembers the choice in this browser.
3. Click **Read now**.

While the meter answers, the **Values** card lists the values as they arrive, and the **Line log** shows every byte to and from the meter. (An administrator can hide the line log on this installation; then the **Line log** card is not shown, and for an IEC 62056-21 meter such as EMH the values appear only when the read ends, see Reading meters.)

After a good read the **Values** card shows the stored reading: each OBIS code with its value and unit, and for the energy registers **This period** and **Previous period**. When the meter sends its clock, a line above the table gives it and how far it is from the PC's clock. The **Line log** card shows the result and the job number; **Show more** makes the log taller

and **Hex** shows the bytes in hex. When a read does not succeed, the note under the log says why (see Troubleshooting).

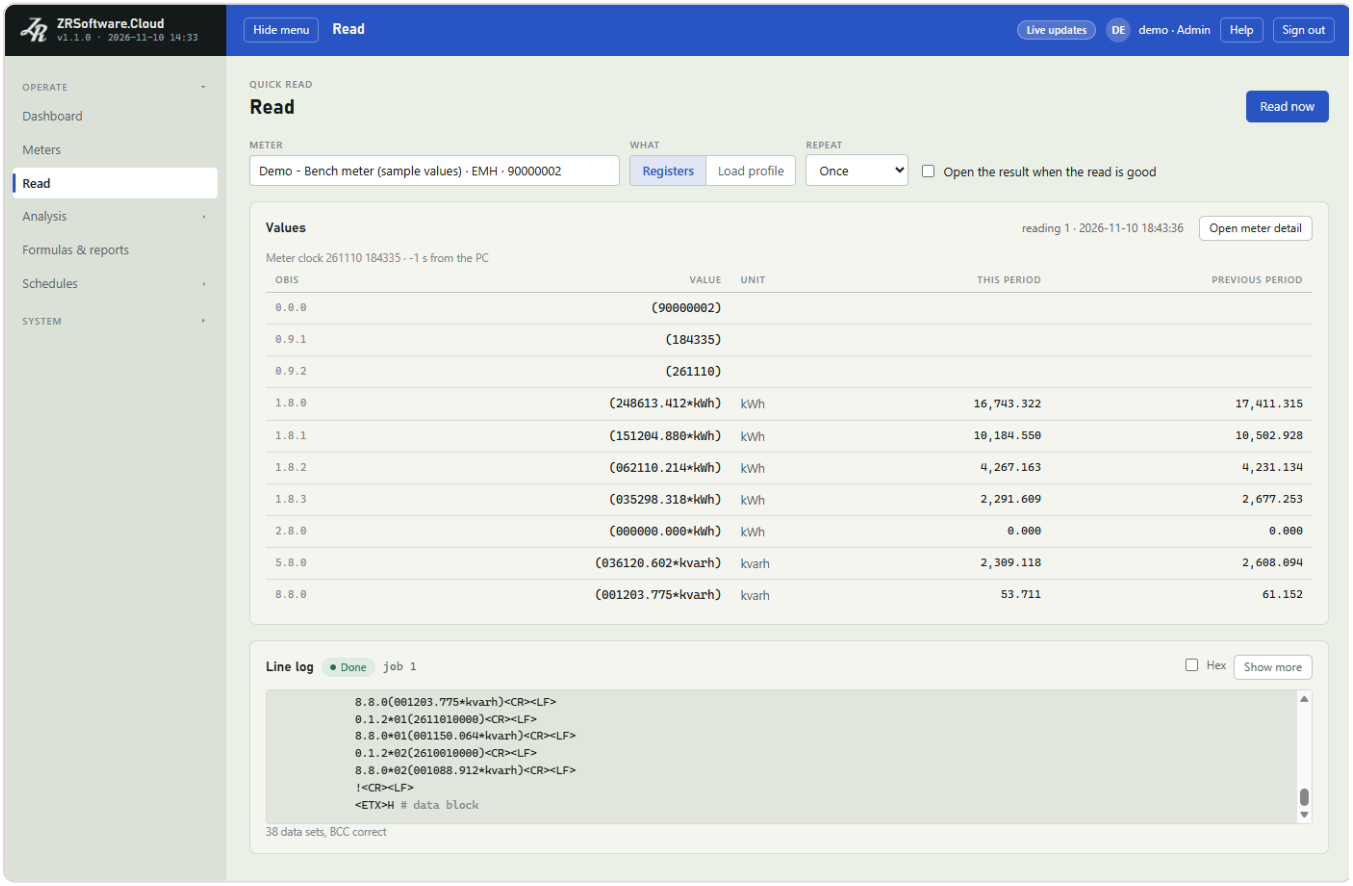


Figure 4.3 The Read page after the first registers read, with the Values card and the Line log (sample values).

See Reading meters.

Step 4: open Meter detail

Click **Open meter detail** in the **Values** card. **Meter detail** shows one registers reading as the meter sent it, in the tabs **Import**, **Export**, **Billing**, **Instantaneous**, **General & events** and **All values**; Operators and administrators also have the tab **Line log** with the bytes of the read, unless the line log is hidden (see Meters and groups). It opens at **Billing**: the registers at the last and the previous end of billing and the energy of this and the previous period, with the **Billing history** below. Each register shows its code under **OBIS**, its name after IEC 62056-6-1 under **Register** (where the standard names the code) and, where it says more than the code, the program's short symbol under **Symbol**. The list at the top chooses an earlier reading, and **Print readout** prints the one shown.

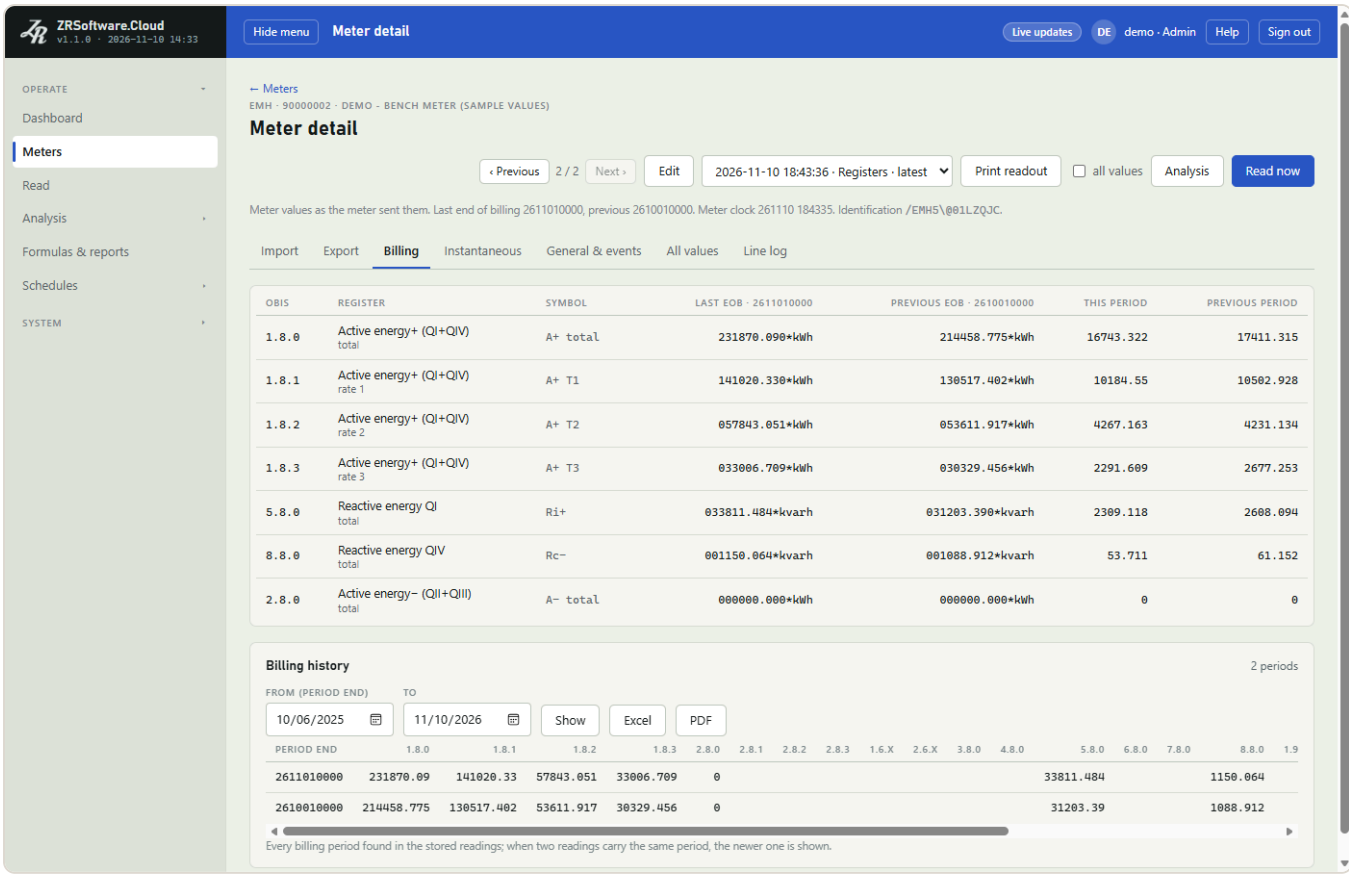


Figure 4.4 Meter detail of the meter, Billing tab and Billing history (sample values).

See Meters and groups.

Step 5: read the load profile

1. Click **Read now** on **Meter detail**: it opens the **Read** page with the meter chosen, and does not read yet. Or open **Read** in the menu, type the meter's serial number or a word of its location in the **Meter** box and choose the meter in the list (see Reading meters).
2. Under **What**, choose **Load profile**.
3. The page proposes yesterday in **From (meter calendar)** and today in the second box. For an EMH meter, as for every IEC 62056-21 meter, that box is **To (until 00:00 of this day)**, so the proposed days read yesterday's profile.
4. Click **Read now**.

After a good read the **Load profile** card shows how many intervals were stored and their length, the first and the last, and the sum of each channel. When the licence includes analysis, **Open in Analysis** opens them on the **Analysis** page; with **Open the result when the read is good** ticked it opens by itself.

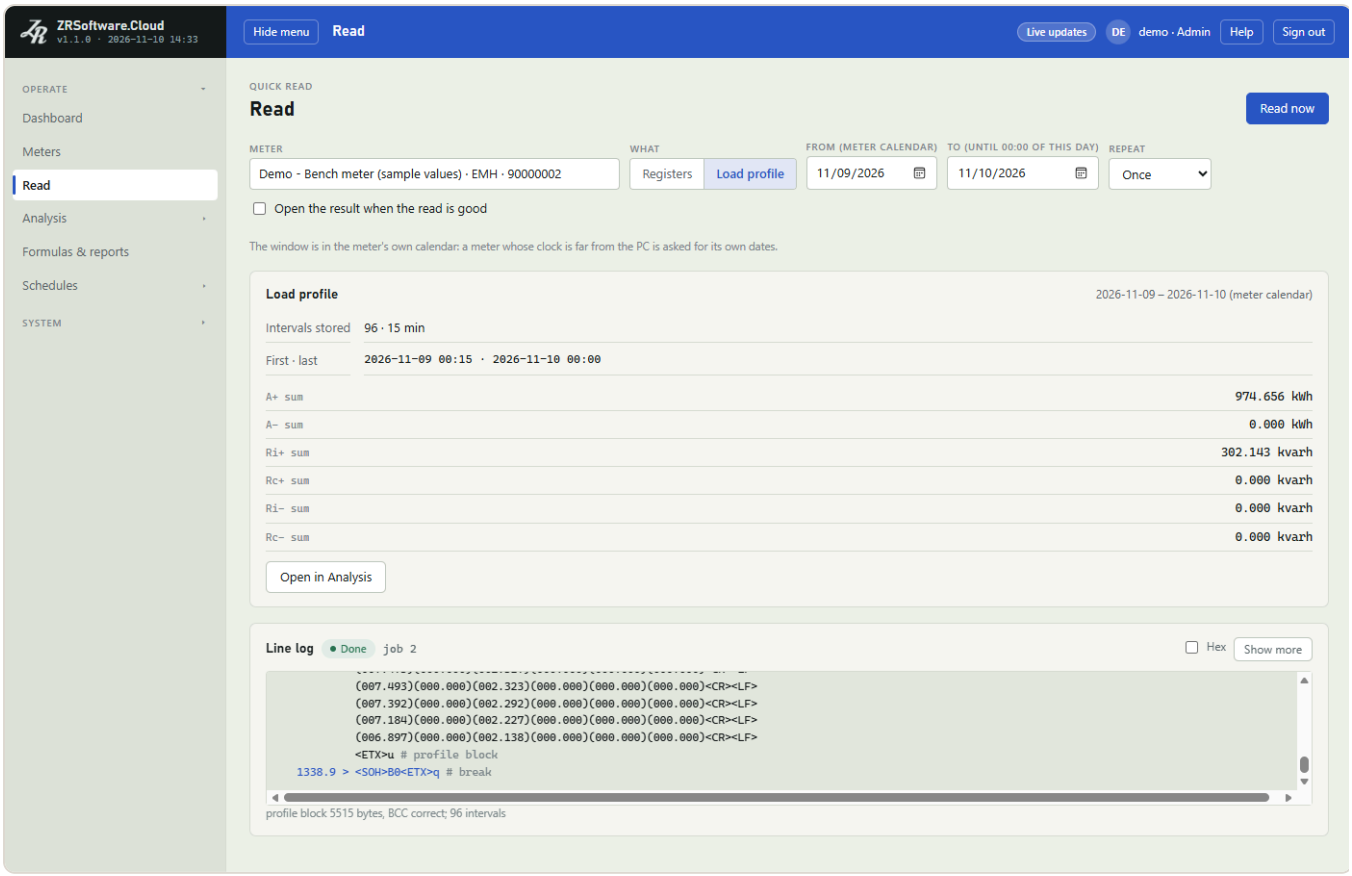


Figure 4.5 The Read page after a load profile read of yesterday (sample values).

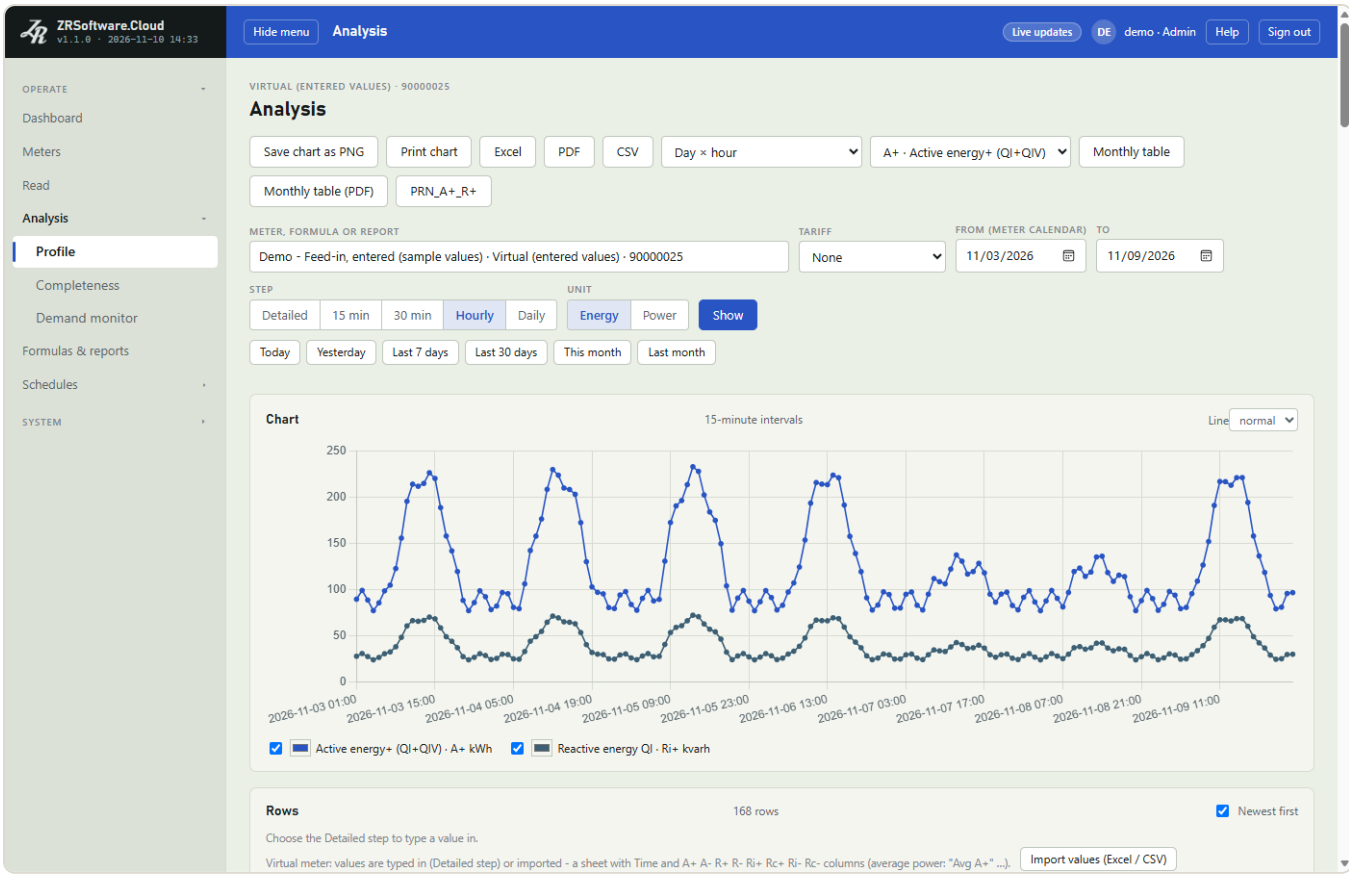
See Reading meters.

Step 6: look at the values in Analysis

> **NOTE**
> The **Analysis** page is there when the licence includes analysis (the trial includes it). In the menu it is **Analysis** > **Profile**.

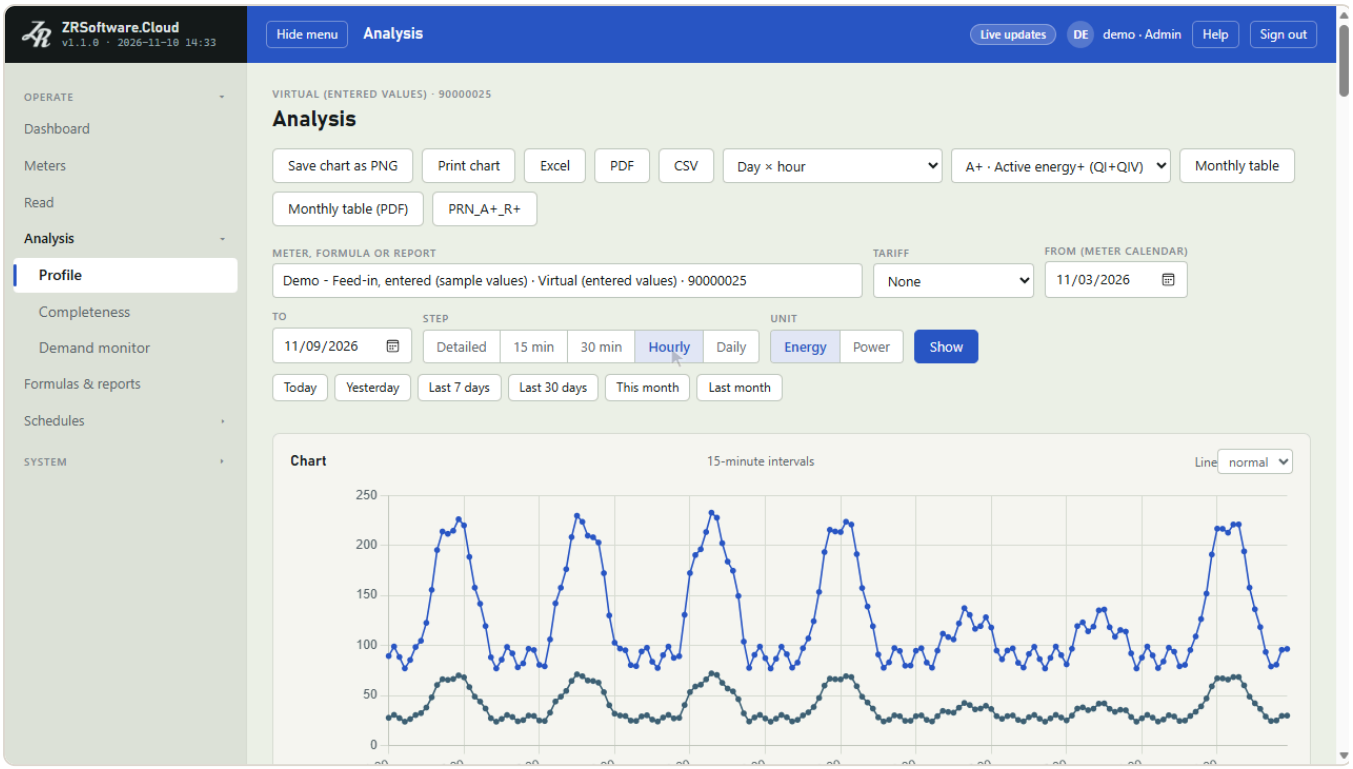
Analysis shows the stored profile of the meter as a chart and as rows.

- **Step** groups the intervals: **Detailed**, **15 min**, **30 min**, **Hourly** or **Daily**. **Unit** chooses **Energy** or **Power**. The page shows the result again at once.
- The ready ranges from **Today** to **Last month** set the days and show them; or set **From (meter calendar)** and **To** and click **Show**.
- Under the chart, each series has a box that shows or hides it, and its colour.
- Pointing at the chart shows the time and the values of the series at that point.
- A **Tariff** adds the **Tariff zones** table under the rows, with the sum of each zone (see Tariffs).
- The **Rows** table lists the rows, the newest first while **Newest first** is ticked, with **MIN**, **MAX**, **AVG** and **SUM** at the bottom.



`Figure 4.6` Analysis of a virtual meter over seven days, step Hourly (sample values).

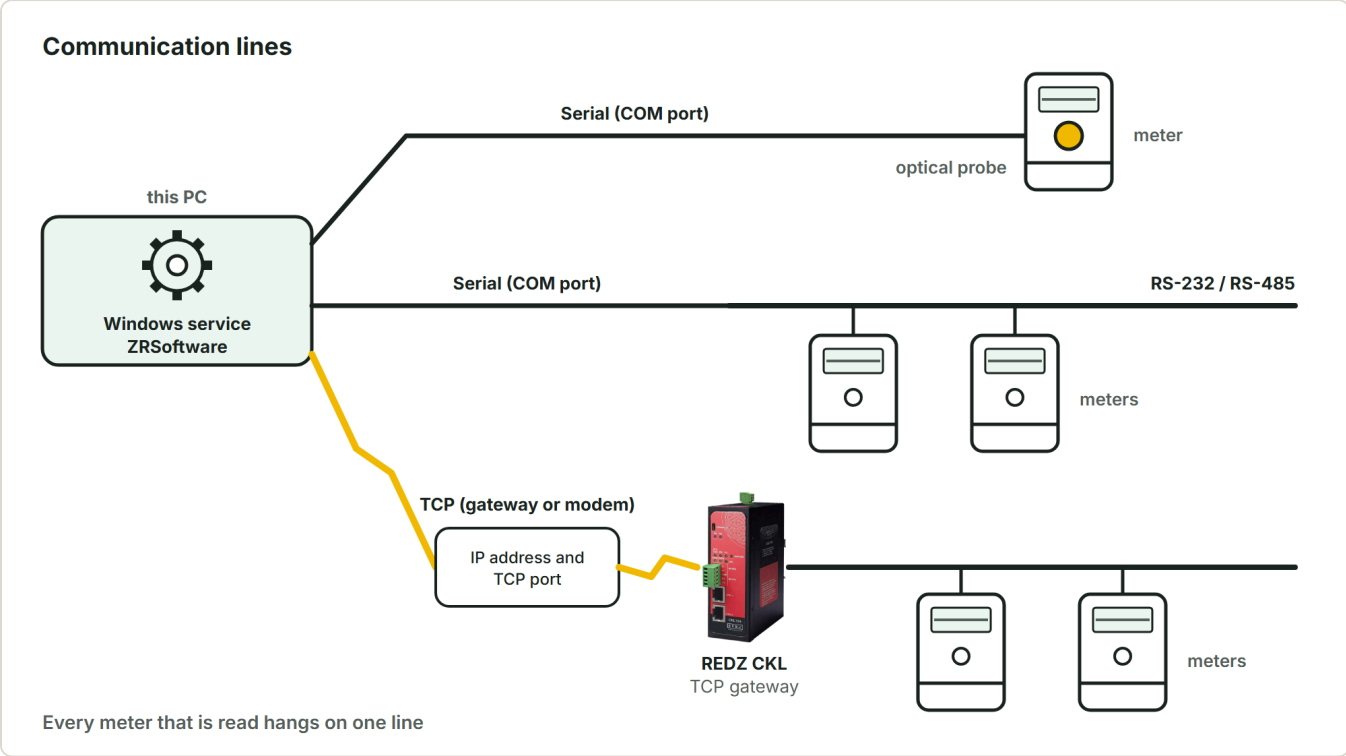
See Analysis.



`Video 4.1` A short video of the Analysis page with a sample virtual meter: chart, steps, tariff zones and rows (sample values). Watch the video in the online manual.

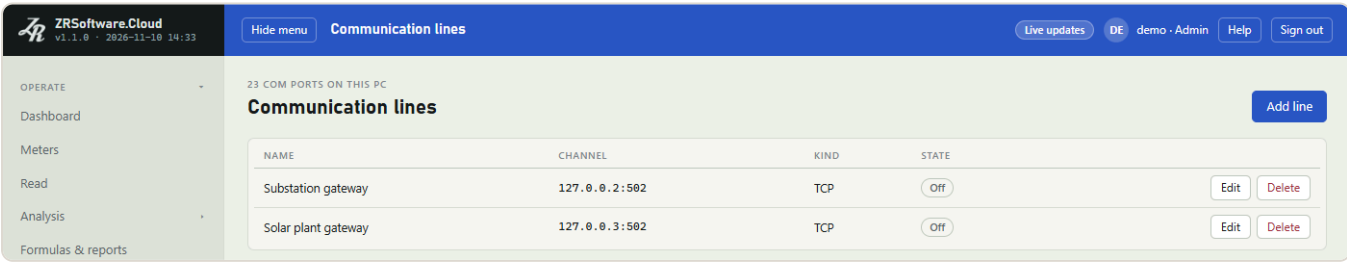
5 Communication lines

A communication line is the way the program reaches meters: a COM port on this PC (an optical probe or an RS-232 / RS-485 connection) or a TCP address (a gateway or modem). Every meter that is read hangs on one line; a virtual meter has none. You find the lines under **System** in the menu, on the page **Communication lines**.



`Figure 5.1` The kinds of communication line: a COM port with an optical probe or an RS-232 / RS-485 connection, or TCP to a gateway or modem, here the REDZ CKL.

Every signed-in user sees the list, also a user who sees only the meters of some groups (see Users). Only an administrator sees the **Add line**, **Edit** and **Delete** buttons and can change a line.



`Figure 5.2` The Communication lines page as an administrator sees it, with two sample TCP lines and the Add line, Edit and Delete buttons.

The line list

Column	What it shows
Name	The name you gave the line.
Channel	The COM port of a serial line, or the IP address and TCP port of a TCP line.
Kind	For a serial line the interface, the framing and, when set, the probe; for a TCP line whether the IEC opening is used.
State	**On** or **Off**.

Above the list the page counts the COM ports of this PC, and the note under the list names them (or says **none**). The list comes from Windows on the PC where the service runs, at the moment the page opens. After each port the note shows the name Windows has recorded for the device on that port; for a Bluetooth port this is the name of the paired device, followed by (Bluetooth). For a USB adapter with an FTDI chip whose serial number Windows has recorded, the note shows the program's own label instead, followed by (USB): for a KMK optical probe its model and serial number, for another FTDI adapter the word FTDI and the adapter's serial number. A port whose device name cannot be found is shown by its name only. The service reads these names from Windows without opening the ports.

With no line yet, the list shows **No line yet.**

Adding a line

1. Open **Communication lines** and click **Add line**.
2. Type a **Name** (required).
3. Choose the **Kind**: **Serial (COM port)** or **TCP (gateway or modem)**.
4. Fill in the fields of that kind (see the tables below).
5. Leave **On** ticked to use the line, and click **Save**.

If the service refuses the line, the form stays open and shows the reason under the fields. **Cancel** closes the form without saving. When you have changed something, Esc, a click outside the form or a menu link does not close it: the form shows "Unsaved changes." with **Save**, **Discard** and **Keep editing**.

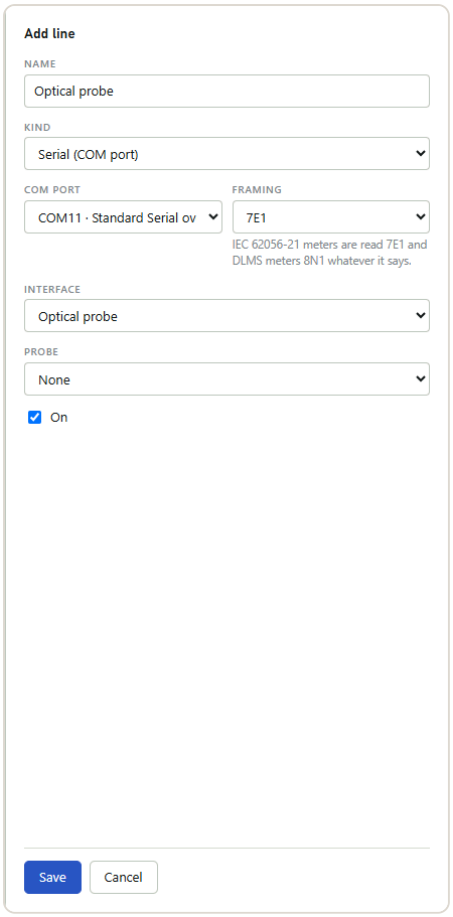


Figure 5.3 Add line for an optical probe on a COM port of this PC, before Save (sample values).

Field (serial line)	Values	New line starts with
COM port	The COM ports of this PC, each with the name of its device as in the note under the list. A stored port that Windows no longer lists is shown with **(not present)** after it.	The first port in the list
Framing	7E1, 8N1, 8E1 or 8O1. IEC 62056-21 meters are read at 7E1 and DLMS meters at 8N1, whatever this field says; the note under the field says so too: "IEC 62056-21 meters are read 7E1 and DLMS meters 8N1 whatever it says." Through the **REDZ BT probe** the PC side is 19200 baud, 8N1 (see below).	7E1
Interface	**Optical probe** or **Electrical (RS-232 / RS-485)**.	**Optical probe**
Probe	**None** or **REDZ BT probe**. Shown only for an optical serial line.	**None**

The service opens a serial line at the meter's **Initial baud rate** (set on the meter, see Meters and groups) and keeps the DTR and RTS signals on while the port is open; some optical probes take their supply from these signals.

Through the **REDZ BT probe** the PC talks to the probe at 19200 baud, 8N1. The service does not send the meter's **Initial baud rate** to the probe: the probe's own mode decides how the sign-on reaches the meter. When the probe is in a mode that keeps the meter side at 8N1 or 8E1, it does not make the IEC opening at 300 baud, 7E1; if the meter then does not answer, the service's message names the probe's mode.

The **Interface** matters for DLMS meters: on an optical line the service first sends the IEC sign-on and switches the meter to DLMS, on an electrical line it talks DLMS directly at 8N1.

Choose **REDZ BT probe** when the optical line is that REDZ probe. The service then asks the probe for its mode, firmware and battery before each read. In command mode, and when the probe does not report its mode, the service sends the meter's new speed to the probe; in the other modes the probe follows the meter's speed by itself. The service never changes the probe's settings. Only IEC 62056-21 meters are read through this probe; for a DLMS meter the read ends without sending anything.

Field (TCP line)	Values
IP address	An IPv4 address such as 192.168.1.20. A host name is refused.
TCP port	1 to 65535.
IEC opening before DLMS (Landis+Gyr over TCP)	Tick it when the meters behind the gateway or modem need the IEC sign-on before DLMS; the label names Landis+Gyr meters over TCP. It changes only DLMS reads. Off for a new line.

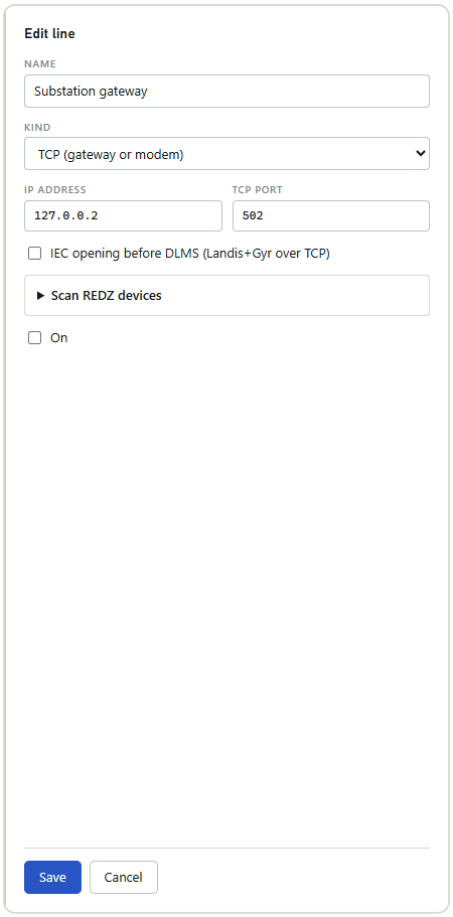


Figure 5.4 The Edit line form of a sample TCP line with its IP address and TCP port.

On a TCP line the gateway or modem sets the serial speed and framing; the program does not change the speed of the connection. That is why the meter form hides **Initial baud rate** for a meter on a TCP line.

When the TCP address does not answer within 5 seconds, or a COM port cannot be opened, the attempt ends at once; the job's message, and the line log while it is shown, name the channel and the reason. When Windows reported the problem, the reason is the program's own short English sentence, whatever the language of Windows, for example "the connection was refused". A scheduled read can make another attempt (see Automatic reading).

Finding a REDZ gateway on the network

On a TCP line the form has a part **Scan REDZ devices** that you open with a click. It looks for REDZ gateways on the network (the Announce scan lists every device that answers its question) and puts the address of the one you choose into the form. Only an administrator opens the form, and only an administrator can scan.

- **Announce (UDP, this PC's networks)** sends a short question on UDP port 30303 to every network of this PC and lists the devices that answer, with their name, address and MAC address. The Announce scan waits about 3 seconds for answers.

- **Web page (HTTP 80) in a range** asks the web page (port 80) of each address from **From** to **To**, at most 256 addresses at once, and lists the addresses whose page has REDZ in its title.

1. In the TCP line's form, open **Scan REDZ devices** and choose how to scan; for the web page scan, type the first and the last address in **From** and **To**.
2. Click **Scan**.
3. In the list of devices found, click the button at the end of the device's row. It puts the device's address into **IP address** and port 502 into **TCP port**.
4. Click **Save** to keep the line; nothing is saved before that.

When the program gets no answer to the Announce question while it waits, the note says "No CKL gateway answered. Try the web page scan with the network's addresses." The web page scan says how many addresses it asked when it found none. If UDP port 30303 cannot be used on this PC, the Announce scan says so and suggests the web page scan. A range that is not two IPv4 addresses, that runs backwards or that holds more than 256 addresses is refused with the reason.

When the service is set up with a list of allowed networks, the web page scan does not ask addresses outside it, and neither scan lists them.

> **NOTE**
> Scanning only asks: nothing is written to a device. The scan sends a short question on UDP port 30303 to the networks of this PC, or asks the web page (port 80) of each address in the range you type. The setup adds a Windows Firewall rule that lets the answers on UDP port 30303 from the local network in to the program; removing the program removes the rule. During a REDZ support session a scan leaves a row in **Jobs & events** > **Event log** too.

What the service checks when you save

- A line needs a name.
- A serial line needs a COM port named COM1 to COM999.
- A TCP line needs an IPv4 address and a port from 1 to 65535.
- Two lines cannot use the same COM port, or the same IP address and TCP port. The message names the line that already uses it.
- When the service is set up with a list of allowed COM ports or networks, a port or address outside that list is refused, and the message names what is allowed.
- The REDZ BT probe can be set only on a serial line with the optical interface.

Changing a line

Click **Edit** on the line's row, change the fields and click **Save**. The same checks apply as for a new line. The meters stay on the line; their next read uses the new settings.

If you change a serial line into a TCP line (or back), the service clears the fields of the old kind: the COM port, or the IP address and TCP port.

Switching a line off

Untick **On** and save to stop using a line without losing it. The list shows **Off**. On the **Read** page, **Read now** is disabled for a meter on a line that is off, and a banner names the line, says that it is turned off and links to **Communication lines** (see Reading meters). **Read now** for the meters chosen on the **Meters** page, and reading the missing intervals on **Analysis** > **Completeness**, leave such a meter out and say that its line is turned off (see Meters and groups and Reading meters). A scheduled read of such a meter still makes a job; it ends with a message that the line is disabled, and nothing is sent. The Demand monitor does not read the watched meters of a line that is turned off (see Analysis).

Deleting a line

An administrator deletes a line with **Delete** on its row. **Delete** asks first in its place: the row shows the question with the line's name and a second **Delete** button, and **Keep** leaves everything as it was. After the delete a banner above the list says the line was deleted.

The service deletes a line only while no meter uses it, archived meters included, and no read is waiting for it or running on it. Otherwise the delete is refused, and the banner above the list gives the reason: how many meters use the line, or that a job is waiting or running.

To delete a line that still has meters, move them to another line first with **Move to line** on the **Meters** page; tick **Show archived** there to choose the archived meters too (see Meters and groups). To keep the meters where they are, switch the line off instead.

> **WARNING**
> A deleted line cannot be brought back; to use its channel again, add a new line. The deletion is written to the event list with your user name. Past jobs of the line stay on **Jobs & events** > **Jobs**, where their line is shown by its number after a # sign instead of its name.

> **NOTE**
> While a REDZ support session runs, REDZ support works with the rights of an Admin (see Support), so it can also add, change and delete lines.

One meter at a time on a line

Every line has its own queue. The service reads one meter at a time on a line, in the order the reads were asked for; different lines are read at the same time, up to four lines at once. The note under the list says it too: "Two jobs never use the same line at the same time; different lines are read in parallel."

A read you start while the line is busy waits in the queue until the reads before it have finished. The **Read** page then shows the job as **Queued** (see Reading meters).

The Demand monitor reads the present power of watched meters on their lines in short rounds (see Analysis). It never uses a line together with a read: when a read of the line is about to start, the monitor finishes the reading in progress, closes its connection and gives the line to the read; a reading still running after 5 seconds is cut. While a read of the line waits or runs, the monitor does not start again.

Before it sends anything the service listens to the line for 1.5 seconds. If a meter is still sending, the attempt ends with a LineBusy message that says the meter is still sending, and nothing is sent.

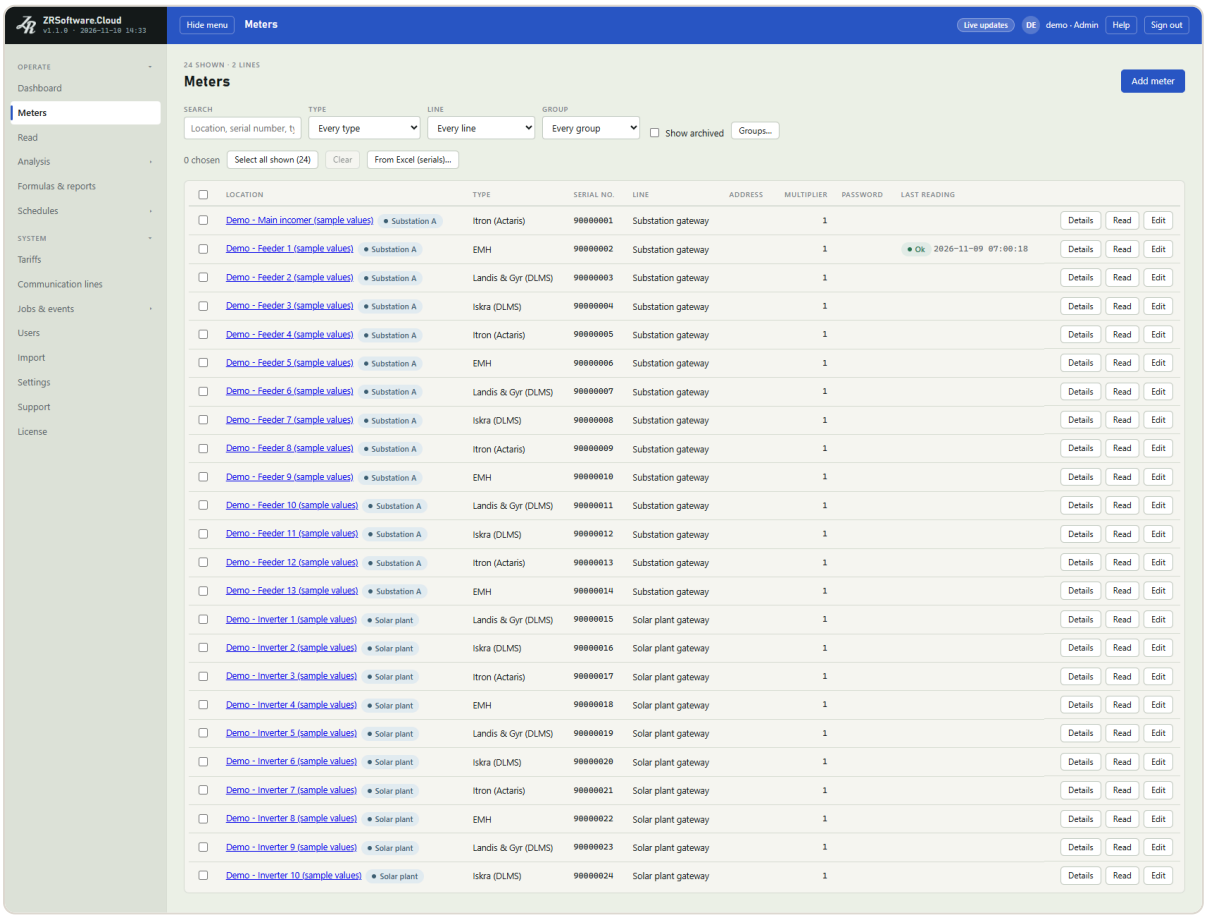
A job, with all its attempts, is stopped after 15 minutes, so one meter cannot hold a line for ever. It ends as cancelled, and its message says that it timed out after 900 seconds, the longest a job may run.

6 Meters and groups

The page **Meters** lists the meters the program knows, with their line, address and last reading. From here you add and change meters, sort them into groups, choose many meters at once to read or change them, and open each meter's own page, **Meter detail**.

Role	What the role can do on this page
Viewer	See the list, the groups of each meter and **Meter detail**.
Operator	As Viewer, and open the **Read** page for a meter, choose meters and read their registers now, and see the **Line log** tab of **Meter detail** (unless an administrator has hidden the line log, see Settings).
Admin	As Operator, and add, change, archive and restore meters, set meter passwords, make groups and change many meters at once.

An administrator can let a Viewer or an Operator see only the meters of some groups (**Meters this user sees** on the **Users** page, see Users). Such a user finds on this page, and on **Meter detail**, only the meters of those groups, and only those groups. Administrators always see every meter.



`Figure 6.1` The Meters page with the 24 sample meters, the filters above the list and the group of each meter.

The meter list

Column	What it shows
Location	The location, or the serial number when no location is set, as a link to **Meter detail**, followed by the meter's groups and the chips **archived** and **reactive** when they apply.
Type	The meter type (see Appendix: supported meters).
Serial no.	The serial number.
Line	The communication line; a dash for a virtual meter.
Address	The physical address, empty when none is set.
Multiplier	The meter's multiplier now (see Changing the multiplier from a date below).
Password	**stored** when a meter password is stored. The password itself is never shown.
Last reading	The outcome of the meter's newest reading of any kind (registers or load profile), good or failed, and when it finished; the outcome is written as one word here, for example NoAnswer. Empty for a meter that has never been read.

The buttons at the end of a row open **Details** (the meter's page), **Read** (the **Read** page with this meter chosen; only for an active meter of a type the program reads) and, for an administrator, **Edit**.

The list shows 50 meters per page; **Previous** and **Next** under the list move between pages.

Click the heading **Location**, **Type**, **Serial no.**, **Line** or **Last reading** to sort the list by that column; a second click turns the order round. A meter without a location is sorted by its serial number, and when the list is sorted by **Last reading**, meters that have never been read come last in both orders.

When the filters match no meter, the list says "No meter matches the filter." with **Clear filters**, which empties the search and the **Type**, **Line** and **Group** filters. With no meter at all it says "No meter here yet." and, to an administrator, to add one with **Add meter**.

The **reactive** chip marks a meter whose newest good registers reading is over a reactive ratio limit; point at it to see which ratio is over and its value, and click it to open **Meter detail**. The limits are on the **Settings** page (see Settings) and the ratios on **Meter detail**.

Adding a meter

A meter that is read needs its line, so add the line first (see Communication lines). While there is no line, the form offers only the type **Virtual (entered values)**, which needs no line.

1. Click **Add meter**.

2. Fill in the fields (see the table below). **Serial no.** and **Communication line** are required.
3. If the meter needs a password, type it into **Meter password**.
4. Click **Save**.

If the service refuses the meter, the form stays open and shows the reason under the fields. **Cancel** closes the form without saving. When you have changed something, Esc, a click outside the form or a menu link does not close it: the form shows "Unsaved changes." with **Save**, **Discard** and **Keep editing**.

The service keeps one active meter per type and serial number. A second meter of the same type with the same serial number is refused, and the message names the location of the meter already on the list. Archived meters do not count here.

The password is stored right after the meter. If the meter is saved but storing the password fails, the form stays open on the saved meter with the reason; clicking **Save** again stores the password into that meter and does not add the meter twice.

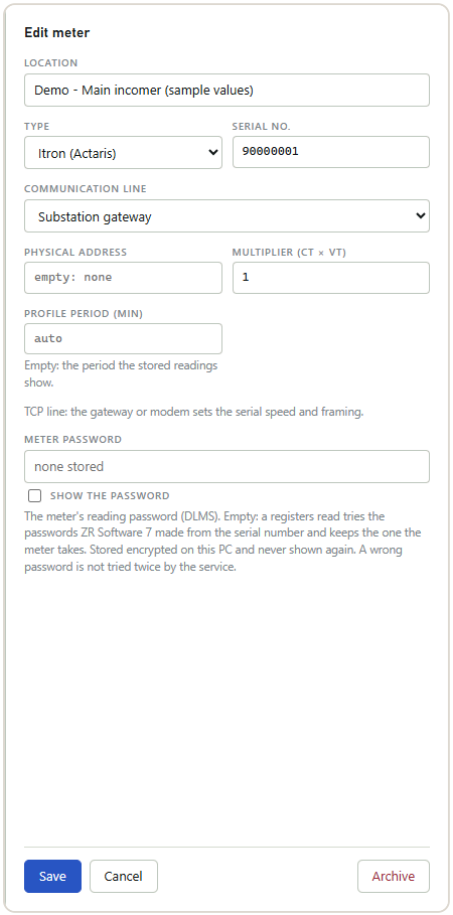


Figure 6.2 The Edit meter form of a sample meter on a TCP line; no meter password is stored.

Field	What to enter	New meter starts with
Location	Free text, for example the site or feeder. Searched by the filters.	Empty
Type	The meter type. The list is in Appendix: supported meters.	The first type of the list; **Virtual (entered values)** while there is no line
Serial no.	The meter's serial number (required).	Empty
Communication line	The line the meter hangs on (required, except for a virtual meter).	The first line
Physical address	The meter's address on the line. Leave it empty when the meter needs none.	Empty
Multiplier	The CT ratio times the VT ratio; a number above 0. When you change it on a saved meter, the form asks from when the new value holds (see below).	1
Initial baud rate	300, 600, 1200, 2400, 4800, 9600 or 19200. Not shown for a meter on a TCP line.	300
Profile period (min)	The interval length the program assumes when it looks for missing intervals and shows the profile. Empty: the interval length of most of the stored profile (15 minutes while none is stored); the note under the field says "Empty: the period the stored readings show." It is not sent to the meter. For a meter that is read, to remove a saved period, empty the box and save.	Empty
Meter password	The password the meter asks for, if any (see below).	Empty

The licence sets how many meters you can have. When the limit is reached the service refuses a new meter, or bringing back an archived one, and the message says how many the licence allows; archived meters do not count (see License). Virtual meters count toward the meter limit too. When more meters are registered than the licence allows, the meters registered first are read, as many as the limit, virtual meters among them; a virtual meter is never read, and its place does not go to another meter. The meters that are not read keep their readings (see Reading meters). This happens, for example, when meters were added during the trial.

The physical address

For an IEC 62056-21 meter the address goes into the sign-on; with an empty field the sign-on carries no address. An Itron or Landis & Gyr DLMS meter needs its address, 1 to 16383. For an Iskra or Cewe DLMS meter the service first tries the address in the field (or, when the field is empty, the address made from the serial number), then the address made from the serial number and the addresses those meters use by default. For these two types the serial number must have at least 8 characters; with a shorter one the read ends with an internal error, also when the field holds an address. When the service has no address it can use, the read ends with "the meter record has no HDLC physical address (1..16383)".

The meter password

The password field never shows a stored password: it says **stored; type to replace** when one is stored and **none stored** when there is none. The service seals the password on this PC and never sends it back to a page, so no one can read it from the pages. Tick **Show the password** under the field to see what you are typing; the box is unticked each time the form opens.

- To keep the stored password, leave the field empty when you save.
- To replace it, type the new password and save.
- To remove it, click **Remove the stored password**.

> **WARNING**
> **Remove the stored password** removes the password at once, without asking; **Cancel** does not bring it back. Type the password again to store it.

The note under the field says what the service does with the password for the chosen type. For IEC 62056-21 meters it says "Not used for IEC 62056-21 meters: the service never sends it to them." For DLMS meters it says whether the type uses the password and what the service does when the field is empty. The note ends with "Stored encrypted on this PC and never shown again. A wrong password is not tried twice by the service."

For an Itron meter, a registers read also tries passwords made from the serial number when the stored one is refused; the one the meter accepts replaces the stored password, and **Jobs & events** > **Event log** says so. When the serial number is not 8 digits, no password is sent.

> **NOTE**
> The sealed password can be opened only on the PC where it was stored. If the program's data is moved to another PC, reads of that meter end with "the stored password cannot be opened on this machine; enter it again". Type the password again in the meter's form.

> **NOTE**
> While a REDZ support session runs, REDZ support works with the rights of an Admin (see Support): it can store, replace and remove meter passwords. An Excel import during the session also stores the meter passwords in the file, and an import of a ZR Software 7 database stores the passwords of the meters it adds. REDZ support cannot change or test the mail settings on the **Mail** card. Settings that are not set here can still come in during the session: restoring a configuration backup adds the settings of the file that this program does not have yet, for example the mail settings without their password (see Settings), and an import of a ZR Software 7 database, also a copy that REDZ support uploads, can set that database's mail server, with user name and password, when none is set here and the licence includes **Exports and e-mail**.

Virtual meters

Choose the type **Virtual (entered values)** for a meter whose values you type in or import instead of reading them. A virtual meter has no line, address, speed or password, and it is not offered on the **Read** page. Its **Profile period (min)** must be 1, 5, 10, 15, 30 or 60; empty means 15. Formulas, reports, exports and tariffs use it like any other meter (see Analysis and Import).

A meter that has read values does not become a virtual meter: the form of a meter whose newest reading is good does not offer the type, and the service refuses the change with "this meter has read values: a read meter does not become virtual (its read values would be open to hand edits). Add a virtual meter instead."

Changing, archiving and restoring a meter

Click **Edit** on the meter's row, change the fields and click **Save**. Readings already stored stay with the meter.

Changing the multiplier from a date

When you change **Multiplier** on a meter that is already saved, the form shows **New multiplier from**: the date and time, in the meter's calendar, from which the new value holds. It starts with the present minute. The note under it says that intervals ending after that time take the new multiplier and earlier ones keep the old one. The time cannot be in the future, and it must be after the last change already recorded; the service refuses otherwise and the form shows the reason. A new meter has no history: its multiplier holds from the start.

Every load profile interval then takes the multiplier that held when it ended, on the **Analysis** page and in the files, automatic exports, formulas and reports made from the profile (see Analysis). The values of **Meter detail** are the meter's own and have no multiplier, as before.

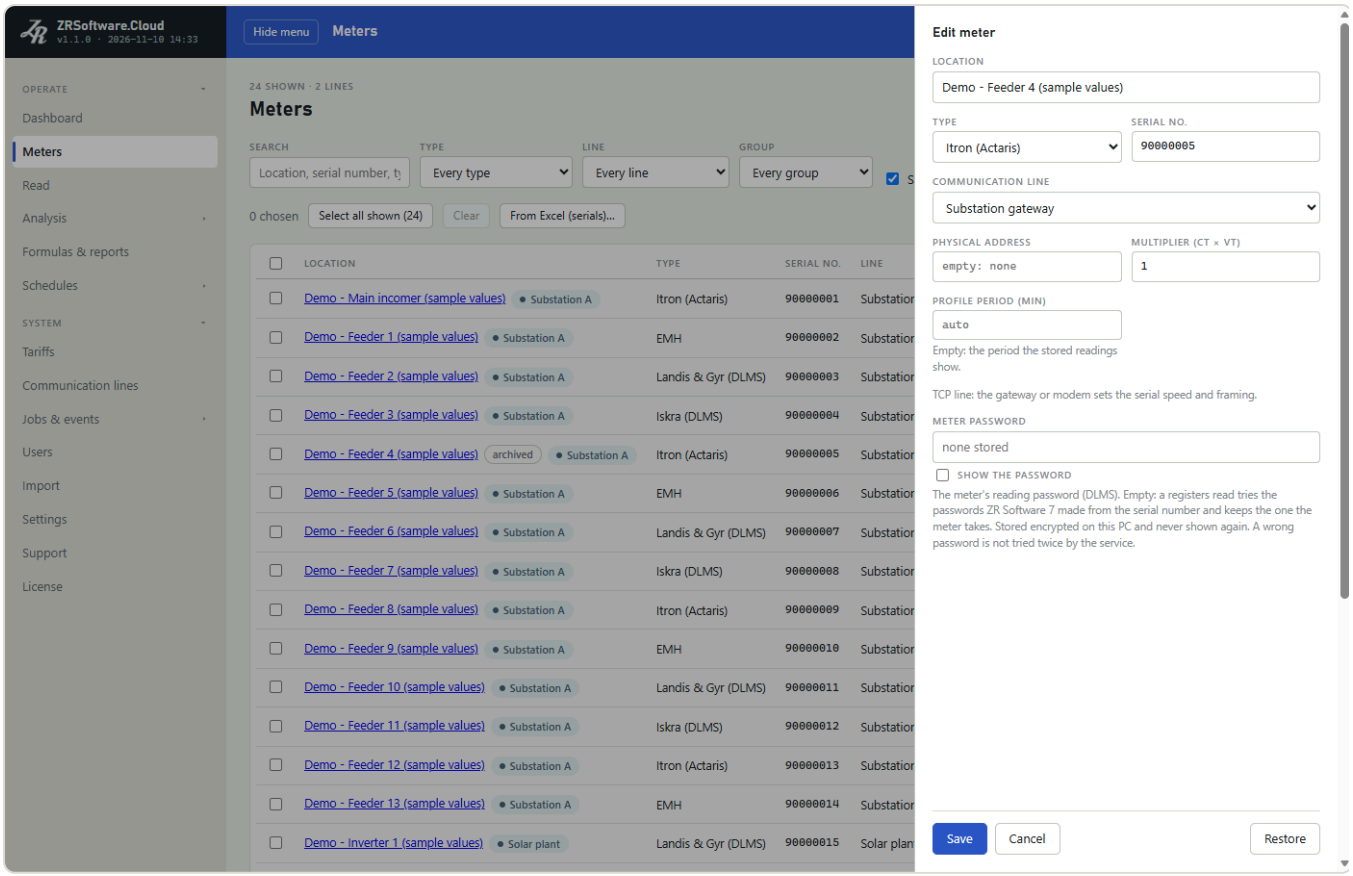
Once the multiplier has changed, the form lists the **Multiplier history**: each value with its **From** time (the first one from the start) and who changed it (**Changed by**). **Remove** on a row takes that change away; the first row has no **Remove**. The meter's multiplier then becomes the newest value left.

> **WARNING**
> **Remove** in the multiplier history acts at once, without asking, and changes the multiplier of the intervals that change covered; **Cancel** does not bring it back. Each change and each removal is written to the event list with the user name (see Jobs & events).

A multiplier changed by importing a meter list from Excel holds from the time of the import (see Import).

To take a meter out of use, click **Archive** in its form. A second button takes its place; it says that the meter is not read any more, that its readings are kept and that Restore brings it back. Click it to confirm. The meter and its readings stay in the program, but it is no longer read (a read already waiting in the queue still runs when the licence has no meter limit, as during the trial; under a meter limit it ends as an error whose message says "the meter is archived: with the licence's meter limit only active meters are read") and it leaves the list; tick **Show archived** to see archived meters again.

To bring an archived meter back, tick **Show archived**, click **Edit** on its row and click **Restore**. The meter becomes active with all its readings and is read again. Restoring is refused, with the reason under the fields, when the licence has no room for another meter or when an active meter of the same type and serial number is already on the list.



`Figure 6.3` An archived sample meter with Show archived ticked: the list marks it archived, and its form has Restore.

> **NOTE**
> A meter cannot be deleted; archive it instead.

Groups

Groups are labels for meters. The meter lists of **Meters**, **Schedules** > **Automatic reading** and **Analysis** > **Completeness**, and the source list of **Schedules** > **Export schedules**, can be filtered by them. A meter can be in several groups. An administrator opens the **Groups** card with the **Groups** button next to the filters.

Groups also decide what a user limited to some groups sees (see Users): putting a meter into such a group lets that user find it on the pages, and taking it out, or deleting the group, hides it from the user's next request on, unless another of the user's groups still holds it. Such a change does not end the user's sessions; a page the user already has open keeps getting the live updates of the meters it saw when it opened, until it is loaded again.

- To make a group, type its name into **New group (e.g. Substation A)** and click **Add group**. A name has 1 to 60 characters and must differ from the other groups' names (upper and lower case count as the same).

- To rename a group, change its name in the box and leave the box. If the service refuses the name, the reason appears next to the box and the box shows the saved name again.
- To delete a group, click **Delete** on its row. A second button then says how many meters lose the label and that the meters stay; click it to delete the group. The **Keep** button next to it closes the question and keeps the group.

> **WARNING**
> Deleting a group cannot be undone. Making a group with the same name again does not bring its members back. A user limited to that group no longer sees the meters that only that group gave them; a user for whom it was the only group then sees no meter until an administrator changes the user's groups (see Users).

Each group shows how many meters it has. To put meters into a group, use the bulk buttons below.

Finding meters

- **Search** finds the text anywhere in the location, serial number, type name and group names; upper and lower case are the same.
- **Type** shows only meters of one type; the list offers the types your meters have.
- **Line** and **Group** show only the meters of one line or one group.
- **Show archived** adds the archived meters.

The filters work together, and the list goes back to its first page when you change one.

The filter, the page and the order are kept in this browser and in the page's address. A plain link to **Meters** opens the list as you left it in this browser; an address that carries a filter or a page opens with it, so a link you copy of a filtered list, with its search words, opens the same list.

Choosing many meters

Operators and administrators can choose meters in the list. An Operator can read the chosen meters now; an administrator can also change them together. The bar above the list counts the meters **chosen**.

- Tick a meter's box to choose it, or the box in the heading (**Choose this page**) to choose every meter on the page.
- The select-all button next to the count chooses every meter the filters show, on all pages; its label gives the number.
- **Clear** empties the choice.

The choice stays when you change the filters, so you can build it from several searches.

> **WARNING**
> An action works on every chosen meter, also the ones the filters now hide.

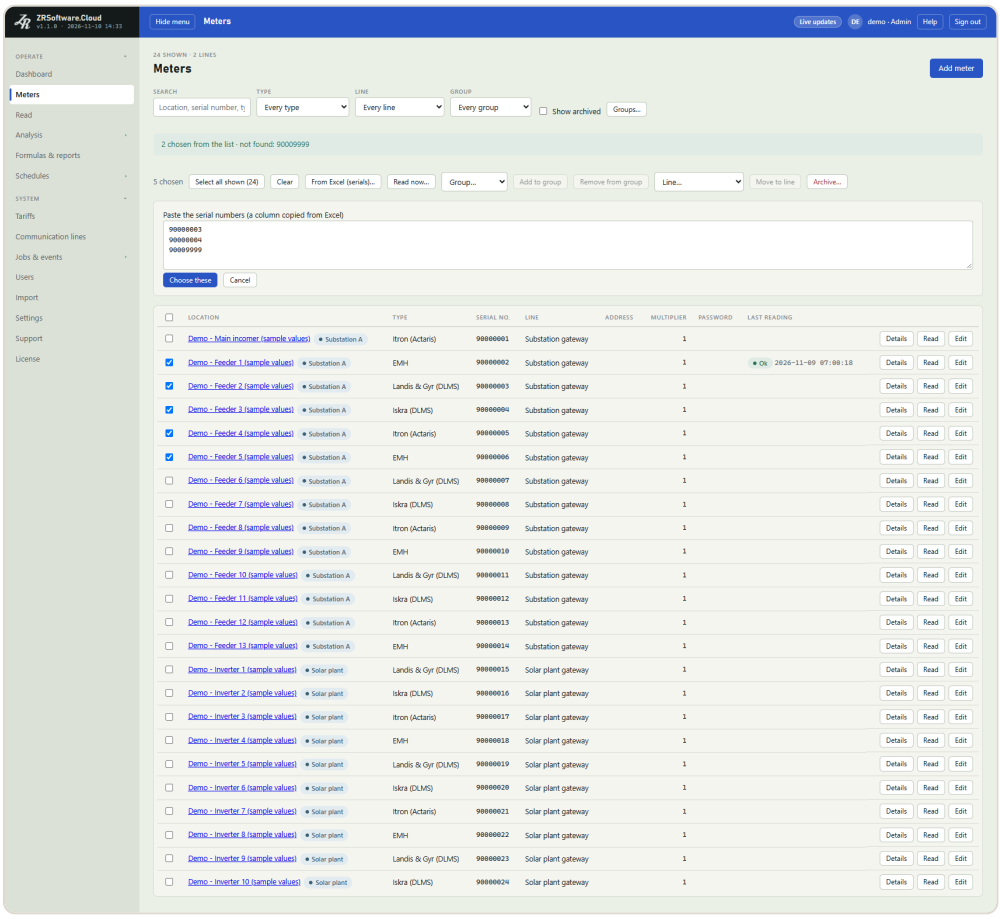


Figure 6.4 Choosing sample meters with a pasted list of serial numbers: the page names the serial number it did not find, and the bulk buttons act on the chosen meters.

Action	What it does
Read now	Operators and administrators. Asks first: the question names how many meters are chosen and on how many lines they are; the second **Read now** button starts the reads, **Cancel** closes the question. Reads the registers of the chosen meters, at most 200 at once (with more chosen the button is off). Each meter is one read on its own line's queue. Archived and virtual meters, meters over the licence's meter limit, meters on a line that is turned off and types whose registers the program does not read are left out; the message after the action says how many meters were queued on how many lines, names the meters left out with the reason (the first five, then how many more), and says that **Jobs & events** shows them. While the licence does not allow reads, the whole action is refused with the licence's message.

Action	What it does
Add to group / **Remove from group**	Choose the group in the list next to the buttons first. The button asks first in its place, naming the number of meters and the group; the second button adds the chosen meters to the group, or takes them out, and **Keep** leaves everything as it was.
Move to line	Choose the line in the list next to the button first. The button asks first in its place, naming the number of meters and the line; the second button puts the chosen meters on that line, archived ones too. Virtual meters are skipped, because they have no line; the message after the action says how many were skipped.
Archive	Asks once more: the second button names the number of meters and says that readings are kept and that each meter can be restored. Archives the chosen meters.

After a group, line or archive action the page says how many of the chosen meters changed; a meter that was already in that state is not counted. Each of these changes is written to the event list with your user name (see Jobs & events).

> **NOTE**
> The choice is emptied after bulk archiving. There is no bulk restore: bring archived meters back one by one with **Restore** in each meter's form.

Choosing meters from a list of serial numbers

When you have the serial numbers in Excel, you do not need to tick the meters one by one:

1. Click **From Excel (serials)** in the bar above the list.
2. Copy the column of serial numbers in Excel and paste it into **Paste the serial numbers (a column copied from Excel)**.
3. Click **Choose these**.

The program splits the text at line breaks, tabs, commas and semicolons, and chooses each meter whose serial number matches exactly (upper and lower case are the same). The search and the **Type**, **Line** and **Group** filters do not narrow a pasted list. Archived meters are chosen only while **Show archived** is ticked; otherwise the message counts them as archived and not chosen. When two meters have the same serial number (for example the same meter entered with two types), only one of them is chosen; tick the other one by hand. The meters are added to the ones already chosen. The message above the list says how many were chosen and names the serial numbers it did not find (the first ten, then how many more).

The meter picker of **Schedules** > **Automatic reading** and of **Analysis** > **Completeness** works the same way: search, the **Type**, **Line** and **Group** filters, the select-all and **Clear**

buttons and the pasted serial list. It lists at most 300 meters; narrow the search to see others, or use the select-all button, which takes every meter the filters show.

The meter detail page

Meter detail shows one good registers reading of the meter, the way a meter readout sheet does. It opens with the newest reading; the list at the top offers the last 100 good registers readings, each by its time and kind.

A link above the title leads back to **Meters**. Next to the reading list, two buttons open the previous and the next meter of the **Meters** list as you last filtered and sorted it in this browser, with the meter's place in that list between them; the tab you have open stays open. For an administrator, **Edit** opens the meter's form on the **Meters** page. The tab you choose goes into the page's address, so the address opens the same tab.

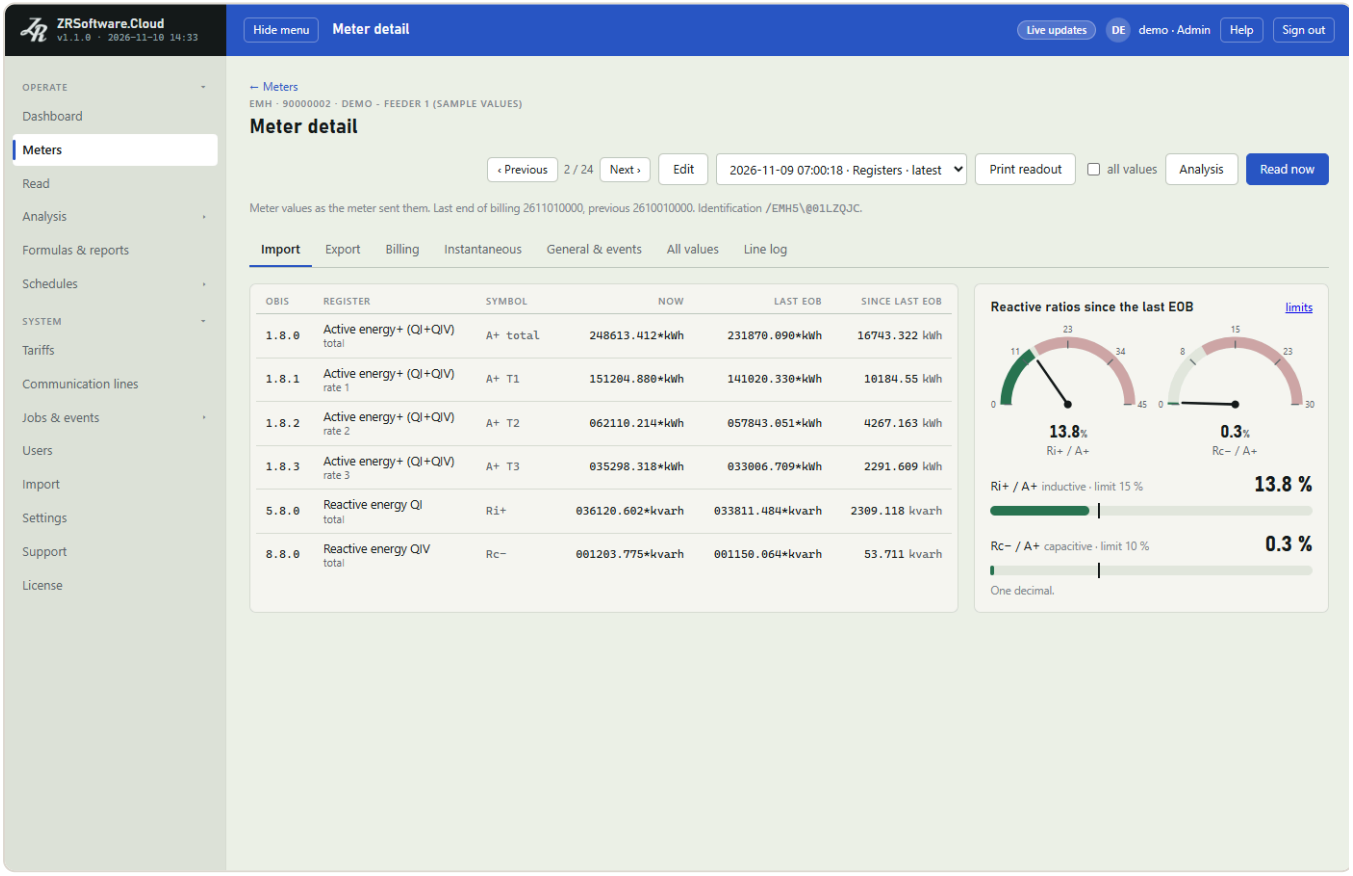


Figure 6.5 Meter detail of a sample meter on the Import tab: each energy register with its OBIS code, name and symbol, now, at the last end of billing and the difference since then, with the reactive ratios.

Tab	What it shows
Import / **Export**	Each energy register now, at the last end of billing, and the difference since then, with the reactive ratios of that direction.
Billing	The last and previous end of billing, this period and the previous period, and the **Billing history** over all stored readings.

Tab	What it shows
Instantaneous	Voltages, currents and other instant values, with dials for the phases, and the **Extra profile channels** of the load profile with their newest value.
General & events	The general values of the reading and the event registers.
All values	Every value of the reading as the meter sent it, with the register's name where the standard gives one.
Line log	Operators and administrators only: the bytes that went between the PC and the meter in the good registers reading chosen at the top, as the service stored them; a received block is shown line by line (see Reading meters). A reading that kept no trace says "This reading kept no trace." **Save as .txt** saves the stored log as a text file.

When an administrator hides the line log on the **Settings** page (see Settings), the **Line log** tab is not shown, and a link that names it opens the **Import** tab. The service still keeps the log with each reading.

The values are shown as the meter sent them. When the meter's multiplier is not 1, the note above the tabs says that it is not applied here.

The register tables of **Import**, **Export** and **Billing** have three name columns: **OBIS** (the code), **Register** (the name of the code after the tables of IEC 62056-6-1, the DLMS Blue Book, with how the value is processed and its rate under it) and **Symbol** (the program's short symbol, when it says more than the code). For 1.8.0, for example, the name is Active energy+ (QI+QIV) with total under it. On **Import** the registers come as 1.8.0 and its rates 1.8.1 to 1.8.4, then 3.8.0, 5.8.0 and 8.8.0, then 1.9.1, 1.9.2, 3.9.1 and 3.9.2, and the maximum demand last; **Export** follows the same pattern: 2.8.0 and its rates 2.8.1 to 2.8.4, then 4.8.0, 6.8.0 and 7.8.0, then 2.9.1, 2.9.2, 4.9.1 and 4.9.2, and the maximum demand last. Only the registers the reading holds are listed. A code the standard's tables do not name keeps the program's short label. **Instantaneous** shows the code and the name the same way, and **All values** has a **Register** column with the name.

On **All values**, type in the find box above the table to keep only the values whose OBIS code, text, group or register name holds every word you type (upper and lower case are the same). Next to the box the page counts the values shown out of all; when none matches, the table says "No value matches."

A difference below zero is shown in red; its tip asks whether the meter was reset.

Reactive ratios since the last EOB compares the inductive and capacitive reactive energy with the active energy since the last end of billing, in per cent with one decimal. A ratio over its limit is shown in red. Without your own settings the limits are 15 % inductive and 10

% capacitive; an administrator changes them under **Reactive ratio limits** on the **Settings** page.

In **Billing history** choose **From (period end)** and **To**, click **Show**, and **Excel** to save the rows as an Excel file, or **PDF** to save the same table as PDF pages (see Analysis for how the PDF pages look). When two readings carry the same billing period, the newer one is shown. The table and both files have the columns of the billing file of ZR Software 7, in its order: 1.8.0 to 1.8.3, 2.8.0 to 2.8.3, the demand 1.6 and 2.6 (shown as 1.6.x and 2.6.x), 3.8.0, 4.8.0, 5.8.0 to 8.8.0, and 1.9.1, 1.9.2, 2.9.1, 2.9.2, 3.9.1, 3.9.2, 4.9.1 and 4.9.2. The Excel file starts with the end of the billing period and the time of the reading, 26 columns in all.

Print readout prints the reading on paper: the meter and the reading, the import and export registers with the same names as on the page, the reactive ratios and the instantaneous, general and event values. The **Billing** tab and the **Extra profile channels** are not printed. Tick **all values** next to it to add the full list of values.

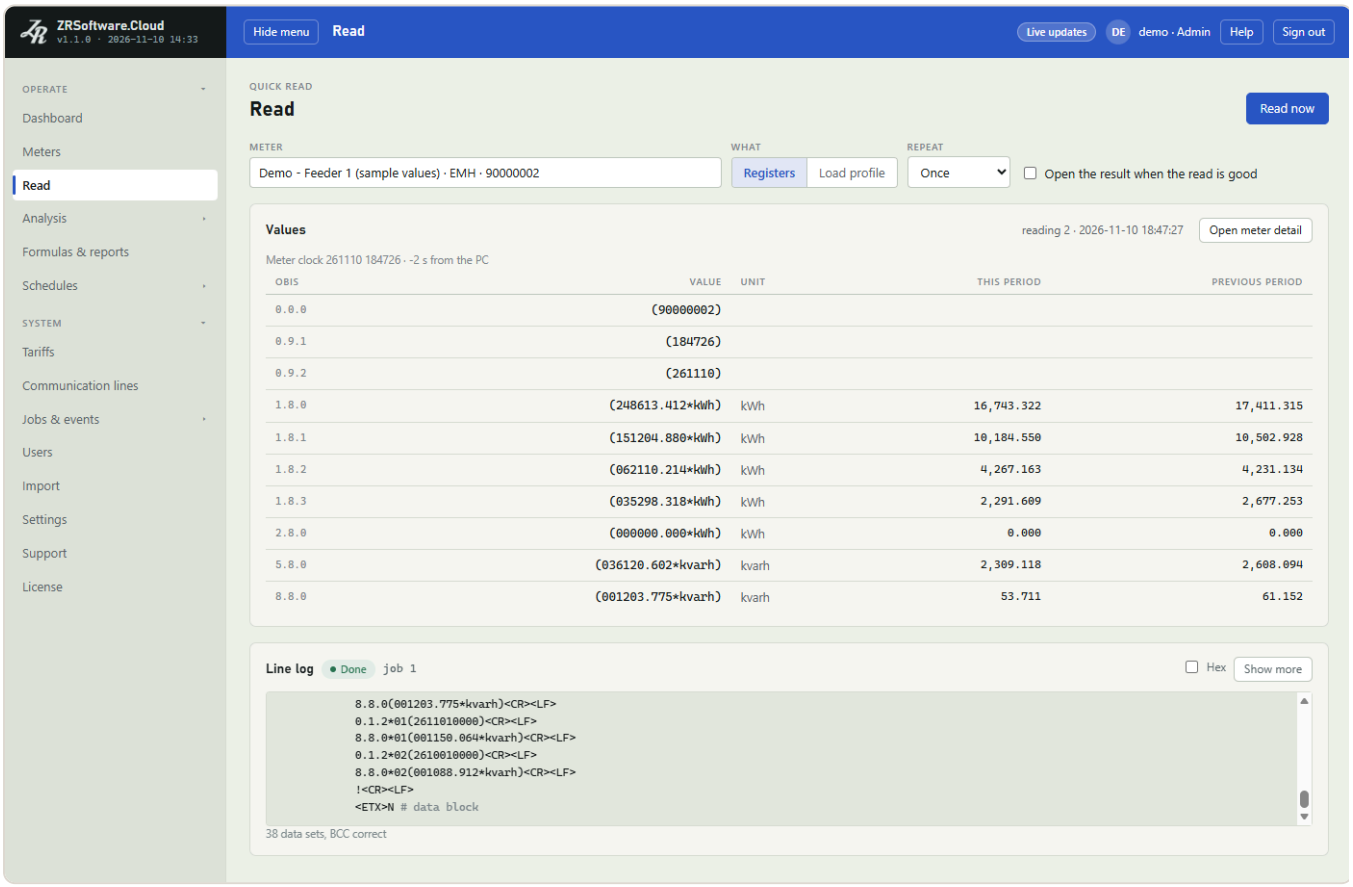
When the identification in the reading shown names another maker than the meter's type, a warning banner says so. Check the type in the meter's form; the program never changes it by itself (see Reading meters).

A meter without a good registers reading shows "This meter has no good registers reading yet. Read it from the Read page."

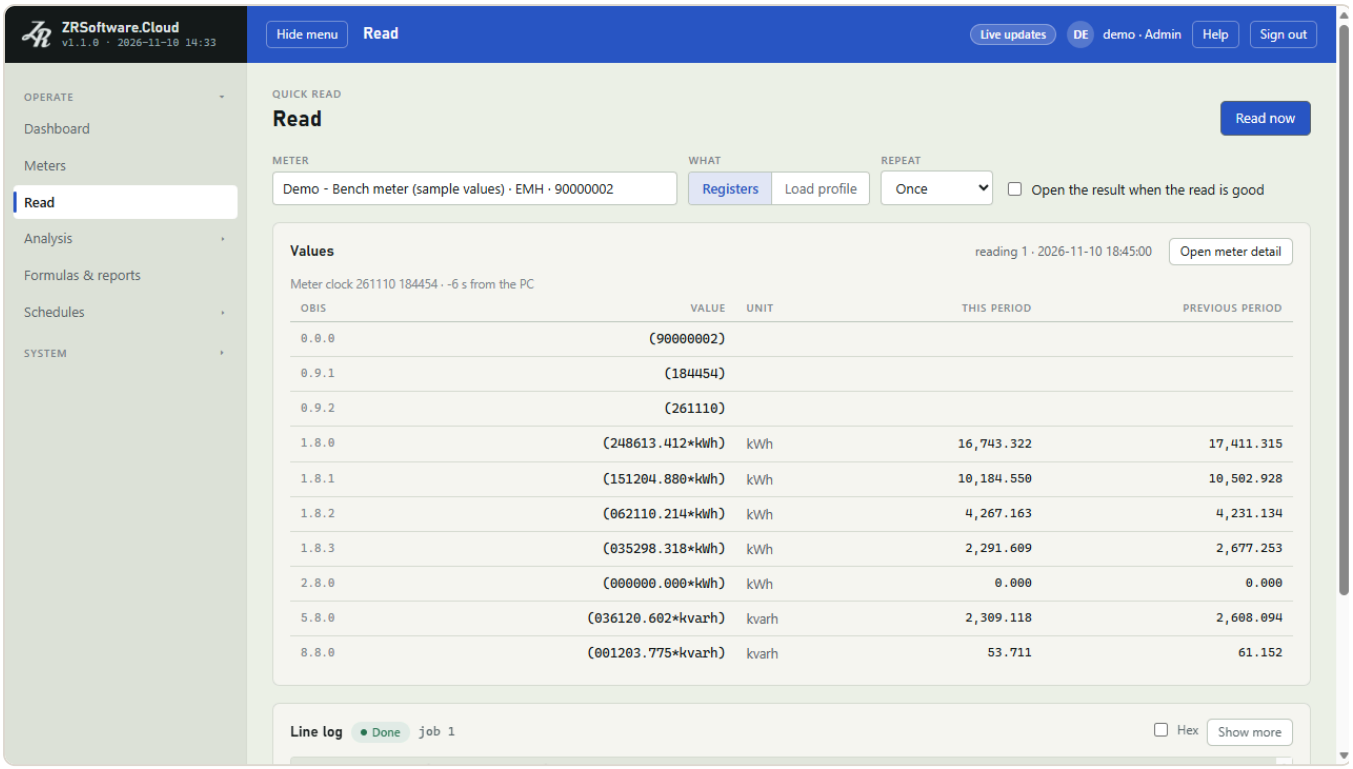
When the licence includes analysis, **Analysis** opens the meter's load profile (see Analysis). **Read now** opens the **Read** page for this meter with **Registers** chosen (Operator and Admin, only for an active meter).

7 Reading meters

The page **Read** reads one meter now and shows what happens on the line while it reads. Operators and administrators start and cancel reads and, unless an administrator has hidden it, see the line log; a viewer sees the meter's newest stored values.



`Figure 7.1` The Read page after a registers read of a sample meter: the Values card above and the Line log below.



`Video 7.1` A short video of a registers read on the Read page with a sample meter: Read now, the line log, the values, Show more and Hex (sample values).
Watch the video in the online manual.

Starting a read

1. Choose the **Meter**. The list holds the active meters that are read from a line. The **Read** button on **Meters** and **Read now** on **Meter detail** open this page with the meter already chosen.
2. Under **What**, choose **Registers** or **Load profile**.
3. For a load profile, choose the days: **From (meter calendar)** and the last day. The label of the second box says what that day means for the chosen meter (see below).
4. Click **Read now**.

Type in the **Meter** box to find the meter: every word you type must be in the meter's location, serial number, type or group names (a word shorter than three characters must be the beginning of one of their words). The list shows at most 50 meters; type more to narrow it. Arrow keys move in the list, Enter takes the meter, and Esc closes the list without a change.

The page opens with the meter and the **What** you chose last in this browser; a link that names a meter, for example **Read now** on **Meter detail**, opens that meter with **Registers**.

When the meter list is closed, Enter in a box of this bar starts the read, as **Read now** does.

With no meter to read, a banner says "There is no meter to read yet." and links to **Meters** to add one.

When the page is opened for a meter that is archived or virtual, no meter is chosen, and a banner says "That meter is archived or virtual, so it is not read. Choose a meter above."

Read now stays disabled while a read of this page runs, for a meter type the program does not read, and for a meter whose line is turned off. A banner then says that the service does not read that type yet, or names the line, says that it is turned off and that you turn it on in **Communication lines**, which is a link to that page (see Communication lines).

If the service refuses the read, the reason appears in a banner. It refuses, for example, when the licence does not allow reads (see License) or when a load profile window is longer than 31 days.

When the trial or the licence has ended, the licence is for another PC and the trial is over, or this version was built after the licence's maintenance ended, meters are not read: **Read now** and reading the missing intervals on **Analysis** > **Completeness** are refused with the licence's message, a read already waiting in the queue ends with that message, and schedules do not read either. For an ended trial or licence the message says "Meters are not read and automatic exports do not run." The readings already stored stay (see License).

When the licence server says that the licence was withdrawn or moved, or that it does not know it on this PC, the program goes on reading meters for seven days and then stops (the state Withdrawn); a copy of a virtual PC stops at once. From then on reads are refused and end in the same way.

Virtual meters count toward the meter limit too. When more meters are registered than the licence allows, the meters registered first are read, as many as the limit, virtual meters among them; a virtual meter is never read, and its place does not go to another meter. For a meter that is not among them, **Read now** is refused with a message that gives the licence's number of meters and the number registered, and suggests archiving a meter or asking for a larger licence; reading the missing intervals on **Completeness** leaves the meter out with the same message. A read of such a meter already waiting in the queue ends with the same message, and a schedule leaves those meters out and writes a warning row in **Jobs & events** > **Event log** (see Meters and groups, Automatic reading and Jobs & events).

The read becomes a job on the meter's line. When another read uses the line, it waits its turn (see Communication lines); the chip of the line log then shows **Queued**, and **Running** once it starts.

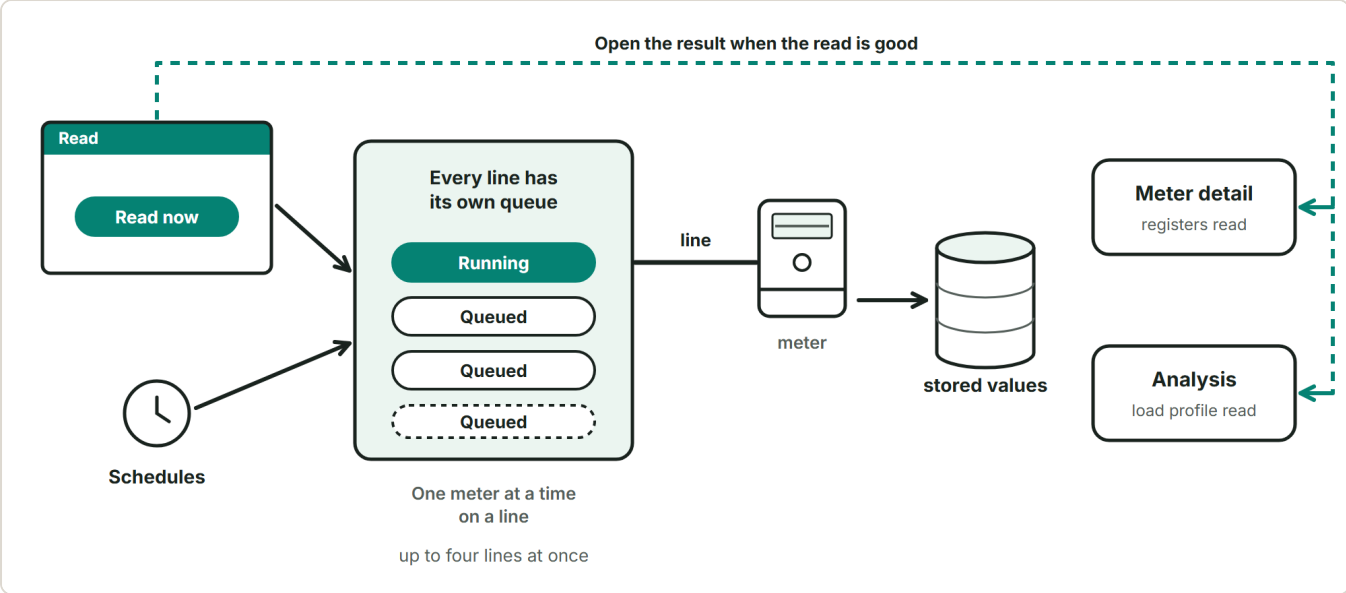


Figure 7.2 The way of a read: Read now or a schedule puts a job in the queue of the meter's line; a line reads one meter at a time, and the values are stored. With Open the result when the read is good ticked, a registers read started on the Read page opens Meter detail and a load profile read Analysis (when the licence includes analysis).

A read started here makes one attempt. Scheduled reads can repeat a failed attempt (see Automatic reading).

If you leave the page during a read, the read goes on in the service. Its result is on the **Jobs & events** > **Jobs** page (see Jobs & events) and, for a good registers read, in the **Values** card the next time you open the page.

Opening the result

With **Open the result when the read is good** ticked, the page opens the result as soon as a read ends well: a registers read opens **Meter detail** at the billing tab (see Meters and groups), a load profile read opens the **Analysis** page for the same meter and the same days (see Analysis). When the licence does not include analysis, a load profile read stays on this page (see License). A read that fails, or is cancelled, stays on this page with the line log.

The box is ticked at first, and the page remembers your choice in this browser. Untick it to stay on the **Read** page and see the **Values** card or the **Load profile** card after the read. While **Repeat** is set, the box is disabled and the page does not leave.

Reading the load profile

For an IEC 62056-21 meter the second box is labelled **To (until 00:00 of this day)**: the window starts at 00:00 on the **From (meter calendar)** day and ends at 00:00 on that day, so the day itself is not read. For a DLMS meter it is labelled **To (this day included)**: the meter is asked, day by day, from the day before the **From (meter calendar)** day up to and

including that day. When the window reaches the end of a month that has fewer than 31 days, the DLMS request starts one to three days earlier still; for example **From (meter calendar)** 30 September and 1 October ask from 28 September. The page starts with yesterday and today.

The days are in the meter's own calendar: the service asks the meter for these dates as the meter's clock counts them, even when that clock is far from the PC's. The note on the page says so too.

The last day must be after the **From (meter calendar)** day, and at most 31 days after it.

Reading days that are already stored replaces the stored values of those intervals with the new ones; an interval corrected by hand is kept.

As soon as a load profile read starts, a **Load profile** card with the chosen days takes the place of the values card and says that the profile is being read. If the read fails, the card says "The load profile read did not succeed; the line log below says why."

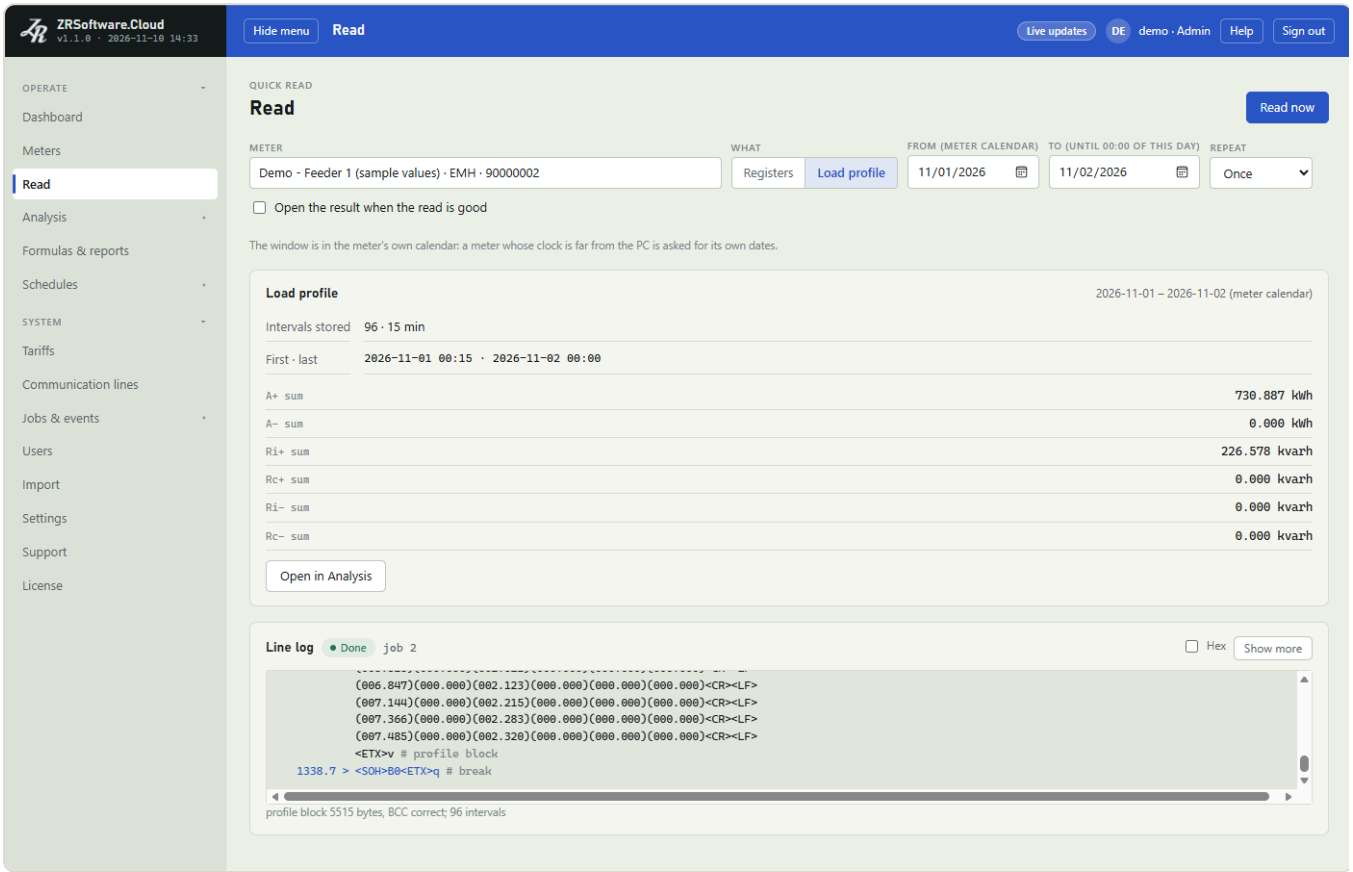


Figure 7.3 The Read page after a good load profile read of a sample meter with Open the result when the read is good unticked: the Load profile card and the Line log.

When the page stays after a good load profile read, the card shows what is stored for the days from the **From (meter calendar)** day up to and including the last day, whatever this read asked for: for an IEC 62056-21 meter it also counts intervals of the last day that were stored before. It shows **Intervals stored** with the interval length, the first and last interval,

and, when the meter has them, the number of other channels (voltage, current and the like), and the sum of each energy channel. When the licence includes analysis, **Open in Analysis** opens the same days on the **Analysis** page (see Analysis).

If the summary cannot be made, the card says "The profile is stored; the Analysis page shows it." When the licence does not include analysis, the card says only that the profile is stored, without the summary and without **Open in Analysis**.

Reading only the missing intervals

To fill gaps in stored load profiles, open **Analysis** > **Completeness** in the menu (it needs a licence that includes analysis; see Analysis). Choose the meters and the days and click **Show**. Operators and administrators see a box in front of each meter that is read; after **Show** the meters whose stored profile is not complete in those days are ticked. Tick or untick meters, then click the button above the table that reads the missing intervals; its label counts the meters ticked. The service takes at most 200 meters at once; with more ticked it refuses the whole request and the page shows the reason. On the **Analysis** page, **Read the missing intervals in Completeness** (for Operators and administrators, on a meter that is read) opens Completeness for the meter and the days shown there, with the table already shown.

For each meter the service looks for missing intervals in the days of the table, the last day included, but only in the last 31 days of them; when more days are shown, the meter's answer says that only the last 31 days were looked at. When the last day is today, the search starts on the day before the **From (meter calendar)** day, at the present time of day, so gaps of that afternoon or evening are read too. Gaps with more than 6 hours of stored profile between them are read as separate jobs, each from its first missing interval to its last; gaps closer together share one window, and the intervals already stored inside it are read again. For a DLMS meter each window is widened to whole days, from the day before the day of its first missing interval (earlier still at the end of a short month, as described above) up to and including the day of its last one. A gap is not asked again when a finished read covered it and had started after that interval had closed, with one exception: an interval that ends at 00:00 is asked again when the interval before it is stored.

Above the table the page then says how many jobs were queued for how many of the meters and how many were left out, with a link to **Jobs**. A new column **Read** gives each meter's answer: the windows that are being read and, when there are several, how many jobs were made, or "no interval is missing in these days", or "not read:" and the reason - for example the meter's line is turned off, the meter is over the licence's meter limit, the program does not read the load profile of its type, or a profile read of the meter is still waiting or running, so clicking twice does not queue a meter twice. A meter that the table ticks can still answer "no interval is missing in these days" when its gaps are older than the last 31 days or a finished read has already asked for them.

Values, units and billing periods

While a registers read runs, the **Values** card fills as the meter sends its values; for an IEC 62056-21 meter this works only while the line log is shown (see The line log below). When the read ends well and the page stays (see above), the card shows the stored reading instead. After a failed read the card keeps the last good reading; the chip and the line log say what failed.

When the page opens it shows the meter's newest good registers reading, with its number and time in the card's heading (**none yet** when there is none). **Open meter detail** opens **Meter detail** at the billing tab with the newest good registers reading (see Meters and groups).

Column	What it shows
OBIS	The register code as the meter sent it.
Value	The value. For a DLMS meter a plain number is shown here and its unit in the next column. An IEC 62056-21 meter's value is shown as the meter sent it, in brackets with its unit, for example (248613.412*kWh); the unit is in the next column too. Any other text is shown exactly as the meter sent it.
Unit	The unit the meter gave.
This period	For an energy register: the value now minus the value at the last end of billing, with three decimals.
Previous period	For an energy register: the last end of billing minus the one before, with three decimals.

The **This period** and **Previous period** columns appear only when the program can work out a period for at least one energy register of the reading.

The table lists the current values. The values of past billing periods are stored with the reading and shown on **Meter detail**.

For a DLMS meter the values come in groups, and each group starts with a heading row.

A row whose period is below zero shows both periods in red; the negative value keeps its minus sign.

Above the table the card gives the meter's clock and how many seconds it is ahead of (+) or behind (-) the PC.

A meter read through the REDZ BT probe also shows what the probe reported before the read (firmware, battery, mode) as chips.

> **NOTE**
> The values in the **Values** card are the meter's own: the meter's multiplier is not applied there. The sums on the **Load profile** card come from the analysis and have the multiplier applied, each interval with the multiplier that held when it ended (see Meters and groups and Analysis).

The line log

The **Line log** card shows the bytes between the PC and the meter as it happens; a DLMS login with a password is not recorded, as described below. Before the first read it says "Press Read now. Every byte to and from the meter appears here as it happens." While the job waits or opens the line, the card shows what the service is doing, for example "opening the line". When a job ends before the line was opened, the card says "Nothing went over the line: the job ended before the line was opened (see below)."

An administrator can hide the line log on this installation, on the **Settings** page (see Settings). While it is hidden, this card, the **Trace** button on **Jobs & events** > **Jobs** and the **Line log** tab of **Meter detail** are not shown, also to Operators and administrators. The service still keeps the log with each reading, and shows it again when the line log is shown.

The log opens as a short box that scrolls to the newest row. Click **Show more** to make it taller, and **Show less** to make it short again.



Figure 7.4 The Line log of a registers read of a sample meter, short with Show more: heading rows start with #, and Hex is unticked.

Part of a row	Meaning
The first number	Milliseconds since the exchange with the meter began.
> or <	> is sent by the PC, < is received from the meter.
The text	The bytes as text. Control characters are shown in angle brackets, such as <CR> and <LF>; a byte without a printable character is shown as its hex value, such as <1F>.
# …	A note of the service on that row, for example the step of the sign-on.

Part of a row	Meaning
A dot in place of > or <	A step of the service without bytes, for example the speed switch; its note follows after #.

Rows starting with # are headings, such as the line that was opened and the meter. Tick **Hex** to see the bytes as hex numbers instead of text.

A block received from the meter that holds line ends is shown line by line: what follows each <CR><LF> starts a new line under the first one. This is only how the page shows it; the stored log and the .txt file keep each block in one row.

The chip in the card's heading gives the job's state and the job number: **Queued**, **Running**, Done or Cancelled. When the read fails, the chip shows the outcome in words instead of the state, and the service's message appears under the log.

Outcome	Meaning
Ok	The read is complete and stored; the chip shows Done.
No answer	No identification, no DLMS answer or no data block came back.
Bad checksum	A block came back incomplete or with a wrong checksum, or an IEC 62056-21 meter refused the load profile request twice.
Login failed	The meter refused the password (for an Itron meter: every password tried, the stored one and the ones made from the serial number), no password is stored for a meter that needs one, an Itron meter's serial number is not 8 digits, so no password is sent, or the stored password cannot be opened on this PC.
No data	An IEC 62056-21 meter answered the load profile request with an error: the window holds no records, or the meter does not accept the request.
Not supported	The program does not read this type or kind yet, or the meter's record lacks what the read needs (for example an address).
Cancelled	The read was cancelled with **Cancel**, it ran longer than the time allowed for one job, or the service stopped during the read; the message says which. The chip shows Cancelled. A read that could not end in time when the service stopped shows Interrupted after the service starts again.
Error	Any other failure, for example an IEC 62056-21 meter that did not accept the profile access; the message says what happened.

The stored meter password never appears in the log. For a DLMS meter that logs in with a password, the login request is not recorded at all: its row says how many bytes were left out because of the password. In the meter's answer to the login, the authentication value

is replaced by '0' characters, and the row says so. The stored meter password is never sent to an IEC 62056-21 meter.

The log of a finished read is kept with the reading when bytes went over the line. While the line log is shown, Operators and administrators open it with **Trace** on **Jobs & events** > **Jobs** or the **Line log** tab of **Meter detail** (for a good registers reading, see Meters and groups), and save it with **Save as .txt**; a job whose reading kept no log has no **Trace** button. The note above the log on **Jobs & events** > **Jobs** depends on the meter: for a DLMS meter it says that the login request is not recorded and the meter's authentication value is masked; for a Landis & Gyr DLMS meter it says "As stored: Landis & Gyr DLMS meters are read without a password, so the sign-in is recorded in full."

Cancelling a read

While the read waits or runs, **Cancel** stops it. A job still in the queue is closed with "cancelled before it started"; for a running job the service closes the line, and the job ends as Cancelled, its message ending with "cancelled". The same button is on **Jobs & events** > **Jobs**.

Repeating a read

Repeat reads the meter again after a pause: **Once** (no repeat), **Every 30 s**, **Every 60 s** or **Every 5 min**. It works for registers and for the load profile. After each read, good or not, a note under the controls says when the next read starts; after a read that did not succeed the note begins with "The last read did not succeed."

Leaving the page stops the repeat, and so does a read that the service refuses (the banner gives the reason). **Cancel** stops only the running read: the next one follows after the pause. To stop repeating, choose **Once**; a next read that is already waiting still starts once, and no other read follows it. If that read ends well with **Open the result when the read is good** ticked, the page opens the result.

Warnings after a read

When the identification the meter sends names another maker than the meter's type in the program, the service writes a warning to the event list and, for a good registers reading, **Meter detail** shows a warning banner. The read itself is kept, and the program does not change the type: check the meter type in the meter's form (see Meters and groups).

When a good registers reading puts a reactive ratio over its limit, the meter's row on **Meters** gets the **reactive** chip and the **Dashboard** lists the meter under **Over the reactive limit**. The ratios and limits are explained in Meters and groups; the limits are set in Settings.

8 Analysis

The Analysis section of the menu has three pages: **Profile**, **Completeness** and **Demand monitor**. **Profile** opens the **Analysis** page. The **Analysis** page shows the load profile that is stored for a meter: as a chart, as a table of rows with minimum, maximum, average and sum, and as files you can save. It works on the intervals that were already read (see Reading meters) and does not ask the meter for anything. **Completeness** shows how complete the stored profiles of many meters are, day by day, and reads the missing intervals; **Demand monitor** reads the present power of chosen meters and warns when an hour is going to be over its target. Both are described at the end of this chapter.

> **NOTE**
> The three pages are in the menu only when the licence includes the feature **Analysis and tariffs** (the **License** page names it under **Features**, or shows **All features**; see License). Every role can open them.

> **NOTE**
> When the trial or the licence has ended, or meters are not read for another licence reason, the **Analysis** page, the tariffs, formulas and custom reports that the licence includes stay open with the stored data, and the files can still be saved (see License). Reading the missing intervals on **Completeness** is then refused, and the values of a virtual meter are not typed in, imported or removed: operators and administrators see the note "Meters are not read now (the note at the top says why), so this virtual meter's values are not typed in or imported here." The program in the browser asks for the licence state at sign-in and then every ten minutes; until it has the new state, it still offers these tools, and the service refuses them with the message of the licence state, as the **License** page shows it.

Choosing what to show

In **Meter, formula or report** you pick the source. Type in the box to find it: every word you type must be in the meter's location, serial number or type, or in the name of the formula or report (a word shorter than three characters must start one of them; the word formula or report finds every formula or every report). The list shows at most 50 entries; type more to narrow it. Arrow keys move in the list, Enter takes the entry, and Esc closes the list without a change.

The list has the groups **Meters**, **Formulas** and **Custom reports**; a meter is listed with its location and type (or only its type when it has no location) and its serial number. Archived meters are not in the list. Formulas and custom reports are made on the **Formulas & reports** page (see Formulas & reports).

The **Formulas** group is there only when there is a formula, and the **Custom reports** group only when there is a report. When the licence does not include formulas or custom reports, the page still opens with the meters.

A user who sees only the meters of some groups finds only those meters here, and only the formulas and reports whose meters are all in those groups (see Users).

When there is no active meter and no formula or report, the page says so and links to the **Meters** page.

From (meter calendar) and **To** are days in the meter's own calendar. When the browser loads the page, both are today, taken from the clock of this PC; when you come back to the page from another page of the program on the same day, it shows the days you chose last. A link from another page that names the days, such as **Open in Analysis** on the **Read** page, opens those days. The page shows whole days: from the start of the first day to the end of the last day.

The page keeps the source and the tariff you chose last in this browser. A link that names the source, such as **Open in Analysis** on the **Read** page or **Analysis** on the **Formulas & reports** page, opens that source instead, without the kept tariff and, unless the link names the days, on today. After such a link the page keeps that source and no tariff as your last choice.

The range can be at most 366 days. If **To** is before **From (meter calendar)**, the page shows "to is before from".

The row of buttons under the boxes fills in both days and shows the result at once: **Today**, **Yesterday**, **Last 7 days** (today and the six days before), **Last 30 days** (today and the 29 days before), **This month** (from the 1st to today) and **Last month** (its first to its last day). These buttons take today's date from the clock of this PC.

- **Detailed**: one row for each stored interval, as the meter recorded it.
- **15 min**, **30 min**, **Hourly**, **Daily**: the intervals are grouped into steps of that length.

Unit is **Energy** (kWh, kvarh; a step adds up its intervals) or **Power** (kW, kvar). For **Power** the page shows this note:

> **NOTE**
> "Power is the meter's own average-power channel; a step shows the mean of its intervals. A meter that records only energy has no power values."

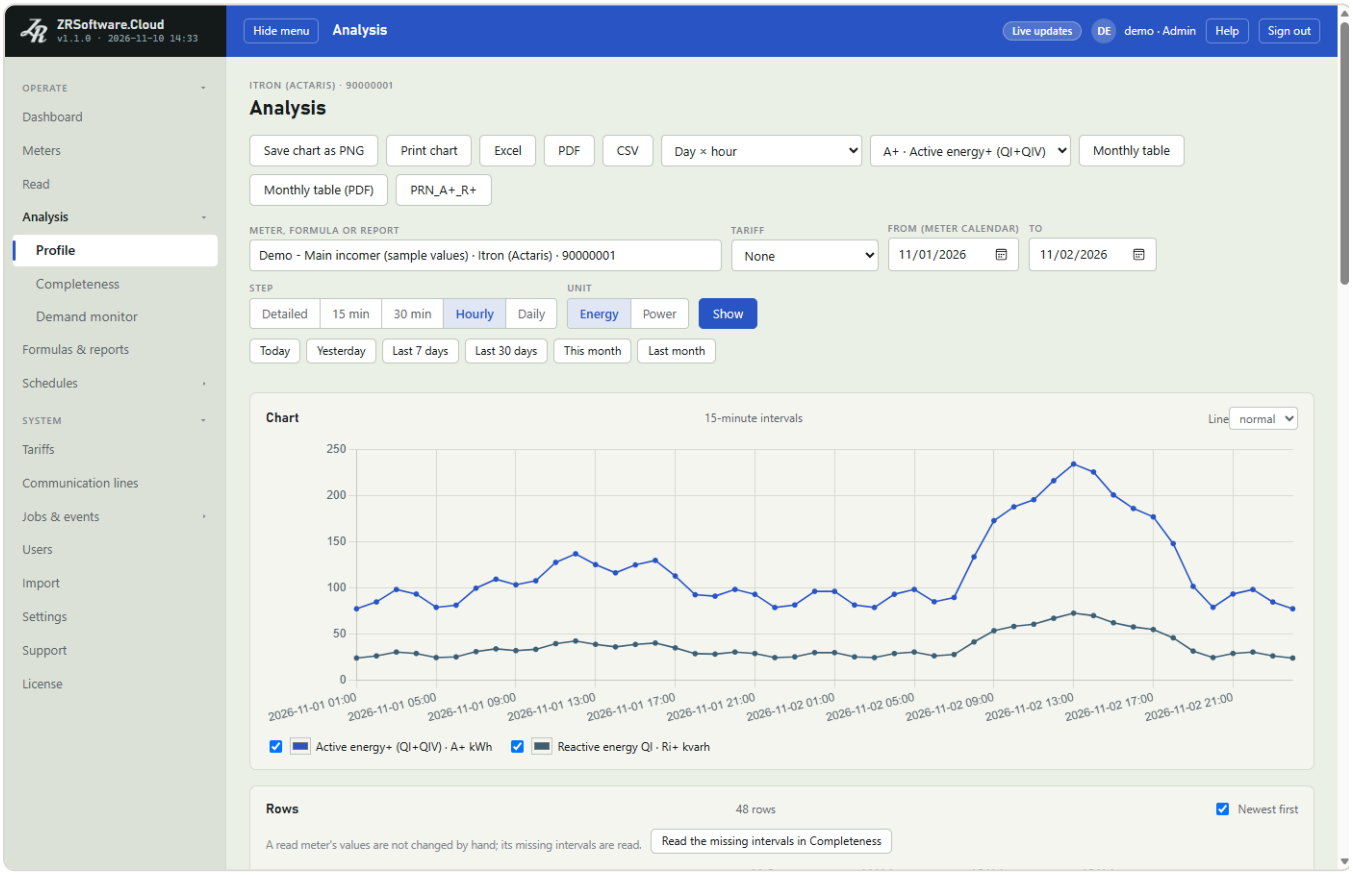
The page shows the result as soon as you change the source, the step, the unit or the tariff. After you type or pick other days in the boxes, select **Show**.

Enter in one of these boxes shows the result as **Show** does; while the list of sources is open, Enter takes the entry instead.

While the days on the screen reach today, the page fetches the result again every five minutes from the values the service has stored, without a message and without asking the

meter. It does not do so while you type a value in, while the page is fetching a new result (for example after **Show**) or while the browser tab is hidden.

The page remembers the step and the unit you last used for each meter, formula and report, in this browser.



`Figure 8.1` The Analysis page with the stored load profile of a sample meter in hourly steps, as a chart and as rows, newest first.

How the steps group the intervals

A row's time is the end of its step, in the meter's calendar. An interval belongs to the step in which it ends: in the **Hourly** step, the intervals ending at 10:15, 10:30, 10:45 and 11:00 form the row 11:00.

In the **Daily** step, 00:00 closes the day before: the row of 5 May has the time 6 May 00:00.

Values are shown with the meter's multiplier applied, rounded to three decimals. When the multiplier was changed from a date (see Meters and groups), each interval takes the multiplier valid at its end: a change from 00:00 leaves the interval ending at 00:00 on the old multiplier, and the next one takes the new one. Next to the **Chart** heading the page shows the meter's interval length and, when it is not 1, the multiplier; when the multiplier changes inside the days shown, it names the old and the new multiplier and the time of the change instead.

The eight channels are A+, A-, R+, R-, Ri+, Rc+, Ri- and Rc-. For a meter, a channel without any value in the range is left out of the chart and the table.

For a meter, each channel also carries its name from the IEC 62056-6-1 standard (the DLMS Blue Book): in the **Energy** unit for example Active energy+ (QI+QIV) for A+, in the **Power** unit Active power+ (QI+QIV). The table heading shows the name above the code and unit, and the row under the chart shows the name before the code. The code (A+ and the others) stays what formulas and reports use; the files keep their own headings (described below). Formulas and custom reports show their own column names.

Missing intervals

In every step except **Detailed**, the **Intervals** column shows how many intervals of the step are stored and how many the meter's interval length allows, for example 3 of 4. A step with fewer intervals is highlighted, and the **Rows** heading counts these rows as **short**. A step without any stored interval is still a row, with no values.

When the step is shorter than the meter's interval (for example **15 min** on a meter that records every 30 minutes), a row in which no interval can end shows a dash in **Intervals** and is not counted as **short**.

For a meter that is read, operators and administrators see a note under the **Rows** heading that the values of a read meter are not changed by hand and its missing intervals are read, and, when the table has short rows, how many. The link **Read the missing intervals in Completeness** next to it opens the **Completeness** page with this meter and the days now in **From (meter calendar)** and **To**, and shows its table at once (for at most 93 days; see Completeness, below); the missing intervals are read from there.

The chart

The **Chart** draws one line for each channel shown. Under the chart, each channel has a check box that shows or hides its line and a colour box that changes its colour.

The chart always runs from the oldest time on the left to the newest on the right, whatever order the table uses.

Line sets the line width: **thin**, **normal** or **thick**. The colours and the width are kept in this browser.

When the step is shorter than the meter's interval, the chart also leaves out the rows in which no interval can end; the table keeps every row.

For a meter, if the range has no stored values in the chosen unit, the chart area says so.

The table

Rows lists the rows. **Meter time** is the end of the row in the meter's calendar; then come the channels with their units (for a meter under their IEC names, described above). **Source**

is **Manual** for values typed in or imported on this page (the values of a virtual meter) and **Read** for the other values, also for a load profile taken over from a ZR Software 7 database (see Import).

With **Newest first** ticked, which it is at the start, the newest row is at the top; untick it to list the oldest row first. The page keeps your choice in this browser.

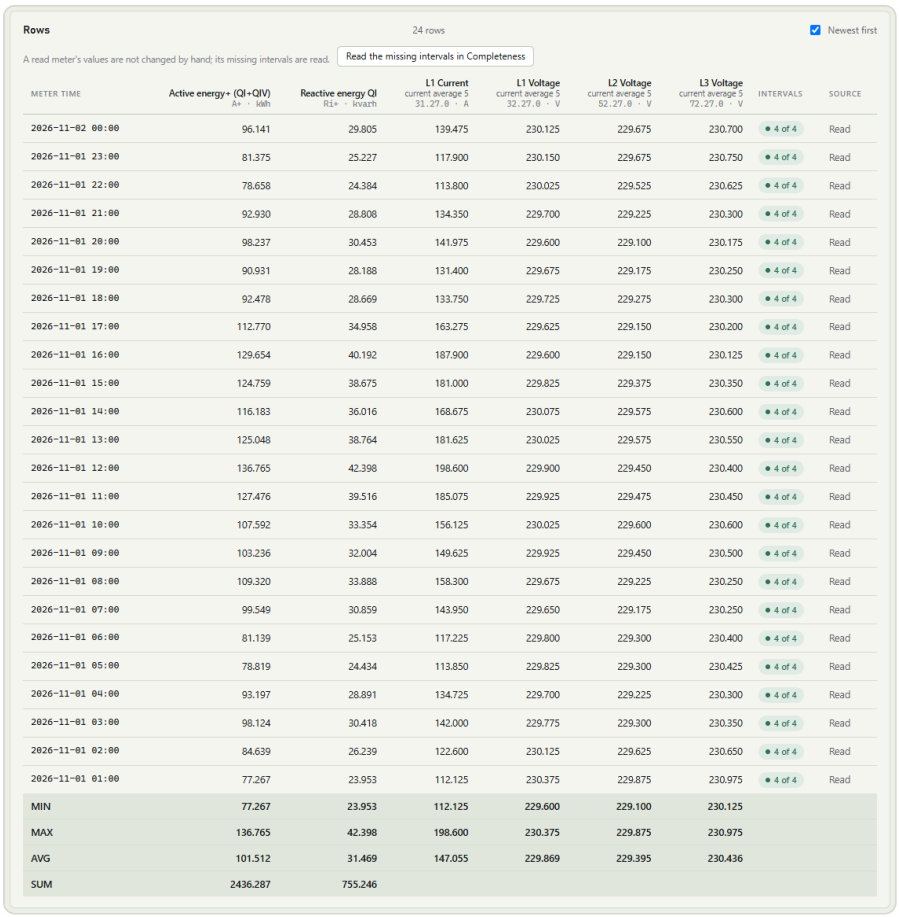
The last four rows are **MIN**, **MAX**, **AVG** and **SUM** of the rows that have a value.

Extra profile channels

Some meters store more channels in their load profile, such as voltages or currents. These extra channels appear in the table after the eight channels. When the IEC 62056-6-1 tables name the OBIS code, the heading shows that name and its details above the code and unit; otherwise it shows the OBIS code and unit. They are not drawn in the chart.

In a step, an extra channel shows the average of its values in the step, not their sum. No multiplier is applied to them. Their **SUM** cell stays empty.

An extra channel without any value in the range is left out.



Rows — 24 rows — Newest first

A read meter's values are not changed by hand; its missing intervals are read. Read the missing intervals in Completeness

METER TIME	Active energy+ (QI+QIV) A+ · kWh	Reactive energy QI R1+ · kvarh	L1 Current current average 5 31.27.0 · A	L1 Voltage current average 5 32.27.0 · V	L2 Voltage current average 5 52.27.0 · V	L3 Voltage current average 5 72.27.0 · V	INTERVALS	SOURCE
2026-11-02 00:00	96.141	29.805	139.475	230.125	229.675	230.700	4 of 4	Read
2026-11-01 23:00	81.375	25.227	117.900	230.150	229.675	230.750	4 of 4	Read
2026-11-01 22:00	78.658	24.384	113.800	230.025	229.525	230.625	4 of 4	Read
2026-11-01 21:00	92.930	28.808	134.350	229.700	229.225	230.300	4 of 4	Read
2026-11-01 20:00	98.237	30.453	141.975	229.600	229.100	230.175	4 of 4	Read
2026-11-01 19:00	90.931	28.188	131.400	229.675	229.175	230.250	4 of 4	Read
2026-11-01 18:00	92.478	28.669	133.750	229.725	229.275	230.300	4 of 4	Read
2026-11-01 17:00	112.770	34.958	163.275	229.625	229.150	230.200	4 of 4	Read
2026-11-01 16:00	129.654	40.192	187.900	229.600	229.150	230.125	4 of 4	Read
2026-11-01 15:00	124.759	38.675	181.000	229.825	229.375	230.350	4 of 4	Read
2026-11-01 14:00	116.183	36.016	168.675	230.075	229.575	230.600	4 of 4	Read
2026-11-01 13:00	125.048	38.764	181.625	230.025	229.575	230.550	4 of 4	Read
2026-11-01 12:00	136.765	42.398	198.600	229.900	229.450	230.400	4 of 4	Read
2026-11-01 11:00	127.476	39.516	185.075	229.925	229.475	230.450	4 of 4	Read
2026-11-01 10:00	107.592	33.354	156.125	230.025	229.600	230.600	4 of 4	Read
2026-11-01 09:00	103.236	32.004	149.625	229.925	229.450	230.500	4 of 4	Read
2026-11-01 08:00	109.320	33.888	158.300	229.675	229.225	230.250	4 of 4	Read
2026-11-01 07:00	99.549	30.859	143.950	229.650	229.175	230.250	4 of 4	Read
2026-11-01 06:00	81.139	25.153	117.225	229.800	229.300	230.400	4 of 4	Read
2026-11-01 05:00	78.819	24.434	113.850	229.825	229.300	230.425	4 of 4	Read
2026-11-01 04:00	93.197	28.891	134.725	229.700	229.225	230.300	4 of 4	Read
2026-11-01 03:00	98.124	30.418	142.000	229.775	229.300	230.350	4 of 4	Read
2026-11-01 02:00	84.639	26.239	122.600	230.125	229.625	230.650	4 of 4	Read
2026-11-01 01:00	77.267	23.953	112.125	230.375	229.875	230.975	4 of 4	Read
MIN	77.267	23.953	112.125	229.600	229.100	230.125		
MAX	136.765	42.398	198.600	230.375	229.875	230.975		
AVG	101.512	31.469	147.055	229.869	229.395	230.436		
SUM	2436.287	755.246						

Figure 8.2 The Rows table of a sample meter for one day, newest first, with extra channels after the energy columns and the summary rows at the bottom.

Tariff zone totals

In **Tariff** you can choose a tariff instead of **None**. Under the rows the page then shows **Tariff zones**: one row for each zone with the channels and the number of intervals in it.

The zone totals are made from the stored intervals, so they are the same in every step. Energy is added up and power is averaged. Zones with the same name (a zone used twice in a day) give one total.

Which zone an interval goes to is described in Tariffs.

Tariff zones · Three-rate (sample) · from the stored intervals, the same in every step

ZONE	A+ KWH	RI+ KVARH	INTERVALS
T1 day	3309.251	1025.862	88
T2 peak	972.765	301.560	40
T3 night	1384.747	429.277	64

Figure 8.3 Tariff zone totals of a sample meter for the sample tariff.

Saving and printing

The **Excel**, **PDF**, **CSV**, **PRN_A+_R+**, **Monthly table** and **Monthly table (PDF)** files are made by the service; the page hands each to the browser under the name the service gives and then shows that name. **Save chart as PNG** saves the chart as it is drawn. The order you choose with **Newest first** does not change the files. The **Excel**, **PDF**, **CSV** and **PRN_A+_R+** files, the picture's name and the printed sheet take the days now in **From (meter calendar)** and **To**, also when you changed them without selecting **Show**. The chart in the picture and on the sheet is always the one on the screen, so select **Show** first when you have changed the days. The monthly table takes its month from the result on the screen.

Button	What you get
Save chart as PNG	The chart as a picture, named Graph_ with the serial number (or the formula or report name) and the two days.
Print chart	A sheet headed with the meter's serial number and type (or the formula or report name), with the days, the step, the unit and the chart, sent to the browser's print dialog.
Excel	An Excel workbook (.xlsx) of the rows, with the zone totals when a tariff is chosen.
PDF	The table of the Excel file as PDF pages; described below.
CSV	A CSV file of the rows with the extra channels. Only for a meter.
PRN_A+_R+	A text file with A+ and R+ for each row. Only for a meter, in the **Energy** unit and a step other than **Detailed**.

Button	What you get
Monthly table	An Excel workbook (.xlsx) for the whole month: in the first layout one channel with a row for each hour and a column for each day, with day and month totals (only in the **Energy** unit); or, for a meter, the OSF form. Described below.
Monthly table (PDF)	The same monthly table, or the OSF form, as PDF pages.

When **PRN_A+_R+** is not available, its tip says why: "PRN_A+_R+ is written for a meter" or "PRN_A+_R+ is energy in 15 min, 30 min, hourly or daily steps".

During a REDZ support session (see Support), every file that REDZ support saves on this page leaves a row with the source REDZ support in **Jobs & events**, with the file name and the session number. When REDZ support saves the chart as a picture or prints a page, the program tells the service and Jobs & events gets a row. Files saved and pages printed by your own users leave no such row.

The Excel file of a meter

The file name has the form location_serial d_M_yyyy H_m_s.xlsx: the meter's location and serial number, then the day and time the file was made without leading zeros, such as 17_10_2026 9_5_30. The workbook has one sheet, named with the serial number.

Unit	Columns
Energy	Meter Date Time, Import Active, Export Active, IMP Reactive Energy, EXP Reactive Energy, Import Inductive, Import Capacitive, Export Inductive, Export Capacitive
Power	Meter Date Time, IMP Active Energy Avrg, EXP Active Energy Avrg, IMP Reactive Energy Avrg, EXP Reactive Energy Avrg, IMP Reactive Inductive Avrg, IMP Reactive Capacitive Avrg, EXP Reactive Inductive Avrg, EXP Reactive Capacitive Avrg

The extra channels follow, each headed with its IEC name and, in brackets, the OBIS code and the unit; a channel the IEC tables do not name is headed with the OBIS code and the unit in brackets. The rows go newest first; a step without any stored interval is left out. In the eight channels a missing value is written as 0, also for a channel the screen leaves out; an extra channel's missing value stays empty. Times have the format M/d/yyyy h:mm AM/PM and numbers three decimals.

With a tariff, an empty row, a row Tariff zone and one row for each zone follow the rows.

The CSV file

The file name has the form location_serial yyyy-MM-dd HH-mm-ss.csv. It is UTF-8 text with commas and a point for decimals. The first column is Meter time (yyyy-MM-dd HH:mm), then the eight channels with their units, such as A+ (kWh), then the extra

channels as OBIS code and unit; the CSV file carries no IEC names. Rows go oldest first, a missing value is an empty cell, and a step without any stored value is left out.

The CSV file has no zone totals.

The PRN_A+_R+ file

The file is named with the serial number and the date it was made, for example 90000001 2026-10-17.prn. It starts with header lines (the program, its version, the report type, the date and time it was made, the meter's location, serial number and type, the type as ZR Software 7 names it and None for a virtual meter, and the step as 15MIN, 30MIN, 1HOUR or 1DAY), then a line with one space and the line ----------DATA STARTS AFTER THIS LINE----------.

The next line is the serial number, 2 and the meter's interval length in minutes. Each row then has day, month, two-digit year, hour, minute, A+ and R+, separated by commas. A row ending at 00:00 is written as hour 24 of the day before. A missing A+ or R+ is written as 0, and a step without any stored interval is left out.

The monthly table

Monthly table and **Monthly table (PDF)** stand with the other file buttons. Once a result is shown, a list of layouts stands next to them: the first entry is the table of days and hours, and for a meter the others are the OSF form (**OSF form (English)**, **OSF form, simplified**, **OSF form, simplified (English)** and the Turkish form; see The OSF form, below). For a formula or report the list offers only the table of days and hours.

With the table of days and hours, the two buttons work only in the **Energy** unit, and a list of channels stands next to them. The list holds the channels the page shows, for a meter with the code and the IEC name: for a meter the channels with values, for a report its columns; a formula, or a report with one column, has only one value, so the list is not there. It starts on the first channel that has a value other than 0 in the result. When the page then shows other days or another source, the list keeps its channel as long as that channel is shown, also when all its values are 0; check the channel before you select **Monthly table**. The buttons save the chosen channel for the month of the **To** day of the result on the screen. When the result has no channel, the buttons are off; show days that have values first.

The service makes the table from the stored intervals of that whole month, whatever days and step the page shows. Each hour is the value of the **Hourly** step: the sum of its intervals, each with the multiplier valid at its end, or for a formula or report its value in that hour. An interval belongs to the hour in which it ends, so the interval that ends at 00:00 counts in the last hour of the day before.

The workbook has one sheet, named Monthly. Its first row names the source, the channel, the month and the unit; the second row is headed Hour and numbers the days of the

month. Then come 24 rows, 00:00-01:00 to 23:00-24:00, with one cell for each day, then the row Day total, an empty row and the row Month total. Numbers have three decimals. An hour without a value is an empty cell, not 0, and so is the total of a day without any value. The table carries no marks: an hour of which only some intervals are stored shows the sum of those, and the INCOMPLETE mark of a formula or report is not in the file.

The file name is Monthly_, then the meter's location and serial number (or the name of the formula or report), then _ and the month as yyyy-MM, for example Monthly_90000001_2026-10.xlsx for a meter without a location. Every character of the name that is not a letter, a digit, - or _ becomes _. **Monthly table (PDF)** gives the same table as PDF pages, under the same name with .pdf.

The OSF form

For a meter, the layout list also offers the OSF form for TEIAS, as ZR Software 7 made it: a normal and a simplified form, each with a Turkish and an English template. The Turkish normal form is the entry with TEIAS in its name; the other three are **OSF form, simplified**, **OSF form (English)** and **OSF form, simplified (English)**. With the OSF form the list of channels goes away and the buttons work in both units: the form always holds the energy of every hour of the month of the **To** day, export (A-) and import (A+). A virtual meter gets the form too; a formula or report does not.

The form has two rows for each hour of the day, export above import, and a column for each day 1 to 31; the hour, day and month totals are Excel formulas of the template. The header of the normal form names the meter: the Turkish form its serial number and the period as 01.M.yyyy (the month without a leading zero), the English form its location, serial number, multiplier and period. The multiplier in the English header is the one of the last interval of the month. An hour without a value, and the hours of a day the month does not have, stay empty; the totals are always written, so the total of such a day shows 0. Values have three decimals, totals three decimals with a thousands separator.

The file name is the meter's location without spaces, the year, the month, OSFFormu and _TR or _ENG, joined by _, with .xlsx. **Monthly table (PDF)** gives the same cells as PDF pages, without the template's empty spacer rows and merged areas; the table's title and the row of days repeat on every page.

The PDF files

PDF and **Monthly table (PDF)** draw the sheet of the Excel file of the same button (the OSF form in the arranged view described above), so a PDF holds the same cells: text as written and numbers as in the Excel file; times are written as yyyy-MM-dd HH:mm. The pages are A4, turned sideways when the columns do not fit upright; the heading rows repeat on every page. When the columns still do not fit, the writing gets smaller, and below a smallest size the columns go on to further pages side by side, each part repeating the first column (for the OSF form, the hour and direction columns). The top of each page names the program and the sheet's title (the meter's location and serial number, or the formula or

report, with the days or the month); the foot carries REDZ's logo, web address and e-mail and the page number.

A PDF holds at most 20000 rows. For a longer table the service refuses with a message that asks for a coarser step or a shorter range, or for the Excel file.

Values of a virtual meter

A virtual meter is not read; its values are typed in or imported here (adding a meter is described in Meters and groups). Operators and administrators can do this. Values are typed in the **Detailed** step; in another step the page says "Choose the Detailed step to type a value in."

1. Choose the virtual meter, the days and the **Detailed** step. With **Energy** you type energy values, with **Power** average-power values.
2. Select **Edit** on a row. The row gets a box for each of the eight channels, also for a channel that has no value yet.
3. Type the values as the page shows them (with the multiplier valid at the interval's end). An empty box means no value.
4. Select **Save**, or **Cancel** to leave the row as it was.

To add an interval that is not in the table, enter its end in **Add a missing interval (meter calendar, interval end)** and select **Add**. The time must be on the meter's interval boundary, for example 10:15 for a 15-minute meter. Typing in and importing use the same interval length.

If a value changed after the page showed it, nothing is saved and the page names the channel and tells you its current value as the table shows it; show the range again and repeat.

When a save leaves an interval without any value (no energy and no power value), the interval is removed and the page says so.

Import values (Excel / CSV) reads an .xlsx, .xls or .csv file. The first column is the time of the interval end, for example 2026-10-16 10:15. The other columns are headed A+, A-, R+, R-, Ri+, Rc+, Ri- or Rc- for energy values, or Avg A+ to Avg Rc- for average-power values, and hold the values as the page shows them (with the multiplier valid at each interval's end). Each channel column may appear only once. An empty cell leaves that value as it is. Each time must be on the meter's interval boundary and appear only once.

If any row has a problem, nothing is imported and the page gives the number of problems and lists the first ten. A file without a row of values under its header row, also one with only empty rows there, is refused with a message that the file needs a header row and at least one row of values. Otherwise the values are imported, the table is shown again with them, and the page reports how many intervals were imported, how many are new and how many changed.

WARNING

Remove the values of these days removes every value, energy and power, of the virtual meter in the days of the result now on the screen: their intervals are removed as a whole. This takes back an import into days that had no values before. An import into days that already had values wrote over them; removing these days does not bring the old values back but removes them too, so type or import the old values from **Corrections** instead. If you have changed **From (meter calendar)** or **To** without selecting **Show**, the days on the screen count, not the boxes. At most 31 days are removed at once; the service refuses a longer range. The button asks first in its place: the toolbar shows the question, which names the number of days and the two days and, in the **Detailed** step, the number of intervals on the screen, with a **Remove** button; **Keep** leaves everything as it was. Check the days before you select **Remove**. Then the page says how many intervals of how many days were removed.

WARNING

Saving, importing and removing change the stored values; there is no undo button. An import writes over the values that are already there. In the **Detailed** step, **Corrections** lists each value that a save, an import or a removal changed, with **Interval**, **Value**, **Was**, **Now**, **By** and **When**; a value that was not there shows as empty. Values are listed with three decimals. It shows at most the 1000 newest changes of the days in **From (meter calendar)** and **To**; choose fewer days to see older ones. One day can hold more than 1000 changes, for example when a day of a meter with 15-minute intervals and values in all eight energy and all eight power channels is removed (1536 changes); the older changes of such a day are not listed. To go back, type or import the old values from this list. A power value is listed with Power before the channel, such as Power A+, and is imported in a column such as Avg A+. **Corrections** is offered only when a meter is the source, not for a formula or a custom report.

NOTE

Typing in, importing and removing values need the licence feature **Manual edit** (see License). Without it the page does not offer these tools for a virtual meter, and while meters are read, operators and administrators see the note "The licence does not include Manual edit, so this virtual meter's values are not typed in or imported here."

The values of a meter that is read cannot be changed by hand; read its missing intervals on **Completeness** instead (below). A meter that already has read values cannot be changed into a virtual meter either; add a virtual meter instead.

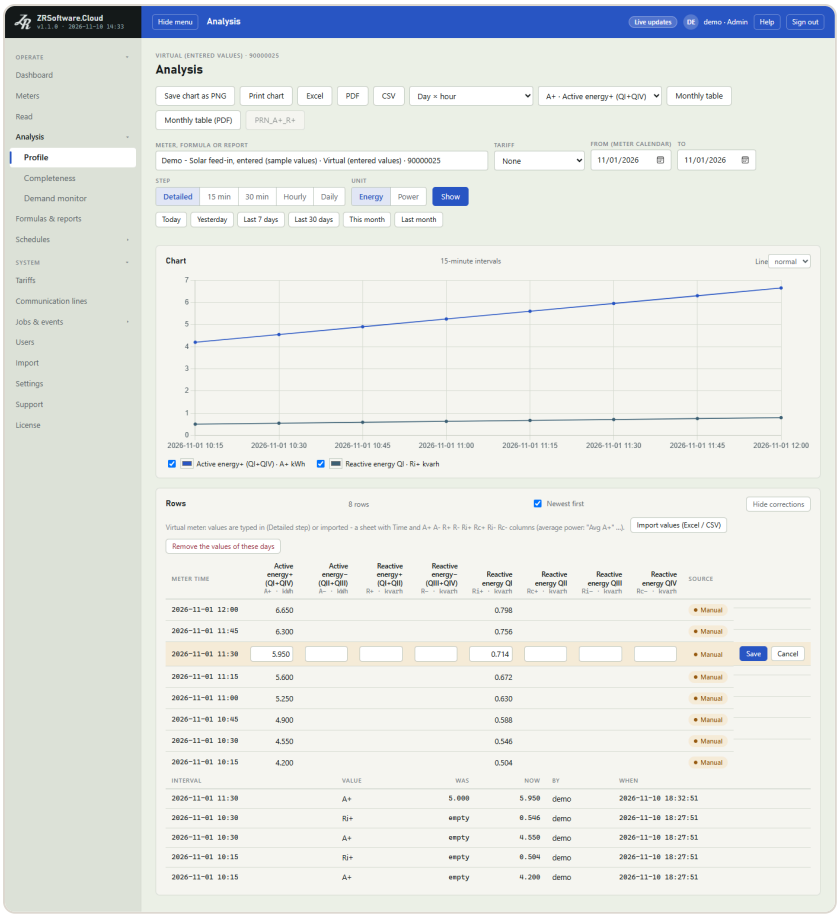


Figure 8.4 A sample virtual meter on the Analysis page in the Detailed step: its own buttons, one row being edited and the corrections below.

Completeness

Completeness in the Analysis section of the menu shows, for each chosen meter and each day, how much of its load profile is stored. The page notes: "The share of each day's intervals stored for each meter, as Analysis counts them (an interval stored on its boundary counts, whatever its channels). The incomplete read meters are ticked; their missing intervals are read as jobs."

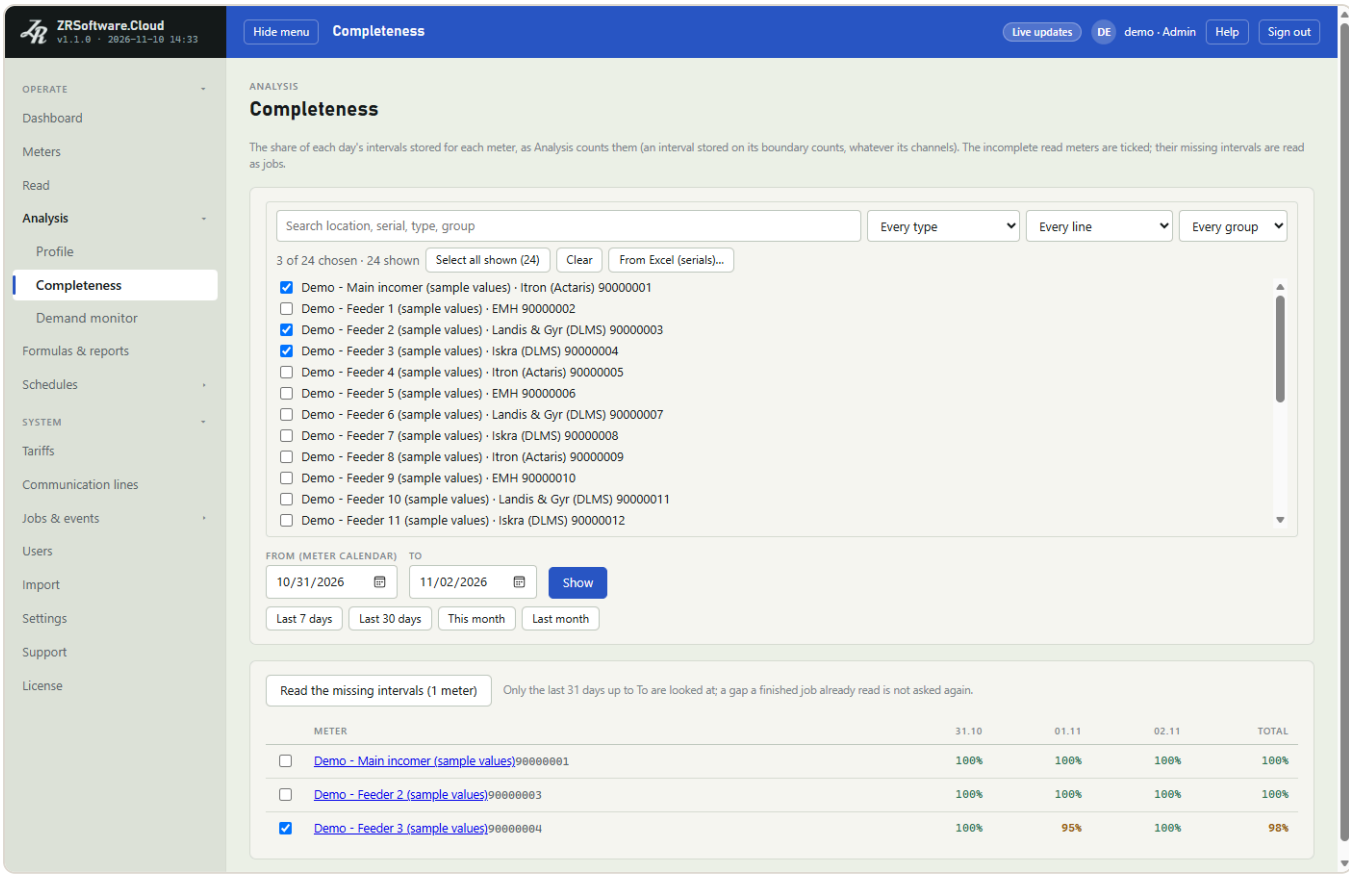


Figure 8.5 Analysis > Completeness for three sample meters over three days: each day's share of stored intervals, one meter short on one day and ticked for reading.

Choose the meters in the list at the top: type in the search box or narrow the list with the type, line and group lists, tick meters, or use the button that selects all meters shown, **Clear** and **From Excel (serials)** (pasting serial numbers is described in Meters and groups). Only active meters are listed. Then set **From (meter calendar)** and **To** and select **Show**. When the page opens from the menu, the days are the seven days before today, taken from the clock of this PC. The buttons **Last 7 days**, **Last 30 days**, **This month** and **Last month** fill in the days as on the **Analysis** page (all but the last include today) and show the table at once. The table covers at most 93 days and 500 meters.

The table has a row for each meter and a column for each day, then **Total**. A cell shows the share of the day's intervals that are stored, as the **Daily** step of the **Analysis** page counts them, rounded down: 100% only for a complete day. A dash means that no interval is expected. The colour tells a complete, a partly stored and an empty day apart, and the tip of a cell gives the number of stored and expected intervals. The meter's name opens the **Analysis** page with that meter, the days of the table and the **Detailed** step.

Operators and administrators see a box before each read meter; a virtual meter has none. After **Show**, the read meters with missing intervals are ticked. The button Read the missing intervals, which counts the ticked meters, asks the service to read the missing intervals of the ticked meters, at most 200 at once, in the days of the table on the screen. Next to the

button the page notes: "Only the last 31 days up to To are looked at; a gap a finished job already read is not asked again."

For each meter the service puts profile reads on its line. Missing intervals that lie more than six hours apart are read in separate reads, so the stored intervals between them are not read again. An interval is not asked again when a finished read of its time had started after the interval ended, with one exception: the interval that ends a day at 00:00 is asked again when the interval before it is stored. The service looks back at most 31 days from the end of the range (from now, when the range reaches today); when the range reaches today, it counts whole days back from now, so it also looks at the last hours of the day before **From (meter calendar)**: with 10 May to 12 May at 15:00 on 12 May, it looks from 15:00 on 9 May.

The page then says how many jobs were queued for how many of the meters and how many meters were left out, with a link to **Jobs & events**, and the table gets a column **Read** with each meter's answer: the times that will be read (and the number of jobs when there are several), "no interval is missing in these days", or why the meter was not read - archived, virtual, beyond the licence's meter limit, its line turned off, a meter type whose load profile the service does not read, or a profile read of the meter that is still waiting or running. You follow the reads on the **Jobs & events** page (see Jobs & events).

> **NOTE**
> While the licence does not allow reading meters, the table still shows, but reading the missing intervals is refused with the message of the licence state (see License).

Demand monitor

Demand monitor in the Analysis section of the menu watches the present power of chosen meters and projects the energy of each hour at its end, against a target for the hour. The service reads the meters; the page shows the result. The page notes: "Each watched meter's present power is read in short rounds on its line; the hour so far and where it ends are compared with the hour's target. A projection over the target warns once an hour: a row in the event log, and a mail when the watch names addresses. A read on the same line comes first; the monitor waits for it."

Every role sees the table; only operators and administrators see the form and the buttons of each row. A user who sees only the meters of some groups sees a watch only when its meter, and the virtual meter or formula of its target, are in those groups (see Users).

The card **This hour** counts the watched meters and shows the service's time; the page asks again every two seconds. Hours are counted by the clock of the PC the service runs on. When nothing is watched, the card says "No meter is watched yet." The table has a row for each watch:

Column	Shows
Meter	The meter's location (or type) and serial number.
Source	What the present power is read from: the meter's power register, or, when it has none, the power computed from voltage, current and power factor. The first round finds it and the watch keeps it.
Read every	The time between two rounds on the line: the time a round takes, at least 5 seconds. While the line does not run, its state instead, for example paused for a scheduled read.
Last read	The time of the last reading.
Now (kW)	The last present power read, with the meter's multiplier.
So far (kWh)	The energy of the hour up to the last reading: each reading's power is held until the next one. When the monitor began after the hour had started (for example after the service was started again), the first reading is counted back to the start of the hour; the value is then marked as an estimate and its tip says so.
Projected (kWh)	So far plus the last power for the rest of the hour, with the end of the hour after it.
Target	The target of the hour: a fixed kWh, or the virtual meter or formula with its value for the same hour.
State	on track, over by the kWh above the target (with warned once the warning of the hour went out), off, error (no reading in this hour yet; the reason under it), no target for this hour, waiting for the first reading, meter archived or no line. The reason of a failed round also shows under any other state.

The present power is multiplied by the meter's multiplier of today. When the virtual meter or the formula has no value for the hour, the state is no target for this hour and no warning goes out.

When the projection of an hour goes over the target, the watch warns once in that hour: Jobs & events gets a warning row with the source Demand monitor that names the meter, the projected kWh, the hour, the target and the difference (see Jobs & events). When the watch names mail addresses, the same text goes by e-mail to those addresses only, through the mail server of the **Mail** card in Settings; an administrator can set that card only while the licence includes exports (see Settings). When no mail server is set, or a mail cannot be sent, another warning row says why.

1. In **Watch a meter**, choose the meter. The list offers active meters on a line of the types whose present power the service reads (Landis & Gyr DLMS, Itron, Iskra DLMS and Cewe) that are not watched yet.

2. In **Target of the hour** choose **A fixed kWh** and type **kWh in the hour**, or choose **A virtual meter's same hour (a plan)** and the **Virtual meter**, or **A formula's same hour** and the **Formula**.
3. Optionally type addresses in **Warning mail to (optional, ; between)**, with ; between them.
4. Select **Watch**. The page says "Watched: the first round starts within seconds."

A meter can be watched only once ("this meter is watched already"), and at most 100 meters are watched; every watch counts, also those a limited user does not see. The virtual meter of a target must be a virtual meter, whose hours are typed in or imported.

Edit on a row loads the watch into the form, which is then headed with the meter's name; the meter itself does not change (remove the watch and watch the other meter). **Save** keeps the change and **Cancel** leaves it. **Turn off** stops the readings of a watch and **Turn on** starts them again. **Remove** asks first in its place; the second **Remove** removes the watch, and **Keep** leaves it. Adding and removing a watch each write a row with the source Demand monitor to Jobs & events.

Reads on the same line come first: when a job's turn comes on the line, the monitor finishes the reading in progress, closes its connection to the meter and gives the line up, and it cuts the connection when this takes more than 5 seconds. It starts again when no job waits or runs on the line. With only one watched meter on a line, the connection stays open between rounds. Itron, Iskra DLMS and Cewe meters are read with the meter password stored in the meter's form; without one the state is error with "no password is stored for this meter; nothing was sent". On a line that is turned off the watch is not read.

9 Tariffs

A tariff divides the day into time-of-use zones, such as day, peak and night. On the **Analysis** page a tariff adds the totals of each zone to the load profile. The **Tariffs** page lists the tariffs and lets an administrator add, change and delete them.

> **NOTE**
> The **Tariffs** page is in the System group of the menu when the licence includes the feature **Analysis and tariffs** (the **License** page names it under **Features**, or shows **All features**; see License). Every role can see the tariffs and the holiday list; only administrators see **Add tariff**, **Edit** and **Delete**, and the buttons that change the holiday list.

The tariff list

Each tariff is a card with its name and either **Every day** or **Weekdays, Saturday, Sunday** (with a holidays set: **Weekdays, Saturday, Sunday, holidays**). Its table lists the zones with **Zone**, **From**, **To** and the length of the zone; a zone that runs past midnight is marked as crossing midnight. A tariff with day types also has the **Days** column, where the zones of a holidays set show as **Holidays**.

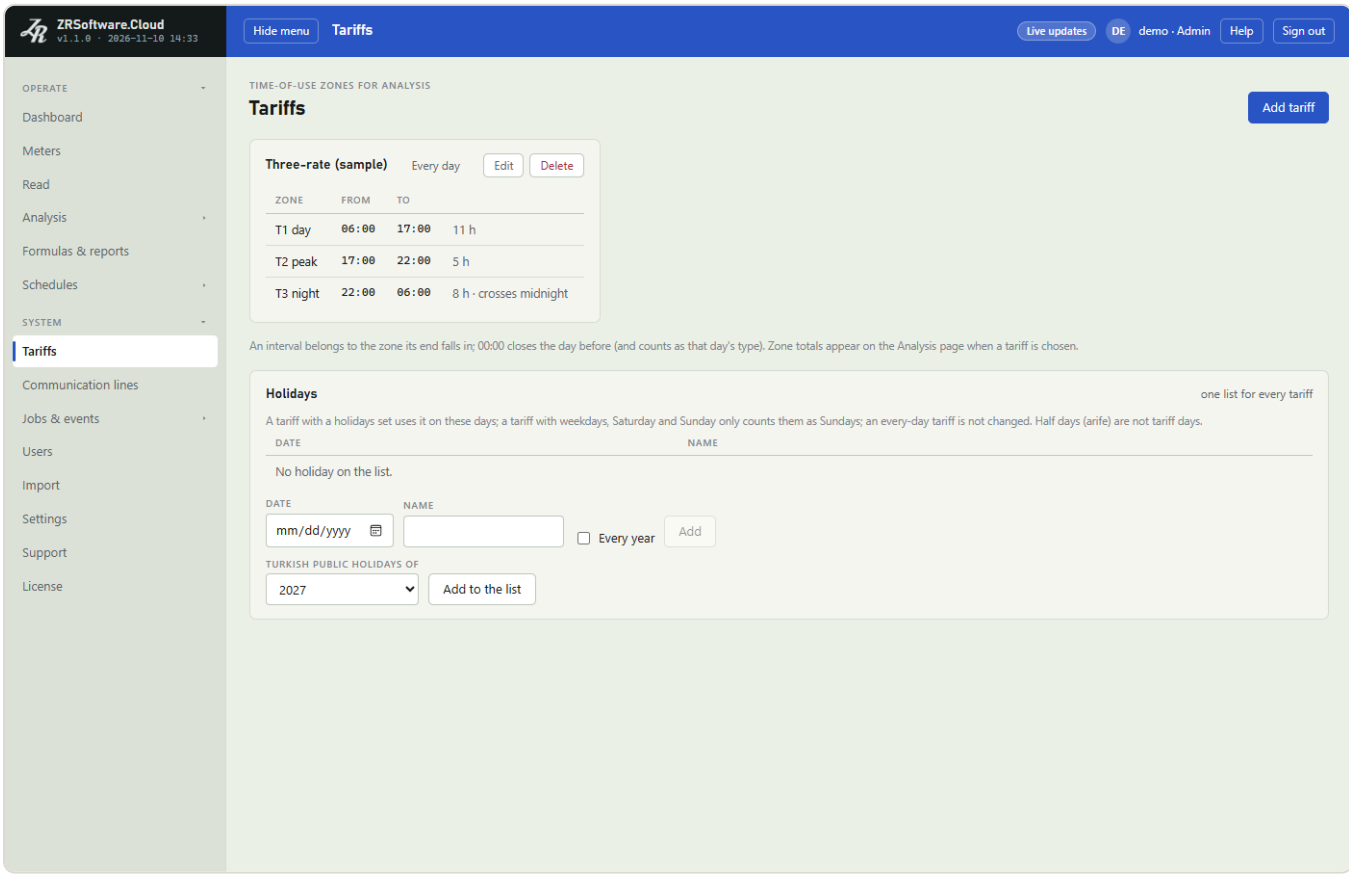


Figure 9.1 The Tariffs page with the sample tariff and its zones, the zone that crosses midnight marked, and the empty Holidays card.

Zones and day types

Zones apply to chooses between one set of zones for **Every day** and one set each for **Weekdays**, **Saturday** and **Sunday**. A tariff with these day types can also have a fourth set for holidays. Each set must cover the whole day: every minute belongs to exactly one zone.

In a tariff with day types, the day type comes from the day of the week, except for a day on the **Holidays** list (below): that day uses the tariff's holidays set, or the **Sunday** zones when the tariff has no holidays set. A tariff whose zones apply to every day is not changed by the list.

> **NOTE**
> "Times as HH:mm; 24:00 is the end of the day. A zone whose end is before its start crosses midnight (22:00 to 06:00)."

An end of 00:00 is stored as 24:00 and shown that way after saving.

Which zone an interval belongs to

> **NOTE**
> "An interval belongs to the zone its end falls in; 00:00 closes the day before (and counts as that day's type). Zone totals appear on the Analysis page when a tariff is chosen."

A zone from 06:00 to 17:00 takes the intervals that end after 06:00 and at or before 17:00. With 15-minute intervals, the interval 16:45 to 17:00 is in this zone and the interval 17:00 to 17:15 is in the next one.

The interval that ends at 00:00 belongs to the day before and to that day's type: the interval ending at 00:00 on a Monday is counted in Sunday's zones, and the one ending at 00:00 after a holiday counts as part of the holiday.

A zone that crosses midnight, such as 22:00 to 06:00, takes the intervals of both ends of the same day: those ending after 22:00 and those ending at or before 06:00.

Holidays

The **Holidays** card under the tariffs holds one list of holidays for every tariff. The card notes:

> **NOTE**
> "A tariff with a holidays set uses it on these days; a tariff with weekdays, Saturday and Sunday only counts them as Sundays; an every-day tariff is not changed. Half days (arife) are not tariff days."

The table lists each holiday with its **Date** and **Name**; a holiday that comes back on the same day every year shows as every year with the day and month. The list changes the zone totals of every tariff with day types: on the **Analysis** page, for formulas and custom reports, and in automatic exports, from the next time they are shown or run.

1. Choose the **Date** and type the **Name** (at most 60 characters).
2. Tick **Every year** for a holiday on the same day every year; leave it empty for a single date.
3. Select **Add**.

A day that is already on the list is refused with "this day is already on the list". **Remove** on a row takes the holiday off the list at once, without asking first.

To add Turkey's public holidays, choose the year in **Turkish public holidays of** (this year or the next one, taken from the clock of this PC; the next year at the start) and select **Add to the list**. The fixed public holidays are added as every-year holidays and the days of the two religious feasts of that year as single dates; half days are not added. Days already on the list are skipped, and the page says how many holidays were added and how many were already there. The feast dates are known only for the years 2026 and 2027; for another year the service refuses and asks you to add the days by hand.

Adding or changing a tariff

1. Select **Add tariff**, or **Edit** on a tariff's card. A new tariff starts with three zones: T1 06:00 to 17:00, T2 17:00 to 22:00 and T3 22:00 to 06:00.
2. Type the **Name** (at most 60 characters; two tariffs cannot have the same name, and capital and small letters A to Z count as the same).
3. Choose **Zones apply to**.
4. For each zone type its name (at most 40 characters) and its start and end. **Add zone** adds a zone and **Remove** removes one.
5. Select **Save**.

Cancel closes the form without saving. When you have changed something, Esc, a click outside the form or a menu link does not close it: the form shows "Unsaved changes." with **Save**, **Discard** and **Keep editing**. When you have changed nothing, Esc and a click outside the form close it.

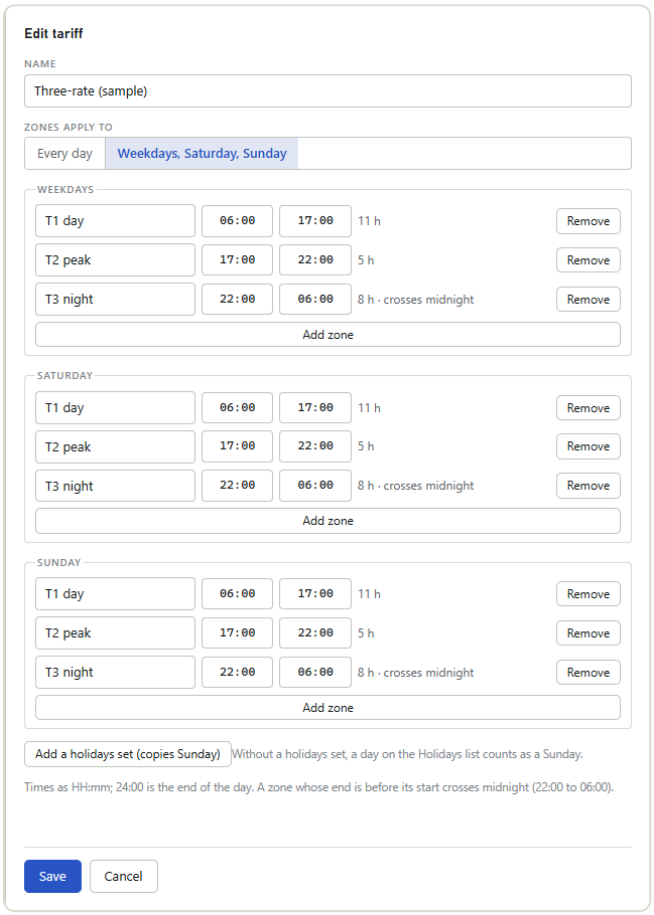
A zone added with **Add zone** starts where the last zone of the set ends and ends where that zone starts. Change the times so that the zones do not overlap.

When you switch to **Weekdays, Saturday, Sunday**, the every-day zones are copied into each of the three sets. When you switch back to **Every day**, the weekday zones are kept for every day and the form says: "The weekday zones now apply to every day; the Saturday and Sunday zones go when you save (Cancel keeps them)." A holidays set goes in the same way, although the note does not name it.

In a tariff with day types, **Add a holidays set (copies Sunday)** adds a fourth set, **Holidays**, with a copy of the Sunday zones; change its zones as for the other sets. **Remove the holidays set** takes it away. Next to the button the form notes: "Without a holidays set, a day on the Holidays list counts as a Sunday."

The service checks the tariff when you save it and shows the first problem in the form, for example when two zones overlap or when a time of the day has no zone. A zone whose start and end are the same time, such as 06:00 to 06:00 or 00:00 to 00:00, covers the whole day. A tariff has at most 48 zones in all its sets together, the holidays set included; each set needs at least one.

A change to a tariff, or to the holiday list, changes the zone totals of every analysis and automatic export that uses the tariff, from the next time they are shown or run. Files saved before keep the totals they had.



`Figure 9.2` The Edit tariff form of the sample tariff, switched to zones for Weekdays, Saturday and Sunday (not saved yet).

Deleting a tariff

Delete asks first in its place: the card's heading shows the question with a second **Delete** button, and **Keep** leaves everything as it was. The second **Delete** deletes the tariff. A tariff that an automatic export uses cannot be deleted; the page says how many exports use it and names up to three of them by number and target (see Export schedules).

> **WARNING**
> A deleted tariff cannot be restored. To use it again, add it again with the same zones.

A tariff in the analysis

On the **Analysis** page, choose the tariff in **Tariff**. The **Tariff zones** table then shows, for each zone, the channels and the number of intervals in it. The totals come from the stored intervals and are the same in every step; energy is added up and power is averaged. Zones with the same name give one total, so a zone such as T1 can appear twice in a day (morning and evening). See Analysis.

A tariff works the same way for a formula and a custom report. There, a value that is empty in an interval (because a meter has no value in it) adds nothing to the zone totals, but the interval is still counted in **Intervals**.

The **Excel** file of the analysis then ends with the zone totals. The CSV and PRN_A+_R+ files have no zone totals.

An automatic export can also add a tariff's zone totals; see Export schedules.

10 Formulas & reports

A formula calculates a new load profile from the channels of several meters, for example a main meter minus its sub-meters. A custom report puts meter channels and formulas side by side in one table. Both are made on the **Formulas & reports** page and shown on the **Analysis** page like a meter.

> **NOTE**
> The page is in the menu when the licence includes the feature **Formulas** or **Custom reports** (the **License** page names them under **Features**, or shows **All features**; see License); each of the two needs its own feature. Every role can see the formulas and reports. A user who sees only the meters of some groups does not see a formula or report that reads a meter outside those groups (see Users). The **Analysis** button of a formula or report is there only when the licence also includes the feature **Analysis and tariffs**. Only administrators see **Add formula**, **Add report**, **Edit** and **Delete**.

The analysis of a formula or report on the **Analysis** page, and its files there (**Excel**, **PDF** and the monthly table), also need the feature **Analysis and tariffs**. An export of a formula runs only while the licence includes **Formulas**, and one of a report only while it includes **Custom reports**, also with **Run now**; otherwise the run is skipped with "the licence does not include formulas" or "the licence does not include reports" (see Export schedules).

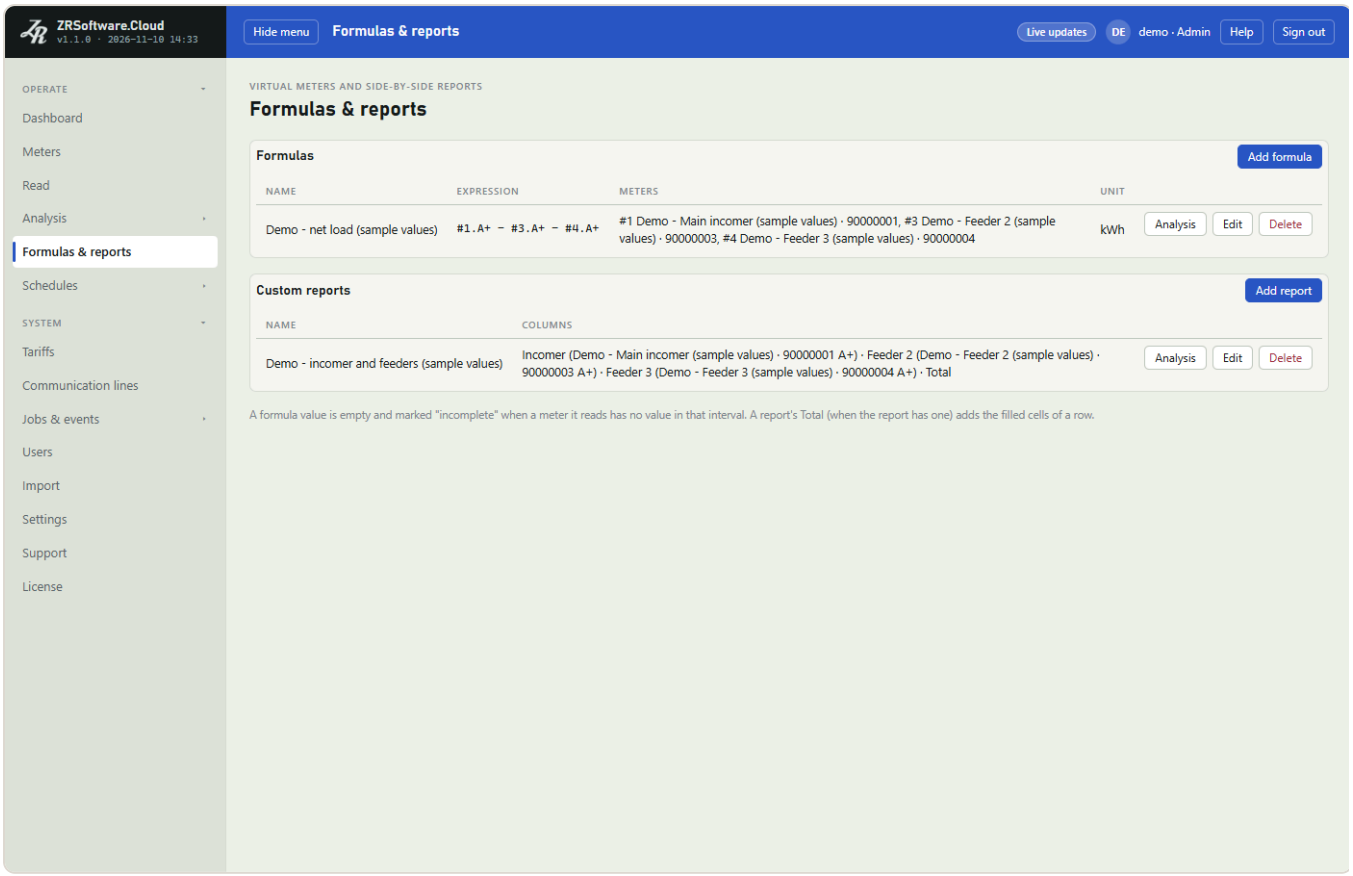
When the licence includes only one of the two, the page still opens: the list of the other kind stays empty, and the service refuses to save one of that kind with a message that the licence does not include it.

The formula list

Formulas lists each formula with **Name**, **Expression**, the **Meters** it reads and its **Unit**. **Analysis** opens the formula on the **Analysis** page.

The unit is kWh when every channel in the formula is active (A+ or A-) and kvarh when every one is reactive. A formula that mixes active and reactive channels has no unit.

When there are more than five formulas and reports together, a **Find a formula or report** box stands above the lists. It keeps the formulas whose name or expression, and the reports whose name or column titles, hold every word you type, in small or capital letters. When nothing matches, the list says so.



`Figure 10.1` The Formulas and reports page with a sample formula and a sample custom report.

Writing a formula

A formula is an expression of meter channels, numbers and the operators + - * /, with parentheses. The form shows this note:

> **NOTE**
> "#meter.channel reads a meter's channel (A+ A- R+ R- Ri+ Rc+ Ri- Rc-); numbers use a point (0.98). A formula cannot use another formula."

The meter number is the number after # that the **Meter** box of the form shows with each meter. For example #1.A+ is the A+ channel of meter 1; the empty **Expression** box shows the example #1.A+ - #2.A+ - #3.A+. Channel names can be typed in small or capital letters.

Multiplication and division are done before addition and subtraction; use parentheses to change the order. A minus sign can also stand before a value. Example: #1.A+ - (#2.A+ + #3.A+) * 0.98.

A formula is at most 1000 characters long and reads at most 50 different meter channels (each #meter.channel counts once).

The formula is saved in a tidy form, with one space around each operator and only the parentheses it needs, so the saved text can look slightly different from what you typed.

Adding or changing a formula

1. Select **Add formula**, or **Edit** on a formula.
2. Type the **Name** (at most 60 characters; two formulas cannot have the same name, and capital and small letters A to Z count as the same).
3. Type the **Expression**. To put a channel in at the cursor, choose the meter in **Meter** and the channel in **Channel** under the expression, then select **Insert**. The buttons + - * / ( ) put in an operator.
4. Check the table under the expression: it shows each **Reference** and the **Meter** it names.
5. Select **Save**.

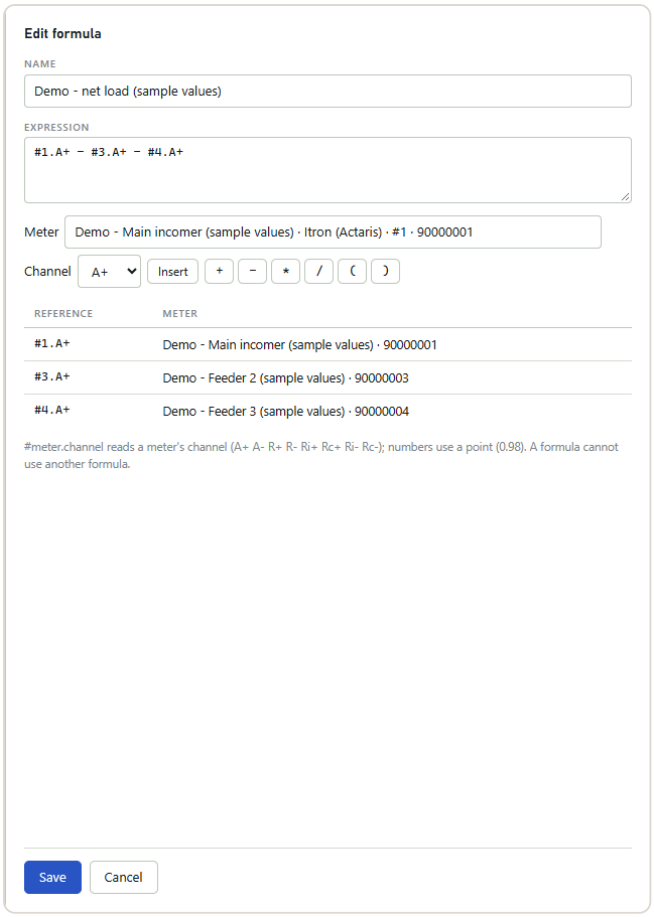
Type in the **Meter** box to find the meter: every word you type must be in the meter's location, serial number or type, or be its number, which you type without the # (for meter 5, type 5; a word shorter than three characters must start one of them). The list shows at most 50 meters; type more to narrow it. Arrow keys move in the list, Enter takes the meter, and Esc closes the list without a change.

Cancel closes the form without saving. When you have changed something, Esc, a click outside the form or a menu link does not close it: the form shows "Unsaved changes." with **Save**, **Discard** and **Keep editing**. When you have changed nothing, Esc and a click outside the form close it. The same holds for the report form.

The service checks the formula when you save it. If the expression cannot be read, the form shows the position of the first problem and what was expected there. A meter number that names no meter is refused. The number of an archived meter is accepted.

Only active meters are offered in the **Meter** box under the expression.

> **NOTE**
> A change to a formula also changes every custom report and every automatic export that uses it, from the next time they are shown or run.



`Figure 10.2` The Edit formula form of the sample formula, with the meter and channel lists, Insert and the operator buttons.

How a formula is calculated

For each row of the chosen step and unit, the formula uses the value of each meter in the same row, with each meter's own multiplier; when a meter's multiplier was changed from a date, each interval takes the multiplier valid at its end (see Meters and groups). The result is rounded to three decimals.

When a meter the formula reads has no value in a row, the formula's value is empty and marked INCOMPLETE; it is not counted as 0. A division by zero leaves the value empty and marked DIVISION BY ZERO. A row in which none of the meters has a stored interval stays empty without a mark.

On the **Analysis** page, the **Rows** heading counts the rows with a marked value as incomplete (and, as for a meter, the rows with fewer intervals as **short**), and the page shows this note:

> **NOTE**
> "A value is empty and marked when a meter it reads has no value in that row; it is not counted as 0."

Custom reports

Custom reports lists each report with its **Name** and its **Columns**: each column's title and what it shows. **Analysis** opens the report on the **Analysis** page.

1. Select **Add report**, or **Edit** on a report.
2. Type the **Name** (at most 60 characters; two reports cannot have the same name, and capital and small letters A to Z count as the same).
3. For each column type its **Title** and choose its source in **Meter or formula**: a meter and one of its channels in **Channel**, or a formula. **Add column** adds a column, **Up** and **Down** move a column one place (Up is off on the first column, Down on the last) and **Remove** removes it.
4. Tick **Add a total column (the sum of the row) after the last one** if the report should have a total.
5. Select **Save**, or **Cancel** to close without saving.

The source of a column is found by typing in its box, as in the **Meter** box of a formula: a meter by its location, serial number or type, a formula by its name (the word formula finds every formula). The list has the group **Meters** and, when there is a formula, the group **Formulas**; a meter is listed with its location and type (or only its type) and its serial number.

As the form notes, a report without the total column has the same columns on the screen and in the files as in ZR Software 7.

A report has 1 to 20 columns. A title is at most 40 characters and can be used only once in a report, whatever the letter case.

The title Total, in any letter case, is kept for the total column; the service refuses a column with this title.

The total column adds up the filled cells of the row. When a cell of the row is empty, the total is marked INCOMPLETE. The total has a unit only when all columns have the same unit.

A meter column is empty and marked INCOMPLETE in a row where the meter has no value. A row in which none of the meters has a stored interval stays empty without a mark, also in the total column.

Only active meters can be chosen as a new source. A column that already reads an archived meter keeps it: the list shows that meter with (archived) after its serial number.

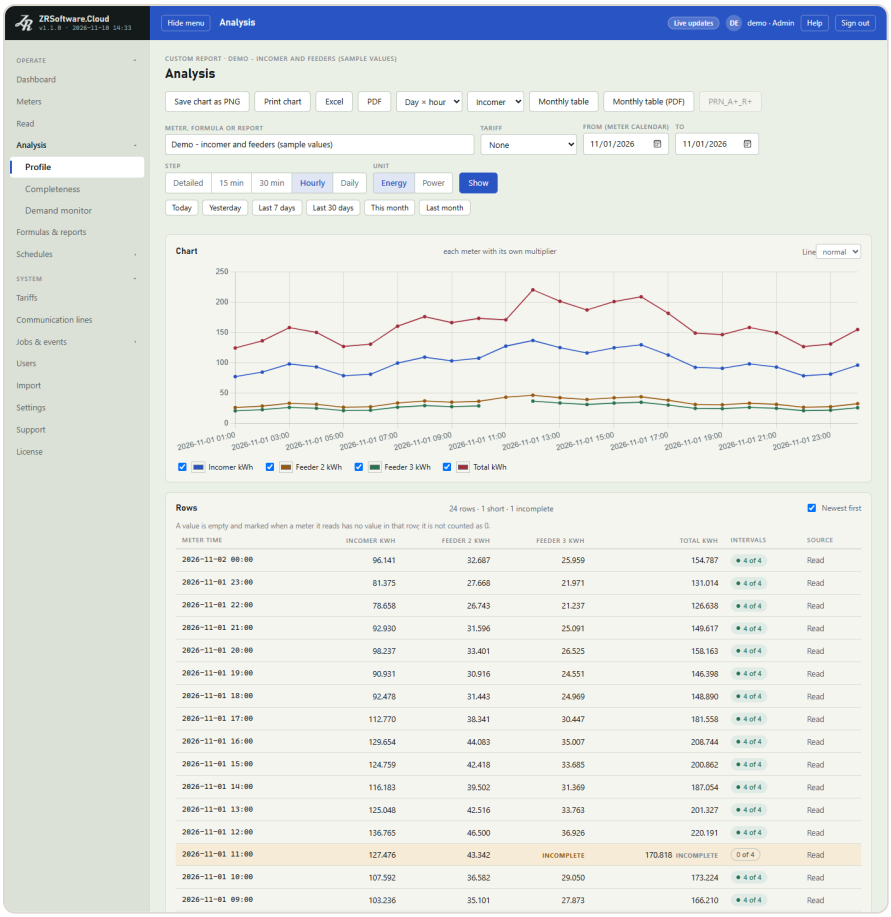


Figure 10.3 A sample custom report on the Analysis page: in a row where a meter has no value, its cell is empty and marked incomplete.

Formulas and reports in the analysis

On the **Analysis** page, choose the formula or report in **Meter, formula or report**. Days, ready ranges, step, unit, tariff and **Newest first** work as for a meter (see Analysis).

All columns are shown, also those without values. A formula or report has no extra profile channels, no values to type in and no CSV or PRN_A+_R+ file; **Excel**, **PDF**, **Monthly table**, **Monthly table (PDF)**, **Save chart as PNG** and **Print chart** work. The monthly table holds the formula's value or one column of the report, which you choose in the list of channels; a formula, or a report with one column, has only one value, so the list is not there. The layout list next to the monthly table offers only the table of days and hours for a formula or report: the OSF form is made only for a meter (see Analysis).

With a tariff, a value that is empty in an interval (because a meter has no value in it) adds nothing to the zone totals, but the interval is still counted in **Intervals**.

The Excel file of a formula or report

The file name has the form name d_M_yyyy H_m_s.xlsx: the formula or report name, then the day and time the file was made without leading zeros. A / or \ in the name becomes _. The sheet is named Formula or Report.

PDF gives the same table as PDF pages, under the same name with .pdf (see Analysis).

The first column is Meter Date Time; then, for a formula, one column headed with its name; for a report, each column under its title. In these headings each space becomes _ and there is no unit. The rows go newest first. A row in which every value is empty is left out when one of the meters has no stored interval in it, so a formula row marked INCOMPLETE on the screen can be missing from the file; an empty value in a row that is written is an empty cell. With the total column, Total is the last column.

With a tariff, the zone totals follow the rows, as in the file of a meter.

Formulas and reports can also be the source of an automatic export; see Export schedules.

Deleting a formula or report

Delete asks first in its place: the row shows the question with a second **Delete** button, and **Keep** leaves everything as it was. The second **Delete** deletes the formula or report. A formula that a report uses cannot be deleted: its **Delete** button is off with the tip **Used by a report**. A formula or report that is the source of an automatic export cannot be deleted either; the page says how many exports use it and names up to three of them by number and target.

> **WARNING**
> A deleted formula or report cannot be restored. The meters and their profiles are not changed.

11 Automatic reading

A schedule reads a list of meters by itself at the times you set: the load profile, the registers, or only what is missing from the stored profile. In the menu, under **Operate**, open **Schedules** and click **Automatic reading**; the page's title is **Schedules**. It is in the menu only when your licence includes schedules and meters are read.

Every signed-in user sees the list, except that a user who sees only some meter groups (see Users) does not see a schedule with a meter outside them. An operator or an administrator can start a schedule at once with **Run now**. Only an administrator sees **Add schedule**, **Edit** and **Delete** and can change a schedule.

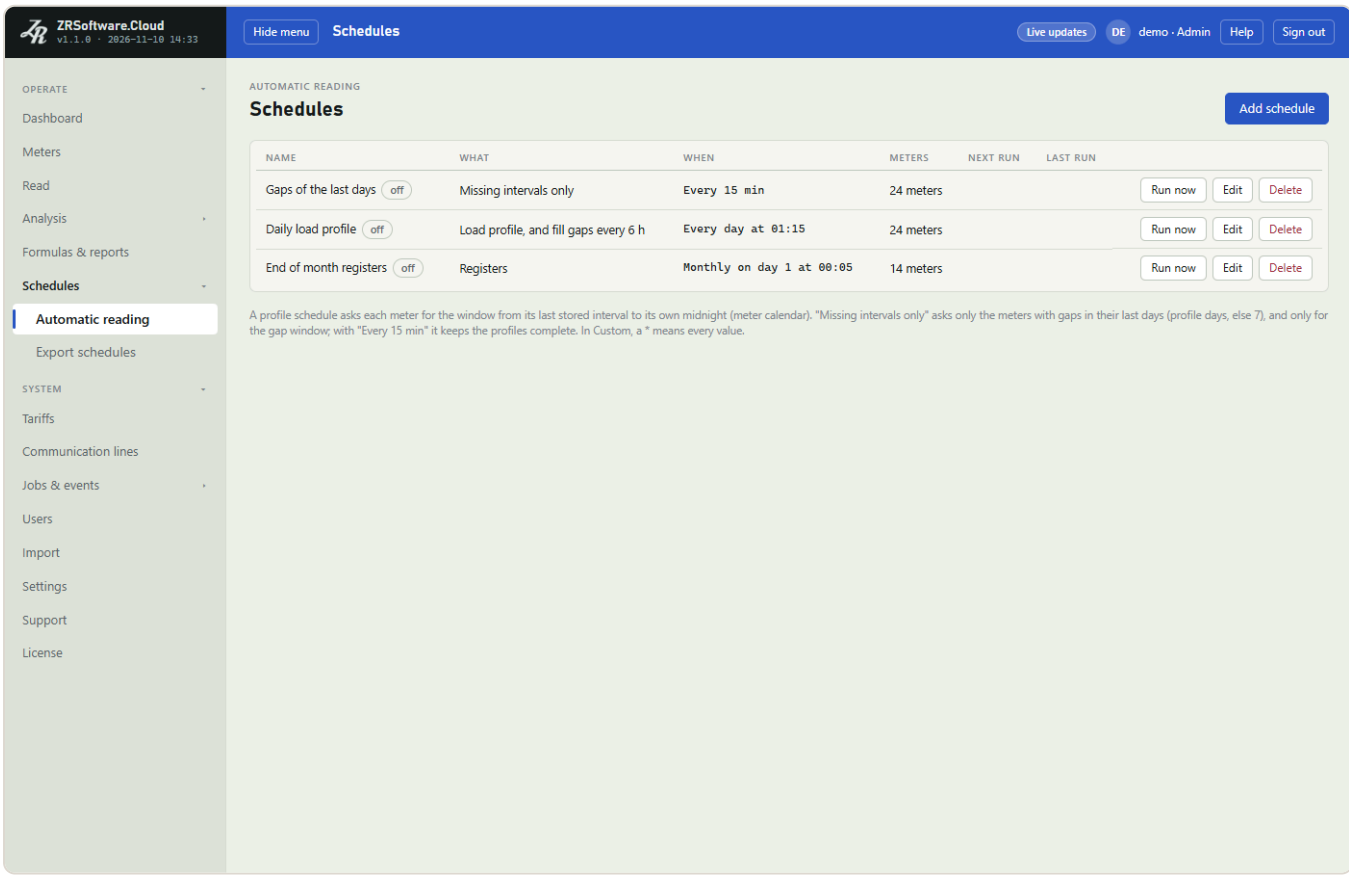


Figure 11.1 The Schedules page with sample schedules, all off, and the Run now, Edit and Delete buttons.

The schedule list

Column	What it shows
Name	The name of the schedule. A schedule that is turned off carries the chip **off**.
What	What the schedule reads (see the next section). For a load profile with gap filling it also shows how many hours apart the gaps are filled.
When	The pattern in words, for example every 5 min, every day at a time, or monthly on a day. A custom pattern shows its four fields as month / day / hour / minute.

Column	What it shows
Meters	The type and serial number of each meter of the schedule; with more than six, only their number.
Next run	The next time the schedule runs. It is empty while the schedule is turned off.
Last run	The time of the last run and the jobs it queued: how many are done, how many did not finish (failed, interrupted or cancelled) and how many are still open (queued or running). A meter that still has a job from an earlier run is skipped. A run that skipped every meter shows nothing done and nothing open, even while those earlier jobs still run; the event log then has a warning from the source Scheduler that says how many meters were skipped.

With no schedule yet, the list shows **No schedule yet.**

When the list has more than five schedules, the box **Find a schedule** above it shows only the schedules whose name and **What** together hold every word you type. When none does, the list shows **No schedule matches.**

While the top bar shows **Live updates**, the list updates by itself each time a job is queued or finishes.

A new schedule that Import takes over from ZR Software 7 comes in turned off, so that the meters are not read twice while ZR Software 7 still reads them. Edit it and tick **On** when the automatic reading of ZR Software 7 has stopped.

Meters of a ZR Software 7 schedule whose kind and time fields match a schedule that is already here are added to that schedule instead, and if it is on, they are read from its next run. A schedule set to **Every 5 min** or **Every 15 min** never takes in such meters: ZR Software 7 has no such pattern.

A schedule that an administrator brings back from a backup with the card **Configuration backup** (see Settings) keeps the **On** it had in the backup: unlike an import, a schedule that was on runs at its next planned time. If the PC the backup came from still reads these meters, edit the schedule and clear **On** until that PC has stopped, or the meters are read twice. A schedule with the same name as one already here is not brought back, and neither is a schedule none of whose meters is here; meters of the schedule that are not here are left out of it.

What a schedule reads

Choice	What each run does
Load profile	Reads each meter's load profile from the day of its last stored interval, however long ago that was, up to the coming midnight of the meter's own calendar. Stored intervals dated after that midnight, for example ones taken over with a wrong clock, are not counted as the last stored interval. When the interval stamped 00:00 of that day is not stored, the read starts one profile period earlier (15 minutes when the meter's **Profile period (min)** is empty), so that the meter gives that interval too; this does not apply to DLMS meters.
Registers	Reads each meter's register values.
Load profile, and fill gaps	Reads the load profile as above. In addition, on the first run and then each time the hours in **Fill gaps every (hours)** have passed, it also asks each meter again for the intervals missing before its last stored interval.
Missing intervals only	Looks at the last days up to now in each meter's calendar and reads only the windows of the missing intervals. A meter with no gap is not read at all.
Missing days of the previous month	Looks at the previous month in each meter's calendar and reads each day that has fewer intervals than a full day (96 for a 15-minute profile), one job per day.

Missing intervals that lie close together are read in one window, from the first to the last of them. Gaps more than 6 hours apart are read as separate windows, one job each, so that the stored intervals between them are not read again.

You choose what a schedule reads and when it runs independently. For example, **Every 15 min** with **Missing intervals only** keeps the profiles complete without reading whole days again. For **Missing intervals only** and for the gap filling, the program looks back as many days as **Profile days** says, or 7 days when that box is empty.

A day or an interval is not asked for again, even if the meter did not deliver it, when a successful profile read covered it and started after it had closed in the meter's calendar: the meter has given all it keeps for that time. A read that started before the day or the interval closed does not count, so it is asked for again. After a read that failed, found no data or was cancelled, it is asked for again at the next run. The interval stamped 00:00 is an exception when the interval just before it is stored: while it is missing, every run that looks at its day asks for it again, and for **Missing days of the previous month** its whole day is read again. A stretch where nothing at all is stored keeps the rule above.

The meter's calendar is the PC clock corrected by the meter's clock difference from its last registers reading, or the PC clock itself while no successful registers reading of the

meter is stored. When no successful registers reading of the last 7 days is stored, a job of a **Load profile** schedule (also with gap filling) first reads the registers to learn the meter's clock; the job then shows "registers read first for the meter's clock". That registers reading is kept as a reading of its own. If it fails, the job fails too, with a message that starts with "the meter's clock is not known".

When a meter has no stored interval yet, the first load profile read goes back **Profile days** days. When that box is empty, the number of days depends on the pattern, and the empty box shows it in grey, for example "empty: 60 days":

Pattern	Days read back the first time
Every 5 min	30
Every 15 min	30
Every hour	30
Every day at a time	60
Monthly on day and a time	365

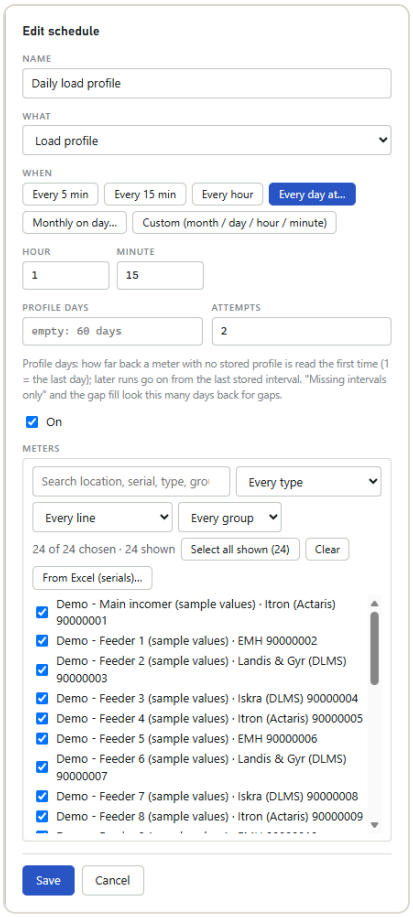
For **Missing intervals only** and for **Load profile, and fill gaps** the empty box shows "empty: the last 7 days", the look-back of the gaps. For **Load profile, and fill gaps** the first load profile read of a meter still goes back the number of days of the pattern from the table above. For **Registers** and **Missing days of the previous month** the box shows that it is not used.

Adding or editing a schedule

1. Click **Add schedule**, or **Edit** in the row of a schedule.
2. Type a **Name** (required).
3. Choose in **What** what the schedule reads. For **Load profile, and fill gaps**, set **Fill gaps every (hours)** (1 to 168; a new schedule offers 6).
4. Choose a pattern under **When** and fill in its time fields (see below).
5. If needed, set **Profile days** and **Attempts**.
6. Choose the meters under **Meters**.
7. Leave **On** ticked for the schedule to run, and click **Save**.

A new schedule starts as a load profile read every day at 01:15, with 2 attempts, turned on.

If the service refuses the schedule, the form stays open and shows the reason under the fields. **Cancel** closes the form without saving. When you have changed something, Esc, a click outside the form or a menu link does not close it: the form shows "Unsaved changes." with **Save**, **Discard** and **Keep editing**.



`Figure 11.2` The Edit schedule form of a sample schedule: what to read, when, the profile days with their default and the meters it reads.

Field	What it does
Profile days	1 to 366. How far back the first load profile read of a meter goes, and how far back the missing intervals are looked for. Empty: the first read goes back the number of days of the pattern, and the missing intervals are looked for in the last 7 days (see above). Clear the box and save to go back to these values.
Attempts	1 to 5. How many times one job tries the meter, 3 seconds apart. Only a read that may work next time is tried again: no answer, a checksum error or another error such as a line that cannot be opened. A refused password is not tried again. All attempts together stay within the 15 minutes a job may take.
Meters	The meters to read. The list offers only active meters that are not virtual; you can narrow it by search, type, line and group, or paste serial numbers from Excel (see Meters and groups). When the program has virtual meters, a note under the list says "Virtual meters are not read, so they are not on this list."
On	Clear it to stop the schedule without losing it.

Choosing when it runs

Pattern	Fields you fill in	When it runs
Every 5 min	None	At :00, :05, :10 and so on, every five minutes of every hour.
Every 15 min	None	At :00, :15, :30 and :45 of every hour.
Every hour	**Minute**	Every hour at that minute. Type a number: a * there makes the schedule run every minute.
Every day at	**Hour**, **Minute**	Every day at that time.
Monthly on day	**Day**, **Hour**, **Minute**	Every month on that day at that time.
Custom (month / day / hour / minute)	**Month**, **Day**, **Hour**, **Minute**	At every time that matches all four fields.

In **Custom (month / day / hour / minute)** each field is a number or *, and * means every value: month 1 to 12, day 1 to 31, hour 0 to 23, minute 0 to 59. A date that never occurs, such as day 30 of month 2, is refused with "this month never has that day". Times are the PC's local time.

With **Monthly on day** and a day that a month does not have (for example 31), the schedule does not run in that month.

When a schedule runs

Schedules are run by the Windows service ZRSoftware, not by the browser: they run while the service runs, whether or not a page is open. The service looks for due schedules every 15 seconds.

If the PC or the service was off at a planned time, the missed run is made once, as soon as the service runs again, while the licence allows it. Several missed runs are not made one after the other: after the catch-up run the schedule goes on with its next planned time.

A job that is running when the service stops is closed as cancelled, and its message ends with "cancelled: the service stopped". A job the service could not close is shown as interrupted when the service starts again. Jobs that were still queued are queued again in their order when the service starts (see Jobs & events).

When the trial or the licence has ended, the licence message says "Meters are not read and automatic exports do not run." Then, and whenever else the licence does not let the program read meters (see License), **Automatic reading** leaves the menu and no schedule runs; the heading **Schedules** stays when **Export schedules** is still there. On a page that was still open, **Run now** is refused with the licence message that says why meters are not

read. Only when the licence does not include schedules is the answer "the licence does not include Schedules". The schedules themselves stay as they are and run again at their next planned time once meters are read again.

While the licence does not allow reading, or does not include schedules, a due run is skipped and not saved up for later: it is not made later, also when the licence allows reading again. The event log then gets a warning from the source Schedule that names the schedule and the reason.

Virtual meters count toward the meter limit too. When more meters are registered than the licence allows, the meters registered first are read, as many as the limit, virtual meters among them; a virtual meter is never read, and its place does not go to another meter. A schedule does not queue its other meters, and its row in the event log is then a warning that says how many meters were not read and why: archive a meter or ask for a larger licence (see License).

Run now runs the schedule at once, also when it is turned off, and the page says how many jobs it queued. For a schedule with ten or more meters it asks first in its place: the row asks whether to run it for that many meters and says on how many lines they queue, with a second **Run now** button and **Cancel**. Run now does not move the planned times. It counts as the last run in **Last run**, and for **Load profile, and fill gaps** the hours until the next gap filling count from the last run that filled the gaps, also when that was Run now.

The order of reads on a line

Each communication line has its own queue: the meters of one line are read one after the other, never two at the same time. Different lines are read at the same time, up to four lines at once.

A schedule queues its meters in the order they were added to the program. Jobs on a line run in the order they were queued; a read you start by hand on the **Read** page waits behind the jobs already queued on that line.

A meter that still has a queued or running job from the same schedule is not queued again by that schedule. With a short pattern such as **Every 5 min** on a long line this keeps the queue from growing.

A meter on a line can also be watched by the **Demand monitor** (see Analysis). The jobs of the line come first: when a job's turn comes on that line, the monitor lets the read in progress finish, closes its connection to the meter and leaves the line to the job; a read that does not finish in time is cut off. The monitor reads again only when no job waits or runs on that line.

One job may take at most 15 minutes; after that it is stopped and shown as cancelled, and its message says that it timed out.

> **NOTE**
> Each job that runs to its end writes a row to the event log. Each run of a schedule writes one more; a schedule set to **Every 5 min** or **Every 15 min** writes it only for the first run of each hour and for every run that queued nothing, skipped a meter or left meters unread because of the licence. With such a pattern and many meters the event log still reaches its limit of 100 000 rows within weeks, and the oldest rows are then deleted (see Jobs & events).

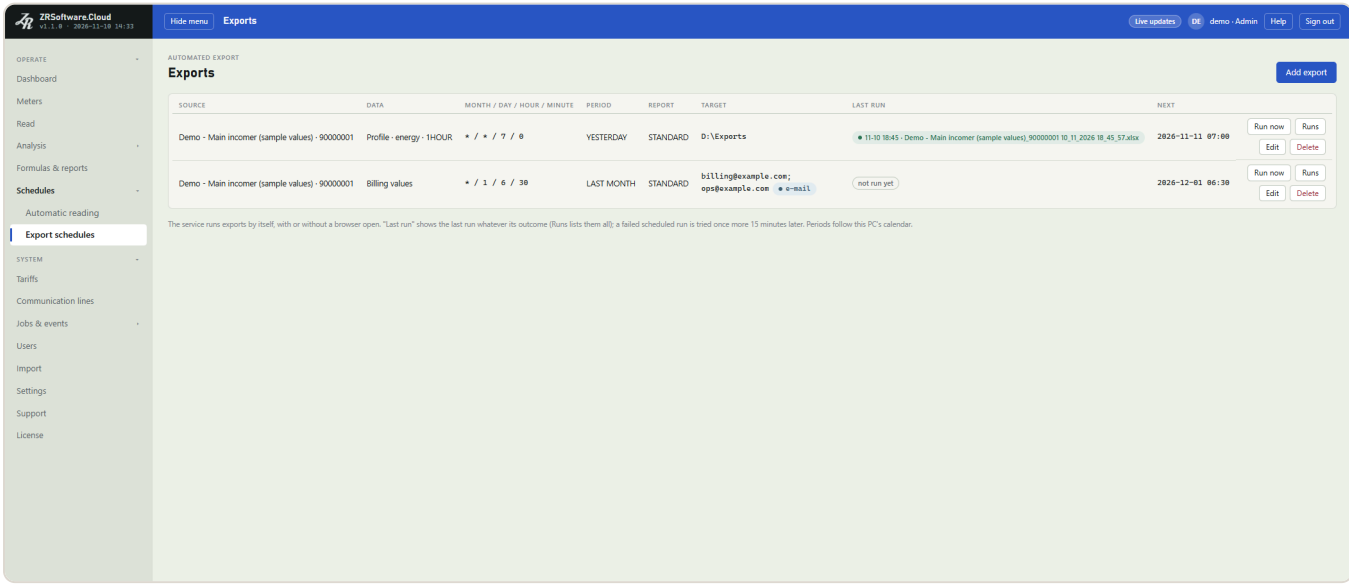
Deleting a schedule

> **WARNING**
> **Delete** asks first in its place: the row shows the question with a second **Delete** button, and **Keep** leaves everything as it was. The second **Delete** removes the schedule with its list of meters; it cannot be undone. Its jobs that are still queued or running are cancelled. The jobs it queued before stay in **Jobs & events** with their history, and the event log notes who deleted the schedule and how many jobs were cancelled. To stop a schedule without losing it, edit it and clear **On**.

12 Export schedules

An export writes a file by itself at the times you set: the load profile or the billing values of a meter, or the result of a formula or a custom report, for a period such as yesterday or last month. The file goes into a folder, is sent by e-mail or is uploaded to an FTP server. In the menu, under **Operate**, open **Schedules** and click **Export schedules**; the page's title is **Exports**. It is in the menu only when your licence includes exports.

Every signed-in user sees the list and the past runs, except that a user who sees only some meter groups (see Users) does not see an export whose meter, formula or report uses a meter outside them. An operator or an administrator can start an export at once with **Run now**. Only an administrator sees **Add export**, **Edit** and **Delete**.



`Figure 12.1` The Exports page with sample exports: one to a folder that has run, and one by e-mail that has not run yet.

The export list

Column	What it shows
Source	The meter (location and serial number), formula or report. A formula or report carries a chip with its kind; an export that is turned off carries **off**.
Data	Billing values, or the profile with its unit and step, and the extra channels when chosen.
Month / day / hour / minute	The four time fields of the export.
Period	The days the file covers.
Report	The file kind, and the tariff when one is chosen.

Column	What it shows
Target	The folder; the recipients with the chip **e-mail**; or the folder on the FTP server with the chip **FTP** (empty for the folder of the FTP settings itself).
Last run	The time and the result of the last run, whatever it was: the file name, or the error of a run that did not succeed. Before the first run it shows **not run yet**.
Next	The next planned run; after a failed scheduled run the time of the retry instead. Empty while the export is turned off.

With no export yet, the list shows **No export yet.**

When the list has more than five exports, the box **Find an export (source, target)** above it shows only the exports whose source, report kind, target (**File**, **E-mail** or **FTP server**) and folder or recipients together hold every word you type. When none does, the list shows **No export matches.**

An export that Import takes over from ZR Software 7 comes in turned off, so that reports are not sent twice while ZR Software 7 still sends them. Edit it and tick **On** when the automated export of ZR Software 7 has stopped.

An export that an administrator brings back from a backup with the card **Configuration backup** (see Settings) keeps the **On** it had in the backup: unlike an import, an export that was on runs at its next planned time. Its target is not checked then as it is when you save: the folder is not tried with a test file, and an export by e-mail or to an FTP server comes in even when the card **Mail** or **FTP** in **Settings** is not set up; check the first run in **Runs**. If the PC the backup came from still sends this export, clear **On** on one of the two PCs, or the file is sent twice.

Adding or editing an export

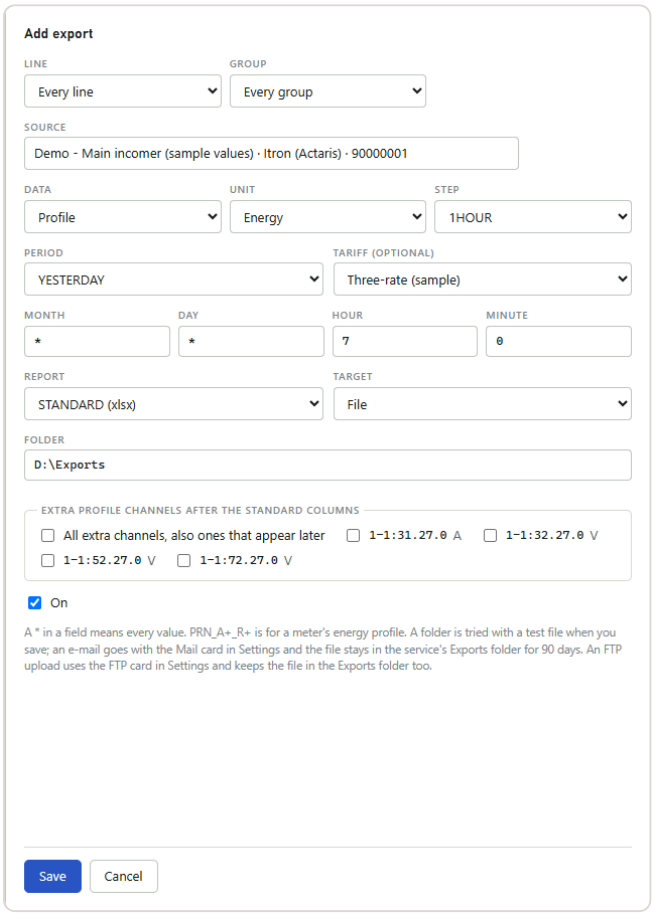
1. Click **Add export**, or **Edit** in the row of an export.
2. Choose the **Source**: a meter, a formula or a report (see below). **Line** and, when there are groups, **Group** above it narrow the list of meters.
3. Choose **Data**, **Unit** and **Step**, then the **Period** and, if you want zone totals, a **Tariff (optional)**.
4. Fill in the time fields **Month**, **Day**, **Hour** and **Minute**.
5. Choose the **Report** kind and the **Target**, and fill in the folder, the recipients or the folder on the FTP server.
6. Leave **On** ticked for the export to run, and click **Save**.

A new export starts as the energy profile in 1-hour steps of yesterday, as an xlsx file into a folder, every day at 07:00.

Type in the **Source** box to find the meter, formula or report: every word you type must be in the meter's location, serial number, type or group names, or in the name of the formula or report (a word shorter than three characters must start one of them); the words formula and report find all formulas or all reports. The list shows at most 50; type more to narrow it. Arrow keys move in the list, Enter takes the choice, and Esc closes the list without a change.

Formulas and reports are offered as a source, and tariffs in **Tariff (optional)**, only when your licence includes them.

If the service refuses the export, the form stays open and shows the reason under the fields. **Cancel** closes the form without saving. When you have changed something, Esc, a click outside the form or a menu link does not close it: the form shows "Unsaved changes." with **Save**, **Discard** and **Keep editing**.



`Figure 12.2` The Add export form with a sample meter as the source, profile data written as a file to a folder, and the extra profile channels to choose.

Field	What it does
Data	**Profile** or **Billing values**. Billing values come from a meter only, not from a formula or report.
Unit	**Energy** or **Power**, for a profile.

Field	What it does
Step	15MIN, 30MIN, 1HOUR or 1DAY: the length of one row of a profile.
Tariff (optional)	Adds the totals of the tariff zones to a profile file (see Tariffs). Only with **STANDARD (xlsx)**.
Extra profile channels after the standard columns	For a meter's profile as xlsx: extra channels such as voltage or current, ticked one by one, or **All extra channels, also ones that appear later**. None are ticked in a new export.

Periods

The period is counted in the PC's calendar on the day the export runs. Each period runs from midnight to midnight:

Period	Days in the file
TODAY	Today.
YESTERDAY	Yesterday.
LAST 2 DAYS	Yesterday and today.
LAST 7 DAYS	The last six days and today.
LAST WEEK	Monday to Sunday of the previous week.
LAST MONTH	The whole previous month.
THIS MONTH	From the first of this month to today.
LAST 15th TO THIS 15th	From the 15th of the previous month to the 14th of this month. Run before the 15th, the file also covers days still to come.

The **Runs** table shows each run's period as its two ends: the values after the first midnight and up to the last one.

File kinds and names

Report	What the file holds	File name
STANDARD (xlsx)	An Excel file: the profile rows of the period (with the zone totals when a tariff is chosen), or the billing values of the period.	For a meter its location and serial number, for a formula or report its name, then the date and time of the run, for example: Main_90000001 16_10_2026 7_0_0.xlsx

Report	What the file holds	File name
PRN_A+_R+	A text file with a header and, per row of the chosen **Step** that has values, its time with the active import energy (A+) and the reactive import energy (R+), for a meter's energy profile only.	The serial number and the date, for example: 90000001 2026-10-16.prn

WARNING

A file with the same name is written over. A PRN file has the date only in its name, so a second run of the same export on the same day replaces the first file. Two exports of the same meter that write into the same folder can also replace each other's PRN file. On the FTP server, too, a file of the same name in the same folder is replaced.

Writing to a folder

With the target **File**, type in **Folder** a full path on this PC, such as D:\Exports, or a shared folder, such as \\server\share\folder. When you save, the service writes a small test file there and deletes it again. If it cannot, the export is not saved and the form says why, starting with "the service cannot write to" and the folder.

The file is written by the Windows service, which runs under its own account NT SERVICE\ZRSoftware, not under your Windows account: the folder must allow the service's account to write. A folder that does not exist yet is created.

The program never deletes files from an export's own folder, unless that folder is the Exports folder of the service's data folder or a folder inside it (see the next section).

Sending by e-mail

With the target **E-mail**, type the addresses in **Recipients (; between)**, with ; or , between them, at most 20. Before you can save such an export, an administrator must set the mail server and the sender address under **Settings**, card **Mail**; otherwise the form says "set the mail server and the From address in the Mail card in Settings first".

The file goes as an attachment, with the subject from the mail settings and the fixed text "Sent via ZR Software - Mail Client". A copy stays in the Exports folder of the service's data folder, C:\ProgramData\REDZ\ZR Software\Exports, in a folder of its own named after the export's number, and is deleted there after 90 days, the next time an export runs.

Only the service, Windows itself and programs started with administrator rights can open the data folder; other Windows users of the PC cannot. To give users these files, choose a target folder they can open.

If the mail server does not accept the e-mail, the run counts as failed even though the file was written, and its error starts with "mail:".

Uploading to an FTP server

With the target **FTP server**, type in **Folder on the FTP server (under its root)** a folder below the **Folder on the server** of the FTP settings, for example daily/main, or leave it empty to use that folder itself. Letters, digits, spaces and / _ . - are allowed. Before you can save such an export, an administrator must set the server and the user name under **Settings**, card **FTP** (see Settings); otherwise the form says "set the FTP server and user in the FTP card in Settings first". The folder is not tried when you save; a folder that does not exist yet on the server is created at the first upload.

Every export with this target uses the one server of the card **FTP**: changing the card changes where all of them upload. When you change the server, the port or the type there without typing the password, the stored password is removed; type the password for the new server on the card, or the uploads cannot sign in.

The file is first written to the Exports folder of the service's data folder, as for e-mail, and is deleted there after 90 days. It is then uploaded with the same name, using the settings of the card **FTP**: under a temporary name ending in .part first; its size on the server is compared with the file, and only then is it renamed. If the sizes differ, the run fails and a file of that name already on the server stays as it was.

When a file of that name is already on the server, the earlier file first gets a temporary name ending in .old; the new file then takes the name, and the .old file is deleted. If the new file cannot take the name, the earlier file gets its name back. An SFTP server that can replace a file in one step does it in one step instead.

> **WARNING**
> When an upload fails, the service tries to delete the .part file on the server. A file ending in .part can stay on the server when the upload or the check after it fails. A file ending in .old that stays on the server is the earlier file of that name: it stays when it could not get its name back or could not be deleted, and also when the time limit ran out during the renaming. The program does not look for such files on the server later; delete them there if you do not need them. When no file of that name is on the server, the .old file is the earlier file: give it its name back or run the export again before you delete anything.

If the upload fails, the run counts as failed even though the file was written, and its error starts with "ftp:" followed by the reason (see Troubleshooting). As for any failed scheduled run, it is tried once more 15 minutes later. In the **Runs** table the result of a run that tried the upload carries ftp uploaded or ftp failed.

Mail settings

The card **Mail** on the page **Settings** is shown to administrators only, and only when your licence includes exports. The full list of its fields is in Settings; in short:

- **SMTP server** and **Port** (587 when nothing is saved yet).

- **Security**: **STARTTLS** (the default; the card pairs it with port 587), **SSL/TLS (465)** or **None**. Choosing one does not change the **Port** box. The server's certificate is checked; **None** sends the password without encryption.
- **User name** and **Password** of the mail account.
- **From address**: when it is empty, the user name is used if it is an e-mail address.
- **Subject** of the export e-mails.

The password is only written, never shown again. The service seals it with Windows on this PC. The **Password** box shows only whether one is stored and whether this PC can open it; leave the box empty to keep the stored password, type a new one to replace it, or, when one is stored, click **Remove password**. **Remove password** removes only the password; what you typed in the other boxes without saving is not saved. A password stored on another PC (for example in a copied database) cannot be opened here and must be typed again.

The same mail server also sends the program's other e-mails: the notices to users and administrators about their account and the licence (see Users and License), the warnings of the **Demand monitor** (see Analysis) and the codes for signing in from outside the local network (see Remote access and the mobile app). Those e-mails have subjects of their own; the **Subject** of the card is used for the exports.

> **NOTE**
> During a REDZ support session, REDZ support can add, change, run and delete exports, also those sent by e-mail; each such change leaves a row in **Jobs & events** (see Jobs & events). It can also change the **FTP** card in **Settings**, and with it the server that every FTP export uploads to. It cannot change the mail settings on the card **Mail**, and it cannot send a test e-mail from it. Two ways can still put mail settings in during the session: an import of a ZR Software 7 database, also a copy that REDZ support uploads, sets that database's mail server, with user name and password, when none is set here and the licence includes exports; and restoring a configuration backup with the card **Configuration backup** adds the settings of the file that this program does not have yet, among them the mail and FTP settings without their passwords (see Settings). A restore needs an administrator only; it also works during a REDZ support session.

Test e-mail

1. Save the mail settings first: the test uses the saved settings.
2. Type an address in **Send a test e-mail to** and click **Send test e-mail**.
3. Look in that mailbox, also in the spam folder.

When the mail server accepts the test e-mail, the card says so and reminds you that delivery is not confirmed: the program only knows that the server took it. When it fails, the card shows "Not sent:" and the reason: the mail server's own answer, for example a

refused sign-in or a TLS error, or, for a connection problem, the program's words, for example that the address could not be resolved. Each test is also written to the event log. The text of the test e-mail names this PC.

When an export runs

Exports are run by the Windows service ZRSoftware, whether or not a browser is open. The four time fields work as in a custom schedule: each is a number or *, and * means every value (see Automatic reading). The service looks for due exports every 15 seconds.

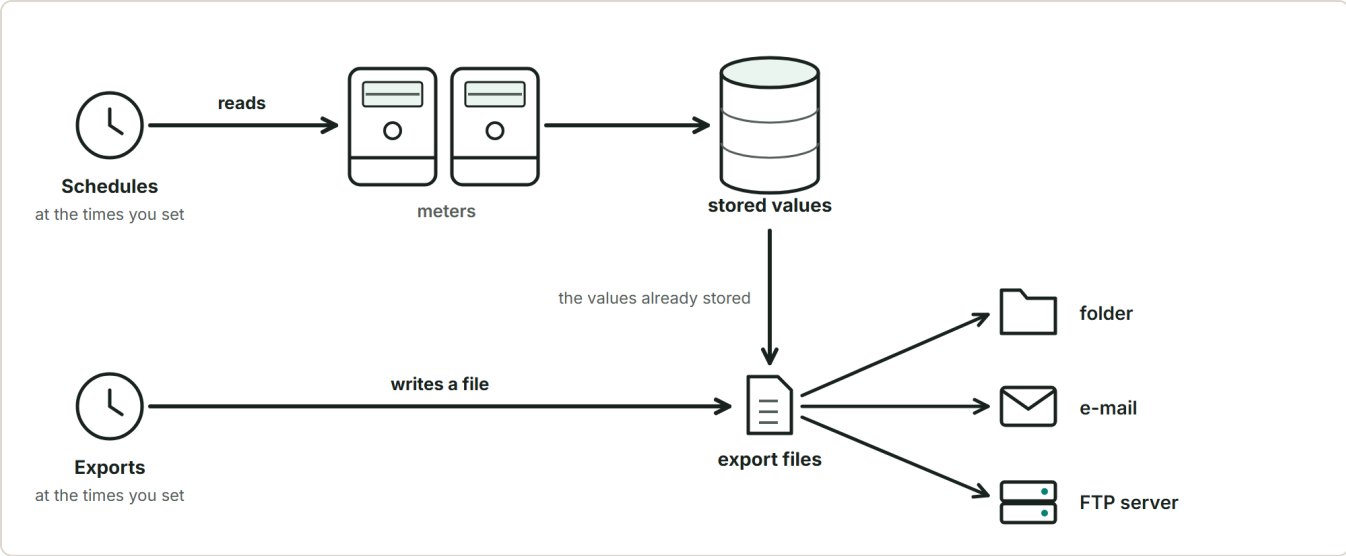


Figure 12.3 Schedules read the meters and store the values; exports run at their own times and write their files from the values already stored, into a folder, by e-mail or to an FTP server.

If the PC or the service was off at a planned time, the missed run is made once when the service runs again, while the licence allows it; the period is then counted from that day.

A scheduled run that fails is tried once more 15 minutes later; the **Next** column shows the time of that retry. If the retry fails too, the export waits for its next planned time. The retry counts the period from its own day, so a retry after midnight writes the period of the new day.

When the trial or the licence has ended, the licence message says "Meters are not read and automatic exports do not run." Then, and whenever else the licence does not let the program read meters (see License), **Export schedules** stays in the menu, but scheduled runs and retries are skipped and not made later, and the event log gets a warning from the source Export. While the licence does not include exports, the scheduled runs are skipped in the same way, with the same warning; **Export schedules** is then not in the menu. While only reading is not allowed, **Run now** still works: it writes the file from the values already stored.

Run now runs the export at once and waits for it. The page then says how many rows were written to which file and whether the e-mail was sent or the file uploaded to the FTP

server, or shows the error. Run now does not change the next planned time.

Past runs and errors

Runs opens the past runs of an export under the list, the newest first (the last 50). Click it again to close them.

Column	What it shows
At	When the run was made.
How	Schedule, Retry or Manual (Run now).
Result	Ok, Failed or Skipped, with the e-mail or FTP result and the error when there is one.
Rows	The number of rows written.
File	The full path of the file.

An export of a formula or a report also needs that part of the licence: when the licence does not include formulas, an export of a formula is skipped with "the licence does not include formulas", and an export of a report likewise with "the licence does not include reports", also with **Run now**.

A run is skipped when its source no longer exists or its meter is archived. Every run, also a skipped or failed one, is written to the event log with the source Export; e-mail addresses appear there shortened, so the log does not list who received what (see Jobs & events).

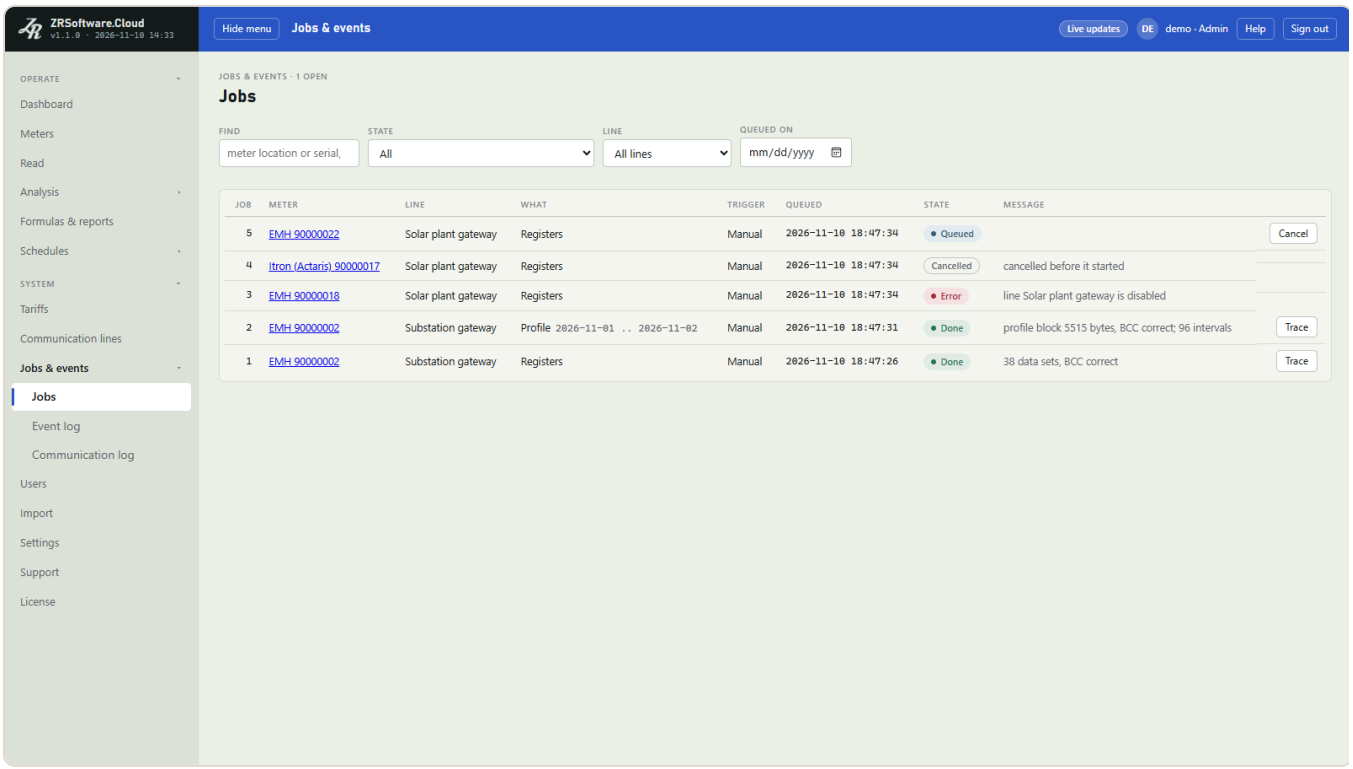
Deleting an export

> **WARNING**
> **Delete** asks first in its place: the row shows the question with a second **Delete** button, and **Keep** leaves everything as it was. The question says that this cannot be undone; the second **Delete** removes the export together with its past runs. The event log notes who deleted it; the rows its runs wrote to the event log stay. Files it wrote are not deleted with it, also not on the FTP server; copies of e-mailed or uploaded files in the Exports folder are still deleted after 90 days, like every file there. To stop an export without losing it, edit it and clear **On**.

13 Jobs & events

Every meter read is a job: a read you start on the **Read** page or with **Read now** for the meters you chose on the **Meters** page, a read a schedule queues, a read of missing intervals from **Completeness** (see Analysis). The short rounds of the **Demand monitor** are not jobs. In the menu, under **System**, the section **Jobs & events** has three pages: **Jobs** lists the jobs, **Event log** lists the program's event log, and **Communication log** shows whether each meter was read, day by day. Every signed-in user can open them. A user who sees only some meter groups (see Users) sees only the jobs and the communication log of those meters, and in **Event log** only the rows that belong to one of those meters: its reads and their warnings, its corrections and multiplier changes, its **Demand monitor** rows and the runs of exports of that meter. Rows that belong to no single meter are not shown to such a user, for example sign-ins, settings, the runs of schedules, the runs of exports of a formula or a report, exports skipped because of the licence, imports, the licence, updates and REDZ support.

Above the title, each of the three pages counts the open jobs (queued or running). The page's address keeps which of the three pages is open and the filters of the job list, with the words typed in **Find**, so reloading the page or a link you copy opens the same view.



`Figure 13.1` Jobs & events > Jobs with sample jobs in different states and the count of open jobs above the title.

The job list

The list shows the newest jobs first, 200 at a time. When there are more, **Older jobs** at the bottom adds the next 200.

Column	What it shows
Job	The job number.
Meter	The meter type and serial number. While the meter exists, the name opens its **Meter detail** (see Meters and groups).
Line	The communication line the job uses.
What	Registers or Profile; for a profile also the dates of the start and the end of its window, for the load profile of a schedule once the job has started. A window that ends at midnight shows the day after its last day as its end.
Trigger	Who started it: Manual (a read started by hand), Schedule, MissingMonth (a schedule reading missing days of the previous month), MissingIntervals (missing intervals, from a schedule or from **Completeness**) or FillGaps (the gap filling of a schedule).
Queued	When the job was queued, in local time.
State	The state of the job (see below).
Message	While the job runs, what it is doing; afterwards the result or the error.

With no job yet, the list shows **No job yet.**

Filter	What it does
Find	Shows the jobs whose meter location or serial number, or whose message, contains what you type.
State	**All**, **Queued or running**, one state, or **Not done (failed, interrupted, cancelled)**.
Line	**All lines**, or the jobs of one line.
Queued on	The jobs queued on that day, in the calendar of the PC the program runs on.

The list follows the filters as you change them; when no job matches, it shows **No job matches. Clear** removes every filter. The two numbers of the last 24 hours on the Dashboard open this list filtered: the jobs that are done, or not done, and finished in the last 24 hours. The state then shows in **State**, and the time limit shows as a chip next to the filters; the small button on the chip removes the time limit.

While the top bar shows **Live updates**, the list updates by itself: each time a job is queued, starts or finishes. After **Older jobs** it stops doing so, so the older jobs stay on the page; change a filter to go back to the newest jobs. While the top bar shows **Not live**, the job list does not update by itself.

Job states

State	Meaning
Queued	Waiting on its line's queue.
Running	The job has started: the line is being opened or the meter is being read.
Done	The read succeeded and its values are stored.
Failed	The read did not succeed. Instead of the word Failed, the chip shows the reason (see the next table).
Cancelled	The job was stopped before it finished. Its message ends with the reason: "cancelled" when a user cancelled it, "cancelled: the service stopped" when the service stopped while it ran, or that it timed out after the time a job may take (15 minutes). A queued job that was cancelled shows "cancelled before it started".
Interrupted	The service ended without closing the job. When the service starts again, the job gets the message "the service stopped while this job was running".

Chip of a failed job	Meaning
No answer	The meter did not answer.
Bad checksum	The meter's answer arrived damaged.
Login failed	The meter refused the password, no password is stored for a meter that needs one, or the stored password cannot be opened on this PC.
No data	The meter answered the load profile request with an error: it holds no records for the window asked, or it does not accept the request.
Not supported	The program does not read this meter type or this kind of read, or the meter's record lacks what the read needs (for example an address).
Error	Any other error, for example a line that cannot be opened, or a meter that the licence does not let the program read; the message gives the reason.

Jobs that were still queued when the service stopped are queued again, in their order, when it starts.

A job from a schedule may try the meter more than once (see Automatic reading); the message then says which attempt it was and what the attempt before it gave.

When a schedule is deleted, its queued and running jobs are cancelled; its other jobs stay in the list.

Cancelling a job

An operator or an administrator sees **Cancel** in the row of a queued or running job. A queued job is cancelled at once and never reaches the meter. A running job is stopped by closing its line. If the job finished in the meantime, the page shows "the job is not queued or running".

> **NOTE**
> Cancelling a job of a schedule does not change the schedule: its next run comes at the planned time.

The trace of a job

When a job has stored a reading together with the bytes exchanged with the meter, an operator or an administrator sees **Trace** in its row. It opens those bytes as they were stored. On the screen, a block received from the meter that holds several lines is shown line by line, broken after each line end; **Save as .txt** keeps the stored text as it is. The note above them says what the trace leaves out: for a DLMS meter the sign-in request is not recorded and the meter's authentication value is masked; Landis & Gyr DLMS meters are read without a password, so their sign-in is recorded in full. For a good registers reading the same trace is also on the **Line log** tab of **Meter detail** (see Meters and groups).

When an administrator hides the line log on the card **Line log** in **Settings** (see Settings), **Trace** is not shown and the trace cannot be opened. The trace is still stored with each reading and can be opened again once the line log is shown. An administrator can show it again, and so can REDZ support during a support session, as it works with an administrator's rights; the change leaves a row from the source Settings in the event log.

Save as .txt saves the trace as a text file named after the meter, the job number and the time it was queued (in UTC); **Close** closes it.

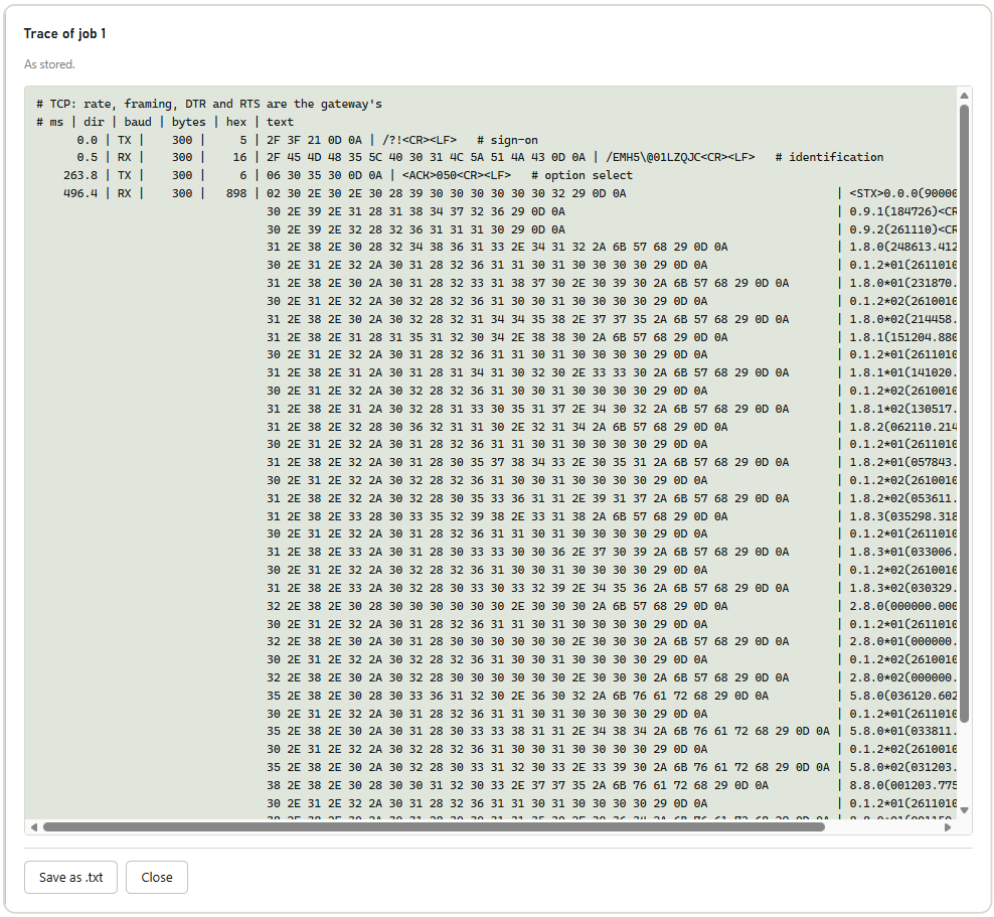


Figure 13.2 The trace of a job that read a sample meter, with Save as .txt and Close.

The event log

Event log lists what the program did and noticed: finished jobs, schedule runs, exports, successful sign-ins, users locked after wrong passwords, password changes, users added and changed, changed settings, imports, configuration backups downloaded and restored, deleted schedules, exports and lines, the warnings of the **Demand monitor**, e-mails about a user's account and the licence, remote access (see Remote access and the mobile app), REDZ support sessions and what REDZ support changed or took, a **Check now** for updates that failed, downloaded updates and updates handed over to be installed, and licence events. The newest come first.

Column	What it shows
Time	When it happened, in local time.
Level	**Info**, **Warning** or **Error**.
Source	The part of the program that wrote the row.
Meter	The meter it is about, when there is one; while the meter exists, the name opens its **Meter detail**.
Text	What happened.

The page shows 200 rows at a time; **Older events** at the bottom adds the next 200. While only the newest 200 rows are shown, the open page looks for new rows every 15 seconds while the browser shows it. After **Older events** it stops looking, so the older rows stay; change a filter to go back to the newest rows.

> **WARNING**
> The event log keeps one year and at most 100 000 rows. Older rows are deleted once a day and cannot be brought back; save them with **CSV** if you need them longer. A CSV file holds the newest 50 000 rows that match the filters. There is no date filter: to save more, save one file at a time per meter or per source.

REDZ support in the event log

During a REDZ support session, Jobs & events gets a row with the source REDZ support for each change REDZ support makes or tries to make, and for each file or reading trace it takes: what was done, on which page, and the answer. A change that was refused or failed is a warning. What was typed, for example a password, is not in the row. Pages that REDZ support only looks at leave no row.

A file is, for example, the Excel file of an analysis, the CSV of the event log or a support bundle. When REDZ support saves the chart as a picture or prints a page, the program tells the service and Jobs & events gets a row. A reading trace is what **Trace** on **Jobs** or the **Line log** tab of **Meter detail** opens; saving it with **Save as .txt** adds no second row. A few requests that only check or test something leave a row as well, for example the preview of an import, a check of the licence or for updates, a scan for REDZ devices, or a test of the FTP connection; while a licence request waits and REDZ support has the License page open, the page asks about it every 30 seconds and each time leaves a row.

The row names the page and the item, for example Meters and the meter's number, and ends with done, refused or failed and the session number. A request to one of the few settings that are closed to REDZ support, such as the remote access settings, the support session or its own password, is refused and named only as "a closed setting". Other refused changes, for example of the mail settings, name their page like any other row.

The start and the end of each session are rows from the same source: who asked for the session and until when, who ended it early, that REDZ or the licence server ended it, or that its time ran out. If REDZ's connection does not accept this program during a session, a warning from the same source says "REDZ support could not connect; ask REDZ". When REDZ support signs in, a row from the source Auth names the session number; a refused sign-in of REDZ support is a warning from the source Auth (see Support).

To see them all, choose REDZ support in **Source**; the sign-ins of REDZ support are under Auth. The chat with REDZ during a session is not written to the event log (see Support).

Updates in the event log

An admin, or REDZ support during a support session, can download and install an update. Each download or install on the page **Settings**, card **Updates**, gives the event log a row from the source Update: that the update was downloaded and checked against the signed list, that it was handed over to be installed, or, as a warning, why it was refused. A **Check now** that fails is a warning from the source Update with the reason; a check that succeeds leaves no row. The program's own daily check leaves no row in the event log, also when it fails. The updates are described in Settings.

Filtering the events

Filter	What it does
Find	Shows the rows whose text contains what you type. Capital and small letters count the same, also for the Turkish letters, and the letter i with or without a dot counts as one letter. The characters *, ? and square brackets are searched as they are.
Level	**All**, or one level.
Source	**All**, or one of the sources that appear in the log, for example Engine for the reads, Scheduler for the runs of schedules, Schedule for skipped schedule runs, Export, Auth for sign-ins, locks, password changes and changes to users (a user added, a role changed, a user turned on or off, a password reset, the meters a user sees), each with who made it and never with the password; a change that is refused leaves no such row. The Auth rows about signing in from outside the local network are described in Remote access and the mobile app. REDZ support for support sessions and what was changed or taken in them, Update for updates, Backup for configuration backups, Demand monitor for its watches and warnings, Mail for the e-mails about a user's account and the licence letters (the address shortened), Remote access, and Settings.
Meter	**All meters**, or the rows of one meter.

Type in the **Meter** box to find the meter: every word you type must be in the meter's location, serial number or type (a word shorter than three characters must start one of them). The list shows at most 50 meters; type more to narrow it. Arrow keys move in the list, Enter takes the meter, and Esc closes the list without a change.

The list follows the filters as you change them. When no row matches, it shows **No event matches.**

CSV saves the rows that match the filters (at most 50 000) as a file for Excel, with ; between the columns. The file has the time twice: in UTC and in the local time of this PC, as the page shows it.

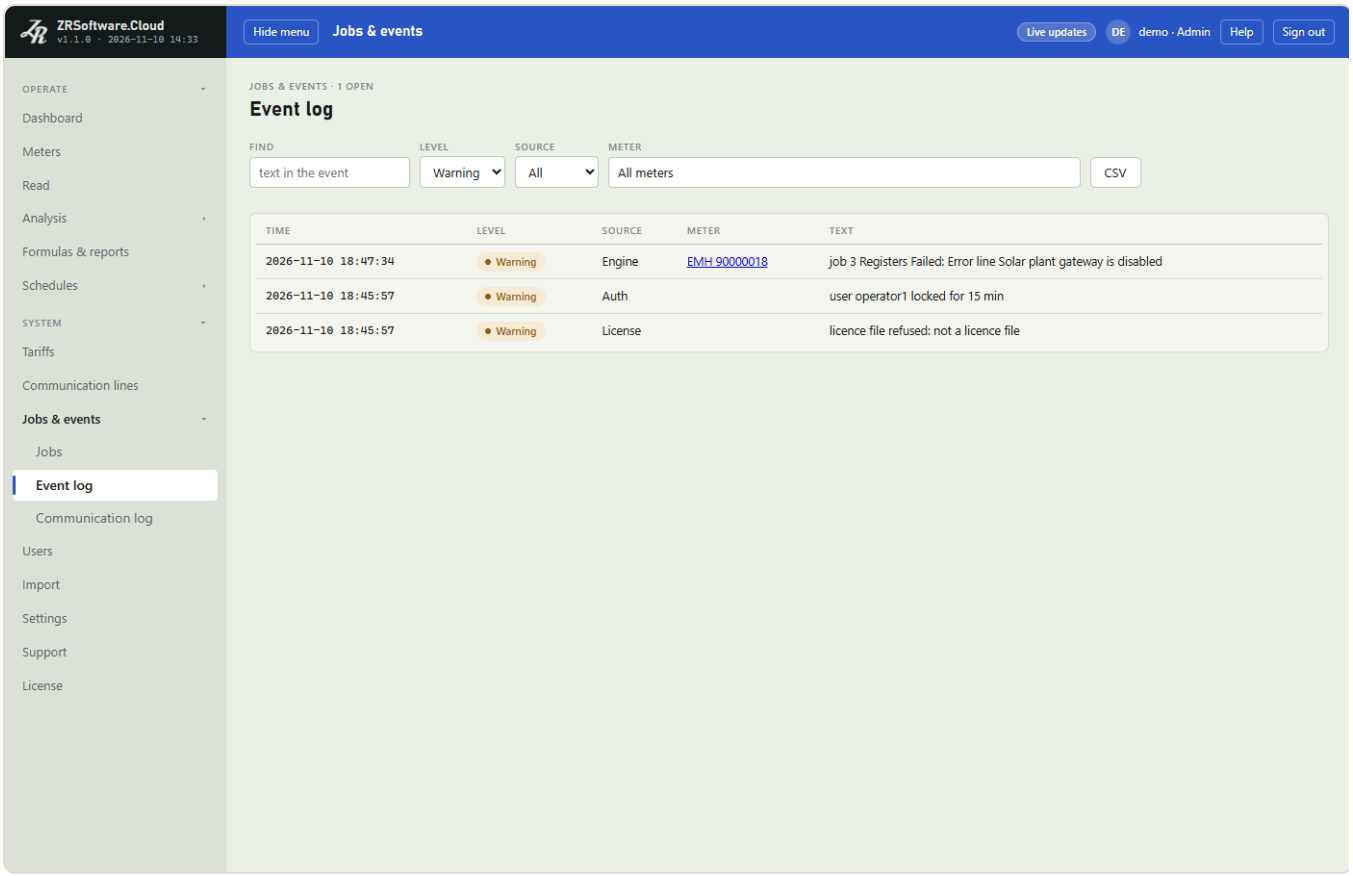


Figure 13.3 Jobs & events > Event log filtered to warnings, with sample events and the CSV button.

The communication log

Communication log shows, for each meter and each day, how many read jobs succeeded out of the jobs that were tried, for example 3/4: scheduled reads, reads started by hand and reads of missing intervals, each by its final result, so the attempts of one job count once. A job that failed or was interrupted counts as tried; a cancelled job is not counted. A day without a job shows -. The table lists every active meter that is not virtual, also one with no job, and any other meter that had a job in those days.

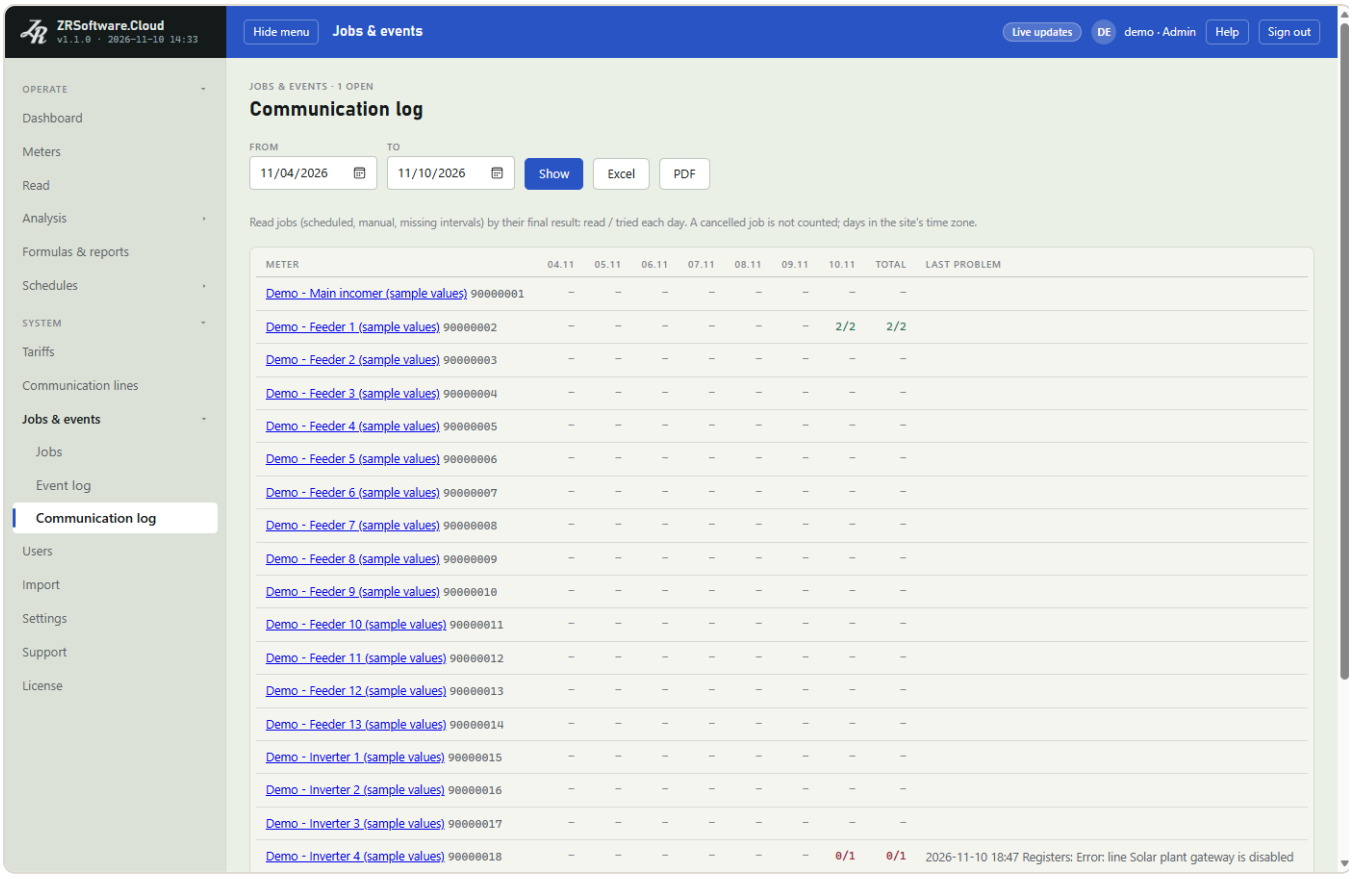


Figure 13.4 Jobs & events > Communication log for the last 7 days with sample meters: read and tried jobs per day, the total and the last problem.

The page opens with the last 7 days, today included. Change **From** and **To** and click **Show**; the table covers at most 93 days. A job counts on the day it finished (an interrupted job on the day the service started again), in the time zone of the PC the program runs on, so a job queued before midnight and finished after it counts on the next day; the filter **Queued on** of **Jobs** goes by the day a job was queued.

Total adds up the days. **Last problem** shows the latest job of those days that did not succeed: when it ended, Registers or Profile, its result and its message. The meter's name opens its **Meter detail**. With no meter to show, the table says **No meter to read.**

Excel and **PDF** save the same table for the days in **From** and **To**, named Communication_log_ with the two dates, as an xlsx or a PDF file.

14 Import

The **Import** page brings lists from files into the program: meters, schedules and exports from an Excel or CSV file, and the whole database of ZR Software 7. The page is in the System menu for administrators, and only when the licence includes the Import feature; see License.

When the trial or the licence ends, or meters are not read for another licence reason, the **Import** page leaves the menu and the program refuses imports with the licence's message until meters are read again.

Four tabs at the top choose what you import: **Meters**, **Schedules** and **Exports** read an Excel file, **Old database** reads a ZR Software 7 database.

> **NOTE**
> To carry this program's own set-up, such as its lines, meters, tariffs, formulas, schedules and exports, to another PC, use **Configuration backup** on **Settings** instead; see Settings. That file is made by this program and does not carry readings. Unlike an import, a restore brings schedules and exports switched on or off as they were in the backup.

Importing from an Excel file

The **Import** page reads Excel 97-2003 (.xls), .xlsx and .csv files of at most 2 MB and 2 000 rows. It reads the first sheet of an Excel file. The file type is taken from the file's contents, not from its name.

The **Schedules** and **Exports** tabs also need the **Schedules** or the **Exports and e-mail** feature of the licence, as their pages do. Without it, the page refuses the file as soon as you choose it and a red banner says that the licence does not include it.

1. Choose the tab of the list: **Meters**, **Schedules** or **Exports**.
2. Under **File**, choose the file. The program reads it and shows what each row would do. Nothing is saved yet.
3. Read the notes above the table and check the table. The **Result** column shows "new", "update", "unchanged", "skip" or "error" for each row, with the reason.
4. Click **Import**. The button shows how many rows it will save. It is available only when no row has an error and at least one row is new or changed.

If the file cannot be saved as it is, a red banner says why as soon as you choose it: how many rows have an error, that every row is already there, or that the new meters do not fit the meter limit of the licence and how many meters it allows.

> **NOTE**
> For an export row with a folder, the preview already writes and removes a test file in a folder that exists. A folder that does not exist yet is made and tried only when you click **Import**; if the service cannot write there, nothing is saved and the page shows why.

When the rows are saved, a green banner shows how many rows were new, updated and already there.

> **WARNING**
> If any row has an error, nothing from the file is saved. Fix the rows marked "error" in the file and choose the file again. When the file is saved, all of its rows are saved together, in one step. An import cannot be undone from this page: change or archive the records on their own pages.

If no row is new or changed, the **Import** button stays unavailable and nothing is saved.

Imported schedules and exports come in off

A schedule the import makes, and every export it adds, is saved switched off, so that the meters are not read and the reports are not sent twice while ZR Software 7 still does it. The notes above the table say so. The lists show such a schedule or export with an "off" chip; see Automatic reading and Export schedules.

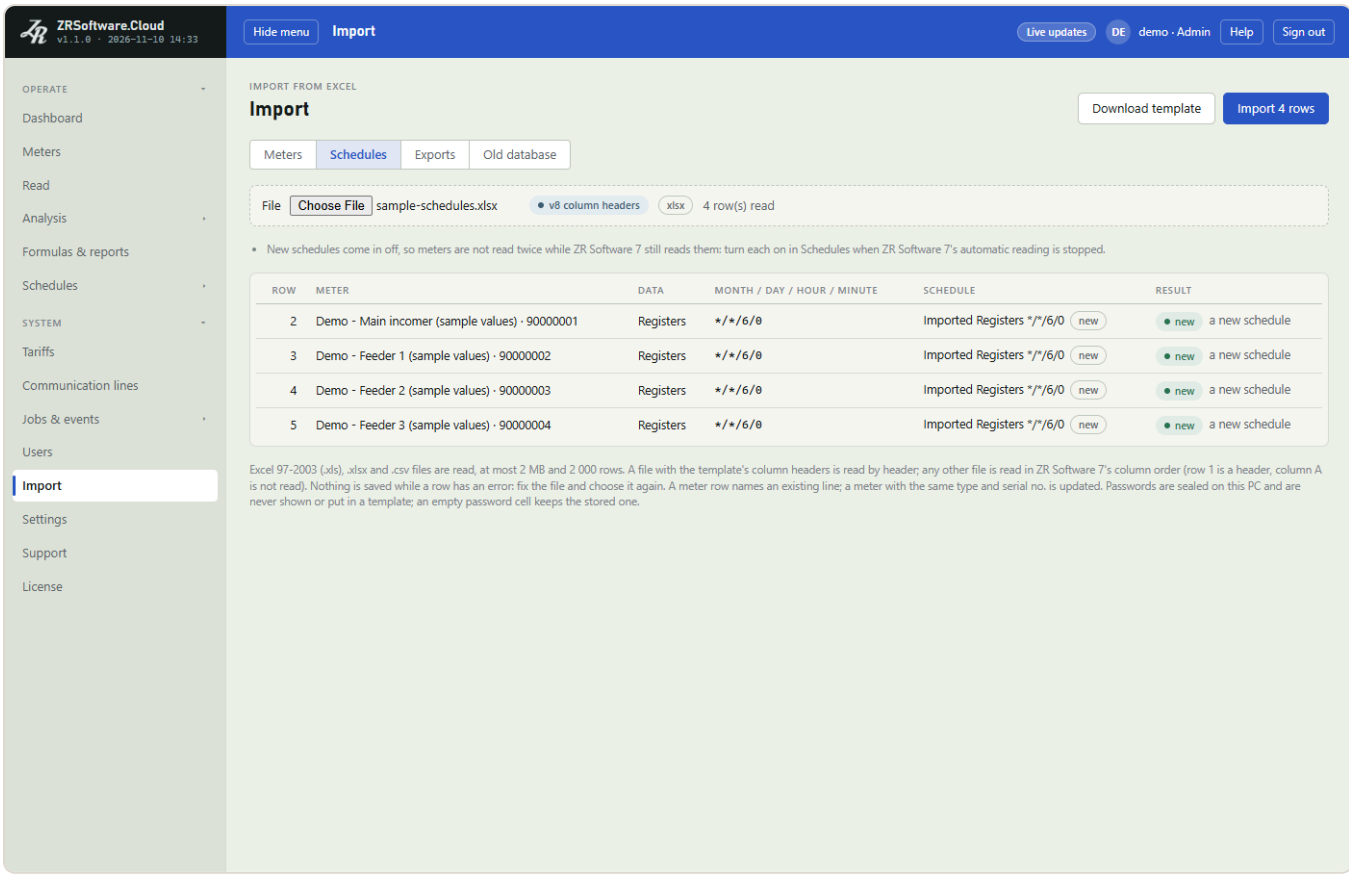


Figure 14.1 The Schedules tab after choosing a sample file: the note above the table says that the new schedule comes in off. Sample values.

> **NOTE**
> Meters added to a schedule that already exists keep that schedule's setting: if it is on, it reads them from its next run, and the notes above the table say so. A schedule set to **Every 5 min** or **Every 15 min** is never joined: a row of the file makes or joins a schedule with its own month / day / hour / minute pattern.

1. Stop the automated readings and automated exports of ZR Software 7 for the same meters.
2. In the menu, open **Schedules** > **Automatic reading** and **Schedules** > **Export schedules**. Click **Edit** in the row of each imported schedule or export, tick **On** and click **Save**.

The two column layouts

The program reads a file in one of two layouts and shows which one it used next to the file name: **v8 column headers** or **ZR Software 7 column order**.

- v8 column headers: row 1 holds the column names of the template. The columns can be in any order and the case of the names does not matter. A meters file needs at least the columns Type, Serial no. and Line.
- ZR Software 7 column order: any other file is read in the column order of ZR Software 7. Row 1 is a header and is not read, and column A is not read. A note above the table lists

what each column means.

Download template saves an .xlsx file with the template's column headers for the open tab. The template is filled with the list that is stored now (active meters, schedules, exports), so you can change it in Excel and import it again. Only meter rows update stored records: a changed schedule or export row is added as a new one and the old one stays; change or delete it under **Schedules** > **Automatic reading** or **Export schedules** in the menu. Meter passwords are never written to the template.

> **NOTE**
> Empty rows in the file are skipped. The row numbers in the table are the row numbers of the file.

Meter rows

A meter row must name a line that already exists on the **Communication lines** page. In the template layout this is the line's name; in the ZR Software 7 column order it is the COM port or the IP address and port. The Excel import never adds a line: a row whose line is not there is an error.

- A meter with the same type and serial no. as a stored meter updates that meter. The message lists what changes.
- A row equal to the stored meter is "unchanged".
- A row for an archived meter, a second row for the same meter in the file, or a row that matches two stored meters is an error.

When a row changes a meter's multiplier, the new multiplier counts from the time of the import: intervals that end later take it, earlier intervals keep the old one. The change appears in the meter's **Multiplier history**, and **Jobs & events** gets a row that names who imported it; see Meters and groups.

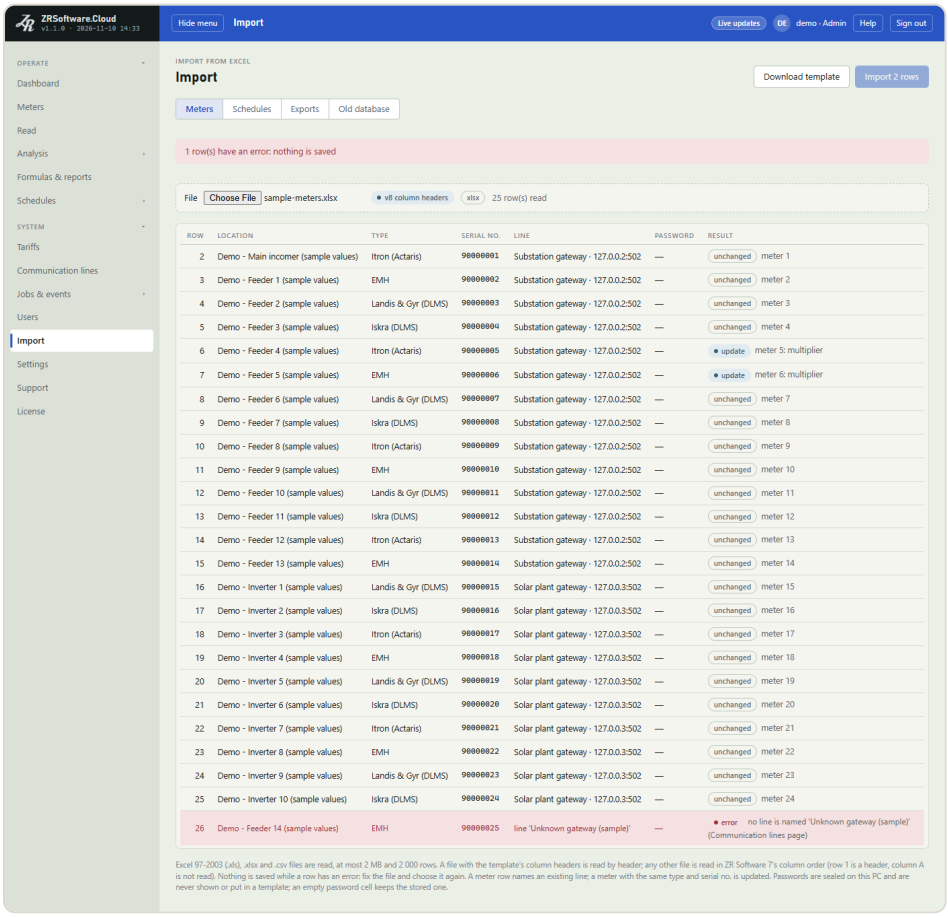
The **Password** column of the table shows only whether the file gives a password. Passwords are sealed on this PC and are never shown. An empty password cell keeps the stored password.

New meters must fit the meter limit of the licence. If they do not, nothing is saved; the red banner says how many meters the licence allows.

Schedule and export rows

A schedule row names a meter by its serial no., or by "#" and the meter's id when two active meters have the same serial no. Rows with the same data and the same month / day / hour / minute pattern join one schedule: an existing schedule with that pattern, or a new one named after the data and the pattern. A meter that is already in that schedule is skipped.

An export row names its source (a meter, or in the template layout also a formula or a report by name) and, if it uses one, a tariff by name. A row equal to a stored export, or to an earlier row of the file, is skipped.



`Figure 14.2` The Meters tab of the Import page after choosing a sample meters file, before importing: each row shows its result, one row has an error, and the banner above says that nothing is saved.

Importing a ZR Software 7 database

The **Old database** tab reads the database file of ZR Software 7 (zrs.s3db) and brings its meters, readings and lists into this program in one step; a row that does not fit is skipped with its reason. It is meant for moving from ZR Software 7 to this program on the same PC or on a new one.

1. Open the **Old database** tab. If the program finds the old database on this PC, its path is already in **File on this PC**, and the card's title line says whether setup recorded it or it was found in the usual ZR Software 7 folder. Otherwise type the full path of the file.
2. Or, under **Or upload a copy**, choose a copy of the file, for example one brought from the old PC. An uploaded file can be at most 512 MB. The check starts by itself when you choose it.

3. Click **Check (no changes)**. The program does the whole import and then discards it, so the counts in the table are those of the import. Nothing is saved in the program's database; as in the Excel preview, an export folder that exists is tried with a test file, and one that does not exist yet is made and tried only at **Import**.
4. Read the table and the notes above it. Then click **Import**. The button is available after a check that found something to import.
5. The button asks first in its place: "Import the old database into ZRSoftware.Cloud now? Its meters, settings, load profile and billing values are added here; ZR Software 7 and its files stay as they are." Click **Import** next to the question to import, or **Not now** to leave everything as it was.

The table has one row for each part of the old database, with the columns **Old table**, **Rows**, **Imported**, **Already there**, **Skipped** and **Why skipped**.

After the import the page says "Imported. Rows that did not fit are listed with the reason."

> **WARNING**
> An old database import cannot be undone from this page: change or archive the records it added on their own pages.

What the old database import brings

Part of the old database	What happens
Meters	Imported with their settings. A line that does not exist yet is added; a meter whose line this PC does not allow is skipped. Meter passwords are sealed on this PC.
Tariffs	Imported with their zones; a tariff whose zones cannot be taken over is skipped with the reason.
Formulas	Imported when each term can be matched to an imported meter and channel; otherwise skipped with the reason. The notes show each imported formula.
Custom reports	Imported with the columns that can be imported; a column that cannot is listed in the notes.
Mail settings	Imported when no mail server is set in this program yet, with its password; a mail server set here is kept.
Automated readings	Imported as schedules, by the same rules as the Excel import. A new schedule comes in off.
Automated data exports	Imported as exports, by the same rules as the Excel import, switched off. An export of a tariff is skipped.

Part of the old database	What happens
Load profile	Imported. Values are divided by the meter's multiplier, because the old program stored them multiplied. The old program kept no multiplier history, so the meter's present multiplier counts from the start; for meters with a multiplier other than 1, a note above the table says so. Voltages and currents of the old load profile are not imported.
Billing values	Imported as readings of the meter.
Read queue and log	Not imported. They are counted in the table as skipped.

The licence decides some parts: tariffs come in only when the licence includes **Analysis and tariffs**, formulas only with **Formulas**, custom reports only with **Custom reports**, schedules only with **Schedules**, and the mail settings and exports only with **Exports and e-mail**. A part the licence leaves out is not imported: the table shows it as not in the licence, and a note above the table says that the licence does not include it. Meters, the load profile and the billing values come in with every licence.

> **NOTE**
> Unlike the Excel import, the old database tab does not show a note that the schedules and exports came in off. Turn them on as described above once ZR Software 7 no longer reads and exports.

A meter of an unknown type, a meter on a GSM modem, or a meter whose line is not allowed here is skipped with the reason. Unlike the Excel import, a row that does not fit does not stop the old database import: it is skipped and the rest is imported.

The licence's meter limit is the exception: the new meters must fit it all together. If they do not, nothing is imported and the page says how many meters the licence allows. The note below the table says so too.

The old database is not changed

The program first copies the old database into the Import folder of its own data folder and reads only that copy, read-only. The old program and its file are not changed.

The copy is deleted when the check or the import is done, whatever its outcome.

A file that is not a SQLite database, or a SQLite database without the meters table of ZR Software 7, is refused and nothing is imported.

Importing the old database again

Running the import again adds nothing twice. Records that are already there are counted in **Already there**:

- A meter with the same type and serial no. is already there. It is not changed: settings changed in ZR Software 7 since the first import are not taken over, as the note below the table says, but its new readings join the stored meter. Change its settings on the **Meters** page.
- A tariff, formula or report with the same name and the same content is already there. One with the same name and other content is imported under a new name that ends in "(old database)"; the notes name it.
- Load profile intervals and billing values that are already stored are kept as they are.

> **NOTE**
> When setup found a ZR Software 7 database, the first start steps include an **Old database** step that shows this tab; see Installation and first start.

Importing during a REDZ support session

While a REDZ support session runs (see Support), REDZ support can use this page as an administrator does, and both imports work as they do for you: the passwords in an Excel file and the meter passwords of a ZR Software 7 database are saved. The **Mail** card stays closed to REDZ support, but an import of a ZR Software 7 database during the session, also a copy that REDZ support uploads, can still set that database's mail server, with user name and password, when none is set here and the licence includes **Exports and e-mail**. Restoring a configuration backup can add mail settings too, without their password, when this program does not have them yet; a restore needs an administrator only, so it also works during the session (see Settings).

15 Users

The **Users** page lists the people who sign in to the program and gives each one a role. Only administrators see the page; it is in the System menu.

The licence does not limit the number of users. Give each person their own user, with the role they need, so that one person can be disabled alone and the event list shows who signed in.

Roles

There are three roles: Viewer, Operator and Admin. Each role can do everything the role before it can do.

Role	What the user can do
Viewer	Opens the pages and reads the stored data: meters, readings, analysis, jobs and events, the licence status. Changes their own password.
Operator	Also starts and cancels meter reads, reads missing load profile intervals, opens the trace of a reading, runs a schedule or an export at once, watches meters on the Demand monitor, and types, imports or removes the load profile values of a virtual meter.
Admin	Also defines lines, meters, groups, meter passwords, schedules, exports, tariffs, formulas and reports, and deletes all of them except meters, which are archived and brought back instead; manages users; imports; manages the licence; makes the support bundle; changes the Settings cards (limits, mail, FTP) and the first start steps; installs updates.

An Admin also chooses which meters each user sees (see below), and only an Admin changes the Settings cards **Line log**, **Remote access** and **Configuration backup** (see Settings). While an Admin keeps the Line log hidden, no one opens the trace of a reading.

The pages **Users**, **Import** and **Support** are in the menu for administrators only.

> **NOTE**
> The program on this PC checks the role for every action, not only the pages in the browser: an action the role does not allow is refused.

	Viewer	Operator	Admin
Opens the pages and reads the stored data	✓	✓	✓
Changes their own password	✓	✓	✓
Starts and cancels meter reads	—	✓	✓
Reads missing load profile intervals	—	✓	✓
Opens the trace of a reading	—	✓	✓
Runs a schedule or an export at once	—	✓	✓
Types, imports or removes the load profile values of a virtual meter	—	✓	✓
Defines lines, meters, groups, meter passwords, schedules, exports, tariffs, formulas and reports	—	—	✓
Manages users; imports; manages the licence; makes the support bundle	—	—	✓
Changes the Settings cards (limits, mail, FTP) and the first start steps	—	—	✓
Installs updates	—	—	✓

Each role can do everything the role before it can do.

Figure 15.1 What each role can do; each role can do everything the role before it can do.

The user list

The table shows each user's **User name**, **Role**, **E-mail**, **State**, **Remote** and **Last sign-in**. Your own user is marked **you**. A Viewer or an Operator who sees only some meter groups has the number of those groups next to the role; point at it to see their names. **Remote** says **remote sign-in** for a user who may sign in from outside the local network, otherwise **this PC only** (see Remote access and the mobile app). The state is one of these:

State	Meaning
Active	The user can sign in.
Must set password	The user has a one-time password, from an administrator or, for admin, the one made at the first start, and chooses their own at the next sign-in.
Locked	Five wrong passwords in a row, at sign-in or on **My password**, locked the user for 15 minutes. A wrong sign-in code from outside the local network counts as a wrong password.
Disabled	An administrator turned the user off. The user cannot sign in.

> **NOTE**
> REDZ support's own user (see Support) is never in this list, cannot be changed here and does not count as one of your administrators. During a support session REDZ support can add users, Admins too, change their role and the meters they see, turn them on or off and reset a password, but not the password of the last enabled Admin. REDZ support types the one-time password. A user whose password is reset is signed out and must sign in with that one-time password, so ask REDZ for it; a user added this way signs in like any other user, sets an own password at the first sign-in, and stays after the session ends. REDZ support cannot change its own account, give or change a user's e-mail address or remote sign-in, or reset the password of a user who may sign in remotely.

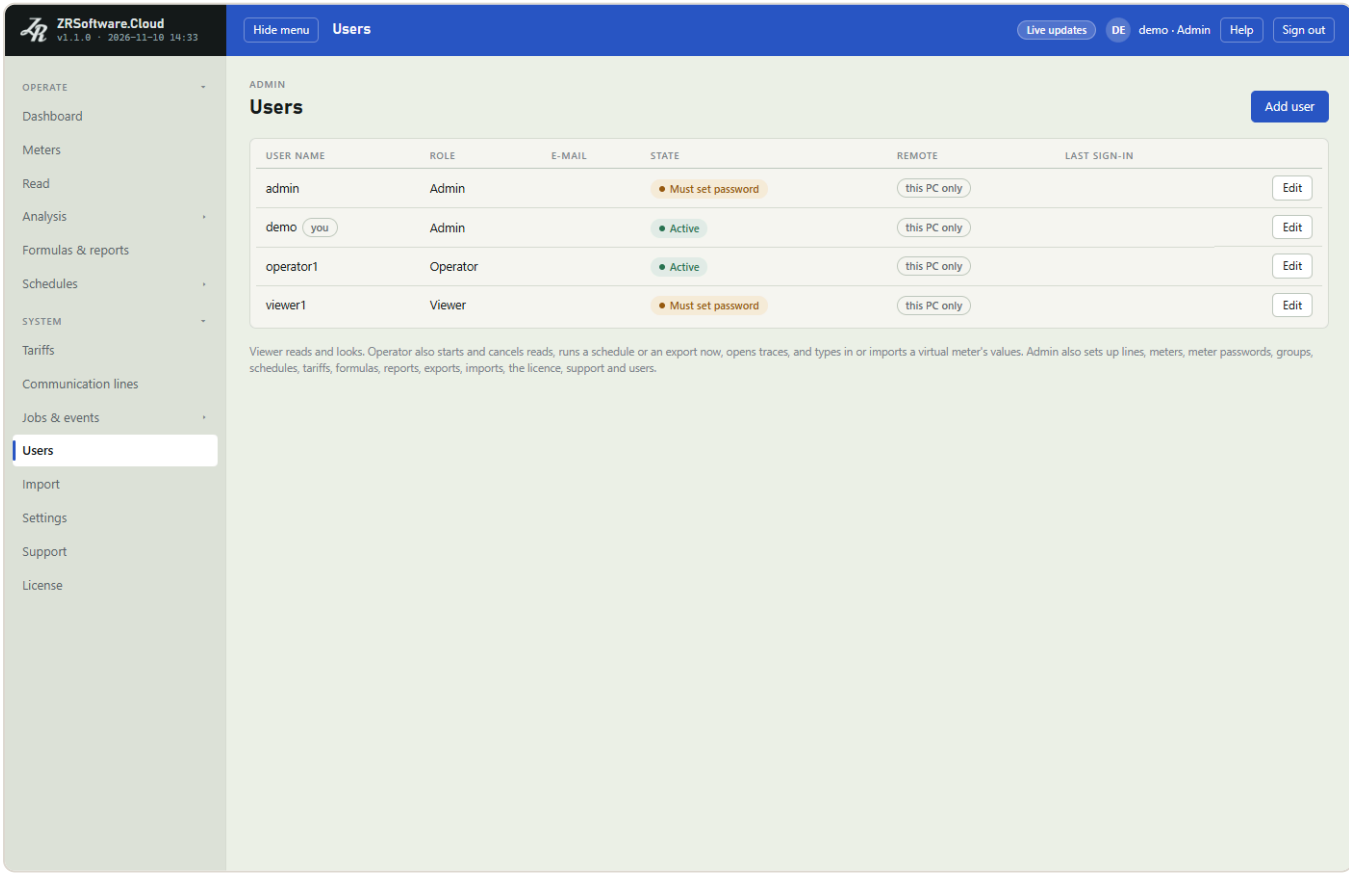


Figure 15.2 The Users page with sample users and their roles and states, and the note on what each role may do.

Adding a user

1. Click **Add user**.
2. Type the **User name**: 3 to 40 characters: the letters A to Z without accents, digits, dots, underscores or hyphens. Upper and lower case count as the same name. The name cannot be changed later.
3. Choose the **Role**. A new user starts as **Viewer**.

4. For a Viewer or an Operator, choose under **Meters this user sees**: **All meters** (the default) or **Only these groups**, and then click each group the user may see. Without groups the box says "No groups yet: make them on Meters." The box is not shown for an Admin (see the next section).
5. Type the user's **E-mail** if the user should get the program's e-mails about the account (see below) or sign in from outside the local network; otherwise leave it empty. An Admin with an address also gets the e-mails about the licence (see License).
6. Type a **One-time password**: at least 10 characters and not the user name. Tick **Show the password** to see what you type; it is not ticked when the form opens.
7. Click **Save**.

A new user is always enabled. Give the one-time password to the user; adding a user sends no e-mail. At the first sign-in the program asks the user to choose their own password; see the section on passwords below.

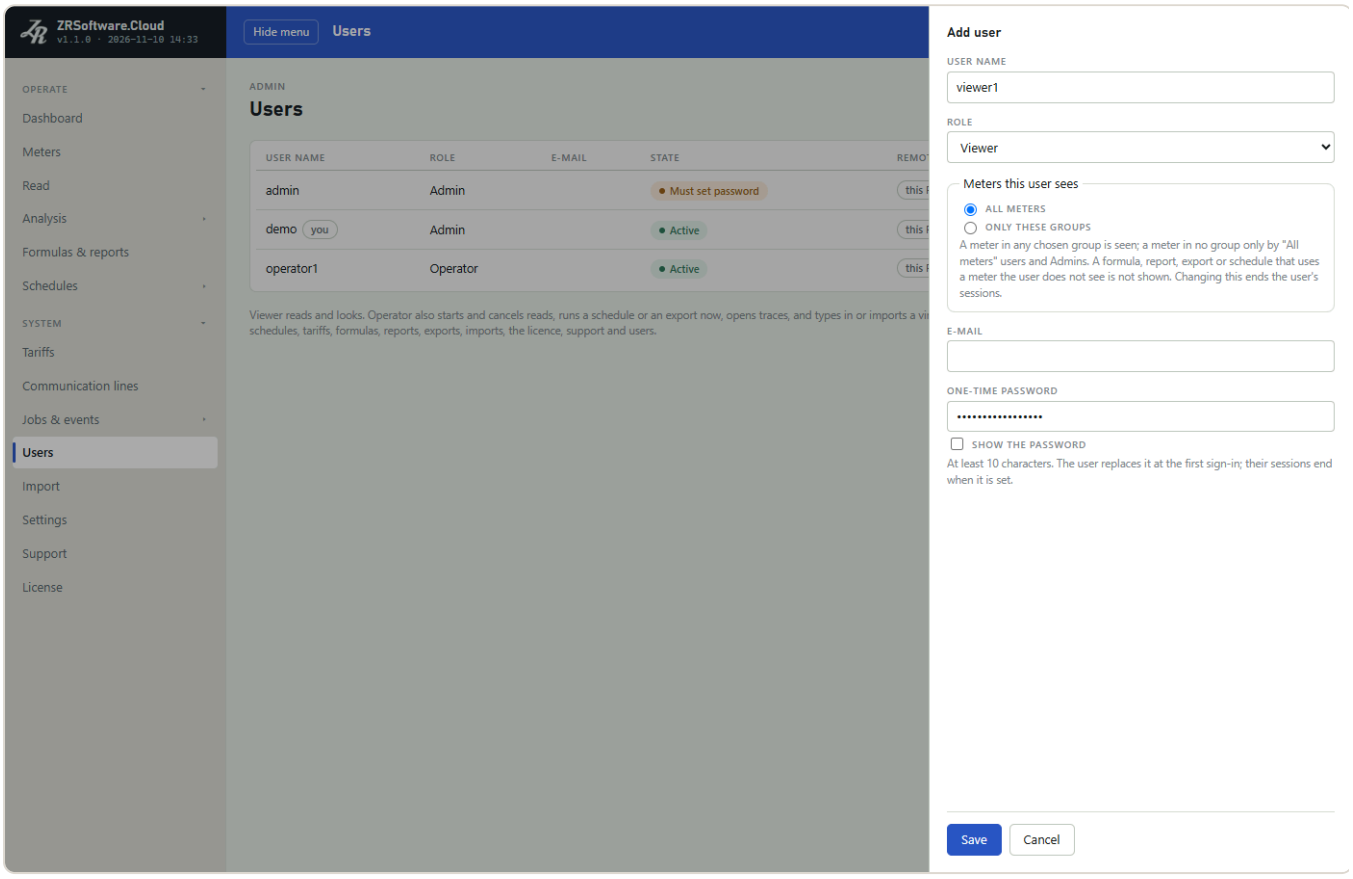


Figure 15.3 The Add user panel with a sample user name, the Viewer role, Meters this user sees and a one-time password.

Which meters a user sees

An Admin always sees every meter. A Viewer or an Operator sees every meter while **All meters** is chosen. With **Only these groups** the user sees only the meters that are in at least one of the chosen groups: a meter in no group is then not seen, and with no group chosen the user sees no meter.

Such a user sees only those meters everywhere in the program: in the meter list and the meter details, in readings, load profiles, Analysis, Completeness and the Demand monitor, in the jobs and the communication log, and only the meter groups that were chosen. The event list shows only rows that belong to one of those meters, such as its reads, warnings and corrections; rows that belong to no single meter are not shown, for example sign-ins, settings, the licence, updates, imports, the runs of schedules and the runs of exports that read a formula or a report, also of those the user sees. A formula, custom report, export, schedule or Demand monitor watch is shown only when the user sees every meter it uses; otherwise it is not listed and cannot be opened.

Which meters are in a group is changed on the **Meters** page (see Meters and groups), and a configuration restore can add meters to groups (see Settings). Adding a meter to one of the user's groups lets the user see it; taking it out of the group, or deleting the group, hides it from the user's next request on, unless the meter is also in another of the user's groups. A user for whom the deleted group was the only one then sees no meter. Such a change does not end the user's sessions and is not written as a change of the user. A page that is already open keeps the live updates of the meters it saw when it connected, until it connects again, for example when the page is loaded again.

Some things are the same for every user: the communication lines (also in the Dashboard's line table), the tariffs and holidays, the settings, and the licence, whose number of meters and meter limit always count every meter.

The program's own work, such as reads, schedules and automatic exports, always covers every meter, and so do Admins and REDZ support during a support session.

Changing **Meters this user sees** ends the user's open sessions at once and forgets the phones the user had remembered for remote sign-in. The change is written to the event list with the groups chosen and the user name of the administrator who made it. A change of the groups on the **Meters** page does not end the user's sessions.

Changing a user

Click **Edit** in the user's row. You can change the role, **Meters this user sees**, the **E-mail** and **Enabled**, and give a new one-time password. The form also has **Remote sign-in (through the relay)** and, when the user has remembered phones, **Trusted phones** with **Forget these phones**; these are described in Remote access and the mobile app.

Cancel closes the form without saving. When you have changed something, Esc, a click outside the form or a menu link does not close it: the form shows "Unsaved changes." with **Save**, **Discard** and **Keep editing**.

- **New one-time password**: leave it empty to keep the password. A password you type here is one-time again: the user chooses their own at the next sign-in. It also unlocks a locked user. **Show the password** shows what you type.
- **E-mail**: empty the box to remove the address.

- **Enabled**: clear it to stop the user from signing in. Users cannot be deleted; a user who leaves is disabled.
- When you change the role or the meters the user sees, disable the user or set a new one-time password, the user's open sessions and their live updates end at once, and the phones the user had remembered for remote sign-in are forgotten.

The program keeps at least one enabled administrator of your own. It refuses with "the last enabled admin cannot lose the Admin role" or "the last enabled admin cannot be disabled".

E-mails to users about their account

A user who has an e-mail address gets an e-mail from the program when the password of the account is changed, by the user or with a one-time password from an administrator; when the account is locked after five wrong passwords or sign-in codes; and when a phone is remembered for signing in from outside the local network (see Remote access and the mobile app). A user without an address gets none. Adding a user, the setup link and the command that gives admin a new one-time password (see Troubleshooting) send no e-mail.

Each e-mail names the account and the time in UTC, not in the PC's local time. It says who changed a password (the account holder, or an administrator with that administrator's user name), until when a lock lasts, or which phone was remembered, as the phone app names it, and what to do if it was not you. It never contains a password or a code.

The e-mails go out through the mail server of the **Mail** card in **Settings** (see Settings); nobody waits for them. Each one is written to **Jobs & events** with the source Mail: sent, or not sent with the reason as a warning. The address shows there only with its first letter and its domain.

> **NOTE**
> Without a mail server on the **Mail** card these e-mails are not sent, and each one leaves a warning in the event list. Only an admin sees the Mail card, and only when the licence includes exports; a configuration restore can still add mail settings (see Settings).

User changes in the event list

Adding a user, changing a role or the meters a user sees, turning a user on or off and giving a new one-time password each write an event with the source Auth to **Jobs & events**: which user, what changed (the role before and after, the groups chosen, or for a new user how many, on or off), and the user name of the administrator who made the change. Allowing or taking away remote sign-in is written too, without the administrator's name. The password itself is not written. A change of a user's **E-mail** is not written to the event list. A change the program refuses writes no such event (see Jobs & events).

Passwords and sign-in

A password has at least 10 characters and is not the user name.

1. The user signs in with the one-time password on the **Sign in** page.
2. The program shows **Set your password**.
3. The user types the new password in **New password** and again in **New password again**. It must differ from the one-time password.
4. The user clicks **Save and sign in** and is signed in.

For an existing user name, after a wrong password the sign-in page says how many attempts are left. After five wrong passwords in a row the user is locked for 15 minutes; the page says how many minutes are left, and the lock is written to the event list and, when the user has an e-mail address, e-mailed to the user. An administrator can end the lock at once by giving a new one-time password.

> **NOTE**
> Every user changes their own password on the page **My password**, opened from the user name at the top right (see Signing in and the window). A one-time password from an administrator is needed only when the user has forgotten the password.

16 Settings

The **Settings** page is in the **System** group of the menu. Every user can open it and sees the cards **Reactive ratio limits**, **Line log** and **Appearance**. Administrators also see **Remote access**, **Who may sign in remotely**, **Updates**, **Configuration backup** and **First start**, and **Mail** and **FTP** when the licence includes exports (see License). Each card is saved on its own.

When meters are not read, for example after the trial or the licence has ended, the cards stay as they are: **Mail** and **FTP** stay for the exports you start yourself, while automatic exports do not run (see License).

Your own password is changed on the page **My password**, which opens from your user name at the top right (see Signing in and the window). That page and the first start steps have the link **Settings** above their title, which leads back here.

Reactive ratio limits

A meter whose reactive ratio since the last end of billing is above a limit is marked on the Meters page, on the Dashboard and on its detail page. The card has two limits, in percent. The defaults are the marks of the gauges of ZR Software 7:

Box	Default	Meaning
Inductive limit, Ri / A (%)	15	Inductive reactive energy against active energy.
Capacitive limit, Rc / A (%)	10	Capacitive reactive energy against active energy.

Type a value from 0.1 to 1000 in each box and click **Save**. The card shows **Saved**, and the change is written to the event list (see Jobs & events).

Every user sees the limits. Only an admin can change them; other users see the note "Only an admin changes these."

Line log

The Line log is the record of what the program and a meter sent each other during a reading. The card says: "The Line log shows the bytes exchanged with the meter: opening the connection, signing in (the password is not recorded) and the register reads. Hidden, it is still recorded with each reading." By default it is shown to Operators and Admins; a Viewer never sees it.

An admin chooses **Show to Operators and Admins** or **Hide on this installation** and clicks **Save**. While the Line log is hidden, the Line log tab of a meter's detail page, the live Line log on the Read page and the **Trace** button of a job in Jobs & events are not shown, and the program refuses to hand out a trace. The program still records the trace with each

reading, so it can be shown again later, also for the readings made while it was hidden. Other users see the choice and the note "Only an admin changes this."

Each change is written to the event list. A configuration backup carries the choice (see below).

Appearance

Choose **Light** or **Dark** for the colours of the pages. The choice applies at once and is kept in this browser only; another browser keeps its own choice. Without a choice the pages are light.

Mail

The **Mail** card holds the mail server that automated exports use to send their files by e-mail (see Export schedules). The program also sends its own e-mails with it: the e-mails to users about their account (see Users), the e-mails to administrators before and when the licence stops the reading (see License), the Demand monitor's warning e-mails (see Analysis), and the sign-in code for users who sign in from outside the local network (see Remote access and the mobile app). Only an admin sees the card, and only when the licence includes exports.

Box	What to enter
SMTP server	The host name or address of the mail server, without spaces.
Port	1 to 65535. The default is 587.
Security	**STARTTLS** (the default; the card pairs it with port 587), **SSL/TLS (465)** or **None**. Choosing one does not change the **Port** box.
User name	The account on the mail server. A name written as domain\user signs in with that domain.
Password	The password of that account. Tick **Show the password** to see what you type.
From address	The sender address. When it is empty, the user name is used if it is an e-mail address.
Subject	The subject of the export e-mails; the test e-mail and the program's own e-mails have their own subjects.

With **None** the password goes to the server without encryption; the program uses it only when you choose it. With the other two the server's certificate is checked.

Click **Save**. The password is never shown again: the password box only says whether a password is stored. Leave the box empty to keep the stored password, or type a new one

to replace it. **Remove password** deletes only the stored password; the other boxes go back to their saved values. Every save is written to the event list.

A configuration restore (see below) adds the mail settings of the backup, without the password, when this program has none.

The password is sealed with Windows on this PC; a copy of the database on another PC cannot read it. The database is in the data folder. Only the service, Windows itself and programs started with administrator rights can open the data folder; other Windows users of the PC cannot (see Installation and first start). If the database was moved from another PC, the password box says so; type the password again and save.

To check the settings, type an address in **Send a test e-mail to** and click **Send test e-mail**. The test uses the saved settings, so save first. Several addresses are separated by ; or , (at most 20). When the mail server accepts the e-mail, the page says so; that does not prove delivery, so look in the inbox and in the spam folder. When the server refuses, the page shows "Not sent:" with the reason.

FTP

The **FTP** card holds the server to which automated exports upload their files (see Export schedules). Like the **Mail** card, only an admin sees it, and only when the licence includes exports.

Box	What to enter
Server	The host name or address of the server, without ftp:// and without spaces.
Port	1 to 65535. Choosing a **Type** sets it to 21, or to 22 for **SFTP**; change it after choosing the type if your server uses another port.
Type	**FTPS (explicit TLS)** (the default), **SFTP** or **FTP (not encrypted)**.
Folder on the server	The folder for the files, for example /meter-data. The program always uses it as a path that starts at /, and an empty box means /. Which folder / is depends on the server: ask its administrator which folder the account may write. Letters, digits, spaces and / _ . - are allowed; a \ is turned into /, and .. is refused.
User name	The account on the server. It is required: without a user name the FTP server counts as not set.
Password	The password of that account. With **SFTP** the program signs in with this password only, not with a key file. Tick **Show the password** to see what you type.
Passive mode (usual behind a router or firewall)	Ticked by default. Not shown for **SFTP**.

With **FTPS (explicit TLS)** the connection is encrypted and the server's certificate is checked: Windows on this PC must accept it, which means it comes from an issuer Windows trusts and is made for the server's name; otherwise the connection is refused and nothing is sent. The card has no way to accept a certificate that Windows does not accept. With **SFTP** the server's key must be trusted first (see below).

> **WARNING**
> **FTP (not encrypted)** sends the password and the files in clear text; the program uses it only when you choose it. Choose it only on a network you trust.

Click **Save**; the card shows **Saved**. As on the Mail card, the password is never shown again: the password box only says whether a password is stored and whether this PC can read it. Leave the box empty to keep the stored password, or type a new one to replace it. The card has no button that removes the stored password. The password is sealed with Windows on this PC; a copy of the database on another PC cannot read it, and the password box then says so: type the password again and save. Every save is written to the event list.

When you save another **Server**, **Port** or **Type** and leave the password box empty, the stored password is removed, so the password of the old server never goes to the new one. The card then says "Saved. The stored password was removed because the server, port or type changed: enter the password for this server." Type the password of the new server in the same save to keep the card ready.

Test connection uses the saved settings, so save first; the button can be clicked once a server is saved. The service connects, writes a small text file whose name starts with .zrs-test- into the **Folder on the server**, creating that folder if it does not exist yet, checks its size and deletes it again. When that works, the card shows "Connected: a test file was written and removed". Otherwise it shows "Not connected:" and the reason (see Troubleshooting). Each test is written to the event list.

Every file, also the test file, is uploaded under a temporary name ending in .part first; its size on the server is compared with the file, and only then is it renamed. When a file of that name is already on the server, the earlier file first gets a temporary name ending in .old; the new file then takes the name, and the .old file is deleted. If the new file cannot take the name, the earlier file gets its name back. An SFTP server that can replace a file in one step does it in one step instead. When the upload, the size check or the rename fails, the test or the run fails.

> **WARNING**
> When an upload fails, the service tries to delete the .part file on the server. A file ending in .part can stay on the server when the upload or the check after it fails. A file ending in .old that stays on the server is the earlier file of that name: it stays when it could not get its name back or could not be deleted, and also when the time limit ran out during the renaming. When no file of that name is on the server, the .old file is the earlier file: give it its name back or run the export again before you delete anything. The program does not look for such files on the server later.

A test whose last step, deleting the test file, fails leaves that file there.

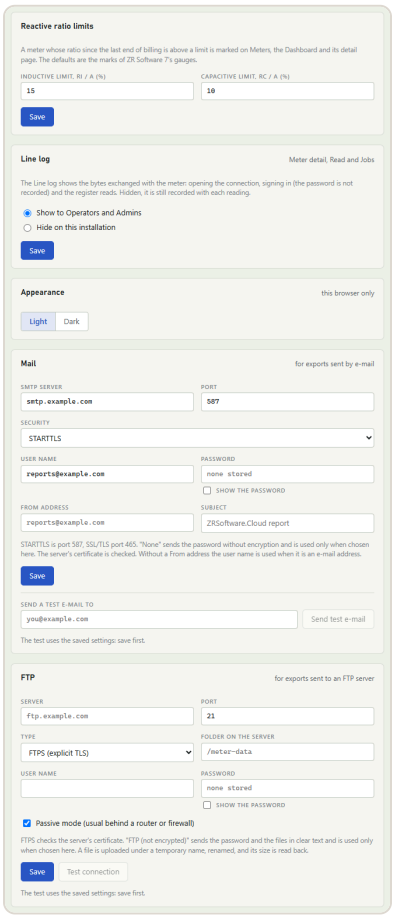
With **SFTP**, the service sends files only to a server whose key you have trusted on this card:

1. Choose **SFTP**, fill in the other boxes and click **Save**. The line **Trusted server key** says "none yet (shown by the connection test)".
2. Click **Test connection**. The first test uploads no file: it shows "Not connected: the server's key is not trusted yet: check it and trust it in the FTP card in Settings", and under it the key the server showed, a text that starts with SHA256:.
3. Compare that key with the one the server's administrator gives you. Only when they are the same, click **Trust this key**. The card shows "Server key trusted: test again".
4. Click **Test connection** again.

From then on the service sends files to this server only while it shows the same key. If the key changes, the test and every export run fail with "the server's key changed: it is not the trusted one (nothing was sent)". **Test connection** then shows the new key with **Trust this key**; trust it only after the server's administrator has confirmed the change. Saving another server, another port or another type forgets the trusted key, and the key has to be trusted again. Trusting a key is written to the event list as a warning.

NOTE

While a REDZ support session runs (see Support), REDZ support works with the rights of an Admin. It cannot change its own account or the support session, it cannot change the remote access settings on the **Remote access** card, and it cannot change or test the mail settings on the **Mail** card. On this page that means: REDZ support sees the **Mail** card but cannot save it, remove its password or send a test e-mail; it can change the **Line log** card, also show a hidden Line log again, and the **FTP** card, trust a server key, use the **Updates** card and download or restore a configuration backup. Restoring a configuration backup adds the settings of the file that this program does not have yet: the mail and FTP settings without their passwords, the reactive ratio limits, the Line log choice and the number of days a phone stays trusted for remote sign-in. A restore needs an administrator only; it also works during a REDZ support session. An import during the session writes the meter passwords of a ZR Software 7 database or of an Excel file; an import of a ZR Software 7 database during the session, also a copy that REDZ support uploads, can set that database's mail server with its user name and password, when none is set here and the licence includes exports. Each change REDZ support makes or tries to make is a row in Jobs & events with the source REDZ support. Requests that only check or test leave such a row too, for example a check for updates or a test of the FTP connection.



`Figure 16.1` The top of the Settings page with sample mail server values; no mail password is stored.

Remote access

The cards **Remote access** and **Who may sign in remotely** let the users you allow reach this PC through a relay with the ZRSoftware phone app. This PC only opens an outgoing connection, and remote access is off until an admin turns it on. REDZ support does not need these cards to be set up: a REDZ support session started on the **Support** page uses REDZ's connection details in place of the card's, and when it ends it leaves them empty and remote access off. Both cards are described in Remote access and the mobile app.

Updates

The **Updates** card is shown to administrators. Its title line shows the installed version. The card tells whether a newer version of ZRSoftware.Cloud is out and installs it when you ask. The list of versions comes from the REDZ licence server, the same server the online licence uses (see License), so this PC must be able to reach it.

An admin, or REDZ support during a support session, can download and install an update.

Line	What it shows
Maintenance until	The last day of your licence's maintenance, or **no end date** when there is no licence with an end of maintenance, also during the trial.
Last check	When the program last asked for the list of versions, or **not yet**. After a check that failed, the reason follows.
Latest	Only when the last check found a newer version: its number, the day it was released, and whether it is **included in your maintenance** or came out **after your maintenance**.
What's new	What that version brings, as REDZ wrote it in the list.

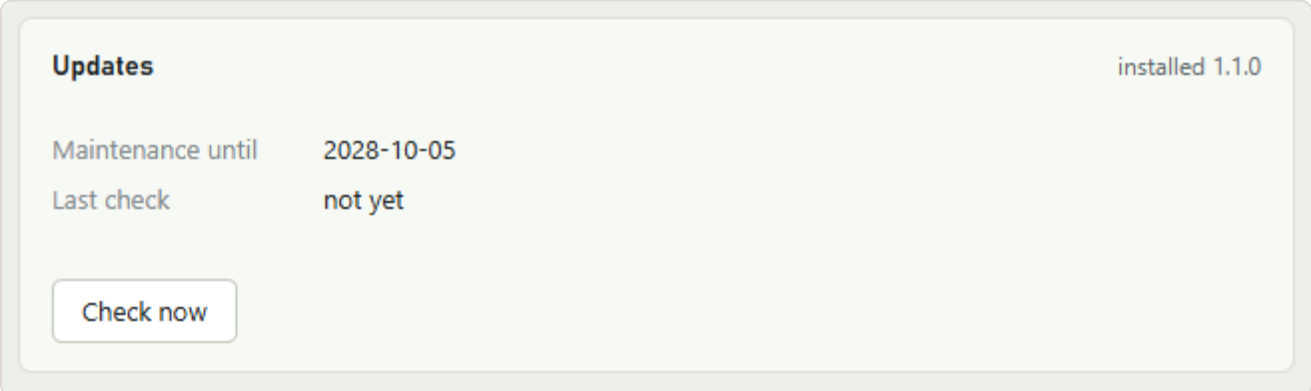


Figure 16.2 The Updates card before the first check (sample values).

Check now fetches the list at once. The program also checks by itself when the last check is a day old or more: it looks five minutes after the service starts and then every hour. A check downloads and installs nothing.

REDZ signs the list. The program accepts it only when the signature matches a key built into the installed version, so a list that did not come from REDZ is refused and nothing changes; **Last check** then says "the update list was refused:" with the reason.

A version released on or before the last day of your maintenance can be installed. A version released after it is shown, but it cannot be installed: the card says so and asks you to contact REDZ. When an earlier newer version is still within your maintenance, the card offers that one instead. Without an end of maintenance (during the trial or after it, without a licence, or with a licence without one) every newer version can be installed. When there is nothing newer, the card says that the installed version is the latest version.

1. When the card offers a version, click **Download** (the button names the version). The service downloads the setup of that version from the licence server and keeps it only when its size and checksum match the signed list; otherwise it deletes the file and the card shows why.
2. Click **Install** (it names the version too). The card first asks in its place whether to install that version now, and says that the service stops for about a minute and reads wait. Click the second **Install** to go on; **Not now** leaves everything as it was.
3. The card then says that the updater starts the setup of that version within 5 minutes, that the service stops for about a minute, that a backup is made first, and that the previous version comes back by itself if the new one does not start.
4. Within 5 minutes the update task of Windows (see Installation and first start) checks the downloaded setup against the signed list once more and runs it without pages. The setup upgrades the program in the steps described in Installation and first start: it stops the service, copies the database, and starts the old version again if the new one does not answer.

While the service is stopping for the update, an action on the pages fails with a message that starts with 503 (see Signing in and the window).

The card then shows the time and the last result of the updater: that it started the setup, or why it refused to. The steps of the upgrade itself are in setup.log in the data folder. An update installed from the Updates card runs the setup without its pages; what it reports is in setup.log. The card does not say whether the upgrade itself worked: look at the installed version in the title line, and at setup.log.

REDZ has tried this with its licence server: a PC with version 1.0.1 updated itself from the licence server to version 1.1.0 and then ran version 1.1.0.

When the updater refused to start the downloaded setup, the card shows why in the last result and offers **Download** again for the same version; **Install** is offered again once that version is downloaded again.

After an update, click **Check now**: until the next check the card still shows what the last check offered.

Every download and every install request is written to Jobs & events with the source Update, also when it is refused (see Jobs & events). A **Check now** that fails is written there too, as a warning with the source Update that starts "update check failed:" and gives the reason. A check that works, and the program's own check, leave no row of the source Update.

Message	What to do
"no update list has been published yet"	REDZ has not published a version list. Nothing to install; check again later.
"check for updates first"	Click **Check now**, then **Download**.
"download the update first"	Click **Download** before **Install**.
"the licence server could not be reached" with a reason	This PC cannot reach the REDZ licence server at the moment, or, after **Download**, the file could not be written on this PC. Check the PC's internet connection, then click **Check now** or **Download** again (see Troubleshooting).

Configuration backup

The **Configuration backup** card is shown to administrators. It saves the set-up of the program in one file and adds the set-up of such a file to this program, on this PC or on another one. It holds no readings. It is not the copy of the database that the setup makes in the Backups folder of the data folder (see Installation and first start).

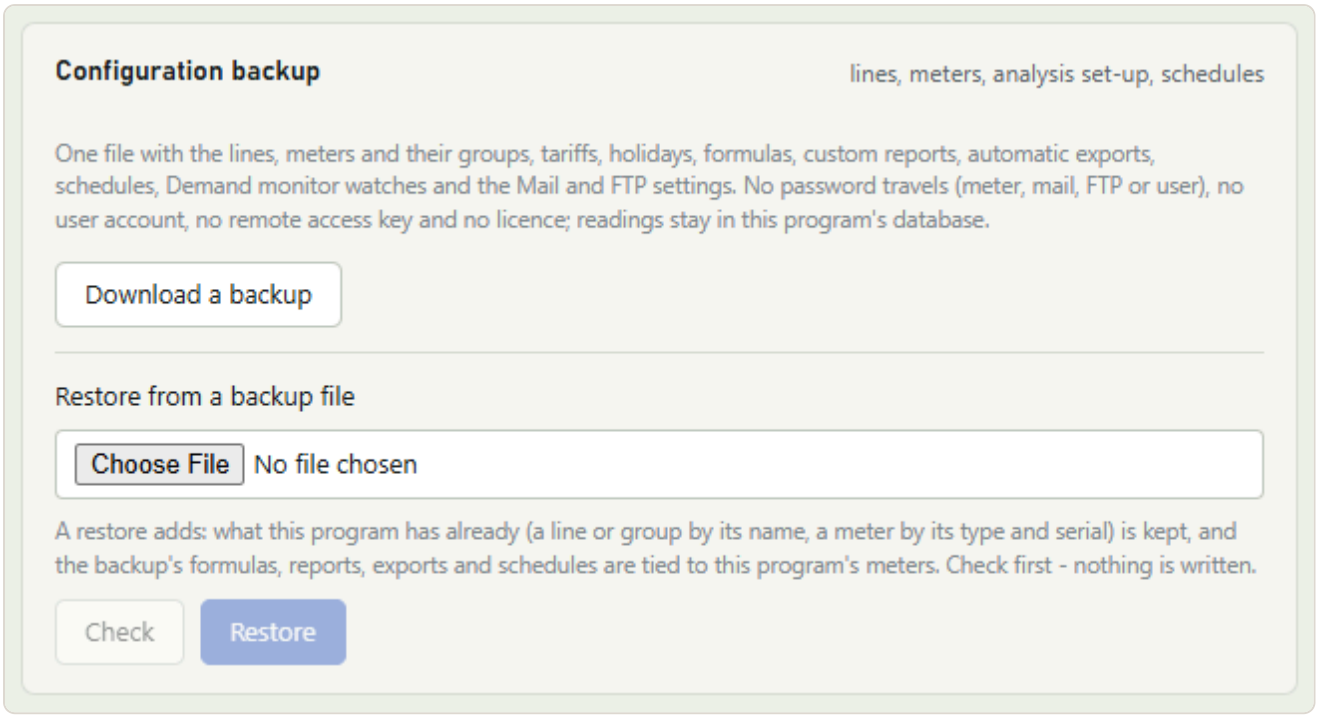


Figure 16.3 The Configuration backup card before a file is chosen (sample program).

Click **Download a backup**. The browser saves a file whose name starts with ZRSoftware_Backup_ and goes on with the date and time and .json.

The file holds the communication lines with their ports and addresses; the active meters with their type, serial number, location, address, multiplier and its changes, groups and driver settings, and whether a meter password was stored; the meter groups, tariffs, holidays, formulas and custom reports; the automatic exports with their targets, which means their e-mail recipients and folders; the schedules; the Demand monitor watches with their warning e-mail addresses; and these settings: the mail server with its user name, From address and subject, the FTP server with its user name, folder and trusted key, the reactive ratio limits, the days a phone stays trusted for remote sign-in, and the Line log choice.

The file holds no password (no meter, mail, FTP or user password), no user accounts, no remote access site key and no licence, and no readings, jobs or events. Archived meters are not in it.

> **WARNING**
> The backup file is plain text and is not encrypted. It contains e-mail addresses, the addresses of your lines and the user names of your mail and FTP servers. Keep it where only the people who may see these can open it.

To restore:

1. Under **Restore from a backup file**, choose the backup file.

2. Click **Check**. The program goes through the whole restore and writes nothing. The card shows "Check: nothing was written." and a table with, for each kind of item, how many would be **Added**, how many are **Already here** and how many are **Left out**, with notes below it.
3. When the table is what you expect, click **Restore**. It can be clicked only after a check of the chosen file. The card then says "Restored. Pages show the added items after they load again."

A restore only adds; it never changes what is already here. A line with the same name, or on the same COM port or the same address and port, is the same line; a meter of the same type and serial number is the same meter, and it gets the groups of the backup in addition to its own. Groups, tariffs, formulas, custom reports and schedules count as the same when they have the same name, a holiday when it has the same day and the same every-year choice, and an export when it has the same source, data, target with its recipients or folder, and time. A setting is added only when this program has none. Because a restore can put meters into groups, a Viewer or an Operator who sees only some groups may see more meters after it (see Users).

The formulas, reports, exports, schedules and watches of the backup are tied to this program's meters. One that uses a meter or formula that did not come with the restore is left out; a schedule keeps the meters that are here and is left out only when none is left.

The meter limit of the licence holds: meters above it are left out, and a note says so. Watches above the limit of the Demand monitor are left out too, without a note. The notes also say how many added meters had a password, which you then type again on the **Meters** page, and, when the backup has a mail server and settings were added, that the mail and FTP passwords do not travel: enter them in Settings if those settings were added.

> **WARNING**
> Restored exports and schedules come with the on or off state they had in the backup, and those that are on run at their next time. If the PC the backup came from still reads these meters or sends these exports, the meters are read twice and the files are sent twice: clear **On** on one of the two. Look at **Automatic reading** and **Export schedules** after a restore. The target of a restored export is not checked as it is when you save: a folder is not tried with a test file, and an e-mail or FTP target comes in even when the **Mail** or **FTP** card is not set up. Open the export and save it to have it checked.

A file larger than 20 MB, a file that is not JSON and a JSON file that is not a configuration backup of this program are refused, for example with "the file is not a configuration backup (not JSON of ZRSoftware.Cloud)". A backup of a newer version is refused too: update this program first.

Each download and each restore is written to the event list with the source Backup and the user name of the administrator; a check is not written. During a REDZ support session REDZ support can download and restore a backup too, and its rows name REDZ support.

First start steps

The card **First start** is shown to administrators. **Open the first start steps** opens the steps of the first start again (see Installation and first start).

17 Remote access and the mobile app

With remote access, the users you allow can work with this program from the ZRSoftware app on their phone when they are outside the local network. The program reaches the phone through a relay on the internet: this PC only opens an outgoing connection to the relay, and nothing on this network is opened. Remote access is off by default.

Everything the phone app and the program exchange travels through the relay: the user name and password at sign-in, the sign-in code and the data the app shows. This PC connects to the relay with https.

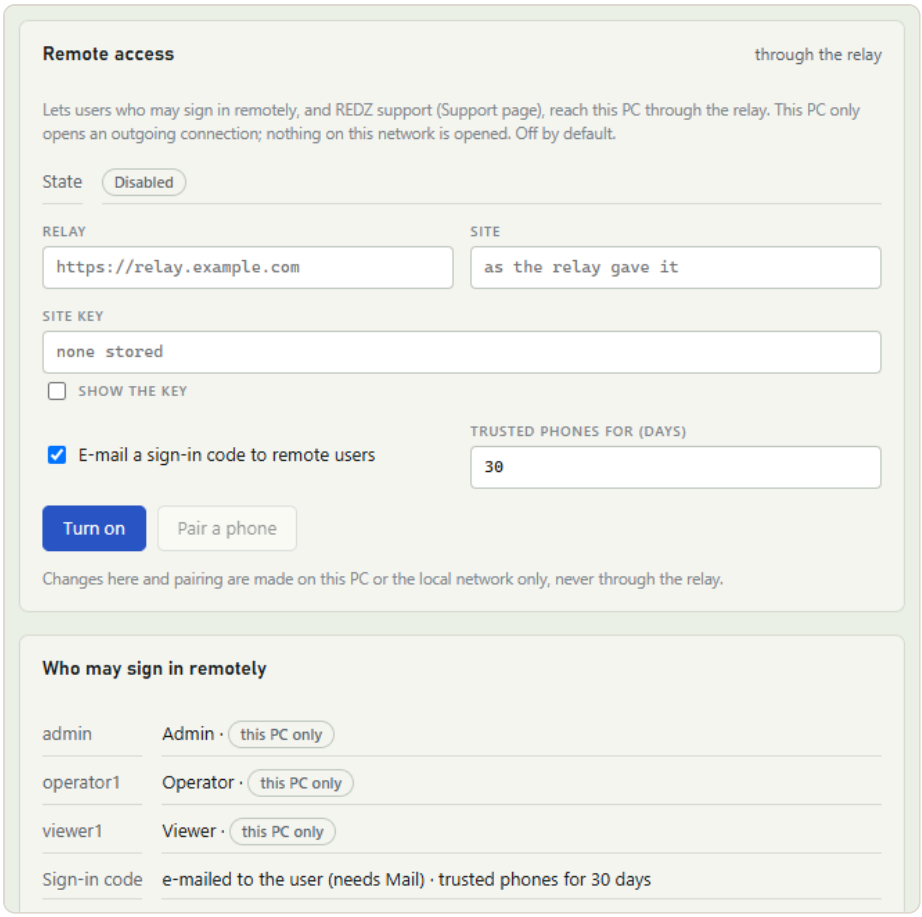
Through the relay only this program is reached, not other devices on your network. Apart from REDZ support during a support session, the relay does not carry the program's pages: a remote user works in the phone app, not in a web browser.

Turning remote access on

The **Remote access** card on **Settings** is shown to administrators. Its settings cannot be changed through the relay.

Turning it on needs a licence that includes **Remote access**; the trial includes it. Without it the card is still shown, but turning remote access on is refused.

1. Type the **Relay** address, the **Site** name and the **Site key** that REDZ gave you for this PC's site on the relay.
2. Leave **E-mail a sign-in code to remote users** ticked (see "The sign-in code" below).
3. Click **Turn on**.



`Figure 17.1` The Remote access card before it is turned on, and the list of who may sign in remotely (sample users).

The relay address starts with https://. Without all three the program refuses to turn remote access on.

The site key is stored encrypted on this PC and is never shown again; **Show the key** shows only what you type. Leave the box empty to keep the stored key, or type a new key to replace it.

State shows the connection: Disabled, Incomplete, Connecting, Connected, Reconnecting or Disconnected. While it is connected it shows since when. It also shows the time of the last request that came through the relay and the last error. The card asks for the state every 5 seconds.

When the licence does not include remote access, the program does not connect and the state gives the reason. When this PC cannot read the stored site key, the state is Incomplete with "the stored site key cannot be read on this PC: enter it again". When the relay says that the site is not a ZRSoftware.Cloud site, the program leaves the connection, the state says why, and it does not try again until the relay address, the site name or the site key changes, remote access is turned off and on, or the service starts again.

When meters are not read any more, for example after the trial or the licence has ended, remote access stops with the reading: the connection closes and sign-ins through the relay are refused. A REDZ support session is not stopped by this (see Support).

A configuration backup (see Settings) carries only the **Trusted phones for (days)** value of this card: not the relay address, the site name, the site key or the sign-in code setting, and no user.

Who may sign in remotely

Remote access alone lets nobody in. A user can sign in through the relay only with **Remote sign-in (through the relay)** ticked in the user's form on **Users**. The box is in the **Edit** form only: a new user starts without remote sign-in, and an administrator ticks it afterwards. Any role can have it.

While the sign-in code is on, ticking the box needs an address in the user's **E-mail** box and a set-up **Mail** card. Otherwise the program refuses with "set up the Mail card in Settings first: a remote sign-in needs the e-mailed code" or "the user needs an e-mail address for the sign-in code".

The **Mail** card needs a licence that includes **Exports and e-mail**. While the code is on and Mail is not set up, the **Remote access** card says "Set up Mail above first: without it no user can be allowed to sign in remotely."

Signing in through the relay needs a licence that includes **Mobile app**; the trial includes it. When the licence stops including it, the remote sessions end at once.

A user who has a one-time password cannot sign in through the relay. They first set their own password on this PC (see Signing in and the window).

The **Users** list shows each user's **E-mail** and, under **Remote**, whether the user may sign in remotely or only on this PC. The card **Who may sign in remotely** on **Settings** shows the same for every user, whether the sign-in code is e-mailed and for how many days phones are trusted; **Open Users** opens the Users page.

That card also lists users who are turned off and, once REDZ support has signed in on this PC, the user redz-support with remote sign-in. That user signs in only during a REDZ support session (see Support).

The sign-in code

With **E-mail a sign-in code to remote users** ticked, a sign-in through the relay also asks for a six-digit code. The program e-mails it with the server of the **Mail** card to the user's own address, with the subject "ZRSoftware.Cloud sign-in code". The code works once and for 10 minutes. Within a minute of a code no new one is sent, and after five wrong codes the code is dropped.

A wrong code counts like a wrong password: five wrong passwords or codes in a row lock the user for 15 minutes.

When the code cannot be e-mailed, the sign-in is refused with "the sign-in code could not be sent; check the Mail card in Settings on site".

When you clear the box, a remote user signs in with the user name and password alone: anyone who knows them can then sign in from outside the local network, and phones are not remembered.

Pairing a phone

A phone is paired from the **Remote access** card, never through the relay. **Pair a phone** works when the relay address, the site name and a site key this PC can read are stored, and the licence includes **Mobile app**.

1. Click **Pair a phone** on the **Remote access** card.
2. A box shows a QR code and the same code as text. The program gets the code from the relay.
3. Follow the box: "On the phone, open the ZRSoftware app, Site setup, and scan this code or type it as the setup code."

The box says that the code works once, for one phone, until the time it shows. Pair each phone with a new code.

The QR code holds the relay address, the site name and the code; it does not hold the site key.

Pairing signs nobody in. To work in the program, the user signs in on the phone with their own user name and password.

Trusted phones

After a correct code, the phone app can ask the program to remember the phone. A remembered phone is not asked for the code again for the days in **Trusted phones for (days)**: 30 by default, from 1 to 365. A new number counts for phones remembered after the change.

When a phone is remembered, the program e-mails the user that a new device was remembered (see Users).

On a remembered phone the app can stay signed in without asking for the code again until the phone's trust ends.

In the user's **Edit** form, **Trusted phones** lists the phones remembered for this user, each with the short description the phone app sent about itself and the date its trust ends or ended. **Forget these phones** forgets all of them: the code is asked again at the next sign-in, and a phone that stays signed in on its trust is signed out. A session that the app renews in another way goes on; to end every remote session of a user at once, take remote sign-in away or give a new one-time password.

The program also forgets a user's remembered phones when the user changes the password and when an administrator gives a new one-time password, changes the role or the meters the user sees, turns the user off, or takes remote sign-in away.

What a remote user cannot do

A user who signs in from the phone app cannot:

- change a password, their own or another user's;
- add a user;
- change a user's e-mail address or **Remote sign-in (through the relay)**;
- change the settings on the **Mail** card or send its test e-mail;
- change the **Remote access** card or pair a phone;
- request or end REDZ support.

Everything else follows the user's role and the meters the user sees, as on this PC: the program does not hold back other changes that come through the relay, for example of a user's role or of turning a user on or off. What the phone app offers is told in the app's own manual.

A configuration backup can be restored through the relay too (see Settings). Restoring a configuration backup adds the settings of the file that this program does not have yet: the mail and FTP settings without their passwords, the reactive ratio limits, the Line log choice and the number of days a phone stays trusted for remote sign-in. A restore needs an administrator only; it also works during a REDZ support session.

Sign-in requests that come through the relay are limited to 10 a minute in total, for all remote users together.

A very large answer is not sent through the relay: the program answers that it is too large and asks for less, for example a shorter range or a coarser step.

Turning remote access off, and a lost phone

Turn off on the card closes the connection; nobody reaches the program through the relay until you turn it on again or ask for REDZ support (see below). The relay address, the site name and the site key stay until then.

To stop one user, clear **Remote sign-in (through the relay)** in the user's form and click **Save**. The user's remote sessions end at once; sessions on this PC go on.

This program keeps no list of paired phones; **Trusted phones** are only the phones remembered after a sign-in code. When a phone is lost, take remote sign-in away from its user, or give the user a new one-time password; both also forget the user's remembered phones.

REDZ support and remote access

REDZ support is asked for on the **Support** page, in the card **Request REDZ support** (see Support). It does not need remote access to be on, nor a licence that includes **Remote access** or **Mobile app**.

While a REDZ support session runs, the program uses REDZ's connection details in place of the relay address, the site name and the site key on the **Remote access** card. When the session ends, the program removes these details and turns remote access off; your own details are not put back. To let remote users in again, type the **Relay** address, the **Site** name and the **Site key** again and click **Turn on**.

> **WARNING**
> While the session runs, end it only with **End now** on the **Support** page, and do not use **Save**, **Turn off** or **Pair a phone** on the **Remote access** card: they work on REDZ's connection details. **Save** or **Turn off** there ends the session on this PC without telling REDZ and leaves REDZ's details on the card; after **Save** this PC also stays connected through REDZ's connection, without an end.

During the session REDZ support works with the rights of an administrator, but it cannot change its own account or the support session, change the settings on the **Remote access** card or pair a phone, change or test the settings on the **Mail** card, change a user's e-mail address or remote sign-in, or reset the password of a user who may sign in remotely or of the last enabled administrator. Unlike a user of the phone app, REDZ support can add users and give a new one-time password to a user who may not sign in remotely (see Support).

Remote access in the event list

Jobs & events > **Event log** gets a row with the source Remote access when the card is saved, turned on or turned off (with the relay address and the site name, never the site key), when a pairing code is issued (the code itself is not written), when the relay refuses a pairing code or cannot be reached, and when the program leaves a site that is not a ZRSoftware.Cloud site.

Rows with the source Auth say when a user signed in from outside the local network, when a sign-in code was sent and to which address (partly hidden), when a code could not be sent, when a code was dropped after five wrong tries, when a remote sign-in was refused because the user may not sign in remotely or has no e-mail address, when remote sign-in was allowed or taken away, and when an administrator clicked **Forget these phones**.

The rows about saving the card or turning remote access on or off, a pairing code, allowing or taking away remote sign-in and forgetting phones do not name the administrator who did it.

Other work of a remote user leaves the same rows as on this PC; apart from the sign-in, a row does not say that the user worked through the relay.

18 License

The **License** page shows the licence of this PC. Everyone who signs in sees the status; only administrators see the cards that request, activate, load, move or remove a licence.

During the trial, when meters are not read because of the licence, after maintenance has ended, and in the seven days of reading described under **Withdrawn** below, a strip at the top of every other page shows the licence message and a **License** link to this page. The strip is red when meters are not read, and amber otherwise.

The status

The **Status** card shows the state of the licence, the program's message about it and these facts:

Line	What it shows
Licence, **Customer**	The licence number and the customer, when a licence is loaded.
Valid until	The last day of the licence or the trial and the days left, or **No end date** for a licence without an end date. Without a licence or trial it shows a dash. A licence ends at the end of that day by the PC clock.
Meters	The number of active meters and the licence's meter limit, or "no limit".
Features	The parts of the program the licence includes, or **All features** when it includes every feature in the table under "Features and the meter limit" below. While meters are not read, only the parts that stay open then.
Maintenance until	The last day of maintenance, marked "ended" after that day.
Machine ID	A short code of this PC and how many of its three parts the program could read. On a virtual PC a **virtual PC** chip follows it.
Last check-in	When the program last asked the REDZ licence server about this licence, and the answer; for a licence file made for a PC without internet, that it is not checked online.

State	Meaning
Trial	The trial runs. Meters are read; every feature is open and there is no meter limit.
Licensed	A licence for this PC is loaded and valid.
Trial ended	The trial is over and no licence is loaded. Meters are not read.
Ended	The licence's last day has passed. Meters are not read.

State	Meaning
Another PC	The licence is for another PC. Meters are not read once the trial is over.
Clock behind	Without a licence once the trial has begun on this PC, or with a licence that has an end date: the PC clock is more than 24 hours behind a time the program has already seen. Meters are not read; see The check-in below. The program also counts the time it has been running, so setting the clock back by less than 24 hours again and again adds up.
Version after maintenance	This version of the program was built after the maintenance of the licence ended. Meters are not read; install a version released by the last day of maintenance, or ask REDZ to extend the maintenance.
Withdrawn	The seven days of reading after one of the licence server's answers or the long time without it (see The check-in below) have passed, or the licence server said that this virtual PC is a copy, which stops reading at once. Meters are not read.
No licence	There is no licence and no trial on this PC. Meters are not read.

On a physical PC a licence stays valid while at least two of its machine parts still match this PC: two of the three, or both when only two could be read. A licence needs at least two machine parts. On a PC where the program can read only one, the licence server refuses a key or a request and says to contact REDZ, and a licence file that knows fewer than two parts counts as one for another PC. On a virtual PC every part must match (see below).

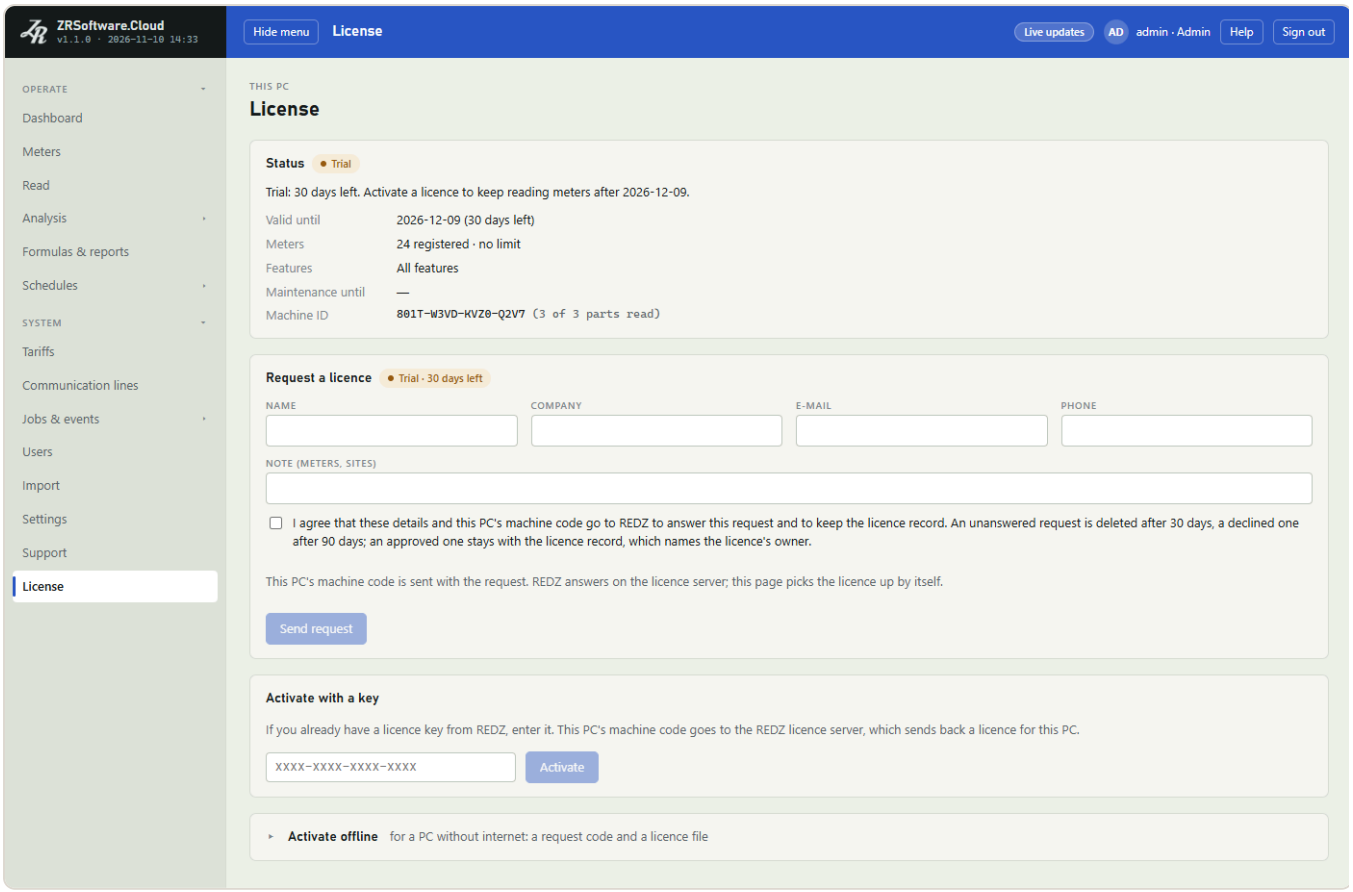


Figure 18.1 The License page during the trial with sample meters: the Status card in the Trial state, the Request a licence and Activate with a key cards, and Activate offline folded.

The trial

The program runs as a trial for 30 days, counting the day it first ran on this PC. During the trial every feature is open and there is no meter limit. The message shows the days left and the last day.

The 30 days count from that first day even when a licence is loaded from the start. Removing or moving the licence therefore does not start a new trial: without a licence, meters are read only while those 30 days still run.

The first day of the trial is kept so that removing the data folder or a part of it does not start a new trial. A data folder copied from another PC does not bring a new trial.

Ways to get a licence

A licence works only on the PC it was made for. A licence key can be in use on as many PCs at the same time as REDZ set for that licence, one unless REDZ set more. There are three ways to get a licence, all on this page:

- **Request a licence**: send your details to REDZ over the internet; the licence arrives by itself once REDZ approves it.

- **Activate with a key**: enter a licence key you already have from REDZ.
- **Activate offline**: for a PC without internet, exchange a request code for a licence file.

The first two need this PC to reach the REDZ licence server. Setup sets its address, so on an installed program without a licence both cards are on the page and **Activate offline** is folded below them; click its title to open it.

Requesting a licence

The **Request a licence** card is there while no licence is loaded. During the trial its title shows the days left.

1. Fill in **Name**, **Company** and **E-mail**. **Phone** and **Note (meters, sites)** are optional; use the note to tell REDZ how many meters and which sites the licence is for.
2. Read the agreement below the boxes and tick it. It says that the details and this PC's machine code go to REDZ to answer the request and keep the licence record, how long REDZ keeps an unanswered or a declined request, and that an approved request stays with the licence record.
3. Click **Send request**. It is available once the agreement is ticked and the name, company and e-mail are filled in.

An approved request, with the details in it, stays on the licence server with the licence record, as the agreement says. A withdrawn request is deleted at once; unanswered and declined requests are deleted after the times the agreement names.

The request carries the details you typed, this PC's machine code and the program version. The machine code holds only codes made from the parts of this PC, never their serial numbers.

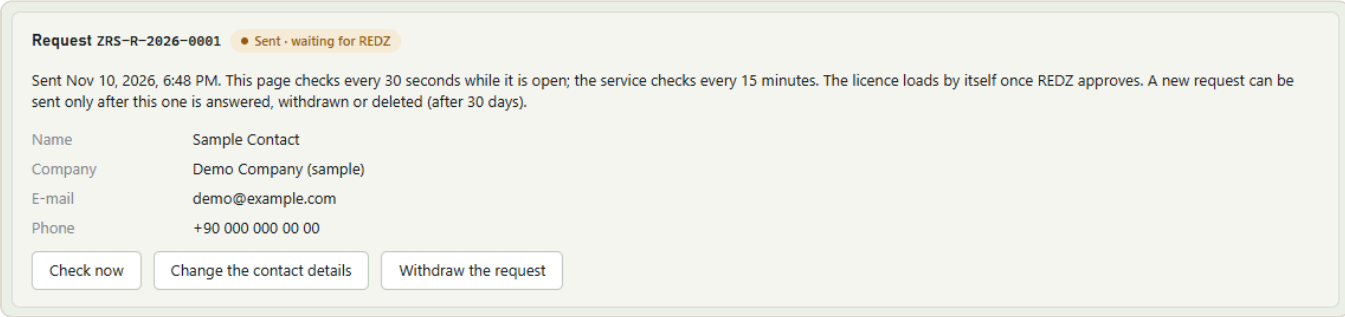
REDZ sees the request on its licence server and approves it with the terms of your licence, or declines it, with a note if REDZ writes one.

After sending, the card shows the request number, the time it was sent, your contact details and a chip that says it waits for REDZ.

- The page asks the licence server about the request every 30 seconds while it is open, and the program asks every 15 minutes without the page. **Check now** on the card asks at once.
- When REDZ approves, the licence loads by itself and the card goes away. If the page is open at that moment, a green banner names the licence received from REDZ; the event log has a line in any case.
- **Change the contact details** opens the boxes again while the request waits. **Save the contact details** corrects them on the licence server. The **Note (meters, sites)** box opens empty, and what it holds when you save replaces the note sent with the request: type the

note again. **Cancel** closes the boxes without sending anything, but the card goes on showing what you typed until the page is opened again.

- **Withdraw the request** deletes the request on the licence server, and the form shows again.

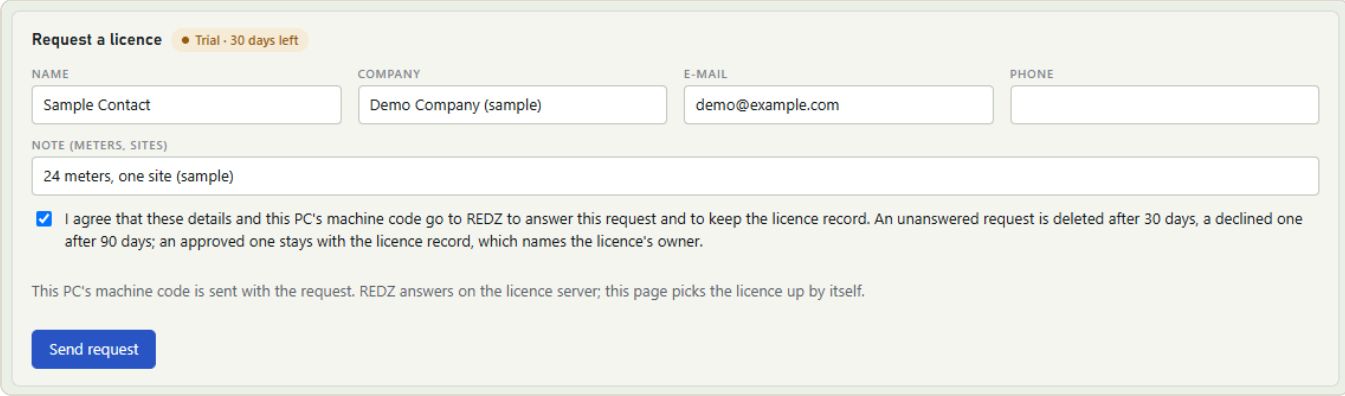


`Figure 18.2` A sample licence request waiting for REDZ: its number, the time it was sent, the contact details and the three buttons.

> **NOTE**
> This PC can have one request waiting at a time. A new one can be sent after it is answered, withdrawn, or deleted by the licence server after 30 days.

If REDZ declines the request, or the licence server no longer has it, an amber banner on the card says so, with REDZ's note if there is one. Click **OK** to clear it and send a new request.

What goes wrong with a request, for example when the licence server cannot be reached, is shown in red at the top right of the card itself.



`Figure 18.3` The Request a licence card filled in with sample contact details and the agreement ticked, before Send request.

Activating with a key

1. In **Activate with a key**, type the licence key: 16 letters and digits in four groups.
2. Click **Activate**. The key, this PC's machine code and the program version go to the REDZ licence server, which sends back a licence for this PC.

A green banner names the licence activated online. If the server refuses, a red banner at the top of the page says why, for example: the key is not known, the licence was withdrawn or has ended, or it is in use on another PC and must be moved from there first.

The licence file

Without internet on this PC, you get the licence as a file from REDZ or from the partner you bought the program from, in exchange for this PC's request code.

1. On the **License** page, open **Activate offline** (click its title if it is closed).
2. Send the request code to REDZ or to your partner: click **Copy request code** and paste it into your message, or take a photo of the QR code next to it.
3. REDZ or your partner sends back a licence file, license.zrl.
4. Click **Load licence file** and choose the file.

When the file is accepted, a green banner names the licence number and the status changes at once. The program keeps the file as license.zrl in its data folder.

> **NOTE**
> Loading a licence file, or activating one online, replaces the licence in use: the new licence is written over license.zrl.

The program refuses a licence file and says why when:

- the file is not a licence file ("not a licence file");
- the file was changed after REDZ made it ("the signature does not match");
- the licence was made with a key this version of the program does not know;
- the licence is for another PC; the message says how many of the machine parts match, or why the licence fits no PC;
- the licence was removed from this PC before; ask REDZ or your partner for a new one;
- the file is larger than 64 KB;
- this PC is a virtual PC, which takes its licence online only (see below).

A licence file made for a PC without internet is not checked with the licence server; **Last check-in** says so.

The check-in

With a licence activated online or received through a request, the program checks in with the REDZ licence server once a week, and on a virtual PC once a day. The check-in sends the licence number, this PC's machine code, the program version and the number of active meters, and also the check-in counter the licence server gave this PC last. When the server cannot be reached, the program tries again after six hours; it also checks in every six hours while meters are not read and during the seven days of reading described below.

Only the REDZ licence server's own answer to this check-in counts; any other answer is taken as "the licence server could not be reached".

The licence server keeps each check-in with the licence record: its time, the program version and the number of meters. It keeps them with no time limit. With each check-in it also keeps, with no time limit, the record of this PC's seat: a code made from parts of the PC, the last version and the number of meters.

Administrators can check in at once with **Check now** under the facts of the **Status** card.

If the PC clock was set forward and then put right, the state becomes **Clock behind** and meters are not read. Reading starts again by itself when the PC clock is again less than 24 hours behind the latest time the program saw; the further the clock had been set forward, the longer that takes. With a licence that is checked online, a good check-in puts it right at once. Contact REDZ if you cannot wait. A clock that was set back and is then put right does not stop the reading.

When the licence server says that the licence was withdrawn or moved, or that it does not know it on this PC, the program goes on reading meters for seven days and then stops (the state **Withdrawn**); a copy of a virtual PC stops at once. On a physical PC the same seven days follow when the licence server says that this PC checked in with an old counter: a copy of this PC, a second installation on it, or one put back from a backup. From that answer on, the licence server gives the same answer to every check-in of this PC's licence, also to the installation that was there first, until REDZ accepts the PC again; activating the licence again does not change it.

The message of the licence then says so, with the day the seven days count from and until when meters are read. On the **Status** card it is an amber banner below the facts, and the strip at the top of the other pages shows it too. The seven days count from the day the licence server gives for that change, or else from its first such answer. Contact REDZ. When the server later answers that the licence is fine again, the seven days are cancelled.

An online licence also needs the licence server now and then. If this PC has not reached it for more than 60 days, on a virtual PC for more than 7 days, the message and the strip say so and the seven days of reading begin, counted from the day that time ran out. As the message says, "let this PC reach the licence server (a good check-in reads meters again), or contact REDZ." A licence file made for a PC without internet is not counted this way.

Virtual PCs

When the firmware of this PC names a virtual machine maker, the program treats it as a virtual PC and shows the **virtual PC** chip next to the **Machine ID**. On a virtual PC:

- the licence is activated online only, with a key or a request; a licence file is refused and **Activate offline** says so. A licence file that reaches the data folder another way is not used either: the message begins "The licence file was not accepted: on a virtual PC the licence is activated online";

- a licence made for a physical PC does not fit: the message says "it was made for a physical PC and this is a virtual PC";
- the licence fits only while every part of the virtual PC still matches, a fourth part that tells virtual PCs apart included;
- the program checks in every day;
- if a copy of the virtual PC, or one put back from a snapshot, checks in, the licence server marks the licence of this virtual PC as copied: from then on it answers "copied" to the original as well as to the copy. From that answer the state is **Withdrawn** and meters are not read, without the seven days; the message on the **Status** card says so. Contact REDZ: when the licence server answers that the licence is fine again, reading starts again;
- if the virtual PC has not reached the licence server for more than seven days, the message and the strip say so and the seven days of reading begin; let the PC reach the internet again: a good check-in reads meters again.

Features and the meter limit

A page whose feature the licence leaves out is not in the menu, and the program refuses its actions.

Feature	Pages
Analysis and tariffs	The **Analysis** section of the menu with **Profile**, **Completeness** and **Demand monitor**, and **Tariffs**; also the analysis of a formula or a custom report
Formulas, **Custom reports**	**Formulas & reports**
Schedules	**Automatic reading** in the **Schedules** section of the menu; also importing schedules from an Excel file on **Import**
Exports and e-mail	**Export schedules** in the **Schedules** section of the menu; on **Settings**, the cards **Mail** and **FTP** are shown only with it, and the program's e-mails go through the mail server of that **Mail** card, the letters about the licence and the warnings of the **Demand monitor** among them; also importing exports from an Excel file on **Import**
Import	**Import**
Manual edit	No page of its own: typing in, importing and removing the load profile values of a virtual meter on **Analysis**. Without it these tools are not on the page, and a note says that the licence does not include Manual edit; while meters are not read, the note says that instead.
Remote access	No page of its own: turning remote access on, on the **Remote access** card of **Settings**; see Remote access and the mobile app. Asking for REDZ support on the **Support** page does not need it.

Feature	Pages
Mobile app	No page of its own: **Pair a phone** on the **Remote access** card, and signing in from the phone app from outside the local network. When the licence stops including it, the sessions from the phone app end at once; see Remote access and the mobile app.

An export of a formula or a custom report needs that feature as well as **Exports and e-mail**; without it the run is skipped and says that the licence does not include it.

The meter limit counts active meters. Virtual meters count toward the meter limit too. The count is the same for every user, also for a user who sees only some of the meters (see Users). When the limit is reached, no meter can be added or brought back from the archive, and the program says how many meters the licence allows; archive a meter or ask REDZ or your partner for a larger licence.

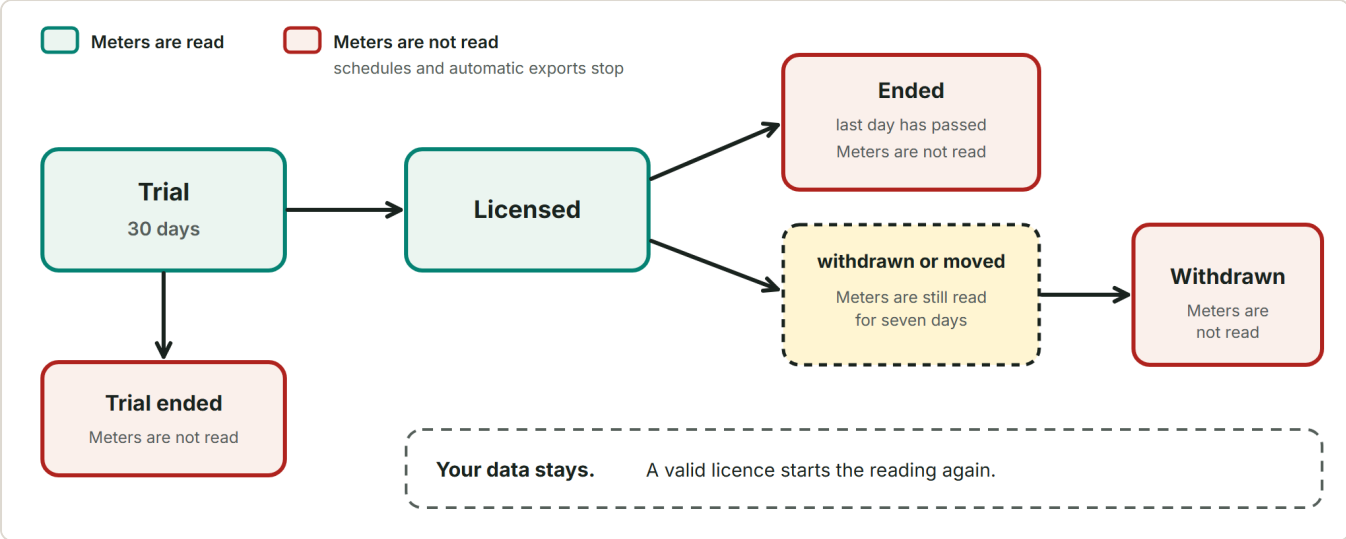
When more meters are registered than the licence allows, the meters registered first are read, as many as the limit, virtual meters among them; a virtual meter is never read, and its place does not go to another meter. The others, for example meters added during the trial, keep their data but are not read. **Read now** refuses them with the reason, reading the missing intervals on **Completeness** leaves them out and names the reason on their row, a schedule counts them as not read in its event log row, which is then a warning, and a job queued for them ends with the same reason. **Read now** for the meters chosen on the **Meters** page leaves them out and names the first five with the reason. Archive meters, or ask REDZ or your partner for a larger licence.

When the licence ends

When the trial or the licence ends, the PC clock is behind, the version was built after maintenance, the licence is for another PC, or the licence is withdrawn, the program stops reading meters, and schedules and automatic exports stop too; the import and the manual edit tools close as well. Your data stays.

Remote access closes as well, and sessions from the phone app end at once; see Remote access and the mobile app.

The message on the **License** page and in the strip says so, for example: "Meters are not read and automatic exports do not run." An action that is refused because meters are not read answers with the same message.



`Figure 18.4` The licence states: during the trial and with a valid licence the meters are read; after the trial or the licence ends, or seven days after the licence was withdrawn or moved, they are not read and schedules and automatic exports stop; your data stays.

Stops	Stays open
Reading meters, also reading missing load profile intervals and jobs already queued	The stored data, the meter pages and the analysis
Automatic reading: **Automatic reading** leaves the **Schedules** section of the menu	**Tariffs**, **Formulas & reports** and their analysis, when the licence includes them
Automatic exports	Running an export at once with **Run now**
The **Import** page and the manual edit tools of **Analysis**	Adding and changing meters and lines
Remote access and the sessions from the phone app	Asking for REDZ support on the **Support** page

A run of a schedule or an automatic export that was skipped is not made later: the next run is at its next planned time. Each skipped run writes a warning to the event log; see Jobs & events. A valid licence starts the reading again.

> **NOTE**
> When maintenance ends, the licence keeps working and meters are still read; the strip at the top shows the message about maintenance. Maintenance decides which updates this PC can install: the **Updates** card offers the newest version released by the last day of maintenance; a later one is named but not installed; see Settings. A version built after maintenance ended, also one installed by hand, does not read meters with this licence: the state is **Version after maintenance**. Setup does not put such a version in place of the installed one: it says so and changes nothing, and the installed version stays as it was; see Installation and first start. Removing the program and installing the new version does not get round this: the licence stays in the data folder, and the setup does not install such a version there either.

E-mail about the licence

The program e-mails its administrators about the licence: once a day in the last seven days before the trial or a licence with an end date ends, and once when meters stop being read because of the licence. A licence with an end date also gets that daily letter during the seven days of reading described under The check-in; then the days in its subject are the days of reading left, not the days to the licence's end. Each letter carries the licence's message, the user name and the time in UTC, and says to open **License**. A licence without an end date gets no such warning, and without a licence or a trial nothing is sent.

- It goes to every enabled administrator on **Users** who has an address in **E-mail**; the user of REDZ support gets none. When no administrator has an address, nothing is sent.
- The program looks a minute after the service starts and then every minute. What it sent is kept, so a restart of the service does not send the same letter again.
- **Jobs & events** gets a License row that says for how many administrators the letter was queued, and a Mail row for each letter, sent or not sent, with the address partly hidden.
- The letters go through the mail server of the **Mail** card on **Settings**, which is shown only when the licence includes **Exports and e-mail**. Without a mail server, each letter is a warning in the event log.

Moving the licence to another PC

Before this PC is replaced, move a licence that was activated online, so it can be activated on the new PC.

1. In **Move licence to another PC**, type the licence key.
2. Click **Move licence**, then confirm with **Move**, or click **Keep it here** to keep the licence on this PC.
3. The licence leaves this PC and the page shows a **Removal code**. On the new PC, activate the licence with the same key.

> **NOTE**
> A licence received through a request comes without a key, so it cannot be moved with this card: ask REDZ for a key, or remove it from this PC (below), which also frees this PC's seat on the licence server.

Removing the licence

Before this PC is replaced, the licence can also be removed from it. This is the way for a licence loaded from a file, so that REDZ or your partner can make a licence for the new PC.

1. In **Remove the licence**, click **Remove licence**.
2. Confirm with **Remove**, or click **Keep it** to keep the licence.
3. The page shows the **Removal code** with a note. Click **Copy removal code** if the note asks you to give the code to REDZ, and give it to REDZ or to your partner.

Before removing, the program asks the REDZ licence server to free this PC's seat. It sends the licence number, this PC's machine code and the licence file loaded here, which the licence server compares with the file it gave this PC. The note on the **Removal code** card says what happened:

- "The licence server freed this PC's seat: the licence can be activated on another PC now. Keep the code for your records." This is the answer for a licence the licence server gave this PC: activated with a key, received through a request, or a licence file REDZ made on its licence server.
- Otherwise the note says that the licence server did not free the seat, and why, for example when it cannot be reached or does not know the licence. The licence is still removed from this PC; give the removal code to REDZ or to your partner.

The event log has a line with the licence number, whether the seat was freed, and the removal code.

> **WARNING**
> Removing cannot be undone. The licence file is deleted and the same file cannot be loaded on this PC again. After removing or moving the licence, meters are read only while the 30 days of the trial of this PC still run.

> **NOTE**
> During a REDZ support session REDZ support can also do what this page offers administrators, for example load, move or remove the licence; each such change leaves a line in Jobs & events. See Support.

19 Support

The **Support** page is where you get help from REDZ support, or from the partner you bought the program from. It is in the System menu for administrators and has two cards: **Request REDZ support**, and **Diagnostics** with the support bundle.

Requesting REDZ support and sending the bundle to REDZ need this PC to reach REDZ over the internet; setup sets the address. Downloading the bundle works without the internet.

Requesting REDZ support

When REDZ support needs to look at this program, for example at a meter that is not read, ask for it here. REDZ support can then work in this program through REDZ's connection for the time you choose. As the card says: "Nothing on this network is opened, and nothing needs to be set up."

1. Choose how long: 4, 12 or 24 hours. 12 hours is chosen first.
2. Under **What is the problem?**, say what REDZ support should look at. Fill in **Name** and **E-mail**; **Phone** is optional.
3. Read the agreement and tick it. It says: "I agree that REDZ support may reach this program through REDZ's connection for the time chosen, with the details above. Every change REDZ makes and every file or reading trace it takes is in Jobs & events (the pages it only looks at are not); I can end it at any time."
4. Click **Request support**. It is available once the agreement is ticked and the name and e-mail are filled in.

The request sends the time chosen, the problem, your name, e-mail and telephone number, this PC's machine code, the licence number if there is one, and the program version to REDZ.

If REDZ cannot open the connection, or cannot be reached, a red banner on the card says so; try again in a few minutes or call REDZ.

The card then turns into **REDZ support is connected**, with the time it ends and its number. A green banner says until when REDZ support can reach this PC. The card repeats that every change REDZ makes and every file or reading trace it takes is in **Jobs & events**, and that the pages it only looks at are not.

- It ends by itself at that time.
- **End now** ends it; a green banner says "REDZ support ended."
- When REDZ ends it, the program notices within about 70 seconds while this PC reaches the REDZ licence server; if it cannot reach it, the session runs until its time. **End now** here always ends it: the program first tells the licence server, and when that server does not answer, the end can take up to about 40 seconds.

When the session ends, by you, by REDZ or by its time, the program also removes the details of REDZ's connection that the session brought; the next request brings them again.

A request for REDZ support puts REDZ's connection in place of the **Relay**, **Site** and **Site key** of the **Remote access** card; when this program's own remote access is on, the card says so in an amber banner before you ask. When the session ends with **End now**, by REDZ or by its time, remote access is off and those three boxes are empty: to use this program's own remote access again (see Remote access and the mobile app), an administrator types them again on this PC or the local network and clicks **Turn on**.

> **WARNING**
> While the session runs, end it only with **End now** on the **Support** page, and do not use **Save**, **Turn off** or **Pair a phone** on the **Remote access** card: they work on REDZ's connection details. **Save** or **Turn off** there ends the session on this PC without telling REDZ and leaves REDZ's details on the card; after **Save** this PC also stays connected through REDZ's connection, without an end.

If REDZ's connection cannot be made while the session runs, **Jobs & events** gets a warning with the source REDZ support: "REDZ support could not connect; ask REDZ".

While REDZ support is connected

While a REDZ support session runs, every user who signs in sees a small green window at the top right of every page. It says until when REDZ support is connected, and "REDZ is working in the program now." while REDZ support has used the program, or had it open, in the last two minutes.

For an administrator the window opens with a click on its title. Closed, its title offers the chat and **End now**, or says how many new messages from REDZ wait; open, it shows **Chat with REDZ** and **End now**, and its title says **Hide**. When REDZ writes a new message, the window opens by itself. Other users see only the line, without the chat.

The **Support** page says so too: "The chat with REDZ is in the green window at the top right of every page."

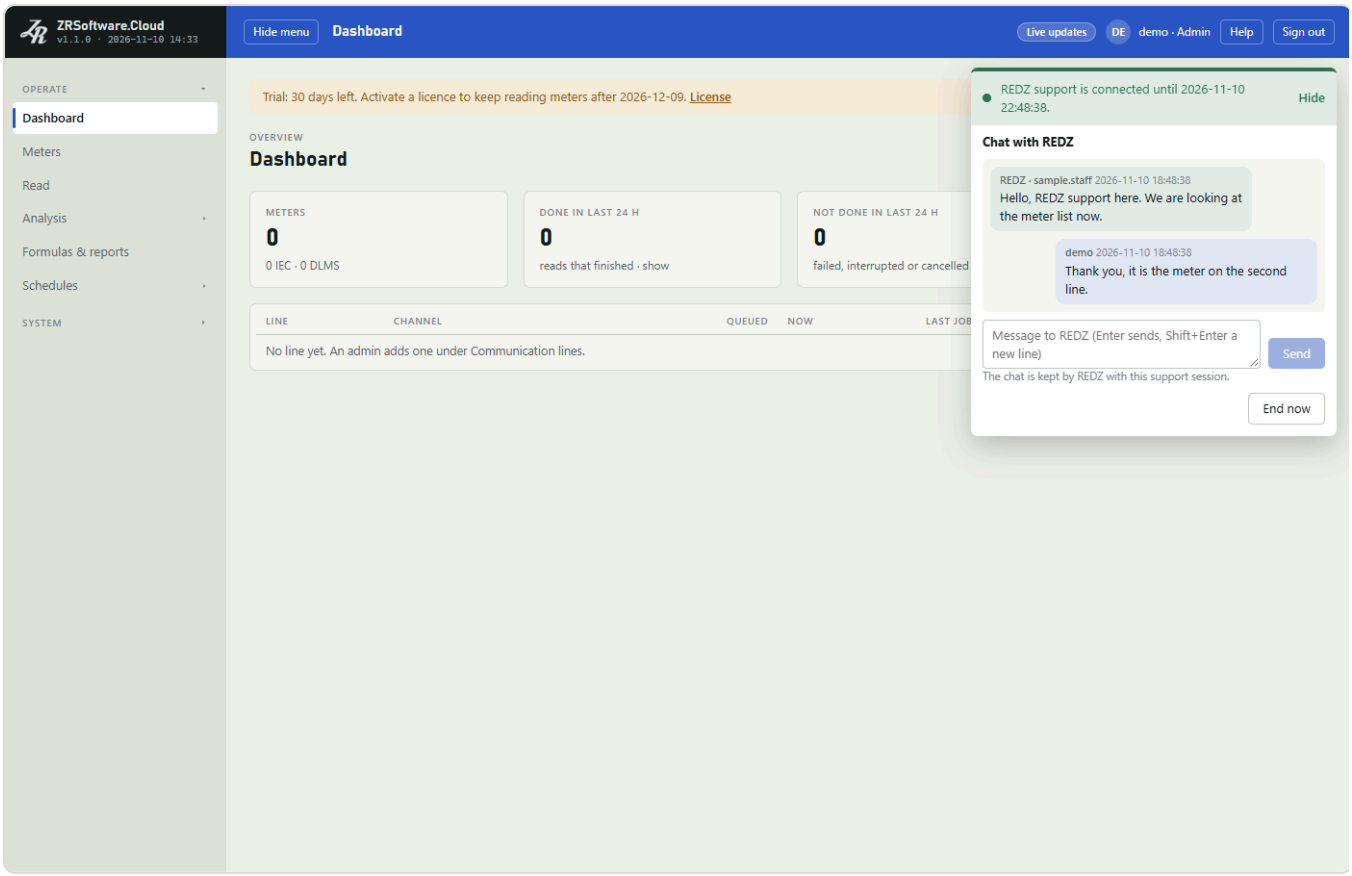


Figure 19.1 The green window at the top right of every page while a REDZ support session runs: a line from REDZ and the admin's answer (sample).

1. Type your message in the box at the bottom of **Chat with REDZ**, at most 2000 characters. Enter sends it; Shift+Enter starts a new line.
2. Or click **Send**.

Each message shows who wrote it and when: your messages carry the user name you signed in with, and REDZ's carry REDZ and the user name of the REDZ staff member. The messages from this program are on the right, REDZ's on the left. While the window is open, it asks for new messages every 5 seconds.

If the licence server cannot be asked for a moment, the window says "REDZ could not be asked just now" with the reason, and tries again.

End now in the window ends the session like the button on the **Support** page. When the session ends, by you, by REDZ or by its time, the green window goes away, and **Jobs & events** has the row that says how it ended.

What REDZ support can do

REDZ support signs in with its own user, which is not in your **Users** list. That user can sign in only while the time runs. When it ends, the user is turned off.

While a REDZ support session runs, REDZ support works with the rights of an Admin. It cannot change the settings on the **Remote access** card, its own account or the support

session; the program refuses with "REDZ support may not change remote access, the REDZ support account or the support session". It cannot change or test the mail settings on the **Mail** card either, and it cannot change a user's e-mail address or remote sign-in, nor reset the password of a user who may sign in remotely; see Remote access and the mobile app.

Settings that are not set here can still come in during the session. Restoring a configuration backup adds the settings of the file that this program does not have yet: the mail and FTP settings without their passwords, the reactive ratio limits, the Line log choice and the number of days a phone stays trusted for remote sign-in. A restore needs an administrator only; it also works during a REDZ support session (see Settings). An import of a ZR Software 7 database, also a copy that REDZ support uploads, can set that database's mail server, with user name and password, when none is set here and the licence includes **Exports and e-mail**.

REDZ support can add users, Admins too, change their role, turn them on or off and reset a password, but not the password of the last enabled Admin. REDZ support types the one-time password. A user whose password is reset is signed out and must sign in with that one-time password, so ask REDZ for it; a user added this way signs in like any other user, sets an own password at the first sign-in, and stays after the session ends. Each of these changes leaves a row with the source Auth that names REDZ support's user; see Users.

> **WARNING**
> Everything else an administrator may do stays open while the time runs, also what cannot be undone: for example loading, moving or removing the licence, changing the **FTP** settings and meter passwords, deleting lines, schedules, exports, tariffs, formulas, reports and groups, removing the values of a virtual meter, scanning for REDZ devices, on this PC's networks or on up to 256 addresses in a range it types, showing the **Line log** again when it is hidden on **Settings**, downloading a configuration backup or restoring one, adding an export that e-mails data to any address, installing an update, importing, or sending the support bundle. An import during the session works as it does for you: the passwords in an Excel file and the meter passwords of a ZR Software 7 database are saved, and the old database's mail server comes in as said above. A configuration backup holds the program's lists without passwords, among them e-mail addresses and the addresses of the lines; see Settings. End the session with **End now** when the work is done.

What the event log shows

During a REDZ support session, **Jobs & events** gets a row with the source REDZ support for each change REDZ support makes or tries to make, and for each file or reading trace it takes: what was done, on which page, and the answer. A change that was refused or failed is a warning. What was typed, for example a password, is not in the row. Pages that REDZ support only looks at leave no row.

REDZ support takes a reading trace when it opens **Trace** on **Jobs & events**, or the **Line log** tab of **Meter detail** for a good registers reading: one row for each reading whose trace it shows. While the **Line log** is hidden on **Settings**, the program refuses the trace to REDZ support too; but REDZ support, working with the rights of an Admin, can show the **Line log** again, and that change gets a row with the source Settings as well as its REDZ support row.

When REDZ support saves the chart as a picture or prints a page, the program tells the service and Jobs & events gets a row.

A change of REDZ support's own password, of the **Remote access** card or of the support session is named "a closed setting"; a refused change of the mail settings or of a user names the page and item like any other row. Requests that only check or test leave such a row too, for example the preview of an import, a check of the licence or for updates, or a test of the FTP connection; while a licence request waits, the License page asks about it every 30 seconds and each time leaves a row. Saving an opened reading trace as a text file leaves no row of its own: opening the trace already did.

Rows with the same source also say when a session starts, with the user who asked for it, and when it ends: ended early by you, ended by REDZ, its time ran out, or it is over on the licence server. A row with the source Auth says when REDZ support signs in through REDZ's connection, with the session number; see Jobs & events. The chat messages are not in **Jobs & events**.

> **NOTE**
> Your details and the problem are seen by REDZ staff on the REDZ licence server. The licence server keeps the record of each support session and support bundle (who sent it, contact details, note) with no time limit; a support bundle's file is deleted after 90 days. The chat lines (time, who wrote it - the user name in the program or of the REDZ staff member - and the text) are kept on the licence server with the support session, with no time limit. The program keeps only the lines of the running session while it runs. The chat says so in short: "The chat is kept by REDZ with this support session." The name you type in the first request and the licence number become the name of this PC's connection at REDZ; later requests keep it.

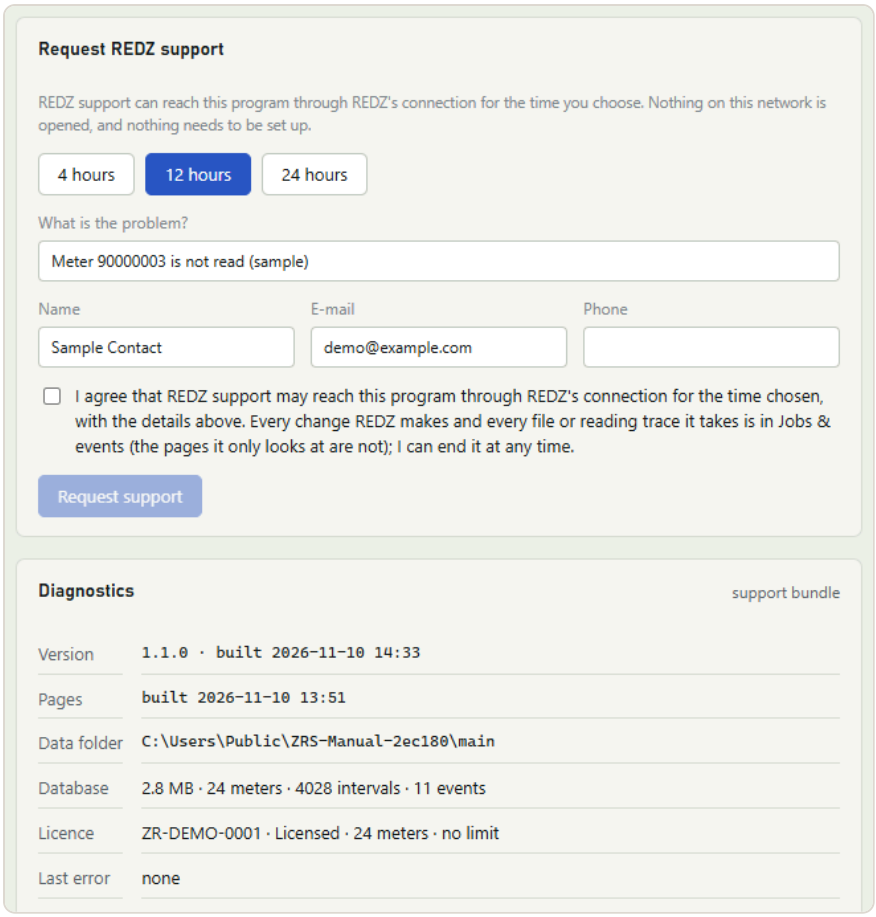


Figure 19.2 The Request REDZ support card filled with sample details before agreeing, and the top of the Diagnostics card.

Diagnostics

The **Diagnostics** card shows the facts support asks for first:

Line	What it shows
Version	The program's version and build date.
Pages	When the pages in the browser were built.
Data folder	The folder that holds the program's database, logs and licence.
Database	The size of the database and how many meters, profile intervals and events it holds.
Licence	The licence number, its state in the words of the **License** page, the number of meters and the meter limit.
Last error	The time, source and text of the latest error in the event log, or "none".

What is in the support bundle

Below the facts, the table **In the support bundle** lists every file of the bundle with its **Size** and **What it holds**, before you download or send anything. The list is made the same way as the bundle itself.

File	What it holds
about.json	Version, build, Windows and .NET version, the PC name, the data folder, the database size and counts, the licence (number, customer, partner, state, features, limits, dates, machine ID), the last error, and what setup recorded: the version, the program and data folders, the port, the path of a ZR Software 7 database, the times of install and upgrade, and setup's options.
config.json	Lines, meters, schedules, exports, tariffs, formulas, reports, users and settings, without passwords.
events.csv	The event log of the last 90 days.
jobs.csv	The reading jobs of the last 30 days: meter, kind, state, times, outcome and message.
logs/	The service's daily log files (the program keeps 14 days, at most 50 MB).
setup.log	What setup did: install, upgrade, uninstall.
README.txt	What is in the bundle and what is not.

What stays out

The lists in the bundle are built field by field; only the service log files and setup.log are copied whole. These stay out:

- the database and its backups, and imported old databases;
- passwords in the lists: meter passwords (config.json says only whether a meter has one), the mail password, the FTP password and user passwords;
- keys and tokens: a setting whose name contains password, secret, key, token or hash never goes into the bundle, even when it is not marked secret (the fingerprint of a trusted SFTP server key, which is not secret, is in the event log);
- the licence file;
- meter readings and load profile values.

> **NOTE**
> config.json holds meter serial numbers and locations, the addresses of the lines (IP address, COM port), user names, the targets of the exports (folders and e-mail addresses) and the settings that are not secret, among them the mail and FTP servers with their user names, the port, type and folder of the FTP server, and the settings of the **Remote access** card except its **Site key**, such as the **Relay** address and the **Site** name. The event log in the bundle also names the FTP server and the fingerprint of a trusted SFTP server key. Support needs them to look at a problem.

Downloading the bundle

1. Click **Download support bundle**.
2. The browser saves the zip as a download. The name has the PC name and the time, for example ZRSoftware_support_OFFICE-PC_20261017-1430.zip; the green banner shows the name.
3. Send the file to REDZ support, or to the partner you bought the program from.

Each download writes a line to the event log with the file name, its size and the user who made it; see Jobs & events.

Sending the bundle to REDZ support

The part **Send to REDZ support** of the **Diagnostics** card, below the download button, sends the same bundle straight to REDZ support.

1. Under **What happened? (optional)**, describe the problem.
2. Fill in **Name**, **E-mail** and, if you like, **Phone**, so REDZ can answer you. The bundle can also be sent without them.
3. Read the agreement and tick it. It lists what the package holds, the mail and FTP server and user names among them, and says that REDZ uses it only to answer this request, keeps it for 90 days and deletes it earlier on request.
4. Click **Send**. It is available only while the agreement is ticked; nothing is sent without it, and it must be ticked again for every bundle.

With the bundle go the licence number, this PC's machine code, the program version, your text and your contact details. A green banner shows the ticket number REDZ gave the bundle, its size and how many days REDZ keeps it, and a line goes to the event log with the ticket and the user who sent it.

REDZ takes a bundle of at most 30 MB. It is kept on the REDZ licence server for 90 days, where REDZ staff can open it, and then deleted. The ticket stays there with its number, your text and your contact details.

If REDZ refuses the bundle, for example when it is larger than 30 MB, or REDZ support cannot be reached, a red banner says so; download the bundle and send it by e-mail instead.

> **NOTE**
> The program remembers the name, e-mail and telephone number you type on this PC and fills them in the next time you request support, send a bundle or request a licence. Emptying a box does not make the program forget what it remembered; the details stay in the program's data folder on this PC.

20 Troubleshooting

This chapter lists the messages the program itself shows, why they appear and what to do. The service's messages appear in a banner on the page or under a form; the result of a meter read appears on the **Read** page and in the **Message** column of the **Jobs** page of **Jobs & events** (see Jobs & events). A message that contains a name, a number or a time is described here in words, not quoted.

> **NOTE**
> The **Jobs**, **Event log** and **Communication log** pages of **Jobs & events** show a user who sees only some meters (see Users) only the jobs and rows of those meters, the runs of exports of such a meter included. Rows that belong to no single meter, for example sign-ins, settings, the runs of schedules, the runs of exports of a formula or a report, exports skipped because of the licence, imports, the licence, updates and REDZ support, are shown only to users who see all meters, and always to admins.

Signing in

What you see	Why	What to do
"Wrong user name or password", sometimes with the number of attempts left or with the news that the account is now locked	The user name is unknown or the password is wrong. On **My password** the **Current password** is wrong.	Type both again. After five wrong passwords in a row the account is locked for 15 minutes (see Signing in and the window).
A message that there were too many wrong passwords, with the minutes to wait, or "The account is locked"	The account is locked after five wrong passwords in a row, also when they were typed as the **Current password** on **My password** or as sign-in codes in the phone app.	Wait the minutes the message names, at most 15, or ask an admin for a new one-time password (see Users).
"The account is disabled"	An admin has disabled the account.	Ask an admin to enable it on the **Users** page (see Users).
"The two new passwords are not the same."	**New password** and **New password again** differ.	Type the same password in both boxes. **Show the password** shows what you typed.
"The password must be at least 10 characters"	The new password is too short.	Choose a password of 10 characters or more.
"The password must not be the user name"	The new password is the user name.	Choose another password.

What you see	Why	What to do
"The new password must differ from the current one"	The new password is the same as the current one, or as the one-time password.	Choose another password.
The sign-in page appears while you work, with "The session has ended. Sign in again."	A session lasts 8 hours. It also ends when an admin changes your role, your password or the meters you see, or disables the account, and when your password is changed in another sign-in.	Sign in again (see Signing in and the window).
"The setup link is used or expired. Sign in as admin with the one-time password."	The setup link of the setup's Finish page works once and for 15 minutes.	Sign in as admin with the one-time password (see Installation and first start and Signing in and the window).

> **NOTE**
> On **My password** the same messages of the service start with a small letter, for example "wrong user name or password".

A user who still knows the password changes it on **My password** (click your user name in the top bar). A user who has lost the password gets a new one-time password from an admin (see Users).

When no admin can sign in, because the admin password is lost, the account admin is disabled, or the account admin is locked and you cannot wait for the 15 minutes of the lock to end, an administrator of the PC gives the account admin a new one-time password:

1. Open Windows PowerShell started as administrator: right-click it and choose Run as administrator.
2. Run the program's file with the switch `--reset-admin-password`: in PowerShell type & "C:\Program Files\REDZ\ZR Software\ZRS.Service.exe" `--reset-admin-password` and press Enter (in a Command Prompt started as administrator the same line without the & at the start).
3. The command shows the user name admin and a new one-time password, and, in lines that start with "Also:", anything else it changed. Its last line names the file admin-initial-password.txt in the data folder, where it also writes the user name and the password.
4. Sign in as admin with that password. The page **Set your password** opens; set your own password (see Signing in and the window).

> **NOTE**
> If PowerShell or the Command Prompt was not started as administrator, the command changes nothing, shows "Run this in a PowerShell (or Command Prompt) started as administrator" and ends with the exit code 5. Close it and open it again with Run as administrator.

The command also enables and unlocks the account admin and ends its open sessions; the old admin password no longer works. The **Event log** page of **Jobs & events** keeps a warning that starts with "admin password reset from the command line" and names the Windows account that ran the command.

> **WARNING**
> The command always makes the account admin an enabled administrator again: if an admin had disabled it or changed its role, it is enabled and gets the role Admin; the lines "Also:" and the warning in the **Event log** say so. If the account should stay disabled, an admin disables it again on the **Users** page (clear **Enabled**) after signing in with another admin account.

To see the user name and the one-time password again, open Windows PowerShell started as administrator and type Get-Content "C:\ProgramData\REDZ\ZR Software\admin-initial-password.txt" (the data folder when Windows is on drive C). The window shows the user name and the one-time password; the file is deleted when you change the password at the first sign-in.

The pages do not open

The pages come from the Windows service of the program, not from files on the desktop. When the browser cannot open http://127.0.0.1:5080, check these points in this order:

1. Is the service running? Its name in Windows is ZRSoftware.Cloud (service name ZRSoftware); Installation and first start lists how it is set up. If it is stopped, start it and open the address again.
2. Is it the right port? If a port other than 5080 was chosen during the setup, the address uses that port. The desktop shortcut ZRSoftware.Cloud, if the setup made one, opens the port the setup used.
3. Is the address typed on this PC? The service answers at 127.0.0.1, the PC itself.

1. If the service stops again by itself, look at the newest file in the folder Logs of the data folder (C:\ProgramData\REDZ\ZR Software when Windows is on drive C). The service writes its warnings and errors there, one file per day, named zrs- and the date. What the setup did is in setup.log in the same data folder. Only the service, Windows itself and programs started with administrator rights can open the data folder; other Windows users of the PC cannot. If the service runs, the support bundle contains these files (see Support); otherwise send the files themselves to REDZ support, or to the partner you bought the program from; like the bundle, they can hold line addresses.

After a crash, Windows starts the service again after one minute, for the first two crashes; after a third crash it stays stopped until it is started again. The count starts again after a day without a crash (see Installation and first start).

When the pages are open but the top bar shows **Not live** instead of **Live updates**, the live connection to the service is down; the page then changes only when you act. If it stays **Not live**, check that the service runs, as above.

If a button answers with a message that starts with 503 while the service is stopping, for example during an update's install or a restart of the service, the service has stopped taking requests and did nothing. Wait until the service runs again and the top bar shows **Live updates**, then try again.

Reading a meter

A read that fails ends with an outcome such as No answer or Login failed, shown in the job's chip (see Reading meters), and a message. The messages below are the most common. The **Line log** on the **Read** page and **Trace** on the **Jobs** page of **Jobs & events** show what went to the meter and what came back; the **Line log** tab of **Meter detail** shows it for a good registers reading. They are there for operators and administrators.

> **NOTE**
> If the **Line log** card, the **Trace** button and the **Line log** tab are missing also for operators and admins, an admin has chosen **Hide on this installation** on the **Line log** card of **Settings**, or a restored configuration backup brought that choice. The trace is still recorded with each reading; **Show to Operators and Admins** and **Save** bring them back (see Settings).

> **NOTE**
> When a read was tried more than once, its message starts with the number of the attempt and ends, in brackets, with what the attempt before gave (see Jobs & events). The messages below are the part in the middle.

What you see	Why	What to do
A message that the line is disabled (Error), for a read that a schedule started	The meter's line is switched off. Nothing was sent. The **Read** page does not start a read on such a line; it shows a banner (see the next table). **Read now** for the meters chosen on **Meters** leaves such a meter out; the note after it lists the meters not read, the first five by name with the reason, such as "its line is turned off". **Completeness** leaves it out of the missing intervals it reads, with the same reason in the meter's row.	An admin ticks **On** for the line on **Communication lines** (see Communication lines), or takes the meter out of the schedule.
A message that starts with "cannot open", followed by the COM port or the IP address and port and the reason	The service could not open the line; the reason follows the channel, in the program's own words, for example "the connection was refused" or "the address could not be resolved". For a TCP line one reason is that the address did not answer within 5 seconds.	For a TCP line check the **IP address** and **TCP port** of the line and that the gateway or modem is switched on. For a serial line check that the **COM port** is still in the line's list; a port that Windows no longer lists is shown with **(not present)**.
A message that the port or the host is not allowed on this service	The service is set up with a list of allowed COM ports or networks, and the line is outside it.	Use a port or an address from the list the message names, or ask whoever set up the PC.
A message that starts with "LineBusy" and says the meter is still sending	Before the sign-on the service heard the meter still sending on the line. Nothing was sent.	Read again when the meter has stopped sending. A scheduled read tries again by itself when its **Attempts** are more than 1.
"The meter did not answer (check the probe alignment and the address)" (No answer)	No identification came back after the IEC sign-on.	On an optical line, check that the probe sits on the meter's optical port. Check also the meter's **Physical address** and the line (see Meters and groups).
A message that the probe is in a mode that does not make the IEC opening (No answer)	The REDZ BT probe is set to a mode in which it does not open the meter.	Set the probe to IEC auto or command mode, as the message says, and read again.

What you see	Why	What to do
"The meter did not answer the IEC sign-on" (No answer)	The service sent the IEC opening first (an optical line, or a TCP line with the IEC opening box ticked) and the DLMS meter did not answer it.	Check the probe and the line's **Interface**: an optical line opens the meter first, an electrical line talks DLMS directly; on a TCP line the box **IEC opening before DLMS (Landis+Gyr over TCP)** decides (see Communication lines).
A message that there was no answer at a server address and that the physical address may be wrong (No answer)	The DLMS meter did not answer at any address the service tried.	Check the meter's **Physical address** (see Meters and groups).
"the meter record has no HDLC physical address (1..16383)" (Not supported)	The DLMS meter needs an address, and the service has none it can use.	Type the address in the meter's **Physical address** (see Meters and groups).
"The answer is not an identification message" (No answer)	Something answered the sign-on, but not with a meter identification.	Look at the **Line log** on the **Read** page, or **Trace** on the **Jobs** page of **Jobs & events**, to see what came back, and check the line and the meter's settings.
"no password is stored for this meter; nothing was sent" (Login failed)	The DLMS meter needs a password and none is stored.	Type the password in the meter's **Meter password** (see Meters and groups).
"the meter refused the association" (Login failed)	The DLMS meter refused the sign-in (with the stored password, where the meter type uses one).	Where the meter type uses a password, check it and type it again in **Meter password**. The job does not try a refused sign-in again.

What you see	Why	What to do
A message that the meter refused every password candidate, or that no Itron password could be used because the serial number is not 8 digits (Login failed)	When the registers of an Itron meter are read, the service tries the stored password and, when it is refused, passwords made from the serial number; the meter refused them all. When the serial number is not 8 digits, no password is sent. A password made from the serial number that the meter accepts replaces the stored password, and **Jobs & events** says so.	Check the meter's **Serial no.** and **Meter password** (see Meters and groups).
"the stored password cannot be opened on this machine; enter it again" (Login failed)	The password was stored on another PC, for example in a copied database.	Type the password again in the meter's form (see Meters and groups).
"The data block ended without ETX and BCC" or "BCC does not match; the block is not trusted"; for a load profile "The profile block ended without ETX and BCC" or "BCC does not match; the profile block is not trusted" (Bad checksum)	The meter's answer arrived incomplete or damaged; the values are not stored.	Read again. A scheduled read tries again by itself when its **Attempts** are more than 1.
"No data block after the option select (speed switch?)" or "No profile block after the request" (No answer)	The meter answered the sign-on but sent no data after it.	Read again. If it keeps coming back, send the trace to REDZ support, or to the partner you bought the program from, as described below.
"The meter answered P.01(ERROR) (no profile in the range, or the request is not accepted)" or "The meter refused the profile request (NAK)" (No data)	The meter holds no load profile for the days asked, or does not accept the request.	Choose days for which the meter keeps a profile.

What you see	Why	What to do
A message that the meter type is not read through the REDZ BT probe (Not supported)	Only IEC 62056-21 meters are read through the REDZ BT probe. Nothing was sent.	Read a DLMS meter on a line without the probe (see Communication lines).
A message that the type, or this kind of read for the type, is not read by the service yet (Not supported)	The program does not read this meter type, or this kind of read for it.	Check the meter's **Type** (see Appendix: supported meters).
A message that starts with "licence:" (Error)	The job was queued before the licence stopped the reading, or the meter is over the licence's meter limit: the message then says that the licence allows a number of meters, how many are registered and that only that many of the meters registered first are read. Virtual meters count toward the limit too. Under a meter limit, the queued job of a meter that was archived in the meantime ends with "the meter is archived: with the licence's meter limit only active meters are read".	See the **License** page and License. For the meter limit, archive a meter you no longer read, or ask REDZ or your partner for a larger licence.
A message that ends with "timed out after", a number of seconds and " (the longest a job may run)" (Cancelled)	The job ran longer than the service lets one job run, and was stopped there.	Read fewer days of load profile at a time, then read again.
A message that ends with "cancelled: the service stopped" (Cancelled)	The service was stopped while the job ran.	Read the meter again.
"the service stopped while this job was running" (Interrupted)	The service ended while the job ran, before the job was closed.	Read the meter again.

Some reads are refused before they start, and the **Read** page shows the reason in a banner:

What you see	Why	What to do
"That meter is archived or virtual, so it is not read. Choose a meter above."	The page was opened for an archived meter, or for a virtual meter, which has no line.	Choose another meter. An archived meter is read again after an admin restores it; a virtual meter's values are entered or imported (see Meters and groups and Analysis).
A banner that the meter's line is turned off, and **Read now** is unavailable	An admin has switched the line off.	An admin ticks **On** for the line on **Communication lines** (see Communication lines).
A banner that the service does not read meters of the meter's type yet, and **Read now** is unavailable	The program does not read this meter type.	Check the meter's **Type** (see Appendix: supported meters).
"a profile read needs from < to (meter calendar)"	The **To** day is not after the **From (meter calendar)** day.	Choose a **To** day after the **From (meter calendar)** day.
"a profile window is at most 31 days"	The load profile days are more than 31 days apart.	Read the days in parts of 31 days or less.
The licence message, for example that the trial has ended	The licence does not allow reading now.	See License and the licence messages below.
A message that the licence allows a number of meters and that only the meters registered first are read	The licence has a meter limit and this meter is not among the meters registered first, as many as the limit. Virtual meters count toward the limit too; a virtual meter among the first takes a place but is not read. Its data stays; it is only not read.	Archive a meter you no longer read, or ask REDZ or your partner for a larger licence (see License).

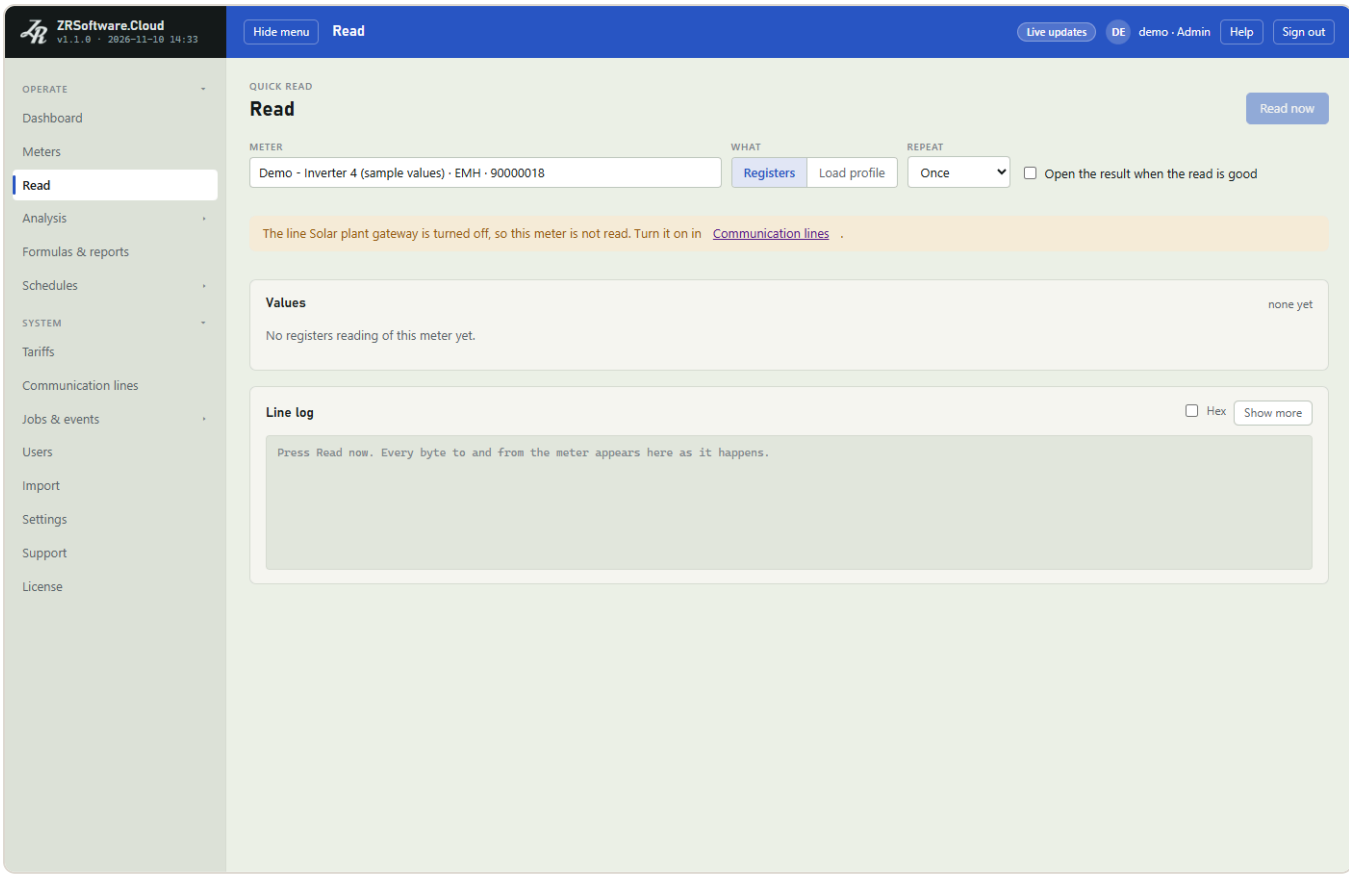


Figure 20.1 The Read page with a sample meter whose line is switched off: Read now is not available and the page says that the line is turned off.

If a message keeps coming back, open **Trace** for the job on the **Jobs** page of **Jobs & events**, save it with **Save as .txt** and send it, together with the support bundle, to REDZ support or to the partner you bought the program from. The bundle itself does not hold the trace. An admin can also send the bundle straight to REDZ support from the **Diagnostics** card of the **Support** page (see Support); the saved trace then still goes separately.

Lines and meters

What you see	Why	What to do
After **Delete** on **Communication lines**, a message that a number of meters use the line, archived ones included	A line is deleted only when no meter uses it, also no archived meter, which keeps its history.	Move the meters to another line with **Move to line** on **Meters** first (tick **Show archived** to choose the archived ones too), or keep the line and clear its **On** box (see Communication lines).
After **Delete**, a message that the line has a job waiting or running	A job of the line is still queued or running.	Delete the line when the job has finished.
Under the meter form, a message that the meter is already on the list, with that meter's location	Another active meter has the same type and serial number.	Open the meter that is already on the list and change it there (see Meters and groups).

What you see	Why	What to do
Under the meter form, "this meter has read values: a read meter does not become virtual (its read values would be open to hand edits). Add a virtual meter instead."	The meter was given the type Virtual, but it has been read; its read values stay as they were read.	Keep the meter's type, and add a new meter of the type Virtual for the values you want to enter (see Meters and groups).
After **Restore**, a message that the licence allows a number of meters	A restored meter counts against the licence's meter limit again, and the limit is reached.	Archive a meter you no longer read first, or ask REDZ or your partner for a larger licence.
After **Scan** in **Scan REDZ devices**, "No CKL gateway answered. Try the web page scan with the network's addresses."	The program got no answer to the Announce question on this PC's networks while it waited, about 3 seconds.	Choose **Web page (HTTP 80) in a range**, type the first and the last address of the network in **From** and **To**, and scan again; or type the gateway's **IP address** and **TCP port** yourself (see Communication lines).
After **Scan**, a message that starts with "the Announce port 30303 cannot be used on this PC"	The program could not use the UDP port 30303 on this PC for the Announce question; the reason follows in brackets.	Use the web page scan, as the message says.
After a web page scan, a message that no REDZ device is in these addresses, or that the range is not right	No web page in the range named REDZ; or **From** and **To** are not IPv4 addresses, **To** comes before **From**, or the range holds more than 256 addresses.	Check that the gateway is on and in that range, correct the range (at most 256 addresses), and scan again.

Completeness, Demand monitor and PDF files

What you see	Why	What to do
On **Completeness**, after **Show**, a message that at most a number of days or of meters can be shown, or "to is before from"	The table shows at most 93 days and 500 meters at a time, and the **To** day must not be before the **From (meter calendar)** day.	Choose fewer days or fewer meters, or correct the days, and click **Show** again.

What you see	Why	What to do
After the button that reads the missing intervals on **Completeness**, a meter's row says "not read:" and a reason, for example "its line is turned off" or that its profile read is still waiting or running	That meter was left out: its line is turned off, the service does not read the profile of its type, a profile read of it is still queued or running, or the licence does not let it be read. The other ticked meters got their jobs; the line above the table counts the jobs and the meters left out.	Solve the reason, for example wait for the open job or turn the line on, and click the button again. Only the last 31 days up to **To** are looked at.
On **Demand monitor**, after **Watch** or **Save**, at the top of the page, "this meter is watched already", "give one target: a kWh for the hour, a virtual meter or a formula", "the target meter must be a virtual meter (its hours are typed in or imported)" or a message that at most 100 meters are watched	A meter is watched once; a watch has exactly one target, and a meter as the target must be a virtual meter. At most 100 meters are watched at a time. Only the meter types named in the label of the meter box (L&G, Itron, Iskra DLMS, Cewe) can be watched.	Edit the existing watch of that meter instead, give one target, or remove a watch you no longer need (see Analysis).
On **Demand monitor**, "the meter of a watch does not change: remove it and watch the other meter"	A watch keeps its meter; **Edit** changes only the target and the addresses.	Remove the watch and watch the other meter.
On **Demand monitor**, the column **Read every** says "paused for a scheduled read", or that the line is not read because it is disabled	"Paused for a scheduled read": a read job of the same line comes first, and the monitor waits for it. The line is disabled: an admin has switched it off; the monitor looks again every 10 seconds.	Nothing for a paused line: the rounds go on after the job. For a line that is switched off, an admin ticks **On** on **Communication lines** (see Communication lines).
On **Demand monitor**, the column **State** says error, or shows a message under the state, for example "no password is stored for this meter; nothing was sent"	The last round could not read the meter's present power; the message gives the reason, as for a read of the meter.	Solve it as in the reading table above, for example type the meter's password on **Meters**.

What you see	Why	What to do
On the **Event log** page of **Jobs & events**, a warning of the source "Demand monitor" that the warning mail was not sent, with the reason	The hour's projection went over the target and the program tried to e-mail the watch's addresses with the settings of the card **Mail**; the mail could not be sent. The warning row itself is there.	An admin checks the card **Mail** on **Settings** with **Send test e-mail**, and the addresses of the watch.
After **PDF**, a message that a PDF holds at most 20000 rows	The table would have more than 20000 rows, for example a long range in a short step.	Choose a coarser step or a shorter range, or save the Excel file instead, as the message says.

Schedules and exports

What you see	Why	What to do
A schedule does not run; its row has the chip **off**	The schedule is turned off.	An admin edits it and ticks **On** (see Automatic reading).
A schedule or an export brought in by **Import** does not run; its row has the chip **off**	New schedules and every export that the import adds come in turned off, so that meters are not read twice and files are not sent twice while ZR Software 7 still does it. The import from an Excel file says so in its notes; the import of the ZR Software 7 database does not.	When ZR Software 7 no longer reads the meters or sends the exports, an admin edits each one and ticks **On** (see Import).
On the **Event log** page of **Jobs & events**, a warning of the source "Schedule" that a schedule was skipped	The licence does not allow reading, or does not include schedules. The run is not made later.	See License.

What you see	Why	What to do
A meter of a schedule gets no job	The meter is archived or has no line, or it still has a queued or running job from the same schedule, or, for a schedule that reads only what is missing, nothing is missing, or it is over the licence's meter limit. For a meter whose job is still open, the **Event log** has a warning of the source "Scheduler" that meters were skipped; for meters over the limit, the warning says how many meters were not read and that the licence reads only the meters registered first.	Check the meter on **Meters** and the open jobs on the **Jobs** page of **Jobs & events**. For the meter limit, see License.
After **Run now** on **Schedules** > **Automatic reading**, "the licence does not include Schedules", or the licence's message, for example that the trial has ended	"The licence does not include Schedules": the licence leaves schedules out. The licence's message: meters are not read now (see the note below the licence table); **Automatic reading** then leaves the menu, and a page that was still open shows the message.	See the state on the **License** page and License.
A job that fails with a message that starts with "the meter's clock is not known"	The registers read made first to learn the meter's clock failed.	Solve the reason given in the brackets of the message, as in the reading table above.
"this month never has that day"	The fields name a date that never occurs, such as day 30 of month 2.	Change the day or the month.
"the folder is required"	An export to a folder has no folder.	Type a folder.
"the folder must be a full path (D:\Exports or \\server\share\folder)"	The folder is not a full path.	Type the full path, with the drive or the server.
A message that the folder is a file, not a folder	The path names an existing file.	Type the path of a folder.
A message that starts with "the service cannot write to" and the folder	The service could not write a test file to the folder, for example because its account has no right to write there or the drive or share cannot be reached; the reason follows, for example "access was denied" or "the network path was not found".	Give the service's account the right to write there, or choose another folder (see Export schedules).

What you see	Why	What to do
"set the mail server and the From address in the Mail card in Settings first", when you save an e-mail export	The mail settings are missing.	An admin fills in the card **Mail** on **Settings**.
A run with the result Failed and an error that starts with "mail:"	The file was written, but the e-mail was not sent; the reason follows.	Check the mail settings with **Send test e-mail** (see Export schedules).
"Not sent:" and a reason, after **Send test e-mail**	The test e-mail was not sent: a mail setting is missing ("no mail server" or "no From address"), the stored mail password cannot be read on this PC, or the mail server refused it. The reason follows.	An admin checks the server, port, security, user name and password of the card **Mail** on **Settings**.
On the **Event log** page of **Jobs & events**, a warning of the source "Mail" that starts with "account notice" and says that it was not sent, with the reason	The program e-mails a user a notice, for example when the password was changed or the account was locked, and admins one about the licence, to the address in the user's **E-mail**; the mail could not be sent with the settings of the card **Mail**. The address in the row is partly hidden.	An admin checks the card **Mail** on **Settings** with **Send test e-mail**, and the user's **E-mail** on **Users** (see Users).
A run with the result Skipped and "the meter is archived" or "the meter does not exist"	The export's meter is archived or was removed.	Edit the export or delete it.
A run with the result Skipped and a message that the formula or report no longer exists	The export's source was deleted.	Edit the export or delete it.
A run with the result Skipped and "the licence does not include formulas" or "the licence does not include reports"	The export's source is a formula or a custom report, and the licence leaves that part of the program out.	Ask REDZ or your partner for a licence with that feature.

What you see	Why	What to do
On the **Event log** page of **Jobs & events**, a warning of the source "Export" that an export was skipped	The licence does not allow reading, or does not include exports. **Run now** still works while only reading is stopped.	See License.
A run with the result Failed and another error	Making or writing the file failed; the error gives the reason.	Try **Run now** after the reason is solved.

FTP

The same reasons appear in two places: after "Not connected:" when an admin clicks **Test connection** on the card **FTP** of **Settings**, and after "ftp:" in a failed run of an export with the target **FTP server**. When a run fails, an admin can repeat the connection with **Test connection** (see Settings).

What you see	Why	What to do
"the server is a host name or address, without ftp:// and without spaces"	The **Server** box holds more than a host name or address.	Type only the name or address, for example ftp.example.com, and save again.
"a folder on the server is letters, digits, spaces and / _ . - (no \ and no ..)"	The folder holds another character, or a .. part.	Use only letters, digits, spaces and / _ . - in the folder.
"set the FTP server and user in the FTP card in Settings first", when you save an export with the target **FTP server**	The card **FTP** has no saved server or no saved user name.	An admin fills in **Server** and **User name** on the card **FTP** and saves.
"no FTP server: set it in the FTP card in Settings"	The server or the user name is not saved on the card **FTP**.	Fill in both and click **Save**.

What you see	Why	What to do
"the stored FTP password cannot be read on this PC: enter it again in the FTP card in Settings"	The password was stored on another PC, for example in a database moved from there.	Type the password again on the card **FTP** and save.
A reason that starts with "sign-in:"	The server did not accept the user name or the password, or, with **SFTP**, the server accepts only key files; the reason follows. After another **Server**, **Port** or **Type** was saved without a password, no password is stored any more.	Check **User name** and **Password**, save, and test again.
A reason that starts with "TLS: the server's certificate is not trusted", or another reason after "TLS:"	With **FTPS (explicit TLS)** the server's certificate is not from an issuer this PC trusts or does not match the server's name, or the encrypted connection could not be made. Nothing was sent.	Use the server name the certificate is made for, or ask the server's administrator about the certificate.
"the server's key is not trusted yet: check it and trust it in the FTP card in Settings"	With **SFTP**, the server's key has not been trusted on this PC yet. Nothing was sent.	Click **Test connection** on the card **FTP**; compare the key it shows with the one from the server's administrator and click **Trust this key** (see Settings).
"the server's key changed: it is not the trusted one (nothing was sent)"	With **SFTP**, the server showed a key other than the trusted one.	Ask the server's administrator. Trust the new key with **Trust this key**, after **Test connection** shows it, only when the change is confirmed.
A reason that starts with "SSH:" and says that the key exchange negotiation failed	With **SFTP**, setting up the secure connection with the server failed.	Ask the server's administrator which methods the server allows for the connection.
"no answer within the time limit"	Connecting and uploading together took longer than the service's limit of 90 seconds, for example with a large file on a slow connection.	Check **Server**, **Port** and **Type**, and test again.

What you see	Why	What to do
A reason that starts with "upload:" or "size check:"	The server took the connection but refused the file, or holds a file of another size than the one sent. The service then tries to delete the .part file on the server.	Ask the server's administrator whether the account may write, rename and delete files in that folder, then run the export again.
Another reason: a technical name, a colon and a text	The connection or the transfer failed for another reason, which the text gives; for a network error the text is in the program's own words, for example "the connection was refused" or "the address could not be resolved". A refused upload, or a refused rename of the .part file to the file's name, also comes this way; the message names what failed.	Check **Server**, **Port** and **Type** on the card **FTP**, and test again. If the server refused the file or the rename, ask the server's administrator whether the account may write, rename and delete files in that folder.

NOTE

When an upload fails, the service tries to delete the .part file on the server. A file ending in .part can stay on the server when the upload or the check after it fails. A file ending in .old that stays on the server is the earlier file of that name: it stays when it could not get its name back or could not be deleted, and also when the time limit ran out during the renaming. When no file of that name is on the server, the .old file is the earlier file: give it its name back or run the export again before you delete anything. The program does not look for such files on the server later (see Export schedules).

Updates

The **Updates** card on **Settings** is for admins (see Settings). When a check fails, its reason stands after the time of **Last check**; after **Check now** the **Event log** of **Jobs & events** also gets a warning of the source "Update" that starts with "update check failed:". When a download or an install is refused, the reason appears in a banner on the card, and the **Event log** gets a warning of the source "Update" that starts with "update download refused:" or "update install refused:". What the updater did last is a line on the card, above the buttons.

What you see	Why	What to do
"Updates come from the REDZ licence server; this PC has no address for it.", and **Check now** is unavailable	The service on this PC has no address of REDZ's licence server; the setup gives it this address.	Ask REDZ support, or the partner you bought the program from.

What you see	Why	What to do
After **Last check**, or in a banner after **Download**, a reason that starts with "the licence server could not be reached"	This PC did not reach REDZ's licence server, or, after **Download**, the file could not be written on this PC; the reason follows in brackets, after a download for example "the disk is full".	Check the PC's internet connection and click **Check now** or **Download** again.
After **Last check**, "no update list has been published yet"	REDZ's licence server has no list of versions yet.	Nothing; try again later.
A reason that starts with "licence server:" and gives an HTTP number	The licence server answered the check or the download with an error.	Try again later; if it comes back, contact REDZ.
After **Last check**, a reason that starts with "the update list was refused:"	The list that came from the licence server did not pass the program's check of REDZ's signature, or is not a list for this program. Nothing is offered.	Contact REDZ.
A note that a version was released after your maintenance ended, and the chip "after your maintenance"	The licence's maintenance ended before that version came out, and no newer version than the installed one came out before the end. **Download** is not offered.	Contact REDZ about the maintenance (see License).
A note that one version is included in your maintenance and a later one came out after it	The later version came out after the licence's maintenance ended. The card offers the included version.	Download and install the included version if you want it, and contact REDZ about the maintenance for the later one (see License).
In a banner, "check for updates first" or "download the update first"	The step before was not done, or its file is gone.	Click **Check now**, then **Download**, then **Install**.
In a banner after **Download**, a reason that starts with "the downloaded setup does not match the signed update list"	The file that arrived is not the one the signed list names. It was deleted; nothing is installed.	Click **Download** again; if it comes back, contact REDZ.

What you see	Why	What to do
On the card, above the buttons, a line with a date and time and "update refused:" and a reason	The updater checks the downloaded setup once more before it runs it, and refused it. Nothing was installed.	Click **Download** again, then **Install**; if the line comes back, contact REDZ.
On the card, above the buttons, a line that the setup of a version was started and "see setup.log for the upgrade"	The updater started the setup of the new version. What the setup then did is not on the card.	Look at setup.log in the data folder (see Installation and first start).

Configuration backup

What you see	Why	What to do
After **Check** on the card **Configuration backup**, "the file is not a configuration backup of ZRSoftware.Cloud", "the file is not a configuration backup (not JSON of ZRSoftware.Cloud)" or "the file is larger than 20 MB: not a configuration backup"	The chosen file is not a backup that **Download a backup** of this program made.	Choose the file that **Download a backup** saved: its name starts with ZRSoftware_Backup_ and goes on with the date and time, .json.
After **Check**, a message that the backup is of a newer version and that this program is to be updated first	The backup was made by a newer version of the program than the one on this PC.	Update this program first (see Settings), then check the file again.
After **Check** or **Restore**, a note that a number of meters were left out because the licence allows a number of meters	The backup holds more meters than the licence of this PC allows; the meters over the limit are not added. Formulas, reports, exports and Demand monitor watches that need such a meter, and schedules left with none of their meters, are left out too (the column **Left out**).	Ask REDZ or your partner for a larger licence, or archive meters you no longer read, then check and restore the file again; what is already here is kept (see License).

What you see	Why	What to do
After **Check** or **Restore**, a note that added meters had a password, or "the mail and FTP passwords do not travel: enter them in Settings if those settings were added"	A backup holds no password. Added meters, and mail or FTP settings that were added, come without their passwords.	Type the meter passwords on **Meters** and the mail and FTP passwords on **Settings**.

Setup

What you see	Why	What to do
When you run the setup of a newer version by hand, "This version is not covered by the maintenance of the installed licence, so it would not read meters. Nothing was changed: the installed version keeps reading. See the details."	The licence on this PC has a maintenance end, and the new version was built after it. With that licence the new version would not read meters, so the setup stops before it changes anything. The details and setup.log in the data folder name the day the version was built, the licence and the end of its maintenance.	Keep the installed version, or install a version released by the end of the maintenance, or ask REDZ to extend the maintenance and run the setup again (see Installation and first start and License). Removing the program and installing the new version does not help: the licence stays in the data folder, and the new installation stops in the same way.
When you install the program anew, "This version is not covered by the maintenance of the licence in the data folder, so it would not read meters. Nothing was installed. See the details."	The data folder still holds the licence of an earlier installation, and its maintenance ended before this version was built. Nothing is left installed.	Install a version released by the end of the maintenance, or ask REDZ to extend the maintenance and run the setup again (see Installation and first start).

REDZ support

While a REDZ support session runs, REDZ support works with the rights of an Admin. It can add users and give a new one-time password to a user who has no remote sign-in. It cannot change its own account or the support session, give or change a user's e-mail address or remote sign-in, reset the password of a user who has remote sign-in, or reset the password of the last enabled Admin. It cannot change or test the mail settings on the **Mail** card or change the remote access settings on the **Remote access** card. Settings that are not set here can still come in during the session. Restoring a configuration backup adds the settings of the file that this program does not have yet: the mail and FTP settings without their passwords, the reactive ratio limits, the Line log choice and the number of days a phone stays trusted for remote sign-in. A restore needs an administrator only; it

also works during a REDZ support session. An import of a ZR Software 7 database can set that database's mail server when none is set here (see Support).

What you see	Why	What to do
On the **Event log** page of **Jobs & events**, a warning of the source "REDZ support" that names what REDZ support changed, deleted or used, followed by refused and the session number	The service refused a change REDZ support tried: one that is closed to it, such as the mail settings on the **Mail** card, remote sign-in for a user or the password of the last enabled Admin, or one with a value the service does not take from any user. What was refused is named by its page or by its part of the program, for example Settings for the mail settings and Users for a user; a scan for REDZ devices is named Lines; a change of REDZ support's own password, of the remote access settings or of the support session is named only "a closed setting". What was typed, for example a password, is not in the row.	Nothing. If the change is needed, an admin of this PC makes it on this PC.
The same kind of warning, followed by failed and the session number	The change REDZ support tried failed in the service itself.	Tell REDZ support.
A warning of the source "REDZ support": "REDZ support could not connect; ask REDZ"	During a REDZ support session, REDZ's connection to this program could not be made.	Ask REDZ, as the message says.
In the green window of the support session, "REDZ could not be asked just now:" and a reason	The program could not get the chat from REDZ just then; the lines already shown stay.	Nothing at first: the window asks again every 5 seconds. If the message stays, check the PC's internet connection.
After **Send** in the green window, a message that starts with "REDZ support could not be reached"	The program could not reach REDZ just then; the line was not sent.	Check the PC's internet connection and click **Send** again.

What you see	Why	What to do
After **Send** in the green window, a message that the session already has 500 messages	One support session keeps at most 500 chat lines. A line holds at most 2000 characters; the box takes no more.	Call REDZ, as the message says.
After **Send**, "no REDZ support session is running" or a message that the support session has ended	The session ended, by its time or because you or REDZ ended it, before the line was sent. The line was not sent.	If you still need REDZ, request a new session on the **Support** page (see Support).

Remote access

What you see	Why	What to do
On the card **Remote access** of **Settings**, after **Turn on** or **Save**, "remote access needs the relay address, the site name and the site key", "the relay address must start with https://";, "the site name is lower-case letters, digits and inner hyphens, as the relay gave it" or "the site key is the long key the relay gave for this site"	A box is empty or holds something other than what the relay gave for this site.	Type the **Relay** address, the **Site** name and the **Site key** exactly as you received them (see Remote access and the mobile app).
After **Save**, "a remembered device lasts 1-365 days"	**Trusted phones for (days)** is outside 1 to 365.	Type a number from 1 to 365.
After **Turn on**, or next to **State**, "the licence does not include remote access; REDZ support still works (Support page)"	The licence leaves remote access out, or meters are not read now (for example the trial has ended): remote access closes with the reading. Requesting REDZ support on the **Support** page still works.	Look at the state on the **License** page; ask REDZ or your partner for a licence with Remote access (see License).
Next to **State**, "the stored site key cannot be read on this PC: enter it again"	The site key was stored on another PC, for example in a data folder copied from there.	Type the **Site key** again and click **Save**.

What you see	Why	What to do
Next to **State**, a message that the site belongs to another product on the relay, or has no owner there and is not a ZRSoftware.Cloud site; the **Event log** has a warning of the source "Remote access" that the relay connection was ended	The site name and key are not those of a site made for this program. The program does not try again until the settings change.	Check the **Site** name and the **Site key** with whoever gave them to you, correct them and click **Save**.
After **Pair a phone**, "the licence does not include the mobile app (ZRSoftware.Mobile)" or the licence's message	Pairing a phone needs a licence that includes **Mobile app**, and a licence that reads meters now.	Ask REDZ or your partner for a licence with Mobile app (see License).
After **Pair a phone**, a message that starts with "the relay would not issue a pairing code", or "the relay answered without a code" or "the relay could not be reached"	The relay refused to give a code for this site, or could not be reached from this PC.	Check the **Relay** address, the **Site** name and the **Site key**, and this PC's internet connection, then click **Pair a phone** again.
On **Users**, after ticking **Remote sign-in (through the relay)**, "set up the Mail card in Settings first: a remote sign-in needs the e-mailed code" or "the user needs an e-mail address for the sign-in code"	While the box **E-mail a sign-in code to remote users** is ticked, a remote sign-in needs a code that the program e-mails to the user, so the card **Mail** and the user's **E-mail** must be set.	Set up the card **Mail** on **Settings**, or type the user's **E-mail**, then tick the box again (see Remote access and the mobile app).

What you see	Why	What to do
A message that ends with "only on this PC or the local network, not through the relay"	The request came through the relay. From the phone app, passwords, new users, e-mail addresses, remote sign-in, the mail settings, the card **Remote access**, pairing a phone, and requesting or ending REDZ support are changed only on this PC or the local network. During a REDZ support session the message comes for an e-mail address, for taking remote sign-in away and for the mail settings; REDZ support can still add a user and give a new one-time password to a user without remote sign-in (see the REDZ support part above).	Make the change on this PC (see Remote access and the mobile app).
On the **Event log** page of **Jobs & events**, a warning of the source "Auth" that starts with "remote sign-in"	A sign-in from the phone app was refused because the user may not sign in remotely or has no e-mail address, the sign-in code could not be e-mailed, or a code was dropped after five wrong tries.	Allow **Remote sign-in (through the relay)** and type the user's **E-mail** on **Users**, or check the card **Mail**; after wrong codes, ask the user (see Remote access and the mobile app).

Licence

What you see	Why	What to do
"There is no licence on this PC. Activate one on the License page."	No licence is loaded and no trial runs on this PC. Meters are not read.	Activate a licence on the **License** page (see License).
A message that the trial ended on a date, followed by "Meters are not read and automatic exports do not run. Your data stays here: open License to activate."	The 30 days of the trial, counted from the program's first start on this PC, are over and no licence is loaded. A data folder copied from another PC does not start a new trial.	Activate a licence (see License).

What you see	Why	What to do
A message that the licence ended on a date and that meters are not read and automatic exports do not run	The licence's last day has passed.	Ask REDZ or your partner for a new licence and activate it.
The state **Version after maintenance** and a message that this version was built after the maintenance of the licence ended, followed by "Meters are not read and automatic exports do not run."	The installed version of the program was built after the licence's maintenance ended. The licence reads meters only with a version built by the maintenance end; the day of the build is in the program, not taken from the PC clock.	Install a version released by the day the message names, or ask REDZ to extend the maintenance (see License).
A message that the licence is for another PC, with how many machine parts match	The licence was made for another PC, or too many parts of this PC changed.	Ask REDZ or your partner for a licence for this PC (see License).
A message that the licence is for another PC because "it was made for a physical PC and this is a virtual PC"	The licence was made for a physical PC. On a virtual PC only a licence made for that virtual PC is valid.	Ask REDZ for a licence for this PC: on a virtual PC it is activated online (see License).
A message that the licence is for another PC because it knows fewer than 2 machine parts	A licence must be bound to at least two parts of a PC; this licence was made with fewer.	Ask REDZ for a new licence for this PC.
A message that starts with "licence server: this PC gives" and says that a licence needs at least 2 machine parts	The program could read fewer than two machine parts of this PC (Windows, the main board serial, the serial of the system disk, and on a virtual PC its virtual part), so the licence server cannot make a licence for this PC.	Contact REDZ, as the message says.

What you see	Why	What to do
"The PC clock is behind a time this service has already seen. Meters are not read until the clock is right."	The PC clock is more than 24 hours behind a time the program has already seen. Setting the clock back by less than that again and again adds up while the service runs. If the PC clock was set forward and then put right, the state is **Clock behind** and meters are not read. Reading starts again by itself when the PC clock is again less than 24 hours behind the latest time the program saw; the further the clock had been set forward, the longer that takes. With a licence that is checked online, a good check-in puts it right sooner.	Set the PC's date and time right. If the clock had only been set back, meters are read again once it is right. With a licence that is checked online, the program tries a check-in every 6 hours while meters are not read. Contact REDZ if you cannot wait.
A message that the licence does not include a feature, for example "the licence does not include Exports and e-mail"	The licence leaves out that part of the program; the message names it as the **License** page does. The analysis of a formula or a custom report also needs Analysis and tariffs, and importing a list of schedules or exports needs that part too. While meters are not read (see the note below the table), import, manual edits and schedules are closed too and their pages leave the menu; a page that was still open then shows the licence's message, for example that the trial has ended.	Ask REDZ or your partner for a licence with that feature. For the licence's message, see the rows above.
When you add or restore meters, a message that the licence allows a number of meters and how many are registered	The meter limit is reached. Virtual meters count toward the limit too.	Archive a meter you no longer read, or ask REDZ or your partner for a larger licence.
A message that starts with "the licence server could not be reached"	This PC did not reach REDZ's licence server over the internet; the reason follows in brackets. A check-in whose answer does not carry the licence server's signature for this request is shown on the **License** page as not reached too.	Check the PC's internet connection and try again. A PC without internet access takes a licence file with **Activate offline** (see License).
A message that starts with "licence server:"	The licence server refused the request; its reason follows, for example about the licence key.	Check the **Licence key** and try again, or ask REDZ.

What you see	Why	What to do
"the licence server does not take this request yet (HTTP 404): it is older than this program. Try again later or contact REDZ."	REDZ's licence server does not know this kind of request yet.	Try again later, or contact REDZ.
After **Remove** in **Remove the licence**, a note that the licence server did not free the seat, with the reason in brackets	The licence server was not reached or refused to free this PC's seat. The licence is removed from this PC all the same.	Give the removal code shown with the note to REDZ (see License).
A message that the licence server said on a date that this licence was withdrawn or moved to another PC, or that it does not know it on this PC	At a check-in, REDZ's licence server answered so. When the licence server says that the licence was withdrawn or moved, or that it does not know it on this PC, the program goes on reading meters for seven days and then stops (the state **Withdrawn**); a copy of a virtual PC stops at once. The seven days count from the day the licence server gives; the message, on the **License** page and in the strip at the top of the pages, says until when meters are read. After them automatic exports do not run either.	Contact REDZ. Your data stays on this PC.
A message that the licence server said this PC checked in with an old counter: "a copy of this PC, a second installation on it, or one put back from a backup"	The licence server saw a check-in from this PC with an older counter than the last one, so it takes this installation as a copy. Meters are read for 7 more days from that day; the message, on the **License** page and in the strip at the top of the pages, says until when. Then the state is **Withdrawn**. Activating the licence again does not change this answer; only REDZ can.	Contact REDZ. Your data stays on this PC.

What you see	Why	What to do
A message that this PC had not reached the licence server for more than 60 days and that meters are read until a date	A licence activated online is checked with REDZ's licence server; a PC that is not virtual checks in every 7 days. This PC has not reached the server for more than 60 days, so meters are read for 7 more days, counted from the end of the 60 days; then the state is **Withdrawn**. A licence file that REDZ made for a PC without internet access is not checked online and does not count these days.	Let the PC reach the licence server, for example by opening its internet access. After a good check-in, meters are read again.
"on a virtual PC the licence is activated online (a licence key or a licence request), not from a file: a file cannot tell a copy of this virtual PC from it"	This PC is a virtual machine (the License page marks it **virtual PC**). A virtual PC does not take a licence file, also not one put into the data folder; the licence message then starts with "The licence file was not accepted:".	Activate the licence with **Activate with a key** or **Request a licence** (see License).
On a virtual PC, a message that the licence server said this virtual PC checked in with an old counter	The licence server takes this as a copy of the virtual PC, or as a virtual PC put back from a snapshot. From its first answer the state is **Withdrawn**: meters are not read and automatic exports do not run.	Contact REDZ to use the licence on this virtual PC again. Your data stays on this PC.
On a virtual PC, a message that this virtual PC had not reached the licence server for more than 7 days and that meters are read until a date	A virtual PC checks in with REDZ's licence server every day, and it has not reached the server for more than 7 days. Meters are read for 7 more days; the message, on the **License** page and in the strip at the top of the pages, says until when. After them the state is **Withdrawn**, meters are not read and automatic exports do not run.	Let the PC reach REDZ's licence server, for example by opening its internet access. After a good check-in, meters are read again.

NOTE

While meters are not read - there is no licence, the trial or the licence has ended, the licence was withdrawn, is for another PC or does not cover this version, or the clock is behind - automatic exports do not run either. **Analysis**, formulas, custom reports and **Run now** on **Schedules** > **Export schedules** stay open when the licence includes them; import, manual edits, schedules and remote access, with sign-ins from the phone app, are closed until a licence reads meters again (see Remote access and the mobile app). Your data stays on this PC.

The reasons why a licence file is refused are listed in License.

Import

What you see	Why	What to do
"the file is empty"	The chosen file has no content.	Choose the right file.
"the file is not an Excel (.xls, .xlsx) or CSV file"	The contents of the file are not Excel or CSV, whatever its name.	Save the list from Excel as .xlsx or .csv and choose that file.
"the file is larger than 2 MB"	The file is over the limit.	Split the list into smaller files.
"the CSV file ends inside a quoted field"	A quotation mark in the CSV file is not closed.	Correct the file in Excel and save it again.
Import stays unavailable after you choose the file, and a banner says that rows have an error and nothing is saved, or "nothing to save: every row is already there"	At least one row is marked error, or no row is new or changed.	Correct the rows marked error in the file and choose it again (see Import).
"Line is empty: give the name of a line (Communication lines page)", or a message that no line has that name or uses that port or address	A meter row must name a line that exists; the import never adds a line.	Add the line on **Communication lines** first, or correct the row (see Communication lines).
"Serial no. is empty" or "Type is empty"	A required cell of the row is empty.	Fill in the cell.
A message that the path is not a file on this PC	The path is not a full path of an existing file.	Type the full path of zrs.s3db.
"the file is not a SQLite database", or a message that the path is not a SQLite database	The file is not a database.	Choose the database file of ZR Software 7, zrs.s3db.
A message that starts with "this is not a ZR Software 7 database"	The file is a database, but not one of ZR Software 7.	Choose the database file of ZR Software 7.

A Appendix: supported meters

The table lists the meter types that have been read on real meters with the program's meter drivers, with the protocol the program uses for each and what was read: the registers (the meter's values) and the load profile.

Meter type	Protocol	Registers	Load profile
EMH	IEC	Yes	Yes
Landis & Gyr (IEC)	IEC	Yes	Yes
Iskra (IEC)	IEC	Yes	No
Itron (Actaris)	DLMS	Yes	Yes
Iskra (DLMS)	DLMS	Yes	Yes
Cewe (Secure Meters)	DLMS	Yes	Yes
Landis & Gyr (DLMS)	DLMS	Yes	Yes

For the load profile of an Iskra meter that also speaks DLMS (such as the MT880), choose the type Iskra (DLMS); it needs the meter's password.

The meter form offers more meter types than the table shows. This manual describes the types in the table and the virtual meter, whose values are typed in or imported (see Meters and groups).

B Appendix: version history

This appendix lists, for each published version of ZRSoftware.Cloud, what changed for the people who use it. The version of the program is shown at the top left of the window, under the program's name (not in a very narrow window), on the sign-in page and in the **Diagnostics** card of the **Support** page (see Support).

Version 1.1.0

This version adds and changes the following:

- the menu has sections: **Analysis** with **Profile**, **Completeness** and **Demand monitor**, **Schedules** with **Automatic reading** and **Export schedules**, and **Jobs & events** with **Jobs**, **Event log** and **Communication log** (see Signing in and the window);
- **Help** in the top bar opens this manual on redzsoftware.com (see Signing in and the window);
- **Completeness** shows for each meter the share of each day's intervals that are stored, and reads the missing intervals of the meters you tick; the missing intervals are read from there now (see Analysis);
- **Demand monitor** reads the present power of the meters you choose in short rounds, projects the energy of the hour against a target, and warns in the event log and, when you give addresses, by e-mail (see Analysis);
- on **Profile**, the tables are saved as PDF files too, the monthly table also as the OSF form, and the channels carry their IEC 62056-6-1 names (see Analysis);
- a meter's multiplier can change from a date, kept in a **Multiplier history**, and a multiplier changed by an Excel import counts from the time of the import; **Meter detail** names the registers with their IEC 62056-6-1 names, and its **Billing history** saves the columns of ZR Software 7's billing file, in its order, also as a PDF file (see Meters and groups);
- **Tariffs** has a **Holidays** list for every tariff, which can take the Turkish public holidays of a year, and a tariff can have its own holidays set (see Tariffs);
- **Communication log** counts the read jobs of each meter per day: read and tried, saved as Excel or PDF (see Jobs & events);
- an administrator chooses which meters a user sees, by meter groups; users with an e-mail address get notices about their account; password boxes have **Show the password** (see Users);
- on **Settings**, **Configuration backup** saves the program's set-up in one file and restores it on this or another PC, and the Line log can be hidden on this installation (see Settings);
- administrators with an e-mail address get a letter in the last days before the trial or a licence with an end date ends, and when it stops the reading (see License);
- remote access: users you allow can work with the program from the ZRSoftware app on their phone, through a relay; the licence names these parts **Remote access** and **Mobile app** (see Remote access and the mobile app and License);

- a missing interval that ends at 00:00 is asked for again when the interval before it is stored, and a stored interval dated in the future, for example one imported from ZR Software 7 while the meter's clock was wrong, no longer cuts the next load profile read to the meter's present day, which could lose the interval that ends at 00:00 (see Reading meters);
- a COM port of a USB adapter with an FTDI chip, when Windows has recorded its serial number, shows the program's own label followed by (USB): for a KMK optical probe its model and serial number, for another FTDI adapter the word FTDI and the adapter's serial number (see Communication lines);
- a message about a Windows error gives the program's own English words instead of the PC language's text (see Troubleshooting).

Version 1.0.1

This version changes the following:

- on **Analysis**, **Monthly table** saves one energy channel of a month as an Excel file, with a row for each hour, a column for each day, and day and month totals (see Analysis);
- a meter is found by typing in its box on the **Read**, **Analysis**, **Formulas & reports**, **Exports** and **Jobs & events** pages (see Reading meters);
- **Read**, **Analysis** and **Meters** keep the choices you made last in this browser (see Meters and groups);
- on **Meters**, a click on a column heading sorts the list, and **Read now** reads the registers of the chosen meters; **Meter detail** steps to the previous and next meter of the list and, for operators and administrators, has a **Line log** tab with the stored trace of a good registers reading (see Meters and groups);
- **Jobs & events** finds jobs by words, state, line and day, and shows them 200 at a time with **Older jobs** (see Jobs & events);
- a form that opens at the side of the **Communication lines**, **Meters**, **Tariffs**, **Formulas & reports**, **Schedules**, **Exports** and **Users** pages does not close with changes that are not saved on Esc, a click outside it or a menu link: it shows "Unsaved changes." with **Save**, **Discard** and **Keep editing**. Deleting a line, a meter group, a tariff, a formula, a report, a schedule or an export, archiving meters, removing the values of days on **Analysis**, moving or removing the licence, importing a ZR Software 7 database and installing an update ask first in their place on the page;
- the COM ports on **Communication lines** show the name Windows gives the device behind them, when Windows has one, and the form of a TCP line has **Scan REDZ devices**, for whose answers the setup adds a Windows Firewall rule (see Communication lines);
- after the PC clock was set forward and put right, **Clock behind** ends by itself once the clock is again less than 24 hours behind the latest time the program saw, and the warning on the **License** page is the licence's own message (see License);

- setup does not upgrade to, or install anew, a version built after the maintenance of the licence in the data folder ended: it says so, an installed version stays as it was, and nothing new is left installed (see Installation and first start and License);
- importing schedules or exports from an Excel or CSV file needs the **Schedules** or **Exports and e-mail** feature of the licence, as their pages do (see Import).

Version 1.0.0

The first version of ZRSoftware.Cloud. It includes:

- reading the meters of Appendix A over optical probes, serial and RS-485 lines and TCP gateways (see Appendix: supported meters and Communication lines);
- meters and groups, and reading billing values and the load profile on the **Read** page (see Meters and groups and Reading meters);
- the load profile analysis, tariffs, formulas and custom reports (see Analysis, Tariffs and Formulas & reports);
- schedules that read meters by themselves, and exports to a folder, by e-mail or to an FTP, FTPS or SFTP server (see Automatic reading and Export schedules);
- the list of reading jobs and the event log (see Jobs & events);
- the import of meters, schedules and exports from Excel or CSV files, and of a whole ZR Software 7 database (see Import);
- users with roles, and the settings of the program (see Users and Settings);
- updates of the program from REDZ on the **Settings** page (see Settings);
- a 30-day trial and a licence by request, by key or as a file (see License);
- REDZ support for a chosen time, with a green window on every page while it is connected and a chat with REDZ for administrators, and the support bundle (see Support).